FINAL

REMEDIAL INVESTIGATION REPORT

MILITARY MUNITIONS RESPONSE PROGRAM
REMEDIAL INVESTIGATION
CLOSED CASTNER FIRING RANGE
FORT BLISS
EL PASO, TEXAS

June 2018

Contract No.: W912DY-10-D-0025
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I have reviewed this document and certify that it contains accurate content and is sufficient to guide project execution.

SAKanga ______________________ 28 June 2018

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Shahrukh Kanga, PE, BCEE, PMP

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ACRONYMS AND ABBREVIATIONS

AGC	Advanced Geophysical Classification
ARAR	Applicable or Relevant and Appropriate Requirements
ASTM	American Society of Testing and Materials
bgs	below ground surface
BRA	Baseline Risk Assessment
BSI	Blind Seed Item
CA	Corrective Action
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHE	Chemical Warfare Materiel Hazard Evaluation
cm^2	square centimeter
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CMUA	Concentrated Munitions Use Area
CMS	CMS Environmental, Incorporated
CSM	Conceptual Site Model
CWM	Chemical Warfare Materiel
DDESB	Department of Defense Explosives Safety Board
DGM	Digital Geophysical Mapping
DGPS	Differential Global Positioning System
DID	Data Item Description
DMM	Discarded Military Munitions
DoD	Department of Defense
DQO	Data Quality Objective
DUA	Data Usability Assessment
EHE	Explosive Hazard Evaluation
EHSI	Environmental Hazard Specialists International, Incorporated
EM	Engineer Manual
EPC	Exposure Point Concentration
ESP	Explosives Site Plan

ACRONYMS AND ABBREVIATIONS (CONTINUED)

ESQD	Explosive Safety-Quantity Distance
ESTCP	Environmental Securities Technology Certification Program
^{o}F	Degrees Fahrenheit
FCR	Field Change Request
FS	Feasibility Study
ft	feet/foot
GIS	Geographic Information System
GPS	Global Positioning System
GSV	Geophysical System Verification
HE	High Explosive
HEAST	Health Effects Assessment Summary Tables
HFD	Hazardous Fragment Distance
HHE	Human Health Evaluation
HHRA	Human Health Risk Assessment
HI	Hazard Index
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HQ	Hazard Quotient
IAVS	Instrument Assisted Visual Survey
IAW	In Accordance With
ID	Identification
IDW	Investigation Derived Waste
IGD	Interim Guidance Document
Inc.	Incorporated
IS	Incremental Sampling
ISM	Incremental Sampling Methodology
ITRC	Interstate Technology Regulatory Council
IVS	Instrument Verification Strip
lb	pound
LIDAR	Light Detection and Ranging

ACRONYMS AND ABBREVIATIONS (CONTINUED)

LUC	Land Use Control
MC	Munitions Constituents
MD	Munitions Debris
MDAS	Material Documented as Safe
MDEH	Material Documented as an Explosive Hazard
MDL	Method Detection Level
MEC	Munitions and Explosives of Concern
MEC HA	Munitions and Explosives of Concern Hazard Assessment
MGFD	Munition with the Greatest Fragmentation Distance
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeter
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MQO	Measurement Quality Objective
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
mV	millivolt
MYBP	million years before present
NA	Not Applicable
NCMUA	Non-Concentrated Munitions Use Area
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCR	Non-Conformance Report
NDAA	National Defense Authorization Act
OB/OD	Open Burn / Open Detonation
OE	Ordnance and Explosives
PCL	Protective Concentration Level
PD	Point Detonating
PE	Professional Engineer
PIKA	PIKA International, Incorporated

ACRONYMS AND ABBREVIATIONS (CONTINUED)

Pirnie	Arcadis/Malcolm Pirnie, Incorporated
PMP	Project Management Professional
PRG	Preliminary Remediation Goals
PWS	Performance Work Statement
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAGS	Risk Assessment Guidelines for Superfund
RAL	Residential Assessment Levels
RAO	Remedial Action Objective
RCA	Root Cause Analysis
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RTK	Real Time Kinematic
SAA	Small Arms Ammunition
Shaw	Shaw Environmental, Incorporated
SI	Site Inspection
SLERA	Screening Level Ecological Risk Assessment
SPLP	Synthetic Precipitation Leaching Procedure
SSL	Soil Screening Level
SUXOS	Senior Unexploded Ordnance Supervisor
TAC	Texas Administrative Code
TBC	To Be Considered
TCEQ	Texas Commission on Environmental Quality
the JV	PIKA International, Incorporated – Arcadis/Malcolm Pirnie, Incorporated Joint Venture, Limited Liability Corporation
TCLP	Toxicity Characteristic Leaching Procedure

ACRONYMS AND ABBREVIATIONS (CONTINUED)

TPP	Technical Project Planning
TRRP	Texas Risk Reduction Program
TSD	Team Separation Distance
TxDOT	Texas Department of Transportation
UCL	Upper Confidence Limit
UFP	Uniform Federal Policy
UPL	Upper Prediction Limit
U.S.	United States
USACE	United States Army Corps of Engineers
USAE	USA Environmental, Incorporated
USAEC	United States Army Environmental Command
USAESCH	United States Army Engineering and Support Center, Huntsville
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UXB	UXB International, Incorporated
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
UXOTI	Unexploded Ordnance Technician I
UXOTII	Unexploded Ordnance Technician II
UXOTIII	Unexploded Ordnance Technician III
VSP	Visual Sample Plan
WAA	Wise Area Assessment
WERS	Worldwide Environmental Remediation Services
WP	White Phosphorous
XRF	X-Ray Fluorescence
%	percent

EXECUTIVE SUMMARY

The PIKA International, Incorporated (Inc.) (PIKA) – Arcadis/Malcolm Pirnie, Inc. (Pirnie) Joint Venture, Limited Liability Corporation (hereafter, the JV) prepared this Remedial Investigation (RI) Report on behalf of the United States (U.S.) Army Corps of Engineers (USACE) to further remedial activities under the Military Munitions Response Program (MMRP) at the Closed Castner Firing Range Munitions Response Site (MRS) (Closed Castner Range MRS), located on Fort Bliss, in El Paso, Texas between U.S. Highway 54 and the Franklin Mountains State Park. By completing the RI, the USACE is in compliance with the Defense Environmental Restoration Program statute (10 United States Code 2701 et seq.), which requires that MMRP activities be carried out subject to and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended (42 United States Code § 9601 et seq.,), and the National Oil and Hazardous Substances Pollution Contingency Plan. This RI Report is consistent with the U.S. Environmental Protection Agency (USEPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA, 1988) and the *Munitions Response Remedial Investigation/Feasibility Study Guidance* (Department of the Army, 2009).

This report describes work performed in the Closed Castner Range MRS in accordance with the field investigation procedures presented in the Final Quality Assurance Project Plan (QAPP) MMRP RI for the Closed Castner Range, Fort Bliss, Texas (PIKA/Arcadis JV, 2015), as modified by two field changes required based on the site conditions. All activities regarding personnel, equipment, and procedures in areas potentially containing munitions and explosives of concern (MEC) hazards were conducted consistent with requirements of the U.S. Army Engineering and Support Center, Huntsville (USAESCH), USACE, Department of the Army, and Department of Defense (DoD).

ES 1.1 OBJECTIVE

The overall goal of the RI was to gather sufficient information to characterize the nature and extent of MEC [including unexploded ordnance (UXO) and discarded military munitions (DMM)] and munitions constituents (MC), and to assess the potential risk and hazards to human health, safety, and the environment arising from potential MEC and MC, if any. The secondary goals of the RI were to collect information to update the Munitions Response Site Prioritization Protocols (MRSPPs) and the conceptual site model (CSM).

ES 1.2 REMEDIAL INVESTIGATION FIELD WORK SUMMARY

The JV conducted initial MEC RI field activities at the MRS between February 29 and June 20, 2016. A smaller UXO team re-mobilized to the site to complete anomaly resolution in Lots 8, 9 and 10 from October 16-21, 2016. The MEC Investigation was performed in three phases as follows:

- <u>MEC Phase I – Instrument Assisted Visual Survey (IAVS) in Areas with Slopes greater than 30 percent (%)</u>. 31.50 miles of 20-foot (ft) wide IAVS transects (76.36 acres) were conducted with all-metal detectors and handheld Global Positioning System units, along unofficial hiking trails and areas of slopes up to 35% to identify surface MEC, potential concentrated munitions use areas (CMUAs), and areas with high densities of munitions debris (MD) and/or range related features (e.g., craters). In addition, IAVS transects were conducted in potential CMUA 21 to determine if there was evidence of surface MEC/MD.

- MEC Phase II – Geophysical and Intrusive Investigation in Areas with Slopes Less than 30%. A total of 29.03 acres was investigated outside CMUAs to show that there is less than 0.1 UXO/acre to a 95% confidence level as follows:
    - 3,303 digital geophysical mapping (DGM) anomalies detected on 1,750,100-ft Wide Area Assessment (WAA) DGM transect segments (16.07 acres) were reacquired and intrusively investigated;
    - 29, 100-ft x 100-ft grids and one, 50-ft x 50-ft grid (6.71 total acres) were randomly located, DGM surveyed, and DGM anomalies were reacquired and intrusively investigated; and
    - a total of 456 randomly placed transects that were nominally 100-ft long (10.77 miles, or 5.22 acres) were investigated using analog (i.e., mag and dig) techniques in areas with slopes between 18 and 30% and outside of CMUAs.
- MEC Phase III – Additional Mag and Dig Investigations. Two high anomaly density areas, potentially representing CMUAs, were identified during Phase I within the western portion of the MRS. A total of 2.13 miles of analog transects (1.03 acres) were conducted within these potential CMUAs to determine the nature of subsurface anomalies and to determine the extent of MEC and MD.

The MC RI field activities were also performed in phases as follows:

- Phase I: Incremental Sampling Methodology (ISM) surface soil samples were collected June/July 2016, with resampling of some decision units for explosives in October/November 2016. Discrete soil sampling was performed in July 2016 and included collection of soil samples from potential small arms range backstop berms and arroyo depositional areas. Recollection of some berm samples was performed in April 2017. Collection of discrete surface water samples from arroyos and seep locations was conducted during a dry weather event in June 2016 and during a wet weather event in August/September 2016.
- Phase II: Phase II samples were collected in January 2017: 1) Additional ISM samples were collected to complete horizontal delineation around Phase I sample locations and to obtain data from newly identified/expanded CMUAs based on the results of the MEC RI, and 2) Additional discrete samples were collected at potential backstop berms and in arroyos to complete delineation and obtain a large enough data set to allow calculation of the 95% upper confidence limit (UCL) concentration for comparison to the Protective Concentration Levels (PCLs). Additionally, a soil boring program was performed in

February 2017 to provide vertical delineation of MC and to demonstrate that the potential soil-to-groundwater pathway is incomplete.

A third investigation phase (planned for the installation of monitoring wells and collection of groundwater samples, if necessary) was not required because the soil to groundwater pathway was determined to be incomplete based on the results of Phase II sampling.

ES 1.3 REMEDIAL INVESTIGATION RESULTS

ES 1.3.1 NATURE AND EXTENT OF MEC

During RI intrusive activities, a total of six MEC items were identified and removed from the investigated areas, as follows: 37millimeter (mm) high explosive (HE) projectile (UXO); M19A1 rifle grenade, white phosphorous (WP) (DMM); 40mm M81 projectile still in cartridge (DMM); 37mm HE projectile (UXO); MK27 point detonating (PD) fuze (UXO); and a 60mm mortar fuzed (UXO). A seventh MEC item, a 3-inch Stokes Mortar (UXO), was discovered outside of the RI field investigation area while the field teams were transiting between investigation locations. Because the item was located outside of the investigation area, it could not be factored into the calculations of residual MEC density for the non-concentrated munitions use area (NCMUA). All MEC items were destroyed through demolition operations.

During the field investigation, 41 munition items containing residual tracer material were classified as material documented as an explosive hazard; a consolidated shot demolition operation was conducted on these items to remove the explosive hazard. Any munitions pieces remaining after the demolition event were inspected, the explosive hazard determined to be removed, and the items were then certified as material documented as safe (MDAS). A total of 1,714 MDAS items were found during the RI. The recovered MDAS consisted of the following: 88 flares, 49 fuzes, 299 grenades, 2 illumination rounds, 2 practice land mines, 39 mortars, 309 projectiles, 26 rockets, and 900 fragments (could not be positively associated with a specific type of munition.).

Based on an evaluation of the WAA and RI dig results, plus historical investigations and removal actions, the JV proposes to modify the CMUA boundaries as shown in **Table ES-1** and **Figure ES-1**.

Table ES-1: Revised CMUA Sizes

CMUA Number	Original Size (acres)	CMUA Expansion Size (acres)	Revised Size (acres)	Comments
1	632.4	288.1	920.5	Four expansion areas and merged with CMUA12
4	119.6	81.1	200.7	Two expansion areas
6	24.5	25.7	50.2	1 Expansion Area
8	8.8	73.7	82.5	1 Expansion Area

CMUA Number	Original Size (acres)	CMUA Expansion Size (acres)	Revised Size (acres)	Comments
10	0.0	114.9	114.9	Was not considered a CMUA in the Final QAPP.
12	23.2	-23.2	0.00	Now included in CMUA 1.
22	0.0	28.4	28.4	New CMUA identified during RI
23	0.0	29.5	29.5	New CMUA identified during RI
Total CMUA	808.5	618.2	1,426.7	--
Total NCMUA	5,994.5	-618.2	5,376.3	--
Total MRS:	6,803.0		6,803.0	--

Notes:
CMUA – Concentrated Munitions Use Area
NCMUA – Non-Concentrated Munitions Use Area
MRS – Munitions Response Site

The modified CMUA boundaries are based on the following information:

- CMUA 1 Area. This is a large CMUA in which a large amount of MEC and MDAS has been found within and adjacent to its boundary, including the two elevated anomaly density areas identified during the IAVS. MEC finds were identified during the 1998 investigation, the 1998 removal action, the 2004 removal action, the 2010 WAA, and the RI. MEC items identified during the WAA included a M18 smoke grenade, 75mm shrapnel, 37mm HE projectiles, and an M68. MEC found during the Environmental Securities Technology Certification Program's (ESTCP) advanced geophysical classification (AGC) live site demonstration in CMUA 1 included a 105mm projectile. MEC items identified during the RI included a 37mm projectile, a 40mm M81 projectile still in the cartridge, and a 60mm mortar fuzed. MDAS in the area included fragments of 37mm projectile, 75mm projectiles, and unidentified projectiles; rockets, fuzes, and unidentified fragments. Farther to the west of CMUA 1, a 40mm projectile MD was found in addition to previously listed items.
- CMUA 4 Area. A large amount of MEC and MDAS has been found within and adjacent to the north and south of the CMUA 4 boundary, including finds from the 1998 investigation, the 1998 removal action, the 2004 removal action, and the 2010 WAA (fragment grenade and 60mm HE mortar). MDAS in the area included rockets, grenades, 37mm projectile and fragment.
- CMUA 6 Area. A large amount of MDAS and MEC has been found to the south and west of CMUA 6 boundary, as presented in the Final QAPP. Several removal actions have

cleared MEC to the south of the site. Most of the MDAS found in this area during the RI could not be positively identified.

- CMUA 8 Area. A large cluster of MEC has been found within and surrounding the CMUA 8 boundary, the former open burn / open detonation (OB/OD) Area A-1, as presented in the Final QAPP. The MEC and MDAS found consisted of 20mm projectiles, 37mm projectiles, and fuzes.
- CMUA 10 Area. Limited MEC and a large cluster of MDAS has been found around the CMUA 10 boundary, as presented in the Final QAPP.
- CMUA 12 Area. This is an area to the southwest of CMUA 1 in which MEC was identified in the 1998 CMS Environmental, Inc. (CMS) investigation, the 2004 Removal Action, and the 2010 WAA (a 37mm armor-piercing HE projectile). MDAS has been identified in and around this area including fragments of 37mm projectile, 75mm projectiles, and unidentified projectiles; fuzes, and unidentified fragment.
- CMUA 22 Area. A cluster of MEC within and around the CMUA 22 boundary has been found, including finds from the 1998 removal action, the 2010 WAA (M29 practice rocket), and the RI (M19A.1 rifle grenade, WP). MDAS in the area included rockets and grenades.
- CMUA 23 Area. As presented in the Final QAPP, many MEC were identified within and to the east of CMUA 23, during the 1998 CMS investigation. The RI identified many grenade MD within and to the west/southwest of the CMUA 23 boundary. MDAS associated with fuzes and unidentified fragment were also found within the CMUA 23 boundary.

Based on the MEC found during this RI and previous investigations and removal actions, the potential exists that MEC is still present in the above areas.

The sampling goal, or null hypothesis, for the RI, as defined in the Final QAPP, was developed to determine to a 95% confidence level whether there are equal to or less than 0.1 UXO/acre within the NCMUA. Within the RI investigation area, a total of six MEC were found during the RI, one MEC was reported to be found in the WAA Report, and one MEC was found during the ESTCP AGC live site demonstration. The JV used UXO Estimator to calculate the upper bound of the MEC density and the upper bound of the total number of MEC that may remain within each of the CMUAs and the NCMUA. **Table ES-2** presents a summary of the amount of 100% investigation areas that were covered during the RI and WAA, the amount of MEC that was found during the investigations, and the estimated upper bound for the MEC density and total number of MEC. Included in these calculations are the results from the ESTCP's AGC live site demonstration; these data results are included in this RI since 100% of anomalies were intrusively investigated within grids that were randomly selected and this randomness is required for inclusion in the UXO Estimator calculation of residual MEC density. It should be noted the upper limits are an estimate of the maximum number of UXO that could remain within each area. The actual number of MEC remaining could be any number from zero to the upper limit. Based on this collective data captured in the RI, the UXO Estimator calculations indicate that there are up to 4,860 MEC remaining on Castner Range. The CMUA residual MEC densities range from 1.2 MEC/acre to 14.9 MEC/acre.

For the NCMUA, the results indicate that the residual MEC density is 0.123 to a 95% confidence level. Therefore, the collective results described in this RI indicate that the original sampling design and null hypothesis must be rejected for the revised hypothesis that the residual MEC density is less than or equal to 0.123 MEC/acre and that there is between 0 and 656 MEC still present within the NCMUA. This does not call into question the validity of UXO Estimator, but it does require us to reject the null hypothesis and accept a revised hypothesis that the residual MEC at the site is less than or equal to 0.123 MEC/acre to a 95% confidence level.

Table ES-2: Residual MEC Estimate

Area Name	Area Size for RI (acres)	Amount of 100% Intrusive Investigation[1] (acre)	Remaining Area to Evaluate (acres)	MEC Found during RI, ESTCP and WAA[2]	Residual MEC Estimate at 95% Confidence Level	
					Upper Bound of MEC Density (anomalies/acre)	Estimated Upper Bound of the Number of Residual MEC[3]
CMUA 1	920.47	6.44	914.03	3	1.2	1,097
CMUA 4	200.68	0.59	200.09	0	5.068	1,015
CMUA 6	50.23	0.20	50.03	0	14.931	748
CMUA 8	82.48	0.80	81.68	2	7.832	640
CMUA 10	114.9	1.64	113.26	0	1.81	206
CMUA 22	28.37	0.69	27.68	1	6.803	189
CMUA 23	29.48	0.28	29.20	0	10.617	310
NCMUA	5,376.39	50.89	5,325.50	2	0.123	655
Total:	**6,803.00**	**59.03**	**6,743.97**	**7.00**	**N/A**	**4,860**

Notes:
1 - The total 100% investigation area includes the acreage of RI Total Investigation Amount without the IAVS plus the WAA Transects Investigated during the WAA, the WAA DGM Transects with No Anomalies, and 2.5 acres of the ESTCP study area within CMUA 1 that were 100% intrusively investigated.
2 - As noted in ES 1.3.1, a 3-inch Stokes Mortar (UXO), was discovered outside of the RI field investigation area and is not be factored into the calculations of residual MEC density for the NCMUA.
3 - This represents the upper bound, or most, MEC within the area to a 95% confidence level. The actual number of MEC may be anywhere between 0 and the number contained in this column.

ES 1.3.2 NATURE AND EXTENT OF MC

Although this RI was performed under CERCLA, the Closed Castner Range is also regulated under a Resource Conservation and Recovery Act (RCRA) permit for Corrective Action (CA) issued by the Texas Commission on Environmental Quality (TCEQ). Therefore, key concepts from the TCEQ's Texas Risk Reduction Program, which is used to implement RCRA CA requirements in Texas, have been incorporated into CERCLA requirements for defining the nature and extent of contamination at the MRS and in preparation of this report.

The Affected Property is the extent of environmental media containing constituent concentrations equal to or greater than the Residential Assessment Levels (RALs). No metals were detected at concentrations that exceed the RALs in surface water (seep) samples. Therefore, there is no Affected Property for surface water. Twelve metals (antimony, arsenic, barium, chromium, copper, lead, manganese, mercury, molybdenum, selenium, vanadium, and zinc) were detected in ISM soil samples at concentrations that exceeded the RAL, and 11 Affected Property areas were identified. Three metals (arsenic, nickel, and zinc) were detected in arroyo soil samples at concentrations that exceeded the RAL, and eight Affected Property areas were identified.

The PCL Exceedance Zone is the portion of the Affected Property that contains environmental media with constituent concentrations in excess of the critical PCL. Two metals (antimony and lead) were detected in ISM samples at concentrations that exceeded the critical PCL and seven PCL Exceedance Zones were identified. Arsenic was the only metal detected in arroyo soil samples at concentrations that exceeded the critical PCL and one PCL Exceedance Zone was identified. Based on results of the soil boring program, the vertical extent of the Affected Property and the PCL Exceedance Zone is limited to the top four feet of the subsurface.

ES 1.4 MEC Hazard Assessment and MRSPP

The MEC Hazard Assessment (MEC HA) and MRSPP were developed for the Closed Castner Range MRS.

The MEC HA score calculated for the MRS is 871, which corresponds to an assigned Hazard Level of 1 (Highest Potential Explosive Hazard Condition), based on the types of munitions found and the potential for remaining munitions on the surface to encounter receptors at the site.

The MRSPP overall site priority was 2, with 1 being highest priority and 8 being the lowest. The MRSPP score presented in this report is preliminary and subject to change based on review by the Department of the Army MRSPP Quality Assurance Board.

ES1.5 Risk Assessment

ISM and arroyo data were used to complete the human health risk assessment (HHRA) and the screening level ecological risk assessment (SLERA). The HHRA concluded that the cumulative hazard index (HI) for soil is greater than the target HI of 1 for a future hypothetical resident at decision units BF052, BW057, CL071, CN073, DG070, and DK074; and in Arroyo Reach 3. The results of the SLERA indicated that calculation of an ecological-based PCL for lead was required for the protection of ecological receptors. However, the SLERA also determined that the concentrations of other metals in surface soil do not result in an unacceptable ecological risk. Therefore, calculation of, and comparison to, an ecological PCL for other metals was not required. The SLERA concluded that the potential for hot spots to exist at the MRS is negligible, and therefore a risk management recommendation relative to hot spots is not warranted for the MRS. The ecological PCL for lead was used to help determine the nature and extent of MC contamination for the MRS. The HHRA and SLERA are conservative and treat all metals in soil as being 100%

available. This assumption is likely to result in an overestimation of potential exposure to metals in soil by human and ecological receptors.

ES 1.6 RECOMMENDATIONS

ES 1.6.1 MEC

Based on the RI MEC results, the JV recommends that the boundaries of the CMUAs be modified to those shown on **Figure ES-1** and as discussed in **ES 1.3.1**. The remainder of the MRS (areas not within the expanded CMUA boundaries) is recommended to be treated as an NCMUA. A Feasibility Study (FS) to support the selection of viable alternatives for mitigating the potential safety risks to human health due to MEC is recommended for the entire MRS, including both the CMUAs and the NCMUA within the Closed Castner Range MRS. Although the NCMUA has a much lower likelihood for containing MEC than the CMUAs, two MEC were found within the NCMUA during the RI and the NCMUA should be included in the FS to support the selection of viable alternatives for mitigating the potential safety risk to human health due to MEC. The FS should evaluate the MEC hazards based on MEC locations found during the RI, WAA, and previous characterization and removal actions.

ES 1.6.2 MC

Eight PCL Exceedance Zones were identified in the MRS; seven are associated with ISM sample locations (located inside two CMUAs and one area immediately adjacent to a CMUA) and one is associated with two discrete arroyo soil sample locations (located inside one CMUA). Based on these RI findings, an FS is recommended to support the identification and evaluation of viable remedial alternatives for mitigating the potential risks to human health and the environment due to MC.

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

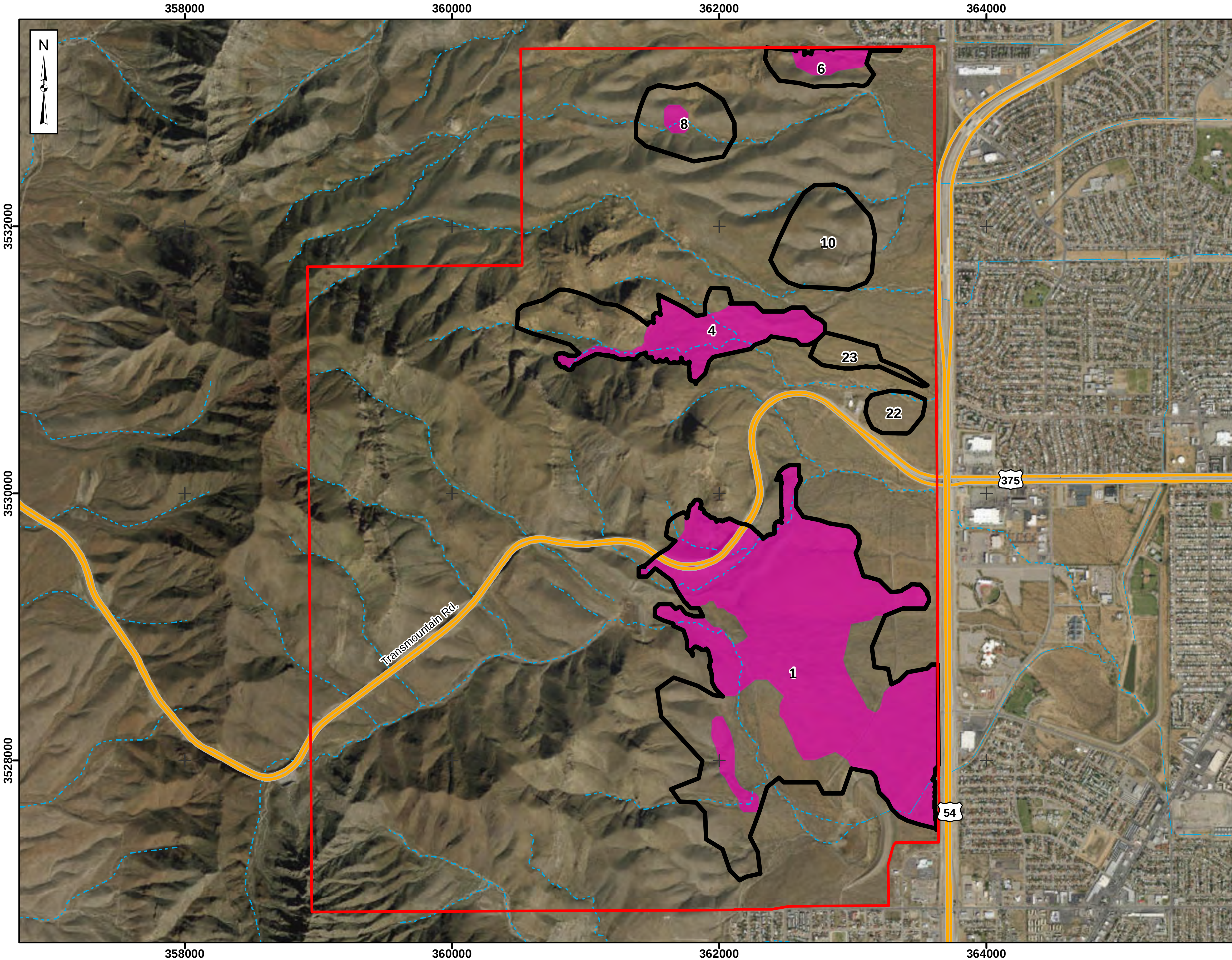


Figure ES-1
Revised CMUAs

Legend

- MRS Boundary
- CMUA prior to RI MEC data collection
- Revised CMUA based on RI MEC data collection
- Intermittent Stream
- Canal/Ditch

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

1 INTRODUCTION

The PIKA International, Incorporated (Inc.) (PIKA) – Arcadis/Malcolm Pirnie, Inc. (Pirnie) Joint Venture, Limited Liability Corporation (hereafter, the JV) prepared this Remedial Investigation (RI) Report on behalf of the United States (U.S.) Army Corps of Engineers (USACE) to further remedial activities under the Military Munitions Response Program (MMRP) at the Closed Castner Firing Range Munitions Response Site (MRS), at Fort Bliss, El Paso, Texas (Closed Castner Range MRS). By completing the RI, the USACE is in compliance with the Defense Environmental Restoration Program statute (10 United States Code 2701 et seq.), which requires that MMRP activities be carried out subject to and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended (42 United States Code § 9601 et seq.,), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This RI Report is consistent with the United States Environmental Protection Agency (USEPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA, 1988) and the *Munitions Response Remedial Investigation/Feasibility Study Guidance* (Department of the Army, 2009), and it has been prepared in accordance with (IAW) the U.S. Army Engineering and Support Center, Huntsville (USAESCH) Data Item Description (DID) Worldwide Environmental Remediation Services (WERS)-010.01 (2010), Environmental and Munitions Center of Expertise Engineer Manual (EM) EM 200-1-15 – Technical Guidance for Military Munitions Response Actions (USACE, 2015), and Engineer Pamphlet 1110-1-18 – Military Munitions Response Process (USACE, 2000a).

This report describes work performed in the Closed Castner Range MRS at Fort Bliss IAW the field investigation procedures developed in the Final Quality Assurance Project Plan (QAPP) Military Munitions Response Program Remedial Investigation for the Closed Castner Range, Fort Bliss, Texas (PIKA/Arcadis JV, 2015a), as modified by two field changes required based on the site conditions (see **Section 3.3** of this RI Report).

The JV performed this RI under USAESCH WERS Contract W912DY-10-D-0025, Task Order DS01. This Task Order and Performance Work Statement (PWS) were issued by the USACE Tulsa District, and the project is under the U.S. Army Environmental Command (USAEC) MMRP. The work required under the PWS (provided in **Appendix A**) falls under the Defense Environmental Restoration Program to address unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) located on current military installations. All activities regarding personnel, equipment, and procedures in areas potentially containing munitions and explosives of concern (MEC) hazards were conducted consistent with requirements of the USAESCH, USACE, Department of the Army (the Army), and Department of Defense (DoD). The 29 Code of Federal Regulations (CFR) 1910.120 also applies to all actions taken at this site.

1.1 Purpose and Objective

The purpose of this RI Report is to document the RI activities and findings for the Closed Castner Range MRS. The overall objective of the RI was to gather sufficient information to characterize the nature and extent of MEC, (including UXO and DMM), and MC, and to assess the potential risk and hazards to human health, safety, and the environment arising from potential MEC and MC, if any. The secondary objective of the RI was to collect information to update the Munitions Response Site Prioritization Protocols (MRSPPs) and update the conceptual site model (CSM).

1.2 Regulatory Framework

Although this RI was performed under CERCLA, the Closed Castner Range MRS is also regulated under a Resource Conservation and Recovery Act (RCRA) permit for Corrective Action (CA) (Permit No. 50296) issued by the Texas Commission on Environmental Quality (TCEQ). In Texas, RCRA CA requirements are implemented under the Texas Risk Reduction Program (TRRP). Therefore, substantive requirements from the TRRP have been included with CERCLA requirements for defining the nature and extent of contamination at the MRS and in preparation of this report as follows:

- <u>Protective Concentration Levels (PCLs)</u>. TRRP PCLs were used to screen analytical results and are included in the report data tables and figures.
- <u>Horizontal Delineation</u>. Constituent concentrations were delineated horizontally to the TRRP Residential Assessment Level (RAL), which was based on Tier 1 residential PCLs and ecological PCLs, if developed. **Section 6.1.1** presents a detailed discussion of the RAL development. The data tables in this report screen analytical results against the RALs. Figures present the extent of the Affected Property, which is the extent of environmental media containing concentrations above the RALs.
- <u>Vertical Delineation</u>. Vertical delineation was performed vertically to the method detection level (MDL) for explosives and perchlorate, and to background for metals.
- <u>PCL Exceedance Zone</u>. The data tables in this report also screen results against the critical PCL and figures present the PCL Exceedance Zone, which is the portion of the Affected Property with concentrations in excess of the critical PCL. The PCL Exceedance Zone is therefore the portion of the site which will require a remedy. **Section 6.1.2** presents a detailed discussion of the critical PCL.
- <u>Analytical Requirements</u>. Analytical laboratory reports meet TRRP requirements. Data Validation Reports meet the Data Usability Summary requirements IAW with TRRP and are included with the analytical data.

1.3 PROPERTY DESCRIPTION AND PROBLEM IDENTIFICATION

1.3.1 Project Location

Fort Bliss is located in three counties, Dona Ana and Otero counties in New Mexico and El Paso County in Texas. The cantonment area is situated adjacent to the city of El Paso, Texas and north of the city of Juarez, Chihuahua, Mexico. The installation encompasses approximately 1.1 million acres. **Figure 1-1** is a location map of Fort Bliss and the Closed Castner Range MRS.

The Closed Castner Range MRS (FTBL-004-R-01) is a closed firing range on Fort Bliss and located within El Paso, Texas between U.S. Highway 54 and the Franklin Mountains State Park; Transmountain Road bisects the range. The MRS is approximately 5 miles south of the New Mexico state line. The Site overview, including the MRS boundary, is shown on **Figure 1-2**. Based on the most recent survey (Brock & Bustillos Inc. Survey Report) which is presented in the Wide Area Assessment Field Demonstration Report (URS, 2012), the Closed Castner Range MRS encompasses 6,803 acres. This acreage differs from the 7,081.8 acres reported for the MRS in a 1983 Department of the Army memorandum, which declared the land was not disposable due to contamination (Department of the Army, 1983). For the purposes of this RI, the Brock & Bustillos survey acreage of 6,803 was used.

1.3.2 MRS Overview

Acquisition of the Closed Castner Range MRS by Fort Bliss began in 1926 with approximately 3,500 acres; by 1939, additional land was acquired to bring the total size of the range to 8,328 acres. From 1926 through 1966, the Closed Castner Range MRS was heavily used for small arms, artillery firing, and impact areas. A wide variety of munitions were used at the MRS, including: large caliber high explosive (HE) munitions, mortars, pyrotechnics, illumination flares, grenades, and small arms. Historical range boundaries and identified features from the 1930s through the 1960s are shown on **Figure 1-3**.

In 1966, all ordnance use at the Closed Castner Range MRS was discontinued. Range operations were then transferred to the Meyer Range Complex. In 1971, the Department of the Army declared the Closed Castner Range MRS excess to its needs. After range activities ended in 1966, the Closed Castner Range MRS was used for training demonstrations or demolition, with the exception of a cratering exercise in 1976. Several parcels (approximately 1,230 acres known as the Castner Range XD MRS) were transferred to non-DoD entities by 1983. The remaining land within the Closed Castner Range MRS was declared unsuitable for transfer (Department of the Army, 1983), and remains mostly unchanged since 1983 under the ownership of the Department of the Army in a closed range status. A portion of the MRS just north of Transmountain Road was sold to the City of El Paso where the U.S. Border Patrol Museum and El Paso Museum of Archaeology were established. Also, parcels for the Immigration and Naturalization Service Border Patrol Headquarters and Texas Department of Transportation are present on the southeast corner of the

MRS. The non-transferred portions of the Closed Castner Range MRS, equaling 6,803 acres, are covered by this RI.

1.3.3 Climate

The climate across Fort Bliss, including the Closed Castner Range MRS, is typified by low relative humidity, hot summers, and moderate temperatures during the spring and winter months. Higher elevations on the installation receive more precipitation and can, therefore, display semi- and sub-humid climatic zones.

The average annual precipitation at Fort Bliss ranges from 8 inches in the valley to 20 inches in the mountains. Warm, moist air from the Gulf of Mexico (and occasionally from the Pacific Ocean) causes thunderstorms in the region. Thunderstorm activity is prevalent between July and September, accounting for a majority of the area's annual rainfall. A dry season occurs from winter to early summer. Snowfall averages 4.6 inches per year; however, snow on the ground rarely lasts for more than a day.

Fort Bliss experiences a highly variable range of temperatures throughout the year, ranging from -8 degrees Fahrenheit (^{o}F) to 114^{o}F, with a daily average of 64^{o}F. Temperatures drop below freezing an average of 34 days per year and rise above 90°F an average of 87 days per year. Evaporation rates are very high, averaging a 97-inch precipitation deficit each year (Fort Bliss, 2001).

Wind speeds at Fort Bliss average 9 to 12 miles per hour with gusts over 60 miles per hour in March and April. Dust and sandstorms occur in March and April due to these stronger winds and lack of precipitation. Spring winds are typically from the west while summer and winter usually bring a more southerly and northerly flow, respectively (Fort Bliss, 2001).

1.3.4 Topography and Surface Features

The Franklin Mountains' northernmost reaches extend into Castner Range MRS and are composed primarily of lower slopes and alluvial fans, which range in elevation from 4,265 to slightly over 5,000 feet (ft) above mean sea level. Extending east to west, the terrain across the MRS varies between rolling terrain (approximately 40 percent [%] or 2,800 acres), heavily rolling terrain (approximately 20% or 1,400 acres), and mountainous terrain (approximately 40% or 1,400 acres) (URS, 2013).

1.3.5 Geology

The Closed Castner Range MRS and vicinity were part of a relatively shallow marine shelf from late Cambrian (500 to 600 million years before present [MYBP]) through early Pennsylvanian (280 to 310 MYBP) time. The oldest sedimentary deposits in this area are approximately 400 million years old, consisting chiefly of dolomite beds that range in age from late Cambrian to late Ordovician (425 to 500 MYBP). Deposition during Devonian (325 to 405 MYBP) time consisted mainly of marine shales and shaly limestones. A relatively thin sequence of upper Mississippian age limestone and shale overlies the Devonian rocks. Overlying the Mississippian deposits are approximately 3,000 ft of Pennsylvanian age sediments. These strata consist of limestone, sandstone, dolomite, and shale, which were deposited in a shallow marine environment. Tectonic disturbances in Virgilian time (late Pennsylvanian) altered the sedimentation origin from marine to terrestrial (URS, 2012). The tectonic movement resulted in the subject area becoming a large depression with landmasses developed to the east, west, and southwest. In later Pennsylvanian and early Permian time, the Hueco Basin (where the Castner Range MRS is located) received a thick sequence of land-derived sediments. Most sedimentary rocks in the area consist of limestone strata of the San Andres formation. These sediments mark the return of marine shelf deposition in the area (URS, 2013).

The southern portion of the Hueco Basin contains more than 6,000 ft of valley fill, stream sand, and gravel; rock slides; alluvial fans from mountains on either side; and lake deposits rich in salt and gypsum derived from sedimentary rocks of the adjacent ranges. Any rainfall or melted snowfall that occurs in the valley either seeps into the porous valley deposits or evaporates from small pools. Fault lines along the edge of the Hueco Basin may still be active, although no movement has been recorded in recent time.

The Fort Bliss region lies in an area considered to be of moderate seismic activity. The Franklin Mountain block has been rising and the Hueco Bolson block has been sinking for tens of millions of years. Earthquake data estimate that the strongest earthquake in the area in a 100-year period lies between a magnitude of 4.8 and 6.0 on the Richter Scale (e2M, 2007).

Relatively small deposits of Castner Limestone containing diabase (or dolerite) dikes and sills are located in the central portion of the site, west of the Fusselman Dam area. This area of potentially magnetic geology is in relatively higher elevations and steeper terrain, as encountered during the 2012 Wide Area Assessment (WAA) (URS, 2013).

1.3.6 Soils

Based on the U.S. Department of Agriculture Natural Resource Conservation Services Soil Survey Geographic database (USDA, 2009), the dominant soil series are the Missile, Crotalus, and Chaparral in the northern portion of the site, while the Missile and the Chipotle series dominate the southern extent.

The Missile, Crotalus, and Chaparral soil found within the northern portion of the site are all part of the Aridisol soil order. Aridisols are primarily located within arid regions, which limit percolation of water into the soils due to either sparse rainfall or another restricting factor. As such these soils are characterized by a lack of water available to mesophylic plants for extended periods, one or more pedogenic horizons, a surface horizon or horizons not significantly darkened by humus, and an absence of deep, wide cracks or andic soil properties. Each of these series are slightly alkaline. A description of each of these soils is provided below:

- The Missile series consists of shallow and very shallow, well drained soils that formed in alluvium derived from mixed igneous material. Permeability is moderately slow above and very slowly permeable in the petrocalcic horizon. These gently sloping to strongly rolling soils are on fan piedmonts. Slope ranges from 3 to 15%. Mean annual precipitation is about 11 inches and the mean annual air temperature is about 62 ^{o}F.
- The Crotalus series consists of very deep, well drained, moderately slowly permeable soils that formed in colluvium derived from tuff modified by eolian material. Crotalus soils are on mountain flanks and bases. Slope ranges from 15 to 35%. Mean annual precipitation is about 11 inches and the mean annual air temperature is about 62 ^{o}F.
- The Chaparral series consists of very deep, well drained, moderately rapidly permeable soils that formed in gravelly alluvium. These gently sloping soils are on alluvial fans and erosional remnants of fan piedmonts. Slope ranges from 2 to 5%. Mean annual precipitation is about 11 inches and the mean annual temperature is about 62 ^{o}F.

The Chipotle soil found in the southern portion of the site is an Entisol. Entisols can be found in any climate under any vegetation. Some unique properties of soils found in this order are the dominance of mineral soil materials and absence of distinct pedogenic horizons. The absence of distinct pedogenic horizons is an important distinction to soils of this order and may be due to causes such as the results of inert parent material, slowly soluble hard rock, insufficient time for horizons to form, or their occurrence on slopes where the rate of erosion exceeds the rate of formation of pedogenic horizons. The Chipotle series is mostly acidic.

A significant portion of the site is rock outcrop. The rocky and gravelly nature of the Closed Castner Range MRS result in thin soil cover over much of the range, even in areas showing specific soil types. This is especially true closer to the Franklin Mountains.

1.3.7 Hydrogeology

Groundwater at Fort Bliss is obtained from both fluvial and lacustrine deposits, although fluvial aquifers are the primary source for the area. The groundwater originates from two major basins, the Hueco Bolson and the Mesilla Bolson, which are separated by the Franklin Mountains. Thirty-nine deep wells from the Hueco Bolson aquifer provide most of the water used at Fort Bliss. The Hueco Bolson is located in the southern half of the Tularosa Basin paralleling the eastern base of the Franklin Mountains. It contains fill material consisting primarily of fluvial and lacustrine deposits with a maximum thickness of 9,000 ft. Groundwater recharge is provided by the runoff of precipitation percolating through alluvial deposits at nearby mountain bases. The fresh water aquifers in the Hueco Bolson are of very high quality and require only chlorination for use. Chemical analyses showed that the total dissolved solids, chloride, sulfate, and nitrate concentrations are above state and federal standards.

No groundwater wells exist on the Closed Castner Range MRS. Below El Paso, the depth to groundwater of the Hueco Bolson on the east side of the Franklin Mountains ranges from 250 ft to 400 ft below ground surface (bgs) (Sheng et al, 2001), but groundwater depths have not been measured on the site. A public well about 1 mile east of Highway 54 reports a static water depth of 324 ft bgs. During site investigation activities in 2004, a test boring was drilled to a depth of 48.5 ft bgs and groundwater was not encountered (URS, 2013). Additionally, during this RI, a soil boring was installed to 30 ft bgs, and groundwater was not encountered.

1.3.8 Hydrology

There are no known perennial surface water flows on the Castner Range MRS. Natural drainage channels are well defined in the steeper foothill areas of the Franklin Mountains, providing channels for heavy storm water flow, as shown on **Figure 1-4**. As the drainage reaches the flatter eastern alluvial fans below the foothills, they become shallow and variable in their courses. Fusselman Dam, located in the south-central part of the Closed Castner Range MRS, a retention basin owned by the Texas Department of Transportation (TxDOT) in the northeast corner of the site, and other engineered drainage, diversion, and retention features have been constructed to help manage runoff during heavy precipitation events (URS, 2013).

The only significant surface water body near Fort Bliss is the Rio Grande River. The Rio Grande is used by local municipalities and industries to partially fulfill their water needs. Water from the Rio Grande is part of a U.S. Bureau of Reclamation irrigation project that regulates and administers the flow of the Rio Grande below Elephant Butte Reservoir in New Mexico (Fort Bliss, 2001).

1.3.9 Vegetation

Vegetation types found on the Closed Castner Range MRS include barren and low grass (approximately 35%), low grass with brush (approximately 64%), and brush with some trees (approximately 1%). The Closed Castner Range MRS has three primary plant communities: agave-lechugilla, alluvial fan-creosotebush, and draw yucca grassland. The mountainous areas of the MRS are characterized by the agave-lechugilla community, which form dense clonal clumps on colluvial slopes, rides, and benches of hills and mountains. This community also extends down slope onto erosional piedmont surfaces. The agave-lechugilla community's predominant species include acacia (*Acacia neovernicosa*), lechuguilla (*Agave lechuguilla*), common sotol (*Dasylirion wheeleri*), ocotillo (*Foquieria splendens*), and catclaw mimosa (*Mimosa aculeaticarpa*).

The alluvial fan of the Franklin Mountains is home to the alluvial fan-creosote community, characterized by creosotebush (*Larrea tridentate*), whitethorn (*Acacia constricta*), American tarbush (*Flourensia cernua*), Spanis dagger (*Yucca torreyi*), broom snakeweed (*Gutierrezia sarothrae*), and lechugilla.

Grasses are rare and where present, basal coverage is low at less than 0.5%. Arroyos and drainage areas are moister than other areas and support different vegetation types, including desert willow

(*Chilopsis linearis*), Apache plume (*Fallugia paradoxa*), and little leaf sumac (*Rhus microphylla*) (Fort Bliss, 2001).

While there are no known threatened or endangered species on the MRS, a high outcropping rock formation on the southwest corner of the MRS exemplifies a preferred habitat and substrate for the Sneed Pincushion Cactus (*Coryphantha sneedii var. sneedii*), a federal and state endangered species. No cacti of this species have been found there.

1.3.10 Natural Resources

The borderlands region of New Mexico and Texas is a center of biodiversity in temperate North America for birds, mammals, amphibians, and reptiles, so the diversity of terrestrial invertebrates on Fort Bliss is high. However, a few warm-blooded vertebrates are centered in or limited in distribution to the Chihuahuan desert. Much of the wildlife found at Fort Bliss is generally found in the Intermountain West, with a substantial Great Plains influence. There are approximately 335 species of birds, 58 species of mammals, 39 species of reptiles, and eight species of amphibians known to occur at Fort Bliss. No invertebrate surveys have been conducted at Fort Bliss; however, several groups of arthropods have their centers of diversity for North America in the region (Fort Bliss 2001).

Only two threatened fauna occur or potentially occur at the Closed Castner Range MRS: the Texas horned lizard and the Texas lyre snake (Locke, 2011).

1.3.11 Cultural and Archaeological Resources

Fort Bliss has conducted intensive archaeological investigations on over 2,400 acres of land situated on the Closed Castner Range MRS. This survey effort represents nearly 35% of the total 7,000 acres of the MRS. These investigations have focused on those portions of the range with past UXO removal actions (primarily surface clearances). Surveys have been conducted on highland, mountain canyon settings as well as the lower alluvial fans, giving a picture of land-use patterns on the different landforms available for study on the Closed Castner Range MRS.

As a result of these surveys, a number of archaeological properties, both historic and prehistoric have been identified. Eighteen prehistoric sites have been discovered and vary in type including plant processing sites with limestone bedrock mortar features, rock art sites with petroglyphs/pictographs, as well as a number of smaller campsites dating to the Late Archaic-Early Formative periods. Fifteen historic sites are also present on the Closed Castner Range MRS including mining sites, ranching features and early military training sites including anti-mechanized target courses and the Indian Peak Navigation Light heliograph station.

All field work was conducted IAW procedures for protecting cultural resources described in the Environmental Protection Plan (Appendix E of the QAPP). Areas of the Closed Castner Range MRS in which cultural resource surveys were previously conducted were identified and incorporated into the project Geographic Information System (GIS). Specific cultural resource areas and points of interest, considered eligible for the Register of Historic Places, were recorded and factored into the field planning activities. These sites were avoided, and no intrusive investigation or sampling activity was conducted at these locations. Fort Bliss archaeologists accompanied the field teams and observed planned intrusive investigation locations to ensure cultural resources were not impacted by the RI.

1.3.12 Demographics

The Closed Castner Range MRS is located in the northwest portion of El Paso County, Texas and within the El Paso city limits. Population within the city of El Paso in 2014 was 679,036 (U.S. Census Bureau, 2016). El Paso has a strong federal and military presence due to the presence of Fort Bliss and other federal agencies including the Drug Enforcement Administration and U.S. Border Patrol. The Closed Castner Range MRS is currently undeveloped with mixed residential, retail and light industrial facilities on the south and east boundaries.

1.3.13 Current and Future Land Use

The land is currently managed by the Army as a closed military training range with no authorized public access. However, trespassing frequently occurs on the range as evidenced by numerous unofficial hiking trails. Interest in future land use of the Closed Castner Range MRS has been expressed by various local and Texas stakeholders including the Texas Parks and Wildlife Department, the City of El Paso, local residents, recreationalists, and Native American tribes. The 2013 National Defense Authorization Act (NDAA) provides the authority for the U.S. Army to convey Castner Range, or portions thereof, to the Texas Parks and Wildlife Department. In December 2017, the NDAA was passed, which includes new provisions relating to Castner Range, including restrictions on commercial development. The Army indicates there is no planned change in land use at this time.

1.4 PREVIOUS INVESTIGATIONS

Numerous MEC/MC investigations and removal actions have been performed on the Closed Castner Range MRS. The following table presents a summary of the previous investigations and removal actions:

Table 1-1 Previous Investigations and Removal Actions

Previous Investigations and Removal Actions		
Date	Event/Document	Summary
1971	Surface Investigation[1] (USACE, 1994)	Covered 200 acres of land on the Castner Range MRS. Thirty MEC items were found, including: 75-millimeter (mm) shrapnel rounds, a 40mm HE round, 37mm HE rounds, and 37mm armor piercing projectiles. The items were removed from the area and destroyed.
1975	Engineer Studies Group, Department of the Army, Chief	The report divided the MRS into six study areas based on previous use and potential for contamination. It was determined that the entire area must be considered to contain MEC. Areas A and B were east of

Previous Investigations and Removal Actions		
Date	Event/Document	Summary
	Engineers Office Report[1] (USACE, 1994)	Highway 54 and are in the Castner Range XD MRS, which has since been transferred.
1976	Memorandum of Record[1] (USACE, 1994)	Reported miscellaneous munitions found between 1974 and 1976 including a 4.2-inch mortar round, four 40mm rounds, a .50 caliber round, and a 3.5-inch rocket.
1979	Surface Sweep[1] (USACE, 1994)	Performed 200 ft on either side of Transmountain Road and along a two-mile stretch of U.S. Highway 54 right of way. MEC was discovered, including six, M52 series fuzes; a pop flare; 14, 37mm shot rounds; 12, 75mm illumination rounds; five, 75mm HE projectiles; two, 7.62mm balls; three, 7.62mm blanks; one, 57mm HE projectile; one, 40mm "Duster"; three powder train time fuzes; and one Stokes mortar.
1981	Surface Sweep[1] (USACE, 1994)	Performed along 30-ft wide power line easement running perpendicular from U.S. Highway 54 to the El Paso Museum of Archaeology on Transmountain Road. Small arms ammunition was found.
1986	Fort Bliss Letter Documenting a Surface Sweep at Northgate Dam Site (Carlson, 1986)	Surface sweep of 7.5 acres performed January 7, 1986. Various metal fragments from 90mm and 37mm HE rounds and 10, 7.62mm ball rounds were found.
1994	UXO Site Investigation, Environmental Hazard Specialists International, Inc. (EHSI) (EHSI, 1994)	Approximately 6,700 acres were investigated. A few MEC items were detonated, but the majority of items were left on site. Recommended that light ordnance impact areas needed surface and subsurface clearance to six inches; heavy ordnance impact areas required subsurface clearance to three ft.
1996	Surface Soil Sampling at the Open Burn/Open Detonation (OB/OD) Pit B-1 Site (IT/OHM, 2001)	Performed by the USACE, Fort Worth District to collect chemical data for a DoD Relative Risk Site Evaluation. Four surface soil samples were taken from outside of the pit. The Texas Natural Resource Conservation Commission Risk Reduction Rules were used as the regulatory framework and the site was evaluated under Risk Reduction Standard 2. Metals and explosive constituents were detected in the soil samples at concentrations above the regulatory action levels. This information was cited in the May 2001 IT/OHM, Addendum #1 Remedial Action Plan, OB/OD Pit B-1 Site.
1997	Final Report Surface Removal Action, UXB International, Inc. (UXB), (UXB, 1997)	The report documented the UXB surface ordnance removal action conducted in 1995 for five areas. The surface removal action took place on areas that were determined to pose an immediate risk to the public where the potential for encountering MEC was suspected at Closed Castner Firing Range MRS. One area (Area 1) had a 100% surface clearance action performed along with 10% subsurface selective sampling to a depth of one ft. (Area 1 is located in the transferred portion of Castner Range.) The other four areas are all described as

Previous Investigations and Removal Actions		
Date	Event/Document	Summary
		former OB/OD areas and a 100% surface clearance action was performed.
1998	Final Survey Report, CMS Environmental, Inc. (CMS), (CMS, 1998)	The report documented MEC surface and subsurface sampling conducted by the CMS investigation in 1996 and 1997. The Final Survey Report divided the MRS into 11 zones. Ten percent of the range was selected for surface sampling (2,035 grids). 172 of the 2,035 grids were selected for subsurface sampling. MEC were found (and detonated or removed) in 9 of the 11 zones. The report concluded that a sufficient number of grids were sampled.
1998	Final Removal Report, UXB (UXB, 1998)	The report documented a surface removal action conducted in 1998 by UXB for the White Sands Bus Parking Lot (a former hand grenade range located in the transferred portion of Castner Range) and the canyon mouth area below the Fusselman Dam. Five fuzed grenades and one unfuzed grenade were found at a former hand grenade range; six 37mm projectiles and three 75mm projectiles were found below the dam. All UXO was detonated on-site.
1999	Malcolm Pirnie, Inc. sampling at OB/OD Pit B-1 Site[2] (IT/OHM, 2001)	In November 1999, Malcolm Pirnie, Inc. completed sampling at OB/OD Pit B-1. Metals and explosives constituents were detected at concentrations above the Risk Reduction Standard 2 Medium Specific Concentrations.
2001-2002	IT/OHM Final Response Action Completion Report, Trans Mountain Buried Drum Site (IT/OHM, 2002)	From November 1997 to February 1998, a site investigation was performed to determine if contamination was associate with the tar flow and drums at the Trans Mountain Buried Drum Site. It was concluded that no immediate risk to human health or the environment was present. In 1999, samples of the tar material and asphalt debris were collected for waste characterization. In June/July 2001 the site was surface swept and cleared prior to removal of the tar, asphalt, and metal debris. One 105mm projectile and two 2.36-inch rocket mortars were found during the sweep. Tar/asphalt materials, metal drums, and buried piping were excavated, and surface asphalt construction debris was removed from the site. The analytical results determined the remedial action fulfilled clean closure requirements. This Response Action Completion Report also referenced the fact that the OB/OD Pit B-1 was cleared to a depth of one ft in June 2001. The access road between the OB/OD pit and the staging area located 250 ft east of the pit was cleared to a depth of approximately 2 ft. No munitions were encountered during the clearance.
2002	A Memorandum for Record, Subject: Closure Decision for FTBL-073[3] (e2M, 2007)	The Memorandum states that a third RI/Feasibility Study (FS) was conducted at OB/OD Area A-1 in Spring 2002. However, no reports identified as “RI/FS” documents were located for OB/OD Area A-1. Therefore, it appears that the use of the term “RI/FS” is incorrect and that activities conducted were likely performed in several site investigations rather than a formal RI/FS. During the third investigation in 2002, extensive soil samples were collected. Suspected

Previous Investigations and Removal Actions		
Date	**Event/Document**	**Summary**
		constituents of concern included octahydro-1,3,5,7,-tetranitro-1,3,5,7-tetrazocine (HMX), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), RCRA metals, and UXO. Test results determined there was no release of regulated materials above USEPA Region VI screening levels on the site.
2004	USA Environmental, Inc. (USAE) Draft Final Removal Report, Ordnance and Explosives (OE) Removal Action (USA, 2004)	USAE performed an OE removal on Closed Castner Firing Range MRS from July 2003 to March 2004. During the removal action, USAE cleared a total of 1,142 acres: subsurface clearance of 167 acres to a depth of up to 3 ft bgs and surface clearance of 975 acres. USAE located, identified, and disposed of 128 UXO items, 52 OE items, and 241 assorted small arms ammunition (SAA). In September, USAE tested surface soils at OB/OD Pit B-1 and tests were negative for explosives and propellants.
2004	Shaw Environmental (Shaw) Test Boring Activities at OB/OD Area A-1 (Shaw, 2004)	A test boring was drilled at OB/OD Area A-1 to determine if groundwater was present beneath the site. The boring was drilled into bedrock (depth of 48.5 ft bgs.) Groundwater was not present beneath the site, and it was therefore concluded that groundwater is not a potential exposure pathway at the site.
2007	e2M Final Site Inspection Report (e^2M, 2007)	e2M documented that there is adequate historical data to show that MEC and elevated levels of MC are likely present at the Castner Range MRS and warrant additional investigation.
2007	Science Applications International Corporation Draft Engineering Evaluation/Cost Analysis (SAIC, 2007)	In 2007, an Engineering Evaluation/Cost Analysis was completed and an Interim Response Action to fence the range was initiated but was then deferred until after the RI/FS is completed. Signage at the Closed Castner Firing Range MRS was updated in early 2009.
2012	URS, Wide Area Assessment Field Demonstration Report for the Closed Castner Firing Range MRS (URS, 2012)	The Closed Castner Range MRS was selected as a demonstration site for an evaluation of the use of WAA technologies in 2010. WAA technologies including light detection and ranging (LIDAR), orthophotography, helicopter-borne magnetometry, man-portable electromagnetic induction digital geophysical mapping (DGM), analogy range reconnaissance, and intrusive investigation. These technologies were applied with the objective of demonstrating the ability to use multiple layers of data in identifying “target areas” (e.g., areas of high anomaly density tied to munitions presence) and areas of concern based on historical site use or LIDAR features. Eighteen preliminary target areas were identified. Significant munitions debris (MD) findings included small arms, grenade fragments, armor piercing projectiles, fuzes, and unidentified frag. Only one MEC item was identified; a 75mm shrapnel projectile. The WAA encompassed all the lower topographic zones on the eastern portion of the MRS; however, the higher topography on the western side of the MRS limited the extent of the WAA coverage.

Previous Investigations and Removal Actions		
Date	Event/Document	Summary
2013	URS, Final Active Army MMRP Program ISM Field Demonstration Report of Incremental Sampling Methodology at Closed Castner Firing Range (URS, 2013)	The Incremental Sampling Methodology (ISM) Field Demonstration was performed over 4,000 acres of the Castner Range MRS, focusing on areas that had been previously characterized for MEC during the 2012 WAA. Sampling and analysis data quality was controlled to allow use in subsequent RI activities. One-acre ISM sampling units were used and a statistically significant correlation between MEC/MD density and MC concentrations was found, leading to the finding that DGM results may be used to guide the number and placement of MC sampling units. Additionally, site-specific background upper prediction limits for metals were calculated based on 15 ISM samples collected on nearby property.
2016	URS, Technical Report Demonstration of Advanced Geophysics and Classification Methods on Munitions Response Sites Closed Castner Range Fort Bliss, TX, ESTCP Project MR-201230	URS performed dynamic and cued surveys with Naval Research Laboratory's TEMTADS 2x2 to demonstrate advanced geophysical classification (AGC) technologies on a 5-acre study area within CMUA 1 at Closed Castner Firing Range. URS collected dynamic TEMTADS data in litter mode across the 5-acre study area and detected 3,000 anomalies. URS collected cued TEMTADS data over approximately ½ of the detected anomalies and intrusively investigated 1,525 anomalies. One MEC was found, a 105-mm HE projectile at 23 centimeters (cm), or 9-inches, bgs. A total of 1,733 MD were found at depths from 0 to 39 cm, or 0 to 1-in, bgs.

Note:

1 - Cited in the 1994 Archive Search Report prepared by the USACE (USACE, 1994)

2 - Cited in the May 2001 IT/OHM, Addendum #1 Remedial Action Plan, OB/OD Pit B-1 Site.

3 - Documented in the 2007 Final Site Inspection Report prepared by e2M.

1.4.1 Overview of Removal Actions and Investigations

As presented in **Section 1.4** of this report, MEC/MC investigations and MEC removal actions have been conducted on the Closed Castner Range MRS over the last 40 years, including the 2012 WAA and the 2013 ISM Field Demonstration. Previous MEC investigation areas from 1994 to the present are shown on **Figure 1-5**. Studies conducted prior to 1994 were not precisely mapped in the historical documentation. The locations of specific removal action projects are depicted on **Figure 1-6**. **Figure 1-7** shows the reported MEC find locations from the WAA, the 1998 CMS investigation, the 2014 Environmental Securities Technology Certification Program's (ESTCP) AGC live site demonstration, and the approximate MEC locations from the 1998 and 2004 removal actions. The 1998-2004 removal actions reported the types of MEC found; however, they did not report the precise coordinates of the MEC finds. These MEC locations were digitized from an orthorectified image of Figure 6-11 of the Site Inspection (SI) Report (e2M, 2007). **Figure 1-8** shows the previous MC sample locations and the areas of concern identified in the WAA.

1.4.2 Determination of Concentrated Munitions Use Areas

The WAA Field Demonstration conducted by URS used several technologies –LIDAR (over the entire MRS), orthophotography (over the entire MRS), helicopter-borne magnetometry (over 1,742 acres), man-portable electromagnetic induction DGM surveys (over 3,521 acres), analog range reconnaissance (over 22 miles of transects), and intrusive investigation – in a layered approach to demonstrate the ability of multiple data layers to identify areas of concern associated with elevated anomaly density areas and historical site use.

During the planning stage of the RI, the JV performed an analysis of the ground-based DGM transect and anomaly data to identify areas with elevated anomaly density relative to background anomaly density that were potential concentrated munitions use areas (CMUAs). Per EM 200-1-15 (USACE, 2015), CMUAs are characterized as having a higher anomaly density than background and they have a greater likelihood of containing MEC (e.g., because munitions were fired into the area). They may be target areas or OB/OD areas. The area outside of the identified potential CMUAs was considered a non-concentrated munitions use area (NCMUA), based on the lower probability of encountering MEC. As part of the WAA investigation, areas of concern with an anomaly density of less than 87 anomalies per acre were reclassified as NCMUAs.

After identifying the potential CMUAs, the JV evaluated available MEC investigation and removal action data to determine whether further investigation was required for the potential CMUAs. The JV identified five confirmed CMUAs through evaluation of historical data, with one potential CMUA, CMUA 21 (**Figure 1-9**) requiring additional evaluation. In the approved Final QAPP, the JV documented that the characterization of the nature and extent of MEC within the five confirmed CMUAs was complete and no additional MEC investigation was required during the RI. However, further investigation was required to determine the nature and extent of MEC within potential CMUA 21 and the NCMUA. The remaining potential CMUAs were determined not to be CMUAs and were considered part of the NCMUA. Additional investigation was required within the NCMUA to determine whether the MEC density is less than or equal to 0.1 UXO/acre to a 95% confidence level. The 2013 ISM Field Demonstration Report concluded there is a correlation between MEC density and MC concentrations for metals. Therefore, delineation of MC concentrations during the RI is performed primarily within the CMUAs. **Figure 1-9** presents the CMUAs and the NCMUA, determined based on the above evaluation.

1.4.3 Potential for Chemical Warfare Materiel Presence

There is no clear evidence of chemical warfare materiel (CWM) storage, usage, or disposal at Castner Range and no documentation of use has been encountered during previous investigations. No CWM was encountered by the JV during the RI field activities.

1.5 RI TASKS

RI tasks were performed IAW the PWS, dated 27 August 2013, and subsequent modifications (**Appendix A**) and the Final QAPP (PIKA/Arcadis JV, 2015a) as modified by two Field Change Requests (FCRs) that were submitted to and approved by USACE. The FCRs are further discussed in **Section 3.3**.

RI activities included document reviews, site visits, planning documents, stakeholder and public information meetings, field activities, laboratory analysis and data validation, data evaluation, risk assessments, and reporting. The following summarizes the key elements of tasks associated with the RI:

- Technical Project Planning (TPP) Process – TPP meetings were held on 27 February 2014, 11 February 2015, 17 January 2017, and 7 November 2017. The TPP meeting minutes are included in **Appendix B**.
- Explosives Site Plan (ESP) – The ESP for the Closure Caster Firing Range (PIKA/Arcadis JV, 2015b) was prepared IAW EM 385-1-97 Errata Sheet No. 3, Department of the Army Pamphlet 385-64, and DoD 6055.09-m (USACE, 2008). The ESP is a stand-alone document that provides specifics on the minimum separation distance and engineering controls enforced during intrusive operations. Interim approval of the ESP was given by the U.S. Army Technical Center for Explosives Safety on February 17, 2016. Final approval of the ESP was received from the DoD Explosives Safety Board (DDESB) on February 29, 2016.
- Quality Assurance Project Plan – The QAPP [which is also considered the RI Work Plan], finalized in February 2015, documents the detailed approach for MEC and MC RI activities. The QAPP also included a Data Usability Assessment (DUA) of the WAA Report, verifying those data deemed acceptable to use in the RI (See Appendix C for the DUA). The project is being conducted under the USAEC MMRP and was performed IAW the U.S Army MMRP Final Munitions Response Remedial Investigation/Feasibility Study Guidance (Department of the Army, 2009), USACE Guidance Document EM 200-1-15 (USACE, 2015), and the WERS DIDs. The Final QAPP was reviewed and approved by Fort Bliss, the USACE, the USAEC, and the TCEQ.
- Community Involvement – The JV conducted a pre-field deployment public meeting on May 13, 2015. The purpose of the meeting was to provide a summary of planned field work and other investigation activities to the general public. The public meeting was conducted IAW the approved Community Relations Plan, prepared by the JV and finalized in March 2014. The JV also provided project presentations at Restoration Advisory Board meetings held in March 2014, March 2016, and March 2017. A second public meeting to present the results of the RI was conducted on November 8, 2017.

- RI Fieldwork – Fieldwork included the following tasks to meet the objectives of the RI:
    - MEC: location surveying and mapping, vegetation clearance, instrument-assisted visual surveys, analog "mag and dig" transects, geophysical system verification (GSV), geophysical investigation, and intrusive investigation.
    - MC: collection and analysis of discrete and incremental sampling methodology soil samples, collection of surface water (seep) samples, and implementation of a soil boring program to determine whether groundwater is present.
- RI Report – This RI report is submitted IAW the USEPA document *Guidance for Conducting Remedial Investigations and Feasibility Studies Under Comprehensive Environmental Response, Compensation, and Liability Act* (1988); the *U.S. Army Military Munitions Response Program Remedial Investigation/Feasibility Study Guidance* (U.S. Army, 2009); EM 200-1-15 (USACE, 2015); and Interim Guidance Document (IGD) 06-04 (USACE, 2006), as applicable. The RI report documents activities performed as part of this work including review of previous investigation documents, site visits, preparation of planning documents, stakeholder and public information meetings, field activities, results of laboratory analysis and data validation, evaluation of data collected, and results of risk assessments for MEC and MC.

1.6 REPORT ORGANIZATION

This RI Report is prepared consistent with DIDs approved for the WERS contract, along with various USACE guidance documents. The sections of this RI Report have been organized following guidance provided in DID WERS-010.01 and U.S. Army Munitions Response Remedial Investigation/Feasibility Study Guidance (Department of the Army, 2009). Specifically, this report includes the following:

- **Section 1: Introduction** – presents the objectives of the project and report with a description of work authorization, an overview of the MRS being addressed, and content of the report.
- **Section 2: Project Remedial Response Objectives** – presents a discussion of the preliminary CSM, project approach, preliminary remedial action objectives for MC and MEC, data needs, and data quality objectives (DQOs) used to develop the RI.
- **Section 3: Characterization of MEC** – provides details on the approach, methods, and procedures used to characterize MEC. Subsections have been grouped into common or specific operational categories and organized to present required elements of work in an approximate chronological order to facilitate communication of the work completed.
- **Section 4: Characterization of MC** – provides details on the rationale for MC characterization, the approach to identifying MC areas of concern, and the procedures used to characterize MC. Subsections have been grouped into common or specific sample type

and organized to present required elements of work in an approximate chronological order to facilitate communication of the work completed.

- **Section 5: MEC Remedial Investigation Results –** presents the findings of the MEC investigation. The field data are organized according to the to the field task components used to achieve RI goals. These include geophysical, analog transects DGM transect survey, and DGM grid survey results. Quality control (QC) for the geophysical surveys; results of the intrusive investigation; source, nature and extent of MEC; and residual MEC evaluation are also presented.
- **Section 6: MC Remedial Investigation Results –** present the findings of the MC investigation. The analytical data results are organized according to the to the sampling task components used to achieve RI delineation goals. These include ISM soil sampling, arroyo soil sampling, berm sampling, surface water sampling, and the soil boring program. The nature and extent of MC constituents above RALs and above critical PCLs is presented.
- **Section 7: Revised Conceptual Site Model –** presents the updated CSM based on the additional information gathered during the RI.
- **Section 8: Contaminant Fate and Transport for MEC and MC –** presents a discussion of the fate and transport of MEC/MC in the environment.
- **Section 9: Risk Assessment –** presents the Human Health Risk Assessment (HHRA) and summarizes the results of the Screening Level Ecological Risk Assessment (SLERA).
- **Section 10: Summary of MEC Hazard Assessment and MRSPP –** presents the results of the MEC Hazard Assessment (MEC HA) worksheets and the MRSPP.
- **Section 11: Summary of Results and Recommendations –** summarizes the RI results and presents recommendations.
- **Section 12: References –** provides a list of references used in preparing this RI Report.

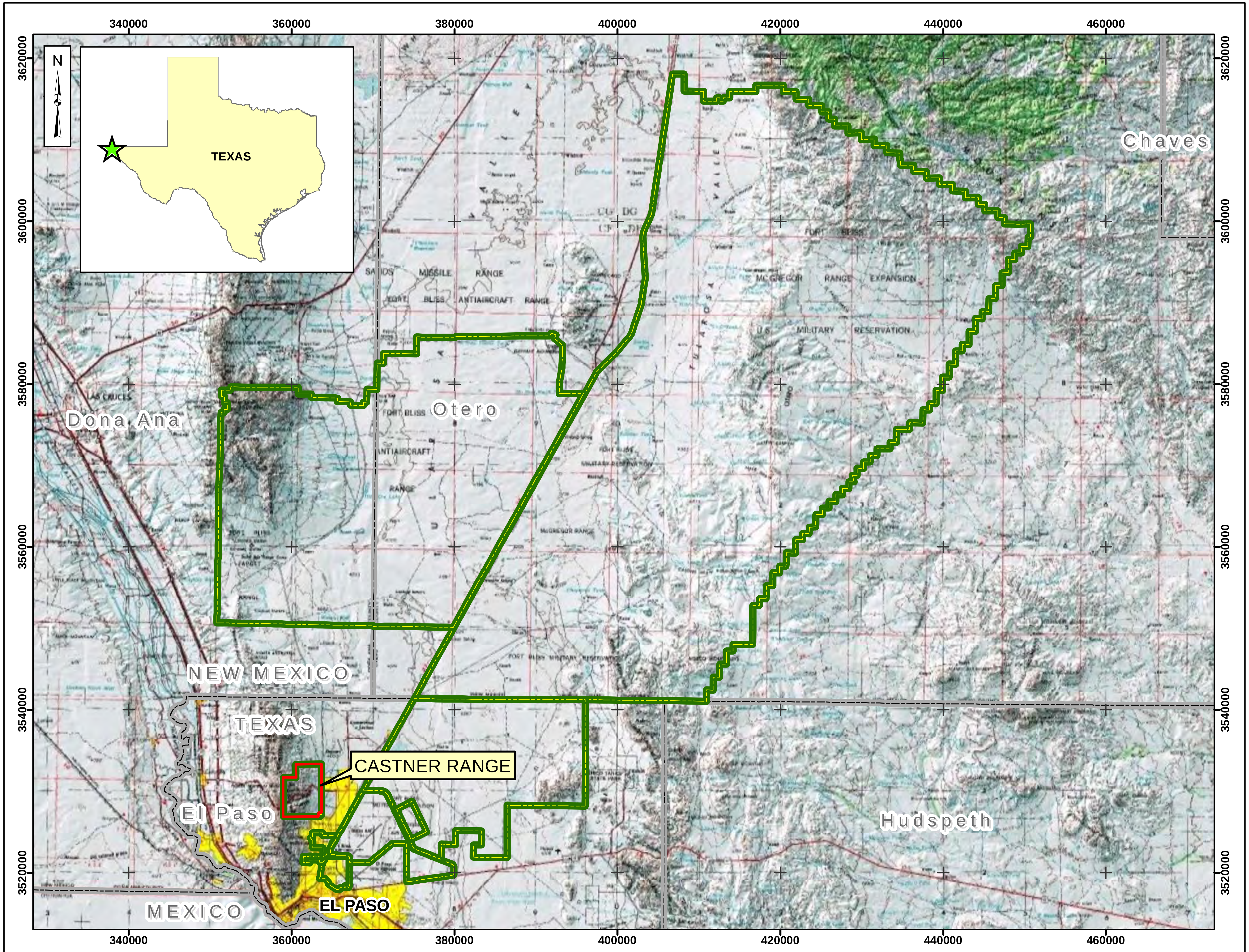
In addition, the following appendices are provided to supplement the results reported in this document:

- **Appendix A** Performance Work Statement
- **Appendix B** Project Meeting Minutes
- **Appendix C** Data Usability Assessments
- **Appendix D** Daily Reports and Field Forms
- **Appendix E** MEC Investigation Data and MS Access Databases
- **Appendix F** IVS Letter Report
- **Appendix G** Field Change Request Forms

- **Appendix H** Photologs
    - **H.1** MEC Investigation Photolog
    - **H.2** MC Investigation Photolog
- **Appendix I** DD Form 1348-1A
- **Appendix J** MEC and MDEH Finds and Disposition Documentation
- **Appendix K** Boring Logs
- **Appendix L** Analytical Laboratory Reports and Data Validation Reports (Data Usability Summary Reports)
- **Appendix M** USGS Mineral Resources On-line Spatial Data Page for El Paso County
- **Appendix N** Baseline Human Health Risk Assessment
- **Appendix O** Screening Level Ecological Risk Assessment
- **Appendix P** MEC HA Worksheets
- **Appendix Q** Munitions Response Site Prioritization Protocol

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-1
Site Location Map



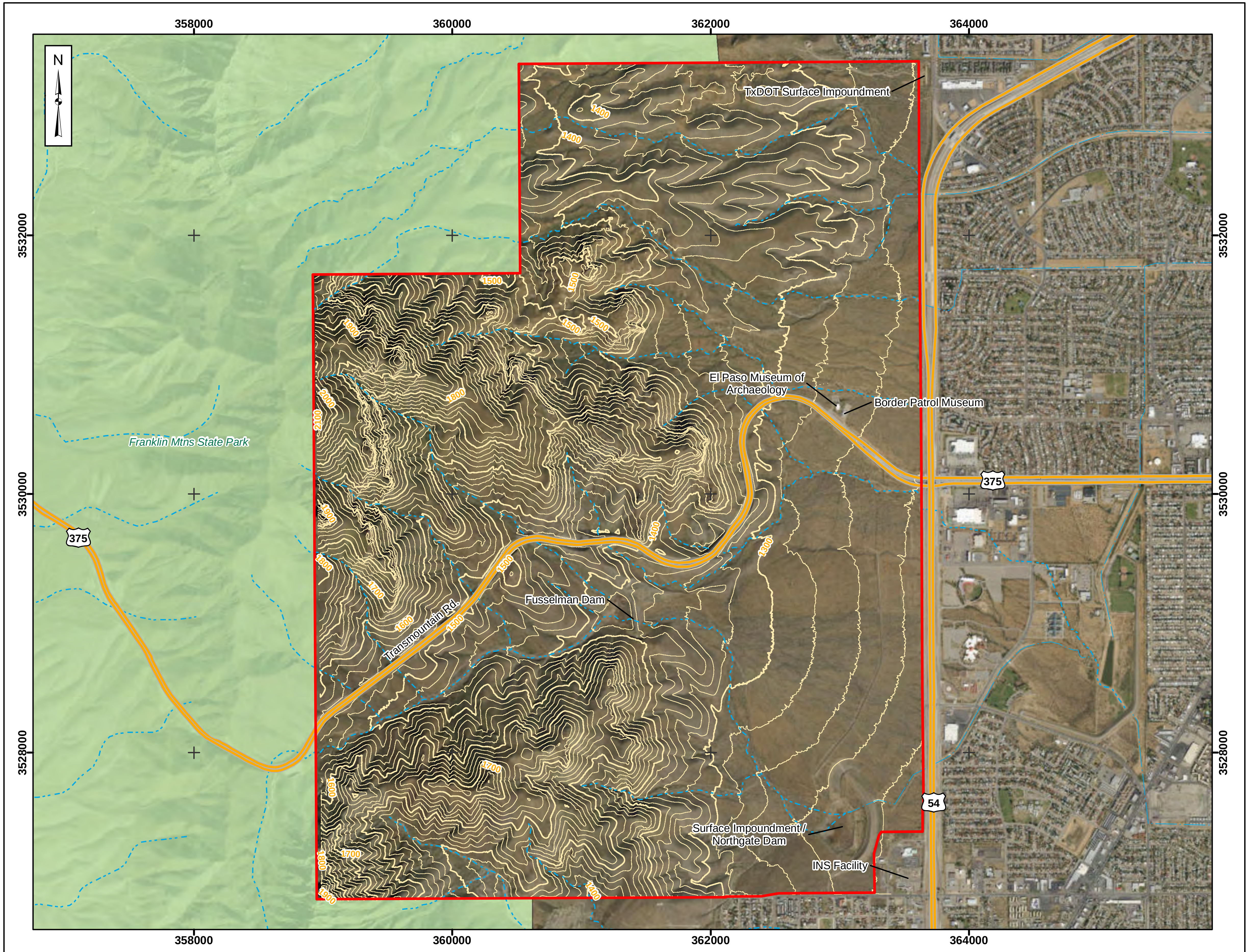
Legend

- Fort Bliss Boundary
- MRS Boundary
- County Boundary
- State Boundary

0 5 10
Miles

Data Sources: ESRI, ArcGIS Online, USGS Topo

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-2
Site Overview

Legend

MRS Boundary
Intermittent Stream
Canal/Ditch
Franklin Mtns. State Park
Elevation Contour (m)

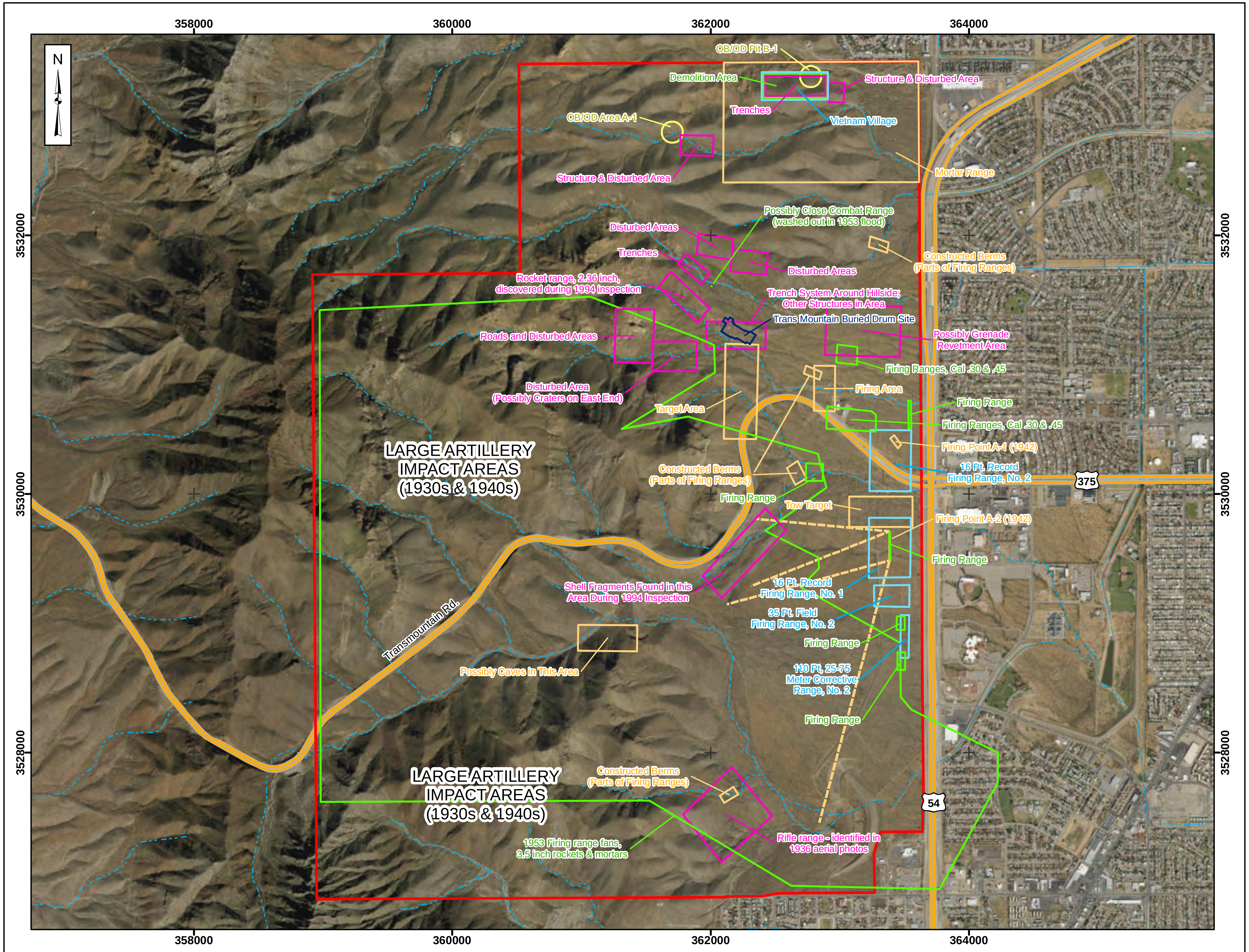
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-3
Historical Range Boundaries and Identified Features



Legend

- MRS Boundary
- Intermittent Stream
- Canal/Ditch

Historical Features

- 1930s Range Feature
- 1940s Range Feature
- 1950s Range Feature
- 1960s Range Feature
- OB/OD Area
- 1940s Firing Range Fan
- Other Range Feature

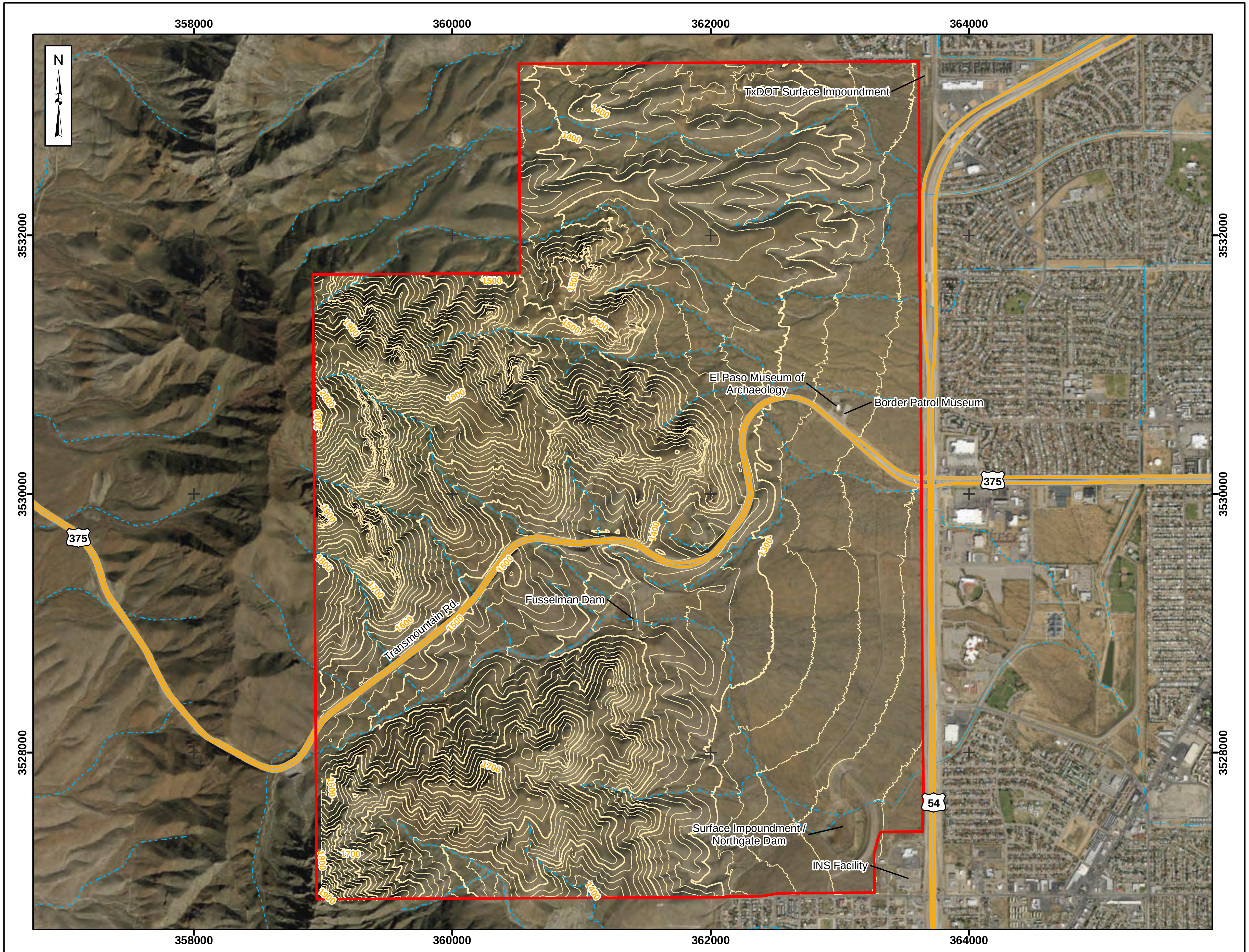
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-4
Drainage Areas



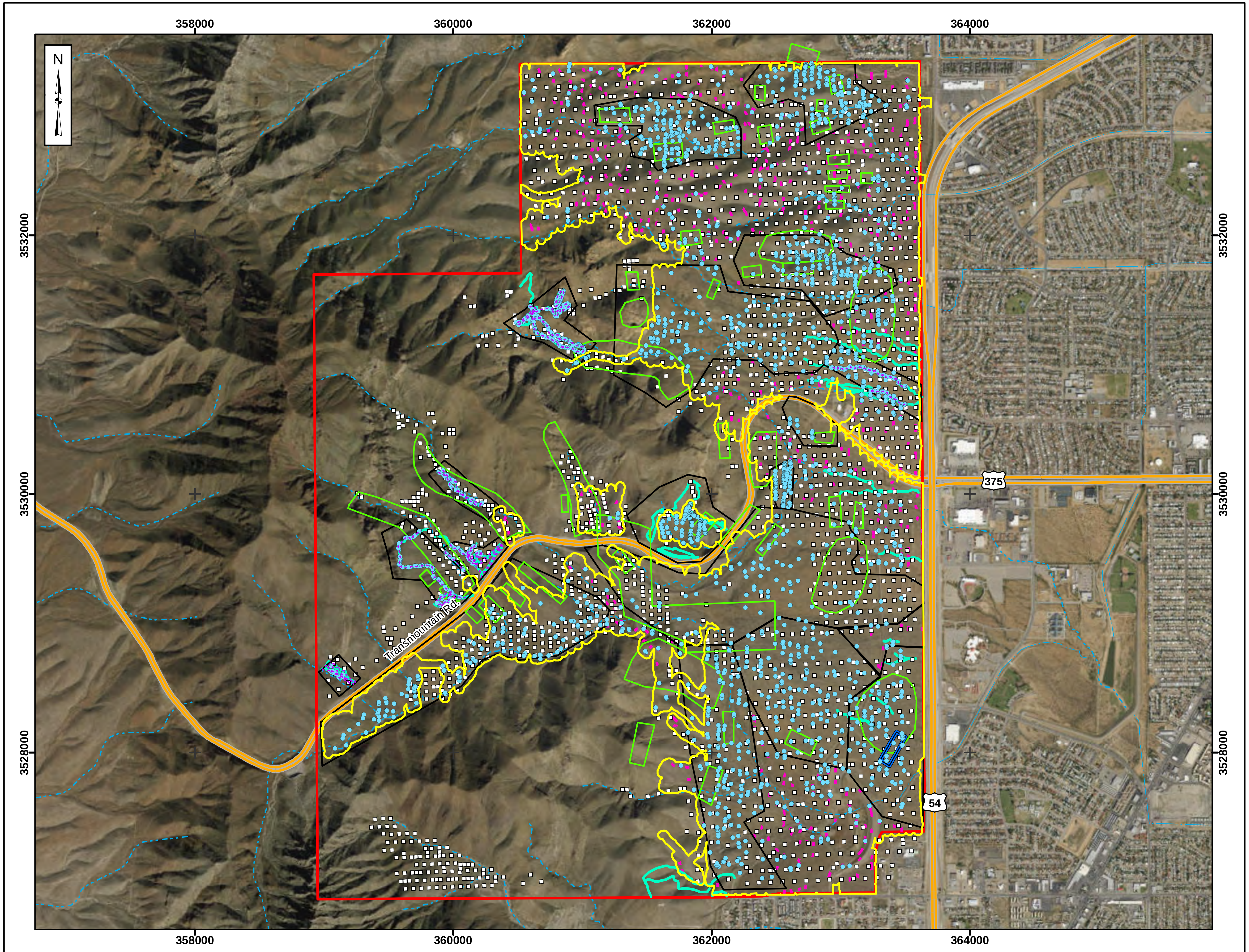
Legend

- MRS Boundary
- Intermittent Stream
- Canal/Ditch
- Elevation Contour (m)
- Drainage Boundary

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-5
Previous MEC Site Characterizations

Legend

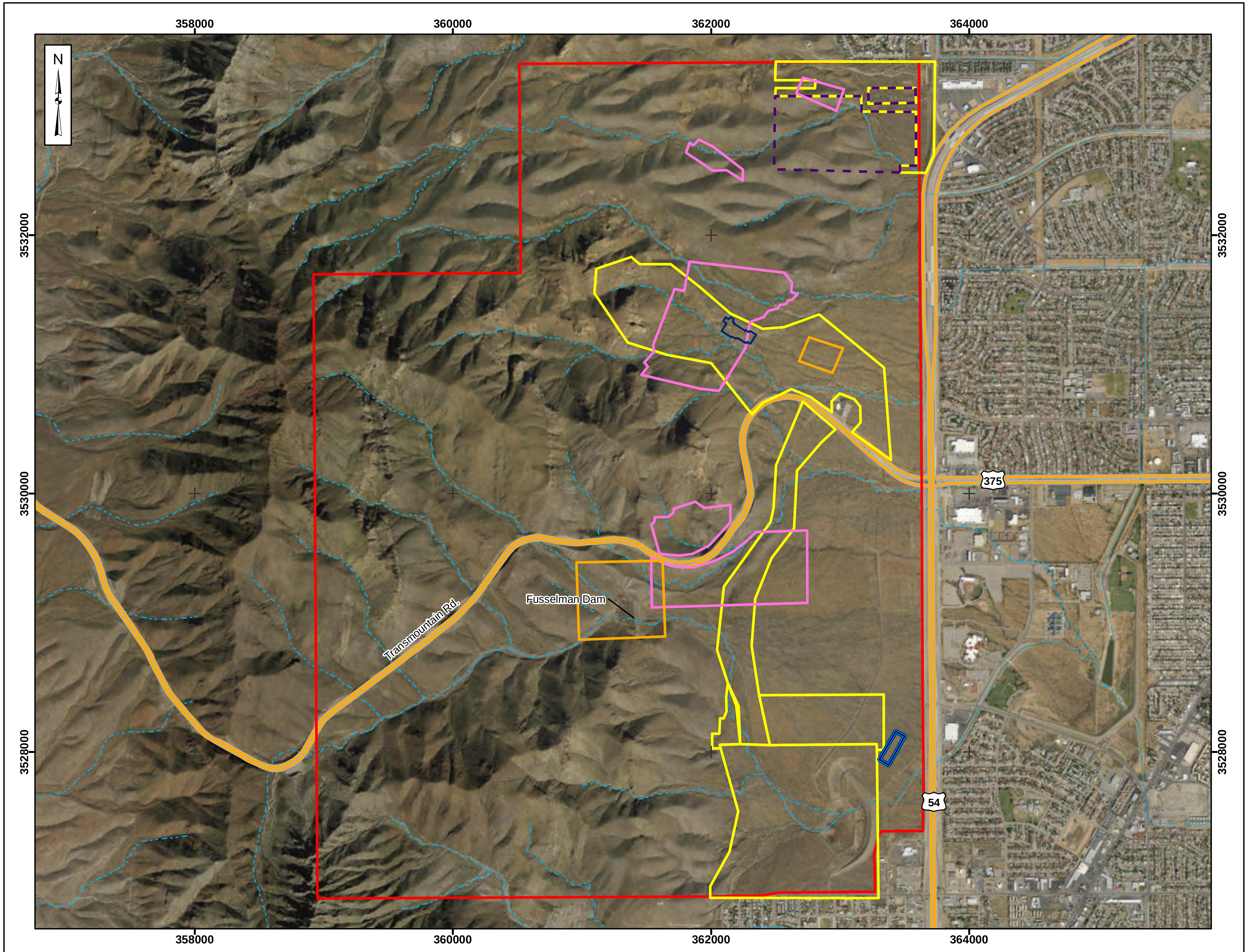
- MRS Boundary
- 2014 ESTCP Study Area
- 2010 WAA Area of Interest
- 2010 WAA Analog/DGM Investigation Area (Non-Arroyo)
- 2010 WAA Analog Arroyo Transect
- 2010 WAA Intrusive Investigation Transect (Non-Target Area)
- 2010 WAA Intrusive Investigation Transect (Arroyo)
- 2010 WAA Excavated Anomaly
- 1994 ESHI Investigation Area
- 1998 CMS Investigation Area
- Intermittent Stream
- Canal/Ditch

Removal actions and other studies have been conducted at the Closed Castner Firing Range MRS since the 1970s. Because the exact spatial locations of the early studies are unknown, studies conducted prior to 1994 are not depicted on this figure.

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-6
Previous MEC Removal Actions

Legend

- MRS Boundary
- 2014 ESTCP Study Area
- 2004 USAE Surface Clearance Area
- 2004 USAE Subsurface Clearance Area
- 2001 Surface Clearance of Trans Mountain Drum Site
- 1997 UXB Surface Removal Action Area
- 1998 UXB Surface Removal Action Area
- Intermittent Stream
- Canal/Ditch

Removal actions and other studies have been conducted at the Closed Castner Firing Range MRS since the 1970s. Because the exact spatial locations of the early studies are unknown, studies conducted prior to 1994 are not depicted on this figure.

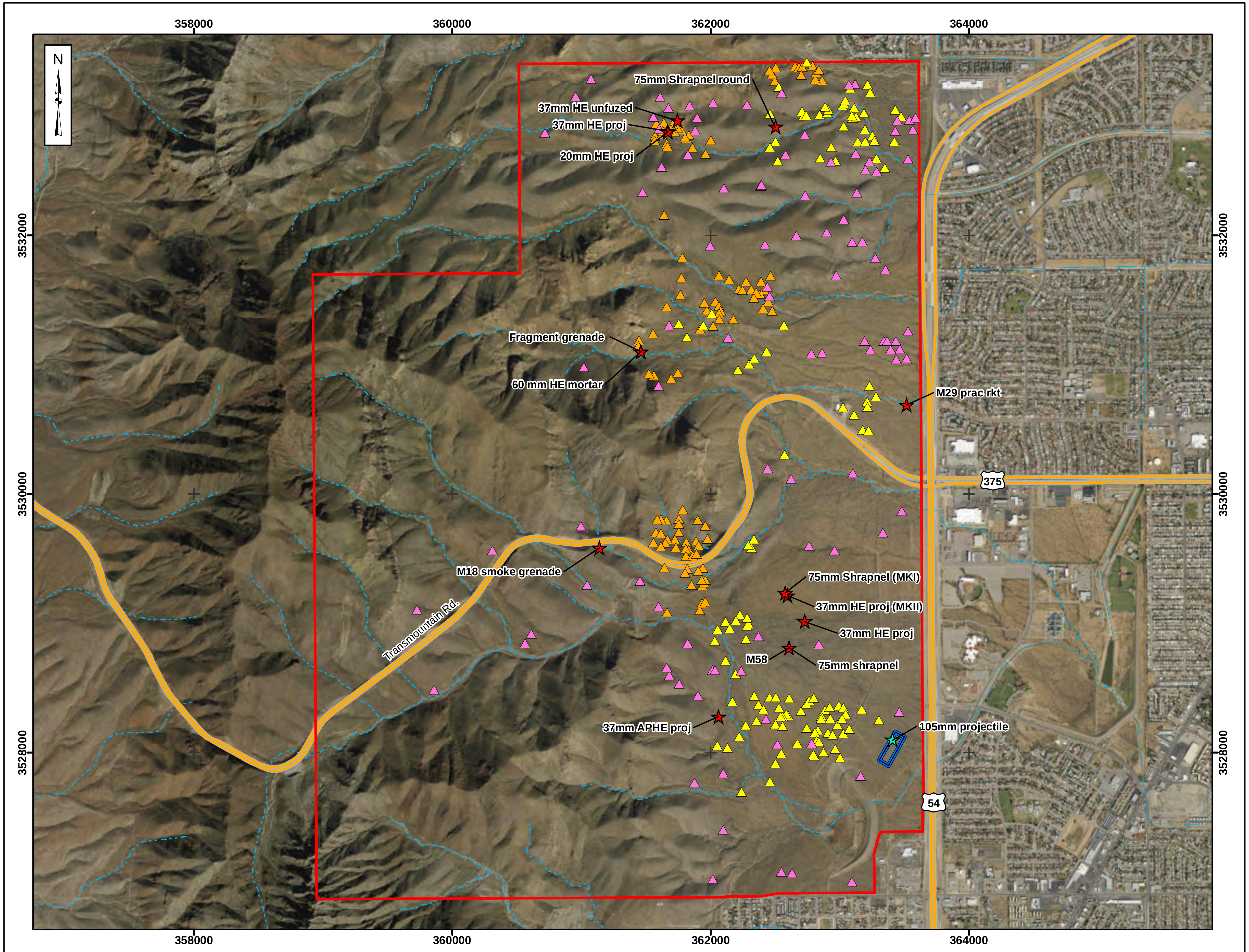
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-7
Previous MEC Find Locations



Legend

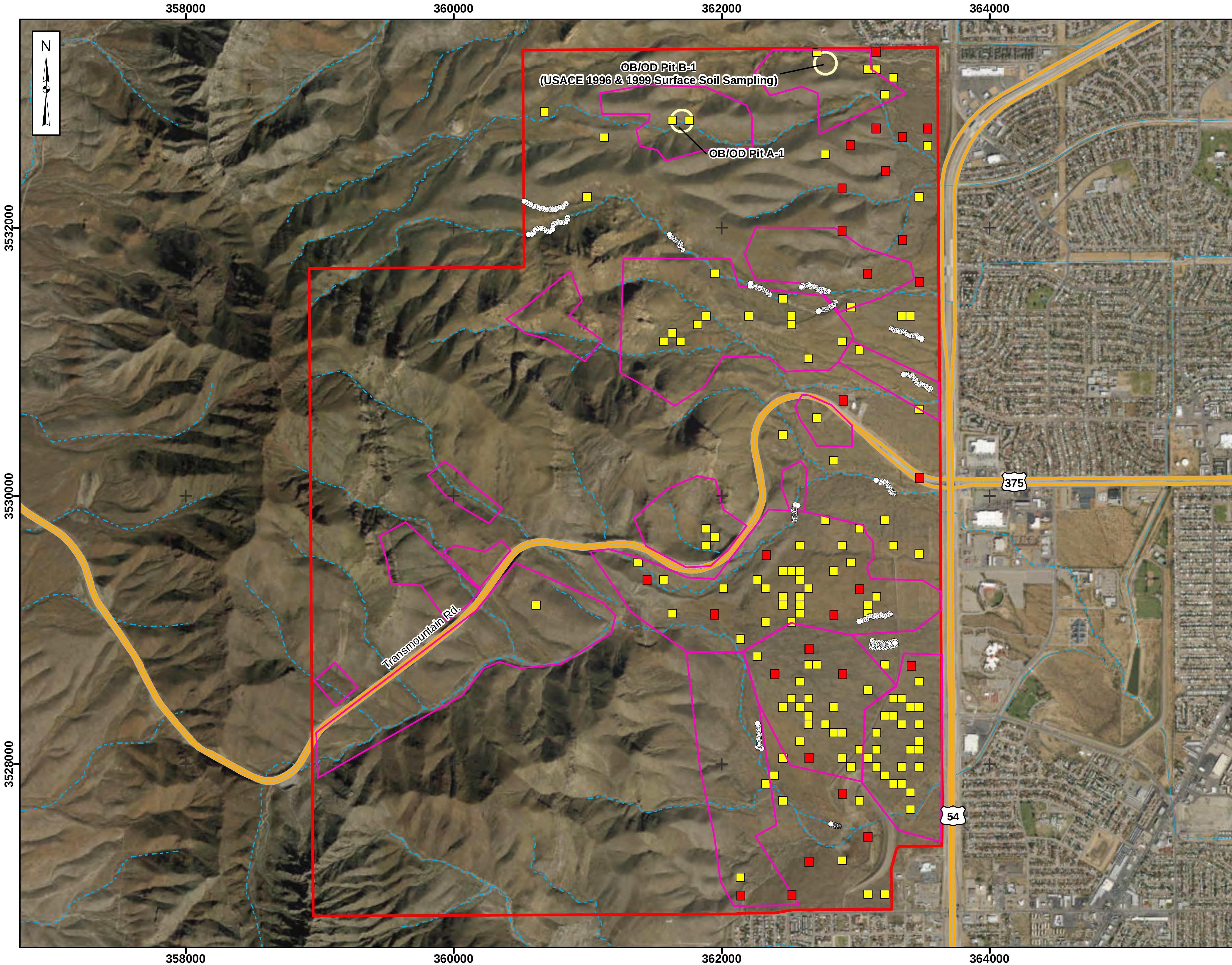
- MRS Boundary
- 2014 ESTCP Study Area
- 2014 ESTCP MEC Find
- 2010 WAA MEC Find
- 2004 USAE Removal Action MEC Find
- 1998 CMS MEC Find
- 1998 UXB Removal Action MEC Find
- Intermittent Stream
- Canal/Ditch

0 0.5 1

Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-8
Previous MC Investigations

Legend

- MRS Boundary
- WAA Area of Concern
- OB/OD Pit
- ISM Phase 1 Decision Unit
- ISM Phase 2 Decision Unit
- ISM Arroyo Decision Unit
- Intermittent Stream
- Canal/Ditch

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

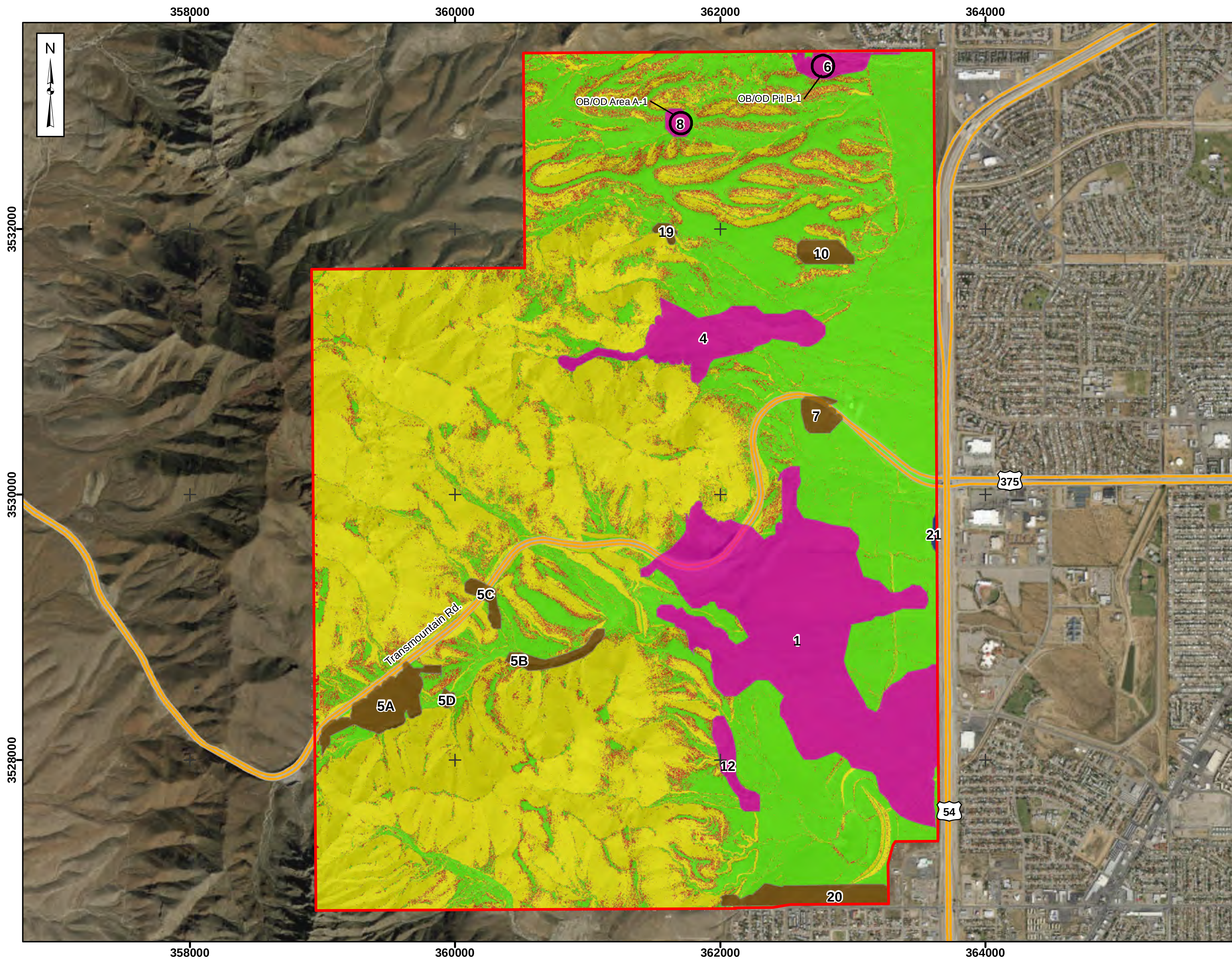


Figure 1-9
Potential CMUA Evaluation Results

Legend

- MRS Boundary
- High Anomaly Density - CMUA; No Investigation Required
- High Anomaly Density - NCMUA; No Investigation Required
- High Anomaly Density - Additional Investigation Required to Determine if CMUA
- Areas with slopes <30% - Analog and WAA Target Investigation
- Areas with slopes between 30-35% - Instrument-Assisted Visual Surveys
- Areas with slopes > 35% - No Investigation Required
- OB/OD Area

CMUA = Concentrated Munitions Use Area

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

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2 PROJECT REMEDIAL RESPONSE OBJECTIVES

This section presents a discussion of the preliminary CSM, project approach, data needs, and DQOs considered while developing response objectives during the RI for the Closed Castner Range MRS. Prior to the initiation of RI field activities, representatives and stakeholders from USACE, Fort Bliss, USAEC, the TCEQ and the JV participated in two TPP meetings (i.e., TPP 1 and TPP 2 -- See TPP minutes in **Appendix B**), which serve as a planning tool throughout the project (note that TPP 3 was held following completion of the field work).

2.1 PRELIMINARY CONCEPTUAL SITE MODEL

The preliminary CSM for the Closed Castner Range MRS was developed during the planning phases of the RI by integrating information from previous investigations, including the WAA Report and ISM Field Demonstration Report. The data collected during the RI have been incorporated into the revised CSM, which is presented in **Section 7.**

The preliminary CSM for the Closed Castner Range MRS, presented in **Table 2-1** below, provided the basis for identifying data collection needs during the RI.

Table 2-1: Closed Castner Firing Range MRS Preliminary CSM

Profile Type	Site Characterization
MRS Profile	**Area and Layout** The Closed Castner Range MRS is in northwest El Paso, in the eastern foothills of the Franklin Mountains. The MRS is approximately 5 miles south of the New Mexico state line and lies between US Highway 54 and the Franklin Mountains State Park.
	CMUAs Evaluation of historical data identified five confirmed CMUAs, and one potential CMUA. No additional MEC investigation was required within the five confirmed CMUAs. Further investigation was required to determine the nature and extent of MEC within CMUA 21 that had not previously been characterized. The remaining portion of the site was considered a NCMUA that required additional investigation to determine whether the MEC density is below 0.1 UXO/acre to a 95% confidence level. The 2013 ISM Field Demonstration Report concluded that there is a correlation between MEC density and MC concentrations for metals. Therefore, delineation of MC concentrations during the RI was performed primarily within the CMUAs. No additional MC sampling was required in the NCMUA, except for delineation around a few locations with exceedances of the RALs identified during the ISM Field Demonstration.
	Structures There are no residential structures within the MRS. The only two structures located within the MRS are the El Paso Museum of Archaeology and the Border Patrol Museum. Both are located along Transmountain Road which bisects the range from east to west. The Fusselman Canyon flood control dam is located in the southern half of the MRS, and there are smaller flood control dams located throughout the MRS.

Profile Type	Site Characterization
	Boundaries US Hwy 54/ Martin Luther King Jr. Blvd forms the eastern boundary of the MRS and the Franklin Mountains State Park is located on the western boundary of the MRS. Hondo Pass Drive is located at the southeast portion of the MRS, with the remaining portion of the southern MRS boundary being adjacent to undeveloped land. The North Hills West residential community is located on the northeast MRS boundary, with the remaining portion of the northern MRS boundary being adjacent to undeveloped land.
	Utilities Utilities located within the Closed Castner Range MRS include electricity, telephone and water.
	Security The Closed Castner Range MRS contains a short section of fence along the northern side and a limited additional portion of the MRS property. Fort Bliss has erected 67 large, bilingual (English and Spanish) warning signs in addition to 102 smaller signs with a large visual display to warn the public against trespassing.
Land Use and Exposure Profile	**Current Land Use** Except for Transmountain Road, the El Paso Museum of Archaeology, the Border Patrol Museum, and the Fusselman Canyon Dam, the MRS is undeveloped. Approximately 40% of the site is gently rolling terrain, progressing to heavily rolling (approximately 20%) and mountainous (approximately 40%) terrain from east to west.
	Potential Future Land Use Future land use for the Closed Castner Firing Range MRS is currently undetermined. In the absence of a documented planned future land use, the most conservative future land use (unrestricted) was assumed for evaluating risk as part of the RI.
	Human Receptors Human receptors include workers and guests to the Border Patrol Museum, El Paso Museum of Archeology, TxDOT and Immigration and Naturalization Service Border Patrol Headquarters; illegal hikers and bikers trespassing on the site; Army workers and Military Police conducting security patrols; and contract workers performing investigation, maintenance, and other work within the MRS. Future human receptors include these, as well as possible residents, and recreational users assuming unrestricted future use.
Ecological Profile	**Ecological Receptors** The region along the state line that separates New Mexico and Texas is a center of biodiversity in temperate North America, and wildlife is abundant at Fort Bliss. There are 58 mammalian species, 39 reptilian species, eight amphibian species and 335 species of birds which are either resident or transient at Fort Bliss. Two threatened fauna occur on the Closed Castner Range MRS: the Texas horned lizard and the Texas lyre snake.
Munitions/Release Profile	**Potential Munitions Used** The Closed Castner Range MRS potentially contains munitions items related to flares; signaling items; training simulator devices; screening smoke; grenades (hand, rifle, smoke); small, medium, and large projectiles (20mm-155mm); mortars; rockets; and small arms.

Profile Type	Site Characterization
	MEC and MD Grenades (hand, rifle, smoke); small, medium, and large projectiles (20mm-120mm); mortars (3-in. Stokes, 4.2 inch, and 81 mm); rockets (2.36 inch and 3.5 inch); and small arms items.
	Associated MC Previous investigations have documented the presence of explosives and metals at the Former Castner Range MRS.
	Release Mechanism Past range training activities such as firing into a target. Disposal operations by OB/OD.
Transport/ Migration Profile	**Transport Mechanisms** The primary transport mechanisms evaluated for the Closed Castner Range MRS included the following: ▪ Surface Soil: Erosion of MC or MEC in soil and run-on and/or run-off via surface water in arroyos or wind. ▪ Subsurface Soil: Soil disturbance of MEC or MC via excavation or other intrusive activity. Ecological activity (e.g., nesting/burrowing animals).
	Migration Routes The primary migration routes evaluated for the Castner Range MRS include the following: ▪ Surface Soil: Precipitation leading to MC infiltration from surface soil to subsurface soil and/or to groundwater. ▪ Subsurface Soil: Infiltration from subsurface soil, and unearthing from subsurface soil to surface soil (via ecological activity) ▪ Surface Water: Surface water containing MC infiltration to subsurface soil and groundwater. Surface water carrying MEC downgradient along arroyos after heavy rain events.
Exposure Pathway Analysis	**MEC** Handling, treading on, and other disturbance by human or ecological intrusive activities.
	MC The MC primary exposure pathways for human and ecological receptors is through direct contact, ingestion, and dust inhalation due to disturbance by human or ecological intrusive activities.

2.2 PRELIMINARY REMEDIATION GOALS AND REMEDIAL ACTION OBJECTIVES

The future land use for the Closed Castner Range MRS has not yet been determined, so the Preliminary Remediation Goals (PRGs) and Remedial Action Objectives (RAOs) for the MRS are conservatively based on a residential scenario as described below.

2.2.1 Remedial Action Objectives

RAOs are site-specific initial clean-up objectives that are established on the basis of the nature and extent of impacts, the resources that are currently and potentially threatened, and the potential for human and environmental exposure. For the Closed Castner Range MRS, the RAOs are based on hazards associated with potential contact with MEC and on risks to receptors due to elevated concentrations of MC in environmental media. The RAO for MEC is to prevent direct physical contact between receptors identified in the CSM to acceptable levels under the most conservative land use scenario (e.g., residential). It is important to note that once a MEC area is identified, there will always be a residual risk of exposure, regardless of the remedial action implemented. The limit of technology for the detection and removal of MEC, combined with the nature of the hazard (explosive), results in a residual risk that must be considered when selecting a remedial action. Because the future land use for the Closed Castner Range MRS has not yet been determined, the RAO for MC is to reduce MC concentrations in environmental media to concentrations that are acceptable for residential use and ecological receptors, as the most conservative scenario.

2.2.2 Preliminary Remediation Goals

PRGs are established to support achievement of the RAOs described above. PRGs for MEC are to complete remedial actions to achieve the RAO described above, and these remedial actions will be evaluated at the FS phase under CERCLA. For MC, the PRGs are conservative, health-based concentrations identified as screening levels. One of the decisions coming out of the TPP process for the Closed Castner Range MRS was that the TRRP PCLs are the appropriate screening levels to be used for remediation goals. Incorporation of substantive TRRP elements into the CERCLA RI and report for the Closed Castner Range MRS is discussed further in **Section 1.2**. The MC of concern for this RI were selected based on review of historical data, munitions used, and constituents that were likely to drive risk for human and ecological receptors. Because the RI assumes an unrestricted future land use, the lowest of the residential human health and ecological PCLs is used for evaluation of potential exposure. For the purposes of this RI Report, the TRRP PCLs will serve as PRGs, and, throughout this document, PRGs will be referred to as PCLs.

2.3 PRELIMINARY IDENTIFICATION OF APPLICABLE OR RELEVANT APPROPRIATE REQUIREMENTS AND "TO BE CONSIDERED" INFORMATION

2.3.1 Definition of Applicable or Relevant and Appropriate Requirements

According to 40 CFR 300.5, applicable requirements means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not ''applicable'' to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

CERCLA response actions are exempted by law from the requirement to obtain Federal, state or local permits related to any activities conducted completely on-site. However, under the CERCLA process, response actions must identify and attain or formally waive applicable or relevant and appropriate requirements (ARARs) under Federal and State laws. ARARs are used as a "starting point" to determining the protectiveness of a site remedy. When ARARs do not exist for a particular chemical or remedial activity, other criteria, advisories, and guidance referred to as To Be Considered (TBC) are useful in designing and selecting a remedial alternative.

2.3.2 Preliminary Identification of ARARs

ARARs can be chemical specific, action-specific, and location specific. Although the RI is not considered a response action, preliminary identification of ARARs (especially chemical-specific and location-specific ARARs) is conducted during RI site characterization.

Table 2-2 lists the primary laws and regulations that may apply to actions at the Castner Range MRS. This table is considered to be a living document subject to modification if additional ARARs are encountered and discussed. The evaluation of the ARARs is an iterative process to be performed throughout the life of the project.

2.3.2.1 Chemical-Specific ARARs

Chemical-specific requirements define acceptable exposure levels for specific hazardous substances and, therefore, may be used as a basis for establishing preliminary remediation goals and cleanup levels for chemicals of concern in the designated media. Chemical-specific ARARs and TBCs are also used to determine treatment and disposal requirements for remedial actions. In the event a chemical has more than one requirement, the more stringent of the two requirements will be used.

One chemical-specific ARAR was identified for lead and is listed in **Table 2-2**.

2.3.2.2 Action-Specific ARARs

Action-specific requirements set controls or restrictions on the design, implementation, and performance of remedial actions. They are triggered by the particular types of treatment or remedial actions that are selected to accomplish the cleanup. After remedial alternatives are developed during the FS, action-specific ARARs and TBCs that specify remedial action performance levels, as well as specific contaminant levels for discharge of media or residual chemical levels for media left in place, are used as a basis for assessing the feasibility and effectiveness of the remedial action.

Four action-specific ARARs that may be applicable during remedial action for the Closed Castner Range MRS are listed in **Table 2-2**.

2.3.2.3 Location-Specific ARARs

Location-specific requirements set restrictions on the types of remedial actions that can be performed based on site-specific characteristics or location. Alternative remedial actions may be restricted or precluded based on federal and state laws for hazardous waste facilities or proximity to wetlands, floodplains or man-made features, such as existing landfills, disposal areas, and local historic landmarks or buildings.

Location-specific ARARs will be identified during the FS stage, as appropriate.

2.3.3 Preliminary Identification of TBCs

TBCs are standards or other screening criteria that may need to be considered during the evaluation of response alternatives but are not promulgated and are therefore not ARARs. As shown in **Table 2-2**, TBCs for the Closed Castner Range MRS include TRRP PCLs (contaminant screening criteria) if remedial actions or demolition activities result in the need to characterize site media (soil, sediment, surface water, or groundwater).

2.4 SUMMARY OF INSTITUTIONAL ANALYSIS

An institutional analysis will be performed as part of a future FS for the Closed Castner Range MRS. An institutional analysis is prepared to identify and analyze the institutional framework necessary to support the development of institutional control strategies (also referred to as land use controls [LUCs]) and plans of action as a munitions response alternative. The institutional analysis will identify those government agencies (federal, State, Tribal, and local level) having jurisdiction over the MRSs with authority and power to protect the public at large from MEC hazards and/or MC risks, and will assess the agencies limitations, appropriateness, capability, and willingness to participate in the remedial alternative selected for the MRS. Any institutional controls that may have been placed on the property in the past as a result of some other activity will be specified. The alternatives selected for further detailed analysis in the FS and their ability to satisfy the project's objectives will be discussed. The cost and effectiveness of existing and proposed institutional controls will also be documented.

2.5 DATA NEEDS AND DATA QUALITY OBJECTIVES

2.5.1 Data Needs

The results of the TPP supported development of the RI technical approach to characterize the nature and extent of MEC and MC at the Closed Castner Firing Range MRS, which is described in **Sections 3 and 4**. The data needs identified by the project team included characterization of the nature and extent of contamination associated with former munitions activities at the Closed Castner Firing Range MRS that may have resulted in the presence of MEC and/or MC.

For MEC, data needs included determining the types, locations, condition, and number of MEC items present in the low-density areas identified during the WAA to assess potential hazards to human health and support the remedial decision-making process. This includes:

- Delineation of the horizontal and vertical extent of MEC in the NCMUA, including in the mountainous areas on the western half of the MRS, to demonstrate there is less than or equal to 0.1 UXO/acre to a 95% confidence level;
- Definition of CMUA boundaries, if any, in the western mountainous areas of the MRS and in potential CMUA 21; and
- Evaluation of the migration potential of MEC from the western portion of the site to the eastern half (i.e., from higher to lower elevation areas).

For MC, data needs included collection of sufficient information to complete the characterization of MC present above RALs within the MRS and to perform a human health risk assessment and a screening level ecological risk assessment. More specifically, the data needed were the MC concentrations present in environmental media that could provide a complete exposure pathway to human health and ecological receptors, as follows:

- Horizontal extent of MC concentrations above the RAL in soil in CMUAs;
- Vertical extent of MC concentrations above the method detection limit for explosives and perchlorate and above background for metals;
- Determination of whether perched groundwater is present below areas of elevated MC concentrations in soil and MC concentrations in groundwater, if the vertical extent of MC in soil was not achieved before encountering groundwater;
- Horizontal extent of MC concentrations in soil within arroyos draining steep slope areas that could contain MEC and/or MD;
- Concentrations of MC in arroyo surface water and/or seeps, where present in the MRS;
- Concentrations of MC in and near soil berms that may have served as small arms backstops.

Quantitative analytical data quality requirements were established in the Uniform Federal Policy (UFP)-QAPP developed as part of the Final QAPP (PIKA-Arcadis JV, 2015a) IAW the DoD Quality Systems Manual, version 5.0 (DoD, 2013).

2.5.2 Data Quality Objectives

The DQOs are qualitative and quantitative statements that define the type, quantity, and quality of data necessary to support the decision-making process during the RI. DQOs were developed during this RI using the *Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4* (USEPA, 2006). DQOs for MEC and MC are presented in **Table 2-3** and **Table 2-4**, respectively and were developed to ensure that the following conditions are met: (1) the field sampling, chemical analyses, and physical analyses are reliable; (2) the preliminary data collected are sufficient; (3) the quality of data generated is acceptable for the intended use of the data; and (4) valid assumptions can be inferred from the data. Project DQOs for MEC and MC were developed in the Final QAPP (PIKA-Arcadis JV, 2015a) in a tabular format.

2.5.2.1 Quality Assurance (QA) / Quality Control (QC)

QA/QC procedures outlined in the Final QAPP (PIKA/Arcadis JV, 2015a) were followed closely. These procedures and the overall design of the investigation were created initially to assure that the DQOs were met. The QA/QC procedures followed are outlined in Worksheets #11-1, #11-2, and #17-1 of the Final QAPP (PIKA/Arcadis JV, 2015a). Intrusive MEC work procedures at the site were overseen by a USACE Fort Worth District Ordnance and Explosives Safety Specialist to verify the JV field team conducted the project as outlined in the QAPP or, where changes to the QAPP were necessary, that these changes adhered to the overall intent of the work to be completed and the DQOs outlined in the QAPP were met. Two approved Field Change Requests documented changes to the QAPP are and are discussed in **Section 3.3**.

The MC related QAPP worksheets were prepared to ensure that the MC quality objectives where met throughout the duration of the project. The worksheets address procedures to assure the precision, accuracy, sensitivity, representativeness, completeness, and comparability of field and laboratory data generated during this project. They also provided a framework for evaluating existing data that was used in this project.

Table 2-2
Preliminary Identification of ARARs and TBCs
Closed Castner Firing Range Remedial Investigation

Regulatory Authority	Type	Law / Regulation	Synopsis	Action to be Taken to Attain Applicable Regulation
ARARs				
*State	Chemical	Texas Risk Reduction Program (TRRP) Rule: 30 TAC 350.76 (c)(1)	The rule codifies the residential soil protective concentration level (PCL) for lead as follows: The Tier 1 residential soil PCL ($^{Tot}Soil_{Comb}$) for lead is 500 mg/kg.	If lead concentration in surface soil exceeds the Tier 1 residential soil PCL, response action will be required.
Federal	Action	RCRA 40CFR265.250	Applies to facilities that treat or store hazardous waste in piles; may apply to stockpiling of waste	Corrective action must be carried out in accordance with RCRA requirements. Texas is responsible for implementing RCRA Corrective Action.
Federal	Action	RCRA 40CFR268.7(a)	Provides testing, tracking, and recordkeeping requirements for generators of hazardous waste.	
Federal	Action	RCRA 40CFR 268.9(a)	Provides special rules for wastes that exhibit a characteristic	
Federal	Action	RCRA 40CFR262.11(a)-(d)	Provides requirements for hazardous waste determination	
TBCs				
*State	Chemical	Texas Risk Reduction Program Rule: 30 TAC Chapter 350.71-350.79 (Development of Protective Concentration Levels)	Provides process for calculation of PCLs for chemicals of concern in soil and groundwater. Tier 1 PCLs provide a starting point for evaluation of potential adverse human health risks from contaminants in soil, air, and water. Calculated Tier 1 PCLs are published by the Texas Commission of Environmental Quality on its website (last update, March 2017).	May need to be considered if chemical contaminants from past DoD use of the site are present in site media at concentrations greater than the PCLs. If PCLs are exceeded, site-specific response actions may be appropriate.

Notes

* Pending RCRA Permit Approval

ARAR	Applicable or Relevant and Appropriate Requirements
TAC	Texas Administrative Code
TBC	To Be Considered
mg/kg	milligrams per killogram
PCL	Protective Concentration Levels

Table 2-3
Project Data Quality Objectives for MEC
Closed Castner Firing Range RI Report

Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Define the problem that necessitates this study	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
Past U.S. Army training activities conducted from the 1930s to 1960s at the MRS have resulted in unknown quantity, type, and distribution of UXO at the site. Historical documents indicate small arms ammunition through large caliber mortars (e.g., 155mm projectile) were used at the site.	• Determine the spatial extent of CMUAs. • Determine the nature of munitions within the CMUAs. • Assess the potential for MEC in NCMUAs, which are low anomaly density areas outside of CMUAs. • Use this information to revise the CSM and determine if MEC exposure pathways for humans are complete	• WAA DGM transect results, VSP analysis of anomaly density, intrusive investigation findings, and QC results. • WAA IAVS anomaly locations. • Intrusive investigation results from the RI. • MEC/ MD locations from the RI, WAA, previous site characterization activities, and previous surface and subsurface removal actions.	• The horizontal input boundary is the MRS/range boundaries, as shown on **Figure 1-3**. The MRS is approximately 7,000 acres in size. • The vertical extent of the geophysical investigation will be the maximum depth of detection for the instrument selected for the investigation. • Depth of the intrusive investigation will be sufficient to resolve anomalies, but will not exceed a maximum vertical extent of 4 feet bgs and intrusive digs will be stopped if bedrock is encountered. • Topography at the site will limit the investigation to slopes less than 35%.	• The usability of the WAA data (e.g., DGM data, analog geophysical data, and QC results) was evaluated in the WAA Data Usability Assessment Report, which is included in Appendix J of this QAPP. • All MD, frag, and high anomaly density areas will be evaluated as possibly indicative of the location of MEC • The WAA anomaly density data and intrusive results from previous investigations will be used to determine anomaly density and distribution across the site and the approximate target area boundaries (*i.e.*, boundaries of the CMUA, which is the boundary between high and low anomaly densities) after being evaluated against the WAA performance metrics and Data Item Description (DID) WERS-004.01 (see Appendix J). • Intrusive results will be used to define the location and spatial extent of MEC • WAA DGM transects nominally spaced 57 meters apart were sufficient to identify CMUAs with diameters up to 370-ft diameter with a 95% confidence level during the WAA. • If additional CMUAs are identified during the RI, step out procedures will be performed to bound CMUAs (within the boundaries of the MRS) if necessary to delineate them to +/- 250 foot accuracy. • Digital geophysical mapping (DGM) grids/transects, analog (mag and dig) transects and intrusive investigation of WAA and RI DGM targets and analog targets will be used to assess the nature and extent of MEC within the NCMUA, or low anomaly density area, identified during the WAA. If WAA DGM targets can't be reacquired within 1.5 meters from the target location, then the WAA DGM reacquisition decision tree (see **Figure 17-3** will be used to determine why anomalies can't be reacquired within this distance and if additional RI data needs to be collected using DGM methods. • The amount of NCMUA investigation acreage was designed in UXO Estimator to provide a 95% confidence that the UXO density in the NCMUA is less than 0.1 UXO/acre. The actual UXO density will be re-evaluated using UXO Estimator once transects have been intrusively investigated. • Prior to collecting DGM data, the DGM system (EM61-MK2 and positioning system) will be tested at the Instrument Verification Strip (IVS) to demonstrate instrument functionality. • Initial testing of the analog geophysical sensor will be performed at an instrument test strip to verify that it is capable of detecting a small Industry Standard Object (ISO) in horizontal orientation to at least a depth of 6 inches bgs.	• The WAA DGM data were evaluated in a Data Usability Assessment Report that is included in Appendix J of this QAPP. The WAA DGM data met the performance criteria of DID WERS-004.01. • Anomaly reacquisition (from WAA DGM transect data) within 1.5 meter accuracy • DGM and analog geophysical data meets or exceeds respective QC performance metrics IAW DID WERS-004.01. • All DGM instrument operators will be tested at the IVS to demonstrate technical ability in operating the DGM system. • All analog geophysical instrument operators will be initially tested at an instrument test strip to demonstrate technical competence and ability to operate and detect anomalies to the instrument's maximum detection depth.	• Areas with slopes greater than 35% o Areas are too steep to traverse by foot. o Visual reconnaissance of these areas will be conducted from less steep areas using high powered binoculars with embedded range finders to visually clear the terrain. • Mountainous areas with slopes up to 35% o Meandering path surveys to identify potential CMUAs. Meandering paths will follow hiking trails and topographic contour lines to minimize safety hazards. o Analog (i.e., mag and dig) transects within newly identified CMUAs to determine nature and extent of MEC. Transects will be 4-ft wide and will be spaced 200-ft apart, if needed. o Intrusive investigation of all anomalies identified along analog (i.e., mag and dig) transects within CMUAs. o Intrusive results will be used in the MEC Hazard Assessment (HA) to determine the MEC hazard levels for the site o The MRSPP will be updated. • Areas with slopes less than 30% o The WAA DGM data had a 95% probability of traversing and detecting CMUAs with a 370-ft diameter (or 187.5-ft radius). The 57-meter transect spacing resulted in an accuracy of CMUA boundary delineation of ± 187 ft. o The WAA DGM data delineated CMUAs that had anomaly densities greater than the critical density of 300 anomalies/acre that are greater than 1.15 acres in size. Areas with anomaly densities lower than 300 anomalies/acre or with smaller size were determined to be background areas, or NCMUAs. o Conduct supplemental investigation of a total of 25.26 acres to achieve a 95% confidence level using UXO Estimator that there is less than 0.1 UXO/acre present in the NCMUAs. o New DGM grids, analog (mag and dig) transects or 100-ft sections of the WAA

Table 2-3
Project Data Quality Objectives for MEC
Closed Castner Firing Range RI Report

Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
					• Daily geophysical instrument QC checks will be conducted IAW DID WERS-004.01 and documented on field forms and in the project database. All seed items in the test strip will be detected by the operator and sensor. • Data will meet all of the project's Measurement Quality Objectives (MQOs) or performance metrics, which are outlined in Worksheet 12.	DGM transects will be randomly selected and all anomalies within those selected sections will be intrusively investigated. o Map surface and subsurface anomaly density and distribution using the WAA DGM data and any newly collected analog data. o Intrusive results will be used in the MEC HA and the MRSPP to determine the MEC hazard levels for the site

Table 2-4
Project Data Quality Objectives for MC
Closed Castner Firing Range RI Report

Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Define the problem that necessitates this study	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
Determine the nature and extent of MC in accordance with the corrective action requirements of the RCRA permit.	• Determine the concentrations of MC potentially present above regulatory screening levels • Regulatory screening levels are specified in QAPP Worksheet #15 and include: TCEQ TRRP Soil PCLs for residential receptors ($^{Tot}Soil_{Comb}$), ecological receptors (eco PCLs), and protection of groundwater ($^{GW}Soil$) and groundwater [if applicable]. Metals concentrations also compared to background (as determined in the ISM Field Demonstration Report for ISM samples and by 30 Texas Annotated Code Chapter 335.51(m) for discrete samples. • Determine the spatial extent of MC above regulatory levels, if present • Determine if MC exposure pathways for human and ecological receptors are complete • Determine if MC pose a human health and/or ecological risk <u>Possible Actions:</u> • No DoD Action Indicated • Institutional Controls • MC Remediation or MC-impacted Media Removal • Combination of Actions	• Data collected during previous activities • Visual observations within transects and in grids (*e.g.*, visible staining or MEC/MD crack/corrosion) • Visual observations during intrusive investigation of identified anomalies (*e.g.*, visible staining or MEC/MD crack/corrosion) • MEC/MD density and distribution to determine if there is a likely MC source • Surface soil, subsurface soil and sediment samples, surface water samples, and groundwater samples (if appropriate) collected and analyzed during RI indicating MC presence above regulatory screening levels (including step out sampling) • Analytical data comparison to leachability criteria to determine if groundwater might be affected. • Metals compared to background. • Groundwater presence/absence above bedrock determination • Survey of site receptors and land use	• A phased approach will be conducted for addressing MC. The number of Phase I sample locations was determined based on evaluation of data gaps based on review of existing studies including, but not limited to, the Wide Area Assessment and the ISM Field Demonstration Report. The number of Phase II and Phase III samples will be determined based on the results of the proceeding phases. • <u>Phase I: MEC Site Sampling (Discrete and ISM)</u>. Up to 7 ISM at post- BIP and consolidated shot locations. Up to 3 discrete samples at MEC locations with signs of release. Samples analyzed for metals, explosives, and perchlorates[1]. • <u>Phase I: Area Wide Horizontal Delineation</u> (ISM): Estimated 149 ISM (including ISM triplicates) around existing CMUAs identified in the ISM Field Demonstration Report that currently have insufficient data to delineate horizontal extent. Number of samples developed using VSP. Samples analyzed for metals, explosives, and perchlorates[1] • <u>Phase I: Arroyo Delineation (Discrete)</u>. Up to 50 sediment samples (+QA/QC) from 10 arroyos, with 5 sampling locations per arroyo plus step out samples for delineation, if necessary. Samples analyzed for metals[1]. 24 surface water samples (6 arroyos, 2 sampling locations, 2 events) [+QA/QC] and samples analyzed for total and dissolved metals[1]. 18 seep samples will also be collected. • <u>Phase I: Backstop Berms (Discrete)</u>. Up to 60 samples (+QA/QC) from up to 10 backstop berms [2 locations with 3 depths per location from within berm and 4 from around base of each berm]. (X-ray Fluorescence [XRF] will be used to screen/select samples for lab analysis: 2 samples with highest XRF readings analyzed by lab). Samples analyzed for antimony, lead, copper, and zinc. Sample with highest lead concentration from each berm also analyzed for Total Characteristic Leaching Procedure (TCLP) lead. The appropriate background concentrations are presented in the 2013 Field Demonstration Report for ISM. • Phase II: A<u>rea Wide Vertical Delineation (Discrete):</u> Up to 15 borings at CMUAs. Up to 45 samples (3/boring, 15 borings) (+QA/QC) analyzed for metals, explosives, and perchlorates[1] and selected samples for Tier 2 parameters/SPLP[2]. Samples at depth and leachability parameters used to determine whether soil to groundwater pathway is complete. Borings will also be	• If the MC concentrations in all the samples from an CMUA are less than the regulatory screening levels identified in Worksheet 15 of the UFP-QAPP, then the action recommended will be no DOD action indicated for the area • If MC concentrations in the samples from the CMUA exceed the regulatory screening levels identified in Worksheet 15, a statistical evaluation of the analytical data or a comparison to site-specific background values (metals only) will be made • Based on this information, if statistical evaluation indicates MC concentrations are above regulatory screening levels or background values, then a Human Health Risk Assessment and Screening Level Ecological Risk Assessment will be developed to determine what further actions, if any, are required *Alternative actions will be formulated in the future Feasibility Study based on the presence/absence of MC, the concentration(s) and media affected, land use, and other data gathered during*	• Standard operating procedures followed during collection, transport, and analyses of QA/QC samples • Field duplicate samples at 10% per media • Matrix Spike (MS) / Matrix Spike Duplicate (MSD) samples at 10% per media • Analysis of samples by both primary and independent QA laboratories • Third-party data validation • Usability of data determined based on criteria specified in the UFP-QAPP	• Biased surface/subsurface soil samples collected immediately under or adjacent to MEC where contamination is most likely (*e.g.*, visual staining or near crack/corrosion). Post-BIP sample collected as well • Samples not collected near inert or intact MEC/ Material Potentially Presenting an Explosive Hazard (MPPEH) unless field observations indicate potential contamination (*e.g.*, staining) • Step-out sampling (Phase 2) to delineate MC hotspots including additional IS decision units and step outs from discrete locations in arroyos. • Sampling and analysis standard operating procedures, protocols, and QC in accordance with UFP-QAPP • Comparison of analytical data to leachability criteria to determine if evaluation of groundwater pathway is needed • Statistical evaluation if needed. • Analytical data will be used in the Human Health Risk Assessment and Screening Level Ecological Risk Assessment, if a risk assessment is needed based on data comparison to risk-based criteria

Table 2-4
Project Data Quality Objectives for MC
Closed Castner Firing Range RI Report

Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
			collected in ISM grids with high metals (lead) concentrations. These concentrations will be compared to Texas-specific background concentrations. • Phase III: Groundwater Assessment. Performed only if needed to determine soil-to-groundwater pathway, based on vertical soil delineation. Up to 3 samples groundwater samples analyzed for metals, explosives, and perchlorates[1] plus total dissolved solids. *Constraints: Weather, accessibility for drill rig, worker health and safety limitations in steep terrain.*	*the investigation and comparison of those data with criteria established herein.*		

Notes:

[1] Metals will include: antimony, arsenic, beryllium, copper, lead, nickel, and zinc. Delineation analyses will be only for those metals that exceeded screening levels. Perchlorate will be analyzed where rocket use was identified in the CMUA.

[2] Tier 2 parameters: pH, fraction organic carbon, grain size distribution, bulk soil density, plus ferric/ferrous iron for redox state of soil and Synthetic Precipitation Leaching Procedure (SPLP) metals and explosives.

3 CHARACTERIZATION OF MEC

This section presents the comprehensive project approach, methods, and operational procedures used for the RI MEC and MC characterization performed at the Closed Castner Range MRS.

3.1 GENERAL

3.1.1 Identification of MEC CMUAs

The Closed Castner Range is comprised of one MRS and has a long history of investigations to characterize the nature and extent of MEC, as well as MEC removal actions (see **Section 1.3** of this report). The 2012 WAA field demonstration used current statistical approaches and technologies used in MMRP investigations. The WAA field demonstration was the most complete MEC site characterization event on the Closed Castner Range MRS prior to the RI. During the development of the QAPP for this RI, and as a result of the TPP meetings with stakeholders, the JV performed a DUA on the WAA assessment data to evaluate whether the data met RI DQOs. The DUA demonstrated the data were sufficient to meet RI DQOs and the data were used to develop the MEC technical approach. DUAs for data evaluated in this RI are provided in **Appendix C.**

As documented in Worksheet #10 of the Final QAPP, the JV evaluated all available previous MEC investigation and removal action data to determine whether further investigation was required within high anomaly density areas, or potential CMUAs. The JV used the ground-based DGM transect paths and anomalies from the WAA as input to Visual Sample Plan’s (VSP) geostatistical analysis module to identify potential target areas, or CMUAs. To determine whether further investigation was required to characterize the nature and extent of MEC within the potential CMUAs, the JV evaluated all existing data for each of the potential CMUAs. Based on this analysis, potential CMUAs were broken down into one of three different categories, as shown on **Figure 1-9**, and described below:

1) **High anomaly density area that is confirmed to be a CMUA; no further investigation is required**
    - These areas have had extensive investigations and/or removal actions performed within the boundaries and there is documented evidence of the types of MEC present within.
    - Sufficient data exists to evaluate remedial alternatives for these CMUAs and no further investigation is required.
2) **High anomaly density area that is confirmed to be a NCMUA; no further investigation is required**
    - These areas have had extensive investigations and/or removal actions performed within the boundaries and there is either no documented MEC impact or there is only very little MEC impact.

  - These areas may contain MEC; however, the MEC density within these areas is not higher than surrounding areas and therefore, they can be considered part of the NCMUA.
  - No further investigation is required to determine whether these areas are CMUAs; however, additional investigation may be conducted as part of the investigation to determine the nature and extent of MEC within the NCMUA.

3) **High anomaly density areas; additional investigation required to determine if the area is a CMUA**
   - No known investigation of potential CMUA 21 has taken place. Based on its location, this CMUA was considered likely to be an edge effect of the VSP analysis (i.e., artifact of the geostatistical modeling due to the data being at the edge of the site boundary). In addition, the potential CMUA is located behind the known firing lines as shown on **Figure 1-3** and therefore, it is unlikely to be a CMUA. This area was investigated during the RI to determine whether it is a CMUA or a part of the NCMUA at the site.

Based on this evaluation, the RI focused on characterizing the nature and extent of MEC in the area outside of confirmed CMUAs (i.e., the NCMUA) and in potential CMUA 21 to determine whether it was a CMUA.

3.1.2 Overview of MEC Field Activities

The JV conducted initial MEC RI field activities between 29 February and 20 June 2016. Most field personnel demobilized the week of 13 June 2016; equipment and office units demobilized the week of 20 June 2016. A limited number of UXO personnel re-mobilized to site on 16 October 2016 to complete anomaly resolution in Lots 8, 9 and 10. These personal demobilized 21 October 2016.

3.1.2.1 Site Specific Training

Site-specific training was conducted IAW the Final QAPP. Before engaging in any on-site activities, all personnel received training appropriate to the tasks to be performed. Training included reviewing the QAPP, including the Accident Prevention Plan, natural/cultural resource training from Fort Bliss staff, and a UXO safety briefing. Daily Safety Tailgate Meetings were completed each morning before the commencement of the day's field activities. Daily forms documenting operations, safety, and QC procedures are included in **Appendix D**.

3.1.2.2 Anomaly Avoidance

When ground disturbance was required for non-UXO intrusive operations (e.g., driving survey stakes, collecting MC soil samples), a UXO Technician II (UXOTII) or higher conducted anomaly avoidance procedures to ensure the location was anomaly-free prior to the ground disturbance. The UXOTII or higher swept a White's MXT All-Metal Detector above and within a three-ft radius of the ground disturbance location. When subsurface anomalies were identified, the location was moved to an anomaly-free location to ensure personnel safety. The UXOTII or higher also escorted and maintained the safe access and egress routes for all non-UXO personnel on site.

3.1.2.3 Field Activities

Field activities for the MEC Investigation occurred in the below phases. **Figure 3-1** shows the transects and grids in which work was conducted during the RI.

<u>MEC Phase I – Instrument Assisted Visual Survey (IAVS) in Areas with Slopes greater than 30%</u>

- The JV's UXO technicians conducted 31.50 miles of 20-ft wide IAVS transects (76.36 acres) with all-metal detectors and handheld Global Positioning System (GPS) units. The survey was conducted along unofficial hiking trails and areas of steep slopes up to 35% to identify surface MEC, potential CMUAs (i.e., areas with anomaly densities greater than 300 anomalies/acre), and areas with high densities of MD and/or range related features (e.g., craters). In addition, IAVS transects were conducted in potential CMUA 21 to determine if there was evidence of surface MEC/MD. Note that the 30% slope metric was used as the primary criteria during the TPP process; however, the JV field teams were able to access slopes up to 35% in the field.
- Survey path width was approximately 20 ft depending on accessibility limitations due to terrain, vegetation, and line-of-site. UXO technicians visually inspected 10 ft on either side of the IAVS path center line; a 4-ft wide instrument assisted survey was performed along the center of the path.
- Location of surface features (e.g, MEC, MD, craters) was electronically recorded to sub-meter accuracy and visual inspection of all geophysical detections was performed. Subsurface anomaly locations were recorded in the handheld GPS.

<u>MEC Phase II – Geophysical and Intrusive Investigation in Areas with Slopes Less than 30%</u>

- Investigate a minimum of 25.27 acres outside CMUAs to show that there is less than 0.1 UXO/acre to a 95% confidence level. A total of 29.03 acres were investigated during the RI as follows:
    - **WAA Transects** - 3,303 DGM anomalies detected on 1,750, 100-ft WAA DGM transect segments (16.07 acres) were reacquired and intrusively investigated.
    - **DGM Grids** – 29, 100-ft x 100-ft grids and one 50-ft x 50-ft grid (6.71 total acres) were randomly located, DGM surveyed, and DGM anomalies were reacquired and intrusively investigated.
    - **Analog Mag and Dig Transects** - A total of 456 randomly placed transects that were nominally 100-ft long (10.77 miles, or 5.22 acres) were investigated using analog (i.e., mag and dig) techniques in areas with slopes between 18 and 30% and outside of CMUAs.

<u>MEC Phase III – Additional Mag and Dig Investigations</u>

- Two high anomaly density areas (e.g., exceeded the 300 anomalies/acre threshold established for Phase 1) were identified within the western portion of the MRS. A total of 2.13 miles of analog transects (1.03 acres) were conducted within these potential

CMUAs to determine the nature of subsurface anomalies and to determine the extent of MEC and MD.

3.2 MEC CHARACTERIZATION PROCEDURES

3.2.1 Mobilization/Site Preparation

3.2.1.1 Mobilization

Field management crews mobilized to the site on 29 February 2016 to place the field office and storage facilities. The explosives magazine was delivered on 3 March 2016 and set up (fencing and grounding) were completed 7 March 2016. Fourteen additional UXO personnel arrived on 7 March 2016 which completed mobilization.

3.2.1.2 Civil Survey

The JV's subcontractor Precision Land Surveyors of Las Cruces, New Mexico established three pairs of temporary control monuments prior to the start of the RI geophysical investigations. All civil survey work was performed IAW the Final QAPP, DID WERS-007, and EM 200-1-15. Control monuments were established with a horizontal and vertical control of Class I, third order or better, and referenced to the Universal Transverse Mercator projection, North American Datum of 1983 datum, with units of meters. Survey control locations were incorporated into the GIS. Surveyors were accompanied by a UXOTII during field efforts who implemented MEC anomaly avoidance procedures and for safe access and egress on the site. **Table 3-1** presents the location and elevation of the six temporary control monuments established by Precision Land Surveyors. Precision Land Surveyors also established the grid corners and surveyed the blind seed items (BSIs) for grids G01 through G22. The JV's DGM data collection and reacquisition teams used the control monuments as Real Time Kinematic (RTK) Differential Global Positioning System (DGPS) base stations to establish the remaining DGM grid corners for Grids G23 through G30 and for all anomaly reacquisition. The UXO Quality Control Specialist (UXOQCS) also used the control monuments as RTK DGPS base stations to place blind seeds in Grids G23 through G30. The Civil Survey is included with the MEC investigation data in **Appendix E**.

Table 3-1: Temporary Control Monument Locations

Monument Number	Easting (ft)[1]	Northing (ft)[1]	Elevation (ft)[2]
GPS 1	363,116.789	3,530,680.805	1,267.996
GPS 2	363,121.148	3,530,710.957	1,268.051
GPS 3	362,804.212	3,527,824.878	1,250.493
GPS 4	362,826.345	3,527,845.801	1,248.577

Monument Number	Easting (ft)[1]	Northing (ft)[1]	Elevation (ft)[2]
GPS 5	362,026.421	3,532,342.495	1,372.818
GPS 6	361,997.604	3,532,332.495	1,374.802

Notes:
1 – Coordinates are provided in Universal Transverse Mercator, Zone 13 North, World Geodetic System 1984, in units of Meters
2 – Elevations are provided in North American Vertical Datum 1988 in units of meters.

3.2.1.3 Vegetation Removal and Surface Clearance
Prior to, and during vegetation removal, UXO technicians visually searched the DGM grids to identify surface metal. All surface metal that could interfere with the DGM grid surveys, or MEC that could represent a safety hazard, was located to a collection point outside of the DGM grid for proper disposal.

The JV's UXO technicians performed vegetation removal in DGM grids to enable the EM61-MK2 to access as much of the grids as possible. Vegetation was cut no closer than six inches from the ground surface using weed whackers for low-lying vegetation and chain saws for thicker vegetation. The UXO technicians wore personal protective equipment as required by EM 385-1-1 (USACE, 2014) during vegetation removal activities. Cut vegetation was moved to outside of the DGM grids and allowed to degrade naturally.

3.2.2 Geophysical Systems Verification

3.2.2.1 Introduction
The JV used the GSV process to monitor and verify DGM equipment functionality. The GSV process consisted of an instrument verification strip (IVS) and a blind seeding program during DGM mapping that was conducted IAW the Final QAPP (PIKA/Arcadis JV, 2015a) and the IVS Report approved by USACE on 21 March 2016 (**Appendix F**). The standard GSV process was used to monitor data quality at the beginning and end of days where DGM data was collected. Although the IVS concept is not directly applicable to analog procedures (because there is no recordable response to verify), UXO technicians also tested their analog sensors at the IVS to ensure they obtained a positive response. The following sections apply only to DGM procedures.

3.2.2.2 Instrument Verification Strip Design and Results
The JV installed one IVS at the Closed Castner Range MRS near the Museum of Archaeology on Transmountain Road. The IVS provided a means to verify on an ongoing basis that the geophysical equipment, including both the EM61-MK2 and the RTK DGPS, was operating properly. The IVSs were established in an open portion of the MRS that were relatively free of background anomalies prior to the start of the field activities. The IVSs were linearly seeded with four items, including two Schedule 80 small surrogate industry standard objects (ISOs), and two Schedule 40 medium

ISOs. IVS construction details, procedures, and results of the IVS are detailed in the Final IVS Letter Report included in **Appendix F**.

As documented in the IVS Letter Report (**Appendix F**), the JV used an anomaly selection threshold of 2.8 millivolts (mV) on EM61-MK2 channel 2. The anomaly selection threshold was calculated based on the statistical analysis of the background measurements acquired within the initial IVS datasets collected on 9 March 2016.

After the initial IVS tests, the JV's DGM team collected EM61-MK2 data over the centerline and noise line at the IVS before and after the DGM surveys on days where DGM data was collected. IVS-specific data and results collected daily during the DGM survey effort are provided with the DGM data in **Appendix E**. Results collected for each day of DGM at the IVS show agreement and repeatable results for the series of seeds. The seed items placed within the IVS were observed in the geophysical data with signals consistent with the sensor response curves developed for the EM61-MK2. All peak responses from the seed items were observed to be greater than the least favorable orientation response and to have consistent responses between surveys. These results demonstrate that the digital geophysical equipment was functioning within a tolerable range to achieve detection performance metrics. The IVS data are included in **Appendix F** and the results are documented in the project's MS Access Database in **Appendix E**.

Although the White's MXT All-Metal Detector is not tested in the GSV process (because no response is recorded), the UXO technicians performed instrument functionality tests at the IVS daily. The UXOQCS confirmed that each White's MXT All-Metal Detector and UXO technician operator could detect the ISOs in the IVS daily. Although the detection depth of the White's MXT All-Metal Detector relative to specific munitions is not known, the instrument functionality tests conducted by the UXO technicians at the IVS indicate that the White's MXT All-Metal Detectors had similar detection depth capabilities to the EM61-MK2 because the ISOs in the IVS were detected.

3.2.2.3 Blind Seeding

A seeding program was instituted in the DGM survey areas to provide ongoing monitoring of the geophysical instrumentation detection performance. All seed items were blind to the DGM data collection and data processing teams. One seed item, consisting of a small ISO80, was placed at approximately 3.5 inches bgs at a minimum frequency of one seed item for each day of DGM data collection. Either Precision Land Surveying, the UXOQCS, or their designee, surveyed the BSI locations. The UXOQCS, or their designee, measured and recorded the depths to the center of mass for the BSIs.

A total of 16 small ISO80 BSIs were placed within the DGM grids. The depth, orientation, location, as well as the corresponding target geophysical response and offset are provided in **Appendix E**. **Table 5-2** in **Section 5.1.3** presents the results of the blind seeding program.

3.2.3 Phase I – Instrument Assisted Visual Survey

In mountainous areas, the UXO technicians performed IAVS transects in up to 10% of the areas with slopes up to 35%, to identify surface MEC and MD, potential CMUAs (i.e., areas with anomaly densities greater than 300 anomalies/acre), areas with high densities of MD, and range related features (e.g., craters). The UXO teams split up into groups of two to perform the IAVS; each two-person group consisted of a UXOTII or higher and one UXO Technician I (UXOTI). This activity was limited to a visual survey / surface walkover, predominantly in areas by unofficial hiking trails and areas with steep slopes. **Figure 3-2** depicts the IAVS transects that were conducted during the RI.

A White's MXT All-Metal Detector was used to conduct the IAVS and detect surface MEC (primarily used for MEC safety avoidance) and subsurface anomalies. Each two-man team followed the proposed IAVS transect to the extent practical, deviating from the proposed path to prevent endangering personnel safety due to steep terrain. The instrument-assisted portion of the survey was 4 ft wide, and the visual portion of the survey path was 20 ft wide. The team visually inspected all geophysical detections or ring-offs related to objects at the surface. The IAVS teams used the handheld GPS with sub-meter accuracy to record the path traversed by the IAVS team, the nature of surface features identified, and the locations of subsurface anomaly detections. GPS data from the survey was downloaded daily; post-processed using Trimble Pathfinder Office software; and incorporated into the project GIS. No intrusive work was conducted as part of the IAVS; however, Phase III analog ("mag and dig") transects were placed within any potential CMUAs (i.e., area with greater than 300 anomalies/acre on average) that were identified during the IAVS transects to determine the nature of the anomalies identified, whether the elevated anomaly density area was a CMUA, and the nature and extent of MEC.

3.2.4 Phase II Geophysical and Intrusive Investigation

3.2.4.1 Reacquisition and Intrusive Investigation of WAA Anomalies

The JV randomly selected 1,750, 100-ft transect segments from the WAA DGM transect data not previously investigated based on the DQO outlined in the QAPP. **Figure 3-3** shows the WAA transect segments that were investigated during the RI. A total of 3,303 anomalies were detected on these transects during the WAA DGM transect surveys. The JV reacquired and intrusively investigated all these anomalies. Dig lists were developed for each DGM transect prior to mobilization to the site. The transects were grouped into 17 lots to determine that 12 anomalies required anomaly resolution within each lot to show to a 70% confidence level that less than 10% of the anomalies were unresolved. This is the default amount of anomaly resolution required per EM 200-1-15 for RIs where MEC is found (see Table 6-6 of EM 200-1-15).

The reacquisition teams reacquired the targets within the transects using an RTK DGPS. Anomaly reacquisition was a two-step process that included 1) locating the ground position of the anomaly coordinates from the dig sheet using the RTK DGPS and placing a pin flag in the ground, and 2) refining the anomaly location by moving the White's MXT All-Metal Detector back and forth over the general anomaly area to identify the location of the peak anomaly response. The reacquisition team performed Step 1 above for all anomalies, and either the reacquisition team or the dig team performed Step 2. The offsets and offset direction were recorded in the project's MS Access database IAW Appendix B of DID WERS-004.01. The Dig Teams intrusively investigated anomalies using the procedures outlined in **Section 3.2.8**.

Because the WAA data was collected in 2010 and the reacquisition and intrusive investigation took place in 2016, there was concern during the planning stages of the RI that some of the anomalies may have moved. The JV developed a decision logic to investigate these anomalies (see Figure 17-4 of the Final QAPP) to evaluate anomalies if a target response could not be found. The number of no contacts (i.e., the anomaly source could not be located) in Lots 15 and 17 exceeded the 15% threshold established in the Final QAPP. Non-Conformance Report (NCR) 2 and Root Cause Analysis (RCA) 2 were written to document this issue and develop a corrective action (see **Appendix E**). The corrective action included collecting new DGM grid data to replace the area of investigation included in the WAA DGM transects contained within Lots 15 and 17. See **Section 3.3** of this report and the field change request in **Appendix G** for further details.

3.2.4.2 DGM Grid Surveys

3.2.4.2.1 DGM Data Collection

The JV conducted DGM grid surveys in a total of 30 grids, including: the originally planned 22 100-ft x 100-ft grids, plus seven 100-ft x 100-ft grids and one 50-ft x 50-ft grid. The additional grids were added as the corrective action to the no-contacts from WAA Lot 15 and 17 data as documented in NCR2/RCA2. **Figure 3-3** shows the locations of the DGM grids that were conducted during the RI. The JV's DGM teams conducted the DGM surveys using the EM61-MK2 in standard wheeled mode along lines spaced 2.5 ft apart and positioned with a Trimble R10 RTK DGPS. EM61-MK2 data was collected at a sampling rate of 10 Hertz, and RTK DGPS was collected at a rate of 1 Hertz. Digital data was recorded in the field data logger and manual data was recorded on field forms for each grid.

3.2.4.2.2 DGM Data Processing

The JV used Geosoft's Oasis Montaj, including the UX-Process and UX-Detect Modules, to process, interpret, and present DGM data. The JV performed daily QC and data processing of all data sets in the same manner as demonstrated and established at the IVS. The DGM data were processed and the anomaly selection criteria were established to identify anomalies potentially representative of MEC. The Senior Geophysicist selected the anomaly selection threshold of 2.8 mV on EM61-MK2 Channel 2 and documented the rationale in the IVS Letter Report (see **Appendix F**). The anomaly selection threshold was above the apparent noise values in the IVS and initial production grids.

The DGM data were acquired, processed, and QC checked IAW the Final QAPP (PIKA-Arcadis JV, 2015a), DID WERS-004.01, and EM 200-1-15. DGM data processing consisted of the initial field processing; standard data analysis (e.g., leveling and performing latency corrections); target selection; data storage; and preliminary processing as outlined in the Final QAPP (PIKA-Arcadis JV, 2015a).

3.2.4.2.3 DGM Data Management

All DGM survey data were managed using Geosoft® Oasis Montaj software. All analog data were managed using a GIS and are stored in Environmental Systems Research Institute® (ESRI)-compatible geographic information system formats, primarily ArcView shape files. All DGM data were provided electronically to the USACE Geophysicist for QA review. Data were provided via the JV's FTP site and were backed up on the Arcadis internal network and project workstations.

3.2.4.2.4 Anomaly Selection

DGM anomalies on grids were selected from the gridded data using the Blakely Test target selection algorithm in Oasis Montaj. A 2.8-mV target threshold on Channel 2, as approved by the USACE QA Geophysicist, was used to select the target list (refer to the IVS Letter Report in **Appendix F**). This threshold was based upon seed item responses and noise levels observed at the IVS during initial pre- and post-seeding surveys. Target review consisted of manually evaluating all selected targets and removing or merging multiple targets associated with large anomalies. Where necessary, targets were moved to the location of the peak response or target center of a given anomaly.

All DGM grid anomalies that had a Channel 2 peak response greater than 2.8 mV were intrusively investigated. The Senior Geophysicist, or their designee, reviewed all DGM grid survey data to ensure that all anomalies with Channel 2 responses above the anomaly selection threshold in DGM grids were selected for reacquisition and intrusive investigation.

3.2.4.2.5 Dig Sheet Development

Following the selection of anomalies, the anomaly locations and characteristics were compiled into a dig list. The JV exported the target database from Geosoft Oasis Montaj to an Excel spreadsheet and verified the Excel file was in the proper format and populated with the correct dig list. The dig list data were imported into a hand-held tablet computer and managed using Arcadis' AssetHound software. The Senior Geophysicist, or their designee, assigned each anomaly a unique target identifier and entered the corresponding information for the target into the database. The following information was included in the database for each anomaly:

- Grid or transect identification (ID);
- Unique target ID, including the grid or transect ID;
- Easting and northing position; and
- Channel 2 response amplitude.

3.2.4.2.6 Anomaly Reacquisition and Intrusive Investigation

All DGM grid anomalies on the dig list were reacquired using the procedures outlined in **Section 3.2.4.1** and intrusively investigated using the procedures outlined in **Section 3.2.8**.

3.2.4.3 Analog Geophysical Transect Investigation

The JV's UXO technicians conducted randomly placed 100-ft long analog (i.e., mag and dig) transects (**Figure 3-4**) that were randomly generated in GIS in areas: 1) outside of the known

CMUAs and 2) in areas with slopes between 18 and 30%. The JV's UXO Technicians conducted the analog transects using a handheld GPS with sub-meter horizontal accuracy and a White's MXT All-Metal Detector along the 4 ft-wide transects. The analog transects were loaded onto the GPS units to enable accurate navigation along the transects. The UXO technicians advanced in a slow, continuous pace, visually inspecting the surface for MEC while sweeping the all metals detector in a side-to-side motion, scanning the transect for subsurface anomalies and successively excavating all subsurface anomalies until the assigned transect was complete. The Team Leader closely monitored individual performance throughout the investigation to ensure full transect coverage and proper search techniques were used. All detected anomalies were excavated using procedures discussed in **Section 3.2.8**. The location and nature of all anomalies were recorded in the handheld GPS unit.

3.2.5 Phase III Additional Analog Transects

As discussed in **Section 3.2.3**, the JV identified two areas during the IAVS transect surveys where the anomaly density exceeded 300 anomalies/acre. Within these areas, the JV conducted additional analog transects to determine if the area was a CMUA, to characterize the nature of the subsurface anomalies, and to characterize the nature and extent of MEC and MD. **Figure 3-4** shows the location of these two additional transects. The Phase III Analog transects were conducted using the same procedures as discussed in **Section 3.2.4.3** of this report.

3.2.6 Quality Control

Analog and DGM measurement quality objectives (MQOs) were established in the Final QAPP and the MQOs were tracked daily throughout the life of the project. The QC Geophysicist, or their designee, performed DGM QC checks on the instrument function tests and on the data collected by the EM61-MK2. The following DGM MQOs were analyzed:

- Static repeatability;
- Along-line measurement spacing;
- Speed;
- Coverage;
- Dynamic detection and positioning repeatability;
- Target selection;
- Anomaly resolution;
- Geodetic equipment functionality;
- Geodetic internal consistency; and
- Geodetic accuracy.

The UXOQCS, or his designee, performed QC of analog data, including IAVS transects, analog transects, and the intrusive investigations. The following analog MQOs were analyzed:

- Repeatability;
- Dynamic repeatability
- Anomaly resolution; and
- Geodetic equipment functionality.

An NCR and RCA were generated for each failed test to determine the cause of the failure. The RCA determined the cause of the QC failure; determined whether the failure adversely impacted project decision making; and made recommendations for modifications to procedures, as needed, to ensure test failures did not persist and that data met project DQOs. The JV provided a rationale for the acceptance of failed QC tests. NCRs and RCAs developed during the field effort are provided in **Appendix E**.

3.2.7 Post-Dig Anomaly Resolution

Per FCR 2, the JV's UXOQCS performed anomaly resolution sampling IAW Attachment D of DID WERS-004.01 and the Final QAPP to ensure the source of anomalies was removed. For WAA, DGM grid, and analog transect anomalies, the UXOQCS or designee checked a sufficient number of anomalies within each lot to ensure there was 70% confidence that no more than 10% of the anomalies were unresolved. For the WAA and DGM grid anomalies, the UXOQCS, or their designee, used the EM61-MK2 for anomaly resolution. For the analog transects, the UXOQCS, or their designee, used the handheld White's MXT All-Metal Detector for anomaly resolution.

Anomalies were considered resolved if they met one of the below requirements per footnote k of Table 11-3 in EM 200-1-15:

- there is no geophysical signal remaining at the flagged/selected location;
- a signal remains but it is too low or too small to be associated with a target of interest;
- a signal remains but is associated with surface material which when moved results in low, or no, signal at the interpreted location; or
- a signal remains and a complete rationale for its presence exists.

If one of the anomalies selected for anomaly resolution within a lot failed, then the entire lot of data failed. This prompted a RCA to identify the source of the failure and CA. This occurred during anomaly resolution in Lots 8, 9, and 10; the CA is discussed in NCR/RCA 3 included in **Appendix E**.

3.2.8 Anomaly Excavation Procedures and Reporting

The JV's UXO Teams intrusively investigated WAA DGM anomalies, DGM grid anomalies, and analog transect anomalies using hand tools IAW the Final QAPP, ESP and MEC Standard

Operating Procedure 7 contained therein. The UXO teams consisted of one UXO Technician III (UXOTIII), two UXOTIIs, and two UXOTIs. The site management team (e.g., Senior UXO Supervisor [SUXOS], UXOQCS, and UXO Safety Officer [UXOSO]) oversaw all field teams. Any suspected or known MEC encountered during excavation was clearly marked in the field and disposed of on the same day it was located if possible. If demolition operations could not be performed on the same day MEC was located, security was provided 24 hours a day until the item could be disposed of. The following sub-sections provide more details on the anomaly excavation procedures.

3.2.8.1 Excavation Procedures

UXO Technicians investigating DGM targets began the anomaly investigations by sweeping a 3-ft radius around the pin flag with a White's MXT All-Metal Detector to focus the excavation at the peak response. The offset and offset direction of the peak response were recorded for each anomaly by UXO Technicians. Intrusive operations at each anomaly location were performed using hand tools. The UXO Technicians excavated at the location of the highest detector response until the source of the anomaly was found, up to the depth of detection of the instrument. The target location was considered clear when a signal source was no longer detected after removal of the conductive item, or the source of the signal was identified to be associated with a cultural feature such as a fence or building. Dig teams recorded the excavation results in the handheld GPS for the analog transects and, in the JV's, AssetHound tablet application for the DGM anomalies. Anomaly attributes logged included anomaly type, MEC/MD type (if appropriate), depth, weight, offset, offset direction, final disposition, and additional information as needed. A detailed account of all MEC and other materials encountered during the surface and subsurface searches was maintained and is provided in the MS Access database provided as **Appendix E**. Photographs of the anomaly excavation process are provided in **Appendix H.1**. Scrap small arms cartridge cases were not removed during excavations. All excavations were filled in and tamped to the approximate consistency of the surrounding soil. The excavations were returned as nearly as feasible to an undisturbed condition. The UXOQCS performed QC of the intrusive investigation using the procedures outlined in **Section 3.2.6**.

3.2.8.2 Munitions with the Greatest Fragmentation Distance

The munition with the greatest fragmentation distance (MGFD) that was reasonably expected (based on research or characterization) to be encountered within the MRS was the 155-mm M107 (Composition B Filled) projectile, as specified in the approved ESP (PIKA/Arcadis JV, 2015b).

3.2.8.3 Minimum Separation Distance

Based on the characteristics of the MGFD, the minimum separation distance is the protective distance at which personnel must be separated from an intentional or unintentional detonation. The hazardous fragment distance (HFD), also known as the 1-in-600 distance, is the calculated distance at which a fragment impacts at 58-ft pounds or more of energy. This is also the distance from which non-essential personnel must be kept from MEC activities for unintentional detonations for fragmenting munitions. The HFD established in the project ESP (PIKA/Arcadis JV, 2015b) for nonessential personnel was set at a distance of 450 ft.

The team separation distance (TSD) is the distance that essential personnel and/or teams must be separated by while conducting MEC activities on an MRS. Normally, this is the K40 distance of the net explosive weight of the MGFD for the MRS. For this project, the TSD was established in the ESP (PIKA/Arcadis JV, 2015b) at a distance of 123 ft.

3.2.8.4 Exclusion Zones

Exclusion zones were established during intrusive investigations to protect essential and nonessential personnel from unintentional and intentional detonations. The primary protective distance is the HFD of 450-ft. The applicable exclusion zone distance was enforced during all intrusive investigations.

3.2.8.5 Inspection of Material Potentially Presenting an Explosive Hazard

During the RI field activities, military munitions-related items were considered material potentially presenting an explosive hazard (MPPEH) until properly inspected by two UXO technicians. As MPPEH was encountered, an inspection was performed by a UXOTII and UXOTIII and classified as material documented as safe (MDAS) or material documented as an explosive hazard (MDEH). If the anomaly was MEC or MPPEH that could not be positively identified as MDAS or MDEH, the Project Manager or SUXOS notified the Ordnance and Explosives Safety Specialist and Fort Bliss representatives as soon as possible after it was discovered. The JV, after receiving authorization by Fort Bliss, scheduled and conducted demolition, or blown in place, operations using the procedures in the Final QAPP to dispose of the located MEC/MDEH. Demolition operations were conducted as needed, and MEC/MDEH were properly marked and remained secured within the MRS until they were demolished. Items classified in the field as MDAS pose no explosive hazard and were transported to a collection point for final inspection, certification and disposal as MDAS as described in the following section.

3.2.8.6 Material Documented As Safe

All items classified as MDAS were recovered, certified, and verified as free from explosives, and stored in a locked container. Following recovery, the SUXOS inspected the MDAS and the UXOQCS performed a re-inspection to verify the process and ensure that only MDAS were stored in the locked container. The SUXOS and UXOQCS inspections were conducted immediately prior to the turn-in of MDAS to Tri State Metals in Texarkana, Arkansas. Certified, verified MDAS was turned in to Tri State Metals with the completed DD Form 1348-1A signed by the SUXOS and UXOQCS to certify and verify the materials listed had been 100% inspected by a UXOTII, 100% re-inspection by an UXOTIII, and classified as MDAS. The total amount of MDAS turned in to Tri State Metals for disposal was 300 pounds.

The storage containers were under the control and custody of the JV from the time the MDAS was inspected, certified, and verified until turned over to the recycler for final disposition. After the DD Form 1348-1A was signed by the SUXOS and UXOQCS, a copy was maintained, and the original accompanied the MDAS to its final disposition at the Tri State Metals facility. Copies of the DD Form 1348-1A are provided in **Appendix I**.

3.2.8.7 Munitions and Explosives of Concern Disposal

All MEC items found during excavation and intrusive investigation activities were determined acceptable-to-move by the SUXOS and UXOSO and were guarded until demolition operations were conducted. While the items were deemed safe to move, the field team either destroyed them in the original locations or moved them a short distance to enhance safety operations.

All MEC items were destroyed using demolition procedures in accordance with the approved QAPP. The first MEC item was located before demolition materials had been delivered to the site. Twenty-four-hour security was provided on this item until demolition operations could be conducted.

The JV conducted demolition operations to dispose of the six MEC items that had been located within the RI Study Area. These were destroyed in five separate demolition operations on the following dates: 1) 16 March 2016, 2) 1 April 2016, 3) 5 April 2016, 4) 16 May 2016 (two items), and 5) 3 June 2016. In addition, demolition operations were conducted on a MEC item (3-inch Stokes HE Mortar) on 17 May 2016 to remove the explosive hazard that was found outside the investigation area while transiting the site. Finally, on 13 June 2016, the JV conducted one final consolidated shot demolition operation on 41 MDEH items to ensure all residual tracer material was completely removed from the items; these included: 24, 37mm target practice; five, 40mm target practice; and 12 miscellaneous fuze parts. Following completion of the MDEH demolition event, any remaining items were inspected and certified as MDAS. Descriptions of the items are included in the MEC and MDEH Finds and Disposition Documentation in **Appendix J**.

Demolition operations were coordinated by the SUXOS and IAW the procedures outlined in Department of the Army Technical Manual 60A-1-1-31 (Department of the Army, 2014), USACE EM 385-1-97, Explosives Safety and Health Requirements Manual, the JV's MEC Demolition Standard Operating Procedure, and the approved ESP (PIKA/Arcadis JV, 2015b).

3.3 DEVIATIONS FROM THE FINAL QAPP

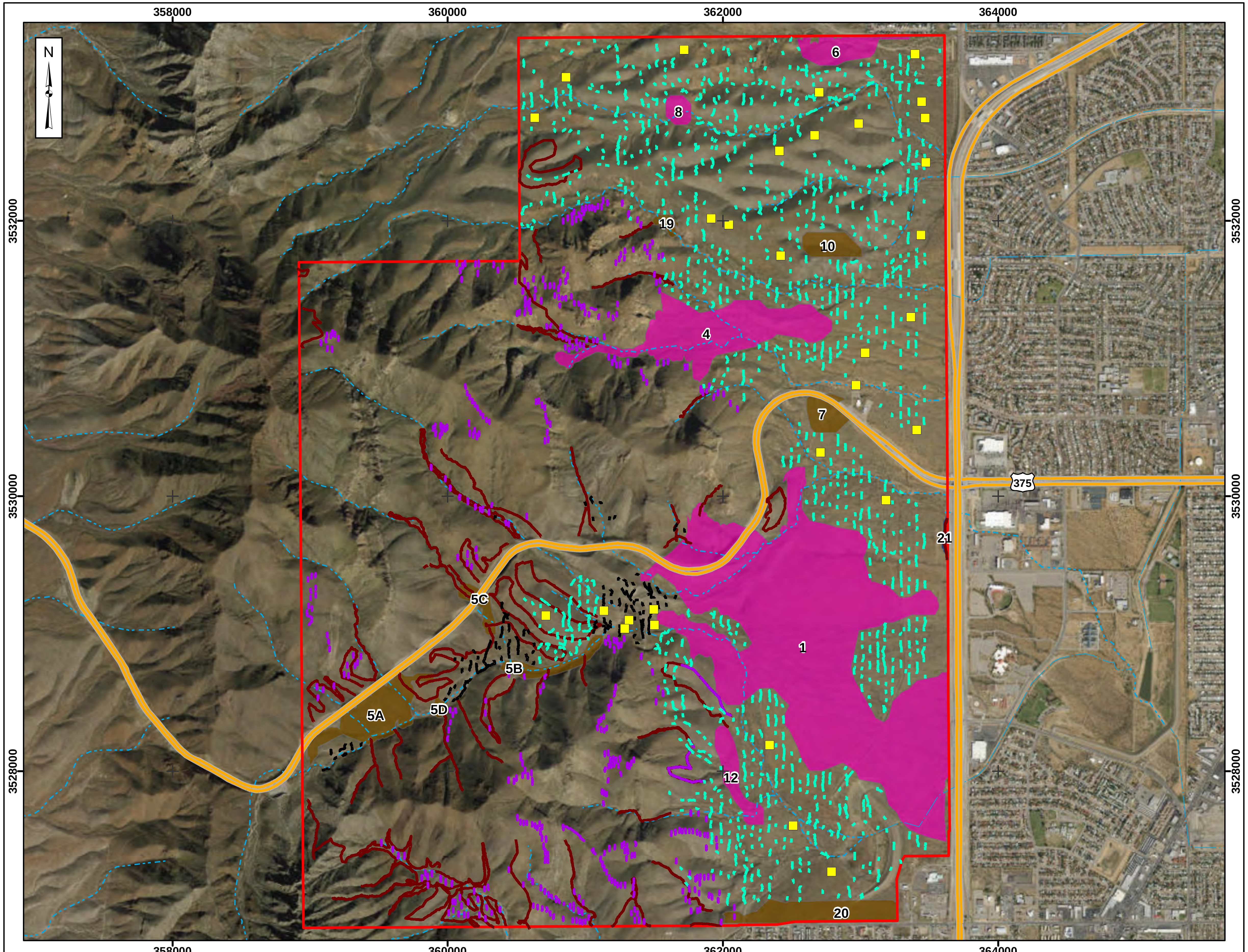
No significant deviations from the Final QAPP occurred during the RI; however, two field changes were requested and approved. These were documented in FCR forms. The FCRs are included in **Appendix G** and are briefly outlined below.

- FCR 1 – This FCR documented the change in the location of DGM grids 2, 5, and 9. DGM Grid 2 was moved to avoid placing it in an arroyo that would have prevented 100% coverage, while DGM Grids 5 and 9 were moved to avoid placing the grids in areas with steep terrain that would have presented a safety hazard to the DGM data collection team.
- FCR 2 – This FCR documented the change to remove one of the two types of anomaly resolution that were required for DGM anomalies in the QAPP. Instead of performing 10% analog anomaly resolution and a statistical DGM anomaly resolution, this FCR changed the requirement so the UXOQCS was only required to perform anomaly resolution with

the EM61-MK2 to ensure to a 70% confidence that no more than 10% of the anomalies were unresolved. The revised requirement is consistent with Table 11-3 of EM 200-1-15 and DID WERS-004.01.

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 3-1
Completed MEC Investigation



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- IAVS Transect
- WAA DGM Transect
- WAA DGM Lot converted to new DGM grid
- Analog Mag-and-Dig Transect
- DGM Grid

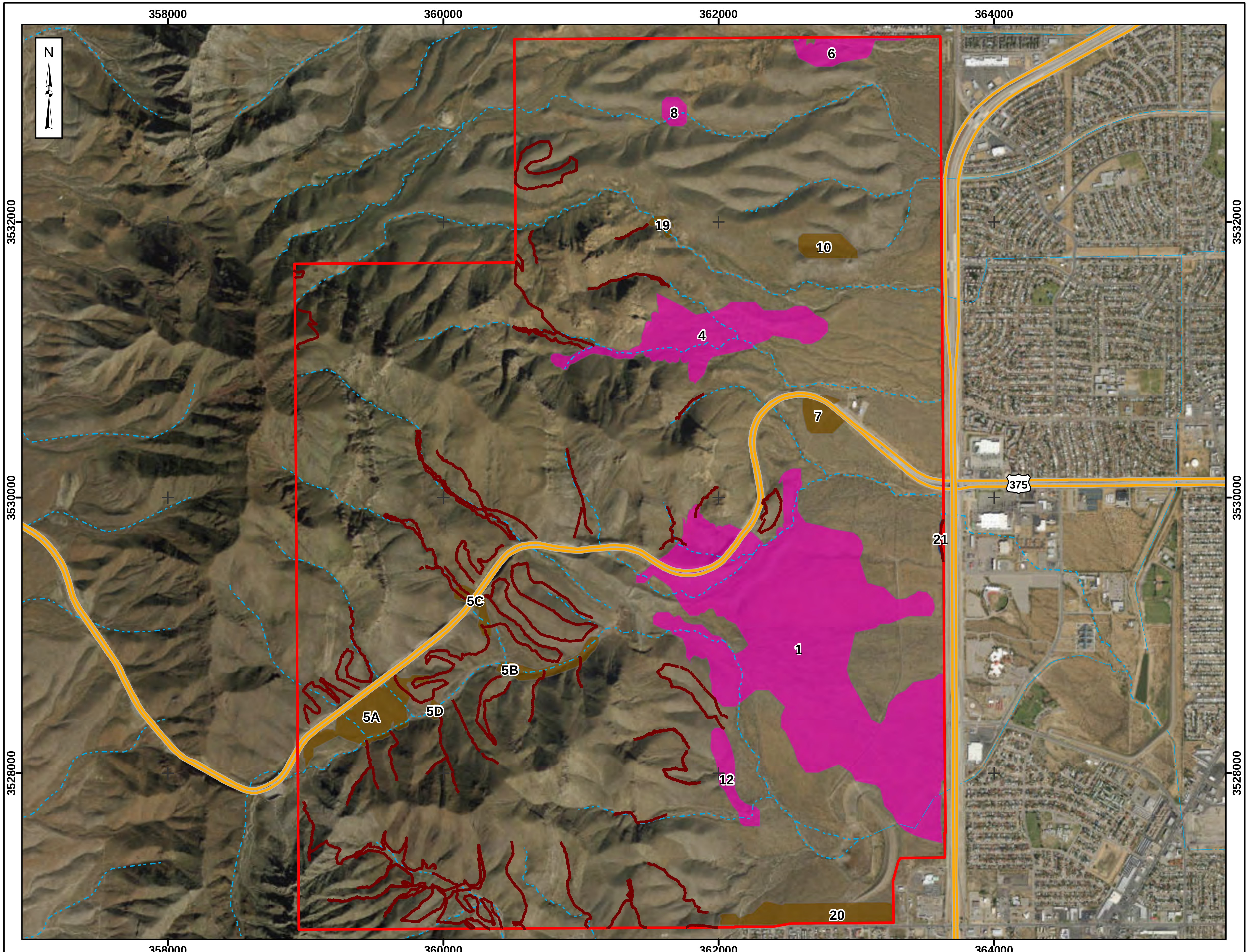
0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 3-2
IAVS Transects



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- IAVS Transect

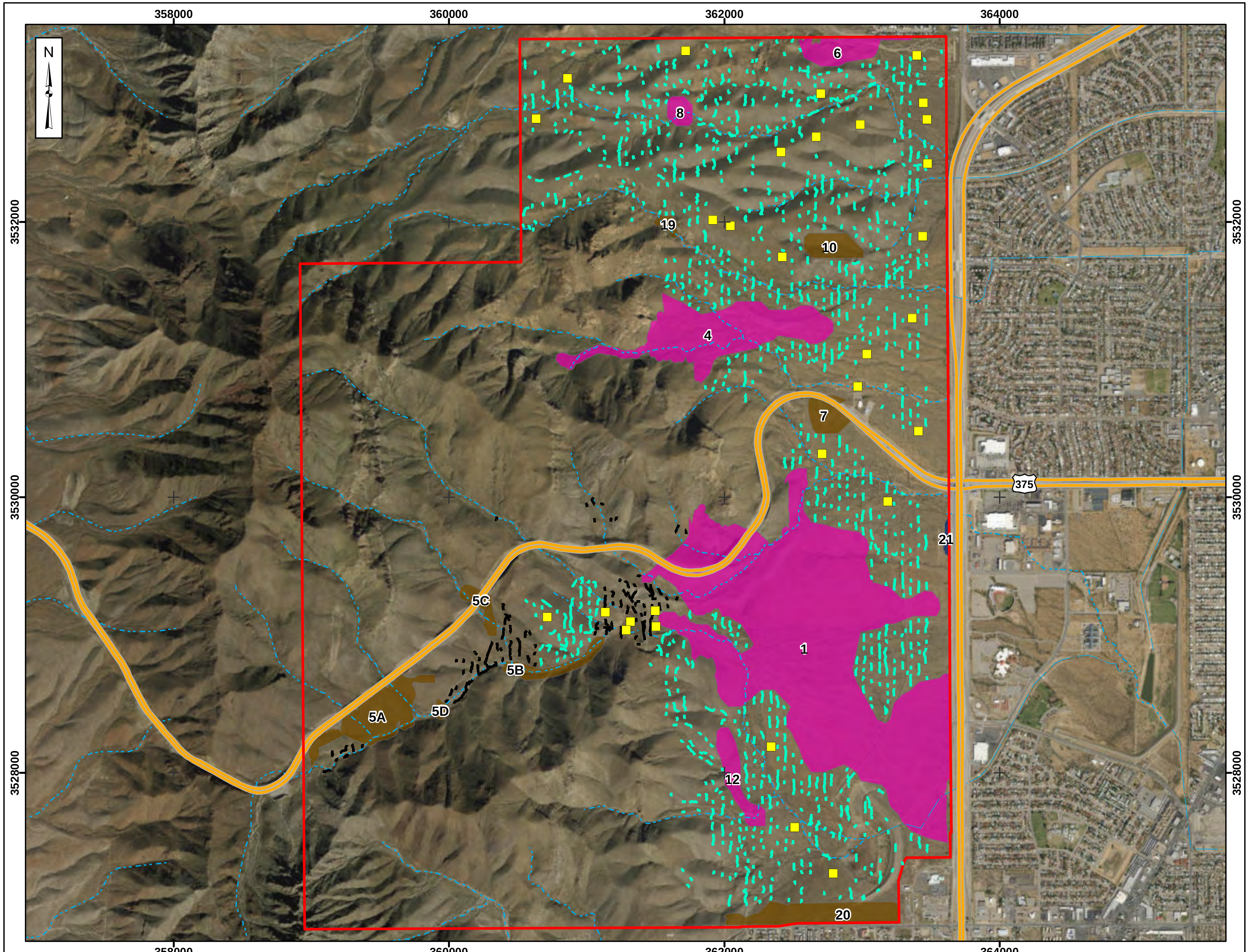
0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 3-3
WAA Transects and DGM Grids



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- WAA DGM Transect
- WAA DGM Lot converted to new DGM grid
- DGM Grid

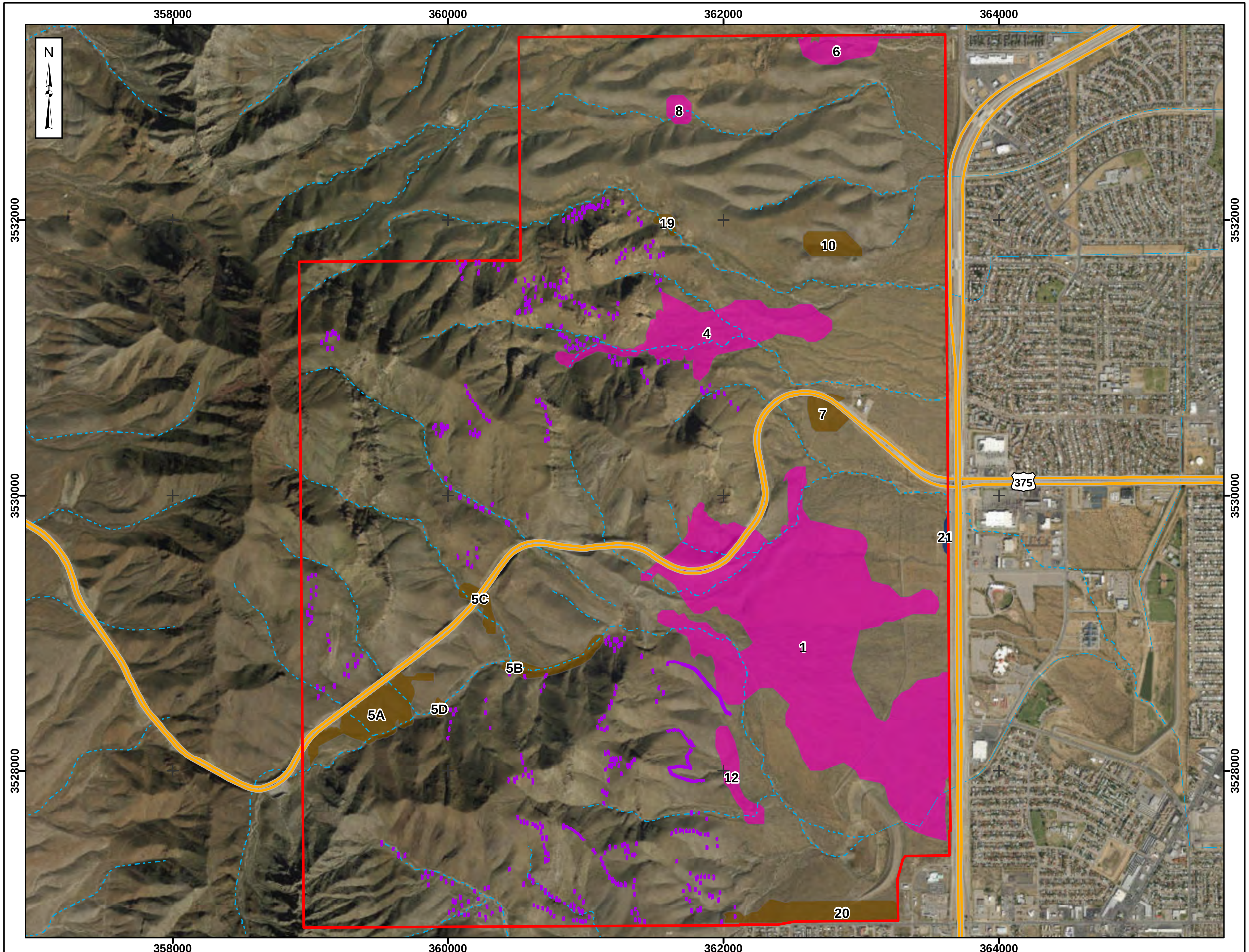
0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 3-4
Analog Transects



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- Analog Mag-and-Dig Transect

0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

4 CHARACTERIZATION OF MC

This section presents the overall approach to the investigation methods and operational procedures used for the RI MC characterization performed at the Closed Castner Range MRS.

4.1 OVERVIEW OF MC INVESTIGATION

The MC RI investigation was performed in a phased approach to collect the data required to perform characterization of MC in environmental media and to support the human health and ecological risk assessments. The sampling program during each of the phases included the following:

Phase I:

- ISM surface soil samples collected to characterize MC concentrations within CMUAs and to delineate exceedances of MC RALs identified from the 2013 ISM Field Demonstration Report. Performed in June/July 2016, with resampling of some decision units for explosives in October/November 2016 (see **Table 4-1** and **Section 4.3** for a discussion of re-sampling activities).
- Discrete soil samples collected from arroyo depositional areas. Performed in July 2016 (see **Table 4-1** and **Section 4.3**).
- Discrete soil samples collected from potential small arms range backstop berms and surrounding soil. Performed in July 2016, with resampling of some berms in April 2017 (see **Table 4-1** and **Section 4.3** for a discussion of re-sampling activities).
- Discrete surface water samples from arroyos and seep locations (Dry Weather Event performed June 2016 and Wet Weather Event performed August/September 2016).

Phase II:

- Collection of additional samples in January 2017, based on the results of the Phase I MC sampling and the MEC RI, including:
    - ISM samples to complete delineation around Phase I decision units with MC exceedances.
    - ISM samples to obtain data from newly identified/expanded CMUAs based on the results of the MEC RI.
    - Discrete soil sampling around arroyo locations to complete delineation and obtain a large enough data set to allow calculation of the 95% upper confidence limit (UCL) of the average concentration for comparison to the PCLs. (TRRP allows for a point-by-point comparison of chemical concentrations in environmental media samples to PCL concentrations or comparison of the 95% UCL.)
    - Discrete soil sampling around berms to complete delineation and obtain a large enough data set to allow calculation of the 95% UCL concentration for comparison to the PCLs.
- Performance of a soil boring program in February 2017, including

- o Collection of discrete soil samples for vertical delineation of MC [to the MDL or background] and for demonstration that the potential soil-to-groundwater pathway is incomplete
- o Collection of undisturbed soil samples for analysis of parameters required for calculation of Tier 2 PCLs for the soil to groundwater exposure pathway
- o Drilling to underlying bedrock, if possible, to demonstrate whether perched groundwater is present above the bedrock. If perched groundwater is not present, the soil to groundwater pathway may be eliminated for the MRS.

Phase III: A third investigation phase, for installation of monitoring wells and collection of groundwater samples, was planned, if necessary. However, because data collected during the Phase II investigation demonstrated that the soil-to-groundwater pathway is incomplete, a groundwater assessment was not required.

In addition, post-demolition soil sampling was performed as part of the MEC investigation.

Table 4-1 provides an overview of the MC sampling program. For each investigation phase and sample type, the table lists the planned scope, the actual scope, and the reason for deviation from the Final QAPP.

Figure 4-1 presents the decision units which were sampled by ISM during the 2012 ISM Field Demonstration and during Phase I and II of the RI. Phase I and II RI sampling locations for the remaining sample types are presented as follows: **Figure 4-2** presents potential backstop berm and surrounding soil sample locations, **Figure 4-3** presents the arroyo soil sample locations, **Figure 4-4** presents the arroyo surface water sample locations (visited during wet and dry weather events) and the four seep locations with water which were sampled, and **Figure 4-5** presents the soil boring locations. Photographs of the RI MC sampling activities are presented in **Appendix H.2**.

4.2 RATIONALE FOR MC SAMPLING APPROACH

The MC RI field activities were performed to determine the nature and extent of MC within the MRS. As part of this RI effort, samples were collected for area-wide soil (focused in CMUAs), soil from depositional areas in arroyos, potential backstop berm material and surrounding soil, and surface water. Data from these samples were used to characterize MC impacts and to support the human health and ecological risk assessments. As discussed further below, the analyte list for each sample type was selected based on suspected munitions use in the area, the likelihood that the analyte would persist in the environment, and the data needed to complete the risk assessments.

4.2.1 Soil Sampling in CMUAs

4.2.1.1 Surface Soil

Based on the results of the WAA (URS, 2012), CMUAs are considered source areas for MEC, and therefore are also considered potential MC source areas. Additionally, as part of the ISM Field Demonstration (URS, 2013), exceedances of the MC RALs were detected primarily within the

CMUAs, with just a few instances occurring within the NCMUA. The initial RI ISM investigation phase (Phase I described in **Section 4.1**) was implemented within CMUAs (to characterize MC concentrations) and around locations of RAL exceedances identified from the ISM Field Demonstration Report (where needed to provide information on the horizontal extent of MC concentrations). The number and location of ISM decision units sampled during Phase I, described above, was determined using the Pacific Northwest National Laboratory's VSP software, as discussed in more detail in the Final QAPP (PIKA-Arcadis JV, 2015a). The analyte list included explosives, metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc), and perchlorate (if there was rocket use suspected in the area).

Additional ISM soil samples were collected as part of Phase II (described in **Section 4.1**) within new CMUAs and CMUAs with expanded boundaries (based on findings of the MEC investigation), as well as to delineate the horizontal extents of MC exceedances detected during Phase I of the MC investigation.

4.2.1.2 Subsurface Soil

Subsurface soil samples were also collected from soil borings advanced to provide vertical delineation of MC exceedances in ISM decision units with the highest MC concentrations, and to evaluate the potential for MC to migrate to groundwater. Prior to mobilizing the drilling rig, 20 discrete samples were collected from each of the decision units and analyzed for lead using a hand-held x-ray fluorescence (XRF) analyzer. The XRF investigation was performed to identify areas of high surface soil lead concentrations within each decision unit to select soil boring locations. Although the boring program targeted the three decision units with the highest ISM lead concentrations, only a few locations with elevated lead concentrations at the surface were identified by the XRF analysis. Therefore, the boring program was adjusted to install one boring at the highest XRF result in each decision unit. Additional detail regarding the soil boring program is presented in **Section 4.4**.

Soil samples were collected from the following borings: SB-01, SB-01D, SB-02, and SB-03. Three soil intervals from each boring were sampled for laboratory analysis: the 0-0.5 inches bgs interval, the intermediate depth interval with the highest XRF field screening results, and the interval from the bottom of the boring. The soil samples were put into lab provided containers, placed on ice in an insulated cooler, and maintained under chain-of-custody control until delivery to the laboratory. The soil boring samples were analyzed for explosives, metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc), and perchlorate (if rockets were used in the area).

Undisturbed geotechnical samples were collected from three different soil materials observed within the borings and were analyzed for pH, fraction organic carbon, grain size distribution, bulk soil density, plus ferric/ferrous iron for redox state of soil.

4.2.2 Evaluation of MC in Arroyos

4.2.2.1 Arroyo Soil

A discrete soil sampling program was performed in intermittent stream beds that flowed from the mountains toward roadway locations, draining areas potentially containing MEC and/or MD. Storm water runoff can entrain MC in soil during high flow events and redeposit it at downstream depositional areas. Therefore, Phase I arroyo soil sample locations were selected based on depositional areas upstream from the confluence of slope runoff drainages, above exposed bed rock, and flow restrictions (i.e., Fusselman Dam and Transmountain Highway culverts). The analyte list included metals only (antimony, arsenic, beryllium, copper, lead, nickel, and zinc) because explosives and perchlorate were not expected to persist in the environment when exposed to water and sunlight. Phase II sample locations were selected to delineate the horizontal extents of MC exceedances detected during Phase I of the MC investigation.

4.2.2.2 Arroyo Surface Water

Storm water represents a migration pathway and potential point of exposure because MC can be transported by storm water during runoff. Therefore, arroyo surface water sampling was attempted during both wet weather (acute exposure) and dry weather (chronic exposure) events. Because no water was expected to occur in the arroyos except after a storm event, arroyo surface water was not expected to represent a chronic exposure. Arroyo surface water sampling was attempted at six locations (one in each major arroyo), at locations receiving runoff from steep slope areas. No surface water was present in the arroyos during either the wet weather or dry weather sampling events and therefore no arroyo surface water samples were collected.

4.2.2.3 Evaluation of Seep Surface Water

Locations where perennial seeps occur in the MRS represent exposure points for ecological receptors and surface water from the seeps could contain MC (dissolved or in suspended solids) if MC is present in the surrounding area. Therefore, seep surface water sampling was conducted during both wet (acute exposure) and dry weather (chronic exposure) events. Potential seep locations were identified using Inverse Synthetic Aperture Radar images and field verified. Of these, seep surface water sampling locations were selected based on accessibility (due to terrain considerations). Seep samples were collected from locations where water was present. The analyte list included only total and dissolved metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc) because explosives and perchlorate were not expected to persist in the environment when exposed to water and sunlight.

4.2.3 Evaluation of Potential Backstop Berms

The RI included collection of discrete soil samples from berms present within the eastern portion of the Castner Range, to evaluate whether these features represent a source of MC. Although review of the historical data indicates that small arms ranges may have one time been present in this area, it is uncertain whether backstop berms were established for them or whether the mountain was used as a natural backstop. Most, if not all, berms currently present in the area are expected to be for storm water control purposes. Potential backstop berms were selected for sampling based on review of orthophotography and available historical use information presented in the WAA.

During the RI Phase I, sampling of the berm material for total metals associated with small arms use (antimony, lead, copper and zinc) and Toxicity Characteristic Leaching Procedure (TCLP) lead (if the total concentrations were high enough to warrant performing TCLP analysis) was performed to evaluate the berm material as a potential waste which may require removal as part of a response action. Discrete samples were collected from two locations per berm and sampling at three depth intervals was attempted (0-1-ft, 1-2-ft, and 2-3-ft bgs). Because of the hardened nature of the berm material, deeper sample intervals could not be achieved at all locations (see discussion in **Section 4.3.3**). Also during Phase I, discrete surface soil samples were collected from around the perimeter of the berms and analyzed for the same total metals list as the berm material samples to delineate any release to the environment that may have occurred from the berms. These samples were collected generally 50 or more feet from the berm to bound an extent for a response action, if one were to be required. The Phase II delineation samples were collected at distances of up to 100 ft from the base of the berm, and were expected to fully delineate the lead concentrations in soils during Phase I.

4.3 MC SAMPLING PROCEDURES

4.3.1 ISM Sampling

The ISM decision units sampled during the RI were 1-acre square grids (approximately 200 ft on each side), which is the same decision unit size used during the 2012 ISM Field Demonstration (URS, 2012), at the MRS. Prior to the field activities, the latitude and longitude of the corners of the decision units selected for sampling were loaded into a hand-held GPS which was used to locate and mark the decision unit in the field. Increments were collected at random locations from within the decision unit, according to the procedure outlined in the Final QAPP.

A UXOTII performed MEC avoidance escort for the field sampling team to each ISM decision unit to be sampled. Once within the decision unit, the UXO technician conducted a more thorough survey using a handheld GPS and White's MXT All-Metal Detector to locate and clear each increment within the decision unit. The field sampling team walked behind the UXO technician and collected the increments for the ISM sample after clearance was verbally given from the UXO technician. The incremental sample soil plug (increment) was collected between 0-2 inches bgs in such a way as to minimize soil disruption. One hundred increments were collected from each decision unit and combined to create one sample. Where possible, an incremental sampling (IS) instrument was used, and the IS instrument was decontaminated before moving to the next sampling location using deionized water and Liquinox solution in spray bottles to limit generation of investigation derived waste (IDW). A sterilized disposable plastic scoop was utilized in place of the IS instrument when utilizing the IS instrument was not practicable due to unsafe conditions in extremely steep areas or due to non-cohesive soils that could not be retained by the IS instrument. When the IS instrument was used, equipment blank samples were collected daily and analyzed for the same analytes as the ISM samples.

The soil samples were placed on ice in an insulated cooler and maintained under chain-of-custody control until shipment to the laboratory. Phase I ISM samples and Phase II ISM samples from newly identified/expanded CMUAs were analyzed for explosives, metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc), and perchlorate (if there was rocket use in the area). Phase II delineation ISM samples were analyzed for constituents identified in Phase I samples at concentrations exceeding the RALs.

4.3.2 Arroyo Soil Sampling

Prior to the field activities, the latitude and longitude of the arroyo soil sample locations were loaded into a hand-held GPS, which was used to locate sample locations in the field. A UXOTII performed MEC avoidance escort for the field sampling team to each of the sample locations. Once at the sampling location, the UXOTII cleared the area for metallic anomalies prior to collection of the sample. For sample locations within a CMUA, samples were collected from two depth intervals: 0-6 inches and 12-18 inches. For sample locations within a NCMUA, only the surface sample (0-6 inches) was collected. A garden trowel was used to dig from 6 inches down to 12 inches for collection of the deeper sample. Soil samples were collected with a disposable scoop. Prior to removal from the hole, the sample volume was mixed together to homogenize the soils.

The soil samples were put into lab provided containers, placed on ice in an insulated cooler, and maintained under chain-of-custody control until delivery to the laboratory. Phase I samples were analyzed for metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc). Phase II step-out samples were analyzed for the metals identified in Phase I samples at concentrations exceeding the RALs.

4.3.3 Backstop Berm (Discrete) Sampling

A UXOTII performed MEC avoidance escort for the field sampling team to each of the suspected berm locations. At the berm location, the UXOTII cleared each location visually and with a White's MXT All-Metal Detector. At locations within the berm that included multiple depths, the UXOTII cleared each interval feet by feet to ensure the hand auger was not going to contact any metal anomalies within the borehole. Two locations per berm were planned to be sampled at three depth intervals (0-1-ft, 1-2-ft, and 2-3-ft bgs) utilizing a hand auger. However, not all locations and depth intervals could be accessed with the hand auger. If refusal was encountered due to hard ground or cobbles, an additional hole next the previous sampling point was attempted. Up to three holes were attempted per sample location. If more than two intervals were collected from the berm samples, the samples were field analyzed for lead using a hand-held XRF detector to determine the two highest intervals to be selected for analysis at the laboratory. The hand auger was decontaminated before moving to the next sampling location using deionized water and Liquinox solution in spray bottles to limit generation of IDW. In addition, four surface soil samples were collected around the base of the berm for delineation utilizing sterilized plastic disposable scoops.

The soil samples were put into lab provided containers, placed on ice in an insulated cooler, and maintained under chain-of-custody control until delivery to the laboratory. Phase I samples were analyzed for select metals (antimony, lead, copper and zinc). Phase II step-out samples were analyzed for the metals identified in Phase I samples at concentrations exceeding the RALs. In addition, if the total lead concentrations were high enough, the sample of berm material from each berm with the highest lead concentration was analyzed for TCLP Lead.

4.3.4 Surface Water Sampling

Surface water sampling activities were performed during a dry weather event (chronic exposure scenario) and during a wet weather event (acute exposure scenario). TCEQ's RG-415: Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring (TCEQ, 2012) states that routine metals-in-water samples are not collected during periods of abnormally high turbidity associated with high or flood flows and specifies that sampling for metals be delayed at least 48 hours after a heavy rainfall. The wet weather sampling was begun 55 hours after a 1.1-inch rain event which fell on August 29, 2016 at 1600. The amount of the rainfall was measured in a rain gauge installed on the City of El Paso Archeology Museum building, on the Closed Castner Range MRS. A UXOTII performed MEC avoidance for the field sampling team to each of the arroyo surface water sampling locations and seep sampling locations.

4.3.4.1 Arroyos

These sample locations were within distinct arroyo drainages which were visited during dry weather and wet weather sampling events. However, no water was present during the dry weather event, nor after the required 48-hour delay period during the wet weather event. Therefore, no surface water samples were collected from the arroyos. Each arroyo surface water sampling location was photographed during both the dry weather and wet weather events to document dry conditions at the arroyo locations.

4.3.4.2 Seeps

At each planned seep location, if water was present, a seep sample was collected by submerging a lab-provided plastic sampling bottle just below the water surface to avoid disturbance of the underlying soil material. The collected water was then transferred to lab-provided sample containers, placed on ice in an insulated cooler, and maintained under chain-of-custody control until delivery to the laboratory. Phase I samples were analyzed for total and dissolved metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc). Dissolved metals samples were field filtered through a 0.45-micron filter prior to placement in the sample container. No Phase II seep sampling was required.

4.4 SOIL BORING PROGRAM

4.4.1 Drilling

The soil boring program was implemented in the following three decision units: BF052, CN073, and DG070. A UXOTII was utilized to perform MEC avoidance escort for the field sampling team to each drilling location.

Once boring locations were selected, the UXOTII cleared a working area twice the length and width of the hollow-stem auger drilling rig and the equipment was mobilized to the MRS. During drilling, the borehole was screened by the UXOTII beginning at the surface and continuing in 2-ft depth intervals, up to a depth of 10 ft, by introducing the White's MXT All-Metal Detector down a polyvinyl chloride pipe within the borehole. During the screening with the White's MXT All-Metal Detector, the drilling equipment was backed 15-20 ft away from the borehole, to ensure there would be no interference with the White's MXT All-Metal Detector readings.

The soil borings were installed as follows:

- DG070. Soil boring SB-01 was installed in this decision unit and reached refusal at 7 ft bgs on an alluvial fan layer with large cobbles. Upon review with the JV Project Manager, it was decided to attempt drilling in additional locations within the decision unit to determine if the lithology was consistent in the area. The first boring was labeled SB-01, and three additional attempts were made within the decision unit: SB-01B was drilled five ft to the north of SB-01, SB-01C was drilled 30 ft to the east of SB-01, and SB-01D was drilled 120 ft to the south of SB-01. The additional drilling attempts resulted in refusal between 4 and 5 ft bgs. All the soil borings within DG070 collapsed to approximately 1-ft bgs once the hollow stem augers were removed from the borehole. Surface soil was pushed over the shallow depression once complete.
- CN073. Soil boring SB-02 was installed in this decision unit and reached refusal at 5.5 ft bgs on a similar cobble layer as seen in DG070. One additional drilling attempt (labeled SB-02B) was made in the far south of the decision unit, but refusal was reached at 4 ft bgs on the same material observed in the first attempt. Due to the consistency of the lithology in the area, no additional drilling attempts were made within the decision unit. Both soil borings within CN073 collapsed to approximately 1-ft bgs once the hollow stem augers were removed from the borehole. Surface soil was pushed over the shallow depression once complete.
- BF052. Soil boring SB-03 was advanced in this decision unit to 20 ft bgs. Based on XRF screening, the 18 to 20-ft sample contained a lead concentration higher that the state-established background for lead (15 milligrams per kilogram [mg/kg]). Drilling continued to bedrock refusal at 29.5 ft bgs. No groundwater entered the boring.

Boring logs are presented in **Appendix K**.

Reusable sampling equipment (e.g., split spoons) was decontaminated using deionized water and Liquinox solution at sampling locations. Equipment blank samples were collected for the same analytical parameters as soil boring samples.

4.4.2 Soil Sampling

Soil samples were collected from the following borings using a split-spoon sampling tool: SB-01, SB-01D, SB-02, and SB-03. Three soil intervals from each boring were sampled for laboratory analysis: the 0-0.5 inches bgs interval, the intermediate depth interval with the highest XRF field screening results, and the interval from the bottom of the boring. The soil samples were put into lab provided containers, placed on ice in an insulated cooler, and maintained under chain-of-custody control until delivery to the laboratory. The soil boring samples were analyzed for explosives, metals (antimony, arsenic, beryllium, copper, lead, nickel, and zinc), and perchlorate (if rocket use was suspected in the area).

Undisturbed geotechnical samples were collected from three different soil materials observed within the borings and were analyzed for pH, fraction organic carbon, grain size distribution, bulk soil density, plus ferric/ferrous iron for redox state of soil.

4.5 SAMPLE ANALYSIS AND QA/QC

In addition to the primary samples collected as described in the above sections, duplicate samples were collected at a rate of 1 per 10 for discrete samples, and equipment blanks were collected when sampling equipment that contacted sample media was reused. Primary and QC samples were submitted to the primary laboratories (ALS, Inc. in Kelso, Washington and Houston, Texas) that are DoD Environmental Laboratory Accreditation Program-certified for analysis for metals by USEPA SW-846 Test Method 6020, explosives by USEPA SW-846 Test Method 8330B, and perchlorate by USEPA SW-846 Test Method 6850, as appropriate and specified in the sections above. Additionally, for discrete samples, 1 in 10 primary samples was split and submitted to the QA laboratory (Accutest in Orlando, Florida, a DoD Environmental Laboratory Accreditation Program-certified analytical laboratory) for the same analyses. Some samples collected from soil borings were also analyzed by PSI in Houston, Texas for pH by USEPA SW-846 Test Method 9045D, fraction organic carbon by Walkley-Black Method, grain size distribution by American Society of Testing and Materials (ASTM) Method D422-07, bulk soil density by ASTM Method D854-10/ASTM Method D763-09, plus ferric/ferrous iron for redox state of soil by SM 3500Fe-B. Laboratory analytical methods were selected to meet the DQOs identified in the Final QAPP.

4.6 Data Validation

Data validation is an analyte- and sample-specific process that determines the analytical quality of a specific data set. Data validation criteria for the RI conducted at the Closed Castner Range MRS were based on the DQOs specified in the Final QAPP. Laboratory Data Consultants, Inc., a third party who was not associated with sample collection and analysis, interpretation of sample data, or any decision-making process for this project, validated the MC data. Data review was performed under USEPA Level III and Level IV guidelines. The analyses were validated using the following documents, as applicable to each analytical method:

- *United States DoD Quality Systems Manual for Environmental Laboratories, Version 5.0* (2013)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review, October 1999*
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004*
- *USEPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, Update 1 through Update V* (1992-2014)

Sample results were subject to a Level III data validation (90% of samples) or a Level IV data validation (10% of samples). Level III data validation assesses data quality by comparing data collection, QC, and reporting parameters to the appropriate criteria (or limits) as specified in the Final QAPP, Contract Laboratory Program requirements, or by method-specific requirements. Level IV data validation checks calculations of quantified analytical data for QC samples and routine field samples. Level IV data validation includes an evaluation of instrument performance, method of calibration, and the original data for calibration standards to ensure that detection limit and data values are appropriate. Data validation results are discussed in **Section 6.3**.

4.7 INVESTIGATION DERIVED WASTE

4.7.1 Decontamination Water

All water from the decontamination procedures was containerized in a 5-gallon bucket with a leak proof lid. All accumulated water evaporated within the 5-gallon bucket, so no IDW water required disposal.

4.7.2 Excess Soil Sample Material/Soil Cuttings

No excess soil sample material was generated from the ISM, berm, or arroyo soil sampling activities. Also, no soil cuttings were generated from the soil boring operations. Due to the gravelly nature of the soils, no material came out of the holes during boring. Soils turned by the augers were either lost on the borehole walls or to formation. Therefore, no IDW soil required disposal.

4.8 DEVIATIONS FROM FINAL QAPP

The MC investigation activities were performed IAW the Final QAPP (PIKA-Arcadis JV, 2015a), except for the deviations presented in **Table 4-1**. Deviations from the QAPP fell under the following general categories:

- Recollection of some ISM and berm samples, due to problems with the analytical laboratory.
- Variation in the number of samples collected. This included:
    - Addition of more arroyo soil samples, based on the TPP process

  - Deletion of some of the surface water samples, borings, and boring soil samples, due to field conditions.
- Discontinuation of delineation sampling prior to achieving the RALs in soils at 2 ISM decision units and 3 berm locations due to inaccessibility.

The above deviations were discussed with USACE and the TCEQ during the investigation process as follows:

- January 19, 2017. TPP No. 3 meeting, presented preliminary Phase I results and proposed Phase II sample locations.
- February 2, 2017. Teleconference, discussed Phase II arroyo soil sampling locations and adjustments to the soil boring program.
- March 23, 2017. Teleconference, discussed preliminary Phase II results summarized in a Technical Memo dated March 16, 2017.

Decisions made during the above meetings are documented in the meeting minutes prepared for each. Meeting minutes are presented in **Appendix B**.

Table 4-1: Overview of MC Sampling Program
Closed Castner Firing Range RI Report

MC Sampling Task	Planned Scope	Actual Scope	Reason for Deviation from QAPP
MC Sampling During MEC Investigation			
MC Sampling Associated with MEC Discoveries	• 7 ISM samples at post- BIP and consolidated shot locations • 3 discrete samples at MEC locations with signs of release Samples analyzed for metals, explosives, and perchlorates (if rocket use).	• 6 ISM samples were collected • No discrete samples were collected	• Only 6 post- BIP/consolidated shot locations occurred • No MEC items with signs of release (visible leaking or stained soil around or under the item) were encountered.
MC Phase I			
ISM Sampling - Area Wide Horizontal Delineation	• 149 ISM DUs to be sampled; 10% collected as ISM triplicates Implemented to characterize MC concentrations within the CMUAs and to delineate around locations identified from the 2013 ISM Field Demonstration Report with insufficient data to determine horizontal extent. Samples analyzed for metals, explosives, and perchlorates (if rocket use).	• 149 DUs sampled; 10% collected as ISM triplicates in June/July 2016 • 100 DUs were re-sampled for explosives (9 were collected as ISM triplicates) in November 2016 • Phase I samples were selected for analysis of pH, and synthetic precipitation leaching procedure for selected metals.	• ISM results for some explosive constituents were rejected for these DUs due low recovery (<10%) in the LCS. • pH and SPLP analysis performed during Phase I to facilitate evaluation of the soil to groundwater pathway for Phase II planning.

Arroyo Soil Delineation (Discrete)	• 50 soil sampling locations within arroyos
	  ▪ 1 sample depth (0-6 inch) at locations not within a CMUA
	  ▪ 2 sample depths (0-6 and 12-18 inch) at locations within a CMUA
	  ▪ 10% collected with QA/QC
	Samples analyzed for metals.
		• 52 arroyo locations sampled in May 2016	Two additional sample locations were added during the TPP process (after the TPP No. 2 meeting). These samples were located at the MRS eastern boundary within a northern and southern arroyo to characterize soil concentrations potentially leaving the site entrained in stormwater runoff.

Backstop Berms (Discrete)	• 60 sample berm samples plus QA/QC
	• 10 berms to be sampled, with 6 samples per berm submitted for analysis
	  ▪ 2 samples of berm material
	  ▪ 4 soil samples from around base of the berm
	Samples analyzed for total antimony, lead, copper, and zinc. Sample with highest lead concentration from each berm (berm material) also analyzed for TCLP lead.
		• Berm samples collected in July 2016.
		• Samples of berm material for 8 of 10 berms were placed on hold by laboratory and discarded after hold time expired. These samples were recollected in April 2017.
		• Only 2 samples of berm material were analyzed by TCLP.
			• Misinterpretation by the lab of information written on the chain of custody led to berm samples not being analyzed for total metals, as intended, requiring recollection of the samples.
			• Only two of the berm material samples had total lead concentrations high enough to warrant analysis by TCLP.

Surface Water - Arroyo	• 12 arroyo surface water samples, plus 10% QA/QC
	  ▪ 6 sample locations (1 in each major arroyo)
	  ▪ 2 sampling events: wet weather and dry weather
	Samples analyzed for total and dissolved metals.
		• No surface water samples were collected in either the wet or dry weather sampling events. (Dry event June 2016; wet event August/September 2016).	Each sample location was visited. No surface water was present for sampling during the dry event or 48 hours after the wet event.

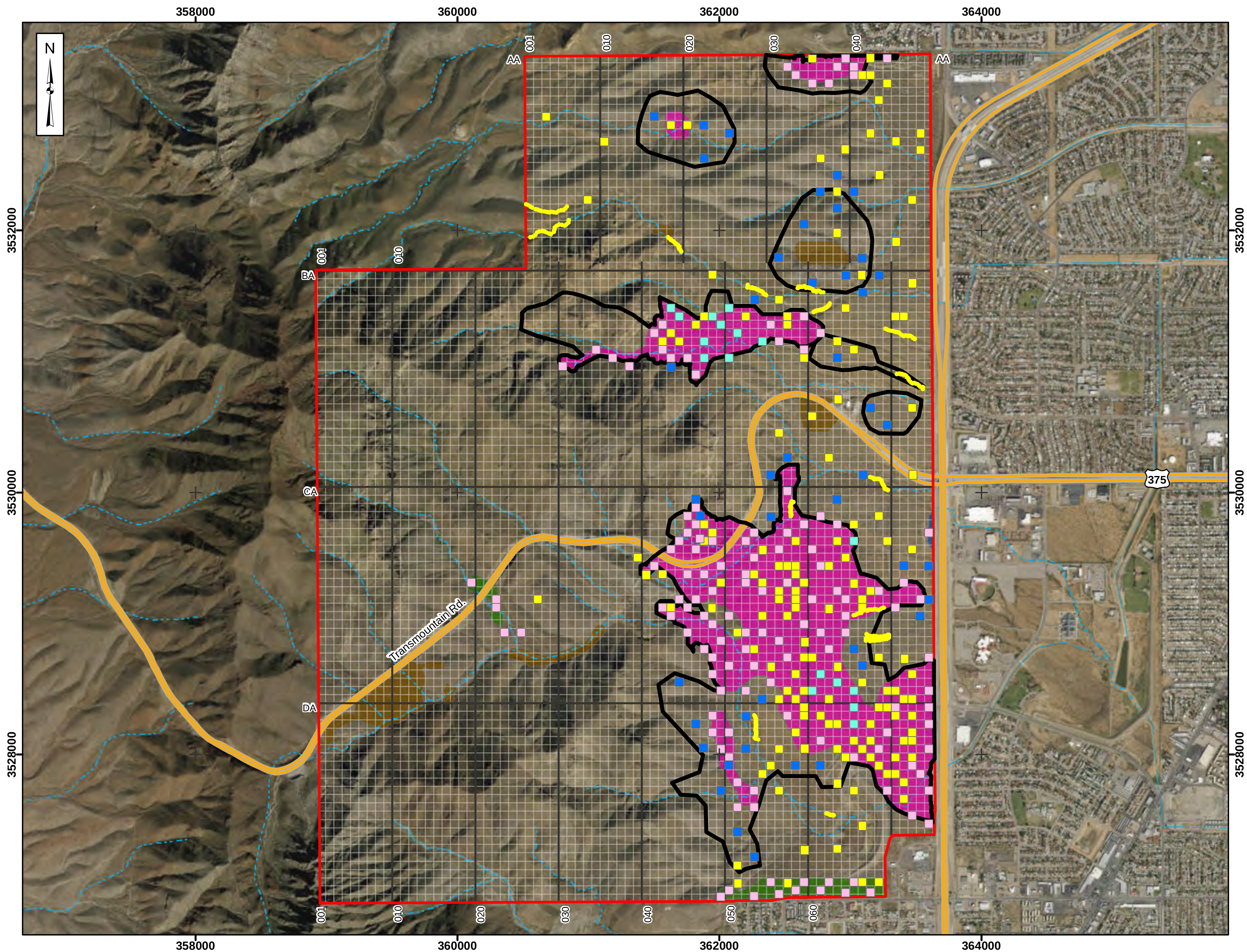
Surface Water - Seeps	• 18 seep samples, plus 10% QA/QC
	  ▪ 9 seep locations
	  ▪ 2 sampling events: wet weather and dry weather
	Samples analyzed for total and dissolved metals.
		• 4 seep samples collected during wet event (August/September 2016)
		• 2 seep samples collected during dry event (June 2016)
			Water was not encountered at 9 locations. Accessible locations with water were sampled.

MC Sampling Task	Planned Scope	Actual Scope	Reason for Deviation from QAPP
MC Phase II			
ISM Sampling Horizontal Delineation	• Step-out ISM samples to complete delineation around Phase I MC areas with exceedances of the assessment levels. • ISM samples to obtain data from newly identified/expanded CMUAs based on the results of the MEC RI. Step-out ISM samples analyzed for constituents identified in Phase I at concentrations exceeding the assessment levels. ISM samples from newly identified/expanded CMUAs analyzed for metals, explosives, and perchlorates (if rocket use in area).	• 45 ISM DUs were sampled during Phase II (January 2017); 10% collected as ISM triplicates • Delineation was completed for ISM samples, except for two locations (ISM DUs 179 and 180) for zinc.	DUs 179 and 180 are located on and adjacent to steep terrain with rocky outcrops, and it was determined that collecting step-out ISM samples was not possible. Results were summarized in a Technical Memo dated March 16, 2017 and presented to the TCEQ in a teleconference on March 23, 2017. The TCEQ concurred and it was agreed that no additional ISM samples are required for the area around these DUs.
Arroyo Soil Delineation (Discrete)	Step out samples to complete delineation and obtain a large enough data set to allow calculation of the 95 % UCL concentration for comparison to the PCLs.	• 24 arroyo soil samples, plus 10% QA/QC were collected during Phase II. • 3 of the 24 samples collected were added based on requests made by the stakeholders during TPP meeting No. 3.	Three sample locations were added during the TPP process. These samples were located at the MRS eastern boundary within arroyos to characterize soil concentrations potentially leaving the site entrained in stormwater runoff
Backstop Berms (Discrete)	Step out samples to complete delineation and obtain a large enough data set to allow calculation of the 95 % UCL concentration for comparison to the PCLs.	• Phase II performed in January 2017. No additional sampling was required around Berms 2, 3, 4, 5, 6, and 10. • A total of 15 step out samples in soil around four of the berms (Berms 1, 7, 8, and 9), plus 10% QA/QC were collected during Phase II • Horizontal delineation was not completed for Berms 1, 8, and 9, based on Phase II data. • No additional discrete sampling was performed around the berms, because Phase II samples were located at distances of up to 100 feet from the base of the berms and are likely attributable to complex-wide range activities (and not small arms use) based on the proximity of these berms to CMUAs and noted munitions debris in the area. Per the QAPP, delineation in soils of complex-wide range use is performed with ISM samples, rather than discrete samples.	Results of the Phase II investigation were summarized in a Technical Memo dated March 16, 2017 and presented to the TCEQ in a teleconference on March 23, 2017. It was agreed that no further berm delineation sampling is required based on the location of these berms inside or adjacent to CMUAs, the degree of munitions debris found near them, and the sufficient ISM sampling conducted on the range complex area.
Area Wide Vertical Delineation (Discrete)	• Up to 15 borings at CMUAs (ISM grids with highest lead concentrations • Boring locations within the DU grids to be determined by analyzing 10 grab samples for lead with an XRF analyzer. • Up to 45 soil samples (3/boring), plus QA/QC Samples analyzed for metals, explosives, and perchlorates (if rocket use in the area) and selected samples for Tier 2 parameters/SPLP. Samples at depth and leachability parameters used to determine whether soil to groundwater pathway is complete.	• During TPP No. 3, the three DUs with the highest lead concentrations were identified and three borings in each of these DUs was proposed. This approach was approved. • 20 grab samples from each DU were analyzed by XRF to determine locations of the borings within the DUs. However, the XRF results did not indicate elevated lead concentrations at all of the DUs. • The soil boring program was adjusted to one boring being completed at the location of the highest XRF result from each DU. Borings were installed in February 2017. Multiple boring attempts were made in DUs that hit refusal at shallow (7 bgs feet or less) depths. A total of 12 primary soil samples were analyzed for metals and explosives and 3 soil samples were collected and analyzed for Tier 2 parameters.	After the TPP No. 3 meeting, a conference call was held with the TCEQ on February 2, 2017 to discuss the Phase II boring program based on the XRF results, and the TCEQ agreed to the revised approach (one boring in each DU at the location of the highest XRF result). Results of the Phase II investigation were summarized in a Technical Memo dated March 16, 2017 and presented to the TCEQ in a teleconference on March 23, 2017. It was agreed that the soil to groundwater pathway is incomplete for the MRS.

MC Sampling Task	Planned Scope	Actual Scope	Reason for Deviation from QAPP
		• In two of the borings. Refusal was encountered at 4-7 feet. In the third boring, refusal was encountered at 30 feet and the top of bedrock was tagged. No groundwater was encountered. • Lead concentrations decreased with depth and background concentrations were achieved. • Zinc concentrations were above the Texas medium specific background concentration published in TRRP of 30 mg/kg. The USGS published background data by county zinc concentrations range from 37 to 107 mg/kg in El Paso County. • Based on the above results, the soil to groundwater pathway is determined to be incomplete. • SPLP analysis performed on selected samples during Phase I. No additional SPLP analysis performed on Phase II samples.	
MC Phase III			
Groundwater Sampling	Performed only if needed to determine soil-to-groundwater pathway, based on vertical soil delineation. Collection of 3 potential groundwater samples, analyzed for metals, explosives, and perchlorates (if rocket use in the area), and total dissolved solids.	• None performed. • Data collected during the Phase II investigation demonstrated that the groundwater pathway is incomplete.	A groundwater assessment was not required.

Abbreviations

CMUA	Concentrated Munitions Use Area
DU	Decision Unit
BIP	Blow In-Place
ISM	Incremental Sampling Methodology
LCS	Laboratory Control Sample
MC	Munitions Constituent
MEC	Munitions and Explosives of Concern
MRS	Munitions Response Site
Mg/kg	Milligrams per Kilogram
PCL	Protective Concentration Level
QA/QC	Quality Assurance/Quality Control
SPLP	Synthetic Precipitation Leaching Procedure
TCLP	Total Characteristic Leaching Procedure
TPP	Technical Project Planning
TRRP	Texas Risk Reduction Program
UCL	Upper Confidence Limit
USGS	United States Geologic Survey
XRF	Xray Fluorescence



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 4-1
ISM Sampling Locations

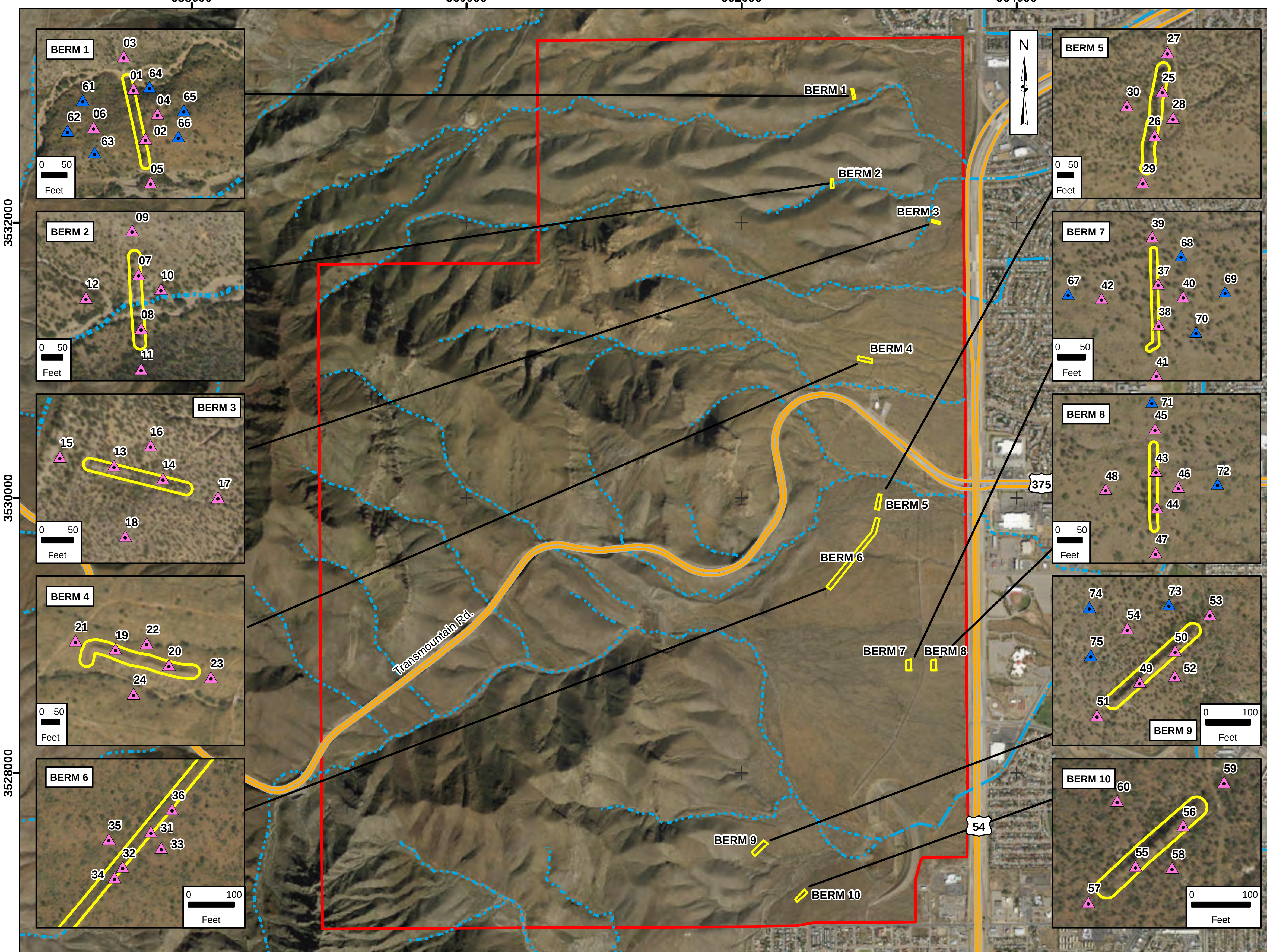
Legend

- MRS Boundary
- Revised CMUA based on RI MEC data collection
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch
- Phase I RI ISM Sample - Metals & Explosives
- Phase I RI ISM Sample - Metals, Explosives, & Perchlorate
- Phase II ISM Grid Location
- ISM Sample from 2011-2012 ISM Study
- Arroyo ISM sample from 2011-2012 ISM Study

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 4-2
Potential Backstop Berm Sampling Locations

Legend

- MRS Boundary
- Berm
- Intermittent Stream
- Canal/Ditch
- Phase I Berm Sample Location
- Phase II Berm Sample Location

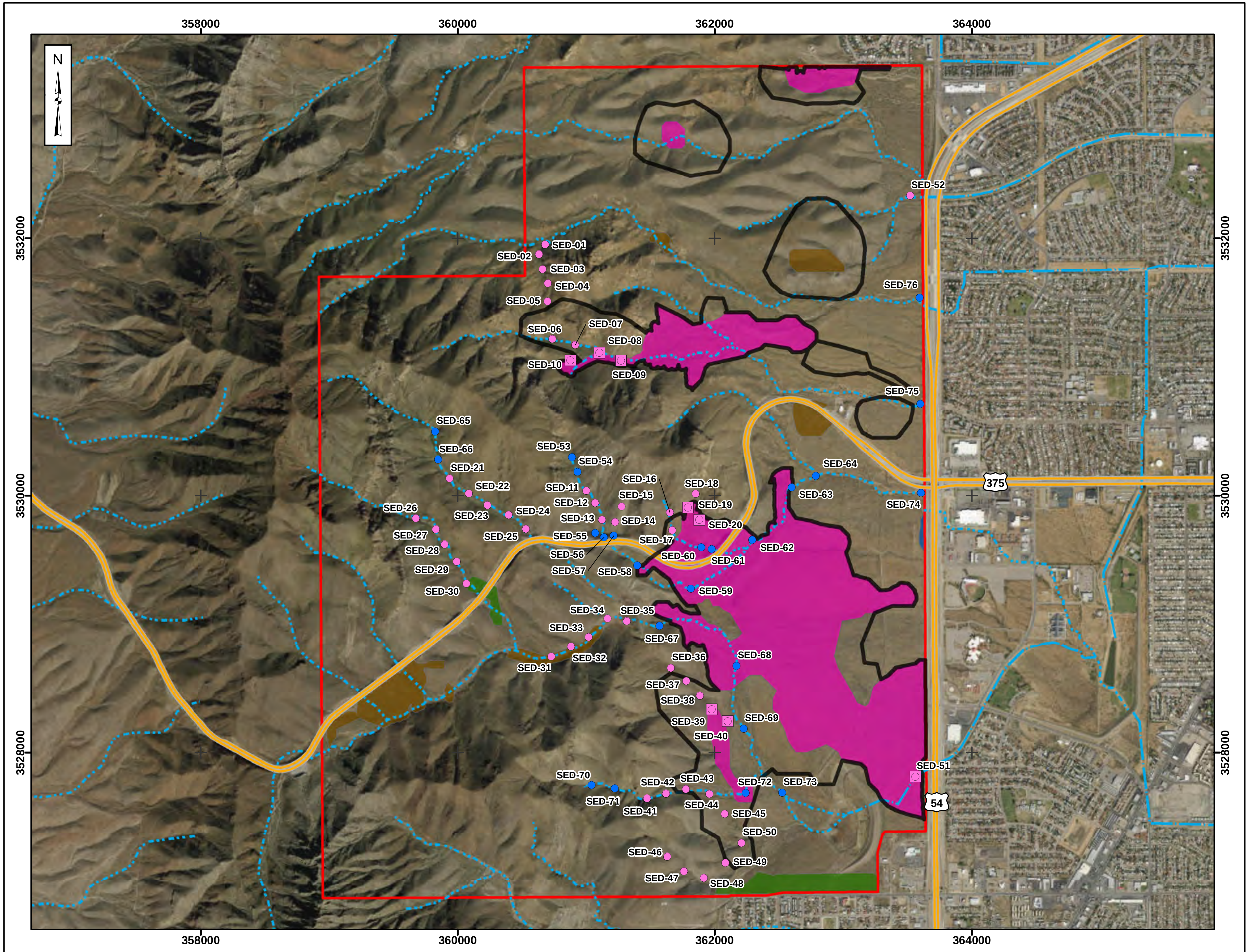
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, US Topo

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 4-3
Arroyo Soil Sample Locations



Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch

Soil Sample (0-6")

- Phase I
- Phase II

Soil Sample (12-18")

- Phase I

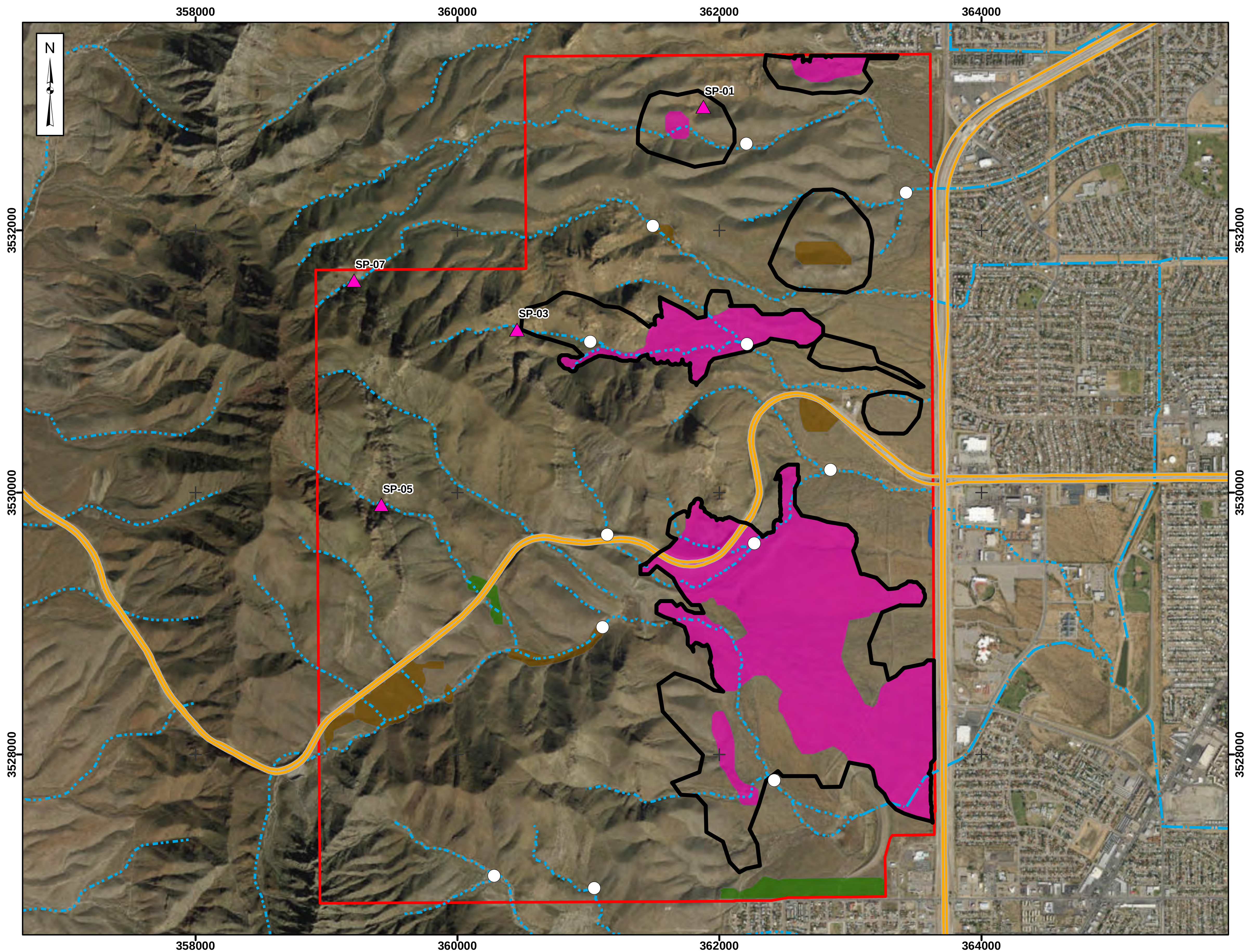
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 4-4
Surface Water Sampling Locations



Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch
- Surface Water (Seep) Sample Location
- Arroyo Surface Water Sample Location, visited during wet and dry sampling events (no water present)

0 0.5 1

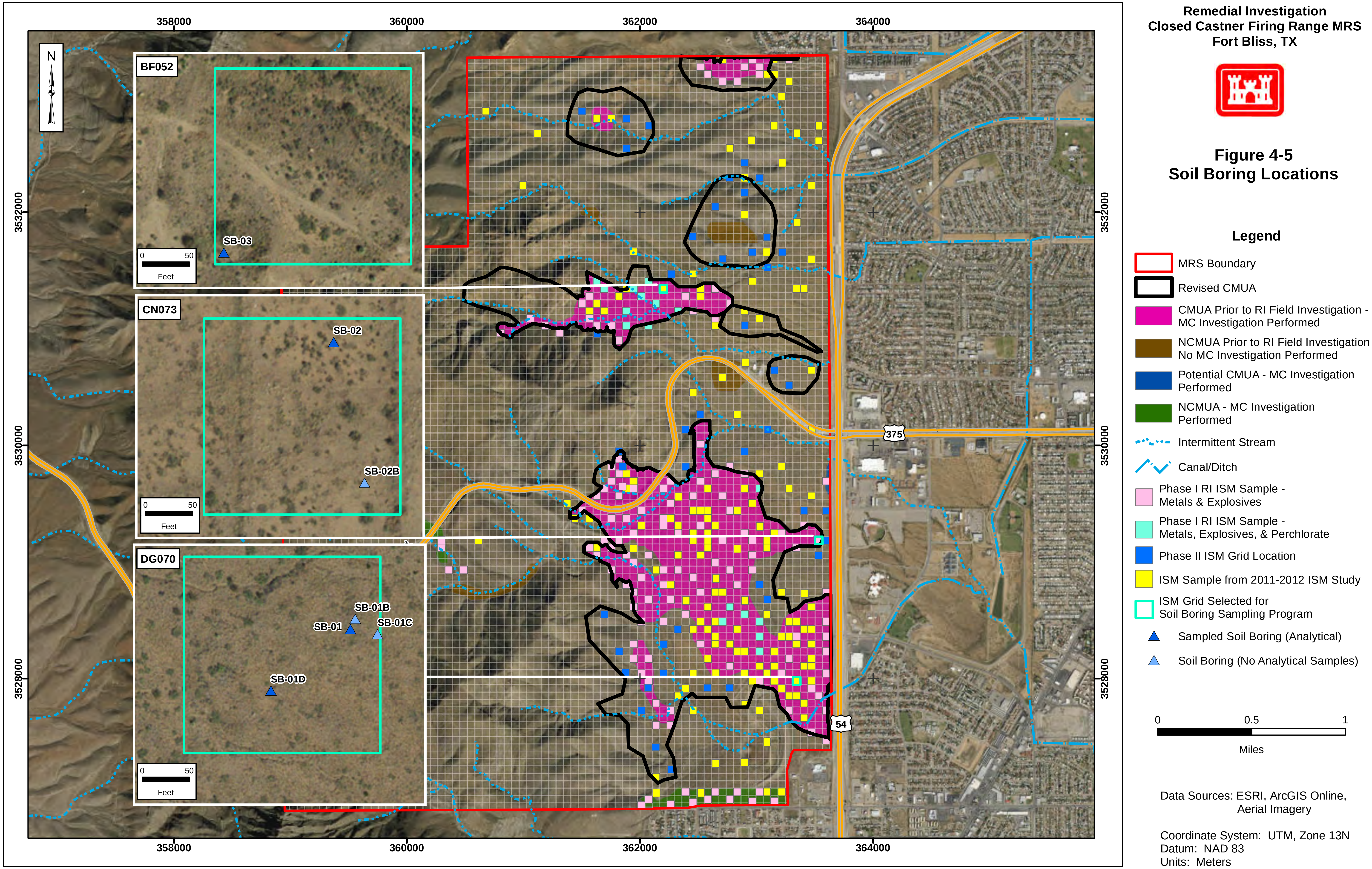
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 4-5
Soil Boring Locations



Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

5 MEC REMEDIAL INVESTIGATION RESULTS

This section presents the results of the RI field investigation and the nature and extent of MEC. The CSMs for the Closed Castner Range MRS, were based on the physical and ecological profile information (as presented in **Section 1**), the preliminary CSM (see **Section 2.1**), and the RI field data (as presented in this section and **Section 3**).

The field data are presented within the following sections and correspond to the field task components used to achieve the RI goals. For specific details/definitions of these tasks and equipment used, see **Section 3**. The main field task components are listed below:

- IAVS data collection;
- Analog transect data collection;
- DGM grid data collection, processing, analysis, and anomaly selection;
- WAA transect and DGM grid target reacquisition; and
- Intrusive investigation of reacquired anomalies.

5.1 GEOPHYSICAL RESULTS

The following sections present the results of the IAVS, analog transect surveys, and WAA and DGM grid surveys conducted in the Castner Range MRS. The intrusive investigation results are discussed in **Section 5.1.3** and included in the MS Access Database that is IAW DID WERS-004.01 found in **Appendix E**.

5.1.1 IAVS Results

A total of 31.5 miles (76.36 acres) of IAVS transects were traversed in areas with slopes greater than 30% and 900 ft (0.41 acres) of IAVS transects were conducted in potential CMUA 21. **Table 5-1** presents a summary of the proposed and actual amount of IAVS transects that were conducted. **Figure 5-1** shows the locations of IAVS transects, anomalies detected along the transects, and nature of surface features identified along the transects. The UXO technicians conducted the IAVS transects using a White's MXT All-Metal Detector and a handheld GPS to record the path traversed, detected anomalies, and the surface features that were identified. Additional information regarding the data collection procedures is in **Section 3.2.4**.

Table 5-1: Proposed vs. Actual Amount of RI Field Work

Data Type	Sub-Data Type	Proposed Sampling Design		Completed Fieldwork	
		units	area (acres)	units	area (acres)
IAVS Transects	IAVS in areas with slopes > 30%	47 transects, 29.1 miles	70.05	55 transects, 31.5 miles	76.36
	IAVS in Potential CMUA 21	1 transect (845 ft, or 0.16 miles)	0.39	1 transect, 0.17 miles)	0.4
Analog Transects	Phase I	452	4.15	456	5.2
	Phase III	NA	NA	4	1.0
WAA Transects		1,750 100-ft transects (3,303 anomalies)	16.06	1,750 transects (3,303 anomalies)	16.06
DGM Grids		22 100-ft x 100-ft grids	5.05	29 100-ft x 100-ft grids and 1 50-ft x 50-ft grid	6.71

5.1.1.1 WAA and DGM Grid Surveys

A total of 29, 100-ft by 100-ft grids and 1, 50-ft x 50-ft grid, were randomly placed in low anomaly density areas and DGM surveyed with the man-portable EM61-MK2. A total of 424 anomalies were detected in the DGM grids with EM61-MK2 Channel 2 responses greater than the anomaly selection threshold of 2.8 mV.

A total of 3,303 WAA transect targets were selected for investigation in accordance with the Final UFP-QAPP. **Table 5-1** presents a summary of the proposed and actual amount of WAA transects and DGM grids that were conducted. **Figure 5-2** shows the locations of WAA transects and DGM grids that were investigated, and the MD that was found during intrusive investigation. Additional information regarding the data collection procedures is in **Section 3.2.4**.

5.1.1.2 Analog Transects

A total of 12.9 miles of 4-ft wide (6.25 acres) analog transects were conducted during Phases II and III. A total of 64 anomalies were detected and intrusively investigated. **Table 5-1** presents a summary of the proposed and actual amount of analog transects that were conducted. **Figure 5-3** shows the locations of analog transects, anomalies detected along the transects, and nature of the detected anomalies. The UXO technicians conducted the analog transects using a White's MXT All-Metal Detector and a handheld GPS to record the path traversed, detected anomalies, and the nature of the anomalies. Additional information regarding the data collection procedures is in **Section 3.2.4**.

5.1.2 Quality Control for Geophysical Surveys

The QC Geophysicist or their designee, and the UXOQCS performed various QC functions. Geophysical performance metrics were established in the Revised Final RI QAPP (PIKA/Arcadis JV, 2015a) to ensure that analog and DGM data met the project DQOs. The JV conducted a DUA in accordance with Worksheet #37 of the Revised Final UFP-QAPP (PIKA/Arcadis JV, 2015a). The QC Geophysicist performed QC of the geophysical field work and assessed the data quality in the RI DUA that is contained in **Appendix C**.

5.1.2.1 Daily Field Activity Records

The JV's UXOQCS ensured all operational checks of analog instruments and equipment by site personnel were conducted, and that the appropriate log entries were made. QC inspections were performed at random, with unscheduled checks of the site to ensure personnel accomplished all work as specified in the Final RI QAPP and approved FCRs. Daily equipment check logs and other QC checks (e.g., geodetic functionality) are included in the analog MS Database in **Appendix E.**

5.1.3 Intrusive Investigation Results

A total of 3,791 WAA transects, DGM grid, analog transect, and IAVS transect anomalies were investigated; all were intrusively investigated except the IAVS transect anomalies. A total of 10,296 items were recovered. **Table 5-2** provides a summary of all the items recovered during the intrusive investigation. **Figure 5-4** shows all the RI intrusive investigation results, while **Figures 5-5, 5-6, and 5-7** are figures of the dig results in the northern, central, and southern portions of the MRS, respectively. The intrusive investigation results are included in the DGM and analog MS Access Databases included in **Appendix E**. The following sub-sections present the intrusive investigation results for the WAA transects, DGM grids, and analog transects.

Table 5-2: Item Summary for Intrusive Investigation per Data Type

Dig Results		Data Type				
		WAA Transects	DGM Grids	Analog Transects	IAVS Transects	Sub-totals:
DMM		2	0	0	0	2
UXO[1]		2	2	0	0	4
MDAS	Flare	88	0	0	0	88
	Fragment	739	66	94	1	900
	Fuze	41	3	4	1	49
	Grenades	294	2	1	2	299
	Illumination	2	0	0	0	2
	Mines (Land)	2	0	0	0	2
	Mortar	25	6	8		39

Dig Results		Data Type				
		WAA Transects	**DGM Grids**	**Analog Transects**	**IAVS Transects**	**Sub-totals:**
	Projectile	170	14	85	40	309
	Rocket	22	4	0	0	26
	MD Total	1,383	95	192	44	1,714
No Contact		257	20	0	0	277
Other		278	18	0	128	424
Small Arms Ammunition		3,991	238	3	0	4,232
Seed		0	17	1	0	18
Scrap Metal		3,198	421	2	4	3,625
Total:		**9,111**	**811**	**198**	**176**	**10,296**

Notes:
1 – One of the UXO items found during the RI was found on the surface of grid 20

While **Table 5-2** describes recovery of six MEC items (two DMM and four UXO), a seventh MEC item, a 3-inch Stokes HE Mortar (classified as UXO), was discovered outside of the RI field investigation area while the field teams were transiting between WAA anomaly investigation locations. Because the item was located outside of the investigation area, it could not be factored into the calculations of residual MEC density for the NCMUA; as such, it is noted here, but not further evaluated as part of the RI. The item was found on the northern end of the berm forming Fusselman Canyon Dam; to address the safety risk from this UXO item, the JV performed demolition on the item.

5.1.3.1 WAA Transect Intrusive Investigation

All 3,303 WAA transect anomalies selected for intrusive investigation were reacquired and investigated. A total of 9,111 items were recovered from these targets, including 2 DMM items, 2 UXO items, and 1,383 MDAS items. The two DMM included:

- 40mm M81 projectile in Lot 9 at 1-inch bgs; and
- M19A1 rifle grenade, white phosphorous (WP) in Lot 8 at 2 inches bgs.

The two DMM were located on the eastern end of Castner Range, near the locations of former firing points. The 40mm projectile, found 1 ft bgs, was still attached to the cartridge, indicating the item had not been fired. The M19A1 rifle grenade, found 2 ft bgs, still had the safety pin installed, indicating the item had not been readied for firing. Given the shallow depth in which the items were found (less than 2 ft bgs) and the lack of other concentrated DMM nearby, it is believed they were left on the range at the firing area. There is no evidence of burial at these locations.

The two UXO included:

- 37mm HE projectile in Lot 2 on the ground surface; and

- MK27 point detonating (PD) fuze in Lot 2 on the ground surface.

The two UXO located in Lot 2 were near former OB/OD Area A-1. The MDAS items included flares, fuzes, grenades, illumination rounds, practice land mines, mortars, projectiles, rockets, and fragments that could not be associated with a specific type of munition. The MDAS were recovered from depths ranging from 0 to 24 inches bgs. The remaining items recovered in the WAA transect anomalies consisted of 3,991 SAA, 3,198 items identified as scrap metal (e.g., wire, nails, cans), 278 other anomalies (e.g., targets shared with other targets), and 257 No Contact anomalies where the dig team could not locate the anomaly source. **Table 5-2** summarizes the number of items within each of these categories. **Figures 5-4** through **5-7** show the locations of the items recovered at each of the WAA transect anomaly locations. The complete dig results are provided in **Appendix E**.

5.1.3.2 DGM Grid Intrusive Investigation

All 424 anomalies identified in the DGM grids selected for intrusive investigation were reacquired and investigated. A total of 811 items were recovered from these targets, including 2 UXO items and 95 MDAS items. The recovered UXO included a 37mm HE projectile that was found on the surface in grid G20 and a 60mm mortar that was found in grid 24 at a depth of 8 inches bgs. The MDAS items included fuzes, grenades, mortars, projectiles, rockets, and fragments that could not be associated with a specific type of munition. The MDAS were recovered from depths ranging from 0 to 8 inches bgs. The remaining items recovered in the DGM grids consisted of 238 SAA, 421 items identified as scrap metal (e.g., wire, nails, cans), 17 BSIs, 18 other anomalies (e.g., targets shared with other targets), and 20 No Contact anomalies where the dig team could not locate the anomaly source. **Table 5-2** summarizes the number of items within each of these categories. **Figures 5-4** through **5-7** show the locations of the items recovered at each of the DGM grid anomaly locations. The complete dig results are provided in **Appendix E**.

5.1.3.3 Analog Transect Intrusive Investigation

All 105 anomalies identified on the analog transects were intrusively investigated, including on the Phase 3 analog transects conducted in elevated anomaly density areas identified during the Phase I IAVS transects. A total of 198 items were recovered from these targets, including 192 MDAS items that included fuzes, grenades, mortars, projectiles, rockets, and fragments that could not be associated with a specific type of munition. The MDAS were recovered from depths ranging from 0 to 4 inches bgs. The remaining items recovered on the analog transects consisted of 3 SAA, and 2 items identified as scrap metal (e.g., wire, nails, cans). **Table 5-2** summarizes the number of items within each of these categories. **Figures 5-4** through **5-7** show the locations of the items recovered at each of the analog transect anomaly locations. The complete dig results are provided in **Appendix E**.

The dig results for the two high anomaly density areas investigated in Phase 3 were predominantly MD. As further discussed in **Section 5.1.4**, these areas are interpreted as being part of the larger CMUA 1.

5.1.3.4 IAVS Transect Surface Investigation

All 176 anomalies identified on the IAVS transects were investigated if they were on the surface. A total of 48 items were recovered from these targets, including 44 MDAS that included 40 projectiles, 1 fuze, 2 grenades, and 1 fragment that could not be associated with a specific type of munition. The remaining 4 items were scrap metal (e.g., wire, nails, cans). One hundred twenty eight anomalies were classified as other and were due to subsurface anomalies that were not intrusively investigated IAW the Final QAPP. However, the total anomalies were recorded to calculate anomaly densities along the IAVS transects. **Table 5-2** summarizes the number of items within each of these categories. **Figures 5-4 through 5-7** show the locations of the items recovered at each of the IAVS transect anomaly locations. The complete IAVS results are provided in **Appendix E**.

5.1.4 Source, Nature, and Extent of MEC/MPPEH

5.1.4.1 RI Results

After intrusive activities, a total of 2 DMM, 4 UXO, and approximately 300 pounds (lbs) of MDAS were identified and removed from the investigated areas during the RI. **Table 5-2** provides a breakdown of the total UXO, DMM, MDAS, and non-MD recovered by data type, while **Table 5-3** provides a summary of the UXO and DMM found. **Figures 5-4** through **5-7** show the locations of the UXO, DMM, and MDAS found during the RI.

Table 5-3: MEC Summary[1]

Target ID	Location	MEC Found	MEC Type	Munitions Type
NA - Surface	Grid 20	37mm HE projectile	UXO	Projectile
WAA-1441	Lot 8	M19A1 rifle grenade, WP	DMM	Grenades
WAA-1735	Lot 9	40mm M81 projectile still in cartridge	DMM	Projectile
WAA-0284	Lot 2	37mm HE projectile	UXO	Projectile
WAA-0391	Lot 2	MK27 PD fuze	UXO	Fuze
G24-0003	Grid 24	60mm mortar fuzed	UXO	Mortar

Notes:
1 - As noted in Section 5.1.3, a 3-inch Stokes Mortar (UXO), was discovered outside of the RI field investigation area and is not be factored into the calculations of residual MEC density for the NCMUA.

Two of the UXO consisted of a 37mm HE projectile found in Grid 20 in the southern portion of the MRS in an area where a relatively high number of 37mm projectile MDAS was also found; a 60mm mortar fuzed that was found in the northern portion of the site. The other two UXO, the

37mm HE projectile found on WAA target 284 and the MK27 PD fuze, were found near CMUA 8, which is a former OB/OD site. These items were interpreted as kick out from the OB/OD site by the UXO Technicians in the field. One DMM, the M19A1 rifle grenade, WP, was found in the eastern portion of the MRS north from Transmountain Road. The other DMM was a 40mm M81 projectile that was still in its cartridge casing in the eastern portion of the MRS south of Transmountain Road.

A total of 41 munitions items were identified as MDEH during the field work. Residual tracer material was observed within these items during the inspection and certification process which prevented designation of the items as MDAS. Therefore, they were classified as MDEH and subjected to a consolidated shot demolition. After the demolition event, the munitions items were inspected, the explosive hazard determined to be removed, and certified as MDAS.

A total of 1,714 MDAS were found during the RI. **Table 5-2** presents a summary of the MDAS recovered within each data type. The recovered MDAS consisted of the following:

- 88 flares
- 49 fuzes
- 299 grenades
- 2 illumination rounds
- 2 practice land mines
- 39 mortars
- 309 projectiles
- 26 rockets, and
- 900 fragments that could not be positively associated with a specific type of munition.

Table 5-4 presents the range of depths over which MEC and MD were found during the RI, WAA, and ESTCP's AGC live site demonstration for each of the CMUAs and the NCMUA. The maximum depth of recovered depths was 40 inches bgs.

Table 5-4: Vertical Extent of MEC and MD

Area	MEC and MD Depths (inches bgs)
CMUA 1	0-18
CMUA 4	0-24
CMUA 6	0-14
CMUA 8	0-20
CMUA 10	0-24
CMUA 22	0-12

Area	MEC and MD Depths (inches bgs)
CMUA 23	0-12
NCMUA	0-24

A complete MEC hazard assessment is included in **Section 10** of this RI Report.

5.1.4.2 RI and Historical MEC Results

Figures 5-8 through **5-11** show the RI and Historical MEC finds from investigations and removal actions for which data are available. The findings from investigations and removal actions prior to 1998 (e.g., the 1979 Surface Sweep by USACE along Highway 54 and Transmountain Highway) are not available and therefore cannot be included in the following evaluation. **Figure 5-8** shows all known, recovered MEC and **Figures 5-9** through **5-11** show the northern, central, and southern portions of the MRS, respectively. These figures show the following (note that the MEC finds from the 1998 and 2004 removal actions did not state which type of MEC were found at each location):

- RI and Historical MEC Finds North (**Figure 5-9**)
  - CMUA 6 Area. A large amount of MDAS and MEC has been found to the south and west of the CMUA 6 boundary, as presented in the Final QAPP. Several removal actions have cleared MEC to the south of the site. Most of the MDAS found in this area during the RI could not be positively identified.
  - CMUA 8 Area. A large cluster of MEC has been found within and surrounding the CMUA 8 boundary, the former OB/OD Area A-1, as presented in the Final QAPP. The MEC and MDAS consist of 20mm projectiles, 37mm projectiles, and fuzes.
  - CMUA 10 Area. Limited MEC and a large cluster of MDAS has been found around the CMUA 10 boundary, as presented in the Final QAPP.
- RI and Historical MEC Finds Central (**Figure 5-10**)
  - CMUA 4 Area. A large amount of MEC and MDAS has been found within and to the north and south of the CMUA 4 boundary, including finds from the 1998 CMS investigation, the 1998 Removal Action, the 2004 Removal Action, and the 2010 WAA (fragment grenade and 60mm HE mortar). MDAS in the area included rockets, grenades, 37mm projectile and fragments.
  - CMUA 22 Area. A cluster of MEC within and around the CMUA 22 boundary has been found, including finds from the 1998 Removal Action, the 2010 WAA (M29 practice rocket), and the RI (M19A.1 rifle grenade, WP). MDAS in the area included rockets and grenades.
  - CMUA 23 Area. As presented in the Final QAPP, a large number of MEC were identified within and to the east of CMUA 23, during the 1998 CMS investigation. The RI identified a large number of grenade MD within and to the west/southwest of the CMUA 23 boundary. These findings demonstrate movement of munitions through the arroyos on the

MRS from areas of higher to lower elevation. MDAS associated with fuzes and unidentified fragments were also found within the CMUA 23 boundary.

- RI and Historical MEC Finds South (**Figure 5-11**)
  - o <u>CMUA 1 Area</u>. This is a large CMUA in which a large amount of MEC and MDAS has been found within and adjacent to its boundary, including the two elevated anomaly density areas identified during the IAVS. MEC finds were identified during the 1998 CMS, the 1998 Removal Action, the 2004 Removal Action, the 2010 WAA, the 2014 ESTCP's AGC live-site demonstration, and the RI. MEC items identified during the WAA included a 75mm shrapnel round. MEC found during the 2014 ESTCP's AGC live site demonstration included a 105mm projectile. MEC items identified during the RI included a 37mm projectile, a 40mm M81 projectile still in the cartridge, and a 60mm mortar fuzed. MDAS in the area included fragments of 37mm projectiles, 75mm projectiles, and unidentified projectiles; rockets, fuzes, and unidentified fragments. Farther to the west of CMUA 1, 40mm projectile MD was found in addition to previously listed items.

  - o <u>CMUA 12 Area</u>. This area is to the southwest of CMUA1 in which MEC was identified in the 1998 CMS, and the 2004 Removal Action. MDAS has been identified in and around this area including fragments of 37mm projectiles, 75mm projectiles, and unidentified projectiles; fuzes, and unidentified fragments.

Based on the MEC found during this RI and previous investigations and removal actions, the potential exists that MEC is still present in the above areas.

Table 5-5 presents a summary of the original size of the CMUAs, the amount the CMUAs were expanded (including the newly identified CMUAs), and the revised total size of the CMUAs. **Table 5-6** summarizes the amount of investigation for each of the data types for each of the CMUAs and for the NCMUA. **Figure 5-12** shows changes to existing CMUA boundaries, and **Figure 5-13** shows CMUA 23, with grenade MD.

Table 5-5: Revised CMUA Sizes

CMUA Number	Original Size (acres)	CMUA Expansion Size (acres)	Revised Size (acres)	Comments
1	632.4	288.1	920.5	Four expansion areas and merged with CMUA12
4	119.6	81.1	200.7	Two expansion areas
6	24.5	25.7	50.2	1 Expansion Area
8	8.8	73.7	82.5	1 Expansion Area
10	0.0	114.9	114.9	Was not considered a CMUA in the Final QAPP.
12	23.2	-23.2	0.00	Now included in CMUA 1

CMUA Number	Original Size (acres)	CMUA Expansion Size (acres)	Revised Size (acres)	Comments
22	0.0	28.4	28.4	New CMUA identified during RI
23	0.0	29.5	29.5	New CMUA identified during RI
Total CMUA	808.5	618.2	1426.7	--
Total NCMUA	5994.5	-618.2	5376.3	--
Total MRS:	6803.0	0	6803.0	--

Notes:
CMUA – Concentrated Munitions Use Area
NCMUA – Non-Concentrated Munitions Use Area
MRS – Munitions Response Site

CMUAs 1 and 6 extend to the southeastern and northern Closed Castner Range MRS boundary, respectively. MEC likely extends north of CMUA 6 outside the Closed Castner Range and additional investigation is required to characterize the extent in this area. An RI is currently being executed in this area by another contractor. The area east of CMUA is the MRS 02 Artillery and Anti-Tank Ranges, which has been previously investigated and characterized as having limited MEC and MC risk and has a signed decision document (CAPE Environmental Management, 2016). As no additional investigation was required in that area, it provides lateral bounding for the nature and extent of MEC and MC for the Closed Castner Range MRS' eastern boundary / CMUA 1.

5.1.5 Summary of MEC and MD Remaining

The sampling goal, or null hypothesis, for the RI, as defined in the Final QAPP was developed to determine to a 95% confidence level whether there are less than 0.1 UXO/acre within the NCMUA. A total of 6 MEC were found during the RI and 1 MEC was reported to be found in the WAA Report. For each of the CMUAs and the NCMUA, the JV used UXO Estimator to calculate the upper bound of the MEC density and the upper bound of the total number of MEC that may remain within each of the CMUAs and the NCMUA. **Table 5-7** presents a summary of the amount of 100% investigation areas that were covered during the RI, WAA, and ESTCP's AGC live-site demonstration, the amount of MEC that was found during these investigations, and the estimated upper bound for the MEC density and total number of MEC. The 100% investigation areas include the following areas:

- DGM grids investigated during the RI;
- WAA transects investigated during the RI (except for the WAA transect lots 15 and 17 that were replaced with Lots 15a and 17a as discussed in NCR2);

- WAA transects investigated during the WAA;
- WAA transects that weren't investigated during either the WAA or RI, but on which anomalies were not detected; and
- Approximately 2.5 acres of ESTCP's AGC live site demonstration conducted in 2014 where all anomalies were intrusively investigated within randomly selected grids.

It should be noted that the upper limits are an estimate of the maximum number of UXO that could remain within each area. The actual number of MEC remaining could be any number from zero to the upper limit. Based on the RI and WAA findings, the UXO Estimator calculations indicate that there are up to 4,860 MEC remaining on Castner Range. The CMUA residual MEC densities range from approximately 1.2 MEC/acre to 14.9 MEC/acre.

For the NCMUA, the results indicate the residual MEC density is 0.123/acre to a 95% confidence level. Therefore, the results of the RI and WAA indicate the original sampling design and null hypothesis must be rejected for the revised hypothesis that the residual MEC density is less than or equal to 0.123 MEC/acre and that there is between 0 and 656 MEC still present within the NCMUA. This does not call into question the validity of UXO Estimator, but it does require us to reject the null hypothesis and accept a revised hypothesis that the residual MEC at the site is less than or equal to 0.123 MEC/acre to a 95% confidence level.

Table 5-6: Investigation Summary by CMUAs and NCMUA

CMUA Location	Revised Size (acres)	RI Investigation Amount									WAA 100% Investigation Amount				ESTCP Investigation Area (acres)	Total 100% Investigation Area (acres)[3]
		Analog Transects		WAA Transects		DGM Grid area (acres)	IAVS Transects		RI Total Investigation Amount		WAA Transects Investigated during the WAA		WAA DGM Transects with No Anomalies[2]			
		Length (miles)	Area (acres)	Length (miles)[1]	Area (acres)[1]		Length (miles)	Visual Survey Area (acres)	Area without IAVS (acres)[1]	Area with IAVS (acres)[1]	Length (miles)	Area (acres)	Length (miles)	Area (acres)		
1	920.47	0.6	0.29	5.3	2.55	0.23	1.1	2.67	3.07	5.74	0.45	0.22	1.34	0.65	2.5	3.94
4	200.68	1.02	0.49	0.2	0.08	0	1.08	2.62	0.57	3.19	0.04	0.02	0	0	0	0.59
6	50.23	0	0	0.4	0.19	0	0	0.00	0.19	0.19	0	0	0.01	0.01	0	0.20
8	82.48	0	0	1.4	0.67	0	0	0.00	0.67	0.67	0.02	0.01	0.24	0.12	0	0.80
10	114.90	0	0	1.4	0.66	0.23	0	0.00	0.89	0.89	0.4	0.19	1.15	0.56	0	1.64
22	28.37	0	0	0.3	0.15	0.23	0	0.00	0.38	0.38	0.19	0.09	0.44	0.22	0	0.69
23	29.48	0	0	0.4	0.18	0.06	0	0.00	0.24	0.24	0	0	0.08	0.04	0	0.28
NCMUA	5376.3	11.26	5.46	20.6	9.97	5.97	31.56	76.51	21.40	97.91	11.79	5.71	49.04	23.78	0	50.89
Total:	6803.0	12.9	6.2	29.8	14.5	6.7	33.7	81.8	27.4	109.2	12.9	6.2	52.3	25.4	2.5	59.0

<u>Notes:</u>
1 - The acreage contained in Lots 15 and 17 are not included in these totals. A total of 0.057 miles in CMUA 1 and 3.33 miles in the NCMUA were contained in Lots 15 and 17.
2 - The length and acreage listed in these columns are the 100-ft WAA DGM transect segments on which no anomalies were selected and that weren't randomly selected for intrusive investigation. Because they do not contain anomalies, they are considered to have been fully investigated.
3- The total 100% investigation area includes the acreage of *RI Total Investigation Amount without the IAVS* plus the *WAA Transects Investigated during the WAA*, the *WAA DGM Transects with No Anomalies*, and the *ESTCP Investigation Area within CMUA1*.

Table 5-7: Residual MEC Estimate

Area Name	Area Size (acres) for RI	Amount of 100% Intrusive Investigation[1]	Remaining Area to Evaluate (acres)	MEC Items Found during RI, ESTCP and WAA[2]	Residual MEC Estimate at 95% Confidence Level	
					Upper Bound of MEC Density (anomalies/acre)	Estimated Upper Bound of the Number of Residual MEC[3]
CMUA 1	920.47	6.44	914.03	3	1.2	1,097
CMUA 4	200.68	0.59	200.09	0	5.068	1,015
CMUA 6	50.23	0.20	50.03	0	14.931	748
CMUA 8	82.48	0.80	81.68	2	7.832	640
CMUA 10	114.9	1.64	113.26	0	1.81	206
CMUA 22	28.37	0.69	27.68	1	6.803	189
CMUA 23	29.48	0.28	29.20	0	10.617	310
NCMUA	5,376.3	50.89	5,325.41	2	0.123	655
Total:	**6,803.00**	**59.03**	**6,743.97**	**7.00**	**N/A**	**4,860**

<u>Notes:</u>

1 - The total 100% investigation area includes the acreage of *RI Total Investigation Amount without the IAVS* plus the *WAA Transects Investigated during the WAA*, the *WAA DGM Transects with No Anomalies*, and *2.5 acres of the ESTCP study area within CMUA1 that were 100% intrusively investigated.*
2 - As noted in Section 5.1.3, a 3-inch Stokes Mortar (UXO), was discovered outside of the RI field investigation area and is not be factored into the calculations of residual MEC density for the NCMUA.
3 - This represents the upper bound, or most, MEC within the area to a 95% confidence level. The actual number of MEC may be anywhere between 0 and the number contained in this column.

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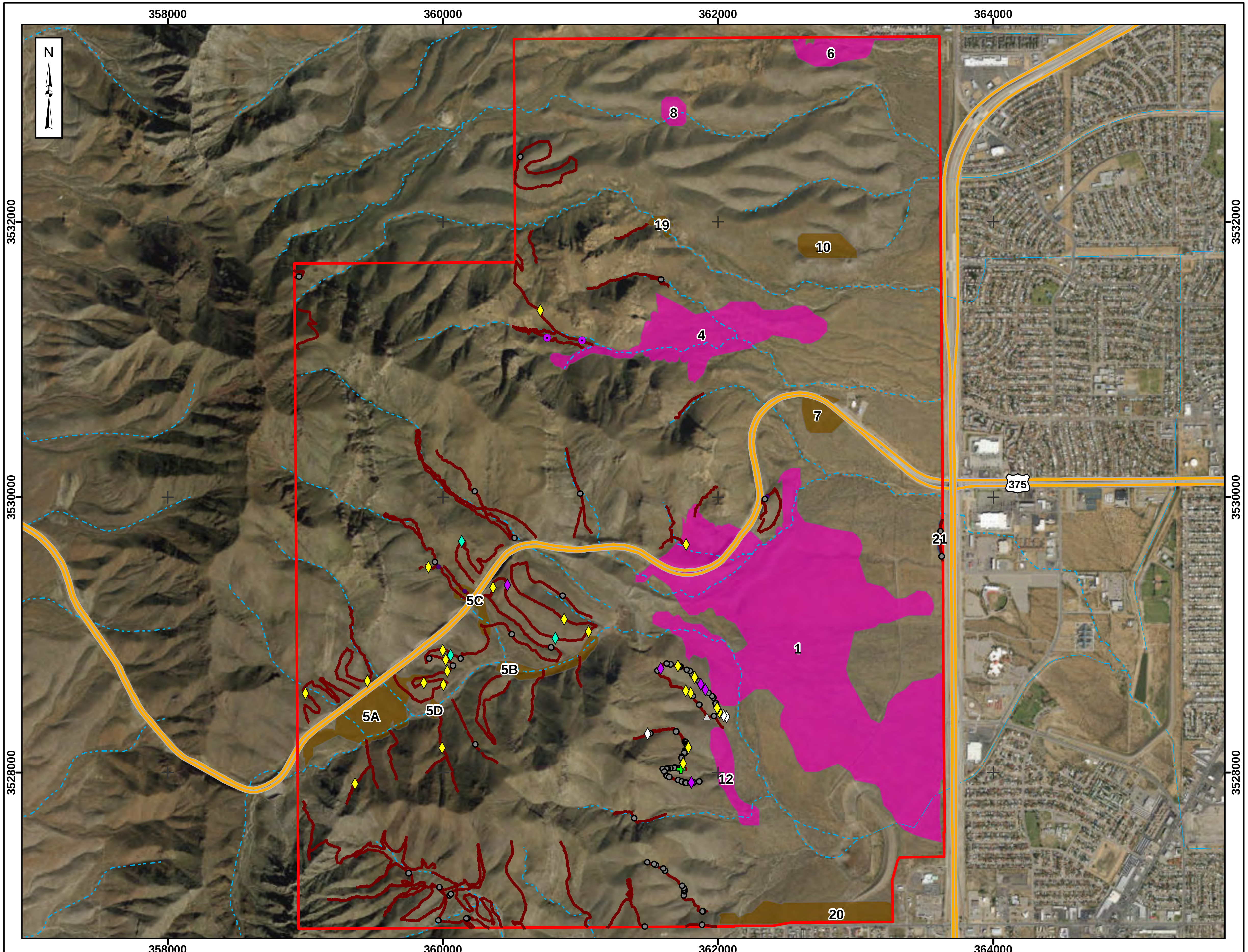
Figure 5-1
IAVS Transects and RI Results



Legend

MRS Boundary
Intermittent Stream
High Anomaly Density - CMUA; No Investigation Performed
High Anomaly Density - NCMUA; No Investigation Performed
High Anomaly Density - Investigation Confirmed a NCMUA
IAVS Transect

MD - Projectiles
37mm Projectile
40mm Projectile
75mm Projectile
Projectile frag

Other Munitions Debris
Fragment
Fuzes
Grenade

Other RI Dig Results
Scrap Metal
Other

0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

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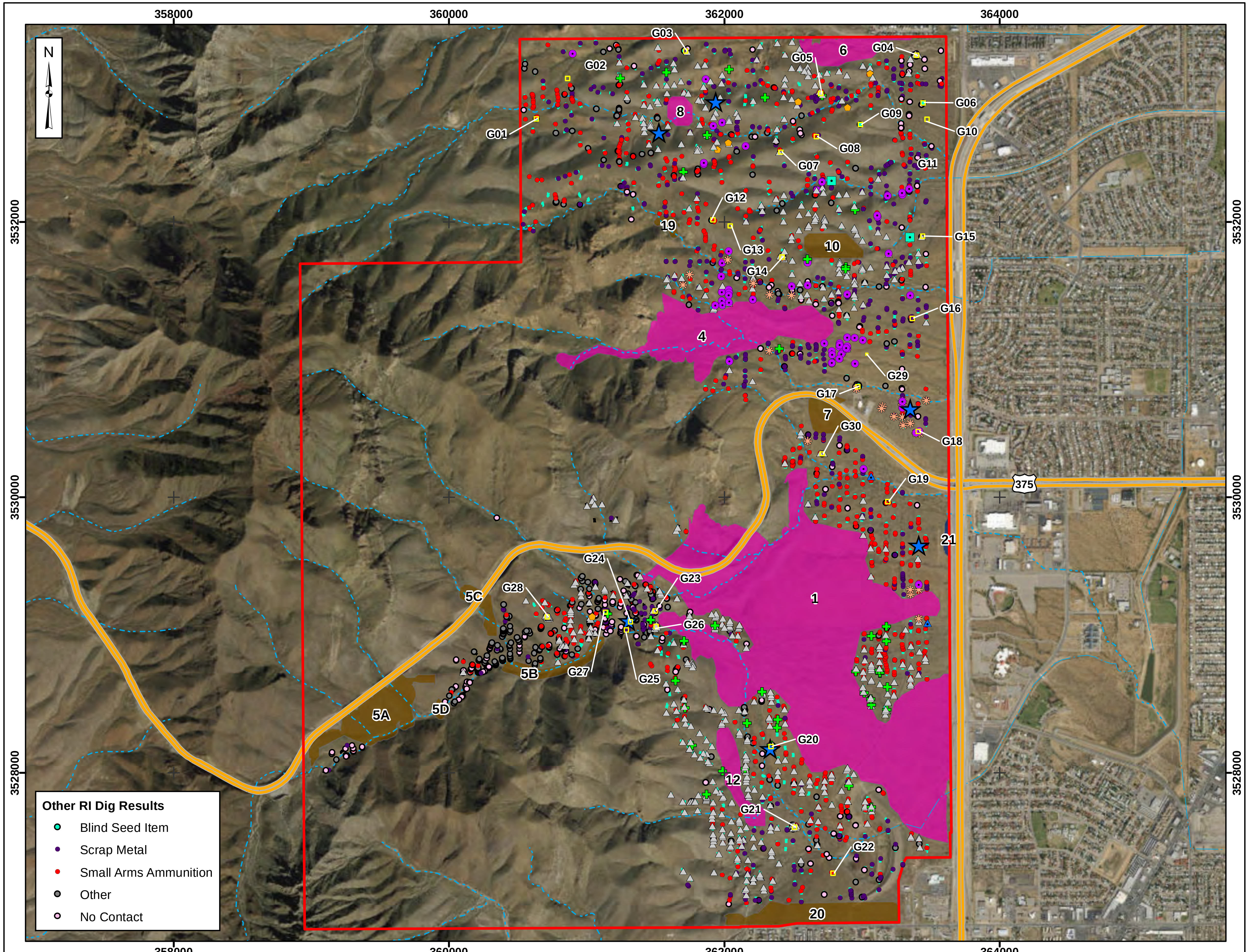
Figure 5-2
WAA Transect / DGM Grid RI Results



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- WAA DGM Transect
- DGM Grid
- WAA DGM Lot converted to new DGM grid
- MEC Find

MD - Projectiles

- 20mm Projectile
- 37mm Projectile
- 40mm Projectile
- 57mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rockets

0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

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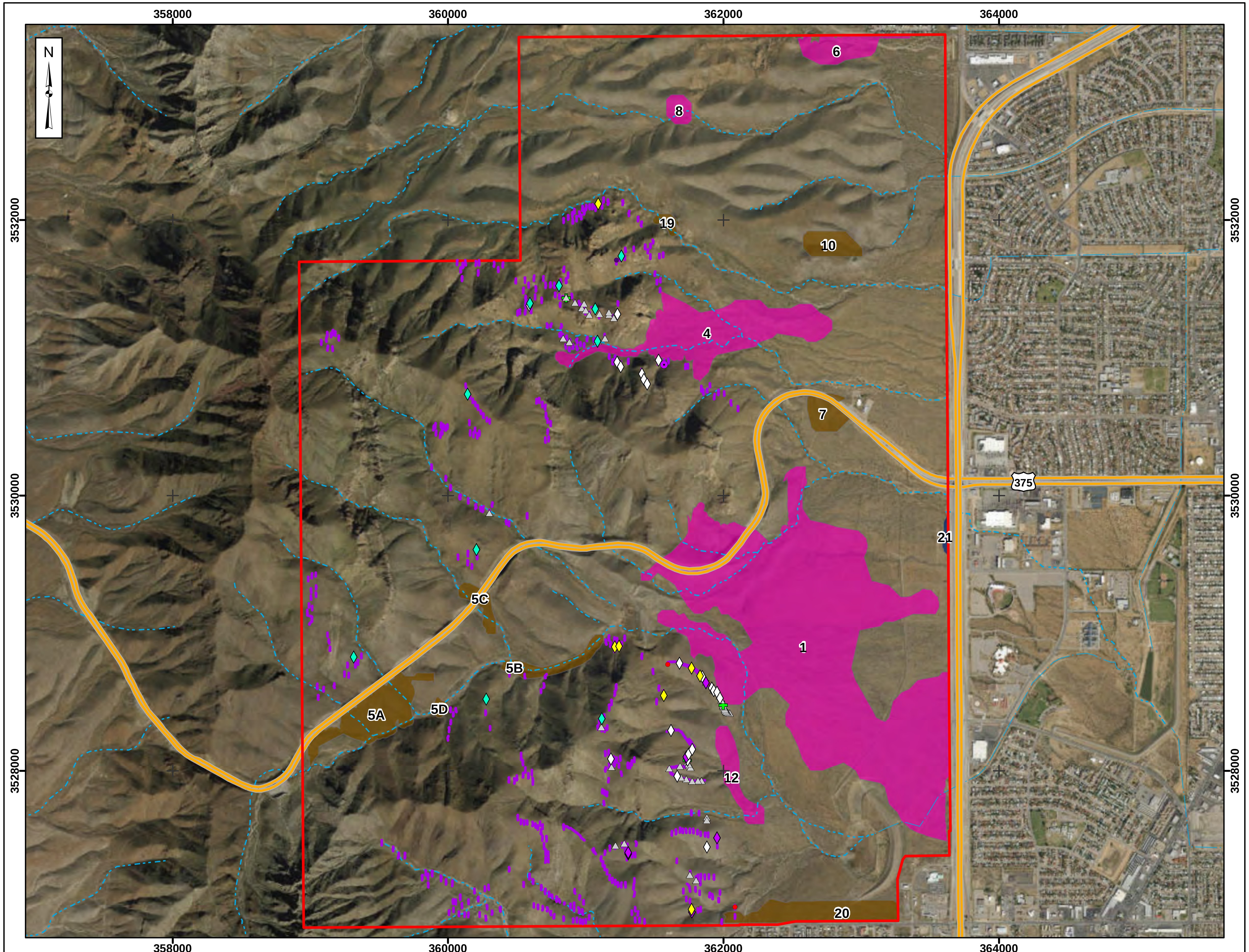
Figure 5-3
Analog Transects and RI Results



Legend

MRS Boundary
Intermittent Stream
High Anomaly Density - CMUA; No Investigation Performed
High Anomaly Density - NCMUA; No Investigation Performed
High Anomaly Density - Investigation Confirmed a NCMUA
Analog Mag-and-Dig Transect

MD - Projectiles

37mm Projectile
40mm Projectile
75mm Projectile
Projectile frag

Other Munitions Debris

Fragment
Fuzes
Grenade
Mortar

Other RI Dig Results

Scrap Metal
Small Arms Ammunition
Other

0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

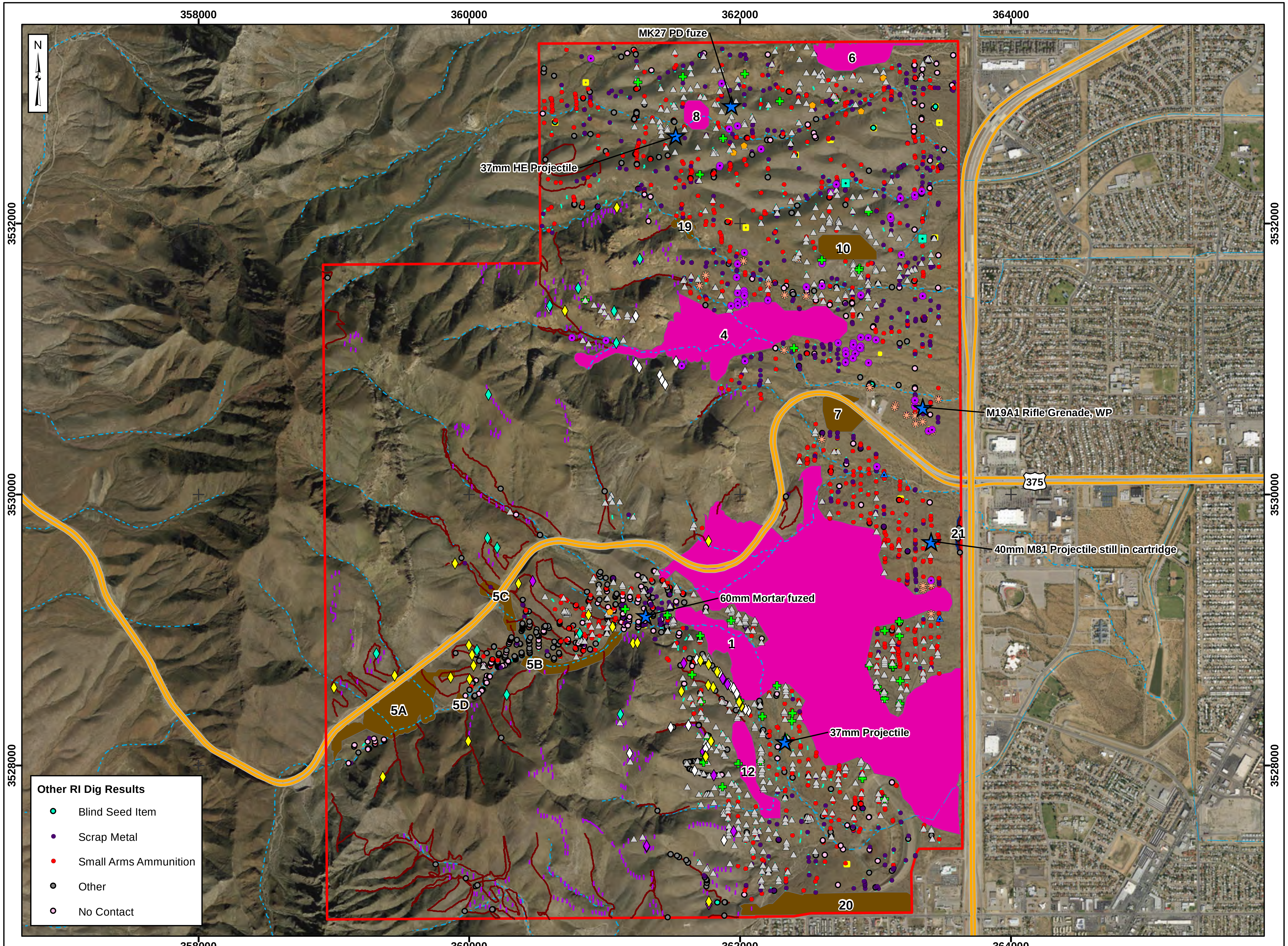


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Figure 5-4
RI Dig Results

Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- Analog Transect
- IAVS Transect
- WAA DGM Transect
- DGM Grid
- MEC Find

MD - Projectiles

- 20mm Projectile
- 37mm Projectile
- 40mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rockets

0 0.25 0.5
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

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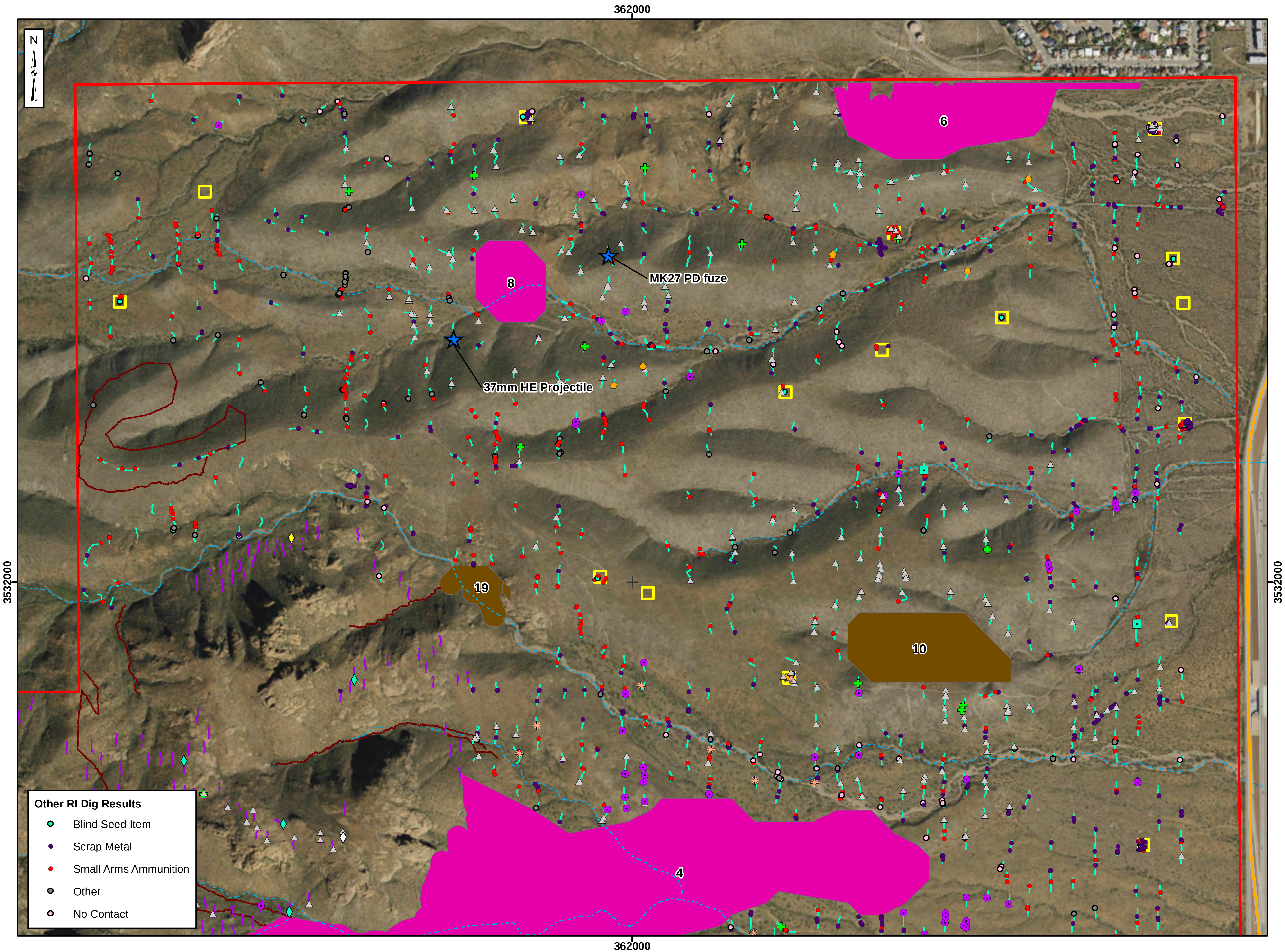
Figure 5-5
RI Dig Results - North



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- Analog Transect
- IAVS Transect
- WAA DGM Transect
- DGM Grid
- MEC Find

MD - Projectiles

- 20mm Projectile
- 37mm Projectile
- 40mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rockets

0 0.1 0.2
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

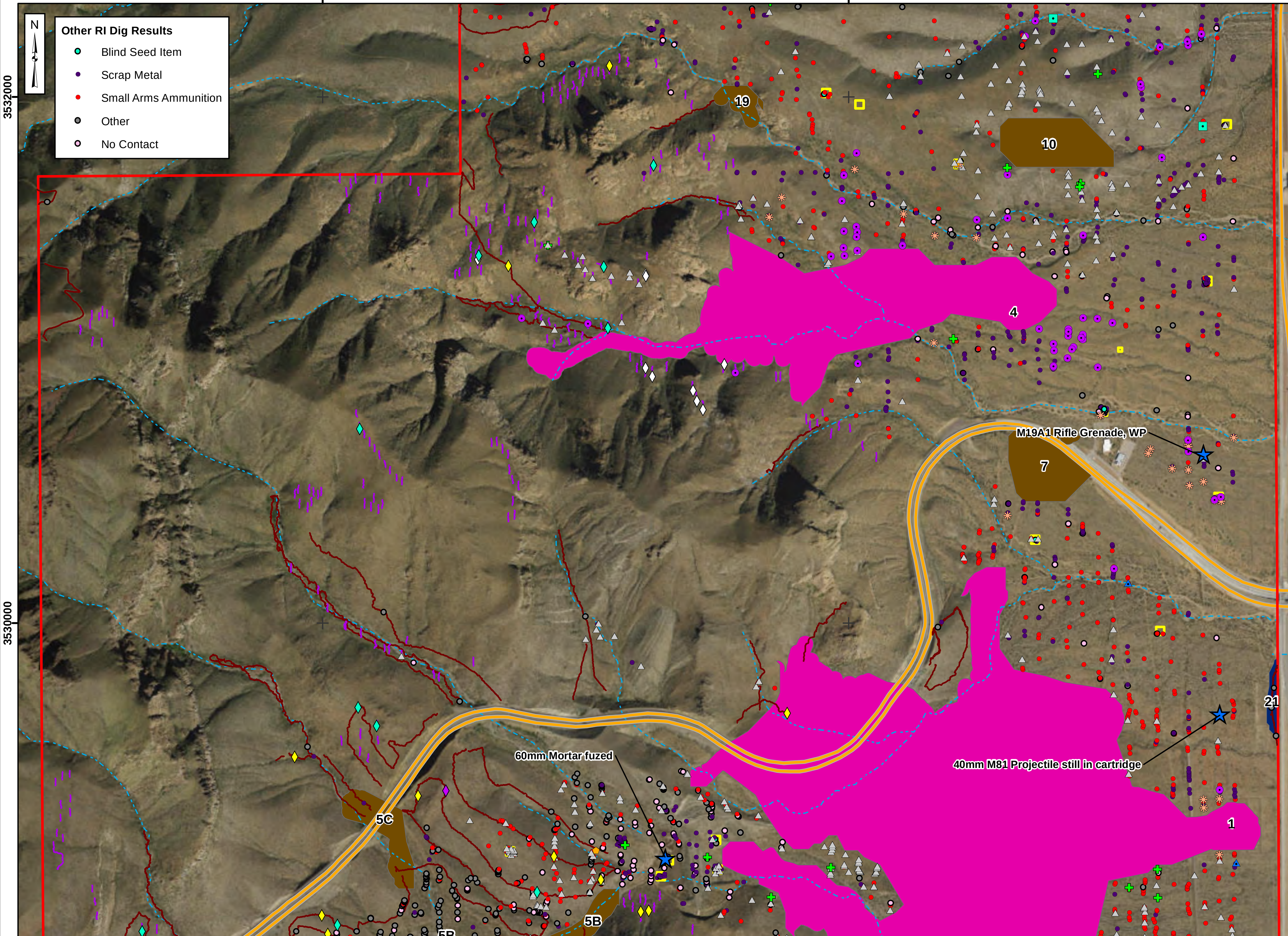


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Figure 5-6
RI Dig Results - Central

Legend

MRS Boundary
Intermittent Stream
High Anomaly Density - CMUA; No Investigation Performed
High Anomaly Density - NCMUA; No Investigation Performed
High Anomaly Density - Investigation Confirmed a NCMUA
Analog Transect
IAVS Transect
WAA DGM Transect
DGM Grid
MEC Find

MD - Projectiles
20mm Projectile
37mm Projectile
40mm Projectile
75mm Projectile
Projectile frag

Other Munitions Debris
Flares
Fragment
Fuzes
Grenade
Mortar
Illumination
Practice Mines (Land)
Rockets

0 0.1 0.2
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

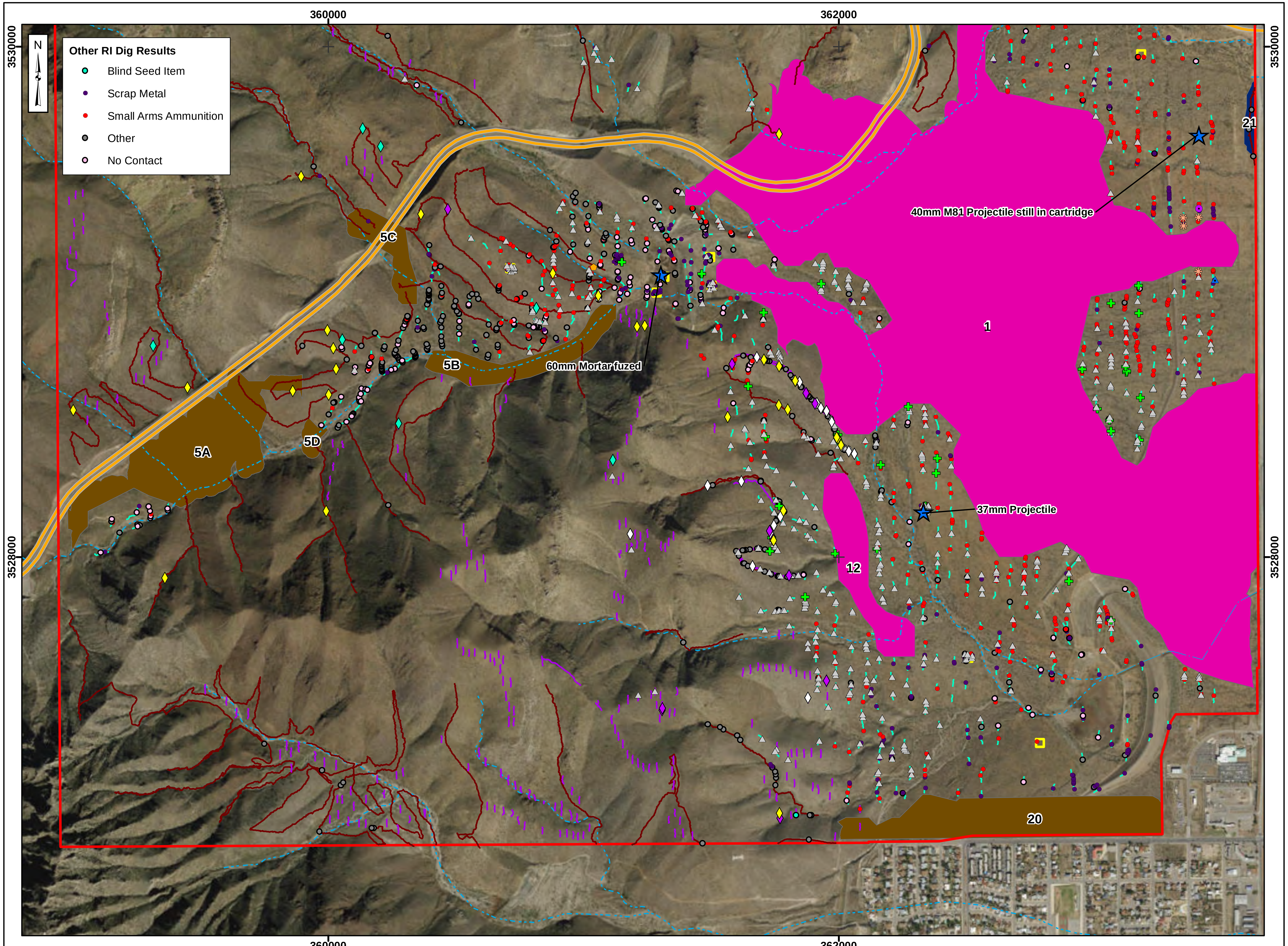

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Figure 5-7
RI Dig Results - South

Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- Analog Transect
- IAVS Transect
- WAA DGM Transect
- DGM Grid
- MEC Find

MD - Projectiles

- 20mm Projectile
- 37mm Projectile
- 40mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rockets

0 0.1 0.2
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

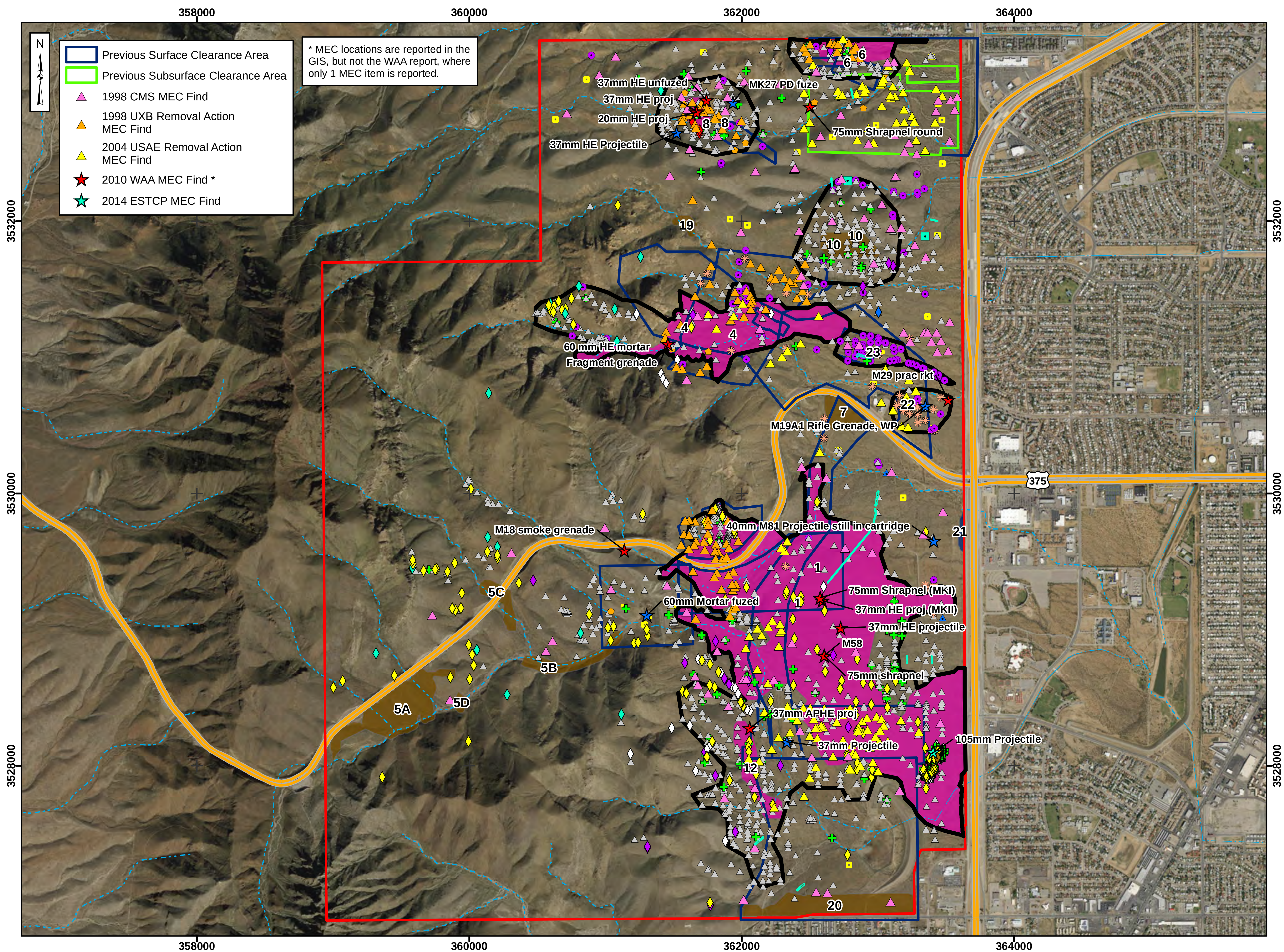

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Figure 5-8
RI and Historical MEC Finds

Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- Revised CMUA based on RI MEC data collection
- DGM Grid
- Berm
- MEC Find (RI)

MD - Projectiles (RI / WAA / ESTCP)

- 20mm Projectile
- 25mm Projectile
- 37mm Projectile
- 40mm Projectile
- 57mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris (RI / WAA / ESTCP)

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rotating Band
- Rockets

0 0.2 0.4
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

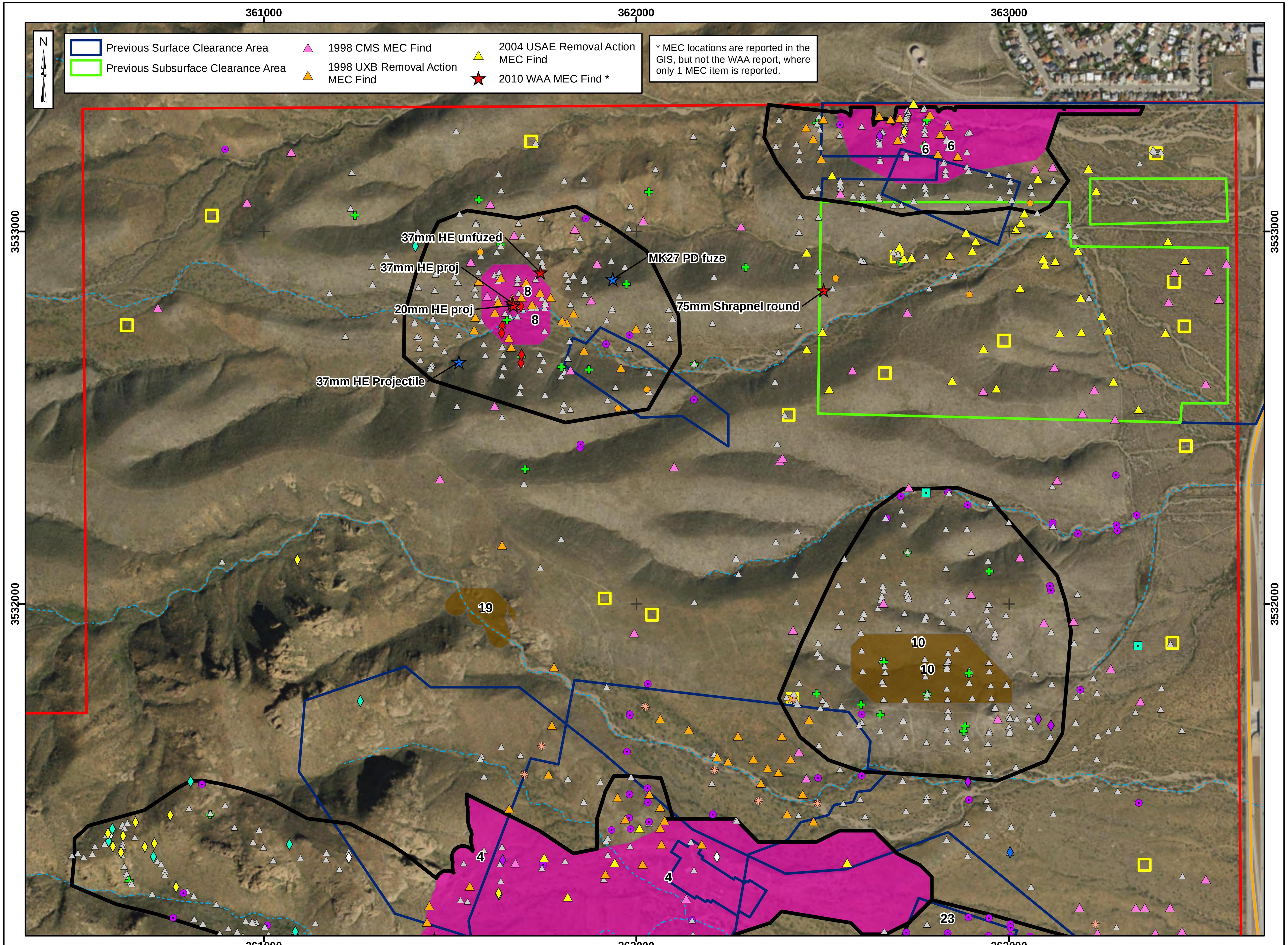

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Figure 5-9
RI and Historical MEC Finds - North

Legend

MRS Boundary
Intermittent Stream
High Anomaly Density - CMUA; No Investigation Performed
High Anomaly Density - NCMUA; No Investigation Performed
High Anomaly Density - Investigation Confirmed a NCMUA
Revised CMUA based on RI MEC data collection
DGM Grid
MEC Find (RI)

MD - Projectiles (RI / WAA)
20mm Projectile
37mm Projectile
40mm Projectile
57mm Projectile
75mm Projectile
Projectile frag

Other Munitions Debris (RI / WAA)
Flares
Fragment
Fuzes
Grenade
Mortar
Illumination
Practice Mines (Land)
Rockets

0 0.1 0.2
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

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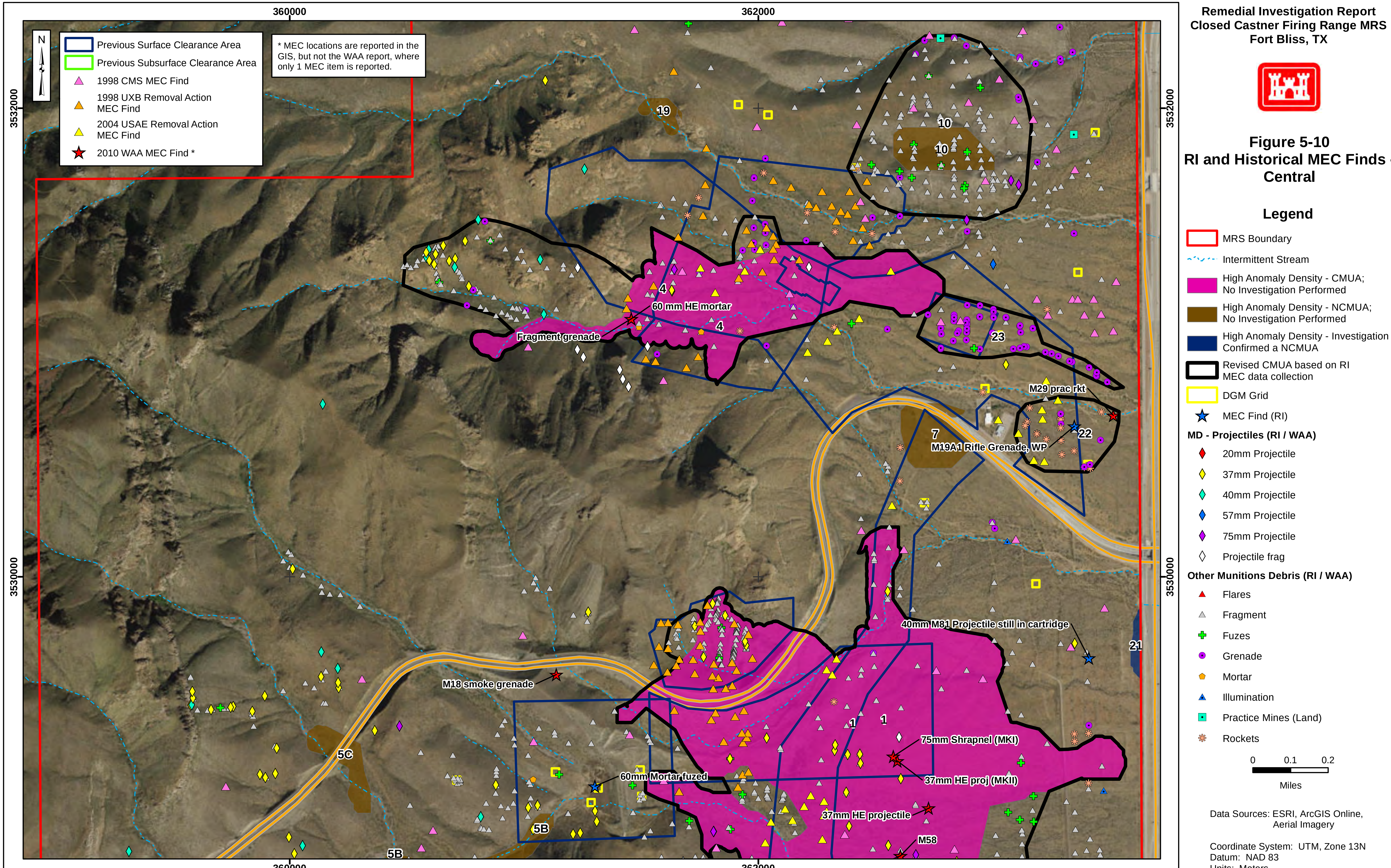

Figure 5-10
RI and Historical MEC Finds - Central

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

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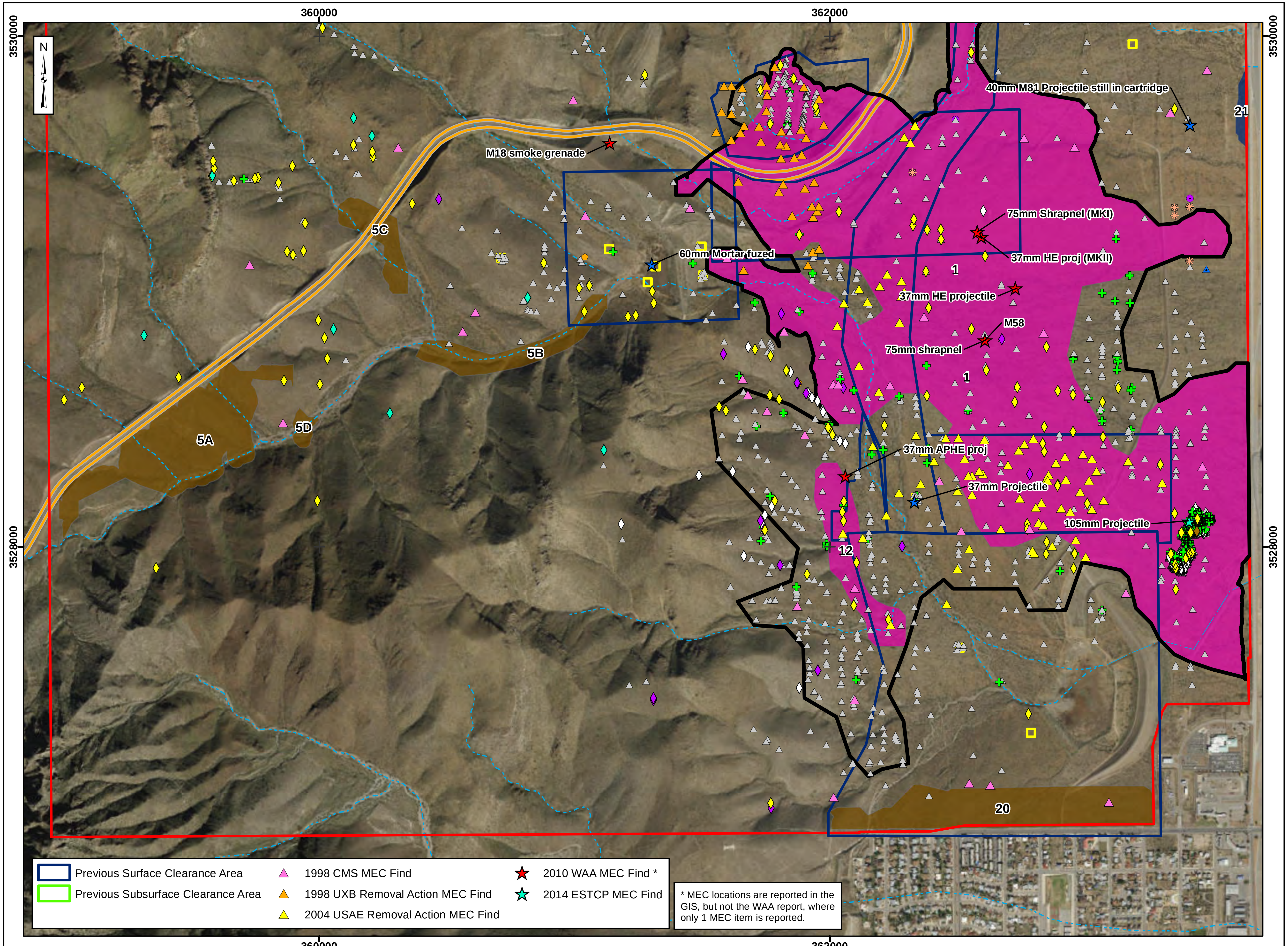
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 5-11
RI and Historical MEC Finds - South



Legend

- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- Revised CMUA based on RI MEC data collection
- DGM Grid
- MEC Find (RI)

MD - Projectiles (RI / WAA / ESTCP)

- 20mm Projectile
- 25mm Projectile
- 37mm Projectile
- 40mm Projectile
- 57mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris (RI / WAA / ESTCP)

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rockets

0 0.1 0.2
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
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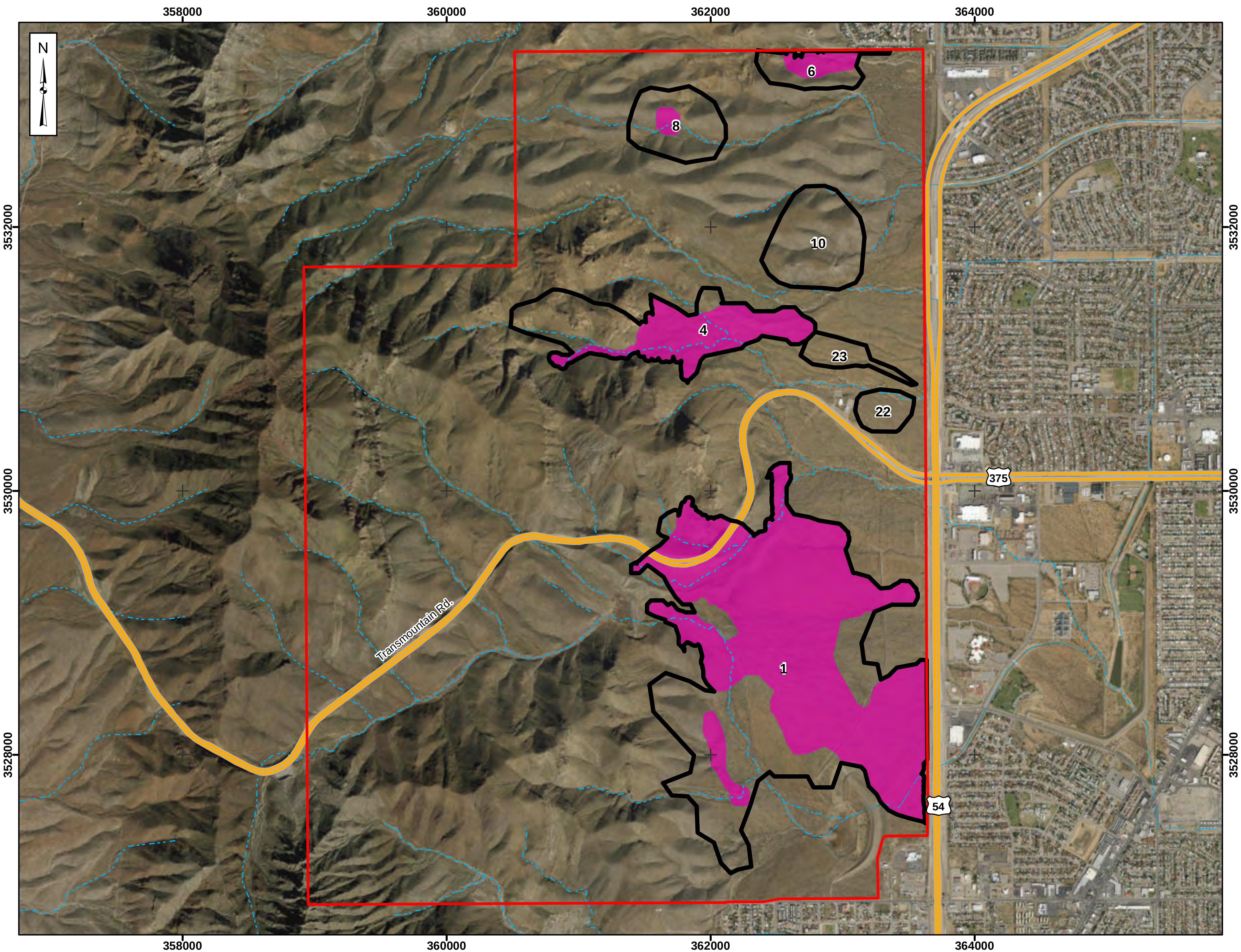

Figure 5-12
Revised CMUAs

Legend

- MRS Boundary
- CMUA prior to RI MEC data collection
- Revised CMUA based on RI MEC data collection
- Intermittent Stream
- Canal/Ditch

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

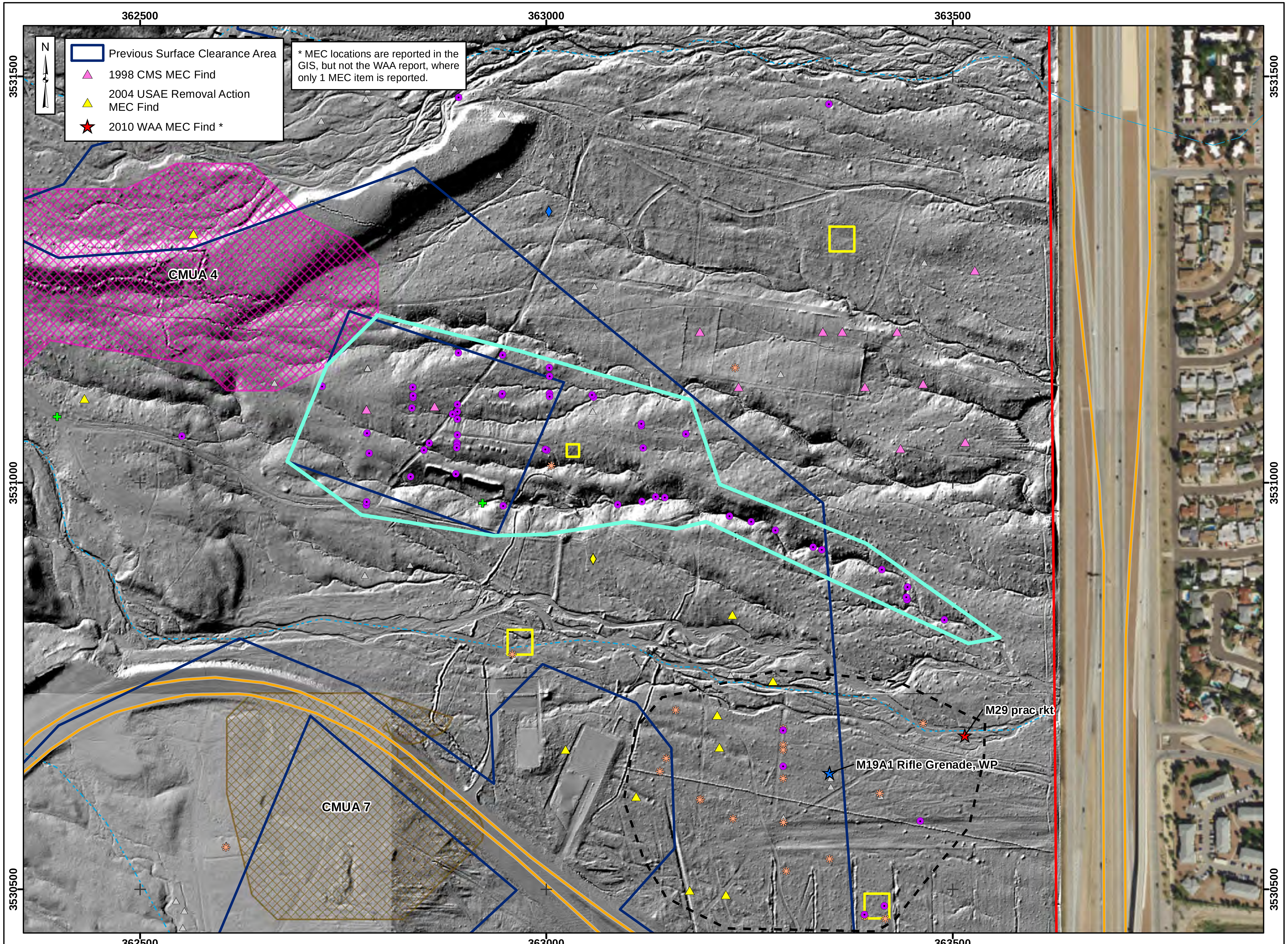

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Figure 5-13
CMUA 23

Legend

- CMUA 23
- MRS Boundary
- Intermittent Stream
- High Anomaly Density - CMUA; No Investigation Performed
- High Anomaly Density - NCMUA; No Investigation Performed
- High Anomaly Density - Investigation Confirmed a NCMUA
- DGM Grid
- MEC Find (RI)

MD - Projectiles

- 20mm Projectile
- 37mm Projectile
- 40mm Projectile
- 57mm Projectile
- 75mm Projectile
- Projectile frag

Other Munitions Debris

- Flares
- Fragment
- Fuzes
- Grenade
- Mortar
- Illumination
- Practice Mines (Land)
- Rockets

0 0.1
Miles

Data Sources: AEC, LIDAR data; ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

6 MC REMEDIAL INVESTIGATION RESULTS

The following sections explain the selection of appropriate screening levels and present the analytical results for soil, surface water (seeps) samples collected for this RI and analyzed for MC. Laboratory analytical reports are in **Appendix L**.

6.1 RALS AND PCLS

6.1.1 RALs

As discussed in **Section 2.2**, during the TPP process for the Closed Castner Range MRS, it was decided that the TRRP PCLs are the appropriate screening levels to be used for the RI. Under TRRP, the RAL is the lowest PCL for a chemical of concern where the human health PCL is established for residential land use under a Tier 1, the PCL for the soil-to-groundwater exposure pathway is established for residential land use under Tier 1, 2, or 3, and ecological PCLs are developed, when necessary, under Tier 2 and/or 3.

RALs for the RI were developed as part of the risk assessment (HHRA and SLERA), and final RALs are presented in **Section 9.3**. The data tables in this section present the RAL for each constituent and specify the exposure pathway upon which it is based. RALs for soil and surface water at the Closed Castner Range MRS are discussed below.

6.1.1.1 Soil

The future land use for the MRS has not been determined. Therefore, the RI results are evaluated for the most conservative land use (residential land use) with ecological PCLs being applicable. In accordance with the TRRP Rule, the surface soil interval for residential land use extends from 0 to 15 ft bgs or to the top of the uppermost groundwater-bearing unit (whichever is shallower). As discussed in **Section 6.2.5**, results of the soil boring program indicate that shallow groundwater is not present beneath the MRS, and the soil to groundwater exposure pathway has been eliminated for the MRS. RALs for the remaining pathways were achieved at depths shallower than 15 ft bgs; therefore, the surface soil RALs apply.

The RALs were determined based on comparison of the following:

- Residential Tier 1 ${}^{Tot}Soil_{Comb}$ PCLs (the PCL for the combined exposure pathway of soil ingestion, dermal contact, inhalation volatiles and particulates, and ingestion of above-ground and below-ground vegetables) for a 30-acre source, and
- Ecological Benchmarks (the lower of the published ecological benchmarks for earthworms and plants was selected). Ecological benchmarks published by the TCEQ were used (TCEQ, 2017b). For explosives constituents for which the TCEQ does not have a published benchmark, values were obtained from the Los Alamos National Laboratory database (LANL, 2015).
- The background value (if applicable), is based on soil sample type. Background values were established for the ISM dataset in the ISM Field Demonstration Report (URS,

2013). Discrete samples were evaluated based on Texas specific background concentrations presented in TRRP.

- No PCL was developed for the soil to groundwater pathway (^{GW}Soil), as this pathway is incomplete.

6.1.1.2 Surface Water

Seeps are not used as a drinking water source and therefore the only potential exposure scenario in which seep water might be contacted by humans is via a recreation scenario. Therefore, the RAL for the surface water seeps is the TRRP Tier 1 surface water contact recreation PCLs. The surface water results were also evaluated in the SLERA and no significant risk to wildlife from concentrations present in the seep water was identified.

6.1.2 Critical PCLs

The critical PCL is the lowest protective concentration level for a chemical of concern within a source medium and is determined from all the applicable human health exposure pathways (and when necessary the applicable ecological exposure pathways). The critical PCL is based on the land use (commercial or residential) and may be determined under Tier 1, 2 or 3.

PCLs for the RI were developed as part of the risk assessment (HHRA and SLERA), and final PCLs are presented in **Section 9.3**. The data tables in this section present the critical PCL for each constituent and specify the exposure pathway upon which it is based. The critical PCLs for soil and surface water at the Closed Castner Range MRS are discussed below.

6.1.2.1 Soil

The results of the SLERA (see **Section 9.2**) indicated that calculation of an ecological-based PCL for lead was required for the protection of ecological receptors. The SLERA also determined the concentrations of other metals in surface soil do not result in an unacceptable ecological risk. Therefore, calculation of, and comparison to, an ecological PCL for the other metals was not required. Because the most conservative land use is assumed for the purposes of the RI, the critical PCL is the lower of the Residential Tier 1 $^{Tot}Soil_{Comb}$ PCL and the Tier 2 ecological PCL (lead only).

6.1.2.2 Surface Water

Surface water results were evaluated in the SLERA, and because no significant risk to wildlife from concentrations present in the seep water was identified, calculation of ecological PCLs for surface water was not required. The surface water contact recreation PCL is therefore the critical PCL for the surface water seeps.

6.1.3 ISM Results

Analytical results for the ISM samples are summarized in **Table 6-1** (explosives results) and **Table 6-2** (metals and perchlorates results) and presented on **Figure 6-1**. The analytical results indicate the following:

- No explosive constituents or perchlorate were detected at concentrations above the RAL.

- Twelve metals were detected at concentrations above the RAL. One hundred ten detections of metals above the RAL were identified.
- One metal (lead) was present at concentrations above the critical PCL. Sixteen detections of lead above the critical PCL were identified.

6.1.4 Arroyo Soil Sampling Results

Analytical results for the arroyo soil samples are summarized in **Table 6-3** and presented on **Figure 6-2**. Analytical results indicate the following:

- Three metals (arsenic, nickel, and zinc) were detected at concentrations above the RAL. Twenty-three sampling locations had metals concentrations above the RAL.
- Arsenic was present at a concentration above the critical PCL at two sampling locations.

6.1.5 Potential Backstop Berm Results

The RI included collection of discrete soil samples from berms within the eastern portion of the Closed Castner Range MRS. **Figure 6-3** presents berm locations relative to locations of former firing range features. Discrete samples were collected from soil around the perimeter of the berms to identify any release to the environment that may have occurred from the berm and from the berm material itself to evaluate whether the berm may require removal as part of a response action and, if so, what the waste classification of the removed material may be. Results for both types of samples are discussed below.

6.1.5.1 Evaluation of MC in Soil Surrounding Berms

Analytical results for the berm samples are summarized in **Table 6-4** and are shown on **Figure 6-4**. Sampling of environmental media around the berms indicated the following:

- Phase 1 Results: One or more perimeter samples exceeded the screening level for lead at four of the 10 berms (Berms 1, 7, 8, and 9).
- Phase II Results: Horizontal delineation of MC impacts was not completed in soil near Berms 1, 8, and 9. Additionally, soil samples collected from near Berms 8 and 9 contained increasing concentrations with distance from the berms.

Because of the distance the Phase II samples were collected from the base of the berms and results indicating increased concentrations with distance, as well as the locations of the berms in or near CMUAs and associated observed MD, the CMUAs are the likely source of these MC impacts to soil. Specifically, the berms are located in or near revised CMUAs as follows (see **Figure 6-3**):

- Berm 1 is located just south of an expanded CMUA area near the northern range boundary.
- Berms 7 and 8 are located just outside of the large CMUA, near the eastern range boundary.

- Berm 9 is located within an expanded area of the large CMUA, area near the southern range boundary.

MC impacts to soil near the berms are attributed to complex-wide range activities rather than to a release from the berms. No further discrete delineation sampling in soils around the berms was performed beyond Phase II. This approach was confirmed with the TCEQ in a teleconference on March 23, 2017 and meeting minutes for this teleconference are presented in **Appendix B**.

6.1.5.2 Evaluation of MC Concentrations in Berm Materials

6.1.5.2.1 Total MC Concentrations and Field Observations

Discrete samples collected from berm materials were evaluated separately from the environmental media surrounding the berms. These data results were used to assess whether the berm may have been used a small arms range backstop berm and to evaluate the potential waste characteristics of the berm material. The results for berm material samples are bolded in **Table 6-4** and are plotted on **Figure 6-4**. As shown on **Figure 6-4**, only two of the berms (Berm 7 and Berm 8) had one sample location with at least one metal concentration above the critical PCLs. At the other sample location(s) from these berms, at least one metal concentration was above the RALs, but no metal concentrations exceeded the critical PCL.

As shown on **Figure 6-3**, Berm 8 is directly west of former firing range features, and Berm 7 and Berm 8 are positioned parallel to one another (with Berm 7 directly west of Berm 8). Berm 7 and Berm 8 are located at distances and in positions that would be expected if these berms were used as backstops for small arms firing activities. Visual inspection during sampling identified one bullet fragment at Berm 7 (see the Photographic Log in **Appendix H.2**). Based on elevated lead concentrations and berm positioning relative to historic firing range features, Berms 7 and 8 are believed to have been used as backstop berms for small arms firing range activities.

Two bullets were identified at Berm 4 and one shotgun shell was identified at Berm 3, during sampling activities. However, Berms 1 through 6, Berm 9 and Berm 10 did not contain metals at concentrations that indicated potential use as backstops. Therefore, these berms are believed to have been installed as surface water control features and not for use as backstops.

6.1.5.2.2 TCLP Results

The two berm material samples with the highest lead concentrations were also analyzed for TCLP lead. Results are presented in **Table 6-4** and are as follows:

- Berm 7. Sample FTBL-SS-B37-0-12-042012-R had a total lead concentration of 526 mg/kg and a TCLP lead result of 4.66 milligrams per liter (mg/L). Under Texas waste classification regulations (30 Texas Administrative Code [TAC] Chapter 335, Subchapter R), this result would classify the material as a Class 1, non-hazardous waste, once generated.
- Berm 8. Sample FTBL-SS-B44-0-12-042012-R had a total lead concentration of 6,710 mg/kg and a TCLP lead result of 151 mg/L. Under Texas waste classification regulations

(30 TAC Chapter 335, Subchapter R), this result would classify the material as a hazardous waste, once generated.

6.1.6 Surface Water Results

Analytical results for surface water samples collected from the seeps are presented in **Table 6-5**. No metals were detected at concentrations that exceed the RALs. Since no exceedances of the screening levels were identified, analytical results are not presented on a figure.

6.1.7 Soil Boring Program Results

The soil boring program was performed to evaluate whether the soil-to-groundwater exposure pathway is complete for the MRS. Evaluation of the soil-to-groundwater pathway included the following elements:

- Vertical delineation of MC concentrations in soils to the MDL (for explosives) or background (for metals).
- Demonstration of whether perched groundwater is present above the bedrock underlying the MRS, if possible.
- Analysis of soil samples by Synthetic Precipitation Leaching Procedure (SPLP) to assess leachability and demonstrate soil concentrations are protective of groundwater, if necessary.
- Collection of undisturbed soil samples and analysis for Tier 2 parameters (pH, fraction organic carbon, grain size distribution, bulk soil density, plus ferric/ferrous iron for redox state of soil) to allow calculation of site specific ^{GW}Soil PCLs, if necessary.

Results of the soil boring program are presented below.

6.1.7.1 Vertical Delineation

Analytical results for soil samples collected from the soil borings are presented in **Table 6-6** for explosives and **Table 6-7** for metals and perchlorate. Vertical delineation was achieved for metals based on soil samples collected from the deep boring (SB-03) as follows:

- The surface concentration of lead was elevated (187 mg/kg) and decreased with depth. The lead concentration in the 28 to 30-ft sample was less than the Texas-specific median background concentration of 15 mg/kg [30 TAC Chapter 335.51(m)].
- Antimony, arsenic, copper, and nickel concentrations were below background concentrations.
- Zinc concentrations for all soil samples collected from the borings within the three decision units were above the Texas-specific median background concentration of 30 mg/kg and did not show a pattern of decreasing concentrations with depth. However, the United States Geologic Survey (USGS) Mineral Resources On-line Spatial Data reports that zinc concentrations range from 37 to 107 mg/kg in El Paso County, Texas. All zinc

concentrations for soil samples from the soil borings were less than 107 mg/kg. The USGS Mineral Resources On-line Spatial Data page for El Paso County is presented in Appendix M.

- Similar to zinc, the beryllium concentrations in samples from soil boring SB-03 were above the Texas-specific median background concentration of 1.5 mg/kg and did not show a pattern of decreasing concentrations with depth (concentrations ranged from 3.81 to 2.89). The USGS Mineral Resources On-line Spatial Data does not provide data for beryllium. However, based on the declining lead concentrations with depth and the presence of other metals below background concentrations in soil samples from this boring, it is believed that the beryllium concentrations observed do not represent a munitions related release to the environment.

No explosives were detected above the RAL in soil samples collected from the borings within the three decision units. In the deep boring, nitroglycerin was detected in the 28 to 30-ft soil sample (FTBL-SB03-28-30-020917), at a concentration near the MDL. This nitroglycerine detection is considered likely to be a false-positive. The reported result is greater than the MDL but less than the limit of quantitation (i.e., is estimated) and since the result was less than the limit of quantitation, a confirmation analysis was not performed to confirm the nitroglycerin detection.

Since the nitroglycerin concentration is near the MDL (the detected concentration was 0.092 mg/kg versus the MDL of 0.06 mg/kg), and it was not confirmed, the presence of nitroglycerin is in question, and could be a false positive. However, vertical delineation was discontinued with this sample, because bedrock was encountered at this depth, no deeper samples could be collected.

6.1.7.2 Presence of Perched Groundwater

As discussed in **Section 4.4.1**, boring SB-03 was drilled to a depth of 29.5 ft bgs and tagged the top of bedrock. No groundwater was encountered in the boring. The lack of perched groundwater on top of the underlying bedrock layer demonstrates that shallow groundwater is not present beneath the MRS, and therefore the soil-to-groundwater exposure pathway is incomplete. This conclusion was presented to the TCEQ during a teleconference on March 23, 2017, and the agency concurred (see the Meeting Minutes presented in **Appendix B**).

6.1.7.3 Additional Analyses

SPLP analyses were performed for selected samples during the Phase I investigation activities. Additionally, analyses for Tier 2 parameters were performed on the undisturbed soil samples collected during the Phase II soil boing activities. However, because the soil-to-groundwater pathway was determined to be incomplete, evaluation of the SPLP results and calculation of Tier 2 PCLs were not performed.

6.2 AFFECTED MEDIA

6.2.1 Affected Property

The Affected Property is the extent of environmental media containing constituent concentrations equal to or greater than the RALs for the site. Surface soil is the only environmental medium at the Closed Castner Range MRS that contained metals at concentrations above the RAL. Explosives and perchlorate were not detected at concentrations above the RAL. The data sets used to delineate the Affected Property included the ISM soil sampling results and the arroyo soil sampling results.

As discussed in **Section 6.1.5.1**, it was determined that MC concentrations in discrete soil samples collected from around the perimeter of the potential backstop berms were attributable to complex-wide range activities (and not a release from the berms). Therefore, soils in the vicinity of the berms investigated during the RI are evaluated based on the results of ISM samples. Therefore, no affected properties were established based on the discrete soil samples collected around the berms.

6.2.1.1 ISM Soil Sampling Results

Figure 6-5 shows the horizontal extent of the Affected Properties based on ISM sample results within the MRS. Horizontal delineation was completed for the ISM samples, except for two locations (near ISM decision units 179 and 180, grids CB046 and CD047, respectively) where the Phase II results exceeded the RAL for zinc but there were no nearby ISM results to provide delineation. These decision units are located on and adjacent to steep terrain with rocky outcrops and additional delineation at these locations was not possible. Therefore, the limit of the Affected Property in this area is bounded by the terrain. This approach was confirmed with the TCEQ in a teleconference on March 23, 2017 and meeting minutes for this teleconference are presented in **Appendix B.**

Twelve metals were detected at concentrations that exceeded the RALs: antimony, arsenic, barium, chromium, copper, lead, manganese, mercury, molybdenum, selenium, vanadium, and zinc. Eleven Affected Property areas were identified, based on 110 exceedances of the RAL for metals, including one large Affected Property that encompasses the large CMUA in the south-eastern corner of the MRS.

6.2.1.2 Arroyo Soil Sampling Results

Figure 6-6 shows the horizontal extent of the Affected Properties, based on discrete soil sampling performed in the arroyos within the MRS. Three metals were detected at concentrations that exceeded the RAL: arsenic, nickel, and zinc. Eight Affected Property areas were identified, based on 23 exceedances of the RALs for these three metals.

6.2.1.3 Vertical Extent of Affected Property

As discussed in **Section 6.1.7.1**, vertical delineation was performed with the soil boring program implemented within the MRS. Soil boring results indicate that for the highest lead concentration detected in the surficial sample (417 mg/kg), the next deeper result (22 mg/kg at 4 to 5.5 ft bgs) was below the RAL and just slightly above the background concentration for lead. Therefore, the Affected Property is limited to the top four ft of the subsurface.

6.2.2 PCL Exceedance Zones

The PCL Exceedance Zone is the portion of the Affected Property that contains environmental media with constituent concentrations in excess of the critical PCL. The PCL Exceedance Zone is therefore the portion of the site which will require a remedy. Surface soil is the only environmental medium that contained constituents at concentrations above the critical PCL. The data sets used to delineate the PCL Exceedance Zones included the ISM soil sampling results and the arroyo soil sampling results as follows:

- Figure 6-7 shows the horizontal extent of the PCL Exceedance Zones based on ISM sample results within the MRS. Two metals (antimony and lead) were detected at concentrations that exceeded the critical PCLs. Seven PCL Exceedance Zones were identified based on 16 exceedances of the critical PCL for antimony and lead.
- Figure 6-8 shows the horizontal extent of the PCL Exceedance Zone, based on discrete soil sampling performed in the arroyos within the MRS. Arsenic was the only metal detected at concentrations that exceeded the critical PCL, and these exceedances were in two samples from within a single arroyo reach. The 95% UCL concentration for arsenic within this reach (Reach No. 3) was calculated to be 33.4 mg/kg, which exceeds the critical PCL. Therefore, one PCL Exceedance Zone was identified, based on the two exceedances of the critical PCL for arsenic. 95% UCL calculations are presented with the HHRA information in Appendix N.

As discussed for the Affected Properties above, based on results of the soil boring program, the PCL Exceedance Zone is limited to the top few ft of the subsurface (4-ft maximum depth). Additionally, no PCL Exceedance Zones were established based on the discrete soil samples collected around the berms.

6.3 ANALYTICAL DATA USABILITY

The Analytical Laboratory Reports and Data Validation Reports for soil and surface water samples analyzed during the RI are presented in **Appendix L**. MC analytical data were validated in accordance with the criteria and procedures presented in the Final QAPP. Data qualifiers are shown with the sample results in the data tables presented in this section.

During validation of the Phase I ISM sample results from the June/July 2016 sampling event, it was determined that explosive results required rejection for 116 samples (representing 100 decision units), as followings:

- Samples for which the Laboratory Control Sample spike, that was ground in the same manner as the samples, was outside the lower control criterion (<10%), and the analyte in question was not detected in the associated field sample for one or more explosive constituents (73 samples affected). Per validation guidance, these results were rejected in the Data Validation Report.

- Samples for which six or more explosive constituents were qualified as estimated due to Laboratory Control Sample recovery that was outside of the laboratory control limits but above the lower criterion (>10%). Per validation guidance, these results were qualified as estimated in the Data Validation Report. However, because of the percentage of explosive constituents that were qualified as estimated (more than one-third of the constituents), the data set was determined to be unacceptable to meet the project DQO criteria (43 samples affected).

Decision units with rejected explosive data were resampled (for explosive constituents only) in November 2016. Once the decision unit was selected for re-sampling, the initial explosive data set was marked as not reportable, and the re-sample was then analyzed for the complete list of explosives.

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																	
AA035	CR-MIS-AA035-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	4.7	0.3	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA039	FTBL-IS-148-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AA039	FTBL-IS-148-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	0.0059 NJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
AA042	CR-IS-AA042-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA042	CR-IS-AA042-01B_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA042	CR-IS-AA042-01C_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA044	FTBL-IS-149-070116-A	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.083 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AA044	FTBL-IS-149-070116-B	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.067 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AA044	FTBL-IS-149-070116-C	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.078 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	0.16 NJ	< 0.081 UJ
AB032	FTBL-IS-145-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AB032	FTBL-IS-145-110216R	N	11/2/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	0.084 NJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
AB038	FTBL-IS-146-070116-A	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	0.32	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.075 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
AB038	FTBL-IS-146-070116-B	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.072 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AB038	FTBL-IS-146-070116-C	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	0.076 NJ	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.091 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AB040	FTBL-IS-147-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AB040	FTBL-IS-147-110116R	N	11/1/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	0.0080 NJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	0.014 NJ	0.32	< 0.020 UJ	< 0.20 U	< 0.080 U
AC033	FTBL-IS-141-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AC033	FTBL-IS-141-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
AC040	FTBL-IS-144-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AC040	FTBL-IS-144-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.33	< 0.021 UJ	< 0.21 U	< 0.081 U
AC041	CR-MIS-AC041-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AC042	CR-MIS-AC042-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AD035	FTBL-IS-142-070516	N	7/5/2016	< 0.082 UJ	< 0.041 U	< 0.041 UJ	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.077 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.082 UJ
AD035	FTBL-IS-142-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
AD037	FTBL-IS-143-070516	N	7/5/2016	< 0.081 UJ	< 0.041 U	< 0.041 UJ	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.071 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
AD037	FTBL-IS-143-110116R	N	11/1/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 UJ	< 0.20 U	< 0.080 U
AD044	CR-MIS-AD044-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	0.6	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AF043	CR-MIS-AF043-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AF043	CR-MIS-AF043-01B_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AF043	CR-MIS-AF043-01C_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AH003	CR-MIS-AH003-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AI018	CR-MIS-AI018-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	1.9	0.1	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	1	< 0.08 ND	< 0.579 ND	< 0.091 ND
AI020	CR-MIS-AI020-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AI022	FTBL-IS-157-012517	N	1/25/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	0.027 JN	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
AJ042	CR-IS-AJ042-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AJ048	CR-IS-AJ048-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AK010	CR-MIS-AK010-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AK016	FTBL-IS-150-071416	N	7/14/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.059 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
AK045	CR-IS-AK045-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AL039	CR-IS-AL039-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AL048	CR-MIS-AL048-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AM036	CR-MIS-AM036-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AO043	CR-IS-AO043-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AQ038	CR-IS-AQ038-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AR008	CR-MIS-AR008-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AR047	CR-MIS-AR047-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AR047	CR-MIS-AR047-02_02072011	FD	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AR047	CR-MIS-AR047-03_02072011	FD	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AT004	CR-IS-AT004-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AU005	CR-IS-AU005-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AV017	CR-IS-AV017-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmar k
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																	
AV038	CR-IS-AV038-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AW045	CR-IS-AW045-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AY041	FTBL-IS-166-012717	N	1/27/2017	< 0.081 U	< 0.041 U	< 0.041 U	0.072 NJ	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.0092 NJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
BA048	CR-MIS-BA048-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BA066	CR-IS-BA066-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BA066	CR-IS-BA066-02_09102012	FD	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BA066	CR-IS-BA066-03_09102012	FD	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BB051	CR-IS-BB051-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BB051	CR-IS-BB051-02_09122012	FD	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BB051	CR-IS-BB051-03_09122012	FD	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BB072	CR-IS-BB072-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BC058	CR-IS-BC058-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BD056	CR-MIS-BD056-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.1	< 0.08 ND	< 0.579 ND	< 0.091 ND
BE043	FTBL-IS-135-062816-A	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE043	FTBL-IS-135-062816-B	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE043	FTBL-IS-135-062816-C	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE043	FTBL-IS-135-110316A-R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	R
BE043	FTBL-IS-135-110316B-R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BE043	FTBL-IS-135-110316C-R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BE050	FTBL-IS-138-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE050	FTBL-IS-138-110316R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.015 J	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BE058	CR-IS-BE058-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BE064	CR-MIS-BE064-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF044	FTBL-IS-136-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.17 J	< 0.021 U	< 0.21 U	< 0.081 UJ
BF047	CR-MIS-BF047-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.1	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF048	FTBL-IS-137-062716	N	6/27/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.051 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.11 NJ	< 0.021 U	< 0.21 U	< 0.082 UJ
BF052	CR-MIS-BF052-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.2	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF057	CR-MIS-BF057-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF059	FTBL-IS-140-062716-A	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.022 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.054 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.023 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BF059	FTBL-IS-140-062716-B	N	6/27/2016	0.050 NJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.063 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.097 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BF059	FTBL-IS-140-062716-C	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.024 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.045 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BF070	CR-MIS-BF070-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF071	CR-MIS-BF071-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BG042	FTBL-IS-127-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 U	< 0.21 U	< 0.081 UJ
BG046	CR-MIS-BG046-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BG049	FTBL-IS-129-062716	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.073 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.099 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BG055	FTBL-IS-139-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BG055	FTBL-IS-139-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.013 NJ	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BG057	CR-MIS-BG057-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BH041	FTBL-IS-126-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 U	< 0.21 U	< 0.081 UJ
BH043	CR-MIS-BH043-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BH051	FTBL-1S-130-103116R	N	10/31/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 U	< 0.021 U	0.069 NJ	< 0.021 UJ	< 0.21 U	< 0.081 U
BH051	FTBL-IS-130-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BH061	FTBL-IS-134-062816	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BH061	FTBL-IS-134-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.029 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BI042	CR-MIS-BI042-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.3	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI042	CR-MIS-BI042-02_02042011	FD	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.5	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI042	CR-MIS-BI042-03_02042011	FD	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.2	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI044	CR-MIS-BI044-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.1	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI047	FTBL-IS-128-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BI047	FTBL-IS-128-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.081 UJ

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

Location ID	Sample ID	Sample Type	Sample Date	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
BI054	FTBL-1S-131-103116R	N	10/31/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 UJ	< 0.020 U	< 0.020 UJ	--	< 0.040 U	< 0.020 U	< 0.040 UJ	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 UJ	< 0.20 U	< 0.080 U
BI054	FTBL-IS-131-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BI056	FTBL-IS-132-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BI056	FTBL-IS-132-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BI063	CR-MIS-BI063-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI063	CR-MIS-BI063-02_02032011	FD	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI063	CR-MIS-BI063-03_02032011	FD	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI072	CR-IS-BI072-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BJ034	FTBL-IS-117-070116	N	7/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.062 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
BJ042	FTBL-IS-120-063016	N	6/30/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.032 U	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	0.12 NJ	< 0.020 U	< 0.20 U	< 0.080 UJ
BJ059	FTBL-IS-133-062816	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BJ059	FTBL-IS-133-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.013 NJ	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BJ065	CR-MIS-BJ065-01_02172011	N	2/17/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BK036	FTBL-IS-118-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 U	< 0.21 U	< 0.081 UJ
BK043	FTBL-IS-121-062716-A	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.11 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BK043	FTBL-IS-121-062716-B	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.037 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.38 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.23 UJ
BK043	FTBL-IS-121-062716-C	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.026 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.13 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BK045	FTBL-IS-122-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.11 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
BK047	FTBL-IS-124-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BK047	FTBL-IS-124-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	0.088 J	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.080 UJ
BK050	FTBL-IS-125-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BK050	FTBL-IS-125-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.081 UJ
BK059	CR-MIS-BK059-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BL030	FTBL-IS-116-070116	N	7/1/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.079 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
BL038	FTBL-IS-119-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.11 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BM046	FTBL-IS-123-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.056 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
BM073	CR-IS-BM073-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BP063	CR-IS-BP063-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BQ067	FTBL-IS-174-012417	N	1/24/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
BQ070	FTBL-IS-151-071416	N	7/14/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.081 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
BQ072	CR-MIS-BQ072-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.2	< 0.08 ND	< 0.579 ND	< 0.091 ND
BR060	CR-MIS-BR060-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BT056	CR-MIS-BT056-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BT056	CR-MIS-BT056-01B_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BT056	CR-MIS-BT056-01C_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BW062	CR-MIS-BW062-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BW062	CR-MIS-BW062-02_02032011	FD	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BW062	CR-MIS-BW062-03_02042011	FD	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BY057	CR-MIS-BY057-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BY064	FTBL-IS-152-071416	N	7/14/2016	< 0.08 U	< 0.04 U	< 0.04 U	< 0.08 U	< 0.02 UJ	< 0.02 U	< 0.02 U	< 0.2 UJ	< 0.06 U	< 0.02 U	< 0.04 U	< 0.2 U	< 0.02 U	< 0.2 U	< 0.02 UJ	< 0.2 UJ	< 0.08 UJ
BY072	CR-IS-BY072-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CA057	FTBL-IS-110-061316	N	6/13/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CA057	FTBL-IS-110-110316R	N	11/3/2016	< 0.083 UJ	< 0.042 UJ	< 0.042 UJ	< 0.083 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.042 U	< 0.021 U	< 0.042 U	< 0.21 U	0.014 NJ	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.083 UJ
CA070	CR-IS-CA070-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CC046	FTBL-IS-109-071216	N	7/12/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.076 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
CC046	FTBL-IS-109-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CD045	FTBL-IS-108-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.030 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.083 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CD061	CR-MIS-CD061-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CD061	FTBL-IS-105-061316	N	6/13/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CD061	FTBL-IS-105-110316R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.022 UJ	0.0087 J	0.0092 J	< 0.21 UJ	< 0.041 U	0.014 NJ	< 0.041 U	< 0.21 U	0.014 J	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.080 UJ
CD068	CR-MIS-CD068-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																	
CE046	FTBL-IS-096-071216	N	7/12/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.013 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
CE046	FTBL-IS-096-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CE047	CR-MIS-CE047-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE056	CR-IS-CE056-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE056	CR-IS-CE056-02_09132012	FD	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE056	CR-IS-CE056-03_09132012	FD	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE059	FTBL-IS-104-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CE063	FTBL-IS-106-061316	N	6/13/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CE063	FTBL-IS-106-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.021 UJ	0.013 NJ	0.015 NJ	< 0.20 UJ	< 0.040 U	0.017 NJ	< 0.040 U	< 0.20 U	0.012 NJ	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.081 UJ
CE065	CR-MIS-CE065-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CF045	FTBL-IS-092-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.067 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CF048	CR-MIS-CF048-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CF053	FTBL-IS-099-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CF053	FTBL-IS-099-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	0.0099 NJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.013 J	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CF057	FTBL-IS-103-061716	N	6/17/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.042 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CF074	FTBL-IS-107-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CF074	FTBL-IS-107-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	0.0052 NJ	0.11 J	< 0.021 UJ	< 0.21 UJ	R
CG044	FTBL-IS-091-071116	N	7/11/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 U	< 0.028 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.071 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CG044	FTBL-IS-091-111416R	N	11/14/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 UJ	< 0.040 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
CG046	FTBL-IS-095-071216	N	7/12/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.071 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
CG046	FTBL-IS-095-111416R	N	11/14/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 UJ	< 0.040 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
CG047	CR-MIS-CG047-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG048	FTBL-IS-094-071216	N	7/12/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
CG048	FTBL-IS-094-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	0.0084 NJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CG052	FTBL-IS-098-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CG052	FTBL-IS-098-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.017 J	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CG058	CR-MIS-CG058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG058	CR-MIS-CG058-01B_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG058	CR-MIS-CG058-01C_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG063	CR-MIS-CG063-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG065	FTBL-IS-102-061716	N	6/17/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CG065	FTBL-IS-102-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.044 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CG069	CR-MIS-CG069-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG071	FTBL-IS-153-071416	N	7/14/2016	< 0.08 U	< 0.04 U	< 0.04 U	< 0.08 U	< 0.02 UJ	< 0.02 U	< 0.02 U	< 0.2 UJ	< 0.12 U	< 0.02 U	< 0.04 U	< 0.2 U	< 0.02 U	< 0.2 U	< 0.02 UJ	< 0.2 UJ	< 0.08 UJ
CH043	FTBL-IS-090-070816	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.026 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.093 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH043	FTBL-IS-090-111416R	N	11/14/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
CH046	FTBL-IS-093-070816-A	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.024 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.11 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH046	FTBL-IS-093-070816-B	N	7/8/2016	0.032 NJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.081 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CH046	FTBL-IS-093-070816-C	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.085 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH046	FTBL-IS-093-111416A-R	N	11/14/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
CH046	FTBL-IS-093-111416B-R	N	11/14/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
CH046	FTBL-IS-093-111416C-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CH054	CR-IS-CH054-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CH056	FTBL-IS-100-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	0.013 NJ	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CH060	FTBL-IS-101-061716	N	6/17/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	0.030 NJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH072	CR-MIS-CH072-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CH072	CR-MIS-CH072-02_02082011	FD	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CH072	CR-MIS-CH072-03_02082011	FD	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CI039	CR-MIS-CI039-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CI053	FTBL-IS-097-062216-A	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CI053	FTBL-IS-097-062216-B	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

Location ID	Sample ID	Sample Type	Analyte / Sample Date	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmar k
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
CI053	FTBL-IS-097-062216-C	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CI053	FTBL-IS-097-111116A-R	N	11/11/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.080 UJ
CI053	FTBL-IS-097-111116B-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CI053	FTBL-IS-097-111116C-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CI064	CR-MIS-CI064-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ041	FTBL-IS-084-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CJ041	FTBL-IS-084-102716R	N	10/27/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.027 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CJ049	FTBL-IS-087-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CJ056	CR-MIS-CJ056-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-02_02082011	FD	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-03_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-03B_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-03C_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ057	CR-MIS-CJ057-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ058	CR-MIS-CJ058-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ061	FTBL-IS-089-061716	N	6/17/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CJ062	CR-MIS-CJ062-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK040	CR-IS-CK040-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK042	CR-MIS-CK042-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK045	FTBL-IS-085-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CK045	FTBL-IS-085-102716R	N	10/27/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CK047	FTBL-1S-086-103116R	N	10/31/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 U
CK047	FTBL-IS-086-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CK052	FTBL-IS-088-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CK052	FTBL-IS-088-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.0047 NJ	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CK053	CR-MIS-CK053-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK058	CR-MIS-CK058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL019	FTBL-IS-115-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.081 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CL049	CR-MIS-CL049-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL052	FTBL-IS-081-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CL052	FTBL-IS-081-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CL054	CR-MIS-CL054-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL057	FTBL-IS-083-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CL059	CR-MIS-CL059-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL065	CR-IS-CL065-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL065	CR-IS-CL065-01B_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL065	CR-IS-CL065-01C_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL071	FTBL-IS-076-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CL071	FTBL-IS-076-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CM048	FTBL-1S-080-103116R	N	10/31/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 U	0.0063 NJ	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
CM048	FTBL-IS-080-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CM054	FTBL-IS-082-062116-A	N	6/21/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CM054	FTBL-IS-082-062116-B	N	6/21/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 U	< 0.080 UJ
CM054	FTBL-IS-082-062116-C	N	6/21/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CM056	CR-MIS-CM056-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM058	CR-MIS-CM058-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM063	FTBL-IS-073-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CM063	FTBL-IS-073-110916R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CM067	CR-MIS-CM067-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM067	CR-MIS-CM067-02_02152011	FD	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM067	CR-MIS-CM067-03_02152011	FD	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																	
CM068	FTBL-IS-075-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CM068	FTBL-IS-075-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.012 NJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CM072	CR-IS-CM072-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN022	FTBL-IS-114-070816-A	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.098 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	0.060 NJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CN022	FTBL-IS-114-070816-B	N	7/8/2016	< 8.6 UJ	< 4.3 U	< 4.3 U	< 8.6 U	< 3.1 UJ	< 2.2 U	< 2.2 U	< 22 UJ	< 11 U	< 2.2 UJ	< 4.3 U	< 22 U	< 2.2 U	< 22 UJ	< 2.2 UJ	< 22 U	< 8.6 UJ
CN022	FTBL-IS-114-070816-C	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.090 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CN022	FTBL-IS-114-111416A-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CN022	FTBL-IS-114-111416B-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CN022	FTBL-IS-114-111416C-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CN027	CR-MIS-CN027-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN044	FTBL-IS-078-062316	N	6/23/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
CN046	FTBL-IS-079-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN046	FTBL-IS-079-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	0.023 NJ	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CN056	CR-MIS-CN056-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN058	CR-MIS-CN058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN060	FTBL-IS-072-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN060	FTBL-IS-072-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
CN064	FTBL-IS-074-060916-A	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN064	FTBL-IS-074-060916-B	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN064	FTBL-IS-074-060916-C	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN064	FTBL-IS-074-110916A-R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CN064	FTBL-IS-074-110916B-R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CN064	FTBL-IS-074-110916C-R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CN066	CR-MIS-CN066-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN073	FTBL-IS-077-060916-A	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN073	FTBL-IS-077-060916-B	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN073	FTBL-IS-077-060916-C	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN073	FTBL-IS-077-110416A-R	N	11/4/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 UJ	< 0.020 U	< 0.020 U	--	0.028 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 UJ	< 0.20 U	< 0.080 UJ
CN073	FTBL-IS-077-110416B-R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.022 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
CN073	FTBL-IS-077-110416C-R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
CO022	FTBL-IS-113-070816	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.086 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CO022	FTBL-IS-113-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CO038	FTBL-IS-154-071416	N	7/14/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.057 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CO042	FTBL-IS-065-062316	N	6/23/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
CO043	CR-MIS-CO043-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO045	FTBL-IS-067-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CO048	CR-IS-CO048-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO058	CR-MIS-CO058-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO062	CR-IS-CO062-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO062	CR-IS-CO062-02_09132012	FD	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO062	CR-IS-CO062-03_09132012	FD	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO066	CR-MIS-CO066-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO070	FTBL-IS-071-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CO070	FTBL-IS-071-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.023 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CP043	FTBL-IS-066-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CP047	FTBL-IS-068-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CP047	FTBL-IS-068-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CP050	FTBL-IS-069-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CP050	FTBL-IS-069-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.0098 NJ	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CP054	CR-MIS-CP054-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CP057	CR-MIS-CP057-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																	
CP064	FTBL-IS-070-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CP064	FTBL-IS-070-110916R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CQ048	FTBL-IS-063-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CQ048	FTBL-IS-063-111116-R	N	11/11/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.080 UJ
CQ059	FTBL-IS-064-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CQ059	FTBL-IS-064-110916R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CQ072	CR-IS-CQ072-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CR023	FTBL-IS-111-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.077 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CR025	FTBL-IS-112-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.090 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CR045	FTBL-IS-056-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.084 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CR051	CR-MIS-CR051-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CR052	FTBL-IS-058-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CR054	FTBL-IS-059-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CR061	FTBL-IS-061-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CR061	FTBL-IS-061-110916R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CR064	FTBL-IS-062-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CR064	FTBL-IS-062-110916R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CS049	FTBL-IS-057-070716	N	7/7/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	1.3	< 0.021 U	< 0.21 U	0.13 J	< 0.21 U	< 0.081 UJ
CS056	FTBL-IS-060-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CS059	CR-IS-CS059-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CT047	FTBL-IS-048-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.024 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.080 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CT052	FTBL-IS-051-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CT053	CR-MIS-CT053-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CT062	FTBL-IS-054-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CT062	FTBL-IS-054-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.092 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
CU048	FTBL-IS-049-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.091 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CU057	FTBL-IS-053-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	0.017 NJ	< 0.21 U	< 0.081 UJ
CU059	CR-MIS-CU059-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU060	CR-MIS-CU060-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU068	CR-MIS-CU068-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU071	CR-IS-CU071-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU074	FTBL-IS-055-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CU074	FTBL-IS-055-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	0.012 NJ	< 0.020 U	< 0.020 U	--	0.025 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CV050	FTBL-IS-050-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	0.11 J	< 0.021 U	< 0.21 U	0.011 NJ	< 0.21 U	< 0.082 UJ
CV053	FTBL-IS-052-062116-A	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CV053	FTBL-IS-052-062116-B	N	6/21/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CV053	FTBL-IS-052-062116-C	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CV055	CR-IS-CV055-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CV063	CR-IS-CV063-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CV066	FTBL-IS-188-012317	N	1/23/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
CW048	FTBL-IS-047-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.14 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CW058	CR-MIS-CW058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CW061	FTBL-IS-043-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	0.017 NJ	< 0.21 U	< 0.081 UJ
CW072	CR-MIS-CW072-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CX055	FTBL-IS-041-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CX063	FTBL-IS-044-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CX066	CR-MIS-CX066-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY049	FTBL-IS-039-062316	N	6/23/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
CY052	FTBL-IS-040-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CY057	CR-MIS-CY057-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY059	CR-MIS-CY059-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmar k
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																	
CY060	FTBL-IS-042-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	0.019 NJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CY065	FTBL-IS-045-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CY065	FTBL-IS-045-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CY069	CR-MIS-CY069-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY070	CR-MIS-CY070-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY074	FTBL-IS-046-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CY074	FTBL-IS-046-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.019 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CZ056	CR-MIS-CZ056-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ058	CR-MIS-CZ058-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ058	CR-MIS-CZ058-02_02142011	FD	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ058	CR-MIS-CZ058-03_02142011	FD	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ062	CR-MIS-CZ062-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ071	CR-MIS-CZ071-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ072	CR-MIS-CZ072-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA053	CR-IS-DA053-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA059	CR-MIS-DA059-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA059	CR-MIS-DA059-01B_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA059	CR-MIS-DA059-01C_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA065	FTBL-IS-036-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DA065	FTBL-IS-036-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
DA068	CR-MIS-DA068-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA069	CR-MIS-DA069-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA070	FTBL-IS-037-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DA070	FTBL-IS-037-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
DA074	FTBL-IS-038-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DA074	FTBL-IS-038-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.011 NJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
DB048	FTBL-IS-034-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.077 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
DB052	FTBL-IS-191-012317	N	1/23/2017	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	0.020 JN	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 U
DB057	FTBL-IS-035-061516-A	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DB057	FTBL-IS-035-061516-B	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DB057	FTBL-IS-035-061516-C	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DB057	FTBL-IS-035-111016A-R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0081 J	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DB057	FTBL-IS-035-111016B-R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DB057	FTBL-IS-035-111016C-R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DB059	CR-MIS-DB059-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DB061	CR-MIS-DB061-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DB070	CR-MIS-DB070-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DB072	CR-MIS-DB072-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC062	CR-MIS-DC062-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC063	CR-MIS-DC063-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC065	FTBL-IS-029-061516	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DC065	FTBL-IS-029-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DC067	CR-MIS-DC067-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC074	FTBL-IS-033-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DC074	FTBL-IS-033-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.027 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
DD048	FTBL-IS-026-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD048	FTBL-IS-026-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DD050	FTBL-IS-027-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD050	FTBL-IS-027-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DD054	FTBL-IS-155-071416	N	7/14/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD054	FTBL-IS-155-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

Location ID	Sample ID	Sample Type	Sample Date	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmar k
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
DD058	CR-MIS-DD058-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DD069	FTBL-IS-031-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD069	FTBL-IS-031-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DD072	CR-MIS-DD072-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE061	FTBL-IS-028-061516	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DE061	FTBL-IS-028-110816R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.093 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DE065	CR-MIS-DE065-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE067	CR-MIS-DE067-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE071	CR-MIS-DE071-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE071	CR-MIS-DE071-01B_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE071	CR-MIS-DE071-01C_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE072	CR-MIS-DE072-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF049	FTBL-IS-024-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF049	FTBL-IS-024-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF056	CR-MIS-DF056-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF059	CR-IS-DF059-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF063	CR-MIS-DF063-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF066	CR-MIS-DF066-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF068	FTBL-IS-030-061516-A	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF068	FTBL-IS-030-061516-B	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF068	FTBL-IS-030-061516-C	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF068	FTBL-IS-030-110816A-R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF068	FTBL-IS-030-110816B-R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF068	FTBL-IS-030-110816C-R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF074	FTBL-IS-032-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF074	FTBL-IS-032-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.032 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
DG050	FTBL-IS-025-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DG050	FTBL-IS-025-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DG064	CR-MIS-DG064-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG065	FTBL-IS-021-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DG065	FTBL-IS-021-110716R	N	11/7/2016	< 0.081 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.081 UJ
DG067	CR-MIS-DG067-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG070	CR-MIS-DG070-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG072	CR-MIS-DG072-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG072	CR-MIS-DG072-01B_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG072	CR-MIS-DG072-01C_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH055	CR-MIS-DH055-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH055	CR-MIS-DH055-01B_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH055	CR-MIS-DH055-01C_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH068	CR-MIS-DH068-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH072	FTBL-IS-022-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DH072	FTBL-IS-022-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.042 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DI054	CR-MIS-DI054-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	0.6	< 0.091 ND
DI069	CR-MIS-DI069-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI069	CR-MIS-DI069-01B_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI069	CR-MIS-DI069-01C_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI069	CR-MIS-DI069-02_02142011	FD	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI069	CR-MIS-DI069-03_02142011	FD	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI070	CR-MIS-DI070-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI073	FTBL-IS-023-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DI073	FTBL-IS-023-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.049 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																	
DJ051	FTBL-IS-017-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DJ051	FTBL-IS-017-111016R	N	11/10/2016	R	< 0.042 UJ	< 0.042 UJ	< 0.083 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.042 UJ	< 0.021 UJ	< 0.042 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DJ063	CR-IS-DJ063-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DJ071	CR-MIS-DJ071-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DJ071	CR-MIS-DJ071-02_02112011	FD	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DJ071	CR-MIS-DJ071-03_02112011	FD	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK053	FTBL-IS-018-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DK053	FTBL-IS-018-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DK056	CR-MIS-DK056-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK065	CR-MIS-DK065-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK065	CR-MIS-DK065-02_02112011	FD	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK065	CR-MIS-DK065-03_02112011	FD	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK069	FTBL-IS-019-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DK069	FTBL-IS-019-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.063 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DK074	FTBL-IS-020-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DK074	FTBL-IS-020-110716R	N	11/7/2016	< 0.080 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.080 UJ
DL071	CR-MIS-DL071-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DM051	FTBL-IS-013-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DM051	FTBL-IS-013-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DM053	FTBL-IS-014-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DM053	FTBL-IS-014-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DN062	CR-IS-DN062-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DN062	CR-IS-DN062-01B_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DN062	CR-IS-DN062-01C_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DN072	FTBL-IS-015-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DN072	FTBL-IS-015-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DO066	CR-IS-DO066-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DO074	FTBL-IS-016-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DO074	FTBL-IS-016-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DR059	CR-IS-DR059-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DR059	CR-IS-DR059-02_09122012	FD	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DR059	CR-IS-DR059-03_09122012	FD	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DR063	CR-MIS-DR063-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.09	< 0.08 ND	< 0.579 ND	< 0.091 ND
DT051	CR-MIS-DT051-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV051	CR-IS-DV051-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV055	FTBL-IS-004-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV055	FTBL-IS-004-110816R	N	11/8/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DV057	CR-IS-DV057-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV059	FTBL-IS-007-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV059	FTBL-IS-007-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DV062	FTBL-IS-009-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV062	FTBL-IS-009-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 U	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0084 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DV065	FTBL-IS-011-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV065	FTBL-IS-011-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.023 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DV066	CR-MIS-DV066-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV066	CR-MIS-DV066-02_02112011	FD	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV066	CR-MIS-DV066-03_02112011	FD	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV068	CR-MIS-DV068-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DW050	FTBL-IS-002-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW050	FTBL-IS-002-110816R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.074 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DW056	FTBL-IS-005-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Table 6-1
ISM Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluen	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9		12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark		Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21		670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL		HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																	
DW056	FTBL-IS-005-110816R	N	11/8/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DW058	FTBL-IS-006-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW058	FTBL-IS-006-110716R	N	11/7/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
DW061	FTBL-IS-008-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW061	FTBL-IS-008-110716R	N	11/7/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
DW064	FTBL-IS-010-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW064	FTBL-IS-010-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0066 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DW067	FTBL-IS-012-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW067	FTBL-IS-012-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0074 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DX049	FTBL-IS-001-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX049	FTBL-IS-001-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DX053	FTBL-IS-003-060616-A	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX053	FTBL-IS-003-060616-B	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX053	FTBL-IS-003-060616-C	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX053	FTBL-IS-003-110816A-R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DX053	FTBL-IS-003-110816B-R	N	11/8/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	0.067 NJ	< 0.021 UJ	< 0.21 UJ	R
DX053	FTBL-IS-003-110816C-R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.073 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R

Notes

FD	Field Duplicate
HH	Human Health
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
J	Result is an estimated value
ND	Not Detected
Notes	Normal (Primary sample)
mg/kg	milligram/kilogram
R	Result was rejected during data validation
RAL	Residential Assessment Level
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
PCL	Protective Concentration Level
U	Analyte not detected

Arroyo ISM Sample Location IDs include: AT004, AU005, AV017, BB051, BC058, BE058, BI072, BM073, CA070, CE056, CM072, CQ072, DA053, and DN062

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	64000	5	18	330	10	32	--	11.9	13	70	--	120	--	231	0.1	2	38	51	--	0.52	97	--	1	26.7	120
			RAL Source	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	--	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	--	Eco Benchmark	HH PCL	--	Eco Benchmark	ISM Background	Eco Benchmark
			Critical PCL	64000	15	24	8100	38	51	--	27000	370	1300	--	334	--	3800	2.1	160	840	51	--	310	97	--	5.3	75	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL	--	Eco PCL	--	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																									
AA035	CR-MIS-AA035-01_02072011	N	2/7/2011	5890	< 0.095 ND	4	67	1.2	1.4	11500	7.6	3.2	**296**	13300	40.1	3010	155	**0.13**	0.8	7.7	--	1420	< 0.244 ND	6.8	220	< 0.206 ND	13.5	80.3
AA039	FTBL-IS-148-070516	N	7/5/2016	--	0.119 J	3.95	--	1.48	--	--	--	--	10.8	--	18.3	--	--	--	--	7.15	--	--	--	--	--	--	--	54.4
AA042	CR-IS-AA042-01_09112012	N	9/11/2012	5370	0.17	0.31	58.1	0.91	0.32	35800	4.2	2.3	8.5	9140	10.7	5630	150	0.014	0.53	4.6	--	1120	0.29	< 0.036 ND	28.5	< 0.206 ND	13.4	33.8
AA044	FTBL-IS-149-070116-A	N	7/1/2016	--	< 0.025 U	4.44	--	1.22	--	--	--	--	10.8	--	16.7 J	--	--	--	--	7.76	--	--	--	--	--	--	--	50.6
AA044	FTBL-IS-149-070116-B	N	7/1/2016	--	< 0.025 U	4.22	--	1.24	--	--	--	--	10.8	--	15.9 J	--	--	--	--	7.67	--	--	--	--	--	--	--	49.2
AA044	FTBL-IS-149-070116-C	N	7/1/2016	--	< 0.025 U	4.15	--	1.23	--	--	--	--	10.6	--	16.2 J	--	--	--	--	7.19	--	--	--	--	--	--	--	50.3
AB032	FTBL-IS-145-070516	N	7/5/2016	--	0.127 J	4.85	--	1.54	--	--	--	--	9.76	--	16.4	--	--	--	--	7.53	--	--	--	--	--	--	--	66.7
AB038	FTBL-IS-146-070116-A	N	7/1/2016	--	< 0.025 U	4.75	--	1.36	--	--	--	--	14.9	--	23.9 J	--	--	--	--	8.51	--	--	--	--	--	--	--	51.8
AB038	FTBL-IS-146-070116-B	N	7/1/2016	--	< 0.025 U	4.65	--	1.26	--	--	--	--	13.8	--	21.9 J	--	--	--	--	9.06	--	--	--	--	--	--	--	48.1
AB038	FTBL-IS-146-070116-C	N	7/1/2016	--	< 0.025 U	4.9	--	1.2	--	--	--	--	13	--	20.4 J	--	--	--	--	8.25	--	--	--	--	--	--	--	45.9
AB040	FTBL-IS-147-070516	N	7/5/2016	--	0.129 J	4.25	--	1.94	--	--	--	--	12.4	--	24.2	--	--	--	--	8.43	--	--	--	--	--	--	--	63
AC033	FTBL-IS-141-070516	N	7/5/2016	--	0.165 J	6.93	--	1.57	--	--	--	--	16.9	--	20.9	--	--	--	--	10.1	--	--	--	--	--	--	--	52
AC040	FTBL-IS-144-070516	N	7/5/2016	--	0.178 J	4.5	--	1.14	--	--	--	--	13.3	--	34.8	--	--	--	--	7.9	--	--	--	--	--	--	--	59.2
AC041	CR-MIS-AC041-01_02072011	N	2/7/2011	4640	2.1	4.5	50.9	0.94	0.26	3330	7.5	4	13.3	12500	54.5	1870	155	0.019	0.7	6.6	--	1410	< 0.244 ND	< 0.036 ND	261	< 0.206 ND	17.3	38.1
AC042	CR-MIS-AC042-01_02072011	N	2/7/2011	4630	0.097	3.7	48.2	0.99	0.27	4730	7.5	3.3	12.4	12000	22.8	2370	165	0.015	0.88	6.8	--	1320	< 0.244 ND	< 0.036 ND	264	< 0.206 ND	15.6	48.8
AD035	FTBL-IS-142-070516	N	7/5/2016	--	0.163 J	6.25	--	1.49	--	--	--	--	18.4	--	24	--	--	--	--	9.66	--	--	--	--	--	--	--	51.5
AD037	FTBL-IS-143-070516	N	7/5/2016	--	< 0.024 U	5.84	--	1.46	--	--	--	--	18.2	--	24.8	--	--	--	--	8.36	--	--	--	--	--	--	--	51.3
AD044	CR-MIS-AD044-01_02042011	N	2/4/2011	3780	< 0.095 ND	3.3	37.1	1	0.17	3760	5	2.7	9.3	11400	13.4	2040	137	0.013	0.88	5.6	--	1110	< 0.244 ND	< 0.036 ND	196	< 0.206 ND	13.8	43.8
AF043	CR-MIS-AF043-01_02042011	N	2/4/2011	5640	< 0.095 ND	3.2	52.9	1	0.15	8490	10.5	3.8	10.5	13900	18.3	3650	171	0.011 0.011	0.72	10.4	--	1450	< 0.244 ND	< 0.036 ND	187	< 0.206 ND	16.2	45.1
AF043	CR-MIS-AF043-01_02042011FD	FD	2/4/2011	6330	< 0.095 ND	3.5	58.2	1.2	0.17	9380	11.7	4.2	9.6	15600	19.5	4060	189	--	0.81	9.3	--	1610	< 0.244 ND	< 0.036 ND	209	< 0.206 ND	17.8	47.9
AH003	CR-MIS-AH003-01_02072011	N	2/7/2011	6510	0.14	4.9	71.2	1.2	0.35	3470	8.7	5.7	14	20900	20	3060	**287**	0.019	1.1	9.4	--	1800	< 0.244 ND	< 0.036 ND	226	< 0.206 ND	23.9	63.7
AH016	FTBL-IS-156-012517	N	1/25/2017	--	0.147 J	5.74	--	1.48	--	--	--	--	15.7	--	21.2	--	--	--	--	9.55	--	--	--	--	--	--	--	43.7
AI018	CR-MIS-AI018-01_02072011	N	2/7/2011	6650	0.85	4.9	68.6	1.1	0.35	15700	9.5	4.5	32.1	15500	35.2	4810	198	0.018	0.89	8.9	--	1880	< 0.244 ND	< 0.036 ND	200	< 0.206 ND	20.3	56.2
AI020	CR-MIS-AI020-01_02072011	N	2/7/2011	5060	< 0.095 ND	5	49.5	0.9	0.3	5020	7.2	3.1	13.2	13300	22.6	2030	164	0.015	**2.9**	6.1	--	1280	< 0.244 ND	< 0.036 ND	195	< 0.206 ND	16.2	44.9
AI022	FTBL-IS-157-012517	N	1/25/2017	--	0.175 J	5.98	--	1.47	--	--	--	--	14.2	--	19.6	--	--	--	--	8.34	--	--	--	--	--	--	--	43.9
AJ025	FTBL-IS-158-012617-A	N	1/26/2017	--	0.158	5.98	--	1.23	--	--	--	--	14.1	--	19.5	--	--	--	--	9.69	--	--	--	--	--	--	--	43.7
AJ025	FTBL-IS-158-012617-B	N	1/26/2017	--	0.161	6.71	--	1.4	--	--	--	--	14.4	--	20.2	--	--	--	--	10.3	--	--	--	--	--	--	--	46.9
AJ025	FTBL-IS-158-012617-C	N	1/26/2017	--	0.177	5.68	--	1.12	--	--	--	--	13.3	--	19	--	--	--	--	8.49	--	--	--	--	--	--	--	39.3
AJ042	CR-IS-AJ042-01_09112012	N	9/11/2012	5150	0.13	0.64	45.5	0.66	0.26	5240	3.6	1.8	10.9	13300	10.5	2440	183	0.027	0.14	3.8	--	1060	0.31	< 0.036 ND	30.8	< 0.206 ND	11.2	20.6
AJ048	CR-IS-AJ048-01_09112012	N	9/11/2012	6030	0.16	0.2	46.9	0.75	0.37	3610	4.7	2.7	10.4	12700	11.7	3380	206	0.017	0.38	5.4	--	1150	0.36	< 0.036 ND	32.7	< 0.206 ND	14	31.2
AK010	CR-MIS-AK010-01_02072011	N	2/7/2011	7170	0.1	5.8	81.6	1.3	0.23	24100	9.1	5.8	14.9	18500	16.4	4330	223	0.019	0.97	9	--	1850	< 0.244 ND	< 0.036 ND	227	< 0.206 ND	**31**	41.7
AK016	FTBL-IS-150-071416	N	7/14/2016	--	0.11 J	6.41	--	1.5	--	--	--	--	16.7	--	19.6	--	--	--	--	9.85	--	--	--	--	--	--	--	44.2
AK045	CR-IS-AK045-01_09122012	N	9/12/2012	3630	0.15	1.4	40.2	0.61	0.23	8670	3.6	2	7.8	8640	9.7	3060	158	0.014	0.3	4.2	--	808	0.26	< 0.036 ND	18	< 0.206 ND	10.5	21.9
AL039	CR-IS-AL039-01_09122012	N	9/12/2012	8120	0.22	< 0.088 ND	68.4	0.74	0.36	25600	5.8	2.1	11.8	12000	9.8	5020	180	0.031	0.24	5.1	--	1580	0.31	< 0.036 ND	40.9	< 0.206 ND	15.1	23.6
AL048	CR-MIS-AL048-01_02042011	N	2/4/2011	5220	< 0.095 ND	3.1	46.5	0.92	0.21	5770	10.7	3.3	8.5	12600	11.7	2890	173	0.011	0.56	9	--	1250	0.42	< 0.036 ND	134	< 0.206 ND	12.6	36.6
AM022	FTBL-IS-159-012517	N	1/25/2017	--	0.168 J	5.97	--	1.46	--	--	--	--	16	--	23.2	--	--	--	--	10	--	--	--	--	--	--	--	44.9
AM036	CR-MIS-AM036-01_02072011	N	2/7/2011	5350	0.19	4	68.3	1.1	0.23	38400	5.8	3.4	12.8	11200	14.4	6400	167	0.023	0.39	6.3	--	1450	< 0.244 ND	< 0.036 ND	199	< 0.206 ND	16.8	33.4
AO038	FTBL-IS-160-012717	N	1/27/2017	--	--	--	--	--	--	--	--	--	15.3	--	20.3	--	--	--	--	--	--	--	--	--	--	--	--	--
AO043	CR-IS-AO043-01_09112012	N	9/11/2012	5720	0.17	1.4	61.6	0.7	0.31	34100	3.9	2	11.2	10400	14	6180	169	0.024	0.17	4.1	--	1090	0.33	< 0.036 ND	31.9	< 0.206 ND	12.2	21.5
AQ036	FTBL-IS-161-012717	N	1/27/2017	--	0.461 J	5.62	--	1.24	--	--	--	--	16.9	--	111	--	--	--	--	8.2	--	--	--	--	--	--	--	38.2
AQ038	CR-IS-AQ038-01_09122012	N	9/12/2012	3580	1	1.5	43.2	0.53	0.18	20200	3	1.8	**185**	7030	**133**	4010	139	0.015	0.17	3.7	--	726	< 0.244 ND	< 0.036 ND	18.1	< 0.206 ND	9.2	39.6
AQ040	FTBL-IS-162-012717	N	1/27/2017	--	--	--	--	--	--	--	--	--	17.6	--	38	--	--	--	--	--	--	--	--	--	--	--	--	--
AR008	CR-MIS-AR008-01_02072011	N	2/7/2011	5910	0.36	7.2	61.7	7.2	0.42	4420	**16.5**	4.2	15.7	20000	22.2	2150	228	0.027	1.3	11	--	1820	< 0.244 ND	< 0.036 ND	206	< 0.206 ND	18.2	51.8
AR047	CR-MIS-AR047-01_02072011	N	2/7/2011	4640	0.19	3.3	51.7	0.81	0.33	22600	5.5	3.2	13.4	11000	21.5	5180	152	0.016	0.42	5.5	--	1420	< 0.244 ND	< 0.036 ND	195	< 0.206 ND	15.3	37.3
AR047	CR-MIS-AR047-02_02072011	FD	2/7/2011	5240	0.12	3.6	57.5	0.96	0.35	22400	6.3	3.2	14.4	12400	29.9	5750	175	0.018	0.49	6.3	--	1520	< 0.244 ND	< 0.036 ND	196	< 0.206 ND	17.5	44
AR047	CR-MIS-AR047-03_02072011	FD	2/7/2011	4810	0.2	3.7	55.9	0.89	0.35	20900	6.1	3.1	15	12000	23.5	5120	168	0.018	0.54	6.1	--	1440	< 0.244 ND	< 0.036 ND	207	< 0.206 ND	16.4	40.4
AS038	FTBL-IS-163-012717	N	1/27/2017	--	0.171 J	7.08	--	1.1	--	--	--	--	14.6	--	23.2	--	--	--	--	7.58	--	--	--	--	--	--	--	35.6
AT004	CR-IS-AT004-01_09112012	N	9/11/2012	5250	0.14	2.1	56	1.4	0.42	8390	4.7	3.1	10.5	13000	10.4	3300	195	0.022	0.45	4.9	--	1190	**0.54**	< 0.036 ND	28.7	< 0.206 ND	15.9	24.4
AU005	CR-IS-AU005-01_09112012	N	9/11/2012	4970	0.098	< 0.088 ND	61.2	1.4	0.38	2130	4	2.6	9.3	12600	11	1300	**321**	0.018	0.8	4.1	--	1200	**0.58**	< 0.036 ND	37.4	< 0.206 ND	13.2	32.3
AU034	FTBL-IS-164-012717	N	1/27/2017	--	0.229 J	11.2	--	1.12	--	--	--	--	18.9	--	25.4	--	--	--	--	10.8	--	--	--	--	--	--	--	37
AV017	CR-IS-AV017-01_09112012	N	9/11/2012	4920	< 0.095 ND	0.58	44.4	1.6	0.39	2810	3.5	2.3	8.1	13500	12.5	1460	202	0.014	0.78	3.7	--	1190	0.45	< 0.036 ND	33.7	< 0.206 ND	11.7	37.3
AV038	CR-IS-AV038-01_09122012	N	9/12/2012	4910	0.14	1.9	69.8	0.59	0.22	43700	3	1.6	10	7500	9.2	5920	169	0.022	< 0.074 ND	3.6	--	997	0.27	0.072	25.8	< 0.206 ND	8.9	17.5
AW045	CR-IS-AW045-01_09122012	N	9/12/2012	4010	0.19	1.6	50.1	0.58	0.28	11400	4	2.2	10	9010	11.4	3080	162	0.015	0.23 0.24	4.5	--	1010	0.29	< 0.036 ND	23.7	< 0.206 ND	11.4	22.8
AY031	FTBL-IS-165-012817-A	N	1/28/2017	--	0.242	9.56	--	1.26	--	--	--	--	18.7	--	27.9	--	--	--	--	8.87	--	--	--	--	--	--	--	37.9
AY031	FTBL-IS-165-012817-B	N	1/28/2017	--	0.265	9.86	--	1.33	--	--	--	--	20.2	--	28.4	--	--	--	--	9.76	--	--	--	--	--	--	--	39.1
AY031	FTBL-IS-165-012817-C	N	1/28/2017	--	0.292	9.84	--	1.32	--	--	--	--	19	--	26.9	--	--	--	--	9.58	--	--	--	--	--	--	--	38.1
AY041	FTBL-IS-166-012717	N	1/27/2017	--	0.253 J	5.89	--	1.32	--	--	--	--	13.2	--	24.5	--	--	--	--	8.35	--	--	--	--	--	--	--	44.3
BA048	CR-MIS-BA048-01_02072011	N	2/7/2011	5520	0.25	6	60.6	1.8	0.32	3750	**17.1**	3.6	13.7	15600	20.1	1770	212	0.016	1.4	10.6	--	1670	< 0.244 ND	< 0.036 ND	179	< 0.206 ND	18	49.8
BA064	FTBL-IS-167-012717	N	1/27/2017	--	0.184 J	5.51	--	1.29	--	--	--	--	11.7	--	33.8	--	--	--	--	6.87	--	--	--	--	--	--	--	43.1

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	**64000**	**5**	**18**	**330**	**10**	**32**	--	**11.9**	**13**	**70**	--	**120**	--	**231**	**0.1**	**2**	**38**	**51**	--	**0.52**	**97**	--	**1**	**26.7**	**120**
			RAL Source	**HH PCL**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	--	**ISM Background**	**Eco Benchmark**	**Eco Benchmark**	--	**Eco Benchmark**	--	**ISM Background**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**HH PCL**	--	**Eco Benchmark**	**HH PCL**	--	**Eco Benchmark**	**ISM Background**	**Eco Benchmark**
			Critical PCL	**64000**	**15**	**24**	**8100**	**38**	**51**	--	**27000**	**370**	**1300**	--	**334**	--	**3800**	**2.1**	**160**	**840**	**51**	--	**310**	**97**	--	**5.3**	**75**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	--	**HH PCL**	**HH PCL**	**HH PCL**	--	**Eco PCL**	--	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	--	**HH PCL**	**HH PCL**	--	**HH PCL**	**HH PCL**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																									
BA066	CR-IS-BA066-01_09102012	N	9/10/2012	4760	1.7	1.2	47.3	0.72	0.28	13200	4	1.9	15	8920	91.3	3010	135	0.02	0.25	3.9	--	1110	< 0.244 ND	< 0.036 ND	25.1	< 0.206 ND	11	23
BA066	CR-IS-BA066-02_09102012	FD	9/10/2012	4840	3.3	1.1	46.9	0.72	0.25	14100	4	1.7	12.9	8800	**150**	3100	135	0.021	0.27	3.9	--	1090	0.39	< 0.036 ND	25.7	< 0.206 ND	11	23.9
BA066	CR-IS-BA066-03_09102012	FD	9/10/2012	5570	4.2	1.3	50.7	0.82	0.31	14800	4.3	2	15.8	9790	**152**	3400	163	0.019	0.31	4.2	--	1210	0.46	< 0.036 ND	27.6	< 0.206 ND	11.7	30.6
BA068	FTBL-IS-168-012817	N	1/28/2017	--	--	--	--	--	--	--	--	--	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--
BB051	CR-IS-BB051-01_09122012	N	9/12/2012	4680	0.12	0.2	42.9	1.3	0.34	3480	3.5	2.2	7.5	12400	10.4	1480	159	0.012	0.6 0.66	3.8	--	1210	0.36	< 0.036 ND	30.4	< 0.206 ND	12	29
BB051	CR-IS-BB051-02_09122012	FD	9/12/2012	6310	0.12	< 0.088 ND	47.4	1.3	0.34	6780	4	2.2	8.3	13300	12.9	2330	214	0.014	0.58	3.9	--	1220	0.33	< 0.036 ND	32.5	< 0.206 ND	12.6	28.9
BB051	CR-IS-BB051-03_09122012	FD	9/12/2012	3470	< 0.095 ND	1.3	36.4	1.1	0.26	3260	3	2.1	7.3	9520	9.3	1350	157	0.01	0.54	3.2	--	922	0.31	< 0.036 ND	20.4	< 0.206 ND	9.6	24.8
BB060	FTBL-IS-169-012817	N	1/28/2017	--	0.157	6.53	--	1.32	--	--	--	--	13.1	--	18.6	--	--	--	--	7.82	--	--	--	--	--	--	--	43.3
BB072	CR-IS-BB072-01_09102012	N	9/10/2012	4250	0.11	0.86	39.5	1.1	0.27	1250	4	2.1	7.4	10200	9.3	1160	170	0.015	0.46	3.8	--	1080	0.25	< 0.036 ND	21.3	< 0.206 ND	11.4	24.5
BC058	CR-IS-BC058-01_09102012	N	9/10/2012	4070	< 0.095 ND	0.2	36.5	1	0.26	5490	3.5	1.8	7.1	10000	8.5	1520	129	0.014	0.5	3.3	--	1010	< 0.244 ND	< 0.036 ND	27.6	< 0.206 ND	10.6	23.8
BC066	FTBL-IS-170-012817	N	1/28/2017	--	--	--	--	--	--	--	--	--	--	--	18.3	--	--	--	--	--	--	--	--	--	--	--	--	--
BD053	FTBL-IS-171-012617	N	1/26/2017	--	--	--	--	--	--	--	--	--	--	--	20.1	--	--	--	--	--	--	--	--	--	--	--	--	--
BD056	CR-MIS-BD056-01_02042011	N	2/4/2011	4680	< 0.095 ND	4	38.5	1.2	0.18	2300	5	2.6	10.1	16500	13.5	1340	131	0.014	0.55	4.4	--	1350	< 0.244 ND	< 0.036 ND	158	0.25	11.5	35.2
BE043	FTBL-IS-135-062816-A	N	6/28/2016	--	0.176 U	7.98	--	2.79	--	--	--	--	14.8	--	36.5	--	--	--	--	4.82	< 0.0050 U	--	--	--	--	--	--	83.8
BE043	FTBL-IS-135-062816-B	N	6/28/2016	--	0.166 U	7.8	--	2.89	--	--	--	--	15.7	--	39.6	--	--	--	--	5.1	< 0.0050 U	--	--	--	--	--	--	90.1
BE043	FTBL-IS-135-062816-C	N	6/28/2016	--	0.161 U	7.98	--	2.68	--	--	--	--	15	--	41.9	--	--	--	--	5.11	< 0.0050 U	--	--	--	--	--	--	83.1
BE050	FTBL-IS-138-062916	N	6/29/2016	--	0.110 U	6.35	--	2.36	--	--	--	--	14.7	--	22.2	--	--	--	--	6.92	< 0.0050 U	--	--	--	--	--	--	60.2
BE058	CR-IS-BE058-01_09102012	N	9/10/2012	4210	< 0.095 ND	0.51	37.7	1.4	0.32	2380	3.3	2.1	6.7	12900	8.5	1330	162	< 0.01 ND	0.77	3.5	--	1030	< 0.244 ND	< 0.036 ND	32.2	< 0.206 ND	12.4	28.4
BE064	CR-MIS-BE064-01_02042011	N	2/4/2011	5080	< 0.095 ND	3.8	51	0.9	0.23	6630	6.2	2.8	10.8	7640	16.6	1740	129	0.017	0.29	5.6	--	1520	< 0.244 ND	< 0.036 ND	126	< 0.206 ND	10.6	29.9
BF044	FTBL-IS-136-063016	N	6/30/2016	--	< 0.025 U	5.59	--	2.22	--	--	--	--	10.1	--	24.5 J	--	--	--	--	6.31	< 0.0050 U	--	--	--	--	--	--	67
BF047	CR-MIS-BF047-01_02032011	N	2/3/2011	4110	< 0.095 ND	4.3	46.6	1.4	0.26	1560	4.6	2.1	8.9	9900	15.7	955	154	0.017	0.57	4.2	--	1380	< 0.244 ND	< 0.036 ND	111	< 0.206 ND	8.2	40.5
BF048	FTBL-IS-137-062716	N	6/27/2016	--	0.155 J	5.62	--	2.4	--	--	--	--	12.3	--	25	--	--	--	--	6.55	< 0.0050 UJ	--	--	--	--	--	--	67.9
BF052	CR-MIS-BF052-01_02032011	N	2/3/2011	6420	2.1	4.7	51.7	1.9	0.25	6850	8.1	2.3	11.9	11200	**1580**	1840	151	0.018	0.72	6.2	--	1530	< 0.244 ND	< 0.036 ND	87.9	< 0.206 ND	10	42.4
BF057	CR-MIS-BF057-01_02042011	N	2/4/2011	5220	< 0.095 ND	4.7	45.8	1.5	0.2	2280	5.3	2.8	9.5	17100	13.4	1350	157	0.015	0.65	4.9	--	1450	< 0.244 ND	< 0.036 ND	156	0.24	12	40.9
BF059	FTBL-IS-140-062716-A	N	6/27/2016	--	0.163 J	5.1	--	2.03	--	--	--	--	16.8	--	23.5	--	--	--	--	7.68	--	--	--	--	--	--	--	68.2
BF059	FTBL-IS-140-062716-B	N	6/27/2016	--	0.150 J	4.96	--	1.95	--	--	--	--	16.8	--	22.9	--	--	--	--	7.91	--	--	--	--	--	--	--	67.5
BF059	FTBL-IS-140-062716-C	N	6/27/2016	--	0.139 J	5.05	--	1.97	--	--	--	--	16.5	--	24	--	--	--	--	7.97	--	--	--	--	--	--	--	68.3
BF070	CR-MIS-BF070-01_02042011	N	2/4/2011	3950	< 0.095 ND	3.2	38	1.2	0.2	1530	8.2	2.1	7.8	9510	12.8	1030	127	0.011	0.61	5.9	--	1190	0.29	< 0.036 ND	100	< 0.206 ND	8.7	33.8
BF071	CR-MIS-BF071-01_02042011	N	2/4/2011	4450	< 0.095 ND	4.1	42.9	1.5	0.11	1220	6.4	2.3	7.5	14400	15.3	1010	144	0.011	0.69	5.1	--	1210	< 0.244 ND	< 0.036 ND	130	0.34	10.3	31.9
BG042	FTBL-IS-127-063016	N	6/30/2016	--	0.312 J	5.99	--	3.75	--	--	--	--	18.8	--	66.0 J	--	--	--	--	5.22	< 0.0050 U	--	--	--	--	--	--	60.5
BG046	CR-MIS-BG046-01_02042011	N	2/4/2011	4310	< 0.095 ND	3.5	44.3	1.2	0.23	1210	6.4	2.1	8.6	9560	14.2	895	145	0.014	0.54	4.7	--	1270	0.33	< 0.036 ND	107	< 0.206 ND	8.9	39.6
BG049	FTBL-IS-129-062716	N	6/27/2016	--	0.165 J	5.57	--	2.37	--	--	--	--	11	--	29	--	--	--	--	4.81	< 0.0050 U	--	--	--	--	--	--	99.7
BG055	FTBL-IS-139-062916	N	6/29/2016	--	0.180 J	5.65	--	2.9	--	--	--	--	19.4	--	28.6	--	--	--	--	7.76	--	--	--	--	--	--	--	71.7
BG057	CR-MIS-BG057-01_02072011	N	2/7/2011	5480	< 0.095 ND	4	65.2	2.2	0.2	30500	4.8	2.5	10.1	11000	13.7	4040	163	0.017	0.56	4.3	--	1600	< 0.244 ND	< 0.036 ND	185	< 0.206 ND	13.9	41.6
BH041	FTBL-IS-126-063016	N	6/30/2016	--	0.873 J	6	--	3.45	--	--	--	--	12.2	--	95.6 J	--	--	--	--	4.95	< 0.0050 U	--	--	--	--	--	--	65
BH043	CR-MIS-BH043-01_02042011	N	2/4/2011	4230	< 0.095 ND	4.8	49.9	1.4	0.27	1240	5.4	2	9.8	10100	27.1	898	160	0.023	0.67	4	--	1270	< 0.244 ND	< 0.036 ND	90	< 0.206 ND	7.9	42.9
BH051	FTBL-IS-130-062916	N	6/29/2016	--	0.104 U	3.92	--	2.34	--	--	--	--	9.29	--	21.7	--	--	--	--	5.45	< 0.0050 UJ	--	--	--	--	--	--	57.7
BH061	FTBL-IS-134-062816	N	6/28/2016	--	0.093 U	4.72	--	2.31	--	--	--	--	9.49	--	14.6	--	--	--	--	6.67	--	--	--	--	--	--	--	50.8
BI042	CR-MIS-BI042-01_02042011	N	2/4/2011	4420	< 0.095 ND	3.8	47.5	1.3	0.3	1580	4.4	2.1	12.8	9670	38.4	943	163	0.021	0.55	3.7	--	1250	0.3	< 0.036 ND	123	< 0.206 ND	8	48.3
BI042	CR-MIS-BI042-02_02042011	FD	2/4/2011	3670	< 0.095 ND	4	43.1	1.2	0.28	1300	3.8	2.1	11.6	7640	57.5	785	165	0.026	0.55	3.2	--	1120	< 0.244 ND	< 0.036 ND	116	< 0.206 ND	7.2	46.4
BI042	CR-MIS-BI042-03_02042011	FD	2/4/2011	3480	< 0.095 ND	3.5	40	1.1	0.26	1310	3.5	1.8	11.3	6940	37	761	142	0.027	0.52	3	--	1050	0.3	< 0.036 ND	102	< 0.206 ND	6.5	42.8
BI044	CR-MIS-BI044-01_02042011	N	2/4/2011	4330	< 0.095 ND	4	38.6	1.1	0.26	1230	5.1	2.4	11.7	9140	21.9	911	129	0.023	0.4	4.3	--	1220	< 0.244 ND	< 0.036 ND	83.9	< 0.206 ND	9.7	36.5
BI047	FTBL-IS-128-062916	N	6/29/2016	--	0.157 J	5.49	--	1.78	--	--	--	--	14.1	--	34	--	--	--	--	7.13	< 0.0050 U	--	--	--	--	--	--	50.3
BI054	FTBL-IS-131-062916	N	6/29/2016	--	0.215 J	3.83	--	2.19	--	--	--	--	9.06	--	15.7	--	--	--	--	5.83	< 0.0050 U	--	--	--	--	--	--	54.6
BI056	FTBL-IS-132-062916	N	6/29/2016	--	0.111 U	4.37	--	2.3	--	--	--	--	9.33	--	15.7	--	--	--	--	5.44	--	--	--	--	--	--	--	53.4
BI063	CR-MIS-BI063-01_02032011	N	2/3/2011	4140	< 0.095 ND	4.9	39.1	1.3	0.35	1160	4.1	1.9	6.6	7540	11.5	831	126	0.012	0.48	4.1	--	1050	< 0.244 ND	< 0.036 ND	120	< 0.206 ND	7.6	42.2
BI063	CR-MIS-BI063-02_02032011	FD	2/3/2011	4320	< 0.095 ND	4.1	44.5	1.5	0.48	1220	6.5	2.1	9	9690	22	923	133	0.011	0.57	5.5	--	1170	0.33	< 0.036 ND	89.6	< 0.206 ND	8.5	51.1
BI063	CR-MIS-BI063-03_02032011	FD	2/3/2011	3530	< 0.095 ND	3.9	37.4	1.3	0.42	1110	6.6	1.8	7.7	6930	12.7	761	118	0.013	0.54	5.2	--	1010	< 0.244 ND	< 0.036 ND	73.1	< 0.206 ND	6.9	62
BI072	CR-IS-BI072-01_09122012	N	9/12/2012	2900	0.11	1.3	38.5	0.86	0.23	1450	3.3	1.7	6.7	8040	10	963	140	0.013	0.38	3.3	--	850	0.25	< 0.036 ND	17.4	< 0.206 ND	8.5	22.1
BJ034	FTBL-IS-117-070116	N	7/1/2016	--	< 0.025 U	5.72	--	2.67	--	--	--	--	12.9	--	23.6 J	--	--	--	--	8.01	--	--	--	--	--	--	--	80.5
BJ042	FTBL-IS-120-063016	N	6/30/2016	--	0.165 J	5.18	--	2.13	--	--	--	--	15.5	--	38.5 J	--	--	--	--	6.62	< 0.0050 U	--	--	--	--	--	--	77.1
BJ059	FTBL-IS-133-062816	N	6/28/2016	--	0.104 U	4.52	--	2	--	--	--	--	9.57	--	15.2	--	--	--	--	5.38	--	--	--	--	--	--	--	49.3
BJ065	CR-MIS-BJ065-01_02172011	N	2/17/2011	3490	< 0.095 ND	0.71	39.9	1.2	0.17	1190	4.2	2.1	7.2	7290	11.1	925	133	0.016	0.48	4.6	--	1050	< 0.244 ND	< 0.036 ND	112	< 0.206 ND	7.3	29.8
BK036	FTBL-IS-118-063016	N	6/30/2016	--	0.247 J	8.72	--	2.29	--	--	--	--	21.2	--	48.4 J	--	--	--	--	7.13	< 0.0050 U	--	--	--	--	--	--	**226**
BK043	FTBL-IS-121-062716-A	N	6/27/2016	--	0.362 J	6.27	--	1.58	--	--	--	--	35.9 J	--	**473 J**	--	--	--	--	6.73	--	--	--	--	--	--	--	81.5
BK043	FTBL-IS-121-062716-B	N	6/27/2016	--	0.312 J	5.91	--	1.65	--	--	--	--	**73.9 J**	--	74.1 J	--	--	--	--	6.41	--	--	--	--	--	--	--	81.2
BK043	FTBL-IS-121-062716-C	N	6/27/2016	--	0.306 J	5.84	--	1.56	--	--	--	--	30.7 J	--	73.1 J	--	--	--	--	6.25	--	--	--	--	--	--	--	76.2
BK045	FTBL-IS-122-063016	N	6/30/2016	--	< 0.025 U	5.31	--	1.87	--	--	--	--	12.1	--	26.3 J	--	--	--	--	5.93	< 0.0050 U	--	--	--	--	--	--	76.7
BK047	FTBL-IS-124-062916	N	6/29/2016	--	0.116 U	5.19	--	2.15	--	--	--	--	13.4	--	23.7	--	--	--	--	6.72	< 0.0050 U	--	--	--	--	--	--	72.8
BK050	FTBL-IS-125-062916	N	6/29/2016	--	0.155 U	5.82	--	2	--	--	--	--	14.9	--	31.6	--	--	--	--	6.52	< 0.0050 U	--	--	--	--	--	--	83.4

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	64000	5	18	330	10	32	--	11.9	13	70	--	120	--	231	0.1	2	38	51	--	0.52	97	--	1	26.7	120
			RAL Source	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	--	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	--	Eco Benchmark	HH PCL	--	Eco Benchmark	ISM Background	Eco Benchmark
			Critical PCL	64000	15	24	8100	38	51	--	27000	370	1300	--	334	--	3800	2.1	160	840	51	--	310	97	--	5.3	75	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL	--	Eco PCL	--	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																									
BK059	CR-MIS-BK059-01_02152011	N	2/15/2011	3910	< 0.095 ND	1	42	1.2	0.12	1380	6.2	2	8.1	9640	11.8	876	135	0.014	0.6	4.6	--	1110	< 0.244 ND	< 0.036 ND	107	< 0.206 ND	8.4	31.8
BK063	FTBL-IS-173-012617	N	1/26/2017	--	0.108	6	--	2.05	--	--	--	--	18.4	--	19.9	--	--	--	--	6.13	--	--	--	--	--	--	--	75.8
BL030	FTBL-IS-116-070116	N	7/1/2016	--	0.287 J	8.07	--	2.88	--	--	--	--	38.4	--	55.4 J	--	--	--	--	19.7	--	--	--	--	--	--	--	71.4
BL038	FTBL-IS-119-063016	N	6/30/2016	--	0.259 J	6.7	--	2.16	--	--	--	--	21	--	49.9 J	--	--	--	--	6.42	< 0.0050 U	--	--	--	--	--	--	111
BL043	FTBL-IS-172-012417	N	1/24/2017	--	--	--	--	--	--	--	--	--	22.2	--	54.8	--	--	--	--	--	--	--	--	--	--	--	--	--
BM046	FTBL-IS-123-063016	N	6/30/2016	--	0.181 J	8.3	--	1.76	--	--	--	--	16.6	--	33.2 J	--	--	--	--	5.4	< 0.0050 U	--	--	--	--	--	--	71.3
BM073	CR-IS-BM073-01_09102012	N	9/10/2012	3810	< 0.095 ND	0.47	38.1	1.1	0.26	1620	3.7	1.5	6.9	9460	9.8	962	133	0.013	0.5	3.2	--	1070	0.27	< 0.036 ND	18.1	< 0.206 ND	9.3	25.1
BP063	CR-IS-BP063-01_09122012	N	9/12/2012	3570	< 0.095 ND	0.82	55.5	1.2	0.35	2180	3.2	1.7	9	9430	15.9	1120	204	0.015	0.55	3.3	--	1120	0.38	< 0.036 ND	22.1	< 0.206 ND	8.2	39.1
BQ067	FTBL-IS-174-012417	N	1/24/2017	--	0.161 J	6.07	--	2.1	--	--	--	--	24.4	--	31.3	--	--	--	--	6.39	< 0.0052 U	--	--	--	--	--	--	75.4
BQ070	FTBL-IS-151-071416	N	7/14/2016	--	0.093 J	4.53	--	2.27	--	--	--	--	11.7	--	18.5	--	--	--	--	6.11	--	--	--	--	--	--	--	73.6
BQ072	CR-MIS-BQ072-01_02152011	N	2/15/2011	5040	< 0.095 ND	< 0.088 ND	63.2	1.5	0.23	1950	4.8	2.6	10	12600	17.8	1160	**253**	0.016	0.76	4.5	--	1580	0.32	< 0.036 ND	155	< 0.206 ND	10.4	50.1
BR060	CR-MIS-BR060-01_02042011	N	2/4/2011	3880	< 0.095 ND	3.9	**850**	1.3	0.24	1930	5.3	2.2	9.1	9440	19	933	155	0.012 0.012	0.68	4.5	--	1180	< 0.244 ND	< 0.036 ND	100	< 0.206 ND	7.7	48
BR060	CR-MIS-BR060-01_02042011FD	FD	2/4/2011	4010	< 0.095 ND	4.4	**947**	1.3	0.24	2020	5.8	2.2	9.4	9920	19	960	160	--	0.68	4.7	--	1240	0.29	< 0.036 ND	69.7	< 0.206 ND	7.8	51.1
BS069	FTBL-IS-175-012417-A	N	1/24/2017	--	0.224 J	5.14	--	1.96	--	--	--	--	14.5	--	32.5	--	--	--	--	5.37	--	--	--	--	--	--	--	69.3
BS069	FTBL-IS-175-012417-B	N	1/24/2017	--	0.200 J	7.04	--	1.89	--	--	--	--	11.9	--	30.3	--	--	--	--	4.81	--	--	--	--	--	--	--	63.8
BS069	FTBL-IS-175-012417-C	N	1/24/2017	--	0.213 J	5.07	--	1.74	--	--	--	--	13.7	--	31.2	--	--	--	--	5.73	--	--	--	--	--	--	--	62.6
BT056	CR-MIS-BT056-01_02042011	N	2/4/2011	4300	< 0.095 ND	4	53.3	1.5	0.25	2200	7.8	2	8.7	10100	18.2	947	188	0.015	0.65	5.5	--	1260	0.27	< 0.036 ND	97.5	< 0.206 ND	7.2	45.4
BW057	FTBL-IS-176-012517	N	1/25/2017	--	--	--	--	--	--	--	--	--	--	--	**2650**	--	--	--	--	--	--	--	--	--	--	--	--	--
BW062	CR-MIS-BW062-01_02032011	N	2/3/2011	4040	< 0.095 ND	3	46.5	1.3	0.25	1550	4.5	1.8	7.9	9980	27.3	909	168	0.011	0.67	3.6	--	1300	0.37	< 0.036 ND	99	< 0.206 ND	6.9	59
BW062	CR-MIS-BW062-02_02032011	FD	2/3/2011	4030	< 0.095 ND	3	44.9	1.3	0.25	1650	7.3	1.9	7.6	9720	21.8	915	161	0.011	0.6	5.1	--	1330	0.33	< 0.036 ND	91.6	< 0.206 ND	6.9	60.1
BW062	CR-MIS-BW062-03_02042011	FD	2/4/2011	3540	< 0.095 ND	2.8	44.5	1.2	0.17	1410	3.5	1.8	7.4	10100	22	832	161	0.011 0.012	0.49	3.2	--	1250	< 0.244 ND	< 0.036 ND	110	< 0.206 ND	6.3	53.8
BY055	FTBL-IS-177-012417	N	1/24/2017	--	--	--	--	--	--	--	--	--	--	--	79.1	--	--	--	--	--	--	--	--	--	--	--	--	--
BY057	CR-MIS-BY057-01_02082011	N	2/8/2011	7250	0.13	5.1	74.2	2.3	0.3	6220	7.4	3.8	17	18300	**129**	2310	**242**	0.028	0.51	6.7	--	2090	< 0.244 ND	< 0.036 ND	167	0.46	14.9	68.7
BY064	FTBL-IS-152-071416	N	7/14/2016	--	0.161 J	7.35	--	1.84	--	--	--	--	20.3	--	32.9	--	--	--	--	8.53	--	--	--	--	--	--	--	**122**
BY066	FTBL-IS-178-011917	N	1/19/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	114
BY072	CR-IS-BY072-01_09122012	N	9/12/2012	2870	0.38	1	40.9	0.96	0.28	1360	3.6	1.6	13.8	7780	32	870	160	0.016	0.41	3.2	--	921	< 0.244 ND	< 0.036 ND	15.8	< 0.206 ND	8	32.7
CA057	FTBL-IS-110-061316	N	6/13/2016	--	0.346 J	8.86	--	4.34	--	--	--	--	22.9	--	**143 J**	--	--	--	--	13.4	--	--	--	--	--	--	--	115
CA057	FTBL-IS-110-110316R	N	11/3/2016	--	--	--	--	--	--	--	--	--	--	--	66.2 J	--	--	--	--	--	--	--	--	--	--	--	--	--
CA070	CR-IS-CA070-01_09142012	N	9/14/2012	5340	0.26	4.1	59.2	1	0.33	9400	5.8	2.4	8.6	15100	23.6	2600	**260**	< 0.01 ND	0.58	4.5	--	1480	< 0.244 ND	< 0.036 ND	67	< 0.206 ND	17.3	59
CB046	FTBL-IS-179-012617	N	1/26/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**317**
CB063	FTBL-IS-182-011917	N	1/19/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	95
CC046	FTBL-IS-109-071216	N	7/12/2016	--	0.260 J	16	--	2.7	--	--	--	--	24.8	--	58.4	--	--	--	--	13.5	--	--	--	--	--	--	--	**353**
CD045	FTBL-IS-108-071116	N	7/11/2016	--	0.145 J	8.61	--	4.51	--	--	--	--	16.5	--	24.8 J	--	--	--	--	5.12	--	--	--	--	--	--	--	101
CD047	FTBL-IS-180-012617	N	1/26/2017	--	0.26	11.4	--	2.25	--	--	--	--	26.7	--	48.4	--	--	--	--	10	--	--	--	--	--	--	--	**291**
CD055	FTBL-IS-181-012417	N	1/24/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	87.7
CD061	CR-MIS-CD061-01_02092011	N	2/9/2011	7510	< 0.095 ND	5.8	59.8	0.8	0.32	2100	9.1	4.3	16.8	14000	21.8	1820	202	0.027	0.35	7.5	--	2390	< 0.244 ND	< 0.036 ND	199	< 0.206 ND	16.1	37.9
CD061	FTBL-IS-105-061316	N	6/13/2016	--	0.173 J	7.54	--	1.66	--	--	--	--	18.5	--	35.3 J	--	--	--	--	9.44	--	--	--	--	--	--	--	116
CD068	CR-MIS-CD068-01_02072011	N	2/7/2011	4950	1.4	6.2	71	1.2	0.53	10600	8.3	4.9	18.7	15900	66.2	3760	**318**	0.017	0.99	7.9	--	2010	0.32	< 0.036 ND	194	< 0.206 ND	17.4	110
CE046	FTBL-IS-096-071216	N	7/12/2016	--	0.136 J	5.67	--	1.25	--	--	--	--	23.1	--	22.5	--	--	--	--	9.33	--	--	--	--	--	--	--	61.4
CE047	CR-MIS-CE047-01_02092011	N	2/9/2011	7140	< 0.095 ND	4.6	94	1.4	0.31	44900	7.4	4.1	17.5	11400	17.3	11400	**433**	0.035	0.086	6.3	--	2660	< 0.244 ND	< 0.036 ND	166	0.96	12.9	49.9
CE056	CR-IS-CE056-01_09132012	N	9/13/2012	3060	0.16	1.3	54.6	0.76	0.38	16100	4	2.4	10.1	10400	13.3	3170	**264**	0.012	0.44	4.5	--	1070	0.44	< 0.036 ND	37.5	< 0.206 ND	10.8	54
CE056	CR-IS-CE056-02_09132012	FD	9/13/2012	2680	0.11	2.4	51.4	0.77	0.36	18000	3.6	2.7	9.2	10100	11.2	3050	**262**	0.012	0.5	4.2	--	979	**0.56**	< 0.036 ND	37.2	< 0.206 ND	10.1	50.2
CE056	CR-IS-CE056-03_09132012	FD	9/13/2012	3470	0.22	1.8	61.1	0.92	0.46	21800	4.1	2.7	10.5	12700	26.7	3870	**316**	0.011	0.52	4.7	--	1210	0.42	< 0.036 ND	48.3	< 0.206 ND	12.7	58.1
CE059	FTBL-IS-104-062316	N	6/23/2016	--	0.146 U	7.65	--	1.7	--	--	--	--	17.5	--	28.4	--	--	--	--	9.45	--	--	--	--	--	--	--	**128**
CE063	FTBL-IS-106-061316	N	6/13/2016	--	0.212 J	7.09	--	1.57	--	--	--	--	19.4	--	32.2 J	--	--	--	--	9.6	--	--	--	--	--	--	--	81.6
CE065	CR-MIS-CE065-01_02072011	N	2/7/2011	5120	0.34	5.4	68.2	1	0.41	3900	9	4.4	17.9	14900	27.2	2240	**261**	0.022	0.74	7.7	--	1960	< 0.244 ND	< 0.036 ND	185	< 0.206 ND	19.3	74.3
CF045	FTBL-IS-092-071116	N	7/11/2016	--	0.168 J	9.22	--	3.11	--	--	--	--	19.2	--	25.3 J	--	--	--	--	6.81	--	--	--	--	--	--	--	91.1
CF048	CR-MIS-CF048-01_02092011	N	2/9/2011	7110	< 0.095 ND	2.2	64.8	0.66	0.27	52700	6	3.1	14.7	6750	15.2	18900	**255**	0.032	< 0.074 ND	4.5	--	2450	< 0.244 ND	0.099	154	0.56	11.3	34
CF053	FTBL-IS-099-062216	N	6/22/2016	--	0.131 U	8.23	--	2.14	--	--	--	--	17.1	--	28.7	--	--	--	--	11.9	--	--	--	--	--	--	--	**154**
CF057	FTBL-IS-103-061716	N	6/17/2016	--	0.218 J	6.27	--	1.38	--	--	--	--	23	--	59.6	--	--	--	--	9.01	--	--	--	--	--	--	--	83.5
CF074	FTBL-IS-107-070616	N	7/6/2016	--	0.353 J	6.42	--	1.72	--	--	--	--	16.3	--	65	--	--	--	--	8.97	--	--	--	--	--	--	--	104
CG044	FTBL-IS-091-071116	N	7/11/2016	--	0.197 J	9.83	--	2.59	--	--	--	--	29.4	--	48.5 J	--	--	--	--	10.7	--	--	--	--	--	--	--	97.8
CG046	FTBL-IS-095-071216	N	7/12/2016	--	0.185 J	**19.6**	--	8.36	--	--	--	--	33.3	--	22.2	--	--	--	--	11.7	--	--	--	--	--	--	--	**153**
CG047	CR-MIS-CG047-01_02092011	N	2/9/2011	8750	< 0.095 ND	6	91	2.4	0.54	38700	8.3	4.8	20.6	19900	21.4	10600	**402**	0.035	0.56	6.8	--	3320	< 0.244 ND	< 0.036 ND	203	0.71	18.9	65
CG048	FTBL-IS-094-071216	N	7/12/2016	--	0.164 J	5.9	--	3.74	--	--	--	--	30.8	--	25.2	--	--	--	--	9.65	--	--	--	--	--	--	--	69.2
CG052	FTBL-IS-098-062216	N	6/22/2016	--	0.220 U	10.1	--	3.81	--	--	--	--	20.5	--	37.6	--	--	--	--	13.2	--	--	--	--	--	--	--	**139**
CG052	FTBL-IS-098-111116-R	N	########	--	--	8.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CG058	CR-MIS-CG058-01_02092011	N	2/9/2011	7520	< 0.095 ND	5.9	63.8	1	0.3	2260	9.1	4.4	17.2	15300	23.1	2150	**233**	0.026	0.54	7.9	--	2220	< 0.244 ND	< 0.036 ND	187	< 0.206 ND	17.1	54.6
CG063	CR-MIS-CG063-01_02092011	N	2/9/2011	6820	< 0.095 ND	5.8	66.2	1.1	0.31	2560	11.3	4.4	18.2	16000	26.7	2290	**256**	0.031	0.67	9.2	--	2030	< 0.244 ND	< 0.036 ND	215	0.27	16.6	64.1

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

Location ID	Sample ID	Sample Type	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	64000	5	18	330	10	32	--	11.9	13	70	--	120	--	231	0.1	2	38	51	--	0.52	97	--	1	26.7	120
			RAL Source	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	--	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	--	Eco Benchmark	HH PCL	--	Eco Benchmark	ISM Background	Eco Benchmark
			Critical PCL	64000	15	24	8100	38	51	--	27000	370	1300	--	334	--	3800	2.1	160	840	51	--	310	97	--	5.3	75	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL	--	Eco PCL	--	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL
CG065	FTBL-IS-102-061716	N	6/17/2016	--	0.343 J	6.54	--	1.55	--	--	--	--	19.7	--	47.4	--	--	--	--	9.22	0.0071	--	--	--	--	--	--	73.6
CG069	CR-MIS-CG069-01_02082011	N	2/8/2011	6100	3	6.3	67.4	1.1	0.33	2510	8.9	4.3	19.9	17300	113	1890	**243**	0.026	0.41	7.9	--	1850	< 0.244 ND	< 0.036 ND	164	0.37	16.9	57.2
CG071	FTBL-IS-153-071416	N	7/14/2016	--	1.41 J	7.18	--	1.4	--	--	--	--	24.1	--	120	--	--	--	--	9.21	--	--	--	--	--	--	--	93.1
CH043	FTBL-IS-090-070816	N	7/8/2016	--	0.233 J	8.49	--	1.54	--	--	--	--	29.3	--	49.9	--	--	--	--	10.8	--	--	--	--	--	--	--	108
CH046	FTBL-IS-093-070816-A	N	7/8/2016	--	0.243 J	9.48	--	1.58	--	--	--	--	24.1	--	37	--	--	--	--	13.5	--	--	--	--	--	--	--	95
CH046	FTBL-IS-093-070816-B	N	7/8/2016	--	0.258 J	9.9	--	1.64	--	--	--	--	28.9	--	39.1	--	--	--	--	13.1	--	--	--	--	--	--	--	101
CH046	FTBL-IS-093-070816-C	N	7/8/2016	--	0.204 J	9.19	--	1.86	--	--	--	--	23.6	--	35.4	--	--	--	--	12.5	--	--	--	--	--	--	--	91.1
CH054	CR-IS-CH054-01_09132012	N	9/13/2012	8640	0.47	< 0.088 ND	61.8	0.69	0.64	2490	9.4	3.2	23.6	14400	31.8	2240	**242**	0.038	0.38	6.4	--	1850	**0.59**	< 0.036 ND	47	< 0.206 ND	20.8	46.8
CH056	FTBL-IS-100-062116	N	6/21/2016	--	0.390 J	6.72	--	1.1	--	--	--	--	30.1	--	99.8	--	--	--	--	10.6	--	--	--	--	--	--	--	71.8
CH060	FTBL-IS-101-061716	N	6/17/2016	--	0.175 J	6.76	--	1.3	--	--	--	--	22.7	--	37.6	--	--	--	--	10	--	--	--	--	--	--	--	66.5
CH072	CR-MIS-CH072-01_02082011	N	2/8/2011	3350	0.89	3.4	34.7	0.56	0.21	1120	5.3	2.4	14.3	7210	**134**	973	131	0.02	0.32	4.6	--	1080	< 0.244 ND	< 0.036 ND	116	0.21	10	33.5
CH072	CR-MIS-CH072-02_02082011	FD	2/8/2011	4990	0.52	4.7	48.5	0.75	0.27	1720	7.3	3.4	20	15100	114	1410	178	0.019	0.48	6.1	--	1500	< 0.244 ND	< 0.036 ND	136	0.29	13.6	45.1
CH072	CR-MIS-CH072-03_02082011	FD	2/8/2011	5800	0.69	4.3	50.9	0.76	0.25	1650	7.6	3.5	20	15400	101	1520	189	0.019	0.42	6.4	--	1600	< 0.244 ND	< 0.036 ND	144	0.36	14.4	46.1
CI039	CR-MIS-CI039-01_02082011	N	2/8/2011	5610	< 0.095 ND	7.6	77.6	1.7	0.53	11700	6.1	3.4	17.9	20600	34.9	2450	**331**	0.029	1.8	5.6	--	1710	< 0.244 ND	< 0.036 ND	209	0.65	12.6	85.1
CI053	FTBL-IS-097-062216-A	N	6/22/2016	--	0.147 U	7.73	--	1.3	--	--	--	--	21.3	--	28.5	--	--	--	--	11.5	--	--	--	--	--	--	--	95.5
CI053	FTBL-IS-097-062216-B	N	6/22/2016	--	0.162 U	7.96	--	1.3	--	--	--	--	20.3	--	28.2	--	--	--	--	11	--	--	--	--	--	--	--	96.5
CI053	FTBL-IS-097-062216-C	N	6/22/2016	--	0.145 U	8.1	--	1.35	--	--	--	--	20.5	--	27.1	--	--	--	--	10.9	--	--	--	--	--	--	--	95.3
CI064	CR-MIS-CI064-01_02142011	N	2/14/2011	6890	< 0.095 ND	2.6	59.3	0.79	0.44	1910	8.5	4	18.5	10600	21.6	1660	208	0.023	0.27	7.2	--	2190	< 0.244 ND	< 0.036 ND	141	0.38	14.4	39.4
CJ041	FTBL-IS-084-070616	N	7/6/2016	--	0.216 J	8.32	--	1.96	--	--	--	--	17.7	--	25	--	--	--	--	10.1	--	--	--	--	--	--	--	96.3
CJ049	FTBL-IS-087-062316	N	6/23/2016	--	0.203 U	6.62	--	1.34	--	--	--	--	20.3	--	30.8	--	--	--	--	11.5	--	--	--	--	--	--	--	72.5
CJ056	CR-MIS-CJ056-01_02082011	N	2/8/2011	7380	< 0.095 ND	4.9	58.6	0.76	0.29	2570	9.1	4.1	15.2	13500	20	1910	191	0.029	0.35	7.7	--	2180	< 0.244 ND	< 0.036 ND	165	< 0.206 ND	16.5	39.7
CJ056	CR-MIS-CJ056-02_02082011	FD	2/8/2011	6740	< 0.095 ND	5.1	56.7	0.77	0.26	2060	8.3	3.8	14.8	16500	29.1	1750	180	0.028	0.34	7.3	--	1930	< 0.244 ND	< 0.036 ND	148	0.28	15	39.3
CJ056	CR-MIS-CJ056-03_02082011	N	2/8/2011	5900	< 0.095 ND	4.9	57.5	0.77	0.3	2360	8	4.2	15.7	15400	24.1	1700	187	0.029 0.03	0.37	7.7	--	1860	< 0.244 ND	< 0.036 ND	157	0.34	14.2	38.2
CJ056	CR-MIS-CJ056-03_02082011FD	FD	2/8/2011	6390	< 0.095 ND	5.7	60.3	0.85	0.31	2460	8.8	4.9	17.3	18500	27.1	1850	214	--	1.5	8.3	--	1990	< 0.244 ND	< 0.036 ND	187	0.37	15.5	40.5
CJ057	CR-MIS-CJ057-01_02082011	N	2/8/2011	4840	< 0.095 ND	3.8	36.1	0.53	0.2	1130	5.7	2.7	10.1	7450	14.2	1120	125	0.028	0.27	5	--	1430	< 0.244 ND	< 0.036 ND	116	< 0.206 ND	10.7	27.1
CJ058	CR-MIS-CJ058-01_02082011	N	2/8/2011	6140	< 0.095 ND	4.7	47.2	0.67	0.27	1490	7.6	3.6	14.7	11800	19.9	1440	155	0.052	0.31	6.1	--	1760	< 0.244 ND	< 0.036 ND	142	< 0.206 ND	14.2	32.6
CJ061	FTBL-IS-089-061716	N	6/17/2016	--	0.152 J	6.46	--	1.01	--	--	--	--	18.9	--	27.4	--	--	--	--	9.47	--	--	--	--	--	--	--	46.6
CJ062	CR-MIS-CJ062-01_02092011	N	2/9/2011	7240	< 0.095 ND	5.8	61	0.85	0.39	1860	9.3	4.4	18	14600	22.9	1770	201	0.031	0.34	7.8	--	2230	< 0.244 ND	< 0.036 ND	182	0.21	16.8	39.3
CJ071	FTBL-IS-183-012517	N	1/25/2017	--	1.72 J	--	--	--	--	--	--	--	--	--	**124**	--	--	--	--	--	--	--	--	--	--	--	--	--
CJ074	FTBL-IS-184-012517	N	1/25/2017	--	0.363 J	--	--	--	--	--	--	--	--	--	53.1	--	--	--	--	--	--	--	--	--	--	--	--	--
CK040	CR-IS-CK040-01_09142012	N	9/14/2012	8430	0.34	4.5	70.4	0.72	0.43	3360	**12.8**	3.7	15.5	15200	23.6	2610	**258**	0.028	0.27	7.1	--	2270	0.3	< 0.036 ND	56.6	< 0.206 ND	26.4	50.1
CK042	CR-MIS-CK042-01_02082011	N	2/8/2011	6120	< 0.095 ND	6.1	73.1	0.97	0.33	5610	7.9	4.2	14.9	16400	21.8	2330	**257**	0.026	0.67	8.1	--	1840	< 0.244 ND	< 0.036 ND	174	0.47	15.9	66.7
CK045	FTBL-IS-085-070616	N	7/6/2016	--	0.196 J	7.65	--	1.41	--	--	--	--	16.4	--	22	--	--	--	--	12.7	--	--	--	--	--	--	--	72
CK047	FTBL-IS-086-070616	N	7/6/2016	--	0.364 J	7.17	--	1.26	--	--	--	--	20.1	--	32.9	--	--	--	--	11.6	--	--	--	--	--	--	--	69.6
CK052	FTBL-IS-088-062216	N	6/22/2016	--	0.199 U	7.47	--	1.61	--	--	--	--	19.3	--	28.2	--	--	--	--	10.8	--	--	--	--	--	--	--	68
CK053	CR-MIS-CK053-01_02092011	N	2/9/2011	7130	< 0.095 ND	5.4	67.4	0.92	0.38	9390	9.3	4.6	21.2	15200	25	3010	214	0.023	0.42	9.3	--	2400	< 0.244 ND	< 0.036 ND	230	0.26	16.3	49.3
CK058	CR-MIS-CK058-01_02092011	N	2/9/2011	7510	< 0.095 ND	5.3	56.7	0.83	0.29	1830	8.7	4	16	13400	20	1710	186	0.032	0.34	7.3	--	2090	< 0.244 ND	< 0.036 ND	172	0.22	15.9	37.3
CL019	FTBL-IS-115-071116	N	7/11/2016	--	0.123 J	5.3	--	1.75	--	--	--	--	17.4	--	23.7 J	--	--	--	--	9.44	--	--	--	--	--	--	--	76.9
CL049	CR-MIS-CL049-01_02092011	N	2/9/2011	8380	< 0.095 ND	5.6	77	0.93	0.34	16300	8.5	4.3	18.6	15400	20.9	3280	215	0.031	0.61	8.1	--	2100	< 0.244 ND	< 0.036 ND	203	0.25	17.7	49.3
CL052	FTBL-IS-081-062216	N	6/22/2016	--	0.185 U	6.03	--	1.3	--	--	--	--	17.1	--	26.9	--	--	--	--	11.4	--	--	--	--	--	--	--	58.8
CL054	CR-MIS-CL054-01_02092011	N	2/9/2011	7990	< 0.095 ND	6.6	68.3	0.96	0.43	2290	10.9	4.9	20.7	16200	31.6	2000	**233**	0.035	0.4	9.1	--	2310	< 0.244 ND	< 0.036 ND	192	0.23	18.2	43.5
CL057	FTBL-IS-083-062116	N	6/21/2016	--	0.217 J	7.19	--	1.06	--	--	--	--	27.5	--	31.1	--	--	--	--	10.1	--	--	--	--	--	--	--	53.5
CL059	CR-MIS-CL059-01_02082011	N	2/8/2011	6700	< 0.095 ND	4.7	49	0.7	0.23	2270	9.1	3.8	12.6	12600	20.2	1550	169	0.026	0.34	7.6	--	1930	< 0.244 ND	< 0.036 ND	145	< 0.206 ND	14.2	33.2
CL065	CR-IS-CL065-01_09132012	N	9/13/2012	7930	0.47	< 0.088 ND	45.6	0.63	0.46	1590	8.4	2.8	15.9	12600	30.5	1630	182	0.028	0.25	5.7	--	1890	**0.55**	< 0.036 ND	37.8	< 0.206 ND	17.9	36.5
CL071	FTBL-IS-076-060916	N	6/9/2016	--	**17.5 J**	6.47	--	1.15	--	--	--	--	59.4	--	**805 J**	--	--	--	--	9.16	--	--	--	--	--	--	--	61.2
CM048	FTBL-IS-080-062216	N	6/22/2016	--	0.147 U	7.06	--	1.22	--	--	--	--	19.7	--	29.8	--	--	--	--	10.5	--	--	--	--	--	--	--	65.5
CM054	FTBL-IS-082-062116-A	N	6/21/2016	--	0.194 J	7.38	--	1.14	--	--	--	--	17	--	26.1	--	--	--	--	10.8	--	--	--	--	--	--	--	53.7
CM054	FTBL-IS-082-062116-B	N	6/21/2016	--	0.151 J	7.88	--	1.17	--	--	--	--	17.8	--	26.9	--	--	--	--	11	--	--	--	--	--	--	--	55.3
CM054	FTBL-IS-082-062116-C	N	6/21/2016	--	0.204 J	7.18	--	1.15	--	--	--	--	17.3	--	27.3	--	--	--	--	10.6	--	--	--	--	--	--	--	55.1
CM056	CR-MIS-CM056-01_02102011	N	2/10/2011	5510	0.18	1.3	42.9	0.65	0.3	1430	6.2	3	12.4	9330	19.6	1290	133	0.024	0.23	5.4	--	1510	< 0.244 ND	< 0.036 ND	69.7	< 0.206 ND	11	34.7
CM058	CR-MIS-CM058-01_02102011	N	2/10/2011	6010	< 0.095 ND	5.1	53.8	0.74	0.35	1700	8	3.9	17.6	12000	24.3	1540	182	0.045	0.35	7	--	1960	< 0.244 ND	< 0.036 ND	158	< 0.206 ND	14	36.2
CM063	FTBL-IS-073-060916	N	6/9/2016	--	0.283 J	7.7	--	0.911	--	--	--	--	24.4	--	34.3 J	--	--	--	--	10.3	--	--	--	--	--	--	--	54.9
CM067	CR-MIS-CM067-01_02152011	N	2/15/2011	5640	0.39	1.2	41	0.57	0.29	1260	6.7	3.1	19.1	9860	60.3	1240	137	0.033	0.27	5.3	--	1610	0.41	< 0.036 ND	124	< 0.206 ND	11.9	35.4
CM067	CR-MIS-CM067-02_02152011	FD	2/15/2011	5020	0.37	1.4	42	0.56	0.32	1620	6	3	18.2	9610	73.6	1230	142	0.029	0.29	5	--	1580	0.4	< 0.036 ND	108	< 0.206 ND	10.6	33.4
CM067	CR-MIS-CM067-03_02152011	FD	2/15/2011	6120	0.49	1.4	44.7	0.62	0.33	1460	7.5	3.3	21.3	10400	77	1350	150	0.034	0.34	5.9	--	1740	0.39	< 0.036 ND	101	< 0.206 ND	12.2	37.6
CM068	FTBL-IS-075-060916	N	6/9/2016	--	**6.41 J**	6.12	--	1	--	--	--	--	39.5	--	**378 J**	--	--	--	--	8.97	--	--	--	--	--	--	--	59.5
CM072	CR-IS-CM072-01_09142012	N	9/14/2012	7320	0.65	3.5	52.7	0.66	0.4	3540	7.8	3.2	14.8	13700	33.2	2720	198	0.019	0.21	6.4	--	2110	< 0.244 ND	< 0.036 ND	63	< 0.206 ND	20.3	36.8
CN022	FTBL-IS-114-070816-A	N	7/8/2016	--	0.172 J	7.06	--	1.81	--	--	--	--	19.8	--	27.1	--	--	--	--	11	--	--	--	--	--	--	--	62.8
CN022	FTBL-IS-114-070816-B	N	7/8/2016	--	0.156 J	7.04	--	1.86	--	--	--	--	20.1	--	26.6	--	--	--	--	11.5	--	--	--	--	--	--	--	64.8
CN022	FTBL-IS-114-070816-C	N	7/8/2016	--	0.178 J	7.6	--	1.99	--	--	--	--	22.1	--	29.8	--	--	--	--	11.9	--	--	--	--	--	--	--	70.2

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	64000	5	18	330	10	32	--	11.9	13	70	--	120	--	231	0.1	2	38	51	--	0.52	97	--	1	26.7	120
			RAL Source	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	--	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	--	Eco Benchmark	HH PCL	--	Eco Benchmark	ISM Background	Eco Benchmark
			Critical PCL	64000	15	24	8100	38	51	--	27000	370	1300	--	334	--	3800	2.1	160	840	51	--	310	97	--	5.3	75	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL	--	Eco PCL	--	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																									
CN027	CR-MIS-CN027-01_02082011	N	2/8/2011	6430	< 0.095 ND	4.1	60.9	0.68	0.34	6840	6.8	3.5	14.7	8110	21.7	1960	160	0.031	0.24	6.8	--	1940	< 0.244 ND	< 0.036 ND	185	0.31	11.2	32.8
CN044	FTBL-IS-078-062316	N	6/23/2016	--	0.129 U	7.59	--	1.77	--	--	--	--	23.1	--	25.2	--	--	--	--	14.5	--	--	--	--	--	--	--	71
CN046	FTBL-IS-079-070616	N	7/6/2016	--	2.03 J	7.35	--	1.28	--	--	--	--	17.8	--	58	--	--	--	--	10.6	--	--	--	--	--	--	--	56.5
CN056	CR-MIS-CN056-01_02102011	N	2/10/2011	5610	0.19	1.7	42.7	0.7	0.31	1330	6.6	3.4	13.5	10200	20.3	1290	148	0.022	0.23	5.9	--	1570	< 0.244 ND	< 0.036 ND	131	< 0.206 ND	10.7	32.9
CN058	CR-MIS-CN058-01_02092011	N	2/9/2011	6930	< 0.095 ND	4.9	52.2	0.74	0.32	1640	8.4	3.7	14.9	12600	19.5	1600	170	0.026	0.29	7	--	2060	< 0.244 ND	< 0.036 ND	176	< 0.206 ND	14.7	36.5
CN060	FTBL-IS-072-061016	N	6/10/2016	--	0.221 J	7.07	--	0.983	--	--	--	--	18.5	--	26.6	--	--	--	--	9.84	--	--	--	--	--	--	--	47.9
CN064	FTBL-IS-074-060916-A	N	6/9/2016	--	0.361 J	6.92	--	0.963	--	--	--	--	23	--	63.6 J	--	--	--	--	9.18	--	--	--	--	--	--	--	48.5
CN064	FTBL-IS-074-060916-B	N	6/9/2016	--	0.470 J	6.74	--	0.965	--	--	--	--	22.8	--	89.1 J	--	--	--	--	8.79	--	--	--	--	--	--	--	48.8
CN064	FTBL-IS-074-060916-C	N	6/9/2016	--	0.920 J	6.54	--	0.935	--	--	--	--	21.8	--	**146 J**	--	--	--	--	8.54	--	--	--	--	--	--	--	46.9
CN066	CR-MIS-CN066-01_02092011	N	2/9/2011	6570	0.31	4.8	50.4	0.71	0.4	1700	8.5	4.5	20.4	< 14 ND	61.5	1520	170	0.03	0.35	6.7	--	1930	< 0.244 ND	< 0.036 ND	127	0.21	14.1	38.3
CN073	FTBL-IS-077-060916-A	N	6/9/2016	--	**40.4 J**	5.02	--	1.7	--	--	--	--	38.3	--	**1070 J**	--	--	--	--	7.76	--	--	--	--	--	--	--	67
CN073	FTBL-IS-077-060916-B	N	6/9/2016	--	**14.1 J**	4.56	--	1.73	--	--	--	--	31.7	--	**552 J**	--	--	--	--	7.68	--	--	--	--	--	--	--	66.3
CN073	FTBL-IS-077-060916-C	N	6/9/2016	--	**50.4 J**	5.61	--	1.71	--	--	--	--	34.7	--	**1320 J**	--	--	--	--	7.89	--	--	--	--	--	--	--	66.3
CN074	FTBL-IS-185-012517	N	1/25/2017	--	0.950 J	--	--	--	--	--	--	--	--	--	76.5	--	--	--	--	--	--	--	--	--	--	--	--	--
CO022	FTBL-IS-113-070816	N	7/8/2016	--	0.169 J	6.49	--	1.81	--	--	--	--	20.3	--	25.5	--	--	--	--	10.3	--	--	--	--	--	--	--	74.3
CO038	FTBL-IS-154-071416	N	7/14/2016	--	0.177 J	8.23	--	2.1	--	--	--	--	25.1	--	27	--	--	--	--	20.5	--	--	--	--	--	--	--	110
CO042	FTBL-IS-065-062316	N	6/23/2016	--	0.121 U	6.16	--	1.23	--	--	--	--	18.6	--	21.7	--	--	--	--	12.6	--	--	--	--	--	--	--	61.5
CO043	CR-MIS-CO043-01_02082011	N	2/8/2011	5620	< 0.095 ND	4.6	59.2	0.88	0.27	9840	7.9	4.5	14	17400	16.8	3210	194	0.021	0.35	8.7	--	1780	< 0.244 ND	< 0.036 ND	202	0.4	14.9	48.9
CO045	FTBL-IS-067-062316	N	6/23/2016	--	0.181 U	6.18	--	1.29	--	--	--	--	19.8	--	24.1	--	--	--	--	14	--	--	--	--	--	--	--	76.4
CO048	CR-IS-CO048-01_09132012	N	9/13/2012	8380	0.43	< 0.088 ND	48.4	0.67	0.47	1970	8.9	2.9	13.4	13800	16.5	1860	187	0.025	0.25	6.1	--	1850	0.51	< 0.036 ND	36.4	< 0.206 ND	19.9	31.8
CO058	CR-MIS-CO058-01_02082011	N	2/8/2011	6250	< 0.095 ND	5.1	54.4	0.76	0.29	1850	8.3	4	14.3	14300	19.7	1590	179	0.025	0.29	7.2	--	1920	< 0.244 ND	< 0.036 ND	154	0.23	15.4	37.2
CO062	CR-IS-CO062-01_09132012	N	9/13/2012	6990	0.29	< 0.088 ND	45.8	0.62	0.4	1450	7.9	2.8	11.7	11800	13.7	1570	177	0.023	0.23	5.6	--	1830	0.37	< 0.036 ND	28.4	< 0.206 ND	16.8	28.7
CO062	CR-IS-CO062-02_09132012	FD	9/13/2012	7990	0.35	< 0.088 ND	48.9	0.62	0.44	1630	9.1	3	12.7	12800	14.9	1750	189	0.025	0.2	6.1	--	1960	0.39	< 0.036 ND	31.4	< 0.206 ND	17.7	30
CO062	CR-IS-CO062-03_09132012	FD	9/13/2012	7210	0.3	0.15	51.4	0.68	0.45	1610	8.4	3.2	13.3	13000	15.3	1710	201	0.024	0.26	6	--	1900	**0.58**	< 0.036 ND	29.1	< 0.206 ND	17.5	29.6
CO066	CR-MIS-CO066-01_02092011	N	2/9/2011	5670	< 0.095 ND	4.1	42.8	0.6	0.25	1830	6.7	3.4	12.7	10600	19.5	1750	148	0.023 0.024	0.3	5.8	--	1690	< 0.244 ND	< 0.036 ND	139	< 0.206 ND	13	32.4
CO066	CR-MIS-CO066-01_02092011FD	FD	2/9/2011	6570	< 0.095 ND	4.5	49.8	0.7	0.31	1990	8.1	3.7	15	12400	22.5	1760	170	--	0.32	6.9	--	1970	< 0.244 ND	< 0.036 ND	155	< 0.206 ND	14.9	37.4
CO070	FTBL-IS-071-060916	N	6/9/2016	--	0.998 J	5.02	--	1.3	--	--	--	--	19.6	--	65.0 J	--	--	--	--	10	--	--	--	--	--	--	--	61.7
CP043	FTBL-IS-066-062316	N	6/23/2016	--	0.136 U	5.81	--	1.59	--	--	--	--	23.5	--	25.8	--	--	--	--	16.8	--	--	--	--	--	--	--	98.2
CP047	FTBL-IS-068-070616	N	7/6/2016	--	0.143 J	6.01	--	1.54	--	--	--	--	17.1	--	21.1	--	--	--	--	13.2	--	--	--	--	--	--	--	74.7
CP050	FTBL-IS-069-062216	N	6/22/2016	--	0.677 J	7.79	--	1.13	--	--	--	--	22.6	--	48.9	--	--	--	--	8.84	--	--	--	--	--	--	--	58.2
CP054	CR-MIS-CP054-01_02082011	N	2/8/2011	6730	0.32	5.8	69.3	0.94	0.47	3960	8.6	5	20.6	16800	40.8	2870	223	0.026	0.4	8.7	--	1960	< 0.244 ND	< 0.036 ND	199	0.39	16.8	55.1
CP057	CR-MIS-CP057-01_02082011	N	2/8/2011	6550	< 0.095 ND	4.7	64.3	0.92	0.42	4820	7.9	5.1	18.3	16000	24.1	3560	223	0.023	0.38	9.3	--	2010	< 0.244 ND	< 0.036 ND	207	0.38	16	53.8
CP064	FTBL-IS-070-061016	N	6/10/2016	--	0.209 J	6.37	--	1.06	--	--	--	--	22.3	--	33.2	--	--	--	--	11.3	--	--	--	--	--	--	--	66.7
CP073	FTBL-IS-186-012317	N	1/23/2017	--	0.532 J	--	--	--	--	--	--	--	--	--	61.4	--	--	--	--	--	--	--	--	--	--	--	--	--
CQ048	FTBL-IS-063-070616	N	7/6/2016	--	0.163 J	5.76	--	1.31	--	--	--	--	20.6	--	28.9	--	--	--	--	12.5	--	--	--	--	--	--	--	79.8
CQ059	FTBL-IS-064-061016	N	6/10/2016	--	0.252 J	5.63	--	1.16	--	--	--	--	22	--	31.4	--	--	--	--	13.6	--	--	--	--	--	--	--	77.7
CQ072	CR-IS-CQ072-01_09132012	N	9/13/2012	7180	0.48	< 0.088 ND	56.9	0.64	0.59	4710	7.2	3.3	15.9	14700	33.6	3650	**236**	0.021	0.25	6.7	--	1750	**0.55**	< 0.036 ND	77.4	< 0.206 ND	17.4	39.9
CR023	FTBL-IS-111-071116	N	7/11/2016	--	0.128 J	5.68	--	1.32	--	--	--	--	18.1	--	23.2 J	--	--	--	--	9.02	--	--	--	--	--	--	--	59.6
CR025	FTBL-IS-112-071116	N	7/11/2016	--	0.165 J	6.03	--	1.41	--	--	--	--	20.2	--	27.9 J	--	--	--	--	9.55	--	--	--	--	--	--	--	62.2
CR045	FTBL-IS-056-070716	N	7/7/2016	--	0.313 J	6.73	--	1.06	--	--	--	--	24.3	--	36.4	--	--	--	--	11	< 0.0050 U	--	--	--	--	--	--	74.3
CR051	CR-MIS-CR051-01_02092011	N	2/9/2011	6320	< 0.095 ND	4.3	67.5	0.89	0.69	6740	8	5.3	**165**	16800	37.8	4430	**245**	0.027	0.44	10.3	--	2020	< 0.244 ND	< 0.036 ND	227	0.36	16.7	75.1
CR052	FTBL-IS-058-062116	N	6/21/2016	--	0.707 J	5.69	--	1.15	--	--	--	--	22.8	--	83	--	--	--	--	13.1	--	--	--	--	--	--	--	86.3
CR054	FTBL-IS-059-062116	N	6/21/2016	--	0.199 J	4.86	--	1.07	--	--	--	--	18.7	--	33	--	--	--	--	11.5	--	--	--	--	--	--	--	76.5
CR061	FTBL-IS-061-061016	N	6/10/2016	--	0.508 J	5.27	--	1.07	--	--	--	--	22.7	--	44.8	--	--	--	--	11.5	--	--	--	--	--	--	--	72.1
CR064	FTBL-IS-062-061016	N	6/10/2016	--	0.394 J	5.46	--	0.947	--	--	--	--	18.7	--	38.2	--	--	--	--	9.55	--	--	--	--	--	--	--	59.3
CS049	FTBL-IS-057-070716	N	7/7/2016	--	0.159 J	4.89	--	1.1	--	--	--	--	16.5	--	26.4	--	--	--	--	9.35	< 0.0050 U	--	--	--	--	--	--	63.4
CS056	FTBL-IS-060-062016	N	6/20/2016	--	0.323 J	5.48	--	1.22	--	--	--	--	22.4	--	45.4	--	--	--	--	13.9	--	--	--	--	--	--	--	87.3
CS059	CR-IS-CS059-01_09132012	N	9/13/2012	7150	0.43	< 0.088 ND	55.9	0.65	0.58	4240	7.4	3.5	16.1	14600	35.5	3570	**236**	0.022	0.26	6.9	--	1680	**0.58**	< 0.036 ND	84.8	< 0.206 ND	18.4	41.7
CT047	FTBL-IS-048-070716	N	7/7/2016	--	0.276 J	6.04	--	1.08	--	--	--	--	25.9	--	33.8	--	--	--	--	10.9	< 0.0050 U	--	--	--	--	--	--	60.4
CT052	FTBL-IS-051-062116	N	6/21/2016	--	0.330 J	5.29	--	1.18	--	--	--	--	21.9	--	51.9	--	--	--	--	12.3	--	--	--	--	--	--	--	89
CT053	CR-MIS-CT053-01_02102011	N	2/10/2011	5250	0.12	< 0.088 ND	50.1	0.72	0.5	4500	6.2	3.6	19.9	11700	40	3020	179	0.021	0.35	7.4	--	1500	< 0.244 ND	< 0.036 ND	132	< 0.206 ND	11.1	53.2
CT062	FTBL-IS-054-061016	N	6/10/2016	--	0.364 J	5.12	--	1.07	--	--	--	--	20.3	--	56.6	--	--	--	--	11.4	--	--	--	--	--	--	--	68.2
CT065	FTBL-IS-187-012317-A	N	1/23/2017	--	0.725 J	5.7	--	1.02	--	--	--	--	22.1	--	80.2	--	--	--	--	10.1	--	--	--	--	--	--	--	63.5
CT065	FTBL-IS-187-012317-B	N	1/23/2017	--	0.419 J	6.11	--	1.05	--	--	--	--	21.7	--	67.4	--	--	--	--	9.89	--	--	--	--	--	--	--	60
CT065	FTBL-IS-187-012317-C	N	1/23/2017	--	0.762 J	5.98	--	1.08	--	--	--	--	24.4	--	**138**	--	--	--	--	10	--	--	--	--	--	--	--	65
CU048	FTBL-IS-049-070716	N	7/7/2016	--	0.248 J	5.71	--	0.949	--	--	--	--	21.6	--	34.4	--	--	--	--	9.34	< 0.0050 U	--	--	--	--	--	--	49.8
CU057	FTBL-IS-053-062016	N	6/20/2016	--	0.394 J	5.35	--	1.13	--	--	--	--	25.1	--	61.1	--	--	--	--	11.7	--	--	--	--	--	--	--	84.7
CU059	CR-MIS-CU059-01_02102011	N	2/10/2011	4250	0.21	0.31	44.1	0.65	0.43	3500	5.1	3.5	15.7	8030	43.2	2400	162	0.022	0.3	6	--	1350	< 0.244 ND	< 0.036 ND	109	< 0.206 ND	9.3	45.5
CU060	CR-MIS-CU060-01_02082011	N	2/8/2011	6550	0.11	< 0.088 ND	68	0.89	0.56	3980	8	5	21.1	16800	48.2	3400	**242**	0.022 0.022	0.4	9.1	--	2020	< 0.244 ND	< 0.036 ND	201	< 0.206 ND	17.4	63.2

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	64000	5	18	330	10	32	--	11.9	13	70	--	120	--	231	0.1	2	38	51	--	0.52	97	--	1	26.7	120
			RAL Source	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	--	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	--	Eco Benchmark	HH PCL	--	Eco Benchmark	ISM Background	Eco Benchmark
			Critical PCL	64000	15	24	8100	38	51	--	27000	370	1300	--	334	--	3800	2.1	160	840	51	--	310	97	--	5.3	75	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL	--	Eco PCL	--	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL
Location ID	Sample ID	Sample Type	Sample Date																									
CU060	CR-MIS-CU060-01_02082011FD	FD	2/8/2011	6730	0.22	0.16	70.6	0.92	0.58	4290	8.4	5.4	23.1	18000	70.6	3560	**253**	--	0.42	9.6	--	2080	< 0.244 ND	< 0.036 ND	232	< 0.206 ND	17.9	63.2
CU068	CR-MIS-CU068-01_02082011	N	2/8/2011	4680	< 0.095 ND	3.3	45.1	0.63	0.29	1750	8	3.4	12.9	16100	33	1830	159	0.018	0.35	7.2	--	1460	< 0.244 ND	< 0.036 ND	136	0.27	11.6	39.5
CU071	CR-IS-CU071-01_09132012	N	9/13/2012	6830	1	< 0.088 ND	48.8	0.63	0.52	1870	7.7	3.2	15.1	14200	101	2270	212	0.017	0.27 0.27	6.1	--	1720	**0.66**	< 0.036 ND	45.1	< 0.206 ND	17.9	36.6
CU074	FTBL-IS-055-060816	N	6/8/2016	--	0.512 J	4.62	--	0.966	--	--	--	--	21.7	--	73.6 J	--	--	--	--	9.91	--	--	--	--	--	--	--	69.2
CV050	FTBL-IS-050-070716	N	7/7/2016	--	0.263 J	5.77	--	1.01	--	--	--	--	18.4	--	32.2	--	--	--	--	9.74	< 0.0050 U	--	--	--	--	--	--	51
CV053	FTBL-IS-052-062116-A	N	6/21/2016	--	0.189 J	6.03	--	1.1	--	--	--	--	16.1 J	--	25.8 J	--	--	--	--	11.1	--	--	--	--	--	--	--	64.6
CV053	FTBL-IS-052-062116-B	N	6/21/2016	--	0.369 J	5.67	--	1.17	--	--	--	--	22.4 J	--	60.2 J	--	--	--	--	13.2	--	--	--	--	--	--	--	86.9
CV053	FTBL-IS-052-062116-C	N	6/21/2016	--	0.318 J	5.52	--	1.16	--	--	--	--	27.0 J	--	42.2 J	--	--	--	--	12.4	--	--	--	--	--	--	--	85.1
CV055	CR-IS-CV055-01_09132012	N	9/13/2012	6980	0.5	< 0.088 ND	57.2	0.6	0.66	4490	7.3	3.1	17.9	13900	33.7	3460	226	0.029	0.27	6.4	--	1690	**0.63**	< 0.036 ND	72.6	< 0.206 ND	17.1	40.8
CV063	CR-IS-CV063-01_09132012	N	9/13/2012	7140	0.7	< 0.088 ND	58.2	0.68	0.64	3700	7.6	3.3	16.7	14500	38.1	3230	**243**	0.028	0.28	6.6	--	1750	**0.56**	< 0.036 ND	73.7	< 0.206 ND	18.3	41.8
CV066	FTBL-IS-188-012317	N	1/23/2017	--	0.194 J	6.05	--	1.05	--	--	--	--	17.8	--	30.5	--	--	--	--	9.48	--	--	--	--	--	--	--	55.5
CW048	FTBL-IS-047-062316	N	6/23/2016	--	0.240 J	6.03	--	1.02	--	--	--	--	24.9	--	37.8	--	--	--	--	9.56	--	--	--	--	--	--	--	59.6
CW058	CR-MIS-CW058-01_02092011	N	2/9/2011	6840	< 0.095 ND	4.4	67.3	0.84	0.52	3950	7.6	4.6	20.7	15600	34.3	3440	**251**	0.024	0.39	8.6	--	2070	< 0.244 ND	< 0.036 ND	229	0.27	14.9	55.5
CW061	FTBL-IS-043-062016	N	6/20/2016	--	0.570 J	5.84	--	1.06	--	--	--	--	22.1	--	47.7	--	--	--	--	11.4	< 0.0050 U	--	--	--	--	--	--	76.4
CW072	CR-MIS-CW072-01_02092011	N	2/9/2011	3990	< 0.095 ND	3.3	37.2	0.53	0.25	1470	5.3	3.1	11.5	10200	17.8	1540	145	0.018	0.3	5.4	--	1300	< 0.244 ND	< 0.036 ND	165	0.25	10.4	35.2
CX044	FTBL-IS-189-012017	N	1/20/2017	--	0.271	8.02	--	1.09	--	--	--	--	25.3	--	40.7	--	--	--	--	9.36	--	--	--	--	--	--	--	70
CX055	FTBL-IS-041-062316	N	6/23/2016	--	0.194 U	5.3	--	1.1	--	--	--	--	22.5	--	33.4	--	--	--	--	11.2	--	--	--	--	--	--	--	73.4
CX063	FTBL-IS-044-062016	N	6/20/2016	--	0.219 J	5.3	--	1.06	--	--	--	--	16.6	--	30.7	--	--	--	--	10.5	0.0026 J	--	--	--	--	--	--	64.2
CX066	CR-MIS-CX066-01_02082011	N	2/8/2011	5950	< 0.095 ND	4.1	55.3	0.73	0.35	2600	7.6	4	15.8	16800	24.6	2110	192	0.021	0.32	7.9	--	1680	< 0.244 ND	< 0.036 ND	176	0.32	15.2	45.3
CY049	FTBL-IS-039-062316	N	6/23/2016	--	0.196 U	6.85	--	1.15	--	--	--	--	24	--	33.1	--	--	--	--	10.2	--	--	--	--	--	--	--	60.6
CY052	FTBL-IS-040-062316	N	6/23/2016	--	0.152 U	6.57	--	1.14	--	--	--	--	19.7	--	28	--	--	--	--	10.9	--	--	--	--	--	--	--	65.4
CY057	CR-MIS-CY057-01_02142011	N	2/14/2011	6920	< 0.095 ND	0.4	63.1	0.76	0.51	3000	7.4	4.1	19.4	13400	24.5	2890	213	0.026	0.23	8	--	2150	< 0.244 ND	< 0.036 ND	167	0.53	13.3	50
CY059	CR-MIS-CY059-01_02142011	N	2/14/2011	6160	< 0.095 ND	1.7	56.9	0.68	0.47	2350	6.7	4	17.1	9520	24.8	2180	194	0.019	0.17	7.6	--	1820	< 0.244 ND	< 0.036 ND	191	0.47	11.2	42.9
CY060	FTBL-IS-042-062016	N	6/20/2016	--	0.163 J	4.96	--	1.02	--	--	--	--	14.1	--	24.6	--	--	--	--	10	< 0.0050 U	--	--	--	--	--	--	61.9
CY065	FTBL-IS-045-061616	N	6/16/2016	--	0.203 J	5.41	--	0.953	--	--	--	--	19.2	--	31.1	--	--	--	--	9.69	< 0.0050 U	--	--	--	--	--	--	63.5
CY069	CR-MIS-CY069-01_02102011	N	2/10/2011	5680	< 0.095 ND	4.5	58.5	0.76	0.49	2830	8.9	4	17.7	14300	27.5	2360	207	0.022	0.43	8.2	--	1800	< 0.244 ND	< 0.036 ND	193	< 0.206 ND	13.4	49.6
CY070	CR-MIS-CY070-01_02152011	N	2/15/2011	4040	< 0.095 ND	< 0.088 ND	36.7	0.49	0.26	1670	11	2.8	11.2	7580	16.9	1550	133	0.022	0.38	7.9	--	1220	0.33	< 0.036 ND	107	< 0.206 ND	9.5	33.5
CY074	FTBL-IS-046-060816	N	6/8/2016	--	0.180 J	4.84	--	0.934	--	--	--	--	17.6	--	32.7 J	--	--	--	--	8.67	--	--	--	--	--	--	--	54.9
CZ054	FTBL-IS-190-012317	N	1/23/2017	--	0.175 J	7.35	--	1.01	--	--	--	--	14.5	--	21.6	--	--	--	--	9.36	--	--	--	--	--	--	--	46.3
CZ056	CR-MIS-CZ056-01_02142011	N	2/14/2011	6780	< 0.095 ND	1.2	60.5	0.74	0.59	3430	7	4.3	20.2	12500	31.7	2960	204	0.029	0.18	8	--	1960	< 0.244 ND	< 0.036 ND	202	0.47	12.2	51.3
CZ058	CR-MIS-CZ058-01_02142011	N	2/14/2011	6210	< 0.095 ND	2.3	58	0.72	0.53	2500	8.1	3.8	19.4	9400	28.2	2310	207	0.022	0.26	7.8	--	1830	< 0.244 ND	< 0.036 ND	180	0.55	11.4	45.7
CZ058	CR-MIS-CZ058-02_02142011	FD	2/14/2011	6310	< 0.095 ND	1.7	58.1	0.75	0.53	3280	6.8	3.8	18.7	9670	30.3	2340	197	0.021	0.18	7.1	--	1870	< 0.244 ND	< 0.036 ND	144	0.6	11.6	44.6
CZ058	CR-MIS-CZ058-03_02142011	FD	2/14/2011	7020	< 0.095 ND	1.2	57.1	0.73	0.53	2690	8.7	3.9	19.4	12600	30.5	2470	197	0.02	0.23	7.8	--	1990	< 0.244 ND	< 0.036 ND	175	0.52	13.3	46.1
CZ062	CR-MIS-CZ062-01_02142011	N	2/14/2011	6310	< 0.095 ND	5.8	59.2	0.73	0.56	2660	6.9	3.8	26.4	13500	28.7	2470	206	0.021	0.28	7.6	--	1920	< 0.244 ND	< 0.036 ND	164	0.47	13.7	49.5
CZ071	CR-MIS-CZ071-01_02102011	N	2/10/2011	5340	< 0.095 ND	4.7	50.1	0.7	0.33	2120	6.7	3.9	13.8	12900	**415**	1990	183	0.021	0.32	6.7	--	1670	< 0.244 ND	< 0.036 ND	173	0.26	13.3	42.4
CZ072	CR-MIS-CZ072-01_02102011	N	2/10/2011	4700	< 0.095 ND	4	48.9	0.7	0.36	1880	6.3	3.7	14.1	12000	22.8	1650	176	0.02	0.33	6.2	--	1590	< 0.244 ND	< 0.036 ND	176	< 0.206 ND	12.2	41.1
DA053	CR-IS-DA053-01_09142012	N	9/14/2012	3580	0.23	1.3	42.2	0.55	0.39	6690	4.2	2.7	11.6	9490	13.4	3090	174	0.023	0.23	4.9	--	1090	0.32	< 0.036 ND	35	< 0.206 ND	11.4	27.8
DA059	CR-MIS-DA059-01_02152011	N	2/15/2011	4650	< 0.095 ND	0.9	41.1	0.57	0.35	1400	5.8	3	15.5	10800	26.4	1250	143	0.027 0.03	0.27	5	--	1340	0.41	< 0.036 ND	118	< 0.206 ND	11.2	35.3
DA059	CR-MIS-DA059-01_02152011FD	FD	2/15/2011	5840	0.14	1.4	46	0.65	0.35	1610	6.7	3.3	17.4	9580	26.8	1480	158	--	0.31	5.8	--	1570	**0.66**	< 0.036 ND	146	< 0.206 ND	12.4	38
DA065	FTBL-IS-036-061616	N	6/16/2016	--	0.185 J	4.94	--	0.957	--	--	--	--	17.7	--	28.7	--	--	--	--	9.73	< 0.0050 U	--	--	--	--	--	--	59.8
DA068	CR-MIS-DA068-01_02102011	N	2/10/2011	3970	0.18	0.65	40	0.59	0.32	1830	5.1	3	12.7	7650	25	1590	145	0.022	0.27	5.4	--	1270	< 0.244 ND	< 0.036 ND	96.5	< 0.206 ND	9	37.4
DA069	CR-MIS-DA069-01_02102011	N	2/10/2011	3600	0.26	0.38	38.2	0.55	0.34	1560	6.3	2.9	12.1	7740	20.9	1570	153	0.02	0.33	6	--	1220	< 0.244 ND	< 0.036 ND	135	< 0.206 ND	8.5	37.3
DA070	FTBL-IS-037-061616	N	6/16/2016	--	0.158 J	4.95	--	0.967	--	--	--	--	19.4	--	31.7	--	--	--	--	9.52	--	--	--	--	--	--	--	60.7
DA074	FTBL-IS-038-060816	N	6/8/2016	--	0.224 J	5.7	--	0.96	--	--	--	--	17.4	--	38.9 J	--	--	--	--	8.62	--	--	--	--	--	--	--	55.8
DB048	FTBL-IS-034-070716	N	7/7/2016	--	0.199 J	7.2	--	1.09	--	--	--	--	24	--	37	--	--	--	--	10.2	< 0.0050 U	--	--	--	--	--	--	87.3
DB052	FTBL-IS-191-012317	N	1/23/2017	--	0.232 J	8.32	--	1.29	--	--	--	--	20.1	--	28.2	--	--	--	--	11.9	--	--	--	--	--	--	--	59.5
DB057	FTBL-IS-035-061516-A	N	6/15/2016	--	0.189 J	6.51	--	0.951	--	--	--	--	18.5	--	26.3 J	--	--	--	--	8.86	--	--	--	--	--	--	--	50.9
DB057	FTBL-IS-035-061516-B	N	6/15/2016	--	0.208 J	6.87	--	1.01	--	--	--	--	19.9	--	29.4 J	--	--	--	--	9.41	--	--	--	--	--	--	--	55
DB057	FTBL-IS-035-061516-C	N	6/15/2016	--	0.186 J	6.26	--	0.964	--	--	--	--	19.2	--	28.1 J	--	--	--	--	8.96	--	--	--	--	--	--	--	53.4
DB059	CR-MIS-DB059-01_02152011	N	2/15/2011	5270	< 0.095 ND	< 0.088 ND	47.6	0.64	0.32	2380	6.2	3.6	14.4	11900	25	2120	169	0.023	0.32	6.3	--	1540	0.51	< 0.036 ND	136	< 0.206 ND	11.5	42.6
DB061	CR-MIS-DB061-01_02142011	N	2/14/2011	7540	1.5	1.7	54.7	0.79	0.54	2060	7.7	3.6	21.6	13300	82	1870	195	0.022	0.24	6.8	--	2050	< 0.244 ND	< 0.036 ND	155	0.38	14.3	45.5
DB070	CR-MIS-DB070-01_02102011	N	2/10/2011	3940	0.25	0.42	40.2	0.67	0.32	1610	5.4	3.1	13	10300	98.9	1640	147	0.017	0.26	5.5	--	1360	< 0.244 ND	< 0.036 ND	107	< 0.206 ND	9.3	36.5
DB072	CR-MIS-DB072-01_02102011	N	2/10/2011	4500	0.2	0.58	50.7	0.8	0.41	2480	5.7	3.9	17	12000	27.7	2180	182	0.019	0.34	6.8	--	1570	< 0.244 ND	< 0.036 ND	137	< 0.206 ND	10.6	46.1
DC046	FTBL-IS-192-012017	N	1/20/2017	--	0.27	10.3	--	0.936	--	--	--	--	24.6	--	40.3	--	--	--	--	10.9	--	--	--	--	--	--	--	110
DC062	CR-MIS-DC062-01_02142011	N	2/14/2011	7370	< 0.095 ND	1.3	56	0.75	0.56	2030	7.8	3.7	26.7	13800	35.3	1860	204	0.023	0.21	6.8	--	2040	< 0.244 ND	< 0.036 ND	150	0.52	14.3	47.6
DC063	CR-MIS-DC063-01_02142011	N	2/14/2011	6890	< 0.095 ND	2.2	57.1	0.78	0.61	2030	8.2	4	47.3	11200	41.6	1820	208	0.022	0.3	7.2	--	1990	< 0.244 ND	< 0.036 ND	138	0.49	15	52.2
DC065	FTBL-IS-029-061516	N	6/15/2016	--	0.220 J	5	--	0.867	--	--	--	--	18.6	--	39.8 J	--	--	--	--	8.63	0.0025 J	--	--	--	--	--	--	52.6
DC067	CR-MIS-DC067-01_02112011	N	2/11/2011	3260	< 0.095 ND	2.6	33.6	0.45	0.24	1630	4.4	2.5	11.6	6910	25.4	1470	124	0.019	0.26	4.6	--	1120	< 0.244 ND	< 0.036 ND	145	0.22	8.2	30.6
DC074	FTBL-IS-033-060816	N	6/8/2016	--	0.239 J	6.1	--	1.05	--	--	--	--	21.2	--	41.1 J	--	--	--	--	10.4	--	--	--	--	--	--	--	66.8

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	64000	5	18	330	10	32	--	11.9	13	70	--	120	--	231	0.1	2	38	51	--	0.52	97	--	1	26.7	120
			RAL Source	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	--	Eco Benchmark	--	ISM Background	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	--	Eco Benchmark	HH PCL	--	Eco Benchmark	ISM Background	Eco Benchmark
			Critical PCL	64000	15	24	8100	38	51	--	27000	370	1300	--	334	--	3800	2.1	160	840	51	--	310	97	--	5.3	75	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL	--	Eco PCL	--	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	--	HH PCL	HH PCL	--	HH PCL	HH PCL	HH PCL
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																									
DD048	FTBL-IS-026-060716	N	6/7/2016	--	0.231 J	7.52	--	1.11	--	--	--	--	24.4	--	39.6	--	--	--	--	10.2	--	--	--	--	--	--	--	100
DD050	FTBL-IS-027-060716	N	6/7/2016	--	0.223 J	7	--	1.04	--	--	--	--	18.8	--	31.9	--	--	--	--	9.72	--	--	--	--	--	--	--	99.6
DD054	FTBL-IS-155-071416	N	7/14/2016	--	0.152 J	6.83	--	1.15	--	--	--	--	15.8	--	21.6	--	--	--	--	8.18	--	--	--	--	--	--	--	47.3
DD058	CR-MIS-DD058-01_02102011	N	2/10/2011	3950	0.21	1.5	36.3	0.58	0.31	1390	5.4	2.8	12.2	7120	20.3	1200	129	0.021	0.22	4.7	--	1240	< 0.244 ND	< 0.036 ND	120	< 0.206 ND	9.1	33.7
DD069	FTBL-IS-031-061616	N	6/16/2016	--	0.172 J	5.19	--	0.978	--	--	--	--	19.3	--	31.5	--	--	--	--	9.46	--	--	--	--	--	--	--	61.4
DD072	CR-MIS-DD072-01_02142011	N	2/14/2011	6350	0.3	0.2	55.4	0.69	0.5	2690	6.8	3.7	37.8	10200	**194**	2310	206	0.019	0.21	7.3	--	1890	< 0.244 ND	< 0.036 ND	148	0.47	12.6	49.6
DE061	FTBL-IS-028-061516	N	6/15/2016	--	0.201 J	4.78	--	0.856	--	--	--	--	20.6	--	36.5 J	--	--	--	--	8.94	--	--	--	--	--	--	--	56.4
DE065	CR-MIS-DE065-01_02112011	N	2/11/2011	4700	0.53	0.41	48.7	0.58	0.32	2590	6	3.4	14.5	10400	110	1540	193	0.022	0.36	6	--	1420	0.49	< 0.036 ND	124	< 0.206 ND	11.4	36.5
DE067	CR-MIS-DE067-01_02142011	N	2/14/2011	6420	0.13	< 0.088 ND	54.5	0.7	0.5	3070	7.3	3.9	23.9	13000	64.9	2450	202	0.019	0.23	8	--	1910	< 0.244 ND	< 0.036 ND	188	0.4	13.6	48.9
DE071	CR-MIS-DE071-01_02142011	N	2/14/2011	5720	0.4	0.3	48.1	0.63	0.41	1960	6.6	3.5	31.8	10200	**218**	2010	185	0.019 0.02	0.21	7	--	1680	< 0.244 ND	< 0.036 ND	161	0.33	11.7	41.9
DE071	CR-MIS-DE071-01_02142011FD	FD	2/14/2011	6070	2.4	0.81	52.3	0.71	0.46	2210	6.9	3.8	37.2	13900	**498**	2290	205	--	0.22	7.3	--	1830	< 0.244 ND	< 0.036 ND	167	0.36	12.3	45.5
DE072	CR-MIS-DE072-01_02142011	N	2/14/2011	5930	0.76	0.41	51.1	0.68	0.56	2260	**22**	3.7	37.8	13100	**327**	2390	193	0.015	0.61	14.8	--	1820	< 0.244 ND	< 0.036 ND	155	0.54	11.6	48.1
DF047	FTBL-IS-193-011917	N	1/19/2017	--	0.316	8.72	--	0.863	--	--	--	--	23.7	--	41.7	--	--	--	--	8.62	--	--	--	--	--	--	--	**122**
DF049	FTBL-IS-024-060716	N	6/7/2016	--	0.244 J	8.14	--	0.996	--	--	--	--	24.8	--	47	--	--	--	--	9.18	--	--	--	--	--	--	--	**142**
DF052	FTBL-IS-194-012017-A	N	1/20/2017	--	0.239	9.38 J	--	0.894	--	--	--	--	20.4	--	39.9	--	--	--	--	8.28	--	--	--	--	--	--	--	**126**
DF052	FTBL-IS-194-012017-B	N	1/20/2017	--	0.315	8.51 J	--	0.891	--	--	--	--	16.8	--	36.9	--	--	--	--	8	--	--	--	--	--	--	--	**121**
DF052	FTBL-IS-194-012017-C	N	1/20/2017	--	0.265	13.1 J	--	0.892	--	--	--	--	19.7	--	40.3	--	--	--	--	8.32	--	--	--	--	--	--	--	**122**
DF056	CR-MIS-DF056-01_02152011	N	2/15/2011	5820	< 0.095 ND	1.8	46.4	0.67	0.34	1470	7.2	3.5	15.6	11500	25.7	1390	156	0.026	0.27	5.7	--	1670	0.52	< 0.036 ND	129	< 0.206 ND	13.2	36.4
DF059	CR-IS-DF059-01_09142012	N	9/14/2012	6500	0.4	4.2	47.1	0.63	0.43	1580	7.6	3	32.5	12600	39.5	1560	185	0.022	0.19	5.3	--	1590	0.3	< 0.036 ND	32.2	< 0.206 ND	19.4	33.4
DF063	CR-MIS-DF063-01_02112011	N	2/11/2011	4900	0.11	0.29	45.2	0.63	0.33	2920	6.1	3.5	15.2	11400	43.1	1790	155	0.017	0.29	6.4	--	1450	0.37	< 0.036 ND	145	< 0.206 ND	11.4	41.9
DF066	CR-MIS-DF066-01_02142011	N	2/14/2011	5170	< 0.095 ND	1.2	46.6	0.63	0.51	1800	5.8	3.5	20.9	111	52.1	1840	174	0.021	0.2	6.1	--	1620	< 0.244 ND	< 0.036 ND	205	0.33	10.7	44.8
DF068	FTBL-IS-030-061516-A	N	6/15/2016	--	0.493 J	5	--	0.924 J	--	--	--	--	22.5	--	103 J	--	--	--	--	9.15	--	--	--	--	--	--	--	52.9
DF068	FTBL-IS-030-061516-B	N	6/15/2016	--	1.38 J	5.25	--	0.873 J	--	--	--	--	23.3	--	**211 J**	--	--	--	--	9.06	--	--	--	--	--	--	--	54.9
DF068	FTBL-IS-030-061516-C	N	6/15/2016	--	0.356 J	5.28	--	1.42 J	--	--	--	--	22.3	--	73.8 J	--	--	--	--	9.54	--	--	--	--	--	--	--	54.9
DF074	FTBL-IS-032-060816	N	6/8/2016	--	0.468 J	5.25	--	0.972	--	--	--	--	26.3	--	**151 J**	--	--	--	--	9.84	--	--	--	--	--	--	--	62.5
DG050	FTBL-IS-025-060716	N	6/7/2016	--	1.39 J	7.68	--	0.956	--	--	--	--	35	--	**376**	--	--	--	--	11.1	--	--	--	--	--	--	--	120
DG064	CR-MIS-DG064-01_02112011	N	2/11/2011	5420	< 0.095 ND	0.36	50	0.65	0.37	2020	6.9	3.8	16	12400	28.8	1760	170	0.021	0.38	6.6	--	1630	**0.58**	< 0.036 ND	100	< 0.206 ND	13.4	41
DG065	FTBL-IS-021-060716	N	6/7/2016	--	0.249 J	6.05	--	1.12	--	--	--	--	19.4	--	42.5	--	--	--	--	9.93	--	--	--	--	--	--	--	55.5
DG067	CR-MIS-DG067-01_02152011	N	2/15/2011	4800	< 0.095 ND	0.23	45	0.6	0.32	1820	6.6	3.8	16.4	12100	29.6	1690	164	0.023	0.38	6.5	--	1540	0.33	< 0.036 ND	110	< 0.206 ND	12.4	39.8
DG070	CR-MIS-DG070-01_02112011	N	2/11/2011	5070	**14.1**	0.88	38.5	0.62	0.3	1470	5.6	3.3	17.2	10000	**5030**	1480	136	0.021	0.23	5.9	--	1450	< 0.244 ND	< 0.036 ND	118	< 0.206 ND	10.5	35.8
DG072	CR-MIS-DG072-01_02112011	N	2/11/2011	4920	0.33	0.41	39.6	0.64	0.29	1630	5.8	3.2	17.5	7980	69.2	1550	141	0.019	0.23	5.6	--	1450	< 0.244 ND	< 0.036 ND	101	< 0.206 ND	10.2	37.2
DH050	FTBL-IS-195-011917	N	1/19/2017	--	0.309	8.21	--	0.887	--	--	--	--	22.2	--	35.3	--	--	--	--	11.2	--	--	--	--	--	--	--	90.8
DH055	CR-MIS-DH055-01_02102011	N	2/10/2011	4510	< 0.095 ND	4.3	49.3	0.72	0.39	6850	5.6	3.7	14.6	12200	23	3170	191	0.02	0.36	6.8	--	1430	< 0.244 ND	< 0.036 ND	158	0.28	11.9	48.9
DH058	FTBL-IS-196-011917	N	1/19/2017	--	0.463	8.17	--	1.02	--	--	--	--	19.1	--	30.5	--	--	--	--	9.18	--	--	--	--	--	--	--	49.1
DH061	FTBL-IS-197-011917	N	1/19/2017	--	0.254	6.21	--	0.964	--	--	--	--	18.4	--	29.9	--	--	--	--	8.67	--	--	--	--	--	--	--	55.6
DH068	CR-MIS-DH068-01_02142011	N	2/14/2011	5820	< 0.095 ND	0.59	48.6	0.62	0.41	1880	6.1	3.5	10.1	12500	26.3	2010	176	0.016 0.016	0.13	6.5	--	1840	< 0.244 ND	< 0.036 ND	144	0.39	11.1	27.8
DH068	CR-MIS-DH068-01_02142011FD	FD	2/14/2011	5820	< 0.095 ND	1.3	53	0.66	0.45	1940	6.4	3.6	10.4	9260	27.5	2030	190	--	0.14	6.9	--	1900	< 0.244 ND	< 0.036 ND	161	0.41	11.2	27.9
DH072	FTBL-IS-022-060816	N	6/8/2016	--	0.526 J	6.32	--	0.938	--	--	--	--	25.7	--	**132 J**	--	--	--	--	9.07	--	--	--	--	--	--	--	52.6
DH072	FTBL-IS-022-110716R	N	11/7/2016	--	--	--	--	--	--	--	--	--	--	--	**128**	--	--	--	--	--	--	--	--	--	--	--	--	--
DI054	CR-MIS-DI054-01_02102011	N	2/10/2011	4360	0.29	1.2	44.1	0.54	0.32	3260	5.5	3.7	10.9	10100	19	1900	157	0.017	0.29	7.4	--	1410	< 0.244 ND	< 0.036 ND	139	< 0.206 ND	10.5	61.9
DI069	CR-MIS-DI069-01_02142011	N	2/14/2011	5620	< 0.095 ND	1.5	46.7	0.62	0.42	1730	6.3	3.6	23.5	11300	44	1760	162	0.018	0.17	6.4	--	1740	< 0.244 ND	< 0.036 ND	153	< 0.206 ND	10.9	40
DI069	CR-MIS-DI069-02_02142011	FD	2/14/2011	5420	< 0.095 ND	1.6	46.2	0.62	0.4	1750	6	3.4	17.7	8740	32.9	1760	161	0.018	0.19	6.2	--	1680	< 0.244 ND	< 0.036 ND	169	0.38	10.6	37.4
DI069	CR-MIS-DI069-03_02142011	FD	2/14/2011	5270	< 0.095 ND	1.1	46.1	0.6	0.42	1660	5.9	3.2	17.3	8870	33.4	1660	160	0.016	0.18	6.1	--	1660	< 0.244 ND	< 0.036 ND	126	0.29	10.6	37.3
DI070	CR-MIS-DI070-01_02112011	N	2/11/2011	4120	0.12	0.52	37.2	0.56	0.29	1450	5.3	2.9	14.5	7390	54.9	1410	127	0.017 0.017	0.25	5	--	1360	< 0.244 ND	< 0.036 ND	114	< 0.206 ND	8.8	35.1
DI070	CR-MIS-DI070-01_02112011FD	FD	2/11/2011	3900	0.095	0.51	37.1	0.53	0.28	1440	4.9	2.7	14	7210	45.9	1400	124	--	0.23	4.9	--	1350	< 0.244 ND	< 0.036 ND	105	< 0.206 ND	8.6	34.2
DI073	FTBL-IS-023-060816	N	6/8/2016	--	0.456 J	4.68	--	0.963	--	--	--	--	20	--	93.4 J	--	--	--	--	7.84	--	--	--	--	--	--	--	46.1
DJ051	FTBL-IS-017-060616	N	6/6/2016	--	0.354 J	8.35	--	0.932	--	--	--	--	29.1	--	44.3	--	--	--	--	10.7	--	--	--	--	--	--	--	77.6
DJ063	CR-IS-DJ063-01_09142012	N	9/14/2012	6090	0.22	3.2	52	0.61	0.37	6500	6.6	3.1	15	12700	23	2840	192	0.019	0.18	5.6	--	1530	< 0.244 ND	< 0.036 ND	48	< 0.206 ND	17.7	32.9
DJ071	CR-MIS-DJ071-01_02112011	N	2/11/2011	5470	0.25	< 0.088 ND	43.6	0.7	0.25	1990	6.3	3.2	13	12100	28.5	1740	144	0.016	0.26	6.3	--	1600	< 0.244 ND	< 0.036 ND	140	< 0.206 ND	11.3	38.5
DJ071	CR-MIS-DJ071-02_02112011	FD	2/11/2011	3700	0.17	0.66	34.9	0.56	0.23	1490	5.4	2.9	11.6	10000	23.9	1340	119	0.015	0.28	5.3	--	1260	0.32	< 0.036 ND	108	< 0.206 ND	8.5	33.2
DJ071	CR-MIS-DJ071-03_02112011	FD	2/11/2011	5580	0.18	0.54	49.6	0.75	0.26	2020	6.9	3.5	14.3	12100	27.3	1830	161	0.015	0.35	6.8	--	1760	< 0.244 ND	< 0.036 ND	143	< 0.206 ND	12.1	40.7
DK049	FTBL-IS-198-012017	N	1/20/2017	--	0.407	9.48	--	0.849	--	--	--	--	25.6	--	44.4	--	--	--	--	12	--	--	--	--	--	--	--	96.6
DK053	FTBL-IS-018-060616	N	6/6/2016	--	0.292 J	8.51	--	1.06	--	--	--	--	21.4	--	32.5	--	--	--	--	24.7	--	--	--	--	--	--	--	120
DK056	CR-MIS-DK056-01_02102011	N	2/10/2011	5400	0.15	1.1	51	0.63	0.46	3060	8	5	16	12600	25.9	2260	195	0.02	0.34	9.8	--	1610	0.35	< 0.036 ND	137	< 0.206 ND	13.8	73.7
DK065	CR-MIS-DK065-01_02112011	N	2/11/2011	4550	< 0.095 ND	< 0.088 ND	41.6	0.6	0.17	5630	5.1	2.9	10.7	9780	13.5	1920	132	0.015	0.31	5.4	--	1400	< 0.244 ND	< 0.036 ND	153	< 0.206 ND	10.2	36
DK065	CR-MIS-DK065-02_02112011	FD	2/11/2011	4680	< 0.095 ND	< 0.088 ND	44.4	0.64	0.19	6130	5.7	3.3	10.8	11200	14.5	2040	146	0.015	0.35	5.8	--	1460	0.27	< 0.036 ND	149	< 0.206 ND	11.6	36.8
DK065	CR-MIS-DK065-03_02112011	FD	2/11/2011	4090	< 0.095 ND	< 0.088 ND	40.8	0.59	0.18	5320	5.1	2.9	10.3	15700	13.6	1920	135	0.016	0.3	5.2	--	1360	0.28	< 0.036 ND	164	< 0.206 ND	10.4	34.5
DK069	FTBL-IS-019-060716	N	6/7/2016	--	0.652 J	6.11	--	1.02	--	--	--	--	22.1	--	**189**	--	--	--	--	8.61	--	--	--	--	--	--	--	55

Table 6-2
ISM Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI

Location ID	Sample ID	Sample Type	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
			RAL	**64000**	**5**	**18**	**330**	**10**	**32**	--	**11.9**	**13**	**70**	--	**120**	--	**231**	**0.1**	**2**	**38**	**51**	--	**0.52**	**97**	--	**1**	**26.7**	**120**
			RAL Source	**HH PCL**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	--	**ISM Background**	**Eco Benchmark**	**Eco Benchmark**	--	**Eco Benchmark**	--	**ISM Background**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**HH PCL**	--	**Eco Benchmark**	**HH PCL**	--	**Eco Benchmark**	**ISM Background**	**Eco Benchmark**
			Critical PCL	**64000**	**15**	**24**	**8100**	**38**	**51**	--	**27000**	**370**	**1300**	--	**334**	--	**3800**	**2.1**	**160**	**840**	**51**	--	**310**	**97**	--	**5.3**	**75**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	--	**HH PCL**	**HH PCL**	**HH PCL**	--	**Eco PCL**	--	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	--	**HH PCL**	**HH PCL**	--	**HH PCL**	**HH PCL**	**HH PCL**
DK069	FTBL-IS-019-110716R	N	11/7/2016	--	--	--	--	--	--	--	--	--	--	--	40.6	--	--	--	--	--	--	--	--	--	--	--	--	--
DK074	FTBL-IS-020-060816	N	6/8/2016	--	2.64 J	5.2	--	0.858	--	--	--	--	26	--	**754 J**	--	--	--	--	8.73	--	--	--	--	--	--	--	47.8
DL071	CR-MIS-DL071-01_02102011	N	2/10/2011	3790	0.13	0.47	35.7	0.55	0.19	1720	4.8	2.6	9.1	6680	15.2	1310	114	0.015	0.21	4.8	--	1280	< 0.244 ND	< 0.036 ND	105	< 0.206 ND	8.3	28.8
DM051	FTBL-IS-013-060616	N	6/6/2016	--	0.453 J	9.43	--	0.865	--	--	--	--	32.2	--	65.9	--	--	--	--	11	--	--	--	--	--	--	--	93.7
DM051	FTBL-IS-013-111016R	N	########	--	--	8.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DM053	FTBL-IS-014-060616	N	6/6/2016	--	0.448 J	8.67	--	0.911	--	--	--	--	38.5	--	70	--	--	--	--	14.8	--	--	--	--	--	--	--	112
DN062	CR-IS-DN062-01_09142012	N	9/14/2012	7600	0.27	3.8	57.5	0.67	0.46	4320	10.5	3.5	15.7	15400	24.5	3060	214	0.016	0.21	7.1	--	2120	< 0.244 ND	< 0.036 ND	67.8	< 0.206 ND	23.1	52.1
DN072	FTBL-IS-015-060716	N	6/7/2016	--	0.187 J	5.79	--	0.974	--	--	--	--	17	--	52.9	--	--	--	--	9.35	--	--	--	--	--	--	--	57
DO066	CR-IS-DO066-01_09122012	N	9/12/2012	8170	0.2	3.8	119	0.88	0.43	35300	5.7	4.2	16.6	12200	16.3	7560	**401**	0.043	0.12	7.2	--	1900	**0.56**	< 0.036 ND	44.5	< 0.206 ND	14.8	38
DO074	FTBL-IS-016-060716	N	6/7/2016	--	0.180 J	5.04	--	0.877	--	--	--	--	14.1	--	27.3	--	--	--	--	9.32	--	--	--	--	--	--	--	59.2
DP051	FTBL-IS-199-012017	N	1/20/2017	--	0.608	6.85	--	0.694	--	--	--	--	24.6	--	89.4	--	--	--	--	10.1	--	--	--	--	--	--	--	52
DR059	CR-IS-DR059-01_09122012	N	9/12/2012	3860	0.3	3.1	48.6	0.43	0.41	2530	5.1	2.5	14.4	8190	18.2	1610	187	0.026	0.24	5	--	1070	0.33	< 0.036 ND	16	< 0.206 ND	11.3	23.6
DR059	CR-IS-DR059-02_09122012	FD	9/12/2012	7120	0.36	0.8	48.5	0.51	0.47	2000	7.8	2.8	15.2	11200	26.9	1970	181	0.029	0.26	6.1	--	1710	**0.57**	< 0.036 ND	29.6	< 0.206 ND	15.4	28.7
DR059	CR-IS-DR059-03_09122012	FD	9/12/2012	3880	0.3	2.9	47	0.43	0.41	1980	5.3	2.5	14.6	8440	18.9	1540	178	0.028	0.24	5	--	1050	0.37	< 0.036 ND	16.1	< 0.206 ND	11.7	24.3
DR063	CR-MIS-DR063-01_02112011	N	2/11/2011	6830	< 0.095 ND	4.4	61.6	0.67	0.27	30200	6.9	3.5	15.3	11600	16	6860	190	0.027	0.21	7	--	1920	< 0.244 ND	< 0.036 ND	168	0.3	12.4	38.6
DS053	FTBL-IS-200-011917	N	1/19/2017	--	0.322	8.15	--	0.85	--	--	--	--	19.3	--	44.8	--	--	--	--	9.87	--	--	--	--	--	--	--	48.6
DT051	CR-MIS-DT051-01_02102011	N	2/10/2011	6440	0.28	1.1	59	0.51	0.29	30400	5.6	2.5	13.3	6480	28.5	4770	130	0.027	< 0.074 ND	5.4	--	1600	< 0.244 ND	< 0.036 ND	115	< 0.206 ND	9.2	30.8
DV051	CR-IS-DV051-01_09142012	N	9/14/2012	4510	1.9	2.3	54.2	0.4	0.37	5550	5.3	2.8	18.3	8180	**132**	2070	164	0.021	0.2 0.2	6	--	1240	**0.55**	< 0.036 ND	23.3	< 0.206 ND	12.8	28.3
DV055	FTBL-IS-004-060316	N	6/3/2016	--	0.314 J	7.32	--	0.91	--	--	--	--	25.4	--	51.4	--	--	--	--	10.4	--	--	--	--	--	--	--	68.4
DV057	CR-IS-DV057-01_09142012	N	9/14/2012	3690	0.32	2.7	41	0.41	0.46	1970	5.3	2.4	15.6	8250	26.1	1420	152	0.028	0.24	4.7	--	1030	0.37	< 0.036 ND	20.1	< 0.206 ND	12	27.1
DV059	FTBL-IS-007-060216	N	6/2/2016	--	0.244 J	6.95	--	0.83	--	--	--	--	21.7	--	34	--	--	--	--	9.66	--	--	--	--	--	--	--	52.1
DV062	FTBL-IS-009-060216	N	6/2/2016	--	0.243 J	5.58	--	0.793	--	--	--	--	21.8	--	35	--	--	--	--	9.17	--	--	--	--	--	--	--	56.4
DV065	FTBL-IS-011-060216	N	6/2/2016	--	0.216 J	5.35	--	0.706	--	--	--	--	17.8	--	27.5	--	--	--	--	9.28	--	--	--	--	--	--	--	50.4
DV066	CR-MIS-DV066-01_02112011	N	2/11/2011	6130	< 0.095 ND	4.4	60.6	0.59	0.46	11800	7.9	3.5	18.6	11900	27.5	4720	200	0.024	0.36	7.5	--	1850	< 0.244 ND	< 0.036 ND	207	0.29	11.9	46.6
DV066	CR-MIS-DV066-02_02112011	FD	2/11/2011	6040	< 0.095 ND	4.4	58.7	0.57	0.43	10800	7.2	3.7	18	12100	31.2	4950	200	0.027	0.33	7.3	--	1910	< 0.244 ND	< 0.036 ND	186	< 0.206 ND	12.6	41.1
DV066	CR-MIS-DV066-03_02112011	FD	2/11/2011	5550 5560	< 0.095 ND < 0.095 ND	3.5 3.8	47.9 49.9	0.45 0.51	0.35 0.38	8440 8440	5.8 6.4	2.9 3.2	14.8 15.5	10500 9620	22.2 23.8	3680 3820	156 163	0.025 0.026	0.28 0.3	6.2 6.4	--	1590 1680	< 0.244 ND < 0.244 ND	< 0.036 ND < 0.036 ND	162 184	0.22 0.3	10.1 10.9	34.7 37.5
DV068	CR-MIS-DV068-01_02112011	N	2/11/2011	6610	< 0.095 ND	5.1	57.7	0.64	0.45	8800	7.4	4.1	19.1	14000	26.9	4870	202	0.022	0.34	7.9	--	1920	< 0.244 ND	< 0.036 ND	216	0.27	13.4	43.8
DW050	FTBL-IS-002-060316	N	6/3/2016	--	0.336 J	6.68	--	0.742	--	--	--	--	32.3	--	51.8	--	--	--	--	9.57	--	--	--	--	--	--	--	61.1
DW056	FTBL-IS-005-060316	N	6/3/2016	--	0.363 J	7.41	--	0.801	--	--	--	--	27.1	--	47.3	--	--	--	--	9.73	--	--	--	--	--	--	--	59.5
DW058	FTBL-IS-006-060316	N	6/3/2016	--	0.283 J	7.41	--	0.85	--	--	--	--	26.2	--	42.4	--	--	--	--	10	--	--	--	--	--	--	--	56.6
DW061	FTBL-IS-008-060216	N	6/2/2016	--	0.279 J	6.31	--	0.875	--	--	--	--	25.8	--	45.1	--	--	--	--	10.3	--	--	--	--	--	--	--	62.9
DW064	FTBL-IS-010-060216	N	6/2/2016	--	0.272 J	7.17	--	0.922	--	--	--	--	28.1	--	52.8	--	--	--	--	11	--	--	--	--	--	--	--	64.8
DW067	FTBL-IS-012-060216	N	6/2/2016	--	0.438 J	7.41	--	0.855	--	--	--	--	29.1	--	55.5	--	--	--	--	11.4	--	--	--	--	--	--	--	65.2
DX049	FTBL-IS-001-060316	N	6/3/2016	--	0.302 J	6.05	--	1.18	--	--	--	--	29.2	--	43.9	--	--	--	--	9.94	--	--	--	--	--	--	--	57
DX053	FTBL-IS-003-060616-A	N	6/6/2016	--	0.329 J	6.52	--	0.864	--	--	--	--	22.6	--	42.8	--	--	--	--	9.64	--	--	--	--	--	--	--	59.3
DX053	FTBL-IS-003-060616-B	N	6/6/2016	--	0.391 J	6.79	--	0.916	--	--	--	--	23.2	--	40.8	--	--	--	--	10.1	--	--	--	--	--	--	--	62.5
DX053	FTBL-IS-003-060616-C	N	6/6/2016	--	0.371 J	6.79	--	0.877	--	--	--	--	20.8	--	36	--	--	--	--	9.82	--	--	--	--	--	--	--	57.6

Notes
Boldfaced results exceed the RAL (110 concentrations are boldfaced)
Concentrations shaded gray exceed the critical PCL (16 concentrations are shaded gray)

HH Human Health
J Result is an estimated value
mg/kg milligram/kilogram
N Normal (Primary sample)
ND Not Detected
RAL Residential Assessment Level
PCL Protective Concentration Level
U Analyte not detected

Arroyo ISM Sample Location IDs include: AT004, AU005, AV017, BB051, BC058, BE058, BI072, BM073, CA070, CE056, CM072, CQ072, DA053, and DN062

Table 6-3
Arroyo Soil Sample Results
Closed Castner Firing Range RI

			Analyte	**Antimony**	**Arsenic**	**Beryllium**	**Copper**	**Lead**	**Nickel**	**Zinc**
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
			RAL	**5**	**18**	**10**	**70**	**120**	**38**	**120**
			RAL Source	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**
			Critical PCL	**15**	**24**	**38**	**1300**	**334**	**840**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**Eco PCL**	**HH PCL**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-01	FTBL-SED-01-0-6-051216	N	5/12/2016	0.173 J	4.3	5.03	12.9	11.1	8.13	56.8
FTBL-SED-02	FD051216	FD	5/12/2016	0.204 J	6.18	3.04	13.9	18.5	6.58	45.8
FTBL-SED-02	FTBL-SED-02-0-6-051216	N	5/12/2016	0.228 J	6.21	3.12	13.9	20.3	6.74	45.1
FTBL-SED-02	FTBL-SED-02-0-6-051216-QA	N	5/12/2016	< 38 U	8.0 J	3.2 J	13.1 J	20.8	7.1 J	60.3
FTBL-SED-03	FTBL-SED-03-0-6-051216	N	5/12/2016	0.211 J	6.56	4.85	44.1	25.4	26.7	119
FTBL-SED-04	FTBL-SED-04-0-6-051216	N	5/12/2016	0.111 J	4.43	7.21	13	17.4	10	67.2
FTBL-SED-05	FTBL-SED-05-0-6-051216	N	5/12/2016	0.188 J	6.28	5.64	60.6	24.8	36.2	117
FTBL-SED-06	FTBL-SED-06-0-6-050616	N	5/6/2016	0.088 J	3.44	2.16	5.08	15.3	3.02	38.3 J
FTBL-SED-07	FTBL-SED-07-0-6-050616	N	5/6/2016	0.228 J	5.98	3.5	20.4	29.4	8.87	73.5 J
FTBL-SED-08	FTBL-SED-08-0-6-050616	N	5/6/2016	0.112 J	4.99	3.14	15.8	20.1	10.5	80.6 J
FTBL-SED-08	FTBL-SED-08-12-18-050616	N	5/6/2016	0.174 J	4.42	5.7	11.3	20.6	7.53	68.4 J
FTBL-SED-09	FTBL-SED-09-0-6-050616	N	5/6/2016	0.190 J	5.15	3.1	14.3	25.3	6.24	72.4 J
FTBL-SED-09	FTBL-SED-09-12-18-050616	N	5/6/2016	0.211 J	5.45	3.96	14.1	22.1	6.75	75.0 J
FTBL-SED-10	FTBL-SED-10-0-6-050616	N	5/6/2016	0.186 J	4.21	1.85	17	26.8	6.6	59.6 J
FTBL-SED-10	FTBL-SED-10-12-18-050616	N	5/6/2016	0.191 J	5.34	2.65	17.4	24.7	8.01	70.3 J
FTBL-SED-11	FTBL-SED-11-0-6-051016	N	5/10/2016	0.183 J	7	1.81	16.8	21.6	10.3	**185**
FTBL-SED-12	FD051016	FD	5/10/2016	0.214 J	8.43	1.98	28.9	29.5	16.8	**352**
FTBL-SED-12	FTBL-SED-12-0-6-051016	N	5/10/2016	0.263 J	9.13 J	2.08	32.2	36	15.3	**318**
FTBL-SED-12	FTBL-SED-12-0-6-051016-QA	N	5/10/2016	< 8.3 U	17.2 J	1.5 J	29.3	34.8	13.9 J	**309**
FTBL-SED-13	FTBL-SED-13-0-6-051016	N	5/10/2016	0.156 J	8.55	1.25	18.5	22.7	13.3	**137**
FTBL-SED-14	FTBL-SED-14-0-6-050916	N	5/9/2016	0.206 J	5.04	1.26	31.8	24.6	11.3	63.1 J
FTBL-SED-15	FTBL-SED-15-0-6-050916	N	5/9/2016	0.168 J	4.92	1.73	15.9	15.4	9.13	50.5 J
FTBL-SED-16	FTBL-SED-16-0-6-051116	N	5/11/2016	0.328 J	**60.1**	4.47	17.8	26.1	6.21	**146**
FTBL-SED-17	FTBL-SED-17-0-6-051116	N	5/11/2016	0.275 J	9.06	3.41	22.3	33.8	6.36	98.9
FTBL-SED-18	FTBL-SED-18-0-6-051116	N	5/11/2016	0.4 J	13.8	2.61	27.2	76.3	17.6	**924**
FTBL-SED-19	FTBL-SED-19-0-6-051116	N	5/11/2016	0.315 J	10.3	3.25	19.8	32.5	12.9	**257**
FTBL-SED-19	FTBL-SED-19-12-18-051116	N	5/11/2016	0.393 J	**33**	3.74	18.9	53.7	12.3	**378**
FTBL-SED-20	FTBL-SED-20-0-6-051116	N	5/11/2016	0.342 J	10.5	3.44	22.1	36.7	14.3	**271**
FTBL-SED-20	FTBL-SED-20-12-18-051116	N	5/11/2016	0.308 J	9.68	3.37	20	33.3	13.2	**247**

Table 6-3
Arroyo Soil Sample Results
Closed Castner Firing Range RI

			Analyte	Antimony	Arsenic	Beryllium	Copper	Lead	Nickel	Zinc
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
			RAL	**5**	**18**	**10**	**70**	**120**	**38**	**120**
			RAL Source	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**
			Critical PCL	**15**	**24**	**38**	**1300**	**334**	**840**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**Eco PCL**	**HH PCL**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-21	FTBL-SED-21-0-6-051016	N	5/10/2016	0.116 J	5.29	1.24	27.5	13.9	**43.3**	102 J
FTBL-SED-22	FTBL-SED-22-0-6-051016	N	5/10/2016	0.127 J	4.56	1.25	25.1	14.2	**38.8**	92.2 J
FTBL-SED-23	FTBL-SED-23-0-6-051016	N	5/10/2016	0.123 J	10.7	1.19	26.4	14.9	37	90.5 J
FTBL-SED-24	FTBL-SED-24-0-6-051016	N	5/10/2016	0.119 J	5.49	1.57	23.8	15.1	33.7	93.0 J
FTBL-SED-25	FTBL-SED-25-0-6-051016	N	5/10/2016	0.07 J	3.09	0.943	18.5	10.4	26.3	72.2
FTBL-SED-26	FTBL-SED-26-0-6-050916	N	5/9/2016	0.188 J	4.93	1.92	18.2	19.3	10	85.0 J
FTBL-SED-27	FTBL-SED-27-0-6-050916	N	5/9/2016	0.187 J	4.94	1.72	15.3	18	10.6	75.5 J
FTBL-SED-28	FTBL-SED-28-0-6-050916	N	5/9/2016	0.195 J	4.05	1.31	11	30.9	7.74	54.7 J
FTBL-SED-29	FD050916	FD	5/9/2016	0.185 J	5.21	2	12.3	13.2	8.33	54.3 J
FTBL-SED-29	FTBL-SED-29-0-6-050916	N	5/9/2016	0.125 J	4.2	1.56	10.7	11.7	6.69	44.4 J
FTBL-SED-29	FTBL-SED-29-0-6-050916-QA	N	5/9/2016	-- R	4.9	1.6 J	13	15.1	8.9 J	57.8
FTBL-SED-30	FTBL-SED-30-0-6-050916	N	5/9/2016	0.368 J	10.4	2.12	22	25.2	15.5	65.7 J
FTBL-SED-31	FTBL-SED-31-0-6-050516	N	5/5/2016	0.13 J	5.04	0.923	11.7	14.2	12	66
FTBL-SED-32	FTBL-SED-32-0-6-050516	N	5/5/2016	0.352 J	7.32	1.39	28.8	42	10.8	79.2
FTBL-SED-33	FTBL-SED-33-0-6-050516	N	5/5/2016	0.176 J	4.62	1.02	11.1	14.4	8.64	44.1
FTBL-SED-34	FD050516	FD	5/5/2016	0.156 J	5.07	1.23	11.2	14.1	10.4	56
FTBL-SED-34	FTBL-SED-34-0-6-050516	N	5/5/2016	0.135 J	5.57	1.43	7.92	11.9	6.66	57.6
FTBL-SED-34	FTBL-SED-34-0-6-050516-QA	N	5/5/2016	< 4.3 U	5.2	1.0 J	9.5	15.5	8.7	52.9
FTBL-SED-35	FTBL-SED-35-0-6-050516	N	5/5/2016	0.445 J	15.6	2.81	44.1	57.6	24.8	**190**
FTBL-SED-36	FTBL-SED-36-0-6-050316	N	5/3/2016	0.226 J	7.2	1.63	33.2 J	32.8	26.5	85.6
FTBL-SED-37	FTBL-SED-37-0-6-050316	N	5/3/2016	0.288 J	6.39	1.35	19 J	22.3	10.1	61.6
FTBL-SED-38	FTBL-SED-38-0-6-050316	N	5/3/2016	0.203 J	6.36	1.27	12.6 J	17.1	11.2	61.6
FTBL-SED-39	FTBL-SED-39-0-6-050316	N	5/3/2016	0.36 J	8.89	1.48	26 J	37.7	12.7	89.1
FTBL-SED-39	FTBL-SED-39-12-18-050316	N	5/3/2016	0.273 J	8.02	1.43	20.9 J	30.1	13.1	74.3
FTBL-SED-40	FTBL-SED-40-0-6-050316	N	5/3/2016	0.244 J	5.9	1.42	6.51 J	17.8	5.53	**129**
FTBL-SED-40	FTBL-SED-40-12-18-050316	N	5/3/2016	0.154 J	6.45	1.5	6.99 J	15.6	5.6	102
FTBL-SED-41	FTBL-SED-41-0-6-050416	N	5/4/2016	0.299 J	9.38	0.855	23.8 J	32.8	32.7	**129**

Table 6-3
Arroyo Soil Sample Results
Closed Castner Firing Range RI

			Analyte	Antimony	Arsenic	Beryllium	Copper	Lead	Nickel	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	5	18	10	70	120	38	120
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	15	24	38	1300	334	840	9900
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	Eco PCL	HH PCL	HH PCL
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-42	FTBL-SED-42-0-6-050416	N	5/4/2016	0.185 J	7.63	0.982	18.1 J	27.2	24.3	101
FTBL-SED-43	FTBL-SED-43-0-6-050416	N	5/4/2016	0.173 J	7.29	0.848	17.8 J	23.9	24.6	102
FTBL-SED-44	FTBL-SED-44-0-6-050416	N	5/4/2016	0.899 J	8.1	1.04	21.6 J	20.1	32.3	115
FTBL-SED-45	FTBL-SED-45-0-6-050416	N	5/4/2016	1.5 J	13.4	0.929	30 J	73.2	13.2	97.2
FTBL-SED-46	FTBL-SED-46-0-6-050416	N	5/4/2016	0.385 J	11.5	1.34	30.1 J	44.6	12.4	85.6
FTBL-SED-47	FTBL-SED-47-0-6-050416	N	5/4/2016	0.349 J	13.5	1.48	20.5 J	33	13.7	84.2
FTBL-SED-48	FTBL-SED-48-0-6-050416	N	5/4/2016	0.18 J	6.33	0.804	12.6 J	15.7	7.83	35.8
FTBL-SED-49	FD050416	FD	5/4/2016	0.463 J	9	0.919	21.1 J	43.6	10.5	41.8
FTBL-SED-49	FTBL-SED-49-0-6-050416	N	5/4/2016	0.47 J	9.42	0.93	16.4 J	41.4	9.39	41.7
FTBL-SED-49	FTBL-SED-49-0-6-050416-QA	N	5/4/2016	< 3.1 U	6	0.77	13.5	50.7	8.6	36.7
FTBL-SED-50	FTBL-SED-50-0-6-050416	N	5/4/2016	0.246 J	6.8	1	14.1 J	23.8	9.03	52.4
FTBL-SED-51	FTBL-SED-51-0-6-050316	N	5/3/2016	0.237 J	4.05	0.974	17.3 J	40.9	8.26	51.6
FTBL-SED-51	FTBL-SED-51-12-18-050316	N	5/3/2016	0.394 J	5.26	1.11	24.4 J	62.2	10.2	61.8
FTBL-SED-52	FTBL-SED-52-0-6-051116	N	5/11/2016	0.164 J	3.98	1.14	10.2	15.5	8.67	37.5
FTBL-SED-53	FTBL-SED-053-0-6-011817	N	1/18/2017	--	--	--	--	--	--	**186**
FTBL-SED-54	FTBL-SED-054-0-6-011817	N	1/18/2017	--	--	--	--	--	--	**271**
FTBL-SED-55	FTBL-SED-055-0-6-011817	N	1/18/2017	--	--	--	--	--	--	65.9
FTBL-SED-56	FTBL-SED-056-0-6-011817	N	1/18/2017	--	--	--	--	--	--	109
FTBL-SED-57	FTBL-SED-057-0-6-011817	N	1/18/2017	--	--	--	--	--	--	48.2
FTBL-SED-58	FTBL-SED-058-0-6-012417	N	1/24/2017	--	--	--	--	--	--	96.9
FTBL-SED-59	FTBL-SED-059-0-6-012417	N	1/24/2017	--	--	--	--	--	--	106
FTBL-SED-60	FTBL-SED-060-0-6-011817	N	1/18/2017	--	5.79	--	--	--	--	83.5
FTBL-SED-61	FTBL-SED-061-0-6-011817	N	1/18/2017	--	11	--	--	--	--	118
FTBL-SED-62	FTBL-SED-062-0-6-012417	N	1/24/2017	--	8.94	--	--	--	--	**141**
FTBL-SED-63	FTBL-SED-063-0-6-011817	N	1/18/2017	--	7.35	--	--	--	--	107
FTBL-SED-64	FTBL-SED-064-0-6-011817	N	1/18/2017	--	9.1	--	--	--	--	**166**
FTBL-SED-64	FD-011817-1	FD	1/18/2017	--	7.03	--	--	--	--	110

Table 6-3
Arroyo Soil Sample Results
Closed Castner Firing Range RI

			Analyte	Antimony	Arsenic	Beryllium	Copper	Lead	Nickel	Zinc
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
			RAL	**5**	**18**	**10**	**70**	**120**	**38**	**120**
			RAL Source	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**
			Critical PCL	**15**	**24**	**38**	**1300**	**334**	**840**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**	**Eco PCL**	**HH PCL**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-64	FTBL-SED-064-0-6-011817-QA	N	1/18/2017	--	6.2	--	--	--	--	**124 J**
FTBL-SED-65	FTBL-SED-065-0-6-011817	N	1/18/2017	--	--	--	--	--	--	118
FTBL-SED-66	FTBL-SED-066-0-6-011817	N	1/18/2017	--	--	--	--	--	--	105
FTBL-SED-67	FTBL-SED-067-0-6-012417	N	1/24/2017	--	--	--	--	--	--	103
FTBL-SED-68	FTBL-SED-068-0-6-012417	N	1/24/2017	--	--	--	--	--	--	58.4
FTBL-SED-69	FTBL-SED-069-0-6-011717	N	1/17/2017	--	--	--	--	--	--	58.8
FTBL-SED-70	FTBL-SED-070-0-6-011717	N	1/17/2017	--	--	--	--	--	--	102
FTBL-SED-71	FTBL-SED-071-0-6-011717	N	1/17/2017	--	--	--	--	--	--	120
FTBL-SED-72	FTBL-SED-072-0-6-011717	N	1/17/2017	--	--	--	--	--	--	77.7
FTBL-SED-72	FD-011717-1	FD	1/17/2017	--	--	--	--	--	--	80.6
FTBL-SED-73	FTBL-SED-073-0-6-011717	N	1/17/2017	--	--	--	--	--	--	101
FTBL-SED-74	FTBL-SED-074-0-6-012817	N	1/28/2017	0.082	4.33	1.45	5.39	22.5	5.14	64.7
FTBL-SED-75	FTBL-SED-075-0-6-012817	N	1/28/2017	0.040 U	3.38	1.24	2.79	7.02	2.39	40.4
FTBL-SED-76	FTBL-SED-076-0-6-012817	N	1/28/2017	0.058	4.34	1.84	4.7	7.73	4.12	33

Notes

Boldfaced results exceed the RAL (23 concentrations are boldfaced)

Concentrations shaded gray exceed the critical PCL (2 concentrations are shaded gray)

FD	Field Duplicate
HH	Human Health
J	Result is an estimated value
mg/kg	milligram/kilogram
N	Normal (Primary sample)
RAL	Residential Assessment Level
PCL	Protective Concentration Level
U	Analyte not detected

Table 6-4
Potential Backstop Berm Sampling Results
Closed Castner Firing Range RI Report

				Antimony	Copper	Lead	TCLP Lead	Zinc
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/L**	**mg/kg**
			RAL	**5**	**70**	**120**	**--**	**120**
			RAL Source	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**--**	**Eco Benchmark**
			Critical PCL	**15**	**1300**	**334**	**--**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**Eco PCL**	**--**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**					
FTBL-SS-B01	FTBL-SS-B01-0-12-072116	N	7/21/2016	0.271 J	6.89	39.9	--	31.7
FTBL-SS-B02	FTBL-SS-B02-0-12-072116	N	7/21/2016	0.631 J	11.6	109	--	33.5
FTBL-SS-B03	FD072116	FD	7/21/2016	0.093 U	7.54	15	--	47.2
FTBL-SS-B03	FTBL-SS-B03-0-6-072116	N	7/21/2016	0.136 J	9.48	23.6	--	45.5
FTBL-SS-B03	FTBL-SS-B03-0-6-072116-QA	N	7/21/2016	< 11 U	9.8 J	25.7	--	52.3
FTBL-SS-B04	FTBL-SS-B04-0-6-072116	N	7/21/2016	4.23 J	33	**1240**	--	49.6
FTBL-SS-B05	FTBL-SS-B05-0-6-072116	N	7/21/2016	0.313 J	13.4	61.9	--	35.4
FTBL-SS-B06	FTBL-SS-B06-0-6-072116	N	7/21/2016	0.417 J	25.2	**165**	--	50.3
FTBL-SS-B07	FTBL-SS-B07-0-12-072116	N	7/21/2016	0.146 J	8.86	24.9	--	55.5
FTBL-SS-B08	FTBL-SS-B08-0-12-072116	N	7/21/2016	0.320 J	9.72	78.9	--	41.2
FTBL-SS-B09	FTBL-SS-B09-0-6-072116	N	7/21/2016	0.201 J	27.2	53.7	--	47.9
FTBL-SS-B10	FTBL-SS-B10-0-6-072116	N	7/21/2016	0.193 J	14	43.9	--	41.4
FTBL-SS-B11	FTBL-SS-B11-0-6-072116	N	7/21/2016	0.128 J	15.8	26.1	--	58.8
FTBL-SS-B12	FTBL-SS-B12-0-6-072116	N	7/21/2016	0.193 J	14.8	55.2	--	44.2
FTBL-SS-B13	FTBL-SS-B13-0-12-041917-R	N	4/19/2017	< 0.193	8.14	8.71	--	34.8
FTBL-SS-B14	FTBL-SS-B14-0-12-041917-R	N	4/19/2017	< 0.194	7.31	6.03	--	30
FTBL-SS-B15	FTBL-SS-B15-0-6-072016	N	7/20/2016	0.159 J	11.9	17	--	48.9
FTBL-SS-B16	FTBL-SS-B16-0-6-072016	N	7/20/2016	0.093 J	8.16	8.61	--	35.5
FTBL-SS-B17	FTBL-SS-B17-0-6-072016	N	7/20/2016	0.100 J	10.6	10.6	--	41
FTBL-SS-B18	FD072016	FD	7/20/2016	0.152 U	14.2	20.2	--	42.6
FTBL-SS-B18	FTBL-SS-B18-0-6-072016	N	7/20/2016	0.126 J	16.8	25.2	--	51.6
FTBL-SS-B18	FTBL-SS-B18-0-6-072016-QA	N	7/20/2016	< 3.0 U	14.6	22.4	--	39.3
FTBL-SS-B19	FD041917	FD	4/19/2017	< 0.193	6.95	9.89	--	44.6
FTBL-SS-B19	FTBL-SS-B19-0-12-041917-R	N	4/19/2017	< 0.186	7.55	10.4	--	48.1
FTBL-SS-B19	FTBL-SS-B19-0-12-041917-R-QA	N	4/19/2017	< 16 U	6.7 J	12	--	53.8
FTBL-SS-B20	FTBL-SS-B20-0-12-041917-R	N	4/19/2017	< 0.186	12	14.4	--	51.8
FTBL-SS-B20	FTBL-SS-B20-12-24-072016	N	7/20/2016	0.089	5.24	9.6	--	44.7
FTBL-SS-B21	FTBL-SS-B21-0-6-072016	N	7/20/2016	0.102 J	7.25	11.4	--	43.5
FTBL-SS-B22	FTBL-SS-B22-0-6-072016	N	7/20/2016	0.066 J	7.5	10.5	--	42.4
FTBL-SS-B23	FTBL-SS-B23-0-6-072016	N	7/20/2016	0.124 J	9.87	13.4	--	49.1
FTBL-SS-B24	FTBL-SS-B24-0-6-072016	N	7/20/2016	0.182 J	11.2	19.9	--	51.5
FTBL-SS-B25	FTBL-SS-B25-0-12-041917-R	N	4/19/2017	< 0.189	11.8	17	--	83.4
FTBL-SS-B26	FTBL-SS-B26-0-12-041917-R	N	4/19/2017	< 0.185	11.6	20.5	--	88.8
FTBL-SS-B27	FTBL-SS-B27-0-6-071516	N	7/15/2016	0.124 J	15.1	23.0 J	--	100
FTBL-SS-B28	FTBL-SS-B28-0-6-071516	N	7/15/2016	0.122 J	13.7	19.3 J	--	86.9
FTBL-SS-B29	FTBL-SS-B29-0-6-071516	N	7/15/2016	0.127 J	17.6	25.2 J	--	97.8
FTBL-SS-B30	FTBL-SS-B30-0-6-071516	N	7/15/2016	0.137 J	16.7	26.3 J	--	77.9
FTBL-SS-B31	FTBL-SS-B31-0-12-041917-R	N	4/19/2017	< 0.189	12.2	18	--	34.9
FTBL-SS-B31	FTBL-SS-B31-12-24-041917-R	N	4/19/2017	< 0.195	10.9	19.3	--	31.3
FTBL-SS-B32	FTBL-SS-B32-0-12-041917-R	N	4/19/2017	0.215	14.5	26.6	--	36.2
FTBL-SS-B33	FTBL-SS-B33-0-6-071916	N	7/19/2016	0.116 J	15	20.0 J	--	40.4
FTBL-SS-B34	FTBL-SS-B34-0-6-071916	N	7/19/2016	0.25	18.6	33.5	--	44.5
FTBL-SS-B35	FTBL-SS-B35-0-6-071916	N	7/19/2016	0.168 J	25.6	33.7 J	--	55
FTBL-SS-B36	FTBL-SS-B36-0-6-071916	N	7/19/2016	0.157 J	13.8	27.7 J	--	40.9
FTBL-SS-B37	FTBL-SS-B37-0-12-042017-R	N	4/20/2017	**7.41**	33.7	**526**	4.66	51.2
FTBL-SS-B37	FTBL-SS-B37-12-24-042017-R	N	4/20/2017	3.49	20.9	**360**	--	46.1
FTBL-SS-B38	FTBL-SS-B38-0-12-042017-R	N	4/20/2017	1.16	27.9	**272**	--	52
FTBL-SS-B39	FTBL-SS-B39-0-6-071516	N	7/15/2016	0.374 J	24.4	52.8 J	--	66.5
FTBL-SS-B40	FTBL-SS-B40-0-6-071516	N	7/15/2016	1.51 J	26	**266 J**	--	52.9
FTBL-SS-B41	FTBL-SS-B41-0-6-071516	N	7/15/2016	0.255 J	15.3	77.3 J	--	58
FTBL-SS-B42	FD071516	FD	7/15/2016	0.353 J	23.3	110 J	--	76.6
FTBL-SS-B42	FTBL-SS-B42-0-6-071516	N	7/15/2016	0.894 J	24.1	**122 J**	--	68.8

Table 6-4
Potential Backstop Berm Sampling Results
Closed Castner Firing Range RI Report

				Antimony	Copper	Lead	TCLP Lead	Zinc
			Analyte	**Antimony**	**Copper**	**Lead**	**TCLP Lead**	**Zinc**
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/L**	**mg/kg**
			RAL	**5**	**70**	**120**	**--**	**120**
			RAL Source	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmark**	**--**	**Eco Benchmark**
			Critical PCL	**15**	**1300**	**334**	**--**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**Eco PCL**	**--**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**					
FTBL-SS-B42	FTBL-SS-B42-0-6-071516-QA	N	7/15/2016	< 3.3 U	24.4	102	--	61.8
FTBL-SS-B43	FTBL-SS-B43-0-12-042017-R	N	4/20/2017	**5.52**	27.4	**317**	--	44.8
FTBL-SS-B44	FD042017	FD	4/20/2017	**39.2**	**141**	**5600**	--	64.1
FTBL-SS-B44	FTBL-SS-B44-0-12-042017-R	N	4/20/2017	**46.8**	**212**	**6710**	151	65.9
FTBL-SS-B44	FTBL-SS-B44-0-12-042017-R-QA	N	4/20/2017	**57.5**	**348**	**12600 J**	--	86.9
FTBL-SS-B45	FD071916	FD	7/19/2016	0.957 J	24	**169 J**	--	61.6
FTBL-SS-B45	FTBL-SS-B45-0-6-071916	N	7/19/2016	0.543 J	18.7	56.0 J	--	54.7
FTBL-SS-B45	FTBL-SS-B45-0-6-071916-QA	N	7/19/2016	2.1 U	17.3	**215 J**	--	48.1
FTBL-SS-B46	FTBL-SS-B46-0-6-071916	N	7/19/2016	1.05 J	14.7	**164 J**	--	49.8
FTBL-SS-B47	FTBL-SS-B47-0-6-071916	N	7/19/2016	0.241 J	12.1	35.3 J	--	62
FTBL-SS-B48	FTBL-SS-B48-0-6-071916	N	7/19/2016	0.250 J	16.2	43.9 J	--	53.8
FTBL-SS-B49	FTBL-SS-B49-0-12-042017-R	N	4/20/2017	0.23	9.32	16.1	--	41.1
FTBL-SS-B50	FTBL-SS-B50-0-12-042017-R	N	4/20/2017	0.236	9.81	21.6	--	36.8
FTBL-SS-B50	FTBL-SS-B50-12-24-042017-R	N	4/20/2017	0.219	9.8	23.6	--	35.7
FTBL-SS-B51	FTBL-SS-B51-0-6-071816	N	7/18/2016	0.822 J	40.1	119 J	--	63.7
FTBL-SS-B52	FTBL-SS-B52-0-6-071816	N	7/18/2016	0.321 J	30.6	74.9 J	--	59.2
FTBL-SS-B53	FTBL-SS-B53-0-6-071816	N	7/18/2016	0.175 J	15.4	29.1 J	--	56.9
FTBL-SS-B54	FTBL-SS-B54-0-6-071816	N	7/18/2016	2.16 J	40.1 J	**330 J**	--	67.3
FTBL-SS-B55	FTBL-SS-B55-0-12-042017-R	N	4/20/2017	< 0.188	8.78	13.1	--	42.6
FTBL-SS-B56	FTBL-SS-B56-0-12-042017-R	N	4/20/2017	0.307	8.28	16.5	--	36.9
FTBL-SS-B57	FTBL-SS-B57-0-6-071816	N	7/18/2016	0.193 J	17.8	32.2 J	--	59.3
FTBL-SS-B58	FTBL-SS-B58-0-6-071816	N	7/18/2016	0.168 J	24	46.7 J	--	54.7
FTBL-SS-B59	FTBL-SS-B59-0-6-071816	N	7/18/2016	0.207 J	30.4	49.9 J	--	67.2
FTBL-SS-B60	FTBL-SS-B60-0-6-071816	N	7/18/2016	0.146 J	19.2	25.7 J	--	39.6
FTBL-SS-B61	FTBL-SS-B061-0-6-011617	N	1/16/2017	--	--	20.1	--	--
FTBL-SS-B62	FTBL-SS-B062-0-6-011617	N	1/16/2017	--	--	23.7	--	--
FTBL-SS-B63	FTBL-SS-B063-0-6-011617	N	1/16/2017	--	--	**262**	--	--
FTBL-SS-B64	FTBL-SS-B064-0-6-011617	N	1/16/2017	--	--	**162**	--	--
FTBL-SS-B65	FTBL-SS-B065-0-6-011617	N	1/16/2017	--	--	103	--	--
FTBL-SS-B66	FTBL-SS-B066-0-6-011617	N	1/16/2017	--	--	18.6 J	--	--
FTBL-SS-B66	FTBL-SS-B066-0-6-011617-QA	N	1/16/2017	--	--	48.8 J	--	--
FTBL-SS-B67	FTBL-SS-B067-0-6-011617	N	1/16/2017	--	--	74.8	--	--
FTBL-SS-B68	FTBL-SS-B068-0-6-011617	N	1/16/2017	--	--	34.1	--	--
FTBL-SS-B69	FTBL-SS-B069-0-6-011617	N	1/16/2017	--	--	68.3	--	--
FTBL-SS-B70	FTBL-SS-B070-0-6-011617	N	1/16/2017	--	--	59.7	--	--
FTBL-SS-B71	FTBL-SS-B071-0-6-011617	N	1/16/2017	--	--	55.9	--	--
FTBL-SS-B72	FTBL-SS-B072-0-6-011617	N	1/16/2017	--	--	**483**	--	--
FTBL-SS-B73	FTBL-SS-B073-0-6-011717	N	1/17/2017	--	--	86.4	--	--
FTBL-SS-B74	FTBL-SS-B074-0-6-011717	N	1/17/2017	--	--	**253**	--	--
FTBL-SS-B75	FTBL-SS-B075-0-6-011717	N	1/17/2017	--	--	**2430**	--	--

Notes

Boldface location IDs indicate sample locations collected from the berm materials
Boldfaced concentrations exceed the RAL (28 concentrations are boldfaced)
Concentrations shaded gray exceed the critical PCL (11 concentrations are shaded gray)

HH	Human Health
J	Result is an estimated value
mg/kg	milligram/kilogram
mg/L	milligram/liter
N	Normal (Primary sample)
RAL	Residential Assessment Level
PCL	Protective Concentration Level
U	Analyte not detected

Table 6-5
Surface Water Sampling Results (Seeps)
Closed Castner Firing Range RI Report

			Analyte	Dissolved Antimony	Total Antimony	Dissolved Arsenic	Total Arsenic	Dissolved Beryllium	Total Beryllium	Dissolved Copper	Total Copper	Dissolved Lead	Total Lead	Dissolved Nickel	Total Nickel	Dissolved Zinc	Total Zinc
			Result Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
			Surface Water RAL/PCL	199	199	28.5	28.5	94.3	94.3	33,100	33,100	1,000	1,000	11,300	11,300	201,000	201,000
			Surface Water RAL/PCL Source	Contact Recreation	Contact Recreation	Contact Recreation	Contact Recreation	Contact Recreation	Contact Recreation	Contact Recreation	Contact Recreation	Cal EPA	Cal EPA	Contact Recreation	Contact Recreation	Contact Recreation	Contact Recreation
Location ID	**Sample ID**	**Sample Type**	**Sample Date**														
FTBL-SP-01	FTBL-SP-01-082416	N	8/24/2016	1.37	1.05	1.9	2	0.011 J	0.022	6.54	4.82	0.283	0.832	1.23	1.11	--	--
FTBL-SP-03	FTBL-SP-03-061516	N	6/15/2016	0.117	0.801	1.5	1.5	2.24	1.71	1.36	2	0.623	0.525	1.15	1.78	2.4	14.5
FTBL-SP-03	FTBL-SP-03-082916	N	8/29/2016	0.46	0.429	0.6	0.7	2.85	3.03	2.49	2.7	0.074	0.117	1.07	1.08	--	--
FTBL-SP-03	FTBL-SP-03-082916-QA	N	8/29/2016	1.2 J	< 6.0 U	< 10 U	< 10 U	2.8 J	3.1 J	1.9 J	2.0 J	< 5.0 U	< 5.0 U	< 40 U	< 40 U	< 20 U	< 20 U
FTBL-SP-05	FD082916	FD	8/29/2016	0.504	0.436	0.7	0.6	2.57	2.95	2.48	2.81	0.095	0.127	1.12	1.13	--	--
FTBL-SP-05	FTBL-SP-05-061716	N	6/17/2016	0.35	0.086	1.3	2.5	0.011 J	0.25	0.89	3.96	0.193	6.8	0.79	1.43	5	23
FTBL-SP-05	FTBL-SP-05-082916	N	8/29/2016	0.649	0.39	0.9	0.9	0.008 J	0.011 J	1.88	1.67	0.104	0.109	1.02	0.92	--	--
FTBL-SP-07	FTBL-SP-07-090116	N	9/1/2016	0.608	0.347	1	0.9	< 0.020 U	0.007 J	3.09	2.27	0.07	0.069	1.11	0.95	6.01	3.62

Notes

FD	Field Duplicate
J	Result is an estimated value
N	Normal (Primary sample)
ug/l	micrograms per liter
RAL	Residential Assessment Level
PCL	Protective Concentration Level
U	Analyte not detected

RAL/PCL based on the Texas Risk Reduction Program Tier 1 Contact Recreation Water PCL

A Contact Recreation PCL is not available for lead. Therefore, the lead screening level is based on a California EPA cancer toxicity value and calculated using the RAIS Preliminary Remediation Goals (PRGs) Calculator for a recreator.

Table 6-6
Soil Boring Sample Results - Explosives
Closed Castner Firing Range RI Report

			Analyte	1,3,5-Trinitrobenzen	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluen	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluen	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			RAL	9	0.073	8	6	5	11	9.9	12	11	22	43	34	6.7	16	100	12
			RAL Source	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark	Eco Benchmark	HH PCL	Eco Benchmark	HH PCL	HH PCL	HH PCL	Eco Benchmark	Eco Benchmark	Eco Benchmark
			Critical PCL	2000	6.7	33	6.9	6.9	11	21	670	11	270	43	34	6.7	1600	130	150
			Critical PCL Source	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL	HH PCL
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																
FTBL-SB01	FD-020717	FD	2/7/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
FTBL-SB01	FTBL-SB-01-0.5-2-020717	N	2/7/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
FTBL-SB01	FTBL-SB-01-0-0.5-020717	N	2/7/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	0.010 NJ	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB01	FTBL-SB-01-0-0.5-020717 QA	N	2/7/2017	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 1 U	< 0.1 U	< 1 U	< 0.1 UJ
FTBL-SB01	FTBL-SB-01-4-6-020717	N	2/7/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB01D	FTBL-SB-01D-0.5-2-020717	N	2/7/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB01D	FTBL-SB-01D-0-0.5-020717	N	2/7/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	0.011 NJ	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB01D	FTBL-SB-01D-4-6-020717	N	2/7/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB02	FD-020817	FD	2/8/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
FTBL-SB02	FTBL-SB-02-0.5-2-020817	N	2/8/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB02	FTBL-SB-02-0-0.5-020817	N	2/8/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.041 U	0.011 NJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
FTBL-SB02	FTBL-SB-02-4-5.5-020817	N	2/8/2017	< 0.081 U	< 0.041 U	0.029 NJ	0.057 NJ	< 0.021 U	< 0.021 U	< 0.021 U	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
FTBL-SB03	FTBL-SB-03-0-0.5-020817	N	2/8/2017	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	0.019 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	2.2 J	< 0.020 U	< 0.20 U	< 0.080 U
FTBL-SB03	FTBL-SB-03-28-30-020917	N	2/9/2017	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.092 UJ	< 0.021 U	< 0.21 U	< 0.082 U
FTBL-SB03	FTBL-SB-03-6-8-020817	N	2/8/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	0.020 NJ	< 0.021 U	< 0.041 U	0.074 J	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U

Notes

FD	Field Duplicate
HH	Human Health
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
J	Result is an estimated value
ND	Not Detected
Notes	Normal (Primary sample)
mg/kg	milligram/kilogram
R	Result was rejected during data validation
RAL	Residential Assessment Level
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
PCL	Protective Concentration Level
U	Analyte not detected

Table 6-7
Soil Boring Sample Results - Inorganics and Perchlorate
Closed Castner Firing Range RI Report

				Antimony	Arsenic	Beryllium	Copper	Iron	Lead	Nickel	Perchlorate	Zinc
			Result Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
			RAL	**5**	**18**	**10**	**70**		**120**	**38**	**51**	**120**
			RAL Source	**Eco Benchmark**	**Eco Benchmark**	**Eco Benchmar**	**Eco Benchmark**		**Eco Benchmark**	**Eco Benchmark**	**HH PCL**	**Eco Benchmark**
			Critical PCL	**15**	**24**	**38**	**1300**		**334**	**840**	**51**	**9900**
			Critical PCL Source	**HH PCL**	**HH PCL**	**HH PCL**	**HH PCL**		**Eco PCL**	**HH PCL**	**HH PCL**	**HH PCL**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**									
FTBL-SB01	FD-020717	FD	2/7/2017	0.242	4.88	0.988	14.6	--	31.8	7.9	--	42.8
FTBL-SB01	FTBL-SB-01-0.5-2-020717	N	2/7/2017	0.257	5.44	0.932	15.3	--	33.3	8	--	45.8
FTBL-SB01	FTBL-SB-01-0-0.5-020717	N	2/7/2017	0.295	5.48	0.898	20.9 J	--	50.3	8.88	--	57.4
FTBL-SB01	FTBL-SB-01-0-0.5-020717 QA	N	2/7/2017	0.65 J	5.0 J	0.80 J	42.0 J	--	50.4 J	7.5 J	--	47.1
FTBL-SB01	FTBL-SB01-0-2-020717	N	2/7/2017	--	--	--	--	13100	--	--	--	--
FTBL-SB01	FTBL-SB-01-4-6-020717	N	2/7/2017	0.141	3.75	1.04	10.4	--	13	8.85	--	41.9
FTBL-SB01D	FTBL-SB-01D-0.5-2-020717	N	2/7/2017	0.292	6.3	1.03	16.8	--	28.5	10.1	--	90.4
FTBL-SB01D	FTBL-SB-01D-0-0.5-020717	N	2/7/2017	0.326	6.46	1.05	21.5	--	38.2	8.92	--	51.6
FTBL-SB01D	FTBL-SB-01D-4-6-020717	N	2/7/2017	0.183	5.35	1.33	12.7	--	18.6	13.1	--	62.3
FTBL-SB02	FD-020817	FD	2/8/2017	**5.33 J**	6.44	1.34	60.2 J	--	**476 J**	6.85	--	66.1
FTBL-SB02	FTBL-SB-02-0.5-2-020817	N	2/8/2017	1.01 J	5.99	1.46	13.5 J	--	41.2 J	8.82	--	39.7
FTBL-SB02	FTBL-SB-02-0-0.5-020817	N	2/8/2017	**6.26**	3.77	1.09	37.2	--	**417**	5.63	--	55.5
FTBL-SB02	FTBL-SB-02-4-5.5-020817	N	2/8/2017	0.371	5.18	1.53	14.5	--	22	9.58	--	52.6
FTBL-SB03	FTBL-SB-03-0-0.5-020817	N	2/8/2017	0.791	3.78	3.81	8.18	--	**187**	2.69	< 0.0050 U	66.9
FTBL-SB03	FTBL-SB03-2-4-020817	N	2/8/2017	--	--	--	--	9800	--	--	--	--
FTBL-SB03	FTBL-SB03-28-30-020917	N	2/9/2017	--	--	--	--	15800	--	--	--	--
FTBL-SB03	FTBL-SB-03-28-30-020917	N	2/9/2017	0.095	4.64	3.43	5.5	--	15	4.42	--	85.4
FTBL-SB03	FTBL-SB-03-6-8-020817	N	2/8/2017	0.103	4.51	2.89	9.23	--	13.1	4.57	< 0.0050 U	46

Notes

FD	Field Duplicate
HH	Human Health
j	Result is an estmated value
mg/kg	milligram/kilogram
N	Normal (Primary sample)
RAL	Residential Assessment Level
PCL	Protective Concentration Level
U	Analyte not detected

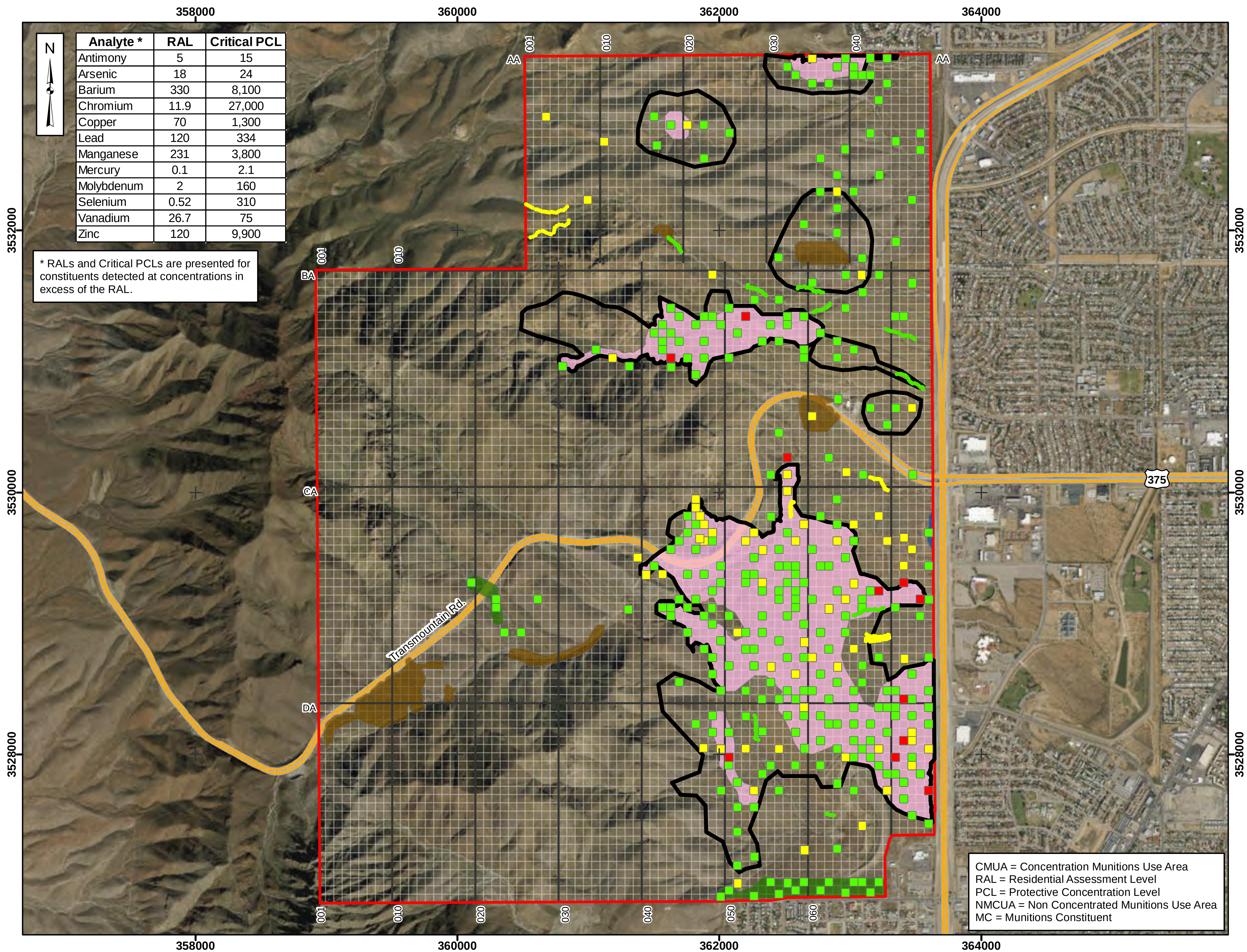
RALs/PCLs shown are for surface soils (these concentrations were achieved in top 6 feet of soil column).

5 concentrations above the standard in Column H are boldfaced

2 concentrations above the standard in Column J are shaded gray

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-1
ISM Sampling Results - Metals



Analyte *	RAL	Critical PCL
Antimony	5	15
Arsenic	18	24
Barium	330	8,100
Chromium	11.9	27,000
Copper	70	1,300
Lead	120	334
Manganese	231	3,800
Mercury	0.1	2.1
Molybdenum	2	160
Selenium	0.52	310
Vanadium	26.7	75
Zinc	120	9,900

* RALs and Critical PCLs are presented for constituents detected at concentrations in excess of the RAL.

CMUA = Concentration Munitions Use Area
RAL = Residential Assessment Level
PCL = Protective Concentration Level
NMCUA = Non Concentrated Munitions Use Area
MC = Munitions Constituent

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation
- NCMUA - MC Investigation Performed
- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL
- All Metals Below RAL (arroyo ISM sample)
- One or more metals >= RAL and < Critical PCL (arroyo ISM sample)

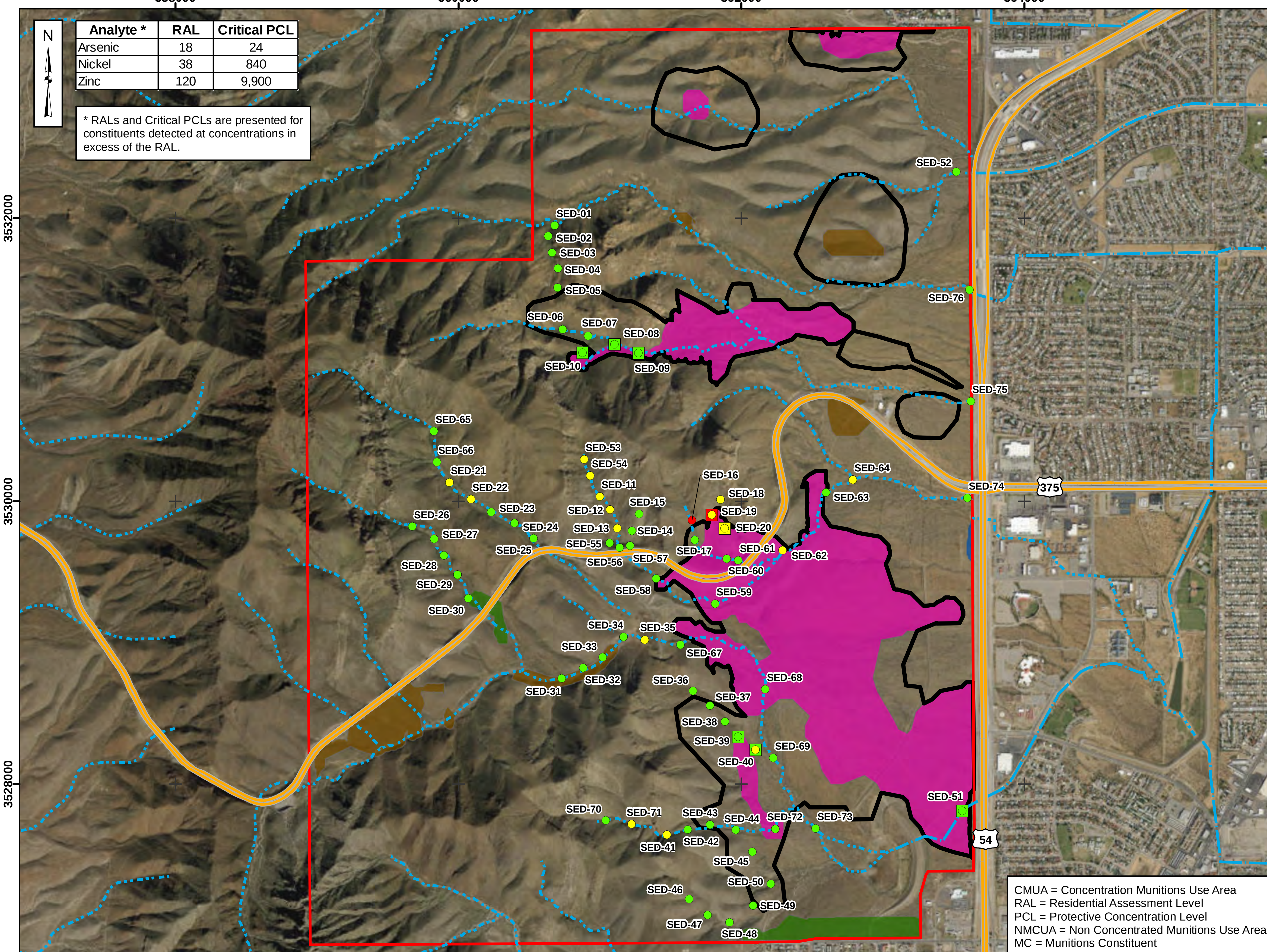
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-2
Arroyo Soil Sampling Results



Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch

0-6" Sample Locations

- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL

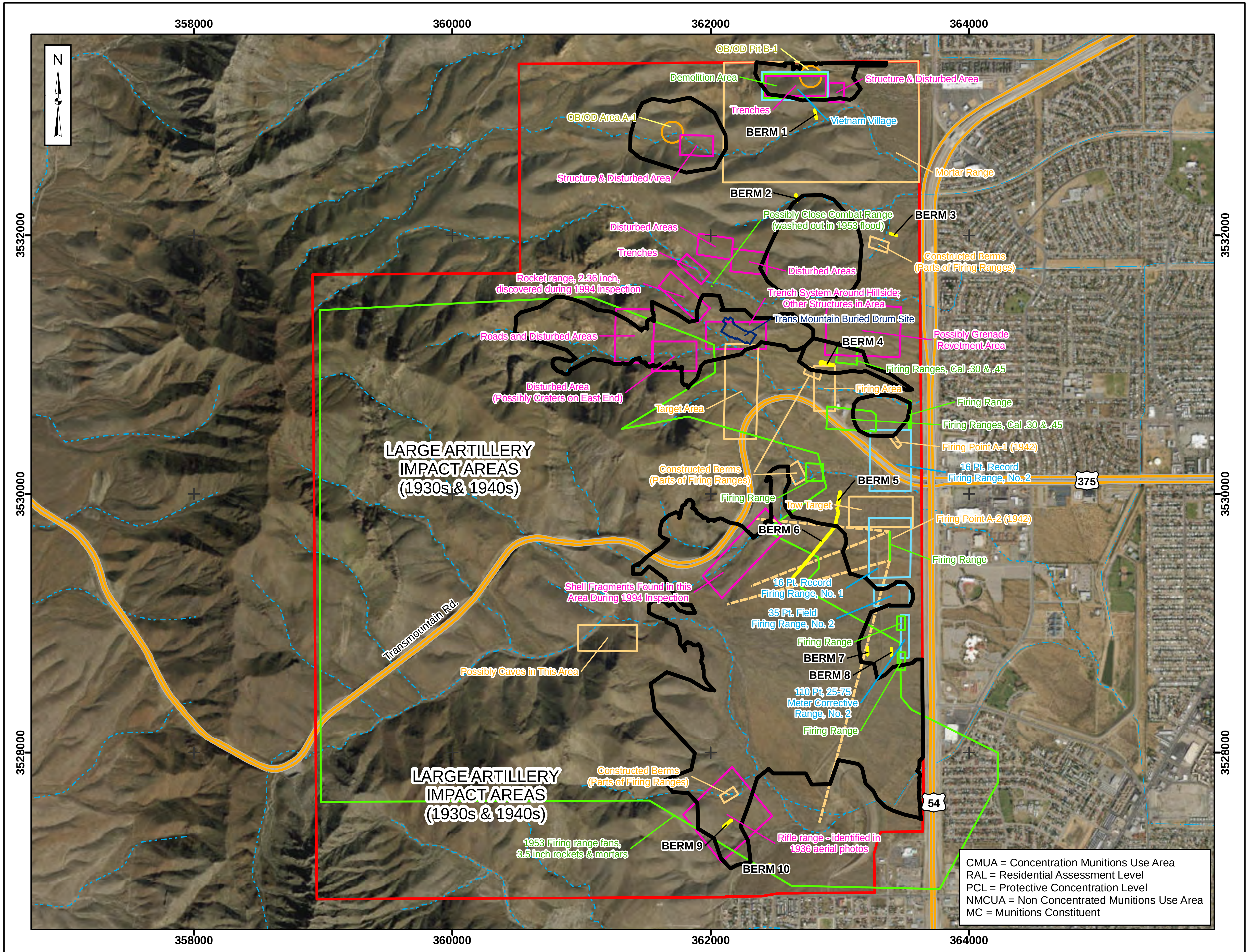
12-18" Sample Locations

- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-3
Potential Backstop Berm Locations Relative to CMUAs and Former Firing Range Features

Legend

- MRS Boundary
- Revised CMUA
- Intermittent Stream
- Canal/Ditch
- Potential Backstop Berm

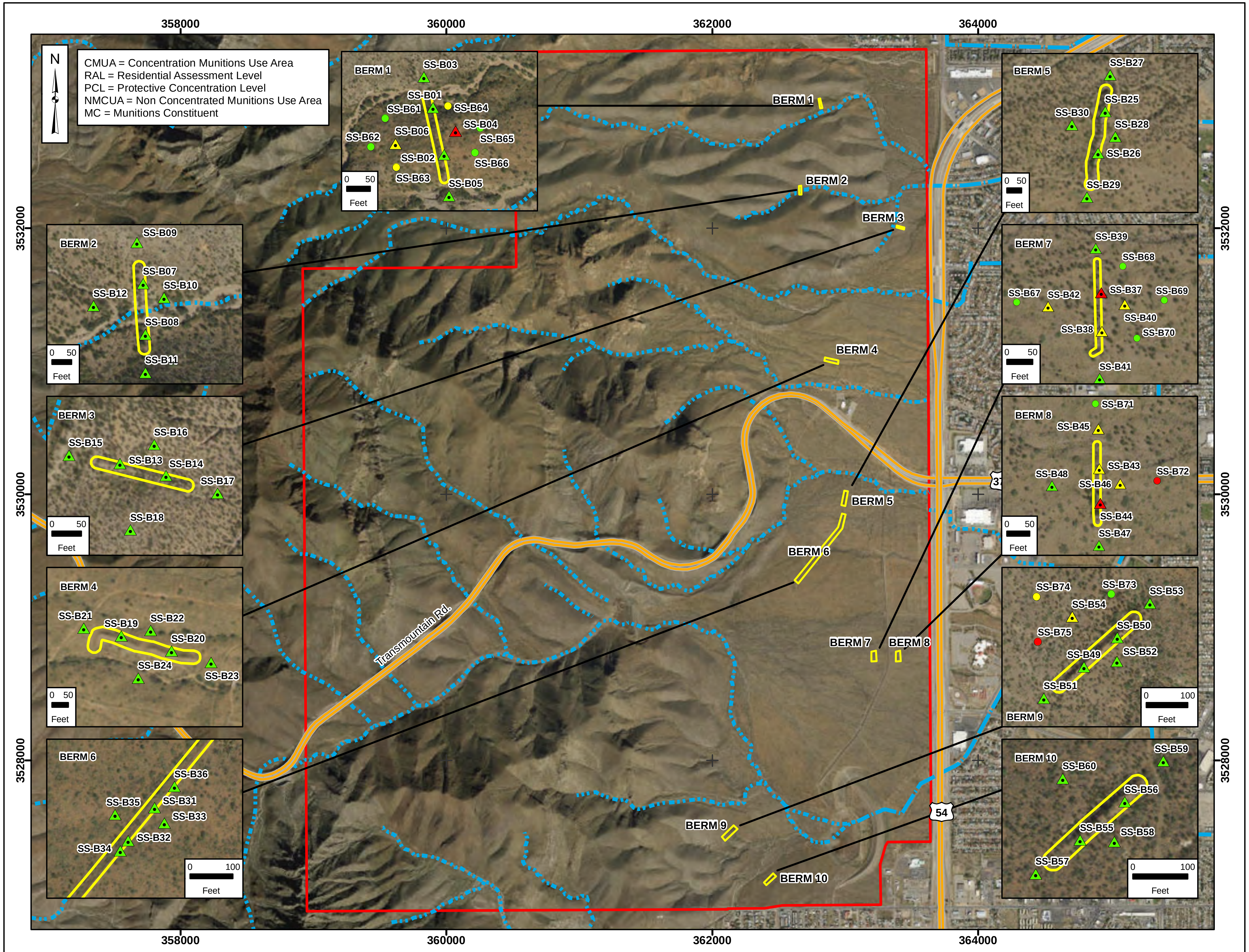
Historical Features

- 1930s Range Feature
- 1940s Range Feature
- 1950s Range Feature
- 1960s Range Feature
- OB/OD Area
- 1940s Firing Range Fan
- Other Range Feature

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-4
Potential Backstop Berm Sampling Results

Legend

MRS Boundary

Berm

Intermittent Stream

Canal/Ditch

Phase I Results

All Metals Below RAL

One or more metals >= RAL and < Critical PCL

One or more metals >= Critical PCL

Phase II Results

Lead Result Below RAL

Lead Result >= RAL and < Critical PCL

Lead Result >= Critical PCL

Analyte *	RAL	Critical PCL
Antimony	5	15
Copper	70	1,300
Lead	120	334

* RALs and Critical PCLs are presented for constituents detected at concentrations in excess of the RAL.

0 0.5 1

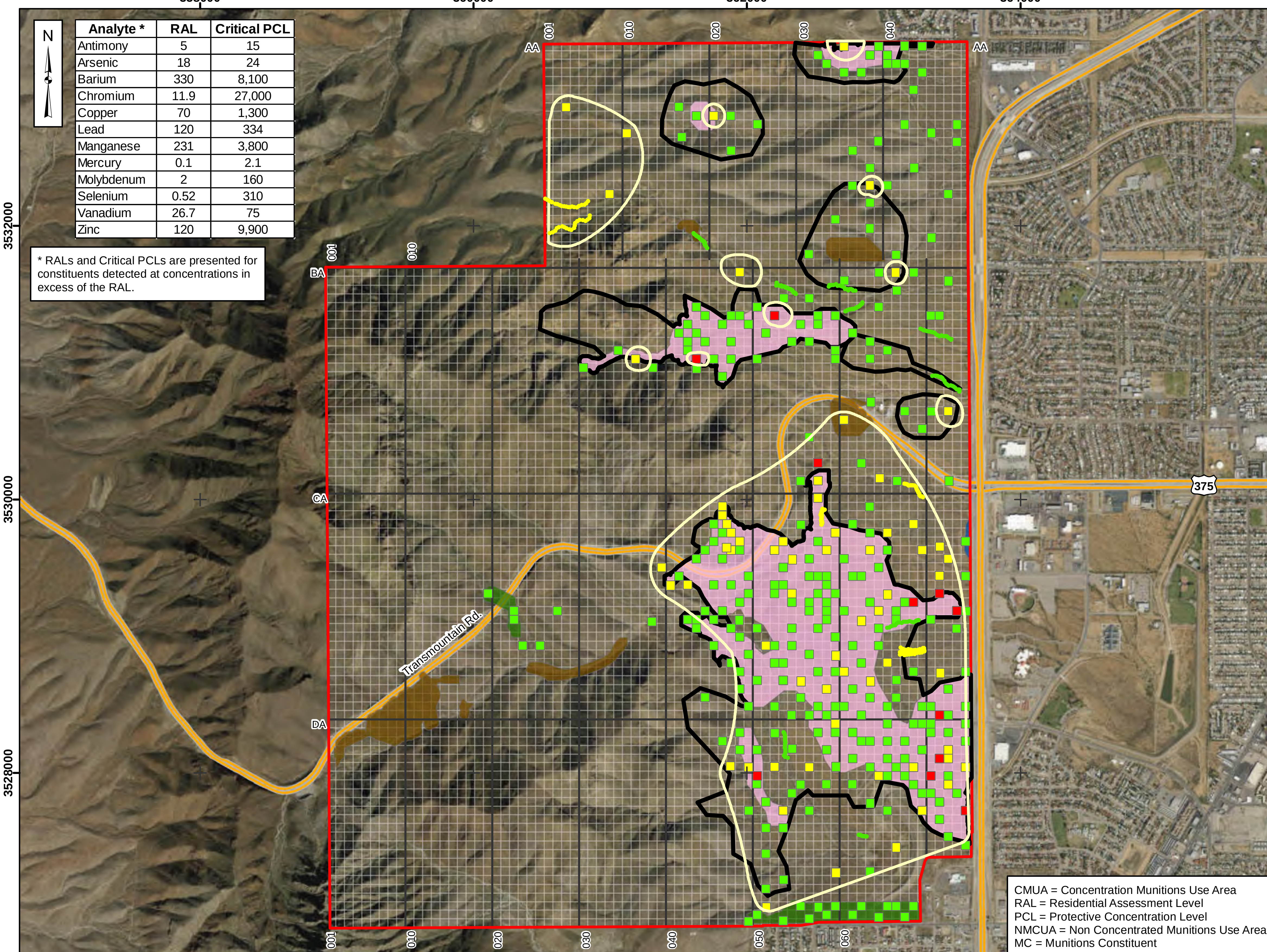
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-5
Affected Properties
ISM Samples



Analyte *	RAL	Critical PCL
Antimony	5	15
Arsenic	18	24
Barium	330	8,100
Chromium	11.9	27,000
Copper	70	1,300
Lead	120	334
Manganese	231	3,800
Mercury	0.1	2.1
Molybdenum	2	160
Selenium	0.52	310
Vanadium	26.7	75
Zinc	120	9,900

* RALs and Critical PCLs are presented for constituents detected at concentrations in excess of the RAL.

CMUA = Concentration Munitions Use Area
RAL = Residential Assessment Level
PCL = Protective Concentration Level
NMCUA = Non Concentrated Munitions Use Area
MC = Munitions Constituent

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL
- All Metals Below RAL (arroyo ISM sample)
- One or more metals >= RAL and < Critical PCL (arroyo ISM sample)
- Limits of Affected Property

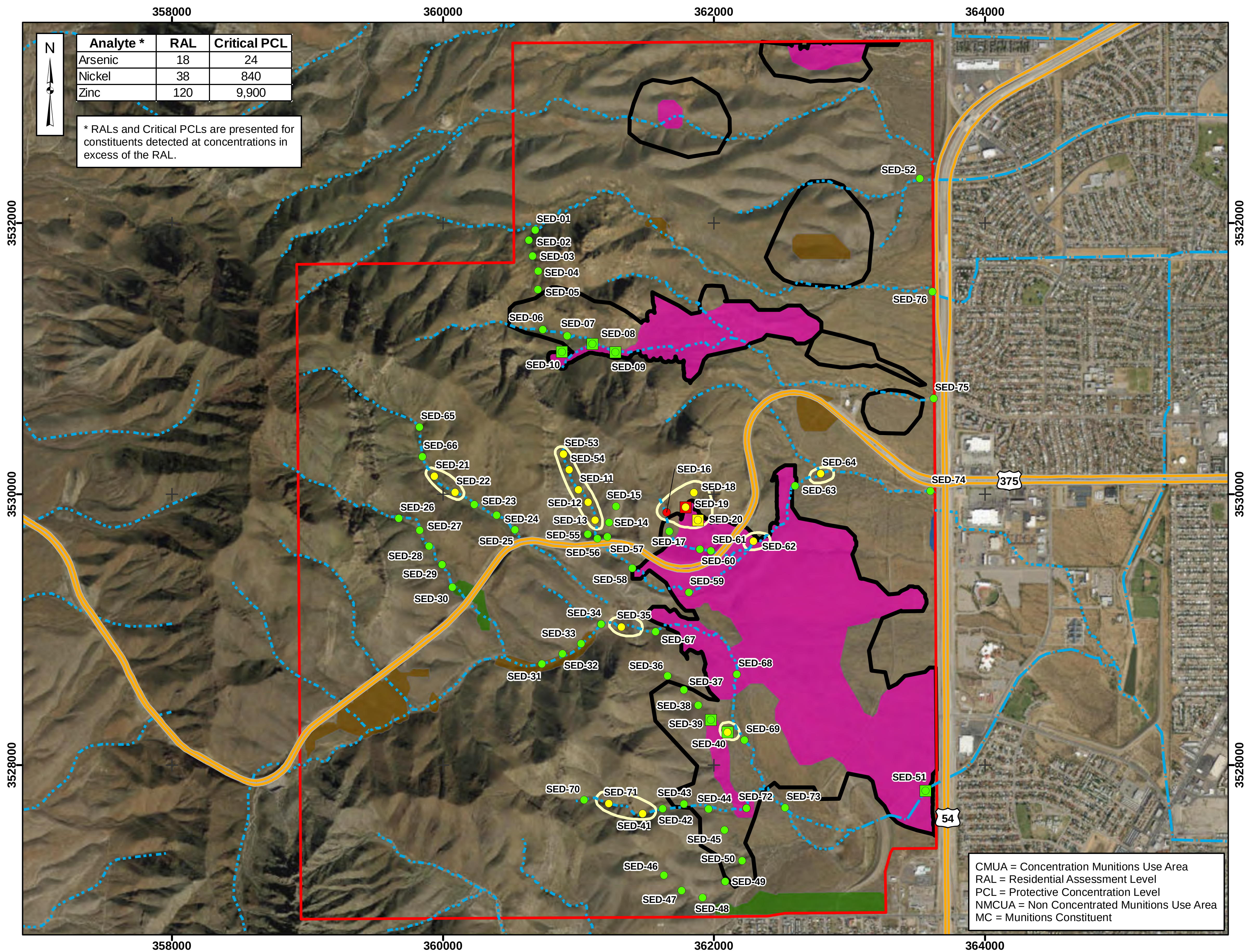
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-6
Affected Property Map
Arroyo Soil Samples



Analyte *	RAL	Critical PCL
Arsenic	18	24
Nickel	38	840
Zinc	120	9,900

* RALs and Critical PCLs are presented for constituents detected at concentrations in excess of the RAL.

CMUA = Concentration Munitions Use Area
RAL = Residential Assessment Level
PCL = Protective Concentration Level
NCMUA = Non Concentrated Munitions Use Area
MC = Munitions Constituent

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch

0-6" Sample Locations

- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL

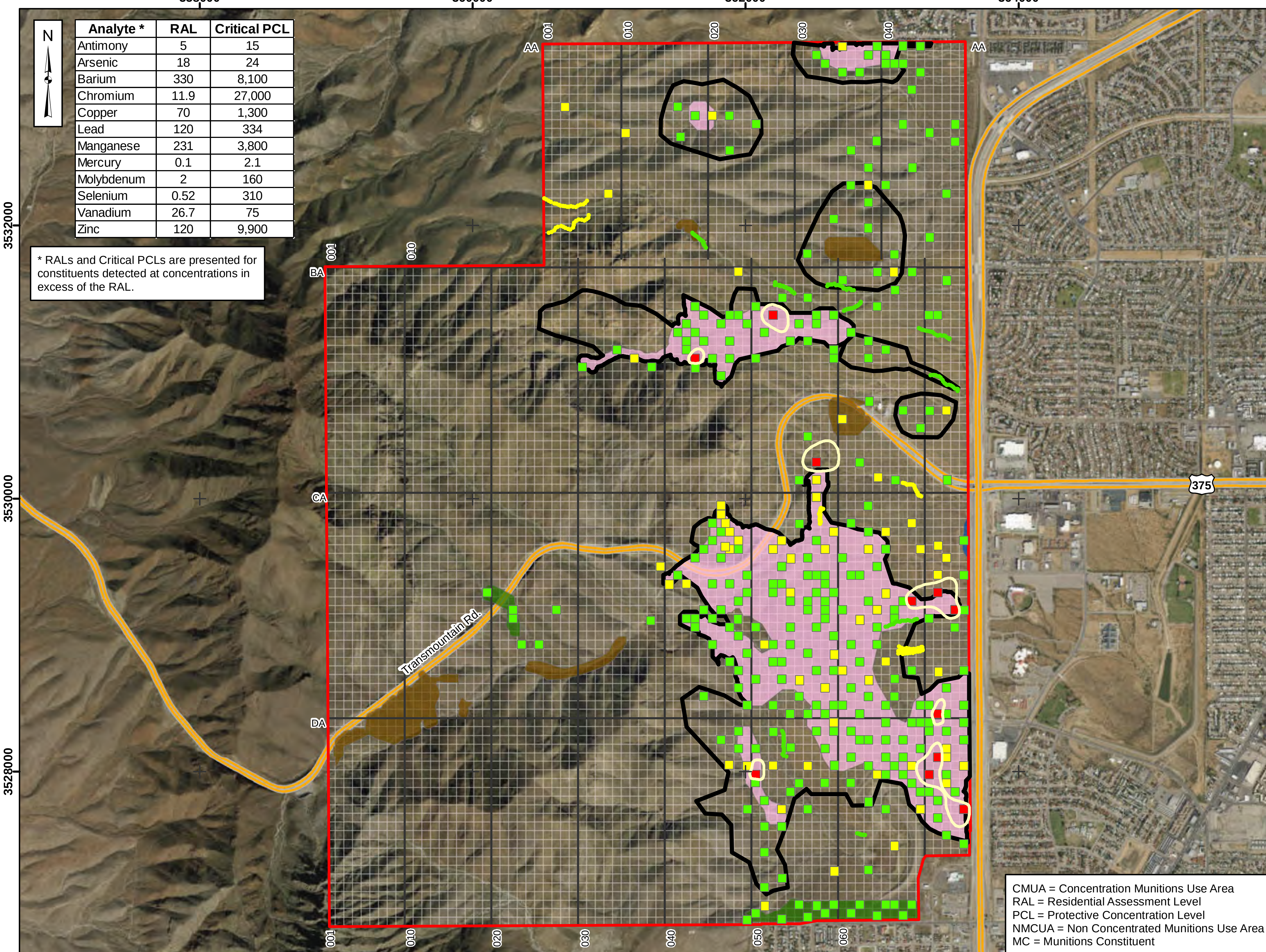
12-18" Sample Locations

- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL
- Limits of Affected Property

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-7
PCL Exceedance Zones ISM Samples

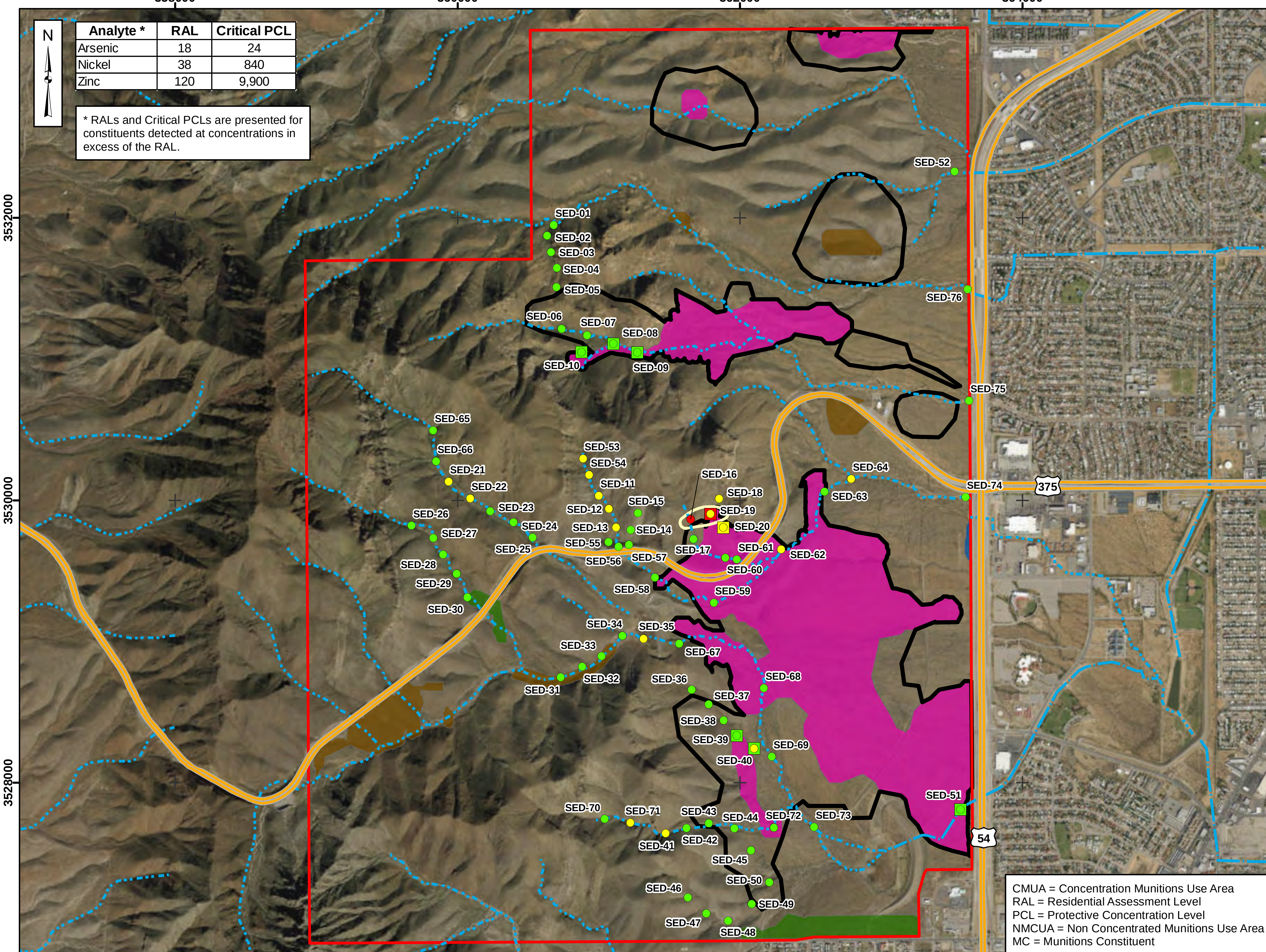
Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL
- All Metals Below RAL (arroyo ISM sample)
- One or more metals >= RAL and < Critical PCL (arroyo ISM sample)
- PCL Exceedance Zone

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 6-8
PCL Exceedance Zone Map
Arroyo Soil Samples

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch

0-6" Sample Locations

- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL

12-18" Sample Locations

- All Metals Below RAL
- One or more metals >= RAL and < Critical PCL
- One or more metals >= Critical PCL
- PCL Exceedance Zone

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

7 REVISED CONCEPTUAL SITE MODEL

The preliminary CSM for the Closed Castner Range MRS was developed during the RI planning phase by integrating information from previous investigations and is presented in **Section 2.1**. The CSMs for MEC and MC have been revised, based on the data collected as part of the RI. (The summary of the MEC RI results is presented in **Section 4**, and the summary of MC RI results is presented in **Sections 5**.) The primary changes to the CSM include:

- Boundaries of CMUAs were revised: The potential CMUA (#21) requiring additional investigation was determined to be an NCMUA. The boundaries of four CMUAs were expanded, and CMUA #1 now encompasses one of the former CMUA areas. Two new CMUAs were added and one NCMUA was changed to a CMUA.
- It was demonstrated that shallow groundwater is not present directly beneath the MRS. The soil to groundwater pathway is incomplete.

The CSMs for MEC and MC are depicted on **Figures 7-1** and **7-2**, respectively, summarizing the source, pathway, and receptor exposure analysis. CSM details are presented in **Table 7-1**, below.

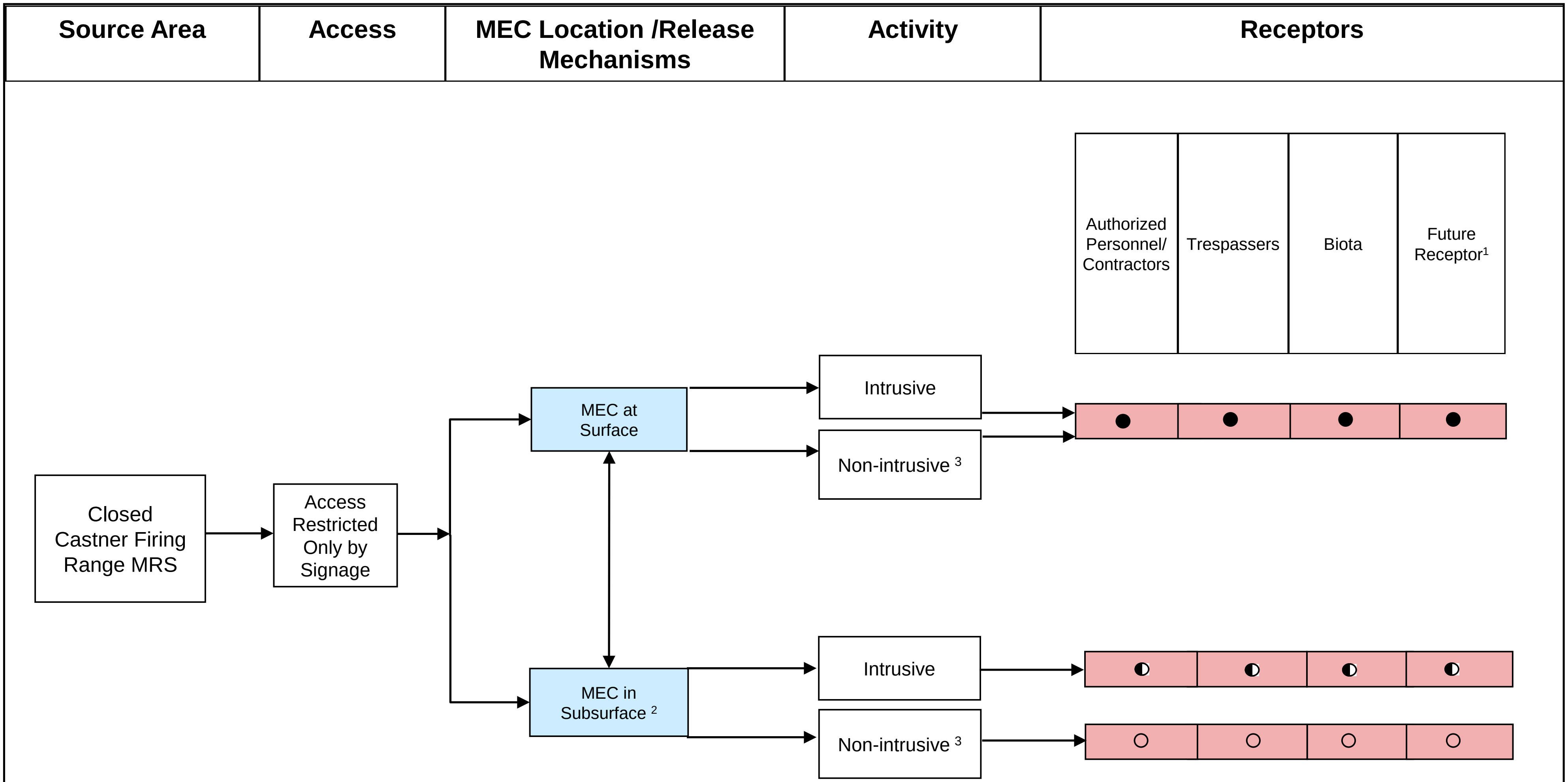
Table 7-1: Closed Castner Range MRS Revised CSM

Profile Type	Site Characterization
MRS Profile	**Area and Layout** The Closed Castner Range MRS is located in northwest El Paso, in the eastern foothills of the Franklin Mountains. The MRS is approximately 15 miles south of the New Mexico state line and lies between U.S. Highway 54 and the Franklin Mountains State Park.
	CMUAs CMUAs contain the highest density of MEC on the MRS, and have the highest likelihood of MC presence above the critical PCLs. Evaluation of historical data identified five confirmed CMUAs, and one potential CMUA. The potential CMUA (#21) was investigated during the RI and was determined to be an NCMUA. Additional MEC investigation was performed within the NCMUA to confirm that the MEC density is less than or equal to 0.1 UXO/acre, to a 95% confidence level. Based on the RI, the boundaries of four of the five confirmed CMUAs were expanded. The fifth CMUA (CMUA#12) is now encompassed within CMUA #1. Two additional CMUAs (CMUAs 22 and 23) were identified during the RI. One CMUA (CMUA 10) was initially identified as a NCMUA, but has been changed to a CMUA based on the large number of MDAS found within it during the WAA and RI. Therefore, there are seven confirmed CMUAs within the MRS. Additionally, based upon completion of the RI, the actual MEC density was determined to be 0.123 MEC/acre (not 0.1) within the NCMUA. There are five PCL Exceedance Zones for metals in surface soil and one PCL Exceedance Zone in an arroyo. These areas exceed the lowest protective concentration level for a chemical of concern within a source medium.
	Structures There are no residential structures within the MRS. The only two building structures located within the MRS are the El Paso Museum of Archaeology

Profile Type	Site Characterization
	and the Border Patrol Museum. Both are located along Transmountain Road which bisects the range from east to west. The Fusselman Canyon flood control dam is located in the southern half of the MRS, and there are smaller flood control dams located throughout the MRS.
	Boundaries U.S. Hwy 54/ Martin Luther King Jr. Blvd forms the eastern boundary of the MRS and the Franklin Mountains State Park is located on the western boundary of the MRS. Hondo Pass Drive is located at the southeast portion of the MRS, with the remaining portion of the southern MRS boundary being adjacent to undeveloped land. The North Hills West residential community is located on the northeast MRS boundary, with the remaining portion of the northern MRS boundary being adjacent to undeveloped land.
	Utilities Utilities located within the Closed Castner Range MRS include electricity, telephone and water.
	Security The Closed Castner Range MRS contains a short section of fence along the northern side and a limited additional portion of the MRS property. Fort Bliss has erected 67 large bilingual (English and Spanish) warning signs in addition to 102 smaller signs with a large visual display to warn the public against trespassing. The Army has plans to install a security fence around the El Paso Museum of Archaeology and the Border Patrol Museum in 2018 or 2019.
Land Use and Exposure Profile	**Current Land Use** Except for Transmountain Road, the El Paso Museum of Archaeology, the Border Patrol Museum, and the Fusselman Canyon Dam, the MRS is undeveloped and subject to trespassing. Approximately 40% of the site is gently rolling terrain, progressing to heavily rolling (approximately 20%) and mountainous (approximately 40%) terrain from east to west.
	Potential Future Land Use Future land use for the Closed Castner Range MRS is currently undetermined. In the absence of a documented planned future land use, the most conservative future land use (unrestricted) is assumed.
	Human Receptors Human receptors include workers and guests to the Border Patrol Museum, El Paso Museum of Archeology, TxDOT and Immigration and Naturalization Service Border Patrol Headquarters; illegal hikers and bikers trespassing on the site; Army workers and Military Police conducting security patrols; and contract workers performing investigation, maintenance, and other work within the MRS. Future human receptors include these, as well as possible residents, and recreational users, assuming unrestricted future use.
Ecological Profile	**Ecological Receptors** The region along the state line that separates New Mexico and Texas is a center of biodiversity in temperate North America, and wildlife is abundant at Fort Bliss. There are 58 mammalian species, 39 reptilian species, eight amphibian species and 335 species of birds which are either resident or transient at Fort Bliss. Two threatened fauna occur on the Closed Castner Range MRS: the Texas horned lizard and the Texas lyre snake.

<table>
<tr><th>Profile Type</th><th>Site Characterization</th></tr>
<tr><td rowspan="4">Munitions/Release Profile</td><td>Potential Munitions Used
According to the SI Report, the Closed Castner Range MRS, potentially contains munitions items related to flares; signaling items; training simulator devices; screening smoke; grenades (hand, rifle, smoke); small, medium, and large projectiles (20mm-155mm); mortars; rockets; and small arms.</td></tr>
<tr><td>MEC and Munitions Debris
Grenades (hand, rifle, smoke, including white phosphorus); small, medium, and large projectiles (20mm-120mm); mortars (3-in. Stokes, 4.2 in., and 81 mm); rockets (2.36 in. and 3.5 in.); and small arms items.</td></tr>
<tr><td>Associated Munitions Constituents
The RI confirmed previous investigations’ findings of elevated metals concentrations at the MRS primarily within CMUAs. Previous investigations have also documented the presence of explosives at the Former Castner Range MRS, but these were not detected during the RI at elevated concentrations. Perchlorate is not present within the MRS.</td></tr>
<tr><td>Release Mechanism
Range training activities such as firing into a target and disposal operations by OB/OD</td></tr>
<tr><td rowspan="2">Transport/ Migration Profile</td><td>Transport Mechanisms
The primary transport mechanisms evaluated for the Closed Castner Range MRS included the following:
<u>Surface Soil</u>: Handling, treading on, and/or re-distribution by human or ecological activity. Erosion by surface water run-on and/or run-off, wind. Transport through arroyos via surface water run-off.
<u>Subsurface Soil</u>: Soil disturbance via excavation or other intrusive activity. Ecological activity (e.g. nesting/burrowing animals).</td></tr>
<tr><td>Migration Routes
The primary migration routes evaluated for the Closed Castner Range MRS include the following:
<u>Surface Soil</u>: Surface soil to subsurface soil, surface soil to surface water.
<u>Subsurface Soil</u>: Subsurface soil to surface soil (via ecological activity).
<u>Surface Water</u>: Surface water to surface soil and subsurface soil
<u>Shallow groundwater not present</u>: Soil to groundwater pathway is incomplete.
Movement of MEC via storm water in the arroyos has been documented based on the findings in CMUA 23. Therefore, it is possible for MEC to move from areas of high elevation (e.g., the mountains) to the lower elevation zones, generally trending from west to east. Most of the mountainous areas reside within the NCMUA where a lower density of MEC is present.</td></tr>
<tr><td rowspan="2">Exposure Pathway Analysis</td><td>MEC
The primary exposure pathway for human and ecological receptors is through surface contact with MEC. Subsurface exposure is possible during excavation or other intrusive activities.</td></tr>
<tr><td>MC</td></tr>
</table>

Profile Type	Site Characterization
	The presence of explosive compounds and metals in the surface soil with the MRS has been established by past investigations. The fate and transport of MC metals is highly complex and is governed by several major reaction types, (including dissolution-precipitation as a function of pH and redox environment, and sorption-desorption reactions as a function of soil composition), extent of soil saturation, and soil organic content. Additionally, the position of potential munitions items at the MRS will influence the dominant fate and transport mechanisms. Explosives MC are subject to various fate and transport mechanisms if released from munitions items. These mechanisms include dissolution, transformation (especially via photodegradation), adsorption, advection, and volatilization. Photodegradation of trinitrotoluene and other nitroaromatic explosives compounds has been studied extensively. If present at the MRS and exposed to the atmosphere, it is likely that most, if not all, trinitrotoluene (and potentially other explosive compounds) have been broken down by photodegradation. However, while detected in some surface soil samples, explosive constituents were not detected above PCLs and do not represent a risk to receptors. The primary exposure pathway for human and ecological receptors is through surface contact with MC. Subsurface exposure is possible during excavation or other intrusive activities.



Notes

[1] Future land use is currently undefined. RI will assume the most conservative land use option, residential, for the purposes of completing the RI. Therefore, the assumed future receptor is residential landowner

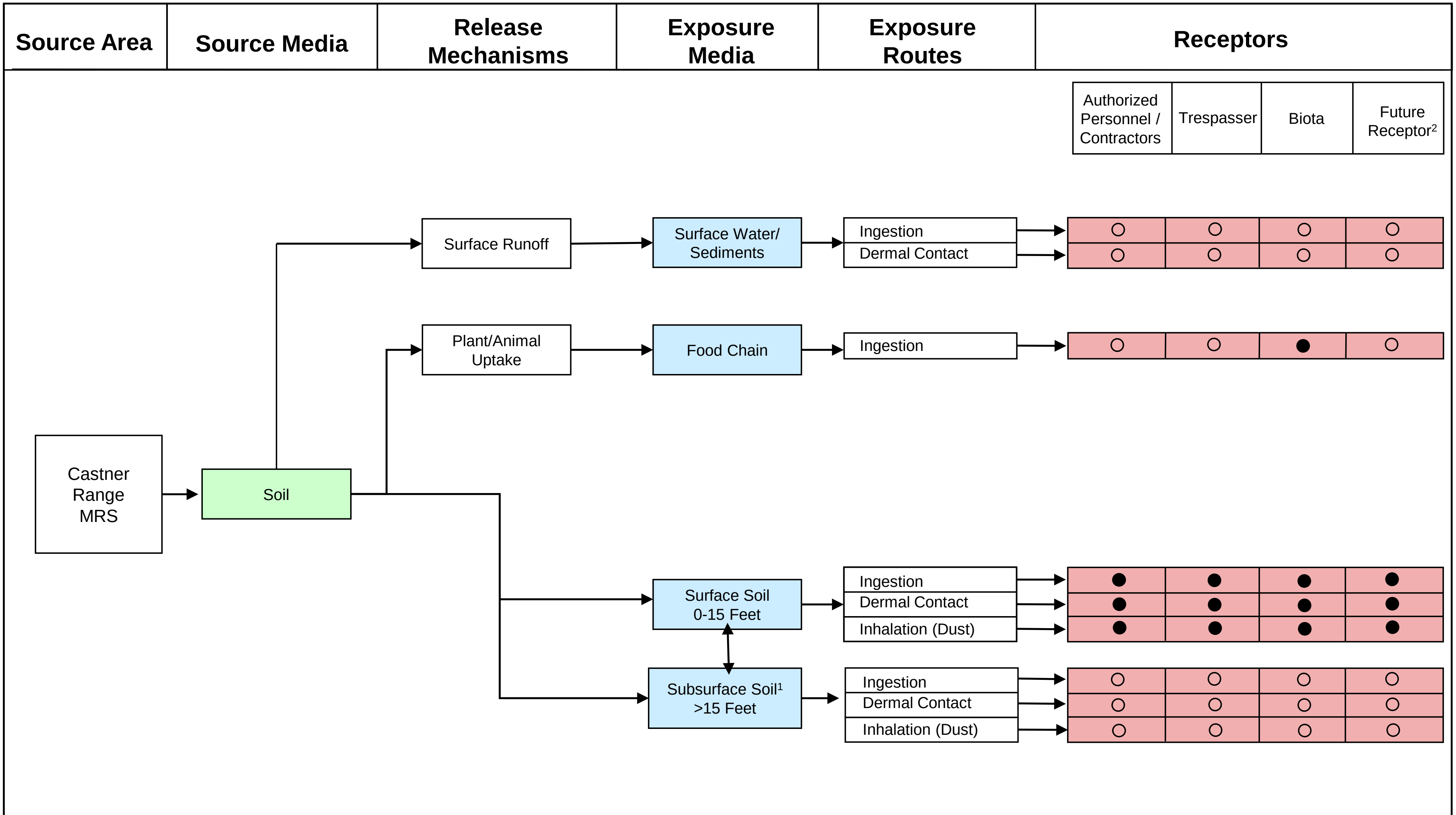
[2] MEC in subsurface is defined as just below ground surface.

[3] Non-intrusive activity means handling/treading underfoot.

Legend

- ● Complete Pathway
- ○ Incomplete Pathway
- ◐ Potentially Complete Pathway

	REMEDIAL INVESTIGATION CLOSED CASTNER FIRING RANGE MUNITIONS RESPONSE SITE MEC CONCEPTUAL SITE EXPOSURE MODEL	June 2018 Figure 7-1



[1] MC in subsurface is defined as greater than 15 feet below ground surface, per Texas Risk Reduction Program requirements for residential land use.

[2] Future land use is currently undefined. RI will <u>assume</u> the most conservative land use option, residential, for the purposes of completing the RI. Therefore, the assumed future receptor is residential landowner.

● Complete Pathway
○ Incomplete Pathway
◐ Potentially Complete Pathway

	REMEDIAL INVESTIGATION CLOSED CASTNER FIRING RANGE MUNITIONS RESPONSE SITE MC CONCEPTUAL SITE EXPOSURE MODEL	June 2017
		Figure 7-2

8 CONTAMINANT FATE AND TRANSPORT FOR MEC AND MC

8.1 FATE AND TRANSPORT DYNAMICS

The intent of this section of the RI Report is to describe the contaminant fate and potential transport mechanisms for MEC and MC identified at the Closed Castner Range MRS. Contaminant fate refers to the expected final state that an element, compound, or group of compounds will achieve following release to the environment. Contaminant transport refers to migration mechanisms away from the source area. Understanding the fate of the MEC and MC present in, or released to, the environment is important in evaluating the potential hazards to human health and the environment. For example, it is possible for natural processes to result in the movement, relocation, or unearthing of MEC in the subsurface to the surface, thereby, increasing the chance of exposure by human and ecological receptors.

8.2 MEC FATE AND TRANSPORT MECHANISMS

Historically and during this RI, MEC items and significant MDAS have been found at the Closed Castner Range MRS. A discussion of MEC migration mechanisms and disposition factors is therefore presented to provide a comprehensive evaluation for MEC.

Potential routes of migration include physical processes that might result in movement or relocation of MEC from its original placement. If not removed, MEC has the potential to pose an explosive hazard to human and ecological health. The following physical processes can result in the transport of MEC from its original placement:

- Person(s) picking up or moving a potential MEC item.
- Construction, excavation, or other soil moving actions (e.g., well installation) disturbing potential MEC.
- Natural processes such as erosion/deposition moving potential MEC.

Natural erosion of soil over time by wind or water (surface water or precipitation) can result in the exposure of buried MEC by the removal of the overlying soil. In some cases, if soil is unstable and the erosive force is sufficient to act on the size of MEC item(s) present, this process can also result in the movement of MEC from its original position to another location (typically somewhere downstream of a wash). The process is occurring in CMUA 23. As discussed in **Section 5.1.5** and shown on **Figure 5-10**, grenade MD is moving into the arroyo which runs through this CMUA and the grenades are migrating downstream within the arroyo, towards the MRS boundary. It is likely that this process also occurs in similar areas within the MRS; although, the highest elevation areas (e.g., the mountains) reside within the NCMUA area where there is a lower MEC density.

As mentioned previously, during historical removal actions/investigations and during this RI, MEC items and MD were found at the MRS. As stated above, it is possible for natural processes to result in the movement, relocation, or unearthing of MEC, increasing the chance of exposure by human and ecological receptors. The topography of the MRS progresses from gently rolling terrain to mountainous terrain from east to west. The composition of the soils at the MRS consists of silty sands with gravel and cobbles. Based on site topography and soil type, it is likely that surface interactions such as wet/dry erosion will impact source material. It is generally accepted within ecological risk assessments that burrowing mammals may be exposed to soils up to 5 ft bgs. Since previous MEC finds and numerous MDAS were found above this depth, biota (e.g., small and large mammals) may also unearth residual MEC by digging or burrowing in the soil.

The MRS is currently undeveloped land, with posted "No Trespassing" signs. However, trespassers do enter the MRS. Additionally, authorized personnel and contractors also enter the MRS at times. Therefore, individuals could come in contact with potential MEC at the surface or shallow subsurface by walking. The MRS does not currently contain buildings where activities (e.g., landscaping, utility maintenance, environmental studies) are likely to disturb surface and subsurface soils. However, any individuals performing intrusive activities could unearth potential MEC.

8.3 MC FATE AND TRANSPORT MECHANISMS

The primary MC associated with the munitions used historically at the MRS are explosives and metals, including lead and antimony associated with small arms munitions. The primary environmental medium for MC at the MRS is surface soil. A discussion of MC fate and transport mechanisms is included below.

Explosives MC are subject to various fate and transport mechanisms if released from munitions items. These mechanisms include dissolution, transformation (especially via photodegradation), adsorption, advection, and volatilization, which can remove these elements from the environment. The position of potential munitions items at the Closed Castner Range MRS (i.e., present in surface soil) influences the dominant fate and transport mechanisms. For instance, photodegradation of trinitrotoluene and other nitroaromatic explosives compounds has been studied extensively. It is likely that at the MRS, most of the trinitrotoluene (and potentially other explosives compounds) exposed to the atmosphere has been broken down due to photodegradation. However, as noted in **Sections 6** and **7**, while detected in some samples, explosive constituents were not detected above PCLs and do not represent a risk to receptors.

The fate and transport of metals MC is highly complex and is governed by several major reaction types, including dissolution-precipitation as a function of pH and redox environment, and sorption-desorption reactions as a function of soil composition, extent of soil saturation, and soil organic content. Metals tend to persist in the environmental in various phases that may or may not be environmentally available for exposure.

The fate and transport mechanisms for the MC present at the Closed Castner Range MRS are discussed in the following section.

8.3.1 Potential Routes of Migration

The way chemicals are transported through the environment is determined by the source medium and the characteristics of the MC. Many metals, including lead, can be soluble and could potentially leach to groundwater depending on soil conditions. However, this pathway is incomplete at the MRS since shallow groundwater is not present at the MRS (see **Section 6.1.7.2**). Migration routes for MC in surface soil as they exist at the MRS include the following:

- Transport of MC to Ambient Air. MC at the MRS are present in surface soil and are available for volatilization and fugitive dust generation to transport constituents in soil to air. The MC identified at the MRS have relatively low volatility; therefore, volatilization is not considered a complete migration pathway. MC at the MRS are typically adhered to soil particles and are available for wind erosion as fugitive dust. Migration of MC in fugitive dust emission is considered a complete pathway at the MRS. The evaluation of inhalation of MC adhered to fugitive dust is completed by comparing constituent concentrations in soil to the respective Tier 1 PCLs for direct contact to residential soil ($^{Tot}Soil_{Comb}$).
- Transport of MC Via Surface Runoff. No perennial surface water flows on the MRS and no permanent water bodies exist. However, there are several distinct arroyos located throughout the MRS that are dry except during precipitation events. MC are present in surface soil and the potential for migration and release to surface waters or to their associated sediments via surface runoff exists. However, based on the dry sediment sample data collected from the downgradient portion of the arroyos, there is no evidence that MC are being transported offsite via runoff.
- Plant and Animal Uptake from Soil. MC in soil at the MRS are available to plants and animals for uptake into the food chain. Human health implications from chemical uptake are principally from exposure to home-grown vegetables. The evaluation of the uptake of MC in home-grown vegetables is addressed by comparisons of constituent concentrations in soil samples to residential direct contact PCLs ($^{Tot}Soil_{Comb}$).

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9 RISK ASSESSMENT

The baseline risk assessment (BRA) for the Closed Castner Range MRS was completed as required under CERCLA regulations for completion of the RI. The BRA is comprised of two parts: the HHRA and the SLERA. The HHRA is presented below and HHRA tables are presented in **Appendix N**. The complete SLERA is presented in **Appendix O**. Environmental setting information for the Site is provided in **Section 1.3** and previous site investigation information is provided in **Section 1.4** of this report.

9.1 HUMAN HEALTH RISK ASSESSMENT (HHRA)

9.1.1 Introduction

CERCLA of 1980 as amended in 1986 (Superfund Amendments and Reauthorization Act) is the Federal program providing requirements for responding to release of hazardous substances to the environment. The overreaching mandate of the CERCLA program is to protect human health and the environment from uncontrolled releases of hazardous substances. CERCLA guidance documents provide the tools and decision framework to serve the basis for determining whether releases to the environment have occurred and how to characterize such releases. The USEPA Guidelines for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988) provides the framework for conducting an RI/FS to characterize the nature and extent of environmental impacts from hazardous releases and the most effective means to address the impacted media. The USEPA RI/FS guidance document states that risk evaluations as presented in the Risk Assessment Guidelines for Superfund (RAGS), (USEPA 1989) are an integral part of the RI/FS. The USEPA RAGS indicate three components of the human health evaluation including: the HHRA, refinement of PRGs, and the evaluation of remedial alternatives. The purpose of this section is to fulfill the requirements of the HHRA for the RI of the Closed Castner Range MRS.

The TRRP (30 TAC 350) is the regulation for governing the determination, characterization, and response to environmental releases of hazardous substances in the State of Texas. The TRRP is a risk-based regulation that employs standard risk assessment methodologies consistent with those presented in the USEPA RAGS. The TRRP regulations are centered on the development of risk-based screening and action levels in soil, groundwater, air, sediment, and surface water to achieve the mandated protection of human health. These levels under TRRP are called PCLs. Since PCLs are calculated with similar equations, exposure assumptions, and toxicity data used in the USEPA RAGS baseline risk assessment, the employment of PCL-based evaluations and use of the TRRP PCLs inherently assesses the HHRA requirement presented in the USEPA RI/FS guidelines. Under TRRP, the affected property assessment report is the reporting format that presents site characterization data and risk-based assessment level and PCL development. The data collection and reporting process presented in this RI report culminates in the selection of chemical-specific PCLs completing the risk assessment process. Based on the risk-based structure of this RI document which includes the HHRA and the SLERA, all requirements of the BRA under CERCLA are addressed in a manner consistent with TRRP.

This section will address the HHRA components of the TRRP program based on the four components of the BRA: hazard identification, exposure assessment, toxicity assessment, and risk characterization.

9.1.2 Hazard Identification

The hazard identification in the CERCLA BRA includes site history, evaluation of site characterization data with respect to potential environmental releases and potential exposure pathways, and a screening of chemicals of potential concern (COPCs) by comparisons to risk-based screening levels. The site history and data characterization have been previously discussed in this RI. The screening process and exposure pathways are discussed below.

9.1.2.1 Chemical of Potential Concern Screening

ISM is a structured composite soil sampling and processing protocol that reduces data variability and provides a reasonable estimate of mean chemical concentrations. Four hundred and one samples were collected by ISM from multiple decision units across the Closed Castner Range MRS. Each decision unit is within U.S. Army boundaries and access is restricted. The ISM data was conservatively evaluated to assess the potential future exposure and risk at each decision unit under a residential (unrestricted) land use scenario. Maximum detected concentrations were compared to TRRP Tier 1 residential direct contact PCLs ($^{Tot}Soil_{Comb}$) and established site-specific background upper prediction limits (UPLs)[1] for COPC selection. The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10^{-6}) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins. The adjusted PCLs are herein referred to as soil screening levels (SSLs).

Table N-1 (**Appendix N**) provides a summary of the surface soil COPC selection for a future unrestricted scenario. Two explosives (2,4-dinitrotoluene and nitroglycerin) and ten metals (aluminum, antimony, arsenic, barium, beryllium, copper, lead, manganese, thallium, and vanadium) were identified as COPCs in ISM surface soil (0-2 inches bgs) due to their site wide maximum concentrations exceeding the respective direct contact SSLs. Decision unit locations are shown in **Figure 4-1**.

No perennial surface water flows on the Closed Castner Range MRS and no permanent water bodies exist. However, there are several distinct arroyos located throughout the site that are dry

[1] UPLs were developed for the Active Army Military Munitions Response Program Field Demonstration Report of Incremental Sampling Methodology (URS 2013).

except during precipitation events. Discrete samples of native surface soil were collected from the arroyos. Arroyo data were separated into nine reaches plus downgradient delineation samples; each reach was evaluated separately to assess the future hypothetical exposure and potential risk under a residential (unrestricted) land use scenario. Maximum concentrations were compared to TRRP $^{Tot}Soil_{Comb}$ PCLs and established site-specific background UPLs for COPC selection. The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10^{-6}) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins. Soil screening levels were used to evaluate the arroyos because the sediment/soil is dry except during infrequent precipitation events, and therefore, soil exposure pathways are applicable.

Tables N-2 through **N-11 (Appendix N)** present the COPC selections for the arroyo reaches. The following table identifies the metals selected as COPCs in arroyo soil due to their maximum concentrations exceeding their COPC-specific direct contact SSLs (i.e., $^{Tot}Soil_{Comb}$ PCLs x 0.1). Arroyo reaches and associated sample locations are shown on **Figure N-1 (Appendix N)**.

Reach	COPCs
Downgradient Delineation	None
Reach 1	Beryllium
Reach 2	Arsenic, Beryllium
Reach 3	Arsenic, Beryllium
Reach 4	Arsenic
Reach 5	Arsenic
Reach 6	Arsenic
Reach 7	Arsenic
Reach 8	Arsenic
Reach 9	Arsenic

Surface water samples were collected from six seeps and evaluated in the HHRA. Seeps are not used as a drinking water source and therefore the only potential exposure scenario in which seep water might be contacted is via a recreation scenario. Maximum concentrations were compared to TRRP Tier 1 Contact Recreation Water PCLs for COPC selection. The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10^{-6}) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins. A Contact Recreation PCL is not available for lead and therefore a lead screening level was calculated using the Risk Assessment Information System PRGs Calculator for a recreator (https://rais.ornl.gov/). The calculated PRG screening level of 1 mg/L for lead is based on a target cancer risk of $1x10^{-6}$ and a California EPA cancer slope factor (0.0085 $[mg/kg\text{-}day]^{-1}$).

Table N-12 (Appendix N) presents a summary of the COPC selection for surface water. Maximum concentrations in surface water seeps do not exceed screening levels. Therefore, no COPCs were identified for surface water. Seep locations are shown on **Figure 4-4**.

9.1.2.2 Exposure Assessment

The goal of the exposure assessment in CERCLA guidance is to estimate the types and magnitudes of potential exposures to chemicals in environmental media by human populations resulting from a release of hazardous substances. The USEPA exposure assessment includes:

- Characterization of the exposure setting;
- Identification of complete exposure pathways;
- Estimation of the exposure concentration; and
- Quantification of exposure using standardized intake assumptions.

Each of these items is addressed separately below.

9.1.2.3 Characterization of Exposure Setting

The exposure setting is characterized under CERCLA by collecting and evaluating data concerning current and future land use, current and future populations, habitats, climate, surface water hydrology, and hydrogeology. This RI Report provides information on climate characteristics, land use, site geology and hydrogeology, regulatory programs, and potential off-site receptors.

Former target areas have been identified as a potential source of range-related MC impacts. The MRS is currently closed and access is restricted. To assess potential future exposures, the available ISM data are evaluated by decision unit, and the arroyo soil data are evaluated by reach, each representing a separate exposure area. **Tables 6-1 and 6-2** present the ISM soil data by decision unit and the arroyo soil data.

The future use of the Closed Castner Range MRS is currently undetermined. However, in the future the potential exists for the land to be redeveloped for residential purposes. Therefore, a future residential (unrestricted) land use scenario is evaluated in this HHRA and PCLs for residential assessment were used.

9.1.2.4 Identification of Complete Exposure Pathways

An exposure pathway under CERCLA describes a unique mechanism by which a population may be exposed to the chemicals at or originating from the site. Exposure pathways are identified based on consideration of the sources, releases, types, and locations of chemicals at the site; the likely environmental fate (including persistence, partitioning, transport, and inter-media transfer) of these chemicals; and the location and activities of the potentially exposed populations. Exposure points (points of potential contact with the chemical) and routes of exposure (e.g., ingestion, inhalation) are identified for each exposure pathway. Screening of exposure pathways for COPCs in soil under the most conservative residential scenario (TRRP Tier 1 $^{Tot}Soil_{Comb}$ PCLs) include:

- Direct absorption of COPCs from soil
- Incidental ingestion of COPCs in soil due to hand-to-mouth activity
- Inhalation of COPCs adsorbed to fugitive dusts or volatilization from impacted soil
- Ingestion of COPCs from home-grown vegetables.

Volatile COPCs were not identified for the site and therefore the exposure pathway for inhalation of volatiles from soil is considered incomplete.

9.1.2.5 Estimate Exposure Concentration

CERCLA guidance for conducting risk assessments recommends using the average concentration of a chemical in samples of environmental media as the appropriate exposure concentration term or exposure point concentration (EPC). The estimation of the average concentration for each decision unit is calculated based on the statistical 95% UCL. The use of the 95% UCL means there is only a 5% chance that the true average concentration of this chemical is above the estimated value. TRRP allows for a point-by-point comparison of chemical concentrations in environmental media samples to PCL concentrations or comparison of the 95% UCL. The TRRP regulations, therefore, allow comparisons of statistically derived 95% UCL concentration terms to demonstrate compliance.

Triplicate samples of soil were collected for 10% of the decision units. Of those, 14 decision units reported one or more detected concentration(s) above a screening level. The 95% UCLs for COPCs in the 14 decision units were calculated using the USEPA software ProUCL (version 5.1) and evaluated using Interstate Technology Regulatory Council (ITRC) Incremental Sampling Methodology guidance (ITRC 2012). Two UCL calculation methods were evaluated for use with the ISM samples: Student's-t UCL and Chebyshev UCL. The Student’s-t UCL was selected for all evaluated decision units as the data appear to have a normal distribution. For the remaining decision units, the reported concentration for each COPC in each ISM sample was used as the EPC. EPCs for surface soil are presented in **Table N-13 (Appendix N)**. The ProUCL output is provided in **Attachment 1** to **Appendix N**.

USEPA’s ProUCL software (version 5.1) was used to calculate 95% UCLs for COPCs in soil collected from each arroyo reach. EPCs for arroyo soil are presented in **Table N-14 (Appendix N).** The ProUCL output is provided in **Attachment 1** to **Appendix N**.

9.1.2.6 Quantification of Exposure

The final step of the exposure assessment is to quantify the chemical exposure by calculating intake using standard pathway specific exposure equations and assumptions. The USEPA RAGS and other guidance for conducting exposure assessments (USEPA 1992) include basic equations to calculate chemical intake by environmental media type and assumptions affecting intake such as food, soil, and water ingestion rates, inhalation rates, body weights, exposure frequencies, exposure durations, and various modifying factors. The goal of the quantification of exposure is to relate a chemical concentration in an environmental medium to a chemical dose in human receptors. The TRRP regulations provide a framework using the same equations and assumptions to back-calculate concentrations of chemicals in media that would not result in a carcinogenic or non-carcinogenic toxic result. TRRP equations for residential exposure to non-carcinogenic chemicals in soil are summarized below.

${}^{Tot}Soil_{Comb}$ (mg/kg) = Residential Soil PCL for combined direct contact pathway exposures (incidental ingestion, inhalation, dermal absorption, and ingestion of home-grown vegetables)

$$= \frac{1}{({}^{Inh}Soil_{Inh\text{-}VP})^{-1} + ({}^{Soil}Soil_{Derm})^{-1} + ({}^{Soil}Soil_{Ing})^{-1} + ({}^{Veg}Soil_{Ing})^{-1}}$$

where:

1. ${}^{Inh}Soil_{Inh\text{-}VP}$ (mg/kg) - Inhalation of non-carcinogenic chemicals volatilized from soil surface or emitted in dust bound to fine particulate

$$= \frac{{}^{Air}RBEL_{Inh\text{-}noncarc}}{VF_{SS} + PEF}$$

where:

$${}^{Air}RBEL_{Inh\text{-}noncarc} = \frac{RfC * HQ * AT.A.res * 365 \text{ days/yr}}{EFres * ED.A.res}$$

2. ${}^{Soil}Soil_{Derm}$ (mg/kg) – Dermal absorption of non-carcinogenic chemicals from direct contact with soil

$$= \frac{HQ * RfDd * BW.C * AT.C.res * 365 \text{ days /yr}}{10\text{-}6 \text{ kg/mg} * ED.C.res * EFres * SA.C.res * AF.C.res * ABS.d}$$

3. ${}^{Soil}Soil_{Ing}$ (mg/kg) – Incidental ingestion of non-carcinogenic chemicals in impacted soil

$$= \frac{HQ * BW.C * RfDo * AT.C.res * 365 \text{ days /yr}}{10^{-6} \text{ kg/mg} * EFres * ED.C.res * IRsoil.C.res * RBAF}$$

4. ${}^{Veg}Soil_{Ing}$ (mg/kg) – Ingestion of non-carcinogenic chemicals in home-grown above-ground vegetables from impacted soil

$$= \frac{HQ * RfD * BW.C * AT.C.res * 365 \text{ days /yr}}{EFres * ED.C.res * IRabg.C.res}$$

The variables and assumptions used as part of the exposure assessment under TRRP are based on the same values as presented in USEPA exposure assessment guidelines as summarized below:

Exposure Variable	TRRP Assumptions	CERCLA Assumptions
HQ – Hazard Quotient	1	1
AT.A.res – Averaging Time (adult)	30 yrs	26 yrs
AT.C.res – Averaging Time (child)	6 yrs	6 years
BW.C – Body Weight (child)	15 kg	15 kg
RfDo – Oral Reference Dose	Chemical Specific	Chemical Specific
RfDd – Dermal Reference Dose	Chemical Specific	Chemical Specific
RfC – Reference Concentration	Chemical Specific	Chemical Specific
EFres – Exposure Frequency (residential)	350 days/yr	350 days/yr

Exposure Variable	TRRP Assumptions	CERCLA Assumptions
ED.A.res – Exposure Duration (adult)	30 yrs	26 yrs
ED.C.res – Exposure Duration (child)	6 yrs	6 yrs
ABSd – Dermal Absorption Factor	Chemical Specific	Chemical Specific
SA.C.res – Skin Surface Area (child)	2,200 cm^2	2,373 cm^2
AF.C.res – Adherence Factor (child)	0.2 mg/cm^2	0.2 mg/cm^2
IRabg.C.res –Vegetable Ingestion Rate	0.0024 (mg-yr)/(kg-day)	NA
IRsoil.C.res –Soil Ingestion Rate (child)	191 mg/day	200 mg/day
RBAF – Relative Bioavailability Factor	1	NA
VFss – Volatile Fraction	Chemical Specific	Chemical Specific
PEF – Particulate Emission Factor	Chemical Specific	Chemical Specific

NA – not applicable
cm^2 – square centimeters

As illustrated in the table above, quantification of PCLs using the TRRP equations and assumptions provides a similar approach to quantifying chemical exposures described for a CERCLA HHRA.

9.1.3 Toxicity Assessment

The purpose of the toxicity assessment is to weigh available evidence regarding the potential for a particular chemical to cause a toxic/carcinogenic response in an exposed individual and provide an estimate of the relationship between the dose of the chemical exposure and the severity of toxic response. The toxicity assessment provides chemical specific information on the mechanism of toxicity, target tissues, and accepted toxicity factors for calculating the severity of toxic responses. These factors include verified reference doses (RfDs) or verified reference concentrations (RfCs) for the evaluation of non-carcinogenic health effects from chronic exposure to chemicals, and cancer potency slope factors and inhalation unit risk for the evaluation of excess cancer risk from lifetime exposure to chemicals. Sources of toxicological information and toxicity values, in order of preference, and consistent with current USEPA guidance (USEPA 2003), include:

(1) IRIS, an on-line USEPA database containing current toxicity criteria for many chemicals that have gone through a peer review and USEPA consensus review process (USEPA 2017).
(2) Provisional Peer-Reviewed Toxicity Values developed by the USEPA Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center [https://hhpprtv.ornl.gov/].
(3) Additional USEPA and non-USEPA sources of toxicity information, including but not limited to the California Environmental Protection Agency toxicity values, the Agency for Toxic Substances and Disease Registry minimum risk levels, and toxicity values published in the USEPA Health Effects Assessment Summary Tables (HEAST) (USEPA 1997).

Under TRRP (30 TAC 350.73(a)), a similar hierarchy of toxicity data sources is used to determine PCLs:

(1) USEPA IRIS.
(2) USEPA Provisional Peer Reviewed Toxicity Values (i.e., Superfund Health Risk Technical Support Center.
(3) USEPA HEAST.
(4) USEPA National Center for Environmental Assessment (i.e., Superfund Technical Support Center).
(5) The TCEQ Chronic Remediation-Specific Effects Screening Levels.
(6) Agency for Toxic Substances and Disease Registry.
(7) Other scientifically valid sources as approved by the executive director.

COPCs at the Closed Castner Range MRS include metals and explosives. Lead represents the principal COPC with respect to potential risks to human health. An assessment of the current data concerning toxicity of lead is discussed below.

Lead is a natural compound but is also pervasive in the urban environment, both as the result of the presence of lead in paint and the former use of lead in gasoline. It is a known component of SAA and munitions casings used for military training. Its environmental mobility is generally low as the result of the formation of water-insoluble sulfides under many conditions.

Lead has been reclassified by the USEPA as a probable human carcinogen (Group B2), although no cancer slope estimate has, or apparently will be made. This is because the USEPA determined that "quantifying lead's cancer risk involves many uncertainties, some of which may be unique to lead. Age, nutritional state, body burden, and exposure duration influence the absorption, release, and excretion of lead." The USEPA also concluded that current knowledge of lead pharmacokinetics indicates that an estimate derived by standard procedures would not truly describe the potential risk. Thus, the USEPA Human Health Assessment Group recommends that a numerical estimate not be used (USEPA 2004b).

The USEPA has also decided that it is inappropriate to develop an RfD for inorganic lead. The reason is that it appears that some of lead's toxic effects, "particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold" (USEPA 2004b).

Consequently, there is no USEPA derived cancer slope factor or reference dose for lead. Instead, USEPA has established a blood level of concern of 10 µg/dL (a deciliter, dL, is one tenth of a liter, or 100 mL) and has promulgated a Maximum Contaminant Level Goal and a Treatment Technology Action Level (in lieu of a Maximum Contaminant Level). The blood action level is not considered a threshold level below which no adverse effects are expected because of the possibility that some adverse effects may occur at lower blood levels than 10 µg/dL.

The EPA Office of Solid Waste has released a detailed directive on risk assessment and cleanup of residential soil lead (USEPA 1994). The directive recommends that soil lead levels less than 400 mg/kg are generally safe for residential use. The TCEQ Tier 1 residential ${}^{Tot}Soil_{Comb}$ PCL is

500 mg/kg, and is also based on the USEPA action level (TCEQ 2017a). This PCL is used in the HHRA to evaluate lead in soil and arroyo soil.

9.1.4 Risk Characterization

The final step in the HHRA process is the risk characterization. The risk characterization combines information developed in the exposure assessment and the toxicity assessment to estimate the potential responses due to the chemical exposure. Non-cancer hazards and cancer risks were calculated for each decision unit that reported one or more screening level exceedance. Non-cancer hazards and cancer risks were also calculated for each evaluated arroyo.

9.1.4.1 Non-Carcinogenic Hazard Estimates

The risk of non-carcinogenic toxic responses to chemical exposure is measured by comparing the chemical dose from the exposure assessment to the chemical-specific RfD. The RfD is a threshold dose, above which a toxic response is considered potentially viable. The ratio of the dose (i.e., EPC) to the RfD is the hazard quotient (HQ). The sum of the HQs across all COPCs is the hazard index (HI). An HI value above unity (1), therefore, requires a risk management decision under CERCLA guidelines. The TRRP Tier 1 PCLs use the current RfD for each COPC to calculate the safe level for this chemical in surface soil based on the exposure assumptions and equations presented in **Section 9.1.2.6.**

9.1.4.1.1 Decision Unit Soil

Table N-15 (Appendix N) provides a summary of the PCLs for non-carcinogenic COPCs as well as non-carcinogenic hazards for each decision unit evaluated. As seen in **Table N-15 (Appendix N)**, the total HI for combined exposure to COPCs in soil at decision unit BF052, BW057, CL071, CN073, DG070, and DK074 range from 2 to 11 and exceed the acceptable HI of 1. The total HI for all remaining decision units do not exceed the acceptable HI of 1.

Because the USEPA and TCEQ benchmark for an acceptable hazard was exceeded, chemicals of concern (COCs) are identified in **Section 9.1.6**.

9.1.4.1.2 Arroyo Soil

Table N-16 (Appendix N) provides a summary of the PCLs for non-carcinogenic COPCs as well as non-carcinogenic hazards for each arroyo reach. As seen in **Table N-16 (Appendix N)**, the total HI for combined exposure to COPCs in arroyo soil in Reach 3 exceeds the acceptable HI of 1. The total HI for all remaining reaches do not exceed the acceptable HI of 1.

Because the USEPA and TCEQ benchmark for an acceptable hazard was exceeded, COCs are identified in **Section 9.1.6**.

9.1.4.2 Cancer Risk Estimates

Carcinogenic responses are not currently regulated under CERCLA and TRRP as having a threshold dose similar to non-carcinogenic chemicals. Risk from exposure to carcinogenic chemicals is evaluated by the additional excess risk of developing cancer due to chemical exposure. Currently, CERCLA guidance allows for a range of acceptable increase in excess lifetime cancer risk from 1-in-1,000,000 (10^{-6}) to 1-in-10,000 (10^{-4}). TRRP Tier 1 PCLs are calculated based on an excess lifetime cancer risk in the middle of the USEPA range of 1-in-100,000 (10^{-5}).

9.1.4.2.1 Decision Unit Soil

A summary of the excess lifetime cancer risks from exposure to carcinogenic COPCs in soil at the Closed Castner Range MRS is presented in **Table N-15 (Appendix N)**. Total excess lifetime cancer risk estimates for exposure to all COPCs simultaneously at each evaluated decision unit are less than or within the acceptable range established in the NCP of 1-in-1,000,000 to 1-in-10,000. As a result, existing concentrations of COPCs in all decision units do not pose an unacceptable risk to human health.

9.1.4.2.2 Arroyo Soil

As seen in **Table N-16 (Appendix N**), the total excess lifetime cancer risk estimates for exposure to all COPCs in arroyo soil simultaneously are within the acceptable range established in the NCP of 1-in-1,000,000 to 1-in-10,000 for the downgradient delineation samples and all nine reaches. As a result, existing concentrations of COPCs in the arroyos do not pose an unacceptable risk to human health.

9.1.5 Uncertainty Analysis

The uncertainty assessment for the HHRA of the Closed Castner Range MRS is focused on the COPC screening process and exposure assessment related to the IS and discrete sampling results for soil.

9.1.5.1 Uncertainties Associated with the Sampling and Analysis

The selection of COPCs was based upon the results of the sampling and analytical program established for the site. The factors that contribute to the uncertainties associated with the identification of COPCs are inherent in the data collection and data evaluation processes, including decision unit selection, appropriate sample locations, adequate sample quantities, laboratory analyses, data validation, and treatment of validated samples.

A comparison of maximum detected chemical concentrations to SSLs was conducted. Chemicals whose maximum concentrations were below their respective SSLs were not carried through the assessment. It is unlikely that this screening would have excluded chemicals that would be of concern, based on the conservative exposure assumptions and protective SSLs. Although following this methodology does not provide a quantitative risk estimate for all chemicals, it focuses the assessment on the chemicals accounting for the greatest risks, and the overall cumulative risk estimates would not be expected to be greater than these conservative screening values.

9.1.5.2 Uncertainties Associated with the IS Triplicate Sample Results

As described in **Section 4.4**, IS have been collected from each decision unit at the Closed Castner Range to characterize the presence and nature of COPCs in surface soil across the site. Results of IS analyses represent a statistical derived average concentration for the sampled decision unit. Ten percent of the IS samples were collected in triplicate. These concentrations, therefore, can be compared directly to risk-based criteria without statistical analysis. However, as with any estimate derived from sampling, IS results are subject to error, and understanding this error is accomplished with statistical analysis.

Two candidate UCL equations that accommodate IS data sets and which are expected to "bracket" the range of UCLs that may be calculated from a data set are the Student's-t (representing the low end of the range) and Chebyshev (representing the high end of the range) UCLs (ITRC 2012). For this HHRA, the Student's-t UCL was used in the risk calculations because the data sets were normally distributed. Since both UCLs are higher than the maximum detected concentrations for each decision unit, the EPCs used in the HHRA are conservative and likely overestimate the risk.

9.1.6 Chemicals of Concern

The cumulative HI for a future hypothetical resident at decision unit BF052, BW057, CL071, CN073, DG070, and DK074, and in Arroyo Reach 3 are greater than the target HI of 1. Therefore, COCs are identified for soil at these six decision units and in Reach 3. For exposure pathways with a cumulative HI greater than 1, the COCs are identified as individual COPCs contributing to the hazard index greater than 1. The following COCs have been identified at the Closed Castner Range:

- Lead at BF052, BW057, CL071, CN073, DG070, and DK074
- Antimony at CN073
- Arsenic in Reach 3 (FTBL-SED-16 and FTBL-SED-19).

9.2 SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT (SLERA)

In accordance with TRRP, a Tier 1 ecological exclusion criteria checklist was prepared and is included in **Appendix O**. The Tier 1 checklist sets forth conditions under which an affected property may be excluded from further ecological assessment based on the absence of any complete or significant ecological exposure pathways. The affected property at the Closed Castner Range does not meet the exclusion criteria and therefore a Tier 2 SLERA was prepared and is included in **Appendix O**. The results of the Tier 2 SLERA are summarized below.

The SLERA has been conducted in accordance with the Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas (TCEQ 2017b). The results of the SLERA indicate that the calculation of an ecological-based PCL for lead was appropriate for the protection of ecological receptors. The ecological PCL for lead has been incorporated into this RI Report. The SLERA also determined that the concentrations of other metals in surface soil do not result in an unacceptable ecological risk.

The Tier 2 SLERA was conducted to:

(1) identify and demonstrate which COCs do not pose an unacceptable ecological risk
(2) develop ecological PCLs for the COCs that may pose an unacceptable risk to potential ecological receptors (as needed)

(3) provide recommendations for managing ecological risk at the MRS based on the final PCLs.

Based on the results of the Tier 1 checklist, communities of ecological receptors potentially exposed to explosives and metals in soil are limited to terrestrial receptors. The desert shrew, scaled quail, mourning dove, desert cottontail, coyote, red-tailed hawk, and the federally threatened Texas horned lizard are the selected terrestrial receptors for this SLERA. Data from historical and present site investigations have been used to identify COCs and calculate exposure point concentrations in soil. The consumption of food sources potentially affected by soil COCs is the primary exposure pathway for terrestrial receptors. Incidental ingestion of soil is also evaluated as a complete pathway.

Based on the HQ analyses and uncertainty analysis for terrestrial vegetation, soil-dwelling invertebrates, and for herbivorous, invertivorous and carnivorous wildlife receptors, the SLERA resulted in the following conclusions:

- No significant risks were identified for upper trophic level receptors that may be exposed to pooled seep water.
- No significant risks were identified for upper trophic level receptors that may be exposed to arroyo soil.
- No significant risks were identified for terrestrial carnivorous bird populations, for terrestrial herbivorous, invertivorous and carnivorous mammal populations, and for the sensitive Texas horned lizard and other reptiles from any of the COCs in decision unit soil
- The potential for hot spots to exist at the MRS is negligible, and therefore a risk management recommendation relative to hot spots is not warranted for the MRS.
- COCs in surface soil that may cause potential adverse effects to ecological receptor populations include:
    - terrestrial plants/terrestrial invertebrates – metals with marginal exceedances of the target HQ of 1 (HQ less than 10): barium, chromium, copper, manganese and zinc in decision unit soil; metals with potential adverse effects (HQ greater than 10) limited to antimony at one location and lead at four locations in decision unit soil.
    - terrestrial plants/terrestrial invertebrates – arsenic and zinc in Arroyo Reach 3 and zinc in Arroyo Reach 4.
    - wildlife receptors scaled quail (and other invertivorous birds) and mourning dove (and other herbivorous birds) – NOAEL HQs for lead in decision unit soil marginally exceed 1 for avian receptors scaled quail (HQ=2) and mourning dove (HQ=2). LOAEL HQs for the avian receptors are less than 1.

Comparative PCLs protective of herbivorous, invertivorous and carnivorous bird and mammal populations and invertivorous and carnivorous reptiles were developed for lead that resulted in HQs greater than 1.

The food chain modeling presented in the SLERA treats all metals in soil as being 100% available for uptake by ecological receptors. It is widely accepted that lead and arsenic have a relative bioavailability less than 100%. This assumption is likely to result in an overestimation of potential exposure to metals in soil by ecological receptors. Considering the form of lead at the Closed Castner Firing Range is unknown, there is uncertainty related with the potential uptake of lead into the food chain and the resulting risk.

9.3 FINAL SCREENING LEVELS AND PCLS

RALs and PCLs were determined for the Closed Castner Range MRS, based on the results of the HHRA and the SLERA. The final MC RALs and PCLs, along with the pathway they are based on, are presented in **Table 9-1** for surface soils and **Table 9-2** for surface water (seeps).

The risk management of all PCL Exceedance Zones will be addressed in the FS.

Table 9-1
Final Residential Assessment Levels and Critical Protective Concentration Levels for Surface Soils
Closed Castner Firing Range RI Report

CAS No.	Consituent	RAL	RAL Source	Critical PCL	Critical PCL Source
Explosives					
99-35-4	1,3,5-Trinitrobenzene	9	Eco Benchmark	2000	HH PCL
99-65-0	1,3-Dinitrobenzene	0.073	Eco Benchmark	6.7	HH PCL
118-96-7	2,4,6-Trinitrotoluene	8	Eco Benchmark	33	HH PCL
121-14-2	2,4-Dinitrotoluene	6	Eco Benchmark	6.9	HH PCL
606-20-2	2,6-Dinitrotoluene	5	Eco Benchmark	6.9	HH PCL
35572-78-2	2-Amino-4,6-dinitrotoluene	11	HH PCL	11	HH PCL
88-72-2	2-Nitrotoluene	9.9	Eco Benchmark	21	HH PCL
618-87-1	3,5-Dinitroaniline	--		--	
99-08-1	3-Nitrotoluene	12	Eco Benchmark	670	HH PCL
19406-51-0	4-Amino-2,6-dinitrotoluene	11	HH PCL	11	HH PCL
99-99-0	4-Nitrotoluene	22	Eco Benchmark	270	HH PCL
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	43	HH PCL	43	HH PCL
98-95-3	Nitrobenzene	34	HH PCL	34	HH PCL
55-63-0	Nitroglycerin	6.7	HH PCL	6.7	HH PCL
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	16	Eco Benchmark	1600	HH PCL
78-11-5	Pentaerythritol Tetranitrate	100	Eco Benchmark	130	HH PCL
479-45-8	Tetryl	12	Eco Benchmark	150	HH PCL
Metals					
7429-90-5	Aluminum	64000	HH PCL	64000	HH PCL
7440-36-0	Antimony	5	Eco Benchmark	15	HH PCL
7440-38-2	Arsenic	18	Eco Benchmark	24	HH PCL
7440-39-3	Barium	330	Eco Benchmark	8100	HH PCL
7440-41-7	Beryllium	10	Eco Benchmark	38	HH PCL
7440-43-9	Cadmium	32	Eco Benchmark	51	HH PCL
7440-70-2	Calcium	--		--	
7440-47-3	Chromium	11.9	ISM Background	27000	HH PCL
		30	Discrete Background		
7440-48-4	Cobalt	13	Eco Benchmark	370	HH PCL
7440-50-8	Copper	70	Eco Benchmark	1300	HH PCL
7439-89-6	Iron	--		--	
7439-92-1	Lead	120	Eco Benchmark	334	Eco PCL
7439-95-4	Magnesium	--		--	
7439-96-5	Manganese	231	ISM Background	3800	HH PCL
		300	Discrete Background		
7439-97-6	Mercury	0.1	Eco Benchmark	2.1	HH PCL

Table 9-1
Final Residential Assessment Levels and Critical Protective Concentration Levels for Surface Soils
Closed Castner Firing Range RI Report

CAS No.	Consituent	RAL	RAL Source	Critical PCL	Critical PCL Source
7439-98-7	Molybdenum	2	Eco Benchmark	160	HH PCL
7440-02-0	Nickel	38	Eco Benchmark	840	HH PCL
7440--09-27	Potassium	--		--	
7782-49-2	Selenium	0.52	Eco Benchmark	310	HH PCL
7440-22-4	Silver	97	HH PCL	97	HH PCL
7440-23-5	Sodium	--		--	
7440-28-0	Thallium	1	Eco Benchmark	5.3	HH PCL
7440-62-2	Vanadium	26.7	ISM Background	75	HH PCL
		50	Discrete Background		
7440-66-6	Zinc	120	Eco Benchmark	9900	HH PCL
Perchlorate					
14797-73-0	Perchlorate	51	HH PCL	51	HH PCL

Notes:
All units in milligrams per kilogram

Critical PCL	Critical Protective Concentration Level
Eco	Ecological
HH	Human Health
RAL	Residential Assessment Level

Table 9-2
Final Residential Assessment Levels and Critical Protective Concentration Levels for Surface Water (seeps)
Closed Castner Firing Range RI Report

CAS No.	Consituent	RAL	RAL Source	Critical PCL	Critical PCL Source
Metals					
7440-36-0	Antimony	0.199	TRRP Tier 1 Contact Recreation Water PCL	0.199	TRRP Tier 1 Contact Recreation Water PCL
7440-38-2	Arsenic	0.0285	TRRP Tier 1 Contact Recreation Water PCL	0.0285	TRRP Tier 1 Contact Recreation Water PCL
7440-41-7	Beryllium	0.0943	TRRP Tier 1 Contact Recreation Water PCL	0.0943	TRRP Tier 1 Contact Recreation Water PCL
7440-50-8	Copper	33.1	TRRP Tier 1 Contact Recreation Water PCL	33.1	TRRP Tier 1 Contact Recreation Water PCL
7439-92-1	Lead (a)	1	Cal EPA (a)	1	Cal EPA (a)
7440-02-0	Nickel	11.3	TRRP Tier 1 Contact Recreation Water PCL	11.3	TRRP Tier 1 Contact Recreation Water PCL
7440-66-6	Zinc	201	TRRP Tier 1 Contact Recreation Water PCL	201	TRRP Tier 1 Contact Recreation Water PCL

Notes:

(a) A Contact Recreation PCL is not available for lead. Therefore, the lead screening level is based on a California EPA cancer toxicity value and calculated using the RAIS Preliminary Remediation Goals (PRGs) Calculator for a recreator.

All units in milligrams per liter

Critical PCL Critical Protective Concentration Level
RAL Residential Assessment Level
TRRP Texas Risk Reduction Program

10 SUMMARY OF HAZARD ASSESSMENT AND MRSPP

10.1 MEC HAZARD ASSESSMENT GENERAL

The MEC HA, a tool used to assess the risk from MEC at an MRS, was completed in accordance with the *Interim Munitions and Explosives of Concern Hazard Assessment (MEC HA) Methodology* (USEPA, 2008) for the MRS addressed by this RI. The purpose of the MEC HA is to evaluate the potential explosive hazard associated with conventional MEC present at an MRS. The MEC HA does not address hazards posed by CWM, MEC that is located underwater, or environmental and/or ecological hazards associated with MEC.

MEC HA scores were developed for the Closed Castner Range MRS. The score developed for the MRS was based on UXO/DMM/MPPEH found during the RI as well as items previously found in the MRS. The MEC HA, which is used to score an MRS under a variety of MRS-specific conditions, including various cleanup scenarios and land-use assumptions, can be used to score a site several times to evaluate current site conditions, as well as reasonably anticipated future land uses. The MEC HA can also be used to assess MRS conditions after completion of different levels of proposed cleanup or the application of LUCs. The MEC HA prepared for this RI includes data/information available through the date of the RI and was developed for an unrestricted land use scenario. The MEC HA for this RI does not provide an evaluation of various cleanup and LUC alternatives for the MRS given that it is unknown what anticipated cleanup and LUCs may be implemented at the MRS. The MEC HA is provided in **Appendix P**.

The MEC HA evaluates risk through a review of three components of a potential explosive hazard.

- **Severity –** the potential consequences (e.g., death, severe injury, property damage) of a MEC item functioning.
- **Accessibility –** the likelihood that a receptor will be able to come in contact with a MEC item.
- **Sensitivity –** the likelihood that a receptor will be able to interact with a MEC item such that it will detonate.

Each component is assessed through the use of input factors that each have two or more categories associated with them and each category is associated with a numeric score that reflects the relative contributions of the different input factors to the hazard assessment. The sum of the input factor categories is then assigned to one of four defined ranges, called hazard levels. Each of the four hazard levels reflects site attributes that describe groups of sites and site conditions ranging from the highest to lowest hazards. The four hazard levels and corresponding minimum and maximum scores for each level of the MEC HA are shown in **Table 10-1**.

Table 10-1: Summary of the MEC HA Levels

Hazard Level	Maximum MEC HA Score	Minimum MEC HA Score	Description
1	1000	840	Highest potential explosive hazard condition
2	835	725	High potential explosive hazard condition
3	720	530	Moderate potential explosive hazard condition
4	525	125	Low potential explosive hazard condition

10.1.1 MEC Hazard Assessment Components

10.1.1.1 Severity

This component is defined in the MEC HA guidance (USEPA, 2008) as "[t]he potential consequences of the effect (i.e., injury or death) on a human receptor should a MEC item detonate." Two input factors are required to determine this component, energetic material type and location of additional human receptors. Each input factor is described in more detail below.

- Energetic Material Type – This factor describes the hazard associated with MEC known or suspected to be present at the MRS. MEC items identified, either on the surface or subsurface, are included in the MEC HA and the energetic material type associated with each item is selected (i.e., high explosive and low explosive filler in fragmenting rounds, white phosphorus, pyrotechnic, propellant, spotting change and incendiary). The energetic material with the highest value entered into the MEC HA (i.e., most hazardous) is included as the input factor category score.

- Location of Additional Human Receptors – This factor, which assumes that a receptor has unintentionally initiated the detonation of a MEC item, accounts for the possibility that secondary receptors could also be affected. Unintentional detonation of MEC would result not only in injury (or death) to the individual initiating the detonation, but also to other receptors that may be exposed to the overpressure or fragmentation hazards from the MEC detonation. For this input factor category, a determination is made whether there are places where people congregate that are either within the MRS or within the explosive safety-quantity distance (ESQD). The ESQD is based on the maximum fragment distance-horizontal of all the MEC items encountered within the MRS. The MRS is given a single value score if there is an affirmative response and no score if there is a negative response to the determination as to whether additional receptors may be exposed.

10.1.1.2 Accessibility

This component, defined in the MEC HA guidance (USEPA, 2008) as "[t]he likelihood that a human receptor will be able to come into contact with a MEC item", contains five input factors, which are described in the following sections.

10.1.1.2.1 Site Accessibility

Site accessibility describes the ease with which receptors can access the MRS. There are four potential site accessibility input factor categories, full, moderate, limited, and very limited. Each category is associated with a numerical value used in scoring. Below is a brief description of each category.

1. **Full Accessibility –** indicates there are no barriers to entry such as fencing, although signage may be present.
2. **Moderate Accessibility** – indicates there are some barriers to entry, such as barbed wire fencing or rough terrain.
3. **Limited Accessibility** – indicates there are significant barriers to entry, such as unguarded chain link fence or requirements for special transportation to reach the site.
4. **Very Limited Accessibility –** indicates there is either a guarded chain link fence or terrain that requires special equipment and skills (e.g., rock climbing) to access.

10.1.1.2.2 Potential Contact Hours

Potential contact hours, which is an estimate of the total number of receptor hours per year, assumes that both the number of receptors and the amount of time they spend at the MRS can affect the likelihood of the receptor encountering MEC. The potential contact hours takes into consideration the activities performed at the MRS as well as the receptor/exposure scenarios presented in the RI. The receptor hours per year for each activity are then summed and determined to be in one of the following four categories:

1. **Many hours –** greater than 1,000,000 receptor hours/year
2. **Some hours –** 100,000 to 999,999 receptor hours/year
3. **Few hours –** 10,000 to 99,999 receptor hours/year
4. **Very few hours –** less than 10,000 receptor hours/year

10.1.1.2.3 Amount of MEC

This input factor, which qualitatively describes the amount of MEC that may be present due to past munitions-related activities at the MRS, is assessed by determining the type of munitions activities that took place at the MRS (e.g., target area, OB/OD area, maneuver area, safety buffer area, storage). Each category is associated with a value based on the relative hazard of each munitions activity.

10.1.1.2.4 MEC Depth Relative to Maximum Receptor Intrusive Depth

This input factor describes whether MEC items are located where receptor activities take place. The shallowest recorded MEC depth is compared to the deepest intrusive depth recorded and one of the following categories is selected. Each category is associated with a numerical value used to score the MRS.

1. Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.

2. Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth does not overlap with subsurface MEC.

3. Baseline Condition: MEC located only subsurface. Baseline Condition or After Cleanup: Intrusive depth overlaps with minimum MEC depth.

4. Baseline Condition: MEC located only subsurface. Baseline Condition or After Cleanup: Intrusive depth does not overlap with minimum MEC depth.

10.1.1.2.5 Migration Potential

This input factor describes the likelihood that MEC items can be moved and potentially exposed by natural processes such as erosion or frost heaving (repeated freeze/thaw cycles). Some elements that could affect the potential for migration include frost line depth, seasonal heavy rains, topographic slope, soil type, and vegetation. One of two categories is selected, possible or unlikely, and the selected category's associated numerical score is used to score the MRS.

10.1.1.3 Sensitivity

The sensitivity component is defined in the MEC HA guidance (USEPA, 2008) as "the likelihood that a MEC item will detonate if a human receptor interacts with it." Two input factors are required to determine this component, MEC classification, and MEC size.

- MEC Classification – The MEC HA guidance (USEPA, 2008) defines six categories of MEC; UXO Special Case, UXO, Fuzed DMM Special Case, Fuzed DMM, Unfuzed DMM, and Bulk Explosives. Each MEC classification has a numerical value and the value associated with the selected classification is used to score the MRS.

- MEC Size – The MEC Size input factor is used to account for the ease with which a MEC item can be moved by a receptor, which increases the likelihood that a receptor will pick it up or otherwise disturb the item. Two categories are used to describe the MEC size.
  - **Small –** which are items that weigh less than 90 pounds
  - **Large –** which are items that weight 90 pounds or more

10.1.2 Site-Specific MEC Hazard Assessment

A MEC hazard assessment was completed for the Closed Castner Range MRS using the MEC HA Guidance and accompanying automated scoring worksheets. The input factors and the MEC HA scores associated with the Closed Castner Range MRS are shown on **Table 10-2.**

Table 10-2: Closed Castner Range MEC HA Input Factor and Scores

Input Factor		Input Factor Category	Score	Rationale for Selection of Input Factor
I.	Energetic Material Type	High Explosive and Low Explosive Filler in Fragmenting Rounds	100	MEC/MPPEH found used high explosives as filler.

Input Factor		Input Factor Category	Score	Rationale for Selection of Input Factor
II.	Location of Additional Human Receptors	Inside the MRS or inside the ESQD arc	30	There are human receptors that could congregate within the MRS or ESQD arc (e.g., military personnel, contractors, residents, businesses, and visitors).
III.	Site Accessibility	Moderate Accessibility	55	Although portions of the Closed Castner Range MRS are fenced and warning signs are posted, the MRS remains largely open to trespassers.
IV.	Potential Contact Hours	10,000 to 99,999 receptor-hrs/yr	40	People using or visiting the following may come into contact with MEC during activities conducted at the MRS. • El Paso Museum of Archaeology • Border Patrol Museum • Illegal Hikers and Bikers • Army Workers and Military Police Conducting Security Patrols • Contract Workers Performing Investigation, Maintenance, and Other Work
V.	Amount of MEC	Target Area	180	Target Area was selected because from 1926 through 1966, the Closed Castner Range MRS was heavily used for small arms, artillery firing, and impact areas.
VI.	Minimum MEC Depth Relative to Maximum Intrusive Depth	Baseline Condition: MEC located surface and subsurface. Baseline Condition or After Cleanup: Intrusive depth overlaps with minimum MEC depth.	240	This category was selected because a) munitions were known to have been found in the surface and subsurface and b) the maximum intrusive depth for current/future activities at the MRS (assumed to be 3 ft due to construction or other similar activities) overlaps with the minimum depth at which munitions were encountered (0 ft).
VII.	Migration Potential	Possible	30	Conditions exist at the MRS in which wind and water erosion (i.e., sandy soils with moderate erodibility and moderate topography) could potentially expose subsurface MEC.
VIII.	MEC Classification	UXO Special Case	180	The selection of "Target Area" as an input factor indicates munitions are UXO. Because a M19A1 Rifle Grenade, WP and a 60mm mortar. were found at the site, they are UXO special cases.
IX.	MEC Size	Small	40	The items found on the site were all under 90 lbs.
Total Score				**895**
Hazard Level Category				**1**

10.1.3 Scoring Results

The scoring results for the MRS with historical MEC finds are included in **Table 10-3**. Scoring results are based on results from previous investigations, to include the RI, and current site conditions. MEC HA scores were developed without select input factor category scores for ranges where no MEC has been found, because for these categories the MEC HA requires information related to MEC finds in the specific range which have not occurred. MEC HA scores for the potential remedial alternatives will be addressed in the FS. The MEC HA worksheets, with details on how the MRS was scored, are included in **Appendix P**.

Table 10-3: Hazard Level Scores

Range	MEC HA Score	Hazard Level
Closed Castner Range MRS	895	1 – Highest Potential Explosive Hazard Condition

10.2 MRSPP

The purpose of the MRSPP is to prioritize potential actions at MRSs for national funding and responses using site-specific information to assess contamination and explosive hazards due to MEC and/or MC at the site. The MRSPP score developed during the 2007 SI was updated based on the results of the RI for the MRS.

10.2.1 Explosive Hazard Evaluation

The Explosive Hazard Evaluation (EHE) is composed of the following nine elements:

1. Munitions Type – Similar to the Type of Filler input factor on the MEC HAs. Refer to **Table 10-2**. Additional detail regarding munitions types can be found in Table 1 of the MRSPPs in **Appendix Q**.
2. Source of Hazard – Used to describe the type(s) of munitions activities that occurred on the MRS. There is no similar input factor on the MEC HAs.
3. Location of Munitions – Describes whether munitions were found in the surface or subsurface, and is similar to the Minimum MEC Depth Relative to Maximum Intrusive Depth MEC HA input factor. Refer to **Table 10-2**. Additional detail regarding the depth that munitions were found can be found on Table 3 of the MRSPPs in **Appendix Q**.
4. Ease of Access – Similar to the Site Accessibility MEC HA input factor. Refer to **Table 10-2**. Additional detail regarding this category can be found on Table 4 of the MRSPPs in **Appendix Q**.

5. Status of Property – Used to describe whether the property is or is not under DoD control. There is no similar input factor on the MEC HAs.
6. Population Density – is used to describe how many people per square mile live within a two-mile radius of the MRSs boundary. There is no similar input factor on the MEC HAs.
7. Population Near Hazard – Used to describe the number of inhabited structures located within two miles of the MRSs boundary. There is no similar input factor on the MEC HAs.
8. Types of Activities/Structures – Describes the types of land use present within two miles of the MRSs boundary. There is no similar input factor on the MEC HAs.
9. Ecological and Cultural Resources – Describes whether ecological and/or cultural resources are present on an MRS. There is no similar input factor on the MEC HAs.

10.2.2 CWM Hazard Evaluation

The CWM Hazard Evaluation (CHE) was not applicable to the MRS since there is no evidence of CWM use throughout the history of the Closed Castner Range.

10.2.3 Human Hazard Evaluation

The Human Health Evaluation (HHE) is determined from the contamination hazard factors for the following endpoints:

- Groundwater data
- Human endpoint surface water data
- Human endpoint sediment data
- Ecological endpoint surface water data
- Ecological endpoint sediment data
- Surface soil data

The contamination hazard factor is an adjectival ranking of the maximum groundwater concentration and associated comparison value ratio.

Table 10-4 presents a summary of the MRSPP scores calculated after the RI and **Table 10-5** presents a comparison the previous and current MRSPP scores. Note that the MRSPP is subject to an independent review and may be changed after this RI is final. Therefore, the scores provided herein are unofficial.

Table 10-4: MRSPP Scores

MRS	EHE Rating	CHE Rating	HHE Rating	MRS Priority or Alternative Rating
Closed Castner Range MRS	A=2	No Known or Suspected	B=3	2

Table 10-5: Previous and Current MRSPPs

MRS	MRSPP Score After SI	MRSPP Score After RI	Comments
Closed Castner Range MRS	3	2	The discovery of the M19A1 white phosphorus rifle grenade resulted in an increase to the EHE score, and an increase in the site priority from the previous MRSPP evaluation.

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11 SUMMARY OF RESULTS AND RECOMMENDATIONS

This section summarizes the significant results obtained and the recommendations reached as a result of the RI activities conducted at the Closed Castner Range MRS. Only the most significant findings are presented in this section and are reproduced directly or abstracted from information contained in this report. The overall goal of the RI was to determine the nature and extent of MEC and MC and subsequently to determine the potential hazards and risks posed to human health and the environment by MEC and MC inside the MRS. As a result of the characterization activities conducted under this RI, the objectives of the RI have been met.

11.1 RI FIELD WORK SUMMARY

11.1.1 MEC Investigation

The initial MEC RI field activities were conducted between 29 February and 20 June 2016. A limited number of UXO personnel re-mobilized to the site on 16 October 2016 to complete anomaly resolution in Lots 8, 9 and 10 which was completed from October 16- 21, 2016. The MEC Investigation was performed in three phases as follows:

- Phase I – Instrument Assisted Visual Survey in Areas with Slopes greater than 30%. 31.50 miles of 20-ft wide IAVS transects (76.36 acres) were conducted with all-metal detectors and handheld GPS units, along unofficial hiking trails and areas of slopes up to 35% to identify surface MEC, potential CMUAs, and areas with high densities of MD and/or range related features (e.g., craters). In addition, IAVS transects were conducted in potential CMUA 21 to determine if there was evidence of surface MEC/MD.
- MEC Phase II – Geophysical and Intrusive Investigation in Areas with Slopes Less than 30%. A total of 29.03 acres was investigated outside CMUAs as follows: 1) 3,303 DGM anomalies detected on 1,750 100-ft WAA DGM transect segments (16.07 acres) were reacquired and intrusively investigated; 2) 29 100-ft x 100-ft grids and one 50-ft x 50-ft grid (6.71 total acres) were randomly located, DGM surveyed, and DGM anomalies were reacquired and intrusively investigated; and 3) a total of 456 randomly placed transects that were nominally 100-ft long (10.77 miles, or 5.22 acres) were investigated using analog (i.e., mag and dig) techniques in areas with slopes between 18 and 30% and outside of CMUAs.
- MEC Phase III – Additional Mag and Dig Investigations. Two high anomaly density areas were identified within the western portion of the MRS. A total of 2.13 miles of analog transects (1.03 acres) were conducted within these potential CMUAs to determine the nature of subsurface anomalies and to determine the extent of MEC and MD.

11.1.2 MC Investigation

The MC RI field activities were performed phases as follows:

- Phase I: ISM surface soil samples were collected June/July 2016, with resampling of some decision units for explosives in October/November 2016. Discrete soil sampling was performed in July 2016 and included collection of soil samples from potential small arms range backstop berms and arroyo depositional areas. Recollection of some berm samples was performed in April 2017. Collection of discrete surface water samples was attempted from arroyos and seep locations during a dry weather event in June 2016 and a wet weather event in August/September 2016.
- Phase II: Phase II samples were collected in January 2017 as follows: 1) ISM samples were collected to complete horizontal delineation around Phase I sample locations and to obtain data from newly identified/expanded CMUAs based on the results of the MEC RI, and 2) Discrete samples were collected at potential backstop berms and in arroyos to complete delineation and obtain a large enough data set to allow calculation of the 95% UCL concentration for comparison to the PCLs. Additionally, a soil boring program was performed in February 2017 to provide vertical delineation of MC and to demonstrate that the potential soil-to-groundwater pathway is incomplete.

A third investigation phase (planned for the installation of monitoring wells and collection of groundwater samples, if necessary) was not required because the soil to groundwater pathway was determined to be incomplete.

The CSM was updated, a MEC HA was completed, and the MRSPPs was updated based on the RI results, as discussed below.

11.2 NATURE AND EXTENT OF CONTAMINATION

11.2.1 Nature and Extent of MEC

After intrusive activities, a total of six MEC items (two DMM and four UXO) and approximately 300 lbs of MDAS were identified and removed from the investigated areas during the RI. The MEC items found and evaluated in the investigation included the following:

- 37mm HE projectile (UXO);
- M19A1 rifle grenade, WP (DMM);
- 40mm M81 projectile still in cartridge (DMM);
- 37mm HE projectile (UXO);
- MK27 PD fuze (UXO);
- and a 60mm mortar fuzed (UXO).

In addition, a total of 1,714 MDAS were found during the RI. The recovered MDAS consisted of the following:

- 88 flares

- 49 fuzes
- 299 grenades
- 2 illumination rounds
- 2 practice land mines
- 39 mortars
- 309 projectiles
- 26 rockets, and
- 900 fragments (could not be positively associated with a specific type of munition)

The range of depths over which MEC and MD were found during the RI, WAA, and ESTCP AGC live site demonstration was 0 to 24 inches within the CMUAs and 0 to 40 inches within the NCMUA. Based on the results of the RI, the extent of the existing CMUAs were revised (expanded) and new CMUAs were identified. Based on these changes to the CMUA boundaries, the total CMUA acreage was increased to 1,426.6 acres and the total NCMUA acreage was decreased to 5,376.4 acres. One data gap was identified for the horizontal extent of the CMUA boundaries. MEC likely extends north of CMUA 6 (beyond the northern boundary of the Closed Castner Range MRS) and additional investigation is required to characterize the extent in this area.

Based on the RI and WAA findings, the UXO Estimator calculations indicate that there are up to 4,860 MEC remaining on the Closed Castner Range MRS. The CMUA residual MEC densities range from approximately 1.2 MEC/acre to 14.9 MEC/acre. For the NCMUA, the results indicate the residual MEC density is 0.123/acre to a 95% confidence level.

11.2.2 Nature and Extent of MC

The Affected Property is the extent of environmental media containing constituent concentrations equal to or greater than the RALs. No metals were detected at concentrations that exceed the RALs in surface water (seep) samples. Therefore, there is no Affected Property for surface water. Twelve metals (antimony, arsenic, barium, chromium, copper, lead, manganese, mercury, molybdenum, selenium, vanadium, and zinc) were detected in ISM samples at concentrations that exceeded the RAL, and 11 Affected Property areas were identified. Three metals (arsenic, nickel, and zinc) were detected in Arroyo soil samples at concentrations that exceeded the RAL, and eight Affected Property areas were identified.

The PCL Exceedance Zone is the portion of the Affected Property that contains environmental media with constituent concentrations in excess of the critical PCL. Two metals (antimony, and lead) were detected in ISM samples at concentrations that exceeded the critical PCL and seven PCL Exceedance Zones were identified. Arsenic was the only metal detected at concentrations that exceeded the critical PCL in arroyo soil samples, and these exceedances occurred within a single arroyo reach. The 95% UCL concentration was calculate for arsenic within this reach and exceeded the critical PCL. Therefore, one PCL Exceedance zone was identified in the arroyos.

Based on results of the soil boring program, the vertical extent of the Affected Property and the PCL Exceedance Zone is limited to the top four ft of the subsurface.

Berm materials from Berm 7 and Berm 8 contain at least one metal at concentrations above the critical PCL (see **Figure 6-4**) and are believed to have been used as backstop berms for small arms firing range activities. TCLP lead results for Berm 7 would classify the material as a Class 1, non-hazardous waste, once generated and TCLP lead for Berm 8 would classify the material as a hazardous waste, once generated.

11.3 CONTAMINANT FATE AND TRANSPORT

It is possible for natural processes to result in the movement, relocation, or unearthing of MEC, increasing the chance of exposure by human and ecological receptors. The topography of the MRS progresses from mountainous terrain in the west to gently rolling terrain in the east. The composition of the soils at the MRS consists of silty sand with gravel and cobbles. Based on site topography and soil type, it is likely that surface interactions such as wet/dry erosion will impact source material and transport MEC from areas of higher elevation to lower elevation. This is occurring in CMUA 23, where grenade MD (grenade spoons, pins, and other related fragments) is moving into the arroyo which runs through this area, and the grenades are migrating downstream within the arroyo, towards the MRS boundary. Additionally, ecological and human receptors may also unearth residual MEC.

Once released, explosives MC are subject to various fate and transport mechanisms including dissolution, transformation, adsorption, advection, and volatilization. However, explosives are not present above PCLs. The fate and transport of metals MC is highly complex and is governed by several major reaction types. Potential route of migration for MC include transport to ambient air, transport via surface runoff, and plant and animal uptake from soil.

11.4 RISK ASSESSMENT SUMMARY

The BRA completed for the Closed Castner Range MRS is comprised of two parts: the HHRA and the SLERA. The HHRA concluded that the cancer risks were acceptable for all decision units and evaluated arroyos. However, the cumulative HI for soil is greater than the target HI of 1 for a future hypothetical resident at: decision units BF052, BW057, CL071, CN073, DG070, and DK074 based on lead; at CN073 based on antimony; and in Arroyo Reach 3, based on arsenic. Therefore, the non-cancer hazards are unacceptable at these locations.

The Tier 1 Ecological Exclusion Checklist completed for the MRS indicated that habitat for ecological receptors was present at the Closed Castner Range MRS, triggering the requirement for completion of the SLERA. The results of the SLERA indicated that calculation of an ecological-based PCL for lead was required for the protection of ecological receptors. The SLERA also determined that the concentrations of other metals in surface soil do not result in an unacceptable ecological risk. Therefore, calculation of, and comparison to, an ecological PCL for other metals was not required. The SLERA concluded that the potential for hot spots to exist at the MRS is negligible, and therefore a risk management recommendation relative to hot spots is not warranted for the MRS. The ecological PCL for lead is incorporated into the RI Report and was used to help determine the nature and extent of MC contamination for the MRS.

11.5 MEC HA AND MRSPP SUMMARY

The MEC HA was evaluated quantitatively and qualitatively as appropriate for the Closed Castner Range MRS. A qualitative MEC HA was completed based on a review of the historical site information and review of all investigations conducted to date on the MRS including this RI. Potential MEC exists on the surface and within the near subsurface at the Closed Castner Range MRS. The associated hazard of human receptors (e.g., trespassers or site workers) encountering MEC is considered high. This corresponds with the MEC HA score which assigned the highest hazard based on the type of munitions found and the potential for remaining munitions on the surface to come into contact with receptors at the site.

An MRSPP was updated based on the RI field activities. The overall site priority was increased to 2, with 1 being highest priority and 8 being the lowest.

11.6 RECOMMENDATIONS

11.6.1 MEC

Based on the RI MEC results, the JV recommends that the boundaries of the CMUAs be modified to those shown on **Figure 5-12** and as discussed in **Section 5.1.4.2** of this report. Additional investigation is required to the north of the Closed Castner Range MRS to characterize the nature and extent of MEC north of CMUA 6; this work is currently under contract to be performed as a separate site. The remainder of the MRS (areas not within the expanded CMUA boundaries) is recommended to be treated as an NCMUA. An FS to support the selection of viable alternatives for mitigating the potential safety risks to human health due to MEC is recommended for the entire MRS, including the CMUAs and the NCMUA within the Closed Castner Range MRS. Although the NCMUA area has a much lower likelihood for containing MEC, two MEC were found within the NCMUA during the RI and the NCMUA should be included in the FS to support the selection of viable alternatives for mitigating the potential safety risk to human health due to MEC. The FS should evaluate the MEC hazards based on MEC locations found during the RI, WAA, and previous characterization and removal actions.

11.6.2 MC

Based on the MC results from the RI, the following recommendations are made:

- Berms. Berms 7 and 8 should be evaluated for response action, based on berm material sample results exceeding the critical PCL (see **Figure 6-4**) and TCLP lead results indicating the material from Berm 7 could classify a Class 1, non-hazardous waste, the material from Berm 8 could classify the material as hazardous waste.
- ISM Locations. Seven PCL Exceedance Zones were identified in the MRS associated with ISM sample results (see **Figure 6-7**). The PCL Exceedance Zone is the portion of

the site which will require a response action. Therefore, the findings of the RI indicate that further action for MC is required at these locations.

- Arroyo Locations. One PCL Exceedance Zone was identified in the MRS associated with two discrete arroyo soil sampling locations in Reach 3 (see **Figure 6-8**). Therefore, the findings of the RI indicate that further action for MC is required within this reach.

Based on the results of this RI, preparation of an FS for the Closed Castner Range MRS is recommended to support the identification and evaluation of remedial alternatives for addressing risks to human health and the environment due to MC impacts at Berms 7 and 8, seven PCL Exceedance Zones within or immediately adjacent to CMUAs 1 and 4, and one PCL Exceedance Zone in Arroyo Reach 3 within CMUA 1 (revised CMUAs are shown on **Figure 5-12)**.

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APPENDIX A

PERFORMANCE WORK STATEMENT

REVISED

PERFORMANCE WORK STATEMENT

REMEDIAL INVESTIGATION

FORT BLISS CLOSED CASTNER FIRING RANGE
(FTBLS-004-R-01)

EL PASO, TEXAS

ENVIRONMENTAL REMEDIATION SERVICES CONTRACT

Contract No. W912DY-10-D-0025
Task Order No. DS01
Modification No. ~~03~~ 04

~~July 18, 2017~~
March 14, 2018

1.0 Background and Introduction

This Performance Work Statement (PWS) is for soliciting proposals under the Small Business/Unrestricted Worldwide Environmental Remediation Services (WERS) Performance Based Acquisition (PBA) held by the U.S. Army Corps of Engineers (USACE) Huntsville District; reference contract number W912DY-10-D-0025. All requirements of this contract are implicit in the PWS and may not be superseded. The project is under the U.S. Army Environmental Command (USAEC) Military Munitions Response Program (MMRP), **to be** performed in accordance with (IAW) ~~ER 200-3-1~~ **the U.S. Army Military Munitions Response Program Final Munitions Response Remedial Investigation/Feasibility Study Guidance (November 2009)**. The objective is to obtain Army and Texas Commission for Environmental Quality (TCEQ) approval of Munitions Response Site (MRS) Remedial Investigation (RI) for the Closed Castner Firing Range Assessment Area at Fort Bliss. For this PWS, the entire Closed Castner Firing Range has been divided into three areas: the East Management Area, the Northwest Management Area, and the Southwest Management Area. The boundaries of these areas are further detailed in section 5.5 and are depicted in Figure 1.

Modification 04 is for a Period of Performance extension from March 31, 2018 to June 30, 2018. The extension is required due to delays in regulatory review of the final report. This extension will not result in a change of cost for the Government.

1.1 Regulatory Requirements

The Closed Castner Firing Range is under TCEQ Resources Conservation and Recovery Act (RCRA) permit 50296 for RCRA Corrective Action. This investigation should be conducted as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) RI with the TCEQ RCRA Corrective Action requirements as an Applicable or Relevant and Appropriate Requirement (ARAR). Closed Castner Firing Range is not on the National Priorities List (NPL).

The Contractor shall perform all work IAW federal, state, and local statutes, regulations, and guidance. The work required under this PWS falls under the Defense Environmental Restoration Program – (DERP) MMRP. All MEC associated work will be consistent with the provisions of the CERCLA of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Executive Order (EO) 12580, Chapter 29 of the Code of Federal Regulations (CFR) Section 1910.120, and USACE, Department of the Army (DA), and Department of Defense (DoD) safety requirements regarding personnel, equipment, and procedures as they pertain to Munitions and Explosives of Concern (MEC), obtaining permits, and making proper notifications and contacts necessary for implementation of project tasks in coordination with the USACE Contracting Officer's Representative (COR). Note that CERCLA has no special provisions for dealing with explosive safety, and as such, the Contractor should refer to DoD's recently revised Explosives Safety Standards [DoD 6055.09-STD (Feb 2008)]. All elements of the task order will be completed in accordance with all USAEC and USACE guidance including, but not limited to, USACE Engineering Pamphlet EP 1110-1-18 for Military Munitions Response Process and Engineering Manual EM 1110-1-4009 or EM 200-1-15. EM 200-1-15 has not been released in final form but is expected in June 2013. When released, it will supersede EM 1110-1-4009.

The Contractor shall be responsible for fully executing the Firm Fixed Price (FFP) task order under a PBA approach. The Contractor shall conduct required environmental investigation services for which the United States Department of the Army (the "Army") is statutorily responsible; addressing any and all environmental, explosive safety, scheduling, and regulatory issues, and assuming contractual liability and responsibility for the achievement of the performance objectives for the aforementioned site.

The Contractor must possess all the required expertise, knowledge, equipment and tools required to meet or exceed the government's objectives identified in this PWS in accordance with established industry standards. The Contractor must have the capability and experience to perform, or provide, a wide range of investigative services required for hazardous substance, waste sites and MEC.

Under this contract, the Contractor shall perform munitions response actions for military munitions, including MEC, and munitions debris (MD). Activities may involve MEC, which includes Unexploded Ordnance (UXO), Discarded Military Munitions (DMM), and Munitions Constituents if found in high enough concentrations to cause an explosive threat, non-explosive concentrations of Munitions Constituents (MC) and incidental contaminants related to military munitions.

TCEQ and U.S. Environmental Protection Agency (USEPA) Region 6 are the regulatory agencies for this site. TCEQ is the lead regulatory agency.

1.2 Site History

Closed Castner Firing Range is located within the city limits of El Paso, Texas, between U.S. Highway 54 and the Franklin Mountains State Park, approximately 4 miles south of the New Mexico state line. Acquisition of Closed Castner Firing Range began in 1926 with approximately 3,500 acres, but by 1939, additional land was acquired to bring the total size of the range to 8,328 acres.

From 1926 through 1966 Closed Castner Firing Range was used heavily for small arms, artillery firing, and impact areas. In 1966 all ordnance use at Closed Castner Firing Range was discontinued. Range operations were then transferred to the Meyer Range Complex. In 1971, the DA declared Closed Castner Firing Range excess to its needs and a non-Base Realignment and Closure (BRAC) excess facility. Several parcels of Closed Castner Firing Range totaling 1,230 acres have since been transferred to non-Department of Defense entities described below, and the remaining 7,081 acres of Closed Castner Firing Range were declared unsuitable for transfer, and remained with a closed range status.

Surface clearance operations have been conducted on Closed Castner Firing Range over the years. Between July 2003 and March 2004, a surface clearance was conducted on 975 acres plus a subsurface clearance on an additional 167 acres. Castner XD, consisting of 1,230 acres were cleared and transferred to the City of El Paso in 1983. However, it is currently undergoing a follow-on RI by USACE Fort Worth District.

The Closed Castner Firing Range is suspected to contain large caliber high explosives, mortars, pyrotechnics, illumination flares, grenades, and small arms. A large area used for a non-permitted Open Burn/Open Detonation, located on the northern boundary of Closed Castner Firing Range, was found to contain cyclotetramethylenetetranitramine (HMX), cyclotrimethylenetrinitramine (RDX), and RCRA metals. This Open Burn/Open Detonation area was previously remediated via a removal action with confirmation sampling. Given the proximity of residential areas, the highway that runs through it and the Franklin Mountain State Park that borders it, Closed Castner Firing Range poses a high hazard to people in the area. Trespassing by the general public is a common and potentially dangerous problem.

An Interim Response Action (IRA) to fence the range was initiated in 2007, but was later deferred until after the Remedial Investigation/Feasibility Study (RI/FS) is completed (Draft Engineering Evaluation and Cost Analysis for Closed Castner Firing Range at Fort Bliss, Texas; Science Applications International Corporation, November 2007). Signage at the Closed Castner Firing Range was updated in early 2009. Closed Castner Firing Range was selected for the Wide Area Assessment (WAA) technologies evaluation and multi-incremental sampling protocol development. The WAA final report was issued in July 2012. Data collected during the WAA included Light Detection and Ranging (LiDAR) data which is available as Government Furnished Information (GFI).

Since 1999, Fort Bliss has conducted intensive archaeological investigations on over 2400 acres of land situated on Castner Range. This survey effort represents nearly 35% of the total 7000 acres of Castner. These investigations have focused on those portions of the range that have been cleared of potentially dangerous UXO. Surveys have been conducted on highland, mountain canyon settings as well as the lower alluvial fans, giving a picture of land-use patterns on the different landforms available for study on Castner Range. As a result of these surveys a number of archaeological properties, both historic and prehistoric have been identified. Eighteen prehistoric sites have been discovered and vary in type including plant processing sites with limestone bedrock mortar features, rock art sites with petroglyphs/pictographs, as well as a number of smaller campsites dating to the Late Archaic-Early Formative periods. Fifteen historic sites are also present on Castner including mining sites, ranching features and early military training sites including anti-mechanized target courses and the Indian Peak Navigation Light heliograph station.

2.0 Types of Services Required

This PWS includes services as authorized under the Small Business WERS PBA held by the USACE Huntsville District; reference solicitation number W912DY-10-D-0022, W912DY-10-D-0023, W912DY-10-D-0024, W912DY-10-D-0025, W912DY-10-D-0026, W912DY-10-D-0027, and W912DY-10-D-0028. These services may include, but are not limited to all aspects of CERCLA phase of Remedial Investigation.

3.0 Performance Objectives and Standards

The Contractor shall be required to furnish all plant, labor, materials and equipment necessary to meet the performance objectives summary identified in Table 1 below. The performance requirements summary for this task order may be found in Table 3.

Table 1: Performance Objectives Summary.

Performance Objective	*Performance Standards*
Approved Project Management Plan (PMP) and Quality Assurance Surveillance Plan (QASP) for the entire Closed Castner Firing Range: • Draft PMP and QASP within 30 calendar days of contract award. • Draft Final QASP within 30 days of receipt of Army's comments. • Final PMP within 30 calendar days of receipt of COR comments on the draft.	Army approval through the COR.
Approved Explosives Site Plan (ESP) for the entire Closed Castner Firing Range: • Draft Final ESP within 30 days of receipt of Army's comments on the Draft ESP. • Final ESP within 7 days of Department of Defense Explosives Safety Board (DDESB) approval.	DDESB approval of contractor prepared ESP.

Approved Planning Documents Work Plan (WP), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP), Site Safety and Health Plan/Accident Prevention Plan (SSHP/APP), Geographic Information System (GIS) data and Conceptual Site Model (CSM), etc.) for the entire Closed Castner Firing Range: • Draft Final documents within 60 days of resolution of Army's comments on the Draft documents. • Final documents within 30 days of resolution of Army's and TCEQ comments.	Army and TCEQ approval of final documents.
Achieve Community Relations Support for the entire Closed Castner Firing Range: • Draft Final Community Relations Plan (CRP) within 30 days of receipt of Army's comments on the Draft CRP. • Final CRP within 7 days of resolution of Army's comments.	Army approval through the COR.
Achieve Stakeholder Meetings for the entire Closed Castner range: • Meeting minutes for Project Kick-off meeting, TPP meetings, and Field Kick-off meetings.	Army approval of final meeting minutes.
OPTION: Perform Consulting Hours	Army approval of Confirmation Notice Deliverable.
OPTION: Achieve Remedial Investigation fieldwork at the following sites by September 30, 2015: • Closed Castner Firing Range East Management Area. • Closed Castner Firing Range Northwest Management Area. • Closed Castner Firing Range Southwest Management Area.	Army and TCEQ approval of final data analysis reports for Closed Castner Firing Range for: • Closed Castner Firing Range East Management Area. • Closed Castner Firing Range Northwest Management Area. • Closed Castner Firing Range Southwest Management Area.
OPTION: Approved RI Report at Closed Castner Firing Range for the Closed Castner Firing Range by September 30, 2016.	• Army and TCEQ approval of final RI report for Closed Castner Firing Range. • Army approval of structured Project File Record.

There are multiple milestones and/or deliverables for each performance objective (see Section 5.3). Payments will be based only on successful completion of the milestones. Final decisions regarding the adequacy of milestone and deliverable completion resides with the COR (see Section 7.2), with appropriate acceptance of necessary documentation by regulators, consistent with applicable regulatory drivers listed in Section 1.0 of this PWS and consistent with the Performance Standards in Table 1 of the QASP Template (see Attachment E).

4.0 Period of Performance

The period of performance for all tasks in the base Major Milestones (numbers 1 through 3) will not exceed ~~March 31, 2018~~ June 30, 2018. Optional Major Milestones (numbers 4 through 8), if awarded, will be awarded by September 30, 2014. The Period of Performance for tasks in the optional Major Milestones will not exceed ~~March 31, 2018~~ June 30, 2018. Award of options will be based on availability of funds.

5.0 General Information

The PBA approach requires careful coordination of project activities to ensure that all stakeholders are kept informed of the project status, existing or potential problems, and any changes required to prudently manage the project and meet the needs of the project stakeholders and decision-makers.

5.1 Deliverables and Review Schedule

All documents must be produced as Draft, Draft-Final, and Final versions, except for the PMP and the QASP or unless otherwise stated. The Contractor shall establish an ftp or SharePoint site, or similar vehicle, to allow for exchange and review of electronic versions of the draft, draft final, and final documents by the stakeholders. **Ten (10) copies of each final deliverable are required (hard copy with one CD/DVD per hard copy). Two (2) additional CD/DVDs with fully editable versions of the Final documents will be provided.** With COR concurrence, the Contractor may coordinate with appropriate agencies to determine if fewer versions of each deliverable are sufficient for review. **All documents must be produced with at least draft, draft-final, and final versions. The Army, through the COR, will receive initial draft documents and will provide comments to the Contractor within forty-five (45) calendar days. The draft documents should be line numbered to make referencing text in the comments easier. The U.S. Army Technical Center for Explosives Safety (USATCES) approval of the ESP is not necessarily on the same timetable and may take up to 60 days, but is subject to change. Once initial comments are addressed, the Army will review draft final documents within 45 days before submission of the draft final documents to TCEQ for review. Based on past government experience, TCEQ review periods may take up to 60 days, but is subject to change.**

5.2 Project Schedule

The Contractor shall propose an overall Activity-Based Schedule that fully supports the technical approach and outlines activities and milestones defined at the appropriate detail level; logically sequenced to support and manage completion of the performance objectives in the PWS and which allows for sufficient review time of deliverables. The schedule shall clearly show all proposed major milestones and submittals necessary to meet task order objectives (see Table 1, Completion Dates). After the task order award, the Contractor shall maintain an updated detailed working schedule as part of monthly project status reports that outlines the due dates for all major milestones and deliverables.

Additionally, the due dates for all payable deliverables shall be identified. The Contractor shall coordinate activities with the COR to ensure that the proposed project schedule does not conflict with other Contractor activities on site, or interrupt Installation mission activities.

5.3 Milestone Payment Schedule and Presentations

Milestone presentations shall be made to the COR at the completion of each major milestone to provide analysis and lessons learned, and to present approaches for completion of future milestones. At the COR's request, the Contractor may also make milestone presentations to the other project stakeholders, consistent with the applicable regulatory drivers listed in Section 1.0, to show achievement of the performance objectives.

The Contractor may propose interim payment milestones and include the recommendation in the PMP. Interim milestones will only be accepted if they represent significant progress toward milestone completion, and the completion of these interim steps can be measured and demonstrated. As noted in Section 3.0, payments will be tied to the successful completion of the following milestones or an interim milestone plan approved by the Army, through the COR. To that end, all proposed interim milestones should be associated with required deliverables. All milestones must have a defined means for demonstrating completion in order to facilitate certification and approval (see Section 7.2 of this PWS, Certification and Approval of Project Milestones and Deliverables).

5.4 Expertise and Necessary Personnel

The Army requires that the following positions, at a minimum, be designated as "key personnel" for this task order, subject to the terms and conditions set forth in the basic WERS contract.

POSITION	PERSONNEL
Project Manager	[TBD]
Senior Scientist/Engineer	[TBD]
Site Superintendent	[TBD]
Senior UXO Supervisor	[TBD]
UXO Safety Officer (UXOSO)	[TBD]
UXO Quality Control Specialist (UXOQCS)	[TBD]
Regulatory Specialist	[TBD]
Risk Assessor	[TBD]
Certified Industrial Hygienist	[TBD]

The Contractor shall provide the necessary personnel and equipment to successfully execute this PWS. The Contractor shall be responsible for ensuring that the requirements for licensed/certified professionals and other personnel meet the standards set forth in the base contract personnel requirements and as required by the Occupational Safety and Health Administration (OSHA), and all other applicable federal and state regulations.

The Contractor shall furnish all plant, labor, materials and equipment necessary to meet the performance objectives. The Contractor shall provide all support activities necessary to ensure the safe and effective accomplishment of all work. For all work performed under this contract, the Contractor shall also develop and implement quality control measures consistent with all applicable federal and state regulatory requirements and standards.

The Contractor shall propose key personnel required to achieve the objectives. The Contractor shall notify the COR of any changes in key personnel. The change of key personnel is subject to approval by the Contracting Officer (KO), although such approval will not be unreasonably withheld provided replacement personnel are of the same quality as originally proposed.

5.5 Place of Performance

Work for the base task order will be performed at the Closed Castner Firing Range and off-site Contractor offices. Major Milestones (see Table 3) 1, 2, 3, 4, and 8, apply to the entire Closed Castner Range. The RI efforts for Major Milestone 5 occur in the area of the Closed Castner Firing Range east of lines A-B and B-C shown in Figure 1, hereafter known as the East Management Area are shown in Table 2 below. Major Milestone 6 deals with RI efforts in the area west of the East Area and north of Transmountain Road, hereafter known as the Northwest Management Area. Major Milestone 7 deals with RI efforts in the area west of the East Area and south of Transmountain Road (Loop 375), hereafter known as the Southwest Management Area.

Table 2 – Coordinates for the East Area Boundary

Point	Coordinate X	Coordinate Y
A	360518	3533323
B	362348	3530964
C	362150	3526896

Coordinate System: WGS_1984_UTM_Zone_13N
Units: Meter

5.6 MEC Related Guidance

MEC related guidance includes, but may not be limited to the following:

- MEC includes: UXO, as defined in 10 U.S.C. 101(e) (5); DMM, as defined in 10 U.S.C. 2710(e) (2); or MC, as defined in 10 U.S.C. 2710(e) (3) (Reference (ai)), present in high enough concentrations to pose an explosive hazard.

- MEC distinguishes specific categories of military munitions that may pose unique explosives safety risks. Because MEC that is actively managed may be determined to be hazardous waste, Hazardous Waste Operations and Emergency Response, Section 1910.120 may apply.

Per the guidelines set forth in DoDI 4140.62 and DDESB Technical Paper 18, the Contractor's UXO qualified personnel are responsible for determining the explosive safety status of any material recovered that may pose an explosive hazard (i.e., material potentially presenting an explosive hazard (MPPEH)).

Should MEC be encountered during RI activities at the site, the Contractor's UXO qualified personnel shall evaluate the explosive hazard, provide notifications per the approved Project Management Plan, and remove the explosive hazard; to include open detonation in place, as applicable. Any visible scrap metal resulting from such activities shall be properly disposed of or recycled by the contractor. All activities shall be conducted per CERCLA, applicable state and federal regulations, and applicable DoD, U.S. Army policies and procedures.

5.7 Health and Safety Requirements

Prior to beginning any field work, the Contractor shall implement the approved site specific final SSHP (Site Safety and Health Plan) and Accident Prevention Plan (APP). The Contractor shall ensure that its subcontractors, suppliers and support personnel comply with the approved SSHP. The Army reserves the right to stop work under this contract for any violations of the SSHP at no additional cost to the Army. The SSHP/APP shall be written IAW EM 385-1-1and all USAEC and USACE guidance. Once the Army verifies through the COR that a violation has been corrected, the Contractor shall be able to continue work.

As a minimum, the SSHP shall contain the following elements: site description and contaminant characterization, safety and health hazard(s) assessment and risk analysis, safety and health staff organization and responsibilities, site specific training and medical surveillance parameters, personal protective equipment (PPE) and decontamination facilities and procedures to be used, monitoring and sampling required, safety and health work precautions and procedures, site control measures, on-site first aid and emergency equipment, emergency response plans and contingency procedures (on-site and off-site), logs, reports, and record keeping. Training and medical screening per 29 CFR 1910.120(e) is required for the contract.

Additionally, the Contractor must adhere to all USAEC and USACE guidance including, but not limited to DoD and DA policies, procedures and regulations for munitions response. This includes but is not limited to DoD 6055.09-STD, DoD Ammunition and Explosives Safety Standards; Army Regulation 385-10, the Army Safety Program; Department of Army Pamphlet 385-63, Range Safety; and Department of Army Pamphlet 385-64, Ammunition and Explosives Safety Standards.

None of the sites under this PWS are suspected to contain Chemical Warfare Materiel (CWM); however, if suspect CWM is encountered during any phase of site activities the Contractor shall immediately halt operations and contact the COR for assistance and guidance.

All activities involving work in areas potentially containing MEC hazards shall be conducted in full compliance with Department of Army, state, and local requirements regarding personnel, equipment and procedures, and DoD Standard Operating Procedures (SOPs) and safety regulations.

5.8 Project Management Plan

The Contractor shall develop and maintain a detailed PMP for all tasks under the PWS. The PMP shall be based on the Contractor's proposal and shall specify the schedule, management, technical approach and resources required for the planning, execution, and completion of each task's performance objectives. The first draft of the PMP shall be due within thirty (30) calendar days of contract award and shall include the payment milestone plan. The draft PMP and all its elements shall be subject to Army review and approval through the COR. The final PMP shall be due within 30 calendar days of receipt of the government's Draft Final comments.

As part of the PMP, the Contractor shall identify and implement a means for providing project status reports to the COR. The PMPs shall address the frequency and content of status reports. The Contractor shall update the PMP and/or schedule to reflect progress towards achievement of the performance objectives and delineate proposed actions to accomplish future project milestones.

5.9 Personnel Qualifications and Work Week

Personnel involved in certain munitions response activities shall, as required, meet the qualifications set forth in USAEC and USACE guidance including, but not limited to DDESB, Technical Paper (TP) 18 – Minimum Qualifications for UXO Technicians and UXO-Qualified Personnel. The Contractor must provide Personnel Qualification Certification Letters IAW Data Item Description (DID) WERS MR MR-012.01. Due to the inherent hazards associated with munitions response activities, personnel performing munitions response activities that present an explosive risk shall be subject to work hour limitations, unless specifically authorized by the COR. Accordingly, MEC personnel working on explosive operations for the Contractor shall be limited to a 50-hour work week for actual MEC field operations with no individual workday exceeding 10-hours total unless otherwise authorized by the COR. Forty-eight (48) hours must separate the MEC field operation workweek. This work restriction only applies to the MEC personnel performing actual MEC field work.

5.10 Quality Management

The Contractor must ensure that the quality of all work performed or produced under this contract meets Army approval, through the COR. The Contractor shall develop a Quality Control Plan (QCP) as part of the work plan which shall be used by the Contractor to validate the quality of the work product.

Since the technical approach for this PBA shall be developed by the Contractor, the Contractor shall also prepare a draft final QASP for all PWS tasks for use by the Army (FAR Subpart 37.6

and 46.4, and EM 385-1-97). The QASP should highlight key quality assurance activities or events that the COR will use to determine when Army (COR or KO) or regulatory (TCEQ) inspections can be conducted to assess progress toward and/or completion and quality of milestone deliverables. Activities identified in the QASP should be appropriately coded in the project schedule to allow for planning of QA inspections. The Army will produce the final QASP.

5.10.1 Quality Control

5.10.1.1 Quality Control for Chemical Analyses

Quality Control shall be provided whenever sampling or analysis for chemical constituents is required in order to achieve milestones. Quality control for traditional soils or geotechnical testing shall also be included. All sampling and analysis shall comply with the requirements of the most recently approved DoD Quality Systems Manual (QSM). Laboratories to be used by the Contractor shall be DoD Environmental Laboratory Accreditation Program (DoD ELAP) certified. The Contractor may establish an on-site testing laboratory at the project site if determined necessary by the Contractor. However, on-site testing laboratory (ies) shall be DoD ELAP certified or equivalent and meet the requirements of USEPA, specific state regulatory requirements, and all requirements of the most recently approved DoD QSM.

5.10.1.2 Quality Assurance/Quality Control (QA/QC) UFP-QAPP

Following contract award and during project implementation, the Contractor shall develop and submit documentation of project-specific QA and QC activities prepared in accordance with the UFP-QAPP. The Contractor shall prepare a detailed UFP-QAPP in accordance with current DID(s). The UFP-QAPP shall cover all data collected during the course of the RI, including chemical and geophysical. The UFP-QAPP shall include emergency contingencies for unexpected encounters with radiological materials and CWM in the event these type items are discovered during RI activities. The UFP-QAPP will cover both the MEC and MC portions of the investigation IAW EM 200-1-15.

Any sub-plan that requires detailed consideration such as an “Environmental Protection Plan”, that may have unique environmental, cultural, and archeological issues, require detailed analysis and additional coordination with USACE and Fort Bliss. The UFP-QAPP shall cover all phases of the work. The government will review and return the quality systems documentation, with comments, indicating acceptance or rejection. If necessary, the Contractor shall revise the documentation to address all comments and shall resubmit the revised documentation to the Government for acceptance. The problems and successes of the work done to control the quality of the chemical measuring activities and other chemically related cleanup activities shall be included in the summary reports.

5.10.1.3 Quality Assurance Surveillance Plan

The Contractor shall draft the QASP using the template provided in Attachment E and incorporating the Performance Objectives in Table 1. The draft QASP shall be submitted within thirty (30) calendar days of award. The Final QASP will be prepared by the Army.

5.10.2 Data Validation

The Contractor shall conduct data validation as specified in the USEPA Protocols. The data validation process shall be conducted according to the method specific SOPs, UFP-QAPP, DoD QSMs and shall be validated and qualified using the USEPA National Functional guidelines, as appropriate. The validation shall be performed as required in accordance with the approved Sampling and Analysis Plan (SAP) and documented in the RI Report. Data validation documentation should address review of the results and data qualifiers of laboratory/field QC and primary field samples.

5.10.2.1 Data Quality

The Contractor shall provide data quality of a level sufficient for the support of project objectives as specified in the approved QAPP. The Contractor shall provide QC of the various analytical tasks performed. The Contractor is responsible for achieving the data quality specified in the approved QAPP. Analytical and geophysical data that does not meet QA requirements may be rejected by the Government; to be corrected at the Contractor's expense.

5.10.2.2 Army Environmental Database and Environmental Restoration Information System

The Contractor shall upload all generated analytical data into the Environmental Restoration Information System (ERIS) on a quarterly basis. The Army, through the COR, will provide data specifications for Army Environmental Database – Restoration (AEDB-R) and ERIS to the Contractor. The Contractor shall comply with all applicable requirements for data validation and submission.

Starting in September 30, 2013, the Army will be migrating to a new database system, Headquarters Army Environmental Systems (HQAES). The Army, through the COR, will provide data specifications for AEDB-R, ERIS and HQAES. In addition, the Contractor shall upload and maintain all analytical data into the ERIS or database equivalent on a quarterly basis. The Army, through the COR, will provide data specifications for AEDB-R and ERIS to the Contractor. The Contractor shall comply with all applicable requirements for data validation (to include Level IV, using National Functional Guidelines data validation) and submission.

5.11 Protection of Property

The Contractor shall be responsible for any damage caused to property of the United States (Federal property) or private landowners by the activities of the Contractor under this contract and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States or private landowners damaged or destroyed by the Contractor incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the Contractor to a condition satisfactory to the COR or reimbursement is made by the Contractor sufficient to restore or replace the property to a condition satisfactory to the COR in accordance with Federal Acquisition Regulation (FAR) Clause 52.245-2.

5.12 Project Stakeholders

For the purpose of this PWS, project stakeholders include the Army and TCEQ. The Contractor shall be responsible for assisting Fort Bliss in obtaining comments with appropriate approval or concurrence on project deliverables consistent with applicable regulatory drivers and agreements for the site.

5.13 Regulatory Involvement

All regulatory coordination will be approved by the Army through the COR. The Contractor shall provide the necessary support to initiate, schedule, and address all regulatory aspects of the project (e.g., organizing discussions with regulators concerning site response objectives and completion requirements, obtaining regulator comments on site documents and appropriately addressing them, and obtaining written documentation of RI completion from the regulators for all of the sites identified in this PWS). The COR, or designee, will attend and represent the Army at all meetings with the regulators. With approval of the COR, the Contractor may also informally discuss investigation issues with regulators and provide an after-action report to the COR. The Army will be the signature authority for all regulatory agreements and documents.

5.14 Public Involvement

All public participation coordination shall be approved by the Army through the COR. The Contractor shall provide the necessary support to initiate, schedule, and address all public participation aspects of the project, such as preparation of briefings, presentations, fact sheets, newsletters, articles/public notices to news media. All initiatives shall be provided to the Fort Bliss Public Affairs Office (PAO) and the Fort Bliss Environmental Division (DPW-E) for review prior to distribution. The Contractor shall be responsible for requesting and addressing all public comments as required by the applicable regulatory drivers listed in Section 1.0 of this PWS. The COR, or designee, will attend and represent the Army at all meetings with the public. The Contractor can expect to make an annual presentation to the Fort Bliss Restoration Advisory Board (RAB).

The Contractor shall be responsible for developing an approved CRP for the sites in this PWS. This effort shall be coordinated with Fort Bliss PAO and DPW-E, the US Army Environmental Command, and the COR.

All public notices, handouts, etc. shall be printed in both English and Spanish (Mexican Dialect). A Spanish language interpreter shall be provided by the Contractor for all public meetings.

5.15 Communications

The Contractor shall not make available or publicly disclose any data or report generated under this contract unless specifically authorized by the COR. If any person or entity requests information from the Contractor about the subject of this performance work statement or work being conducted hereunder, the Contractor shall refer them to the COR. All reports and other information generated under this performance work statement will become the property of the Government, and distribution to any other source by the Contractor is prohibited unless authorized by the COR.

5.16 Deliverable Requirements

All documents must be produced with at least draft, draft-final, and final versions. The Army, through the COR, will receive initial draft documents and will provide comments to the Contractor within forty-five (45) calendar days. The draft documents should be line numbered to make referencing text in the comments easier. The U.S. Army Technical Center for Explosives Safety (USATCES) approval of the ESP is not necessarily on the same timetable and may take up to 60 days, but is subject to change. Once initial comments are addressed, the Army will review draft final documents within 45 days before submission of the draft final documents to TCEQ for review. Based on past government experience, TCEQ review periods may take up to 60 days, but is subject to change. The Contractor shall ensure that review periods are consistent with the applicable regulatory drivers noted in Section 1.0 of this PWS. All documents shall be identified as draft or draft final, as appropriate, until completion of TCEQ review, when they will be signed and finalized. One copy of the final document shall be placed in both the project repository and Administrative Record (for CERCLA documents) at Fort Bliss.

The Contractor shall follow the substantive requirements for all subject areas of the USAEC and USACE guidance (e.g. Engineer Manuals, DID, etc.) applicable to deliverables required for achievement of performance objectives identified in this PWS. The most recently approved versions shall apply to this PWS.

In addition, the Munitions Response Site Prioritization Protocol (MRSPP) requirements in 32 CFR Section 179 require the DoD in consultation with representatives of the states and Indian tribes, to assign each MRS a relative priority for response actions. The initial MRSPP score for MRSs is developed during the Site Investigation (SI) phase. These MRSPP scores must be reviewed annually and must be revised whenever new data are obtained. Pursuant to this requirement, the Contractor shall annually review and revise MRSPP scores based on new information, and submit to the Army. In addition, the Contractor shall also include any information that may have influenced the MRS priority or MRS sequencing decision in the Administrative Record and the Information Repository. Furthermore, the FY02 Defense Authorization Act creating the MMRP requires DoD to develop and maintain an inventory of defense sites that are known or suspected to contain UXO, DMM or MC. Pursuant to this requirement, the Contractor shall submit annual updates to the Installation Munitions Response map that reflect changes to the location, boundaries and/or extent of the MMRP sites in .pdf format. Note that the annual deliverables described above will not be accepted as interim payment milestones.

5.17 Access and Security

In order to ensure the security and orderly running of the installation, any Contractor personnel who require access to Fort Bliss will follow procedures established by the Installation. Fort Bliss is an active facility with operational and security requirements for various activities. The Contractor may be subject to these limitations relative to coordination of activities, schedule, training and access, and will be responsible for all costs associated with complying with any limitations. The Contractor should account for potential delays due to DoD security requirements in its pricing.

Table 3. Payment Milestones.

	PWS Section	Milestone/Task	PERFORMANCE OBJECTIVE	Deliverable	PERFORMANCE APPROVAL STANDARDS
BASE TASKS	**6.1**	**1**	**Approved Planning Documents for Closed Castner Firing Range**		
	6.1.1	1A	Work Plan and SSHP/APP	Work Plan, SSHP/APP	Gov't approval of final Work Plan, SSHP/APP
	6.1.2	1B	Explosives Site Plan	ESP	Gov't approval of final ESP
	6.1.3	1C	GIS data/Conceptual Site Model	GIS data/CSM	Gov't approval of GIS data/Final CSM
	6.2	**2**	**Achieve Community Relations Support**		
	6.2.1	2A	Community Relations Plan	CRP	Gov't approval of final CRP
	6.2.2	2B	Public Meetings (2)	Meeting minutes	Gov't approval of meeting minutes
	6.2.3	2C	Presentation of Project (4)	Presentation slides	Gov't approval of presentation
	6.3	**3**	**Stakeholder Meetings**		
	6.3.1	3A	Project Kick-off Meeting	Meeting minutes	Gov't approval of meeting minutes
	6.3.2	3B	TPP Meetings	Meeting minutes	Gov't approval of meeting minutes
	6.3.3	3C	Field Kick-off Meetings	Meeting minutes	Gov't approval of meeting minutes
OPTION	**6.4**	**4**	**Perform Consulting Services**	As identified in the Confirmation Notice	Gov't approval of Confirmation Notice Deliverable
OPTION	**6.5**	**5**	**Achieve RI Field Work at Closed Castner Firing Range, East Management Area**		
	6.5.1	5A	Mobilization/Demobilization	Field activity report	Gov't approval of field activity report
	6.5.2	5B	Location Surveys and Mapping	Survey data	Gov't approval of final survey data
	6.5.3	5C	Geophysical/Visual Survey	Geophysical data	Gov't approval of final geophysical data
	6.5.4	5D	MEC Characterization/Identification/Disposal	Field activity report	Gov't approval of field activity report
	6.5.5	5E	MC Sampling	Analytical data	Gov't approval of final analytical data
	6.5.6	5F	Data Analysis	Data analysis report	Gov't approval of final data analysis report
OPTION	**6.6**	**6**	**Achieve RI Field Work at Closed Castner Firing Range, Northwest Management Area**		
OPTION	**6.7**	**7**	**Achieve RI Field Work at Closed Castner Firing Range, Southwest Management Area**		
OPTION	**6.8**	**8**	**Approved Final RI Report for Closed Castner Firing Range**		
	6.8.1	8A	Final RI Rpt for Closed Castner Firing Range	Final RI report	Gov't approval of final RI report
	6.8.2	8B	Prepare and Provide Access to Administrative Record for Closed Castner Firing Range	Final Administrative Record	Gov't approval of structured Project File Record on CD/DVD; to include table of contents, all project correspondence, e-mail, Draft, Draft Final and Final Documents, etc.

6.0 Site Specific Task Requirements

6.1 Major Milestone 1: Achieve RI Planning for Closed Castner Firing Range

This Major Milestone is for preparation of RI planning documents for the RI field work covering **all of the Closed Castner Firing Range**.

6.1.1 Task 1A: Work Plan and Site Safety and Health Plan/Accident Prevention Plan

The Contractor shall propose a technical approach that adequately characterizes the nature and extent of and hazards posed by MEC in all three areas of the Closed Castner Firing Range (north, south and east areas) accessible to foot traffic and potential accumulation points for MEC due to slope erosion/instability, taking into consideration any limitations posed by the rugged terrain to meet the objective of this task order, which is to achieve a regulatory approved MRS RI.

The Contractor shall prepare the WP in accordance with WERS-001.01 and EM 1110-1-4009, EM 385-1-1, and EM 385-1-97. The WP shall cover all RI field activities. The Contractor must ensure that the quality of all work performed or produced under this contract meets Army approval, through the COR.

The WP shall also include a SAP for MC sampling. The Contractor shall prepare and submit for acceptance a SAP that includes a field sampling plan IAW DID WERS-009.01 and EM 200-1-3. The contractor shall describe their phased approach and addresses contaminants of interest and sample media in the SAP. The SAP shall be included under the UFP-QAPP. The Contractor shall also provide a discussion on data evaluation and fate and transport analysis. The potential for fate and transport shall address all transport pathways, and it should also address future degradation products resulting from biodegradation, photolysis, and chemical reactions. The SAP shall be submitted to TCEQ for regulatory review. It shall be inserted in the WP after it is finalized. Results of initial phase must be submitted prior to initiation of a second phase of MC sampling, if needed.

6.1.1.1 Safety Documentation and Reporting

Army Engineering Manual 385-1-1, part 01.D "Accident Reporting and Recordkeeping" shall be required for the work identified in this PWS. The Contractor shall comply with all USAEC and USACE guidance.

6.1.2 Task 1B: Explosive Site Plan

The Contractor shall prepare the ESP for the MEC/MC RI in accordance with ER 385-1-97 Errata Sheet no. 3, DA Pamphlet 385-64, and DOD 6055.09-m and in consultation with USACE, and ensuring that USACE and DDSEB approval is received.

6.1.3 Task 1C: Geographical Information Systems (GIS) data/Conceptual Site Model (CSM)

The Contractor shall utilize GIS in the development of the CSM. The GIS will be integrated with the Fort Bliss GIS database and managed IAW all USAEC and USACE guidance and Fort Bliss requirements (see GFI). Pre and post-project response action geospatial data analyses shall be performed using a GIS. All available existing data that is applicable to the project shall be consolidated into a geospatial database and analyzed to relay pertinent information to the Project Development Team (PDT) which may include GIS layers relating to cultural, environmental, biological, socio-economic, and/or infrastructure variables. The GIS database is a living repository that is refined throughout the life of the project. The Contractor shall submit the GIS data in a format compatible to the ESRI (ArcView/ArcInfo) system, version 10.x. The Contractor shall incorporate layers that overlay on maps of the site that identify physical, cultural, biological and ordnance related items found during the investigation. Examples include: real estate parcel boundaries, streets, highways, flora, fauna, and other sensitive habitats, MEC positively identified, positively identified archeological sites, environmental samples, and community structures. The Contractor shall provide all submittals in the Universal Transverse Mercator (UTM) WGS 84 coordinate system. Known or discovered archeological site location(s) shall not be released to the public. The Contractor shall submit GIS files to USACE Tulsa prior to the first TPP meeting. This submission may be by CD/DVD or ftp site. The Contractor shall coordinate with USACE Tulsa for this submission.

The CSM will be used to facilitate the TPP process; taking into account the potential hazards associated with MEC investigation and clearance work and its impact on traffic and public safety. The GIS database shall be updated monthly through the course of the fieldwork, and quarterly at all other times, to reflect geophysical survey data, survey and mapping data, MEC data, sampling (environmental and MEC) data, and all data collected in association with the RI and MEC clearance activities, as applicable. The development of the GIS shall follow requirements set forth in DID WERS MR-007.01.

6.2 Major Milestone 2: Achieve Community Relations Support

6.2.1 Task 2A: Community Relations Plan

The Contractor shall develop and gain approval of a CRP for the project in coordination with the COR. All public participation coordination shall be approved by the Government through the COR and be coordinated with Fort Bliss PAO and DPW-E.

The Contractor shall prepare the CRP in compliance with:

- Engineer Pamphlet 200-3-1, September 2011, Public Participation Requirements for Defense Environmental Restoration Program
- USACE Engineer Regulation 200-3-1, May 2004, Environmental Quality—Formerly Used Defense Sites Program Policy
- U.S. Environmental Protection Agency (EPA), April 2005, Superfund Community Involvement Handbook (EPA540-K-05-003)

6.2.2 Task 2B: Public Meetings

The Contractor shall anticipate that two (2) public meetings will be required to meet the objectives of this Task Order and propose accordingly. These meetings are different from and in addition to TPP and Restoration Advisory Board meetings. All public meetings shall be held in the El Paso area. The support shall include, but is not limited to: preparation and delivery of briefings, graphics, maps, posters, question and answer support sessions, public notices and attendance and support to the Government at the public meetings. Prior to public meetings, presentation material must be reviewed by the COR and Fort Bliss. The actions are independent of the field activities that involve interaction with the community. The Contractor shall submit a short summary, within 7 days after each public meeting, of the results of the public meeting. This submittal may be electronically by email.

6.2.3 Task 2C: Presentation of Project

The Contractor shall anticipate making four (4) 1-day presentations at Fort Bliss to Fort Bliss, USACE, USAEC, and TCEQ personnel concerning the progress of the project, addressing issues the project may have, and to answer any questions.

6.3 Major Milestone 3: Stakeholder Meetings

6.3.1 Task 3A: Project Kick-off Meeting

The Contractor shall hold a Project Kick-Off Meeting at Fort Bliss within 30 days of delivery of the draft PMP.

6.3.2 Task 3B: Technical Project Planning (TPP) Meetings

The objective of this task is to develop Data Quality Objectives (DQOs) and stakeholder buy-in to the DQOs, with the technical approach developed in the planning documents, and to review the field effort results. In coordination with the Government, the Contractor shall implement the TPP process in accordance with *EM 200-1-2, Technical Project Planning (TPP) Process* and Interim Guidance Document 01-02, *Implementation of Technical Project Planning (TPP) Ordnance and Explosives (OE) Formerly Used Defense Sites (FUDS) Projects*. The TPP meetings shall take place at Fort Bliss, or El Paso, Texas.

The Contractor shall organize, coordinate, and be responsible for all logistics for the TPP meetings. The Contractor shall prepare a TPP Memorandum after the meetings containing the results of the TPP meeting for review and comment by the stakeholders.

As part of the TPP process, the Contractor shall develop a CSM for the project using GIS based data and methods to graphically describe the physical and environmental profiles of the site, exposure pathways, and data needs based on existing information. The draft CSM shall be presented at the first TPP meeting.

6.3.3 Task 3C: Field Kick-Off Meetings

The Contractor shall hold Field Kick-Off Meetings at Fort Bliss prior to field mobilization.

6.4 Major Milestone 4: Consulting Services

This is a firm fixed price task to address one or more anticipated, but unidentified (at the time of task order award) work requirements necessary to meet project objectives. Costs for periodic work assignments (via confirmation notices) will be agreed to in advance on a fixed price basis. The Contractor shall provide an estimated $100,000 (over the duration of the task order) in periodic consultation services under this time and materials task. To perform services under this task, the Contractor will be notified by the Contracting Officer of the task(s) to be performed. The Government will provide all pertinent and available Government Furnished Information to the Contractor for use in preparing a Confirmation Notice (Enclosure 1) as required. The Contractor shall provide a completed and signed Confirmation Notice documenting the work to be performed for review and approval by the USACE Contracting Officer. Enclosure 1 will document the agreed upon level of effort relative to tasks, deliverables, schedule, and fix priced cost for the requested consultation services, and will be signed by the Contractor's authorized representative and the USACE Tulsa District Contracting Officer. Enclosure 2 is a tracking of expenditures form for each consultation services request.

6.5 Major Milestone 5: Achieve RI Field Work for Closed Castner Firing Range, East Management Area

This part of the Closed Castner Firing Range is defined as being east of the A-B and B-C line shown on Figure 1. This task will include all field activities necessary to execute this task including a geophysical survey and Data Analysis Report.

6.5.1. Task 5A: Mobilization/Demobilization

The Contractor shall mobilize resources to begin field work. After completion of field work, the Contractor shall demobilize all resources.

6.5.2 Task 5B: Location Surveys and Mapping

The Contractor shall perform all necessary location surveys IAW all USAEC and USACE guidance. All data submitted shall be placed in the UTM coordinate system.

6.5.3 Task 5C: Geophysical/Visual Survey

The contractor shall propose both the locations and technical approach for conducting geophysical surveys of this area. The contractor shall propose an approach that meets DID WERS-004.01 performance requirements for RI/FS.

The contractor shall be responsible for ensuring that DQOs based on their technical approach shall meet TPP requirements. Again, the Contractor shall perform geophysical surveys IAW all

USAEC and USACE guidance including, but not limited to DIDS WERS-004.01. This task includes all components required for completion of the geophysics such as brush clearing, licensed professional surveying of seed items, etc. If performing digital geophysical mapping (DGM), the Contractor may propose using the geophysical verification system (GSV) process instead of the traditional process. The Contractor shall submit the IVS or GVS letter report within 7 days of IVS or GVS establishment.

6.5.4 Task 5D: MEC Characterization/Identification and Disposal/Accountability

MEC characterization will be based on the performance requirements for RI/FS noted in DID WERS-004.01. The contractor shall propose how many acres to be surveyed, grid size and transect spacing, anomaly resolution, based on either a DGM or analog approach.

The Contractor shall demonstrate that all areas with potential to contain MEC have been traversed at the completion of fieldwork and that there is a 95% chance of detecting these areas. The Contractor shall demonstrate with at least 95% confidence that areas classified as MEC-contaminated have greater than or equal to 0.1 UXO per acre. The Contractor shall demonstrate that the boundaries of all identified MEC contaminated areas have been delineated to an accuracy of at least +/- half of the transect spacing maximum, which is 250 feet, and demonstrate that a 95% confidence has been achieved for bounding the potential depth of MEC. The Contractor shall demonstrate 95% confidence in the nature (type and density) of MEC and MEC related debris, for each relatively homogenous MEC contaminated area, has been achieved. The contractor shall demonstrate that data inputs from the RI into the FS will enable remediation cost estimates with an accuracy of +50 percent/-30 percent. The work and reporting shall address the surface and sub-surface metallic anomaly density distribution (anomaly/acre) across identified MEC contaminated areas and other remediation cost drivers such as vegetation type and density, terrain conditions, soil type, exclusion zone evacuation costs, etc. each to a level of accuracy within the range specified herein.

All geophysics work shall be conducted in accordance with the geophysics DID WERS-004.01. For this task order, one acre of transects equals 14,520 linear feet (2.75 miles) of transects 3 feet wide. One acre worth of grids equals seventeen 2500 sq. ft. grids or four 10,000 sq. ft. grids.

With respect to MEC disposal and accountability, the Contractor shall maintain a detailed accounting of all MEC items/components encountered. This accounting shall include the amounts of MEC, nomenclature and condition, location and depth of MEC, and disposition. The contractor shall also account for all demolition materials utilized to detonate MEC on site. The Contractor shall take digital photographs of identifiable MEC found during the investigation.

All MD shall be inspected, certified, and disposed of in accordance with all USAEC and USACE guidance including, but not limited to EM 1110-1-4009 chapter 14. MD inspection shall be certified on DD Form 1348-1 as follows: "This certifies and verifies that the munitions debris listed has been 100 percent properly inspected and to the best of our knowledge and belief, is free of explosive hazards". This certification requires dual signatures. Both the Senior Unexploded Ordnance Specialist (SUXOS) and the UXOSO/UXOQCS shall sign as certifiers, and the on-site USACE OE Safety Specialist will sign as verifier. The inspected and certified inert munitions debris shall be containerized, maintained, and then safeguarded until proper disposal is arranged and accomplished.

All MPPEH and other metallic debris shall be twice-inspected and certified as presenting no explosive hazards by Contractor UXO qualified personnel prior to being removed from the grid. Once inspected and certified as presenting no explosive hazard, MPPEH shall be reclassified as munitions debris and containerized in an on-site storage container and safeguarded until proper disposition can be arranged. The storage container shall be locked at all times when not in use. Munitions debris shall be segregated from other metallic debris. All munitions debris shall be disposed of at a foundry and/or recycler where it shall be processed through a smelter, shredder or furnace prior to resale or release in accordance with all governing regulations. Munitions debris is to be disposed of permanently. The Contractor shall document transport of munitions debris to the next responsible party, and must provide certification of destruction as part of the RI Report.

The Contractor shall be responsible for the destruction of all MEC encountered during project activities. The Contractor shall be responsible for destruction/disposition of all MEC/MPPEH encountered during the project; in coordination with the USACE OE Safety Specialist. The Contractor shall establish the method of destruction/disposition in the project QAPP consistent with the ESP. During intrusive activities and disposal operations, the Contractor shall be responsible for the use of engineering controls, as needed, and coordinate with the USACE OE Safety Specialist in the event that evacuation of local residents located within the calculated Minimum Separation Distances (MSDs) is required.

All access/excavation/detonation holes shall be backfilled by the Contractor. The Contractor shall restore such areas to their prior conditions. If a Blow-In-Place (BIP) occurs, post-detonation sampling for explosives residue is required prior to backfill.

6.5.5 Task 5E: MC Sampling

The objective of the MC sampling is to determine the presence of and the nature and extent of the MCs that are detected above the applicable regulatory criteria and to perform a human health risk assessment as well as an ecological risk assessment, if appropriate, in accordance with the EPA Risk Assessment Guidance (RAGS) and USACE EM 200-1-4, Volumes I and II. Sampling shall be conducted to support the MC baseline risk assessment. The Contractor shall propose the sampling approach, quantities, and analytical methodology, including QC requirements. Please note that for sampling and analysis of explosives and propellants, EPA SW-846 method 8330B with the multi-increment composite sampling approach will be utilized for all soil matrices.

6.5.5.1 Deviations. Any deviations from the accepted SAP shall be documented in the Data Quality Control Reports (DQCRs). Any deviations that may affect DQO's shall be conveyed to the USACE COR immediately. Specifics of the environmental sampling program shall be determined at the TPP meeting.

6.5.5.2 Laboratory Qualifications. Environmental laboratory services are to be provided only by laboratories compliant with the most recently published version of the DoD QSM and holding a current DELAP accreditation for all appropriate fields-of-testing.

As requested by the COR, the laboratory shall submit, in a timely manner, the self-declaration forms (including required supporting documentation), as well as information related to the laboratories current DELAP accreditation. Before testing services can be performed by the laboratory, the COR will notify the candidate laboratory of the acceptability of the declaration and supporting documentation.

Self-declaration and provision of DELAP accreditation information is to be provided annually while supporting USACE, Tulsa contracts.

In addition to DELAP certification the laboratory shall hold current certification for all appropriate fields-of-testing in the State holding regulatory over-sight for the project. Proof of current certification for the applicable field of testing is required prior to acceptance of any samples for the project.

An environmental laboratory either anticipating, or engaged in support of USACE Tulsa contracts shall notify the prime Contractor and COR immediately of change in status of laboratory operations that may affect on-going compliance with these requirements. The COR may, at any time, conduct audits (including requests for pertinent data or information) that support an environmental laboratory's certifications and/or self-declaration of compliance with DoD QSM. If the COR finds the laboratory non-compliant, alternate compliant laboratory services will be utilized, until such time as compliance is again demonstrated.

Before performing environmental testing for USACE, Tulsa the laboratory shall have access to the approved QAPP.

6.5.5.3 Data Reporting Requirements. The Contractor shall provide data reporting elements for definitive data per Section I.13.4.2 of EM 200-1-3. The laboratory shall report all analytical results greater than the Method Detection Limit (MDL), which, in the analyst’s professional judgment, are believed to be reliably detected. Concentrations reported between the MDL and the Method Quantization Limit (MQL)/Reporting Limit (RL) shall be flagged as estimated. RLs shall be at least 3 times MDLs for all analytes.

6.5.5.4 Hardcopy Data Deliverables. The data shall be assembled in a package so that USEPA could validate the data in accordance with USEPA requirements. The data packages shall be submitted as part of the RI Report. There should be, at a minimum, two types of data tables. The first shall include all analytical results for all samples collected (i.e., this table will include concentration, MDL, RL, laboratory and data validation qualifiers). The second shall include all analytical results greater than MDL (Hits Table showing concentration, RL, laboratory and data validation qualifiers) for all samples collected. Tables should be sorted by method and include appropriate data flags resulting from laboratory review and from Contractor’s data validation.

<u>In addition, the full final data packages shall be supplied by the laboratory in .pdf format (with sections bookmarked for easy searching). The final data submittals shall include documentation to match the laboratory samples with the associated field samples. Minimum reporting requirements shall be as defined in the DoD QSM, version 3, January 2006, section 5.10. The final pdf data reports must contain full calibrations. The complete .pdf files shall be included with the Final RI Report (on CD).</u>

6.5.5.5 Electronic Data Deliverables. All electronic data submitted by the contract laboratory shall be error-free, and in complete agreement with the hardcopy data. Data files are to be delivered both by e-mail and on high density CD accompanying the hardcopy data reports. The disk must be submitted with a transmittal letter from the laboratory that certifies that the file is in agreement with hardcopy data reports and has been found to be free of errors using the latest version of the ADR evaluation software provided to the laboratory. The contract laboratory, at their cost, shall correct any errors identified by the Government. The Contractor shall be responsible for the successful electronic transmission of field and laboratory data under this PWS. The Contractor's laboratory shall be responsible for archiving the electronic raw data and sufficient associated hardcopy data (e.g., sample login sheets and sample preparation log sheets) to completely reconstruct the analyses that were performed for a period of ten years after completion of this task order.

The laboratory results shall be submitted by the Contractor in an Excel spreadsheet and the laboratory data reports shall be submitted in MS Word format. The final data package shall be submitted in .pdf format.

6.5.5.6 Data Validation. The Contractor shall conduct data validation as specified in the U.S. EPA Protocols. The data validation process shall be conducted according to the method specific SOPs, project specific QAP, DoD QSMs and be validated and qualified using the U.S. EPA National Functional guidelines, as appropriate. The validation shall be performed as required in accordance with the approved SAP and documented in the RI Report. The document of data validation documentation should address review of the results and data qualifiers of laboratory/field QC and primary field samples.

6.5.5.7 Data Quality. The Contractor shall provide data quality of a level sufficient for the support of project objectives as specified in the approved SAP. The Contractor shall provide QC of the various analytical tasks performed. The Contractor shall achieve the data quality specified in the approved SAP. Analytical data that does not meet QA requirements may be rejected by the Government; to be corrected at the Contractor's expense.

6.5.6 Task 5F: Data Analysis Report

The Contractor shall prepare a Data Analysis Report summarizing the results of the RI field effort. This report shall form the basis for the final RI report and, as such, should be compatible with the requirements for an RI report (EP 1110-1-18, EM CX Interim Guidance 06-04 and FINAL United States Army Military Munitions Response Program RI/FS Guidance dated November 2009).

6.6 Major Milestone 6: Achieve RI Field Work at Closed Castner Firing Range, Northwest Management Area

This part of the Closed Castner Firing Range is defined as being west of the A-B and B-C line shown on Figure 1 and north of Transmountain road. This task includes all field activities necessary to execute this task including a geophysical survey and Data Analysis Report. The requirements are identical to those found in section 6.5, Major Milestone 5.

6.7 Major Milestone 7: Achieve RI Field Work at Closed Castner Firing Range, Southwest Management Area

This part of the Closed Castner Firing Range is defined as being west of the A-B and B-C line shown on Figure 1 and south of Transmountain road. This task includes all field activities necessary to execute this task including a geophysical survey and Data Analysis Report. The requirements are identical to those found in section 6.5, Major Milestone 5.

6.8 Major Milestone 8: Achieve Final RI for Closed Castner Firing Range

6.8.1 Task 8A: Final RI Report for Closed Castner Firing Range

The Contractor shall provide a RI Report for the investigation IAW EP 1110-1-18, EM CX Interim Guidance 06-04 and FINAL United States Army Military Munitions Response Program RI/FS Guidance dated November 2009. The final RI report shall be based on the completed data analysis report(s).

6.8.2 Task 8B: Prepare and Provide Access to Administrative Record for Closed Castner Firing Range

The Contractor shall establish and maintain the Administrative Record, located at Fort Bliss, for the on-going project in accordance with all USAEC and USACE guidance. The Contractor shall update and maintain the Administrative Record for the on-going project in accordance with the guidance given in EP 1110-3-8, Chapter 4 (Establishing and Maintaining Administrative Records). This task requires close coordination with the Corps of Engineers Tulsa District (CESWT) to secure all required documents to support the Administrative Record. The Contractor shall provide all final documents in the Administrative Record on CD/DVD to CESWT. These files will be suitable for placement on the PIRS web site. The Contractor shall submit 2 copies to CESWT.

7.0 Additional Requirements

7.1 Resources

7.1.1 Army Furnished Resources

The Army, through the COR, will make available the following resources to the Contractor:

- Records, reports, data, analyses, and information, in their current format (e.g., paper copy, electronic, tape, disks, CDs), to facilitate development of an accurate assessment of current, former, and historical site activities and operations; waste generation and contaminant characteristics; parameters of interest; and site environmental conditions.
- Access to personnel to conduct interviews on site operations and activities.
- Access to DoD and Army policy and guidance documents.
- All Army owned property used for investigation purposes must be maintained by the Contractor in accordance with applicable maintenance requirements, and may not be replaced by the Army should new equipment be required.

Information pertaining to the sites, regulatory status, etc. supplied in the PWS and as GFI is intended to assist the offerors in developing proposals. However, the proposing Contractor(s) bear the full burden to perform whatever due diligence they deem prudent to examine records, documents, and etc. necessary to develop a proposal including independent verification of the information in the PWS and in any provided GFI. A reasonable effort (at the time of the Request for Proposal) has been made to supply all relevant information for the use of the offerors.

USACE Tulsa will provide the reference documents listed in Attachment A as GFI at the time of the Request for Proposals (RFP).

7.1.2 Contractor Furnished Resources

The Contractor must possess all the required expertise, knowledge, equipment and tools required to meet or exceed the Army's objectives identified in this PWS in accordance with established industry standards.

In addition, the Contractor shall be responsible for the following:

- The provision and cost of the utilities associated with implementation of investigative activities, including installation of individual meters for necessary utilities.
- All waste generated under this contract will be the responsibility of the Contractor.
- Any other necessary resources needed to achieve the performance objectives.

7.2 Certification and Approval of Project Milestones and Deliverables

The COR will be responsible for contract management, inspection, oversight, review, and approval activities. Certification and approval of project milestones by the COR is necessary before distribution of payments. Final acceptance of milestone completion will include appropriate acceptance of site investigation documentation by regulators.

Certification and approval of project milestones by the Army is contingent upon the Contractor performing in accordance with the terms and conditions of the contract, this PWS, and all amendments.

As required by the COR, representatives of USAEC, the Installation and the Contractor shall meet in person or via conference call with the COR or his designated representative at a date and time designated by the COR after receipt of each status report to:

- Formally review the quantity and quality of services;
- Inspect work for compliance with this PWS, the associated Contractor's final proposal, and project documentation;
- Accept or reject milestones and deliverables completed since the previous review; and
- Prepare, approve and submit DD Form 250 "Material Inspection and Receiving Report" or equivalent for milestone payments in accordance with milestone completions and approvals at the COR level.

7.3 Government Rights

The Army has unlimited rights to all documents/material produced under this contract. All documents and materials, to include the source codes of any software, produced under this contract will be Army owned and are the property of the Army with all rights and privileges of ownership/copyright belonging exclusively to the Army. These documents and materials cannot be used or sold by the Contractor without written permission from the KO. All materials supplied to the Army will be the sole property of the Army and cannot be used for any other purpose. This right does not abrogate any other Army rights under the applicable Data Rights clause(s).

7.4 Stop Work

The Contractor, authorized site personnel, and the COR have the responsibility to stop work immediately if the work is considered to be a serious threat to the safety or health of workers, other personnel, or to the environment. Authorized Installation personnel include Fort Bliss safety officers, Environmental Division personnel, and command personnel with responsibility for overall operations. When work is stopped due to a hazard/threat to worker safety, health, or the environment, the situation and resolution must be documented and submitted to the KO. Work must be stopped whenever chemical and biological warfare agents are encountered.

7.5 Environmental Responsibility Considerations

- The Army will retain responsibility for any assessed natural resource damages that are attributed to historic releases of hazardous substances (prior to contract with the Contractor) and any injuries that are necessary and incidental to the reasonable implementation of a selected response or remedial action. The Contractor shall be responsible for any/all additional natural resource injuries and associated Natural Resource Damages claims brought as a result of its actions (e.g. release of hazardous substance or unreasonable disturbance of natural resources as a result of construction activities).

- The Army will retain all responsibility for third party liability for Chemical Warfare Material (CWM)or radiological material that are either targeted for or may be discovered during the course of investigation.

- Response cost claims, property damage and personal injury claims brought due to contamination and hazardous substance releases that have occurred historically (prior to contract with the Contractor) and are not due to Contractor investigation activities are excluded from Contractor responsibility. The Contractor shall be responsible for and indemnify the Army for:

    - Any response cost claims for any environmental remediation services which the Contractor has assumed responsibility for under this PWS;

    - All costs associated with correction of a failure of any remedy implemented or operated and maintained by the Contractor to the extent such failure was caused by the willful or negligent acts or omissions of the Contractor in the course of performing the environmental services;

    - All personal injury or property damage claims to the extent caused by the acts or omissions of the Contractor in the course of performing the environmental services;

    - All natural resource damages pursuant to 42 U.S.C. Section 9607(a)(4)(C), to the extent that such damages were caused or contributed to by the actions of the Contractor or its successors in interest; and

    - All costs associated with or arising from any negligent acts or omissions or willful misconduct of the Contractor in the course of performing the environmental services or implementing remedial actions.

7.6 Inspections

The Army technical experts will independently review Contractor work to ensure compliance with all applicable requirements. Any service or submittal performed that does not meet contract requirements will be corrected or re-performed by the Contractor and at no additional cost to the Government. Corrective action must be certified and approved by the COR consistent with the basic contract. If the Contractor performs any task unsatisfactorily and all defects are not corrected, the Government reserves the right to terminate the contract for default. In addition, the Government reserves its rights under the FAR clause 52.246-4, “Inspection of Services – Fixed Price”, for further remedies concerning a Contractor’s failure to perform in conformance with contract requirements.

7.7 Travel

Travel to/from Fort Bliss and to other CONUS locations for such purposes as to attend meetings, briefings and/or presentations may be required incidental to this requirement, the costs for which will be included in the total price for the PWS.

7.8 Performance and Payment Bonds

In accordance with the base contract, the Contractor:

☒ is NOT required to furnish Performance and Payment Bonds on this PWS.

☐ is required to furnish Performance and Payment Bonds on this PWS in accordance with the following:

8.0 Milestone Payment Requests (Invoices)

Invoices, with corresponding documentation attached, will be submitted to the USACE Tulsa District Air Force/IIS Section via email upon completion of one or more performance milestones to:

Tulsa District, Corps of Engineers
Attn: Diedrie Hurd, CESWF-PEC-EE
~~1645 S. 101st East Avenue~~ 2488 East 81st Street
Tulsa, OK ~~74128-4609~~ 74137-4290
Email: Diedrie.Hurd@usace.army.mil

9.0 Government Points of Contact

USACE Project Manager:	Rick Smith US Army Corps of Engineers, Fort Worth District MIE Branch, Army/FUDS Section ~~1645 S 101 E Ave~~ 2488 East 81st Street Tulsa, OK ~~74128-4609~~ 74137-4290 Phone: (918) 669-4956 Richard.P.Smith@usace.army.mil
USACE Technical Manager:	Frank Roepke US Army USACE, Fort Worth District MIE Branch, Army/FUDS Section ~~1645 S 101 E Ave~~ 2488 East 81st Street Tulsa, OK ~~74128-4609~~ 74137-4290 Phone: (918) 669-7444 Frank.Roepke@usace.army.mil

All written correspondence pertaining to this Performance Work Statement should be addressed to the contract specialist unless otherwise directed by the KO. Written directions or clarifications to this Performance Work Statement may only be given to the Contractor by the KO or contract specialist. A change in Government Points of Contact during the period of performance for task order execution does not constitute a change to the PWS.

APPENDIX B

PROJECT MEETING MINUTES

Meeting Minutes for:

TPP No. 1 – 27 February 2014

Technical Project Planning Meeting #1 – 27 February 2014
Remedial Investigation, Closed Castner Firing Range, Fort Bliss, Texas

A stakeholder Technical Project Planning (TPP) Meeting for the Remedial Investigation (RI) at the Closed Castner Firing Range (Castner Range) was held at 9:00 AM on 27 February 2014 at the Radisson Hotel - El Paso Airport, El Paso, Texas.

The purpose of the meeting was to:

- Confirm project stakeholders
- Discuss communication tools and protocols
- Review the Military Munitions Response Program (MMRP) and RI objectives
- Review site information and current Conceptual Site Model (CSM)
- Present the proposed technical approach, and
- Introduce and develop preliminary Data Quality Objectives (DQOs)

Meeting Attendees:

Name	Organization
Sarah Alder-Schaller	PIKA-ARCADIS JV
Andrew Maly	USAEC
Robert Rowden	USAEC
Eric Kirwan	USACE
Shawn Corcoran	PIKA-ARCADIS JV
Rick Smith	USACE
Frank Roepke	USACE
Jackie Smith	USACE
Janae Reneaud Field	Frontera Land Alliance
Gonzalo Cedillos	El Paso Water Utilities
John Sparks	PIKA-ARCADIS JV
Allan Posnick	TCEQ – Austin
Jim Tolbert	Elpasonaturally.com
John Moses	Historical Landmarks
Joel Reyes	Fort Bliss DPW-E
Ramon Herrera	City of El Paso – Environmental Services
Robert Gilliam	TCEQ Region 6
Arturo Leyor	TCEQ Region 6
Richard Teschner	Franklin Mountains Wilderness Coalition
Garett Ferguson	PIKA-ARCADIS JV
Judy Ackerman	Franklin Mountains Wilderness Coalition
Jerry Kummerl	Fort Bliss RE
Lois Balin	TPWD
Mark Thomas Bray	Castner Heights Neighborhood Association
Cynthia Cano	Congressman O'Rourke

Name	Organization
Javier Loera	Ysleta del Sur Pueblo
Adam	Ysleta del Sur Pueblo
Steve Stacy	PIKA-ARCADIS JV
Eugene Mikell	UXO Pro
Mark Worley	Franklin Mountain Wilderness Coalition
Tony Mazzocchi	RAB
Lilly Mazzocchi	Guest
George & Rose Gomez	NA
Jerry Kurtyka	Sierra Club
Laurence Gibson	Sierra Club
Arden Comanche	Mescalero Apache Tribe
Howard W. Bennett	RAB
Ron Baca	Fort Bliss / PB & A
Rachel C. Walton	UMC El Paso
John C. Walton	UTEP
Tom Hope	PIKA-ARCADIS JV
Mike Madl	PIKA-ARCADIS JV

Mr. Rick Smith, United States Army Corps of Engineers (USACE) – Tulsa District, kicked off the meeting by introducing the Castner Range RI project and its overall purpose of identifying the nature and extent of any contamination on the property. He also noted that a Feasibility Study (FS) is often conducted in conjunction with an RI project, but in the case of Castner Range, it would not be part of the current project. He explained that the project was funded by the Army Environmental Command (AEC) with technical oversight from the USACE and that the PIKA-ARCADIS JV ("JV") team was the contractor chosen to execute the work.

Mike Madl, project manager for the JV, began the meeting by welcoming everyone to the first technical project planning meeting. Mr. Madl briefly discussed the meeting agenda and overall meeting goals. He then led an introduction of Army project team members, regulatory stakeholders, the JV team, and local stakeholders. Local stakeholders were asked to introduce themselves and their organization.

Mr. Madl discussed the tools that the Army and JV will utilize throughout the RI process to communicate project details to the stakeholders. This includes additional TPP meetings, two public meetings, and annual Restoration Advisory Board (RAB) meetings. He noted that the TPP process had been previously utilized for the Wide Area Assessment (WAA) field demonstration; it is specifically important, as it allows the Army and JV to seek out and engage stakeholders to provide input to the project design. This will enable the Army and JV to better identify data needs and develop appropriate DQOs for the project. Mr. Madl stated that the next TPP meeting would be during the work plan development timeframe, possibly late summer 2014. Mr. Joel Reyes stated that the next RAB meeting is scheduled for 19 March 2014.

Mr. Madl went on to describe the MMRP, noting it is the programmatic framework used by the Department of Defense (DoD) to conduct munitions investigations and clean-up action. It is part of the DoD Environmental Restoration Program, and follows the guidelines of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). No active training is conducted on the Castner Range, so the site is defined as an "other than operational range" within the MMRP.

Mr. Madl discussed the different phases within the MMRP and stated that the Castner Range is now within the RI phase. The objective of the RI phase is to determine the nature and extent of contamination on the site, including both munitions and explosives of concern (MEC) and munitions constituents (MC). Mr. Madl also noted the results of the RI field activities will be used to conduct MEC and MC risk assessments on the 7,000 acre site. The results of the RI will be used in the FS phase to determine future remedial alternatives for the range. Mr. Madl noted that the FS phase is not part of the current project but will be conducted in the future.

Sarah Alder-Schaller, the JV regulatory specialist, reviewed the Resource Conservation and Recovery Act (RCRA) requirements related to Castner Range. Castner Range is listed on Fort Bliss' RCRA permit; the site would be regulated under RCRA if it was not a MMRP site. She discussed the general goals of the RI and the different stages within RCRA and CERCLA, noting that they are essentially parallel programs. While the Castner Range RI will proceed in accordance with the CERCLA process, the substantive requirements of the RCRA permit will be integrated into the RI, including the use of Protective Concentration Levels (PCLs) for MC. Ms. Alder-Schaller discussed that the JV will determine appropriate background concentrations for the primary chemical of concern (metals) and stated that the PCLs will likely be driven by the ecological receptors found at Castner Range. The appropriate background concentrations may be those already part of the WAA, the State-wide background concentrations published by TCEQ, or determined as part of the RI.

Ms. Judy Ackerman (Franklin Mountain Wilderness Coalition) asked whether the Incremental Sampling Methodology (ISM) Field Demonstration Report was finished. Ms. Alder-Schaller confirmed it was completed and that the overall findings of the study would be presented later in the meeting. Mr. Robert Rowden (USAEC) stated that the ISM was a function of the WAA. The primary goals of the WAA and ISM program were to get an understanding of where the munitions were, have been and currently are. The secondary goal was to sample to determine the MC contamination as a whole.

Tom Hope, the JV deputy project manager, discussed the tasks associated with the Castner Range RI to include TPP meetings, planning documents, community relations support, RI field activities, preparation of the RI report, and the updating of the project administrative record. Mr. Hope stated that the project is an RI only and that a FS is not included in the project. Mr. Hope indicated that the input obtained from TPP #1 will be used to develop project plan documents.

Mr. Hope discussed the general location and the current land use of the Castner Range. The current land use is a closed military range; future land use is not currently designated at this time. Mr. Hope stated that the RI will use the most conservative approach for planning purposes, which is unrestricted land use.

Ms. Ackerman asked if the WAA investigation conducted any of the field activities listed on slide 16 (visual survey, analog geophysics, MEC characterization / identification, and MC sampling). Mr. Steve Stacy, the JV senior geophysicist, confirmed the WAA did perform the listed field activities during their investigation.

Mr. Hope discussed how the historical range training information gathered will be used as the basis for the RI. Richard Teschner (Franklin Mountains Wilderness Coalition) asked if the site would be further evaluated after the RI; Mr. Frank Roepke (USACE, Tulsa District) confirmed it would be. Mr. John Moses (Historical Landmarks) asked what is involved in the Munitions Response Site Prioritization Protocol (MRSPP). Mr. Roepke noted it is a DoD process that internally scores MMRP sites and prioritizes them for funding for future responses. Mr. Allan Posnick, TCEQ, stated that the scores rate from 1-9; he recalled Castner Range scored high during the previous Site Inspection phase. He noted that some sites might be subdivided later and the areas separately scored based on risk.

Mr. Rowden stated that DoD is executing and funding MMRP cleanup. It is a program to address specifically former ranges, like Castner Range, which may require different response levels, across all of DoD (not just the Army). The military has similar programs that address operational sites. Castner Range is considered a single Munition Response Site (MRS) rather than individual ranges; the Army and the JV will evaluate possibly separating the sites based on the results of RI.

Ms. Ackerman noted that the WAA collected much of the data that the JV is proposing to collect, and asked what it was used for. Steve Stacy noted that would be answered in the technical approach, to be presented later in the meeting.

Mr. Stacy reviewed the previous MEC investigations, removal activities, and MEC findings on the Castner Range. He then reviewed, in greater detail, the goals and results of the WAA investigation. The WAA, completed in 2012, evaluated the use of several site characterization methodologies to determine their suitability for identifying concentrated munitions use areas (CMUAs). He noted the effort was considered a field demonstration, but was designed in a manner that would provide data useful for the RI.

Mr. Stacy provided an explanation of the difference between analog and digital geophysics. Analog is conducted with a handheld geophysical sensor and no recording of data is collected. Digital involves the recording of data responses as the geophysical sensor is moved along the ground surface. The data can then be processed and interpreted at a later time.

A stakeholder asked what was meant by intrusive investigation. Mr. Stacy described that if a technician identifies an anomaly using a geophysical sensor, a pin flag would be placed at the location and would then be dug using hand tools. Once removed, the UXO technician verifies that the metallic source of the anomaly was removed by passing the sensor over the anomaly location and verifying there is no response.

Mr. Teschner asked if this activity had already been completed, as he has recently seen workers in the southeastern quadrant of Castner Range. Mr. Stacy noted that the DoD's Environmental Security Technology Certification Program (ESTCP) has just completed a field demonstration in a five-acre parcel in the southeastern quadrant. The project is a munitions classification demonstration that is attempting to discriminate unexploded ordnance (UXO) from non-UXO in the subsurface. Mr. Posnick asked, within the previous investigation, how much MEC was seen visually on the ground surface versus intrusive anomalies? Mr. Stacy responded that the majority of MEC was found on the surface.

Mr. Javier Loera (Ysleta del Sur Pueblo) asked what procedures will be used if an archeological artifact is located during investigation? Mr. Stacy responded that the JV will likely have an archeologist on staff to provide training to the team. Mr. Madl added that current standard operating procedures (SOPs) within the Fort Bliss Directorate of Public Works – Environment Division (DPW-E) provide protocols for investigations within areas of archeological significance. Fort Bliss DPW-E has surveys of previously recorded items and the JV will factor these surveyed locations into the investigation plans. In the past when an archeological item was found, Fort Bliss DPW-E would call a "stop work" to investigate the finding.

Mr. Stacy completed the discussion of the WAA conclusions; he noted that the ground-based digital and analog geophysical data collected during the WAA would be the primary data from the WAA that is used in the RI. LIDAR data will also be used to supplement the investigation. The helicopter-borne magnetometry was not effective at the Castner Range and will not be used in the RI.

Mr. Posnick noted limited investigation has been conducted to date in the mountainous areas on the west side of the site, and asked whether this was due to the Army not expecting munitions there or due to the difficulty in accessing these areas. Mr. Stacy indicated it was due to the terrain and an expectation that there is less MEC there than on the eastern half of the site, but that the RI would investigate these areas to document munitions presence and determine if concentrated munitions use areas (CMUAs) were present in the high slope areas.

Ms. Alder-Schaller discussed the past historical MC investigations. Following a short break, Mr. Madl gave a brief overview of the MEC and MC present at the Castner Range. Typical MEC found at Castner Range can range from small arms to artillery projectiles. MC associated with the Castner Range is mainly metals, with some limited explosives. Based on a 2013 ISM investigation, perchlorate (propellant) could be present due to past rocket use on the range. However, perchlorate can sometimes occur naturally in arid soils. The small arms are typically slugs and would not have explosive hazards associated with them.

Mr. Madl defined the conceptual site model (CSM) for Castner Range and its purpose in the RI. He then reviewed the components of the CSM, including MEC/MC sources, fate and transport mechanisms, exposure routes, and receptors. Castner Range was used from 1926-1966 and over time, any explosive constituents would be anticipated to degrade by biodegradation and photolysis. MC metals do not degrade but can be made more / less available by absorbing onto sediment and a slight potential to dissolve into water. Exposure to MEC is limited to walking on and handling as well as intrusive investigations. MC exposure for human and ecological receptors is generally through dermal contact and ingestion; some constituents may bioaccumulate in wildlife.

Mr. Eugene Mikell, UXOPro, noted on that the graphical CSM for MEC exposures to certain receptor groups should be considered complete pathways rather than potentially complete. Mr. Madl responded that this is a preliminary CSM and will be revisited as the RI work plan progresses.

Mr. Madl discussed the general RI approach and data gaps. The RI will leverage data generated from previous investigations, especially the WAA and ISM field demonstrations, and will collect new MEC and MC data to fill remaining data gaps. The remaining data gaps include completing the vertical and horizontal delineation of MEC and MC and refining MEC density outside of CMUAs.

Mr. Stacy reviewed the MEC RI technical approach in greater detail. He noted that there is sufficient data to define CMUA boundaries in areas with slopes less than 30%, and previous investigations have adequately defined the nature of MEC within the CMUAs. The CMUAs consist of approximately 970 acres of the former Castner Range. The MEC investigation will employ a statistical evaluation to determine whether there is less than 0.1 MEC per acre in non-concentrated munitions use areas (NCMUAs) at a 95% confidence level. He noted the WAA demonstrated that NCMUAs in the eastern portion of the site have less than 0.5 MEC per acre to a 90% statistical confidence level. The RI will collect additional data to determine if there is a lower MEC density in the NCMUA to a higher confidence level than in the WAA. It was noted that if the RI is successful in demonstrating that there is less than 0.1 MEC/acre in the NCMUAs across the approximately 6,000 acres NMCUAs, then the RI will have shown there are between 0 and 600 total MEC remaining in the NCMUAs. Therefore, while the greatest MEC hazard is present within the CMUAs, MEC does remain in the remaining areas and will present a hazard even after the RI is completed.

Mr. Moses stated that the WAA investigation had trouble with 18-30 percent slopes; what techniques will be used to detect subsurface MEC in high slope areas? Mr. Stacy explained how the equipment was used during the WAA. For the RI, the JV will use analog detection methods for higher slope areas. Mr. Teschner asked what depth is that effective at? Mr. Stacy stated that it depends on the instrument used and the type and size of MEC. Generally, the maximum depth of detection is approximately 11 times the diameter of a MEC item. The JV will implement an instrument test strip prior to the full investigation to demonstrate equipment detection depth.

Mr. Stacy discussed the MEC RI characterization statistical tools that the JV will utilize including the UXO estimator. Mr. Teschner asked what the difference was between UXO estimator and the Time-domain Electromagnetic Multi-sensor Tower Array Detection System (TEMTADS) being used in the current field demonstration at Castner Range. Mr. Stacy clarified that UXO estimator is a software program while the TEMTADS is one of several advanced geophysical sensors used to detect and/or classify anomalies. Several technologies are currently being tested through ESTCP in the field for possible future use. Mr. Eric Kirwan, USACE Fort Worth District, stated that TEMTADS was used at Camp Beale as a demonstration; it is not yet commercially available. Mr. Jackie Smith, USACE Fort Worth District, further noted that TEMTADS and other technologies (such as the Metal Mapper) show promise but the current version is expensive and fragile, and is not currently considered an industry standard (e.g., not yet accepted by military). Mr. Stacy stated that, during an RI, these new classification tools are best used for identifying munitions in CMUAs, but this data already exists at Castner Range. He offered to show video of some demonstration technologies at the end of the presentation if there was sufficient time.

Mr. Posnick asked, if a MEC item is found in an NCMUA, does it become a CMUA? Mr. Stacy noted that it would not. The JV expects to find some MEC in these areas, and will evaluate the data against the 0.1 MEC per acre metric. One possible result of this analysis may be to develop a range of MEC that might remain in the non-CMUAs. For example the calculated MEC density may be 0.15 MEC per acre, or approximately 600-900 MEC in these areas. Another option will be to look at historical MEC data in these areas, which might indicate closer to 400 MEC remaining.

Mr. Stacy described the potential CMUAs and how the MEC finds correlate to defining these areas. Ms. Ackerman asked what is the difference between expected CMUA and “anomaly areas?” In particular, she noted an anomaly area in the far west Fusselman Canyon area and did not recall that from the previous evaluation. Mr. Stacy replied a high anomaly density doesn’t necessarily mean that the area is a CMUA. For example, an area where scrap metal is thrown on the ground would have a high anomaly density, but wouldn’t include MEC. Mr. Stacy noted that the particular example at the western boundary of Castner Range appears not to be a CMUA due to the lack of MEC found during the WAA; however, there is historical evidence of MEC further east in Fusselman Canyon. Mr. Kirwan noted that some area high anomaly density areas will likely be shown to have no evidence of munitions; in these cases, the area will then be considered as part of the NCMUA.

Mr. Stacy reviewed the field investigation methods, to include reacquisition of anomalies identified in the WAA, new analog transects, and instrument-assisted visual surveys in the high slope areas. Mr. Kirwan asked if the JV would be conducting any new DGM data collection. Mr. Stacy stated that no new DGM data would be collected. The JV will reacquire anomalies identified in the WAA that were not previously dug, and will also use analog methods to obtain the additional data necessary to meet the <0.1 MEC per acre with 95% confidence level.

Ms. Ackerman asked if UXO Estimator outputs tell us where to place the investigation transects. Mr. Stacy responded that the software only tells you how much investigation is needed. Transects are generated randomly using the project geospatial information systems (GIS) data and other methods. Mr. Posnick asked if the 100 foot transects are based on the estimator tool? Mr. Stacy responded that the transect 100 foot segments are based on the methods used in previous investigations.

Mark Thomas Bray (Castner Heights Neighborhood Association) asked if the construction at Highway 54 and Diana Drive would impact the RI? Mr. Stacy stated that it would not affect the RI field work.

Ron Baca (Fort Bliss / PB&A) asked what was the optimum height from the ground surface for the analog instruments to work? Mr. Stacy stated that the instruments should be as close to surface as possible, noting that gravel and boulders may be impediments.

Ms. Alder-Schaller discussed the MC RI approach, which will include a phased approach to data collection. The JV's work will include additional soil sampling using the ISM; discrete sampling will also be used in some areas. She noted the strengths of each of these sampling techniques. ISM is a composite sample which helps reduce hotspots within the data and gives a true average of the data within exposure-based decision units.

Phase I activities will include: (1) ISM sampling in areas not sampled during the ISM field demonstration and those that had exceeded PCLs; (2) vertical borings on the eastern side of the site; (3) backstop berms, if present; and (4) sediment and surface water sampling of arroyos.

Mr. Posnick asked at what point do we stop when vertically delineating an area. Ms. Alder-Schaller responded that the JV will locate the vertical delineation borings in an area of known contamination; once the final depth of exceedances has been documented, we will know the site has is vertically delineated. If the vertical delineation boring is for the soil to groundwater pathway evaluation, the delineation will end when background concentrations are confirmed.

Phase II of the MC RI activities will include: (1) bounding ISM decision unit exceedances with additional ISM samples; (2) delineation of scour and bank areas in arroyos; (3) a second surface water sampling event; and (4) groundwater assessment, if necessary.

Mr. Posnick asked if springs have been identified in the area. Mark Worley noted that there are two active springs: Whispering Springs and Barn Dog Springs. Indian Springs is also located within Castner Range but is currently dry.

Following a short break, Mr. Madl resumed the meeting and discussed the quality assurance and quality control procedures and the importance of safety on the project. He stated that a UXO safety officer will always be onsite.

Mr. Madl reviewed the purpose of DQOs, and Mr. Stacy introduced the DQO statements for the MEC portion of the project. The DQOs were divided into areas with slopes greater than and less than 30 percent.

Ms. Ackerman asked: is the goal to reach <0.1 MEC with 95% confidence and if reached what does it mean? Mr. Stacy responded that the JV will produce a Munitions and Explosives of Concern Hazard Analysis (MECHA) to evaluate the hazards, taking into account the current and future land use scenarios and the RI data. Mr. Mikell stated that during the FS, alternatives that could be considered include no action and land use controls that could be implemented such as signs and or pamphlets. Mr. Madl stated that one possible outcome of the RI would be to identify non-CMUAs and CMUAs, develop separate MRSs based on these areas, and then develop remedial alternatives for each during the FS. Mr. Rowden stated that Fort Bliss and Army Headquarters would make any future land use determinations in this regard. He reiterated the focus of the RI is to obtain information to support the FS, which will consider all other factors, processes and remedies. He reiterated the site is a closed, former range that is part of the Fort Bliss installation and the project will follow that designation until a change is made.

Mr. Stacy stated that unrestricted land use is the most conservative approach for future land use; as such, the RI will be conducted assuming this case, in order to obtain enough data so we do not have to do additional investigations in the future to collect more data.

Ms. Alder-Schaller discussed the DQOs for the MC. She stated that the RI data will be validated through a data usability summary, per TCEQ requirements, to demonstrate sufficient data quality for drawing RI conclusions. Mr. Posnick agreed, stating that the JV will need to have sufficient quantity and quality of data for the nature and extent of risk for possible future land use.

Mr. Madl described the upcoming schedule for the remainder of the year, highlighting key work plan and future meeting dates. Mr. Posnick questioned why the work plan development stage is so long (March 2014- October 2014). Mr. Madl stated an initial review will be an internal Army draft; then the draft final version will be sent to the Army and TCEQ with a 30-day review period.

Mr. Madl concluded the presentation and opened the meeting for questions and comments, which are summarized below.

- Mr. Teschner asked which Army organization is leading the Castner Range RI effort.
    - Mr. Smith stated the USACE is taking the lead, funding is by the USAEC and the work is being completed for Fort Bliss.
    - Mr. Rowden added the RI is implemented through the MMRP, a congressional program where funding comes from the DoD and Army at the highest levels. As such, multiple levels are engaged, including the installation, AEC (oversight and funding), USACE (expertise and process), and a contract entity to USACE with munitions experts.
- Mr. Bray asked who makes the final decisions?
    - Mr. Joel Reyes (Fort Bliss DPW-E) responded: The Garrison Commander is ultimately responsible for the project; this has been designated by the Army at the highest levels. Mr. Posnick agreed, noting that Castner Range is listed on the installation's RCRA permit, which requires a response action.
- Ms. Ackerman asked if it was possible to obtain the meeting handouts in digital format. She followed up with a question on how to get additional stakeholders that we not invited to on this list so they can attend next meetings.
    - Mr. Reyes stated the presentation will go up on the RAB webpage. Additionally, if email addresses should be provided to Fort Bliss and they will look into distributing the materials. Stakeholders can also send email addresses for other potential stakeholders to Mr. Reyes.
- Ms. Ackerman asked if meeting minutes would be generated for this meeting.
    - Mr. Reyes responded that Fort Bliss would look at it and get back to stakeholders with a decision.
- Ms. Ackerman stated that she recalls that land use planning was going to be part of the RI and asked why it does not appear to be included?
    - Mr. Rick Smith stated that land use is usually addressed during the FS phase, and the RI and FS are separate activities for this project.
    - Mr. Rowden added that is why the Army is taking the conservative RI approach based on unrestricted land use so we will have enough data when the Army is ready to make a decision, without another project step to collect additional data. He stated we must have a land use when we enter the FS.
- Ms. Ackerman stated that she had some perspectives on the future for Castner Range. Her organization and others would like to see the investigation and remedy process speed up. She stated she has many helpful documents, a land use plan, and a conservation conveyance document. All these documents are available online.
    - Mr. Reyes acknowledged that Fort Bliss has received all of the documents.

With no further questions, Mr. Madl thanked the stakeholders for attending and adjourned the meeting at 1:15 pm.

As required by the TPP process, the following stakeholders were invited but unable to attend:

Name	Organization
Judge Veronica Escobar	El Paso County Judge
Dr. Cesar Mendez	Texas Parks and Wildlife Department
Senator Jose Rodriguez	Texas State District 29
Dr. Carlos Rincon	U.S. EPA Region 6 Border Office Director
Salvador Zamora	Border Patrol
Chairman Wallace Coffey	Comanche Nation
Representative Ann Morgan Lilly	El Paso District 1
Representative Larry Romero	El Paso District 2
Representative Carl Robinson	El Paso District 4
Chairman Ron Twohatchet	Kiowa Tribe of Oklahoma
Noemi Horn	Texas Department of Transportation

Meeting Minutes for:

TPP No. 2 – 11 February 2015

Technical Project Planning Meeting #2 – 11 February 2015
Remedial Investigation, Closed Castner Firing Range, Fort Bliss, Texas

A stakeholder Technical Project Planning (TPP) Meeting for the Remedial Investigation (RI) at the Closed Castner Firing Range (Castner Range) was held at 9:00 AM on 11 February 2015 at the Radisson Hotel - El Paso Airport, El Paso, Texas.

The purpose of the meeting was to:

- Review the project stakeholders;
- Review the Military Munitions Response Program (MMRP) and RI objectives;
- Review and confirm TPP Meeting #1 conclusions;
- Present the detailed technical approach documented in the Quality Assurance Project Plan (QAPP);
- Confirm regulatory concurrence with the investigation approach; and
- Obtain stakeholder input on the plan.

The meeting attendees included the following:

Name	Organization
Robert Rowden	USAEC
Eric Kirwan	USACE
Rick Smith	USACE
Frank Roepke	USACE
Jackie Smith	USACE
Sylvia Waggoner	Fort Bliss DPW-E
Isaac Trejo	Fort Bliss DPW-E
Ron Baca	Fort Bliss / PB & A
Elisa Morales	Fort Bliss DPW-E
Robert Gilliam	TCEQ Region 6
Allan Posnick	TCEQ – Austin
Joseph Miller	TCEQ Region 6
Sarah Alder-Schaller	PIKA-ARCADIS JV
Amy Aragon	PIKA-ARCADIS JV
Greg Peterson	PIKA-ARCADIS JV
Shahrukh Kanga	PIKA-ARCADIS JV
Mike Madl	PIKA-ARCADIS JV
Steve Stacy	PIKA-ARCADIS JV
John Sparks	PIKA-ARCADIS JV
Marilyn Guida	Franklin Mountains Wilderness Coalition
Judy Ackerman	Franklin Mountains Wilderness Coalition
C.S. "Dusty" Rhodes	Franklin Mountains Wilderness Coalition
Thomas Robinson	Franklin Mountains Wilderness Coalition
Louis Lopez	Franklin Mountains Wilderness Coalition

Name	Organization
Pat White	Franklin Mountains Wilderness Coalition
Paul H. Thrasher	NARFE / Franklin Mountains Wilderness Coalition
Janae Reneaud Field	Frontera Land Alliance
Jamie Ackerman	Frontera Land Alliance
Gonzalo Cedillos	El Paso Water Utilities
Dr. Cesar Mendez	Texas Parks and Wildlife Department
Marty Boyd	Texas Department of Transportation
Megan Ortegon	Office of Congressman O'Rourke
George O. Maloof	Museum of Archaeology
Bethany M. Hutchinson	Museum of Archaeology
Adrian Aizpuru	US Border Patrol
Angel Galindo	US Border Patrol
John Moses	El Paso Historical Landmarks
Ryan Pope	City of El Paso
Eddie Chew	El Paso Audubon Society
Laurence Gibson	Sierra Club
Blanca Gadner Moss	Private Citizen
Pam Baker	Not Listed
Youngja Holloway	Not listed
Woody Bare	Not Listed
Georgena Askew	Not Listed
David Evans	Not Listed
John Miller	3 Amigos Realty

Mr. Isaac Trejo, Fort Bliss Directorate of Public Works – Environmental Division (DPW-E) began the meeting by welcoming everyone to the second technical project planning meeting. He introduced Mr. Mike Madl, the project manager for the PIKA-ARCADIS Joint Venture ("JV"). Mr. Madl briefly discussed the meeting agenda and overall meeting goals. Mr. Greg Peterson, who will be the Senior Unexploded Ordnance (UXO) Supervisor for the field investigation, presented a safety moment on the 3Rs (Recognize, Retreat, and Report) for explosive safety. Mr. Jackie Smith of the United States Army Corps of Engineers (USACE) – Fort Worth District discussed a recent incident that occurred at the Fort Bliss McGregor Range in which an UXO item exploded and caused injury to individuals attempting to illegally collect scrap metal from the range. Mr. Smith was asked if the individuals will be charged with a crime. He said they could be charged with trespass on a federal installation and removal of government property, but that it is up to local law enforcement to decide if charges will be brought.

Mr. Madl then continued the meeting by leading an introduction of Army project team members, regulatory stakeholders, the JV team, and local stakeholders. Local stakeholders were asked to introduce themselves and their organization. During the introductions, Mr. Madl stated that Ms. Sylvia Waggoner, Chief, Compliance Branch at the Fort Bliss DPW-E is the point of contact for comments, questions, or concerns coming out of the TPP process. Mr. Madl was asked for Ms. Waggoner's contact information. Mr. Madl stated that Ms. Waggoner would be joining the TPP meeting later and her contact information would be obtained and presented to the group at that time. Allan Posnick stated that he is the Texas Commission on Environmental Quality (TCEQ) project manager for the site and that he also oversees a grant that TCEQ has for cleanup of military sites.

Mr. Madl presented key definitions and acronyms that would be used throughout the presentation. Among these, he introduced the terms Concentrated Munitions Use Area (CMUA) and Non-Concentrated Munitions Use Area (NCMUA). Mr. Posnick asked if CMUA and NCMUA are terms that are now being used at all MMRP sites. Mr. Steve Stacy, the JV's Senior Geophysicist, replied that the USACE recently came out with a guidance document that explains this terminology. He stated that these are relatively new terms that are now being applied at MMRP sites. Mr. Posnick added that he is not an expert on munitions and explosives of concern (MEC) and that the TCEQ relies on its contractor for MEC issues. The contractor was not able to attend this TPP meeting.

Mr. Madl summarized topics covered in TPP Meeting #1 and presented the project activities completed since that meeting. Mr. Madl went on to describe the MMRP, noting it is the programmatic framework used by the Department of Defense (DoD) to conduct munitions investigations and clean-up action and follows the guidelines of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Mr. Madl discussed the different phases within the MMRP and stated that the Castner Range is now within the RI phase. The objective of the RI phase is to determine the nature and extent of contamination on the site, including MEC and munitions constituents (MC) and to assess potential risks. The results of the RI will be used in the Feasibility Study (FS) phase to determine future remedial alternatives for the range. Mr. Madl noted that the FS phase is not part of the current project but will be conducted by the Army in the future.

Mr. Madl also discussed the Resource Conservation and Recovery Act (RCRA) requirements related to Castner Range. Castner Range is listed on Fort Bliss' RCRA permit as subject to corrective action. While the Castner Range RI will proceed in accordance with the CERCLA process, the substantive requirements of the RCRA permit will be integrated into the RI, including the use of the Texas Risk Reduction Program (TRRP) Protective Concentration Levels (PCLs) for MC. Mr. Posnick added that MC data are compared to PCLs and background concentrations, as appropriate. Mr. Madl stated that background concentrations would be applicable to the metal constituents.

A stakeholder asked a question about the last study in which soil constituents were analyzed to determine background concentrations and samples were collected from off Castner Range. Mr. Madl discussed that data were collected previously during the Wide Area Assessment (WAA) and the Incremental Sampling Methodology (ISM) Field Demonstration. The background study was part of the ISM Field Demonstration and that background concentrations were determined in accordance with TRRP regulations. Mr. Posnick discussed site-specific background determinations and stated that the TCEQ was involved in the background study performed for the Castner Range. Mr. Madl stated that the data collected from the previous investigations will be used for the RI.

Mr. Madl then presented the Castner Range RI planning tasks and anticipated dates of completion. He stated that the TPP meetings were intended to present the ‘technical aspects’ of the project. A public meeting will be held approximately one month before the RI field work begins and will provide general information to the public about the investigation. The public meeting is currently scheduled for the April/May 2015 timeframe. Additionally, a Restoration Advisory Board (RAB) meeting will be held in the May/June 2015 timeframe. The RAB meeting covers ongoing Installation Restoration Program and MMRP activities, and will include updates on several Fort Bliss projects.

Mr. Madl then transitioned into a discussion of the RI. He presented an overview of the RI tasks, discussed the current land use (closed military training range), provided an overview of MEC and MC found on Castner Range, and discussed the past investigation activities conducted on the site.

Mr. Madl then turned the presentation over to Mr. Stacy to discuss the specifics of the MEC investigation which will be performed during the RI. Mr. Stacy provided a review of the WAA work. He reviewed the technologies evaluated in the WAA, and specified which technologies were determined to be useable for the RI phase. Mr. Stacy then discussed QAPP (e.g., the work plan for the project) and the RI technical approach for MEC. He stated that the RI will close data gaps including defining boundaries (if any) of CMUAs in the steep areas of the Closed Castner Firing Range Munitions Response Site (MRS), verifying that MEC density outside of the CMUAs is <0.1 MEC/acre to a 95% confidence interval, and assessing the migration potential of MEC from higher to lower elevation areas. Mr. Stacy stated that based on a JV site walk, it was determined that a maximum slope of 35% could be safely accessed by personnel as part of the RI activities. For slopes greater than that, only visual inspections may be performed.

Mr. Stacy presented the CMUAs which were identified during review of the WAA data and stressed that areas outside of the CMUAs may still contain MEC. The following questions were asked with regard to the slide presenting the Delineated CMUAs.

- Ms. Marilyn Guida asked two questions:
    - Based on intense storms within the last year, there is concern about movement of MEC and MC through the arroyos. How are the arroyos being targeted as part to the investigation? Mr. Madl stated that the

    - investigation of the arroyos will be discussed during the MC portion of the presentation.
    - What is the brown area around the curve of Transmountain Highway? Mr. Stacy stated that is an anomaly area, but not a CMUA (e.g., the anomalies represent metal debris, and not concentrated MEC).

- Mr. Posnick asked that since the goal of the RI is to determine the nature and extent of MEC and MC, how will the CMUA on the northern border of the Castner Range be evaluated, since it extends right up to the boundary of the MRS? Will the RI extend off Castner Range? Mr. Stacy responded that the RI scope is restricted to within the MRS boundary. Bob Rowden of the Army Environmental Command concurred and stated that the JV's contract is restricted to investigation within the MRS boundary. A separate study will be performed outside of the MRS.

- It was noted that the yellow areas on the slide represent slopes greater than 30% that are not accessible. It was asked if these areas will be accessed by getting to the terrace of the slopes and walking along the top. Mr. Stacy stated that it will depend on accessibility and safety concerns. The field team will access the ridges if it is safe to do so. Mr. Peterson stated that in some of the ravines the vegetation is thick and hard to get through. At 35% slopes, the ground surface is gravelly and slippery and it's not safe to walk up those slopes. The JV is looking into the use of binoculars with advanced features to assist in the visual survey.

Mr. Stacy then discussed the MEC investigation approaches to be performed in various portions of the MRS. The MEC investigation will be performed in phases and will include:

- Phase 1 (slopes >30%) – Investigation of 70 acres via instrument assisted visual surveys
- Phase 2 (slopes <30%) – Investigation of 25 acres using three different methods:
    - Reacquisition and intrusive investigation of WAA anomalies
    - Collection of new digital geophysical mapping (DGM) data, processing and intrusive investigation
    - Analog ("mag and dig") transect surveys.

Upon conclusion of the MEC investigation discussion, the MC RI program elements were presented by Ms. Sarah Alder-Schaller, the JV Regulatory Specialist. She discussed that the RI will include both ISM and discrete sampling methodologies and will be performed in phases. Phase I will include:

- Area wide horizontal delineation with 149 ISM sample locations in 1-acre decision units. The constituents of concern include explosives, metals, and perchlorate (where rockets were used);
- Discrete sampling at up to 10 backstop berms associated with small arms use analyzed for metals;

- Arroyo delineation sampling including up to 50 discrete sediment samples in depositional areas (analyzed for metals); and
- Surface water sampling at seeps (18 locations) and after rain events (24 locations). Analyzed for metals.

Phase II will include ISM sampling at new CMUAs (if any) identified during the MEC investigation, ISM sampling around MC exceedances identified based on the Phase I data, step out sampling around arroyo sediment exceedances, and a second surface water sampling event. Additionally, soil borings will be installed during Phase II to vertically delineate constituent concentrations within the ISM decision units. If a groundwater investigation is determined to be necessary, it will be performed during Phase III. Additionally, one discrete sample will be collected adjacent to any MEC items identified with evidence of contamination.

The following questions were asked during discussion of the MC RI program elements:

- Mr. Posnick noted that the majority of the sampling within the arroyos is occurring in the western portion of the MRS, and asked if that was because sampling was already performed in the eastern portion of the MRS as part of the ISM Field Demonstration effort. It was noted that ISM samples were collected from the arroyos during the ISM Field Demonstration. Ms. Alder-Schaller stated that the primary focus of the samples to be collected during the RI will be to evaluate the transport mechanism from the steep slope areas down into the arroyos. Therefore, the majority of the samples are located in depositional areas beneath the steep slopes in the western portion of the MRS.

- Mr. George Maloof asked whether sampling would be performed around the Museum of Archaeology. Ms. Alder-Schaller referred back to the ISM sampling locations slide and answered that ISM samples were collected in the Museum area during the ISM Field Demonstration, and no PCL exceedances were identified. Therefore, no additional samples are planned in the area as part of the RI.

- A stakeholder asked if samples would be collected within the Texas Department of Transportation right of way. Ms. Alder-Schaller answered that no samples would be collected within the right of way. Any samples identified on the map that are in the right of way will be moved to outside of the right of way.

Following the completion of the MC investigation elements, Mr. Madl presented information on quality assurance/quality control, outlining the elements that will be included in the RI Report, and presenting the upcoming project schedule. The field work will be performed in the May-December 2015 timeframe, with TPP Meeting No. 3 tentatively scheduled around September 2015 to discuss results of the MEC investigation and Phase I of the MC investigation. TPP Meeting No. 4 is planned for approximately March 2016, to present the results of the RI before the report is finalized. Mr. Madl posted Ms. Waggoner's contact information to the screen and asked if there were any questions. The following discussion points were raised:

- Mr. Posnick stated that he is in favor of the phased RI approach that is being implemented for this site. The phased approach allows the stakeholders to evaluate the data and select additional sample locations to fill remaining data gaps. With this approach, a supplemental RI is not required.

  Mr. Posnick also stated that a common comment that he often hears is, "Why does the process take so long"? Mr. Posnick stated that in his experience with RCRA and CERCLA cleanups is that they can take up to 15 years to reach closure. He noted that the Castner Range is a large project area and will take time to complete the process.

- A stakeholder asked whether there will be statistical measures presented in the RI Report so that people may judge the validity of the report for themselves. Mr. Madl answered yes, the MEC investigation will have statistical metrics which will be evaluated and presented in the report.

- A stakeholder asked if the cultural and archeological records have been checked and the correct departments contacted to preserve prehistoric and cultural sites. Ms. Waggoner responded that coordination is being performed with the Conservation Branch where the intrusive investigation activities will be performed.

- The same stakeholder then asked if biological concerns, such as the pin-cushion cactus and migratory birds, are being considered. Ms. Waggoner responded that the biological considerations have been evaluated. Flora and fauna were looked at for previous investigations. Work on the Castner Range is in compliance with the Migratory Bird Treaty Act. Additionally, no threatened or endangered species have been identified. The RI investigation will have limited intrusive work. No clearance or digging up of vegetation is proposed. A biologist will be involved from the Conservation Branch.

- Ms. Guida asked if the results of the past arroyo sampling included surface water or seep samples. Mr. Madl indicated these media had not been previously sampled. Sampling performed during the ISM Field Demonstration included only soil and sediment sampling.

- Ms. Guida asked whether there was information on the munitions that were found when the Border Patrol Museum was built. Mr. Posnick said he was involved and that it was only small arms ammunition (no MEC).

- Mr. Posnick asked whether, with the intense rainfall that had occurred in the last year, any standing water had been seen at the Fusselman or Northgate Dams. He said that in previous years the answer to that question had been no. Ms. Guida said that she had observed standing water at the Northgate Dam after rainfall in the fall.

- Mr. Posnick said that he was wondering if collection of surface water samples behind the dams (if present) would be warranted as part of the surface water sampling events. It was noted that the work plan does not currently have a sample near the Northgate Dam. However, there is a sample near the Fusselman Dam.

With no further questions, Mr. Madl thanked the stakeholders for attending and adjourned the meeting at 12 pm.

As required by the TPP process, the following stakeholders were invited but unable to attend:

Name	**Organization**
Judge Veronica Escobar	El Paso County Judge
Senator Jose Rodriguez	Texas State Senate, District 29
Representative Pete P. Gallego	Texas House of Representatives, District 23
Representative Mary Gonzalez	Texas House of Representatives, District 75
Representative Naomi Gonzalez	Texas House of Representatives, District 76
Representative Marisa Marques	Texas House of Representatives, District 77
Representative Joe Moody	Texas House of Representatives, District 78
Representative Joe Pickett	Texas House of Representatives, District 79
Mayor Oscar Leeser	Mayor, City of El Paso
Dr. Carlos Rincon	U.S. EPA Region 6 Border Office Director
Annette Gutierrez	Rio Grande Council of Governments
Representative Ann Morgan Lilly	El Paso District 1
Representative Larry Romero	El Paso District 2
Representative Emma Acosta	El Paso District 3
Representative Carl Robinson	El Paso District 4
Representative Michiel Noe	El Paso District 5
Representative Claudia Ordaz	El Paso District 6
Representative Lily Limon	El Paso District 7
Representative Cortney Niland	El Paso District 8
Commissioner Carlos Leon	El Paso County Commissioner, Precinct 1
Commissioner Patrick Abelin	El Paso County Commissioner, Precinct 4
Chairman Wallace Coffey	Comanche Nation
President Frederick Chino, Sr.	Mescalero Apache Tribe
Chairman Jeff Houser	Fort Sill Apache
Chairman Ron Twohatchet	Kiowa Tribe of Oklahoma
Javier Loera	Ysleta Del Sur Pueblo

Meeting Minutes for:

TPP No. 3 – 19 February 2017

Technical Project Planning Meeting #3 – 19 January 2017
Remedial Investigation, Closed Castner Firing Range, Fort Bliss, Texas

A stakeholder Technical Project Planning (TPP) Meeting for the Remedial Investigation (RI) at the Closed Castner Firing Range (Castner Range) was held at 9:00 AM on 19 January 2017 the Radisson Hotel - El Paso Airport, El Paso, Texas.

The purpose of the meeting was to:

- Review and confirm TPP Meeting #2 conclusions;
- Present summary of field work performed to date and preliminary results
    - MEC Investigation
    - MC Investigation
- Discuss remaining field work
- Discuss RI Report
- Review remaining schedule

The meeting attendees included the following:

Name	Organization
Mike Bowlby	USAEC
Eric Kirwan	USACE
Rick Smith	USACE
Frank Roepke	USACE
Mike Slavens	USACE
Victor Garcia	Fort Bliss DPW-E
Ron Baca	Fort Bliss / PB & A
Robert Gilliam	TCEQ Region 6
Allan Posnick	TCEQ – Austin
Ruth Winsor	TCEQ – Austin
Sarah Alder-Schaller	PIKA-ARCADIS JV
Garett Ferguson	PIKA-ARCADIS JV
Mike Madl	PIKA-ARCADIS JV
Steve Stacy	PIKA-ARCADIS JV
Marilyn Guida	Franklin Mountains Wilderness Coalition
Judy Ackerman	Franklin Mountains Wilderness Coalition
Thomas Robinson	Franklin Mountains Wilderness Coalition
Pat White	Franklin Mountains Wilderness Coalition
Janae Reneaud Field	Frontera Land Alliance
Jamie Ackerman	TPMN
Dr. Cesar Mendez	Texas Parks and Wildlife Department
Stephanie Acosta	Office of Congressman O'Rourke
Laurence Gibson	Sierra Club
David Evans	NA

Name	Organization
Matt Leveque	UXO Pro
Guy Volb	Fort Bliss PAO
Richard Teschner	Castner Range Conservation Committee
Richard Langford	Fort Bliss (not legible)
Scott Cutler	Frontera Land Alliance
Mike Blondell	Fort Bliss Garrison Safety
Cathy Conti	NA
Joe Conti	North Hill Neighborhood Association
Vicki Hamilton	NA
Christi DeBates	Franklin Mountains Wilderness Coalition
Joe Molinar	Franklin Mountains Wilderness Coalition
William Kilmer	Mahorsky Group
Aliris Lopez	Legislative Intern
David Pentland	USAG Safety
Lois Balin	TPWD
Charles Turner	Franklin Mountains Wilderness Coalition
Richard Solis	NA
Jose Barriga	Citizen

Mr. Ron Baca, Fort Bliss Directorate of Public Works – Environmental Division (DPW-E) began the meeting by welcoming everyone to the technical project planning meeting. He introduced Mr. Mike Madl, the project manager for the PIKA-ARCADIS Joint Venture ("JV"), the contractor conducting the RI. Mr. Madl briefly discussed the meeting agenda, a safety moment and overall meeting goals. He noted the purpose of this this third TPP meeting was to provide an interim update on the progress of the work, focusing on the results of the MEC and Phase 1 MC investigations completed to date.

Mr. Madl then continued the meeting by leading an introduction of Army project team members, regulatory stakeholders, the JV team, and local stakeholders. Local stakeholders were asked to introduce themselves and their organization. Mr. Madl noted key definitions and acronyms were provided as a handout that would be used throughout the presentation.

Mr. Madl summarized topics covered in TPP Meeting #2 and presented the project activities completed since that meeting. Mr. Madl went on to describe RI project objectives and the JVs general approach.

Mr. Madl then turned the presentation over to Mr. Stacy to discuss the specifics of the MEC field investigation that was completed from February to July 2016. Mr. Stacy provided a review of RI Technical approach (e.g., focusing the current field work on the non-concentrated munitions use areas (NCMUAs), data gaps from previous investigations, and the boundaries of the CMUAs defined to date. He then reviewed the MEC investigation phases which included:

- Phase 1 (slopes >30%) – Investigation of 70 acres via instrument assisted visual surveys (IAVS).
- Phase 2a (slopes <30%) – Investigation of 1750 100-foot Wide Area Assessment transects to reacquire anomalies and investigate using hand tools.
- Phase 2b (slopes <30%) – DGM Grid investigation designed by UXO Estimator program. 22 grids investigated and all anomalies investigated using hand tools.
- Phase 2c (slopes <30%) – Investigation of 1,002 Analog mag and dig 100-foot transects using EMI sensors and investigated using hand tools.
- Phase 3 (slopes >30%) – Analog mag and dig investigation in IAVS areas where anomaly densities were found to be greater than 300 anomalies/acre. Transects were used to determine the nature and extent of MEC with in potential CMUAs.

As discussed in TPP Meeting #2, the investigation area planned in the approved QAPP totaled 29.8 acres using these investigation approaches. The actual field investigation covered 33.6 acres, resulting in additional data to be used in the evaluation.

Mr. Stacy then presented the results of all phases of the RI investigation using a series of figures that depicted the MEC and other munitions debris found during the RI field work, and then the total amount of material found when factoring in past investigations and removal actions. He noted that 6 additional MEC items were found in the NCMUA areas investigated during the RI field effort.

As a result of the MEC finds and density of other munitions debris, the boundaries of several existing CMUAs are recommended for expansion, and three new CMUAs are recommended to be added within the Munitions Response Site. No additional investigation is required, as the MEC density is expected to exceed the original assumptions, and sufficient data is available to calculate new MEC densities for the NCMUAs.

Mr. Allan Posnick, TCEQ, asked about the total number of DGM grids that were investigated. Mr. Stacy clarified that 30 total DGM grids were performed. Mr. Posnick then noted that 2 of the 6 MEC items were located in DGM grids, and asked whether the MEC density is better correlated to DGM grid investigations rather than DGM transect investigations. Mr. Stacy noted that even with these finds, there is still a higher MEC density from investigations using the WAA DGM transects than compared to the DGM grid investigations, but that both were useful tools in determining MEC density. Mr. Stacy also noted that these 6 MEC items were found in NCMUAs, and that a much greater number of MEC have been located within CMUAs.

A TPP stakeholder asked whether the property where the Border Patrol and Archaeological museums are located had been cleared of MEC. Mr. Mike Bowlby, AEC, noted that the Army had transferred the land to the City of El Paso, which included a recommendation of restricting its land use. Later, Mr. Richard Teschner asked whether there was any past data on MEC finds near the Border Patrol museum. While the JV did not have any information related to this, Allan Posnick noted he had been involved with a USACE Albuquerque District project here; his recollection was that no MEC was found, but that small arms in the hundreds of pounds may have been removed.

Mr. Richard Teschner asked whether munition items were migrating down from the mountains to the flatter terrain areas on Castner Range. Mr. Bowlby confirmed that this migration pathway did appear to be occurring.

Another TPP member asked about the understanding of the past training activities that might have occurred within Fusselman Canyon. Mr. Stacy stated that most of the range fans were located on the east end of Castner Range, and that some may have pointed toward the canyon, but that a specific range had not been established inside the canyon. This will be further evaluated in the RI report.

A TPP member asked whether the hand grenades located within new CMUA 23 were practice or high explosive. Mr. Mike Slavens, USACE Ordnance and Explosives Safety Specialist (OESS), stated that no grenades were found that would be considered MEC, but that fragmentation from high explosive grenades has been found there, so there is confirmation on their use in this location.

Mr. Posnick asked: how big do metallic fragments need to be in order to determine whether they are associated with munitions? Mr. Slavens stated that it depends on the munition item. For example, a MK2 grenade is designed to break into fragments about a square inch in size, but a larger item with a thick body would break into much larger pieces. In many cases the metal is small enough that a UXO technician cannot be sure.

With regard to the conclusion that no additional investigation is warranted since the NCMUAs appear to have more than 0.1 MEC/acre; Mr. Posnick asked whether the few MEC finds we made during the RI field work were enough to make a deviation from the 0.1 MEC/acre metric? Mr. Stacy stated yes; even finding one MEC item in an NCMUA area would change this MEC density value. Mr. Eric Kirwan, USACE geophysicist, asked if the JV had rerun the MEC density calculation assuming that four of the six MEC were now located in expanded CMUA boundaries, leaving two MEC in the NCMUAs. Mr. Stacy indicated the calculation had been run, and estimated it at 0.3 MEC/acre. He also noted that when we move to reporting the results in the RI Report, this revised MEC density would be finalized using UXO Estimator at a 95% confidence level and described in the RI Report.

A TPP member asked that after the MEC density analysis is complete, would the value apply across the entire extent of Castner Range? He pointed out that no MEC and little munitions debris had been found in the southwest corner of Castner Range and wondered whether the MEC density would still apply at this portion of the site. Mr. Stacy confirmed that it would, but that the RI report would pull in qualitative data to provide further input on future remedial objectives for areas such as this.

Several TPP members asked whether munitions were found in other arroyos that might be leading eastward to the property boundary. The JV confirmed some items had been found in the locations where investigations had occurred.

Following a short break, the MC RI field investigation findings were presented by Ms. Sarah Alder-Schaller, the JV Regulatory Specialist. She reviewed the RI program elements, including the Incremental Sampling Methodology (ISM) for surface soil sampling, discrete soil sampling of berms, and sediment and surface water samples from the arroyos and seeps located on Castner Range.

Phase I included the area wide horizontal delineation with collection of 149 ISM surface soil sample locations in 1-acre decision units. The samples were sent to an analytical laboratory and analyzed for explosives and metals; some additional samples included perchlorate analysis (at locations where rockets had been used). The analytical results from the samples were compared human health (direct contact) and ecological screening levels to determine potential exposure exceedances of the protective concentration levels (PCLs). Ms. Alder-Schaller noted that only six of the 149 sampling locations had analytical results exceeding a PCL for a metallic constituent of concern (COC). Very few detections of explosive COCs were encountered, and none exceeded the PCLs.

Phase II will include ISM sampling at the new CMUAs and around the six exceedances identified based on the Phase I data. All samples collected around the new CMUAs will be analyzed for metals, and 10% of the samples will be analyzed for explosives. Samples collected in "step out" locations around the six exceedances from Phase 1 will be analyzed only for the COC that exceeded the screening level PCLs.

Phase II sample collection will include sampling for sediment and berm locations based on Phase I exceedances. Sediment "step-outs" will be located upstream and downstream of exceedances and will be analyzed for only the COCs that exceeded in Phase I. Phase II sampling related to berm locations will be conducted at the four berm locations showing exceedances in Phase I to delineate the surface soils and will only be analyzed for lead. No surface water will be collected during the upcoming Phase II event as both a Phase I and II surface water samples were collected in 2016.

The following questions were asked during discussion of the MC RI program elements:

- Why did the JV collect surface water samples more than 48-hours after a rain event? Ms. Alder-Schaller stated that it is in a surface water guidance document as any water flows within 48-hours of a rain event is considered storm water and would not represent actual exposure conditions to people, plants, and animals during this period.

- Are ecological screening levels lower than human health screening levels? Ms. Alder-Schaller stated yes, ecological screening levels are less than human health screening levels.
- Several sediment sampling locations appear to be on ridges and not within arroyos. Ms. Alder-Schaller stated that the aerial imagery can be deceiving but all sediment samples were located within arroyo drainages.
- Ms. Ruth Winsor asked if JV will consider fixed lab data to confirm XRF sampling during the soil boring selection process? Ms. Alder-Schaller stated that the JV is not relying on XRF data but could possibly take a split sample and send to a fixed lab for analysis.
- Mr. Teschner asked how much clearance of vegetation is needed to make roads to drill wells and how much damage to vegetation will occur at Castner? Mr. Garett Ferguson stated that a track mounted rig will be utilized to drill wells in off-road locations. The JV will use existing trails and roads as much as possible to limit vegetation damage while mobilizing to drilling locations.
- Are there any shallow wells near Castner? Mr. Ferguson stated that there are wells to 400+ feet deep around the Castner Range but no shallow wells are known to be installed in or around the Castner Range.
- How are ecological screening levels (benchmarks) defined? Ms. Alder-Schaller stated that they are developed for both flora and fauna; the most conservative levels are used for comparisons.

Following the completion of the MC investigation elements, Mr. Madl presented information the development of the RI Report, updating the Conceptual Site Model, reporting on the nature and extent of MEC and MC, preparation of the Human Health Risk Assessment and Screening Level Ecological Risk Assessment, preparation of the MEC Hazard Assessment, and updating the Munitions Response Site Prioritization Protocol. Mr. Madl presented the upcoming schedule for Castner Range noting that a Restoration Advisory Board meeting is likely in April 2017 with the TPP #4 in May 2017. The draft RI report is expected in May 2017 with a public meeting in July or August 2017.

- Ms. Judy Ackerman asked if the slides and meeting minutes will be provided to the stakeholders? Mr. Mike Bowlby stated that they will be provided and are available through the Fort Bliss PAO. Mr. Ron Baca stated that the slides used will have all names removed and then will be published. Contact for receiving these files is Ms. Sylvia Waggoner.
- Would the JV be able to provide larger graphics and topographical maps? These would be more beneficial to the meeting attendees. Mr. Madl stated that for TPP#4 the JV would move to a LIDAR background similar to the CMUA 23 slide. The Army will be providing the slides after the meeting where the items would be more readily visible than the handouts. He also encouraged the TPP

members to review the posters of the MEC and MC investigation results, which were posted outside the meeting room.

- Ms. Ackerman asked if money been "POM'd" (Department of Defense term for funding plans) for the clearance of Castner Range? Mr. Mike Bowlby stated that the final land use still needs to be determined by stakeholders and HQ Army in order to assist in the development of the Feasibility Study and possible Remedial Action alternatives. Based on the collaborative efforts, leading up to and in conjunction with the Feasibility Study, appropriate levels of Remedial Action will be determined and subsequently budgeted for in the out years. Mr. Allan Posnick stated that the TCEQ will work with the Army as they do not want to stall the MMRP process.

- Based on Figure 51 (sediment sampling locations) water is flowing off Castner Range under Highway 54 into residential neighborhoods. Will this require cleanup since Castner Range is polluting the water? Ms. Alder-Schaller stated that the screening levels are for delineation of contamination and not actual cleanup levels.

- A stakeholder requested samples at the edge of the Castner Range boundary to confirm no MC are leaving the installation. Ms. Alder-Schaller stated that surface water was not observed and storm water flows are outside the JV's scope of work. Mr. Madl stated that two samples were collected within CMUAs (areas with the highest potential to have MC contamination) with results less than the screening levels, indicating offsite migration was not likely in the other arroyos.

- A stakeholder asked if contamination has been found within a storm water ponding area southeast of the Castner Range. Mr. Mike Bowlby stated that he believes previous contractors investigated this pond location. Mr. Eric Kirwan stated that soil sampling was conducted east of Highway 54 and all results were below the screening levels. He was unsure if sampling took place in ponds but noted that samples were collected from arroyos and other locations downstream that were most likely to contain contamination from the ponds themselves if any existed.

- A stakeholder asked what is the storm water impacts to El Paso for the flows leaving Castner Range. Mr. Madl stated that this is unknown to the JV. Mr. Ron Baca stated that the El Paso Water Public Service Board has information regarding storm water flows. The stakeholder stated none of the agencies can do anything due to the MEC on Castner Range. Mr. Mike Bowlby stated that the current contract (Castner Range RI) does not cover that type of analysis. A separate study and contract would need to be awarded for that type of effort if it was determined that there was an environmental concern or impact.

With no further questions, Mr. Madl thanked the stakeholders for attending and adjourned the meeting at 12:30 pm.

As required by the TPP process, the following stakeholders were invited but unable to attend:

Name	**Organization**
Judge Veronica Escobar	El Paso County Judge
Senator Jose Rodriguez	Texas State Senate, District 29
Representative Mary Gonzalez	Texas House of Representatives, District 75
Representative Marisa Marques	Texas House of Representatives, District 77
Representative Joe Moody	Texas House of Representatives, District 78
Representative Joe Pickett	Texas House of Representatives, District 79
Mayor Oscar Leeser	Mayor, City of El Paso
Dr. Carlos Rincon	U.S. EPA Region 6 Border Office Director
Annette Gutierrez	Rio Grande Council of Governments
Representative Emma Acosta	El Paso District 3
Representative Carl Robinson	El Paso District 4
Representative Michiel Noe	El Paso District 5
Representative Claudia Ordaz	El Paso District 6
Representative Lily Limon	El Paso District 7
Representative Cortney Niland	El Paso District 8
Commissioner Carlos Leon	El Paso County Commissioner, Precinct 1
President Frederick Chino, Sr.	Mescalero Apache Tribe
Chairman Jeff Houser	Fort Sill Apache
Chairman Ron Twohatchet	Kiowa Tribe of Oklahoma
Javier Loera	Ysleta Del Sur Pueblo

Meeting Minutes for:

Teleconference with TCEQ – 2 February 2017

Remedial Investigation, Fort Bliss Closed Castner Firing Range, El Paso, TX
U.S. Army Corps of Engineers – Tulsa District

Phase II MC Investigation Discussion Minutes – 2 February 2017

A teleconference was held to discuss sediment sample locations that were suggested at the TPP #3 meeting on 19 January 2017 and to confirm the locations of the JV's Phase II soil borings. The persons in attendance are listed below:

- Frank Roepke – USACE RPEC
- Ron Baca – Fort Bliss Directorate of Public Works – Environmental Division (DPW-E)
- Victor Garcia – DPW-E
- Allan Posnick – TCEQ
- Ruth Winsor – TCEQ
- Mike Madl – PIKA-Arcadis JV
- Sarah Alder-Schaller – PIKA-Arcadis JV
- Garett Ferguson – PIKA-Arcadis JV

During the 18 January 2017 pre-TPP meeting between the Army and the TCEQ, the planned sediment and Incremental Sampling Methodology (ISM) soil samples for Phase II of the RI field work were discussed. The TCEQ provided initial concurrence with the planned locations, but asked for additional time to review the figures discussed in the meeting. TCEQ provided comments and several questions related to the sampling activity on 20 January 2017. Today's conference call was conducted to discuss those comments and questions, and to provide an update on a proposed change to the subsurface soil boring program.

TCEQ Comments

Sediment Sampling - based on comments from the Stakeholders at TPP Meeting #3, the Army/JV and TCEQ had agreed to add one more sediment sample location along the eastern boundary of the Castner Range where arroyos flow off the range. Stakeholders wanted confirmation that no MC was leaving the site. In the 20 January 2017 email, TCEQ asked the Army/JV to consider adding two more sediment sampling locations in other arroyos that also flowed off the range.

The JV evaluated the request and indicated that there appeared to be no technical basis for sampling in these additional locations, based on the data obtained during the first phase of the investigation. However, the JV recognizes the stakeholder concerns for verifying potential MC migration pathways off the range to the commercial and residential properties on the other side of Highway 54. Allan Posnick noted he agreed that there was likely no technical basis for the additional samples and that the sampling request was proposed to satisfy stakeholder concerns. He felt the JV had a large dataset and that it was unlikely an exceedance would be found. Based on these discussions, the additional two locations will be added to the one already agreed upon during the TPP meeting and will be collected during Phase II.

TCEQ Questions

In the 20 January 2017 email, TCEQ asked why upstream locations were not proposed for sediment sampling in two locations. The JV noted that the mountainside topography (e.g., cliffs) restricted access in these locations, preventing collection of upstream samples. Allan concurred with this, and the JV will add a description to the RI Report explaining this justification.

TCEQ's email also asked why ISM sampling was not proposed for the area west of CMUA 4, which was being added to the CMUA boundary based on the MEC investigation. The JV noted that topography and safety concerns in this area precluded sample collection. TCEQ concurred with the decision.

Adjustments to Soil Boring Program

The JV provided an update to the TCEQ on the implementation of the soil boring program discussed during the TPP meetings. Three ISM decision units were identified based on sampling results obtained during the ISM Field Demontration and Phase I of the Remedial Investigation (RI). The ISM decision units which exhibited the highest lead concentrations were selected for the boring investigation in Phase II of the RI; three soil borings were planned to be installed within each of these decision units to provide characterization data for vertical delineation of metals in soil and elimination of the soil-to-groundwater exposure pathway.

Field personnel visited each of the decision units the week of January 23rd and collected 10 XRF grab samples for surface soil field screening; the three highest concentrations in each decision unit would be selected for a soil boring location. The JV anticipated that at least several XRF results in each decision unit would approach the concentrations of lead detected in the ISM decision units (1,320 mg/kg, 1,520 mg/kg, and 5,030 mg/kg). However, most of the XRF results were well below these values.

To ensure the data quality objective could be met to demonstrate elimination of the soil-to-groundwater pathway, the JV returned and collected an additional 10 XRF screening samples within each of the decision units. These additional results only indicated a few locations with elevated lead concentrations. The collected data were presented on a figure (see enclosures).

While the JV did not expect to mirror exactly the ISM results (due to that process producing an average concentration across a large area), some concentrations were expected to be found that would be high enough so TCEQ would have confidence in getting the vertical migration information needed. The JV's approach intended to use the human health direct contact PCL level (500 mg/kg) as the minimum threshold in which to select the boring locations; however, XRF screening results did not indicate exceedance of this PCL at all of the selected DUs.

Based on these results, the JV proposed to adjust the soil boring program so that one soil boring would be conducted in the highest XRF result from each decision unit (total of three borings). Following group discussion on the best location to place the borings, TCEQ agreed that biasing the boring locations to the highest XRF result was appropriate, and concurred with the adjusted approach. All participants agreed on the three decision unit locations.

Other Discussion Topics

Allan mentioned he had not had an opportunity to contact the El Paso Water Utilities to determine if they have been sampling stormwater east of Highway 54. He asked if the Army had knowledge of this. Fort Bliss (Ron Baca and Victor Garcia) indicated they would look into the matter.

Allan mentioned the discussion during the TPP meeting concerning the 48-hour delay in collecting surface water samples. He spoke with Vicki Reat (TCEQ Risk Assessment) about the topic and she was not aware of this restriction. The JV indicated it would send a copy of the TCEQ guidance document where the provision is listed for reference (see enclosures).

Allan mentioned he participated in a Department of Defense meeting on the new USACE munitions risk methodology, which will be used for a two-year test period in place of the MEC Hazard Assessment. DoD will be meeting with some states in the coming weeks to discuss the process. It reportedly uses the best of the MRSPP and MEC HA methods.

Allan asked about the possibility of a Formerly Used Defense Site (FUDS) being present on Castner Range, as someone had mentioned it during the DoD call. The Army is not aware of a FUDS on the Castner Range property. The person may have been referencing the Castner XD site (located east of Highway 54) or possibly the City of El Paso property (where the museums are located) since that property was transferred prior to 1986.

Action Items

- JV will implement the adjusted soil boring program
- JV to send copy of the TCEQ surface water quality monitoring guidance to TCEQ
- Fort Bliss to contact El Paso Water Utilities for information related to stormwater sampling

Enclosures
XRF Results for Soil Boring Locations
Surface Water Quality Monitoring Procedures, Volume 1

Meeting Minutes for:

Teleconference with TCEQ – 23 March 2017

(Including 16 March 2017 Technical Memo which was discussed)

Remedial Investigation (RI), - Phase II Investigation Results
Fort Bliss Closed Castner Firing Range, El Paso, TX
U.S. Army Corps of Engineers (USACE) – Tulsa District

Meeting Minutes
Army / Texas Commission on Environmental Quality (TCEQ) Conference Call
23 March 2017

A teleconference was held between the USACE, U.S. Army, U.S. Army Environmental Command (AEC), TCEQ, and the PIKA-ARCADIS Joint Venture (JV) to discuss the Fort Bliss Closed Castner Firing Range RI project. The objective of the call was to discuss the results of the RI Phase II sampling. Prior to the meeting, Fort Bliss distributed a Technical Memo covering specific results from the Phase II Berm and Incremental Sampling Methodology (ISM) sampling for which the team wanted to receive TCEQ feedback. The Technical Memo is attached to the end of these minutes.

The following personnel participated in the meeting:

Name	Organization	Name	Organization
Rick Smith	USACE	Allan Posnick	TCEQ - Remediation
Frank Roepke	USACE	Ruth Winsor	TCEQ - Remediation
Mike Bowlby	USAEC	Ron Baca	Fort Bliss/Directorate of Public Works-Environmental (DPW-E)
Rick Smith	USACE	Sarah Alder-Schaller	JV

RI Phase II investigation results discussed during the call included the following:

Berm Sampling

- The berm sampling information in the Technical Memo was presented by Sarah Alder-Schaller.
- Allan Posnick agreed that the lead concentrations obtained in the samples are not indicative of the berms having been used as small arms backstops. They are more likely flood control features. He would expect to see concentrations exponentially higher that what was encountered [concentrations are generally below or slightly above the ecological benchmarks, with a few instances of exceedances of the human health protective concentration levels (PCLs)].
- Allan Posnick asked if bullet casings were identified around the berms and stated he would expect them to be observed if the berms had been used as backstops. Sarah Alder-Schaller said she did not believe bullet casings had been observed.
- Allan Posnick does not believe that there is a metals issue related to the berms that will drive PCL exceedance zones. It was agreed that continued delineation with discrete samples will not be required and the area around the berms will be evaluated based on ISM data collected. ISM data already collected for the site

will be used for the evaluation; no additional ISM sampling around the berms will be performed.

- Sarah Alder-Schaller discussed that some samples from the berms had been placed on hold at the lab and that the hold times had expired. She stated that the data validators would use 'professional judgement' and would not reject the data if within 2 times the hold time. She also stated she had spoken to the TCEQ chemist, Ann Strahl, about qualifying metals data analyzed outside of the hold time and Ms. Strahl had provided an EPA document that could be cited to state that if the samples are analyzed within 364 days, no qualification would be required for the metals of concern. Allan stated that he did not see a problem in analyzing the metals beyond the hold times. He also stated he had not seen reference to the EPA document Ms. Strahl provided in other projects he has worked on.

ISM Sampling

Delineation was completed for ISM samples, except for two locations for zinc. Additional step outs at these locations are not possible due to the steep surrounding terrain. Allan Posnick said that he remembers this area of the site and agreed that additional step outs would not be practicable. Therefore, no additional ISM sampling is required.

Arroyo (Sediment) Sampling

Results for samples collected of arroyo soils at the three locations on the eastern range boundary which were added to the Phase II scope based on Technical Project Planning Meeting No. 3 (TPP3) comments were at background levels.

Soil To Groundwater Pathway Boring Investigation

Sarah Alder-Schaller reported that one of the three borings was able to be drilled to a depth of 30 feet, and tagged the top of bedrock. No groundwater was encountered in the boring. Lead concentrations decreased with depth and background concentrations were achieved. Based on these results, the soil to groundwater pathway is determined to be incomplete.

Sarah Alder-Schaller noted that zinc concentrations for all the soil samples collected from the three borings were above the Texas medium specific background concentration published in Texas Risk Reduction Program (TRRP) of 30 milligrams per kilogram (mg/kg). The RI report will provide an additional line of evidence from the United States Geologic Survey (USGS), which publishes background data by county, and shows that for El Paso County zinc concentrations range from 37 to 107 mg/kg.

Other Topics

- Allan asked if the TPP3 Meeting Minutes have been issued. Mike Bowlby stated that they have not and that he is currently reviewing them and incorporating comments from Public Affairs. He will send final minutes to Fort Bliss for distribution in the next day or two.
- Allan Posnick stated that he and Ruth will not be going to the Restoration Advisory Board (RAB) meeting next week. However, TCEQ Region staff will attend. Allan will call them and brief them prior to the RAB meeting.
- Mike Bowlby stated that he will talk at the RAB about the Feasibility Study (FS) process for the site. The government plans to go forward with the FS, and to include the stakeholders in the discussion of the FS options evaluated for the site.
- Allan Posnick asked when the TCEQ will receive the RI Report and when TPP4 will occur. Sarah Alder-Schaller stated that the JV has begun drafting the RI Report and anticipates submittal to the TCEQ during the Summer (July/August timeframe). Mike Bowlby stated that TPP4 will be scheduled to occur after the RI Report has been submitted to the TCEQ.
- Allan Posnick asked about the option for an interim control which was submitted as part of an Engineering Evaluation/Cost Analysis (EE/CA), a few years ago for Castner Range. He stated that the EE/CA recommended installation of a fence around Castner Range as an interim control and TCEQ had concurred with that recommendation. Allan asked about the schedule for fence installation. Ron Baca asked Mike Bowlby to comment. Mike Bowlby stated that he had heard about the fence as an historic idea but that it wasn't an economically feasible (and in some cases not technically feasible) option. A fence could come out of the FS, as a possible approach. But he has not heard of an interim action being implemented at this time.

16 March 2017 Technical Memo

March 16, 2017

Technical Memorandum – Phase II Delineation Results and Path Forward
Closed Castner Firing Range, Fort Bliss, Texas
Contract #W912DY-10-D-0025, Task Order #DS01

Prepared By: Sarah Alder-Schaller (PIKA-Arcadis Joint Venture)

The purpose of this Technical Memorandum is to summarize the Remedial Investigation (RI) Phase II delineation results for berm and incremental sampling methodology (ISM) samples which exceed the assessment levels and to provide recommendations for the project path forward based on these results.

Phase II Berm Delineation Results

- Phase I Berm Sampling Scope: Phase I of the RI included collection of discrete soil samples from berms present within the eastern portion of the Castner Range. Although review of the historical data indicates that small arms range may have one time been present in this area, it is uncertain whether backstop berms were established for them or whether the mountain was used as a natural backstop. Most, if not all, berms currently present in the area are expected to be for storm water control purposes. Therefore, sampling of the berm material for total metals and Toxicity Characteristic Leaching Procedure (TCLP) metals (if the totals concentrations were high enough to warrant performing TCLP analysis) was included in the scope to evaluate the berm material as a potential waste which may require removal as part of a response action. Additionally, discrete samples were collected from around the perimeter of the berm to delineate any release to the environment that may have occurred from the berm. These samples were collected generally 50 or more feet from the berm to help bound an extent for a response action, if one were to be required.
- Phase 1 Delineation Results: One or more perimeter samples exceeded the screening level for lead at four of the 10 berms (Berms 1, 7, 8, and 9). The exceedances were generally marginal compared to the expected protective concentration level (PCL) for lead.
- Phase II Scope: Additional step-out samples for berms were planned for Phase II of the RI to fulfill two purposes: 1) to provide lateral delineation to the screening level and 2) to provide a data set of eight samples that would allow calculation of a 95% upper concentration limit for comparison to the PCL, with the intent that it would be possible to eliminate the PCL exceedance zone. The Phase II step-out samples were located at distance of up to 100 feet from the base of the berm, so were expected to fully delineate the lead.
- Phase II Delineation Results:
  - Horizontal delineation was completed at Berm 7, and no further evaluation of this berm is required.

- Horizontal delineation was not completed for Berms 1, 8, and 9. For Berms 8 and 9, the Phase II delineation samples showed an increase in concentrations in one direction. Results for the berm perimeter samples collected during the Phase I and II of the RI for Berms 1, 8, and 9 are shown below on **Figures 1**, **2,** and **3**, respectively. Lead results for nearby ISM samples collected during Phase I of the RI and during the ISM Field Demonstration are also presented on these figures.

- Evaluation of the CSM in the Berm Areas: Because of the distance of the Phase II sample locations from the base of the berms and results indicating increased concentrations with distance, the CSM in the berm area was reevaluated. It was determined that these berms are located in, or near to, concentrated munitions use areas (CMUAs) as follows:
    - Berm 1 is located just south of an expanded CMUA area near the northern range boundary.
    - Berms 7 and 8 are located just outside of the large CMUA, near the eastern range boundary.
    - Berm 9 is located within an expanded area of the large CMUA, area near the southern range boundary.

  Figure 4, below, presents berm locations, CMUA extents, and locations of MEC and MD finds.

  The concentrations of lead in soils surrounding the berms, as samples are collected at distances farther away from the berms, may be attributable to complex-wide range activities (and not small arms use) based on the proximity of these berms to CMUAs and noted munitions debris in the area. Per the QAPP, delineation in soils of complex-wide range use is performed with ISM samples, rather than discrete samples. Further, the lead results in samples taken from within Berms 1 and 9 do not suggest these berms were used for small arms training, as lead concentrations would be expected to be in the hundreds or thousands of milligrams per kilogram. Resampling of Berms 7 and 8 will be conducted in March 2017 and will be similarly evaluated.

- Rationale for Berm Sampling Completion: Delineation of impacts at Berms 1, 8, and 9 are believed to be complete. While the discrete step-out samples did not achieve the action levels, these samples have moved such a distance from the original possible source area (e.g., the berm) that they no longer represent potential impacts from small arms use; rather, they are located in areas affected by complex-wide range activities, which are being delineated by ISM.

  The decision units containing the berms were not selected for ISM sampling during the RI, as shown on **Figure 5,** below, which presents the relative locations of the berms, CMUAs, and ISM decision units. However, comparison of the relative locations of the berms to (1) the historical range features and munitions debris locations (**Figure 4**), and (2) the ISM samples collected near the berms (**Figure 5**) indicate the following:

    - Berm 1 is located 300 feet south of CMUA 6, within the boundary of a former Mortar Range. Two ISM grids are present to the north, and three others are present to the south and east of the berm. Munitions debris has been located on the near-side and downrange areas of the berm.

- Berm 8 is located adjacent to two former ranges and 200 feet north of CMUA 1. There is one ISM decision unit located immediately south of the berm and four other ISM decision units are located in the vicinity (500 – 900 feet away). Munitions debris has been located on the near-side and downrange areas of the berm.
- Berm 9 is located within the general boundaries of a former rifle range and is fully contained within the expanded boundary of CMUA 12. Six ISM samples were collected from this area, including a Phase II sample immediately south of the berm. Munitions debris has been located on the near-side and downrange areas of the berm.

Given the location of these berms inside or adjacent to CMUAs, the degree of munitions debris found near them, and the sufficient ISM sampling conducted on the range complex area, no further berm delineation sampling is required. The JV will use samples collected from within the berms to evaluate waste characteristics of the berm material.

Phase II ISM Results

Analytical data from the RI Phase II ISM sampling have been received and are being validated. A preliminary review of the data indicates that there is one area (near ISM decision units 179 and 180) where the Phase II results exceed the assessment level for zinc and there are no nearby ISM results to provide delineation. **Figure 6,** below, presents the Google Earth imagery for these locations, and shows that they are located on and adjacent to steep terrain with rocky outcrops. Collecting step-out ISM samples will not be possible. Therefore, no additional samples are recommended, and the RI will document that the exceedance area is bounded by mountain terrain.

Other Phase II ISM sample results were either at/below the action levels or had nearby ISM results to provide delineation.

Enclosures:

Figure 1 - Berm 1 Lead Results
Figure 2 - Berm 8 Lead Results
Figure 3 - Berm 9 Lead Results
Figure 4 - Berms, MEC Finds, and Historical Range Features
Figure 5 - Berms, CMUAs, and ISM Sample Locations/Screening Results
Figure 6 – Google Earth Imagery Around ISM Samples 179 and 180

FIGURES

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

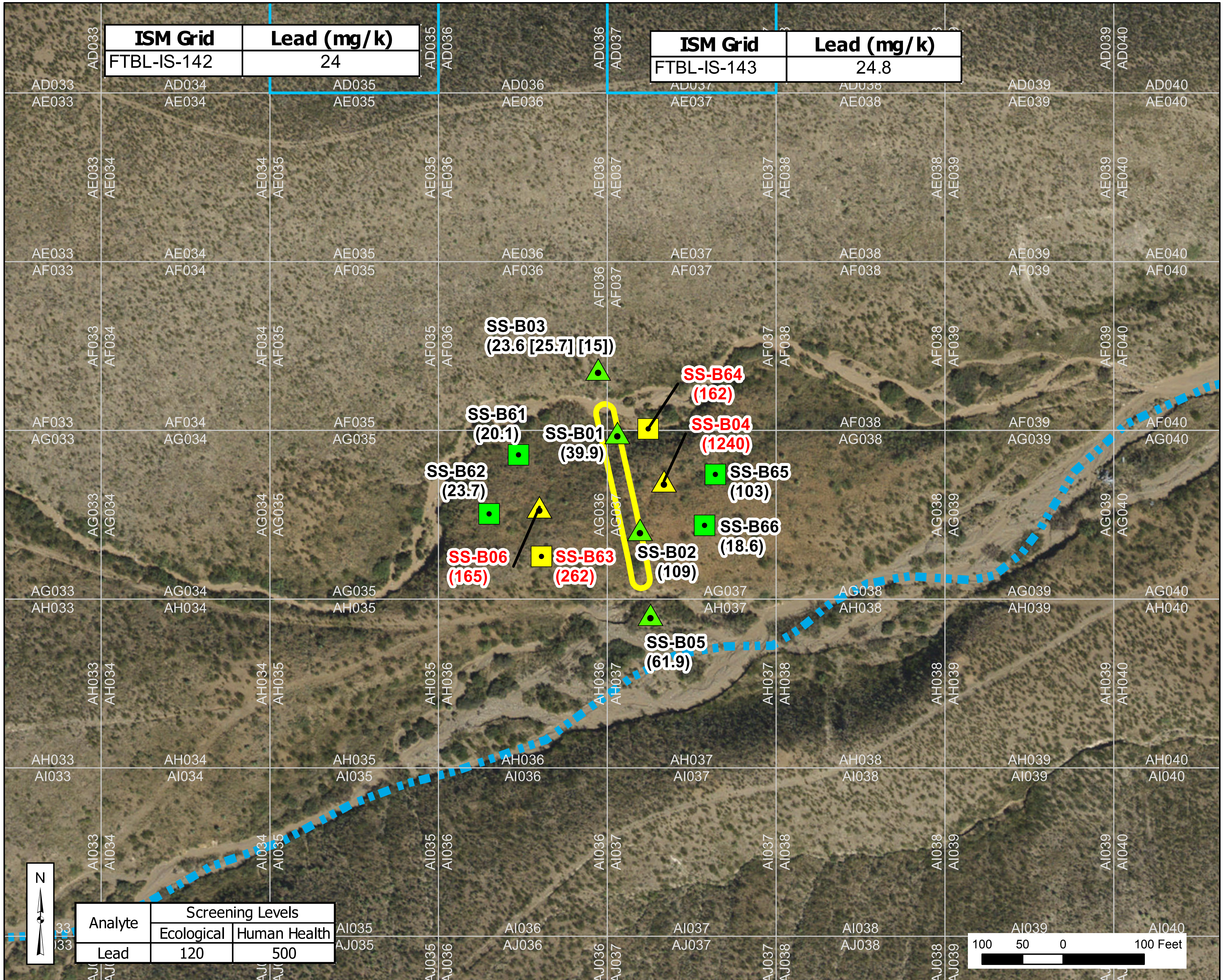


Figure 1
Berm 1 Phase I and Phase II Results

Legend

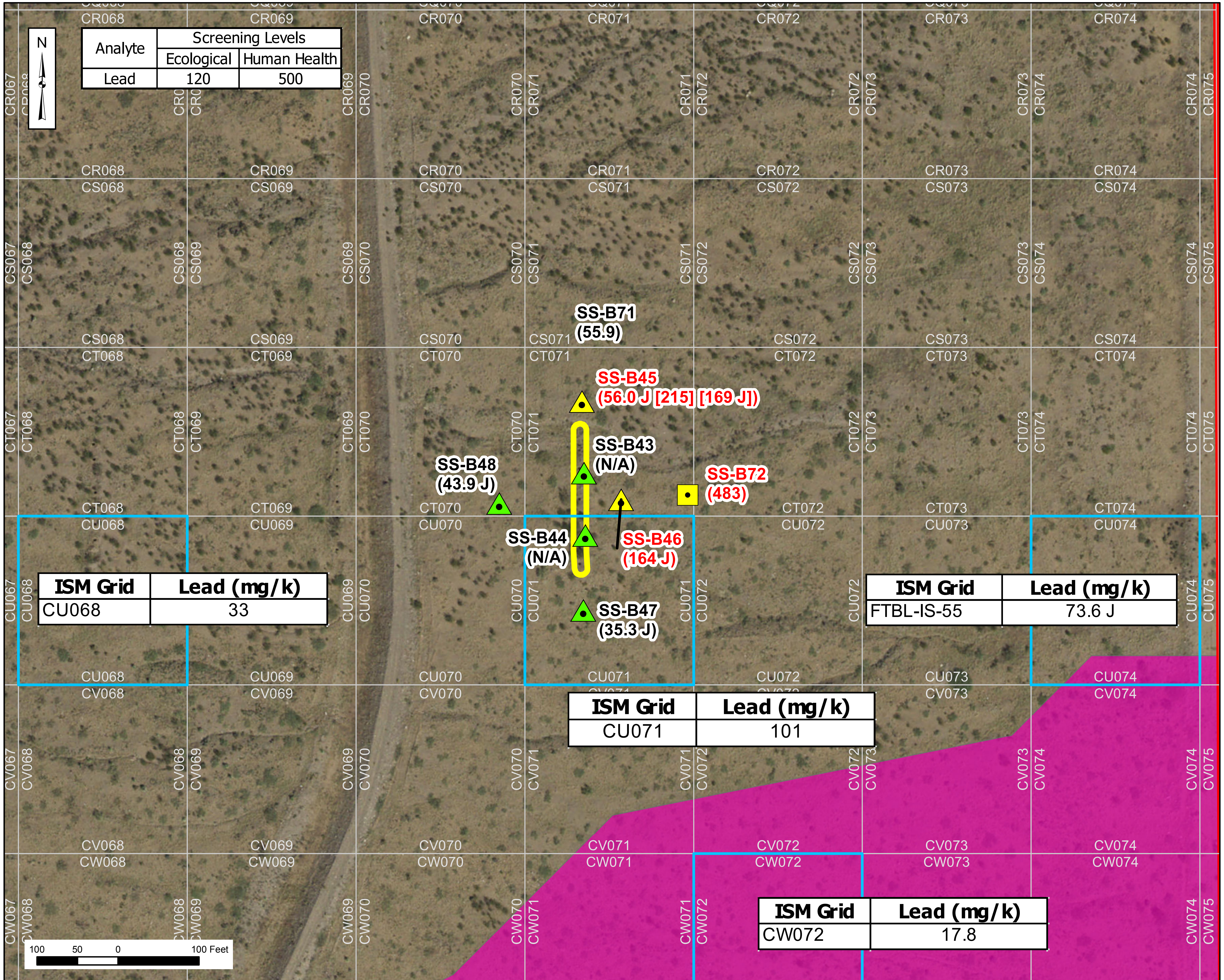
- Berm
- Intermittent Stream
- Canal/Ditch
- Phase I: All Metals Below Assessment Level
- Phase I: One or more metals >= Ecological Screening Level and < Residential Tier 1 1 Tot Soil comb PCL
- PhaseII: All Lead Below Assessment Level
- Phase II: Lead >= Ecological Screening Level and < Residential Tier 1 1 Tot Soil comb PCL
- ISM Grid
- CMUA - Additional MC Investigation Required
- NCMUA - No Additional MC Investigation Required
- Potential CMUA - Additional MC Investigation Required
- NCMUA - Additional MC Investigation Required

SS-B50 Sample Location
(15.2) Lead Result (mg/kg)

Red text indicates exceedances.

Data Sources: ESRI, ArcGIS Online, US Topo

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 2
Berm 8 Phase I and Phase II Results

Legend

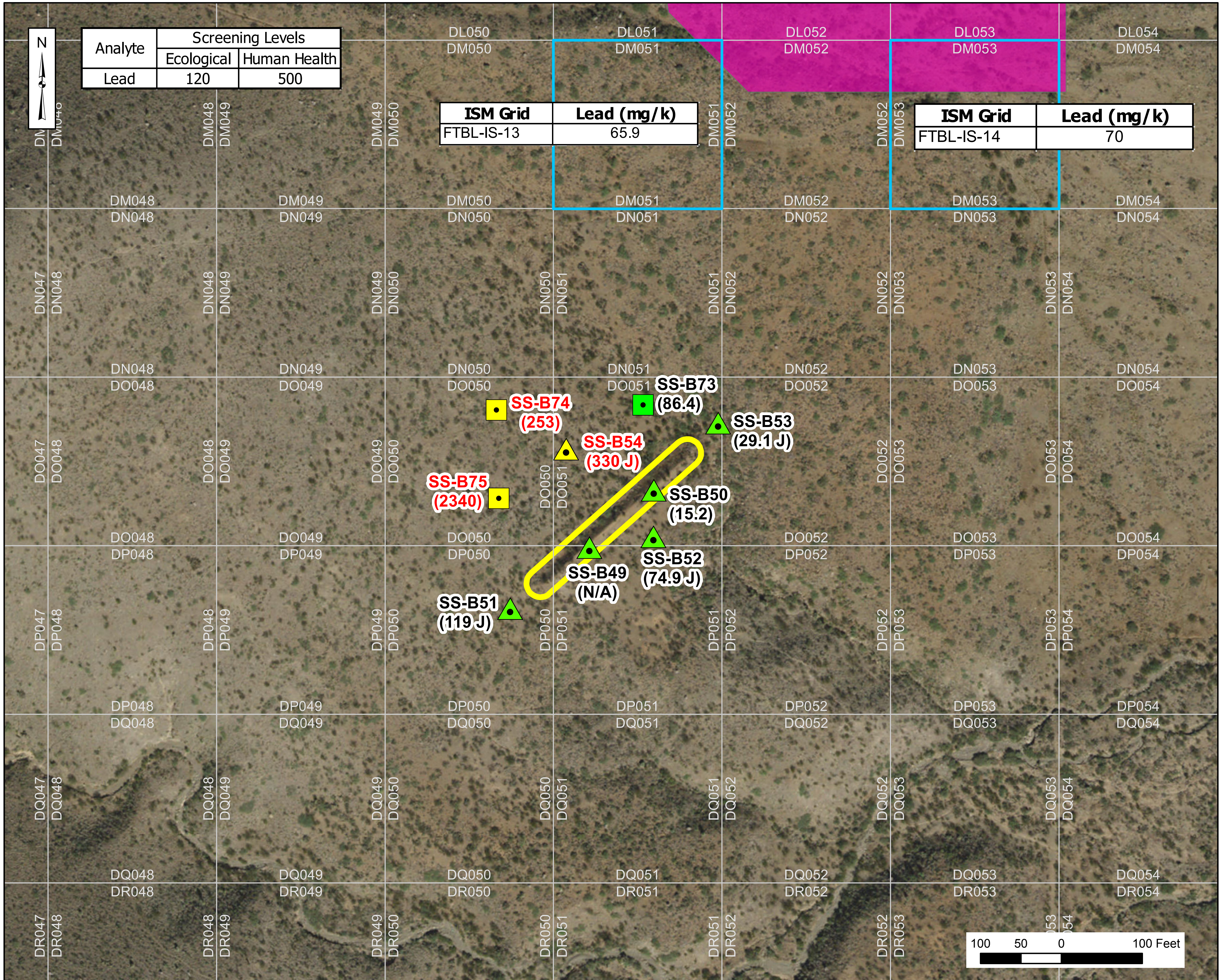
- Berm
- Intermittent Stream
- Canal/Ditch
- Phase I: All Metals Below Assessment Level
- Phase I: One or more metals >= Ecological Screening Level and < Residential Tier 1 1 Tot Soil comb PCL
- PhaseII: All Lead Below Assessment Level
- Phase II: Lead >= Ecological Screening Level and < Residential Tier 1 1 Tot Soil comb PCL
- ISM Grid

SS-B50 Sample Location
(15.2) Lead Result (mg/kg)

Red text indicates exceedances.

Data Sources: ESRI, ArcGIS Online, US Topo

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 3
Berm 9 Phase I and Phase II Results

Legend

- Berm
- Intermittent Stream
- Canal/Ditch
- Phase I: All Metals Below Assessment Level
- Phase I: One or more metals >= Ecological Screening Level and < Residential Tier 1 1 Tot Soil comb PCL
- PhaseII: All Lead Below Assessment Level
- Phase II: Lead >= Ecological Screening Level and < Residential Tier 1 1 Tot Soil comb PCL
- ISM Grid
- CMUA - Additional MC Investigation Required
- NCMUA - No Additional MC Investigation Required
- Potential CMUA - Additional MC Investigation Required
- NCMUA - Additional MC Investigation Required

SS-B50 Sample Location
(15.2) Lead Result (mg/kg)

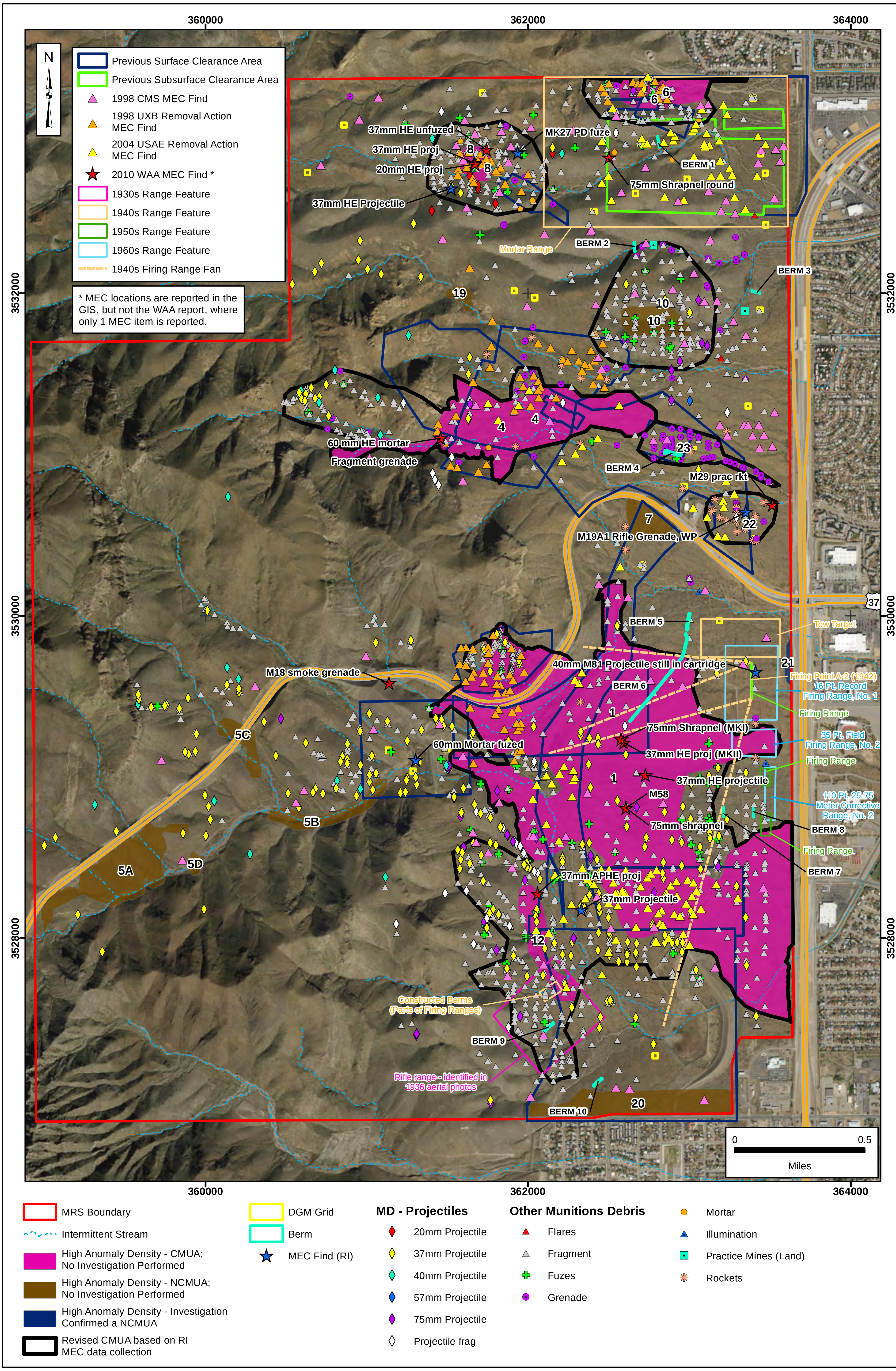
Red text indicates exceedances.

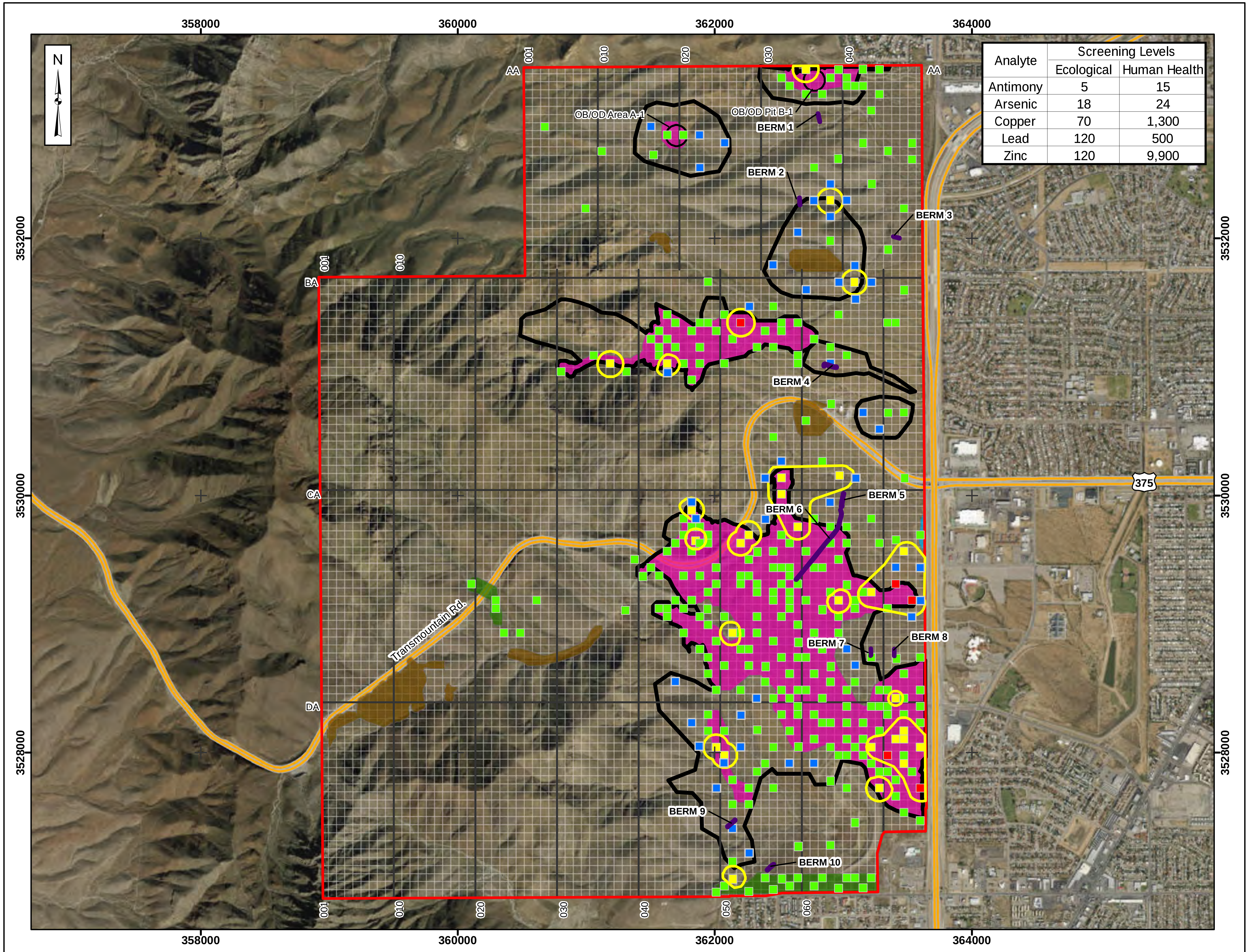
Data Sources: ESRI, ArcGIS Online, US Topo

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 4 - RI/WAA Dig Results and Previous MEC Findings





Analyte	Screening Levels	
	Ecological	Human Health
Antimony	5	15
Arsenic	18	24
Copper	70	1,300
Lead	120	500
Zinc	120	9,900

Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 5 -Phase II ISM Sample Locations

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- OB/OD Area
- Limits of the Affected
- Berm
- Phase II ISM Grid Location

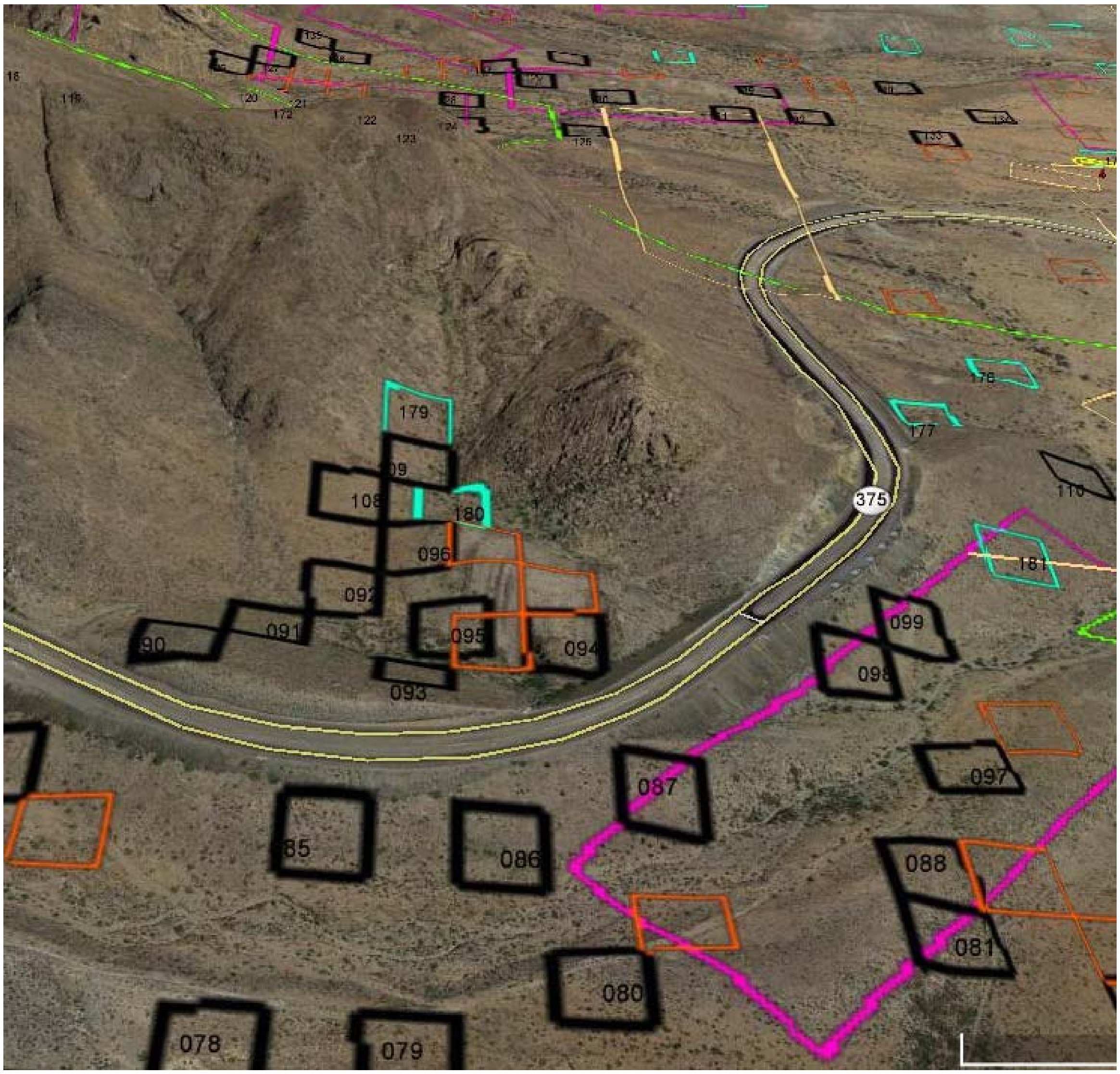
Phase I ISM Grids

- All Metals Below Assessment Level
- One or more metals >= Ecological Screening Levels and < Residential Tier 1 Tot Soil comb PCL
- One or more metals >= Residential Tier 1 Tot Soil comb PCL

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery
Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters
Contract: W912DY-10-D-0025-DS01
Date: November 2016

Figure 6: Google Earth Imagery Of ISM Decision Units 179 and 180



Meeting Minutes for:

TPP No. 4 – 7 November 2017

Technical Project Planning Meeting #4 – 7 November 2017
Remedial Investigation, Closed Castner Firing Range, Fort Bliss, Texas

A stakeholder Technical Project Planning (TPP) Meeting for the Remedial Investigation (RI) at the Closed Castner Firing Range (Castner Range) was held at 9:00 AM on 07 November 2017 at the Fort Bliss Directorate of Public Works Environment Division (DPW-ED) Office (Building 622) – El Paso, Texas.

The purpose of the meeting was to:

- Review the RI project objectives
- Review TPP Meeting #3 conclusions
- Present actions completed since TPP Meeting #3
- Present the RI Report Findings and Recommendations
- Discuss the next steps for Castner Range

The meeting attendees included the following:

Name	Organization
Mike Bowlby	United States Army Environmental Command (USAEC)
Cathy Krupp	USAEC
Eric Kirwan	United States Army Corps of Engineers (USACE)
Rick Smith	USACE
Frank Roepke	USACE
Mike Slavens	USACE
Victor Garcia	Fort Bliss DPW-ED
Ron Baca	Fort Bliss DPW-ED
Sylvia Waggoner	Fort Bliss DPW-ED
Isaac Trejo	Fort Bliss DPW-ED
Robert Gilliam	Texas Commission on Environmental Quality (TCEQ) Region 6
Joseph Miller	TCEQ Region 6
Allan Posnick	TCEQ – Austin
Kirk Coulter	TCEQ – Austin
Samuel 'Keith' Rivera	UXO* Pro
Sarah Alder-Schaller	PIKA-ARCADIS Joint Venture (JV)
Mike Madl	PIKA-ARCADIS JV
Jim Duty	PIKA-ARCADIS JV
Gisela Dagnino	El Paso Water Utilities (EPWU)
Gonzalo Cedillo	EPWU
James Wolff	EPWU
George Maloof	City of El Paso
David Ham	Border Patrol Museum

*UXO = Unexploded ordinance

Mr. Mike Madl introduced himself as the project manager for the PIKA-ARCADIS Joint Venture ("JV"), the contractor conducting the RI. He then called the meeting to order and began by having each of the attendees introduce themselves and state the organization they represent. Mr. Madl noted the purpose of this fourth TPP meeting was to focus on the RI report, which is currently in the Draft Final version and is under review by the TCEQ). This meeting is the last TPP sessions associated with the RI phase of Castner Range.

Mr. Madl began the PowerPoint slide presentation and briefly discussed the meeting agenda, a safety moment and project objectives for the RI. He then summarized topics covered in TPP Meeting #3. TPP#3 presented the results of the completed munitions and explosives of concern (MEC) investigation, the results of Phase I of the munitions constituents (MC) investigation, and the plan for Phase II of the MC investigation.

Mr. Madl provided a general overview of the field work that had been completed prior to TPP#3. He stated that the MEC investigation and Phase 1 of the MC investigation was 100% complete at the time of TPP#3 and the results were discussed in detail during that meeting. Therefore, the focus of the TPP#4 discussions would be on the work completed after TPP#3. Mr. Baca, Fort Bliss DPW-ED asked if any surface water samples were collected from off-site locations. Mr. Madl replied no, because no water was present in the arroyos after the storm event. Mr. Baca said to be prepared to answer this question during the public meeting, because he felt it likely that it would be asked.

Mr. Madl then discussed the actions that were completed since TPP#3, which included completion of the Phase 2 MC investigation and preparation of the RI Report, which has been submitted to the TCEQ for review as a Draft Final version. Mr. Posnick, TCEQ asked if the Draft Final RI Report will be available for the public to review. Mr. Madl replied it would not. However, the Final RI report will be posted to the Fort Bliss external website. Mr. Bowlby, USAEC concurred.

Mr. Posnick asked Mr. Kirwan, USACE about the Castner XD site, and if sampling was done in drainages at that site. Mr. Kirwan stated that sampling was done during the site inspection (SI) phase for the site, but not during the RI. Mr. Bowlby stated that this question was addressed during TPP#3 and that he believes the answer was that no contamination was found on the other side of the freeway. Mr. Madl stated that the RI Report will show results of sediment samples collected at the munitions response site (MRS) boundary, which were below the residential assessment levels (RALs). Mr. Kirwan stated that sampling at the Castner XD site was biased sampling performed in soils from scarred areas, and results were below action levels.

Mr. Madl presented the RI Report purpose and stated that the RI Report is the foundation for development of remedial alternatives during the feasibility study (FS). Mr. Roepke, USACE asked when the Final RI Report will be ready. Mr. Posnick asked by what date the Army team wants to have TCEQ comments. Mr. Madl requested an agency review time of 30 days. Mr. Posnick stated that there is a lot of information for its MEC subcontractor, UXO Pro, to review and that he has not yet coordinated with UXO Pro. Mr. Posnick also stated that the TCEQ ecological risk assessor has just been assigned to this project. Mr. Coulter, the new TCEQ project manager, will need to coordinate review of the ecological risk assessment, which requires 30 days minimum review time. Based on these discussions, Mr. Madl stated he is estimating February or March 2018 for submittal of the Final RI Report.

Mr. Posnick stated that the TCEQ would not concur with the Texas Risk Reduction Program (TRRP) Protective Concentration Levels (PCLs) being listed within the RI Report as 'To Be Considered' (TBCs) instead of Applicable or Relevant and Appropriate Requirements (ARARs). Mr. Posnick believes PCLs should be ARARs. Mr. Bowlby stated that they were not listed as ARARs because the land use has not yet been determined, and the Resource Conservationand Recovery Act (RCRA) permit language has not yet been resolved. Mr. Posnick stated that TRRP applies as an ARAR, no matter what the land use and that he would like this resolved. Mr. Roepke stated that this issue can be revisited and resolved. He stated that the JV's task order expires on March 31, 2018, so he would like to have all issues resolved and the Final RI Report published by then. Mr. Coulter stated he would review the RI Report concurrently with the ecological risk assessor's review.

Mr. Madl then presented a high-level summary of the MEC investigation and results:

1. No Concentrated Munitions Use Areas (CMUAs) were identified in the mountains. Anomalies were found at the base of steep slope areas and were dug, but no CMUAs were identified.
2. Based on the dig results, the MEC density in the non-CMUAs (NCMUAs) is 0.119 MEC/acre. This exceeds the RI sampling goal of 0.1 MEC/acre; as such, the null hypothesis was rejected and the conclusion is there is a higher MEC density outside of CMUAs than originally anticipated.
3. The boundaries of four CMUAs require expansion, and three new CMUAs were identified.

   Mr. Posnick asked if the entire area outside of the CMUAs is one large NCMUA. Mr. Kirwan, USACE stated that the calculation applies only to the areas which can be dug, so mountainous areas are excluded from the calculation of the number of MEC/acre. Mr. Kirwan also stated that 0.1 MEC/acre is the threshold used in UXO Estimator for the UU/UE (unrestricted use/unrestricted exposure or residential land use scenario) potential future use, the most conservative land use scenario. Mr. Posnick asked what number of MEC found during the RI would be needed to meet the 0.1 MEC/acre. Mr. Bowlby provided an example stating that if three items were found within the 30 total acres investigated, the 0.1 MEC/acre threshold would be met.
4. It was confirmed that transport of MEC from high elevations to low elevations is occurring within an arroyo in the MRS.

Following a break, Ms. Sarah Alder-Schaller, JV presented the specifics of the MC field investigation. Ms. Alder-Schaller presented a summary of the different sample types that were collected during Phase I and II of the MC investigation. She then presented maps showing incremental sampling methodology (ISM) and arroyo soil sample results with locations exceeding the RAL, and the associated extent of the Affected Properties (as required by TRRP). Mr. Bowlby asked if the numerical results of the sample exceedances are shown on the map. Ms. Alder-Schaller replied no, numerical values for results are not plotted but are presented in the RI Report tables. However, the driver for exceedances in the ISM samples was lead (with one antimony exceedance co-located with a lead exceedance) and the driver for exceedances in the arroyo soils is arsenic.

Ms. Alder-Schaller then presented other results for the MC investigation, including sampling results for berms, surface water, subsurface soil, and elimination of the soil-to-groundwater pathway (based on tagging the top of bedrock and finding no perched groundwater). Mr. Posnick asked about questions presented during previous meetings as to whether bullets were found in the berms believed to have been used as backstops for small arms training. Ms. Alder-Schaller confirmed that two of the berms appear to have been used as small arms backstops and limited number of bullets were observed. She stated that this information is discussed in the RI Report and that photographs are presented in an appendix showing the bullets.

Ms. Alder-Schaller then presented updates to the conceptual site model based on the RI results including revisions to the CMUA boundaries, confirmation of transport of MEC/munitions debris (MD) in the arroyos, identification of PCL exceedance zones for MC in surface soil, and determination that the soil to groundwater pathway is incomplete. The details of these items were discussed and then a summary of the results of the baseline risk assessment was presented.

A stakeholder asked whether, after redrawing the CMUA boundaries, the NCMUA area now represents 0.1 or 0.12 MEC/acre. After follow-up with the JV geophysicist, it was confirmed that the NCMUA area contains less than or equal to 0.12 MEC/acre, since the original hypothesis (0.1 MEC/acre) was rejected based on the findings of the RI.

Mr. Posnick asked whether two different types NCMUAs could be identified on the site maps: one for the mountains and one in the remaining site area outside of the CMUAs. It was confirmed that all of the area outside the CMUAs are considered to be a NCMUA that has less than 0.12 MEC/acre to a 95% confidence level. The amount of MEC within the mountainous areas is likely to be lower than in the flat, eastern areas due to the limited evidence of munitions that were found during the RI and previous investigations.

Mr. Roepke asked what ecological receptors were evaluated in the screening level ecological risk assessment (in case it is asked during the public meeting). The JV was unsure at the time but verified the ecological receptors used in the risk assessment prior to the public meeting.

Mr. Madl then presented a summary of the MEC hazard assessment (HA) results. The MEC HA considers the potential severity, site accessibility, and MEC sensitivity to evaluate the risk to people on the MRS. Based on the data collected for the RI, including past investigations and removal actions, the MRS received the highest potential explosive hazard score. Mr. Posnick asked if the MEC found at the MRS was totally visible on the ground surface. Mr. Madl replied that the finds have run the full range of possibilities, including totally exposed, partially exposed, and subsurface.

The question was asked whether the NCMUAs could be evaluated separately, instead of looking at the entire site. Mr. Madl stated that it is possible for the MRS site to be subdivided and evaluated separately with the MEC HA and provided some examples. However, for the purposes of establishing a baseline hazard in the RI Report, conservative assumptions were used for the entire site. This is the baseline and different scenarios will be evaluated during the FS.

The recommendations of the RI Report were then presented, including:

- MEC: CMUA boundaries need to be modified and remainder of the site is assumed to be NCMUA. An FS is required for MEC. It was noted that after revision of the CMUA boundaries, two of the MEC items found during the RI would still be located within the NCMUA.
- MC: five PCL exceedance zones were identified for ISM soil sample locations and one PCL exceedance zone was identified for arroyo sample locations. In addition, soil within Berms 7 and 8 need to be addressed; An FS is required for MC.

Based on the residual risk from MEC and MC, the MRS will move to the FS stage in the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) process. A discussion of "where do we go from here" was then conducted. The Army will work with community and stakeholders to evaluate cleanup goals and remedial action alternatives. The goal is to complete the first stages of remedial action by 2023. Mr. Bowlby stated that this means the Army will work towards performing remedial actions in targeted areas that can get to immediate use more quickly. The question was asked about how the Army will receive public input during the FS stage, as this usually happens with the proposed plan. Mr. Bowlby stated there will be public meetings built into the FS project, just as there were in the RI process.

Mr. Madl presented the elements of an FS. Ms. Waggoner, Chief, Fort Bliss DPW-ED, noted that because we don't know the future use of the site, we can't tell the public up front what the alternatives may be. That is part of the FS process. One alternative to be considered is 'status closed.' Mr. Madl then presented other possible approaches for remedial alternatives.

The slide presentation was concluded and a question and answer period was held:

- Mr. Posnick asked if the team had looked at evaluations performed at other facilities, such as Fort Ord. Mr. Bowlby replied yes, and that the USAEC is writing the FS statement of work to align with Fort Ord approach, which will be evaluated during the FS.

- EPWU personnel stated that EPWU has built a structure to collect sediment coming off of the range with stormwater (east of Highway 54 near Fairbanks). After storms, crews with mechanized equipment remove the captured debris/sediment. Concern was raised about the potential for MEC being captured in this structure. Mr. Bowlby stated he would look into a mechanism for a shared responsibility for cleaning out the structure, such as providing UXO support. Mr. Rick Smith, USACE stated that UXO support had been provided to Texas Department of Transportation for cleanup of a detention basin on Castner Range after the flood event in 2006. EPWU also asked if the FS could evaluate detaining sediment/debris on-site, as part of the initial actions to be completed by 2023. They stated that their Master Plan has two retention basins planned west of US 54 on Castner Range. These are just part of their engineering studies, and no right-of-way has been obtained for them. USAEC and Fort Bliss will coordinate with EPWU on future discussions on this topic.
- Mr. Ham, Border Patrol Museum, asked if the arroyo with grenade MD is the one that runs through their property. Mr. Madl stated it is not. It is the arroyo north of that.
- Mr. Posnick asked about the Bureau of Land Management (BLM) involvement. Mr. Bowlby stated that they are a potential landowner if the site is declared a national monument.
- Ms. Waggoner said that a wide range of opinions exist on how Castner Range should be used in the future. Some people want no clean up (so no development can happen), others want a state park, and others want to develop the lower slopes. Fort Bliss's job is to collect data with good science to make an informed decision on future remedial action and site use. That decision will be made by the Army at a higher level.

With no further questions, Mr. Madl thanked the stakeholders for attending and adjourned the meeting at 11:00 am.

As required by the TPP process, the following stakeholders were invited but unable to attend:

Name	Organization
Bill Childress, District Manager	Bureau of Land Management

APPENDIX C

DATA USABILITY ASSESSMENTS

FINAL
WIDE AREA ASSESSMENT DATA USABILITY ASSESSMENT REPORT

MILITARY MUNITIONS RESPONSE PROGRAM
REMEDIAL INVESTIGATION
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

February 2015

Contract No.: W912DY-10-D-0025
Task Order No.: DS01

Prepared for
U.S. Army Corps of Engineers, Tulsa District
1645 S. 101st E. Avenue
Tulsa, Oklahoma 74128

Prepared by:

PIKA-PIRNIE JV, LLC
12723 Capricorn Drive, Suite 500
Stafford, Texas 77477

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LIST OF ACRONYMS AND ABBREVIATIONS

%	percent
Castner Range	Closed Castner Firing Range
cm	centimeter
CMUA	Concentrated Munitions Use Area
DGM	Digital Geophysical Mapping
DGPS	Differential Global Positioning System
DID	Data Item Description
DQCR	Daily QC Reports
EM	Engineer Manual
ft	foot/feet
GPS	Global Positioning System
GSV	Geophysical System Verification
IAW	in accordance with
ISO	Industry Standard Object
IVS	Instrument Verification Strip
JV	Joint Venture
LIDAR	Light Detection and Ranging
LLC	Limited Liability Corporation
MEC	Munitions and Explosives of Concern
MQO	measurement quality objectives
mV	millivolt
NAEVA	NAEVA Geophysics, Inc.
PIKA	PIKA International, Inc.
Pirnie	Malcolm Pirnie, Inc.
QC	Quality Control
RI	Remedial Investigation
RTK	Real Time Kinematic
Sky	Sky Research, Inc.
The JV	PIKA International, Inc. /Malcolm Pirnie, Inc. Joint Venture, LLC
TCEQ	Texas Commission on Environmental Quality

URS	URS Group, Inc.
U.S.	United States
USAEC	U.S. Army Environmental Command
USAESCH	U.S. Army Engineering Support Center Huntsville
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
WAA	Wide Area Assessment
WERS	Worldwide Environmental Remediation Services

1.0 INTRODUCTION

The PIKA International, Inc. (PIKA) Malcolm Pirnie, Inc. (Pirnie) Joint Venture (JV), Limited Liability Corporation (LLC) (the JV) has developed this Data Usability Assessment Report to respond to comments that the Texas Commission on Environmental Quality (TCEQ) had regarding the quality of the geophysical data collected during the Wide Area Assessment (WAA) at the Closed Castner Firing Range (Castner Range) at Ft. Bliss, Texas. This would include an assessment of whether the data met the performance requirements of the WAA and could be used to aid in the determination of the nature and extent of Munitions and Explosives of Concern (MEC) during the Remedial Investigation (RI) at the Castner Range. The JV is performing the Castner Range RI under the United States (U.S.) Army Engineering Support Center Huntsville (USAESCH) Worldwide Environmental Remediation Services (WERS) contract number W912DY-10-D-0025 task order DS01, under management and oversight from the U.S. Army Environmental Command (USAEC) and U.S. Army Corps of Engineers (USACE), Tulsa District.

The WAA was conducted as a demonstration of various technologies to determine the usefulness of these technologies in the site characterization process that is often applied during an RI. Although the WAA was not an RI, it collected data consistent with the methodologies commonly used to traverse and detect concentrated munitions use areas (CMUAs), such as MEC target areas; characterize the nature and extent of MEC within target areas; and characterize the nature and extent of MEC outside of CMUAs. The site characterization technologies conducted during the WAA were consistent with those planned for the RI; however, during the RI, the JV will collect additional data and use both the WAA and RI results together to provide a more complete evaluation of the nature and extent of MEC at the Castner Range. The WAA technologies that will be used during the RI to evaluate the nature and extent of MEC include the following:

- Light Detection and Ranging (LIDAR),
- Man Portable EM61-MK2 digital geophysical mapping (DGM) surveys,
- Analog Mag and Dig transect surveys,
- Analog Reconnaissance Surveys (i.e., instrument assisted visual surveys)
- Intrusive investigation of DGM anomalies

This report is written to address questions raised by TCEQ, which are included in **Appendix A**. Some of the comments are of a more general nature (i.e., they are not related to data quality) and therefore, are not addressed in this report. The comments that this report addresses include the following:

- Comment 1 regarding the quality control (QC) program that was implemented during the WAA.
- Comment 4 regarding the QC requirements for anomaly investigation

The following sections provide responses to these comments, as well as an analysis of whether the performance metrics established during the WAA were met and are acceptable for use during the RI.

2.0 WAA QUALITY CONTROL PROGRAM

URS Group, Inc. (URS) was the prime contractor for the WAA. URS conducted the analog portions of the WAA (i.e., intrusive investigation, analog reconnaissance); however, they subcontracted DGM activities to NAEVA Geophysics, Inc. (NAEVA) and Sky Research, Inc. (Sky). URS was also responsible for developing and implementing the QC program during the WAA field demonstration. There are three components to TCEQ comment 1, which are listed below and discussed in the following sections.

- Documentation of daily equipment checks in accordance with (IAW) with Table 3-2 of the WAA Report;
- Instrument Verification Strip (IVS) results IAW Table 3-5 of the WAA Report; and
- Analog QC inspection results.

2.1 EQUIPMENT CHECK RESULTS

The JV evaluated the WAA DGM data to determine whether the data met the established performance metrics as listed in Table 3-2 of the WAA Report, as well as the performance requirements contained in Data Item Description (DID) WERS-004.001 that will be used during the RI. **Table 1** shows the WAA and DID WERS-004.01 performance metrics for the following measurement quality objectives (MQOs):

- Static Repeatability
- Along line measurement spacing
- Speed
- Dynamic Detection Repeatability (on transects)
- Dynamic Detection Repeatability (in the IVS),
- Dynamic Positioning Repeatability,
- Appropriate Latency Correction Applied,
- Target Selection,
- Anomaly Resolution, and
- Geodetic Equipment Functionality.

In general, these performance metrics are very similar, but the performance standard can sometimes vary between WAA and the DID requirements. The following sub-sections present the results of the DGM data collected by NAEVA and Sky and an evaluation of that data against the performance metrics.

Table 1: WAA Measurement Quality Objectives for Ground-based Systems

MQO	Test Method	WAA Performance Standard	DID WERS-004.01 RI DGM Performance Standard	Frequency	Consequence of Failure
Static Repeatability	Static Background and Spike Test	Response within +/- 10 percent (%) after subtraction of background	Same as WAA Performance Standard	Beginning and end of day	Day's data fail unless seed item is mapped with repeatable anomaly characteristics
Along Line Measurement Spacing	Evaluation of DGM survey data to ensure compliance	98% less than or equal to 25 centimeters (cm) along line	Same as WAA Performance Standard	By dataset	Data set submittal fails
Speed	Evaluation of DGM survey data to ensure compliance	95% of data less than 3.5 miles per hour	Same as WAA Performance Standard	By dataset	Data set submittal fails
Dynamic Detection Repeatability	Repeat Survey Data	Number of anomalies within +/- 5% or +/- 4 of original, whichever is greater or Repeatability of response amplitude within 20%; Repeatability of position +/0 8 inches.	(a) Number of anomalies on repeat segment within +/- 20% or +/- 8 of original or within range of adjacent sections. (b) Test item (in test strip or on transect) anomaly characteristics (peak response and size) repeatable with allowable variation +/- 25%.	100-foot (ft) section of transect per mile of transect	Lot submittal fails
	Repeat IVS Data	Response +/- 10% of original value or within range of anticipated response[1]		Beginning and end of day	Day's data fail unless seed item is mapped with repeatable anomaly characteristics

MQO	Test Method	WAA Performance Standard	DID WERS-004.01 RI DGM Performance Standard	Frequency	Consequence of Failure
Dynamic Positioning Repeatability	Transects with reacquisition/digging	Not included in Table 3-2 of the WAA Report.	Demonstrate reacquisition by reproducing randomly chosen anomaly signals (reac amplitude >= original & offset <= 1 m) or Test item anomaly characteristics (peak response and size) repeatable with allowable variation +/- 25% and position offset < 1 meter.	2 targets per system per lot	Lot submittal fails
Appropriate latency corrections applied	Evaluation of results of time calibration and point position tests to ensure compliance	No visible chevron effects in the data or pseudo-color plots	None contained in the DID.	By data set	Data set will be reprocessed
Target Selection	WAA Prime Contractor QC of target selection	Not included in Table 3-2 of the WAA Report.	All dig list targets are selected according to project design	By grid or dataset	Submittal Fails
Anomaly Resolution	Verification checking of anomaly footprint	Not included in Table 3-2 of the WAA Report.	If MEC: 70% < 10% unresolved anomalies	Rate varies depending on lot size.	Lot submittal fails

MQO	Test Method	WAA Performance Standard	DID WERS-004.01 RI DGM Performance Standard	Frequency	Consequence of Failure
Geodetic Equipment Functionality	Evaluation of daily Real Time Kinematic (RTK) Differential Global Positioning System (DGPS) offset measurements	Not included in Table 3-2 of the WAA Report.	Position offset of known/temporary control point within expected range as described in the approved Work Plan	Daily	Redo affected work or reprocess affected data.

Note:

1 – During WAA data collection, minor variations in the height of the EM61-MK2 coil (due to the data being collected in litter mode) caused variations of channel 2 peak response in excess of the initial 10% response performance standard. After accounting for potential response variations, or calculating an error budget, IAW USACE Engineering Manual (EM) 200-1-15, URS developed a new range of acceptable channel 2 peak responses that were used for evaluation of the IVS results. See Section 2.1.5 of this report for further discussion.

Table 2: Static Repeatability Results

Dataset	Contractor	Issue
January 28 Team 2 AM and PM	NAEVA	Isolated spikes slightly greater than 2 millivolts (mV) in static background data
All other datasets	NAEVA	None; met performance metric
All Datasets	Sky	None; met performance metric

2.1.1 Static Repeatability

Static background and static spike tests were collected at the beginning and end of each day of DGM data collection. The results of the QC tests are contained within **Appendix B** of this report and **Appendix C** provides summaries of tests and whether they pass. All static background and spike tests passed, with a couple of exceptions, which are listed on **Table 2**. All of the NAEVA static tests pass the ±10% performance standard; however, both the AM and PM static tests on January 28th contained data spikes in Channel 2. NAEVA attributed these spikes to a combination of performing the test near the site trailer and heavy rains, which may have included lightning, which often causes spikes in EM data. These spikes appear to be an isolated incidence and there is a known cause for them; therefore, the NAEVA static tests are all determined to be acceptable. The Sky research static data, which is documented in the daily QC reports contained in **Appendix B** and summarized in **Appendix C** of this report, show that their static data measurements were within the performance metrics for all days of data collection. The results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

2.1.2 Along Line Measurement Spacing

The along line measurement QC requirement was established to ensure that data was collected at a frequency sufficient to detect the MEC of interest at the Castner Range. The performance standard was that 98% of data had to have an along line spacing less than or equal to 25 cm. The along line measurement spacing is contained in the SKY and NAEVA QC reports that are contained in **Appendix B** and are summarized in **Appendix C**. All DGM data met or exceeded the along line measurement spacing performance criteria. The results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

2.1.3 Speed

The speed QC requirement was established to ensure that data was not collected at too high of a speed, which can lead to increased noise and false alarms (i.e., No Finds). The performance standard was that 95% of the data within each dataset had to be less than 3.5 miles per hour. The speed of each dataset is contained in the Sky and NAEVA QC reports that are contained in **Appendix B** and are summarized in **Appendix C**. All DGM data met or exceeded the speed performance criteria. The results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

2.1.4 Dynamic Detection Repeatability on Transects

As shown in **Table 1**, the evaluation criteria for determining whether the dynamic detection repeatability of transects DGM survey data was acceptable during the WAA was that the either

a) the number of anomalies on a repeat segment within +/- 20% or +/- 8 of original or within range of adjacent sections or
b) test item (in test strip or on transect) anomaly characteristics (peak response and size) repeatable with allowable variation +/- 25%.

Repeat data is included in **Appendix B** and summarized in **Appendix C**. All repeat data that was collected meets the first requirement that the number of repeat anomalies are with +/- 5% or +/- 4 and therefore pass this performance standard. Some of the peak responses do exceed the +/- 20% response variation. These variations are summarized in **Appendix C**. Variations in response can be up to 50% when the EM61-MK2 is run over the same item at a 0.5-meter offset (e.g., half of the coil width). The geophysical contractor did not mark the exact ground over which they walked; therefore, it can be expected that the offsets could have been up to 0.5-m or more and that there could be considerable variation of response between the original and repeat data. Because of the difficulty in verifying that repeat lines are collected over the exact same location, they are often replaced by analysis of the anomaly characteristics (e.g., peak response) in test lines (e.g., in the IVS) IAW DID WERS-004.01. As discussed below, the dynamic detection repeatability on the IVS was successfully demonstrated on a daily basis. The results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

2.1.5 Dynamic Detection Repeatability on IVS

As shown in **Table 1**, the evaluation criteria for determining whether IVS data was acceptable during the WAA was that the peak channel 2 response was within ± 10% of the original channel 2 response. As discussed in the NAEVA DGM Report that is included in **Appendix B** of this assessment), the slight variations in the EM61-MK2 caused the measured peak channel 2 response to often vary by an amount greater than 10%. Both NAEVA and Sky had difficulty meeting the initial performance standard. Variations in coil height can be expected when the EM61-MK2 is carried in litter mode, as was necessitated by the terrain at the Castner Range. URS conducted analysis of the potential variations of response that could be expected due to variations in coil height, non-horizontal seed item placement, side-to-side sensor placement, and site-specific noise to determine more appropriate site-specific response ranges IAW USACE guidance (see Section 6.6 of USACE Interim Guidance Document 14-01). Based on this analysis, URS modified the performance standard to account for these variations; **Table 3** presents the modified ranges of acceptable responses that were used to document daily IVS performance. Appendix A of the NAEVA DGM Report (contained in **Appendix B** of this assessment) shows that the NAEVA IVS data was within the acceptable range of Channel 2 peak responses for all days of data collection. The SKY QC reports contained within **Appendix B** show that Sky also passed the IVS performance metric on every day of data collection. The results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

Table 3: Ranges of Acceptable Responses for Daily IVS Collection[1]

Seed Number	ISO Size	Depth (cm)	Orientation	Theoretical Channel 2 Response (mV)	Acceptable Channel 2 Range of Peak Response (mV)
1	Small	7.6	Horizontal along path	16	9.4-38.4
2	Small	17.8	Horizontal along path	7.8	3.6-21.3
3	Small	7.6	Horizontal across path	16	9.9 – 28.9
4	Small	17.8	Horizontal across path	7.8	4.1 – 14.8

1 – After Tables 3-3 and 3-5 of the WAA Field Demonstration Report.
ISO=Industry Standard Object

2.1.6 Dynamic Positioning Repeatability

As shown in **Table 1**, a dynamic positioning repeatability test was not included in Table 3-2 of the WAA Demonstration Report. In addition, blind seed items were not placed along the WAA transects due to the inherent difficulty in ensuring traversal on the transect. These factors complicate directly assessing the dynamic positioning repeatability; however, the intrusive investigation offset from the target location is contained within the dig results, which is contained in **Appendix D** of this Report. The dig results indicate that 2,895 of 2,952 dig results were found within 1 meter (40 inches) of the reported target location. Note that the number of dig results is higher than the number of anomalies because multiple items were found at some of the target locations. While not all of the anomalies are within the 1.0 meter metric, the vast majority of the anomalies meet the performance standard contained in DID WERS-004.01, which is intended for use when reacquisition is performed using a RTK DGPS with centimeter-level accuracy. Given that the WAA used a handheld Global Positioning System (GPS) unit (e.g., GeoXH) with a sub-meter level of accuracy instead of an RTK DGPS, the offsets achieved within the WAA were very good and are consistent with the positioning capability of that unit. It should be noted that three extreme outliers, with offsets from 120 to 330 inches (10 to 27.5 ft) are assumed to be either typographical errors or anomalies where the dig team could not locate the anomaly at the target location and did an expanded search. The dig results contained in Table 3-11 of the WAA Demonstration Report also indicate that only 38 of the 2,622 anomalies chosen for investigation were no finds. This equates to 1.45% of the number of anomalies, which is far below the 15% false positive threshold typically used on munitions response projects and suggests that the dig team did not have difficulty finding the targets of interest. The reacquisition offsets and the low number of no finds indicate that the positioning systems were working as intended during the WAA and the results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

2.1.7 Appropriate Latency Corrections Applied

Latency corrections are applied to adjust the positioning of data to account for time delays between when the data is collected and when it is recorded in the data logger. NAEVA and Sky both performed latency corrections; however, NAEVA uses the term “lag” correction, and Sky uses the term “time slew”. Both terms are synonymous with a latency correction. The amount of latency correction was calculated each day based on the daily IVS and repeat lines. Based on a review of the repeat lines contained in **Appendix B** of this report, the applied latency corrections all appear to be appropriate and produce repeatable locations of the anomaly peaks on the repeat lines. The results of this QC test indicate that the WAA DGM data is acceptable for use in the RI.

2.1.8 Target Selection

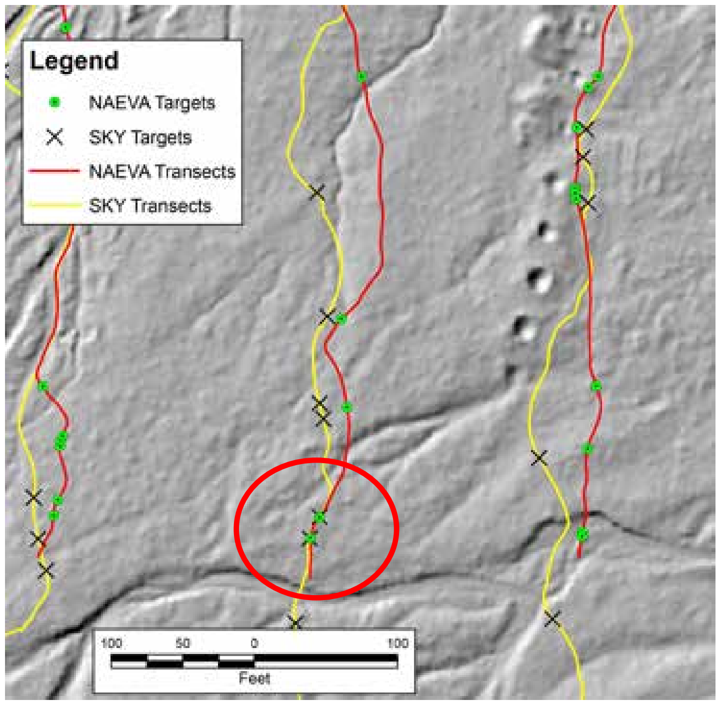
The target selection performance metric is used to ensure that all dig list targets meeting the project’s anomaly selection criteria are selected during data processing and interpretation. The reports contained in **Appendix B** of this report indicate that each data set was reviewed by a trained geophysicist to ensure all targets were picked. In addition, Section 3.2.3.3 of the WAA Demonstration Report discussed the 200 acre overlap area that was mapped by both Sky and NAEVA. Minor variations in the transect path led to different identified anomalies; however, **Figure 1** shows an example of both geophysical companies traversing the same two targets and correctly identifying those targets. The target selection results indicate that the WAA DGM data is acceptable for use in the RI.

2.1.9 Anomaly Resolution

Post-dig anomaly resolution sampling ensures that the anomaly peak is removed to below the anomaly selection threshold for the entire anomaly footprint to avoid leaving behind potential munitions. Per DID WERS-004.01, “resolved is defined as

1) there is no geophysical signal remaining at the flagged/selection location, or
2) a signal remains but is too low or too small to be associated with unexploded ordnance (UXO) / discarded military munitions, or
3) a signal remains but is associated with surface material which when moved results in low, or no signal at the interpreted location, or
4) a signal remains and complete rationale for its presence exists."

Figure 1: Example NAEVA and Sky Targets in Overlap Area



As shown on **Table 1**, the Table 3-2 of the WAA Demonstration Report didn't include an anomaly resolution metric; however, Appendix F2 of the WAA Demonstration Report contains the proposed Anomaly Reacquisition, Intrusive Investigation, and Characterization procedures for the intrusive investigation. Section 5 of that document outlines the acceptance sampling procedures, which were conducted by the UXO Quality Control Specialist (UXOQCS) with an RTK DGPS and the EM61-MK2. DID WERS-004.01 recommends anomaly resolution acceptance on a per lot basis to show there is 70% confidence that less than 10% of the anomalies are unresolved if MEC is found during an RI. This equates to performing anomaly resolution sampling on 12 anomalies for any lot size. During the WAA, 22 lots were identified (including the background areas) and 12 anomalies were resolved for each lot.

The UXOQCS' Daily QC Reports (DQCRs), which are contained in **Appendix E** of this report, provide documentation of the anomalies that were resolved during the WAA and when all targets that were selected for anomaly resolution within a specific lot were completed. In addition, the DQCRs also document the No Find anomalies and the EM61-MK2 channel 2 response when the UXOQCS performed QC at a target location. The anomaly sampling results indicate that the WAA DGM data is acceptable for use in the RI.

2.1.10 Geodetic Equipment Functionality

The geodetic equipment QC requirement was established to ensure that positioning data was collected at a known control monument at the beginning of each day of data collection and that the positioning offset of the RTK DGPS was within 10 cms. The geodetic functionality test results are contained in the Sky and NAEVA QC reports that are contained in **Appendix B** and are summarized in **Appendix C**. All collected geodetic functionality test results were within the 10 cm performance metric; however, Sky team 2 did not collect the position test on February 2, 2010. It is unclear why this test was not collected on this day. To determine whether the RTK DGPS was operating properly on Feb. 2, 2010 for team 2, the JV evaluated the IVS positional offsets for the day to see if the total offsets (due to both DGPS and targeting offsets) were within the 1-meter dynamic detection positioning performance metric. **Figures 2** and **3** respectively show the AM and PM IVS results with the observed and test item peak (i.e., actual seed item location) response locations. As shown on the figures, all IVS seed items were found within 1 meter of the actual seed item location; therefore, the DGPS appears to have been functioning properly on this and all other dates. The geodetic positioning functionality results indicate that the WAA DGM data is acceptable for use in the RI.

Figure 2: Sky February 2, 2010 Team 2 AM IVS Results

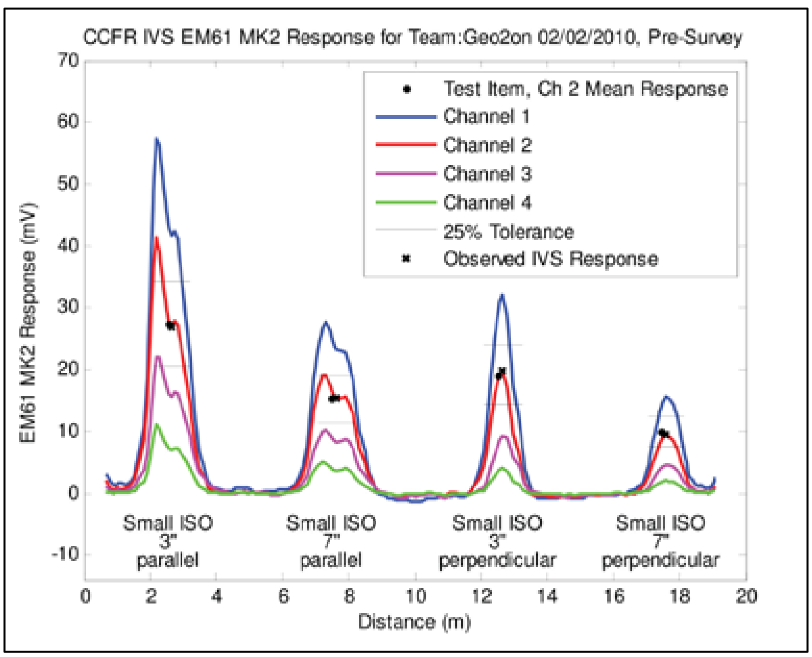
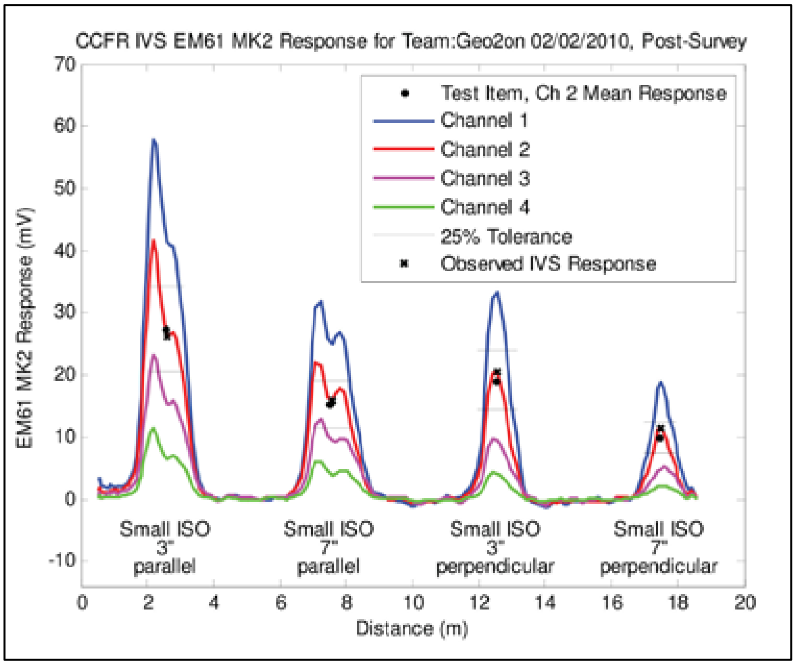


Figure 3: Sky February 2, 2010 Team 2 PM IVS Results



2.2 Analog Reconnaissance QC Inspection Results

The analog data collected during the WAA was used to evaluate the potential for MEC in areas that were inaccessible to DGM methods. The following three tests are required by DID WERS-004.01 for analog reconnaissance surveys to verify data quality:

- Daily instrument test functionality tests of analog instruments at an instrument test strip.
- Daily geodetic equipment checks.
- Repeat data along a portion of the sections of analog reconnaissance transects.

URS collected the first two types of QC checks; however, they didn't collect repeat data along the production reconnaissance paths. Because URS didn't collect repeat data, the JV has not performed QC of the WAA Analog Reconnaissance and the anomaly density estimates can't be used during the RI. However, the munitions debris locations found during the WAA analog reconnaissance can be used to further help in defining the potential nature of extent of MEC within Castner Range. In addition, the RI will collect analog reconnaissance data in some of the same general locations as the WAA using similar procedures, so, the RI instrument assisted visual surveys may be able to corroborate the anomaly densities identified during the WAA. The DCQR daily reports document that the UXO Technicians performed daily equipment test checks of the handheld GPS and handheld Minelab II EM sensors at an instrument test strip near the IVS.

3.0 ANOMALY INVESTIGATION QC REQUIREMENTS

TCEQ raised the following question regarding the anomaly investigation QC requirements.

- Page 3, Appendix F, Bullet 2: The QC requirements for anomaly investigation in Appendix F, Section 3 do not identify the QC process implemented for the target areas. The QC process identified in Appendix F2, Section 3, bullet 2 states the QC will "provide independent verification for anomalies in the non-target areas that are not completely resolved." The independent verification of anomalies in the suspected target areas should also be required. This may be an oversight in the wording as bullet one in the same section requires the QC to check intrusive teams for "properly characterizing/resolution target anomalies." Please clarify that the independent verification of anomalies was conducted by QC in both the non-target areas and the target areas in Appendix F2, Section 3.

As discussed above in Section 2.1.9, the WAA anomaly resolution procedures were conducted within each of the 18 Target Areas, as well as the four background areas. The QC requirements appear to have been consistent for each of these “Lots” and included anomaly resolution of 12 anomalies within each of the lots IAW DID WERS-004.01. It is believed that the missing QC procedures were inadvertently left out of Appendix F of the WAA Demonstration Report, but that they were consistent across all lots. The successful completion of anomaly resolution is documented in the UXOQCS’ DQCRs, which are included in **Appendix E** of this report. The anomaly resolution results indicate that the WAA intrusive investigation data is acceptable for use in the RI.

4.0 CONCLUSIONS

The JV performed this usability assessment to determine whether the DGM and analog geophysical data collected during the WAA was of sufficient quality to allow it to be used during the RI that the JV is currently performing at the Castner Range. With minor exceptions, all DGM and intrusive investigation QC metrics that were evaluated during this usability assessment met the criteria established during the WAA and DID WERS-004.01; therefore, the JV concludes that the WAA DGM and intrusive investigation data can be used during the RI to determine the nature and extent of MEC at the Castner Range. The lack of repeat data along the WAA Analog Reconnaissance paths indicates that the JV can’t use the data to determine the anomaly density and distribution in the western mountainous areas; however, the locations of MEC found during these reconnaissance paths may be used to aid in determining the nature and extent of MEC at Castner Range.

Appendix A – TCEQ Comments on the Wide Area Assessment

TCEQ Comments on the WAA Demonstration Report

The following are detailed comments on the draft final WAA demonstration report that the Army and Ft. Bliss may wish to address:

1. The QC program is not adequately documented. For example:

- ☐ The report says that the GSV process was implemented in Section 1.1, paragraph 2. But the daily QC documentation verifying that the results of the IVS is within the parameters as presented in Table 3-5, Page 3-7 is not provided in any of the appendices to document that the QC inspections were conducted.
- ☐ The daily equipment checks are described as performed in Section 3.2.3.3, Page 3-41 and Table 3-2, Page 3-5. But documentation of the performance of daily equipment inspections is not provided.
- ☐ A QC inspection matrix is provided for ground-based DGM only in Table 3-2, Page 3-5. But a similar QC matrix is not provided for the other data collection processes. Documentation of the QC inspections should be presented in the project's after action report as identified in the USACE data item description (DID) OE-030 (10.2.5), MMRP-09-13(2.4) and WERS-013.01 (2.4). TCEQ recommends including all QC documentation in the final version of the report to maximize use of the data as described in the "path forward" above.

2. Page iv, Executive Summary: The depiction that TCEQ was actively involved in the approval and concurrence of the closed Castner Firing Range WAA Demonstration process is incorrect. TCEQ doesn't agree with statements in the executive summary that "Stakeholders were engaged early and often through the TPP process" and "Stakeholder concurrence was obtained at every phase of the project." TCEQ was not afforded an opportunity to review and provide comments on the WAA work plan in accordance with the Army RI guidance.
3. Page 2-5, Section 2.4: Statements concerning the effectiveness of the helicopter-borne magnetometry are not consistent. Section 2.4 says the "helicopter-borne magnetometry was effective" while Section 3.2.2.2 "Data Analysis" says "helicopter-borne magnetometry system was ineffective at this location." The results of the helicopter-borne magnetometry should be presented consistently.
4. Page 3, Appendix F, Bullet 2: The QC requirements for anomaly investigation in Appendix F, Section 3 do not identify the QC process implemented for the target areas. The QC process identified in Appendix F2, Section 3, bullet 2 states the QC will "provide independent verification for anomalies in the non-target areas that are not completely resolved." The independent verification of anomalies in the suspected target areas should also be required. This may be an oversight in the wording as bullet one in the same section requires the QC to check intrusive teams for "properly characterizing/resolution target anomalies." Please clarify that the independent verification of anomalies was conducted by QC in both the non-target areas and the target areas in Appendix F2, Section 3.
5. The following comments identify inconsistencies between Castner Range WAA TPP Meeting #6 PowerPoint presentation and the Castner Range WAA Demonstration Report.

As each of the following examples show, there are differences in the acreage shown in the WAA report identifies and what was presented at the TPP meeting in El Paso. This is indicative of possible quality issues because the acreage surveyed is critical basic data that should be accurately and consistently reported:

☐ The WAA demonstration report identifies (Page 2-6, Section 2.5) that 1742-acres was collect using helicopter-borne magnetometry, while the WAA TPP Meeting #6 PowerPoint presentation identifies 1577-acres.

☐ Page 2-6, Section 2.5 of the WAA demonstration report identifies man-portable DGM was conducted along transects representing 3521-acres while the WAA TPP Meeting #6 PowerPoint presentation identifies 4020-acres.

Appendix B –Wide Area Assessment Geophysical Data

(see Data CD)

Appendix C – DGM Performance Metric Summary Tables

Date	Team	AM/PM	Geodetic Equipment Functionality
27-Jan	Team 1	AM	Pass
27-Jan	Team 1	PM	Not collected
27-Jan	Team 2	AM	Pass
27-Jan	Team 2	PM	Not collected
28-Jan	Team 2	AM	Pass
28-Jan	Team 2	PM	Not collected
29-Jan	Team 1	AM	Pass
29-Jan	Team 1	PM	Not collected
29-Jan	Team 2	AM	Pass
29-Jan	Team 2	PM	Not collected
1-Feb	Team 1	AM	Pass
1-Feb	Team 1	PM	Not collected
1-Feb	Team 2	AM	Pass
1-Feb	Team 2	PM	Not collected
2-Feb	Team 1	AM	Pass
2-Feb	Team 1	PM	Not collected
2-Feb	Team 2	AM	Pass
2-Feb	Team 2	PM	Not collected
4-Feb	Team 1	AM	Pass
4-Feb	Team 1	PM	Not collected
4-Feb	Team 2	AM	Pass
4-Feb	Team 2	PM	Not collected
5-Feb	Team 1	AM	Pass
5-Feb	Team 1	PM	Not collected
5-Feb	Team 2	AM	Pass
5-Feb	Team 2	PM	Not collected
8-Feb	Team 1	AM	Pass
8-Feb	Team 1	PM	Not collected

8-Feb	Team 2	AM	Pass
8-Feb	Team 2	PM	Not collected
9-Feb	Team 1	AM	Pass
9-Feb	Team 1	PM	Not collected
9-Feb	Team 2	AM	Pass
9-Feb	Team 2	PM	Not collected
10-Feb	Team 1	AM	Pass
10-Feb	Team 1	PM	Not collected
10-Feb	Team 2	AM	Pass
10-Feb	Team 2	PM	Not collected
12-Feb	Team 1	AM	Pass
12-Feb	Team 1	PM	Not collected
12-Feb	Team 2	AM	Pass
12-Feb	Team 2	PM	Not collected
13-Feb	Team 1	AM	Pass
13-Feb	Team 1	PM	Not collected
13-Feb	Team 2	AM	Pass
13-Feb	Team 2	PM	Not collected
15-Feb	Team 1	AM	Pass
15-Feb	Team 1	PM	Not collected
15-Feb	Team 2	AM	Pass
15-Feb	Team 2	PM	Not collected
16-Feb	Team 1	AM	Pass
16-Feb	Team 1	PM	Not collected
16-Feb	Team 2	AM	Pass
16-Feb	Team 2	PM	Not collected

Date	Team	AM/PM	Geodetic Equipment Functionality
27-Jan	Team 1	AM	Pass
27-Jan	Team 1	PM	Not collected
27-Jan	Team 2	AM	Pass
27-Jan	Team 2	PM	Not collected
29-Jan	Team 1	AM	Pass
29-Jan	Team 1	PM	Not collected
29-Jan	Team 2	AM	Pass
29-Jan	Team 2	PM	Not collected
1-Feb	Team 1	AM	Pass
1-Feb	Team 1	PM	Not collected
1-Feb	Team 2	AM	Pass
1-Feb	Team 2	PM	Not collected
2-Feb	Team 1	AM	Pass
2-Feb	Team 1	PM	Not collected
2-Feb	Team 2	AM	Not collected
2-Feb	Team 2	PM	Not collected
4-Feb	Team 1	AM	Pass
4-Feb	Team 1	PM	Not collected
4-Feb	Team 2	AM	Pass
4-Feb	Team 2	PM	Not collected
5-Feb	Team 1	AM	Pass
5-Feb	Team 1	PM	Not collected
5-Feb	Team 2	AM	Pass
5-Feb	Team 2	PM	Not collected
8-Feb	Team 1	AM	Pass
8-Feb	Team 1	PM	Not collected
8-Feb	Team 2	AM	Pass
8-Feb	Team 2	PM	Not collected
9-Feb	Team 1	AM	Pass
9-Feb	Team 1	PM	Not collected
9-Feb	Team 2	AM	Pass
9-Feb	Team 2	PM	Not collected
10-Feb	Team 1	AM	Pass

10-Feb	Team 1	PM	Not collected
10-Feb	Team 2	AM	Pass
10-Feb	Team 2	PM	Not collected
12-Feb	Team 1	AM	Pass
12-Feb	Team 1	PM	Not collected
12-Feb	Team 2	AM	Pass
12-Feb	Team 2	PM	Not collected
13-Feb	Team 1	AM	Pass
13-Feb	Team 1	PM	Not collected
13-Feb	Team 2	AM	Pass
13-Feb	Team 2	PM	Not collected
15-Feb	Team 1	AM	Pass
15-Feb	Team 1	PM	Not collected
16-Feb	Team 1	AM	Pass
16-Feb	Team 1	PM	Not collected
18-Feb	Team 1	AM	Pass
18-Feb	Team 1	PM	Not collected

Appendix D – WAA Dig Results

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
97	0	CD	N_014_01515_E	3531825.715	362833.7219	85.046079	1	10/13/2010	10:23	E	330	SE	Horizontal	E	2	0.005	0.005	1
212	0	MD	N_0C2_06367_C	3531179.388	361538.9789	7.406251	1	10/6/2010	13:54	C	234	SW	Horizontal	N	3	0.5	0.5	1
3139	0	MD		3529156.844	359873.2595	0	3	1/12/2011	9:53	11.1.2	120	W	Veritical	W	4	2	2	1
38	0	MD	N_036_04943_B	3531079.902	361575.2722	6.399703	1	10/4/2010	9:50	B	78	N	Horizontal	N	1	0.5	0.5	1
833	0	propellant	N_0A3_06123_B	3532835.671	362190.562	5.7385	3	11/1/2010	12:09	B	72	W	Horizontal	E	4	1	1	1
2	0	Hot Rock	N_065_05589_B	3531041.437	361318.177	5.8945	1	9/30/2010	10:05	B	62	NW	Horizontal	N	12	12	12	1
61	0	CD	N_0C2_06328_A	3531020.689	362608.6528	12.796344	2	10/4/2010	8:49	A	62	NW	Horizontal	N	3	1	1	1
1	0	Hot Rock	N_065_05589_A	3531041.867	361318.4728	5.8945	1	9/30/2010	9:58	A	60	NW	Horizontal	N	6	4	4	1
15	0	MD	N_013_01429_A	3531198.319	362887.325	6.531211	2	9/30/2010	9:24	A	60	W	Horizontal	S	2	1	1	1
18	0	MD	N_015_01925_A	3531141.284	362780.1597	4.709869	2	9/30/2010	10:19	n015 01925	60	NW	Horizontal	S	2	0.5	2	1
235	0	MD	N_019_02765_A	3531516.176	362547.658	7.857659	2	10/6/2010	10:14	A	60	SE	Horizontal	E	3	0.5	0.5	2
334	0	RRD	N_011_01109_B	3531785.732	362993.3152	16.247382	1	10/14/2010	12:09	B	60	W	Horizontal	W	1200	0.25	0.25	1
13	0	MD	N_063_05416_C	3531102.258	361525.534	9.034953	1	9/30/2010	14:19	C	58	NW	Pointing Down Toward	N	4.5	1	0	1
151	0	MD	N_012_01228_A	3531660.724	362946.6548	31.315728	2	10/13/2010	14:44	A	58	NW	Horizontal	W	6	3	2	1
21	0	CD	N_018_02536_A	3531076.442	362613.7294	389.132165	2	9/30/2010	12:33	A	56	NW	Horizontal	E	99	1	1	1
68	0	RRD	N_020_02872_A	3530965.797	362491.3189	59.762593	2	10/4/2010	9:52	A	56	NW	Horizontal	N	60	0.1	60	1
69	0	RRD	N_022_03161_A	3531032.774	362375.776	5.011924	2	10/4/2010	10:31	A	56	W	Horizontal	S	2	1	2	1
59	0	CD	N_018_02591_A	3531013.985	362618.7547	11.301438	2	10/4/2010	8:36	A	55	NW	Horizontal	E	5	1	1	1
70	0	CD	N_021_03070_A	3531081.99	362431.1971	5.647938	2	10/4/2010	10:41	A	55	NW			4	4	0	1
65	0	CD	N_019_02726_C	3531054.68	362552.0054	13.993316	2	10/4/2010	9:16	C	53	S	Horizontal	N	5	4	5	1
74	0	MD	N_020_02950_A	3531202.192	362483.1294	5.309264	2	10/4/2010	11:23	A	53	NW	Horizontal	E	3	1	1	1
553	0	MD	N_014_01513_B	3533183.816	362824.2131	88.828232	2	10/26/2010	15:18	B	52	SW	Horizontal	S	2	1	1	1
73	0	MD	N_022_03155_A	3531130.029	362370.7939	5.879815	2	10/4/2010	11:08	A	51	NW	Horizontal	E	3	1	1	1
67	0	RRD	N_020_02887_A	3530992.299	362492.3997	20.386407	2	10/4/2010	9:46	A	50	NW	Horizontal	N	6	0.25	6	1
84	0	MD	N_020_02949_B	3531303.648	362490.0674	5.385072	2	10/4/2010	13:42	B	50	S	Horizontal	W	1	0.25	1	1
285	0	CD	N_035_04624_D	3531302.419	361635.0182	66.140334	1	10/12/2010	11:09	D	50	SE	Horizontal	E	24	0.1	0.1	1
751	0	CD	N_014_01607_A	3532869.824	362829.323	8.579766	2	10/28/2010	11:44	A	50	NE	Horizontal	N	3	3	3	1
821	0	MD	N_035_04766_A	3532666.928	361642.4928	5.012015	2	11/1/2010	15:39	A	50	NE	Horizontal	N	2	1	1	1
63	0	MD	N_019_02726_A	3531057.003	362551.2763	13.993316	2	10/4/2010	9:10	A	49	NW	Horizontal	N	5	1	0.5	1
5	0	CD	N_064_05464_A	3531082.082	361492.4259	46.117887	1	9/30/2010	11:20	A	48	SE	Horizontal	N	2	1	0.1	1
7	0	MD	N_064_05489_B	3531067.065	361490.2952	6.161132	1	9/30/2010	11:39	B	48	N	Horizontal	N	1	0.2	0.2	1
10	0	MD	N_064_05464_C	3531083.17	361490.2244	46.117887	1	9/30/2010	12:34	C	48	NW	Veritical	N	4	0.5	0.1	1
14	0	Hot Rock	N_063_05416_D	3531102.281	361526.5884	9.034953	1	9/30/2010	14:22	D	48	NE	Horizontal	N	18	18	12	1
16	0	MD	N_014_01637_A	3531230.618	362827.4731	6.17877	2	9/30/2010	9:34	A	48	NW	Horizontal	N	2	0.5	0.5	1
27	0	CD	N_0C2_06280_B	3531154.821	362262.8219	157.865579	3	9/30/2010	10:51	B	48	S	Horizontal	S	29	2	2	1
28	0	CD	N_0C2_06280_C	3531156.205	362264.0148	157.865579	3	9/30/2010	11:16	C	48	NW	Pointing Down Toward	N	36	24	24	1
36	0	MD	N_036_04876_A	3531093.305	361579.8579	13.850854	1	10/4/2010	9:05	A	48	NW	Horizontal	W	1	0.5	0.5	1
66	0	CD	N_020_02864_A	3531055.712	362492.0165	111.739744	2	10/4/2010	9:28	A	48	W	Horizontal	E	240	1	1	1
195	0	CD	N_033_04348_A	3531183.765	361744.1299	25.475186	1	10/6/2010	10:51	A	48	N	Horizontal	N	36	0.2	0.2	1
306	0	MD	N_008_00794_A	3531490.246	363176.1961	4.993833	2	10/12/2010	8:36	A	48	SW	Horizontal	S	1	1	1	1
3229	0	CD		3530020.326	360035.2721	0	2	1/19/2011	11:11	16 4 04	48	E	Horizontal	E	5	3	5	1
3230	0	CD		3530029.662	360019.0181	0	2	1/19/2011	11:21	16 3 01	48	E	Horizontal	E	4	0.1	4	1
307	0	MD	N_008_00821_A	3531507.033	363180.3158	4.204877	2	10/12/2010	8:45	A	46	NE	Horizontal	N	1	1	1	1
22	0	CD	N_019_02673_A	3531125.319	362562.1508	540.485965	2	9/30/2010	12:43	A	45	N	Horizontal	N	4	4	0	1
62	0	CD	N_0C2_06328_B	3531020.3	362611.1488	12.796344	2	10/4/2010	8:56	B	45	NE	Horizontal	N	8	5	0	1
72	0	MD	N_021_03070_C	3531082.093	362431.5829	5.647938	2	10/4/2010	10:50	C	45	NW	Horizontal	N	3	1	0	1
75	0	RRD	N_020_02950_B	3531200.581	362485.4717	5.309264	2	10/4/2010	11:25	B	45	SE	Horizontal	N	3	1	1	1
76	0	MD	N_020_02950_C	3531199.901	362483.7747	5.309264	2	10/4/2010	11:31	B	45	S	Horizontal	W	3	1	1	1
37	0	MD	N_036_04943_A	3531079.48	361575.6074	6.399703	1	10/4/2010	9:47	A	42	NE	Veritical	E	2	1	0.5	1
60	0	MD	N_018_02591_B	3531012.184	362620.4842	11.301438	2	10/4/2010	8:39	B	42	SE	Horizontal	E	3	11	0	1
64	0	MD	N_019_02726_B	3531056.654	362552.3073	13.993316	2	10/4/2010	9:14	B	41	NE	Horizontal	N	3	1	1	1
26	0	CD	N_0C2_06280_A	3531155.611	362262.7683	157.865579	3	9/30/2010	10:32	A	40	W	Horizontal	S	29	1	1	1
77	0	CD	N_019_02674_A	3531175.618	362555.2552	489.306187	2	10/4/2010	11:38	A	40	NW	Horizontal	W	1500	1	1	1
81	0	RRD	N_018_02527_A	3531382.428	362609.0093	792.447668	2	10/4/2010	12:30	n08 02527	40	NW	Horizontal	W	240	0.25	240	1
83	0	MD	N_020_02949_A	3531303.718	362488.4448	5.385072	2	10/4/2010	13:37	A	40	N	Horizontal	W	1	0.25	1	1
475	0	CD	N_019_02674_A	3531177.644	362554.3668	489.306187	1	10/19/2010	15:07	A	40	NE	Horizontal	W	900	0.25	0.25	1
40	0	MD	N_036_04959_A	3531097.662	361583.4963	5.423286	1	10/4/2010	10:06	A	39	W	Horizontal	W	1.5	0.5	0.5	1
43	0	MD	N_034_04544_A	3531054.379	361689.1011	8.571986	1	10/4/2010	11:13	A	39	E	Veritical	E	1	0.5	0.2	1
44	0	MD	N_034_04544_B	3531055.647	361688.3367	8.571986	1	10/4/2010	11:16	B	39	N	Horizontal	N	1.5	0.5	0.2	1
47	0	MD	N_034_04544_E	3531054.571	361688.3671	8.571986	1	10/4/2010	11:24	D	39	SE	Horizontal	S	2.5	0.5	0.5	1
52	0	CD	N_032_04176_A	3530986.12	361811.8233	125.343238	1	10/4/2010	12:10	A	39	N	Horizontal	N	3	0.5	0.5	1
98	0	CD	N_014_01515_F	3531825.499	362834.2754	85.046079	1	10/13/2010	10:26	F	39	E	Horizontal	E	6	6	6	1
100	0	MD	N_014_01653_B	3531834.09	362833.9456	5.240494	1	10/13/2010	11:20	B	39	NE	Horizontal	E	0.5	0.05	0.5	1
103	0	RRD	N_014_01525_C	3531830.917	362834.0229	61.484704	1	10/13/2010	11:51	C	39	SE	Pointing Down Toward	E	3	1	2	1
110	0	MD	N_014_01508_C	3531850.12	362837.3507	112.032503	1	10/13/2010	14:39	C	39	E	Horizontal	E	5	4	0.5	1
127	0	MD	N_013_01355_A	3531822.974	362893.2023	30.973924	1	10/13/2010	17:13	A	39	W	Horizontal	W	12	12	0.05	1
155	0	MD	N_012_01241_A	3531626.398	362943.5345	13.768475	2	10/13/2010	15:41	A	39	NW	Horizontal	N	7	3	1	2
213	0	MD	N_0C2_06349_A	3531202.92	361547.3224	9.475625	1	10/6/2010	14:12	A	39	NW	Pointing Down Toward	N	2	0.5	0.5	1
227	0	MD	N_035_04733_A	3531257.086	361636.1276	6.10562	1	10/6/2010	16:37	A	39	W	Horizontal	N	1	0.5	0.05	1
360	0	RRD	N_008_00695_A	3531819.651	363182.103	275.100553	1	10/18/2010	10:43	A	39	NW	Horizontal	W	18	10	0.005	1
361	0	CD	N_008_00695_B	3531818.394	363181.956	275.100553	1	10/18/2010	10:47	B	39	SW	Veritical	W	5	3	5	1
364	0	CD	N_008_00798_B	3531816.246	363180.9104	4.764993	1	10/18/2010	11:12	B	39	SW	Veritical	S	5	3	3	1
367	0	CD	N_007_00616_B	3531801.077	363227.4914	21.32333	1	10/18/2010	11:30	B	39	SE	Horizontal	E	5	5	0.005	1
377	0	CD	N_007_00644_A	3531761.645	363234.8733	9.910887	1	10/18/2010	13:38	A	39	W	Horizontal	W	24	0.005	0.005	1
380	0	RRD	N_007_00644_D	3531760.035	363235.6292	9.910887	1	10/18/2010	13:48	D	39	S	Horizontal	S	4	2	3	1
469	0	MD	N_021_03070_C	3531083.765	362431.8388	5.647939	1	10/19/2010	16:09	C	39	NE	Horizontal	N	3	0.3	0.3	1
500	0	CD	N_008_00735_B	3532916.129	363169.6372	12.844441	1	10/26/2010	10:06	B	39	NW	Pointing Down Toward	W	5	3	0.0005	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
600	0	MD	N_00A_06035_A	3533005.958	363191.2897	5.3	1	10/22/2010	13:48	A	39	SW	Horizontal	N	2.5	0.05	0.05	1
607	0	CD	N_00A_06028_A	3533001.244	363124.3937	6.2	1	10/22/2010	14:48	A	39	NE	Horizontal	E	2.5	0.05	0.05	1
781	0	CD	N_038_05055_A	3532977.387	361456.9049	19.196766	1	11/1/2010	12:21	A	39	NW	Horizontal	W	6.5	6.5	2	1
992	0	MD	N_048_05246_A	3533327.867	360900.0714	4.426209	1	11/9/2010	9:38	A	39	SE	Horizontal	S	0.25	0.25	0.25	1
1220	0	MD	S_027_10119_A	3528612.697	362093.0674	5.703294	1	11/15/2010	15:40	A	39	W	Horizontal	W	2.5	2.5	2.5	1
1566	0	CD	S_019_06993_A	3528008.083	362559.9214	554.669508	1	11/17/2010	14:54	A	39	NE	Horizontal	W	36	36	18	1
1779	0	MD	S_050_12030_A	3528897.745	360791.4662	6.669954	1	11/23/2010	9:45	A	39	N	Horizontal	N	1	0.025	0.025	1
1855	0	CD	S_010_03650_B	3527543.941	363070.1523	152.828946	1	12/6/2010	12:44	B	39	E	Horizontal	W	6	0.025	0.025	1
2091	0	MD	S_019_07148_A	3529261.25	362552.8925	12.179916	1	12/13/2010	9:19	A	39	NE	Horizontal	E	0.25	0.05	0.05	7
78	0	CD	N_019_02785_A	3531232.596	362552.3184	6.584681	2	10/4/2010	11:49	A	38	NW	Horizontal	W	5	0.5	0.5	1
48	0	MD	N_033_04434_A	3531046.137	361755.1036	5.15059	1	10/4/2010	11:40	A	37	NW	Pointing Down Toward	W	3	2	0.5	1
1241	0	MD	S_025_09209_A	3527854.249	362218.3161	7.73328	2	11/15/2010	14:32	A	37	NE	Horizontal	E	3	1	1	1
1297	0	MD	N_018_02657_A	3532923.881	362602.4338	4.013295	2	11/8/2010	15:42	A	37	W	Horizontal	E	3	0.4	0.4	1
23	0	Hot Rock	N_023_03232_A	3531170.644	362318.2617	5.15	3	9/30/2010	9:46	A	36	NW	Horizontal	N	2	2	2	1
24	0	CD	N_023_03232_B	3531171.071	362319.5555	5.15	3	9/30/2010	9:52	B	36	N	Horizontal	N	3	1	1	3
51	0	MD	N_032_04246_B	3530946.725	361801.8719	8.809218	1	10/4/2010	12:00	B	36	W	Horizontal	W	2.5	0.5	0.5	1
54	0	CD	N_032_04176_C	3530986.039	361811.8672	125.343238	1	10/4/2010	12:15	C	36	N	Horizontal	N	6	0.5	0.5	1
55	0	MD	N_032_04219_A	3531098.432	361799.6644	17.998233	1	10/4/2010	12:38	A	36	NW	Pointing Down Toward	W	2.5	0.5	0.5	1
56	0	MD	N_032_04219_B	3531098.455	361799.7979	17.998233	1	10/4/2010	12:40	B	36	NW	Veritical	W	2	1	0.5	1
57	0	MD	N_032_04219_C	3531098.22	361799.8357	17.998233	1	10/4/2010	12:42	C	36	NW	Horizontal	W	2.5	0.5	0.5	1
58	0	MD	N_032_04219_D	3531098.214	361799.6457	17.998233	1	10/4/2010	12:44	D	36	NW	Veritical	W	2.5	0.5	0.5	1
80	0	MD	N_019_02785_C	3531232.258	362553.937	6.584681	2	10/4/2010	11:57	C	36	E	Horizontal	E	3	0.5	0.5	1
201	0	MD	N_034_04603_C	3531178.947	361692.6117	4.202085	1	10/6/2010	11:20	C	36	SE	Horizontal	W	2.5	0.5	0.5	1
203	0	CD	N_036_04903_A	3531168.966	361583.4763	9.62435	1	10/6/2010	12:01	A	36	NE	Horizontal	N	3	0.05	0.05	1
205	0	MD	N_036_04903_C	3531169.096	361582.3651	9.62435	1	10/6/2010	12:06	C	36	NW	Horizontal	N	3	0.5	0.5	1
207	0	MD	N_036_04873_B	3531174.623	361580.3629	14.640012	1	10/6/2010	12:27	B	36	NW	Pointing Down Toward	E	2.5	0.5	0.5	1
208	0	MD	N_036_04873_C	3531174.577	361580.3862	14.640012	1	10/6/2010	12:29	C	36	NW	Horizontal	W	2.5	0.5	0.5	1
215	0	MD	N_063_05385_A	3531206.453	361527.5284	54.615026	1	10/6/2010	14:46	A	36	N	Horizontal	N	2	1	1	1
219	0	CD	N_036_04988_A	3531195.894	361580.1398	4.300934	1	10/6/2010	15:21	A	36	SW	Horizontal	N	36	0.5	0.5	1
228	0	MD	N_035_04733_B	3531256.706	361636.815	6.10562	1	10/6/2010	16:39	B	36	N	Horizontal	W	2.5	0.5	0.5	1
231	0	CD	N_035_04733_E	3531255.859	361635.8472	6.10562	1	10/6/2010	16:47	E	36	SW	Veritical	S	5.05	0.05	0.05	1
239	0	CD	N_024_03305_B	3531498.774	362262.1754	5.298523	2	10/6/2010	11:30	A	36	W	Horizontal	W	6	4	4	1
253	0	CD	N_0C2_06423_C	3531311.596	362152.1049	4.462017	3	10/6/2010	10:38	C	36	N	Pointing Down Toward	N	3	1	1	1
255	0	RRD	N_026_03569_A	3531361.727	362146.6611	4.298689	3	10/6/2010	12:37	A	36	S	Horizontal	N	3	1	1	1
261	0	MD	N_024_03314_C	3531419.815	362269.1718	4.739034	3	10/6/2010	14:11	C	36	E	Horizontal	S	1	1	1	1
467	0	CD	N_021_03070_A	3531081.436	362430.9861	5.647939	1	10/19/2010	16:04	A	36	SW	Horizontal	N	2	1	0.01	1
484	0	MD	N_032_04209_A	3531282.258	361801.6834	23.338047	3	10/19/2010	11:30	A	36	S	Horizontal	N	1	1	1	1
517	0	MD	N_010_01057_C	3532888.769	363058.8966	4.00007	1	10/26/2010	14:50	C	36	SE	Horizontal	E	2	0.5	0.5	1
522	0	RRD	N_011_01156_A	3533003.452	363011.6272	6.778409	1	10/26/2010	16:18	A	36	S	Horizontal	S	18	0.02	0.02	1
582	0	CD	N_00A_06004_C	3533004.492	363341.8857	8.472305	1	10/22/2010	10:06	C	36	SE	Horizontal	S	6	0.5	0.5	1
654	0	MD	N_008_00745_D	3533060.868	363173.7609	10.184659	1	10/27/2010	10:54	D	36	NE	Horizontal	E	1	0.5	0.5	1
881	0	MD	N_035_04662_A	3532539.156	361631.7967	14.819595	2	11/2/2010	11:30	A	36	E	Horizontal	E	0.5	0.1	0.5	1
1073	0	CD	N_005_00370_A	3532401.001	363346.4031	4.288234	1	11/10/2010	12:08	A	36	E	Horizontal	N	5	2.5	2.5	1
1082	0	MD	N_014_01685_A	3532305.899	362857.6709	4.099695	2	11/10/2010	8:50	A	36	NW	Horizontal	N	0.25	0.1	0.25	1
96	0	MD	N_014_01515_D	3531825.152	362833.2472	85.046079	1	10/13/2010	10:20	D	35	S	Horizontal	S	0.5	0.005	0.5	1
134	0	CD	N_010_00945_A	3531551.447	363060.9041	36.457307	2	10/13/2010	9:42	A	35	E	Horizontal	E	24	8	8	1
548	0	MD	N_014_01513_A	3533186.317	362825.9577	88.828232	2	10/26/2010	15:08	A	35	SE	Horizontal	S	4	1	1	1
945	0	MD	N_030_04029_A	3532921.7	361932.1315	5.190508	3	11/3/2010	12:56	A	35	E			2	1	1	1
1146	0	MD	N_012_01231_A	3531923.934	362963.0215	27.259543	2	11/11/2010	11:00	A	35	N	Horizontal	N	12	2	0.3	1
1499	0	MD	S_029_10579 _A	3528045.5	361981.8201	5.79996	2	11/16/2010	15:36	A	35	NE	Horizontal	N	4	1	0.3	1
1636	0	MD	S_017_06260_A	3528813.609	362672.7695	14.548233	2	11/21/2010	12:27	A	35	W	Horizontal	W	6	0.5	0.5	1
2337	0	MD	N_074_05728_A	3529688.572	361896.6031	15.948528	1	1/6/2011	14:40	A	35	SE	Horizontal	W	4	2	1	1
308	0	MD	N_007_00681	3531504.211	363233.3005	4.067278	2	10/12/2010	8:59	A	34	N	Horizontal	N	5	2	1	1
1109	0	CD	N_008_00708	3531226.309	363172.8283	34.884181	3	11/10/2010	9:33	A	34	NW			14	14	10	1
699	0	MD	N_021_03089_A	3533234.729	362429.3325	4.208926	2	10/27/2010	13:21	A	33	SE	Horizontal	S	5	2	0.2	1
537	0	MD	N_015_01738_C	3533297.594	362779.0216	72.532077	2	10/26/2010	10:51	C	33	S	Horizontal	S	3	1	1	1
798	0	MD	N_00A_05993_A	3532794.275	361731.3734	12.148522	2	11/1/2010	10:32	A	33	S	Horizontal	S	4	1	0.05	1
1897	0	CD	S_018_06544_A	3527103.162	362608.1991	28.419804	3	12/6/2010	10:27	A	33	W			36	24	1	1
158	0	MD	N_015_01917_A	3531663.996	362777.4121	4.956485	2	10/13/2010	16:11	A	32	N	Pointing Down Toward	N	1	1	1	1
968	0	MD	N_018_02609_B	3532920.046	362609.698	7.332967	2	11/4/2010	11:19	B	32	N	Horizontal	N	3	2	2	4
149	0	CD	N_012_01219_A	3531669.911	362948.8524	41.258242	2	10/13/2010	14:33	A	31	NW	Horizontal	E	8	5	1	1
162	0	MD	N_017_02354_A	3531660.536	362654.7971	14.705249	2	10/13/2010	17:08	A	31	N	Horizontal	N	4	1	1	1
969	0	RRD	N_018_02636_A	3532920.568	362608.3214	4.812987	2	11/4/2010	11:30	A	31	NW	Horizontal	N	4	1	1	1
1099	0	RRD	N_014_01633_A	3532490.156	362828.7164	6.55996	2	11/10/2010	15:06	A	31	NE	Horizontal	N	3	2	2	1
1167	0	RRD	N_006_00480_A	3531886.326	363292.4656	7.257365	2	11/11/2010	15:17	A	31	S	Horizontal	N	3	2	2	1
1643	0	MD	S_018_06709_A	3528693.024	362612.3092	36.394749	2	11/21/2010	13:53	A	31	W	Horizontal	W	4	2	2	1
3	0	CD	N_065_05570_A	3531092.093	361445.9825	7.27625	1	9/30/2010	10:25	A	30	SW	Horizontal	N	18	1	1	1
164	0	MD	N_018_02574_B	3531683.158	362604.663	22.776463	2	10/13/2010	17:41	B	30	SW	Horizontal	W	3	1	1	1
181	0	CD	N_017_02273_A	3531866.161	362655.1935	206.883933	3	10/13/2010	15:20	A	30	N	Horizontal	E	200	1	1	1
237	0	CD	N_023_03249_B	3531485.105	362325.9119	4.148932	2	10/6/2010	11:15	A	30	SW	Horizontal	N	6	1	1	1
294	0	MD	N_035_04664_C	3531348.926	361639.4142	14.40746	1	10/12/2010	12:25	C	30	SE	Horizontal	W	3	1	0.2	1
323	0	MD	N_014_01663_B	3531951.498	362820.1934	4.835889	1	10/14/2010	9:54	B	30	SW	Horizontal	W	7	1.5	0.3	1
327	0	CD	N_012_01286_B	3531819.924	362946.9736	6.449793	1	10/14/2010	11:05	B	30	W	Horizontal	N	20	20	1	1
337	0	CD	N_010_00948_C	3531791.585	363056.6994	32.411106	1	10/14/2010	12:30	C	30	SE	Horizontal	E	6	4	0.25	1
412	0	CD	N_020_02924_B	3531758.822	362481.8319	6.97784	2	10/18/2010	8:53	B	30	W	Horizontal	W	6	3	6	1
428	0	MD	N_016_02062_A	3531689.473	362716.1494	23.423584	3	10/18/2010	10:33	A	30	N	Horizontal	E	4	1	1	1
456	0	CD	N_013_01429_A	3531199.411	362887.6583	6.531212	1	10/19/2010	9:24	A	30	N	Horizontal	W	14	4	2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
462	0	MD	N_017_02301_A	3531123.124	362665.1471	51.020198	1	10/19/2010	11:10	A	30	E	Horizontal	W	0.25	0.25	0.25	1
463	0	MD	N_018_02527_A	3531382.764	362608.0432	792.447669	1	10/19/2010	12:35	A	30	NW	Horizontal	N	0.75	0.75	0.75	1
468	0	CD	N_021_03070_B	3531081.138	362431.3223	5.647939	1	10/19/2010	16:05	B	30	S	Horizontal	W	3	0.05	0.01	1
470	0	CD	N_022_03161_A	3531033.267	362376.385	5.011924	1	10/19/2010	16:24	A	30	S	Horizontal	E	1	1	0.1	1
474	0	CD	N_018_02536_A	3531076.771	362613.4431	389.132165	1	10/19/2010	13:55	A	30	N	Horizontal	W	480	0.25	0.25	1
499	0	CD	N_008_00735_A	3532915.402	363169.7066	12.844441	1	10/26/2010	10:03	A	30	SW	Horizontal	W	2	1	1	1
810	0	MD	N_00A_06052_A	3532772.369	361680.4586	4.258381	2	11/1/2010	12:39	A	30	N	Horizontal	N	2	2	0.3	1
829	0	RRD	N_026_03477_A	3532662.663	362150.3781	23.226889	3	11/1/2010	10:32	A	30	N			14	3	8	1
835	0	MD	N_025_03406_A	3532753.6	362203.8026	5.54646	3	11/1/2010	12:31	A	30	W	Horizontal	E	14	8	1	1
889	0	RRD	N_033_04338_A	3532677.707	361727.993	77.220529	2	11/2/2010	14:03	A	30	N	Horizontal	N	12	3	4	1
1021	0	MD	N_015_01877_A	3532325.172	362777.2594	7.231266	2	11/9/2010	15:04	A	30	S	Horizontal	W	1	0.5	0.5	1
1042	0	MD	N_015_01877_A	3532325.172	362777.2594	7.231266	2	11/9/2010	15:04	A	30	S	Horizontal	W	1	0.5	0.5	1
1111	0	CD	N_008_00814	3531171.792	363175.2541	4.505688	3	11/10/2010	9:56	A	30	SE			5	1	1	1
1140	0	MD	N_013_01330_A	3532138.844	362898.6656	279.913286	2	11/11/2010	9:20	A	30	NE	Horizontal		6	6	0.4	1
1147	0	MD	N_014_01677_A	3532008.957	362834.174	4.320296	2	11/11/2010	11:11	A	30	W	Horizontal	W	5	2	0.5	1
1298	0	CD	N_00B_06136_A	3532534.329	362463.7872	39.402681	2	11/8/2010	16:01	A	30	N	Horizontal	E	20	0.5	0.5	1
1433	0	MD	S_052_12093_A	3529151.927	360673.5468	4.736634	2	11/22/2010	8:47	A	30	SE	Horizontal	S	1	1	1	1
1437	0	CD	S_055_12176_A	3528802.179	360509.1471	52.054641	2	11/22/2010	10:52	A	30	N	Horizontal	W	20	0.1	20	1
1493	0	MD	S_029_10603 _A	3528322.671	361973.8663	10.826592	2	11/16/2010	12:55	A	30	E			2	0.2	0.2	1
1701	0	MD	S_009_03582_A	3529411.884	363122.7948	70.47	1	12/1/2010	9:49	A	30	N	Horizontal	N	4.5	1.5	1.5	1
1716	0	CD	S_012_04468_A	3530892.401	362935.1635	4.543302	3	12/1/2010	8:54	A	30	SE			3	3	1	1
2027	0	MD	S_RoadD_14477_B	3530079.067	362568.5745	5.123298	1	12/8/2010	11:51	B	30	E	Horizontal	E	2	1	1	1
2037	0	CD	S_019_07249_A	3529951.593	362553.5947	6.863286	1	12/9/2010	9:09	A	30	NW	Horizontal	N	4.5	4	4	1
2123	0	RRD	S_020_07601_B	3529673.563	362491.8981	17.786544	3	12/13/2010	9:41	B	30	W			4	1	1	1
2124	0	Hot Rock	S_020_07601_D	3529673.421	362491.9952	17.786544	3	12/13/2010	9:44	D	30	W			3	4	4	1
2134	0	MD	S_020_07616_A	3529831.243	362499.8	6.573288	3	12/13/2010	9:05	A	30	W			3	1	1	3
2137	0	CD	S_020_07601_A	3529673.774	362491.7376	17.786544	3	12/13/2010	9:40	A	30	W			5	3	1	3
2138	0	MD	S_020_07601_C	3529673.576	362492.0155	17.786544	3	12/13/2010	9:42	C	30	W			6	1	1	5
2142	0	MD	S_027_10204_A	3529271.713	362093.1347	8.554941	3	12/13/2010	12:38	A	30	SW			4	1	1	2
2145	0	CD	S_020_07580_A	3529617.488	362494.5947	16.578219	1	12/14/2010	9:09	A	30	N	Horizontal	N	6	8	0.005	1
2304	0	MD	S_009_03471_B	3528412.619	363117.8917	6.19	3	1/4/2011	16:20	B	30	E			1	1	1	1
2433	0	MD	N_076_05844_A	3529802.33	361784.2828	4.630882	3	1/6/2011	9:50	A	30	N			1	1	2	1
2449	0	MD	N_079_05870_A	3529700.491	361618.5478	58.503138	3	1/6/2011	14:41	A	30	NW	Horizontal	N	3	2	0.5	7
3506	0	CD	N_008_00816_A	3530829.332	363170.3056	4.343155	2	1/21/2011	10:19	A	30	W	Horizontal	N	6	3	6	1
589	0	MD	N_00A_06005_B	3533008.175	363219.3844	8.3	1	10/22/2010	11:15	B	29	NE	Horizontal	E	2.5	0.05	0.05	1
1097	0	CD	N_009_00837_A	3532397.326	363127.3019	86.198611	2	11/10/2010	14:21	A	29	W	Horizontal	W	4	0.5	0.5	1
99	0	MD	N_014_01653_A	3531834.239	362833.0676	5.240494	1	10/13/2010	11:18	A	28	NW	Horizontal	N	1.5	1	1	1
107	0	CD	N_014_01578_C	3531843.315	362832.9958	11.616449	1	10/13/2010	12:51	C	28	S	Horizontal	S	3	2	3	1
508	0	CD	N_012_01262_A	3532970.148	362947.8192	9.613231	1	10/26/2010	12:21	A	28	SW	Horizontal	W	3	3	1	1
604	0	CD	N_00A_06011_A	3532999.397	363139.3974	7.7	1	10/22/2010	14:15	A	28	NW	Horizontal	N	3	0.05	0.05	1
648	0	CD	N_008_00715_C	3533027.057	363178.073	29.74734	1	10/27/2010	9:43	C	28	SE	Horizontal	S	6	1.5	0.005	1
774	0	MD	N_0A3_06124_A	3532935.056	361328.9576	5.52339	1	11/1/2010	9:48	A	28	N	Horizontal	N	2	1	0.5	1
845	0	MD	N_028_03758_A	3532700.553	362036.1711	6.980462	3	11/1/2010	15:24	A	28	N	Horizontal	N	3	1	1	1
1022	0	MD	N_014_01670_A	3532296.3	362829.8372	4.657003	2	11/9/2010	15:45	A	28	SW	Horizontal	S	0.5	0.5	0.5	3
1043	0	MD	N_014_01670_A	3532296.3	362829.8372	4.657003	2	11/9/2010	15:45	A	28	SW	Horizontal	S	0.5	0.5	0.5	3
1244	0	MD	S_023_08446_A	3527856.643	362335.0772	10.14993	2	11/15/2010	15:02	A	28	E	Horizontal	E	5	2	2	1
1632	0	MD	S_014_05035_A	3528784.314	362847.3635	7.93	2	11/21/2010	11:35	A	28	N	Horizontal	W	3	1	0.3	1
1886	0	MD	S_036_11369_B	3528533.305	361592.6112	306.334554	2	12/6/2010	13:37	B	28	S	Horizontal	W	4	2	2	1
1901	0	MD	S_017_06127_A	3527420.495	362683.1579	4.301637	3	12/6/2010	11:52	A	28	N			3	1	1	1
131	0	CD	N_009_00852_A	3531588.905	363113.9487	26.914362	2	10/13/2010	8:07	A	27	SE	Horizontal	E	4	2	2	1
153	0	CD	N_012_01233_B	3531654.152	362946.4336	24.183259	2	10/13/2010	15:04	B	27	S	Horizontal	W	16	1	1	1
545	0	MD	N_015_01869_A	3533214.036	362772.7468	7.677858	2	10/26/2010	14:27	A	27	N	Horizontal	N	5	2	2	1
825	0	MD	N_034_04605_A	3532662.829	361690.6839	4.1909	2	11/1/2010	16:11	A	27	S	Horizontal	W	2	2	1	1
1386	0	Hot Rock	S_024_08927_B	3528903.016	362283.7816	9.231603	3	11/18/2010	9:05	B	27	S			15	7	12	1
1650	0	MD	S_019_07093_A	3528854.3	362554.0972	7.926612	2	11/21/2010	15:06	A	27	NE	Veritical	N	3	2	2	1
2448	0	MD	N_079_05873_A	3529666.428	361631.1833	6.59637	3	1/6/2011	14:26	A	27	W	Horizontal	W	2	0.5	0.5	1
79	0	MD	N_019_02785_B	3531232.748	362553.0957	6.584681	2	10/4/2010	11:52	B	26	N	Horizontal	E	3	0.5	0.5	1
130	0	CD	N_009_00883_A	3531613.12	363108.2509	6.652677	2	10/13/2010	8:47	A	26	E	Horizontal	E	3	0.5	0.5	3
152	0	MD	N_012_01233_A	3531655.758	362946.1487	24.183259	2	10/13/2010	14:50	A	26	N	Horizontal	N	4	2	2	1
200	0	MD	N_034_04603_B	3531178.862	361691.8996	4.202085	1	10/6/2010	11:18	B	26	SW	Horizontal	W	2.5	0.5	0.5	1
248	0	CD	N_018_02570_A	3531341.509	362609.4067	25.961523	2	10/6/2010	15:31	A	26	SE	Horizontal	E	60	1	0	1
528	0	MD	N_015_01741_A	3533327.882	362770.0947	69.954999	2	10/26/2010	8:34	A	26	SW	Horizontal	W	4	1	1	3
814	0	CD	N_035_04639_A	3532780.151	361646.6608	30.638715	2	11/1/2010	14:06	A	26	NW	Horizontal	N	4	2	1	1
820	0	MD	N_036_04884_A	3532668.413	361594.5803	12.019696	2	11/1/2010	15:27	A	26	W	Horizontal	W	3	1	1	2
1246	0	MD	S_024_08843_A	3527693.148	362279.1536	11.59992	2	11/15/2010	15:43	A	26	E	Horizontal	E	3	2	1	4
1644	0	MD	S_018_06711_A	3528705.273	362612.3005	31.754781	2	11/21/2010	14:06	A	26	W	Horizontal	W	3	2	2	6
1651	0	MD	S_018_06733_A	3528834.726	362606.1499	28.758135	2	11/21/2010	15:41	A	26	W	Veritical	W	4	4	2	1
1877	0	MD	S_036_11362_A	3528347.377	361565.3061	6.089958	2	12/6/2010	13:14	A	26	N	Horizontal	N	2	0.5	0.2	1
1885	0	MD	S_036_11369_A	3528534.936	361591.7963	306.334554	2	12/6/2010	13:35	A	26	SW	Horizontal	W	4	2	2	1
2095	0	CD	S_018_06799_B	3529301.487	362607.1324	40.261389	1	12/13/2010	11:03	B	26	SW	Horizontal	E	5	0.002	0.002	1
2300	0	MD	S_009_03462_A	3528341.227	363120.8355	4.06	3	1/4/2011	16:00	A	26	W			1	1	1	1
2382	0	MD	N_075_05816_B	3529808.22	361829.3989	5.980108	2	1/6/2011	11:58	B	26	NW			1	1	0.3	1
2452	0	MD	N_079_05878_A	3529733.154	361613.9491	4.673565	3	1/6/2011	15:01	A	26	N	Veritical	N	2	0.5	0.5	2
490	0	CD	N_00A_06038_A	3532897.443	362874.0331	4.899853	2	10/20/2010	14:19	A	25	W	Horizontal	W	6	0.5	0.5	1
527	0	MD	N_015_01788_A	3533332.656	362771.9038	22.775063	2	10/26/2010	8:18	A	25	NE	Horizontal	N	4	1	1	1
543	0	MD	N_015_01793_A	3533231.251	362771.6678	20.403354	2	10/26/2010	14:08	A	25	W	Horizontal	W	2	2	2	1
1415	0	MD	S_RoadD_14323_A	3528973.357	360960.3203	5.944959	1	11/22/2010	8:52	A	25	E	Horizontal	W	2.5	0.5	0.5	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1648	0	MD	S_019_07088_A	3528813.333	362557.5917	6.959952	2	11/21/2010	14:45	A	25	S	Horizontal	S	1	0.5	0.5	4
1873	0	MD	S_035_11281_A	3528422.446	361645.6384	5.606628	2	12/6/2010	12:45	A	25	SW	Horizontal	W	2	0.5	0.2	1
1953	0	MD	S_015_05246_A	3527672.664	362782.991	12.953244	3	12/7/2010	14:06	A	25	N	Horizontal	S	1	1	1	18
2097	0	CD	S_020_07516_A	3529334.802	362498.9377	55.486284	1	12/13/2010	12:17	A	25	N	Pointing Down Toward	E	5	2	2	1
4	0	Hot Rock	N_0C2_06393_A	3531109.898	361456.8859	6.041221	1	9/30/2010	11:01	A	24	N	Horizontal	N	1	1	1	1
12	0	MD	N_063_05416_B	3531100.585	361526.1514	9.034953	1	9/30/2010	14:16	B	24	SE	Horizontal	S	1	0.5	0.5	1
29	0	CD	N_0C2_06329_A	3531162.629	362245.1769	12.626344	3	9/30/2010	11:58	A	24	SW	Horizontal	S	3	1	1	3
41	0	MD	N_036_04959_B	3531097.733	361584.3058	5.423286	1	10/4/2010	10:10	B	24	N	Horizontal	N	1.5	0.5	0.5	1
45	0	MD	N_034_04544_C	3531055.434	361688.0682	8.571986	1	10/4/2010	11:18	C	24	N	Pointing Down Toward	N	2.5	0.5	0.5	1
89	0	MD	N_014_01495_B	3531744.053	362834.3108	264.953668	1	10/13/2010	9:17	B	24	W	Horizontal	W	12	6	0.05	1
92	0	CD	N_014_01601_C	3531773.579	362833.4386	9.067372	1	10/13/2010	9:42	C	24	E	Horizontal	E	0.3	0.3	0.05	1
95	0	MD	N_014_01515_C	3531825.975	362834.1141	85.046079	1	10/13/2010	10:17	C	24	NE	Horizontal	E	0.5	0.05	0.5	1
101	0	MD	N_014_01525_A	3531831.817	362833.5036	61.484704	1	10/13/2010	11:45	A	24	N	Horizontal	N	1.5	0.5	1.5	1
106	0	MD	N_014_01578_B	3531844.027	362832.6731	11.616449	1	10/13/2010	12:49	B	24	NW	Pointing Down Toward	W	5	11	5	1
108	0	CD	N_014_01508_A	3531851.433	362836.4843	112.032503	1	10/13/2010	14:31	A	24	N	Horizontal	N	5	3	5	1
111	0	CD	N_014_01687_A	3531858.393	362835.971	4.064604	1	10/13/2010	14:58	A	24	SE	Horizontal	E	5	4	0.05	1
114	0	RRD	N_014_01687_D	3531859.047	362835.0008	4.064604	1	10/13/2010	15:06	D	24	NW	Pointing Down Toward	N	4	2	2	1
190	0	CD	N_032_04222_A	3531106.203	361810.5558	15.697294	1	10/6/2010	9:20	A	24	NW	Pointing Down Toward	W	6	6	0.5	1
193	0	CD	N_032_04259_B	3531121.495	361809.9699	6.795203	1	10/6/2010	9:45	B	24	N	Horizontal	N	4	0.5	0.2	1
194	0	MD	N_032_04241_A	3531151.817	361802.9897	9.484034	1	10/6/2010	10:07	A	24	NE	Horizontal	N	2.5	0.5	0.5	1
197	0	MD	N_033_04348_C	3531182.063	361744.5091	25.475186	1	10/6/2010	10:56	C	24	S	Horizontal	S	2.5	0.5	0.5	1
204	0	MD	N_036_04903_B	3531168.793	361583.2424	9.62435	1	10/6/2010	12:03	B	24	NE	Horizontal	W	2.5	0.5	0.5	1
218	0	MD	N_063_05385_D	3531205.011	361527.2044	54.615026	1	10/6/2010	14:55	D	24	W	Horizontal	W	2.5	0.5	0.5	1
222	0	CD	N_0C2_06294_C	3531248.07	361568.574	43.163372	1	10/6/2010	15:47	C	24	SW	Horizontal	E	3	0.5	0.5	1
223	0	MD	N_0C2_06294_D	3531248.028	361568.5356	43.163372	1	10/6/2010	15:50	D	24	SW	Horizontal	W	1	0.5	0.5	1
224	0	CD	N_0C2_06294_E	3531247.827	361568.377	43.163372	1	10/6/2010	15:52	E	24	SW	Horizontal	W	3	0.5	0.5	1
225	0	CD	N_0C2_06294_F	3531247.802	361568.4334	43.163372	1	10/6/2010	15:54	F	24	SW	Horizontal	N	0.5	0.5	0.5	1
226	0	CD	N_0C2_06294_A	3531247.785	361577.9252	43.163372	1	10/6/2010	16:13	A	24	W	Horizontal	W	120	0.05	0.05	1
230	0	CD	N_035_04733_D	3531255.442	361636.6472	6.10562	1	10/6/2010	16:45	D	24	SE	Horizontal	W	1	0.05	0.05	1
259	0	MD	N_024_03314_A	3531421.176	362267.4461	4.739034	3	10/6/2010	14:02	A	24	W	Horizontal	S	4	3	2	2
260	0	RRD	N_024_03314_B	3531419.808	362268.4572	4.739034	3	10/6/2010	14:05	B	24	S	Horizontal	S	2	2	1	1
269	0	MD	N_0C2_06410_C	3531251.107	361731.3821	4.927961	1	10/12/2010	9:03	C	24	E	Horizontal	N	2.5	0.5	0.5	1
316	0	MD	N_036_04910_A	3531442.911	361577.486	8.667361	3	10/12/2010	11:55	A	24	S	Horizontal	N	1	1	1	1
324	0	MD	N_013_01428_A	3531932.208	362890.8094	6.835353	1	10/14/2010	10:26	A	24	N	Horizontal	N	1.5	1.5	0.25	1
329	0	MD	N_012_01200_B	3531815.289	362942.8971	1572.741157	1	10/14/2010	11:20	B	24	NE	Horizontal	N	1.5	0.3	0.3	1
357	0	MD	N_010_00957_A	3531813.831	363069.6886	27.949896	1	10/18/2010	9:53	A	24	NE	Horizontal	N	8	2	1	1
358	0	CD	N_010_00957_B	3531813.669	363069.7045	27.949896	1	10/18/2010	9:55	B	24	SE	Horizontal	S	5	3	5	1
363	0	RRD	N_008_00798_A	3531816.575	363180.7193	4.764993	1	10/18/2010	11:09	A	24	W	Veritical	W	3	2	3	1
371	0	CD	N_007_00675_C	3531798.878	363226.6476	4.506463	1	10/18/2010	11:48	C	24	W	Horizontal	W	1	0.005	0.005	1
372	0	CD	N_007_00675_D	3531798.859	363226.7103	4.506463	1	10/18/2010	11:50	D	24	W	Pointing Down Toward	W	24	1	0.005	1
373	0	CD	N_007_00587_A	3531776.339	363235.8447	789.652473	1	10/18/2010	12:13	A	24	W	Horizontal	W	68	12	68	1
379	0	CD	N_007_00644_C	3531761.742	363236.0601	9.910887	1	10/18/2010	13:45	C	24	N	Horizontal	N	1	1	1	1
381	0	CD	N_007_00650_A	3531745.497	363226.0341	7.788859	1	10/18/2010	14:11	A	24	N	Horizontal	S	5	0.005	0.005	1
384	0	CD	N_008_00775_B	3531749.487	363181.4044	6.12328	1	10/18/2010	14:30	B	24	E	Horizontal	E	3	2	1	1
395	0	MD	N_020_02882_A	3531859.219	362494.2075	27.505587	2	10/18/2010	10:47	A	24	E	Horizontal	E	3	1	3	1
423	0	CD	N_017_02391_C	3531793.566	362659.4833	9.721701	3	10/18/2010	9:38	C	24	N	Horizontal	E	100	1	1	1
439	0	RRD	N_012_01260_C	3531704.09	362951.4572	10.286921	3	10/18/2010	14:00	C	24	E	Horizontal	N	2	2	1	1
442	0	RRD	N_012_01297_B	3531712.594	362955.7801	5.626473	3	10/18/2010	14:09	B	24	N	Horizontal	N	2	2	1	2
448	0	CD	N_012_01274_A	3531748.411	362953.296	7.840387	3	10/18/2010	14:49	A	24	E	Horizontal	N	14	5	3	2
457	0	MD	N_014_01637_A	3531230.265	362827.7314	6.17877	1	10/19/2010	9:38	A	24	N	Horizontal	N	0.75	0.75	0.75	1
458	0	MD	N_015_01951_A	3531287.884	362786.9691	4.019006	1	10/19/2010	10:03	A	24	N	Horizontal	W	2.5	0.5	0.5	1
464	0	CD	N_019_02673_A	3531124.495	362560.4394	540.485966	1	10/19/2010	14:11	A	24	W	Horizontal	N	157	1	0.005	1
492	0	CD	N_013_01344_B	3532876.211	362886.0439	39.97157	2	10/20/2010	14:56	B	24	W	Horizontal	W	3	0.25	0.25	10
672	0	CD	N_011_01191_A	3533223.974	363005.3263	4.249503	1	10/27/2010	14:21	A	24	SW	Horizontal	S	4	0.005	0.005	1
675	0	CD	N_012_01292_A	3533282.487	362941.8137	5.894834	1	10/27/2010	15:12	A	24	W	Horizontal	W	4	0.005	0.005	1
680	0	MD	N_013_01349_A	3533173.572	362887.5123	33.643091	2	10/27/2010	9:35	A	24	SE	Horizontal		6	3	0.1	1
498	0	CD	N_008_00782_A	3532934.4	363173.7473	5.486853	1	10/26/2010	9:31	A	24	SE	Horizontal	S	3	0.005	0.005	1
503	0	CD	N_007_00674_A	3532957.694	363232.476	4.890616	1	10/26/2010	10:57	A	24	NE	Horizontal	N	4	4	0.005	1
526	0	MD	N_008_00714_A	3532988.645	363176.6344	29.818733	1	10/26/2010	9:10	A	24	N	Horizontal	N	2	1	0.05	1
576	0	MD	N_016_02161_A	3533203.089	362723.8661	8.889195	3	10/26/2010	15:25	A	24	SW	Horizontal	N	7	3	1	1
578	0	MD	N_016_02049_A	3533122.088	362716.6486	31.292818	3	10/26/2010	16:13	A	24	W	Horizontal	N	6	3	1	1
587	0	MD	N_005_00278_E	3533008.534	363350.8331	33.3	1	10/22/2010	10:54	E	24	S	Horizontal	S	0.5	0.05	0.05	1
588	0	RRD	N_00A_06005_A	3533008.443	363218.8491	8.3	1	10/22/2010	11:12	A	24	N	Horizontal	N	6	0.005	0.005	1
592	0	CD	N_00A_05952_C	3533007.92	363204.7025	103.4	1	10/22/2010	11:57	C	24	W	Horizontal	W	2	0.5	0.005	1
593	0	RRD	N_00A_05952_D	3533007.233	363205.669	103.4	1	10/22/2010	12:04	D	24	SE	Horizontal	E	3	1	1	1
599	0	CD	N_00A_05992_B	3533007.255	363199.4505	13.1	1	10/22/2010	13:01	B	24	E	Horizontal	E	6	3	0.5	1
603	0	CD	N_00A_06035_D	3533006.607	363192.0282	5.3	1	10/22/2010	13:58	D	24	NE	Horizontal	E	2	0.5	0.5	1
606	0	CD	N_00A_06011_C	3532998.617	363140.2331	7.7	1	10/22/2010	14:20	C	24	NE	Horizontal	E	3	0.005	0.005	1
609	0	MD	N_00A_05954_A	3532981.259	363036.3796	73.4	1	10/22/2010	15:06	A	24	NE	Horizontal	N	2.5	0.05	0.05	1
610	0	CD	N_008_00730_A	3532994.281	363174.122	14.3	1	10/22/2010	15:30	A	24	NW	Horizontal	N	2.5	0.05	0.05	1
611	0	MD	N_008_00730_B	3532994.327	363174.1309	14.3	1	10/22/2010	15:32	B	24	N	Horizontal	W	2.5	0.05	0.05	1
612	0	CD	N_008_00730_C	3532994.327	363174.0273	14.3	1	10/22/2010	15:35	C	24	N	Horizontal	W	8	0.05	0.05	1
645	0	RRD	N_0A1_06083_B	3533024.875	363144.6046	4.254728	1	10/27/2010	9:19	B	24	N	Horizontal	N	2	1	0.005	1
653	0	MD	N_008_00745_C	3533060.745	363173.6691	10.184659	1	10/27/2010	10:52	C	24	NE	Horizontal	E	2.5	0.05	0.05	1
721	0	MD	N_017_02368_A	3533254.136	362652.8057	12.481197	3	10/27/2010	12:37	A	24	S	Horizontal	N	3	3	1	1
738	0	CD	N_011_01117_A	3533038.969	362999.9898	13.774089	1	10/28/2010	10:11	A	24	NE	Horizontal	E	5	2.5	5	1
739	0	CD	N_00A_06028_A	3533001.758	363122.0661	6.28354	1	10/28/2010	10:56	A	24	W	Horizontal	W	4	0.005	0.005	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
762	0	MD	N_016_01983_B	3533319.141	362729.2205	220.738207	3	10/28/2010	12:35	B	24	S	Horizontal	E	1	1	1	1
764	0	MD	N_016_02001_B	3533313.806	362727.0194	131.04766	3	10/28/2010	12:44	B	24	S	Horizontal	N	2	2	1	1
791	0	MD	N_0A3_06107_A	3532883.191	361619.5877	42.187492	1	11/1/2010	16:02	A	24	W	Horizontal	W	10	2	0.05	1
795	0	MD	N_033_04364_B	3532805.881	361755.9273	15.095313	2	11/1/2010	9:46	B	24	E	Horizontal		3	1	0.2	1
831	0	CD	N_026_03500_A	3532831.058	362142.3777	10.966255	3	11/1/2010	11:47	A	24	N	Horizontal	N	4	4	1	1
853	0	MD	N_035_04627_A	3532867.377	361628.9786	53.15116	1	11/2/2010	9:58	A	24	E	Horizontal	W	6	2	0.05	1
856	0	CD	N_036_04979_A	3532841.884	361566.4713	4.453715	1	11/2/2010	10:54	A	24	E	Horizontal	E	3	1.5	1	1
861	0	MD	N_036_04908_A	3532759.599	361583.4126	8.881556	1	11/2/2010	12:29	A	24	SE	Horizontal	E	4	1	0.005	1
862	0	MD	N_037_05021_A	3532741.782	361521.9623	6.675769	1	11/2/2010	12:43	A	24	N	Veritical	N	1	0.025	0.025	1
864	0	MD	N_037_05010_B	3532722.292	361523.6773	16.152069	1	11/2/2010	13:45	B	24	W	Horizontal	W	7	1	0.005	1
873	0	MD	N_038_05062_A	3532765.338	361454.0291	7.574821	1	11/2/2010	16:10	A	24	N	Horizontal	N	1	0.5	0.005	1
874	0	MD	N_041_05128_A	3532857.637	361291.4921	5.738431	1	11/2/2010	16:29	A	24	N	Horizontal	W	2.5	0.025	0.025	1
895	0	MD	N_034_04488_A	3532860.575	361680.2774	39.451737	2	11/2/2010	16:02	A	24	NE	Horizontal	E	4	2	0.2	1
904	0	MD	N_029_03836_A	3532686.751	361979.8106	180.543794	3	11/2/2010	11:08	A	24	W			4	3	1	1
914	0	MD	N_036_04969_A	3532989.015	361584.4323	4.839371	1	11/3/2010	9:54	A	24	SE	Horizontal	E	1	1	0.005	1
915	0	MD	N_036_04969_B	3532989.32	361584.1557	4.839371	1	11/3/2010	9:57	B	24	NE	Horizontal	N	1	0.25	0.25	1
919	0	MD	N_035_04674_A	3532964.466	361636.2067	13	1	11/3/2010	11:31	A	24	N	Horizontal	W	2.5	1.5	1.5	1
926	0	MD	N_0A3_06128_A	3532871.804	361729.7545	4.282681	2	11/3/2010	10:02	A	24	NE	Horizontal	E	3	0.2	3	1
942	0	MD	N_031_04156_A	3532867.02	361860.5542	4.158166	3	11/3/2010	12:20	A	24	S			2	1	1	1
953	0	MD	N_030_03981_B	3531877.721	361918.6593	9.613875	3	11/3/2010	16:59	B	24	W	Horizontal	N	1	1	1	1
960	0	MD	N_048_05230_A	3532114.306	360887.7231	18.934714	1	11/4/2010	11:14	A	24	N	Veritical	N	2	1.5	1.5	1
975	0	Hot Rock	N_032_04230_C	3531967.752	361793.2692	12.613308	3	11/4/2010	9:35	C	24	S	Horizontal	N	2	1	1	3
988	0	CD	N_030_04019_A	3531783.642	361918.4171	5.517419	3	11/4/2010	11:30	A	24	NW	Horizontal	N	5	4	2	3
1051	0	MD	N_006_00446_A	3532345.863	363286.6419	14.209406	1	11/10/2010	14:43	A	24	N	Horizontal	W	5	2	2	1
1065	0	CD	N_004_00185_A	3532586.428	363399.4001	89.975534	1	11/10/2010	9:38	A	24	W	Horizontal	W	8	3	3	1
1316	0	MD	N_030_03973_B	3531777.939	361920.3699	10.671243	3	11/8/2010	9:33	B	24	E			3	2	2	1
1123	0	CD	N_007_00666_A	3532178.651	363229.8011	5.387098	1	11/11/2010	9:56	A	24	E	Horizontal	E	8	0.5	0.5	1
1124	0	CD	N_005_00326_A	3532172.282	363342.9276	6.748569	1	11/11/2010	10:28	A	24	NW	Horizontal	N	8	4	8	1
1126	0	CD	N_006_00478_A	3532114.26	363291.2289	7.301798	1	11/11/2010	11:16	A	24	W	Horizontal	W	3	0.5	0.5	1
1129	0	CD	N_004_00223_A	3532090.58	363410.717	8.114844	1	11/11/2010	12:17	A	24	W	Horizontal	W	2.5	0.025	0.025	1
1149	0	MD	N_009_00851_A	3531438.052	363118.7041	27.72251	2	11/11/2010	11:45	A	24	N	Horizontal	W	4	2	0.5	1
1205	0	MD	S_029_10647_A	3528800.056	361972.6489	6.28329	1	11/15/2010	10:04	A	24	N	Horizontal	N	4	0.025	0.025	1
1208	0	MD	S_029_10636_B	3528747.425	361969.956	5.703294	1	11/15/2010	10:54	B	24	N	Horizontal	N	3	0.5	0.025	1
1212	0	MD	S_028_10457_A	3528723.324	362033.3523	12.663246	1	11/15/2010	12:19	A	24	SW	Horizontal	S	3	3	0.005	1
1223	0	MD	S_025_09241_A	3528447.431	362214.7466	16.91655	2	11/15/2010	9:13	A	24	NW	Horizontal	S	3	0.5	3	1
1224	0	MD	S_025_09240_A	3528408.669	362210.1459	226.585104	2	11/15/2010	9:24	A	24	NW	Horizontal	N	6	6	6	1
1347	0	MD	S_020_07378_B	3528268.105	362494.0854	10.63326	1	11/18/2010	9:31	B	24	W	Horizontal	W	3	1	0.25	1
1349	0	MD	S_020_07391_A	3528356.97	362495.2366	150.605628	1	11/18/2010	10:35	A	24	E	Horizontal	W	1	0.25	0.25	1
1393	0	MD	S_022_08176_A	3528936.125	362386.7387	6.186624	3	11/18/2010	10:59	A	24	NW			4	1	1	1
1400	0	MD	S_022_08154_A	3528688.227	362378.3383	5.364963	3	11/18/2010	13:08	A	24	S			1	1	1	1
1401	0	Hot Rock	S_022_08149_A	3528660.657	362377.3018	6.089958	3	11/18/2010	13:20	A	24	S			2	4	2	1
1416	0	MD	S_047_11889_A	3528981.183	360961.1131	4.543302	1	11/22/2010	9:05	A	24	N	Horizontal	W	1	0.025	0.025	1
1429	0	CD	S_043_11717_A	3529027.814	361185.4977	10.343262	1	11/22/2010	13:33	A	24	SE	Horizontal	W	5	2.5	2.5	1
1456	0	MD	S_027_10109_B	3528536.722	362088.4011	7.443282	1	11/16/2010	8:43	B	24	W	Horizontal	W	3	0.25	0.005	1
1457	0	MD	S_028_10417_A	3528542.948	362060.9605	206.285244	1	11/16/2010	9:09	A	24	S	Horizontal	S	3.5	1.5	0.5	1
1976	0	CD	S_RoadD_14475_A	3530076.416	362565.187	17.496546	1	12/8/2010	12:27	A	24	NW	Horizontal	W	3	1	1	1
1983	0	CD	S_018_06921_A	3530089.269	362604.8348	4.736634	1	12/8/2010	14:42	A	24	SE	Horizontal	W	24	0.005	0.005	1
1528	0	MD	S_093_13368_A	3528153.191	361813.4324	8.941605	1	11/17/2010	10:39	A	24	W	Horizontal	W	3	1	1	1
1539	0	MD	S_026_09712_A	3527756.87	362150.173	10.536594	2	11/17/2010	11:04	A	24	NW	Horizontal	W	1	0.25	1	2
1543	0	MD	S_100_13304_A	3527875.217	361916.558	17.786544	2	11/17/2010	11:47	A	24	N	Horizontal	N	7	1	7	1
1657	0	MD	S_004_01720_B	3528833.238	363400.9925	19.429866	1	11/30/2010	9:46	B	24	E	Horizontal	E	4	1	0.25	1
1681	0	Hot Rock	N_007_00617_A	3530757.207	363228.9649	19.537325	3	11/30/2010	9:06	A	24	S			4	3	3	1
1702	0	MD	S_012_04454_A	3530189.509	362944.5074	4.929966	1	12/1/2010	10:41	A	24	N	Horizontal	N	0.5	0.5	0.5	1
1725	0	CD	N_025_03384_A	3531019.925	362209.8051	8.562571	3	12/1/2010	11:25	A	24	E			7	1	1	1
1751	0	CD	N_065_05578_A	3531052.84	361026.5207	6.782088	1	12/2/2010	10:04	A	24	E	Horizontal	E	5	5	0.005	1
1781	0	MD	S_049_11991_A	3528870.937	360849.9912	10.053264	1	11/23/2010	10:20	A	24	NW	Horizontal	W	2.5	0.5	0.5	1
1783	0	MD	S_047_11899_A	3529087.804	360960.0873	8.313276	1	11/23/2010	11:26	A	24	S	Pointing Down Toward	S	1	1	1.5	1
1786	0	MD	S_045_11792_A	3529129.974	361067.4169	4.446636	1	11/23/2010	12:19	A	24	W	Horizontal	W	1.5	0.25	0.25	1
1856	0	CD	S_010_03651_A	3527555.593	363069.018	5.413296	1	12/6/2010	13:09	A	24	SE	Horizontal	S	1.5	1.5	0.5	1
1902	0	MD	S_017_06131_A	3527470.663	362663.1184	5.606628	3	12/6/2010	12:02	A	24	SE			1	1	1	1
1916	0	CD	S_014_04901_A	3527799.094	362834.0654	4.06	1	12/7/2010	9:29	A	24	SW	Horizontal	W	6	0.025	0.025	1
1920	0	MD	S_014_04905_A	3527848.459	362843.3547	4.06	1	12/7/2010	11:01	A	24	N	Horizontal	W	1.5	0.25	0.25	1
1921	0	MD	S_014_04906_A	3527855.814	362844.4861	10.15	1	12/7/2010	11:14	A	24	N	Horizontal	N	2	0.5	0.5	1
1922	0	MD	S_014_04907_A	3527869.467	362843.1961	15.47	1	12/7/2010	12:50	A	24	N	Horizontal	W	1	1	1	1
1947	0	MD	S_020_07350_A	3527968.833	362504.3121	20.589858	3	12/7/2010	11:10	A	24	E			4	1	1	1
1949	0	MD	S_020_07353_A	3527985.979	362504.3542	15.853224	3	12/7/2010	11:35	A	24	N			2	3	1	1
1950	0	MD	S_019_06990_A	3527956.787	362563.1848	7.73328	3	12/7/2010	11:55	A	24	SE			2	2	1	1
1999	0	CD	S_019_07269_A	3530194.122	362558.7931	15.369894	2	12/8/2010	11:30	A	24	S	Horizontal	W	5	0.25	0	1
2023	0	MD	S_RoadD_14480_B	3530137.531	362580.7865	5.79996	1	12/8/2010	11:10	B	24	E	Horizontal	N	1	1	1	3
2036	0	CD	S_RoadD_14467_A	3529951.633	362553.265	15.901557	1	12/9/2010	9:01	A	24	NW	Horizontal	N	4.5	4	4	1
2058	0	MD	S_018_06913_A	3529924.106	362603.5434	13.339908	1	12/9/2010	14:35	A	24	N	Horizontal	W	3	1	1	1
2059	0	MD	S_018_06914_A	3529932.343	362602.3306	11.11659	1	12/9/2010	14:47	A	24	S	Horizontal	W	2	1	1	3
2092	0	CD	S_019_07148_B	3529260.793	362551.5817	12.179916	1	12/13/2010	9:27	B	24	NW	Horizontal	S	10	10	0.05	1
2101	0	MD	S_024_09034_A	3529399.236	362255.1621	23.973168	1	12/13/2010	15:21	A	24	S	Horizontal	W	4	1	0.5	1
2146	0	CD	S_020_07580_B	3529617.407	362494.6442	16.578219	1	12/14/2010	9:12	B	24	N	Pointing Down Toward	W	6	2	0.25	1
2287	0	MD	S_008_03162_A	3528286.825	363182.6329	18.46	3	1/4/2011	13:49	A	24	W			1	1	1	1
2313	0	MD	S_004_01675_A	3528408.407	363411.608	14.596566	2	1/5/2011	10:43	A	24	SW	Horizontal	W	10	4	0.3	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2319	0	MD	N_074_05739_B	3529820.192	361885.9245	9.437259	1	1/6/2011	9:13	B	24	S	Horizontal	W	2	0.5	0.5	1
2326	0	MD	N_074_05748_A	3529767.373	361907.2196	7.426937	1	1/6/2011	11:03	A	24	W	Horizontal	W	0.5	0.5	0.5	1
2327	0	MD	N_074_05748_B	3529767.443	361907.2274	7.426937	1	1/6/2011	11:05	B	24	W	Horizontal	S	1	0.25	0.25	1
2329	0	MD	N_074_05724_A	3529764.987	361907.3504	22.543114	1	1/6/2011	11:33	A	24	N	Horizontal	W	1	0.5	0.5	3
2330	0	MD	N_074_05724_B	3529764.402	361907.4073	22.543114	1	1/6/2011	11:35	B	24	S	Horizontal	W	2	0.5	0.5	1
2334	0	MD	N_074_05720_A	3529711.496	361900.2833	30.435175	1	1/6/2011	12:27	A	24	SW	Horizontal	W	3	0.25	0.25	3
2336	0	MD	N_074_05768_A	3529690.691	361895.8252	4.667594	1	1/6/2011	14:30	A	24	SW	Horizontal	E	1	3	0.5	1
2422	0	MD	N_073_05711_A	3529697.672	361948.2062	4.804152	2	1/6/2011	15:53	A	24	N	Horizontal	N	1	0.25	1	1
2669	0	MD	S_018_06940_A	3530576.442	362606.1068	4.34997	1	1/7/2011	13:20	A	24	E	Horizontal	S	2	1	1	2
2672	0	MD	S_018_06938_B	3530551.565	362605.5488	6.76662	1	1/7/2011	14:02	B	24	W	Horizontal	W	3	0.25	0.25	1
2675	0	CD	S_017_06492_B	3530574.623	362658.9208	7.056618	1	1/7/2011	14:52	B	24	SW	Horizontal	S	3	1	1	1
2676	0	CD	S_017_06491_A	3530568.298	362658.0669	20.976522	1	1/7/2011	15:05	A	24	W	Horizontal	W	10	4	1	1
2697	0	MD	N_078_05863_A	3529738.48	361653.1918	9.152466	3	1/7/2011	9:12	A	24	W			3	1	1	1
3509	0	MD	N_006_00507_A	3530761.656	363289.1925	5.827953	2	1/21/2011	11:26	A	24	W	Horizontal	W	2	0.25	2	1
3520	0	CD	N_004_00220_B	3530711.495	363403.9851	9.194726	2	1/21/2011	15:02	B	24	S	Horizontal	S	4	0.1	4	1
3521	0	MD	N_004_00220_C	3530711.626	363405.1923	9.194726	2	1/21/2011	15:04	C	24	SE	Horizontal	W	1	0.3	1	1
343	0	MD	N_015_01824_A	3531968.251	362777.0603	12.388367	2	10/14/2010	9:41	A	23	SW	Horizontal	W	10	3	1	1
403	0	CD	N_010_01014_B	3531727.751	363052.9166	6.279426	2	10/18/2010	13:44	B	23	SE	Horizontal	E	4	3	1	1
605	0	CD	N_00A_06011_B	3532999.232	363139.8398	7.7	1	10/22/2010	14:18	B	23	NE	Horizontal	N	3	0.05	0.05	1
789	0	CD	N_038_05049_A	3532922.879	361465.4171	108.479344	1	11/1/2010	15:27	A	23	NW	Horizontal	N	7	3	0.005	1
1024	0	CD	N_014_01519_A	3532299.426	362831.8621	77.688092	2	11/9/2010	16:17	A	23	N	Horizontal	N	36	1	1	1
1046	0	CD	N_014_01519_A	3532299.426	362831.8621	77.688092	2	11/9/2010	16:17	A	23	N	Horizontal	N	36	1	1	1
1239	0	MD	S_025_09213_A	3527950.049	362212.1824	5.703294	2	11/15/2010	14:12	A	23	NW	Horizontal	N	2	1	1	1
1242	0	MD	S_025_09207_A	3527828.508	362217.6608	7.443282	2	11/15/2010	14:40	A	23	NE	Horizontal	E	2	1	1	1
1383	0	MD	S_015_05307_A	3528515.167	362779.2185	38.618067	2	11/18/2010	14:45	A	23	E	Horizontal	W	6	1.5	0.3	1
1489	0	MD	S_029_10592 _A	3528221.913	361970.41	7.443282	2	11/16/2010	12:20	A	23	NE	Horizontal	W	3	0.5	0.5	1
1625	0	MD	S_014_04999_A	3528471.194	362839.3255	11.94	2	11/21/2010	10:19	A	23	NE	Horizontal	N	4	1	0.3	1
2454	0	MD	N_079_05880_A	3529745.653	361610.8969	4.326034	3	1/6/2011	15:33	A	23	NE	Horizontal	N	2	1	0.5	2
147	0	MD	N_00C_06231_A	3531691.629	363078.0903	4.21838	2	10/13/2010	12:47	A	22	SW	Horizontal	S	7	3	0	1
622	0	MD	N_014_01624_A	3533291.983	362835.6951	6.837466	2	10/22/2010	15:00	A	22	S	Horizontal	S	1	1	1	1
800	0	MD	N_00A_05986_A	3532794.941	361718.279	14.98046	2	11/1/2010	10:48	A	22	SE	Horizontal	W	3.5	1	0.1	1
1142	0	MD	N_011_01062_A	3531970.357	362991.6497	276.772136	2	11/11/2010	9:57	A	22	N	Horizontal	E	11	6	0.2	1
1377	0	MD	S_013_04649_A	3528611.56	362892.3088	8.41	2	11/18/2010	13:56	A	22	W	Horizontal	W	3	1	0.3	1
1649	0	MD	S_019_07091_A	3528842.211	362548.3905	9.134937	2	11/21/2010	15:00	A	22	W	Pointing Down Toward	W	1	0.5	0.5	3
1934	0	MD	S_043_11713_A	3528991.102	361186.9371	7.346616	2	12/7/2010	14:12	A	22	W	Horizontal	W	2	0.5	0.2	1
2338	0	MD	N_074_05722_A	3529681.792	361894.8725	26.700655	1	1/6/2011	14:54	A	22	S	Horizontal	W	4	3	2	3
2345	0	MD	N_074_05761_A	3529643.707	361888.6832	5.595964	1	1/6/2011	16:19	A	22	E	Horizontal	E	4	4	0.5	1
405	0	MD	N_013_01348_A	3531788.813	362892.6449	34.160363	2	10/18/2010	14:18	A	21	SE	Horizontal	S	4	3	1	1
534	0	MD	N_015_01756_E	3533299.391	362779.0528	42.91783	2	10/26/2010	10:24	E	21	SW	Horizontal	W	3	1	1	1
544	0	MD	N_015_01946_A	3533228.217	362771.6589	4.146737	2	10/26/2010	14:18	A	21	S	Horizontal	S	2	2	1	1
547	0	MD	N_015_01869_C	3533212.428	362772.5532	7.677858	2	10/26/2010	14:30	C	21	SE	Horizontal	S	2	1	1	1
1096	0	MD	N_009_00893_A	3532208.838	363117.678	5.395766	2	11/10/2010	14:06	A	21	NE	Horizontal	N	2	1	1	1
1165	0	CD	N_006_00517_A	3531376.982	363286.6141	5.517747	2	11/11/2010	14:48	A	21	E	Horizontal	E	4	0.5	0.5	1
1626	0	MD	S_010_03783_A	3528568.267	363067.2472	6.38	2	11/21/2010	10:44	A	21	NE	Horizontal	W	3.5	1	0.3	1
1638	0	MD	S_017_06262_A	3528815.892	362670.3757	5.79996	2	11/21/2010	12:36	A	21	NE	Horizontal	N	2.5	0.3	0.3	1
1894	0	CD	S_019_06969_B	3527190.708	362560.6203	42.774705	3	12/6/2010	10:02	B	21	N			4	3	1	1
2450	0	MD	N_079_05870_B	3529699.6	361618.4784	58.503138	3	1/6/2011	14:43	B	21	W	Horizontal	W	3	0.5	0.5	2
31	0	Hot Rock	N_025_03421_B	3531133.629	362206.1284	4.758632	3	9/30/2010	12:52	B	20	W	Horizontal	N	2	2	2	1
71	0	CD	N_021_03070_B	3531081.097	362432.8038	5.647938	2	10/4/2010	10:43	B	20	SE	Horizontal	N	3	3	1	1
122	0	MD	N_013_01336_C	3531879.928	362859.5569	146.329657	1	10/13/2010	16:33	C	20	NE	Horizontal	N	3	2	0.005	1
146	0	RRD	N_009_00923_A	3531687.854	363114.305	4.178049	2	10/13/2010	12:30	A	20	NW	Horizontal	W	3	1	1	1
173	0	MD	N_015_01818_A	3531852.349	362773.7631	13.483524	3	10/13/2010	11:24	A	20	S	Horizontal	N	3	2	1	1
214	0	CD	N_0C2_06349_B	3531201.876	361547.1564	9.475625	1	10/6/2010	14:14	B	20	W	Pointing Down Toward	S	2	0.5	0.5	1
272	0	CD	N_0C2_06368_C	3531252.238	361734.8221	7.33278	1	10/12/2010	9:20	C	20	SE	Horizontal	N	5	0.25	0.1	1
279	0	MD	N_035_04677_A	3531224.032	361629.8133	12.355327	1	10/12/2010	10:19	A	20	N	Horizontal	W	2	1	0.5	1
283	0	CD	N_035_04624_B	3531303.142	361633.8593	66.140334	1	10/12/2010	11:02	B	20	NE	Horizontal	N	24	0.1	0.1	1
305	0	MD	N_013_01395_A	3531412.026	362887.3277	11.056214	2	10/12/2010	8:14	A	20	W	Horizontal	E	4	1	1	1
385	0	CD	N_008_00748_A	3531741.97	363176.6809	9.3392	1	10/18/2010	14:39	A	20	S	Horizontal	S	2	2	0.005	1
430	0	MD	N_00C_06182_B	3531693.439	363020.1051	14.735647	3	10/18/2010	12:33	B	20	N	Horizontal	N	1	1	1	2
433	0	MD	N_00C_06214_B	3531692.925	363002.4168	5.658417	3	10/18/2010	13:40	B	20	SE	Horizontal	N	3	1	1	1
444	0	MD	N_012_01300_B	3531720.118	362961.5426	5.291177	3	10/18/2010	14:18	B	20	W	Horizontal	N	3	1	1	1
471	0	MD	N_020_02872_A	3530965.597	362490.9683	59.762594	1	10/19/2010	16:47	A	20	W	Horizontal	W	2.5	0.5	0.5	1
681	0	MD	N_013_01349_B	3533173.206	362886.553	33.643091	2	10/27/2010	9:38	B	20	S	Horizontal	S	5	3	0.2	1
686	0	MD	N_014_01543_A	3533151.761	362829.3891	29.733485	2	10/27/2010	10:13	A	20	E	Horizontal	S	4	6	0.4	1
689	0	MD	N_015_01767_A	3533114.41	362775.6949	32.598259	2	10/27/2010	10:52	A	20	SE	Horizontal	N	4	2	0.3	1
513	0	MD	N_010_00993_B	3532936.298	363059.8692	9.22798	1	10/26/2010	14:21	B	20	S	Horizontal	S	1	1	0.05	1
631	0	MD	N_016_01988_E	3533323.874	362728.1406	193.823692	3	10/22/2010	12:49	E	20	E	Horizontal	S	3	3	1	1
731	0	MD	N_0A1_06063_A	3533016.968	363159.8713	27.588258	3	10/27/2010	15:21	A	20	NE	Horizontal	N	2	1	1	1
760	0	MD	N_016_01988_B	3533325.209	362726.5206	193.823693	3	10/28/2010	12:17	B	20	W	Horizontal	N	1	1	1	2
933	0	MD	N_032_04307_A	3533047.479	361829.0338	4.534174	2	11/3/2010	12:26	A	20	N	Pointing Down Toward	N	5	3	5	1
950	0	MD	N_00C_06223_B	3531966.87	361877.9669	4.770261	3	11/3/2010	16:34	B	20	W	Horizontal	S	1	1	1	1
980	0	CD	N_033_04331_C	3531943.587	361748.8643	934.457857	3	11/4/2010	10:04	C	20	W	Veritical	N	30	1	1	1
1138	0	MD	N_016_02066_A	3532138.09	362727.1589	22.488469	2	11/11/2010	9:05	A	20	NW	Horizontal	S	2.5	2.5	0.5	1
1200	0	CD	N_006_00461_A	3531926.699	363289.8266	9.910493	3	11/11/2010	15:17	A	20	N	Horizontal	E	4	4	4	1
1233	0	MD	S_025_09232_A	3528202.108	362206.897	4.736634	2	11/15/2010	11:47	A	20	SE	Horizontal	S	0.5	0.2	0.5	1
1299	0	MD	N_022_03113_A	3532430.062	362377.7291	25.4342	2	11/8/2010	16:15	A	20	N	Horizontal	E	6	1.5	0.5	1
1477	0	MD	S_090_13407 _A	3528479.904	361929.5914	7.926612	2	11/16/2010	9:11	A	20	E	Horizontal	E	1	0.2	1	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1488	0	MD	S_029_10591 _A	3528218.283	361970.8308	4.639968	2	11/16/2010	12:14	A	20	N	Horizontal		2	2	0.4	1
1520	0	MD	S_028_10279_A	3527396.373	362045.309	21.363186	3	11/16/2010	15:16	A	20	W	Pointing Down Toward	S	2	1	1	3
1544	0	MD	S_100_13309_A	3527892.91	361909.981	5.896626	2	11/17/2010	11:57	A	20	W	Horizontal	W	0.5	0.25	0.5	1
1757	0	CD	S_008_03279_A	3529908.452	363177.049	5.993292	2	12/2/2010	10:37	A	20	W	Horizontal	W	166	0.4	0.4	1
1905	0	MD	S_019_06975_B	3527574.917	362562.1531	101.4993	3	12/6/2010	13:52	B	20	NW	Horizontal	S	1	1	1	3
1911	0	MD	S_022_08110_A	3527731.642	362377.919	7.056618	3	12/6/2010	16:15	A	20	SW	Pointing Down Toward	N	3	2	1	2
1938	0	CD	S_041_11672_A	3529122.986	361294.1682	4.34997	2	12/7/2010	15:34	A	20	NW	Horizontal	N	5	3	0.2	1
1940	0	MD	S_Cross1_13441_A	3529415.839	361022.6978	5.993292	2	12/7/2010	16:13	A	20	NE			3	0.5	0.2	1
1961	0	MD	N_080_05888_C	3529843.77	361271.1495	10.425857	2	12/8/2010	8:45	C	20	S	Horizontal	S	2	0.5	0.2	1
2001	0	CD	S_019_07268_B	3530191.247	362557.9056	8.69994	2	12/8/2010	12:07	B	20	SW	Horizontal	W	4	0.1	4	2
2008	0	CD	S_019_07263_B	3530143.485	362559.1529	13.436574	2	12/8/2010	14:13	B	20	SE	Horizontal	S	4	0.1	4	1
2021	0	CD	S_RoadD_14482_B	3530152.998	362582.7486	4.929966	1	12/8/2010	10:53	B	20	NE	Horizontal	N	3	1	1	3
2030	0	CD	S_019_07255_A	3530067.68	362561.2522	7.829946	3	12/8/2010	12:24	A	20	S	Horizontal	N	6	1	1	4
2042	0	RRD	S_RoadD_14463_A	3529914.694	362552.2599	4.929966	1	12/9/2010	10:34	A	20	E	Horizontal	W	2	2	1	1
2128	0	MD	S_015_05484_A	3529523.101	362781.1344	12.663246	3	12/13/2010	15:02	A	20	NE	Pointing Down Toward	N	2	1	1	6
2169	0	MD	S_021_07829_C	3529204.802	362434.3716	4.446636	2	12/14/2010	9:25	C	20	SW	Veritical	W	2	1	0.3	1
2285	0	MD	S_010_03684_B	3528316.984	363182.2726	12.28	3	1/4/2011	13:33	B	20	SW			1	1	1	1
2288	0	MD	S_008_03162_B	3528287.142	363182.9744	18.46	3	1/4/2011	13:50	B	20	N			3	1	1	1
2401	0	MD	N_075_05793_B	3529664.711	361833.3693	12.043811	2	1/6/2011	13:19	B	20	N			1	1	0.3	1
338	0	MD	N_016_02020_A	3531935.218	362703.4578	68.055748	2	10/14/2010	9:56	A	19	NW	Horizontal	S	7	3	1	1
502	0	RRD	N_008_00735_D	3532915.819	363170.635	12.844441	1	10/26/2010	10:12	D	19	E	Horizontal	E	1	0.5	0.5	1
529	0	CD	N_015_01698_A	3533326.238	362770.7782	1117.881712	2	10/26/2010	8:40	A	19	W	Horizontal	W	24	24	4	1
541	0	MD	N_015_01862_A	3533260.367	362774.3361	8.196286	2	10/26/2010	13:41	A	19	SE	Horizontal	E	2	2	2	1
709	0	MD	N_012_01304_A	3533123.688	362950.721	4.958507	2	10/27/2010	15:34	A	19	E	Horizontal	E	4	1	0.4	1
819	0	MD	N_035_04645_A	3532690.904	361640.3362	21.847072	2	11/1/2010	15:11	A	19	W	Horizontal	W	3	1	1	1
1630	0	MD	S_010_03794_A	3528712.035	363063.0742	7.25	2	11/21/2010	11:15	A	19	E	Horizontal	S	2	2	0.3	1
1647	0	MD	S_019_07081_A	3528766.892	362547.7548	5.944959	2	11/21/2010	14:36	A	19	NW	Horizontal	N	1	0.5	0.5	4
2368	0	MD	N_074_05743_A	3529842.379	361852.1004	8.301129	2	1/6/2011	10:40	A	19	SW	Horizontal	N	2	0.5	0.3	1
2383	0	MD	N_075_05816_C	3529808.603	361829.5616	5.980108	2	1/6/2011	11:59	C	19	N			1	0.5	0.3	1
2451	0	MD	N_079_05879_A	3529721.439	361618.2057	4.53173	3	1/6/2011	14:52	A	19	N	Pointing Down Toward	N	3	1	0.5	2
2683	0	CD	S_015_05574_A	3530468.637	362774.413	5.896626	3	1/7/2011	13:48	A	19	S	Horizontal	S	5	4	0.5	1
11	0	MD	N_063_05416_A	3531101.155	361525.833	9.034953	1	9/30/2010	14:14	A	18	N	Horizontal	N	1	0.5	0.5	1
34	0	CD	N_026_03490_A	3531112.015	362152.5349	14.266689	3	9/30/2010	13:50	A	18	W	Horizontal	N	2	1	1	1
42	0	MD	N_036_04959_C	3531097.039	361585.1018	5.423286	1	10/4/2010	10:12	C	18	E	Horizontal	E	1.5	0.5	0.5	1
49	0	MD	N_033_04434_B	3531046.265	361756.0039	5.15059	1	10/4/2010	11:43	B	18	NE	Pointing Down Toward	N	3	3	3	1
94	0	MD	N_014_01515_B	3531826.332	362833.3885	85.046079	1	10/13/2010	10:14	B	18	NE	Pointing Down Toward	E	1.5	1	1.5	1
104	0	CD	N_014_01525_D	3531831.034	362833.6773	61.484704	1	10/13/2010	11:53	D	18	S	Horizontal	S	5	3	5	1
113	0	MD	N_014_01687_C	3531859.068	362835.4002	4.064604	1	10/13/2010	15:03	C	18	N	Horizontal	N	2.5	0.5	2.5	1
116	0	CD	N_014_01590_B	3531869.013	362836.0977	10.097006	1	10/13/2010	15:23	B	18	W	Horizontal	W	6	4	0.5	1
118	0	CD	N_014_01542_A	3531887.817	362832.9262	30.048841	1	10/13/2010	16:03	A	18	W	Horizontal	W	4	2	0.05	1
191	0	MD	N_032_04222_B	3531105.897	361811.9282	15.697294	1	10/6/2010	9:26	B	18	E	Horizontal	E	2.5	0.5	2.5	1
196	0	MD	N_033_04348_B	3531182.235	361743.9271	25.475186	1	10/6/2010	10:54	B	18	W	Horizontal	W	0.5	0.2	0.2	1
198	0	MD	N_033_04348_D	3531182.351	361744.8369	25.475186	1	10/6/2010	10:58	D	18	SE	Horizontal	S	0.5	0.2	0	1
199	0	MD	N_034_04603_A	3531180.056	361692.0237	4.202085	1	10/6/2010	11:14	A	18	NE	Horizontal	N	2.5	0.5	0.5	1
216	0	CD	N_063_05385_B	3531205.886	361528.3975	54.615026	1	10/6/2010	14:50	B	18	N	Horizontal	S	10	0.5	0.5	1
234	0	CD	N_020_02973_A	3531497.981	362497.0842	4.30387	2	10/6/2010	9:48	A	18	N	Horizontal	N	1	1	0	1
236	0	CD	N_023_03249_A	3531486.336	362326.3387	4.148932	2	10/6/2010	11:13	A	18	NE	Horizontal	N	2	2	0.5	1
242	0	CD	N_028_03807_B	3531749.456	362030.5279	4.585914	2	10/6/2010	12:13	B	18	SW	Horizontal	N	3	5	3	1
303	0	CD	N_033_04368_A	3531300.986	361748.3406	14.526605	1	10/12/2010	16:18	A	18	W	Horizontal	W	1	0.5	0.1	1
322	0	MD	N_014_01663_A	3531951.366	362821.059	4.835889	1	10/14/2010	9:51	A	18	SE	Horizontal	W	2.5	0.3	0.3	1
328	0	CD	N_012_01200_A	3531814.612	362941.9669	1572.741157	1	10/14/2010	11:16	A	18	SW	Horizontal	N	12	12	2	1
344	0	MD	N_018_02553_A	3531923.984	362601.8229	57.933328	2	10/14/2010	10:20	A	18	NW	Horizontal	W	4	1	0.5	1
368	0	MD	N_007_00616_C	3531801.269	363226.8662	21.32333	1	10/18/2010	11:32	C	18	S	Horizontal	W	2.5	0.5	0.5	1
374	0	CD	N_007_00587_B	3531776.29	363237.5699	789.652473	1	10/18/2010	12:16	B	18	E	Horizontal	N	24	4	0.005	1
396	0	MD	N_019_02846_A	3531831.314	362540.8392	4.022729	2	10/18/2010	11:09	A	18	S	Horizontal	S	2	1	2	1
461	0	MD	N_015_01925_C	3531141.328	362779.7585	4.70987	1	10/19/2010	10:45	C	18	W	Horizontal	W	0.75	0.75	0.75	1
501	0	CD	N_008_00735_C	3532916.364	363170.0131	12.844441	1	10/26/2010	10:10	C	18	N	Pointing Down Toward	N	9	0.005	0.005	1
512	0	CD	N_010_00993_A	3532936.583	363059.4649	9.22798	1	10/26/2010	14:19	A	18	W	Horizontal	N	1	1	0.05	1
579	0	MD	N_016_02146_A	3533070.081	362710.6825	10.208983	3	10/26/2010	16:23	A	18	SE	Horizontal	S	4	1	1	2
601	0	CD	N_00A_06035_B	3533006.351	363191.1388	5.3	1	10/22/2010	13:51	B	18	W	Horizontal	W	2	0.5	0.5	1
621	0	MD	N_013_01397_A	3533266.175	362894.7214	10.830949	2	10/22/2010	14:49	A	18	W	Horizontal	W	2	0.5	2	1
623	0	MD	N_014_01548_A	3533280.415	362837.0089	21.013859	2	10/22/2010	15:28	A	18	W	Veritical	W	5	1	5	1
632	0	MD	N_016_01988_F	3533324.395	362728.0359	193.823692	3	10/22/2010	12:51	F	18	N	Horizontal	N	4	1	1	1
659	0	MD	N_008_00788_C	3533091.142	363171.1954	5.226651	1	10/27/2010	11:40	C	18	SE	Horizontal	E	3	0.5	0.5	1
713	0	MD	N_020_02934_A	3533037.47	362487.8697	6.438097	3	10/27/2010	9:15	A	18	N	Horizontal	N	2	2	1	1
714	0	MD	N_017_02383_A	3533087.15	362652.2948	10.163068	3	10/27/2010	9:43	A	18	W	Horizontal	N	3	2	1	1
723	0	MD	N_017_02462_A	3533253.861	362651.6559	5.432846	3	10/27/2010	12:48	A	18	W	Horizontal	N	2	2	1	1
727	0	MD	N_017_02474_A	3533215.198	362654.9155	5.037379	3	10/27/2010	14:07	A	18	S	Pointing Down Toward	N	3	1	1	3
736	0	CD	N_007_00638_A	3533079.346	363237.4155	10.658965	1	10/28/2010	9:32	A	18	SE	Horizontal	S	0.5	0.5	0.5	1
741	0	CD	N_00A_05992_A	3533008.26	363197.7122	13.158752	1	10/28/2010	11:29	A	18	N	Horizontal	N	2.75	0.05	0.005	1
784	0	MD	N_036_04985_A	3533025.485	361569.9997	4.369362	1	11/1/2010	14:02	A	18	NE	Horizontal	W	2	1	1	1
785	0	MD	N_036_04958_A	3533023.706	361569.6327	5.486836	1	11/1/2010	14:13	A	18	N	Horizontal	N	2	2	0.05	1
834	0	CD	N_025_03437_A	3532798.53	362202.7838	4.162024	3	11/1/2010	12:21	A	18	E	Horizontal	N	3	2	3	1
840	0	MD	N_027_03657_A	3532713.892	362089.7694	5.018301	3	11/1/2010	14:32	A	18	NW	Horizontal	N	2	1	1	1
846	0	MD	N_028_03758_B	3532699.928	362036.306	6.980462	3	11/1/2010	15:26	B	18	NE	Horizontal	N	2	2	1	1
847	0	CD	N_028_03758_C	3532698.893	362036.3584	6.980462	3	11/1/2010	15:27	C	18	SE	Horizontal	N	3	2	1	3
855	0	MD	N_036_04967_A	3532846.61	361566.9115	4.869665	1	11/2/2010	10:38	A	18	E	Horizontal	E	2	1	0.005	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
858	0	MD	N_036_04990_A	3532822.105	361575.5516	4.187733	1	11/2/2010	11:22	A	18	S	Veritical	S	1	1	1	1
863	0	MD	N_037_05010_A	3532722.135	361523.8783	16.152069	1	11/2/2010	13:43	A	18	S	Horizontal	N	3	1.5	0.005	1
883	0	MD	N_033_04417_A	3532567.247	361753.2975	5.93242	2	11/2/2010	11:56	A	18	N	Pointing Down Toward	N	2	0.5	2	1
896	0	RRD	N_034_04475_A	3532863.144	361680.6535	58.312877	2	11/2/2010	16:08	A	18	NW	Horizontal	E	4	1.5	0.2	1
903	0	MD	N_029_03860_A	3532685.083	361980.5735	22.922075	3	11/2/2010	10:47	A	18	E			3	1	1	1
912	0	MD	N_032_04180_A	3532638.698	361801.1946	103.116498	3	11/2/2010	15:59	A	18	S	Horizontal	N	3	1	1	1
941	0	MD	N_032_04291_A	3532868.855	361817.1802	4.938262	3	11/3/2010	11:59	A	18	W			1	1	1	1
1001	0	MD	N_043_05172_A	3532835.502	361176.4082	6.649729	2	11/9/2010	9:59	A	18	N	Horizontal	E	4	1	4	1
1017	0	CD	N_007_00603_A	3532822.444	363214.17	54.360908	1	11/9/2010	16:36	A	18	NW	Horizontal	N	4	0.005	0.005	1
1038	0	CD	N_007_00603_A	3532822.444	363214.17	54.360908	1	11/9/2010	16:36	A	18	NW	Horizontal	N	4	0.005	0.005	1
1052	0	CD	N_006_00446_B	3532345.761	363287.1534	14.209406	1	11/10/2010	14:47	B	18	NE	Pointing Down Toward	S	4	4	0.005	1
1053	0	RRD	N_006_00446_C	3532345.46	363286.1287	14.209406	1	11/10/2010	14:51	C	18	W	Horizontal	W	1	1	0.5	1
1323	0	CD	N_031_04160_A	3531831.736	361860.9265	4.017458	3	11/8/2010	10:24	A	18	N			6	1	1	1
1342	0	CD	N_00B_06148_A	3532323.71	361876.9488	7.451847	3	11/8/2010	15:53	A	18	W	Horizontal	N	3	1	1	1
1130	0	CD	N_004_00223_B	3532089.945	363412.1231	8.114844	1	11/11/2010	12:21	B	18	E	Horizontal	E	6	1	0.005	1
1139	0	MD	N_016_02153_A	3532141.398	362727.5372	9.455831	2	11/11/2010	9:09	A	18	NE	Horizontal	N	4	2	0.3	1
1193	0	CD	N_006_00466_A	3531389.993	363287.9695	8.578145	3	11/11/2010	14:16	A	18	S	Horizontal	S	2	1	1	3
1194	0	CD	N_006_00453_A	3531369.906	363286.2244	11.618208	3	11/11/2010	14:30	A	18	SW	Pointing Down Toward	S	1	1	1	1
1201	0	MD	N_007_00610_A	3531930.451	363235.4491	28.378491	2	11/11/2010	15:31	A	18	N	Horizontal	W	6	2	1	1
1204	0	MD	S_087_13432_A	3528763.435	361754.2035	7.926612	1	11/15/2010	9:21	A	18	N	Horizontal	N	3	2	0.5	1
1263	0	MD	S_025_09165_A	3527354.997	362203.3529	12.56658	3	11/15/2010	14:01	A	18	NE	Horizontal	S	2	1	1	1
1306	0	CD	N_029_03917_A	3533306.398	361995.4337	4.319835	2	11/8/2010	10:40	A	18	S	Horizontal	S	2	0.1	2	2
1344	0	CD	N_029_03921_A	3532072.422	361976.5185	4.029148	3	11/8/2010	16:09	A	18	N	Horizontal	N	5	3	3	1
1398	0	MD	S_021_07785_A	3528727.503	362439.6027	9.086604	3	11/18/2010	12:50	A	18	N			1	1	1	1
1414	0	MD	S_013_04688_A	3528918.266	362893.0728	8.7	3	11/22/2010	12:37	A	18	W			1	2	3	1
1424	0	MD	S_046_11837_A	3529014.587	361017.3041	124.69914	1	11/22/2010	12:01	A	18	NW	Horizontal	N	4	1.5	1.5	1
1461	0	MD	S_028_10421_A	3528556.378	362060.3697	10.923258	1	11/16/2010	9:58	A	18	E	Horizontal	E	1	0.25	1	1
1978	0	CD	S_019_07251_A	3530058.842	362562.9444	28.9998	1	12/8/2010	12:48	A	18	W	Horizontal	N	36	0.025	0.025	1
1486	0	MD	S_029_10582 _A	3528115.61	361970.992	5.79996	2	11/16/2010	11:57	A	18	W	Horizontal	S	4	0.5	0.3	1
1525	0	MD	S_092_13377_B	3528263.412	361849.1139	9.086604	1	11/17/2010	9:07	B	18	E	Horizontal	W	3	1	1	1
1654	0	MD	S_005_02210_A	3528822.431	363353.0532	28.23	1	11/30/2010	9:23	A	18	S	Horizontal	S	0.5	0.25	0.25	1
1673	0	MD	S_003_01409_A	3529505.441	363468.109	4.45	1	11/30/2010	14:48	A	18	W	Horizontal	W	1	0.25	0.25	1
1717	0	MD	N_014_01595_A	3530898.94	362832.1502	9.666164	3	12/1/2010	9:14	A	18	N			2	2	2	1
1824	0	MD	S_082_13149_A	3528219.987	359264.1399	22.909842	1	11/29/2010	10:10	A	18	N	Horizontal	W	2.5	0.25	0.25	1
1852	0	CD	S_RoadE_13925_A	3527451.474	363117.8943	632.582304	1	12/6/2010	12:04	A	18	W	Horizontal	N	27	6	1	1
1864	0	CD	S_RoadE_13943_B	3527767.055	362860.0932	10.439928	1	12/6/2010	15:58	B	18	SE	Horizontal	N	2	0.5	0.5	1
1875	0	MD	S_036_11361_A	3528343.718	361565.0672	7.443282	2	12/6/2010	13:02	A	18	N	Horizontal	S	5	1	0.3	1
1893	0	CD	S_019_06969_A	3527190.53	362560.5865	42.774705	3	12/6/2010	10:01	A	18	N			2	2	1	1
1896	0	CD	S_018_06543_A	3527091.482	362611.8105	5.123298	3	12/6/2010	10:19	A	18	NW			2	3	1	1
1900	0	MD	S_015_05239_A	3527345.973	362777.4612	9.956598	3	12/6/2010	11:32	A	18	SW			4	1	1	1
1903	0	CD	S_022_08100_A	3527310.989	362391.6797	30.739788	3	12/6/2010	12:25	A	18	N			120	1	1	1
1923	0	MD	S_014_04907_B	3527869.143	362843.4755	15.47	1	12/7/2010	12:52	B	18	E	Horizontal	W	1.5	0.5	0.5	1
1935	0	MD	S_043_11713_B	3528990.499	361188.426	7.346616	2	12/7/2010	14:13	B	18	SE	Horizontal	E	2	2	0.2	1
1960	0	MD	N_080_05888_B	3529844.106	361271.2924	10.425857	2	12/8/2010	8:44	B	18	W	Horizontal	W	4	0.5	0.3	1
1966	0	MD	S_018_06925_A	3530233.945	362607.5872	8.603274	1	12/8/2010	9:07	A	18	SE	Horizontal	W	1	0.025	0.025	1
1967	0	CD	S_018_06925_B	3530233.975	362607.6281	8.603274	1	12/8/2010	9:08	B	18	SE	Horizontal	N	0.5	0.5	0.025	1
1970	0	CD	S_RoadD_14484_A	3530158.486	362583.892	4.639968	1	12/8/2010	10:04	A	18	N	Horizontal	W	1	1	1	1
2038	0	MD	S_RoadD_14466_A	3529937.71	362552.5478	37.506408	1	12/9/2010	9:27	A	18	N	Horizontal	S	4	1	1	1
2055	0	MD	S_018_06911_A	3529899.408	362592.2779	7.056618	1	12/9/2010	14:21	A	18	N	Horizontal	W	2	1	1	1
2056	0	MD	S_018_06912_A	3529916.937	362604.8317	6.379956	1	12/9/2010	14:27	A	18	NW	Horizontal	S	2	1	1	1
2093	0	CD	S_018_06798_A	3529301.07	362606.9785	55.58295	1	12/13/2010	10:07	A	18	SW	Horizontal	N	4	4	2	1
2127	0	MD	S_017_06390_A	3529496.985	362671.3682	9.763266	3	12/13/2010	14:46	A	18	NW	Veritical	N	2	1	1	4
2129	0	MD	S_015_05475_A	3529500.676	362781.4347	7.201617	3	12/13/2010	15:12	A	18	NW	Horizontal	S	2	1	1	4
2132	0	CD	S_010_03910_B	3529779.255	363060.0181	5.51	3	12/13/2010	16:41	B	18	W	Horizontal	S	5	1	1	1
2141	0	MD	S_027_10203_A	3529263.805	362095.8733	8.796606	3	12/13/2010	12:18	A	18	S			1	1	1	3
2277	0	MD	S_003_01161_A	3528143.021	363471.6452	5.219964	1	1/4/2011	15:12	A	18	S	Horizontal	W	2	1	0.25	3
2284	0	MD	S_010_03684_A	3528317.528	363182.8634	12.28	3	1/4/2011	13:31	A	18	S			1	1	1	1
2318	0	MD	N_074_05739_A	3529820.446	361885.7121	9.437259	1	1/6/2011	9:10	A	18	N	Horizontal	N	1	0.5	0.5	1
2362	0	MD	N_075_05789_B	3529844.48	361822.2501	15.020215	2	1/6/2011	10:16	B	18	NW			1	0.3	0.3	1
2387	0	MD	N_075_05798_B	3529777.953	361843.7667	10.58281	2	1/6/2011	12:14	B	18	W			1.5	1	0.3	1
2390	0	MD	N_075_05823_B	3529775.489	361845.0256	4.988852	2	1/6/2011	12:24	B	18	N			1	0.5	0.3	1
2395	0	MD	N_075_05821_B	3529695.979	361836.335	5.287592	2	1/6/2011	12:53	B	18	NE			1	0.5	0.5	1
2423	0	MD	N_073_05711_B	3529697.782	361949.3769	4.804152	2	1/6/2011	15:55	B	18	E	Horizontal	N	1	0.5	1	3
2431	0	MD	N_076_05838_A	3529838.894	361795.8471	6.085857	3	1/6/2011	9:30	A	18	N			3	1	1	1
2434	0	MD	N_076_05832_A	3529795.899	361779.6739	11.091435	3	1/6/2011	10:04	A	18	E			3	1	1	1
2442	0	MD	N_077_05851_B	3529810.371	361724.1514	9.385247	3	1/6/2011	11:45	B	18	N			2	1	1	1
2668	0	MD	S_018_06941_A	3530583.617	362607.042	8.989938	1	1/7/2011	13:06	A	18	W	Horizontal	S	2	0.5	0.5	1
3519	0	CD	N_004_00220_A	3530712.441	363402.5586	9.194726	2	1/21/2011	14:58	A	18	N	Horizontal	S	3	3	3	1
408	0	MD	N_013_01352_B	3531813.763	362892.0852	31.707877	2	10/18/2010	15:04	B	17	SW	Horizontal	N	3	3	3	1
420	0	CD	N_017_02469_D	3531786.027	362663.804	5.137467	3	10/18/2010	9:25	D	17	S	Horizontal	S	2	1	1	1
531	0	CD	N_015_01830_A	3533304.403	362784.4499	11.40188	2	10/26/2010	9:50	A	17	W	Veritical	W	6	4	4	2
535	0	MD	N_015_01756_F	3533299.512	362779.117	42.91783	2	10/26/2010	10:26	F	17	W	Pointing Down Toward	W	3	1	1	1
539	0	MD	N_015_01914_A	3533275.942	362772.9046	5.054083	2	10/26/2010	11:39	A	17	W	Horizontal	W	1	1	1	10
546	0	MD	N_015_01869_B	3533212.568	362772.1023	7.677858	2	10/26/2010	14:28	B	17	SW	Horizontal	S	2	1	1	1
638	0	MD	N_016_01955_B	3533310.285	362725.8181	5121.236998	3	10/22/2010	14:03	B	17	NW	Horizontal	N	1	1	1	5
1247	0	CD	S_024_08837_A	3527670.559	362276.5374	7.829946	2	11/15/2010	15:54	A	17	E	Horizontal	E	6	1	1	1
1645	0	MD	S_018_06715_A	3528711.24	362609.6513	52.006308	2	11/21/2010	14:16	A	17	NW	Horizontal	N	4	2	2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2354	0	MD	N_075_05806_C	3529887.958	361823.8131	7.869055	2	1/6/2011	9:43	C	17	SW	Horizontal	W	2	1	0.3	1
2380	0	MD	N_075_05830_B	3529818.046	361821.1405	4.057964	2	1/6/2011	11:50	B	17	SE			2	0.5	0.3	1
2453	0	MD	N_079_05877_A	3529743.623	361612.225	4.674379	3	1/6/2011	15:28	A	17	N	Horizontal	N	2	0.5	0.5	1
2681	0	MD	S_015_05579_C	3530484.762	362777.0298	3194.666301	3	1/7/2011	13:24	C	17	NW	Horizontal	N	1	1	1	3
123	0	CD	N_013_01336_D	3531879.1	362858.8885	146.329657	1	10/13/2010	16:35	D	16	S	Horizontal	S	0.5	0.5	0.5	1
133	0	CD	N_009_00877_B	3531567.447	363121.4474	7.505039	2	10/13/2010	9:35	B	16	W	Horizontal	W	4	0	0	1
150	0	RRD	N_012_01219_B	3531669.37	362949.5403	41.258242	2	10/13/2010	14:36	B	16	SE	Horizontal	E	2	2	1	3
166	0	MD	N_019_02819_A	3531654.289	362545.7756	4.619277	2	10/13/2010	18:01	A	16	W	Horizontal	W	3	1	1	1
268	0	MD	N_0C2_06410_B	3531251.241	361729.8237	4.927961	1	10/12/2010	9:00	B	16	N	Horizontal	N	2.5	0.5	0.5	1
277	0	MD	N_035_04702_B	3531220.443	361631.0351	8.498081	1	10/12/2010	10:02	B	16	W	Horizontal	N	1.5	0.5	0.25	1
278	0	MD	N_035_04702_C	3531220.449	361630.9967	8.498081	1	10/12/2010	10:04	C	16	W	Horizontal	N	2.5	0.5	0.5	1
284	0	CD	N_035_04624_C	3531302.496	361634.4637	66.140334	1	10/12/2010	11:04	C	16	SE	Horizontal	N	24	0.1	0.1	1
302	0	RRD	N_034_04492_A	3531394.039	361700.3816	27.268876	1	10/12/2010	15:54	A	16	N	Horizontal	N	6	6	0.2	1
332	0	MD	N_012_01311_A	3531843.807	362946.0269	4.415574	1	10/14/2010	11:49	A	16	NW	Horizontal	W	2	1	0.25	1
333	0	MD	N_011_01109_A	3531784.195	362993.6859	16.247382	1	10/14/2010	12:06	A	16	SW	Horizontal	N	1	1	0.25	1
459	0	MD	N_015_01925_A	3531141.443	362779.4678	4.70987	1	10/19/2010	10:39	A	16	N	Horizontal	N	0.5	0.5	0.1	1
466	0	CD	N_020_02864_A	3531056.729	362491.4719	111.739744	1	10/19/2010	15:46	A	16	W	Horizontal	N	1	1	0.25	1
570	0	MD	N_016_02095_B	3533264.064	362717.0071	15.600344	3	10/26/2010	12:05	B	16	SE	Horizontal	N	1	1	1	5
718	0	MD	N_017_02365_B	3533268.612	362660.8512	12.929683	3	10/27/2010	11:00	B	16	N	Horizontal	N	1	1	1	1
720	0	MD	N_017_02514_A	3533258.532	362652.9649	4.106248	3	10/27/2010	11:36	A	16	S	Horizontal	N	1	1	1	3
936	0	MD	N_030_04016_A	3532978.316	361922.4147	5.626578	2	11/3/2010	13:14	A	16	E	Horizontal	E	2	0.25	0	1
949	0	MD	N_00C_06223_A	3531967.095	361878.788	4.770261	3	11/3/2010	16:33	A	16	W	Horizontal	N	3	1	1	4
987	0	Hot Rock	N_030_04025_A	3531785.442	361918.448	5.36218	3	11/4/2010	11:20	A	16	S	Horizontal	N	2	1	1	3
1118	0	MD	N_006_00486	3531133.716	363288.0933	7.039249	3	11/10/2010	15:38	C	16	SW	Horizontal	S	3	1	1	1
1143	0	MD	N_012_01324_A	3531998.977	362945.9596	4.054978	2	11/11/2010	10:32	A	16	NW	Horizontal	N	1.5	1.5	0.3	1
1265	0	MD	S_025_09153_A	3527268.745	362213.593	5.31663	3	11/15/2010	14:23	A	16	E	Horizontal	S	2	1	1	1
1881	0	MD	S_036_11381_A	3528807.88	361586.6435	14.98323	2	12/6/2010	15:36	A	16	E	Horizontal	N	3	0.5	0.5	1
1895	0	CD	S_019_06969_A	3527191.704	362559.927	42.774705	3	12/6/2010	10:09	A	16	N			4	1	1	1
1908	0	MD	S_020_07333_A	3527609.349	362505.4004	4.156638	3	12/6/2010	14:27	A	16	W	Horizontal	E	1	1	1	1
1963	0	MD	N_080_05885_B	3529848.273	361274.4709	19.151889	2	12/8/2010	8:51	B	16	W	Horizontal	N	1.5	0.5	0.2	1
2034	0	MD	S_018_06918_A	3530058.575	362602.5415	4.929966	1	12/8/2010	14:09	A	16	E	Horizontal	N	1	1	1	3
2043	0	MD	S_019_07246_A	3529905.134	362552.06	4.059972	1	12/9/2010	10:45	A	16	W	Horizontal	N	2	1	1	2
2065	0	MD	S_020_07667_B	3530077.866	362494.6597	15.853224	2	12/9/2010	9:25	B	16	W	Horizontal	W	4	1	0.3	1
2130	0	MD	S_013_04805_A	3529602.041	362889.9118	15.56	3	12/13/2010	16:02	A	16	W	Horizontal	W	3	1	1	3
2242	0	MD	S_006_02503_C	3528224.412	363294.8466	13.87	2	12/15/2010	10:28	C	16	E			1	0.5	0.2	1
2256	0	MD	S_007_02876_A	3528272.332	363241.227	10.83	3	12/15/2010	8:51	A	16	SW	Horizontal	N	3	1	1	3
2293	0	MD	S_009_03409_A	3528071.817	363128.4765	6.19	3	1/4/2011	14:41	A	16	N			1	1	1	1
2295	0	MD	S_008_03106_B	3528057.344	363181.0316	14.31	3	1/4/2011	14:56	B	16	W			4	1	1	1
2357	0	MD	N_075_05815_B	3529860.188	361827.9867	5.99434	2	1/6/2011	9:58	B	16	NW	Horizontal	W	1	1	0.3	1
2364	0	MD	N_075_05814_B	3529839.801	361819.6967	6.03288	2	1/6/2011	10:23	B	16	N			1	0.5	0.3	1
2365	0	MD	N_075_05814_C	3529839.827	361819.6578	6.03288	2	1/6/2011	10:24	C	16	NW			1	0.5	0.3	1
2367	0	MD	N_075_05799_B	3529837.72	361818.0784	10.444172	2	1/6/2011	10:33	B	16	NW	Horizontal	W	2	1	0.3	1
2389	0	MD	N_075_05823_A	3529775.46	361845.4027	4.988852	2	1/6/2011	12:23	A	16	NE	Horizontal	E	1.5	0.5	0.3	1
2684	0	MD	S_015_05573_A	3530452.117	362776.6748	5.993292	3	1/7/2011	13:57	A	16	E	Horizontal	E	1	0.5	0.5	1
139	0	MD	N_009_00864_A	3531643.532	363110.3885	15.657047	2	10/13/2010	11:42	A	15	W	Horizontal	W	4	1	0	1
154	0	CD	N_012_01233_C	3531654.762	362947.1099	24.183259	2	10/13/2010	15:06	C	15	E	Horizontal	E	3	0.5	0.5	3
156	0	CD	N_015_01753_A	3531619.744	362777.5828	43.976222	2	10/13/2010	15:51	A	15	NW	Pointing Down Toward	N	3	3	2	1
157	0	MD	N_015_01720_A	3531628.604	362777.9408	211.440009	2	10/13/2010	15:59	A	15	N	Horizontal	N	9	3	1	2
160	0	MD	N_016_02084_A	3531687.333	362715.4382	17.498486	2	10/13/2010	16:45	A	15	NW	Horizontal	N	4	1	1	1
240	0	CD	N_028_03712_A	3531703.276	362020.5473	18.720126	2	10/6/2010	11:51	A	15	NW	Horizontal	S	6	3	6	1
244	0	RRD	N_029_03883_A	3531739.6	361973.3133	9.009914	2	10/6/2010	13:40	A	15	E	Horizontal	W	6	2	6	1
245	0	MD	N_030_04033_A	3531523.551	361903.0641	4.922165	2	10/6/2010	14:02	A	15	S	Horizontal	E	1	1	0	1
246	0	CD	N_022_03127_A	3531303.8	362379.6954	13.027996	2	10/6/2010	15:17	A	15	N	Horizontal	N	99	4	4	1
339	0	CD	N_017_02348_A	3531934.681	362658.9148	17.289834	2	10/14/2010	10:05	A	15	N	Horizontal	E	36	0.25	0.25	1
341	0	MD	N_017_02509_A	3531989.254	362647.8629	4.253489	2	10/14/2010	9:22	A	15	NE	Horizontal	S	1	0.5	0.5	1
409	0	MD	N_013_01365_A	3531748.192	362901.3843	24.444779	2	10/18/2010	15:21	A	15	S	Horizontal	E	6	2	1	1
694	0	MD	N_019_02723_A	3533207.364	362546.5762	15.802371	2	10/27/2010	12:37	A	15	S	Horizontal	S	3	0.5	0.5	1
524	0	MD	N_011_01156_C	3533004.58	363011.5192	6.778409	1	10/26/2010	16:23	C	15	NE	Horizontal	N	2.5	0.05	0.05	1
550	0	MD	N_015_01756_B	3533299.604	362779.5133	42.91783	2	10/26/2010	10:17	B	15	SE	Horizontal	S	3	1	1	1
583	0	CD	N_005_00278_A	3533009.281	363349.9408	33.3	1	10/22/2010	10:34	A	15	N	Horizontal	N	1	1	1	1
613	0	MD	N_015_01942_A	3532846.094	362787.3213	4.269332	2	10/22/2010	10:03	A	15	NE	Horizontal	N	0.25	0.1	0.3	33.1
643	0	MD	N_016_02028_B	3533301.216	362724.9895	52.360417	3	10/22/2010	15:29	B	15	S	Horizontal	N	2	1	1	1
812	0	MD	N_035_04758_A	3532761.926	361652.4958	5.153372	2	11/1/2010	12:54	A	15	NE	Veritical	N	3	3	1	1
886	0	MD	N_034_04530_A	3532585.308	361688.7796	9.894847	2	11/2/2010	12:25	A	15	E	Horizontal	E	4	0.1	1	1
972	0	Hot Rock	N_034_04567_B	3532051.25	361698.0868	6.494513	3	11/4/2010	9:08	B	15	N	Horizontal	N	2	1	1	3
1148	0	CD	N_009_00842_A	3531444.468	363119.1373	58.244723	2	11/11/2010	11:40	A	15	NE	Horizontal	E	7	1	1	1
1238	0	MD	S_024_08856_A	3528002.975	362282.554	112.519224	2	11/15/2010	13:51	A	15	N	Veritical	N	9	3	3	1
1243	0	MD	S_024_08849_A	3527837.34	362273.391	6.186624	2	11/15/2010	14:51	A	15	S	Horizontal	S	3	1	1	1
1245	0	MD	S_023_08438_A	3527704.673	362329.7773	15.079896	2	11/15/2010	15:30	A	15	NW	Horizontal	N	3	2	2	2
1276	0	MD	N_048_05248_A	3533026.704	360885.1849	4.323279	1	11/8/2010	12:08	A	15	S	Horizontal	S	1	0.05	0.05	1
1363	0	MD	S_012_04223_A	3527917.061	362953.7944	37.603074	2	11/18/2010	8:32	A	15	SE	Horizontal	N	2	0.5	2	1
1367	0	MD	S_013_04589_A	3528244.156	362892.0225	6.67	2	11/18/2010	10:36	A	15	SE	Horizontal	E	3	0.5	3	1
1380	0	MD	S_016_05815_A	3528623.27	362734.4138	82.456098	2	11/18/2010	14:19	A	15	E	Horizontal	W	6	1.5	0.3	1
1434	0	CD	S_053_12123_A	3529272.788	360536.055	13.339908	2	11/22/2010	9:03	A	15	NW	Horizontal	N	30	0.2	30	1
1435	0	MD	S_055_12174_A	3528797.179	360508.1646	20.976522	2	11/22/2010	10:26	A	15	NW	Horizontal	S	3	4	3	1
1463	0	MD	S_090_13418_A	3528523.582	361818.4546	11.213256	1	11/16/2010	11:06	A	15	W	Horizontal	W	3	1	1	1
1464	0	MD	S_090_13418_B	3528524.053	361818.2185	11.213256	1	11/16/2010	11:08	B	15	W	Horizontal	W	2	1	0.025	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1465	0	MD	S_090_13418_C	3528523.93	361818.222	11.213256	1	11/16/2010	11:09	C	15	W	Horizontal		1	1	2	1
1484	0	MD	S_028_10363 _A	3528137.677	362048.1567	20.29986	2	11/16/2010	11:24	A	15	SE	Horizontal	S	3.5	1	0.3	1
1492	0	MD	S_029_10602 _A	3528317.076	361972.9472	8.554941	2	11/16/2010	12:43	A	15	W	Horizontal	S	3	0.5	0.5	1
1524	0	MD	S_092_13377_A	3528263.365	361848.6513	9.086604	1	11/17/2010	9:05	A	15	W	Horizontal	W	3	1	1	1
1538	0	MD	S_027_10048_A	3527770.687	362093.3967	17.013216	2	11/17/2010	10:49	A	15	N	Horizontal	N	3	0.5	3	1
1545	0	MD	S_029_10566_A	3527911.177	361963.0627	11.406588	2	11/17/2010	12:08	A	15	W	Horizontal	N	5	0.5	5	1
1616	0	MD	S_012_04230_B	3527973.386	362958.4423	22.619844	2	11/21/2010	9:21	B	15	S	Horizontal	S	3	1	3	1
1627	0	MD	S_009_03485_A	3528543.946	363111.7221	6.28	2	11/21/2010	10:52	A	15	W	Horizontal	S	2	1	0.3	1
1759	0	MD	S_009_03600_A	3529723.805	363116.6898	7.06	2	12/2/2010	11:23	A	15	NE	Horizontal	W	2.5	0.3	0.3	1
1763	0	MD	S_004_01766_A	3529599.939	363414.3922	8.6	2	12/2/2010	12:24	A	15	SE	Horizontal	W	4	1	1	1
1867	0	MD	S_096_13341_A	3527897.475	361760.7794	5.123298	2	12/6/2010	9:35	A	15	SW	Horizontal	W	3	0.5	0.2	1
1876	0	MD	S_036_11361_B	3528343.156	361564.2757	7.443282	2	12/6/2010	13:03	B	15	W	Horizontal	N	3	0.5	0.5	1
1942	0	MD	S_048_11972_B	3529328.499	360886.7829	13.774905	2	12/7/2010	16:37	B	15	W	Horizontal	S	2	0.5	0.2	1
1958	0	MD	N_080_05886_A	3529811.173	361270.0783	11.78914	2	12/8/2010	8:35	A	15	NW	Horizontal	N	4	0.5	0.2	1
1959	0	MD	N_080_05888_A	3529845.477	361271.8649	10.425857	2	12/8/2010	8:42	A	15	NE	Horizontal	N	6	2	0.3	1
2006	0	CD	S_019_07264_A	3530146.039	362558.639	6.186624	2	12/8/2010	14:02	A	15	S	Horizontal	S	4	0.1	4	3
2071	0	MD	S_020_07672_B	3530100.867	362493.1201	5.31663	2	12/9/2010	10:50	B	15	N	Horizontal	N	1	0.3	0.3	1
2077	0	CD	S_018_06917_A	3530051.956	362603.0598	6.863286	2	12/9/2010	12:55	A	15	W			20	4	0.1	1
2118	0	CD	S_RoadD_14354_A	3529176.333	361386.0025	8.119944	2	12/13/2010	16:07	A	15	N	Horizontal	N	3	0.5	3	1
2139	0	MD	S_017_06419_A	3529622.119	362679.3921	6.379956	3	12/13/2010	10:31	A	15	W			3	2	1	4
2140	0	MD	S_028_10518_A	3529361.511	362033.7318	10.246596	3	12/13/2010	11:47	A	15	W			3	2	3	3
2176	0	MD	S_024_08947_A	3529120.99	362259.936	38.859732	2	12/14/2010	9:57	A	15	N	Horizontal	W	4	1	0.3	1
2179	0	MD	S_RoadD1_14305_A	3528949.045	362153.4486	19.719864	2	12/14/2010	10:51	A	15	S	Veritical	W	4	4	0.3	1
2183	0	MD	S_032_10981_B	3528913.647	361809.1766	23.731503	2	12/14/2010	11:34	B	15	W	Horizontal	N	7	0.5	0.5	1
2198	0	MD	S_007_02985_A	3529289.348	363232.7372	16.91655	3	12/14/2010	14:49	A	15	N			1	1	1	1
2215	0	MD	S_006_02588_C	3528467.73	363294.7128	8.6	2	12/15/2010	8:33	C	15	N	Horizontal	N	1	1	0.2	1
2219	0	MD	S_005_02155_B	3528462.004	363355.8605	11.89	2	12/15/2010	8:53	B	15	W	Horizontal	W	3	0.5	0.2	1
2220	0	MD	S_005_02155_C	3528461.778	363356.7375	11.89	2	12/15/2010	8:55	C	15	E	Horizontal	W	2	0.5	0.2	1
2223	0	MD	S_005_02149_C	3528448.398	363354.9016	23.78	2	12/15/2010	9:05	C	15	NW	Horizontal	N	3	0.5	0.2	1
2236	0	MD	S_005_02102_C	3528300.743	363355.5794	4.54	2	12/15/2010	10:03	C	15	SW			1	0.5	0.2	1
2239	0	MD	S_005_02094_C	3528277.782	363354.6794	5.61	2	12/15/2010	10:16	C	15	S	Horizontal	N	1	0.5	0.2	1
2260	0	MD	S_007_02847_A	3528182.264	363235.7332	6.48	3	12/15/2010	9:29	A	15	S	Horizontal	N	1	1	1	9
2310	0	MD	S_003_01318_A	3528786.586	363459.5532	26.486484	2	1/5/2011	9:31	A	15	E	Horizontal	E	4	1	0.3	1
2311	0	MD	S_004_01712_A	3528677.938	363405.544	27.259812	2	1/5/2011	9:54	A	15	NW	Horizontal	N	7	1.5	0.3	1
2340	0	MD	N_074_05765_A	3529675.993	361894.7771	5.166771	1	1/6/2011	15:23	A	15	N	Veritical	S	6	3	1	1
2346	0	MD	N_075_05829_A	3529921.083	361834.2068	4.181766	2	1/6/2011	9:05	A	15				2	0.5	0.5	1
2351	0	MD	N_075_05791_C	3529892.588	361825.9199	12.622328	2	1/6/2011	9:31	C	15	SW			1	1	0.3	1
2360	0	MD	N_075_05786_C	3529848.468	361822.8806	18.073804	2	1/6/2011	10:07	C	15	NE			1.5	0.5	0.3	1
2372	0	CD	N_074_05719_C	3529835.353	361858.7559	65.074661	2	1/6/2011	10:52	C	15	N			1	1	0.1	1
2385	0	MD	N_075_05777_B	3529783.163	361841.9587	57.315487	2	1/6/2011	12:07	B	15	W			2	0.5	0.3	1
2404	0	MD	N_075_05792_C	3529654.889	361832.1405	12.341279	2	1/6/2011	13:27	C	15	NW			1.5	0.3	0.3	1
2410	0	MD	N_075_05804_B	3529649.168	361833.9655	8.782377	2	1/6/2011	13:53	B	15	S	Horizontal	W	2	0.5	0.5	1
2682	0	CD	S_015_05578_A	3530482.335	362776.6354	5221.89732	3	1/7/2011	13:34	A	15	SW	Horizontal	S	3	1	1	2
3225	0	MD		3529935.356	360134.7004	0	2	1/19/2011	10:34	16 5 5	15	W	Horizontal	W	2	0.5	2	1
3234	0	CD		3530110.975	359959.9032	0	2	1/19/2011	12:09	16 2 03	15	W	Horizontal	W	4	3	4	1
3522	0	CD	N_004_00181_A	3530711.255	363403.4638	140.978397	2	1/21/2011	15:11	A	15	W	Horizontal	W	12	0.2	12	1
3523	0	CD	N_003_00137_A	3530674.823	363462.5938	8.730789	2	1/21/2011	15:38	A	15	E	Horizontal	W	6	4	6	4
17	0	MD	N_015_01951_A	3531286.929	362788.0759	4.019005	2	9/30/2010	9:54	A	14	SW	Horizontal	E	2	0.5	0.5	1
267	0	MD	N_0C2_06410_A	3531250.701	361729.6972	4.927961	1	10/12/2010	8:57	A	14	NW	Horizontal	W	2.5	0.5	0.5	1
688	0	MD	N_015_01935_B	3533122.753	362772.3975	4.469245	2	10/27/2010	10:47	B	14	W	Horizontal	W	2	3	0.4	1
702	0	MD	N_019_02705_B	3533286.15	362546.8126	23.775006	2	10/27/2010	14:17	B	14	S	Horizontal	W	3	1	0.5	1
514	0	CD	N_010_00993_C	3532937.203	363060.0558	9.22798	1	10/26/2010	14:23	C	14	N	Horizontal	N	4	0.05	0.05	1
523	0	RRD	N_011_01156_B	3533004.595	363011.7744	6.778409	1	10/26/2010	16:20	B	14	N	Horizontal	N	3	1	2.5	1
549	0	MD	N_014_01616_A	3533165.248	362829.7523	8.000105	2	10/26/2010	15:31	A	14	E	Horizontal	E	1	1	1	1
569	0	MD	N_016_02095_A	3533264.149	362716.1557	15.600344	3	10/26/2010	12:04	A	14	S	Horizontal	N	4	1	1	1
586	0	CD	N_005_00278_D	3533009.399	363350.3821	33.3	1	10/22/2010	10:49	D	14	SW	Horizontal	E	4	0.5	0	1
663	0	MD	N_009_00918_C	3533135.588	363118.4745	4.307109	1	10/27/2010	12:25	C	14	NW	Horizontal	W	0.5	0.5	0.5	1
946	0	Hot Rock	N_030_03969_A	3532921.304	361930.036	12.245656	3	11/3/2010	13:10	A	14	W			3	3	3	1
961	0	CD	N_020_02974_A	3532749.892	362510.895	4.295576	2	11/4/2010	9:02	A	14	W	Horizontal	W	5	0.5	0.5	1
1005	0	MD	N_035_04630_A	3532501.739	361639.4406	47.301889	2	11/9/2010	13:49	A	14	NE	Horizontal	N	4	3	1	1
1331	0	CD	N_035_04674_A	3531930.453	361624.2909	12.842303	3	11/8/2010	12:18	A	14	E			3	3	1	1
1095	0	RRD	N_009_00913_A	3532212.259	363115.9998	4.440281	2	11/10/2010	13:55	A	14	S	Horizontal	S	2	2	0.5	2
1157	0	CD	N_004_00194_A	3531506.846	363402.3573	26.531192	2	11/11/2010	12:48	A	14	NE	Horizontal	S	3	1	1	1
1292	0	CD	N_045_05193_A	3533287.746	361065.5615	13.077684	2	11/8/2010	14:13	A	14	N	Horizontal	N	4	3	0.02	1
1646	0	MD	S_018_06723_A	3528752.547	362614.8341	8.168277	2	11/21/2010	14:24	A	14	SW	Horizontal	S	8	1	1	1
1678	0	MD	N_0C1_06257_A	3530720.34	363159.0436	7.61477	3	11/30/2010	8:43	A	14	S			3	1	1	1
1730	0	Hot Rock	S_028_10523_A	3530818.161	362034.0964	4.881633	3	12/1/2010	12:32	A	14	S			4	2	3	1
1931	0	MD	S_041_11665_B	3528955.277	361309.2552	44.079696	2	12/7/2010	12:59	B	14	W	Pointing Down Toward	N	3	0.5	0.5	1
1937	0	CD	S_Cross5253S_13479_A	3528721.078	360672.5899	5.79996	2	12/7/2010	15:04	A	14	N			8	8	0.3	1
1951	0	MD	S_019_06991_A	3527973.056	362562.2758	6.863286	3	12/7/2010	12:06	A	14	E			1	1	1	1
2039	0	CD	S_RoadD_14465_A	3529922.53	362551.8412	6.76662	1	12/9/2010	9:45	A	14	N	Horizontal	N	3	3	1	3
2105	0	MD	S_023_08599_A	3529283.227	362328.2847	20.009862	1	12/13/2010	12:36	A	14	N	Horizontal	E	0	0	0	1
2125	0	MD	S_028_10509_A	3529312.591	362035.4749	11.889918	3	12/13/2010	10:59	A	14	E			3	2	2	1
2154	0	MD	S_023_08649_A	3529419.381	362316.0471	14.4999	1	12/14/2010	12:47	A	14	SE	Horizontal	S	2	2	0.5	1
2205	0	MD	S_005_01927_A	3527833.48	363354.639	6.19	2	12/14/2010	15:40	A	14	N			2	1	0.3	1
2222	0	MD	S_005_02149_B	3528448.153	363354.8922	23.78	2	12/15/2010	9:04	B	14	W			1	1	0.2	1
2227	0	MD	S_005_02133_C	3528397.54	363350.1892	16.67	2	12/15/2010	9:23	C	14	SE	Horizontal	W	2	1	0.2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2241	0	MD	S_006_02503_B	3528224.04	363295.2591	13.87	2	12/15/2010	10:27	B	14	S			1	0.5	0.2	1
2286	0	Hot Rock	S_010_03684_C	3528317.23	363182.3947	12.28	3	1/4/2011	13:34	C	14	W			3	5	2	1
2289	0	MD	S_008_03158_A	3528277.279	363183.5321	7.83	3	1/4/2011	14:04	A	14	S			1	1	1	1
2298	0	MD	S_010_03743_A	3528298.684	363067.2559	4.06	3	1/4/2011	15:45	A	14	SW			1	1	1	1
2301	0	MD	S_010_03760_A	3528398.53	363072.3434	6.38	3	1/4/2011	16:09	A	14	N			2	1	1	1
2302	0	MD	S_010_03760_B	3528398.65	363072.7455	6.38	3	1/4/2011	16:10	B	14	N			2	1	1	1
2305	0	MD	S_008_03179_A	3528431.005	363177.7611	4.45	3	1/4/2011	16:28	A	14	E			3	1	1	1
2339	0	MD	N_074_05736_A	3529678.889	361895.1347	10.892091	1	1/6/2011	15:06	A	14	SW	Horizontal	N	5	3	1	3
2343	0	MD	N_074_05759_A	3529660.585	361891.0794	5.777467	1	1/6/2011	16:01	A	14	W	Horizontal	E	4	4	0.5	1
2371	0	MD	N_074_05719_B	3529834.91	361858.6281	65.074661	2	1/6/2011	10:51	B	14	NE			3	1	0.3	1
2435	0	MD	N_076_05835_A	3529777.523	361772.5937	7.628265	3	1/6/2011	10:14	A	14	E			3	1	1	1
2437	0	MD	N_077_05856_A	3529776.069	361725.9907	5.6885	3	1/6/2011	10:57	A	14	W			2	1	1	1
2445	0	MD	N_077_05857_A	3529823.186	361723.7032	5.66591	3	1/6/2011	12:03	A	14	N			3	1	1	1
2698	0	MD	N_078_05869_A	3529700.364	361660.4073	4.054828	3	1/7/2011	9:21	A	14	NW			5	1	1	1
2701	0	MD	N_076_05846_A	3529674.853	361767.2509	4.085901	3	1/7/2011	9:51	A	14	N			2	1	1	1
340	0	CD	N_023_03220_A	3531851.737	362314.3931	8.951836	2	10/14/2010	12:21	A	13	E	Horizontal	W	6	0.5	0.5	1
345	0	MD	N_019_02683_A	3531978.187	362549.7828	83.533583	2	10/14/2010	11:50	A	13	S	Horizontal	W	8	4	0.5	1
402	0	MD	N_010_01014_A	3531728.071	363052.0685	6.279426	2	10/18/2010	13:42	A	13	N	Horizontal	N	3	1	0.5	2
407	0	MD	N_013_01352_A	3531814.163	362891.8547	31.707877	2	10/18/2010	15:03	A	13	SW	Horizontal	E	3	1	1	1
536	0	MD	N_015_01738_A	3533297.492	362778.1623	72.532077	2	10/26/2010	10:48	A	13	W	Horizontal	S	2	1	1	1
538	0	MD	N_015_01828_A	3533292.055	362775.103	11.587549	2	10/26/2010	11:21	A	13	SE	Horizontal	S	1	1	1	10
816	0	MD	N_035_04739_A	3532746.694	361638.8116	5.935433	2	11/1/2010	14:15	A	13	N	Horizontal	N	2	1	1	1
1027	0	CD	N_014_01583_C	3532299.726	362835.9076	10.576239	2	11/9/2010	16:44	C	13	NW	Horizontal	N	6	1	1	1
1049	0	CD	N_014_01583_C	3532299.726	362835.9076	10.576239	2	11/9/2010	16:44	C	13	NW	Horizontal	N	6	1	1	1
1328	0	CD	N_035_04658_A	3531921.303	361628.1984	15.88491	3	11/8/2010	12:04	A	13	N			4	5	2	1
1098	0	RRD	N_011_01193_A	3532366.467	363005.2014	4.16614	2	11/10/2010	14:35	A	13	W	Horizontal	S	2	2	1	50
1158	0	CD	N_004_00201_A	3531528.607	363398.0687	21.123774	2	11/11/2010	12:54	A	13	NW			25	0.3	0.3	1
1240	0	MD	S_026_09728_A	3527865.722	362164.0766	4.736634	2	11/15/2010	14:24	A	13	N	Horizontal	N	2	1	1	1
1629	0	MD	S_009_03497_A	3528692.981	363123.7595	84.29	2	11/21/2010	11:09	A	13	N	Veritical	N	3	3	2	1
1639	0	MD	S_017_06264_A	3528826.787	362667.2645	21.073188	2	11/21/2010	12:43	A	13	W	Horizontal	W	2.5	0.5	0.5	1
1686	0	CD	N_003_00165_A	3530583.483	363460.1018	4.40265	3	11/30/2010	10:06	A	13	N			3	3	1	1
1719	0	CD	N_015_01866_A	3530863.709	362776.2384	7.779758	3	12/1/2010	9:35	A	13	S			4	3	1	1
1746	0	MD	S_004_01771_A	3529680.482	363402.0605	4.16	2	12/2/2010	13:44	A	13	NW	Horizontal	S	3	1	3	1
1863	0	MD	S_RoadE_13943_A	3527766.815	362858.8492	10.439928	1	12/6/2010	15:56	A	13	W	Horizontal	W	1	0.5	0.5	1
1944	0	MD	S_022_08123_A	3528150.215	362382.9005	5.123298	3	12/7/2010	9:39	A	13	N			3	2	2	1
2063	0	CD	S_020_07666_A	3530071.182	362494.6063	6.959952	2	12/9/2010	9:12	A	13	SE	Horizontal	E	5	3	3	1
2238	0	MD	S_005_02094_B	3528278.215	363354.4557	5.61	2	12/15/2010	10:15	B	13	W	Horizontal	W	3	0.5	0.2	1
2356	0	MD	N_075_05815_A	3529859.961	361827.8004	5.99434	2	1/6/2011	9:57	A	13	NW	Horizontal	N	1	0.5	0.3	1
2366	0	MD	N_075_05799_A	3529836.938	361818.2859	10.444172	2	1/6/2011	10:31	A	13	NW	Horizontal	S	3	1	0.3	1
2408	0	MD	N_075_05778_B	3529651.952	361832.5755	43.543332	2	1/6/2011	13:41	B	13	SW			2	1	0.3	1
2441	0	MD	N_077_05851_A	3529809.75	361724.4141	9.385247	3	1/6/2011	11:42	A	13	E			3	1	1	1
3305	0	MD	N_011_01098_A	3531021.097	363005.9152	24.708338	2	1/20/2011	11:44	A	13	NW	Horizontal	W	4	3	3	1
6	0	CD	N_064_05489_A	3531065.959	361490.7835	6.161132	1	9/30/2010	11:37	A	12	E	Horizontal	N	3	1	1	1
8	0	MD	N_064_05489_C	3531065.563	361490.8655	6.161132	1	9/30/2010	11:59	C	12	E	Horizontal	S	3	1	0.1	1
9	0	MD	N_064_05489_D	3531065.784	361490.512	6.161132	1	9/30/2010	12:03	D	12	W	Pointing Down Toward	W	3	2	2	1
20	0	RRD	N_017_02301_A	3531122.636	362664.6777	51.020198	2	9/30/2010	12:20	n017 2301	12	NW	Horizontal	N	0	0	0	1
25	0	CD	N_023_03232_C	3531170.509	362318.8936	5.15	3	9/30/2010	9:57	C	12	N	Horizontal	N	2	2	3	1
32	0	CD	N_025_03421_A	3531133.353	362207.3665	4.758632	3	9/30/2010	12:54	A	12	E	Pointing Down Toward	S	5	1	1	1
33	0	MD	N_026_03501_A	3531151.521	362149.6522	10.772812	3	9/30/2010	13:35	A	12	W	Horizontal	W	2	1	1	1
35	0	MD	N_026_03490_B	3531111.899	362152.9817	14.266689	3	9/30/2010	13:52	B	12	E	Horizontal	S	1	1	1	1
39	0	MD	N_036_04943_C	3531078.517	361575.2932	6.399703	1	10/4/2010	9:53	C	12	N	Horizontal	W	1	0.5	0.5	1
46	0	MD	N_034_04544_D	3531054.635	361687.9145	8.571986	1	10/4/2010	11:22	D	12	S	Horizontal	S	2.5	0.5	0.5	1
50	0	CD	N_032_04246_A	3530946.848	361803.1142	8.809218	1	10/4/2010	11:56	A	12	N	Horizontal	W	18	0.5	0.5	1
53	0	MD	N_032_04176_B	3530985.339	361811.6146	125.343238	1	10/4/2010	12:12	B	12	N	Horizontal	N	2	1	0.5	1
90	0	MD	N_014_01601_A	3531773.099	362832.8704	9.067372	1	10/13/2010	9:37	A	12	SE	Horizontal	E	3	2	0.05	1
91	0	MD	N_014_01601_B	3531773.557	362833.2297	9.067372	1	10/13/2010	9:40	B	12	NE	Horizontal	S	2	0.5	0.5	1
112	0	RRD	N_014_01687_B	3531858.426	362835.5101	4.064604	1	10/13/2010	15:00	B	12	S	Pointing Down Toward	S	4	2	2	1
115	0	MD	N_014_01590_A	3531868.5	362836.4233	10.097006	1	10/13/2010	15:20	A	12	S	Pointing Down Toward	S	2.5	1	0.5	1
117	0	CD	N_014_01590_C	3531868.497	362837.1445	10.097006	1	10/13/2010	15:25	C	12	E	Horizontal	E	3	2	0.05	1
119	0	CD	N_014_01542_B	3531888.285	362833.2855	30.048841	1	10/13/2010	16:06	B	12	N	Pointing Down Toward	N	4	0.5	4	1
125	0	CD	N_013_01374_B	3531838.15	362881.523	20.397439	1	10/13/2010	16:54	B	12	S	Horizontal	S	0.05	0.05	0.05	1
128	0	CD	N_013_01355_B	3531822.876	362893.6499	30.973924	1	10/13/2010	17:15	B	12	W	Horizontal	W	4	2	0.005	1
132	0	CD	N_009_00877_A	3531567.553	363121.9009	7.505039	2	10/13/2010	9:33	A	12	N	Horizontal	N	12	0	0	1
135	0	CD	N_011_01162_A	3531517.901	363006.711	5.985056	2	10/13/2010	10:05	A	12	W	Horizontal	N	15	0	0	1
165	0	MD	N_018_02616_A	3531676.185	362597.5856	6.670014	2	10/13/2010	17:51	A	12	S	Horizontal	S	2	2	1	1
169	0	RRD	N_015_01836_B	3531758.402	362779.7957	10.917052	3	10/13/2010	9:38	B	12	N	Horizontal	N	3	1	1	3
170	0	MD	N_015_01759_A	3531760.219	362780.7919	41.355111	3	10/13/2010	9:57	A	12	N	Horizontal	N	6	1	1	1
171	0	MD	N_015_01838_A	3531805.481	362775.4548	10.581471	3	10/13/2010	10:38	A	12	W	Horizontal	N	8	3	1	1
177	0	MD	N_016_02003_A	3531743.707	362720.8858	117.351943	2	10/13/2010	14:26	A	12	S	Horizontal	N	8	2	1	3
178	0	MD	N_015_01892_A	3531847.044	362762.1801	6.504958	3	10/13/2010	14:46	A	12	S	Horizontal	N	2	1	1	3
179	0	CD	N_015_01892_B	3531846.932	362761.9637	6.504958	3	10/13/2010	14:49	B	12	S	Horizontal	S	6	1	1	1
192	0	MD	N_032_04259_A	3531120.48	361810.151	6.795203	1	10/6/2010	9:41	A	12	S	Veritical	S	2.5	0.5	2.5	1
202	0	MD	N_034_04529_A	3531181.531	361691.6949	9.904514	1	10/6/2010	11:35	A	12	N	Horizontal	W	2.5	0.5	0.5	1
209	0	CD	N_0C2_06283_A	3531145.98	361489.6966	123.766876	1	10/6/2010	12:48	A	12	E	Horizontal	S	10	0.5	0.5	1
210	0	CD	N_0C2_06367_A	3531180.159	361539.5253	7.406251	1	10/6/2010	13:48	A	12	NE	Horizontal	N	6	0.05	0.05	1
211	0	MD	N_0C2_06367_B	3531179.896	361539.7266	7.406251	1	10/6/2010	13:51	B	12	NE	Horizontal	W	2.5	0.5	0.5	1
217	0	CD	N_063_05385_C	3531205.942	361527.4213	54.615026	1	10/6/2010	14:52	C	12	W	Pointing Down Toward	W	3	3	0.5	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
220	0	CD	N_0C2_06294_A	3531248.779	361569.1621	43.163372	1	10/6/2010	15:43	A	12	N	Horizontal	W	1	0.5	0.05	1
229	0	CD	N_035_04733_C	3531255.993	361636.968	6.10562	1	10/6/2010	16:43	C	12	NE	Horizontal	W	2	0.05	0.05	1
241	0	CD	N_028_03807_A	3531750.2	362031.2265	4.585914	2	10/6/2010	12:09	A	12	NW	Horizontal	W	2	3	0	1
247	0	MD	N_022_03127_B	3531303.602	362379.0273	13.027996	2	10/6/2010	15:20	B	12	E	Horizontal	S	3	1	1	1
249	0	MD	N_0C2_06434_A	3531286.808	362153.9107	4.062912	3	10/6/2010	9:53	A	12	N	Horizontal	N	1	1	1	3
251	0	RRD	N_0C2_06423_A	3531310.837	362152.2136	4.462017	3	10/6/2010	10:34	A	12	N	Horizontal	N	1	1	1	1
256	0	CD	N_026_03569_B	3531362.329	362146.8229	4.298689	3	10/6/2010	12:39	B	12	S	Pointing Down Toward	N	4	1	1	1
257	0	MD	N_026_03569_C	3531362.687	362146.2727	4.298689	3	10/6/2010	12:42	C	12	W	Horizontal	W	1	1	1	1
262	0	CD	N_0C2_06321_A	3531321.163	362215.5636	16.183343	3	10/6/2010	15:13	A	12	W	Horizontal	N	4	1	1	3
263	0	MD	N_0C2_06321_B	3531321.522	362215.741	16.183343	3	10/6/2010	15:16	B	12	NE	Horizontal	S	1	1	1	1
265	0	CD	N_0C2_06302_A	3531302.796	362243.8048	29.941383	3	10/6/2010	15:43	A	12	W	Pointing Down Toward	E	12	12	1	3
266	0	CD	N_025_03335_A	3531262.312	362203.5106	56.283432	3	10/6/2010	16:39	A	12	E	Horizontal	N	2	1	1	3
270	0	MD	N_0C2_06368_A	3531252.81	361734.6565	7.33278	1	10/12/2010	9:14	A	12	SE	Horizontal	W	0.5	0.3	0.3	1
276	0	CD	N_035_04702_A	3531221.032	361632.1101	8.498081	1	10/12/2010	9:59	A	12	E	Horizontal	N	6	0.25	0.25	1
281	0	CD	N_035_04677_C	3531223.824	361629.6581	12.355327	1	10/12/2010	10:24	C	12	N	Horizontal	E	24	0.1	0.1	1
282	0	MD	N_035_04624_A	3531302.997	361633.8384	66.140334	1	10/12/2010	10:59	A	12	N	Horizontal	N	1	1	1	1
293	0	MD	N_035_04664_B	3531349.076	361639.2699	14.40746	1	10/12/2010	12:23	B	12	E	Horizontal	W	2	1	0.2	1
304	0	MD	N_033_04368_B	3531300.291	361749.2535	14.526605	1	10/12/2010	16:24	B	12	SE	Horizontal	W	7	3	2	1
313	0	RRD	N_030_03958_A	3531322.214	361916.9215	15.986681	3	10/12/2010	9:50	A	12	NW	Horizontal	S	3	1	1	1
325	0	MD	N_013_01428_B	3531931.83	362890.4428	6.835353	1	10/14/2010	10:29	B	12	W	Horizontal	N	10	0.75	0.75	1
336	0	CD	N_010_00948_B	3531792.008	363055.5911	32.411106	1	10/14/2010	12:27	B	12	W	Horizontal	N	2	0.1	0.1	1
348	0	CD	N_017_02292_A	3531814.508	362670.3013	73.091804	3	10/14/2010	10:40	A	12	N	Horizontal	E	2	1	1	3
353	0	CD	N_010_00942_A	3531793.778	363056.7697	43.893101	1	10/18/2010	9:14	A	12	N	Horizontal	N	2	0.05	2	1
354	0	CD	N_010_01002_A	3531802.987	363064.4484	8.039242	1	10/18/2010	9:35	A	12	N	Horizontal	E	10	0.5	10	1
355	0	MD	N_010_01002_B	3531802.614	363064.0113	8.039242	1	10/18/2010	9:38	B	12	W	Horizontal	W	2.5	0.05	2.5	1
356	0	CD	N_010_01002_C	3531802.366	363064.7131	8.039242	1	10/18/2010	9:40	C	12	E	Horizontal	E	2	0.005	2	1
359	0	MD	N_009_00862_A	3531785.93	363114.8677	16.837782	1	10/18/2010	10:08	A	12	E	Horizontal	W	8	2	8	1
365	0	CD	N_008_00798_C	3531816.296	363181.4712	4.764993	1	10/18/2010	11:14	C	12	SE	Horizontal	S	1	1	0.5	1
366	0	MD	N_007_00616_A	3531801.47	363226.2817	21.32333	1	10/18/2010	11:27	A	12	W	Horizontal	N	8	1	0.05	1
369	0	CD	N_007_00675_A	3531799.17	363227.7213	4.506463	1	10/18/2010	11:43	A	12	E			1	0.005	0.005	1
370	0	CD	N_007_00675_B	3531798.99	363227.5454	4.506463	1	10/18/2010	11:46	B	12	S	Horizontal	S	1	0.005	0.005	1
375	0	CD	N_006_00489_A	3531766.303	363288.6472	6.897089	1	10/18/2010	12:38	A	12	S	Horizontal	S	2	0.005	0.005	1
376	0	CD	N_006_00489_B	3531766.977	363289.1544	6.897089	1	10/18/2010	12:40	B	12	N	Horizontal	N	2	0.005	0.005	1
378	0	MD	N_007_00644_B	3531761.483	363235.6933	9.910887	1	10/18/2010	13:42	B	12	N	Horizontal	N	2	1	0.05	1
382	0	MD	N_007_00650_B	3531744.558	363225.8813	7.788859	1	10/18/2010	14:13	B	12	S	Horizontal	S	0.5	0.5	0.5	1
383	0	MD	N_008_00775_A	3531749.708	363180.6149	6.12328	1	10/18/2010	14:28	A	12	NW	Horizontal	N	4	1	0.5	1
388	0	MD	N_008_00777_B	3531703.454	363176.8471	5.92758	1	10/18/2010	15:30	B	12	E	Horizontal	W	0.5	0.5	0.05	1
389	0	CD	N_008_00777_C	3531703.138	363176.3219	5.92758	1	10/18/2010	15:31	C	12	W	Horizontal	W	12	0.05	0.05	1
390	0	CD	N_00C_06179_A	3531695.203	363302.7182	16.109359	1	10/18/2010	16:12	A	12	NW	Horizontal	E	12	12	0.05	1
399	0	CD	N_006_00392_C	3531717.3	363289.6758	558.000637	2	10/18/2010	11:52	C	12	E	Horizontal	E	6	3	0	1
413	0	MD	N_00C_06172_A	3531741.934	362499.492	23.075457	2	10/18/2010	9:05	A	12	NW	Horizontal	N	2	1	2	1
416	0	MD	N_017_02443_A	3531744.068	362663.7347	6.05355	3	10/18/2010	9:07	A	12	W	Horizontal	N	3	1	1	1
425	0	MD	N_017_02249_A	3531795.32	362659.2232	6252.683529	3	10/18/2010	9:56	A	12	N	Horizontal	W	1	1	1	3
427	0	CD	N_017_02249_C	3531794.687	362659.704	6252.683529	3	10/18/2010	9:58	C	12	SE	Horizontal	N	2	1	1	1
437	0	CD	N_012_01260_A	3531704.673	362950.7263	10.286921	3	10/18/2010	13:57	A	12	W	Horizontal	N	3	3	1	2
446	0	MD	N_012_01275_B	3531723.609	362961.997	7.833627	3	10/18/2010	14:37	B	12	W	Horizontal	N	1	1	1	1
453	0	RRD	N_011_01164_C	3531721.821	363004.8612	5.902367	3	10/18/2010	15:05	C	12	E	Horizontal	S	1	1	1	1
454	0	CD	N_005_00293_A	3531711.143	363343.897	17.215914	3	10/18/2010	16:03	A	12	W	Horizontal	N	20	1	1	1
455	0	CD	N_005_00264_A	3531705.672	363343.245	84.16862	3	10/18/2010	16:10	A	12	SE	Horizontal	N	8	4	1	3
465	0	CD	N_019_02785_A	3531231.435	362552.2662	6.584681	1	10/19/2010	14:51	A	12	SE	Horizontal	N	4	0.25	0.25	1
476	0	MD	N_033_04436_A	3531291.516	361746.5988	5.089723	3	10/19/2010	9:39	A	12	E	Horizontal	N	1	1	1	1
670	0	CD	N_010_00979_C	3533181.45	363061.8807	11.358173	1	10/27/2010	13:51	C	12	S	Horizontal	S	2	1	0.005	1
673	0	CD	N_011_01087_A	3533227.364	363004.4789	40.628553	1	10/27/2010	14:39	A	12	NW	Horizontal	N	4	0.005	0.005	1
674	0	CD	N_011_01087_B	3533227.57	363004.8301	40.628553	1	10/27/2010	14:41	B	12	NE	Horizontal	E	3	1	0.005	1
679	0	MD	N_013_01417_A	3533197.793	362888.8493	7.756839	2	10/27/2010	9:24	A	12	N	Horizontal	N	0.5	0.3	0.3	1
696	0	MD	N_021_03044_A	3533191.59	362436.977	12.497974	2	10/27/2010	12:56	A	12	N	Horizontal	N	2	2	0.2	1
698	0	CD	N_021_03014_A	3533238.018	362429.263	38.176462	2	10/27/2010	13:15	A	12	NE	Horizontal	N	7	2	0.2	1
505	0	CD	N_011_01146_A	3532924.861	363000.798	7.845405	1	10/26/2010	11:52	A	12	E	Horizontal	W	4	0.05	0.05	1
506	0	MD	N_011_01146_B	3532925.36	362999.9839	7.845405	1	10/26/2010	11:55	B	12	W	Horizontal	W	0.5	0.5	0.5	1
507	0	MD	N_011_01146_C	3532924.612	363000.4358	7.845405	1	10/26/2010	11:57	C	12	S	Horizontal	S	3	0.05	0.05	1
509	0	CD	N_012_01263_A	3532953.075	362944.501	9.297566	1	10/26/2010	13:50	A	12	W	Horizontal	W	4	4	0.005	1
510	0	CD	N_012_01263_B	3532953.727	362944.4768	9.297566	1	10/26/2010	13:52	B	12	N	Horizontal	N	12	0.005	0.005	1
511	0	CD	N_012_01263_C	3532953.43	362944.8743	9.297566	1	10/26/2010	13:54	C	12	E	Horizontal	E	4	0.005	0.005	1
515	0	CD	N_010_01057_A	3532889.756	363057.8163	4.00007	1	10/26/2010	14:45	A	12	W	Horizontal	W	4	0.005	0.005	1
516	0	CD	N_010_01057_B	3532889.934	363058.2911	4.00007	1	10/26/2010	14:47	B	12	N	Horizontal	N	1	1	0.005	1
520	0	CD	N_010_00967_B	3532867.39	363056.1454	14.893993	1	10/26/2010	15:54	B	12	E	Horizontal	E	4	0.05	0.05	1
521	0	CD	N_010_00967_C	3532868.131	363055.7142	14.893993	1	10/26/2010	15:58	C	12	N	Horizontal	N	12	0.005	0.005	1
557	0	MD	N_016_02021_A	3533295.409	362719.2544	67.159156	3	10/26/2010	9:57	A	12	SW	Horizontal	N	7	2	1	3
559	0	propellant	N_016_02076_C	3533285.414	362720.3632	19.667337	3	10/26/2010	11:02	C	12	S			1	1	1	1
562	0	MD	N_016_02152_A	3533281.52	362720.44	9.591841	3	10/26/2010	11:13	A	12	N	Horizontal	N	3	1	1	3
565	0	MD	N_016_02166_A	3533269.393	362718.4848	8.490798	3	10/26/2010	11:30	A	12	N	Horizontal	N	2	2	1	2
573	0	MD	N_016_02160_A	3533245.194	362714.4265	9.028845	3	10/26/2010	12:42	A	12	N	Horizontal	N	2	1	1	3
580	0	CD	N_00A_06004_A	3533004.877	363341.0595	8.472305	1	10/22/2010	10:00	A	12	W	Horizontal	W	0.5	0.5	0.5	1
581	0	CD	N_00A_06004_B	3533005.54	363341.63	8.472305	1	10/22/2010	10:03	B	12	NE	Horizontal	N	6	0.05	0.05	1
584	0	CD	N_005_00278_B	3533009.378	363350.8678	33.3	1	10/22/2010	10:40	B	12	NE	Horizontal	N	18	0.005	0.005	1
585	0	CD	N_005_00278_C	3533008.713	363350.7048	33.3	1	10/22/2010	10:44	C	12	SE	Horizontal	W	1	0.5	0.5	1
590	0	CD	N_00A_05952_A	3533007.123	363205.3712	103.4	1	10/22/2010	11:44	A	12	N	Horizontal	N	3	0.5	0.005	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
591	0	MD	N_00A_05952_B	3533007.728	363205.7796	103.4	1	10/22/2010	11:53	B	12	E	Pointing Down Toward	E	2.5	0.5	0.5	1
594	0	MD	N_00A_06037_A	3533008.021	363196.5052	5.1	1	10/22/2010	12:30	A	12	N	Horizontal	N	0.5	0.05	0.05	1
595	0	CD	N_00A_06037_B	3533007.585	363196.3124	5.1	1	10/22/2010	12:35	B	12	NE	Horizontal	N	2	0.005	0.005	1
596	0	CD	N_00A_06037_C	3533007.033	363195.9765	5.1	1	10/22/2010	12:37	C	12	W	Horizontal	W	1	1	1	1
597	0	MD	N_00A_06037_D	3533006.981	363196.3201	5.1	1	10/22/2010	12:40	D	12	E	Horizontal	E	0.5	0.5	0.5	1
598	0	CD	N_00A_05992_A	3533007.504	363198.7395	13.1	1	10/22/2010	12:57	A	12	NW	Horizontal	N	4	2	2	1
602	0	CD	N_00A_06035_C	3533006.528	363191.5473	5.3	1	10/22/2010	13:54	C	12	N	Horizontal	N	2.5	0.05	0.05	1
618	0	CD	N_014_01531_A	3532900.82	362838.1103	43.068095	2	10/22/2010	12:41	A	12	NE	Horizontal	N	600	0.3	0	1
627	0	CD	N_016_01983_A	3533319.332	362730.0535	220.738207	3	10/22/2010	12:13	A	12	W	Horizontal	N	6	5	1	1
634	0	MD	N_016_02001_B	3533314.09	362727.417	131.047659	3	10/22/2010	12:55	B	12	NW	Horizontal	S	1	1	1	3
635	0	MD	N_016_02001_C	3533313.555	362727.2964	131.047659	3	10/22/2010	12:56	C	12	S	Horizontal	E	1	1	1	2
637	0	MD	N_016_01955_A	3533310.436	362725.7924	5121.236998	3	10/22/2010	14:01	A	12	NW	Pointing Down Toward	N	5	3	1	2
644	0	CD	N_0A1_06083_A	3533023.844	363145.3359	4.254728	1	10/27/2010	9:15	A	12	E	Horizontal	E	6	0.005	0.005	1
647	0	RRD	N_008_00715_B	3533027.913	363177.6614	29.74734	1	10/27/2010	9:41	B	12	NE	Pointing Down Toward	E	3	2	2	1
649	0	CD	N_008_00719_A	3533054.908	363170.5735	24.402617	1	10/27/2010	10:04	A	12	W	Horizontal	W	4	0.05	0.05	1
650	0	CD	N_008_00719_B	3533055.026	363171.311	24.402617	1	10/27/2010	10:07	B	12	E	Horizontal	E	4	4	0.005	1
652	0	CD	N_008_00745_B	3533060.632	363173.2014	10.184659	1	10/27/2010	10:48	B	12	N	Horizontal	N	2	1	0.005	1
655	0	CD	N_008_00739_A	3533063.291	363175.3014	10.925276	1	10/27/2010	11:08	A	12	E	Horizontal	E	4	0.005	0.005	1
656	0	MD	N_008_00739_B	3533063.875	363174.5614	10.925276	1	10/27/2010	11:13	B	12	W	Horizontal	W	0.5	0.5	0.5	1
658	0	CD	N_008_00788_B	3533091.253	363171.185	5.226651	1	10/27/2010	11:37	B	12	NE	Horizontal	E	1	0.5	0.5	1
662	0	MD	N_009_00918_B	3533135.538	363118.5029	4.307109	1	10/27/2010	12:24	B	12	NW	Horizontal	W	4	1	0.005	1
669	0	CD	N_010_00979_B	3533181.648	363061.4427	11.358173	1	10/27/2010	13:50	B	12	W	Horizontal	W	1	1	0.005	1
715	0	MD	N_017_02395_A	3533096.391	362650.5824	9.272813	3	10/27/2010	9:51	A	12	NW	Horizontal	N	3	1	1	1
722	0	MD	N_017_02352_A	3533255.923	362652.7554	14.969537	3	10/27/2010	12:38	A	12	NW	Horizontal	N	3	3	1	1
724	0	MD	N_017_02347_A	3533246.338	362651.471	17.759421	3	10/27/2010	13:44	A	12	SW	Horizontal	S	3	1	1	3
725	0	CD	N_017_02339_B	3533240.403	362651.8528	20.87435	3	10/27/2010	13:54	B	12	E	Horizontal	N	3	2	1	1
726	0	MD	N_017_02427_A	3533232.753	362652.7264	6.457588	3	10/27/2010	14:02	A	12	W	Pointing Down Toward	N	3	2	1	3
728	0	MD	N_017_02476_A	3533193.932	362653.1982	4.914187	3	10/27/2010	14:15	A	12	NW	Horizontal	N	3	1	1	1
732	0	MD	N_0A1_06070_A	3533085.252	363007.3774	9.238947	3	10/27/2010	15:33	A	12	W	Veritical	S	2	2	2	1
734	0	MD	N_017_02339_A	3533240.561	362650.988	20.87435	3	10/27/2010	13:52	A	12	W	Horizontal	N	3	1	1	3
742	0	CD	N_00A_05952_A	3533008.226	363204.5134	103.402655	1	10/28/2010	12:10	A	12	NE	Horizontal	E	20	0.5	0.5	1
763	0	MD	N_016_02001_A	3533313.837	362726.7201	131.04766	3	10/28/2010	12:43	A	12	SW	Pointing Down Toward	N	5	4	2	2
768	0	MD	N_016_02028_A	3533302.843	362723.3862	52.360417	3	10/28/2010	13:05	A	12	S	Horizontal	N	1	1	1	3
1033	0	CD	N_002_00051_A	3533001.029	363507.1114	342.686031	1	11/9/2010	14:50	A	12	E	Horizontal	N	8	2	2	1
780	0	MD	N_039_05075_A	3532960.562	361406.8185	24.192692	1	11/1/2010	12:06	A	12	E	Horizontal	E	6	2	6	1
790	0	MD	N_036_04912_A	3532890.963	361575.6156	8.451239	1	11/1/2010	15:50	A	12	SE	Horizontal	S	3	1	0.005	1
792	0	CD	N_00A_05974_A	3532772.221	361774.5274	22.286642	2	11/1/2010	9:22	A	12	S	Horizontal	W	4	0.2	0.2	1
838	0	CD	N_027_03659_A	3532696.501	362090.9259	4.974017	3	11/1/2010	14:10	A	12	N	Horizontal	N	5	1	1	3
839	0	CD	N_027_03591_A	3532711.432	362089.4271	40.698619	3	11/1/2010	14:21	A	12	W	Horizontal	E	24	1	1	3
841	0	CD	N_027_03657_B	3532713.362	362090.1235	5.018301	3	11/1/2010	14:34	B	12	S	Horizontal	E	2	1	1	2
842	0	MD	N_028_03743_A	3532728.047	362034.9774	9.608441	3	11/1/2010	14:53	A	12	S	Horizontal	N	2	1	1	1
843	0	CD	N_028_03743_B	3532728.662	362034.6672	9.608441	3	11/1/2010	14:54	B	12	NW	Horizontal	N	3	1	1	3
848	0	MD	N_028_03730_A	3532683.342	362031.5013	11.987169	3	11/1/2010	15:58	A	12	E	Horizontal	N	3	1	1	1
849	0	CD	N_028_03730_B	3532682.149	362030.9728	11.987169	3	11/1/2010	15:59	B	12	SW	Horizontal	N	6	1	1	2
851	0	MD	N_0A3_06111_A	3532883.628	361630.7695	13.788541	1	11/2/2010	9:29	A	12	E	Horizontal	E	5	2	0.05	1
852	0	MD	N_035_04754_A	3532880.809	361631.7194	5.194949	1	11/2/2010	9:44	A	12	W	Horizontal	W	5.5	2	2	1
854	0	MD	N_035_04790_A	3532890.911	361631.3087	4.362018	1	11/2/2010	10:25	A	12	E	Horizontal	E	2	0.5	0.005	1
860	0	MD	N_035_04729_A	3532821.825	361626.7083	6.267055	1	11/2/2010	12:10	A	12	E	Horizontal	N	4	1	0.005	1
867	0	MD	N_00A_05960_A	3532678.302	361484.3809	38.467884	1	11/2/2010	14:18	B	12	NW	Horizontal	N	7	2	0.025	1
869	0	MD	N_038_05070_A	3532643.26	361451.7661	4.077426	1	11/2/2010	14:54	A	12	NE	Horizontal	N	0.75	0.5	0.005	1
870	0	MD	N_038_05057_A	3532639.81	361448.6651	10.211437	1	11/2/2010	15:32	A	12	W	Horizontal	W	6.5	2	0.025	1
872	0	MD	N_038_05060_A	3532745.881	361463.6912	9.7171	1	11/2/2010	15:57	A	12	SE	Horizontal	W	2	1	1	1
909	0	Hot Rock	N_00A_05963_A	3532732.654	361868.2628	29.311595	3	11/2/2010	14:45	A	12	NW			3	2	2	3
910	0	MD	N_031_04138_A	3532739.562	361870.4637	5.05119	3	11/2/2010	15:29	A	12	S	Pointing Down Toward	N	3	2	1	2
911	0	MD	N_032_04186_A	3532660.068	361815.8285	65.378129	3	11/2/2010	15:45	A	12	S	Horizontal	S	5	3	1	1
916	0	MD	N_036_04965_A	3532953.247	361580.6964	4.937603	1	11/3/2010	10:13	A	12	W	Horizontal	W	2	0.5	0.025	1
921	0	MD	N_035_04801_A	3532944.391	361624.6387	4.050208	1	11/3/2010	11:56	A	12	N	Horizontal	N	4	1	1	1
928	0	MD	N_033_04419_A	3532907.004	361748.9815	5.827736	2	11/3/2010	10:23	A	12	E	Horizontal	E	0	0	0	1
932	0	MD	N_034_04592_A	3532987.716	361693.9881	4.738534	2	11/3/2010	11:12	A	12	NW	Horizontal	W	2	1	2	1
939	0	MD	N_032_04168_A	3532804.267	361822.7661	426.559414	3	11/3/2010	10:50	A	12	W			1	1	1	1
952	0	CD	N_030_03981_A	3531877.511	361919.238	9.613875	3	11/3/2010	16:57	A	12	W	Horizontal	S	2	1	1	1
974	0	MD	N_032_04230_B	3531967.859	361793.2277	12.613308	3	11/4/2010	9:33	A	12	S	Horizontal	N	3	1	1	1
978	0	MD	N_033_04331_A	3531943.9	361749.4378	934.457857	3	11/4/2010	10:01	A	12	N	Horizontal	N	3	1	1	2
979	0	RRD	N_033_04331_B	3531943.381	361749.338	934.457857	3	11/4/2010	10:02	B	12	SW	Horizontal	S	2	2	1	1
998	0	CD	N_040_05106_A	3532829.984	361332.0213	4.927432	2	11/9/2010	9:20	A	12	N	Horizontal	N	4	0.75	4	1
1006	0	Hot Rock	N_025_03442_A	3532022.196	362206.5009	4.085158	3	11/9/2010	8:37	A	12	N			4	3	2	1
1009	0	MD	N_028_03813_A	3532084.026	362043.003	4.404498	3	11/9/2010	9:28	A	12	N			2	1	1	1
1037	0	CD	N_002_00067_A	3532988.504	363509.2692	25.694281	1	11/9/2010	15:48	A	12	S	Horizontal	S	8	0.005	0.005	1
1061	0	CD	N_007_00631_A	3532434.596	363245.8703	11.638778	1	11/10/2010	16:19	A	12	E	Horizontal	N	8	0.25	0.25	1
1068	0	CD	N_00B_06144_A	3532422.896	363482.1445	12.208474	1	11/10/2010	11:17	A	12	W	Horizontal	W	2.5	0.005	0.005	1
1069	0	CD	N_00B_06144_B	3532422.945	363482.4758	12.208474	1	11/10/2010	11:21	B	12	S	Horizontal	S	3	2	1	1
1070	0	MD	N_00B_06144_C	3532423.212	363482.6967	12.208474	1	11/10/2010	11:23	C	12	E	Horizontal	E	0.5	0.25	0.5	1
1071	0	CD	N_00B_06138_A	3532423.605	363479.112	28.468138	1	11/10/2010	11:48	A	12	S	Horizontal	W	8	3	3	1
1075	0	CD	N_005_00282_B	3532393.282	363345.8265	25.035713	1	11/10/2010	12:28	B	12	E	Horizontal	E	14	6	0.005	1
1318	0	CD	N_030_04023_A	3531781.013	361920.3522	5.453422	3	11/8/2010	9:47	A	12	N			2	6	1	1
1334	0	CD	N_00C_06184_A	3532164.525	361672.4014	12.57509	3	11/8/2010	13:48	A	12	E	Horizontal	E	24	1	1	3
1337	0	MD	N_00C_06207_A	3532295.087	361575.7926	6.442619	3	11/8/2010	14:24	A	12	N	Horizontal	N	2	1	1	5

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1340	0	CD	N_036_04899_B	3532295.287	361575.7689	10.14187	3	11/8/2010	14:47	B	12	S	Horizontal	S	2	1	1	2
1341	0	Hot Rock	N_036_04899_C	3532295.056	361576.1318	10.14187	3	11/8/2010	14:48	C	12	SE	Horizontal	S	2	1	1	3
1085	0	CD	N_012_01273_A	3532286.139	362948.4905	7.962673	2	11/10/2010	10:02	A	12	N	Horizontal	N	4	0.1	4	4
1090	0	CD	N_010_01007_A	3532233.345	363061.1745	7.355292	2	11/10/2010	11:53	A	12	E	Horizontal	W	120	0.2	120	1
1091	0	CD	N_009_00901_A	3532223.952	363118.8186	4.962673	2	11/10/2010	12:08	A	12	W	Horizontal	W	6	0.1	6	1
1092	0	CD	N_009_00914_A	3532220.081	363118.7352	4.436103	2	11/10/2010	12:23	A	12	SE	Horizontal	N	4	0.1	4	12
1094	0	RRD	N_009_00902_A	3532217.877	363116.88	4.888936	2	11/10/2010	12:52	A	12	NW	Horizontal	W	3	1	3	1
1119	0	CD	N_005_00329	3531026.094	363346.4154	6.550889	3	11/10/2010	15:49	A	12	W	Horizontal	N	3	1	1	1
1120	0	CD	N_003_00136	3531062.763	363458.9273	10.363128	3	11/10/2010	16:00	A	12	N	Horizontal	W	4	1	1	2
1121	0	CD	N_006_00443_A	3532444.449	363291.6811	15.993712	1	11/11/2010	8:39	A	12	E	Horizontal	E	117	0.025	0.025	1
1125	0	MD	N_006_00578_A	3532123.542	363292.5193	4.048287	1	11/11/2010	11:03	A	12	N	Horizontal	N	2.5	0.025	0.025	1
1127	0	CD	N_005_00302_A	3532090.886	363349.8663	11.698436	1	11/11/2010	11:46	A	12	S	Horizontal	S	2.5	0.025	0.025	1
1128	0	CD	N_005_00302_B	3532091.174	363349.9792	11.698436	1	11/11/2010	11:48	B	12	N	Horizontal	N	4	4	0.025	1
1137	0	MD	N_016_02193_A	3532056.445	362716.8863	6.669425	2	11/11/2010	8:59	A	12	SE	Horizontal	E	2	1	0.3	1
1192	0	Hot Rock	N_006_00490_A	3531393.407	363288.5036	6.821478	3	11/11/2010	14:07	A	12	W	Horizontal	W	2	1	1	3
1196	0	Hot Rock	N_006_00453_C	3531370.407	363286.8412	11.618208	3	11/11/2010	14:32	C	12	N	Horizontal	S	2	2	2	3
1197	0	CD	N_006_00416_A	3531350.598	363287.6741	65.243805	3	11/11/2010	14:41	A	12	W	Horizontal	E	3	1	1	11
1198	0	CD	N_006_00419_A	3531349.482	363287.5249	51.018508	3	11/11/2010	14:46	A	12	S	Horizontal	E	3	1	1	3
1202	0	Hot Rock	N_007_00610_B	3531929.858	363234.7686	28.378491	3	11/11/2010	15:32	B	12	SW	Horizontal	N	2	1	1	3
1203	0	MD	S_087_13424_A	3528834.241	361763.9537	7.153284	1	11/15/2010	9:03	A	12	W	Horizontal	N	2.5	0.05	2.5	1
1206	0	MD	S_029_10647_B	3528799.701	361972.6545	6.28329	1	11/15/2010	10:07	B	12	E	Horizontal	W	1	0.025	1	1
1216	0	MD	S_028_10441_A	3528656.642	362039.5314	6.186624	1	11/15/2010	14:16	A	12	W	Horizontal	S	0.5	2	0.5	1
1218	0	MD	S_028_10435_A	3528623.526	362051.4964	67.472868	1	11/15/2010	14:40	A	12	N	Horizontal	N	5	3	5	1
1222	0	MD	S_025_09245_A	3528475.181	362213.4037	16.91655	2	11/15/2010	9:03	A	12	N	Horizontal	N	6	2	6	1
1228	0	CD	S_026_09769_A	3528396.577	362157.7452	4.446636	2	11/15/2010	10:28	A	12	NE	Horizontal	E	4	0.2	0	1
1229	0	MD	S_028_10394_A	3528417.28	362075.238	32.86644	2	11/15/2010	10:50	A	12	N	Horizontal	N	2	0.25	2	1
1236	0	MD	S_025_09223_A	3528050.029	362205.6406	4.398303	2	11/15/2010	12:32	A	12	E	Horizontal	E	1	0.2	1	3
1264	0	MD	S_026_09668_A	3527339.388	362162.1292	16.239888	3	11/15/2010	14:12	A	12	N	Pointing Down Toward	N	3	1	1	1
1268	0	CD	S_025_09160_A	3527297.197	362207.5025	4.639968	3	11/15/2010	14:40	A	12	E	Horizontal	S	8	6	1	1
1269	0	MD	S_025_09167_A	3527427.143	362210.6454	9.279936	3	11/15/2010	15:46	A	12	W	Pointing Down Toward	N	1	1	1	1
1304	0	CD	N_0A2_06093_A	3532998.512	362278.1087	6.717647	2	11/8/2010	9:39	A	12	S	Horizontal	S	2	0.1	2	6
1307	0	CD	N_027_03673_A	3533261.474	362095.8983	4.353275	2	11/8/2010	10:59	A	12	N	Horizontal	N	4	2	4	1
1308	0	MD	N_026_03479_A	3533255.566	362152.458	21.633566	2	11/8/2010	11:10	A	12	NE	Horizontal	N	5	3	5	1
1310	0	MD	N_028_03800_A	3533166.807	362050.8579	4.72241	2	11/8/2010	11:46	A	12	S	Horizontal	S	2	0.2	2	1
1346	0	MD	S_020_07378_A	3528267.891	362494.9336	10.63326	1	11/18/2010	9:29	A	12	E	Horizontal	E	1	0.25	0.12	1
1351	0	MD	S_021_07767_A	3528425.417	362439.5666	4.059972	1	11/18/2010	10:56	A	12	E	Horizontal	W	1	0.25	0.25	1
1352	0	MD	S_021_07767_B	3528425.349	362439.719	4.059972	1	11/18/2010	10:58	B	12	E	Horizontal	W	1	0.025	0.025	1
1354	0	MD	S_022_08135_B	3528443.173	362386.1548	6.863286	1	11/18/2010	11:21	B	12	NE	Horizontal	E	1.5	1	0.5	1
1358	0	MD	S_019_07054_B	3528534.6	362540.4345	5.896626	1	11/18/2010	12:49	B	12	S	Horizontal	S	3	0.5	0.5	1
1359	0	MD	S_019_07054_C	3528534.644	362540.5298	5.896626	1	11/18/2010	12:52	C	12	E	Horizontal	E	0.5	0.5	0.5	1
1360	0	MD	S_019_07055_A	3528548.019	362539.4035	4.446636	1	11/18/2010	13:37	A	12	W	Horizontal	W	1	0.025	0.025	1
1361	0	MD	S_019_07055_B	3528547.864	362539.9718	4.446636	1	11/18/2010	13:38	B	12	E	Horizontal	W	2	1	1	1
1366	0	MD	S_014_04957_A	3528256.649	362844.7565	35.67	2	11/18/2010	9:58	A	12	NE	Horizontal	N	2.5	0.75	2.5	1
1371	0	MD	S_012_04281_A	3528451.135	362952.0328	14.789898	2	11/18/2010	12:32	A	12	S	Horizontal	W	1	1	1	2
1372	0	MD	S_012_04281_B	3528451.012	362952.3247	14.789898	2	11/18/2010	12:35	B	12	SE	Pointing Down Toward		0.75	0.5	0.75	1
1375	0	MD	S_012_04301_A	3528624.942	362948.1449	15.563226	2	11/18/2010	13:39	A	12	SW	Horizontal	S	3	3	0.2	1
1382	0	MD	S_016_05802_A	3528567.508	362723.3496	5.413296	2	11/18/2010	14:35	A	12	E	Horizontal	W	2	1	0.3	1
1402	0	MD	S_022_08145_A	3528615.633	362379.2102	14.98323	3	11/18/2010	14:44	A	12	N	Horizontal	W	1	1	1	3
1413	0	MD	S_014_05039_A	3528843.687	362838.9968	5.41	3	11/22/2010	12:21	A	12	N			1	1	1	1
1417	0	MD	S_047_11887_A	3528873.74	360952.814	10.729926	1	11/22/2010	9:25	A	12	N	Horizontal	W	2.5	0.5	0.5	1
1418	0	MD	S_046_11829_A	3528921.649	361037.8071	195.023655	1	11/22/2010	9:48	A	12	N	Horizontal	N	4.5	1.5	1.5	1
1419	0	MD	S_Cross5_13462_A	3529014.807	360931.4282	742.636545	1	11/22/2010	10:46	A	12	N	Horizontal	N	2.5	0.5	0.5	1
1420	0	MD	S_Cross5_13462_B	3529014.856	360931.7038	742.636545	1	11/22/2010	10:50	B	12	E	Horizontal	E	1.5	0.5	0.5	1
1425	0	MD	S_045_11780_A	3529039.683	361058.5843	6.476622	1	11/22/2010	12:57	A	12	W	Horizontal	W	1	0.5	0.5	1
1426	0	CD	S_045_11780_B	3529039.857	361058.951	6.476622	1	11/22/2010	12:58	B	12	N	Horizontal	N	3	0.5	0.5	1
1445	0	MD	S_055_12202_A	3529025.484	360513.2628	24.64983	2	11/22/2010	12:15	A	12	N	Horizontal	W	3	1	3	1
1455	0	MD	S_027_10109_A	3528536.725	362089.0033	7.443282	1	11/16/2010	8:41	A	12	E	Horizontal	E	2.5	0.5	0.5	1
1458	0	MD	S_028_10417_B	3528543.394	362060.7789	206.285244	1	11/16/2010	9:11	B	12	W	Horizontal	W	2	1	0.025	1
1459	0	MD	S_028_10418_A	3528544.65	362059.9309	9.908265	1	11/16/2010	9:33	A	12	W	Horizontal	W	2.5	0.5	0.5	1
1460	0	MD	S_028_10418_B	3528544.265	362059.7968	9.908265	1	11/16/2010	9:35	B	12	E	Horizontal	E	2	2	0.025	1
1462	0	MD	S_090_13403_A	3528502.459	361942.9725	7.153284	1	11/16/2010	10:19	A	12	W	Horizontal	W	2	0.5	0.25	1
1467	0	MD	S_026_09781_A	3528583.333	362148.4076	4.543302	1	11/16/2010	12:15	A	12	W	Horizontal	S	4	1.5	1.5	1
1471	0	MD	S_025_09254_B	3528643.301	362212.1049	6.28329	1	11/16/2010	13:51	B	12	E	Horizontal	W	2.5	0.5	0.5	1
1980	0	CD	S_019_07253_A	3530063.548	362561.7165	4.446636	1	12/8/2010	13:51	A	12	SE	Horizontal	N	5	0.025	0.025	1
1981	0	CD	S_018_06919_A	3530059.478	362601.7105	5.123298	1	12/8/2010	14:11	A	12	S	Horizontal	N	4	4	0.025	1
1478	0	MD	S_027_10091 _A	3528206.885	362099.1251	5.026632	2	11/16/2010	9:43	A	12	SE	Horizontal	N	0.5	0.2	0.5	3
1490	0	MD	S_029_10597 _A	3528284.496	361969.8704	9.376602	2	11/16/2010	12:28	A	12	E	Pointing Down Toward	S	2	1	0.4	1
1519	0	CD	S_028_10275_A	3527369.012	362050.2901	4.34997	3	11/16/2010	15:05	A	12	W	Horizontal	N	2	1	1	3
1522	0	MD	S_028_10283_A	3527414.063	362043.7268	9.859932	3	11/16/2010	15:35	A	12	NE	Horizontal	W	1	1	1	3
1523	0	MD	S_028_10284_A	3527416.836	362043.776	14.403234	3	11/16/2010	15:44	A	12	W	Horizontal	N	1	1	1	3
1526	0	MD	S_094_13352_A	3528094.233	361862.4222	14.596566	1	11/17/2010	9:58	A	12	N	Horizontal	N	2.5	1	1	1
1527	0	MD	S_094_13352_B	3528094.018	361862.4044	14.596566	1	11/17/2010	10:02	B	12	E	Horizontal	W	3	1	1	1
1529	0	MD	S_093_13368_B	3528153.195	361813.9512	8.941605	1	11/17/2010	10:41	B	12	E	Horizontal	W	1	1	1	1
1535	0	CD	S_027_10047_A	3527727.675	362094.6068	43.403034	2	11/17/2010	9:44	A	12	W	Horizontal	E	72	0.1	72	1
1546	0	MD	S_028_10328_A	3527880.079	362061.1379	4.736634	2	11/17/2010	12:29	A	12	W	Horizontal	N	0.5	0.25	0.5	4
1581	0	MD	S_012_04246_A	3528149.619	362955.9739	20.589858	2	11/17/2010	16:06	A	12	E	Horizontal	W	4	1.5	0.3	1
1615	0	MD	S_012_04230_A	3527973.839	362959.0161	22.619844	2	11/21/2010	9:18	A	12	S	Horizontal	W	3	3	3	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1617	0	MD	S_012_04265_A	3528284.273	362953.4302	11.793252	2	11/21/2010	9:34	A	12	S	Horizontal	N	1.5	0.25	1.5	1
1622	0	MD	S_015_05295_A	3528381.451	362780.7057	6.476622	2	11/21/2010	10:02	A	12	S			2.5	0.3	0.3	1
1640	0	MD	S_016_05845_A	3528776.492	362730.8991	70.179516	2	11/21/2010	12:51	A	12	NE	Horizontal	S	6	5	0.4	1
1656	0	MD	S_004_01720_A	3528833.11	363400.4946	19.429866	1	11/30/2010	9:44	A	12	SE	Horizontal	N	0.5	0.25	0.25	1
1660	0	MD	S_005_02219_A	3528997.512	363351.3149	29.29	1	11/30/2010	10:47	A	12	E	Horizontal	N	4	3	0.25	1
1661	0	MD	S_005_02219_B	3528997.269	363350.8782	29.29	1	11/30/2010	10:49	B	12	S	Horizontal	S	0.5	0.25	0.25	1
1670	0	CD	S_RoadE_14002_A	3529562.027	363270.6975	4.736634	1	11/30/2010	14:02	A	12	N	Horizontal	N	4	0.025	0.025	1
1671	0	CD	S_005_02258_A	3529584.828	363349.9737	15.9	1	11/30/2010	14:22	A	12	NW	Horizontal	N	1	1	0.05	1
1676	0	MD	S_005_02253_A	3529460.855	363347.91	17.98	1	11/30/2010	16:20	A	12	NE	Horizontal	W	1.5	0.25	0.25	1
1677	0	RRD	S_005_02253_B	3529460.71	363347.9341	17.98	1	11/30/2010	16:22	B	12	NE	Horizontal	N	2	1	2.5	1
1688	0	CD	S_004_01828_A	3530615.365	363411.8303	12.759912	3	11/30/2010	10:43	A	12	N			2	1	1	1
1689	0	RRD	S_004_01828_B	3530613.793	363411.3992	12.759912	3	11/30/2010	10:45	B	12	S			1	1	1	1
1705	0	MD	S_RoadE_14021_A	3530232.047	362806.8435	4.446636	1	12/1/2010	11:39	A	12	N	Horizontal	N	0.5	0.025	0.025	1
1707	0	MD	S_016_06020_A	3530294.936	362717.5826	7.008285	1	12/1/2010	12:29	A	12	NE	Horizontal	W	3	1	0.25	1
1714	0	MD	S_015_05557_A	3530056.135	362770.5741	8.989938	1	12/1/2010	15:39	A	12	N	Horizontal	W	3	1	1	1
1747	0	CD	N_065_05565_A	3531061.172	361043.128	7.891493	1	12/2/2010	9:14	A	12	N	Horizontal	W	5	0.025	0.025	1
1748	0	RRD	N_065_05605_A	3531054.433	361027.7049	4.40837	1	12/2/2010	9:42	A	12	W	Horizontal	W	2.5	0.25	0.25	1
1749	0	MD	N_065_05605_B	3531054.362	361027.9832	4.40837	1	12/2/2010	9:46	B	12	S	Horizontal	W	1.5	0.25	0.25	1
1750	0	CD	N_065_05605_C	3531054.525	361027.9953	4.40837	1	12/2/2010	9:48	C	12	S	Horizontal	W	5	0.005	0.005	1
1752	0	MD	N_065_05581_A	3531051.475	361024.368	6.617312	1	12/2/2010	10:21	A	12	W	Horizontal	W	1	0.25	0.25	1
1753	0	MD	N_065_05581_B	3531051.605	361024.9084	6.617312	2	12/2/2010	10:22	B	12	E	Horizontal	W	1.5	0.25	0.005	1
1758	0	MD	S_009_03601_A	3529728.951	363115.0288	6.09	2	12/2/2010	11:09	A	12	W	Horizontal	W	4	0.5	0.1	1
1770	0	CD	S_005_02270_A	3529838.527	363348.8346	8.89	2	12/2/2010	15:52	A	12	SE	Horizontal	S	0	0	0	1
1846	0	CD	S_RoadE3_13885_A	3527121.398	363067.2561	17.689878	1	12/6/2010	9:21	A	12	N	Veritical	N	2	0.25	2	1
1848	0	CD	S_013_04503_A	3527330.685	362897.4336	12.57	1	12/6/2010	10:20	A	12	E	Horizontal	S	15	1.5	1.5	1
1853	0	CD	S_009_03358_A	3527505.543	363127.6943	128.855778	1	12/6/2010	12:21	A	12	W	Horizontal	N	12	6	0.25	1
1858	0	MD	S_RoadE3_13907_A	3527714.703	363046.5407	10.729926	1	12/6/2010	14:41	A	12	W	Horizontal	W	1	0.25	0.25	1
1859	0	MD	S_RoadE3_13906_A	3527715.676	363046.6341	11.309922	1	12/6/2010	14:47	A	12	SE	Horizontal	W	4	1	0.5	1
1868	0	MD	S_100_13287_A	3527434.324	361938.3311	7.346616	2	12/6/2010	10:56	A	12	W	Horizontal	W	4	1	0.3	1
1882	0	MD	S_036_11380_A	3528803.949	361586.3446	6.573288	2	12/6/2010	15:43	A	12	W		W	6	0.5	0.3	1
1907	0	CD	S_018_06555_A	3527602.8	362615.6244	12.421581	3	12/6/2010	14:13	A	12	SW	Horizontal	W	12	1	1	1
1909	0	CD	S_020_07333_B	3527609.781	362505.7361	4.156638	3	12/6/2010	14:28	B	12	N	Veritical	E	2	1	1	1
1910	0	MD	S_021_07737_A	3527751.872	362429.3343	15.659892	3	12/6/2010	14:42	A	12	E	Pointing Down Toward	S	1	1	1	4
1913	0	MD	S_022_08111_B	3527754.574	362386.2242	10.729926	3	12/6/2010	16:22	B	12	W	Pointing Down Toward	N	1	1	1	1
1918	0	CD	S_014_04902_A	3527800.61	362833.8572	23.34	1	12/7/2010	10:34	A	12	N	Horizontal	N	7	1	0.025	1
1925	0	MD	S_013_04525_A	3527876.801	362900.5179	4.93	1	12/7/2010	14:18	A	12	E	Horizontal	W	2	0.5	0.5	1
1929	0	CD	S_040_11615_A	3528953.616	361359.1476	12.179916	2	12/7/2010	12:46	A	12	E	Horizontal	W	4	3	3	1
1933	0	MD	S_041_11667_A	3529000.416	361303.2614	6.186624	2	12/7/2010	13:57	A	12	NE	Horizontal	S	3	2	2	1
1943	0	MD	S_023_08456_A	3528263.652	362327.9433	4.929966	3	12/7/2010	9:25	A	12	E			2	1	1	1
1945	0	MD	S_022_08120_A	3528076.066	362388.9275	5.413296	3	12/7/2010	9:58	A	12	N			1	1	1	1
1946	0	MD	S_021_07740_A	3527984.734	362430.5537	5.703294	3	12/7/2010	10:19	A	12	W			3	2	2	1
1952	0	MD	S_016_05699_A	3527753.184	362731.7008	10.874925	3	12/7/2010	12:58	A	12	E			2	2	1	1
1956	0	MD	S_016_05696_A	3527714.632	362738.2146	15.369894	3	12/7/2010	14:43	A	12	NW	Horizontal	W	1	1	1	5
1957	0	MD	S_016_05700_A	3527763.789	362734.442	6.041625	3	12/7/2010	15:28	A	12	SW	Horizontal	S	1	1	1	9
1968	0	CD	S_RoadD_14486_A	3530191.816	362593.0424	8.651607	1	12/8/2010	9:24	A	12	S	Horizontal	N	6	0.005	0.005	1
1974	0	CD	S_RoadD_14478_B	3530106.338	362575.0472	10.343262	1	12/8/2010	11:32	B	12	S	Horizontal	W	3.5	2	2	1
1975	0	CD	S_RoadD_14476_A	3530077.521	362566.4208	4.8333	1	12/8/2010	11:58	A	12	W	Horizontal	W	4	0.025	0.025	1
1993	0	CD	S_019_07273_A	3530232.982	362565.5642	10.053264	2	12/8/2010	10:32	A	12	N	Horizontal	S	5	0.1	5	1
2002	0	CD	S_019_07267_A	3530187.44	362558.2383	7.73328	2	12/8/2010	12:16	A	12	SW	Horizontal	W	4	0.1	4	3
2017	0	CD	S_019_07257_B	3530087.229	362556.9985	4.34997	2	12/8/2010	16:04	B	12	SE	Horizontal	S	6	6	6	1
2018	0	CD	S_019_07256_A	3530080.005	362560.0335	4.929966	2	12/8/2010	16:16	A	12	SE	Horizontal	S	3	0.5	3	1
2024	0	CD	S_RoadD_14479_A	3530131.507	362579.2944	7.443282	3	12/8/2010	11:22	A	12	NE	Horizontal	W	7	1	1	3
2025	0	MD	S_RoadD_14479_B	3530131.056	362579.1768	7.443282	1	12/8/2010	11:23	B	12	S	Horizontal	N	1	1	1	1
2026	0	CD	S_RoadD_14477_A	3530079.348	362567.9761	5.123298	1	12/8/2010	11:49	A	12	N	Pointing Down Toward	N	2	2	1	3
2028	0	CD	S_RoadD_14474_A	3530068.103	362561.5887	7.24995	1	12/8/2010	12:11	A	12	N	Horizontal	S	6	4	3	3
2029	0	MD	S_RoadD_14474_B	3530068.514	362561.419	7.24995	1	12/8/2010	12:12	B	12	NW	Horizontal	W	1	1	1	2
2031	0	MD	S_RoadD_14473_A	3530066.877	362560.8823	34.751427	1	12/8/2010	12:48	A	12	NW	Veritical	N	1	1	1	3
2033	0	CD	S_019_07254_A	3530066.373	362561.1152	20.589858	1	12/8/2010	13:52	A	12	S	Horizontal	S	2	1	1	2
2040	0	CD	S_RoadD_14464_A	3529916.876	362552.5539	33.446436	1	12/9/2010	9:59	A	12	N	Horizontal	S	1	1	1	1
2049	0	MD	S_020_07657_A	3530014.895	362491.8477	6.573288	1	12/9/2010	11:36	A	12	W	Horizontal	S	2	1	1	2
2062	0	MD	S_020_07665_A	3530069.805	362495.2681	14.306568	2	12/9/2010	8:58	A	12	E	Horizontal	W	3	1	0.3	1
2083	0	MD	S_011_04189_B	3530232.421	362998.5853	9.279936	2	12/13/2010	9:11	B	12	N	Horizontal	N	2	1	0.5	1
2099	0	MD	S_024_09015_A	3529357.169	362266.4873	10.343262	1	12/13/2010	14:36	A	12	N	Horizontal	W	2	1	1	1
2110	0	MD	S_010_03838_A	3529162.754	363069.4682	14.02	2	12/13/2010	10:42	A	12	NE	Horizontal	S	2	0.5	0.2	1
2119	0	MD	S_036_11403_A	3529126.894	361592.4573	8.313276	2	12/13/2010	16:28	A	12	W	Horizontal	N	1	0.5	1	1
2120	0	MD	S_036_11403_B	3529126.871	361592.5865	8.313276	1	12/13/2010	16:32	B	12	W	Horizontal	N	1	0.5	1	1
2126	0	MD	S_017_06353_A	3529328.802	362666.7149	13.919904	3	12/13/2010	14:36	A	12	S	Horizontal	W	1	1	1	5
2147	0	MD	S_021_07959_A	3529606.088	362440.8569	440.023632	1	12/14/2010	9:44	A	12	S	Horizontal	S	12	12	5	1
2149	0	MD	S_022_08340_A	3529570.022	362384.7016	23.828169	1	12/14/2010	11:13	A	12	W	Horizontal	N	1	0.5	0.25	1
2151	0	MD	S_022_08298_A	3529497.143	362382.3291	13.53324	1	12/14/2010	11:46	A	12	W	Horizontal	S	2	2	3	1
2158	0	MD	S_017_06292_B	3529029.609	362671.959	8.21661	2	12/14/2010	8:24	B	12	W			2	0.5	0.5	1
2173	0	CD	S_024_08976_A	3529219.958	362267.5828	19.043202	2	12/14/2010	9:45	A	12	W	Veritical		3	3	0.2	1
2174	0	MD	S_024_08976_B	3529219.842	362267.9944	19.043202	2	12/14/2010	9:46	B	12	S	Horizontal	W	3	0.25	0.25	1
2178	0	MD	S_022_08192_B	3529080.139	362375.3196	4.446636	2	12/14/2010	10:08	B	12	NW	Horizontal	W	2	2	0.3	1
2191	0	CD	S_RoadE_13974_A	3529105.833	363310.118	201.54861	3	12/14/2010	11:51	A	12	W			10000000	10000000	1	1
2194	0	MD	S_010_03886_A	3529566.221	363063.9975	9.67	3	12/14/2010	12:52	A	12	E			2	1	1	1
2196	0	MD	S_013_04761_A	3529302.388	362887.3287	5.22	3	12/14/2010	14:13	A	12	N			1	1	1	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2197	0	MD	S_012_04361_A	3529282.873	362954.6662	5.896626	3	12/14/2010	14:25	A	12	N			1	2	1	1
2199	0	MD	S_003_01368_A	3529192.114	363465.5147	7.73	3	12/14/2010	15:07	A	12	N			1	1	1	1
2214	0	MD	S_006_02588_B	3528466.88	363294.2967	8.6	2	12/15/2010	8:32	B	12	SW	Horizontal	N	5	1	0.2	1
2255	0	MD	S_007_02896_A	3528346.016	363233.1444	13.53	3	12/15/2010	8:41	A	12	E	Horizontal	W	4	1	1	3
2261	0	MD	S_007_02825_A	3528100.862	363235.1006	9.47	3	12/15/2010	9:41	A	12	SW	Horizontal	W	1	1	1	18
2265	0	MD	S_007_02751_A	3527801.129	363239.5705	7.93	3	12/15/2010	11:04	A	12	W	Horizontal	W	1	1	1	9
2266	0	MD	S_007_02737_A	3527750.734	363236.5893	11.7	3	12/15/2010	11:21	A	12	S	Horizontal	S	1	1	1	8
2271	0	MD	S_003_01123_A	3528051.822	363471.2954	5.79996	1	1/4/2011	14:12	A	12	E	Horizontal	N	3	1	0.25	1
2279	0	MD	S_003_01188_A	3528234.688	363473.0182	7.056618	1	1/4/2011	15:48	A	12	S	Horizontal	N	6	2	0.5	1
2280	0	MD	S_003_01202_A	3528278.075	363474.0249	5.606628	1	1/4/2011	15:58	A	12	N	Horizontal	N	6	0.5	0.5	1
2283	0	MD	S_003_01087_A	3527911.781	363462.6664	1088.072496	1	1/4/2011	13:12	A	12	N	Horizontal	N	7	12	3	1
2290	0	MD	S_008_03158_B	3528277.525	363183.2813	7.83	3	1/4/2011	14:06	B	12	W			3	1	1	1
2306	0	MD	S_003_01273_A	3528472.202	363471.1602	30.643122	2	1/5/2011	8:45	A	12	N	Horizontal	N	5	1	0.2	1
2307	0	MD	S_003_01294_A	3528545.278	363466.7024	5.896626	1	1/5/2011	8:59	A	12	NE	Horizontal	W	4	0.75	0.2	1
2321	0	MD	N_074_05741_A	3529794.777	361912.6033	8.684951	1	1/6/2011	9:41	A	12	SW	Horizontal	W	1	0.5	0.5	1
2323	0	MD	N_074_05749_A	3529782.157	361909.7191	7.407658	1	1/6/2011	10:09	A	12	S	Horizontal	W	2	0.5	0.5	3
2341	0	MD	N_074_05750_A	3529671.252	361895.0458	7.406024	1	1/6/2011	15:34	A	12	NE	Horizontal	W	3	2	0.5	1
2350	0	MD	N_075_05791_B	3529892.764	361824.9031	12.622328	2	1/6/2011	9:30	B	12	NW	Horizontal		2	1	0.3	1
2353	0	MD	N_075_05806_B	3529888.861	361824.4812	7.869055	2	1/6/2011	9:41	B	12	E	Horizontal	N	2	1	0.3	1
2355	0	MD	N_076_05831_A	3529885.759	361805.3564	33.763314	2	1/6/2011	9:50	A	12	N	Horizontal	N	5	1.5	1.5	1
2358	0	MD	N_075_05786_A	3529848.247	361823.1281	18.073804	2	1/6/2011	10:05	A	12	NW	Horizontal	E	3	0.5	0.3	1
2359	0	MD	N_075_05786_B	3529848.339	361823.0627	18.073804	2	1/6/2011	10:06	B	12	NW			1	1	0.3	1
2363	0	MD	N_075_05814_A	3529839.722	361819.7839	6.03288	2	1/6/2011	10:22	A	12	N	Horizontal	E	3	0.75	0.3	1
2369	0	MD	N_074_05743_B	3529841.603	361851.2852	8.301129	2	1/6/2011	10:42	B	12	NW			1	0.5	0.3	1
2375	0	MD	N_074_05744_C	3529831.17	361864.4841	7.941608	2	1/6/2011	11:00	C	12	SW			2	0.5	0.3	1
2378	0	MD	N_075_05785_C	3529823.584	361818.2193	20.373995	2	1/6/2011	11:13	C	12	S			2	0.5	0.3	1
2388	0	MD	N_075_05798_C	3529778.539	361844.8789	10.58281	2	1/6/2011	12:15	C	12	E			1	0.5	0.3	1
2394	0	MD	N_075_05821_A	3529695.455	361835.8412	5.287592	2	1/6/2011	12:51	A	12	N			2	0.5	0.5	1
2399	0	MD	N_075_05805_C	3529675.483	361835.2119	8.722925	2	1/6/2011	13:08	C	12	E			1	1	0.3	1
2403	0	MD	N_075_05792_B	3529654.896	361832.0944	12.341279	2	1/6/2011	13:26	B	12	W	Horizontal		1	0.3	0.3	1
2426	0	MD	N_073_05690_A	3529721.276	361947.0826	8.990337	2	1/6/2011	16:23	A	12	E	Horizontal	N	1	0.5	1	4
2427	0	MD	N_073_05665_A	3529725.159	361943.6521	121.591484	2	1/6/2011	16:33	A	12	W	Horizontal	W	4	1	4	1
2430	0	MD	N_076_05836_A	3529866.649	361799.2223	6.929568	3	1/6/2011	9:18	A	12	W			1	2	1	1
2432	0	MD	N_076_05843_A	3529812.456	361790.4638	4.788631	3	1/6/2011	9:40	A	12	E			3	1	1	1
2436	0	MD	N_077_05854_A	3529731.828	361721.4457	7.093628	3	1/6/2011	10:40	A	12	N			3	2	2	1
2438	0	MD	N_077_05848_A	3529790.555	361727.9665	38.968267	3	1/6/2011	11:07	A	12	E			3.5	2	2	1
2439	0	MD	N_077_05858_A	3529797.293	361725.6499	4.6665	3	1/6/2011	11:15	A	12	S			1	1	1	1
2443	0	MD	N_077_05861_A	3529821.446	361723.6693	4.460227	3	1/6/2011	11:52	A	12	W			2	1	1	1
2444	0	MD	N_077_05861_B	3529821.176	361724.608	4.460227	3	1/6/2011	11:54	B	12	N			2	1	1	1
2446	0	CD	N_077_05850_A	3529828.35	361726.7674	10.708949	3	1/6/2011	12:16	A	12	N			1	1	1	1
2447	0	Hot Rock	N_078_05866_A	3529805.082	361669.0774	5.52814	3	1/6/2011	12:26	A	12	N			4	2	1	1
2671	0	MD	S_018_06938_A	3530551.362	362605.8692	6.76662	1	1/7/2011	13:59	A	12	S	Horizontal	S	1	0.25	0.25	3
2673	0	MD	S_018_06937_A	3530540.593	362604.7566	10.053264	1	1/7/2011	14:20	A	12	NW	Horizontal	W	2	1	1	1
2677	0	CD	S_017_06490_A	3530529.87	362662.6159	7.73328	1	1/7/2011	15:21	A	12	E	Horizontal	N	3	0.25	0.25	1
2678	0	CD	S_017_06488_A	3530479.207	362667.8249	334.077696	1	1/7/2011	15:49	A	12	N	Pointing Down Toward	N	12	4	0.5	2
2680	0	CD	S_015_05579_B	3530484.422	362777.0333	3194.666301	3	1/7/2011	13:22	B	12	W	Veritical	W	3	1	1	1
2694	0	MD	N_073_05698_A	3529739.268	361938.5877	7.631557	1	1/7/2011	10:01	A	12	E	Horizontal	E	2	0.5	0.5	3
2696	0	MD	N_078_05864_A	3529742.289	361650.0587	8.795319	3	1/7/2011	9:04	A	12	N			3	1	1	1
2699	0	MD	N_076_05840_A	3529717.429	361768.8858	5.851379	3	1/7/2011	9:32	A	12	E			2	1	1	1
2700	0	MD	N_076_05841_A	3529696.793	361767.7297	5.701418	3	1/7/2011	9:45	A	12	S			4	1	2	1
3224	0	MD		3529934.642	360137.4549	0	2	1/19/2011	10:28	16 5 4	12	W	Horizontal	W	3	3	3	1
3226	0	MD		3529996.322	360061.0102	0	2	1/19/2011	10:58	16 4 01	12	W	Horizontal	W	3	0.5	3	1
3232	0	MD		3530052.822	359986.9301	0	2	1/19/2011	11:48	16 2 01	12	E	Horizontal	W	1.5	0.25	1.5	1
3233	0	MD		3530069.697	359972.1869	0	2	1/19/2011	11:54	16 2 02	12	W	Horizontal	W	2	0.5	2	1
3290	0	CD	N_013_01426_A	3531023.817	362890.2965	6.902295	2	1/20/2011	8:50	A	12	N	Horizontal	E	8	3	3	2
3507	0	MD	N_006_00571_A	3530829.419	363290.6089	4.146823	2	1/21/2011	10:51	A	12	N	Horizontal	N	0.5	0.5	0.5	1
3511	0	MD	N_006_00445_A	3530757.603	363290.281	14.475106	2	1/21/2011	11:43	A	12	SE	Horizontal	W	3	0.2	3	1
3512	0	CD	N_006_00445_B	3530758.508	363289.4203	14.475106	2	1/21/2011	11:46	B	12	N	Horizontal	N	12	0.2	12	1
3515	0	CD	N_005_00373_A	3530718.895	363346.1117	4.123017	2	1/21/2011	12:22	A	12	E	Horizontal	E	0.5	0.5	0.5	1
3516	0	MD	N_005_00336_A	3530752.148	363344.0864	5.747839	2	1/21/2011	13:52	A	12	W	Horizontal	W	0.5	0.5	0.5	1
3524	0	CD	N_003_00158_A	3530671.64	363462.3337	5.120286	2	1/21/2011	15:49	A	12	S	Horizontal	N	8	4	8	3
712	0	MD	N_015_01935_A	3533122.67	362773.1188	4.469245	2	10/27/2010	10:45	A	11	S	Horizontal	W	2	2	0.4	1
799	0	CD	N_00A_05968_A	3532795.681	361727.4866	25.056212	2	11/1/2010	10:38	A	11	SW			6	6	0.01	1
815	0	MD	N_035_04639_B	3532780.017	361647.2699	30.638715	2	11/1/2010	14:08	B	11	N	Horizontal	N	2	1	1	1
893	0	CD	N_034_04528_A	3532728.921	361696.4192	10.527521	2	11/2/2010	14:45	A	11	E	Horizontal	E	9	0.3	0.3	1
1164	0	CD	N_006_00514_A	3531364.201	363287.3565	5.566973	2	11/11/2010	14:39	A	11	S	Horizontal	S	3	1	1	1
2237	0	MD	S_005_02094_A	3528278.231	363354.9322	5.61	2	12/15/2010	10:14	A	11	NE			1	0.5	0.2	1
2361	0	MD	N_075_05789_A	3529844.217	361822.5298	15.020215	2	1/6/2011	10:15	A	11	N	Horizontal	N	3	0.75	0.3	1
2455	0	MD	N_079_05875_A	3529769.668	361608.8089	5.432697	3	1/6/2011	15:45	A	11	NE	Veritical	E	3	0.5	0.5	2
3306	0	MD	N_010_01040_A	3531088.273	363056.5063	4.740099	2	1/20/2011	11:55	A	11	SW	Horizontal	W	2	0.5	0.5	1
85	0	seed	N20_A	3530950.97	362708.3954	0	2	10/4/2010	15:07	A	10	NW	Horizontal	W	10	3	10	1
140	0	RRD	N_009_00864_B	3531643.318	363110.7642	15.657047	2	10/13/2010	11:44	B	10	E	Horizontal	E	3	1	0	1
144	0	RRD	N_009_00829_B	3531674.346	363111.5766	180.428811	2	10/13/2010	12:19	B	10	N		N	3	1	0	1
159	0	CD	N_015_01848_A	3531537.161	362765.5195	9.222107	2	10/13/2010	16:27	A	10	E	Horizontal	E	6	4	1	1
167	0	MD	N_015_01878_A	3531749.095	362777.9641	7.134611	3	10/13/2010	9:15	A	10	W	Horizontal	N	2	2	1	1
271	0	CD	N_0C2_06368_B	3531252.989	361734.4917	7.33278	1	10/12/2010	9:17	B	10	NE	Horizontal	E	7	0.1	0.1	1
280	0	MD	N_035_04677_B	3531223.502	361630.3079	12.355327	1	10/12/2010	10:22	B	10	SE	Horizontal	W	1	0.5	0.5	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
289	0	CD	N_034_04478_A	3531339.521	361686.168	50.470006	1	10/12/2010	12:02	A	10	E	Horizontal	N	8	0.25	0.25	1
290	0	CD	N_034_04478_B	3531339.204	361686.1357	50.470006	1	10/12/2010	12:04	B	10	E	Horizontal	E	6	0.25	0.25	1
291	0	CD	N_034_04478_C	3531339.372	361686.0959	50.470006	1	10/12/2010	12:06	C	10	E	Horizontal	E	10	0.25	0.25	1
434	0	RRD	N_00C_06214_C	3531693.369	363001.9685	5.658417	3	10/18/2010	13:42	C	10	S	Horizontal	N	2	2	1	1
489	0	CD	N_026_03501_B	3531152.245	362148.5057	10.772812	3	10/19/2010	15:26	B	10	N	Horizontal	N	3	1	1	1
690	0	MD	N_015_01860_A	3533100.045	362777.2329	8.217828	2	10/27/2010	11:00	A	10	S	Horizontal	W	1	1	0.4	1
566	0	MD	N_016_02166_B	3533269.142	362718.7383	8.490798	3	10/26/2010	11:31	B	10	NE	Horizontal	N	2	1	1	1
567	0	MD	N_016_02083_A	3533267.401	362718.0752	17.565643	3	10/26/2010	11:46	A	10	S	Horizontal	N	3	3	1	1
574	0	MD	N_016_02196_A	3533198.101	362723.5682	6.383678	3	10/26/2010	15:03	A	10	N	Pointing Down Toward	N	3	1	1	2
704	0	MD	N_020_02945_A	3533290.467	362484.4888	5.681484	2	10/27/2010	14:32	A	10	W	Horizontal	W	3	0.5	0.5	1
794	0	MD	N_033_04364_A	3532806.097	361755.3462	15.095313	2	11/1/2010	9:44	A	10	N	Horizontal	N	2	2.5	0.2	1
822	0	MD	N_034_04578_A	3532634.12	361690.6903	5.922511	2	11/1/2010	15:51	A	10	W	Horizontal	W	2	1	1	1
888	0	MD	N_033_04362_A	3532732.934	361753.6811	15.417293	2	11/2/2010	13:52	A	10	SE	Horizontal	N	5	3	0.2	1
1023	0	CD	N_014_01566_A	3532299.279	362830.896	14.686852	2	11/9/2010	16:08	A	10	SW	Horizontal	N	3	1	1	3
1025	0	MD	N_014_01583_A	3532298.608	362836.634	10.576239	2	11/9/2010	16:41	A	10	E	Horizontal	E	2	1	1	1
1045	0	CD	N_014_01566_A	3532299.279	362830.896	14.686852	2	11/9/2010	16:08	A	10	SW	Horizontal	N	3	1	1	3
1047	0	MD	N_014_01583_A	3532298.608	362836.634	10.576239	2	11/9/2010	16:41	A	10	E	Horizontal	E	2	1	1	1
1093	0	CD	N_009_00881_A	3532217.601	363117.7611	6.988678	2	11/10/2010	12:39	A	10	SW	Horizontal	S	12	0.25	6	1
1161	0	CD	N_008_00760_A	3531821.751	363181.1516	7.499644	2	11/11/2010	14:03	A	10	E	Horizontal	N	24	24	1	1
1162	0	CD	N_008_00691_A	3531821.968	363182.0021	530.764259	2	11/11/2010	14:07	A	10	N	Horizontal	N	24	24	1	1
1296	0	CD	N_0A2_06094_A	3532991.852	362140.1606	6.629909	2	11/8/2010	15:27	A	10	N	Horizontal	E	20	0.3	0.3	1
1368	0	MD	S_015_05275_A	3528221.002	362780.6552	16.43322	2	11/18/2010	11:03	A	10	SE	Horizontal	E	1	0.25	1	1
1373	0	MD	S_010_03766_A	3528430.43	363069.5439	8.22	2	11/18/2010	12:47	A	10	N	Horizontal	N	2	1	2	1
1374	0	MD	S_009_03493_A	3528622.107	363128.4682	5.41	2	11/18/2010	13:14	A	10	NW	Horizontal	W	2	1	2	1
1482	0	MD	S_028_10372 _A	3528178.419	362054.3632	5.896626	2	11/16/2010	10:54	A	10	S	Horizontal	N	3	1	0.3	1
1483	0	MD	S_028_10368 _A	3528163.305	362052.9988	34.026432	2	11/16/2010	11:15	A	10	W	Horizontal		3	3	3	1
1487	0	MD	S_029_10583 _A	3528139.507	361965.7474	35.573088	2	11/16/2010	12:07	A	10	N	Horizontal	N	3	1	0.3	1
1495	0	MD	S_026_09746 _A	3528069.642	362151.6922	6.863286	2	11/16/2010	14:21	A	10	W	Horizontal	W	3	0.5	0.5	1
1547	0	MD	S_027_10054_A	3527821.637	362107.407	12.759912	2	11/17/2010	12:51	A	10	N	Horizontal	N	1	0.25	1	1
1618	0	MD	S_013_04587_A	3528240.872	362890.7303	38.52	2	11/21/2010	9:43	A	10	S	Horizontal	S	5	1	5	1
1637	0	MD	S_017_06260_B	3528813.867	362672.8661	14.548233	2	11/21/2010	12:32	B	10	N	Horizontal	N	3	2	0.3	1
1771	0	CD	S_006_02672_A	3529870.295	363290.0161	393.24	2	12/2/2010	16:02	A	10	SW	Horizontal	E	72	0.2	72	1
1874	0	MD	S_035_11282_A	3528427.208	361646.1107	4.736634	2	12/6/2010	12:51	A	10	N	Horizontal	W	1	1	0.2	1
2007	0	CD	S_019_07263_A	3530144.595	362559.562	13.436574	2	12/8/2010	14:10	A	10	NE	Horizontal	E	20	3	20	1
2015	0	CD	S_019_07258_A	3530108.15	362555.3072	10.198263	2	12/8/2010	15:48	A	10	SE	Horizontal	N	4	0.2	4	1
2053	0	MD	S_020_07661_A	3530050.987	362492.5801	7.056618	1	12/9/2010	12:10	A	10	SW	Pointing Down Toward	W	1	1	1	3
2086	0	CD	S_006_02678_A	3529991.792	363290.6024	4.54	2	12/13/2010	9:51	A	10	N	Horizontal	S	1.5	0.3	0.3	1
2087	0	MD	S_003_01403_A	3529446.168	363464.6163	5.8	2	12/13/2010	12:58	A	10	NE			1	0.4	0.4	1
2108	0	MD	S_009_03549_A	3529206.102	363121.0789	21.75	2	12/13/2010	10:27	A	10	N			3	1	1	1
2144	0	MD	S_026_09922_A	3529434.037	362149.0223	4.639968	3	12/13/2010	13:09	A	10	NE			2	1	1	3
2148	0	MD	S_021_07932_A	3529581.068	362438.6773	65.24955	1	12/14/2010	10:20	A	10	E	Horizontal	W	8	9	6	1
2157	0	MD	S_017_06292_A	3529029.671	362671.3678	8.21661	2	12/14/2010	8:23	A	10	S	Horizontal	E	3	1	0.3	1
2186	0	MD	S_031_10875_A	3529223.199	361879.2101	32.286444	2	12/14/2010	12:18	A	10	NW	Horizontal	W	4	1.5	1.5	1
2225	0	MD	S_005_02133_A	3528398.018	363349.6982	16.67	2	12/15/2010	9:21	A	10	NW	Horizontal	N	5	1	0.2	1
2231	0	MD	S_006_02535_A	3528323.35	363294.121	4.88	2	12/15/2010	9:53	A	10	N	Horizontal	W	3	1	0.2	1
2235	0	MD	S_005_02102_B	3528300.825	363355.6168	4.54	2	12/15/2010	10:02	B	10	W			1	1	0.3	1
2240	0	MD	S_006_02503_A	3528224.198	363295.6854	13.87	1	12/15/2010	10:26	A	10	E	Horizontal	E	3	1	0.2	1
2259	0	MD	S_007_02848_A	3528183.573	363235.1657	6.19	3	12/15/2010	9:22	A	10	SE	Horizontal	N	1	1	1	3
2299	0	MD	S_010_03743_B	3528299.255	363067.9922	4.06	3	1/4/2011	15:46	B	10	N			3	1	1	1
2303	0	MD	S_009_03471_A	3528412.762	363117.4975	6.19	3	1/4/2011	16:19	A	10	N			2	1	1	1
2314	0	MD	S_004_01674_A	3528406.748	363411.349	5.993292	1	1/5/2011	10:47	A	10	N			3	1	0.2	1
2342	0	MD	N_074_05755_A	3529662.389	361891.9115	6.386453	1	1/6/2011	15:49	A	10	SW	Horizontal	W	4	3	1	1
2347	0	MD	N_075_05780_A	3529910.346	361829.9199	28.79573	2	1/6/2011	9:13	A	10	N	Horizontal	N	4	1	0.2	1
2419	0	MD	N_075_05809_C	3529625.077	361843.427	6.77799	2	1/6/2011	14:15	C	10	S			0.5	0.5	0.3	1
3235	0	MD		3530113.131	359959.5825	0	2	1/19/2011	12:12	16 2 04	10	E	Horizontal	W	1	0.5	1	1
145	0	RRD	N_009_00829_C	3531673.825	363111.5298	180.428811	2	10/13/2010	12:21	C	9	W	Horizontal	W	1	1	0.5	1
163	0	CD	N_018_02574_A	3531682.756	362604.9764	22.776463	2	10/13/2010	17:38	A	9	W	Horizontal	E	18	0.5	0.5	1
326	0	MD	N_012_01286_A	3531820.342	362946.4546	6.449793	1	10/14/2010	11:03	A	9	E	Horizontal	N	2	2	0.1	1
401	0	CD	N_010_00962_A	3531741.158	363057.0347	20.443045	2	10/18/2010	12:47	A	9	SE	Horizontal	N	6	2	0.5	3
685	0	MD	N_014_01550_A	3533156.026	362828.6752	20.61104	2	10/27/2010	10:08	A	9	S	Horizontal		3	2	0.4	1
540	0	MD	N_015_01792_A	3533273.348	362773.079	20.659331	2	10/26/2010	13:27	A	9	E	Horizontal	E	1	1	1	10
551	0	MD	N_015_01756_C	3533299.962	362779.9154	42.91783	2	10/26/2010	10:19	C	9	SE	Horizontal	S	3	1	1	1
558	0	MD	N_016_02021_B	3533295.38	362719.7194	67.159156	3	10/26/2010	9:59	B	9	N	Horizontal	N	5	2	1	4
710	0	MD	N_011_01138_A	3533109.224	363001.4942	9.783453	2	10/27/2010	15:45	A	9	E	Horizontal	E	2	1	1	1
818	0	MD	N_035_04787_A	3532727.181	361638.0713	4.421209	2	11/1/2010	15:01	A	9	N	Horizontal	E	2	1	1	1
1166	0	CD	N_006_00497_A	3531312.2	363294.3557	6.379047	2	11/11/2010	15:04	A	9	W	Horizontal	N	4	0.5	0.5	1
1376	0	MD	S_012_04295_A	3528595.778	362952.2197	8.506608	2	11/18/2010	13:46	A	9	E	Horizontal	W	2.5	1	0.3	1
1410	0	MD	S_016_05864_B	3528959.772	362717.918	6.669954	3	11/22/2010	11:39	B	9	NW			1	1	1	1
1578	0	MD	S_015_05261_A	3528090.255	362772.584	22.813176	2	11/17/2010	15:38	A	9	N	Horizontal	S	3	1	0.3	1
1593	0	MD	S_017_06219_A	3528484.135	362673.8658	12.953244	1	11/21/2010	11:19	A	9	S			3	2	2	1
1624	0	MD	S_013_04625_A	3528441.739	362898.6726	5.99	2	11/21/2010	10:12	A	9	S	Horizontal	E	2.5	0.5	0.3	1
1642	0	MD	S_016_05850_A	3528816.248	362731.8562	6.573288	2	11/21/2010	13:06	A	9	W	Horizontal	W	2.5	0.3	0.3	1
1720	0	CD	N_025_03373_A	3531015.323	362208.0981	11.746492	3	12/1/2010	10:43	A	9	SE			2	1	1	1
1793	0	MD	S_063_12471_A	3528754.749	360097.2364	4.253304	2	11/23/2010	9:40	A	9	SE			3	1	1	1
1842	0	Hot Rock	S_075_12707_A	3528566.144	359660.334	12.759912	3	11/29/2010	10:36	A	9	N			8	7	5	1
2352	0	MD	N_075_05806_A	3529888.321	361823.6861	7.869055	2	1/6/2011	9:40	A	9	NW	Horizontal	W	3	0.5	0.3	1
2377	0	MD	N_075_05785_B	3529823.401	361818.3551	20.373995	2	1/6/2011	11:11	B	9	S			2	1	0.3	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2379	0	MD	N_075_05830_A	3529817.967	361820.3466	4.057964	2	1/6/2011	11:49	A	9	W			2	0.5	0.5	1
2392	0	MD	N_075_05826_B	3529755.41	361844.6132	4.784505	2	1/6/2011	12:31	B	9	SE			2	0.5	0.3	1
3314	0	MD	N_009_00897_A	3531042.198	363119.341	5.237029	2	1/20/2011	14:36	A	9	SW	Pointing Down Toward	S	2	0.5	0.5	3
86	0	MD	N_018_02591_C	3531013.502	362618.7981	11.301438	2	10/4/2010	15:18	A	8	S	Horizontal	N	1	1	1	1
143	0	MD	N_009_00829_A	3531674.071	363111.8779	180.428811	2	10/13/2010	12:16	A	8	N	Horizontal	E	5	1	0	1
168	0	MD	N_015_01836_A	3531758.126	362780.0103	10.917052	3	10/13/2010	9:35	A	8	N	Horizontal	N	2	1	1	1
172	0	MD	N_015_01838_B	3531806.009	362775.2567	10.581471	3	10/13/2010	10:41	B	8	NE	Horizontal	E	2	1	1	3
238	0	CD	N_024_03305_A	3531498.384	362262.5112	5.298523	2	10/6/2010	11:26	A	8	W	Horizontal	E	6	4	4	1
252	0	Hot Rock	N_0C2_06423_B	3531309.744	362152.3798	4.462017	3	10/6/2010	10:36	B	8	SE	Horizontal	W	2	2	2	1
264	0	RRD	N_0C2_06321_C	3531322.102	362214.8806	16.183343	3	10/6/2010	15:19	C	8	NE	Horizontal	E	1	1	1	1
295	0	CD	N_036_04840_A	3531320.878	361585.9964	34.990569	1	10/12/2010	12:45	A	8	SE	Horizontal	N	6	0.25	0.25	1
310	0	CD	N_027_03648_B	3531360.573	362091.5006	5.803423	3	10/12/2010	9:13	B	8	NW	Veritical	N	3	1	1	1
311	0	MD	N_029_03869_A	3531350.453	361982.9999	14.77441	3	10/12/2010	9:27	A	8	N	Horizontal	N	4	1	1	3
315	0	RRD	N_030_03999_B	3531261.409	361912.9418	7.581814	3	10/12/2010	10:56	B	8	N	Horizontal	N	3	1	1	1
406	0	CD	N_013_01414_A	3531799.451	362889.8322	8.029688	2	10/18/2010	13:35	A	8	N	Horizontal	N	5	4	4	1
417	0	MD	N_017_02469_A	3531786.062	362663.8924	5.137467	3	10/18/2010	9:21	A	8	E	Horizontal	S	1	1	1	2
424	0	CD	N_017_02271_A	3531793.871	362659.0429	277.482057	3	10/18/2010	9:42	A	8	W	Horizontal	E	100	1	1	1
432	0	MD	N_00C_06214_A	3531693.532	363002.0551	5.658417	3	10/18/2010	13:39	A	8	S	Pointing Down Toward	E	3	1	1	1
436	0	MD	N_00C_06214_E	3531693.883	363002.4453	5.658417	3	10/18/2010	13:44	E	8	N	Horizontal	N	1	1	1	1
452	0	MD	N_011_01164_B	3531721.756	363004.3727	5.902367	3	10/18/2010	15:03	B	8	SE	Horizontal	N	1	1	1	1
460	0	MD	N_015_01925_B	3531141.052	362780.277	4.70987	1	10/19/2010	10:41	B	8	E	Horizontal	W	0.75	0.75	0.75	1
478	0	CD	N_031_04074_A	3531113.738	361866.1449	31.235093	3	10/19/2010	14:04	A	8	NE	Pointing Down Toward	N	24	1	1	1
483	0	CD	N_031_04102_A	3531394.669	361856.6891	10.405529	3	10/19/2010	16:25	A	8	W	Horizontal	S	56	1	1	1
683	0	MD	N_013_01431_A	3533163.299	362890.837	6.357055	2	10/27/2010	9:48	A	8	S	Horizontal	S	3	1	0.3	1
703	0	MD	N_020_02952_A	3533273.947	362491.5159	5.259963	2	10/27/2010	14:26	A	8	E	Horizontal	W	2.5	1	0.2	1
554	0	MD	N_016_02008_A	3533296.835	362720.3763	91.174383	3	10/26/2010	9:31	A	8	NE	Horizontal	N	4	1	1	5
555	0	MD	N_016_02008_B	3533296.97	362720.0669	91.174383	3	10/26/2010	9:33	B	8	N	Horizontal	N	1	1	1	17
560	0	MD	N_016_02076_A	3533285.569	362720.4133	19.667337	3	10/26/2010	11:04	A	8	SE	Horizontal	N	3	1	1	9
564	0	MD	N_016_02176_B	3533279.921	362720.6166	7.566717	3	10/26/2010	11:20	B	8	S	Horizontal	N	1	1	1	2
568	0	MD	N_016_02083_B	3533267.58	362718.4408	17.565643	3	10/26/2010	11:49	B	8	E	Horizontal	N	1	1	1	5
577	0	MD	N_016_02072_A	3533206.366	362723.0149	20.564556	3	10/26/2010	15:39	A	8	N	Horizontal	N	5	4	1	2
625	0	MD	N_016_01988_B	3533323.837	362727.736	193.823692	3	10/22/2010	12:08	B	8	S	Horizontal	N	1	1	1	8
626	0	CD	N_016_01988_C	3533323.632	362727.8212	193.823692	3	10/22/2010	12:11	C	8	SE	Horizontal	N	3	3	1	2
628	0	MD	N_016_01983_B	3533319.347	362730.0911	220.738207	3	10/22/2010	12:14	B	8	N	Horizontal	E	3	1	1	1
630	0	MD	N_016_01988_D	3533323.624	362727.6063	193.823692	3	10/22/2010	12:48	D	8	S	Horizontal	N	3	3	3	1
639	0	MD	N_016_01955_C	3533309.867	362726.2646	5121.236998	3	10/22/2010	14:05	C	8	E	Horizontal	N	2	1	1	5
719	0	MD	N_017_02325_A	3533266.596	362660.3802	27.599696	3	10/27/2010	11:24	A	8	S	Horizontal	E	4	1	1	3
761	0	MD	N_016_01983_A	3533319.467	362729.2152	220.738207	3	10/28/2010	12:34	A	8	SW	Horizontal	N	2	1	1	3
766	0	MD	N_016_02039_A	3533308.618	362723.7797	40.136461	3	10/28/2010	12:57	A	8	NW	Veritical	E	1	1	1	4
793	0	MD	N_033_04398_A	3532794.947	361753.9492	7.328486	2	11/1/2010	9:36	A	8	N	Horizontal	W	3	0.5	0.2	1
796	0	MD	N_033_04357_A	3532810.733	361755.7338	17.850269	2	11/1/2010	9:55	A	8	N	Horizontal	N	3	1	0.1	1
801	0	CD	N_00A_06046_A	3532776.414	361696.1994	4.437013	2	11/1/2010	11:45	A	8	N	Horizontal		0.3	0.3	0.3	1
811	0	MD	N_035_04658_A	3532772.303	361660.5771	15.911703	2	11/1/2010	12:45	A	8	N	Horizontal	N	3	2	0.01	1
882	0	MD	N_033_04347_A	3532561.841	361754.982	26.032398	2	11/2/2010	11:45	A	8	S	Horizontal	S	1	0.5	4	1
890	0	MD	N_033_04421_A	3532670.794	361740.6181	5.772997	2	11/2/2010	14:13	A	8	E	Horizontal	N	3	1.5	0.2	1
892	0	MD	N_034_04506_A	3532668.738	361691.1606	16.579226	2	11/2/2010	14:35	A	8	N	Horizontal	N	3	1	1	1
931	0	MD	N_033_04345_A	3533035.714	361744.3567	28.489831	2	11/3/2010	10:59	A	8	N	Horizontal	N	4	2	4	1
951	0	CD	N_00C_06223_C	3531967.372	361878.2905	4.770261	3	11/3/2010	16:36	C	8	N	Veritical	S	2	2	1	1
965	0	CD	N_017_02379_A	3532946.194	362660.4159	10.913709	2	11/4/2010	10:04	A	8	N	Horizontal	W	6	4	4	1
971	0	MD	N_034_04567_A	3532050.984	361698.3711	6.494513	3	11/4/2010	9:07	A	8	S	Horizontal	N	2	1	1	2
973	0	MD	N_032_04230_A	3531967.852	361793.5435	12.613308	3	11/4/2010	9:31	A	8	SE	Horizontal	S	1	1	1	3
976	0	MD	N_032_04272_A	3531946.451	361792.9081	5.797582	3	11/4/2010	9:46	A	8	S	Horizontal	S	2	1	1	1
983	0	Hot Rock	N_030_03961_B	3531864.04	361922.6173	15.336997	3	11/4/2010	10:26	B	8	N	Horizontal	S	1	1	1	3
1012	0	MD	N_028_03769_A	3532070.943	362038.1292	6.265936	3	11/9/2010	9:49	A	8	N			2	1	1	1
1020	0	CD	N_017_02510_A	3532281.715	362654.948	4.239075	2	11/9/2010	14:31	A	8	S	Horizontal	S	0.5	0.5	0.5	1
1041	0	CD	N_017_02510_A	3532281.715	362654.948	4.239075	2	11/9/2010	14:31	A	8	S	Horizontal	S	0.5	0.5	0.5	1
1335	0	Hot Rock	N_00C_06184_B	3532164.405	361672.8671	12.57509	3	11/8/2010	13:50	B	8	S	Horizontal	S	1	1	1	3
1339	0	MD	N_036_04899_A	3532295.389	361576.0503	10.14187	3	11/8/2010	14:46	A	8	S	Horizontal	N	3	1	1	2
1113	0	MD	N_007_00606	3531141.371	363232.2226	50.723617	3	11/10/2010	11:03	A	8	N			21	3	3	1
1114	0	MD	N_006_00504	3531145.662	363287.3319	6.019924	3	11/10/2010	15:07	B	8	NW	Horizontal	N	2	1	1	1
1117	0	MD	N_006_00486	3531133.817	363288.3831	7.039249	3	11/10/2010	15:37	B	8	W	Veritical	E	3	1	1	1
1144	0	MD	N_012_01230_A	3531984.169	362940.4648	27.551631	2	11/11/2010	10:46	A	8	W	Horizontal	W	2	1	0.3	1
1151	0	CD	N_005_00327_A	3531332.808	363344.2344	6.590999	2	11/11/2010	12:14	A	8	E			3	0.1	0.1	1
1163	0	CD	N_006_00525_A	3531340.782	363289.1725	5.314279	2	11/11/2010	14:25	A	8	N	Horizontal	N	4	0.5	0.5	8
1195	0	MD	N_006_00453_B	3531370.008	363286.9307	11.618208	3	11/11/2010	14:31	B	8	E	Horizontal	N	1	1	1	1
1199	0	CD	N_006_00484_A	3531346.451	363287.7095	7.113604	3	11/11/2010	14:53	A	8	W	Pointing Down Toward	S	4	1	1	3
1237	0	MD	S_025_09217_A	3528009.196	362209.9788	8.119944	2	11/15/2010	12:51	A	8	N	Horizontal	N	1	0.2	1	1
1267	0	MD	S_025_09159_A	3527293.222	362208.4074	6.089958	3	11/15/2010	14:32	A	8	S	Pointing Down Toward	W	3	1	1	1
1379	0	MD	S_016_05816_5	3528625.843	362734.0249	6.573288	2	11/18/2010	14:15	5	8	E	Horizontal	W	3	1	0.3	1
1412	0	MD	S_015_05369_A	3528965.733	362784.4391	10.101597	3	11/22/2010	12:07	A	8	N			2	2	1	1
1481	0	MD	S_028_10373 _A	3528207.979	362049.8427	7.104951	2	11/16/2010	10:38	A	8	N	Horizontal	N	3	0.5	0.5	1
1521	0	MD	S_028_10282_A	3527410.546	362042.5429	5.509962	3	11/16/2010	15:28	A	8	SE	Horizontal	W	2	1	1	3
1533	0	MD	S_026_09705_A	3527675.228	362158.4599	33.543102	2	11/17/2010	9:13	A	8	W	Horizontal	W	1	0.2	1	8
1536	0	MD	S_028_10314_A	3527743.145	362051.6707	6.089958	2	11/17/2010	9:56	A	8	NW	Horizontal	W	1	0.25	1	1
1541	0	MD	S_028_10320_A	3527821.154	362047.6654	5.026632	2	11/17/2010	11:26	A	8	N	Horizontal	N	1	0.25	1	1
1577	0	MD	S_014_04923_A	3528108.481	362832.954	16.05	2	11/17/2010	15:18	A	8	W	Horizontal	W	3	0.5	0.5	1
1623	0	MD	S_014_04985_A	3528404.825	362833.4657	4.54	2	11/21/2010	10:07	A	8	W	Horizontal	W	2	2	0.3	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1697	0	MD	S_008_03306_A	3530610.746	363189.8124	278.688078	3	11/30/2010	12:52	A	8	E			21.6	3	3	1
1732	0	Hot Rock	N_029_03864_B	3530780.919	361981.9106	18.198708	3	12/1/2010	12:47	B	8	N			3	2	2	1
1760	0	MD	S_009_03598_A	3529708.662	363116.5016	4.35	2	12/2/2010	11:37	A	8	W	Horizontal	S	1	0.3	0.3	1
1838	0	Hot Rock	S_075_12681_A	3528436.619	359639.7302	12.953244	3	11/29/2010	9:41	A	8	N			5	6	3	1
1840	0	Hot Rock	S_075_12690_A	3528523.11	359651.4757	17.88321	3	11/29/2010	9:59	A	8	N			6	6	2	1
1843	0	Hot Rock	S_074_12644_A	3528566.764	359729.4791	10.053264	3	11/29/2010	11:00	A	8	S			3	7	4	1
1869	0	MD	S_100_13287_B	3527434.757	361939.2449	7.346616	2	12/6/2010	10:58	B	8	NW	Horizontal		3	1	0.3	1
1870	0	MD	S_100_13286_A	3527433.095	361939.5143	7.24995	2	12/6/2010	11:05	A	8	W			1	0.2	0.2	1
1871	0	MD	S_099_13314_A	3527711.382	361862.1209	15.659892	2	12/6/2010	11:21	A	8	NW	Horizontal	N	1	1	0.3	1
1879	0	CD	S_037_11451_B	3528936.301	361540.5006	6.863286	2	12/6/2010	15:19	B	8	W	Horizontal	W	4	2	2	1
1928	0	CD	S_040_11613_A	3528945.334	361360.5503	80.812776	2	12/7/2010	12:38	A	8	N	Horizontal	S	4	3	3	1
1930	0	MD	S_041_11665_A	3528955.163	361309.5535	44.079696	2	12/7/2010	12:58	A	8	NW	Horizontal	N	2	2	2	1
1932	0	MD	S_041_11664_A	3528938.987	361304.2315	4.688301	2	12/7/2010	13:08	A	8	W	Horizontal	S	3	0.5	0.5	1
1962	0	MD	N_080_05885_A	3529849.272	361274.1184	19.151889	2	12/8/2010	8:50	A	8	NE	Veritical	W	3	1	1	1
1997	0	MD	S_019_07271_B	3530213.922	362560.0046	14.306568	2	12/8/2010	11:03	B	8	E	Horizontal	W	0.2	0.2	0.2	1
2005	0	CD	S_019_07265_A	3530154.504	362559.9148	6.28329	2	12/8/2010	12:53	A	8	NE	Horizontal	S	2	0.1	2	12
2009	0	CD	S_019_07262_A	3530139.529	362558.2201	29.386464	2	12/8/2010	14:27	A	8	SW	Horizontal	S	25	0.5	25	1
2012	0	CD	S_019_07261_A	3530130.421	362556.9412	54.422958	2	12/8/2010	14:45	A	8	N	Horizontal	W	12	0.2	12	1
2020	0	MD	S_RoadD_14482_A	3530153.318	362582.7164	4.929966	1	12/8/2010	10:51	A	8	NE	Pointing Down Toward	S	3	1	1	1
2022	0	CD	S_RoadD_14480_A	3530137.282	362580.543	5.79996	1	12/8/2010	11:08	A	8	S	Horizontal	W	8	1	1	4
2032	0	MD	S_019_07254_B	3530066.471	362561.5044	20.589858	1	12/8/2010	13:50	B	8	SE	Horizontal	W	1	1	1	6
2046	0	MD	S_020_07654_A	3529968.111	362492.9452	11.793252	1	12/9/2010	11:14	A	8	N	Horizontal	N	4	1	1	1
2050	0	MD	S_020_07658_A	3530037.691	362492.6663	8.893272	1	12/9/2010	11:52	A	8	S	Horizontal	W	2	1	1	1
2057	0	CD	S_018_06912_B	3529916.945	362605.4452	6.379956	1	12/9/2010	14:28	B	8	NE	Horizontal	E	10	1	1	1
2064	0	MD	S_020_07667_A	3530077.973	362494.9372	15.853224	2	12/9/2010	9:22	A	8	N	Horizontal	N	4	1	0.3	1
2070	0	MD	S_020_07672_A	3530100.545	362493.0503	5.31663	2	12/9/2010	10:49	A	8	N	Horizontal	W	2	0.5	0.5	1
2122	0	CD	S_036_11413_A	3529155.774	361594.7678	34.896426	2	12/13/2010	16:48	A	8	NW	Horizontal	N	4	0.1	4	1
2131	0	MD	S_012_04439_A	3529761.577	362948.4766	4.543302	3	12/13/2010	16:17	A	8	W	Horizontal	S	1	1	1	4
2152	0	MD	S_022_08285_A	3529447.968	362378.9191	7.24995	1	12/14/2010	12:06	A	8	N	Horizontal	N	3	2	0.5	1
2167	0	MD	S_021_07829_A	3529205.156	362434.9899	4.446636	2	12/14/2010	9:23	A	8	N	Horizontal	S	5	1	0.3	1
2168	0	MD	S_021_07829_B	3529204.813	362435.4454	4.446636	2	12/14/2010	9:24	B	8	SE	Horizontal	E	2	2	0.3	1
2177	0	MD	S_022_08192_A	3529079.626	362375.6242	4.446636	2	12/14/2010	10:07	A	8	S	Pointing Down Toward	S	3	1	0.3	1
2182	0	MD	S_032_10981_A	3528913.611	361809.2793	23.731503	2	12/14/2010	11:33	A	8	W	Horizontal	W	3	1	0.3	1
2211	0	MD	S_005_01980_A	3527974.249	363350.615	11.79	2	12/14/2010	16:34	A	8	N			2	0.5	0.2	1
2212	0	MD	S_006_02607_A	3528537.615	363289.3157	7.44	2	12/15/2010	8:21	A	8	N	Horizontal	W	3	0.5	0.2	1
2221	0	MD	S_005_02149_A	3528448.469	363355.4112	23.78	2	12/15/2010	9:03	A	8	N	Pointing Down Toward	S	4	2	0.4	1
2232	0	MD	S_006_02535_B	3528323.474	363293.759	4.88	2	12/15/2010	9:54	B	8	NW			2	0.5	0.2	1
2257	0	MD	S_007_02871_A	3528252.588	363238.6537	5.22	3	12/15/2010	9:00	A	8	SW	Horizontal	E	2	1	1	5
2263	0	MD	S_007_02798_A	3528006.088	363238.1341	9.96	3	12/15/2010	10:45	A	8	W	Horizontal	S	3	2	1	3
2264	0	MD	S_007_02769_A	3527885.951	363235.6723	13.63	3	12/15/2010	10:55	A	8	S	Pointing Down Toward	S	1	1	1	12
2348	0	MD	N_075_05822_A	3529899.864	361825.4601	5.028761	2	1/6/2011	9:22	A	8	SW			1	1	0.3	1
2373	0	MD	N_074_05744_A	3529831.834	361864.3728	7.941608	2	1/6/2011	10:58	A	8	NW	Horizontal	E	3	2	0.2	1
2374	0	MD	N_074_05744_B	3529831.275	361864.3208	7.941608	2	1/6/2011	10:59	B	8	S			2	1	0.3	1
2393	0	MD	N_075_05801_A	3529715.209	361839.1704	9.665278	2	1/6/2011	12:43	A	8	SW			0.5	0.5	0.3	1
2398	0	MD	N_075_05805_B	3529675.623	361835.3285	8.722925	2	1/6/2011	13:07	B	8	SE	Horizontal	W	2	0.3	0.3	1
2412	0	MD	N_075_05782_B	3529626.259	361841.5698	25.535091	2	1/6/2011	14:02	B	8	SE			1	0.5	0.3	1
2415	0	MD	N_075_05783_B	3529625.577	361842.2616	22.501611	2	1/6/2011	14:08	B	8	NE			2	0.5	0.3	1
2421	0	MD	N_073_05708_B	3529693.902	361947.9164	5.320844	2	1/6/2011	15:43	B	8	N	Horizontal	N	1	0.5	1	1
2685	0	MD	S_015_05571_A	3530447.065	362776.7129	8.554941	3	1/7/2011	14:14	A	8	N	Horizontal	N	0.5	0.5	0.5	3
2688	0	MD	S_015_05569_A	3530434.2	362777.0428	8.21661	3	1/7/2011	14:57	A	8	E	Horizontal	S	1	0.5	0.5	3
3286	0	RRD	N_013_01453_A	3531046.951	362890.0366	4.925087	2	1/20/2011	8:22	A	8	NE			1	1	0.2	3
3293	0	MD	N_012_01246_A	3531107.727	362945.275	12.385117	2	1/20/2011	9:49	A	8	NW	Horizontal	N	1.5	1	0.3	1
3303	0	CD	N_0C1_06248_A	3531040.607	362998.7823	15.373031	2	1/20/2011	11:34	A	8	N			4	0.3	0.3	3
3311	0	MD	N_010_01042_A	3530906.187	363057.2546	4.72275	2	1/20/2011	12:34	A	8	NE	Veritical		5	1.5	1.5	1
488	0	MD	N_030_03930_B	3531049.989	361921.4931	138.502184	3	10/19/2010	14:30	B	7	W	Horizontal	N	2	1	1	1
824	0	MD	N_034_04540_A	3532647.559	361689.9233	8.94464	2	11/1/2010	16:05	A	7	W	Horizontal	W	3	1	1	2
898	0	MD	N_034_04480_A	3532876.774	361681.8715	49.59632	2	11/2/2010	16:32	A	7	S	Horizontal	E	6	2	0.4	1
970	0	CD	N_018_02639_A	3532922.474	362603.8529	4.653446	2	11/4/2010	11:49	A	7	S	Horizontal	W	3	1	1	1
1013	0	Hot Rock	N_028_03769_B	3532071.147	362038.2322	6.265936	3	11/9/2010	9:50	B	7	N			2	4	1	1
1026	0	RRD	N_014_01583_B	3532299.574	362836.3437	10.576239	2	11/9/2010	16:42	B	7	N	Horizontal	N	2	2	1	1
1044	0	Hot Rock	N_014_01599_A	3532298.294	362830.3771	9.27175	2	11/9/2010	15:56	A	7	N	Horizontal		0	0	0	1
1048	0	RRD	N_014_01583_B	3532299.574	362836.3437	10.576239	2	11/9/2010	16:42	B	7	N	Horizontal	N	2	2	1	1
1332	0	CD	N_034_04547_A	3532138.259	361692.961	8.348213	3	11/8/2010	13:01	A	7	N			5	1	1	1
1110	0	CD	N_008_00708	3531224.577	363174.1351	34.884181	3	11/10/2010	9:35	B	7	E			3	1	1	1
1258	0	MD	S_025_09134_A	3527158.437	362198.0615	6.089958	3	11/15/2010	12:35	A	7	S			1	1	1	1
1260	0	Hot Rock	S_025_09129_A	3527134.335	362229.049	6.76662	3	11/15/2010	12:49	A	7	S			2	2	1	1
1585	0	MD	S_020_07459_A	3528838.875	362489.6691	18.84987	3	11/22/2010	9:43	A	7	W			1	1	1	1
1600	0	MD	S_018_06659_B	3528424.062	362612.2177	37.844739	1	11/21/2010	12:17	B	7	N			3	2	1	1
1690	0	MD	S_004_01828_C	3530614.504	363411.3141	12.759912	3	11/30/2010	10:47	C	7	S			1	1	1	1
1899	0	MD	S_017_06125_B	3527125.455	362672.6584	19.284867	3	12/6/2010	10:46	B	7	SW			3	1	1	1
2096	0	MD	S_018_06801_A	3529316.267	362600.3488	37.409742	1	12/13/2010	11:40	A	7	NW	Horizontal	N	1	2	0.5	1
2133	0	MD	S_010_03910_A	3529779.256	363060.4281	5.51	3	12/13/2010	16:42	A	7	S	Horizontal	W	1	1	1	4
2170	0	MD	S_022_08226_A	3529242.37	362380.5483	8.69994	2	12/14/2010	9:32	A	7	NE	Horizontal	W	2	0.5	0.5	1
2192	0	MD	S_RoadE_13977_A	3529169.622	363308.2059	5.79996	3	12/14/2010	12:09	A	7	NE			4	3	1	1
2252	0	MD	S_006_02385_A	3527866.349	363296.2266	10.25	2	12/15/2010	11:34	A	7	N	Horizontal	N	2	0.5	0.3	1
2294	0	MD	S_008_03106_A	3528056.876	363181.0196	14.31	3	1/4/2011	14:53	A	7	S			1	1	1	1
2376	0	MD	N_075_05785_A	3529823.138	361817.7242	20.373995	2	1/6/2011	11:10	A	7	NW	Veritical	S	2	0.5	0.5	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2396	0	MD	N_075_05784_A	3529682.178	361835.1699	21.354693	2	1/6/2011	12:59	A	7	N	Horizontal	N	3	1	0.3	1
2402	0	MD	N_075_05792_A	3529654.95	361832.3919	12.341279	2	1/6/2011	13:25	A	7	N	Horizontal	W	4	1	0.3	1
3285	0	RRD	N_013_01390_A	3531048.66	362890.2147	13.038505	2	1/20/2011	8:14	A	7	N			1	1	0.2	3
3315	0	MD	N_009_00897_B	3531042.644	363119.2339	5.237029	2	1/20/2011	14:37	B	7	NE			1	1	1	1
30	0	CD	N_025_03410_A	3531163.793	362208.0115	5.186335	3	9/30/2010	12:27	A	6	S	Horizontal	N	5	2	3	3
87	0	RRD	N_018_02591_D	3531014.044	362618.1161	11.301438	2	10/4/2010	15:21	B	6	W	Horizontal	S	0	0	0	1
88	0	MD	N_014_01495_A	3531743.818	362834.886	264.953668	1	10/13/2010	9:14	A	6	N	Horizontal	W	4	2	0.05	1
102	0	MD	N_014_01525_B	3531831.641	362833.5597	61.484704	1	10/13/2010	11:48	B	6	N	Veritical	N	1	1	0.5	1
105	0	CD	N_014_01578_A	3531843.785	362833.2069	11.616449	1	10/13/2010	12:46	A	6	N	Horizontal	E	24	0.5	24	1
121	0	MD	N_013_01336_B	3531879.518	362858.7275	146.329657	1	10/13/2010	16:30	B	6	W	Horizontal	N	2.5	0.05	2.5	1
129	0	MD	N_013_01355_C	3531823.14	362893.8246	30.973924	1	10/13/2010	17:18	C	6	N	Horizontal	N	2.5	0.5	2.5	1
148	0	MD	N_010_01050_A	3531690.622	363052.9238	4.209857	2	10/13/2010	14:18	A	6	S	Horizontal	E	4	1	1	1
161	0	MD	N_016_02185_A	3531644.025	362721.7033	7.135925	2	10/13/2010	16:57	A	6	N	Horizontal	E	4	1	1	1
182	0	MD	N_017_02512_A	3531851.191	362658.4228	4.161009	3	10/13/2010	15:39	A	6	N	Horizontal	E	2	1	1	3
184	0	MD	N_017_02286_A	3531844.828	362664.0186	91.923521	3	10/13/2010	16:11	A	6	N	Horizontal	W	3	3	3	1
185	0	CD	N_017_02286_B	3531845.207	362664.6433	91.923521	3	10/13/2010	16:13	B	6	N	Horizontal	N	2	1	1	3
188	0	CD	N_017_02307_C	3531833.988	362666.0416	46.970974	3	10/13/2010	16:43	C	6	NW	Horizontal	N	2	1	1	1
189	0	MD	N_017_02343_A	3531828.76	362663.1165	18.899686	3	10/13/2010	16:57	A	6	N	Horizontal	N	3	1	1	3
221	0	CD	N_0C2_06294_B	3531248.35	361568.9914	43.163372	1	10/6/2010	15:45	B	6	S	Horizontal	N	3	3	2	1
233	0	MD	N_021_03011_A	3531433.575	362435.4717	47.088568	2	10/6/2010	9:11	A	6	N	Horizontal	N	5	4	0	1
250	0	RRD	N_0C2_06434_B	3531286.575	362154.2499	4.062912	3	10/6/2010	9:56	B	6	W	Horizontal	W	3	1	1	1
258	0	CD	N_025_03443_A	3531378.663	362207.0737	4.033418	3	10/6/2010	13:46	A	6	S	Horizontal	N	3	3	1	1
292	0	MD	N_035_04664_A	3531349.285	361638.7743	14.40746	1	10/12/2010	12:20	A	6	W	Horizontal	N	8	1	0.2	1
299	0	MD	N_063_05396_B	3531303.491	361536.0394	19.321265	1	10/12/2010	15:28	B	6	S	Horizontal	W	2.5	0.5	0.5	1
301	0	MD	N_063_05396_D	3531303.088	361536.2163	19.321265	1	10/12/2010	15:32	D	6	S	Horizontal	N	2.5	0.5	0.5	1
309	0	RRD	N_027_03648_A	3531361.052	362091.4508	5.803423	3	10/12/2010	9:11	A	6	N	Horizontal	N	1	1	1	2
317	0	CD	N_036_04816_A	3531366.862	361586.1136	84.859044	3	10/12/2010	12:10	A	6	S	Horizontal	W	24	1	1	1
318	0	MD	N_036_04816_B	3531366.684	361586.0152	84.859044	3	10/12/2010	12:12	B	6	S	Horizontal	N	1	1	1	3
320	0	CD	N_034_04462_A	3531711.765	361687.0493	317.512475	3	10/12/2010	16:04	A	6	W	Horizontal	W	200	1	1	1
331	0	RRD	N_012_01204_a	3531838.973	362944.0519	175.082986	1	10/14/2010	11:36	a	6	N	Horizontal	W	1200	0.25	0.25	1
335	0	CD	N_010_00948_A	3531792.008	363056.0835	32.411106	1	10/14/2010	12:25	A	6	E	Horizontal	N	2	0.1	0.1	1
346	0	CD	N_017_02320_A	3531818.955	362663.6443	30.942022	2	10/14/2010	10:06	A	6	S	Horizontal	E	24	1	1	3
347	0	MD	N_017_02313_A	3531816.976	362667.6357	41.678186	3	10/14/2010	10:25	A	6	S	Horizontal	S	2	1	1	3
349	0	CD	N_017_02346_A	3531807.982	362670.2165	17.807974	3	10/14/2010	11:18	A	6	S	Horizontal	N	2	1	1	3
350	0	MD	N_017_02346_B	3531808.01	362670.1147	17.807974	3	10/14/2010	11:19	B	6	NE	Horizontal	S	2	1	1	2
351	0	MD	N_018_02593_A	3531820.38	362607.2649	11.08724	3	10/14/2010	11:37	A	6	N	Horizontal	N	3	1	1	3
352	0	MD	N_018_02556_A	3531875.51	362604.4756	46.312792	3	10/14/2010	11:51	A	6	N	Horizontal	W	12	3	1	3
386	0	CD	N3_A	3531719.688	363226.2007	0	1	10/18/2010	14:55	A	6	NW	Horizontal	N	12	5	5	1
387	0	CD	N_008_00777_A	3531703.701	363176.6143	5.92758	1	10/18/2010	15:26	A	6	N	Horizontal	N	4	0.05	0.05	1
391	0	CD	N_00C_06179_B	3531694.767	363303.598	16.109359	1	10/18/2010	16:18	B	6	S	Horizontal	N	3	2	3	1
419	0	CD	N_017_02469_C	3531786.528	362663.4004	5.137467	3	10/18/2010	9:24	C	6	W	Horizontal	S	2	1	1	2
422	0	MD	N_017_02391_B	3531792.861	362659.3731	9.721701	3	10/18/2010	9:37	B	6	S	Horizontal	N	1	1	1	1
426	0	CD	N_017_02249_B	3531794.867	362658.9271	6252.683529	3	10/18/2010	9:57	B	6	SW	Horizontal	E	100	1	1	1
429	0	MD	N_00C_06182_A	3531692.894	363020.4011	14.735647	3	10/18/2010	12:32	A	6	N	Pointing Down Toward	E	3	1	1	1
435	0	CD	N_00C_06214_D	3531693.82	363001.9763	5.658417	3	10/18/2010	13:43	D	6	N	Horizontal	E	1	1	1	1
440	0	MD	N_012_01260_D	3531704.47	362950.8866	10.286921	3	10/18/2010	14:01	D	6	N	Horizontal	N	1	1	1	1
443	0	RRD	N_012_01300_A	3531720.323	362962.0161	5.291177	3	10/18/2010	14:17	A	6	NW	Horizontal	N	2	2	1	3
445	0	MD	N_012_01275_A	3531723.682	362962.2874	7.833627	3	10/18/2010	14:35	A	6	N	Horizontal	N	2	1	1	1
447	0	RRD	N_012_01275_C	3531723.529	362962.2439	7.833627	3	10/18/2010	14:38	C	6	W	Horizontal	N	2	2	1	1
450	0	MD	N_012_01274_C	3531747.505	362951.8566	7.840387	3	10/18/2010	14:52	C	6	SW	Horizontal	W	2	1	1	1
451	0	MD	N_011_01164_A	3531722.11	363004.3406	5.902367	3	10/18/2010	15:02	A	6	N	Horizontal	S	2	1	1	2
477	0	MD	N_032_04217_A	3531310.438	361808.6765	19.261558	3	10/19/2010	9:56	A	6	N	Horizontal	N	3	2	1	3
479	0	MD	N_026_03490_A	3531113.413	362151.9059	14.26669	3	10/19/2010	15:10	A	6	W	Horizontal	N	1	1	1	3
480	0	MD	N_026_03490_B	3531113.572	362151.7869	14.26669	3	10/19/2010	15:12	B	6	NW	Horizontal	N	1	1	1	2
481	0	MD	N_026_03501_A	3531151.712	362149.0019	10.772812	3	10/19/2010	15:25	A	6	N	Horizontal	N	1	1	1	2
485	0	CD	N_032_04314_A	3531402.142	361803.3959	4.350767	3	10/19/2010	11:54	A	6	E	Horizontal	S	2	1	1	2
486	0	CD	N_036_04850rw_A	3531551.591	361582.9958	26.425164	3	10/19/2010	12:34	A	6	N	Horizontal	N	3	3	1	3
676	0	MD	N_011_01069_A	3533151.032	362999.016	91.230674	1	10/27/2010	15:28	A	6	W	Horizontal	N	8	3	0.5	1
684	0	MD	N_014_01602_A	3533162.051	362829.6988	8.940446	2	10/27/2010	9:59	A	6	S	Horizontal	S	3	0.5	0.5	1
701	0	MD	N_019_02705_A	3533287.003	362546.9867	23.775006	2	10/27/2010	14:15	A	6	S	Horizontal	W	3	1	0.2	1
494	0	MD	N_0A1_06064_A	3533109.517	362472.844	20.847426	3	10/20/2010	15:51	A	6	N	Horizontal	N	5	3	1	1
497	0	MD	N_019_02797_B	3533136.262	362547.372	5.309373	3	10/20/2010	16:09	B	6	N	Horizontal	N	1	1	1	1
552	0	MD	N_015_01738_B	3533297.928	362778.8508	72.532077	2	10/26/2010	10:50	B	6	SE	Horizontal	E	3	2	2	1
556	0	CD	N_016_02008_C	3533297.018	362720.1387	91.174383	3	10/26/2010	9:34	C	6	N	Horizontal	N	1	1	1	3
563	0	MD	N_016_02176_A	3533280.058	362720.7253	7.566717	3	10/26/2010	11:19	A	6	SE	Horizontal	N	4	3	1	1
571	0	MD	N_016_02108_A	3533261.8	362715.9526	14.150198	3	10/26/2010	12:23	A	6	SW	Horizontal	N	4	2	1	2
572	0	MD	N_016_02108_B	3533261.857	362716.2567	14.150198	3	10/26/2010	12:25	B	6	S	Horizontal	N	2	1	1	1
575	0	MD	N_016_02140_A	3533200.17	362724.0248	10.683957	3	10/26/2010	15:17	A	6	S	Horizontal	N	3	1	1	2
608	0	CD	N_00A_06028_B	3533001.52	363123.8087	6.2	1	10/22/2010	14:51	B	6	N	Horizontal	N	3	2	0.005	1
614	0	CD	N_015_01809_A	3532901.924	362778.4834	15.443788	2	10/22/2010	10:40	A	6	W	Horizontal	W	24	0.25	24	1
615	0	MD	N_015_01822_A	3532933.458	362776.6538	12.731473	2	10/22/2010	10:57	A	6	N	Horizontal	N	1	0.25	1	1
620	0	MD	N_013_01415_A	3533264.031	362888.3101	7.901318	2	10/22/2010	14:39	A	6	NW	Horizontal	N	0.5	0.25	0.5	1
624	0	MD	N_016_01988_A	3533323.89	362728.0798	193.823692	3	10/22/2010	12:06	A	6	N	Horizontal	N	6	3	1	2
633	0	MD	N_016_02001_A	3533314.332	362727.7986	131.047659	3	10/22/2010	12:54	A	6	W	Pointing Down Toward	N	4	1	1	1
636	0	CD	N_016_02001_D	3533313.893	362727.5203	131.047659	3	10/22/2010	12:58	D	6	SE	Horizontal	N	3	1	1	2
640	0	MD	N_016_01955_D	3533309.862	362726.0873	5121.236998	3	10/22/2010	14:06	D	6	S	Horizontal	N	4	1	1	5
641	0	MD	N_016_02039_A	3533308.067	362725.2508	40.13646	3	10/22/2010	14:18	A	6	N	Horizontal	N	3	2	1	3

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
642	0	MD	N_016_02028_A	3533301.488	362724.7544	52.360417	3	10/22/2010	15:28	A	6	S	Horizontal	N	7	3	1	2
646	0	CD	N_008_00715_A	3533027.653	363177.6452	29.74734	1	10/27/2010	9:36	A	6	N	Horizontal	N	14	1	0.005	1
660	0	CD	N11	3533119.225	363169.489	0	1	10/27/2010	11:53	A	6	NW	Horizontal	N	12	6	6	1
661	0	MD	N_009_00918_A	3533135.534	363118.6506	4.307109	1	10/27/2010	12:21	A	6	W	Horizontal	W	2.5	2	1	1
665	0	CD	N_010_00936	3533156.225	363061.1252	63.065842	1	10/27/2010	13:01	A	6	W	Horizontal	W	3	3	0.005	1
666	0	CD	N_010_00936	3533156.157	363061.1959	63.065842	1	10/27/2010	13:05	B	6	W	Pointing Down Toward	W	4	1.5	0.005	1
667	0	RRD	N_010_00936	3533156.151	363061.3602	63.065842	1	10/27/2010	13:07	C	6	W	Horizontal	W	4	1	0.005	1
668	0	CD	N_010_00979_A	3533181.678	363061.4626	11.358173	1	10/27/2010	13:48	A	6	W	Horizontal	W	12	0.005	0.005	1
717	0	MD	N_017_02365_A	3533268.637	362660.8507	12.929683	3	10/27/2010	10:59	A	6	N	Horizontal	N	2	1	1	2
729	0	MD	N_017_02419_A	3533189.83	362653.5411	7.062986	3	10/27/2010	14:21	A	6	S	Horizontal	N	2	1	1	1
733	0	MD	N_0A1_06068_A	3533089.855	362975.7806	12.844758	3	10/27/2010	15:41	A	6	E	Horizontal	S	3	2	1	1
737	0	CD	N_011_01130_A	3533026.618	363003.428	10.470545	1	10/28/2010	9:58	A	6	N	Horizontal	W	8	2	8	1
740	0	CD	N_008_00730_A	3532994.386	363173.8923	14.154215	1	10/28/2010	11:15	A	6	E	Horizontal	E	11	0.005	0.005	1
744	0	CD	N_013_01378_A	3532996.123	362887.7581	17.063472	1	10/28/2010	14:07	A	6	W	Horizontal	W	2.5	0.005	0.005	1
753	0	CD	N_015_01809_A	3532902.598	362777.8662	15.443788	2	10/28/2010	12:45	A	6	N	Horizontal	N	24	0.1	0	1
754	0	RRD	N_015_01797_A	3532980.016	362775.4321	19.541455	2	10/28/2010	13:16	A	6	N	Horizontal	N	1	1	1	1
755	0	CD	N_014_01651_A	3532931.348	362826.2909	5.313682	2	10/28/2010	14:08	A	6	W	Horizontal	W	1	0.1	1	1
759	0	MD	N_016_01988_A	3533324.556	362726.7823	193.823693	3	10/28/2010	12:16	A	6	W	Pointing Down Toward	N	1	1	1	1
765	0	MD	N_016_01955_A	3533311.202	362724.9159	5121.236998	3	10/28/2010	12:49	A	6	SW	Pointing Down Toward	N	3	2	1	3
767	0	propellant	N_016_02039_B	3533308.602	362723.8555	40.136461	3	10/28/2010	12:58	B	6	N	Horizontal	S	1	1	1	1
775	0	CD	N_042_05133_A	3532947.229	361244.3199	3.889706	1	11/1/2010	10:07	A	6	W	Horizontal	W	2	0.005	0.005	1
783	0	MD	N_0A4_06134_A	3533047.099	361525.2297	6.184386	1	11/1/2010	13:46	A	6	SE	Horizontal	W	2	1	1	1
786	0	MD	N_036_04853_A	3533021.512	361569.1188	24.541591	1	11/1/2010	14:28	A	6	N	Horizontal	N	4	2	0.5	1
787	0	MD	N_036_04853_B	3533021.063	361568.9853	24.541591	1	11/1/2010	14:30	B	6	S	Horizontal	S	1	0.25	0.25	1
788	0	MD	N_038_05058_A	3532884.605	361460.4682	10.175867	1	11/1/2010	14:55	A	6	NW	Horizontal	N	2	2	0.5	1
797	0	MD	N_033_04407_A	3532821.218	361746.1081	6.280377	2	11/1/2010	10:02	A	6	N	Horizontal	S	1.5	1.5	0.3	1
826	0	MD	N_026_03531_A	3532643.89	362155.4109	6.362799	3	11/1/2010	9:55	A	6	W			3	1	2	2
827	0	MD	N_026_03531_B	3532643.807	362155.3081	6.362799	3	11/1/2010	10:00	B	6	W			2	2	1	1
828	0	MD	N_026_03491_A	3532646.137	362155.0271	13.491173	3	11/1/2010	10:16	A	6	N			3	2	1	1
830	0	CD	N_026_03505_A	3532706.363	362153.1653	9.102753	3	11/1/2010	11:28	A	6	N	Horizontal	N	1	1	1	1
836	0	CD	N_025_03334_A	3532697.433	362203.5661	61.526319	3	11/1/2010	12:48	A	6	S	Horizontal	E	60	1	1	1
844	0	CD	N_028_03718_A	3532701.331	362035.4402	17.08159	3	11/1/2010	15:13	A	6	S	Horizontal	S	3	1	1	3
857	0	MD	N_036_04847_A	3532828.994	361568.1637	28.193951	1	11/2/2010	11:07	A	6	E	Horizontal	E	6	1	1	1
877	0	MD	N_035_04796_A	3532591.031	361630.7159	4.219132	2	11/2/2010	10:20	A	6	E	Horizontal	W	0.5	0.2	0.5	1
901	0	CD	N_029_03842_A	3532656.361	361973.9348	98.913269	3	11/2/2010	10:05	A	6	E			500	1	1	1
907	0	Hot Rock	N_030_04062_A	3532714.161	361894.7495	4.173537	3	11/2/2010	14:09	A	6	N	Horizontal	S	2	2	2	3
908	0	CD	N_031_04079_A	3532673.367	361874.2919	19.818502	3	11/2/2010	14:20	A	6	N	Horizontal	S	5	1	1	2
913	0	MD	N_032_04177_A	3532635.961	361799.0224	109.037425	3	11/2/2010	16:11	A	6	N	Horizontal	S	3	3	2	1
917	0	MD	N_036_04946_A	3532945.254	361580.8392	6.211203	1	11/3/2010	10:32	A	6	W	Horizontal	N	2.5	4	0.025	1
923	0	MD	N_0A3_06116_A	3532827.228	362114.1147	7.595887	1	11/3/2010	12:56	A	6	W	Horizontal	N	4	1	1	1
929	0	MD	N_033_04420_A	3532919.365	361746.2154	5.821791	2	11/3/2010	10:30	A	6	E	Horizontal	E	5	1	5	1
934	0	CD	N_032_04268_A	3532951.45	361836.9199	6.141866	2	11/3/2010	12:56	A	6	N	Horizontal	N	5	0.1	5	1
937	0	MD	N_032_04327_A	3532623.294	361806.5694	4.027106	3	11/3/2010	10:09	A	6	E			3	1	1	1
938	0	MD	N_032_04300_A	3532611.193	361797.5257	4.719023	3	11/3/2010	10:18	A	6	N			1	1	1	1
940	0	MD	N_032_04229_A	3532850.564	361816.4232	12.979044	3	11/3/2010	11:48	A	6	E			2	2	2	1
943	0	MD	N_031_04087_A	3532873.636	361859.9643	13.301879	3	11/3/2010	12:29	A	6	N			2	2	2	1
948	0	Hot Rock	N_029_03915_A	3532003.862	361974.3106	4.40584	3	11/3/2010	16:09	A	6	N	Horizontal	N	3	3	2	3
963	0	Hot Rock	N_017_02446_A	3532818.293	362660.5378	5.919429	2	11/4/2010	9:32	A	6	W			0	0	0	1
977	0	Hot Rock	N_032_04272_B	3531946.819	361793.1516	5.797582	3	11/4/2010	9:47	B	6	N	Horizontal	S	1	1	1	3
981	0	Hot Rock	N_033_04331_D	3531943.688	361749.2654	934.457857	3	11/4/2010	10:05	D	6	W	Horizontal	N	2	1	1	3
982	0	MD	N_030_03961_A	3531863.483	361922.6417	15.336997	3	11/4/2010	10:25	A	6	S	Horizontal	S	2	1	1	2
984	0	MD	N_030_03974_A	3531862.787	361922.7595	10.24876	3	11/4/2010	10:34	A	6	N	Horizontal	N	2	1	1	1
985	0	Hot Rock	N_030_03974_B	3531862.401	361922.778	10.24876	3	11/4/2010	10:36	B	6	S	Horizontal	S	2	2	1	3
986	0	Hot Rock	N_030_04015_A	3531793.469	361920.2438	5.690776	3	11/4/2010	10:48	A	6	N	Horizontal	E	2	1	1	1
989	0	CD	N_030_03950_A	3531781.671	361919.4805	19.444124	3	11/4/2010	11:49	A	6	N	Horizontal	E	24	2	2	3
995	0	CD	N_040_05102_A	3532722.196	361342.6023	6.538551	2	11/9/2010	8:45	A	6	W	Horizontal	W	4	1	4	1
1007	0	Hot Rock	N_025_03433_A	3532006.159	362202.938	4.357693	3	11/9/2010	8:46	A	6	S			1	4	2	1
1008	0	CD	N_026_03454_A	3531972.423	362146.4907	503.696267	3	11/9/2010	9:04	A	6	W			12	2	1	1
1011	0	Hot Rock	N_028_03799_A	3532080.543	362042.4651	4.876269	3	11/9/2010	9:39	A	6	N			2	3	3	1
1014	0	CD	N_002_00103_A	3533197.688	363515.1494	4.095797	1	11/9/2010	13:11	A	6	W	Veritical	W	8	0.005	0.005	1
1018	0	MD	N_007_00603_B	3532821.855	363214.3505	54.360908	1	11/9/2010	16:38	B	6	S	Horizontal	W	0.5	0.5	0.5	1
1028	0	CD	N_002_00103_A	3533197.688	363515.1494	4.095797	1	11/9/2010	13:11	A	6	W	Veritical	W	8	0.005	0.005	1
1039	0	MD	N_007_00603_B	3532821.855	363214.3505	54.360908	1	11/9/2010	16:38	B	6	S	Horizontal	W	0.5	0.5	0.5	1
1072	0	CD	N_00B_06138_B	3532423.417	363479.2371	28.468138	1	11/10/2010	11:50	B	6	E	Horizontal	E	3	0.025	0.025	1
1079	0	CD	N_00B_06159_A	3532440.826	363255.8543	5.204051	1	11/10/2010	16:31	A	6	E	Horizontal	E	24	8	0.025	1
1080	0	MD	N_014_01686_A	3532298.664	362838.8904	4.088973	2	11/10/2010	8:21	A	6	S	Horizontal	S	0.5	0.1	0.5	1
1081	0	MD	N_014_01683_A	3532283.48	362829.7284	4.109091	2	11/10/2010	8:37	A	6	S	Horizontal	S	0.5	0.2	0.5	1
1311	0	CD	N_031_04144_A	3533082.633	361838.0821	4.897402	2	11/8/2010	11:58	A	6	S	Horizontal	W	6	3	6	1
1314	0	MD	N_036_04863_A	3533233.774	361571.2141	19.738735	2	11/8/2010	12:48	A	6	N	Horizontal	N	1	0.2	1	1
1315	0	CD	N_030_03973_A	3531778.639	361919.3114	10.671243	3	11/8/2010	9:31	A	6	W			1	1	1	1
1317	0	Hot Rock	N_030_03973_C	3531778.135	361919.8137	10.671243	3	11/8/2010	9:34	C	6	NW			2	4	2	1
1322	0	Hot Rock	N_031_04113_C	3531827.979	361861.6902	7.699856	3	11/8/2010	10:14	C	6	S			1	3	2	1
1326	0	Hot Rock	N_032_04317_B	3531850.688	361806.2271	4.242892	3	11/8/2010	10:49	B	6	S			2	2	1	1
1329	0	CD	N_035_04658_B	3531920.946	361628.6968	15.88491	3	11/8/2010	12:07	B	6	NW			6	1	1	1
1333	0	Hot Rock	N_034_04547_B	3532138.177	361692.9017	8.348213	3	11/8/2010	13:03	B	6	NW			4	3	3	1
1336	0	CD	N_00C_06206_A	3532223.87	361625.0665	6.614062	3	11/8/2010	13:59	A	6	S	Horizontal	E	3	1	1	3
1338	0	CD	N_00C_06207_B	3532294.902	361575.8422	6.442619	3	11/8/2010	14:25	B	6	S	Horizontal	N	3	1	1	5

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1343	0	Hot Rock	N_00B_06148_B	3532323.557	361877.2922	7.451847	3	11/8/2010	15:56	B	6	E	Horizontal	S	2	2	1	3
1083	0	MD	N_013_01345_A	3532265.615	362888.6547	38.684096	2	11/10/2010	9:22	A	6	W	Horizontal	W	2	0.25	2	1
1084	0	CD	N_012_01272_A	3532295.836	362950.0136	7.97817	2	11/10/2010	9:41	A	6	N	Horizontal	N	10	0.1	10	1
1087	0	MD	N_012_01217_A	3532269.941	362949.246	48.20408	2	11/10/2010	10:55	A	6	N	Horizontal	N	4	3	4	1
1105	0	CD	N_010_01010	3531241.928	363059.6181	6.861878	3	11/10/2010	8:44	D	6	NE			3	4	1	1
1106	0	MD	N_008_00711	3531222.809	363174.5231	31.768803	3	11/10/2010	9:19	A	6	W			2	2	1	1
1116	0	MD	N_006_00486	3531133.626	363288.5501	7.039249	3	11/10/2010	15:36	A	6	N	Horizontal	S	2	1	1	3
1131	0	CD	N_004_00217_A	3532066.681	363409.3901	9.661425	1	11/11/2010	12:47	A	6	S	Horizontal	S	3.5	0.5	0.025	1
1132	0	RRD	N_004_00188_A	3532007.448	363399.4747	36.281026	1	11/11/2010	13:50	A	6	S	Horizontal	W	10	3	0.025	1
1133	0	CD	N_006_00481_A	3532034.071	363285.6585	7.154868	1	11/11/2010	14:08	A	6	N	Horizontal	N	5	2.5	5	1
1169	0	CD	N_010_00954_A	3531375.268	363058	29.463065	3	11/11/2010	8:47	A	6	W			3	1	1	1
1170	0	CD	N_010_00956_A	3531376.812	363057.913	28.168327	3	11/11/2010	9:08	A	6	E			3	1	1	1
1174	0	CD	N_010_00991_A	3531388.026	363056.0789	9.567367	3	11/11/2010	9:42	A	6	W			3	1	1	1
1176	0	MD	N_011_01103_A	3531333.653	363002.7088	22.154206	3	11/11/2010	10:05	A	6	N			5	3	3	1
1178	0	CD	N_010_00986_A	3531391.068	363056.8277	10.147404	3	11/11/2010	10:42	A	6	E			2	1	1	1
1181	0	CD	N_008_00792_A	3531390.404	363174.9039	5.05811	3	11/11/2010	11:17	A	6	W			3	2	1	1
1185	0	MD	N_006_00471_A	3531498.433	363291.9109	8.131818	3	11/11/2010	12:16	A	6	N			3	2	0	1
1191	0	CD	N_006_00459_A	3531403.779	363288.9031	10.165577	3	11/11/2010	14:00	A	6	S	Horizontal	S	8	8	1	3
1207	0	MD	S_029_10636_A	3528747.135	361969.6582	5.703294	1	11/15/2010	10:52	A	6	S	Horizontal	W	1	0.005	1	1
1209	0	MD	S_029_10626_B	3528721.428	361961.4982	5.219964	1	11/15/2010	11:15	B	6	S	Horizontal	S	1	0.25	1	1
1211	0	MD	S_028_10460_A	3528730.65	362035.3625	4.34997	1	11/15/2010	11:59	A	6	N	Horizontal	W	1	0.25	0.25	1
1214	0	MD	S_028_10450_A	3528684.91	362038.4285	7.829946	1	11/15/2010	12:51	A	6	N	Horizontal	W	9	0.5	0.005	1
1215	0	MD	S_028_10447_A	3528677.948	362038.5588	38.618067	1	11/15/2010	13:14	A	6	N	Horizontal	N	3	1.5	3	1
1217	0	MD	S_028_10441_B	3528656.342	362039.5408	6.186624	1	11/15/2010	14:18	B	6	N	Horizontal	W	1	0.005	0.005	1
1221	0	MD	S_027_10119_B	3528612.275	362093.4869	5.703294	1	11/15/2010	15:42	B	6	N	Horizontal	N	2.5	0.5	0.5	1
1225	0	MD	S_025_09238_A	3528379.722	362208.222	7.443282	2	11/15/2010	9:31	A	6	N	Horizontal	N	1	1	1	1
1235	0	MD	S_025_09224_A	3528058.557	362220.3949	4.446636	2	11/15/2010	12:21	A	6	SE	Horizontal	S	1	0.2	1	1
1248	0	CD	S_021_07719_A	3527036.042	362464.2196	14.209902	3	11/15/2010	9:00	A	6	N			4	2	2	1
1253	0	Hot Rock	S_024_08807_A	3527224.756	362267.2901	5.79996	3	11/15/2010	11:20	A	6	N			24	24	9	1
1262	0	MD	S_025_09126_B	3527066.48	362218.391	9.086604	3	11/15/2010	13:04	B	6	N			1	1	1	1
1266	0	MD	S_025_09153_B	3527268.389	362213.0082	5.31663	3	11/15/2010	14:24	B	6	S	Horizontal	E	1	1	1	2
1280	0	MD	N_048_05256_A	3533099.302	360892.5868	4.026533	1	11/8/2010	12:56	A	6	S	Horizontal	S	1	0.005	0.005	1
1345	0	MD	S_020_07373_A	3528233.784	362501.0963	4.446636	1	11/18/2010	9:11	A	6	SW	Horizontal	W	2	0.5	0.5	1
1357	0	MD	S_019_07054_A	3528534.819	362540.4302	5.896626	1	11/18/2010	12:47	A	6	N	Horizontal	N	1	0.025	0.025	1
1365	0	MD	S_013_04604_A	3528320.205	362892.3768	4.06	2	11/18/2010	9:24	A	6	N	Horizontal	N	0.5	0.2	0.5	1
1370	0	MD	S_013_04622_A	3528427.171	362898.8414	29.58	2	11/18/2010	12:18	A	6	W	Horizontal	E	6	1	6	1
1387	0	Hot Rock	S_023_08515_A	3528877.64	362315.3224	6.863286	3	11/18/2010	9:42	A	6	W			3	5	2	1
1403	0	MD	S_020_07476_A	3529038.726	362520.3296	19.81653	3	11/22/2010	8:59	A	6	W			2	1	1	1
1404	0	MD	S_019_07109_A	3528987.198	362561.233	6.379956	3	11/22/2010	9:17	A	6	NE			3	1	1	1
1408	0	MEC	S_016_05871_A	3529013.291	362726.844	87.047733	3	11/22/2010	11:24	A	6	N	Horizontal	E	4	1	1	1
1409	0	MD	S_016_05864_A	3528958.98	362717.6353	6.669954	3	11/22/2010	11:38	A	6	W			3	1	1	1
1427	0	MD	S_RoadD_14333_A	3529053.612	361110.9235	5.123298	1	11/22/2010	13:15	A	6	SE	Horizontal	W	1	0.025	0.025	1
1469	0	MD	S_025_09251_B	3528586.187	362201.8201	6.186624	1	11/16/2010	12:41	B	6	E	Horizontal	E	4	0.5	0.5	1
1470	0	MD	S_025_09254_A	3528643.6	362211.843	6.28329	1	11/16/2010	13:48	A	6	W	Horizontal	W	1	0.25	0.25	1
1473	0	MD	S_026_09796_A	3528784.614	362134.9275	9.763266	1	11/16/2010	14:48	A	6	N	Horizontal	W	2.5	0.5	0.5	1
1479	0	MD	S_027_10088 _A	3528176.243	362092.5624	4.253304	2	11/16/2010	9:54	A	6	N	Horizontal	N	0.5	0.2	0.5	2
1505	0	CD	S_026_09677_A	3527437.285	362149.2376	2120.36871	3	11/16/2010	9:56	A	6	W			10	1	1	1
1518	0	CD	S_028_10271_A	3527304.32	362048.2084	5.31663	3	11/16/2010	13:39	A	6	N			5	3	5	1
1531	0	MD	S_025_09194_A	3527714.948	362229.0383	22.764843	2	11/17/2010	8:40	A	6	NW	Horizontal	N	3	0.5	3	1
1534	0	MD	S_026_09710_A	3527715.954	362124.8011	14.161569	2	11/17/2010	9:34	A	6	NW	Horizontal	N	4	1	4	1
1540	0	MD	S_027_10051_A	3527794.069	362098.8387	9.569934	2	11/17/2010	11:15	A	6	SW	Horizontal	W	1	0.25	1	2
1549	0	CD	S_022_08104_A	3527572.33	362383.0153	43.306368	3	11/17/2010	9:23	A	6	E			2	2	2	1
1568	0	MD	S_018_06598_A	3528083.933	362612.3411	24.939828	1	11/17/2010	15:15	A	6	E	Horizontal	E	3	2	1	1
1570	0	MD	S_018_06598_C	3528083.878	362612.2804	24.939828	1	11/17/2010	15:19	C	6	SE	Horizontal	N	0.5	0.5	0.5	1
1572	0	MD	S_020_07368_A	3528172.548	362502.1132	23.054841	1	11/17/2010	16:03	A	6	NE	Horizontal	S	3	2	0.5	1
1586	0	MD	S_022_08143_A	3528591.683	362379.8873	19.913196	1	11/21/2010	9:53	A	6	N			4	2	2	1
1588	0	MD	S_020_07437_A	3528642.083	362489.9381	7.056618	1	11/21/2010	10:19	A	6	N			1	1	1	1
1595	0	MD	S_018_06672_B	3528493.152	362603.7615	11.406588	1	11/21/2010	11:41	B	6	W			2	1	1	1
1619	0	MD	S_013_04587_B	3528241.485	362891.1661	38.52	2	11/21/2010	9:45	B	6	N	Horizontal	N	0	0	0	1
1621	0	MD	S_015_05284_A	3528285.622	362782.2365	5.993292	2	11/21/2010	9:57	A	6	S	Horizontal	S	6	0.4	0.4	1
1653	0	MD	S_005_02209_A	3528809.889	363353.5108	6.14	1	11/30/2010	9:03	A	6	N	Horizontal	N	0.5	0.025	0.025	1
1655	0	MD	S_005_02210_B	3528822.738	363353.1987	28.23	1	11/30/2010	9:25	B	6	E	Horizontal	E	1	0.5	0.5	1
1685	0	CD	N_0C1_06253_B	3530768.581	363159.367	8.949986	3	11/30/2010	9:32	B	6	N			3	2	3	1
1687	0	MD	N_003_00165_B	3530583.385	363460.2222	4.40265	3	11/30/2010	10:07	B	6	N			1	1	1	1
1693	0	RRD	N_004_00225_A	3530628.032	363404.5204	7.633648	3	11/30/2010	11:37	A	6	E			2	2	2	1
1695	0	CD	S_006_02697_A	3530635.424	363291.042	5.703294	3	11/30/2010	11:58	A	6	W			3	1	1	1
1708	0	CD	S_018_06933_A	3530385.605	362602.8984	29.579796	1	12/1/2010	12:45	A	6	S	Horizontal	W	4	3	2	1
1711	0	MD	S_016_06016_A	3530180.149	362718.908	5.074965	1	12/1/2010	14:24	A	6	S	Horizontal	W	1	0.5	0.5	1
1715	0	CD	S_012_04447_A	3529924.909	362944.9774	16.723218	1	12/1/2010	15:54	A	6	N	Horizontal	N	18	0.025	0.025	1
1722	0	RRD	N_025_03381_B	3531014.247	362208.0443	8.789088	3	12/1/2010	10:57	B	6	NW			2	1	1	1
1723	0	CD	N_025_03374_A	3531005.777	362207.0669	11.70662	3	12/1/2010	11:04	A	6	NW			3	1	1	1
1724	0	CD	N_025_03412_A	3531003.634	362206.266	4.992004	3	12/1/2010	11:16	A	6	W			3	1	1	1
1727	0	MD	N_026_03564_A	3530952.117	362149.8936	4.472633	3	12/1/2010	11:59	A	6	N			3	1	1	1
1728	0	Hot Rock	N_026_03564_B	3530952.117	362149.8744	4.472633	3	12/1/2010	12:00	B	6	N			2	2	2	1
1729	0	Hot Rock	N_026_03568_A	3530944.125	362148.0179	4.300157	3	12/1/2010	12:13	A	6	N			2	2	1	1
1731	0	MD	N_029_03864_A	3530780.56	361981.9128	18.198708	3	12/1/2010	12:45	A	6	N			2	2	2	1
1733	0	Hot Rock	N_030_04009_A	3530877.809	361930.4867	6.044167	3	12/1/2010	13:00	A	6	N			3	4	2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1765	0	CD	S_003_01416_A	3529598.966	363458.6909	14.31	2	12/2/2010	12:53	A	6	E	Horizontal	E	6	2	0.2	1
1767	0	MD	S_005_02266_A	3529716.442	363350.1278	4.45	2	12/2/2010	14:20	A	6	NW	Horizontal	W	3	1	3	1
1769	0	CD	S_004_01777_A	3529786.097	363408.0009	4.25	2	12/2/2010	15:25	A	6	S	Horizontal	W	1	1	1	1
1772	0	CD	S_006_02673_A	3529916.14	363292.4821	17.21	2	12/2/2010	16:10	A	6	S	Horizontal	W	420	0.2	420	1
1773	0	MD	S_003_01428_A	3529913.652	363459.3712	4.54	2	12/2/2010	16:23	A	6	NE	Horizontal	W	0.5	0.2	0.5	1
1785	0	MD	S_045_11787_A	3529117.705	361069.8989	7.829946	1	11/23/2010	12:06	A	6	N	Horizontal	N	2.5	0.5	0.5	1
1823	0	CD	S_079_12939_A	3528246.11	359423.5005	55.486284	1	11/29/2010	9:53	A	6	S	Pointing Down Toward	S	12	6	1	1
1839	0	MD	S_075_12684_A	3528488.463	359649.2749	25.326492	3	11/29/2010	9:51	A	6	N			2	1	1	1
1878	0	CD	S_037_11451_A	3528936.49	361541.6325	6.863286	2	12/6/2010	15:18	A	6	E	Horizontal	E	8	4	4	1
1887	0	CD	S_020_07323_A	3527168.022	362504.7689	9.6666	3	12/6/2010	9:19	A	6	S			2	1	1	1
1888	0	CD	S_019_06966_A	3527184.985	362561.6288	22.764843	3	12/6/2010	9:36	A	6	N			12	1	1	1
1898	0	CD	S_017_06125_A	3527125.549	362672.487	19.284867	3	12/6/2010	10:45	A	6	SW			24	18	1	1
1912	0	CD	S_022_08111_A	3527754.712	362386.359	10.729926	3	12/6/2010	16:21	A	6	S	Horizontal	N	12	12	1	1
1915	0	MD	S_RoadE_13944_A	3527793.33	362838.5389	5.848293	1	12/7/2010	9:18	A	6	SW	Horizontal	W	1	0.25	0.25	1
1917	0	MD	S_RoadE_13945_A	3527796.012	362836.9168	6.669954	1	12/7/2010	9:41	A	6	W	Veritical	N	0.25	0.25	0.25	1
1919	0	MD	S_RoadE_13946_A	3527800.866	362833.8594	21.26652	1	12/7/2010	10:40	A	6	E	Horizontal	W	1.5	0.5	0.5	1
1941	0	MD	S_048_11972_A	3529328.886	360886.2634	13.774905	2	12/7/2010	16:36	A	6	N	Horizontal	W	3	0.5	0.5	1
1954	0	MD	S_015_05247_A	3527729.195	362784.3413	5.026632	3	12/7/2010	14:20	A	6	N	Horizontal	S	1	1	1	9
1955	0	MD	S_016_05695_A	3527712.679	362739.0694	8.21661	3	12/7/2010	14:31	A	6	S	Horizontal	W	1	1	1	6
1969	0	CD	S_RoadD_14485_A	3530175.673	362587.7646	4.446636	1	12/8/2010	9:42	A	6	S	Horizontal	S	1.5	0.5	0.5	1
1992	0	MD	S_019_07274_A	3530237.944	362565.2178	5.026632	2	12/8/2010	10:16	A	6	S	Horizontal	S	0.5	0.5	0.5	30
1994	0	CD	S_019_07272_A	3530226.237	362561.2829	21.26652	2	12/8/2010	10:43	A	6	N	Pointing Down Toward	S	4	0.1	4	3
1995	0	MD	S_019_07272_B	3530224.866	362561.025	21.26652	2	12/8/2010	10:46	B	6	S	Horizontal	S	0.5	0.5	0.5	20
1996	0	RRD	S_019_07271_A	3530214.484	362559.7516	14.306568	2	12/8/2010	11:00	A	6	NE	Horizontal	S	3	2	3	1
2000	0	CD	S_019_07268_A	3530192.448	362558.5775	8.69994	2	12/8/2010	12:04	A	6	N	Horizontal	W	4	2	4	1
2003	0	CD	S_019_07266_A	3530160.334	362560.4653	9.763266	2	12/8/2010	12:31	A	6	SE	Horizontal	S	5	3	5	3
2004	0	CD	S_019_07266_B	3530160.97	362559.5898	9.763266	2	12/8/2010	12:35	B	6	NW	Horizontal	W	2	0.1	2	9
2010	0	CD	S_019_07262_B	3530140.474	362558.7268	29.386464	2	12/8/2010	14:30	B	6	NE	Horizontal	W	8	4	8	1
2013	0	MD	S_019_07260_A	3530124.653	362556.3241	11.986584	2	12/8/2010	15:02	A	6	NW	Horizontal	W	3	0.53	0	1
2014	0	CD	S_019_07259_A	3530109.723	362555.6793	23.973168	2	12/8/2010	15:16	A	6	E	Horizontal	W	3	1	3	1
2016	0	CD	S_019_07257_A	3530088.373	362556.6282	4.34997	2	12/8/2010	16:01	A	6	N	Horizontal	N	3	0.5	3	1
2019	0	CD	S_019_07256_B	3530079.804	362559.2311	4.929966	2	12/8/2010	16:23	B	6	W	Horizontal	S	3	0.5	3	2
2041	0	MD	S_RoadD_14464_B	3529916.23	362551.8266	33.446436	1	12/9/2010	10:00	B	6	S	Pointing Down Toward	N	4	2	1	1
2048	0	MD	S_020_07656_A	3529990.273	362493.8929	4.736634	1	12/9/2010	11:26	A	6	N	Pointing Down Toward	E	1	1	1	2
2052	0	CD	S_020_07660_A	3530047.532	362492.1291	9.956598	1	12/9/2010	12:03	A	6	N	Horizontal	W	2	1	1	3
2061	0	CD	S_020_07664_A	3530063.396	362494.2424	604.742496	2	12/9/2010	8:48	A	6	N	Horizontal	N	5	4	4	1
2094	0	CD	S_018_06799_A	3529301.564	362607.8663	40.261389	1	12/13/2010	10:56	A	6	E	Horizontal	W	2.5	2.5	0.125	1
2100	0	MD	S_022_08262_A	3529365.519	362375.8395	6.041625	1	12/13/2010	14:54	A	6	E	Horizontal	W	2	2	2	1
2115	0	CD	S_013_04706_A	3529055.092	362887.3943	51.33	2	12/13/2010	11:32	A	6	N	Veritical		30	0.2	0.2	1
2121	0	CD	S_036_11403_C	3529127.519	361593.5468	8.313276	2	12/13/2010	16:35	C	6	E	Horizontal	E	12	0.2	12	1
2143	0	MD	S_026_09918_A	3529418.893	362150.251	5.509962	3	12/13/2010	12:54	A	6	N			1	1	1	3
2150	0	MD	S_022_08340_B	3529569.484	362385.1611	23.828169	1	12/14/2010	11:19	B	6	E	Horizontal	S	2	4	1	1
2153	0	frag	S_022_08284_A	3529444.511	362378.425	7.346616	1	12/14/2010	12:18	A	6	SW	Horizontal	S	3	2	0	1
2162	0	MD	S_021_07836_A	3529243.608	362433.7305	10.729926	2	12/14/2010	9:03	A	6	NW	Veritical		2	2	2	1
2180	0	MD	S_031_10831_A	3528921.232	361881.1471	15.369894	2	12/14/2010	11:16	A	6	W	Pointing Down Toward		3	3	0.4	1
2200	0	MD	S_003_01345_A	3529193.717	363466.4519	4.01	3	12/14/2010	15:20	A	6	S			2	2	1	1
2226	0	MD	S_005_02133_B	3528397.766	363349.616	16.67	2	12/15/2010	9:22	B	6	SW	Veritical	S	3	1	0.2	1
2234	0	MD	S_005_02102_A	3528300.938	363356.0379	4.54	2	12/15/2010	10:01	A	6	N	Horizontal	W	2	1	0.2	1
2320	0	MD	N_074_05730_A	3529795.828	361912.7906	14.941283	1	1/6/2011	9:32	A	6	S	Horizontal	S	2.5	1	0.5	1
2322	0	MD	N_074_05756_A	3529783.657	361910.1103	6.222922	1	1/6/2011	9:54	A	6	S	Horizontal	W	2.5	0.25	0.25	3
2324	0	MD	N_074_05733_A	3529780.923	361909.4947	11.913399	1	1/6/2011	10:31	A	6	N	Horizontal	W	1.5	0.05	0.05	3
2325	0	MD	N_074_05752_A	3529771.939	361907.2273	6.803489	1	1/6/2011	10:48	A	6	S	Horizontal	N	1	0.5	0.5	3
2328	0	MD	N_074_05737_A	3529763.471	361907.4586	10.591539	1	1/6/2011	11:16	A	6	NE	Horizontal	S	1	0.5	0.5	3
2333	0	MD	N_074_05727_A	3529733.44	361905.8751	18.972327	1	1/6/2011	12:14	A	6	E	Horizontal	E	2.5	1	0.5	3
2349	0	MD	N_075_05791_A	3529892.765	361825.4098	12.622328	2	1/6/2011	9:29	A	6	N	Horizontal	N	3	1	0.3	1
2420	0	MD	N_073_05708_A	3529693.583	361948.638	5.320844	2	1/6/2011	15:39	A	6	N	Horizontal	N	1	0.5	1	1
2424	0	MD	N_073_05671_A	3529708.078	361948.0114	24.389803	2	1/6/2011	16:07	A	6	E	Horizontal	E	3	1	3	1
2425	0	MD	N_073_05671_B	3529707.977	361948.4981	24.389803	2	1/6/2011	16:10	B	6	E	Horizontal	N	1	0.5	1	3
2440	0	MD	N_077_05859_A	3529808.986	361725.7325	4.595658	3	1/6/2011	11:30	A	6	W			2	2	1	1
2691	0	MD	N_073_05704_A	3529780.738	361947.0753	6.285717	1	1/7/2011	8:59	A	6	NE	Horizontal	N	2	0.5	0.5	1
2693	0	MD	N_073_05706_A	3529747.585	361939.8783	5.539961	1	1/7/2011	9:40	A	6	NW	Horizontal	W	2.75	1	0.5	1
3228	0	MD		3530011.33	360038.45	0	2	1/19/2011	11:06	16 4 03	6	W	Horizontal	W	2	0.5	2	1
3231	0	MD		3530041.093	359998.9963	0	2	1/19/2011	11:35	16 3 03	6	W	Horizontal	E	1	0.25	1	1
3236	0	MD		3530113.545	359958.8386	0	2	1/19/2011	12:16	16 2 05	6	E	Horizontal	E	1	0.5	1	1
3237	0	CD		3530116.942	359955.3289	0	2	1/19/2011	12:21	16 2 06	6	E	Horizontal	E	1	1	1	1
3288	0	MD	N_013_01463_B	3531042.98	362889.8507	4.395836	2	1/20/2011	8:35	B	6	NE			0.5	0.5	0.2	3
3298	0	MD	N_011_01187_A	3531109.708	363003.8358	4.302195	2	1/20/2011	10:15	A	6	NE			1	1	0.5	3
3313	0	CD	N_009_00833_A	3530900.62	363117.8143	134.363635	2	1/20/2011	14:18	A	6	NE	Veritical		10	1	1	1
3508	0	CD	N_005_00314_A	3530882.889	363347.9015	7.808831	2	1/21/2011	11:03	A	6	NW	Horizontal	W	0.5	0.5	0.5	1
3510	0	CD	N_006_00507_B	3530761.947	363290.0332	5.827953	2	1/21/2011	11:29	B	6	W	Horizontal	W	0.5	0.2	0.5	1
3513	0	CD	N_006_00520_A	3530755.266	363289.422	5.44894	2	1/21/2011	12:01	A	6	N	Horizontal	W	5	3	5	1
3517	0	CD	N_004_00224_A	3530757.635	363407.6501	7.933042	2	1/21/2011	14:12	A	6	E	Horizontal	W	1	0.25	1	1
137	0	CD	N_012_01208_A	3531514.63	362943.1301	87.577507	2	10/13/2010	11:03	A	5	S	Horizontal	S	5	2	0	1
142	0	RRD	N_009_00830_B	3531669.519	363111.5062	145.453018	2	10/13/2010	12:06	B	5	N	Horizontal		3	1	0	1
183	0	MD	N_017_02468_A	3531847.496	362661.453	5.162119	3	10/13/2010	15:55	A	5	N	Horizontal	S	2	1	1	3
491	0	CD	N_013_01344_A	3532876.436	362886.6481	39.97157	2	10/20/2010	14:54	A	5	N	Horizontal	N	8	8	1	1
678	0	MD	N_013_01437_A	3533214.084	362887.0238	5.985584	2	10/27/2010	9:13	A	5	E	Horizontal	S	1	2	0.2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
682	0	MD	N_013_01349_C	3533173.921	362886.936	33.643091	2	10/27/2010	9:40	C	5	N	Horizontal	W	4	2	0.2	1
687	0	MD	N_015_01950_A	3533124.215	362772.8303	4.050632	2	10/27/2010	10:39	A	5	S	Horizontal	E	3	1	0	1
693	0	MD	N_014_01682_A	3533248.495	362831.986	4.154646	2	10/27/2010	11:50	A	5	S	Horizontal	N	1	0.5	0.1	1
700	0	MD	N_018_02611_A	3533282.024	362604.8007	7.255497	2	10/27/2010	14:06	A	5	N	Horizontal	N	1	1	0.3	1
708	0	MD	N_012_01281_A	3533153.469	362945.7036	6.938592	2	10/27/2010	15:29	A	5	W	Horizontal	E	3	0.5	0.2	1
805	0	MD	N_034_04472_B	3532796.704	361691.1131	69.193684	2	11/1/2010	12:10	B	5	N	Horizontal	N	3	1	0.3	1
807	0	MD	N_034_04474_A	3532799.557	361689.7375	59.695437	2	11/1/2010	12:25	A	5	N	Horizontal	N	3	1	0.3	1
891	0	MD	N_033_04369_A	3532629.165	361740.3596	14.356416	2	11/2/2010	14:23	A	5	N	Horizontal	S	4	1	0.1	1
944	0	MD	N_031_04087_B	3532873.511	361860.5608	13.301879	3	11/3/2010	12:31	B	5	E			2	2	1	1
962	0	Hot Rock	N_020_02948_A	3532754.917	362509.6005	5.561419	2	11/4/2010	9:09	A	5	NW			0	0	0	1
1019	0	MD	N_007_00603_C	3532821.536	363214.2978	54.360908	1	11/9/2010	16:40	C	5	W	Horizontal	W	2.5	0.5	0.5	1
1040	0	MD	N_007_00603_C	3532821.536	363214.2978	54.360908	1	11/9/2010	16:40	C	5	W	Horizontal	W	2.5	0.5	0.5	1
1319	0	Hot Rock	N_030_04023_B	3531780.17	361920.9952	5.453422	3	11/8/2010	9:49	B	5	N			6	3	1	1
1321	0	RRD	N_031_04113_B	3531828.629	361860.8033	7.699856	3	11/8/2010	10:12	B	5	N			2	3	2	1
1330	0	Hot Rock	N_035_04658_C	3531921.48	361628.7517	15.88491	3	11/8/2010	12:08	C	5	NE			3	4	2	1
1102	0	MD	N_010_01010	3531241.913	363059.298	6.861878	3	11/10/2010	8:38	A	5	W			2	1	1	1
1103	0	MD	N_010_01010	3531241.988	363059.1388	6.861878	3	11/10/2010	8:39	B	5	W			2	2	1	1
1104	0	RRD	N_010_01010	3531241.838	363059.0392	6.861878	3	11/10/2010	8:41	C	5	W			3	1	5	1
1141	0	RRD	N_010_00934_A	3532132.515	363056.3062	119.415275	2	11/11/2010	9:36	A	5	SE	Horizontal	S	6	3.5	3.5	1
1155	0	CD	N_004_00242_A	3531385.112	363403.8787	4.115938	2	11/11/2010	12:37	A	5	N	Horizontal	E	20	0.1	0.1	1
1159	0	CD	N_00C_06213_A	3531677.114	363461.3761	5.729242	2	11/11/2010	13:02	A	5	NE	Horizontal	N	2	1	0.1	1
1160	0	MD	N_003_00142_A	3531660.863	363463.4894	7.887148	2	11/11/2010	13:07	A	5	NE	Horizontal	N	4	4	0.1	1
1175	0	CD	N_010_00958_A	3531389.877	363056.3375	26.455513	3	11/11/2010	9:55	A	5	W			3	1	1	1
1177	0	MD	N_011_01103_B	3531333.485	363002.4884	22.154206	3	11/11/2010	10:08	B	5	N			3	1	1	1
1182	0	CD	N_008_00797_A	3531399.995	363175.2755	4.8786	3	11/11/2010	11:30	A	5	N			3	2	1	1
1250	0	MD	S_022_08087_A	3527025.815	362387.9137	229.871748	3	11/15/2010	9:38	A	5	N			2	2	1	1
1252	0	CD	S_022_08096_A	3527171.904	362395.2837	4.8333	3	11/15/2010	10:00	A	5	N			4	4	1	1
1254	0	MD	S_024_08814_A	3527313.134	362260.5437	40.213056	3	11/15/2010	11:40	A	5	S			2	1	1	1
1388	0	MD	S_024_08912_A	3528812.011	362273.529	5.896626	3	11/18/2010	9:51	A	5	W			1	1	1	1
1389	0	MD	S_024_08910_A	3528799.668	362273.3557	6.476622	3	11/18/2010	10:07	A	5	N			1	1	1	1
1390	0	MD	S_024_08905_A	3528773.417	362272.7229	5.848293	3	11/18/2010	10:15	A	5	N			1	1	1	1
1391	0	MD	S_025_09262_A	3528729.83	362203.4572	4.8333	3	11/18/2010	10:30	A	5	N			2	2	2	1
1392	0	MD	S_022_08174_A	3528921.077	362388.3436	9.18327	3	11/18/2010	10:46	A	5	N			2	1	1	1
1394	0	MD	S_022_08176_B	3528936.504	362388.1236	6.186624	3	11/18/2010	11:00	B	5	N			3	2	1	1
1405	0	MD	S_020_07464_A	3528931.669	362503.9409	5.993292	3	11/22/2010	9:31	A	5	S			3	1	2	1
1406	0	MD	S_020_07459_B	3528838.998	362489.282	18.84987	3	11/22/2010	9:45	B	5	W			3	2	2	1
1407	0	MD	S_017_06288_A	3529024.342	362671.6454	35.089758	3	11/22/2010	10:24	A	5	N			2	3	2	1
1411	0	MD	S_015_05355_A	3528876.57	362784.5382	15.659892	3	11/22/2010	11:54	A	5	W			1	1	1	1
1498	0	MD	S_028_10354 _A	3528034.682	362047.9585	4.736634	2	11/16/2010	15:25	A	5	N	Horizontal	W	3	0.5	0.5	1
1502	0	MD	S_027_10067 _A	3527939.414	362104.2887	4.543302	2	11/16/2010	16:20	A	5	W	Horizontal	N	3	1	0.3	1
1503	0	CD	S_025_09169_A	3527516.042	362212.5877	27.839808	3	11/16/2010	9:24	A	5	N			10000000000	1	1	1
1509	0	Hot Rock	S_028_10266_A	3527118.883	362039.6865	76.752804	3	11/16/2010	11:57	A	5	N			4	3	3	1
1511	0	CD	S_027_10016_A	3527126.715	362044.93	24.553164	3	11/16/2010	12:18	A	5	E			3	2	3	1
1550	0	MD	S_022_08104_B	3527573.672	362381.8934	43.306368	3	11/17/2010	9:24	B	5	W			1	1	1	1
1555	0	MD	S_027_10028_A	3527468.954	362100.8546	10.439928	3	11/17/2010	10:42	A	5	N			1	1	1	1
1561	0	MD	S_028_10306_A	3527602.868	362055.0473	4.543302	3	11/17/2010	14:26	A	5	E			3	3	4	1
1590	0	MD	S_019_07060_A	3528604.681	362548.6121	4.639968	1	11/21/2010	10:36	A	5	W			2	1	1	1
1599	0	MD	S_018_06659_A	3528424.217	362612.002	37.844739	1	11/21/2010	12:15	A	5	N			2	3	1	1
1605	0	MD	S_018_06640_A	3528344.104	362618.8742	41.759712	1	11/21/2010	14:02	A	5	W			3	2	1	1
1606	0	MD	S_018_06640_B	3528345.108	362619.3372	41.759712	1	11/21/2010	14:03	B	5	N			1	1	1	1
1610	0	MD	S_017_06198_B	3528328.048	362668.7705	8.361609	1	11/21/2010	14:39	B	5	NW			3	1	1	1
1611	0	MD	S_017_06192_A	3528295.17	362668.5738	5.79996	1	11/21/2010	14:53	A	5	N			3	2	2	1
1613	0	MD	S_018_06616_A	3528249.402	362625.9511	28.709802	1	11/21/2010	15:24	A	5	NE			2	3	1	1
1614	0	MD	S_018_06616_B	3528250.056	362625.2633	28.709802	1	11/21/2010	15:26	B	5	NW			3	2	3	1
1620	0	MD	S_014_04965_A	3528299.788	362847.0469	14.21	2	11/21/2010	9:53	A	5	N	Horizontal	W	2.5	0.3	0.3	1
1631	0	MD	S_012_04306_A	3528775.254	362955.0093	8.989938	2	11/21/2010	11:26	A	5	S	Horizontal	S	2.5	0.3	0.3	1
1634	0	MD	S_017_06251_A	3528740.525	362671.0022	5.026632	2	11/21/2010	12:06	A	5	N	Horizontal	N	2.5	0.3	0.3	1
1641	0	MD	S_016_05846_A	3528786.261	362730.5951	5.509962	2	11/21/2010	12:58	A	5	W	Horizontal	W	2.5	0.3	0.3	1
1679	0	CD	N_0C1_06257_B	3530721.627	363159.0635	7.61477	3	11/30/2010	8:45	B	5	N			2	3	1	1
1682	0	CD	S_007_03019_A	3530762.839	363226.3585	5.703294	3	11/30/2010	9:14	A	5	W			3	3	1	1
1683	0	MD	S_007_03019_B	3530763.26	363226.7204	5.703294	3	11/30/2010	9:16	B	5	N			1	1	1	1
1684	0	CD	N_0C1_06253_A	3530768.767	363158.73	8.949986	3	11/30/2010	9:30	A	5	W			36	1	1	1
1694	0	CD	N_004_00225_B	3530628.387	363403.7239	7.633648	3	11/30/2010	11:41	B	5	W			2	3	1	1
1696	0	MD	S_006_02697_B	3530636.02	363291.388	5.703294	3	11/30/2010	11:59	B	5	W			2	1	1	1
1721	0	MD	N_025_03381_A	3531013.697	362208.3618	8.789088	3	12/1/2010	10:56	A	5	SE			4	1	1	1
1762	0	MD	S_004_01765_A	3529596.965	363411.9308	4.64	2	12/2/2010	12:13	A	5	N			1	0.3	0.3	1
1841	0	Hot Rock	S_075_12698_A	3528552.831	359654.5174	16.771551	3	11/29/2010	10:27	A	5	N			3	4	2	1
2066	0	MD	S_020_07668_A	3530081.088	362495.5045	5.413296	2	12/9/2010	9:48	A	5	N	Horizontal	W	1	0.3	0.3	1
2073	0	MD	S_020_07673_B	3530110.951	362492.9605	6.573288	2	12/9/2010	11:14	B	5	S			1	0.2	0.2	1
2080	0	MD	S_019_07285_A	3530485.447	362543.9747	52.102974	2	12/13/2010	8:15	A	5	W	Horizontal	W	3	3	2	1
2107	0	MD	S_009_03553_B	3529233.866	363123.2499	19.33	2	12/13/2010	10:21	B	5	NW	Horizontal	W	3	1	0.2	1
2113	0	MD	S_009_03539_A	3529079.053	363128.925	4.45	2	12/13/2010	11:08	A	5	W	Horizontal	E	2	0.5	0.5	1
2159	0	MD	S_018_06768_A	3529138.686	362607.4899	21.459852	2	12/14/2010	8:35	A	5	N	Horizontal	W	2	1	1	1
2161	0	MD	S_018_06783_A	3529240.895	362611.3644	9.859932	2	12/14/2010	8:51	A	5	NW	Horizontal	N	2	0.5	0.5	1
2165	0	MD	S_021_07837_A	3529245.772	362433.5408	5.79996	2	12/14/2010	9:14	A	5	N	Horizontal	N	4	3	0.2	1
2181	0	MD	S_031_10832_A	3528931.089	361872.7492	7.24995	2	12/14/2010	11:19	A	5	NW	Horizontal	W	2	2	0.3	1
2187	0	MD	S_031_10875_B	3529223.52	361879.5774	32.286444	2	12/14/2010	12:20	B	5	NE	Veritical		2	2	0.3	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2189	0	MD	S_018_06834_A	3529442.094	362608.6407	14.209902	2	12/14/2010	13:58	A	5	N			1	1	0.2	1
2190	0	MD	S_019_07172_A	3529449.408	362548.7436	4.156638	2	12/14/2010	14:14	A	5	N			2	0.5	0.5	1
2216	0	MD	S_006_02579_A	3528451.902	363296.8913	6.77	2	12/15/2010	8:43	A	5	SW	Horizontal	S	3	1	0.2	1
2229	0	MD	S_005_02120_6	3528352.093	363354.1702	43.98	2	12/15/2010	9:40	6	5	NE			1	1	0.2	1
2248	0	MD	S_006_02408_A	3527928.094	363300.075	11.41	2	12/15/2010	11:12	A	5	S	Horizontal	W	3	0.5	0.3	1
2296	0	MD	S_008_03082_A	3527967.38	363176.9916	4.74	3	1/4/2011	15:11	A	5	E			1	1	1	1
2297	0	MD	S_010_03684_A	3528018.499	363065.2614	11.5	3	1/4/2011	15:27	A	5	N			1	1	1	1
2308	0	MD	S_003_01312_A	3528729.614	363466.4653	9.18327	1	1/5/2011	9:13	A	5	N			3	1	0.3	1
2413	0	MD	N_075_05782_C	3529626.153	361841.5968	25.535091	2	1/6/2011	14:03	C	5	NE			1	0.3	0.3	1
3295	0	MD	N_012_01256_A	3531109.565	362945.5002	10.806193	2	1/20/2011	9:56	A	5	W			2	0.5	0.5	1
175	0	CD	N_016_02159_A	3531850.174	362731.3772	9.146611	3	10/13/2010	12:19	A	4	S	Pointing Down Toward	E	24	1	1	3
186	0	MD	N_017_02307_A	3531833.714	362665.7657	46.970974	3	10/13/2010	16:38	A	4	NE	Horizontal	N	5	2	1	1
254	0	RRD	N_0C2_06409_A	3531348.684	362150.014	5.010556	3	10/6/2010	10:59	A	4	NW	Horizontal	E	1	1	1	1
312	0	MD	N_0C2_06428_A	3531327.531	361923.0732	4.28141	3	10/12/2010	9:44	A	4	N	Horizontal	N	3	2	2	1
319	0	MD	N_036_04904_A	3531340.053	361591.3702	9.585082	3	10/12/2010	12:30	A	4	S	Horizontal	N	3	1	1	3
415	0	MD	N_019_02736_A	3531726.998	362550.8328	11.740238	2	10/18/2010	9:23	A	4	W	Horizontal	W	2	1	2	1
418	0	MD	N_017_02469_B	3531786.543	362663.8727	5.137467	3	10/18/2010	9:23	B	4	E	Horizontal	S	1	1	1	1
438	0	CD	N_012_01260_B	3531704.157	362951.2173	10.286921	3	10/18/2010	13:58	B	4	SE	Horizontal	E	3	1	1	1
441	0	MD	N_012_01297_A	3531711.558	362955.8435	5.626473	3	10/18/2010	14:08	A	4	N	Horizontal	N	3	1	1	3
449	0	MD	N_012_01274_B	3531747.517	362952.533	7.840387	3	10/18/2010	14:51	B	4	NW	Horizontal	N	3	1	1	2
487	0	MD	N_030_03930_A	3531049.599	361921.7548	138.502184	3	10/19/2010	14:26	A	4	E	Horizontal	E	12	3	2	1
691	0	MD	N_014_01540_A	3533223.649	362835.1504	33.777767	2	10/27/2010	11:32	A	4	N	Horizontal	N	1	1	0.2	1
496	0	MD	N_019_02797_A	3533135.831	362547.2667	5.309373	3	10/20/2010	16:08	A	4	S	Horizontal	N	2	1	1	1
533	0	MD	N_015_01756_D	3533300.113	362779.5035	42.91783	2	10/26/2010	10:21	D	4	N	Horizontal	N	1	1	1	1
629	0	MD	N_016_01983_C	3533319.228	362729.847	220.738207	3	10/22/2010	12:16	C	4	N	Horizontal	S	1	1	1	2
752	0	MD	N_015_01942_A	3532846.693	362785.9849	4.269333	2	10/28/2010	12:34	A	4	NW	Horizontal	N	4	2	4	1
756	0	CD	N_013_01479_A	3532969.962	362881.4799	4.004272	2	10/28/2010	14:20	A	4	N	Horizontal	N	5	0.1	5	1
758	0	MD	N_015_01822_A	3532933.924	362777.0049	12.731473	2	10/28/2010	13:54	A	4	S	Horizontal	N	1	3	1.2	1
1034	0	CD	N_002_00060_A	3532992.765	363508.2376	49.665564	1	11/9/2010	15:04	A	4	N	Horizontal	N	1	0.005	0.005	1
1035	0	CD	N_002_00060_B	3532992.693	363508.359	49.665564	1	11/9/2010	15:09	B	4	N	Horizontal	N	4	2	4	1
884	0	MD	N_033_04453_A	3532582.076	361744.6066	4.413487	2	11/2/2010	12:07	A	4	E	Horizontal	E	0.5	0.1	0.5	1
935	0	MD	N_032_04268_B	3532950.576	361836.5902	6.141866	2	11/3/2010	12:59	B	4	S	Horizontal	S	4	0.5	5	1
996	0	CD	N_040_05102_B	3532722.223	361342.287	6.538551	2	11/9/2010	8:54	A	4	W	Horizontal	W	4	1	4	1
1004	0	MD	N_030_04064_A	3532153.369	361900.9334	4.024795	2	11/9/2010	12:43	A	4	N	Horizontal	N	2	0.25	2	1
1016	0	CD	N_002_00060_B	3532992.693	363508.359	49.665564	1	11/9/2010	15:09	B	4	N	Horizontal	N	4	2	4	1
1055	0	CD	N_006_00448_B	3532425.012	363287.0072	12.677737	1	11/10/2010	15:27	B	4	S	Horizontal	W	12	4	0.005	1
1056	0	CD	N_006_00448_C	3532425.478	363287.017	12.677737	1	11/10/2010	15:30	C	4	E	Horizontal	E	14	5	0.005	1
1057	0	CD	N_006_00400_A	3532427.922	363286.6343	202.263873	1	11/10/2010	15:39	A	4	N	Horizontal	N	3	3	5	1
1312	0	MD	N_033_04376_A	3533187.885	361747.8386	12.495959	2	11/8/2010	12:16	A	4	N	Horizontal	N	2	0.2	2	1
1327	0	Hot Rock	N_035_04699_A	3531918.255	361630.5875	8.990434	3	11/8/2010	11:47	A	4	N			2	2	5	1
1086	0	MD	N_012_01265_A	3532273.446	362949.1561	9.027647	2	11/10/2010	10:44	A	4	S	Horizontal	W	1	0.2	1	1
1088	0	CD	N_012_01203_A	3532239.801	362950.6636	278.98507	2	11/10/2010	11:14	A	4	S	Horizontal	W	120	0.25	0	1
1107	0	RRD	N_008_00711	3531223.43	363173.2162	31.768803	3	11/10/2010	9:20	B	4	W			2	1	1	1
1108	0	CD	N_008_00711	3531223.662	363173.7912	31.768803	3	11/10/2010	9:21	C	4	N			3	1	1	1
1115	0	CD	N_006_00504	3531145.052	363287.4496	6.019924	3	11/10/2010	15:08	B	4	S	Horizontal	N	3	1	1	2
1171	0	CD	N_010_00966_A	3531381	363057.4717	15.124039	3	11/11/2010	9:15	A	4	N			3	1	1	1
1172	0	CD	N_010_00989_A	3531382.014	363056.6621	9.733503	3	11/11/2010	9:23	A	4	NW			3	3	2	1
1173	0	CD	N_010_00970_A	3531386.869	363055.8633	14.365344	3	11/11/2010	9:33	A	4	N			3	1	1	1
1179	0	CD	N_010_01015_A	3531400.245	363055.7885	6.270056	3	11/11/2010	10:51	A	4	W			3	1	1	1
1180	0	CD	N_010_00987_A	3531401.911	363056.3001	10.096872	3	11/11/2010	11:01	A	4	W			3	1	1	1
1183	0	CD	N_008_00768_A	3531404.265	363176.3704	6.603909	3	11/11/2010	11:40	A	4	E			1	1	0	1
1227	0	MD	S_024_08865_A	3528368.968	362264.0387	13.339908	2	11/15/2010	9:55	A	4	NW	Horizontal	N	0	0	0	1
1230	0	MD	S_028_10398_A	3528441.59	362080.9285	11.503254	2	11/15/2010	11:03	A	4	NE	Horizontal	N	4	0.5	4	1
1251	0	CD	S_022_08087_B	3527025.767	362388.3657	229.871748	3	11/15/2010	9:40	B	4	N			3	2	1	1
1256	0	CD	S_025_09144_A	3527173.942	362208.5297	30.836454	3	11/15/2010	12:07	A	4	N			3	2	1	1
1257	0	CD	S_025_09135_A	3527162.463	362198.5136	74.722818	3	11/15/2010	12:21	A	4	N			100	1	1	1
1303	0	MD	N_023_03248_A	3532954.33	362311.3135	4.154794	2	11/8/2010	9:20	A	4	E	Horizontal	E	2	0.25	2	1
1305	0	CD	N_029_03831_A	3533302.395	361998.2965	463.109252	2	11/8/2010	10:07	A	4	SW	Horizontal	S	144	0.2	144	1
1385	0	MD	S_024_08927_A	3528903.859	362283.8717	9.231603	3	11/18/2010	9:04	A	4	N			3	2	1	1
1397	0	MD	S_024_08892_A	3528701.237	362270.1446	5.896626	3	11/18/2010	12:26	A	4	N			2	3	1	1
1436	0	CD	S_055_12175_A	3528799.721	360509.5694	6.331623	2	11/22/2010	10:42	A	4	W	Horizontal	W	0.5	0.1	0.5	1
1985	0	CD	S_018_06923_A	3530165.958	362606.2506	21.363186	1	12/8/2010	15:02	A	4	N	Horizontal	N	3	3	1	1
1500	0	MD	S_029_10575 _A	3528001.41	361987.7871	37.313076	2	11/16/2010	15:48	A	4	N	Veritical	S	3	3	3	1
1506	0	MD	S_027_10026_A	3527409.042	362092.3614	4.253304	3	11/16/2010	10:09	A	4	N			2	1	1	1
1507	0	MD	S_028_10273_A	3527349.172	362049.7021	5.31663	3	11/16/2010	11:13	A	4	W			2	1	1	1
1515	0	Hot Rock	S_026_09653_A	3527132.823	362130.7832	8.313276	3	11/16/2010	13:02	A	4	N			2	2	2	1
1530	0	MD	S_025_09198_A	3527741.704	362226.1862	6.863286	2	11/17/2010	8:27	A	4	S	Horizontal	W	3	1	3	2
1548	0	MD	S_023_08427_A	3527529.607	362328.1623	5.703294	3	11/17/2010	9:14	A	4	E			2	1	2	1
1576	0	MD	S_014_04911_A	3528020.052	362848.4606	8.89	2	11/17/2010	15:05	A	4	N	Horizontal	W	3	1	0.3	1
1582	0	MD	S_011_04005_A	3528162.333	363008.3666	31.851447	2	11/17/2010	16:18	A	4	E	Horizontal	N	2	1	0.3	1
1583	0	MD	S_011_04007_A	3528169.781	363008.1535	10.536594	2	11/17/2010	16:27	A	4	W	Horizontal	W	3	2	0.3	1
1587	0	MD	S_022_08143_B	3528591.984	362379.2513	19.913196	1	11/21/2010	9:56	B	4	W			1	1	1	1
1589	0	MD	S_020_07437_B	3528641.628	362489.8811	7.056618	1	11/21/2010	10:21	B	4	S			1	1	1	1
1591	0	MD	S_019_07060_B	3528604.869	362549.3135	4.639968	1	11/21/2010	10:38	B	4	NW			2	2	2	1
1592	0	MD	S_018_06694_A	3528579.904	362607.1436	12.759912	1	11/21/2010	11:00	A	4	N			2	1	1	1
1594	0	MD	S_018_06672_A	3528493.303	362604.3974	11.406588	1	11/21/2010	11:40	A	4	N			2	1	1	1
1597	0	MD	S_019_07046_B	3528470.847	362558.6293	8.893272	1	11/21/2010	12:01	B	4	NW			1	2	1	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1598	0	MD	S_019_07046_C	3528470.694	362558.7993	8.893272	1	11/21/2010	12:02	C	4	N			2	1	1	1
1601	0	MD	S_019_07036_A	3528392.563	362553.206	5.31663	1	11/21/2010	13:19	A	4	N			1	1	1	1
1604	0	MD	S_019_07027_B	3528349.856	362555.0244	26.679816	1	11/21/2010	13:45	B	4	NE			1	1	1	1
1607	0	MD	S_017_06204_A	3528371.749	362675.1065	8.409942	1	11/21/2010	14:20	A	4	N			1	1	1	1
1608	0	MD	S_017_06204_B	3528371.71	362674.1915	8.409942	1	11/21/2010	14:22	B	4	NW			3	2	2	1
1609	0	MD	S_017_06198_A	3528327.08	362669.4574	8.361609	1	11/21/2010	14:37	A	4	E			1	1	1	1
1669	0	CD	S_RoadE_13997_A	3529482.222	363290.8592	7.153284	1	11/30/2010	13:48	A	4	N	Horizontal	N	4	4	0.025	1
1718	0	MD	N_015_01952_A	3530886.318	362776.5516	4.013724	3	12/1/2010	9:27	A	4	E			1	1	1	1
1726	0	CD	N_025_03362_A	3531022.211	362208.168	14.812531	3	12/1/2010	11:37	A	4	S			2	1	1	1
1764	0	MD	S_004_01768_A	3529617.169	363413.7155	5.61	2	12/2/2010	12:39	A	4	N			1	0.3	0.3	1
1766	0	RRD	S_004_01772_A	3529693.506	363403.0239	9.09	2	12/2/2010	13:58	A	4	W	Pointing Down Toward	E	3	1	3	1
1837	0	Hot Rock	S_076_12758_A	3528452.029	359598.732	11.696586	3	11/29/2010	9:31	A	4	N			2	2	4	1
1844	0	Hot Rock	S_074_12651_A	3528590.046	359724.2515	8.989938	3	11/29/2010	11:08	A	4	N			3	7	5	1
1890	0	CD	S_019_06967_A	3527188.767	362560.9438	6.379956	3	12/6/2010	9:49	A	4	N			3	1	1	1
1948	0	MD	S_020_07352_A	3527984.655	362505.1816	12.56658	3	12/7/2010	11:24	A	4	N			2	2	1	1
1965	0	MD	S_018_06926_A	3530240.948	362606.1441	4.446636	1	12/8/2010	8:50	A	4	E	Horizontal	N	0.5	0.005	0.005	1
2011	0	CD	S_019_07262_C	3530140.308	362558.3761	29.386464	2	12/8/2010	14:32	C	4	N	Horizontal	W	3	2	3	1
2035	0	MD	S_RoadD_14468_A	3529968.604	362557.6819	11.59992	1	12/9/2010	8:43	A	4	W	Horizontal	N	2.5	0.5	0.5	1
2047	0	MD	S_020_07655_A	3529968.831	362493.304	5.413296	1	12/9/2010	11:15	A	4	E	Horizontal	S	3	1	1	1
2103	0	MD	S_023_08671_A	3529466.074	362323.1208	79.556118	1	12/13/2010	16:18	A	4	N	Horizontal	W	12	4	4	1
2163	0	MD	S_021_07836_B	3529243.173	362433.8233	10.729926	2	12/14/2010	9:05	B	4	E	Horizontal	E	1.5	0.5	0.5	1
2201	0	MD	S_003_01010_A	3527580.132	363468.8459	26.969814	1	12/14/2010	15:39	A	4	N	Horizontal	N	8	1	1	1
2246	0	MD	S_005_02045_A	3528130.835	363349.1993	11.5	2	12/15/2010	11:00	A	4	SW	Horizontal	W	2.5	1	0.3	1
2249	0	CD	S_006_02408_B	3527928.43	363300.1283	11.41	2	12/15/2010	11:13	B	4	N	Horizontal	N	5	3	3	1
2291	0	MD	S_009_03446_A	3528231.105	363127.4219	4.83	3	1/4/2011	14:21	A	4	N			1	1	1	1
2292	0	MD	S_009_03408_A	3528070.485	363128.8576	10.05	3	1/4/2011	14:38	A	4	E			1	1	1	1
2315	0	MD	S_004_01593_A	3528069.175	363407.6083	4.929966	1	1/5/2011	11:08	A	4	N	Horizontal	W	4	1	0.3	1
2344	0	MD	N_074_05757_A	3529655.419	361890.5403	6.03952	1	1/6/2011	16:10	A	4	NE	Horizontal	E	3	3	0.25	1
2370	0	MD	N_074_05719_A	3529834.714	361857.8857	65.074661	2	1/6/2011	10:49	A	4	SW	Horizontal	N	2	1.5	1.5	1
2381	0	MD	N_075_05816_A	3529807.865	361829.6552	5.980108	2	1/6/2011	11:57	A	4	S	Horizontal	N	2	1	0.3	1
2391	0	MD	N_075_05826_A	3529755.671	361843.5074	4.784505	2	1/6/2011	12:30	A	4	NE	Horizontal	N	2	0.5	0.5	1
2406	0	MD	N_075_05781_B	3529653.955	361832.6369	27.592612	2	1/6/2011	13:34	B	4	W			1	0.5	0.3	1
2411	0	MD	N_075_05782_A	3529626.521	361841.2631	25.535091	2	1/6/2011	14:00	A	4	N	Horizontal	E	3	2	0.3	1
2416	0	MD	N_075_05783_C	3529625.635	361842.1088	22.501611	2	1/6/2011	14:09	C	4	NE			2	1	0	1
2429	0	Hot Rock	N_076_05845_A	3529844.815	361798.1267	4.404643	3	1/6/2011	9:09	A	4	N			2	3	3	1
2695	0	MD	N_073_05709_A	3529726.927	361943.0212	5.20269	1	1/7/2011	10:13	A	4	NW	Horizontal	W	2	0.25	0.25	3
3503	0	CD	N_008_00705_A	3530872.666	363175.2902	74.561205	2	1/21/2011	8:45	A	4	W	Horizontal	W	72	0.1	72	1
3526	0	CD	N_003_00108_A	3530661.808	363461.7346	222.658161	2	1/21/2011	16:03	A	4	NE	Horizontal	W	5	0.1	5	9
93	0	MD	N_014_01515_A	3531826.473	362832.9491	85.046079	1	10/13/2010	10:11	A	3	NW	Horizontal	W	1	0.5	0.005	1
174	0	MD	N_015_01748_A	3531823.08	362782.761	55.707417	3	10/13/2010	11:55	A	3	SE	Horizontal	N	2	1	1	3
187	0	CD	N_017_02307_B	3531833.887	362666.0013	46.970974	3	10/13/2010	16:41	B	3	N	Horizontal	N	3	1	1	2
243	0	CD	N_028_03698_A	3531745.312	362034.0692	70.475689	2	10/6/2010	12:43	A	3	E	Horizontal	W	6	3	6	1
275	0	MD	N_034_04585_C	3531261.509	361690.896	5.377806	1	10/12/2010	9:38	C	3	N	Horizontal	E	2.5	0.5	0.5	1
342	0	MD	N_015_01944_A	3531958.539	362773.1074	4.197099	2	10/14/2010	9:33	A	3	N	Horizontal	S	2	1	0.5	1
362	0	CD	N_008_00695_C	3531819.18	363182.7321	275.100553	1	10/18/2010	10:49	C	3	N	Horizontal	N	3	0.005	0.005	1
392	0	MD	N_017_02471_A	3531703.057	362654.7242	5.093278	2	10/18/2010	9:36	A	3	E	Horizontal	E	1	1	1	1
404	0	MD	N_012_01205_A	3531781.702	362950.6175	168.908819	2	10/18/2010	14:03	A	3	N	Horizontal	N	10	3	1	1
411	0	MD	N_020_02924_A	3531759.358	362483.1457	6.97784	2	10/18/2010	8:48	A	3	N	Horizontal	N	3	0.5	3	1
414	0	MD	N_00C_06166_A	3531732.328	362509.2034	117.472968	2	10/18/2010	9:14	A	3	NE	Horizontal	E	6	2	6	1
431	0	CD	N_00C_06191_A	3531695.573	363045.2198	9.444991	3	10/18/2010	12:40	A	3	NE	Horizontal	S	3	1	1	1
495	0	MD	N_019_02724_A	3533127.883	362546.386	14.969581	3	10/20/2010	16:01	A	3	N	Horizontal	N	3	2	1	1
518	0	CD	N_010_01000_A	3532870.186	363055.8035	8.151833	1	10/26/2010	15:09	A	3	N	Horizontal	N	4	0.005	0.005	1
519	0	MD	N_010_00967_A	3532867.328	363055.3865	14.893993	1	10/26/2010	15:51	A	3	N	Pointing Down Toward	W	0.5	0.05	0.05	1
542	0	MD	N_015_01804_A	3533236.756	362773.1002	16.851899	2	10/26/2010	13:52	A	3	N	Horizontal	N	3	3	2	1
743	0	CD	N_00A_06004_A	3533005.342	363340.7933	8.472305	1	10/28/2010	12:38	A	3	W	Horizontal	N	4	0.005	0.005	1
802	0	MD	N_034_04471_A	3532790.115	361694.8599	109.343363	2	11/1/2010	11:58	A	3	S	Horizontal	N	3	5	0.4	1
808	0	MD	N_034_04474_B	3532799.583	361689.6705	59.695437	2	11/1/2010	12:26	B	3	S	Horizontal	S	3	0.8	0.8	1
817	0	MD	N_035_04715_A	3532745.701	361639.3384	7.408745	2	11/1/2010	14:46	A	3	N	Horizontal	N	3	1	1	1
859	0	MD	N_037_05042_A	3532821.632	361521.203	4.267861	1	11/2/2010	11:43	A	3	E	Horizontal	E	2	1	0.02	1
894	0	MD	N_034_04520_A	3532834.374	361684.1928	12.243173	2	11/2/2010	15:52	A	3	N	Horizontal	N	3	1	0.01	1
930	0	MD	N_033_04395_A	3532956.532	361739.3779	8.244094	2	11/3/2010	10:41	A	3	E	Horizontal	E	4	4	4	1
1010	0	Hot Rock	N_028_03813_B	3532083.547	362043.0022	4.404498	3	11/9/2010	9:29	B	3	N			2	3	2	1
1054	0	CD	N_006_00448_A	3532425.195	363287.1847	12.677737	1	11/10/2010	15:23	A	3	N	Horizontal	N	3	3	5	1
1325	0	MD	N_032_04317_A	3531851.08	361805.3057	4.242892	3	11/8/2010	10:48	A	3	N			2	1	1	1
1184	0	Hot Rock	N_006_00531_A	3531507.215	363291.6145	5.15722	3	11/11/2010	12:09	A	3	N			3	2	2	1
1186	0	RRD	N_006_00397_A	3531420.34	363290.1277	269.502273	3	11/11/2010	12:30	A	3	N			8	6	1	1
1187	0	RRD	N_006_00397_B	3531420.335	363290.1042	269.502273	3	11/11/2010	12:32	B	3	N			1	1	1	1
1188	0	CD	N_006_00397_C	3531420.203	363290.0594	269.502273	3	11/11/2010	12:33	C	3	N			1	1	1	1
1189	0	RRD	N_006_00386_A	3531416.139	363288.7779	1815.292806	3	11/11/2010	12:43	A	3	N			36	4	1	1
1249	0	CD	S_022_08088_A	3527027.791	362390.1028	11.696586	3	11/15/2010	9:21	A	3	N			2	2	2	1
1300	0	CD	N_043_05171_A	3532326.627	361184.3145	20.140849	2	11/8/2010	16:36	A	3	N	Horizontal	N	6	1	0.2	1
1350	0	CD	S_020_07391_B	3528357.073	362494.7248	150.605628	1	11/18/2010	10:38	B	3	W	Veritical	N	7	0.5	0.5	1
1353	0	MD	S_022_08135_A	3528443.107	362385.519	6.863286	1	11/18/2010	11:19	A	3	W	Horizontal	N	1	0.025	0.025	1
1395	0	CD	S_023_08487_A	3528644.772	362328.3999	39.63306	3	11/18/2010	11:57	A	3	N			3	5	1	1
1396	0	MD	S_024_08884_A	3528658.962	362262.5749	13.04991	3	11/18/2010	12:15	A	3	N			2	2	1	1
1399	0	MD	S_022_08155_A	3528709.746	362378.2999	6.379956	3	11/18/2010	13:00	A	3	N			1	1	1	1
1423	0	MD	S_049_12007_A	3529034.842	360837.982	6.186624	1	11/22/2010	11:41	A	3	S	Horizontal	S	1	1	1	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1428	0	CD	S_RoadD_14333_B	3529053.87	361110.7052	5.123298	1	11/22/2010	13:17	B	3	N	Horizontal	N	2	0.5	0.005	1
1984	0	CD	S_018_06922_A	3530127.291	362604.5114	42.146376	1	12/8/2010	14:50	A	3	W	Horizontal	W	2	1	1	1
1990	0	CD	S_019_07250_A	3530000.64	362563.1579	4.688301	1	12/8/2010	16:24	A	3	N	Horizontal	N	12	0.005	0.005	1
1991	0	CD	S_RoadD_14469_A	3530000.662	362563.0628	10.923258	1	12/8/2010	16:32	A	3	S	Horizontal	S	12	0.005	0.005	1
1497	0	MD	S_028_10357 _A	3528043.824	362046.0428	4.736634	2	11/16/2010	15:18	A	3	N	Horizontal	S	4	1	0.3	1
1504	0	MD	S_025_09169_B	3527515.014	362212.347	27.839808	3	11/16/2010	9:28	B	3	N			2	2	3	1
1508	0	MD	S_027_10014_A	3527116.945	362053.9558	9.134937	3	11/16/2010	11:46	A	3	N			1	1	1	1
1512	0	CD	S_027_10017_A	3527139.59	362040.9565	22.184847	3	11/16/2010	12:23	A	3	N			2	2	1	1
1514	0	MD	S_027_10005_A	3527154.577	362089.6661	7.73328	3	11/16/2010	12:51	A	3	N			1	1	1	1
1516	0	CD	S_027_10002_A	3527180.349	362105.6713	5.461629	3	11/16/2010	13:09	A	3	S			4	4	1	1
1517	0	MD	S_029_10543_A	3527225.165	361986.4318	10.343262	3	11/16/2010	13:26	A	3	N			2	4	5	1
1552	0	MD	S_027_10032_A	3527480.648	362103.6026	11.889918	3	11/17/2010	10:02	A	3	N			1	1	1	1
1554	0	MD	S_027_10031_A	3527479.262	362102.3471	47.559672	3	11/17/2010	10:31	A	3	W			3	3	2	1
1556	0	MD	S_027_10034_A	3527484.668	362105.8061	59.062926	3	11/17/2010	10:55	A	3	N			1	1	1	1
1557	0	CD	S_026_09691_A	3527502	362131.9158	6.959952	3	11/17/2010	12:28	A	3	N			2	1	3	1
1558	0	MD	S_028_10297_A	3527525.716	362043.021	5.026632	3	11/17/2010	12:50	A	3	N			2	3	1	1
1560	0	MD	S_029_10556_A	3527630.374	361984.5841	9.859932	3	11/17/2010	14:12	A	3	N			3	2	2	1
1562	0	MD	S_028_10303_A	3527578.897	362044.5361	144.322338	3	11/17/2010	14:38	A	3	W			3	4	2	1
1573	0	MD	S_020_07368_B	3528172.623	362501.9578	23.054841	1	11/17/2010	16:05	B	3	NW	Horizontal	W	1	0.025	0.025	1
1602	0	MD	S_019_07036_B	3528393.506	362553.633	5.31663	1	11/21/2010	13:21	B	3				2	1	1	1
1603	0	MD	S_019_07027_A	3528350.371	362554.2051	26.679816	1	11/21/2010	13:43	A	3	N			3	2	1	1
1612	0	MD	S_017_06192_B	3528294.702	362669.6814	5.79996	1	11/21/2010	14:54	B	3	NW			3	2	4	1
1658	0	MD	S_004_01721_A	3528853.905	363405.3707	4.8333	1	11/30/2010	10:00	A	3	S	Horizontal	S	0.5	0.25	0.25	3
1691	0	RRD	S_004_01829_A	3530617.745	363410.1919	233.44839	3	11/30/2010	11:22	A	3	W			360	1	1	1
1699	0	CD	S_007_02996_A	3529456.598	363232.5309	16.626552	1	12/1/2010	8:54	A	3	W	Horizontal	N	4	2.5	0.025	1
1854	0	CD	S_010_03650_A	3527543.492	363068.8196	152.828946	1	12/6/2010	12:41	A	3	W	Horizontal	N	10	10	0.25	1
1892	0	RRD	S_019_06967_C	3527188.46	362560.2258	6.379956	3	12/6/2010	9:52	C	3	S			2	1	1	1
1972	0	CD	S_RoadD_14481_A	3530142.264	362581.2859	4.591635	1	12/8/2010	11:18	A	3	W	Horizontal	W	5	0.005	0.005	1
1973	0	CD	S_RoadD_14478_A	3530106.498	362574.9963	10.343262	1	12/8/2010	11:30	A	3	E	Horizontal	N	18	0.025	0.025	1
2081	0	MD	S_021_08021_A	3530439.716	362431.2034	12.276582	2	12/13/2010	8:37	A	3	N	Horizontal	N	3	2	0.2	1
2102	0	MD	S_RoadD_14401_A	3529458.786	362214.7298	5.993292	1	12/13/2010	15:41	A	3	E	Horizontal	E	2	1	0.5	1
2135	0	CD	S_019_07206_A	3529686.737	362552.3719	5.413296	3	12/13/2010	9:24	A	3	N			4	2	0	6
2136	0	RRD	S_019_07206_B	3529687.428	362552.3206	5.413296	3	12/13/2010	9:27	B	3	S			2	1	1	2
2175	0	MD	S_024_08976_C	3529220.249	362268.167	19.043202	2	12/14/2010	9:47	C	3	N	Horizontal	N	2	0.5	0.5	1
2193	0	MD	S_RoadE_14010_A	3529676.959	363084.4457	14.209902	3	12/14/2010	12:28	A	3	N			3	1	1	1
2195	0	Hot Rock	S_010_03886_B	3529565.89	363063.9036	9.67	3	12/14/2010	12:53	B	3	NW			5	6	3	1
2204	0	MD	S_005_01882_A	3527704.155	363357.1296	9.47	2	12/14/2010	15:22	A	3	N	Horizontal	N	3	0.5	0.3	1
2224	0	MD	S_005_02146_A	3528435.205	363355.7404	4.25	2	12/15/2010	9:14	A	3	W	Horizontal	W	2	1	0.2	1
2250	0	MD	S_006_02389_A	3527880.291	363298.5841	10.1	2	12/15/2010	11:26	A	3	N			1	0.5	0.3	1
2270	0	MD	S_003_01098_A	3527952.176	363469.4095	7.73328	1	1/4/2011	13:58	A	3	NE	Horizontal	W	1.5	0.5	0.025	1
2335	0	MD	N_074_05751_A	3529695.789	361896.3803	7.128588	1	1/6/2011	14:03	A	3	NW	Horizontal	S	3	1	0.25	1
2400	0	MD	N_075_05793_A	3529664.35	361833.6483	12.043811	2	1/6/2011	13:17	A	3	N	Horizontal	N	2	0.5	0.5	1
2414	0	MD	N_075_05783_A	3529625.535	361842.3029	22.501611	2	1/6/2011	14:07	A	3	N	Horizontal	W	3	0.5	0.3	1
2692	0	MD	N_073_05701_A	3529765.064	361941.6962	7.2399	1	1/7/2011	9:28	A	3	W	Horizontal	S	3	0.25	0.25	1
2702	0	MD	N_076_05842_A	3529620.037	361779.9939	4.791858	3	1/7/2011	10:07	A	3	N			2	1	1	1
3221	0	MD		3529918.672	360169.2459	0	2	1/19/2011	10:03	16 5 01	3	N	Horizontal	W	0	0	0	1
3299	0	MD	N_011_01187_B	3531109.925	363003.6826	4.302195	2	1/20/2011	10:17	B	3	N	Horizontal	W	2	0.5	0.5	1
3301	0	CD	N_0C1_06260_A	3531039.718	363000.5424	7.142841	2	1/20/2011	11:23	A	3	NE	Horizontal		4	0.3	0.3	2
138	0	MD	N_013_01364_A	3531523.138	362889.4594	24.890958	2	10/13/2010	11:25	A	2	W	Horizontal	W	7	3	0	1
176	0	MD	N_016_02199_A	3531846.67	362731.0604	6.272998	3	10/13/2010	12:33	A	2	S	Horizontal	N	1	1	1	2
180	0	MD	N_016_02091_A	3531871.947	362718.4786	16.260374	3	10/13/2010	15:03	A	2	S	Horizontal	S	2	1	1	3
206	0	MD	N_036_04873_A	3531175.099	361580.1587	14.640012	1	10/6/2010	12:25	A	2	NW	Veritical	W	2.5	0.5	0.5	1
273	0	MD	N_034_04585_A	3531261.231	361691.1002	5.377806	1	10/12/2010	9:33	A	2	S	Horizontal	N	2.5	0.5	0.5	1
274	0	MD	N_034_04585_B	3531261.295	361691.064	5.377806	1	10/12/2010	9:35	B	2	S	Horizontal	N	2.5	0.5	0.5	1
393	0	MD	N_023_03219_A	3531701.859	362321.0431	8.984463	2	10/18/2010	9:53	A	2	N	Horizontal	N	1	0.25	1	1
394	0	CD	N_020_02876_A	3531841.272	362498.7151	47.262519	2	10/18/2010	10:36	A	2	S	Horizontal	S	4	1	4	1
397	0	CD	N_006_00392_A	3531716.313	363290	558.000637	2	10/18/2010	11:48	A	2	N	Horizontal	W	36	2	0.25	1
410	0	CD	N_006_00398_A	3531698.753	363291.6908	245.971759	2	10/18/2010	16:03	A	2	N	Horizontal	N	20	20	3	1
421	0	MD	N_017_02391_A	3531792.886	362659.5387	9.721701	3	10/18/2010	9:36	A	2	N	Horizontal	S	3	1	1	1
697	0	MD	N_022_03156_A	3533228.528	362374.3508	5.743101	2	10/27/2010	13:06	A	2	S	Horizontal	N	2	1	0.2	1
532	0	MD	N_015_01756_A	3533299.817	362779.6014	42.91783	2	10/26/2010	10:16	A	2	N	Horizontal	N	5	2	2	1
823	0	MD	N_034_04497_A	3532644.466	361690.8868	23.987615	2	11/1/2010	15:59	A	2	N	Horizontal	N	5	4	4	1
885	0	RRD	N_033_04329_A	3532584.597	361742.0773	4260.108087	2	11/2/2010	12:13	A	2	N	Horizontal	N	20	0.5	15	1
899	0	MD	N_028_03711_A	3532620.524	362033.4328	20.816519	3	11/2/2010	9:31	A	2	N	Horizontal	E	2	2	1	1
1060	0	CD	N_006_00412_A	3532424.287	363287.5347	75.286579	1	11/10/2010	15:58	A	2	N	Horizontal	N	2.5	2	2.5	1
1089	0	CD	N_012_01206_A	3532321.592	362946.0854	157.760568	2	11/10/2010	11:30	A	2	N	Horizontal	W	120	0.25	120	1
1112	0	CD	N_007_00672	3531178.208	363233.9688	5.098084	3	11/10/2010	10:06	A	2	N			3	3	1	1
1152	0	CD	N_005_00322_A	3531330.762	363344.5869	6.90594	2	11/11/2010	12:20	A	2	N	Horizontal	E	4	0.1	0.1	1
1156	0	CD	N_004_00241_A	3531491.833	363402.8439	4.178524	2	11/11/2010	12:44	A	2	N	Horizontal	N	3	1	0.2	1
1190	0	CD	N_006_00386_B	3531415.929	363288.8802	1815.292806	3	11/11/2010	12:44	B	2	N			1	1	0	1
1226	0	MD	S_024_08864_A	3528364.74	362258.7766	8.313276	2	11/15/2010	9:46	A	2	N	Horizontal	N	1	0.25	1	1
1255	0	MD	S_025_09145_A	3527178.917	362209.5446	5.171631	3	11/15/2010	11:54	A	2	S			2	1	1	1
1259	0	CD	S_025_09134_B	3527159.785	362197.7689	6.089958	3	11/15/2010	12:36	B	2	N			7	3	1	1
1294	0	CD	N_0A2_06088_A	3532984.55	362135.1895	14.333333	2	11/8/2010	14:54	A	2	N	Horizontal		3	3	0.01	1
1496	0	MD	S_027_10079 _A	3528052.496	362093.3199	10.536594	2	11/16/2010	14:47	A	2	N			2	0.2	0.2	1
1513	0	MD	S_027_10007_B	3527150.616	362086.621	25.326492	3	11/16/2010	12:42	B	2	S			2	2	3	1
1551	0	CD	S_022_08105_A	3527576.01	362381.6209	11.986584	3	11/17/2010	9:34	A	2	N			2	2	2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1553	0	MD	S_027_10030_A	3527476.398	362102.5975	7.153284	3	11/17/2010	10:17	A	2	W			3	1	1	1
1559	0	Hot Rock	S_029_10550_A	3527525.155	361986.5032	37.603074	3	11/17/2010	13:56	A	2	N			3	2	3	1
1563	0	MD	S_027_10038_A	3527567.846	362106.1086	7.24995	2	11/17/2010	14:53	A	2	N			2	1	1	1
1579	0	MD	S_015_05260_A	3528070.182	362771.851	5.79996	2	11/17/2010	15:45	A	2	NW	Horizontal	N	2	1	0.3	1
1596	0	CD	S_019_07046_A	3528470.134	362558.3746	8.893272	1	11/21/2010	11:59	A	2	S			72	1	1	1
1633	0	MD	S_015_05331_A	3528730.681	362782.8273	7.539948	2	11/21/2010	11:48	A	2	N	Horizontal	W	2.5	0.3	0.3	1
1680	0	CD	N_007_00620_A	3530745.937	363231.6552	17.593069	3	11/30/2010	8:57	A	2	N			24	1	1	1
1692	0	MD	S_004_01829_B	3530617.881	363410.1027	233.44839	3	11/30/2010	11:26	B	2	W			4	2	2	1
1698	0	MD	S_008_03306_B	3530609.651	363188.8666	278.688078	3	11/30/2010	12:55	B	2	S	Horizontal	S	21.3	3	3	1
1889	0	MD	S_019_06966_B	3527184.971	362561.6886	22.764843	3	12/6/2010	9:39	B	2	S			3	1	1	1
1904	0	CD	S_019_06975_A	3527574.18	362562.4197	101.4993	3	12/6/2010	13:51	A	2	S	Horizontal	N	12	18	1	1
1998	0	CD	S_019_07270_A	3530205.607	362560.1779	224.458452	2	12/8/2010	11:10	A	2	E	Pointing Down Toward	E	36	24	36	1
2072	0	MD	S_020_07673_A	3530110.804	362493.0368	6.573288	2	12/9/2010	11:13	A	2	N	Horizontal	W	3	0.5	0.5	1
2156	0	MD	S_020_07546_A	3529473.701	362503.448	16.481553	1	12/14/2010	14:24	A	2	SE	Horizontal	W	0.5	0.5	0.5	1
2171	0	MD	S_022_08226_B	3529242.612	362380.2795	8.69994	2	12/14/2010	9:33	B	2	N	Horizontal	E	3	0.5	0.3	1
2262	0	MD	S_007_02802_A	3528019.261	363236.3959	5.22	3	12/15/2010	10:36	A	2	N	Horizontal	S	1	1	1	10
2386	0	MD	N_075_05798_A	3529778.073	361844.4131	10.58281	2	1/6/2011	12:13	A	2	N	Horizontal	N	2	1	0.3	1
2409	0	MD	N_075_05804_A	3529649.252	361833.5538	8.782377	2	1/6/2011	13:52	A	2	W	Horizontal	N	3	1	0.3	1
2418	0	MD	N_075_05809_B	3529625.339	361843.3741	6.77799	2	1/6/2011	14:14	B	2	E			1	1	0.3	1
2674	0	CD	S_017_06492_A	3530574.679	362659.7724	7.056618	1	1/7/2011	14:49	A	2	E	Horizontal	N	2	1	1	1
2679	0	CD	S_015_05579_A	3530484.307	362777.8353	3194.666301	3	1/7/2011	13:21	A	2	N	Horizontal	N	72	5	2	1
2689	0	CD	S_015_05577_A	3530481.279	362775.6284	134.124075	3	1/7/2011	15:20	A	2	S	Horizontal	N	12	6	4	27
2690	0	CD	S_015_05575_A	3530475.726	362773.8503	318.611136	3	1/7/2011	15:37	A	2	W	Horizontal	W	10	5	5	13
3222	0	MD		3529931.267	360157.5415	0	2	1/19/2011	10:09	16 5 2	2	E	Horizontal	W	2	0.5	2	1
3223	0	MD		3529937.09	360142.9115	0	2	1/19/2011	10:21	16 5 3	2	E	Horizontal	W	3	0.5	3	1
3238	0	MD		3530033.652	360011.7462	0	2	1/19/2011	11:29	16 3 02	2	E	Horizontal	E	4	1	4	1
3316	0	MD	N_009_00897_C	3531042.669	363119.1526	5.237029	2	1/20/2011	14:39	C	2	E	Horizontal	N	2	0.4	0.4	3
3504	0	CD	N_008_00723_A	3530841.12	363174.1285	21.074934	2	1/21/2011	9:04	A	2	W	Horizontal	W	15	0.1	15	1
82	0	RRD	N_020_02857_A	3531375.58	362488.9706	549.426419	2	10/4/2010	12:49	n 020 0285	1	NW	Horizontal	W	240	0.25	240	1
109	0	MD	N_014_01508_B	3531850.451	362836.8266	112.032503	1	10/13/2010	14:35	B	1	W	Horizontal	S	1.5	1	1.5	1
141	0	CD	N_009_00830_A	3531669.433	363111.3307	145.453018	2	10/13/2010	12:04	A	1	N	Horizontal		14	3	3	1
321	0	MD	N_034_04462_B	3531711.511	361687.4878	317.512475	3	10/12/2010	16:06	B	1	W	Horizontal	W	2	1	1	1
400	0	MD	N_011_01180_A	3531700.962	362999.6489	4.817256	2	10/18/2010	12:06	A	1	E	Horizontal	N	2	1	2	1
706	0	CD	N_012_01250_A	3533239.904	362947.7273	11.798577	2	10/27/2010	15:12	A	1	N	Horizontal	S	4	2	0.1	1
707	0	CD	N_012_01310_A	3533200.259	362939.1046	4.449285	2	10/27/2010	15:18	A	1	N	Horizontal	S	2	3	0.1	1
1032	0	CD	N_002_00062_A	3533003.53	363506.6599	41.765336	1	11/9/2010	14:30	A	1	W	Horizontal	W	4	2	4	1
832	0	CD	N_0A3_06123_A	3532835.823	362192.5186	5.7385	3	11/1/2010	12:05	A	1	N	Horizontal	N	2	1	1	1
875	0	MD	N_035_04622_A	3532636.797	361644.4992	71.508065	2	11/2/2010	9:52	A	1	S	Horizontal	N	1	5	5	1
876	0	MD	N_035_04713_A	3532612.993	361639.4656	7.446701	2	11/2/2010	10:07	A	1	S	Horizontal	S	1	1	1	1
897	0	MD	N_034_04485_A	3532871.556	361681.9644	43.502788	2	11/2/2010	16:25	A	1	N	Horizontal	E	5	1	0.02	1
1015	0	CD	N_002_00062_A	3533003.53	363506.6599	41.765336	1	11/9/2010	14:30	A	1	W	Horizontal	W	4	2	4	1
1074	0	CD	N_005_00282_A	3532393.239	363345.7107	25.035713	1	11/10/2010	12:25	A	1	N	Horizontal	N	2.5	2.5	5	1
1283	0	MD	N_050_05284_A	3533251.168	360773.0343	6.477753	1	11/8/2010	14:19	A	1	N	Horizontal	N	0.5	0.05	0.05	1
1285	0	MD	N_053_05343_A	3533122.643	360620.6398	4.68538	1	11/8/2010	15:02	A	1	N	Horizontal	N	0.5	0.2	0.2	1
1494	0	MD	S_029_10608 _A	3528343.339	361975.8395	7.829946	2	11/16/2010	13:04	A	1	N	Horizontal	S	3	0.5	0.5	1
1510	0	CD	S_028_10267_A	3527126.444	362035.7739	98.502654	3	11/16/2010	12:08	A	1	N			1	1	1	1
1628	0	MD	S_008_03200_A	3528612.205	363178.7971	4.929966	2	11/21/2010	10:59	A	1	N	Horizontal	E	2	2	0.5	1
1635	0	MD	S_017_06254_A	3528759.761	362671.5497	10.198263	2	11/21/2010	12:14	A	1	N	Horizontal	W	2.5	0.5	0.5	1
2082	0	MD	S_011_04189_A	3530231.536	362998.792	9.279936	2	12/13/2010	9:09	A	1	N	Horizontal	W	5	0.5	0.2	1
2084	0	CD	S_011_04182_A	3530151.709	363000.3042	50.072988	2	12/13/2010	9:16	A	1	E	Horizontal	N	15	2	0.2	1
2213	0	MD	S_006_02588_A	3528467.105	363294.7276	8.6	2	12/15/2010	8:31	A	1	N	Horizontal		3	0.5	0.5	1
2384	0	MD	N_075_05777_A	3529783.395	361842.4075	57.315487	2	1/6/2011	12:06	A	1	N	Veritical		2	2	2	1
2405	0	MD	N_075_05781_A	3529653.816	361832.9869	27.592612	2	1/6/2011	13:33	A	1	S	Horizontal	W	2.5	0.5	0.3	1
3140	0	MD		3529205.548	359907.6439	0	3	1/12/2011	10:12	11.2.1	1	N	Horizontal	N	3	1	1	1
3142	0	CD		3529546.232	359939.8018	0	3	1/12/2011	12:00	11.4.1	1	N	Veritical	N	4	4	4	1
3143	0	CD		3529536.809	359945.5599	0	3	1/12/2011	12:08	11.4.2	1	N	Horizontal	N	4	3	3	1
3144	0	MD		3529535.565	359948.5771	0	3	1/12/2011	12:12	11.4.3	1	N	Horizontal	N	1	0.25	0.25	1
3145	0	MD		3529515.357	359971.8756	0	3	1/12/2011	12:24	11.4.4	1	N	Horizontal	W	7	2	0.25	1
3227	0	MD		3529997.526	360059.9964	0	2	1/19/2011	11:00	16 4 02	1	W	Horizontal	W	3	0.5	3	1
120	0	RRD	N_013_01336_A	3531879.631	362859.2305	146.329657	1	10/13/2010	16:27	A	0.1	S	Pointing Down Toward	W	100	0.05	0.06	1
3103	0	MD		3529443.182	359797.0736	0	1	1/12/2011	11:14	11/8/2009	0.06489	N	Horizontal	N	2	0.25	0.25	1
19	0		N_016_02212_A	3531191.842	362720.7047	5.621809		9/30/2010		m06 0	0	N			72	0	0	1
124	0	CD	N_013_01374_A	3531838.361	362881.5795	20.397439	1	10/13/2010	16:51	A	0	E	Horizontal	N	0.05	0.05	0.05	1
126	0	CD	N_013_01446_A	3531836.927	362882.4113	5.606143	1	10/13/2010	17:01	A	0	S	Horizontal	N	39	0.05	0.05	1
136	0	No Find	N_010_01019_A	3531531.472	363056.9593	5.967479	2	10/13/2010	10:47	A	0				0	0	0	1
232	0	CD	N_019_02665_A	3531383.305	362554.855	1914.356771	2	10/6/2010	8:52	A	0	S	Horizontal	W	200	0	0	1
286	0	CD	N_035_04607_A	3531313.315	361641.202	6035.822024	1	10/12/2010	11:44	A	0		Horizontal	E	16	15	15	1
287	0	CD	N_035_04607_B	3531313.244	361641.2012	6035.822024	1	10/12/2010	11:47	B	0		Horizontal	N	5	2	2	1
288	0	MD	N_035_04607_C	3531312.895	361641.2293	6035.822024	1	10/12/2010	11:50	C	0		Veritical	N	11	4	1	1
296	0	CD	N_036_04840_B	3531321.141	361586.1315	34.990569	1	10/12/2010	12:47	B	0		Horizontal	W	5	0.1	0.1	1
297	0	CD	N_036_04840_C	3531321.377	361585.9333	34.990569	1	10/12/2010	12:50	C	0		Horizontal	W	3	0.1	0.1	1
298	0	MD	N_063_05396_A	3531303.59	361535.9592	19.321265	1	10/12/2010	15:25	A	0		Horizontal	N	8	3	0.2	1
300	0	MD	N_063_05396_C	3531303.16	361536.2507	19.321265	1	10/12/2010	15:30	C	0		Horizontal	W	2.5	0.5	0.5	1
314	0	MD	N_030_03999_A	3531261.204	361912.4452	7.581814	3	10/12/2010	10:54	A	0		Horizontal	N	1	1	1	3
330	0	RRD	N_012_01204_A	3531838.838	362943.7324	175.082986	1	10/14/2010	11:31	A	0		Horizontal	W	1200	0.2	0.2	2
398	0	CD	N_006_00392_B	3531715.877	363290.1618	558.000637	2	10/18/2010	11:50	B	0	S	Veritical	W	12	6	6	1
472	0	none	N_020_02887_A	3530991.676	362492.4904	20.386407	1	10/19/2010	17:02	A	0				0	0	0	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
473	0	none	N_022_03155_A	3531129.252	362370.7912	5.879816	1	10/19/2010	17:15	A	0				0	0	0	1
482	0		N_026_03530_A	3531087.567	362153.9626	6.395834	3	10/19/2010		A	0				0	0	0	1
671	0	CD	N_010_00994_A	3533199.874	363061.3019	8.981394	1	10/27/2010	14:04	A	0	N	Horizontal	W	18	0.005	0.005	1
677	0	CD	N_010_00933_A	3533025.451	363035.2985	128.564022	1	10/27/2010	15:48	A	0	N	Horizontal	N	5	4	4	1
692	0	MD	N_014_01659_A	3533243.158	362832.4981	5.031738	2	10/27/2010	11:39	A	0	NW	Pointing Down Toward	N	3	1	0.3	1
695	0	MD	N_020_02886_A	3533225.485	362492.9716	20.56418	2	10/27/2010	12:48	A	0	W	Horizontal	W	3	3	2	1
493	0	No Find	N_014_01607_A	3532868.927	362828.7512	8.579766	2	10/20/2010	15:17	A	0				0	0	0	0
504	0	No Find	N_011_01133_A	3532959.595	363014.4252	10.103828	1	10/26/2010	11:21	A	0		Pointing Down Toward		0	0	0	1
525	0	No Find	N_0A1_06079_A	3533011.253	363167.4916	4.526582	1	10/26/2010	16:39	A	0	N			0	0	0	1
530	0	No Find	N_015_01842_A	3533311.607	362776.1782	10.06925	2	10/26/2010	9:04	A	0				0	0	0	1
561	0	CD	N_016_02076_B	3533285.864	362720.1526	19.667337	3	10/26/2010	11:05	B	0	N	Horizontal	N	1	1	1	3
616	0	No Find	N_015_01797_A	3532980.582	362777.8354	19.541455	2	10/22/2010	11:39	A	0				0	0	0	1
617	0	Hot Rock	N_014_01651_A	3532930.573	362827.7674	5.313682	2	10/22/2010	12:31	A	0				0	0	0	1
619	0	MD	N_013_01479_A	3532970.323	362881.9211	4.004272	2	10/22/2010	12:56	A	0	NW	Horizontal	N	1	0.25	1	1
651	0	CD	N_008_00745_A	3533060.41	363173.2793	10.184659	1	10/27/2010	10:44	A	0	W	Horizontal	N	4	0.005	0.005	1
657	0	CD	N_008_00788_A	3533090.726	363170.9602	5.226651	1	10/27/2010	11:33	A	0	N	Horizontal	N	1	1	0.005	1
664	0	CD	N_010_00974_A	3533153.667	363059.4576	12.4	1	10/27/2010	12:45	A	0	NW	Horizontal	W	4	2	4	1
705	0	MD	N_020_02945_B	3533289.889	362484.8544	5.681484	2	10/27/2010	14:33	B	0	S	Horizontal	S	3	1	0.3	1
711	0	MD	N_010_01025_A	3533101.954	363061.3998	5.765016	2	10/27/2010	15:54	A	0	SW	Horizontal	S	2	4.3	0	1
716	0	No Find	N_016_02167_A	3533064.986	362711.8072	8.313883	3	10/27/2010	10:28	A	0				0	0	0	1
730	0	No Find	N_017_02503_A	3533158.993	362647.4755	4.384178	3	10/27/2010	14:28	A	0				0	0	0	1
735	0	No Find	N_006_00551_A	3533042.907	363292.7171	4.642291	1	10/28/2010	9:21	A	0	N	Horizontal	N	0	0	0	1
745	0	No Dig	N_00A_05954_A_RW	3532981.358	363035.3051	73.422775	1	10/28/2010	10:45	A	0	N	Horizontal	N	0	0	0	1
746	0	No Dig	N_00A_06011_A_RW	3532998.994	363138.704	7.781148	1	10/28/2010	11:05	A	0	N	Horizontal	N	0	0	0	1
747	0	No Dig	N_00A_06037_A_RW	3533007.25	363195.5155	5.196808	1	10/28/2010	11:40	A	0	N	Horizontal	N	0	0	0	1
748	0	No Dig	N_00A_06035_A_RW	3533006.977	363190.9102	5.364516	1	10/28/2010	11:49	A	0	N	Horizontal	N	0	0	0	1
749	0	No Dig	N_00A_06005_A_RW	3533008.566	363217.8548	8.395575	1	10/28/2010	12:22	A	0	N	Horizontal	N	0	0	0	1
750	0	No Dig	N_005_00278_A_RW	3533009.135	363349.2334	33.329852	1	10/28/2010	12:55	A	0	N	Horizontal	N	0	0	0	1
757	0	No Find	N_014_01531_A_RW	3532901.155	362838.2607	43.068096	2	10/28/2010	12:17	A	0				0	0	0	1
769	0	No Dig	N_0A1_06064_A_RW	3533109.086	362473.1493	20.847426	3	10/28/2010	11:49	A	0				0	0	0	1
770	0	No Find	N_014_01624_A_RW	3533293.941	362834.8199	6.837467	3	10/28/2010	13:42	A	0				0	0	0	1
771	0	No Find	N_014_01548_A_RW	3533281.239	362836.2784	21.013859	3	10/28/2010	13:51	A	0				0	0	0	1
772	0	No Find	N_013_01415_A_RW	3533264.693	362887.4351	7.901319	3	10/28/2010	13:58	A	0				0	0	0	1
773	0	No Find	N_013_01397_A_RW	3533265.613	362894.5747	10.83095	3	10/28/2010	14:04	A	0				0	0	0	1
1031	0	Hot Rock	N_002_00089_B	3533067.121	363521.3118	5.387197	1	11/9/2010	14:02	A	0				0	0	0	1
1036	0	CD	N_002_00079_A	3532990.418	363508.6894	9.623829	1	11/9/2010	15:22	A	0	N	Horizontal	N	2	2	0.02	1
776	0	CD	N_042_05133_A_dup	3532984.506	361232.6089	1031.401631	1	11/1/2010	10:54	A	0	N	Horizontal	E	78	0.05	0.05	1
777	0	CD	N_043_05170_A	3532977.792	361181.8033	546.432229	1	11/1/2010	11:07	A	0	N	Horizontal	E	78	0.05	0.05	1
778	0	No Find	N_041_05115_A	3533018.433	361291.949	2.820933	1	11/1/2010	11:26	A	0	N	Horizontal	N	0	0	0	1
779	0	CD	N_041_05115_A_dup	3533007.317	361295.8992	408.362629	1	11/1/2010	11:36	A	0	N	Horizontal	E	78	0.05	0.05	1
782	0	CD	N_039_05080_A	3532993.516	361416.5707	10.358263	1	11/1/2010	12:42	A	0	N	Horizontal	N	8	8	1	1
803	0	CD	N_034_04471_B	3532790.038	361694.7942	109.343363	2	11/1/2010	12:00	B	0				3	0.01	1	1
804	0	CD	N_034_04472_A	3532796.464	361691.1271	69.193684	2	11/1/2010	12:08	A	0	N			0.3	0.3	0.3	1
806	0	CD	N_034_04467_A	3532797.73	361691.0427	123.98009	2	11/1/2010	12:17	A	0	N			0.3	0.3	0.3	1
809	0	MD	N_034_04474_C	3532799.573	361689.574	59.695437	2	11/1/2010	12:28	C	0				0.3	0.3	0.3	1
813	0	Hot Rock	N_035_04789_A	3532762.935	361653.6607	4.387097	2	11/1/2010	13:01	A	0	N			0	0	0	1
837	0	No Find	N_027_03651_A	3532623.128	362104.8288	5.423699	3	11/1/2010	14:04	A	0				0	0	0	1
850	0	No Find	N_028_03823_A	3532664.852	362024.7635	4.073552	3	11/1/2010	16:06	A	0		Horizontal	S	0	0	0	1
865	0	No Find	N_00A_06036_A	3532695.735	361529.4046	5.223446	1	11/2/2010	13:59	A	0	N	Horizontal	N	0	0	0	1
866	0	CD	N_00A_05960_A	3532678.019	361484.6585	38.467884	1	11/2/2010	14:13	A	0	N	Horizontal	W	12	0.025	0.025	1
868	0	No Find	N_038_05064_A	3532664.69	361458.9706	6.771399	1	11/2/2010	14:30	A	0	N	Horizontal	N	0	0	0	1
871	0	MD	N_038_05052_A	3532630.639	361446.6786	37.091847	1	11/2/2010	15:40	A	0	N	Horizontal	W	4	2	0.05	1
878	0	No Find	N_035_04781_A	3532566.228	361633.0229	4.631346	2	11/2/2010	10:31	A	0				0	0	0	1
879	0	No Find	N_035_04750_A	3532567.475	361630.7125	5.395916	2	11/2/2010	10:46	A	0				0	0	0	1
880	0	No Find	N_035_04800_A	3532548.97	361639.345	4.055697	2	11/2/2010	10:56	A	0				0	0	0	1
887	0	CD	N_033_04330_A	3532765.45	361748.4427	1448.326239	2	11/2/2010	13:41	A	0	N			24	24	0.3	1
900	0	No Find	N_029_03876_A	3532648.401	361960.6387	10.940747	3	11/2/2010	9:51	A	0				0	0	0	1
902	0	No Find	N_029_03895_A	3532670.354	361982.3901	6.698024	3	11/2/2010	10:19	A	0				0	0	0	1
905	0	No Find	N_030_03995_A	3532666.409	361925.2863	7.847943	3	11/2/2010	11:51	A	0				0	0	0	1
906	0	No Find	N_030_04049_A	3532673.892	361922.8996	4.509674	3	11/2/2010	12:08	A	0				0	0	0	1
918	0	CD	N_036_04823_A	3532941.944	361583.1333	61.770503	1	11/3/2010	10:47	A	0	N	Horizontal	N	3	3	1	1
920	0	MD	N_035_04776_A	3532961.939	361635.5551	4.743345	1	11/3/2010	11:43	A	0	N	Horizontal	N	2.5	1.5	0.005	1
922	0	CD	N_037_05011_A	3532975.417	361509.3903	15.264887	1	11/3/2010	12:26	A	0	N	Horizontal	N	1	0.5	0.5	1
924	0	MD	N_029_03900_A	3532858.55	361973.2515	5.236556	1	11/3/2010	13:11	A	0	N	Horizontal	N	1.5	0.005	0.005	1
925	0	CD	N_028_03683_A	3532903.192	362034.114	973.022637	1	11/3/2010	13:27	A	0	N	Horizontal	N	6	4	4	1
927	0	RRD	N_034_04465_A	3532894.241	361683.3727	184.407044	2	11/3/2010	10:10	A	0		Horizontal	N	8	3	8	1
947	0	Hot Rock	N_00A_05964_A	3532715.455	362450.0901	29.170476	2	11/3/2010	16:31	A	0				0	0	0	1
954	0	Hot Rock	N_046_05208_A	3532430.169	360995.8177	4.434564	1	11/4/2010	9:29	A	0	N	Horizontal	N	0	0	0	1
955	0	Hot Rock	N_046_05205_A	3532432.195	360990.6183	4.635706	1	11/4/2010	9:43	A	0	N	Horizontal	N	0	0	0	1
956	0	No Find	N_048_05245_A	3532202.202	360884.8073	4.512446	1	11/4/2010	10:16	A	0	N	Horizontal	N	0	0	0	1
957	0	Hot Rock	N_048_05245_B	3532202.113	360884.775	4.512446	1	11/4/2010	10:21	A	0	N	Horizontal	N	0	0	0	1
958	0	Hot Rock	N_048_05235_A	3532186.741	360881.7696	7.174921	1	11/4/2010	10:34	A	0	N	Horizontal	N	0	0	0	1
959	0	Hot Rock	N_051_05311_A	3532139.21	360726.9191	4.88699	1	11/4/2010	10:53	A	0	N	Horizontal	N	0	0	0	1
964	0	Hot Rock	N_017_02432_A	3532858.131	362667.7381	6.251861	2	11/4/2010	9:45	A	0				0	0	0	1
966	0	Hot Rock	N_018_02606_A	3532926.047	362619.9988	7.624186	2	11/4/2010	10:47	A	0				0	0	0	1
967	0	MD	N_018_02609_A	3532919.554	362609.9594	7.332967	2	11/4/2010	11:17	A	0	S	Horizontal	S	2	1	1	1
990	0	Hot Rock	N_048_05252_A	3533271.859	360891.9816	4.162783	1	11/9/2010	9:09	A	0				0	0	0	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
991	0	Hot Rock	N_048_05243_A	3533308.141	360896.2202	4.635494	1	11/9/2010	9:25	A	0				0	0	0	1
993	0	Hot Rock	N_052_05317_A	3532798.069	360665.1772	8.066911	1	11/9/2010	11:12	A	0				0	0	0	1
994	0	CD	N_047_05210_A	3532599.755	360949.4334	10033.7284	1	11/9/2010	11:52	A	0	N	Horizontal	N	120	36	3	1
997	0	Hot Rock	N_040_05097_A	3532828.013	361331.7142	28.33064	2	11/9/2010	9:15	A	0				0	0	0	1
999	0	Hot Rock	N_040_05095_A	3532832.952	361332.3424	38.8209	2	11/9/2010	9:29	A	0				0	0	0	1
1000	0	Hot Rock	N_043_05177_A	3532811.506	361178.9716	4.198852	2	11/9/2010	9:48	A	0				0	0	0	1
1002	0	Hot Rock	N_044_05187_A	3532586.394	361129.6191	4.466405	2	11/9/2010	10:59	A	0				0	0	0	1
1003	0	Hot Rock	N_030_04066_A	3532178.919	361903.0012	4.020051	2	11/9/2010	12:34	A	0				0	0	0	1
1029	0	Hot Rock	N_002_00103_B	3533197.893	363515.434	4.095797	1	11/9/2010	13:14	B	0				0	0	0	1
1030	0	Hot Rock	N_002_00089_A	3533067.053	363521.2662	5.387197	1	11/9/2010	14:01	A	0	N			0	0	0	1
1050	0	MEC		3532842	362502	0		11/4/2010			0				0	0	0	0
1058	0	CD	N_006_00400_B	3532428.198	363286.7554	202.263873	1	11/10/2010	15:40	B	0	W	Horizontal	W	48	1	1	1
1059	0	CD	N_006_00438_A	3532429.323	363286.3855	22.88149	1	11/10/2010	15:50	A	0	N	Horizontal	N	5	2.5	2.5	1
1062	0	CD	N_007_00685_A	3532779.582	363228.6124	4.01749	1	11/10/2010	8:40	A	0	N	Horizontal	N	2	0.25	0.25	1
1063	0	CD	N_004_00228_A	3532618.648	363403.2623	6.819383	1	11/10/2010	9:13	A	0	N	Horizontal	N	6	3	0.025	1
1064	0	CD	N_004_00228_B	3532618.637	363403.3374	6.819383	1	11/10/2010	9:16	B	0	N	Horizontal	W	26	1	1	1
1066	0	CD	N_004_00185_B	3532586.323	363400.0562	89.975534	1	11/10/2010	9:49	B	0	N	Horizontal	N	3	1	0.005	1
1067	0	Hot Rock	N_002_00094_A	3532606.201	363505.6399	4.638313	1	11/10/2010	10:18	A	0				0	0	0	1
1076	0	CD	N_005_00265_A	3532391.5	363345.8722	65.291237	1	11/10/2010	12:44	A	0	N	Horizontal	N	78	0.005	0.005	1
1077	0	CD	N_005_00333_A	3532385.429	363345.5204	5.934012	1	11/10/2010	12:55	A	0	N	Horizontal	N	2.5	2.5	5	1
1078	0	CD	N_006_00574_A	3532360.163	363287.9672	4.088129	1	11/10/2010	13:52	A	0	S	Horizontal	S	150	36	0.005	1
1313	0	CD	N_033_04332_A	3533238.271	361742.0778	406.964992	2	11/8/2010	12:31	A	0	E	Horizontal	E	150	0.2	150	1
1320	0	CD	N_031_04113_A	3531829.461	361861.3973	7.699856	3	11/8/2010	10:09	A	0	N			5	1	1	1
1324	0	Hot Rock	N_031_04160_B	3531830.895	361860.721	4.017458	3	11/8/2010	10:26	B	0				2	3	3	1
1100	0	Hot Rock	N_016_02240_A	3532516.933	362727.1371	4.167777	2	11/10/2010	15:14	A	0				0	0	0	1
1101	0	CD	N_013_01328_A	3532659.508	362897.5992	353.858496	2	11/10/2010	16:14	A	0	E	Horizontal	E	60	3	3	1
1122	0	CD	N_006_00393_A	3532456.107	363289.6967	531.286952	1	11/11/2010	9:01	A	0	N	Horizontal	N	6	1.5	1.5	1
1134	0	MD	N_008_00738_A	3532025.872	363183.6117	10.937536	1	11/11/2010	14:45	A	0	N	Horizontal	W	9	3	0.025	1
1135	0	CD	N_008_00802_A	3532021.782	363184.053	4.736559	1	11/11/2010	15:13	A	0	N	Horizontal	N	5	5	0.25	1
1136	0	MD	N_016_02040_A	3532058.412	362714.8816	37.128326	2	11/11/2010	8:49	A	0	NW	Horizontal	E	6	2	0.3	1
1145	0	CD	N_012_01317_A	3531980.506	362940.3472	4.284832	2	11/11/2010	10:52	A	0	N			3	0.1	0.1	1
1150	0	CD	N_005_00306_A	3531334.974	363344.0776	10.076856	2	11/11/2010	12:05	A	0	N	Horizontal		3	0.1	0.1	1
1153	0	CD	N_005_00380_A	3531323.709	363344.2139	4.053748	2	11/11/2010	12:25	A	0	N	Horizontal	N	1	0.3	0.1	1
1154	0	CD	N_005_00318_A	3531315.68	363346.284	7.301479	2	11/11/2010	12:31	A	0	N	Horizontal	W	4	0.1	0.1	1
1168	0	Hot Rock	N_006_00530_A	3531908.272	363294.429	5.157698	2	11/11/2010	15:25	A	0				0	0	0	1
1210	0	MD	S_028_10461_A	3528744.948	362036.0137	6.573288	1	11/15/2010	11:38	A	0	N	Pointing Down Toward	W	2.5	0.5	0.5	1
1213	0	MD	S_028_10457_B	3528723.388	362033.5028	12.663246	1	11/15/2010	12:21	B	0	N	Horizontal	W	1	0.25	1	1
1219	0	MD	S_027_10124_A	3528636.022	362101.1197	5.026632	1	11/15/2010	15:23	A	0	N	Horizontal	N	2.5	0.5	0.5	1
1231	0	Hot Rock	S_026_09763_A	3528283.979	362171.7266	6.669954	2	11/15/2010	11:25	A	0				0	0	0	1
1232	0	Hot Rock	S_026_09764_A	3528293.653	362171.7835	5.413296	2	11/15/2010	11:34	A	0				0	0	0	1
1234	0	Hot Rock	S_024_08858_A	3528085.035	362280.0713	4.881633	2	11/15/2010	12:02	A	0				0	0	0	1
1261	0	CD	S_025_09126_A	3527066.506	362218.4803	9.086604	3	11/15/2010	13:03	A	0	N			3	3	3	1
1270	0	Hot Rock	N_054_05378_A	3532767.246	360557.4786	4.101322	1	11/8/2010	9:25	A	0	N	Horizontal	N	0	0	0	1
1271	0	Hot Rock	N_053_05341_A	3532802.288	360607.836	5.161985	1	11/8/2010	9:54	A	0				0	0	0	1
1272	0	Hot Rock	N_052_05325_A	3532819.357	360669.7784	4.467838	1	11/8/2010	10:50	A	0				0	0	0	1
1273	0	Hot Rock	N_052_05320_A	3532825.675	360669.887	5.382517	1	11/8/2010	11:02	A	0				0	0	0	1
1274	0	Hot Rock	N_052_05316_A	3532820.427	360669.8592	9.33663	1	11/8/2010	11:13	A	0				0	0	0	1
1275	0	CD	N_052_05324_A	3532932.84	360671.2238	4.488992	1	11/8/2010	11:44	A	0	N	Horizontal	N	5	2	5	1
1277	0	Hot Rock	N_048_05248_B	3533026.947	360884.9053	4.323279	1	11/8/2010	12:10	B	0	N			0	0	0	1
1278	0	CD	N_048_05227_A	3533033.146	360885.2295	40.383497	1	11/8/2010	12:38	A	0	N	Horizontal	N	5	2	2	1
1279	0	Hot Rock	N_048_05227_B	3533033.135	360885.2267	40.383497	1	11/8/2010	12:39	B	0				0	0	0	1
1281	0	Hot Rock	N_048_05256_B	3533099.486	360892.389	4.026533	1	11/8/2010	12:58	B	0	N			0	0	0	1
1282	0	Hot Rock	N_047_05220_A	3533143.798	360943.8099	5.70987	1	11/8/2010	13:48	A	0				0	0	0	1
1284	0	Hot Rock	N_053_05345_A	3533201.734	360612.9378	4.475748	1	11/8/2010	14:38	A	0				0	0	0	1
1286	0	Hot Rock	N_053_05343_B	3533122.758	360620.7493	4.68538	1	11/8/2010	15:05	B	0				0	0	0	1
1287	0	Hot Rock	N_054_05376_A	3533106.471	360546.6098	4.347926	1	11/8/2010	15:36	A	0				0	0	0	1
1288	0	Hot Rock	N_053_05347_A	3533038.332	360606.8716	4.410164	1	11/8/2010	15:55	A	0				0	0	0	1
1289	0	CD	N_048_05225_A	3533012.679	360888.3722	117.175084	1	11/8/2010	12:24	A	0	N	Horizontal	W	78	0.5	0.5	1
1290	0	Hot Rock	N_041_05125_A	3533279.476	361291.1122	6.406754	2	11/8/2010	13:48	A	0				0	0	0	1
1291	0	CD	N_044_05179_A	3533259.156	361134.773	11405.60846	2	11/8/2010	14:02	A	0	N			0	0	0	1
1293	0	CD	N_0A2_06089_A	3532984.815	362132.9821	14.322916	2	11/8/2010	14:43	A	0	N	Horizontal	S	3	0.01	0.01	1
1295	0	Hot Rock	N_0A2_06087_A	3532988.195	362137.904	15.472391	2	11/8/2010	15:10	A	0	N			0	0	0	1
1301	0	Hot Rock	N_019_02833_A	3532934.593	362542.2209	4.273507	2	11/8/2010	8:41	A	0				0	0	0	1
1302	0	Hot Rock	N_019_02840_A	3532909.198	362535.1705	4.133138	2	11/8/2010	9:00	A	0				0	0	0	1
1309	0	Hot Rock	N_026_03570_A	3533265.801	362149.2463	4.18775	2	11/8/2010	11:34	A	0				0	0	0	1
1348	0	MD	S_021_07758_A	3528340.426	362438.1251	4.446636	1	11/18/2010	9:52	A	0	N	Horizontal	W	1	0.25	0.25	1
1355	0	MD	S_020_07414_A	3528477.814	362500.8942	5.123298	1	11/18/2010	11:42	A	0	N	Horizontal	W	1	0.25	0.25	1
1356	0	MD	S_020_07418_A	3528510.903	362504.2405	4.059972	1	11/18/2010	11:58	A	0	N	Horizontal	W	1	0.025	0.025	1
1362	0	MD	S_020_07433_A	3528587.332	362492.1471	9.279936	1	11/18/2010	13:55	A	0	N	Horizontal	W	1	0.025	0.025	1
1364	0	CD	S_011_03972_A	3527875.191	363013.0463	3300.44918	2	11/18/2010	8:53	A	0				0	0	0	1
1369	0	MD	S_014_04978_A	3528373.777	362839.6409	21.12	2	11/18/2010	11:45	A	0		Horizontal	N	3	0.75	3	2
1378	0	Hot Rock	S_016_05820_A	3528638.374	362733.6165	10.439928	2	11/18/2010	14:09	A	0				0	0	0	1
1381	0	MD	S_016_05813_A	3528614.95	362734.7972	7.73328	2	11/18/2010	14:24	A	0	N	Horizontal		2.5	0.3	0.3	1
1384	0	MD	S_016_05786_A	3528468.073	362721.8786	6.959952	2	11/18/2010	14:56	A	0	N			2.5	0.3	0.3	1
1421	0	Hot Rock	S_048_11948_A	3529016.546	360911.7805	5.413296	1	11/22/2010	11:09	A	0				0	0	0	0
1422	0	Hot Rock	S_Cross5_13467_A	3529032.587	360850.8346	5.993292	1	11/22/2010	11:23	A	0				0	0	0	1
1430	0	Hot Rock	S_044_11738_A	3528985.38	361134.9719	5.219964	1	11/22/2010	13:44	A	0				0	0	0	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1431	0	CD	S_049_11986_A	3528801.069	360833.2215	40.454721	1	11/22/2010	14:10	A	0	N	Horizontal	N	36	0.25	0.25	1
1432	0	Hot Rock	S_050_12019_A	3528774.114	360802.5736	11.019924	1	11/22/2010	14:32	A	0				0	0	0	1
1438	0	Hot Rock	S_054_12136_A	3528764.439	360555.3817	14.306568	2	11/22/2010	11:04	A	0				0	0	0	1
1439	0	Hot Rock	S_054_12134_A	3528746.583	360544.8218	10.343262	2	11/22/2010	11:11	A	0				0	0	0	1
1440	0	Hot Rock	S_053_12100_A	3528743.261	360627.7794	5.509962	2	11/22/2010	11:18	A	0				0	0	0	1
1441	0	Hot Rock	S_052_12069_A	3528750.37	360673.8161	10.729926	2	11/22/2010	11:29	A	0				0	0	0	1
1442	0	Hot Rock	S_052_12070_A	3528755.178	360667.6907	4.543302	2	11/22/2010	11:35	A	0				0	0	0	1
1443	0	Hot Rock	S_054_12146_A	3528918.471	360543.4352	6.186624	2	11/22/2010	11:51	A	0				0	0	0	1
1444	0	Hot Rock	S_054_12154_A	3528950.411	360552.1115	8.409942	2	11/22/2010	12:04	A	0				0	0	0	1
1446	0	Hot Rock	S_057_12232_A	3528781.443	360391.0507	24.1665	2	11/22/2010	13:15	A	0				0	0	0	1
1447	0	Hot Rock	S_058_12295_A	3528827.019	360340.1459	6.76662	2	11/22/2010	13:21	A	0				0	0	0	1
1448	0	Hot Rock	S_058_12299_A	3528848.296	360343.6558	5.123298	2	11/22/2010	13:27	A	0				0	0	0	1
1449	0	Hot Rock	S_057_12244_A	3528843.438	360380.894	5.413296	2	11/22/2010	13:33	A	0				0	0	0	1
1450	0	Hot Rock	S_057_12252_A	3528930.05	360381.4247	17.448213	2	11/22/2010	13:42	A	0				0	0	0	1
1451	0	Hot Rock	S_057_12250_A	3528929.919	360381.257	10.004931	2	11/22/2010	13:45	A	0				0	0	0	1
1452	0	Hot Rock	S_057_12255_A	3528960.206	360385.0019	5.413296	2	11/22/2010	13:54	A	0				0	0	0	1
1453	0	Hot Rock	S_059_12341_A	3528940.581	360309.1359	5.703294	2	11/22/2010	14:02	A	0				0	0	0	1
1454	0	Hot Rock	S_059_12344_A	3528959.445	360312.3944	5.703294	2	11/22/2010	14:10	A	0				0	0	0	1
1466	0	CD	S_026_09779_A	3528519.532	362151.7675	903.537102	1	11/16/2010	11:54	A	0	W	Horizontal	W	84	0.25	0.25	1
1468	0	MD	S_025_09251_A	3528586.006	362201.5777	6.186624	1	11/16/2010	12:39	A	0	W	Horizontal	W	1	0.25	0.23	2
1977	0	CD	S_RoadD_14472_A	3530059.391	362562.1273	31.803114	1	12/8/2010	12:38	A	0	N	Horizontal	N	5	5	0.025	1
1979	0	CD	S_019_07252_A	3530060.8	362562.4239	27.259812	1	12/8/2010	13:40	A	0	N	Horizontal	N	10	10	0.025	1
1982	0	CD	S_018_06920_A	3530064.4	362602.549	4.8333	1	12/8/2010	14:24	A	0	N	Horizontal	N	12	0.005	0.005	1
1986	0	CD	S_018_06924_A	3530209.456	362610.3004	3195.584628	1	12/8/2010	15:32	A	0	N	Horizontal	W	48	2.5	2.5	1
1987	0	CD	S_RoadD_14471_A	3530056.229	362563.0584	9.473268	1	12/8/2010	16:00	A	0	N	Horizontal	N	7	0.005	0.005	1
1988	0	MD	S_RoadD_14471_B	3530056.195	362563.0954	9.473268	1	12/8/2010	16:01	B	0	N	Horizontal	W	0.5	0.025	0.025	1
1989	0	CD	S_RoadD_14470_A	3530053.841	362563.192	7.636614	1	12/8/2010	16:10	A	0	N	Horizontal	W	4	2	0.005	1
1472	0	Hot Rock	S_026_09786_A	3528710.714	362163.8204	6.573288	1	11/16/2010	14:13	A	0				0	0	0	1
1474	0	MD	S_026_09797_A	3528788.675	362132.8262	15.273228	1	11/16/2010	15:10	A	0	N	Horizontal	W	1	0.025	0.025	1
1475	0	Hot Rock	S_026_09797_B	3528788.605	362132.7189	15.273228	1	11/16/2010	15:12	B	0				0	0	0	1
1476	0	MD	S_026_09803_A	3528841.975	362145.8249	4.639968	1	11/16/2010	16:01	A	0	N	Horizontal	W	1	0.025	0.025	1
1480	0	MD	S_028_10375 _ 6	3528209.682	362049.2271	5.79996	2	11/16/2010	10:28	6	0	NW	Horizontal	N	3	0.5	0.5	1
1485	0	MD	S_028_10358 _ A	3528102.221	362053.261	35.089758	2	11/16/2010	11:35	A	0	NE	Horizontal	E	4	1.5	1.5	1
1491	0	MD	S_029_10598 _ A	3528298.142	361970.9214	27.839808	2	11/16/2010	12:35	A	0	NW	Horizontal	N	3	0.5	0.5	1
1501	0	MD	S_028_10344 _ A	3527975.744	362056.0814	25.13316	2	11/16/2010	16:07	A	0	N	Horizontal	W	3	1	0.4	1
1532	0	MD	S_025_09180_A	3527662.963	362227.3769	6.089958	2	11/17/2010	8:56	A	0		Horizontal	E	1	0.25	0	3
1537	0	MD	S_028_10312_A	3527708.719	362040.9801	5.509962	2	11/17/2010	10:34	A	0	NW	Horizontal	N	2	1	2	1
1542	0	MD	S_028_10323_A	3527860.017	362048.9237	5.509962	2	11/17/2010	11:37	A	0		Horizontal	E	1	0.25	0	1
1564	0	Hot Rock	S_025_09174_A	3527620.031	362214.765	4.34997	3	11/17/2010	15:32	A	0	N			2	2	4	1
1565	0	CD	S_017_06160_A	3527997.598	362665.3496	42.243042	1	11/17/2010	14:24	A	0	N	Horizontal	N	12	4	1	1
1567	0	MD	S_019_06993_B	3528008.181	362559.036	554.669508	1	11/17/2010	14:57	B	0	N	Horizontal	W	1	0.025	0.025	1
1569	0	MD	S_018_06598_B	3528083.918	362612.3011	24.939828	1	11/17/2010	15:18	B	0	N	Horizontal	W	1	0.025	0.025	1
1571	0	MD	S_020_07359_A	3528088.908	362496.6745	4.34997	1	11/17/2010	15:40	A	0	N	Horizontal	W	1	0.025	0.025	1
1574	0	MD	S_017_06174_A	3528170.815	362672.1425	7.588281	1	11/17/2010	16:21	A	0	N	Horizontal	W	1.5	0.5	0.5	1
1575	0	MD	S_014_04908_A	3527972.712	362845.8475	7.73	2	11/17/2010	14:56	A	0	N	Horizontal	N	2	0.5	0.5	1
1580	0	MD	S_016_05728_A	3528089.574	362726.9245	14.113236	2	11/17/2010	15:55	A	0	N			2	0.3	0.3	1
1584	0	MD	S_011_04000_A	3528077.752	363010.0999	5.509962	2	11/17/2010	16:38	A	0	N			3	0.3	0.3	1
1652	0	Hot Rock	S_018_06734_A	3528841.624	362606.5852	18.173208	2	11/21/2010	15:56	A	0				0	0	0	1
1659	0	MD	S_005_02218_A	3528991.12	363349.8684	4.16	1	11/30/2010	10:33	A	0	N	Horizontal	N	0.5	0.25	0.25	1
1662	0	No Find	S_006_02636_A	3528972.746	363286.3344	9.57	1	11/30/2010	11:06	A	0				0	0	0	1
1663	0	Hot Rock	S_007_02948_A	3528986.407	363233.6067	4.64	1	11/30/2010	11:18	A	0				0	0	0	1
1664	0	Hot Rock	S_007_02947_A	3528981.772	363232.7665	5.32	1	11/30/2010	11:30	A	0				0	0	0	1
1665	0	MD	S_009_03524_A	3528963.196	363116.5906	10.63	1	11/30/2010	11:42	A	0	N	Horizontal	N	1	0.5	0.5	1
1666	0	MD	S_009_03508_A	3528819.286	363122.0066	5.12	1	11/30/2010	12:04	A	0	N	Horizontal	W	1	0.25	0.25	3
1667	0	CD	S_RoadE_13996_A	3529467.955	363291.5016	7.24995	1	11/30/2010	12:25	A	0	N	Horizontal	S	4	0.025	0.025	1
1668	0	CD	S_RoadE_13995_A	3529465.765	363291.5974	4.156638	1	11/30/2010	12:41	A	0	N	Horizontal	S	3.5	0.025	0.025	1
1672	0	Hot Rock	S_003_01410_A	3529522.082	363465.7531	4.45	1	11/30/2010	14:34	A	0				0	0	0	1
1674	0	MD	S_003_01408_A	3529503.902	363466.4636	4.25	1	11/30/2010	14:53	A	0	N	Horizontal	N	1	0.25	0.25	1
1675	0	CD	S_004_01758_A	3529416.173	363408.5482	83.62	1	11/30/2010	15:36	A	0	N	Horizontal	N	4	0.025	0.025	1
1700	0	CD	S_008_03259_A	3529486.484	363162.7948	4.059972	1	12/1/2010	9:21	A	0	N	Horizontal	W	36	0.5	0.5	1
1703	0	CD	S_013_04838_A	3530182.291	362909.2337	9.76	1	12/1/2010	10:54	A	0	N	Horizontal	W	30	0.025	0.025	1
1704	0	Hot Rock	S_015_05561_A	3530216.1	362784.6118	21.073188	1	12/1/2010	11:20	A	0				0	0	0	1
1706	0	RRD	S_RoadE_14022_A	3530268.921	362720.6584	3406.219842	1	12/1/2010	12:01	A	0	N	Veritical	N	48	48	60	1
1709	0	CD	S_018_06928_A	3530252.869	362606.2513	18.173208	1	12/1/2010	13:03	A	0	N	Horizontal	N	1	1	1	1
1710	0	MD	S_018_06927_A	3530250.779	362606.1939	6.669954	1	12/1/2010	14:04	A	0	N	Horizontal	W	0.5	0.25	0.25	1
1712	0	CD	S_016_06015_A	3530167.9	362721.5362	23.393172	1	12/1/2010	14:43	A	0	N	Horizontal	N	1	1	1	1
1713	0	CD	S_016_06013_A	3530114.953	362727.1929	21.26652	1	12/1/2010	15:23	A	0	N	Horizontal	W	24	1	1	1
1734	0	Hot Rock	S_079_12999_A	3528380.266	359422.2738	10.439928	1	12/2/2010	14:07	A	0				0	0	0	1
1735	0	Hot Rock	S_079_12998_A	3528374.53	359421.9507	5.31663	1	12/2/2010	14:18	A	0				0	0	0	1
1736	0	Hot Rock	S_079_12969_A	3528314.287	359412.4575	5.268297	1	12/2/2010	14:36	A	0				0	0	0	1
1737	0	Hot Rock	S_079_12948_A	3528276.174	359422.2413	23.393172	1	12/2/2010	14:48	A	0				0	0	0	1
1738	0	Hot Rock	S_078_12861_A	3528284.398	359472.5291	11.696586	1	12/2/2010	15:03	A	0				0	0	0	1
1739	0	Hot Rock	S_078_12901_A	3528381.208	359480.0202	17.206548	1	12/2/2010	15:27	A	0				0	0	0	1
1740	0	Hot Rock	S_078_12903_A	3528389.639	359481.3094	5.703294	1	12/2/2010	15:36	A	0				0	0	0	1
1741	0	Hot Rock	S_078_12904_A	3528390.295	359481.3209	7.153284	1	12/2/2010	15:40	A	0				0	0	0	1
1742	0	Hot Rock	S_078_12911_A	3528418.694	359473.4156	20.686524	1	12/2/2010	15:56	A	0				0	0	0	1
1743	0	Hot Rock	S_077_12820_A	3528373.943	359542.3242	20.106528	1	12/2/2010	16:06	A	0				0	0	0	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1744	0	Hot Rock	S_077_12808_A	3528317.61	359534.4435	8.989938	1	12/2/2010	16:19	A	0				0	0	0	1
1745	0	Hot Rock	S_077_12801_A	3528271.627	359536.9443	6.186624	1	12/2/2010	16:27	A	0				0	0	0	1
1754	0	MD	N_065_05596_A	3531016.31	360956.1677	4.822723	1	12/2/2010	10:39	A	0	N	Horizontal	W	2	0.25	0.25	1
1755	0	MD	N_065_05600_A	3531010.419	360945.9379	4.718029	1	12/2/2010	10:52	A	0	N	Horizontal	N	2	1	0.005	1
1756	0	MD	N_068_05609_A	3530955.45	360877.3019	21.653713	1	12/2/2010	11:14	A	0	N	Horizontal	N	2	1	0.005	1
1761	0	CD	S_005_02260_A	3529590.037	363349.1449	20.01	2	12/2/2010	11:55	A	0	N			20	0.3	0.3	1
1768	0	MD	S_006_02668_A	3529716.62	363291.0339	5.12	2	12/2/2010	15:04	A	0	SW	Horizontal	W	2	2	2	1
1774	0	No Find	S_004_01786_A	3529943.576	363395.7952	8.12	2	12/2/2010	16:39	A	0				0	0	0	1
1775	0	No Find	S_004_01784_A	3529940.094	363392.7477	4.45	2	12/2/2010	16:54	A	0				0	0	0	1
1776	0	No Find	S_004_01785_A	3529942.783	363395.642	4.64	1	12/2/2010	16:58	A	0				0	0	0	1
1777	0	Hot Rock	S_Cross3_13447_A	3528990.246	360775.6123	5.123298	1	11/23/2010	9:13	A	0				0	0	0	1
1778	0	Hot Rock	S_Cross5152_13478_A	3528933.893	360693.2978	10.439928	1	11/23/2010	9:29	A	0				0	0	0	1
1780	0	Hot Rock	S_050_12029_A	3528892.779	360790.3763	6.379956	1	11/23/2010	10:00	A	0				0	0	0	1
1782	0	Hot Rock	S_047_11898_A	3529081.611	360960.9431	4.784967	1	11/23/2010	11:13	A	0				0	0	0	1
1784	0	Hot Rock	S_044_11754_A	3529124.677	361132.1039	12.08325	1	11/23/2010	11:47	A	0				0	0	0	1
1787	0	Hot Rock	S_046_11859_A	3529153.645	361031.5734	8.409942	1	11/23/2010	12:39	A	0				0	0	0	1
1788	0	Hot Rock	S_046_11862_A	3529209.627	361016.5994	5.026632	1	11/23/2010	12:57	A	0				0	0	0	1
1789	0	Hot Rock	S_047_11910_A	3529164.62	360959.1218	6.379956	1	11/23/2010	14:08	A	0				0	0	0	1
1790	0	Hot Rock	S_065_12418_A	3528802.946	360217.483	4.736634	2	11/23/2010	9:13	A	0				0	0	0	1
1791	0	Hot Rock	S_Cross6465_13504_A	3528841.783	360158.2422	15.853224	2	11/23/2010	9:20	A	0				0	0	0	1
1792	0	Hot Rock	S_063_12478_A	3528863.698	360116.8112	9.763266	2	11/23/2010	9:27	A	0				0	0	0	1
1794	0	Hot Rock	S_063_12470_A	3528754.234	360098.1102	12.56658	2	11/23/2010	9:48	A	0				0	0	0	1
1795	0	Hot Rock	S_063_12462_A	3528708.132	360104.8146	6.379956	2	11/23/2010	9:58	A	0				0	0	0	1
1796	0	Hot Rock	S_063_12455_A	3528689.911	360130.2162	6.379956	2	11/23/2010	10:05	A	0				0	0	0	1
1797	0	Hot Rock	S_064_12432_A	3528720.603	360151.8727	7.829946	2	11/23/2010	10:11	A	0				0	0	0	1
1798	0	Hot Rock	S_064_12427_A	3528705.393	360169.7972	8.989938	2	11/23/2010	10:16	A	0				0	0	0	1
1799	0	Hot Rock	S_070_12575_A	3528669.646	359917.2749	4.34997	2	11/23/2010	10:31	A	0				0	0	0	1
1800	0	Hot Rock	S_070_12571_A	3528636.903	359929.5826	11.019924	2	11/23/2010	10:38	A	0				0	0	0	1
1801	0	Hot Rock	S_070_12570_A	3528632.506	359928.4078	5.993292	2	11/23/2010	10:46	A	0				0	0	0	1
1802	0	Hot Rock	S_059_12354_A	3529038.636	360300.4989	5.606628	2	11/23/2010	12:24	A	0				0	0	0	1
1803	0	Hot Rock	S_059_12361_A	3529082.907	360282.6314	6.28329	2	11/23/2010	12:41	A	0				0	0	0	1
1804	0	Hot Rock	S_059_12363_A	3529088.3	360281.3367	9.18327	2	11/23/2010	12:47	A	0				0	0	0	1
1805	0	Hot Rock	S_059_12373_A	3529109.19	360298.4408	7.298283	2	11/23/2010	12:53	A	0				0	0	0	1
1806	0	Hot Rock	S_057_12268_A	3529069.115	360398.9712	7.24995	2	11/23/2010	13:04	A	0				0	0	0	1
1807	0	Hot Rock	S_068_12511_A	3528555.711	360045.3997	7.829946	3	11/23/2010	9:43	A	0				0	0	0	3
1808	0	Hot Rock	S_068_12510_A	3528553.429	360046.5885	6.76662	3	11/23/2010	9:50	A	0				0	0	0	3
1809	0	Hot Rock	S_068_12513_A	3528581.008	360050.8488	13.146576	3	11/23/2010	9:58	A	0				0	0	0	3
1810	0	Hot Rock	S_068_12514_A	3528581.453	360045.6184	4.929966	3	11/23/2010	10:04	A	0				0	0	0	3
1811	0	Hot Rock	S_Cross6870_13510_A	3528622.763	360038.0112	7.394949	3	11/23/2010	10:14	A	0				0	0	0	3
1812	0	Hot Rock	S_070_12540_A	3528452.773	359938.7027	15.853224	3	11/23/2010	11:49	A	0				0	0	0	3
1813	0	Hot Rock	S_070_12543_A	3528460.452	359935.712	10.536594	3	11/23/2010	11:56	A	0				0	0	0	3
1814	0	Hot Rock	S_074_12582_A	3528382.604	359713.0037	13.968237	3	11/23/2010	12:12	A	0				0	0	0	3
1815	0	Hot Rock	S_074_12594_A	3528434.022	359702.6592	4.8333	3	11/23/2010	12:20	A	0				0	0	0	3
1816	0	Hot Rock	S_074_12599_A	3528472.628	359697.2432	16.43322	3	11/23/2010	12:25	A	0				0	0	0	3
1817	0	Hot Rock	S_074_12600_A	3528475.025	359697.4014	19.139868	3	11/23/2010	12:28	A	0				0	0	0	3
1818	0	Hot Rock	S_074_12604_A	3528495.282	359696.2474	66.409542	3	11/23/2010	12:35	A	0				0	0	0	3
1819	0	Hot Rock	S_074_12613_A	3528508.068	359704.3078	11.503254	3	11/23/2010	12:43	A	0				0	0	0	3
1820	0	Hot Rock	S_081_13097_A	3528290.513	359305.8226	8.361609	1	11/29/2010	9:09	A	0				0	0	0	1
1821	0	Hot Rock	S_081_13082_A	3528265.041	359297.9585	10.246596	1	11/29/2010	9:22	A	0				0	0	0	1
1822	0	Hot Rock	S_080_13027_A	3528255.034	359384.4688	5.606628	1	11/29/2010	9:39	A	0				0	0	0	1
1825	0	Hot Rock	S_083_13168_A	3528172.911	359195.3298	12.56658	1	11/29/2010	10:24	A	0				0	0	0	1
1826	0	Hot Rock	S_086_13254_A	3528131.719	359149.5121	9.859932	1	11/29/2010	10:37	A	0				0	0	0	1
1827	0	Hot Rock	S_084_13182_A	3528107.862	359140.6897	9.18327	1	11/29/2010	10:46	A	0				0	0	0	1
1828	0	CD	S_085_13193_A	3528031.445	359083.0787	5.896626	1	11/29/2010	12:16	A	0	N	Horizontal	N	1	1	1	1
1829	0	CD	S_Cross8284S_13617_A	3528054.217	359169.0379	29.096466	1	11/29/2010	12:29	A	0	N	Horizontal	N	24	0.5	0.5	1
1830	0	Hot Rock	S_Cross8081S_13594_A	3528152.658	359323.9941	4.156638	1	11/29/2010	12:42	A	0				0	0	0	1
1831	0	Hot Rock	S_079_12962_A	3528300.067	359413.2767	5.896626	1	11/29/2010	12:58	A	0				0	0	0	1
1832	0	Hot Rock	S_079_12966_A	3528308.598	359414.5784	16.723218	1	11/29/2010	14:29	A	0				0	0	0	1
1833	0	Hot Rock	S_079_12980_A	3528329.322	359423.9629	18.559872	1	11/29/2010	14:40	A	0				0	0	0	1
1834	0	Hot Rock	S_078_12878_A	3528322.216	359482.11	4.929966	1	11/29/2010	14:51	A	0				0	0	0	1
1835	0	Hot Rock	S_078_12876_A	3528321.407	359482.0841	7.539948	1	11/29/2010	14:59	A	0				0	0	0	1
1836	0	Hot Rock	S_079_13002_A	3528386.883	359422.3583	8.893272	1	11/29/2010	15:12	A	0				0	0	0	1
1845	0	CD	S_011_03948_A	3527113.778	363014.0088	1152.838716	1	12/6/2010	9:01	A	0	N	Horizontal	N	10	6	1	1
1847	0	Hot Rock	S_008_03040_A	3527312.598	363186.8775	10.729926	1	12/6/2010	9:42	A	0				0	0	0	1
1849	0	No Find	S_013_04502_A	3527326.153	362896.8669	4.06	1	12/6/2010	10:39	A	0				0	0	0	1
1850	0	Hot Rock	S_014_04879_A	3527330.523	362846.1106	4.543302	1	12/6/2010	11:18	A	0				0	0	0	1
1851	0	Hot Rock	S_014_04878_A	3527309.671	362844.381	5.509962	1	12/6/2010	11:27	A	0				0	0	0	1
1857	0	CD	usacoe_A	3528179.741	363083.0457	0	1	12/6/2010	14:01	A	0	N	Horizontal	N	4	4	0.25	1
1860	0	CD	S_RoadE_13936_A	3527665.89	362919.7633	4.204971	1	12/6/2010	15:02	A	0	N	Horizontal	N	3	0.005	0.005	1
1861	0	Hot Rock	S_RoadE_13937_A	3527672.797	362912.8093	7.926612	1	12/6/2010	15:13	A	0				0	0	0	1
1862	0	MD	S_014_04889_A	3527659.423	362847.8977	5.51	1	12/6/2010	15:29	A	0	N	Horizontal	N	1	0.05	0.05	1
1865	0	MD	S_013_04515_A	3527768.038	362894.4416	9.28	1	12/6/2010	16:14	A	0	N	Horizontal	W	3.5	1	1	1
1866	0	MD	S_RoadE3_13891_A	3527584.379	363220.6047	5.896626	1	12/6/2010	16:26	A	0	N	Horizontal	N	1	0.5	0.5	1
1872	0	Hot Rock	S_035_11280_A	3528416.839	361648.2884	5.79996	2	12/6/2010	12:39	A	0				0	0	0	1
1880	0	MD	S_037_11450_A	3528917.317	361539.7386	8.023278	2	12/6/2010	15:27	A	0	W	Horizontal	E	3	1	0.3	1
1883	0	No Find	S_038_11500_A	3528774.468	361490.6031	5.509962	2	12/6/2010	15:55	A	0				0	0	0	1
1884	0	MD	S_038_11501_A	3528780.994	361483.898	18.269874	2	12/6/2010	16:08	A	0	N	Horizontal	N	1.5	0.3	0.3	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
1891	0	MD	S_019_06967_B	3527188.506	362560.2192	6.379956	3	12/6/2010	9:50	B	0				3	1	1	1
1906	0	Hot Rock	S_018_06554_A	3527602.083	362616.1134	13.823238	3	12/6/2010	14:12	A	0				0	0	0	3
1914	0	CD	S_006_02315_A	3527468.048	363297.8905	94.44	1	12/7/2010	8:55	A	0	N	Horizontal	N	4	4	1	1
1924	0	CD	S_RoadE_13948_A	3527906.152	362873.0821	14.01657	1	12/7/2010	13:53	A	0	N	Horizontal	N	2	2	0.025	1
1926	0	MD	S_013_04524_A	3527856.017	362899.6652	4.64	1	12/7/2010	14:33	A	0	N	Horizontal	W	1.5	0.25	0.25	1
1927	0	CD	S_038_11509_A	3528956.673	361471.544	84.147753	2	12/7/2010	12:16	A	0	N	Horizontal	W	9999	1.4	1.4	1
1936	0	Hot Rock	S_051_12047_A	3528748.93	360737.0293	12.56658	2	12/7/2010	14:34	A	0				0	0	0	1
1939	0	No Find	S_043_11730_A	3529254.809	361186.1703	13.823238	2	12/7/2010	15:52	A	0				0	0	0	1
1964	0	Hot Rock	N_081_05897_A	3529813.316	361212.0248	4.198106	2	12/8/2010	9:05	A	0				0	0	0	1
1971	0	CD	S_RoadD_14483_A	3530156.233	362583.0943	9.473268	1	12/8/2010	10:52	A	0	N	Horizontal	N	8	8	0.025	1
2044	0	Hot Rock	S_020_07652_A	3529958.268	362493.0025	19.913196	1	12/9/2010	11:00	A	0				0	0	0	1
2045	0	Hot Rock	S_020_07653_A	3529959.001	362493.0043	5.026632	1	12/9/2010	11:06	A	0				0	0	0	1
2051	0	Hot Rock	S_020_07659_A	3530038.148	362492.5385	8.119944	1	12/9/2010	11:53	A	0				0	0	0	1
2054	0	Hot Rock	S_020_07662_A	3530053.515	362494.016	6.28329	1	12/9/2010	12:13	A	0				0	0	0	1
2060	0	MD	S_020_07663_A	3530059.839	362495.4816	9.231603	2	12/9/2010	8:42	A	0	N			1	0.3	0.3	1
2067	0	Hot Rock	S_020_07669_A	3530087.222	362495.2931	6.379956	2	12/9/2010	10:01	A	0				0	0	0	1
2068	0	Hot Rock	S_020_07670_5	3530092.031	362495.0834	8.023278	2	12/9/2010	10:16	5	0				0	0	0	1
2069	0	MD	S_020_07671_A	3530097.42	362493.5392	8.69994	2	12/9/2010	10:32	A	0	N			1	0.3	0.3	1
2074	0	MD	S_020_07674_A	3530148.903	362489.5255	6.573288	2	12/9/2010	11:35	A	0	N			1	0.3	0.3	1
2075	0	MD	S_020_07675_A	3530177.486	362493.1973	15.756558	2	12/9/2010	11:50	A	0	N			1	0	0.3	1
2076	0	Hot Rock	S_020_07675_B	3530177.357	362493.3388	15.756558	2	12/9/2010	11:52	B	0				0	0	0	1
2078	0	CD	S_018_06916_A	3530023.456	362595.8198	68.729526	2	12/9/2010	14:20	A	0	N	Horizontal	E	48	0.2	0.2	1
2079	0	No Find	S_018_06915_A	3530008.594	362611.4605	6.28329	2	12/9/2010	14:25	A	0				0	0	0	1
2085	0	MD	S_010_03922_A	3530176.72	363072.6313	76.75	2	12/13/2010	9:35	A	0	E			1	0.3	3	1
2088	0	MD	S_003_01404_A	3529452.83	363464.2903	4.83	2	12/13/2010	13:06	A	0				1	0.4	0.4	1
2089	0	MD	S_003_01405_A	3529454.098	363464.2889	4.54	2	12/13/2010	13:16	A	0				1	0.4	0.4	1
2090	0	CD	trash pile	3529714.885	362581.849	0	1	12/13/2010	8:22	A	0	N	Horizontal	N	12	4	4	1
2098	0	CD	S_023_08588_A	3529259.052	362325.3673	10.536594	1	12/13/2010	14:12	A	0	S	Horizontal	E	6	3	0.5	1
2104	0	Hot Rock	S_RoadD1_14250_A	3529426.21	362391.4145	6.76662	1	12/13/2010	16:54	A	0				0	0	0	1
2106	0	MD	S_009_03553_A	3529233.75	363123.1194	19.33	2	12/13/2010	10:20	A	0	N			2	0.5	0.5	1
2109	0	MD	S_009_03549_B	3529206.013	363121.26	21.75	2	12/13/2010	10:28	B	0				2	0.5	0.5	1
2111	0	MD	S_010_03838_B	3529162.561	363069.6335	14.02	2	12/13/2010	10:43	B	0	N	Horizontal	E	1	0.2	0.2	1
2112	0	MD	S_RoadD2_14043_A	3529142.128	363086.3427	8.69994	2	12/13/2010	10:56	A	0	N			1	0.2	0.2	1
2114	0	MD	S_RoadD2_14054_A	3529156.161	362994.4981	5.413296	2	12/13/2010	11:18	A	0	N			2	0.5	0.5	1
2116	0	MD	S_015_05397_A	3529124.53	362775.9874	16.529886	2	12/13/2010	11:41	A	0	N			1	0.3	0.3	1
2117	0	Hot Rock	S_039_11557_A	3529121.785	361418.8337	6.573288	2	12/13/2010	15:58	A	0				0	0	0	1
3240	0	CD		3529926.571	360219.4739	0	3	1/19/2011	9:45	16.6.2	0				3	2	2	1
3241	0	MD		3529924.505	360215.6207	0	3	1/19/2011	9:47	16.10.3	0				3	1	1	1
3242	0	MD		3529927.583	360170.6742	0	3	1/19/2011	9:59	16.10.4	0				4	3	3	1
3243	0	MD		3529949.297	360154.0135	0	3	1/19/2011	10:06	16.10.5	0				2	1	1	1
3244	0	MD		3529961.88	360134.9192	0	3	1/19/2011	10:14	16.7.1	0				3	2	2	1
3245	0	MD		3529991.67	360079.3721	0	3	1/19/2011	10:22	16.7.2	0				2	2	1	1
3246	0	MD		3530008.96	360057.2533	0	3	1/19/2011	10:51	16.8.1	0				3	1	1	1
3247	0	CD		3530028.1	360036.0761	0	3	1/19/2011	11:02	16.8.2	0				3	3	4	1
3248	0	CD		3530794.238	363317.0515	0	1	1/20/2011	15:36	17-10-1	0	N	Horizontal	N	1	1	0.025	1
3249	0	RRD		3530792.336	363279.8763	0	1	1/20/2011	15:42	17-10-2	0	N	Horizontal	N	1	1	0.5	1
3250	0	CD		3530796.09	363260.7264	0	1	1/20/2011	15:46	17-10-3	0	N	Horizontal	N	1	0.5	0.025	1
3251	0	MD		3530798.247	363246.5945	0	1	1/20/2011	15:52	17-10-4	0	N	Horizontal	N	2	0.25	0.25	1
3252	0	CD		3530795.378	363230.9972	0	1	1/20/2011	15:56	17-10-5	0	N	Horizontal	N	6	4	4	1
3253	0	MD		3530695.067	363497.8269	0	1	1/20/2011	8:49	17-7-1	0	N	Horizontal	N	1	1	0.25	1
3254	0	MD		3530694.555	363494.1177	0	1	1/20/2011	8:54	17-7-2	0	N	Horizontal	S	0.5	0.025	0.025	1
3255	0	MD		3530693.696	363492.5731	0	1	1/20/2011	9:02	17-7-3	0	N	Horizontal	N	1	0.25	0.25	1
3256	0	CD		3530693.022	363491.7287	0	1	1/20/2011	9:07	17-7-4	0	N	Horizontal	N	2	0.025	0.025	1
3257	0	CD		3530693.728	363491.0475	0	1	1/20/2011	9:16	17-8-1	0	N	Horizontal	N	12	3	6	1
3258	0	MD		3530691.895	363485.0201	0	1	1/20/2011	9:29	17-8-2	0	N	Horizontal	N	0.5	0.25	0.25	1
3259	0	CD		3530694.389	363470.3011	0	1	1/20/2011	11:29	17-8-3	0	N	Pointing Down Toward	N	3.5	2	0.025	1
3260	0	Hot Rock		3530695.394	363467.1181	0	1	1/20/2011	11:32	17-8-hr	0				0	0	0	1
3261	0	CD		3530731.493	363426.0103	0	1	1/20/2011	11:36	17-8-4	0	N	Horizontal	N	8	8	0.25	1
3262	0	MD		3530738.269	363407.8307	0	1	1/20/2011	11:39	17-8-5	0	N	Horizontal	N	0.5	0.25	0.25	1
3263	0	MD		3530745.84	363390.4107	0	1	1/20/2011	12:19	17-9-1	0	N	Horizontal	N	1	0.25	0.25	1
2155	0	MD	S_021_07873_A	3529417.517	362437.7855	7.636614	1	12/14/2010	13:57	A	0	N	Horizontal	W	1	0.25	0.25	1
2160	0	MD	S_018_06768_B	3529139.121	362606.9958	21.459852	2	12/14/2010	8:39	B	0		Horizontal		1	0.3	0.3	1
2164	0	MD	S_021_07836_C	3529243.157	362433.8532	10.729926	2	12/14/2010	9:06	C	0	N			2	0.5	0.5	1
2166	0	MD	S_021_07837_B	3529245.491	362433.5634	5.79996	2	12/14/2010	9:15	B	0		Horizontal		1	0.3	0.3	1
2172	0	MD	S_022_08226_C	3529241.809	362380.4748	8.69994	2	12/14/2010	9:34	C	0				2	0.5	0.5	1
2184	0	Hot Rock	S_033_11149_A	3529030.89	361747.52	6.186624	2	12/14/2010	11:51	A	0				0	0	0	1
2185	0	Hot Rock	S_033_11212_A	3529212.417	361798.5188	8.989938	2	12/14/2010	12:07	A	0				0	0	0	1
2188	0	MD	S_018_06834_A	3529441.761	362608.6155	14.209902	2	12/14/2010	13:56	A	0				2	0.5	0.5	1
2202	0	MD	S_003_01015_A	3527599.727	363476.6792	5.896626	1	12/14/2010	15:53	A	0	N	Horizontal	W	0.5	0.25	0.25	1
2203	0	MD	S_003_01047_A	3527768.256	363462.315	16.43322	1	12/14/2010	16:26	A	0	N	Horizontal	N	0.5	0.25	0.25	1
2206	0	MD	S_005_01927_B	3527833.587	363354.6819	6.19	2	12/14/2010	15:41	B	0				2	0.3	0.3	1
2207	0	MD	S_005_01943_A	3527867.406	363352.7084	20.88	2	12/14/2010	16:10	A	0	N			2	0.25	0.1	1
2208	0	MD	S_005_01943_B	3527867.338	363352.7541	20.88	2	12/14/2010	16:11	B	0	N			1	0.2	0.2	1
2209	0	MD	S_005_01967_A	3527935.326	363352.5367	15.27	2	12/14/2010	16:26	A	0	N			3	0.2	0.2	1
2210	0	MD	S_005_01967_B	3527935.244	363352.4957	15.27	2	12/14/2010	16:27	B	0	N			2	0.5	0.5	1
2217	0	MD	S_006_02579_B	3528452.174	363297.3336	6.77	2	12/15/2010	8:44	B	0	NW	Horizontal	W	2	1	0.2	1
2218	0	MD	S_005_02155_A	3528462.084	363356.2641	11.89	2	12/15/2010	8:52	A	0	N	Horizontal	E	4	1	0.2	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
2228	0	MD	S_005_02120_A	3528352.353	363354.0297	43.98	2	12/15/2010	9:38	A	0	N			3	1	0	1
2230	0	Hot Rock	S_005_02120_C	3528352.815	363354.4306	43.98	2	12/15/2010	9:41	C	0				0	0	0	1
2233	0	MD	S_006_02535_C	3528323.138	363293.4522	4.88	2	12/15/2010	9:55	C	0				1.5	0.5	0.2	1
2243	0	MD	S_006_02497_A	3528200.819	363292.1828	5.99	1	12/15/2010	10:36	A	0				1	0.3	0.3	1
2244	0	MD	S_005_02061_A	3528175.705	363352.4564	40.12	2	12/15/2010	10:51	A	0				1	0.3	0.3	1
2245	0	Hot Rock	S_005_02061_B	3528175.626	363352.5204	40.12	2	12/15/2010	10:52	B	0				0	0	0	1
2247	0	MD	S_005_02045_B	3528131.114	363349.2928	11.5	2	12/15/2010	11:01	B	0				1	0.3	0.3	1
2251	0	MD	S_006_02389_B	3527880.418	363298.6336	10.1	2	12/15/2010	11:27	B	0	N			1	0.3	0.3	1
2253	0	MD	S_006_02385_B	3527866.47	363296.1972	10.25	2	12/15/2010	11:35	B	0				1	0.3	0.3	1
2254	0	Hot Rock	S_007_02918_A	3528476.524	363240.2853	15.27	3	12/15/2010	8:31	A	0				0	0	0	1
2258	0	Hot Rock	S_007_02857_A	3528213.526	363235.7667	6.67	3	12/15/2010	9:11	A	0				0	0	0	1
2267	0	Hot Rock	S_RoadE2_13642_A	3527851.026	363061.3078	4.543302	3	12/15/2010	11:32	A	0				0	0	0	1
2268	0	MD	S_003_01087_B	3527911.32	363462.6304	1088.072496	1	1/4/2011	13:15	B	0	N	Horizontal	W	1	0.25	0.25	1
2269	0	Hot Rock	S_RoadE2_13681_A	3527858.399	363489.1852	8.989938	1	1/4/2011	13:45	A	0				0	0	0	1
2272	0	MD	S_003_01125_A	3528057.782	363474.3427	25.326492	1	1/4/2011	14:26	A	0	N	Horizontal	N	2.5	1	1	1
2273	0	MD	S_003_01125_B	3528057.751	363474.5543	25.326492	1	1/4/2011	14:28	B	0	N	Horizontal	W	1	0.25	0.25	1
2274	0	MD	S_003_01148_A	3528108.06	363476.6837	11.019924	1	1/4/2011	14:43	A	0	N	Horizontal	N	2	1	0.5	14
2275	0	MD	S_003_01156_A	3528129.208	363474.6629	8.409942	1	1/4/2011	14:57	A	0	N	Horizontal	N	2	0.5	0.5	1
2276	0	MD	S_003_01156_B	3528129.078	363474.8476	8.409942	1	1/4/2011	14:59	B	0	N	Horizontal	N	1	0.25	0.25	24
2278	0	Hot Rock	S_003_01162_A	3528144.492	363471.3215	20.589858	1	1/4/2011	15:20	A	0				0	0	0	1
2281	0	MD	S_003_01261_A	3528430.026	363467.0771	6.911619	1	1/4/2011	16:12	A	0	N	Horizontal	S	3	1	0.5	3
2282	0	MD	S_003_01269_A	3528458.347	363467.4576	8.603274	1	1/4/2011	16:27	A	0	N	Horizontal	E	4	1	0.5	3
2309	0	Hot Rock	S_003_01314_A	3528743.242	363463.0192	5.123298	2	1/5/2011	9:21	A	0				0	0	0	1
2312	0	MD	S_004_01696_A	3528528.768	363406.71	14.693232	2	1/5/2011	10:18	A	0	N			3	1	0.2	1
2316	0	Hot Rock	S_RoadE2_13659_A	3527770.921	363396.8555	15.756558	1	1/5/2011	11:23	A	0				0	0	0	1
2317	0	MD	S_004_01506_A	3527755.932	363420.701	18.076542	2	1/5/2011	11:29	A	0		Horizontal	W	3	1	0.3	1
2331	0	MD	N_074_05723_A	3529761.69	361907.3447	23.056201	1	1/6/2011	11:47	A	0	N	Horizontal	N	1.5	0.25	0.25	3
2332	0	MD	N_074_05721_A	3529734.336	361906.3447	29.990054	1	1/6/2011	12:01	A	0	N	Horizontal	W	3	1	0.6	3
2397	0	MD	N_075_05805_A	3529675.812	361835.2248	8.722925	2	1/6/2011	13:06	A	0	N	Horizontal	N	1.5	1.5	0.3	1
2407	0	MD	N_075_05778_A	3529652.671	361832.7939	43.543332	2	1/6/2011	13:40	A	0	N	Pointing Down Toward		2	2	2	1
2417	0	MD	N_075_05809_A	3529625.137	361843.1015	6.77799	2	1/6/2011	14:13	A	0	N			1	0.5	0.3	1
2428	0	MD	N_073_05665_B	3529725.335	361944.294	121.591484	2	1/6/2011	16:36	B	0		Horizontal	W	1	5	1	1
2456	0	Hot Rock	N_079_05874_A	3529787.961	361619.751	6.236771	3	1/6/2011	15:54	A	0				0	0	0	1
2670	0	MD	S_018_06939_A	3530554.204	362605.9436	150.412296	1	1/7/2011	13:41	A	0	N	Pointing Down Toward	N	5	2.5	2.5	3
2686	0	No Find	S_015_05572_A	3530448.797	362776.6264	7084.361142	3	1/7/2011	14:18	A	0				0	0	0	1
2687	0	Hot Rock	S_015_05570_A	3530442.763	362777.5824	6.476622	3	1/7/2011	14:32	A	0				0	0	0	1
3068	0	Hot Rock		3529197.223	360059.9762	0	1	1/11/2011	12:08	11/10/2001	0				0	0	0	1
3069	0	MD		3529197.672	360057.441	0	1	1/11/2011	12:11	11/10/2002	0	N	Horizontal	W	2	0.25	0.25	1
3070	0	Hot Rock		3529201.052	360047.8556	0	1	1/11/2011	12:16	11/10/2003	0				0	0	0	1
3071	0	Hot Rock		3529236.657	359986.5572	0	1	1/11/2011	12:37	11/10/2004	0				0	0	0	1
3072	0	MD		3529239.617	359984.9871	0	1	1/11/2011	12:51	11/10/2005	0	N	Horizontal	S	1	2	0.025	1
3073	0	CD		3529243.051	359981.9032	0	1	1/11/2011	14:19	11/9/2001	0	N	Horizontal	N	1	0.025	0.025	1
3074	0	MD		3529251.642	359967.9617	0	1	1/11/2011	14:31	11/9/2002	0	N	Horizontal	N	2	2	0.025	1
3075	0	MD		3529253.266	359964.158	0	1	1/11/2011	14:36	11/9/2003	0	N	Horizontal	E	2	0.25	0.25	1
3076	0	MD		3529268.079	359944.2227	0	1	1/11/2011	14:52	11/9/2004	0	N	Horizontal	W	5	2	2	1
3077	0	MD		3529278.48	359935.9515	0	1	1/11/2011	15:04	11/9/2005	0	N	Horizontal	W	1	0.25	0.25	1
3078	0	MD		3529307.727	359906.9581	0	1	1/11/2011	15:17	11/9/2006	0	N	Horizontal	W	2	0.25	0.25	1
3079	0	MD		3529311.524	359903.4772	0	1	1/11/2011	15:39	11/9/2007	0	N	Horizontal	N	2	0.25	0.25	1
3080	0	MD		3529333.603	359886.2337	0	1	1/11/2011	15:50	11/9/2008	0	N	Horizontal	S	2	0.25	0.25	1
3081	0	MD		3529334.372	359886.2707	0	1	1/11/2011	15:54	11/9/2009	0	N	Horizontal	S	1	0.025	0.025	1
3082	0	Hot Rock		3529335.919	359884.9116	0	1	1/11/2011	16:01	11/9/2010	0				0	0	0	1
3083	0	MD		3529338.393	359884.2679	0	1	1/11/2011	16:05	11/9/2011	0	N	Horizontal	W	2	0.25	0.25	2
3084	0	MD		3529351.404	359850.3014	0	1	1/11/2011	16:17	11/9/2012	0	N	Horizontal	E	2	0.25	0.25	1
3085	0			3529162.517	359964.5952	0		1/11/2011		11.3.1	0				0	0	0	1
3086	0			3529162.668	359964.9702	0		1/11/2011		11.3l.1	0				0	0	0	1
3087	0			3529133.806	359905.2721	0		1/11/2011		11.3l.2	0				0	0	0	1
3088	0	MD		3529132.656	359894.7335	0	3	1/11/2011	13:01	11.3l.3	0				1	1	1	1
3089	0	MD		3529144.113	359896.0624	0	3	1/11/2011	14:39	11.3r.4	0				3	1	1	1
3090	0	MD		3529144.274	359900.6262	0	3	1/11/2011	14:52	11.3r.5	0				1	1	1	1
3091	0	MD		3529156.257	359934.9255	0	3	1/11/2011	15:34	11.3r.7	0				2	1	1	1
3092	0	MD		3529159.635	359935.047	0	3	1/11/2011	15:38	11.3r.8	0				2	1	1	1
3093	0	MD		3529160.175	359938.0342	0	3	1/11/2011	15:43	11.3r.9	0				3	1	1	1
3094	0	MD		3529187.595	359970.1764	0	3	1/11/2011	15:54	11.3r.10	0				2	1	1	1
3095	0	MD		3529363.402	359845.5576	0	1	1/12/2011	9:42	11/8/2001	0	N	Horizontal	N	1	0.025	0.025	1
3096	0	MD		3529405.743	359843.8618	0	1	1/12/2011	9:55	11/8/2002	0	N	Horizontal	N	0.25	0.25	0.025	1
3097	0	MD		3529414.267	359840.5881	0	1	1/12/2011	10:14	11/8/2003	0	N	Horizontal	N	0.25	0.25	0.025	1
3098	0	CD		3529416.179	359839.6636	0	1	1/12/2011	10:18	11/8/2004	0	N	Horizontal	W	6	0.25	0.25	1
3099	0	MD		3529417.87	359839.1004	0	1	1/12/2011	10:28	11/8/2005	0	N	Horizontal	N	1	0.25	0.25	1
3100	0	MD		3529426.392	359839.4514	0	1	1/12/2011	10:33	11/8/2006	0	N	Horizontal	N	5	2	2	1
3101	0	MD		3529429.717	359836.9863	0	1	1/12/2011	10:41	11/8/2007	0	N	Horizontal	W	6	2	2	1
3102	0	MD		3529442.267	359815.6712	0	1	1/12/2011	11:03	11/8/2008	0	N	Horizontal	W	2	0.25	0.25	1
3104	0	MD		3529447.29	359759.0672	0	1	1/12/2011	11:31	11/8/2010	0	N	Veritical	N	5	2	2	1
3105	0	MD		3529446.746	359757.7658	0	1	1/12/2011	11:38	11/8/2011	0	N	Horizontal	N	3	3	0.025	1
3106	0	MD		3529443.553	359747.7314	0	1	1/12/2011	11:46	11/8/2012	0	N	Veritical	N	5	2	2	1
3107	0	MD		3529442.272	359744.8998	0	1	1/12/2011	11:49	11/8/2013	0	N	Horizontal	N	2	0.25	0.25	1
3108	0	MD		3529440.083	359741.0054	0	1	1/12/2011	11:54	11/8/2014	0	N	Horizontal	W	1.5	0.5	0.5	1
3109	0	MD		3529439.385	359740.3443	0	1	1/12/2011	12:14	11/8/2015	0	N	Horizontal	N	1	0.5	0.5	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
3110	0	MD		3529439.41	359717.3336	0	2	1/12/2011	10:52	11.7.001	0	N			1	0.5	0.2	1
3111	0	MD		3529440.947	359703.7698	0	2	1/12/2011	11:00	11.7.002	0		Pointing Down Toward		1	1	1	1
3112	0	MD		3529440.631	359702.5897	0	2	1/12/2011	11:07	11.7.003	0				2	0.5	0.5	1
3113	0	MD		3529434.296	359670.3563	0	2	1/12/2011	11:25	11.7.004	0				1.5	0.25	0.2	1
3114	0	MD		3529433.969	359664.2806	0	2	1/12/2011	11:31	11.7.005	0		Horizontal	W	4	1.5	1.5	1
3115	0	MD		3529434.434	359660.4006	0	2	1/12/2011	11:37	11.7.006	0				1	0.5	0	1
3116	0	MD		3529431.037	359649.277	0	2	1/12/2011	11:51	11.7.007	0				0.5	0.5	0.2	1
3117	0	MD		3529431.976	359606.1398	0	2	1/12/2011	12:08	11.7.008	0				0.75	0.5	0.2	1
3118	0	MD		3529433.109	359604.556	0	2	1/12/2011	12:11	11.7.009	0		Horizontal	W	2	0.5	0.5	1
3119	0	MD		3529452.882	359577.405	0	2	1/12/2011	12:40	11.7.010	0		Pointing Down Toward	E	4	1.5	1.5	1
3120	0	MD		3529454.752	359581.3343	0	2	1/12/2011	12:48	11.7.011	0		Horizontal	N	5	3	0.3	1
3121	0	MD		3529481.375	359587.3917	0	1	1/12/2011	13:55	11.6.001	0				1	1	0.3	1
3122	0	MD		3529483.589	359587.0886	0	2	1/12/2011	13:56	11.6.002	0		Horizontal	N	4	1.5	1.5	1
3123	0	MD		3529491.742	359589.727	0	2	1/12/2011	14:09	11.6.003	0				1	0.5	0.3	1
3124	0	MD		3529498.684	359587.9727	0	2	1/12/2011	14:15	11.6.004	0		Horizontal	W	2	0.5	0.3	1
3125	0	MD		3529511.61	359583.7787	0	2	1/12/2011	14:22	11.6.005	0		Horizontal	W	4	1.5	1.5	1
3126	0	CD		3529513.982	359583.8522	0	2	1/12/2011	14:28	11.6.006	0				1	1	0.5	1
3127	0	MD		3529570.385	359578.2093	0	2	1/12/2011	14:57	11.6.007	0				1	1	1	1
3128	0	MD		3529574.624	359577.0352	0	2	1/12/2011	15:01	11.6.008	0				1	1	1	1
3129	0	MD		3529577.705	359575.1363	0	2	1/12/2011	15:07	11.6.009	0				2	2	0.5	1
3130	0	MD		3529616.614	359578.8239	0	2	1/12/2011	15:21	11.6.010	0				1.5	0.5	0.5	1
3131	0	MD		3529659.448	359626.8238	0	2	1/12/2011	15:43	11.5.001	0	N			2	0.5	0.5	1
3132	0	MD		3529660.648	359643.1487	0	2	1/12/2011	15:49	11.6.002	0		Horizontal	W	2	0.5	0.5	1
3133	0	MD		3529657.357	359660.8615	0	2	1/12/2011	15:55	11.5.003	0		Horizontal	N	2	0.5	0.5	1
3134	0	MD		3529655.619	359668.6659	0	2	1/12/2011	15:59	11.5.004	0				1	0.3	0.3	1
3135	0	MD		3529668.814	359689.3678	0	2	1/12/2011	16:05	11.5.005	0		Horizontal	W	2	0.5	0.5	1
3136	0	MD		3529677.616	359700.4274	0	2	1/12/2011	16:11	11.5.006	0				1	0.3	0.3	1
3137	0	CD		3529709.12	359736.0073	0	2	1/12/2011	16:20	11.5.007	0				1	1	1	1
3138	0	Hot Rock		3529186.186	359908.9758	0	3	1/12/2011	9:21	11.1.1	0				0	0	0	1
3141	0	Hot Rock		3529220.692	359984.9354	0	3	1/12/2011	10:28	11.2.2	0				0	0	0	1
3146	0	Hot Rock		3529497.844	359999.3357	0	3	1/12/2011	12:32	11.4.5	0				0	0	0	1
3147	0	Hot Rock		3529421.696	360072.35	0	3	1/12/2011	12:49	11.4.6	0				0	0	0	1
3148	0	Hot Rock		3529411.991	360077.7654	0	3	1/12/2011	12:52	11.4.7	0				0	0	0	1
3149	0	Hot Rock		3528578.951	359111.7721	0	1	1/13/2011	10:02	14-1-1	0				0	0	0	1
3150	0	Hot Rock		3528580.526	359110.6139	0	1	1/13/2011	10:05	14-1-2	0				0	0	0	1
3151	0	Hot Rock		3528583.241	359107.7846	0	1	1/13/2011	10:10	14-1-3	0				0	0	0	1
3152	0	Hot Rock		3528585.025	359107.0073	0	1	1/13/2011	10:12	14-1-4	0				0	0	0	1
3153	0	Hot Rock		3528593.552	359104.9552	0	1	1/13/2011	10:17	14-1-5	0				0	0	0	1
3154	0	Hot Rock		3528604.104	359094.3839	0	1	1/13/2011	10:44	14-1-6	0				0	0	0	1
3155	0	Hot Rock		3528616.01	359071.9189	0	1	1/13/2011	10:53	14-2-1	0				0	0	0	1
3156	0	RRD		3528623.04	359056.7454	0	1	1/13/2011	10:57	14-2-2	0	N	Horizontal	N	3	3	3	1
3157	0	Hot Rock		3528629.648	359046.3107	0	1	1/13/2011	11:05	14-2-3	0				0	0	0	1
3158	0	Hot Rock		3528630.571	359059.497	0	1	1/13/2011	12:25	14-5-1	0				0	0	0	1
3159	0	MD		3528625.315	359069.5357	0	1	1/13/2011	12:31	14-5-2	0	N	Horizontal	N	5	2.5	2.5	1
3160	0	MD		3528619.038	359078.9361	0	1	1/13/2011	12:36	14-5-3	0	N	Horizontal	N	2	0.25	0.25	1
3161	0	CD		3528584.501	359141.6345	0	1	1/13/2011	12:47	14-4-1	0	N	Horizontal	N	4	3	3	1
3162	0	Hot Rock		3528669.916	359049.7621	0	3	1/13/2011	12:26	14.6.1	0				6	7	9	1
3163	0	CD		3528598.823	359145.4716	0	3	1/13/2011	12:48	14.8.1	0				4	2	2	1
3164	0	CD		3529502.051	360117.749	0	1	1/18/2011	10:35	15-3-1	0	N	Horizontal	N	3	3	0.025	1
3165	0	CD		3529497.584	360119.0573	0	1	1/18/2011	10:44	15-3-2	0	N	Horizontal	N	1	1	0.25	1
3166	0	MD		3529493.396	360119.5806	0	1	1/18/2011	10:47	15-3-3	0	N	Horizontal	N	2	1	0.025	1
3167	0	MD		3529484.796	360125.7656	0	1	1/18/2011	10:54	15-3-4	0	N	Horizontal	N	2	0.25	0.25	1
3168	0	MD		3529482.492	360136.1371	0	1	1/18/2011	11:01	15-3-5	0	N	Horizontal	N	2	2	0.025	1
3169	0	MD		3529473.405	360141.2927	0	1	1/18/2011	11:05	15-3-6	0	N	Horizontal	N	2	0.25	0.25	1
3170	0	MD		3529472.332	360145.5542	0	1	1/18/2011	11:08	15-3-7	0	N	Horizontal	N	2	0.25	0.25	1
3171	0	MD		3529461.743	360143.4336	0	1	1/18/2011	11:13	15-3-8	0	N	Horizontal	W	1	0.25	0.25	1
3172	0	CD		3529461.829	360150.8427	0	1	1/18/2011	11:18	15-3-9	0	N	Horizontal	W	5	3	3	1
3173	0	MD		3529461.587	360153.4529	0	1	1/18/2011	11:20	15-3-10	0	N	Horizontal	N	3	2	0.025	1
3174	0	MD		3529531.537	360122.3328	0	1	1/18/2011	13:45	15-7-1	0	N	Horizontal	W	2	0.25	0.25	1
3175	0	MD		3529539.775	360122.177	0	1	1/18/2011	13:51	15-7-2	0	N	Horizontal	N	2	0.25	0.25	1
3176	0	MD		3529552.079	360130.1036	0	1	1/18/2011	13:56	15-7-3	0	N	Horizontal	N	2	0.25	0.25	1
3177	0	MD		3529560.883	360137.3869	0	1	1/18/2011	13:59	15-7-4	0	N	Horizontal	N	3	2	0.25	1
3178	0	CD		3529598.114	360167.3764	0	1	1/18/2011	14:14	15-7-5	0	N	Horizontal	N	4	1	1	1
3179	0	MD		3529535.296	360216.6506	0	1	1/18/2011	14:32	15-10-1	0	N	Horizontal	N	2	0.25	0.25	1
3180	0	MD		3529600.528	359983.2463	0	2	1/18/2011	10:49	15.1.001	0		Horizontal	W	2	0.5	0.5	1
3181	0	MD		3529594.47	359986.9723	0	2	1/18/2011	10:54	15.1.002	0		Horizontal	E	2	0.5	0.5	1
3182	0	CD		3529581.305	360006.3219	0	2	1/18/2011	10:59	15.1.003	0		Horizontal	W	4	2	2	1
3183	0	CD		3529580.849	360004.8609	0	2	1/18/2011	11:00	15.1.004	0		Horizontal	W	5	3	0.2	1
3184	0	CD		3529580.35	360007.9324	0	2	1/18/2011	11:03	15.1.005	0				1	1	0.2	1
3185	0	CD		3529580.811	360036.9115	0	2	1/18/2011	11:16	15.1.006	0		Horizontal	S	3	0.5	0.5	1
3186	0	MD		3529560.052	360052.9033	0	2	1/18/2011	12:35	15.2.001	0				2	0.5	0.5	1
3187	0	MD		3529547.421	360066.6933	0	2	1/18/2011	12:42	15.2.002	0		Horizontal	W	1.5	0.25	0.3	1
3188	0	MD		3529538.846	360072.4841	0	2	1/18/2011	12:50	15.2.003	0				1	0.5	0.5	1
3189	0	MD		3529527.213	360104.4355	0	2	1/18/2011	13:03	15.2.004	0		Horizontal	W	2.5	0.25	0.2	1
3190	0	MD		3529527.649	360108.8604	0	2	1/18/2011	13:09	15.2.005	0				1	0.3	0.3	1
3191	0	CD		3529534.838	360107.1465	0	2	1/18/2011	13:46	15.4.001	0		Pointing Down Toward		3	3	0.2	1
3192	0	MD		3529554.216	360120.8044	0	2	1/18/2011	13:54	15.4.001	0		Horizontal	N	2	0.5	0.5	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
3193	0	MD		3529574.014	360133.2024	0	2	1/18/2011	14:00	15.2.003	0		Pointing Down Toward		4	0.75	0.2	1
3194	0	MD		3529573.869	360135.1639	0	2	1/18/2011	14:02	15.4.004	0		Horizontal	S	2	0.5	0.5	1
3195	0	MD		3529598.929	360154.5205	0	2	1/18/2011	14:10	15.4.005	0		Horizontal	N	2.5	0.5	0.2	1
3196	0	MD		3529526.65	360209.0901	0	3	1/18/2011	10:51	15.6.1	0				3	1	1	1
3197	0	MD		3529528.953	360212.2655	0	3	1/18/2011	10:56	15.6.2	0				2	1	1	1
3198	0	MD		3529548.259	360206.4996	0	3	1/18/2011	11:02	15.6.3	0				2	1	1	1
3199	0	MD		3529549.201	360205.3435	0	3	1/18/2011	11:07	15.6.4	0				1	1	1	1
3200	0	MD		3529543.254	360186.1306	0	3	1/18/2011	11:12	15.6.5	0				2	1	1	1
3201	0	MD		3529505.586	360115.8787	0	3	1/18/2011	13:56	15.5.1	0				1	1	1	1
3202	0	MD		3529506.084	360114.6762	0	3	1/18/2011	14:00	15.5.2	0				2	1	1	1
3203	0	MD		3529507.138	360111.9948	0	3	1/18/2011	14:02	15.5.3	0				2	1	1	1
3204	0	MD		3530090.812	360012.8957	0	1	1/19/2011	10:14	16-9-1	0	N	Horizontal	W	2	0.25	0.25	1
3205	0	Hot Rock		3530092.225	360009.3349	0	1	1/19/2011	10:17	16-9-2	0				0	0	0	1
3206	0	MD		3530097.179	360006.0997	0	1	1/19/2011	10:20	16-9-3	0	N	Horizontal	W	1	0.25	0.25	1
3207	0	CD		3530095.67	359997.053	0	1	1/19/2011	10:26	16-9-4	0	N	Horizontal	W	1.5	1	0.025	1
3208	0	MD		3530096.219	359995.5558	0	1	1/19/2011	10:32	16-9-5	0	N	Horizontal	W	1	0.25	0.25	1
3209	0	CD		3530103.105	359987.7665	0	1	1/19/2011	10:38	16-9-6	0	N	Horizontal	N	1	0.25	0.25	1
3210	0	Hot Rock		3530103.802	359988.5454	0	1	1/19/2011	10:41	16-9-7	0				0	0	0	1
3211	0	MD		3530108.379	359993.9861	0	1	1/19/2011	10:44	16-9-8	0	N	Horizontal	N	2	1	0.025	1
3212	0	MD		3530143.152	359949.3604	0	1	1/19/2011	11:12	16-10-1	0	N	Horizontal	N	2	0.25	0.25	1
3213	0	CD		3530146.736	359948.5899	0	1	1/19/2011	11:15	16-10-2	0	N	Horizontal	N	5	5	0.025	1
3214	0	CD		3530180.594	359919.9009	0	1	1/19/2011	11:23	16-10-3	0	N	Horizontal	N	1	0.5	0.025	1
3215	0	CD		3530169.874	359885.9346	0	1	1/19/2011	11:54	16-1-1	0	N	Horizontal	N	12	0.025	0.025	1
3216	0	CD		3530170.015	359887.7319	0	1	1/19/2011	11:57	16-1-2	0	N	Horizontal	N	12	0.025	0.025	2
3217	0	CD		3530161.635	359895.037	0	1	1/19/2011	12:02	16-1-3	0	N	Horizontal	N	24	12	0.025	2
3218	0	MD		3530158.385	359912.2732	0	1	1/19/2011	12:14	16-1-4	0	N	Horizontal	N	2	0.25	0.25	1
3219	0	Hot Rock		3530142.063	359930.8685	0	1	1/19/2011	12:20	16-1-5	0				0	0	0	1
3220	0	CD		3530131.194	359938.1906	0	1	1/19/2011	12:24	16-1-6	0	N	Horizontal	N	2	1	0.025	1
3239	0	CD		3529927.869	360221.2709	0	3	1/19/2011	9:42	16.10.1	0				3	3	3	1
3264	0	CD		3530751.362	363382.0104	0	1	1/20/2011	12:25	17-9-2	0	N	Horizontal	S	2	2	0.025	1
3265	0	Hot Rock		3530753.416	363380.9437	0	1	1/20/2011	12:27	17-9-hr	0				0	0	0	1
3266	0	CD		3530756.834	363372.5869	0	1	1/20/2011	12:31	17-9-3	0	N	Horizontal	N	5	5	4	1
3267	0	CD		3530795.087	363326.7233	0	1	1/20/2011	12:45	17-9-5	0	N	Horizontal	W	72	1	1	1
3268	0	Hot Rock		3530791.632	363313.6179	0	1	1/20/2011	14:50	17-10-hr	0				0	0	0	1
3269	0	CD		3530783.282	363357.1022	0	1	1/20/2011	12:40	17-9-4	0	N	Horizontal	N	30	4	3	1
3270	0	CD		3530791.447	363332.0338	0	1	1/20/2011	12:49	17-9	0	N	Horizontal	N	36	30	30	1
3271	0	CD		3530830.87	363501.3165	0	3	1/20/2011	9:14	17.1.1	0				4	5	1	1
3272	0	MD		3530831.504	363491.7315	0	3	1/20/2011	11:39	17.1.2	0				3	3	1	1
3273	0	RRD		3530831.107	363489.9073	0	3	1/20/2011	11:42	17.1.3	0				4	1	1	1
3274	0	Hot Rock		3530855.693	363445.6226	0	3	1/20/2011	11:48	17.1.4	0				6	6	6	1
3275	0	RRD		3530855.918	363444.4976	0	3	1/20/2011	11:50	17.1.5	0				4	1	1	1
3276	0	RRD		3530856.066	363443.6656	0	3	1/20/2011	11:59	17.1.6	0				4	1	1	1
3277	0	RRD		3530858.911	363443.0009	0	3	1/20/2011	12:02	17.1.7	0				4	1	1	1
3278	0	RRD		3530871.596	363444.5117	0	3	1/20/2011	12:06	17.1.8	0				4	1	1	1
3279	0	Hot Rock		3530891.3	363420.1937	0	3	1/20/2011	15:11	17.2.1	0				0	0	0	1
3280	0	RRD		3530893.026	363412.7066	0	3	1/20/2011	15:16	17.2.2	0		Horizontal	N	4	1	1	1
3281	0	CD		3530907.489	363347.1188	0	3	1/20/2011	15:42	17.2.6	0		Horizontal	W	6	1	1	1
3282	0	CD		3530897.005	363401.1907	0	3	1/20/2011	15:19	17.2.3	0		Horizontal	N	60	4	4	1
3283	0	CD		3530904.76	363385.7853	0	3	1/20/2011	15:24	17.2.4	0		Horizontal	S	14	12	1	1
3284	0	CD		3530904.524	363367.5459	0	3	1/20/2011	15:29	17.2.5	0		Veritical	E	6	1	1	4
3287	0	RRD	N_013_01463_A	3531043.135	362889.8077	4.395836	2	1/20/2011	8:34	A	0	N			1	1	0.2	1
3289	0	CD	N_013_01325_A	3531031.196	362889.6833	3230.701194	2	1/20/2011	8:41	A	0	N	Horizontal	W	60	3	2	1
3291	0	MD	N_013_01438_A	3531010.47	362888.4176	5.961719	2	1/20/2011	8:59	A	0				0.5	0.5	0.2	3
3292	0	MD		3531058.544	362890.3465	0	2	1/20/2011	9:09	area 17	0				0	0	0	1
3294	0	MD	N_012_01246_B	3531107.62	362945.4306	12.385117	2	1/20/2011	9:50	B	0	N			2	0.5	0.5	1
3296	0	MD	N_012_01256_B	3531109.523	362945.5704	10.806193	2	1/20/2011	9:57	B	0				0.5	0.5	0.2	3
3297	0	MD	N_011_01181_A	3531130.828	363003.9995	4.65476	2	1/20/2011	10:09	A	0				0.5	0.5	0.2	10
3300	0	MD	N_011_01179_A	3531105.784	363004.0416	4.842518	2	1/20/2011	10:25	A	0				0.3	0.3	0.3	40
3302	0	MD	N_0C1_06260_B	3531039.859	363000.7169	7.142841	2	1/20/2011	11:25	B	0		Horizontal	N	0.25	0.25	0.25	50
3304	0	MD	N_0C1_06248_B	3531040.64	362998.5467	15.373031	2	1/20/2011	11:35	B	0				0.25	0.25	0.25	50
3307	0	MD	N_010_01040_B	3531088.061	363057.0492	4.740099	2	1/20/2011	11:56	B	0				0.25	0.25	0.25	4
3308	0	MD	N_010_01008_A	3531105.055	363058.1086	6.992828	2	1/20/2011	12:07	A	0				0.25	0.25	0.25	30
3309	0	MD	N_010_01047_A	3531107.858	363056.3508	4.327966	2	1/20/2011	12:16	A	0				0.25	0.25	0.25	25
3310	0	CD	N_010_01009_A	3530914.861	363058.3963	6.898432	2	1/20/2011	12:24	A	0		Horizontal	N	25	0.5	0.5	1
3312	0	No Find	N_009_00889_A	3530920.301	363116.0024	5.722522	2	1/20/2011	14:12	A	0				0	0	0	1
3317	0	CD	N_009_00870_A	3531069.961	363116.5813	11.419353	2	1/20/2011	14:50	A	0				4	0.3	0.3	4
3318	0	CD	N_009_00870_B	3531069.921	363116.5743	11.419353	2	1/20/2011	14:51	B	0				1	0.3	0.3	10
3319	0	MD	N_009_00870_C	3531069.968	363116.614	11.419353	2	1/20/2011	14:52	C	0				0.25	0.25	0.25	20
3320	0	CD	N_009_00867_A	3531072.183	363116.6677	14.022275	2	1/20/2011	15:10	A	0				4	0.3	0.3	3
3321	0	CD	N_009_00867_B	3531072.159	363116.68	14.022275	2	1/20/2011	15:11	B	0				1	0.2	0.2	9
3322	0	MD	N_009_00867_C	3531072.23	363116.8633	14.022275	2	1/20/2011	15:12	C	0				0.25	0.25	0.25	15
3323	0	CD	N_009_00909_A	3531083.52	363117.4768	4.625918	2	1/20/2011	15:19	A	0				4	0.3	0.3	1
3324	0	CD	N_008_00750_A	3531059.626	363171.9624	9.049902	2	1/20/2011	16:25	A	0				4	0.3	0.3	1
3325	0	MD	N_008_00750_B	3531059.939	363171.7448	9.049902	2	1/20/2011	16:26	B	0				0.25	0.25	0.25	4
3326	0	CD	N_004_00172_A	3530938.493	363407.8321	1824.030911	2	1/20/2011	16:34	A	0				5	5	1	1
3327	0	MD		3530932.538	363234.6801	0	1	1/21/2011	9:05	ta17	0	N	Pointing Down Toward	N	120	120	48	1
3328	0	MD		3530938.543	363232.7903	0	1	1/21/2011	9:08	ta17	0	N	Pointing Down Toward	N	120	120	48	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
3329	0	MD		3530974.848	362921.3487	0	1	1/21/2011	11:37	17-7-5	0	N	Horizontal	S	2.5	1	0.5	1
3330	0	RRD		3530977.061	362932.7134	0	1	1/21/2011	11:45	17-7-6	0	N	Horizontal	N	4.5	0.5	0.25	1
3331	0	MD		3530968.164	362962.7131	0	1	1/21/2011	11:53	17-7-7	0	N	Horizontal	N	0.5	0.5	0.5	1
3332	0	CD		3530972.581	362965.4741	0	1	1/21/2011	11:56	17-7-8	0	N	Horizontal	W	10	3	0.025	1
3333	0	Hot Rock		3530973.886	362986.4472	0	1	1/21/2011	12:04	17-7-hr	0				0	0	0	1
3334	0	RRD		3530974.66	362990.9806	0	1	1/21/2011	12:09	17-7-9	0	N	Horizontal	N	4.5	1	0.5	1
3335	0	CD		3530971.121	362999.2586	0	1	1/21/2011	12:17	17-6-1	0	N	Horizontal	N	5	4	0.25	1
3336	0	RRD		3530968.226	363012.0441	0	1	1/21/2011	12:23	17-6-2	0	N	Horizontal	W	1	1	0.025	1
3337	0	Hot Rock		3530963.414	363026.4139	0	1	1/21/2011	12:25	17-6-hr	0				0	0	0	1
3338	0	CD		3530964.173	363030.0376	0	1	1/21/2011	12:26	17-6-3	0	N	Horizontal	S	4	4	0.025	1
3339	0	CD		3530984.475	363071.6893	0	1	1/21/2011	12:41	17-6-5	0	N	Horizontal	S	3	3	0.025	1
3340	0	RRD		3530979.385	363062.8594	0	1	1/21/2011	12:43	17-6-4	0	N	Horizontal	E	1	1	0.025	1
3341	0	RRD		3530917.417	363339.0673	0	3	1/21/2011	11:50	17.3.1	0				4	1	1	1
3342	0	Hot Rock		3530921.698	363329.3046	0	3	1/21/2011	11:54	17.3.2	0				18	20	10	1
3343	0	RRD		3530920.645	363328.1782	0	3	1/21/2011	11:56	17.3.3	0				4	1	1	1
3344	0	CD		3530916.681	363305.0689	0	3	1/21/2011	12:00	17.3.4	0				18	24	1	1
3345	0	RRD		3530941.279	363281.6368	0	3	1/21/2011	12:04	17.3.5	0				4	1	1	1
3346	0	CD		3530946.295	363277.8176	0	3	1/21/2011	12:11	17.3.6	0				3	1	1	1
3347	0	RRD		3530951.979	363251.9388	0	3	1/21/2011	12:23	17.4.1	0				4	1	1	1
3348	0	RRD		3530958.766	363225.4701	0	3	1/21/2011	12:28	17.4.2	0				4	1	1	1
3349	0	Hot Rock		3530961.367	363207.2541	0	3	1/21/2011	12:31	17.4.3	0				12	24	12	1
3350	0	CD		3530964.958	363188.936	0	3	1/21/2011	12:43	17.4.4	0				14	1	1	1
3351	0	RRD		3530973.11	363181.6859	0	3	1/21/2011	12:47	17.4.5	0				3	3	1	1
3352	0	CD		3530976.576	363179.1014	0	3	1/21/2011	12:52	17.4.6	0				3	3	1	1
3353	0	CD		3530980.038	363163.9251	0	3	1/21/2011	14:22	17.5.1	0	N	Horizontal	N	3	3	0.5	1
3354	0	RRD		3530981.556	363145.5649	0	3	1/21/2011	14:26	17.5.2	0	N	Horizontal	E	5	1	1	2
3355	0	RRD		3530982.591	363134.4724	0	3	1/21/2011	14:30	17.5.3	0	E	Horizontal	S	5	1	1	4
3356	0	RRD		3530976.657	363117.5528	0	3	1/21/2011	14:34	17.5.4	0	E	Horizontal	S	5	1	1	1
3357	0	Hot Rock		3530972.746	363108.3475	0	3	1/21/2011	14:38	17.5.5	0				0	0	0	1
3358	0	RRD		3530972.974	363088.0115	0	3	1/21/2011	14:42	17.5.6	0	E	Horizontal	S	1	1	1	1
3359	0	MD		3531428.068	360836.4688	0	1	1/24/2011	11:29	18-9-6	0	N	Horizontal	N	3	0.5	0.5	1
3360	0	Hot Rock		3531425.493	360843.3392	0	1	1/24/2011	11:32	18-9-hr2	0				0	0	0	1
3361	0	MD		3531427.111	360840.297	0	1	1/24/2011	11:34	18-9-7	0	N	Horizontal	N	3	0.5	0.5	1
3362	0	MD		3531427.435	360858.9829	0	1	1/24/2011	11:40	18-9-8	0	N	Horizontal	N	3	0.5	0.5	1
3363	0	RRD		3531442.588	360887.753	0	1	1/24/2011	11:45	18-9-9	0	N	Horizontal	N	3	2	2	1
3364	0	MD		3531460.944	360896.2006	0	1	1/24/2011	11:53	18-9-10	0	N	Horizontal	W	3.5	1	1	1
3365	0	MD		3531471.882	360882.9427	0	1	1/24/2011	12:02	18-10-1	0	N	Horizontal	N	3	0.5	0.5	1
3366	0	MD		3531465.679	360863.064	0	1	1/24/2011	12:07	18-10-2	0	N	Horizontal	N	3	0.5	0.5	1
3367	0	RRD		3531459.447	360853.0528	0	1	1/24/2011	12:12	18-10-3	0	N	Horizontal	N	3	2	2	1
3368	0	RRD		3531441.071	360832.7369	0	1	1/24/2011	12:16	18-10-5	0	N	Horizontal	W	3	1	2	1
3369	0	RRD		3531416.725	360807.8705	0	1	1/24/2011	12:21	18-10-6	0	N	Horizontal	W	3	1	2	1
3370	0	Hot Rock		3531412.748	360805.215	0				18-10-hr1	0				0	0	0	1
3371	0	MD		3531406.016	360775.1683	0	1	1/24/2011	12:30	18-10-7	0	N	Horizontal	W	3	0.5	0.5	1
3372	0	Hot Rock		3531412.531	360767.5432	0	1	1/24/2011	12:33	18-10-hr2	0				0	0	0	1
3373	0	MD		3531407.925	360770.732	0	1	1/24/2011	12:36	18-10-8	0	N	Horizontal	W	2	0.25	0.25	2
3374	0	MD		3531417.213	360769.0071	0	1	1/24/2011	12:39	18-10-9	0	N	Horizontal	S	3	0.5	0.5	1
3375	0	RRD		3531422.452	360769.4349	0	1	1/24/2011	12:42	18-10-10	0	N	Horizontal	N	3	1	2	1
3376	0	MD		3531375.683	360788.523	0	1	1/24/2011	14:02	18-9-1	0	N	Horizontal	W	3	0.5	0.5	1
3377	0	MD		3531375.662	360802.0792	0	1	1/24/2011	14:05	18-9-2	0	N	Horizontal	S	3	0.5	0.5	1
3378	0	MD		3531392.151	360808.3319	0	1	1/24/2011	14:07	18-9-3	0	N	Horizontal	N	3	0.5	0.5	1
3379	0	MD		3531403.798	360822.7699	0	1	1/24/2011	14:10	18-9-4	0	N	Horizontal	E	3	0.5	0.5	1
3380	0	MD		3531407.226	360828.1369	0	1	1/24/2011	14:11	18-9-5	0	N	Horizontal	W	3	0.5	0.5	1
3381	0	MD		3531464.208	360790.8751	0	1	1/24/2011	14:44	18-7-1	0	N	Horizontal	W	2	0.5	0.5	1
3382	0	Hot Rock		3531485.768	360793.9072	0	1	1/24/2011	14:47	18-7-hr1	0				0	0	0	1
3383	0	RRD		3531504.541	360799.3088	0	1	1/24/2011	14:50	18-7-2	0	N	Horizontal	N	3	1	2	1
3384	0	MD		3531513.869	360802.6011	0	1	1/24/2011	14:56	18-7-3	0	N	Horizontal	N	1	0.3	0.3	1
3385	0	MD		3531524.238	360811.1396	0	1	1/24/2011	15:02	18-7-4	0	N	Horizontal	W	2	0.5	0.5	1
3386	0	MD		3531557.605	360827.8644	0	1	1/24/2011	15:07	18-7-5	0	N	Horizontal	N	0.5	0.5	0.5	1
3387	0	MD		3531571.873	360851.9734	0	1	1/24/2011	15:12	18-7-6	0	N	Horizontal	N	2	0.5	0.5	1
3388	0	MD		3531562.744	360851.3136	0	1	1/24/2011	15:18	18-7-7	0	N	Horizontal	W	2	0.5	0.5	1
3389	0	Hot Rock		3531543.664	360846.5398	0	1	1/24/2011	15:21	18-7-hr2	0				0	0	0	1
3390	0	MD		3531539.61	360843.7998	0	1	1/24/2011	15:24	18-7-8	0	N	Horizontal	S	3	0.5	0.5	8
3391	0	MD		3531515.86	360834.0127	0	1	1/24/2011	15:34	18-7-9	0	N	Horizontal	S	5	2	2	1
3392	0	MD		3531494.966	360828.0725	0	1	1/24/2011	15:40	18-7-10	0	N	Horizontal	N	3	0.5	0.5	1
3393	0	MD		3531374.335	360653.7727	0	2	1/24/2011	10:10	18.md1	0		Horizontal	N	3	2	1	1
3394	0	CD		3531363.298	360570.9081	0	2	1/24/2011	10:24	18.8barbed	0			N	0	0	0	1
3395	0	MD		3531363.68	360583.5684	0	2	1/24/2011	10:58	18.md2	0		Horizontal	W	6	1.5	1.5	1
3396	0	MD		3531377.494	360621.8717	0	2	1/24/2011	11:30	18.md3	0		Horizontal	S	4	1.5	1.5	1
3397	0	Hot Rock		3531400.315	360607.8955	0	2	1/24/2011	11:33	18.8.001	0				0	0	0	1
3398	0	MD		3531392.451	360593.6661	0	2	1/24/2011	11:37	18.8.002	0		Horizontal	N	2	0.5	0.5	1
3399	0	MD		3531377.078	360583.9758	0	2	1/24/2011	11:42	18.8.003	0				2	0.5	0.5	1
3400	0	MD		3531368.678	360580.1215	0	2	1/24/2011	11:46	18.8.004	0				1	1	0.2	1
3401	0	MD		3531357.332	360572.932	0	2	1/24/2011	11:59	18.8.005	0		Horizontal	W	1.5	1	0.2	1
3402	0	MD		3531335.031	360544.4117	0	2	1/24/2011	12:05	18.8.006	0		Horizontal	S	2	0.5	0.5	1
3403	0	MD		3531330.366	360540.1057	0	2	1/24/2011	12:11	18.8.007	0				1	0.5	0.2	1
3404	0	MD		3531321.037	360517.0061	0	2	1/24/2011	12:15	18.8.008	0		Horizontal	E	4	1	0.2	1
3405	0	Hot Rock		3531305.42	360504.4579	0	2	1/24/2011	12:22	18.8.009	0				0	0	0	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
3406	0	MD		3531325.654	360485.0266	0	2	1/24/2011	12:32	18.8.010	0				2	2	0.2	1
3407	0	MD		3531332.554	360501.0785	0	2	1/24/2011	12:41	18.8.011	0				1	1	0.2	1
3408	0	MD		3531349.699	360546.5205	0	2	1/24/2011	12:54	18.8.002	0		Horizontal	W	3	1	0.2	1
3409	0	MD		3531349.692	360595.0936	0	2	1/24/2011	12:58	18.md3	0		Horizontal	W	4	1.5	1.5	1
3410	0	MD		3531449.775	360598.2768	0	2	1/24/2011	14:24	18.9.001	0				3	0.3	0.3	1
3411	0	Hot Rock		3531449.186	360595.7493	0	2	1/24/2011	14:26	18.9.002	0				0	0	0	1
3412	0	MD		3531432.283	360608.6351	0	2	1/24/2011	14:31	18.9.003	0				2	0.5	0.5	1
3413	0	MD		3531404.748	360618.6335	0	2	1/24/2011	14:54	18.10.001	0				1	1	0.3	1
3414	0	MD		3531409.83	360621.8011	0	2	1/24/2011	14:58	18.10.002	0				1	1	0.2	1
3415	0	Hot Rock		3531414.834	360631.5824	0	2	1/24/2011	15:01	18.10.003	0				0	0	0	1
3416	0	MD		3531413.496	360633.5116	0	2	1/24/2011	15:03	18.10.004	0				1	0.5	0.2	1
3417	0	MD		3531384.591	360581.9322	0	2	1/24/2011	15:33	18.5.001	0		Horizontal	E	4	1.4	1.4	1
3418	0	MD		3531380.97	360577.2716	0	2	1/24/2011	15:38	18.5.002	0		Horizontal	W	1	1.5	0.2	1
3419	0	Hot Rock		3531378.185	360575.9564	0	2	1/24/2011	15:41	18.5.003	0				0	0	0	1
3420	0	MD		3531114.252	361012.4878	0	3	1/24/2011	12:16	18.1.1	0				3	1	1	1
3421	0	Hot Rock		3531098.148	361001.7683	0	3	1/24/2011	12:21	18.1.2	0				6	8	4	1
3422	0	MD		3531100.2	360968.6124	0	3	1/24/2011	12:30	18.1.2	0				1	1	1	1
3423	0	MD		3531109.291	360943.8274	0	3	1/24/2011	12:38	18.1.3	0				3	1	1	1
3424	0	MD		3531120.88	360929.2094	0	3	1/24/2011	12:46	18.1.5	0				1	1	1	1
3425	0	MD		3531130.658	360904.4129	0	3	1/24/2011	14:03	18.1.6	0		Horizontal	N	1	1	1	2
3426	0	MD		3531131.474	360881.9022	0	3	1/24/2011	14:08	18.1.7	0		Horizontal	E	2	1	1	1
3427	0	MD		3531135.111	360865.5374	0	3	1/24/2011	14:14	18.1.8	0		Pointing Down Toward	S	3	1	1	1
3428	0	Hot Rock		3531136.918	360849.0566	0	3	1/24/2011	14:18	18.1.9	0				0	0	0	1
3429	0	CD		3531139.439	360833.4175	0	3	1/24/2011	14:22	18.1.10	0		Veritical	W	6	4	4	1
3430	0	MD		3531147.805	360816.8917	0	3	1/24/2011	14:28	18.1.11	0		Horizontal	S	1	0.5	0.5	1
3431	0	MD		3531155.289	360813.6324	0	3	1/24/2011	14:36	18.1.12	0		Horizontal	S	1	0.5	0.5	1
3432	0	RRD		3531181.217	360798.0307	0	3	1/24/2011	15:07	18.2.1	0		Horizontal	N	3	2	2	1
3433	0	MD		3531187.755	360774.2293	0	3	1/24/2011	15:15	18.2.2	0		Horizontal	E	3	1	1	1
3434	0	MD		3531202.548	360752.4164	0	3	1/24/2011	15:23	18.2.3	0		Horizontal	S	3	1	1	1
3435	0	Hot Rock		3531208.017	360743.2559	0	3	1/24/2011	15:26	18.2.4	0				0	0	0	1
3436	0	MD		3531210.557	360717.3321	0	3	1/24/2011	15:31	18.2.5	0		Horizontal	W	2	1	1	1
3437	0	MD		3531222.544	360700.5165	0	3	1/24/2011	15:43	18.2.6	0		Veritical	S	3	1	1	1
3438	0	MD		3531478.104	360819.4635	0	1	1/25/2011	10:01	18-6-10	0	N	Veritical	N	3	0.5	0.5	1
3439	0	RRD		3531463.472	360810.6863	0	1	1/25/2011	10:09	18-6-9	0	N	Horizontal	N	3	1	2	1
3440	0	MD		3531452.497	360799.1912	0	1	1/25/2011	10:14	18-6-8	0	N	Horizontal	N	2	2	2	1
3441	0	Hot Rock		3531429.948	360755.4431	0				18-6-hr2	0				0	0	0	1
3442	0	MD		3531431.244	360757.558	0	1	1/25/2011	10:26	18-6-7	0	N	Horizontal	S	3	0.5	0.5	1
3443	0	MD		3531431.633	360752.0108	0	1	1/25/2011	10:31	18-6-6	0	N	Horizontal	N	3	0.5	0.5	1
3444	0	Hot Rock		3531429.93	360755.6593	0	1	1/25/2011	10:33	18-6-hr2	0				0	0	0	1
3445	0	MD		3531359.042	360652.2107	0	1	1/25/2011	11:13	18-5-1	0	N	Horizontal	N	0.25	0.025	0.025	1
3446	0	Hot Rock		3531360.569	360675.6412	0	1	1/25/2011	11:20	18-5-hr1	0				0	0	0	1
3447	0	MD		3531360.622	360673.4508	0	1	1/25/2011	11:21	18-5-2	0	N	Horizontal	W	2	0.5	0.5	1
3448	0	MD		3531348.665	360680.4465	0	1	1/25/2011	11:28	18-5-3	0	N	Horizontal	N	8	2	2	1
3449	0	MD		3531337.935	360690.8493	0	1	1/25/2011	11:37	18-5-4	0	N	Horizontal	W	2	0.5	0.5	1
3450	0	MD		3531324.959	360700.2112	0	1	1/25/2011	11:44	18-5-5	0	N	Horizontal	W	2	0.5	0.5	1
3451	0	MD		3531322.008	360703.5198	0	1	1/25/2011	11:46	18-5-6	0	N	Horizontal	W	8	2	1	1
3452	0	Hot Rock		3531318.13	360707.1484	0	1	1/25/2011	11:49	18-5-hr2	0				0	0	0	1
3453	0	MD		3531310.284	360714.3908	0	1	1/25/2011	11:55	18-5-7	0	N	Horizontal	W	1	1	1	1
3454	0	MD		3531303.749	360720.9278	0	1	1/25/2011	11:58	18-5-8	0	N	Horizontal	S	2	0.5	0.5	1
3455	0	MD		3531301.932	360724.2008	0	1	1/25/2011	12:01	18-5-9	0	N	Horizontal	E	1.5	0.5	0.5	1
3456	0	MD		3531284.956	360734.1363	0	1	1/25/2011	12:07	18-5-10	0	N	Horizontal	W	2	2	2	1
3457	0	MD		3531399.711	360626.217	0	2	1/25/2011	9:51	18.6.001	0				2	1	0.2	1
3458	0	CD		3531407.33	360641.5109	0	2	1/25/2011	9:55	18.6.002	0				0.75	0.75	0.2	1
3459	0	MD		3531414.362	360655.5753	0	2	1/25/2011	10:00	18.6.003	0		Horizontal	W	4	1.5	1.5	1
3460	0	RRD		3531430.279	360722.7579	0	2	1/25/2011	10:22	18.6.004	0				2	1	0.2	1
3461	0	Hot Rock		3531433.388	360751.2746	0	2	1/25/2011	10:30	18.6.005	0				0	0	0	1
3462	0	MD		3531433.771	360748.9151	0	2	1/25/2011	10:31	18.6.006	0		Horizontal	N	4	1.5	1.5	1
3463	0	MD		3531358.104	360622.9549	0	2	1/25/2011	11:18	18.3.001	0				2	0.5	0.5	2
3464	0	MD		3531357.826	360621.1926	0	2	1/25/2011	11:25	18.3.002	0		Horizontal		2	2	0.2	1
3465	0	MD		3531349.735	360619.4556	0	2	1/25/2011	11:29	18.3.003	0				2	1	0.2	1
3466	0	MD		3531336.331	360615.0281	0	2	1/25/2011	11:31	18.3.004	0		Horizontal	W	3	0.5	0.2	1
3467	0	MD		3531334.127	360616.5555	0	2	1/25/2011	11:34	18.3.005	0		Horizontal	N	4	1.5	1.5	1
3468	0	MD		3531326.128	360619.6618	0	2	1/25/2011	11:37	18.3.006	0				4	0.5	0.2	1
3469	0	MD		3531304.308	360622.2918	0	2	1/25/2011	11:47	18.3.007	0				2	0.5	0.5	1
3470	0	MD		3531296.236	360625.5864	0	2	1/25/2011	11:51	18.3.008	0				1	1	0.2	1
3471	0	MD		3531279.419	360631.6501	0	2	1/25/2011	12:11	18.2.001	0				1	1	0.2	1
3472	0	MD		3531276.202	360631.8173	0	2	1/25/2011	12:17	18.2.002	0				1	0.5	0	2
3473	0	MD		3531261.555	360633.683	0	2	1/25/2011	12:25	18.2.002	0		Horizontal	N	5	1.5	0.2	1
3474	0	MD		3531257.096	360638.5089	0	2	1/25/2011	13:29	18.2.004	0				3	3	2	1
3475	0	MD		3531253.505	360642.03	0	2	1/25/2011	13:32	18.2.005	0		Horizontal	N	4	0.5	0.2	1
3476	0	MD		3531249.569	360645.1917	0	2	1/25/2011	13:34	18.3.006	0				1.5	2	0	1
3477	0	MD		3531134.097	361002.8808	0	3	1/25/2011	9:16	18.3.1	0				1	1	1	1
3478	0	MD		3531141.538	360988.1963	0	3	1/25/2011	9:23	18.3.2	0				2	1	1	1
3479	0	Hot Rock		3531142.517	360985.9524	0	3	1/25/2011	9:25	18.3.3	0				18	14	6	1
3480	0	MD		3531146.063	360980.6765	0	3	1/25/2011	9:30	18.3.4	0				1	1	1	1
3481	0	MD		3531145.569	360972.556	0	3	1/25/2011	9:35	18.3.5	0				3	1	1	1
3482	0	MD		3531147.542	360968.5158	0	3	1/25/2011	9:41	18.3.6	0				2	1	1	1

OBJECTID	ID	ANOM_TYPE	ANOM_ID	NORTHING	EASTING	CH2_SIG	TEAM	DATESTMP	TIMESTMP	OBJ_NUMBER	DIST_AWAY	DRCT_AWAY	ORIENT	ORIENT_DIR	ANOM_LNGTH	ANOM_WIDTH	ANOM_HGHT	QUANTITY
3483	0	Hot Rock		3531145.416	360963.4035	0	3	1/25/2011	9:45	18.3.7	0				18	24	24	1
3484	0	MD		3531150.068	360951.513	0	3	1/25/2011	9:55	18.3.8	0				2	2	1	1
3485	0	MD		3531150.843	360944.0996	0	3	1/25/2011	9:59	18.3.9	0				2	1	1	1
3486	0	MD		3531150.643	360938.4335	0	3	1/25/2011	10:02	19.3.10	0				2	1	1	1
3487	0	MD		3531151.87	360924.1154	0	3	1/25/2011	10:10	18.3.11	0				3	1	1	1
3488	0	MD		3531175.505	360901.4991	0	3	1/25/2011	10:28	18.3.12	0				2	1	1	1
3489	0	MD		3531185.098	360891.9862	0	3	1/25/2011	11:03	18.4.1	0				3	1	1	1
3490	0	MD		3531195.16	360872.375	0	3	1/25/2011	11:12	18.4.2	0				4	1	1	1
3491	0	Hot Rock		3531195.208	360866.5654	0	3	1/25/2011	11:14	18.4.3	0				0	0	0	1
3492	0	MD		3531199.403	360846.4689	0	3	1/25/2011	11:19	18.4.4	0				3	1	1	1
3493	0	MD		3531197.143	360819.6183	0	3	1/25/2011	11:28	18.4.5	0				2	1	1	1
3494	0	MD		3531217.174	360811.4625	0	3	1/25/2011	11:33	18.4.6	0				3	1	1	1
3495	0	MD		3531230.637	360794.2553	0	3	1/25/2011	11:39	18.4.7	0				2	1	1	1
3496	0	MD		3531224.086	360784.1466	0	3	1/25/2011	11:52	18.4.8	0				3	2	2	1
3497	0	Hot Rock		3531222.222	360784.9424	0	3	1/25/2011	11:55	18.4.9	0				0	0	0	1
3498	0	MD		3531240.837	360764.5855	0	3	1/25/2011	12:04	18.4.10	0				3	2	2	1
3499	0	MD		3531251.34	360751.7025	0	3	1/25/2011	12:12	18.4.11	0				3	1	1	1
3500	0	MD		3531273.603	360734.6461	0	3	1/25/2011	12:17	18.4.12	0				1	1	1	1
3501	0	MD		3531233.013	360684.5824	0	3	1/25/2011	13:31	18.3.7	0				2	1	1	1
3502	0	Hot Rock		3531245.058	360646.0011	0	3	1/25/2011	13:39	18.2.8	0				0	0	0	1
3505	0	No Find	N_008_00805_A	3530863.395	363176.0304	4.707949	2	1/21/2011	9:37	A	0				0	0	0	1
3514	0	CD	N_006_00520_B	3530754.663	363290.0103	5.44894	2	1/21/2011	12:04	B	0	S	Horizontal	E	6	0.1	0	1
3518	0	Hot Rock	N_004_00209_A	3530696.778	363403.8291	12.829055	2	1/21/2011	14:33	A	0				0	0	0	1
3525	0	CD	N_003_00135_A	3530664.154	363460.7281	10.406562	2	1/21/2011	15:58	A	0	W	Horizontal	W	5	0.1	5	1
3527	0	CD	N_003_00128_A	3530663.359	363462.5544	17.352768	2	1/21/2011	16:08	A	0		Horizontal	W	10	0.2	10	1
, "	other		0	S_025_09251	2	2												

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Wire	NO	10	YES			2 inch		0	N_014_01515	3	0.005
Small Arms Bullet	NO	4	YES	2- 7.62 spent blankes		Other		0	N_0C2_06367	5	0.05
Projectile APT	NO	11	YES	found 1-37 mm APT ten foot south of the end of transect 1		37 mm		0		0	> 1 lb
Small Arms Bullet	NO	4	YES	50 cal.		.50 cal		0	N_036_04943	2	0.5
	YES	8	YES	found off flag but close. potential sampling location.				0	N_0A3_06123	0	1
No further entries- mar	NO	4	YES	big hot rock		12x12		0.460264	N_065_05589	1	40
	NO	4	NO			bolt		0	N_0C2_06328	2	1
No further entries- mar	NO	4	YES	big hot rock		big		0.10059	N_065_05589	2	20
Small Arms Bullet	NO	4	YES			.50 cal		0	N_013_01429	10	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_015_01925	5	0.25
Small Arms Bullet	NO	4	YES	two 50 cal bullets and a piece of wire		.50 cal		0	N_019_02765	12	1
Barbed Wire	YES	10	YES	Barbed wire strand unmoved.		long wire		0	N_011_01109	0	0
Tail Fins	NO	4	YES	possible smoke rifle grenade		Other		0.143117	N_063_05416	6	1
Frag (heavy)	NO	10	YES	piece of frag		big piece of frag		0	N_012_01228	1	4
Wire	NO	4	YES	wire was up 12+ in off the ground		10 plus feet length		0	N_018_02536	0	1
Barbed Wire	NO	4	YES			60 inches		0	N_020_02872	2	0.25
Other	NO	4	YES			pieces of rusty can		0	N_022_03161	1	0.1
	NO	4	NO					0	N_018_02591	0	1
	YES	4	NO			tin can lid		0	N_021_03070	0	1
old can	NO	4	YES	old 12 oz. can		12 ounce can		0	N_019_02726	12	0.5
Small Arms Bullet	NO	4	YES			.50 cal		0	N_020_02950	0	1
Frag (light)	NO	6	YES	founs a small piece of frag a meter and a half away from point		small piece of frag		0	N_014_01513	3	0.1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_022_03155	4	1
Barbed Wire	NO	4	YES			6 inches		0	N_020_02887	0	0.1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_020_02949	3	0.1
Wire	NO	4	YES			barbed		0	N_035_04624	6	0.2
can lid	NO	6	YES	hit outside meter		3 in dia		0	N_014_01607	1	0.1
Frag (light)	NO	8	YES	found 1 piece of frag just outside of a meter		small piece of frag		0	N_035_04766	4	0.2
Frag (light)	NO	4	YES	grenade arm		grenade arm		0	N_019_02726	8	0.5
Other	NO	4	YES	1oz piece of can		2x1		0.099999	N_064_05464	1	0
Small Arms Bullet	NO	4	YES			.50 cal		0.101374	N_064_05489	0	0.1
Frag (medium)	YES	4	YES			Other		0.099999	N_064_05464	4	0.1
No further entries- mar	NO	4	YES			24 inches		0.173687	N_063_05416	0	100
Small Arms Bullet	NO	4	YES	50 cal bullet		50 cal		0	N_014_01637	10	0.5
	NO	4	YES			pipe		0	N_0C2_06280	20	8
	YES	4	YES	still in ground		big		0	N_0C2_06280	24	40
Small Arms Bullet	YES	4	YES	3-50 cal in hole		.50 cal		0	N_036_04876	3	0.5
barbed wire	NO	4	YES	barbed wire		20 feer		0	N_020_02864	5	3
Wire	NO	4	YES			36 inch		0	N_033_04348	0	1
Small Arms Bullet	NO	10	YES	2 shotgun shells		shotgun shells		0	N_008_00794	5	1
Cans	NO	16	YES			12 oz		0		0	1
Can lid	NO	16	YES			4 in diameter		0		0	< 1
Small Arms Bullet	NO	10	YES	one shotgun shell		shotgun shell		0	N_008_00821	1	0.5
Other	NO	4	YES			sheet metal 4/4		0	N_019_02673	0	2
Other	NO	4	YES			sheet metal		0	N_0C2_06328	2	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_021_03070	8	1
	NO	4	YES			m1 clip		0	N_020_02950	3	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_020_02950	3	0
Frag (medium)	NO	4	YES	frag		Unknown		0	N_036_04943	2	0.5
Small Arms Bullet	NO	4	YES			Other		0	N_018_02591	4	1
Small Arms Bullet	NO	4	YES	50 cal bullet		50 cal		0	N_019_02726	9	0.5
	NO	4	YES			steel pipe		0	N_0C2_06280	3	3
barbed wire	NO	4	YES	150 foot of barbed wire		120 feet		0	N_019_02674	0	0
Barbed Wire	NO	4	YES			240 in		0	N_018_02527	0	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_020_02949	1	0.1
Barbed Wire	YES	4	YES	several strands of barbed wire running nw for approx 75ft				0	N_019_02674	0	15
Small Arms Bullet	NO	4	YES	1of 3 50 cal		.50 cal		0	N_036_04959	0.5	0.5
Frag (light)	YES	4	YES			Unknown		0	N_034_04544	1	0.5
Frag (light)	YES	4	YES			Unknown		0	N_034_04544	2	0.5
Small Arms Bullet	YES	4	YES			.50 cal		0	N_034_04544	2	0.5
Wire	YES	4	YES			3 inc		0	N_032_04176	4	0.5
Can	NO	10	YES			6 inch long		0	N_014_01515	0	1
Small Arms Bullet	NO	10	YES			.30 cal		0	N_014_01653	6	0.005
Other	NO	10	YES			clip m1		0	N_014_01525	2	0.05
Frag (heavy)	NO	10	YES	poss .75mm frag		Other		0	N_014_01508	3	1
Frag (light)	NO	10	YES			Unknown		0	N_013_01355	0	1
Frag (medium)	NO	10	YES	3 pieces of frag		2 pieces of frag		0	N_012_01241	2	6
Frag (medium)	YES	4	YES			Unknown		0	N_0C2_06349	4	0.05
Frag (heavy)	NO	4	YES	poss 75mm		1x.5		0	N_035_04733	3	0.005
Target/Target Debris	NO	LOT 2	YES	10x18 plate		10 inch x 18 inches		0	N_008_00695	0	1
Can	NO	10	YES	tin can		tin can		0	N_008_00695	0	0.005
Can	NO	10	YES	tin can		tin can		0	N_008_00798	0	0.05
Can lid	NO	10	YES	paint can lid		5 inch		0	N_007_00616	7	0.005
Wire	NO	10	YES	24 inches wire, 12 inches wire , can lid 3inch		24 inches		0	N_007_00644	0	1
Other	YES	10	YES	m1 clip		clip		0	N_007_00644	3	0.005
Small Arms Bullet	NO	4	YES	30-06 cartridge				0	N_021_03070	0	0.1
other	YES	6	YES	varies pieces of aluminum foil		varies sizes		0	N_008_00735	4	0.0005

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
small arms carriage	NO	6	YES	30 06 blank	no	30 06 cartridges		0	N_00A_06035	4	0.005
nail	NO	6	YES	2d nail	no	2.5 inch long		0	N_00A_06028	12	0.005
other	NO	8	YES	6.5 inch metal disk...looks like small hub cap or cap to somethi		6.5 inch		0	N_038_05055	0	5
Casing	NO	LOT 1	YES	22 cal cartridge no bullet ....cartridge has been fired		Small Arms		0	N_048_05246	3	0.005
Fuze/Fuze Components	YES	12	YES	possible pttf...magnetic signature still remaining because of ho		possible pttf		0	S_027_10119	4	> 1 lb
Can	YES	3	YES	3ft x 3ft drum.....hot rocks found with schonstedt		3 ft drum		0	S_019_06993	0	> 1 lb
Small Arms Bullet	YES	5	YES	1 7.62 bullet ....magnetic signature still remaining because of h		other		0	S_050_12030	4	2
Wire	YES	LOT 4	YES	small piece of metal wire .....magnetic signature still remaining		6 inch long		0	S_010_03650	1	2
Small Arms Bullet	YES	1	YES	7 x 7.62 bullets .... remaining magnetic signature still rem		other		0	S_019_07148	3	< 1
nail	NO	4	YES	5 inch nail		5 inches		0	N_019_02785	4	0.5
Frag (heavy)	NO	4	YES	poss. 37mm		Other		0	N_033_04434	6	0.75
Frag (light)	NO	12	YES	found 1 piece of frag		small piece of frag		0	S_025_09209	4	4
brass casing	NO	LOT 1	YES	no mangnetic signature remains				0	N_018_02657	0.001	1
No further entries- mar	NO	4	YES			2 inch		0	N_023_03232	0	1
	YES	4	YES			nails and old truck latch		0	N_023_03232	2	0
Small Arms Bullet	YES	4	YES	3 .50 cal		.50 cal		0	N_032_04246	0.5	0.5
Wire	YES	4	YES			12		0	N_032_04176	6	0.5
Small Arms Bullet	YES	4	YES			.50 cal		0	N_032_04219	2	0.5
Frag (medium)	YES	4	NO			Unknown		0	N_032_04219	4	0.5
Small Arms Bullet	YES	4	NO			.50 cal		0	N_032_04219	7	0.5
Small Arms Bullet	YES	4	YES	3-.50 cals		.50 cal		0	N_032_04219	12	0.5
Small Arms Bullet	NO	4	YES	3- 50 cal bullet		50 cal bullet		0	N_019_02785	18	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_034_04603	2	0.05
Wire	NO	4	YES			3inch wire		0	N_036_04903	0	0.05
Small Arms Bullet	NO	4	YES	spent 7.62 blake		Other		0	N_036_04903	0	0.05
Small Arms Bullet	YES	4	NO			.50 cal		0	N_036_04873	4	0.05
Small Arms Bullet	NO	4	YES			.50 cal		0	N_036_04873	6	0.05
Frag (heavy)	NO	4	YES	poss 75mm frag		Other		0	N_063_05385	8	0.05
Other	NO	4	YES	metal rod		36 inches		0	N_036_04988	12	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_035_04733	2	0.05
Can	NO	4	YES			5 inch		0	N_035_04733	0	0.005
Cans	NO	4	YES	rusty tin can		tin can		0	N_024_03305	0	1
Nails	NO	4	YES					0	N_0C2_06423	6	0.1
30-06	NO	4	YES					0	N_026_03569	8	0.1
Frag (light)	NO	4	YES					0	N_024_03314	6	0.1
aluminum foil	NO	4	YES					0	N_021_03070	2	0.01
bullet	NO	4	YES	.50 cal metal jacket				0	N_032_04209	3	0.02
Small Arms Bullet	NO	6	YES	.50 cal steel core		.50 cal		0	N_010_01057	4	0.005
Barbed Wire	NO	6	YES	18 inches barbed wire		18 inches		0	N_011_01156	12	0.005
bolt	NO	6	YES	carriage bolt		6 inches		0	N_00A_06004	12	0.05
Small Arms Bullet	YES	6	YES	.45 cal bullet		.45 cal bullet		0	N_008_00745	6	0.05
Frag (light)	NO	8	YES	does not meet the mv requirement		.5x.5		0	N_035_04662	1	0.1
Cans	NO	LOT 2	YES	2 cans 1 beer , and 1 milk can		other		0	N_005_00370	0	1
Small Arms Bullet	NO	LOT 2	YES			bullet pieces		0	N_014_01685	2	< 1
Small Arms Bullet	NO	10	YES			.30 cal		0	N_014_01515	6	0.005
old style fire extinguisher	NO	10	YES					0	N_010_00945	0	3
Frag (medium)	NO	6	YES	found a big piece of frag and multiple small pieces of frag		piece of frag		0	N_014_01513	2	0.5
Frag (light)	NO	8	YES	1 items dig complete				0	N_030_04029	2	0
Frag (medium)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_012_01231		1
Frag (medium)	NO	12	YES	2 pieces of frag simular size		Unknown		0	S_029_10579	1	< 1
Frag (light)	NO	3	YES			75mm flash tube		0		4	< 1
Frag (heavy)	YES	9	YES	3xfrag 2x.5 to 1 inch size magnetic signature remaining becau				0	N_074_05728	0	< 1
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_007_0068	12	1
concrete black with steel spike	YES	LOT 2	YES	1 items dig complete				0	N_008_00708	1	> 1 lb
Frag (medium)	NO	6	YES	meets the MV requirement, possibly MV signature picked up		Unknown		0	N_021_03089	2	0.8
Small Arms Bullet	NO	6	YES	found 1- 50 cal bullet and enough to meet the mv reading		50 cal		0	N_015_01738	8	0.1
Frag (light)	NO	8	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_00A_05993	0	0.01
tin	YES	LOT 4	YES	1 items dig complete				0	S_018_06544	0	> 1 lb
Small Arms Bullet	NO	10	YES	shotgun shell		shotgun shell		0	N_015_01917	6	0.5
brass	NO	LOT 1	YES	found multiple pieces of brass		2x3		0	N_018_02609	12	0.25
Cans	NO	10	YES	metal can		metal can		0	N_012_01219	1	0.5
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_017_02354	3	1
metal tab to a booby trap	NO	LOT 1	YES	found 1 metal tab from a booby trap		1x4		0	N_018_02636	3	0.1
m1 clip	NO	LOT 2	YES	found 1- m1 clip		m1		0	N_014_01633	3	2
m1 clip	NO	LOT 2	YES	found 1 m1 clip		3in		0	N_006_00480	8	1
Frag (heavy)	NO	3	YES	found an empty 37mm APT		37mm apt		0		1	1 lb
Wire	NO	4	YES	wire		18 inches		0.099999	N_065_05570	2	1
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_018_02574	5	1
Wire	YES	10	YES	left in place		fence, intact		0	N_017_02273	0	5
Other	NO	4	YES	piece of metal		metal		0	N_023_03249	6	1
Frag (light)	YES	4	YES			Unknown		0	N_035_04664	3	0.2
Frag (heavy)	NO	10	YES	reiterate, heavy frag, flag cleared		7"		0	N_014_01663	3	1.5
Cans	NO	10	YES	large trash can lid, only measured 6.4 mv ???		20"		0	N_012_01286	1	3
Cans	YES	10	YES	Hit is on western edge of often used campsite littered with del		steel drink can		0	N_010_00948	0	0.25
Cans	NO	10	YES			12 oz		0	N_020_02924	1	0.1
Frag (medium)	NO	10	YES					0	N_016_02062	6	1
Wire	NO	4	YES	flattened clump of wire, approximate diameter .25"				0	N_013_01429	0	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	NO	4	YES	one small frag. approximately 2 meters east are 4 strands of b				0	N_017_02301	3	0.05
Small Arms Bullet	NO	4	YES	2 meters north of flag is large pile of barbed wire running SW a		12 ga brass		0	N_018_02527	2	0.1
can rim	NO	4	YES	smashed flat can lid				0	N_021_03070	5	0.01
Aluminum scrap	NO	4	YES	small unidentified aluminum scrap				0	N_022_03161	2	0.1
Barbed Wire	YES	4	YES	nonremoveable barbed wire, pulled out of one meter area				0	N_018_02536	0	5
Cans	YES	6	YES	2 tin cans poss. peanut butter cans from c-rations		2x1 inch		0	N_008_00735	4	0.005
Frag (medium)	NO	8	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_00A_06052	3	0.1
Ammo Can	NO	8	YES	1 items dig complete				0	N_026_03477	1	1
Frag (medium)	NO	8	YES	1 items dig complete		Unknown		0	N_025_03406	1	2
Target/Target Debris	NO	8	YES	large targer debree				0	N_033_04338	0	20
Small Arms Bullet	NO	LOT 2	YES	hole was left uncovered, spoils were still hot		223 bullets		0	N_015_01877	1	24
Small Arms Bullet	NO	LOT 2	YES	hole was left uncovered, spoils were still hot		223 bullets		0	N_015_01877	24	1
fork	NO	LOT 2	YES	1 items dig complete				0	N_008_00814	3	3
Frag (medium)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_013_01330	1	1
Frag (heavy)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_014_01677	2	1
ree bar	NO	LOT 1	YES	meets the mv requirement, no mangnetic signature remains				0	N_00B_06136	0.5	0
Frag (light)	NO	5	YES			small piece of frag		0	S_052_12093	2	1
metal rod	NO	5	YES			20 inch		0	S_055_12176	2	2
Small Arms Bullet	NO	12	YES	does not meet the mv requirement		762		0	S_029_10603	1	< 1
Frag (heavy)	YES	LOT 3	YES	37mm not in bad shape .....hot rocks found with schonstedt		other		0	S_009_03582	1	> 1 lb
Cans	NO	LOT 3	YES	1 items dig complete				0	S_012_04468	8	1
Casing	YES	13	YES			Small Arms		0	S_RoadD_14477	SPOILS	< 1
other	YES	13	YES	this flag is about 12 inches away from #s_roadd_14467 so we		4.5 inch		0	S_019_07249	4	> 1 lb
grenade spoon	YES	1	YES	1 items dig complete				0	S_020_07601	0	1
	YES	1	YES					0	S_020_07601	0	6
Frag (light) and bullet	NO	1	YES	3 like items dig complete				0	S_020_07616	4	3
Buckets	YES	1	YES	3 like items dig complete				0	S_020_07601	0	3
Frag (light)	YES	1	YES	5 like items dig complete				0	S_020_07601	0	4
Frag (light)	YES	1	YES	2 like items dig complete				0	S_027_10204	3	3
metal can	YES	1	YES	thin sheet metal can remains rip		8x6 sheet metal		0	S_020_07580	5	< 1
Small Arms Bullet	YES	2	YES	2 like items dig complete				0	S_009_03471	3	1
Frag (light)	YES	9	YES	1 items dig complete				0	N_076_05844	3	1
Frag (heavy)	NO	9	YES	found several pieces of frag		3x2		0	N_079_05870	6	1 lb
Can	NO	17	YES			12 oz		0	N_008_00816	1	1
small arms	NO	6	YES	30 06 cartridges no projectile	no	30.06		0	N_00A_06005	3	0.005
Nails	NO	LOT 2	YES	found 1 nail but is not consistent with the mv reading		1 4in nail		0	N_009_00837	4	1
Frag (medium)	NO	10	YES			Unknown		0	N_014_01653	6	0.5
Other	NO	10	YES			scrap poss can		0	N_014_01578	0.5	0.005
other	NO	6	YES	2 pieces of aluminum scrap from unknown object		3inch piece		0	N_012_01262	3	0.05
nail	NO	6	YES	2d nail	no	30 inch long		0	N_00A_06011	1	0.005
other	NO	6	YES	looks like a piece of tin flashing for a house siding		6 inch long		0	N_008_00715	5	0.005
Frag (heavy)	NO	8	YES	unknown piece of frag		Unknown		0	N_0A3_06124	3	1
Casing	NO	8	YES			Small Arms		0	N_028_03758	2	1
Small Arms Bullet	NO	LOT 2	YES	found bullet casings and hot dirt		bullet casings		0	N_014_01670	1	10
Small Arms Bullet	NO	LOT 2	YES	found bullet casings and hot dirt		bullet casings		0	N_014_01670	10	1
Frag (medium)	NO	12	YES	found a piece of frag 5x2		medium size piece of frag		0	S_023_08446	3	4
Frag (medium)	NO	3	YES	also 762 bullets 10+		37mm		0		1	< 1
Projectile TP	NO	LOT 4	YES			37mm		0	S_036_11369	2	< 2
Small Arms Bullet	NO	LOT 4	YES	1 items dig complete				0	S_017_06127	4	3
Vehicle parts	NO	10	YES	motorbike peg		motorbike peg		0	N_009_00852	4	3
Other	NO	10	YES	piece of metal		metal piece		0	N_012_01233	1	0.5
Frag (heavy)	NO	6	YES	found a big piece of 75mm frag		big piece of frag		0	N_015_01869	2	0.5
Fuze/Fuze Components	NO	8	YES	found 1- cartridge casing		cart casing		0	N_034_04605	2	0.5
	YES	3	YES	1 items dig complete				0	S_024_08927	0	
Projectile AP	NO	3	YES	found an empty nose to a 37mm AP Projo and multiple 223 bu		37mm nose		0		1	8
Small Arms Bullet	NO	9	YES	found 1- 50 cal bullet		.50 cal		0	N_079_05873	0	< 1
Small Arms Bullet	NO	4	YES	50 cal bullet		50 cal bullet		0	N_019_02785	8	0.5
Nails	NO	10	YES	3 nails on surface		3 nails		0	N_009_00883	0	1
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_012_01233	1	2
Small Arms Bullet	NO	4	YES			.50 cal		0	N_034_04603	2	0.05
Other	NO	4	YES			fence		0	N_018_02570	0	2
Frag (medium)	YES	6	YES	found 3 like items that met the mv reading		1x4 piece of frag		0	N_015_01741	10	0.7
	NO	8	YES	1 door hinge		door hinge		0	N_035_04639	4	0.5
Frag (medium)	NO	8	YES	found 2 pieces of frag		piece of frag		0	N_036_04884	5	0.4
Frag (medium)	NO	12	YES	found 4 pieces of frag		4 pieces of frag		0	S_024_08843	18	8
Frag (medium)	NO	3	YES	found multiple pieces of frag		pieces of frag		0		7	10
Frag (heavy)	NO	3	YES	found a big piece of frag and multiple hot rocks		big piece of frag		0		1	10
Frag (light)	NO	LOT 4	YES			Unknown		0	S_036_11362	1	< 1
Projectile TP	NO	LOT 4	YES			37mm		0	S_036_11369	1	< 2
Wire	YES	1	YES	5 inch piece of metal wire twisted .....remaining magnetic sign		5 inch piece of wire		0	S_018_06799	2	< 1
Small Arms Bullet	YES	2	YES	12 like items dig complete				0	S_009_03462	2	2
Frag (light)	YES	9	YES			Unknown		0	N_075_05816	SPOILS	< 1
Small Arms Bullet	NO	9	YES	found 1-50 cal bullet and 1-30 cal bullet		.50 cal		0	N_079_05878	3	1
Nails	NO	6	YES	big 6 inch nail		big nail		0	N_00A_06038	7	0.2
Frag (medium)	NO	6	YES	piece of 1x4 frag and no remaining magnetic signature		1x4 piece of frag		0	N_015_01788	9	0.3
Frag (medium)	YES	6	YES	found the base end from a rifle grenade and multiple small pie		piece of frag		0	N_015_01793	6	0.2
Small Arms Bullet	YES	5	YES	.50 cal bullet .....magnetic signature still remaining because of		.50 cal		0	S_RoadD_14323	3	5

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	NO	3	YES	found 3- 762 bullets and 1- 223 bullet		762 bullets		0		4	2
Frag (light)	NO	LOT 4	YES			Unknown		0	S_035_11281	1	< 1
Small Arms Bullet	NO	LOT 4	YES					0	S_015_05246	2	4
37mm frag /50 cal bullet	YES	1	YES	37mm frag with 50 cal bullet x2 remaining magnetic signature		5x2 inches frag		0	S_020_07516	1	> 1 lb
No further entries- mar	NO	4	YES	hot rock		1 inch		0.100391	N_0C2_06393	1	0
Small Arms Bullet	NO	4	YES			.50 cal		0.177385	N_063_05416	0.1	0.1
	YES	4	YES	3 nails				0	N_0C2_06329	1	0
Small Arms Bullet	NO	4	YES	2of3 50 cal		.50 cal		0	N_036_04959	1	0.5
Small Arms Bullet	YES	4	YES			.50 cal		0	N_034_04544	2	0.5
Frag (heavy)	NO	10	YES	poss 105 frag		Other		0	N_014_01495	0	1
Other	NO	10	YES	can lid		can lid		0	N_014_01601	0	0.005
Small Arms Bullet	NO	10	YES			.30 cal		0	N_014_01515	5	0.005
Small Arms Bullet	NO	10	YES	assorted small arms carriages		Other		0	N_014_01525	0.3	0.5
Frag (heavy)	NO	10	YES	.37mm frag		Other		0	N_014_01578	12	1
Cans	NO	10	YES			3 cans		0	N_014_01508	0	0.05
Other	NO	10	YES			sheet metal		0	N_014_01687	0	0.05
Other	NO	10	YES			rifle clip		0	N_014_01687	4	0.005
Other	NO	4	YES	paint can lid, .5 inch wide banding by 1 inch long pieces		6 inch		0	N_032_04222	12	0.2
Other	NO	4	YES			.5 inch wide x 3 inch		0	N_032_04259	0	0.1
Small Arms Bullet	YES	4	YES	3 .50 cals		.50 cal		0	N_032_04241	16	0.2
Small Arms Bullet	NO	4	YES			.50 cal		0	N_033_04348	2	0.01
Small Arms Bullet	NO	4	YES			.50 cal		0	N_036_04903	4	0.05
Small Arms Bullet	NO	4	YES			.50 cal		0	N_063_05385	4	0.05
Nail	NO	4	YES			3inch		0	N_0C2_06294	0	0.05
Small Arms Bullet	NO	4	YES	spent cartridges		5.56mm		0	N_0C2_06294	2	0.05
Other	NO	4	YES	410 shell		3		0	N_0C2_06294	4	0.05
Other	NO	4	YES	bottle cap		bottle cap		0	N_0C2_06294	5	0.005
Wire	NO	4	YES			10 feet		0	N_0C2_06294	5	0.005
Other	NO	4	YES			pull tab		0	N_035_04733	0	0.005
Frag (light)	NO	4	YES					0	N_024_03314	4	0.5
	NO	4	YES					0	N_024_03314	6	0.1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_0C2_06410	5	0.25
Small Arms Bullet	YES	4	YES			and frag		0	N_036_04910	3	0.1
Frag (medium)	NO	10	YES	small frag		Other		0	N_013_01428	3	0.25
Small Arms Bullet	YES	10	YES	3 .30 cal cartridges, 2 steel and 1 brass, target has been charac		0.3		0	N_012_01200	4	0.2
Frag (heavy)	NO	10	YES	possible 75mm frag		Other		0	N_010_00957	1	1
Can	NO	10	YES	tin can		tin can		0	N_010_00957	0	0.05
Other	NO	10	YES	ammo clip		clip		0	N_008_00798	0	0.5
Can pull tab	NO	10	YES	3 of 3 pull tabs		1 inch		0	N_007_00675	2	0.005
Other	NO	10	YES	fish stringer		fish stringer		0	N_007_00675	6	0.5
Other	NO	10	YES	florence lights		light		0	N_007_00587	0	30
Other	NO	10	YES	possible giswhompus		1 inch		0	N_007_00644	2	0.005
Other	NO	10	YES	3 like objects		springs		0	N_007_00650	1	0.005
Wire	NO	10	YES	coil of wire		3inch		0	N_008_00775	0	0.005
Frag (light)	NO	10	YES			1x3		0	N_020_02882	3	0.1
Wire	NO	10	YES	left in place		fence		0	N_017_02391	0	2
Other	YES	10	YES					0	N_012_01260	1	0.03
Other	YES	10	YES	2 M1 clips				0	N_012_01297	0	0.05
Cans	YES	10	YES	point characterized as 3 like items, frag				0	N_012_01274	0	2
Small Arms Bullet	NO	4	YES	brass from 12 ga shot gun shell		brass		0	N_014_01637	3	0.1
Small Arms Bullet	NO	4	YES	1 .50 cal round, continued trend of anomaly to north of flag		.50 cal		0	N_015_01951	6	0.25
Other	NO	4	YES	banding strap		banding strap		0	N_019_02673	0	1
Nails	NO	6	YES	10 nails		10 nails		0	N_013_01344	13	0.2
Nails	NO	6	YES	3 2d nails found dig stopped...no other anomalies found with r		4 inch		0	N_011_01191	3	0.005
Nail	NO	6	YES	1 2d nail found		4 inch		0	N_012_01292	2	0.005
Frag (light)	NO	6	YES			Unknown		0	N_013_01349	0	0.2
Nails	YES	6	YES	3 2d nails total at veries depths 2,4,5 inch down. total 3 items t		3inch		0	N_008_00782	2	0.005
other	NO	6	YES	can lid unknown type of can		4 inch		0	N_007_00674	12	0.005
Frag (heavy)	NO	6	YES	possible 37mm frag		other		0	N_008_00714	0	0.05
Frag (heavy)	NO	6	YES					0	N_016_02161	1	1
Frag (heavy)	NO	6	YES					0	N_016_02049	2	1
.22 cal cartridge	NO	6	YES	1 .22 cal cartridge	no	.5 inch long		0	N_005_00278	2	0.005
barbed wire	NO	6	YES	6 inches barbed wire	no	6 inches		0	N_00A_06005	1	0.005
banding	NO	6	YES	2 inch long piece of banding	no	2 inch long		0	N_00A_05952	6	0.005
clip	NO	6	YES	m1 clip ....no other anomalies found that equal 103	no	3inch		0	N_00A_05952	12	0.005
spray paint can	NO	6	YES	flattened spray paint can	no	6 inches		0	N_00A_05992	5	0.005
spring	NO	6	YES	s shaped spring	no	2 inch long		0	N_00A_06035	4	0.005
wire	NO	6	YES	plain piece of wire	no	3inch		0	N_00A_06011	1	0.005
30 06 cartridges	NO	6	YES	30 06 cartridge no projectile....no other anomalies found	no	2.5		0	N_00A_05954	7	0.005
nails	NO	6	YES	3 2d nails	no	2.5		0	N_008_00730	3	0.005
small arms	NO	6	YES	30 06 blank	no	2.5		0	N_008_00730	6	0.005
bolt	NO	6	YES	8 inch bolt	n0	8 inches		0	N_008_00730	12	0.005
other	NO	6	YES	bottom piece of ammo clip 30 06		2 inch long		0	N_0A1_06083	2	0.005
Small Arms Bullet	YES	6	YES	30 06 cartridge no bullet		.30 cal		0	N_008_00745	4	0.005
Frag (medium)	NO	6	YES					0	N_017_02368	3	1
Can	NO	6	YES	beer can		5 inch long		0	N_011_01117	0	0.005
Nail	NO	6	YES	2d nail		4 inch long		0	N_00A_06028	7	0.005

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	YES	6	YES			.30 cal		0	N_016_01983	6	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02001	1	1
Frag (heavy)	NO	8	YES	10x2 inch piece of metal frag possible 75mm frag		Unknown		0	N_0A3_06107	4	1
Frag (medium)	NO	8	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_033_04364	1	0.1
Cans	NO	8	YES	1 items dig complete				0	N_026_03500	1	1
Frag (heavy)	NO	8	YES	several pieces of frag 1 6x2inches, 1 3x.5 inch , 2x2 inch possib		Unknown		0	N_035_04627	4	1
unknown	NO	8	YES	unknown piece of metal		3x1.5		0	N_036_04979	0	1
Frag (heavy)	NO	8	YES	4x1 inch piece of metal frag unknown		Unknown		0	N_036_04908	6	0.005
Small Arms Bullet	NO	8	YES	anomaly was underground 1 inch but was 36 inches under the		7.62		0	N_037_05021	0.1	0.005
Frag (heavy)	NO	8	YES	possible 75mm frag		Unknown		0	N_037_05010	4	0.05
Frag (light)	NO	8	YES	small piece of aluminum frag unknown		Unknown		0	N_038_05062	4	0.005
Frag (heavy)	NO	8	YES	heavy piece of metal frag		Unknown		0	N_041_05128	4	0.5
Frag (medium)	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		Unknown		0	N_034_04488	2	0.3
Frag (medium)	NO	8	YES	1 items dig complete				0	N_029_03836	1	0
Small Arms Bullet	NO	8	YES	metal jacket of a 7.62 bullet		other		0	N_036_04969	1	0.005
Small Arms Bullet	NO	8	YES	7.62 bullet		other		0	N_036_04969	1	0.005
Fuze/Fuze Components	NO	8	YES	37mm aluminum nose cone		2 inch long		0	N_035_04674	0	0.25
Frag (light)	NO	8	YES			1x3		0	N_0A3_06128	1	0.1
Frag (light)	NO	8	YES	1 items dig complete				0	N_031_04156	1	1
Small Arms Bullet	NO	LOT 1	YES					0	N_030_03981	10	1
Frag (heavy)	NO	LOT 1	YES	37mm nose piece		other		0	N_048_05230	2	1
	YES	LOT 1	YES	3 like items dig complete				0	N_032_04230	1	1
Vehicle parts	YES	LOT 1	YES	3 like items dig complete				0	N_030_04019	2	1
other	NO	LOT 2	YES	rifle grenade tail boom		5 inch		0	N_006_00446	0	1 lb
other	NO	LOT 2	YES	a very cool electric motor, with a collet on the end		8 inches		0	N_004_00185	4	> 1 lb
	YES	LOT 1	YES	1 items dig complete				0	N_030_03973	1	2
other	YES	LOT 2	YES	7 battery hold down bolts 8 inches long, 1 battery hold down 7		8 inches long		0	N_007_00666	18	3
Cans	YES	LOT 2	YES	big to small 1 8x4 inch can, 1 3x2.5 inch can, 1 2x2 inch , and pi		8 inches		0	N_005_00326	12	3
other	YES	LOT 2	YES	co2 cartridge.....magnetic signature remaining because of hot		3 inches long		0	N_006_00478	0	2
Nails	YES	LOT 2	YES	14 nails of various sizes ...seems to be a nail pitt		other		0	N_004_00223	3	1
Frag (heavy)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_009_00851	4	1
Frag (medium)	YES	12	YES	possible band		Unknown		0	S_029_10647	0	1
Frag (heavy)	YES	12	YES	magnetic signature still remaining because of hot rocks found		Unknown		0	S_029_10636	1	3
Frag (light)	YES	12	YES	possible mortar frag		Unknown		0	S_028_10457	2	4
Frag (medium)	NO	12	YES			pusher plate		0	S_025_09241	2	6
Frag (heavy)	NO	12	YES			6x6		0	S_025_09240	1	1 lb
Frag (heavy)	YES	3	YES	37mm piece of frag .....magnetic signature still remaining beca		other		0	S_020_07378	0	1 lb
Small Arms Bullet	YES	3	YES	3 7.62 bullets...magnetic signature still remaining because of h		other		0	S_020_07391	2	3
37mm	YES	3	YES	1 items dig complete				0	S_022_08176	3	6
Small Arms Bullet	NO	3	YES	1 like items dcomplete ig				0	S_022_08154	3	1
	YES	3	YES	3 like items dig complete				0	S_022_08149	2	4
Small Arms Bullet	YES	5	YES	1 7.62 bullet .....magnetic signature still remaining because of		other		0	S_047_11889	2	2
Can	YES	5	YES	1 orange soda can.......magnetic signature still remaining becau		5 inch		0	S_043_11717	12	6
Frag (heavy)	YES	12	YES	1 unknown piece of metal frag ....magnetic signature still rema		Unknown		0	S_027_10109	0	1
Frag (heavy)	YES	12	YES	37mm frag ......magnetic signature still remaining because of h		other		0	S_028_10417	3	6
other	NO	13	YES	3x1 bolt ....with hot rocks still remaining		3 inch long		0	S_RoadD_14475	4	1 lb
Wire	NO	13	YES	1 24 inches long piece of metal wire , and 1 3x.5 inch co2 cartri		24 inches		0	S_018_06921	3	< 1
Frag (heavy)	YES	12	YES	3x1 piece of metal frag unknown ....magnetic signature still re		Unknown		0	S_093_13368	4	6
Frag (light)	NO	12	YES			2 pieces of frag		0	S_026_09712	2	< 1
Frag (medium)	NO	12	YES			1x7 inch frag		0	S_100_13304	0	2
Frag (heavy)	YES	LOT 3	YES	4x1 piece of metal frag unknown .....hot rocks found with scho		Unknown		0	S_004_01720	6	5
	NO	LOT 3	YES	3 like items dig complete				0	N_007_00617	6	3
Small Arms Bullet	YES	LOT 3	YES	1 20 ga. shotgun shell and 1 .30 cal bullet ....hot rocks found w		other		0	S_012_04454	4	2
Wire	NO	LOT 3	YES	5 like items dig complete				0	N_025_03384	6	1
Cans	YES	LOT 3	YES	trash pit....what looks like rusted oil can......a bunch of rusted		5 inch		0	N_065_05578	4	3
Small Arms Bullet	YES	5	YES	3 .50 cal bullets, and 1 7.62 bullet ....magnetic signature still re		.50 cal		0	S_049_11991	3	6
Frag (heavy)	YES	5	YES	37mm tracer element....magnetic signature still remaining bec		other		0	S_047_11899	1	1
Small Arms Bullet	YES	5	YES	1 .50 cal bullet , and 1 .50 cal jacket .....magnetic signature still		.50 cal		0	S_045_11792	1	4
	NO	LOT 4	YES	1 very large nut.		1.5 inch long		0	S_010_03651	4	1 lb
Fuze/Fuze Components	NO	LOT 4	YES	1 items dig complete				0	S_017_06131	4	1
Wire	NO	LOT 4	YES	1 6 inch long metal wire and 1 1 inch long spring ....hot rocks s		6 inch long		0	S_014_04901	0	4
Small Arms Bullet	NO	LOT 4	YES	5 7.62 bullets all around the flag.....hot rocks still remaining		other		0	S_014_04905	0	3
Small Arms Bullet	NO	LOT 4	YES	1 .50 cal bullet an 2 7.62 bullets ...hot rocks still remaining		.50 cal		0	S_014_04906	SPOILS	6
Frag (heavy)	NO	LOT 4	YES	2 1x1 inch pieces of 37mm frag ....hot rocks still remaining		other		0	S_014_04907	2	1 lb
Frag (light) and bullet s	NO	LOT 4	YES	1 frag 5 bullet s				0	S_020_07350	4	4
Frag (light)	NO	LOT 4	YES	6 like items dig complete item				0	S_020_07353	3	4
Frag (light) and bullets	NO	LOT 4	YES	2 bullet 1vfrag				0	S_019_06990	4	4
metal fitting	NO	13	YES					0	S_019_07269	2	4
Small Arms Bullet	YES	13	YES			.30 cal		0	S_RoadD_14480	3	1
other	YES	13	YES	what we have here is an automatic inflater......hot rocks still r		4.5 inch long		0	S_RoadD_14467	5	> 1 lb
Frag (heavy)	YES	13	YES	hot rocks still remaining				0	S_018_06913	0	2
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.50 cal		0	S_018_06914	5	3
Wire	YES	1	YES	round metal wire. remaining magnetic signature still remaining		11 wire loop		0	S_019_07148	4	< 1
Frag (heavy)	YES	1	YES	3 piece of metal frag 1 4x1, 2 3x1, 3 2x1.....magnetic signature		other		0	S_024_09034	3	2
frag	YES	1	YES	2x6 inch piece of metal frag aluminum possibly 3.5 inch rocket		2x4 metal		0	S_020_07580	4	< 1
Small Arms Bullet	YES	2	YES	7 like items dig complete				0	S_008_03162	3	2
Frag (light)	YES	2	YES	also 3 piece of small frag from 1 inch to 2 inch long		Unknown		0	S_004_01675	0	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	YES	9	YES	2 .50 cal bullet....magnetic signature because of hot rocks four		.50 cal		0	N_074_05739	1	1
Frag (heavy)	YES	9	YES	.5x.5 square piece of metal frag ....magnetic signature still rem		Unknown		0	N_074_05748	SPOILS	< 1
Small Arms Bullet	YES	9	YES	1 7.62 bullet....magnetic signature still remaining because of h		other		0	N_074_05748	1	< 1
Frag (heavy)	YES	9	YES	3 piece of metal frag 1x.5 inch down to .5x.5......magnetic sign		Unknown		0	N_074_05724	2	< 1
Small Arms Bullet	YES	9	YES	1 .50 cal bullet ....magnetic signature still remaining because o		.50 cal		0	N_074_05724	1	1
Frag (heavy)	YES	9	YES	3 and done ....3 piece of metal frag 3x1 inch down to .5x.5......		Unknown		0	N_074_05720	1	< 1
Frag (light)	YES	9	YES	3xfrag 1.5x.5 to size of pinkie nail magnetic signature remaini				0	N_074_05768	1	< 1
Small Arms Bullet	NO	9	YES			50 cal		0	N_073_05711	1	1
Small Arms Bullet	YES	7	YES	2 .50 cal bullets.....magnetic signature still remaining because		.50 cal		0	S_018_06940	2	1
Tail Fins	YES	7	YES	1 236 fin.....magnetic signature still remaining because of hot		2.36 inch Rocket		0	S_018_06938	1	< 1
other	YES	7	YES	who would have thought in a cultural resource area that we w		other		0	S_017_06492	3	2
other	YES	7	YES	again in a cultural resource area a 4 inch towlet bowl flang....m		4 inch		0	S_017_06491	0	> 1 lb
Frag (light)	YES	9	YES	1 items dig complete				0	N_078_05863	2	2
Casing	NO	17	YES			Small Arms		0	N_006_00507	1	< 1
Wire	NO	17	YES			4 in		0	N_004_00220	1	< 1
Casing	NO	17	YES			Small Arms		0	N_004_00220	3	1
Frag (heavy)	NO	10	YES	big piece of frag		big piece of frag		0	N_015_01824	5	2
Other	NO	10	YES	door hinge		door hinge		0	N_010_01014	4	0.5
wire	NO	6	YES	plain piece of wire	no	3inch piece		0	N_00A_06011	1	0.005
other	NO	8	YES	deflector plate from a left handed smoke shifter		7 inches		0	N_038_05049	0	1
Wire	NO	LOT 2	YES	found a roll of barbed wire		barbed wire		0	N_014_01519	5	2
Wire	NO	LOT 2	YES	found a roll of barbed wire		barbed wire		0	N_014_01519	2	5
Frag (light)	NO	12	YES	found 1 piece of frag		small piece of frag		0	S_025_09213	4	< 1
Frag (light)	NO	12	YES	found 1 piece of frag and 2-762 bullets		small piece of frag		0	S_025_09207	3	1
Frag (medium)	NO	3	YES	hot rocks also		Unknown		0	S_015_05307	1	< 1
Small Arms Bullet	NO	12	YES			.50 cal		0	S_029_10592	0	< 1
Frag (medium)	NO	3	YES			37mm		0		0	< 1
Small Arms Bullet	NO	9	YES	found 1-.30 cal jacket and 1-762 bullet		.30 cal		0	N_079_05880	3	< 1
Frag (medium)	NO	10	YES			75mm		0	N_00C_06231	8	1
frag	NO	6	YES			1x1		0	N_014_01624	0	0.1
Frag (light)	NO	8	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_00A_05986	1	0.2
Frag (light)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_011_01062	0	1
Frag (medium)	NO	3	YES	also hot rocks		37mm		0	S_013_04649	1	< 1
Small Arms Bullet	NO	3	YES	223 bullets		223 bullets		0		8	3
Frag (light)	NO	LOT 4	YES			Unknown		0	S_043_11713	3	< 1
Frag (heavy)	YES	9	YES	3xfrag 2.25x.5 to .5x.5 inch magnetic signature remaining beca				0	N_074_05722	2	< 1
Frag (medium)	YES	9	YES	3xfrag 2.5x1 to 1x.25 inch magnetic signature remaining becau				0	N_074_05761	0	< 1
Frag (medium)	NO	10	YES	big piece of frag		big piece of frag		0	N_013_01348	4	2
Small Arms Bullet	YES	6	YES	found 1- 50 cal bullet		50 cal		0	N_015_01756	6	0.1
Fuze/Fuze Components	NO	6	YES	found a part of a fuze component that met the mv reading of 4		part of a fuze		0	N_015_01946	3	0.2
Frag (light)	NO	6	YES	found a small piece of frag		small piece of frag		0	N_015_01869	3	0.1
Frag (light)	NO	LOT 2	YES	found a 2x1 piece of frag		piece of frag		0	N_009_00893	3	3
Nails	NO	LOT 2	YES	found 1 nail and rest of meter clear		1 nail		0	N_006_00517	3	1
Frag (medium)	NO	3	YES	2 37mm frag of simular size in same location		37mm		0		1	< 1
Small Arms Bullet	NO	3	YES	3+bullets		762		0		SPOILS	< 1
horseshoe	YES	LOT 4	YES	1 items dig complete				0	S_019_06969	3	6
Small Arms Bullet	NO	9	YES	found like items dig complete		.50 cal		0	N_079_05870	2	< 1
	NO	4	YES					0	N_025_03421	0	1
scrap metal	NO	4	YES					0	N_021_03070	4	1
Frag (light)	NO	10	YES			Unknown		0	N_013_01336	4	0.005
m1 clip	YES	10	YES					0	N_009_00923	6	0
Frag (heavy)	YES	10	YES					0	N_015_01818	3	0.4
Nails	NO	4	YES	3 horse shoe nails		2 inches		0	N_0C2_06349	4	0.05
Other	NO	4	YES			banding		0	N_0C2_06368	6	0.1
Frag (medium)	NO	4	YES			37 frag		0	N_035_04677	3	0.25
Wire	NO	4	YES			barbed		0	N_035_04624	3	0.25
Frag (light)	NO	10	YES	piece of frag		frag		0	N_013_01395	4	1
Other	NO	10	YES	1 square washer		washer		0	N_008_00748	3	0.05
Small Arms Bullet	YES	10	YES					0	N_00C_06182	4	0.01
Casing	NO	10	YES			Small Arms		0	N_00C_06214	1	0.05
Frag (medium)	NO	10	YES					0	N_012_01300	2	0.4
Small Arms Bullet	NO	4	YES	.50 cal jacket. note: on page 3 a value of 2 lbs was entered in a		.50 cal		0	N_020_02872	0	0.25
Frag (medium)	NO	6	YES			Unknown		0	N_013_01349	3	0.5
Frag (heavy)	NO	6	YES	meets MV requirement, no mangnetic signitre signature rema		Unknown		0	N_014_01543	1	1
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_015_01767	1	0.3
Small Arms Bullet	YES	6	YES	4 .45 cal bullets over 3 anomalies found dig stopped		45 cal bullet		0	N_010_00993	2	0.005
frag medium	YES	6	YES					0	N_016_01988	9	1
Frag (light)	NO	6	YES					0	N_0A1_06063	4	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_01988	4	1
base of cartridge	NO	8	YES			2x5		0	N_032_04307	2	0.2
Small Arms Bullet	NO	LOT 1	YES			.30 cal		0	N_00C_06223	4	1
Wire	YES	LOT 1	YES					0	N_033_04331	1	1
Fuze/Fuze Components	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		base portion of a fuze		0	N_016_02066	0	< 1
Vehicle parts	NO	LOT 2	YES					0	N_006_00461	0	6
Small Arms Bullet	NO	12	YES			.30 cal		0	S_025_09232	2	< 1
Frag (heavy)	NO	LOT 1	YES	meets the mv requirement, no mangnetic signature remains				0	N_022_03113	0.5	0
Small Arms Bullet	NO	12	YES			.50 cal		0	S_090_13407	1	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (medium)	NO	12	YES			Unknown		0	S_029_10591	0	< 1
Frag (medium)	YES	12	YES	3 like items dig complete				0	S_028_10279	2	3
Frag (light)	NO	12	YES	50 cal bullet also found		37mm		0	S_100_13309	1	< 1
Wire	NO	LOT 3	YES	wire runs east to west				0	S_008_03279	0	1
Small Arms Bullet	NO	LOT 4	YES			.30 cal		0	S_019_06975	2	1
Frag (medium)	NO	LOT 4	YES					0	S_022_08110	5	5
Cans	NO	LOT 4	YES			soda		0	S_041_11672	0	< 1
Small Arms Bullet	NO	LOT 4	YES			.50 cal jacket		0	S_Cross1_13441	SPOILS	< 1
Frag (light)	NO	LOT 4	YES			Unknown		0	N_080_05888	2	< 1
Nails	NO	13	YES			4 inch		0	S_019_07268	3	< 1
can lid	NO	13	YES			4binch diameter		0	S_019_07263	3	< 1
Cans	YES	13	YES	3 like items dig complete				0	S_RoadD_14482	1	1
Wire	YES	13	YES	3 like items dig complete				0	S_019_07255	SPOILS	1
Ammo Can	YES	13	YES	hot rocks still remaining				0	S_RoadD_14463	4	< 1
Frag (medium)	YES	1	YES	3 like items dig complete				0	S_015_05484	3	3
Frag (light)	NO	1	YES			Unknown		0	S_021_07829	3	< 1
Frag (light)	YES	2	YES	1 items dig complete				0	S_010_03684	0	1
Frag (light)	YES	2	YES	3 like items dig complete				0	S_008_03162	4	3
Frag (light)	NO	9	YES	2 pieces of frag of simular size		Unknown		0	N_075_05793	SPOILS	< 1
Frag (heavy)	NO	10	YES	big piece of frag		big piece of frag		0	N_016_02020	1	2
other	YES	6	YES	3 ammo links .30 cal dig stopped trash pit		1 inch		0	N_008_00735	4	0.005
Vehicle parts	YES	6	YES	big square jeep seat that meets the mv reading		square seat		0	N_015_01698	0	3
Frag (medium)	YES	6	YES	found big piece of frag along with miltiple small pieces of frag		piece of frag		0	N_015_01862	5	0.25
Frag (heavy)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_012_01304	0	0.4
Frag (light)	NO	8	YES	found 1- 3x1 piece of frag		piece of frag		0	N_035_04645	5	0.25
Frag (medium)	NO	3	YES			Unknown		0		1	< 1
Small Arms Bullet	NO	3	YES	found 4- 223 bullets		223 bullets		0		7	2
Frag (light)	YES	9	YES			Unknown		0	N_074_05743	0	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05816	SPOILS	< 1
Frag (light)	NO	9	YES	found a piece of frag and a 50 cal casing		3x1		0	N_079_05879	4	1
Cans	NO	7	YES	found 1-alluminum can		alluminum can		0	S_015_05574	3	< 1
Small Arms Bullet	NO	4	YES			.50 cal		0.099999	N_063_05416	0.1	0.1
Other	NO	4	YES			al scrap		0	N_026_03490	2	0.1
Small Arms Bullet	NO	4	YES	3of3 50 cal		.50 cal		0	N_036_04959	0.5	0.5
Tail Fins	NO	4	YES			60mm Mortar		0	N_033_04434	0	1
Frag (heavy)	NO	10	YES	noise cap		Unknown		0	N_014_01515	2	0.5
Can	NO	10	YES			can		0	N_014_01525	0	0.05
Small Arms Bullet	NO	10	YES			.30 cal		0	N_014_01687	4	0.005
Can	NO	10	YES			6 inches		0	N_014_01590	6	1
Can	NO	10	YES			4 inch long		0	N_014_01542	6	0.005
Small Arms Bullet	NO	4	YES			.50 cal		0	N_032_04222	6	0.2
Small Arms Bullet	NO	4	YES	7.62		Other		0	N_033_04348	4	0.001
Small Arms Bullet	NO	4	YES			Other		0	N_033_04348	2	0.01
Small Arms Bullet	NO	4	YES			.50 cal		0	N_034_04603	2	0.01
Other	NO	4	YES	bucket handle		10 inches		0	N_063_05385	6	0.5
Cans	NO	4	YES			1		0	N_020_02973	0	0
Cans	NO	4	YES	tin can top		tin top		0	N_023_03249	0	0
hinge	NO	4	YES			3x5		0	N_028_03807	4	0.25
pull tab	NO	4	YES					0	N_033_04368	1	0.01
Small Arms Bullet	NO	10	YES	30-06 empty cartridge		.30 cal		0	N_014_01663	4	0.1
Cans	NO	10	YES	12" round gas can lid, rusty but intact.		12" round		0	N_012_01200	0	1.5
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_018_02553	3	0.5
Small Arms Bullet	NO	10	YES	.30 cal carbine 2 shells		.30 cal		0	N_007_00616	5	0.005
Other	NO	10	YES	sheet metal		sheet metal		0	N_007_00587	0	1
Frag (light)	NO	10	YES			1x2		0	N_019_02846	2	0.1
Frag (light)	NO	4	YES	piece of hand grenade fuze				0	N_015_01925	2	0.1
other	YES	6	YES	9 inch metal rod poss. handle		9 inches		0	N_008_00735	2	0.005
other	YES	6	YES	2 bottle caps		1 inch		0	N_010_00993	0	0.005
Frag (medium)	NO	6	YES					0	N_016_02146	2	1
staple	NO	6	YES	2 inch long staple	no	2 inch long		0	N_00A_06035	2	0.005
frag	NO	6	YES			2x.5		0	N_013_01397	0	0.2
frag	NO	6	YES			5x1		0	N_014_01548	3	1
igniter	YES	6	YES					0	N_016_01988	7	1
Small Arms Bullet	NO	6	YES	part of a .50 cal cartridge		.50 cal		0	N_008_00788	4	0.005
Frag (medium)	NO	6	YES					0	N_020_02934	6	1
Frag (medium)	NO	6	YES					0	N_017_02383	4	1
Frag (medium)	NO	6	YES					0	N_017_02462	2	1
Casing	YES	6	YES	3 like items dig complete		Small Arms		0	N_017_02474	1	1
other	NO	6	YES	.5x.5 inch piece of metal ...doesn't meet 10.6 but flag is in was		.5x.5 inch		0	N_007_00638	4	0.005
	NO	6	YES	a steel thingamabob (metric) with slag		2.75 inch		0	N_00A_05992	18	0.005
Frag (heavy)	NO	8	YES	20mm frag		other		0	N_036_04985	4	1
Frag (heavy)	NO	8	YES	unknown piece of frag		Unknown		0	N_036_04958	3	1
Cans	NO	8	YES	1 items dig complete				0	N_025_03437	1	0
Frag (light)	NO	8	YES					0	N_027_03657	3	1
Frag (light)	YES	8	YES					0	N_028_03758	2	1
Vehicle parts	YES	8	YES	3 like items dig complete				0	N_028_03758	6	1
Frag (heavy)	NO	8	YES	unknown piece of frag 2x1 inch		Unknown		0	N_036_04967	2	0.005

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	NO	8	YES	2 pieces of small arms 1 20 ga. and 1 30 06 cartridge cases		20 ga. & 30 06 cartridges cases		0	N_036_04990	6	0.005
Frag (heavy)	NO	8	YES	possible 20mm frag		Unknown		0	N_037_05010	4	0.05
Frag (medium)	NO	8	YES			.5x2		0	N_033_04417	1	0.2
Target/Target Debris	NO	8	YES	meets the mv requirement, no mangnetic signature remains w				0	N_034_04475	0	0.02
Frag (light)	NO	8	YES	1 items dig complete				0	N_029_03860	2	1
Frag (medium)	NO	8	YES					0	N_032_04180	2	1
Frag (light)	NO	8	YES	1 items dig complete				0	N_032_04291	2	1
Frag (light)	NO	LOT 1	YES			1x4		0	N_043_05172	1	0
Nails	YES	LOT 2	YES	12 2d nails found		4 inch		0	N_007_00603	1	3
Nails	YES	LOT 2	YES	12 2d nails found		4 inch		0	N_007_00603	3	1
Can	NO	LOT 2	YES	flatten tin can		4 inch		0	N_006_00446	3	1
other	NO	LOT 2	YES	6 ammunition links		1 inch		0	N_006_00446	3	< 1
Nails	NO	LOT 1	YES	1 items dig complete				0	N_031_04160	1	5
Nails	YES	LOT 1	YES					0	N_00B_06148	1	1
other	YES	LOT 2	YES	ok we have some brick ties and metal banding ....so I was wro		6 inch		0	N_004_00223	4	2
Frag (medium)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_016_02153	0	< 1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_006_00466	2	1
Nails	YES	LOT 2	YES					0	N_006_00453	SPOILS	< 1
Frag (heavy)	YES	LOT 2	YES					0	N_007_00610	0	1 lb
Frag (heavy)	YES	12	YES	1 heavy piece of metal frag unknown .....also hot rocks found v		Unknown		0	S_087_13432	3	5
Frag (medium)	NO	12	YES					0	S_025_09165	2	1
staples	NO	LOT 1	YES			2 in.		0	N_029_03917	0.1	3
Cans	NO	LOT 1	YES					0	N_029_03921	1	2
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_021_07785	3	1
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_013_04688	2	3
Projectile AP	YES	5	YES	1 37mm apct........magnetic signature still remaining because c		37mm		0	S_046_11837	0	0
Small Arms Bullet	YES	12	YES	2 7.62 bullets.....magnetic signature still remaining because of		other		0	S_028_10421	3	1
Wire	NO	13	YES	coiled heavy wire , also and condencer from a set of points....h		36 inches long		0	S_019_07251	0	5
Frag (medium)	NO	12	YES	no mangnetic signature remains		Unknown		0	S_029_10582	SPOILS	< 1
Frag (heavy)	YES	12	YES	37mm piece of frag......magnetic signature still remaining beca		other		0	S_092_13377	3	7
Small Arms Bullet	YES	LOT 3	YES	3 45 cal bullets.....hot rocks		other		0	S_005_02210	3	4
Small Arms Bullet	YES	LOT 3	YES	1 .50 cal bullet ....hot rocks found with schonstedt		.50 cal		0	S_003_01409	0	5
Frag (light)	NO	LOT 3	YES	5 like items dig complete				0	N_014_01595	5	3
Small Arms Bullet	YES	5	YES	1 .50 cal bullet .....magnetic signature still remaining because c		.50 cal		0	S_082_13149	2	5
other	YES	LOT 4	YES	27x6 inches long metal plate.....magnetic signature still remair		27 inch long		0	S_RoadE_13925	1	> 1 lb
other	NO	LOT 4	YES	1 AA battery ....hot rocks still remaining		2 inches long		0	S_RoadE_13943	2	5
Frag (medium)	NO	LOT 4	YES			Unknown		0	S_036_11361	1	< 1
Nails	YES	LOT 4	YES	3 like items dig complete				0	S_019_06969	3	1
scrap	YES	LOT 4	YES	1 items dig complete				0	S_018_06543	0	2
Projectile TP	NO	LOT 4	YES	1 items dig complete		37mm		0	S_015_05239	4	4
Barbed Wire	NO	LOT 4	YES	1 items dig complete				0	S_022_08100	3	> 1 lb
Small Arms Bullet	NO	LOT 4	YES	5 7.62 bullets .....hot rocks still remaining		other		0	S_014_04907	2	3
Frag (light)	NO	LOT 4	YES			Unknown		0	S_043_11713	2	< 1
Frag (medium)	NO	LOT 4	YES			Unknown		0	N_080_05888	0	< 1
Small Arms Bullet	NO	13	YES	5 7.62 bullets ....hot rocks still remaining		other		0	S_018_06925	4	1
other	NO	13	YES	a bottle cap.....hot rocks still remaining		.5 inch		0	S_018_06925	4	< 1
other	NO	13	YES	some type of clamping bolt, banding, bottle cap, pieces of a ca		1 inch		0	S_RoadD_14484	4	10
Projectile AP	YES	13	YES	same anomaly for point s_019_07248 and s_road_d14466. ho		37mm		0	S_RoadD_14466	7	> 1 lb
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.50 cal		0	S_018_06911	1	1
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.50 cal		0	S_018_06912	3	1
conduit cap	YES	1	YES	metal cover 4 inch x 2 inch possibly electrical .... remaining m		4 inch metal cap		0	S_018_06798	5	> 1 lb
Small Arms Bullet	YES	1	YES	3 like items dig complete		.50 cal		0	S_017_06390	2	7
Small Arms Bullet	YES	1	YES	3 like items dig complete		.50 cal		0	S_015_05475	5	7
Vehicle parts	YES	1	YES					0	S_010_03910	2	2
Frag (light)	YES	1	YES	3 like items dig complete				0	S_027_10203	4	3
Frag (heavy)	YES	2	YES	3 piece of metal frag all 2 inch long ....magnetic signature beca		Unknown		0	S_003_01161	2	1
Small Arms Bullet	YES	2	YES	3 like items dig complete				0	S_010_03684	3	1
Frag (heavy)	YES	9	YES	3 and done.....3 piece of metal frag about 1x.5 inch .....magnet		Unknown		0	N_074_05739	1	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05789	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05798	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05823	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05821	SPOILS	< 1
Frag (light)	NO	9	YES			1x.5		0	N_073_05711	2	2
Frag (light)	YES	9	YES	3 like items dig complete				0	N_076_05838	3	2 like items dig complete
Frag (light)	YES	9	YES	4 like items dig complete				0	N_076_05832	4	2
Small Arms Bullet	YES	9	YES	1 like items dig complete		.50 cal		0	N_077_05851	3	2
Small Arms Bullet	YES	7	YES	1 .50 cal bullet .....magnetic signature still remaining because c		.50 cal		0	S_018_06941	SPOILS	1
tin	NO	17	YES			3 inch dia		0	N_004_00220	3	< 1
Fuze/Fuze Components	NO	10	YES	t-bar inert fuze		t-bar inert fuze		0	N_013_01352	24	1
Other	YES	10	YES					0	N_017_02469	2	0.02
Cans	YES	6	YES	found 2 oil cans that met the mv reading		2 6inx4in oil cans		0	N_015_01830	8	1
Small Arms Bullet	NO	6	YES	found 1- 50 cal bullet and found enough to meet the mv readir		50 cal		0	N_015_01756	4	0.1
Frag (light)	YES	6	YES	found multiple small pieces of frag all around the point		small pieces of frag		0	N_015_01914	1	0.25
Frag (light)	NO	6	YES	found a small piece of 1x2in. frag		small pieces of frag		0	N_015_01869	4	0.2
frag light	YES	6	YES	dug beyond 3 like items due to high channel 2 reading				0	N_016_01955	4	1
bolt	NO	12	YES	found a rusty bolt and a piece of wire		rusted bolt		0	S_024_08837	4	4
Frag (medium)	NO	3	YES	found a big piece of a 37mm and multiple bullets		big piece of frag		0		6	6

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	YES	9	YES			Unknown		0	N_075_05806	0	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05830	SPOILS	< 1
Small Arms Bullet	NO	9	YES	found 1-.50 cal bullet		.50 cal		0	N_079_05877	3	< 1
Small Arms Bullet	NO	7	YES	found 2-45 slug bullets and 1-762 bullet but did not meet mv r		45 slug		0	S_015_05579	3	< 1
Wire	NO	10	YES			staple		0	N_013_01336	0	0.005
Nails	NO	10	YES	3+ nails				0	N_009_00877	8	0
Other	NO	10	YES	3 M1 clips		M1 clips		0	N_012_01219	5	1
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_019_02819	10	1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_0C2_06410	5	0.25
Frag (light)	YES	4	NO			37 frag		0	N_035_04702	8	0.5
Small Arms Bullet	NO	4	YES			.50 cal		0	N_035_04702	8	0.25
Wire	NO	4	YES			barbed		0	N_035_04624	3	0.2
Ammo Can	YES	4	YES			90 mm		0	N_034_04492	0	0.1
Frag (light)	NO	10	YES	One piece of brass frag w/no additional hits. Eight feet due ea		2x1		0	N_012_01311	3	0.25
Frag (light)	NO	10	YES	brass frag		1x1		0	N_011_01109	3	0.1
Frag (light)	NO	4	YES	steel frag				0	N_015_01925	2	0.1
bottle cap	NO	4	YES	clumps of barbed wire to W and NW, 2 to 3 meters away				0	N_020_02864	1	0.05
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02095	4	1
Frag (light)	NO	6	YES	3 like items dig complete				0	N_017_02365	1	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_017_02514	2	1
Frag (light)	NO	8	YES			1x2		0	N_030_04016	2	0.1
Casing	NO	LOT 1	YES			Small Arms		0	N_00C_06223	2	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_030_04025	1	1
Frag (light)	NO	LOT 2	YES					0	N_006_00486	5	1
Frag (medium)	NO	LOT 2	YES	2 pieces of frag, meets the mv requirement, no mangnetic sigr		Unknown		0	N_012_01324	1	< 1
Frag (medium)	YES	12	YES					0	S_025_09153	0	1
Small Arms Bullet	NO	LOT 4	YES			.50 cal		0	S_036_11381	1	< 1
Nails	YES	LOT 4	YES	4 like items dig complete				0	S_019_06969	4	4
Small Arms Bullet	NO	LOT 4	YES			.30 cal		0	S_020_07333	3	1
Frag (light)	NO	LOT 4	YES			Unknown		0	N_080_05885	0	< 1
Small Arms Bullet	YES	13	YES	3 like items dig complete		.30 cal		0	S_018_06918	3	1
Frag (medium)	YES	13	YES	hot rocks still remaining				0	S_019_07246	3	3
Frag (medium)	NO	13	YES			Unknown		0	S_020_07667	6	< 1
Frag (medium)	YES	1	YES	3 like items dig complete				0	S_013_04805	3	3
Frag (light)	YES	2	YES			Unknown		0	S_006_02503	SPOILS	< 1
Frag (medium)	YES	2	YES	3 like items dig complete				0	S_007_02876	0	4
Small Arms Bullet	YES	2	YES	14 like items dig complete				0	S_009_03409	3	3
Frag (light)	YES	2	YES	1 like items dig complete				0	S_008_03106	0	3
Frag (light)	NO	9	YES			Unknown		0	N_075_05815	3	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05814	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05814	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05799	5	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05823	3	< 1
Small Arms Bullet	NO	7	YES	found 1-.762 bullet		.762 bullet		0	S_015_05573	2	< 1
Frag (light)	YES	10	NO			Unknown		0	N_009_00864	0	1
Nails	NO	10	YES	3 rusty nails		rusty nails		0	N_012_01233	17	0.5
Vehicle parts	NO	10	YES	metal gas cap		metal gas cap		0	N_015_01753	0	1
Frag (heavy)	NO	10	YES	2 pieces of frag		2 pieces of frag		0	N_015_01720	1	7
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_016_02084	5	1
Cans	NO	4	YES			12 oz		0	N_028_03712	0	0.2
ammo clip	NO	4	YES			2x6		0	N_029_03883	6	0.25
Frag (light)	NO	4	YES					0	N_030_04033	1	0.5
Other	YES	4	NO			fence		0	N_022_03127	8	15
Wire	NO	10	YES	3 foot piece of wire		3 foot piece of wire		0	N_017_02348	0	0.3
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_017_02509	4	0.01
Frag (medium)	NO	10	YES	piece of frag		piece of frag		0	N_013_01365	7	1
Small Arms Bullet	NO	6	YES	does not meet the MV requirement, no mangnetic signature r		.50 cal		0	N_019_02723	0	0.2
Small Arms Bullet	NO	6	YES	30 06 blank fired		30 06		0	N_011_01156	6	0.005
Small Arms Bullet	YES	6	YES	case from a 50 cal bullet		50 cal		0	N_015_01756	5	0.1
nut	NO	6	YES	variety of sizes 1 nut 1 inch ,2 nut 1/2 inch ,3 nut 1/4 inch....3 r	no	variety		0	N_005_00278	6	0.005
bullet frag	NO	6	YES	multiple hot rocks	no	3 small pieces		0	N_015_01942	2	0
bullet	YES	6	YES	3 like items dig complete		50 cal		0	N_016_02028	12	1
Fuze/Fuze Components	NO	8	YES	meets the MV requirement , no mangnetic signature remains		base fuse " for something really big"		0	N_035_04758	12	1
Frag (light)	NO	8	YES			1x4		0	N_034_04530	2	0.1
	NO	LOT 1	YES	3 like items dig complete				0	N_034_04567	1	1
wrench	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		5/8 and 9/16 combination lug wrench		0	N_009_00842	1	1
Frag (heavy)	NO	12	YES	found 1 empty 75 mm projectile		75 mm		0	S_024_08856	18	> 1 lb
Small Arms Bullet	NO	12	YES	found 1-50 cal bullet		50 cal bullet		0	S_024_08849	7	1
Frag (medium)	NO	12	YES	found 2 pieces of frag		3x2		0	S_023_08438	1	5
Small Arms Bullet	YES	LOT 1	YES	.30 cal bullet found with minelab		.30 cal carbide		0	N_048_05248	0.005	6
Frag (medium)	NO	3	YES			37mm frag		0	S_012_04223	0	1
Frag (medium)	NO	3	YES			37mm frag		0	S_013_04589	2	2
Frag (medium)	NO	3	YES			Unknown		0	S_016_05815	0	1
Wire	NO	5	YES			30 inch		0	S_053_12123	2	2
Frag (medium)	NO	5	YES			3x5 frag		0	S_055_12174	2	8
Frag (heavy)	YES	12	YES	37mm frag ....magnetic signature still remaining because of ho		other		0	S_090_13418	2	1 lb
Frag (light)	YES	12	YES	possible rotating band from 37mm ....magnetic signature still r		other		0	S_090_13418	3	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Fuze/Fuze Components	YES	12	YES	37mm base fuse ....magnetic signature still remaining because		2 inch		0	S_090_13418	4	6
Frag (medium)	NO	12	YES	meets the mv requirement, no mangnetic signature remains		37 mm		0	S_028_10363	0	< 1
Small Arms Bullet	NO	12	YES			.50 cal		0	S_029_10602	1	< 1
Frag (heavy)	YES	12	YES	unknown piece of metal frag.....magnetic signature still remair		Unknown		0	S_092_13377	4	7
Frag (light)	NO	12	YES			3x.5 37 mm		0	S_027_10048	2	1
Frag (light)	NO	12	YES			.5x5 inch frag		0	S_029_10566	0	< 1
Frag (medium)	NO	3	YES			37mm frag		0		1	2
Frag (light)	NO	3	YES	also 2 small pieces of frag		Unknown		0		2	< 1
Small Arms Bullet	NO	LOT 3	YES			.50 cal		0	S_009_03600	3	< 1
Small Arms Bullet	NO	LOT 3	YES	also 2 762 bullets casings		.50 cal		0	S_004_01766	2	< 1
Frag (light)	NO	LOT 4	YES			Unknown		0	S_096_13341	2	< 1
Small Arms Bullet	NO	LOT 4	YES			.50 cal		0	S_036_11361	0	< 1
Frag (light)	NO	LOT 4	YES			Unknown		0	S_048_11972	1	< 1
Frag (light)	NO	LOT 4	YES			Unknown		0	N_080_05886	0	< 1
Frag (medium)	NO	LOT 4	YES			Unknown		0	N_080_05888	0	< 1
Wire	NO	13	YES			3 pieces		0	S_019_07264	1	< 1
Small Arms Bullet	NO	13	YES			762		0	S_020_07672	SPOILS	< 1
coat hangar	NO	13	YES					0	S_018_06917	0	< 1
bolt	NO	1	YES			3x1/2 inch		0	S_RoadD_14354	6	3
Frag (light)	YES	1	YES	4 like items dig complete				0	S_017_06419	3	4
Frag (light)	YES	1	YES	3 like items dig complete				0	S_028_10518	4	4
Frag (medium)	NO	1	YES	does not meet the mv requirement		Unknown		0	S_024_08947	0	< 1
Frag (light)	NO	1	YES			Unknown		0	S_RoadD1_14305	8	< 1
Frag (light)	NO	1	YES			75mm flash tube		0	S_032_10981	0	< 1
	YES	1	YES	7 like items dig complete				0	S_007_02985	2	3
Frag (light)	YES	2	YES			Unknown		0	S_006_02588	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02155	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02155	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02149	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02102	SPOILS	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02094	SPOILS	< 1
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02847	2	5
Frag (light)	YES	2	YES	3 piece of frag of similar size and also hot rocks still remaining		Unknown		0	S_003_01318	0	< 1
Frag (light)	NO	2	YES			Unknown		0	S_004_01712	0	< 1
Frag (medium)	YES	9	YES	4xfrag 1.5x.25 to slightly small than pinkie nail magnetic signat				0	N_074_05765	2	< 1
Small Arms Bullet	NO	9	YES			.50 cal		0	N_075_05829	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05791	4	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05786	SPOILS	< 1
pledge pin	YES	9	YES			boy scout		0	N_074_05719	0	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05777	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05792	SPOILS	< 1
Small Arms Bullet	NO	9	YES			.50 cal		0	N_075_05804	0	< 1
Vehicle parts	NO	7	YES	found 2 bolts but did not meet mv reading		2 bolts		0	S_015_05578	5	4
Small Arms Bullet	NO	16	YES			.50 cal		0		1	1
Can	NO	16	YES			3x4 squashed		0		0	< 1
car part	NO	17	YES			12x12 inch		0	N_004_00181	0	48
Cans and lids	NO	17	YES			12 oz		0	N_003_00137	12	2
Small Arms Bullet	NO	4	YES	50 cal bullet		50 cal		0	N_015_01951	11	0.5
Small Arms Bullet	YES	4	YES			.50 cal		0	N_0C2_06410	4	0.25
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_015_01935	2	0.4
gernade fuse	NO	6	YES	no mangnetic signature remains within 1 meter, gernade puse				0	N_019_02705	1	0.1
Nails	YES	6	YES	3 2d nails found dig stopped		4		0	N_010_00993	3	0.005
other	NO	6	YES	30 06 clip		3inch		0	N_011_01156	6	0.005
Frag (light)	NO	6	YES	found 3 like pieces of frag in the same dig that meet the mv re		small pieces of frag		0	N_014_01616	5	0.15
Frag (medium)	NO	6	YES					0	N_016_02095	1	1
handle	NO	6	YES	handle to some type of eating utensile	no	4 inch long		0	N_005_00278	3	0.005
Small Arms Bullet	NO	6	YES	.45 cal bullet....busy little target for a 4.3 hit		.45 cal bullet		0	N_009_00918	2	0.005
No further entries- mar	NO	8	YES	3 like items dig complete				0	N_030_03969	3	1
Nails	NO	LOT 1	YES	found 1 rusty 5 inch nail that meets the mv reading		5 inch nail		0	N_020_02974	7	0.1
Frag (medium)	NO	LOT 1	YES	found a big piece of frag 4in x 3in		3x4		0	N_035_04630	1	1
Nails	YES	LOT 1	YES	1 items dig complete				0	N_035_04674	1	6
grenade pins	NO	LOT 2	YES	found 2 grenade pins and multiple nails		pins		0	N_009_00913	4	1
Co2 cartridge	NO	LOT 2	YES	meets the mv requirement				0	N_004_00194	1	< 1
Cans	NO	LOT 1	YES	the banquet beer, meets the mv requirement , no mangnetic s		beer coors original		0	N_045_05193	0.002	2
Frag (medium)	NO	3	YES	found a rotating band		rotating bad		0		5	2
2.36 rocket fin	NO	LOT 3	YES	1 items dig complete				0	N_0C1_06257	3	1
	YES	LOT 3	YES	3 like items dig complete				0	S_028_10523	0	3
Small Arms Bullet	NO	LOT 4	YES			.50 cal		0	S_041_11665	0	< 1
pie tin	NO	LOT 4	YES					0	S_Cross5253S_13479	18	< 1
Small Arms Bullet	NO	LOT 4	YES	2 like items dig complete				0	S_019_06991	4	1
Cans	YES	13	YES	hot rocks still remaining				0	S_RoadD_14465	6	4
37mm frag		1	YES	6 x 37mm frag between 2and6 inches long and between 0.5 ar		6x37mm frag		0	S_023_08599	2	< 1
Projectile AP	YES	1	YES	1 items dig complete		37mm		0	S_028_10509	4	6
Small Arms Bullet	YES	1	YES	6x50cal bullet ..... remaining magnetic signature because of hc		.50 cal		0	S_023_08649	3	< 1
Frag (light)	NO	2	YES			37mm		0	S_005_01927	SPOILS	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02149	SPOILS	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02133	0	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	YES	2	YES			Unknown		0	S_006_02503	SPOILS	< 1
	YES	2	YES	3 like items dig complete				0	S_010_03684	4	5
Small Arms Bullet	YES	2	YES	12 like items dig complete				0	S_008_03158	5	4
Small Arms Bullet	YES	2	YES	4 like items dig complete				0	S_010_03743	2	2
Frag (light)	YES	2	YES	2 like items dig complete				0	S_010_03760	3	2
Small Arms Bullet	YES	2	YES	2 like items dig complete				0	S_010_03760	4	2
Frag (light)	YES	2	YES	2 like items dig complete				0	S_008_03179	4	2
Frag (heavy)	YES	9	YES	3xfrag 3x.5 to .5x.5 inch magnetic signature remaining becaus				0	N_074_05736	1	< 1
Frag (medium)	YES	9	YES	3xfrag 2x1 to 1x1 inch magnetic signature remaining because				0	N_074_05759	0	< 1
Frag (light)	YES	9	YES	3 pieces of frag of similar size		Unknown		0	N_074_05719	SPOILS	< 1
Frag (light)	YES	9	YES	3 like items dig				0	N_076_05835	2	1
Frag (light)	YES	9	YES	4 like items dig complete				0	N_077_05856	3	3
Frag (light)	YES	9	YES	1 like items dig complete				0	N_077_05857	2	1
Frag (light)	YES	9	YES	2 like items dig complete				0	N_078_05869	3	3
Frag (light)	YES	9	YES	3like items dig complete item				0	N_076_05846	2	2
bolt	NO	10	YES					0	N_023_03220	5	0
Frag (medium)	NO	10	YES			Unknown		0	N_019_02683	3	2
Frag (light)	NO	10	YES	2 pieces of frag		2 pieces of frag		0	N_010_01014	5	0.5
Frag (light)	NO	10	YES			piece of frag		0	N_013_01352	22	0.2
Frag (medium)	NO	6	YES	found part of the tail boom from a rifle grenade		rifle grenade frag		0	N_015_01738	5	0.2
Frag (light)	YES	6	YES	found several small pieces of frag all around the point		small pieces of frag		0	N_015_01828	3	0.2
Frag (light)	NO	8	YES	found a piece of a cartridge casing but does not meet the mv r		cart casing		0	N_035_04739	3	0.1
Wire	NO	LOT 2	YES	found 1 piece of wire		piece of wire		0	N_014_01583	2	7
Wire	NO	LOT 2	YES	found 1 piece of wire		piece of wire		0	N_014_01583	7	2
	YES	LOT 1	YES	1 items dig				0	N_035_04658	1	3
belt links	NO	LOT 2	YES	found several machine gun belt links		machine gun belt links		0	N_011_01193	4	6
rod	NO	LOT 2	YES	meets the mv requirement				0	N_004_00201	2	1
Small Arms Bullet	NO	12	YES	found 1 50 cal bullet and 2-223 bullets		50 cal		0	S_026_09728	4	1
Fuze/Fuze Components	NO	3	YES			t bar fuse		0		0	1
Small Arms Bullet	NO	3	YES	3 + 762 bullets pieces		.50 cal		0		0	< 1
Cans	NO	LOT 3	YES	2 like items dig complete				0	N_003_00165	4	4
Cans	NO	LOT 3	YES	1 items dig complete				0	N_015_01866	3	1
Frag (medium)	NO	LOT 3	YES			1 piece of frag		0	S_004_01771	0	2
Small Arms Bullet	NO	LOT 4	YES	3 7.62 bullets ....hot rocks still remaining		other		0	S_RoadE_13943	2	3
Frag (light)	YES	LOT 4	YES	3 like items dig complete				0	S_022_08123	4	2
Cans	NO	13	YES			soda		0	S_020_07666	3	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02094	1	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05815	2	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05799	2	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05778	SPOILS	< 1
Frag (light)	YES	9	YES	1 items dig complete				0	N_077_05851	2	2
Rocket Motor	NO	17	YES			M6 2.36 nossel and fins		0	N_011_01098	0	< 1
Cans	NO	4	YES	piece of can		3		0.108573	N_064_05489	2	1
Frag (light)	NO	4	YES			Unknown		0.125989	N_064_05489	3	0.1
Tail Fins	NO	4	YES			81mm Mortar		0.099999	N_064_05489	4	1
Barbed Wire		4	YES			12		0	N_017_02301	0	0
	NO	4	YES	found with minelab		al foill		0	N_023_03232	4	0.1
Nails	NO	4	YES					0	N_025_03421	4	0.1
Fuze/Fuze Components	NO	4	YES			grenade		0	N_026_03501	1	0.2
Frag (medium)	NO	4	YES					0	N_026_03490	4	0.1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_036_04943	1	0.5
Small Arms Bullet	YES	4	YES			.50 cal		0	N_034_04544	2	0.5
Wire	YES	4	YES			18 inch		0	N_032_04246	0	0.5
Frag (medium)	YES	4	YES			Unknown		0	N_032_04176	1	0.5
Other	NO	10	YES			rotating band		0	N_014_01601	3	0.005
Small Arms Bullet	NO	10	YES	30.06 case		Other		0	N_014_01601	2	0.005
Other	NO	10	YES			clip		0	N_014_01687	4	0.05
Frag (heavy)	NO	10	YES			Unknown		0	N_014_01590	3	1
Other	NO	10	YES			scrap		0	N_014_01590	7	0.005
Nails	NO	10	YES			3 nails		0	N_014_01542	6	0.005
Wire	YES	10	YES	com. wire 3 pieces		10 ft		0	N_013_01374	4	0.05
Other	NO	10	YES			sheet metal		0	N_013_01355	3	0.05
Wire	YES	10	NO					0	N_009_00877	4	0
Wire	NO	10	YES					0	N_011_01162	1	0
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_018_02616	5	1
Other	NO	10	YES					0	N_015_01836	4	0.1
Frag (medium)	NO	10	YES			rotating band		0	N_015_01759	1	0.1
Frag (heavy)	YES	10	YES					0	N_015_01838	0	2
Frag (heavy)	NO	10	YES					0	N_016_02003	1	4
Casing	YES	10	YES			Small Arms		0	N_015_01892	2	0.1
Other	NO	10	YES					0	N_015_01892	3	0.2
Small Arms Bullet	NO	4	YES			.50 cal		0	N_032_04259	12	0.2
Small Arms Bullet	NO	4	YES			.50 cal		0	N_034_04529	2	0.05
Buckets	NO	4	YES	2 bucket handles and pieces of bucket		10 inch		0	N_0C2_06283	4	0.05
Wire	NO	4	NO	barbed wire		6 inches		0	N_0C2_06367	2	0.05
Small Arms Bullet	NO	4	YES	2-.50 cal		.50 cal		0	N_0C2_06367	6	0.05
Other	NO	4	YES	can lid		3inch		0	N_063_05385	3	0.05

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Other	NO	4	YES	can pull tabs		1 inch		0	N_0C2_06294	0	0.005
Nail	NO	4	YES			2 inch		0	N_035_04733	2	0.005
hinge	NO	4	YES			2x3		0	N_028_03807	3	2
Small Arms Bullet	NO	4	YES			.50 cal		0	N_022_03127	3	0.5
Frag (light)	YES	4	YES					0	N_0C2_06434	6	0.2
Other	NO	4	YES					0	N_0C2_06423	8	0.1
Nails	NO	4	YES			and wire		0	N_026_03569	10	0.1
Frag (light)	NO	4	YES					0	N_026_03569	8	0.1
Nails	YES	4	YES			and wire		0	N_0C2_06321	1	0.2
Projectile AP	YES	4	YES			30 caliber		0	N_0C2_06321	2	0.1
Wire	YES	4	YES					0	N_0C2_06302	20	1
Other	NO	4	YES					0	N_025_03335	6	0.4
Small Arms Bullet	NO	4	YES			.30 cal		0	N_0C2_06368	4	0.1
Wire	NO	4	YES			barbed		0	N_035_04702	2	0.2
Wire	NO	4	YES			barbed		0	N_035_04677	3	0.2
Frag (medium)	NO	4	YES			Unknown		0	N_035_04624	6	0.25
Frag (light)	YES	4	YES			Unknown		0	N_035_04664	2	0.2
Frag (light)	NO	4	YES			rifle grenade		0	N_033_04368	4	0.5
	NO	4	YES					0	N_030_03958	4	0.1
flash tube	NO	10	YES	flash tube		10"		0	N_013_01428	8	1
Nails	YES	10	YES	Nail pit, 11 nails total.		avg nails		0	N_010_00948	3	0.1
Other	YES	10	YES					0	N_017_02292	2	0.2
Nails	YES	10	YES	nail pit 3 like		2 inches		0	N_010_00942	0	0.005
Other	NO	10	YES	10 inch bolt		10 inch bolt		0	N_010_01002	3	0.5
Small Arms Bullet	NO	10	YES	2 .30 carbin		.30 cal		0	N_010_01002	4	0.005
Nails	NO	10	YES	2 nails		2 inch		0	N_010_01002	2	0.005
Frag (heavy)	NO	10	YES	possible 75mm frag		Other		0	N_009_00862	6	1
Other	NO	10	YES	12 gauge shot gun shell		shot gun shell		0	N_008_00798	2	0.005
Frag (heavy)	NO	10	YES	poss 75mm frag		Other		0	N_007_00616	12	1
Can pull tab	NO	10	YES	1 of 3		1 inch		0	N_007_00675	2	0.005
Can pull tab	NO	10	YES	2 of 3		1 inch		0	N_007_00675	1	0.005
Nails	NO	10	YES	2 nails		2 inch		0	N_006_00489	6	0.005
Nail	NO	10	YES	1 of 3 nails 3 like items		2 inch		0	N_006_00489	1	0.005
Frag (medium)	NO	10	YES	unk frag		Other		0	N_007_00644	3	0.05
Small Arms Bullet	NO	10	YES	.45 cal shell		Other		0	N_007_00650	0.5	0.005
Frag (heavy)	NO	10	YES	rotating band		Other		0	N_008_00775	5	1
Small Arms Bullet	NO	10	YES	.45 cal slug		Other		0	N_008_00777	4	0.05
Wire	NO	10	YES	cable		12 inches		0	N_008_00777	0	0.005
Can	NO	10	YES	flattened can		12 inches		0	N_00C_06179	1	1
Cans		10	YES			12 oz		0	N_006_00392	0	0.2
Frag (light)	NO	10	YES			1x2		0	N_00C_06172	1	0.1
Frag (medium)	NO	10	YES					0	N_017_02443	3	0.3
Casing	YES	10	YES			Small Arms		0	N_017_02249	6	0.1
Nails	YES	10	YES					0	N_017_02249	7	0.02
Cans	YES	10	YES					0	N_012_01260	2	0.05
Small Arms Bullet	NO	10	YES					0	N_012_01275	1	0.02
Other	YES	10	YES	desintigrating metal link				0	N_011_01164	6	0.01
Wire	NO	10	YES					0	N_005_00293	3	0.3
Cans	YES	10	YES	3 like items				0	N_005_00264	3	2
Nails	NO	4	YES	16d nail				0	N_019_02785	8	0.1
frag	NO	4	YES					0	N_033_04436	8	0.02
other	NO	6	YES	a piece of bent up metal		2 inch long		0	N_010_00979	2	0.005
Nail	NO	6	YES	1 2d nail found		4 inch		0	N_011_01087	3	0.005
other	NO	6	YES	a 3x1 inch hasp....no other anomalies found with minelab .....a		3inch		0	N_011_01087	6	0.005
Small Arms Bullet	NO	6	YES	does not meet the MV requirements		45		0	N_013_01417	2	0.1
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_021_03044	0	0.3
scrap metal	NO	6	YES	meets the MV requirement, no mangnetic signature remains v				0	N_021_03014	0	1
Nails	YES	6	YES	1 2d nail, 1 finishing nail, 1 horse shoe nail..3 same dig complet		4		0	N_011_01146	3	0.005
Small Arms Bullet	YES	6	YES	6 .45 cal bulles over 3 same items found dig stopped		.45 cal		0	N_011_01146	4	0.05
Small Arms Bullet	YES	6	YES	1 30 06 cartridges no bullet in cartridge, cartridge has been fir		30 06 cartridges		0	N_011_01146	3	0.005
other	NO	6	YES	metal can lid unknown type		4 inch		0	N_012_01263	4	0.005
Wire	NO	6	YES	wire metal use unknown		12 inches		0	N_012_01263	3	0.005
Nail	NO	6	YES	2d nail		4 inch		0	N_012_01263	6	0.005
Nail	NO	6	YES	2d nail		4 inch long		0	N_010_01057	6	0.005
other	NO	6	YES	pull tab from can of beer or soda, my bet is can of beer		1 inch long		0	N_010_01057	2	0.005
Nails	YES	6	YES	4 2d nails found dig stopped,same type of garbage as flag #n_(		4 inch long		0	N_010_00967	6	0.005
Wire	YES	6	YES	12 inch metal wire and 1 half inch steel pin		12 inches		0	N_010_00967	4	0.005
Frag (medium)	YES	6	YES	dug beyond 3 like items due to high channel 2 reading				0	N_016_02021	3	1
	YES	6	YES	potential sampling ste				0	N_016_02076	2	0
Frag (medium)	YES	6	YES	3 like items dig complete				0	N_016_02152	1	1
Frag (light)	YES	6	YES					0	N_016_02166	2	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02160	2	1
nut	NO	6	YES	locking nut		.5 inches		0	N_00A_06004	4	0.005
wire	NO	6	YES	plain wire		6 inches wire		0	N_00A_06004	4	0.005
wire	NO	6	YES	2 pieces of plain wire 1 piece 18 inches the other 6 inches	no	16 & 6		0	N_005_00278	6	0.005
2 bolts	NO	6	YES	2 galvinized bolts	no	1 inch long and .5 inch long		0	N_005_00278	2	0.005
saw blade	NO	6	YES	saw blade...the type you would bake into a cake	no	3inch		0	N_00A_05952	4	0.005

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
30 06	NO	6	YES	30 06 cartridge no projectile	no	2.5		0	N_00A_05952	4	0.005
small arms carriage	NO	6	YES	.22 cal cartridge no projectile	no	.22 cal cartridge		0	N_00A_06037	5	0.005
nail	NO	6	YES	finishing nail	no	2 inch long		0	N_00A_06037	4	0.005
nut	NO	6	YES	lug nut	no	1 inch		0	N_00A_06037	6	0.005
small arms carriage	NO	6	YES	.9mm cartridge no projectile	no	.5 inch long		0	N_00A_06037	2	0.005
caster	NO	6	YES	caster from office chair	no	4 inches		0	N_00A_05992	4	0.5
nail	NO	6	YES	2 b nail	no	2.5 inch long		0	N_00A_06035	6	0.005
roll of barbed wire	NO	6	YES			barbed wire		0	N_014_01531	0	3
can	YES	6	YES					0	N_016_01983	2	1
frag light	YES	6	YES	3 like items complete				0	N_016_02001	6	1
bullets	YES	6	YES			30 cal		0	N_016_02001	4	1
frag medium	YES	6	YES					0	N_016_01955	5	1
Wire	NO	6	YES	1 6 inch long piece of wire and 1 9 inch long by 1/2 inch wide p		6 inch long		0	N_0A1_06083	6	0.005
other	NO	6	YES	part of a 30 06 clip		3inch		0	N_008_00715	4	0.005
Nails	YES	6	YES	anomaly classification as nail pit 9 2d nails found dig stopped		4 inch long		0	N_008_00719	5	0.005
other	YES	6	YES	looks like touch up paint can lid		4 inch		0	N_008_00719	12	0.005
other	YES	6	YES	beer can pull tab...if we would have saved them all we could h		2 inch		0	N_008_00745	2	0.005
Nails	NO	6	YES	3 2d nails and 1 finishing nail carrictorized as a nail pitt...same		4 inch		0	N_008_00739	1	0.005
Small Arms Bullet	NO	6	YES	only 1 .45 cal bullet		.45 cal bullet		0	N_008_00739	22	0.005
other	NO	6	YES	2 curtain rod brackets and 1 1x1 piece of magnet		1 inch		0	N_008_00788	3	0.005
Frag (heavy)	NO	6	YES	poss 75mm frag		4 inch		0	N_009_00918	4	0.5
other	NO	6	YES	plain bottle cap		1 inch long		0	N_010_00979	3	0.005
Frag (medium)	NO	6	YES					0	N_017_02395	1	1
Casing	NO	6	YES			75mm		0	N_017_02352	1	1
Frag (medium)	YES	6	YES					0	N_017_02347	2	1
door hinge	YES	6	YES					0	N_017_02339	2	1
Frag (medium)	NO	6	YES					0	N_017_02427	3	1
Frag (medium)	NO	6	YES					0	N_017_02476	8	1
Frag (medium)	NO	6	YES					0	N_0A1_06070	2	1
Frag (medium)	YES	6	YES	3 like items dig complete				0	N_017_02339	3	1
other	NO	6	YES	20 inch steel spike....alls we need is 1 more and 6 horses for a		20 inches		0	N_00A_05952	12	5
Frag (heavy)	YES	6	YES					0	N_016_02001	2	3
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02028	2	1
other	YES	LOT 2	YES	just 2 yards away another trash pit....1st item a piece of metal		8 inches		0	N_002_00051	3	1 lb
Casing	NO	8	YES	40mm cartridge case		40mm		0	N_039_05075	2	1
Frag (light)	NO	8	YES	2 different pieces of aluminum frag both pieces of frag 3x1 incl		Unknown		0	N_036_04912	6	0.005
Wire	NO	8	YES	does not meet the MV requirement, no mangnetic signature r				0	N_00A_05974	1	0.001
Vehicle parts	YES	8	YES	3 like items dig complete				0	N_027_03659	1	1
steel banding	YES	8	YES	3 like items dig complete				0	N_027_03591	1	1
Nails	NO	8	YES					0	N_027_03657	5	1
Small Arms Bullet	YES	8	YES			.50 cal		0	N_028_03743	2	1
Nails	YES	8	YES	3 like items dig complete				0	N_028_03743	4	1
Casing	NO	8	YES			Small Arms		0	N_028_03730	1	1
Nails	NO	8	YES					0	N_028_03730	3	1
Frag (heavy)	NO	8	YES	possible 75mm frag		Unknown		0	N_0A3_06111	7	1
Frag (heavy)	NO	8	YES	37mm frag		other		0	N_035_04754	0	2
Frag (heavy)	NO	8	YES	unknown piece of frag 2x.5 inch		Unknown		0	N_035_04790	3	0.005
Frag (heavy)	NO	8	YES	4x1 inch piece of metal frag unknown		Unknown		0	N_035_04729	0	0.05
Frag (heavy)	NO	8	YES	possible 105mm frag		Unknown		0	N_00A_05960	8	0.5
Frag (light)	NO	8	YES	very small piece of frag unknown		Unknown		0	N_038_05070	8	0.0005
Frag (heavy)	NO	8	YES	possible 75mm frag		Unknown		0	N_038_05057	4	1
Frag (heavy)	NO	8	YES	2x1 inch piece of metal frag unknown		Unknown		0	N_038_05060	1	1
No further entries- mar	YES	8	YES	3 like items dig complete				0	N_00A_05963	3	1
Frag (medium)	NO	8	YES					0	N_031_04138	3	1
Frag (medium)	NO	8	YES					0	N_032_04186	2	1
Frag (heavy)	NO	8	YES	unknown piece of metal frag		Unknown		0	N_036_04965	2	0.005
Frag (medium)	NO	8	YES	unknown piece of aluminum frag		Unknown		0	N_035_04801	4	0.025
Frag (light)		8	YES			2x2		0	N_033_04419	0	0
Frag (light)	NO	8	YES			1x2		0	N_034_04592	1	0.1
Casing	NO	8	YES	3 like items dig complete				0	N_032_04168	1	1
Nails	NO	LOT 1	YES					0	N_030_03981	6	1
Casing	YES	LOT 1	YES			Small Arms		0	N_032_04230	2	1
Casing	YES	LOT 1	YES			Small Arms		0	N_033_04331	5	1
	YES	LOT 1	YES	m1 clip				0	N_033_04331	2	1
metal band	NO	LOT 1	YES			4 inch		0	N_040_05106	3	0
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_025_03442	2	1
Small Arms Bullet	YES	LOT 1	YES	1 items dig complete				0	N_028_03813	4	1
Wire	YES	LOT 2	YES	we have with this hole here 2 8 inches long piece of wire, 1 cru		2 8 inch		0	N_002_00067	2	< 1
Wire	NO	LOT 2	YES	2 piece of metal wire		8 inches		0	N_007_00631	4	5
Nails	NO	LOT 2	YES	asortment of different sizes from a 2d to finishing nail....7 nails		other		0	N_00B_06144	4	1
other	NO	LOT 2	YES	rocker arm from an engine		3 inch		0	N_00B_06144	6	6
Casing	NO	LOT 2	YES	7 .30 cal cartridges all fired, they were found at different depth		30 cal		0	N_00B_06144	6	< 1
other	NO	LOT 2	YES	a cromed platen domaflatchy....possible bracket for a bike		8 inches long		0	N_00B_06138	4	1 lb
other	NO	LOT 2	YES	1 coat hanger		14 inches		0	N_005_00282	2	1
Wire	YES	LOT 1	YES	2 items dig complete				0	N_030_04023	1	4
Vehicle parts	YES	LOT 1	YES					0	N_00C_06184	1	1
Small Arms Bullet	NO	LOT 1	YES			.30 cal		0	N_00C_06207	1	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Cans	YES	LOT 1	YES					0	N_036_04899	1	7
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_036_04899	1	1
Nails	NO	LOT 2	YES			4 4ingh nails		0	N_012_01273	1	
Wire	NO	LOT 2	YES	item found did not conform to mv requirement		roll of wire		0	N_010_01007	0	1 lb
Nails	NO	LOT 2	YES			various sizes		0	N_009_00901	1	0.2
Nails	NO	LOT 2	YES			vartous sized nails		0	N_009_00914	1	0.25
grenade spoon	NO	LOT 2	YES	12 oz can also found		3x.5 inches		0	N_009_00902	1	0.1
Nails	NO	LOT 2	YES					0	N_005_00329	5	< 1
Nails	NO	LOT 2	YES					0	N_003_00136	5	1
other	NO	LOT 2	YES	3 foot long piece of barbed wire		117 inches long		0	N_006_00443	0	7
Small Arms Bullet	YES	LOT 2	YES	1 30 06 cartridge case, 1 .50 cal bullet , 1 30 06 skin, 1 .45 cal b		other		0	N_006_00578	2	1
Nails	YES	LOT 2	YES	3 nails		2.5 inch		0	N_005_00302	3	1
other	YES	LOT 2	YES	1 4 inch can lid, 2 the bottom piece of light bolb...the screw in		4 inch		0	N_005_00302	3	1
Frag (medium)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_016_02193	0	< 1
No further entries- mar	YES	LOT 2	YES	3 like items dig complete				0	N_006_00490	0	6
No further entries- mar	YES	LOT 2	YES	3 like items dig complete				0	N_006_00453	0	8
Nails	YES	LOT 2	YES	nail pit				0	N_006_00416	1	3
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_006_00419	2	2
No further entries- mar	YES	LOT 2	YES	3 like items dig complete				0	N_007_00610	1	6
Small Arms Bullet	YES	12	YES	1 50 cal found ...also hot rocks found with schonstedt		.50 cal		0	S_087_13424	3	1
Small Arms Bullet	YES	12	YES	bullets found from surface down to 4 inches....area still hot wi		7.62		0	S_029_10647	4	2
Fuze/Fuze Components	NO	12	YES	unknown fuse component		unknown		0	S_028_10441	4	6
Frag (heavy)	YES	12	YES	75 mm frag.....magnetic signature still remaining because of h		75 mm		0	S_028_10435	0	> 1 lb
Projectile AP	NO	12	YES			37mm		0	S_025_09245	6	8
Barbed Wire	NO	12	YES			4 inch		0	S_026_09769	1	< 1
Small Arms Bullet	NO	12	YES	does not meet the mv requirement		.50 cal		0	S_028_10394	2	2
Small Arms Bullet	NO	12	YES			.30 cal		0	S_025_09223	1	1
Frag (medium)	NO	12	YES					0	S_026_09668	4	1
Buckets	NO	12	YES					0	S_025_09160	3	5
Small Arms Bullet	NO	12	YES			.30 cal		0	S_025_09167	4	< 1
Nails	NO	LOT 1	YES			2 inch		0	N_0A2_06093	0.1	2
Cans	NO	LOT 1	YES			6 oz		0	N_027_03673	0.1	0
Frag (medium)	NO	LOT 1	YES			3x5		0	N_026_03479	0.2	0.5
Casing	NO	LOT 1	YES			brass		0	N_028_03800	0.2	1
Small Arms Bullet	YES	3	YES	4 7.62 bullets .....magnetic signature still remaining because of		other		0	S_020_07378	3	2
Small Arms Bullet	YES	3	YES	1 7.62 bullet .....magnetic signature still remaining because of		other		0	S_021_07767	1	1
Frag (medium)	YES	3	YES	unknown piece of metal frag .....magnetic signature still remai		Unknown		0	S_021_07767	4	2
Frag (heavy)	YES	3	YES	looks like 37mm frag ......magnetic signature still remaining be		other		0	S_022_08135	3	8
Frag (heavy)	YES	3	YES	unknown piece of		Unknown		0	S_019_07054	1	4
Fuze/Fuze Components	YES	3	YES	unknown piece of aluminum fuse component......magnetic sig		other		0	S_019_07054	1	4
Small Arms Bullet	YES	3	YES	3 7.62 bullets .....magnetic signature still remaining because of		other		0	S_019_07055	2	2
Frag (heavy)	YES	3	YES	2 piece of metal frag 1 2x1 the other 2x.5.....magnetic signatur		Unknown		0	S_019_07055	2	10
Frag (medium)	NO	3	YES	dozen small pieces of bullets		37mm frag		0	S_014_04957	2	2
Frag (medium)	NO	3	YES			37mm frag		0	S_012_04281	1	1
Fuze/Fuze Components	NO	3	YES			37mm fuse		0	S_012_04281	2	1
Frag (light)	NO	3	YES			Unknown		0	S_012_04301	0	< 1
Frag (medium)	NO	3	YES			37mm		0	S_016_05802	0	< 1
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_022_08145	1	1
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_014_05039	5	1
Small Arms Bullet	YES	5	YES	2 .50 cal bullets and 1 7.62 bullet ...magnetic signature still ren		.50 cal		0	S_047_11887	0	6
Projectile TP	YES	5	YES	37mm tpt.....magnetic signature still remaining because of hot		37mm		0	S_046_11829	0	0
Small Arms Bullet	YES	5	YES	1 .50 cal bullet , 2 7.62 bullets ......could not find anything that		other		0	S_Cross5_13	1	5
Frag (medium)	YES	5	YES	1.5x.5 piece of metal frag ....no anomalies found that would ec		Unknown		0	S_Cross5_1346	2	4
Frag (medium)	YES	5	YES	small piece of metal frag .....magnetic signature still remaining		Unknown		0	S_045_11780	2	2
other	YES	5	YES	some type of clip......magnetic signature still remaining becaus		3 inches		0	S_045_11780	3	2
Frag (light)	NO	5	YES			1x3 frag		0	S_055_12202	2	1
Small Arms Bullet	YES	12	YES	2 .50 cal bullets....magnetic signature still remaining because c		.50 cal		0	S_027_10109	2	3
Frag (light)	YES	12	YES	possible rotating band from 37mm...magnetic signature still re		other		0	S_028_10417	1	1
Small Arms Bullet	YES	12	YES	1 .50 cal bullet , 2 7.62 bullets, and 1 30 06 bullet .....magnetic		.50 cal		0	S_028_10418	2	4
Frag (heavy)	YES	12	YES	unknown piece of metal frag ....magnetic signature still remair		Unknown		0	S_028_10418	2	4
Frag (heavy)	YES	12	YES	unknown piece of metal frag ...magnetic signature still remain		Unknown		0	S_090_13403	2	6
Frag (heavy)	YES	12	YES	37mm frag ....magnetic signature still remaining because of ho		other		0	S_026_09781	12	1 lb
Small Arms Bullet	YES	12	YES	1 .50 cal bullet .....magnetic signature still remaining because c		.50 cal		0	S_025_09254	1	4
Wire	NO	13	YES	1 5 inch long piece of metal wire, and 1 bottle cap....hot rocks		5 inch long		0	S_019_07253	2	1
other	NO	13	YES	1 very big washer, 4 inch big....hot rocks still remaining		4 inch		0	S_018_06919	4	9
Small Arms Bullet	NO	12	YES			3 small bullet		0	S_027_10091	1	< 1
Frag (medium)	NO	12	YES			Unknown		0	S_029_10597	1	< 1
Nails	YES	12	YES	3 like items dig complete				0	S_028_10275	SPOILS	1
Small Arms Bullet	YES	12	YES	3 like items dig complete		.30 cal		0	S_028_10283	2	1
Small Arms Bullet	YES	12	YES	3 like items dig complete		.30 cal		0	S_028_10284	SPOILS	1
Small Arms Bullet	YES	12	YES	2 .50 cals and a .50 cal skin....that means there is a naked .50 c		.50 cal		0	S_094_13352	2	4
Frag (heavy)	YES	12	YES	4 pieces of metal frag 1 3x1, the others are about 1x1......magr		Unknown		0	S_094_13352	2	5
Frag (heavy)	YES	12	YES	1x1 piece of metal frag unknown .....magnetic signature still re		Unknown		0	S_093_13368	2	8
Wire	NO	12	YES			72 inch		0	S_027_10047	0	3
Frag (light)	NO	12	YES			3 small pieces		0	S_028_10328	1	1
Frag (medium)	NO	3	YES	also multiple 762 bullets 10+		Unknown		0	S_012_04246	0	< 1
Fuze/Fuze Components	NO	3	YES			t bar fuse		0		3	2

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	NO	3	YES	dozen small bullet bullets in same hole		.50 cal		0		3	1
Small Arms Bullet	NO	3	YES	10+ bullets		762		0		SPOILS	< 1
Frag (heavy)	NO	3	YES			Unknown		0		1	1
Small Arms Bullet	YES	LOT 3	YES	4 45 cal bullets......hot rocks		other		0	S_004_01720	2	3
Frag (heavy)	YES	LOT 3	YES	possibly a 3.5 mortar frag.....hot rocks found with schonstedt		other		0	S_005_02219	6	> 1 lb
Small Arms Bullet	YES	LOT 3	YES	1 45 cal bullet ....hot rocks found with schonstedt		other		0	S_005_02219	2	3
Nail	YES	LOT 3	YES	1 4 inch long double headed nail....hot rocks found with schons		4 inch long		0	S_RoadE_14002	1	3
other	YES	LOT 3	YES	1 very large lock washer		1 inch		0	S_005_02258	1	5
Small Arms Bullet	YES	LOT 3	YES	1 .50 cal bullet and 3 7.62 bullets ....hot rocks found with schon		.50 cal		0	S_005_02253	0	5
other	YES	LOT 3	YES	1 m1 clip....hot rocks found with schonstedt		2 inch long		0	S_005_02253	0	4
Nails	NO	LOT 3	YES	10 like items dig complete				0	S_004_01828	3	4
can lids and pull tab	NO	LOT 3	YES	3 like items dig complete				0	S_004_01828	3	1 items dig complete
Small Arms Bullet	YES	LOT 3	YES	2 7.62 bullets ....hot rocks found with schonstedt		other		0	S_RoadE_14021	1	2
Frag (heavy)	YES	LOT 3	YES	possibly 105 or 155 frag .....hot rocks found with schonstedt		Unknown		0	S_016_06020	4	1 lb
Frag (heavy)	YES	LOT 3	YES	3x1 piece of metal frag unknown .....hot rocks found with scho		Unknown		0	S_015_05557	3	1 lb
Wire	YES	LOT 3	YES	looks like a tiny bucket handle for a tiny bucket .....hot rocks fo		5 inch		0	N_065_05565	0	4
other	YES	LOT 3	YES	30.06 spent cartridge		2.5 inch		0	N_065_05605	1	3
Small Arms Bullet	YES	LOT 3	YES	.50 cal bullet		.50 cal		0	N_065_05605	1	5
Wire	YES	LOT 3	YES	5 inch long piece of wire.....hot rocks found with schonstedt		5 inch long		0	N_065_05605	0	2
Small Arms Bullet	YES	LOT 3	YES	oh no a naked .50 cal bullet		.50 cal		0	N_065_05581	2	4
Casing	YES	LOT 3	YES	ok good we found the jacket to the .50 cal bullet now it can wa		Small Arms		0	N_065_05581	2	2
Frag (light)	NO	LOT 3	YES	3 pieces of frag of simular size and 5 small bullets pieces		Unknown		0	S_009_03601	3	< 1
Wire		LOT 3	YES			3 feet		0	S_005_02270		
other	YES	LOT 4	YES	survey spike.......also just to let you know 1 foot east a concret		other		0	S_RoadE3_13885	2	1 lb
other	YES	LOT 4	YES	a screen door closer.....you know that black tube on a screen d		15 inch long		0	S_013_04503	18	> 1 lb
other	YES	LOT 4	YES	12x6 inches metal filter screen .....magnetic signature still rem		12 inches long		0	S_009_03358	1	1 lb
Small Arms Bullet	NO	LOT 4	YES	4 7.62 bullets ....found from surface to 4 inch down.....magnet		other		0	S_RoadE3_13907	4	3
Frag (medium)	NO	LOT 4	YES	1x4 inch piece of unknown metal frag ....magnetic signature st		Unknown		0	S_RoadE3_13906	2	10
Frag (medium)	NO	LOT 4	YES			Unknown		0	S_100_13287	1	< 1
Frag (light)	NO	LOT 4	YES			Unknown		0	S_036_11380	0	< 1
Wire	NO	LOT 4	YES					0	S_018_06555	1	< 1
Vehicle parts	NO	LOT 4	YES					0	S_020_07333	5	4
Small Arms Bullet	NO	LOT 4	YES			.30 cal		0	S_021_07737	3	2
Small Arms Bullet	NO	LOT 4	YES					0	S_022_08111	4	< 1
other	NO	LOT 4	YES	1 aluminum handle .....handle in between the flag an s_roade_		7 inch long		0	S_014_04902	0	6
Small Arms Bullet	NO	LOT 4	YES	1 .50 cal bullet 4 7.62 bullets .....hot rocks still remaining		.50 cal		0	S_013_04525	4	6
pipe fitting	NO	LOT 4	YES					0	S_040_11615	1	2
Frag (medium)	NO	LOT 4	YES			37mm		0	S_041_11667	1	< 1
Small Arms Bullet	YES	LOT 4	YES	3 like items dig complete				0	S_023_08456	3	4
Small Arms Bullet	NO	LOT 4	YES	7 like items dig complete				0	S_022_08120		5
Small Arms Bullet and frag	NO	LOT 4	YES	11 bullets 1 frag				0	S_021_07740	7	6
Frag (light)and bullets	NO	LOT 4	YES	16 like items dig complete				0	S_016_05699	3	4
Small Arms Bullet	NO	LOT 4	YES					0	S_016_05696	5	2
Small Arms Bullet	NO	LOT 4	YES			.30 cal		0	S_016_05700	SPOILS	4
other	NO	13	YES	1 piece of l shape rod, 2 bottle caps, 1 .25 inch staple , and 1 pu		6 inch long		0	S_RoadD_14486	2	2
other	NO	13	YES	some type of bolt and bracket ....hot rocks still remaining		3.5 inch		0	S_RoadD_14478	1	8
Nail	NO	13	YES	lets start with a 2d nail, 1 1 inch pice of barbed wire , car door		4 inch long		0	S_RoadD_14476	4	2
Nails	NO	13	YES			2 5 inch nails		0	S_019_07273	3	2
Nails	NO	13	YES			4 inch nails		0	S_019_07267	0	1
Wire	NO	13	YES			clamp		0	S_019_07257	3	< 1
spark plug	NO	13	YES			3 inch		0	S_019_07256	4	1
Wire	YES	13	YES	3 like items dig complete				0	S_RoadD_14479	0	2
Small Arms Bullet	YES	13	YES			.30 cal		0	S_RoadD_14479	3	< 1
Vehicle parts	YES	13	YES	3 like items dig complete				0	S_RoadD_14477	9	1 lb
Vehicle parts	YES	13	YES	3 like items dig complete				0	S_RoadD_14474	5	> 1 lb
Casing	YES	13	YES			Small Arms		0	S_RoadD_14474	3	< 1
Small Arms Bullet	YES	13	YES			.30 cal		0	S_RoadD_14473	4	1
Nails	YES	13	YES					0	S_019_07254	SPOILS	< 1
Vehicle parts	YES	13	YES	exceedingly magnetic				0	S_RoadD_14464	3	1
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.50 cal		0	S_020_07657	2	3
Frag (light)	NO	13	YES			Unknown		0	S_020_07665	5	< 1
Frag (medium)	NO	LOT 3	YES			Unknown		0	S_011_04189	5	< 1
Frag (heavy)	YES	1	YES	1 2x1 inch piece of metal frag possibly 37mm ...and1 .50 cal bu		other		0	S_024_09015	3	2
Frag (light)	YES	1	YES			Unknown		0	S_010_03838	2	< 1
Frag (light)	NO	1	YES			.5x1 inch		0	S_036_11403	1	< 1
Frag (light)	NO	1	YES			.5x1		0	S_036_11403	1	< 1
Small Arms Bullet	YES	1	YES	3 like items dig complete		.30 cal		0	S_017_06353	2	2
	YES	1	YES	numerous frag items ranging from 0.5x0.5 to 3x8 inches in fra				0	S_021_07959	12	> 1 lb
frag	YES	1	YES	4xsmall frag all 0.5x0.5 remaining magnetic signature because		4xfrag 1x0.5		0	S_022_08340	4	< 1
50 cal	YES	1	YES	4x 50 cal bullet ..... remaining magnetic signature because of h		50 cal bullet		0	S_022_08298	2	< 1
Small Arms Bullet	YES	1	YES	3+ Bullets		.50 cal		0	S_017_06292		< 1
can lid	YES	1	YES			3in		0	S_024_08976	0	< 1
Frag (light)	YES	1	YES			Unknown		0	S_024_08976	0	< 1
Frag (medium)	NO	1	YES			37mm		0	S_022_08192	1	< 1
Wire	YES	1	YES	1 items dig complete				0	S_RoadE_13974	7	> 1 lb
Small Arms Bullet	YES	1	YES	2 like items dig complete				0	S_010_03886	3	2
Small Arms Bullet	YES	1	YES	3 like items dig complete				0	S_013_04761	3	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	YES	1	YES	13 like items dig complete				0	S_012_04361	1	3
Small Arms Bullet	YES	1	YES	5 like items dig complete				0	S_003_01368	3	2
Frag (light)	YES	2	YES			Unknown		0	S_006_02588	0	< 1
Frag (medium)	YES	2	YES	3 like items dig complete				0	S_007_02896	1	5
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02825	1	8
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02751	1	3
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02737	3	3
Frag (heavy)	YES	2	YES	3x1 inch piece of metal frag ....magnetic signature because of		Unknown		0	S_003_01123	2	1
Frag (heavy)	YES	2	YES	6 piece of metal frag from 6 inch down to 1 inch long .....magn		Unknown		0	S_003_01188	0	> 1 lb
Frag (heavy)	YES	2	YES	1 6x.5 inch long piece of metal frag ....magnetic signature beca		Unknown		0	S_003_01202	0	2
Frag (medium)	YES	2	YES	7x12 inch piece of metal frag ....magnetic signature because of		Unknown		0	S_003_01087	3	< 1
Frag (light)	YES	2	YES	1 items dig complete				0	S_008_03158	4	2
Frag (light)	YES	2	YES	also hot rocks and another small piece of frag 1x1		Unknown		0	S_003_01273	0	< 1
Frag (light)	YES	2	YES	3 piece of frag of similar size		Unknown		0	S_003_01294	5	< 1
Frag (heavy)	YES	9	YES	2 piece of metal frag about 1x.5....magnetic signature because		Unknown		0	N_074_05741	2	< 1
Frag (heavy)	YES	9	YES	3 and done .....all 3 piece of metal frag are 2x.5......magnetic si		Unknown		0	N_074_05749	3	< 1
Frag (medium)	YES	9	YES	3xfrag 2x.25 to .5x.25 magnetic signature remaining because c				0	N_074_05750	2	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05791	3	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05806	4	< 1
Projectile APT	NO	9	YES			37mm		0	N_076_05831	7	1
Frag (light)	YES	9	YES			Unknown		0	N_075_05786	2	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05786	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05814	3	< 1
Frag (light)	NO	9	YES			Unknown		0	N_074_05743	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_074_05744	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05785	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05798	SPOILS	< 1
Small Arms Bullet	YES	9	YES			.50 cal		0	N_075_05821	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05805	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05792	SPOILS	< 1
Frag (light)	NO	9	YES			4 inch frag		0	N_073_05690	1	1
Projectile TP	NO	9	YES			37mm		0	N_073_05665	1	1 lb
Frag (light)	YES	9	YES	1 like items dig complete				0	N_076_05836	3	1
Frag (light)	YES	9	YES	1 like items dig complete				0	N_076_05843	3	2
Frag (light)	YES	9	YES	8 like items dig complete				0	N_077_05854	4	4
Projectile AP	YES	9	YES	1 items dig complete		37mm		0	N_077_05848	5	10
Frag (light)	YES	9	YES	2 like items dig complete item				0	N_077_05858	2	1
Frag (light)	YES	9	YES	1 items dig complete				0	N_077_05861	3	1
Small Arms Bullet	YES	9	YES	1 like items dig complete		.50 cal		0	N_077_05861	2	2
horsesh0e	YES	9	YES	1 like items dig complete				0	N_077_05850	3	2
	YES	9	YES	3 like items dig complete				0	N_078_05866	0	2
Small Arms Bullet	YES	7	YES	2 7.62 bullets and 1 .30 carbine bullet ....magnetic signature st		other		0	S_018_06938	2	< 1
Small Arms Bullet	YES	7	YES	1 .50 cal bullet .....magnetic signature still remaining because c		.50 cal		0	S_018_06937	2	1
other	YES	7	YES	a link from a chain....so you could call it a missing link.....magne		3 inch		0	S_017_06490	3	1
other	YES	7	YES	2 12x4 inch u shape rods.....magnetic signature still remaining		12 inch		0	S_017_06488	3	6
Vehicle parts	NO	7	YES	found 1 bolt but did not meet mv reading		bolt		0	S_015_05579	4	3
Frag (heavy)	YES	9	YES	3 and done ...3 piece of metal frag starting at 2x.5 down to 1x1		Unknown		0	N_073_05698	2	< 1
Frag (light)	YES	9	YES	3 like items dig complete				0	N_078_05864	3	2 like items dig complete
Frag (light)	YES	9	YES	2 like items dig complete				0	N_076_05840	2	2
Frag (light)	YES	9	YES	5 like items dig complete				0	N_076_05841	3	2
Frag (medium)	NO	16	YES			possible ballistic windshield		0		3	2
Small Arms Bullet	NO	16	YES			.50 cal		0		0	1
Small Arms Bullet	NO	16	YES			.50 cal		0		1	1
Frag (light)	NO	16	YES			2x.5		0		2	< 1
Cans	NO	17	YES			spray paint		0	N_013_01426	0	< 1
Frag (light)	NO	17	YES			.5x.5		0	N_006_00571	1	< 1
Casing	NO	17	YES			Small Arms		0	N_006_00445	1	< 1
metal rod	NO	17	YES			12inx.2in.		0	N_006_00445	0	1
bottle cap	NO	17	YES			.5 in diameter		0	N_005_00373	0	< 1
Frag (light)	NO	17	YES			.5x.5		0	N_005_00336	2	< 1
Cans / lid	NO	17	YES			12 and 24oz		0	N_003_00158	2	2
Frag (medium)	YES	6	YES	meets the MV requirement, magnetic signature remains withi		Unknown		0	N_015_01935	1	0.3
can lid	NO	8	YES	no mangnetic signature remains within 1 meter , meets the M		1 gallon		0	N_00A_05968	0	0.3
Frag (medium)	NO	8	YES	found a 2x1 piece of frag		2x1 piece of frag		0	N_035_04639	6	0.4
screw driver	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		flat head		0	N_034_04528	0	0.02
Wire	NO	LOT 2	YES	found 1 piece of wire and multiple hot rocks		3 in wire		0	N_006_00514	5	1
Frag (light)	YES	2	YES			Unknown		0	S_005_02094	SPOILS	1
Frag (light)	YES	9	YES			Unknown		0	N_075_05789	4	< 1
Small Arms Bullet	NO	9	YES	found 2-.50 cal bullets		.50 cal		0	N_079_05875	4	1
Small Arms Bullet	YES	17	YES			.50 cal		0	N_010_01040	2	< 1
pipe	NO	4	YES			10\4		0	N20	5	3
clip	NO	10	YES	2 clips				0	N_009_00864	0	0
m1 clips	YES	10	NO					0	N_009_00829	3	0
Cans	NO	10	YES	alluminum can		alluminum can		0	N_015_01848	9	0.5
Frag (medium)	NO	10	YES			small		0	N_015_01878	2	0.2
Wire	NO	4	YES			7"		0	N_0C2_06368	1	0.1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_035_04677	3	0.1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Wire	YES	4	NO			barbed		0	N_034_04478	1	0.25
Wire	YES	4	NO			barbed		0	N_034_04478	1	0.25
Wire	NO	4	YES			barbed		0	N_034_04478	1	0.25
Other	YES	10	YES	0				0	N_00C_06214	0	0.03
nail	NO	4	YES	nail				0	N_026_03501	8	0.01
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_015_01860	1	0.2
Small Arms Bullet	YES	6	YES	3 like items dig complete		.50 cal		0	N_016_02166	2	1
Casing	NO	6	YES			37mm base		0	N_016_02083	3	1
Frag (light)	NO	6	YES					0	N_016_02196	6	1
Fuze/Fuze Components	NO	6	YES	meets the MV requirement				0	N_020_02945	1	0.1
Frag (medium)	NO	8	YES	meets the MV requirement		Unknown		0	N_033_04364	3	0.2
Small Arms Bullet	NO	8	YES	found 1- 50 cal bullet		50 cal bullet		0	N_034_04578	4	0.2
Frag (medium)	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		multiple small pieces		0	N_033_04362	1	1
Nails	NO	LOT 2	YES	found a piece of wood with nails in it and multiple hot rocks		1x3		0	N_014_01566	1	1
Small Arms Bullet	NO	LOT 2	YES	found 1 bullet		1x2		0	N_014_01583	1	4
Nails	NO	LOT 2	YES	found a piece of wood with nails in it and multiple hot rocks		1x3		0	N_014_01566	1	1
Small Arms Bullet	NO	LOT 2	YES	found 1 bullet		1x2		0	N_014_01583	4	1
Cable	NO	LOT 2	YES			15 inch		0	N_009_00881	0	0.25
55 gal drum lid	NO	LOT 2	YES	found a 55 gallon drum lid		55 gal		0	N_008_00760	1	> 1 lb
55 gal lid	NO	LOT 2	YES	same as N_008_00760		55 gal		0	N_008_00691	1	> 1 lb
scrap metal	NO	LOT 1	YES	meets the mv requirement, no mangnetic signature remains				0	N_0A2_06094	0.4	0
Small Arms Bullet	NO	3	YES	6 bullets pieces in hole		.50 cal		0	S_015_05275	1	1
Frag (medium)	NO	3	YES			37mm frag		0	S_010_03766	0	2
Frag (light)	NO	3	YES			37mm frag		0	S_009_03493	1	1
Frag (medium)	NO	12	YES	meets the mv requirement, no mangnetic signature remains		37 mm		0	S_028_10372	5	< 1
Fuze/Fuze Components	NO	12	YES	no mangnetic signature remains		1904 pttf		0	S_028_10368	1	< 1
Frag (medium)	NO	12	YES	other small pieces of frag and bullets, no mangnetic signature		Unknown		0	S_029_10583	1	< 1
Small Arms Bullet	NO	12	YES			.50 cal		0	S_026_09746	2	< 1
Small Arms Bullet	NO	12	YES			.50 cal		0	S_027_10054	2	< 1
Frag (medium)	NO	3	YES			37mm frag		0		2	3
Frag (medium)	NO	3	YES			Unknown		0		0	< 1
Wire	NO	LOT 3	YES			8 feet copper wire		0	S_006_02672	0	8
Frag (light)	NO	LOT 4	YES	same as s35 11283		Unknown		0	S_035_11282	2	< 1
bicycle part	NO	13	YES			20 inch		0	S_019_07263	0	6
nail and pop tops	NO	13	YES			4 in		0	S_019_07258	2	< 1
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.30 cal		0	S_020_07661	4	1
bolt	NO	LOT 3	YES					0	S_006_02678	1	< 1
Small Arms Bullet	YES	LOT 3	YES	3 +Bullets		.45 cal		0	S_003_01403	SPOILS	< 1
m50 dummy fuse	YES	1	YES					0	S_009_03549	0	< 1
Small Arms Bullet	YES	1	YES	3 liklike items dig complete item				0	S_026_09922	3	3
frag	YES	1	YES	frag pit with numerous frag ranging from 0.25x0.25 to 3x8 inch		numerous		0	S_021_07932	5	> 1 lb
Frag (light)	YES	1	YES			Unknown		0	S_017_06292	1	< 1
Frag (light)	NO	1	YES			37mm body		0	S_031_10875	0	1
Frag (light)	YES	2	YES			Unknown		0	S_005_02133	0	< 1
Frag (light)	YES	2	YES			37mm		0	S_006_02535	2	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02102	SPOILS	< 1
Frag (light)	YES	2	YES			Unknown		0	S_006_02503	0	< 1
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02848	2	2
Frag (light)	YES	2	YES	1 items dig complete				0	S_010_03743	3	2
Frag (light)	YES	2	YES	2 like items dig complete				0	S_009_03471	4	1
Frag (light)	YES	2	YES	3 piece of frag of similar size, frag os on the surface throughou		Unknown		0	S_004_01674	0	< 1
	YES	9	YES	4xfrag 3x1 to .5x.5 inch and small part of t bar fuze magnetic s				0	N_074_05755	0	< 1
Frag (light)	NO	9	YES	also 1 more pieces of frag that's .5x.5in		Unknown		0	N_075_05780	0	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05809	SPOILS	< 1
Small Arms Bullet	NO	16	YES			.50 cal		0		1	< 1
belt links	YES	10	YES					0	N_009_00829	0	0
Wire	NO	10	YES	piece of wire		piece of wire		0	N_018_02574	0	0.5
Frag (light)	NO	10	YES	brass		2x2		0	N_012_01286	3	0.1
Other	NO	10	YES	3 metal brackets		3 metal brackets		0	N_010_00962	6	2
Frag (medium)	NO	6	YES	meets MV requirement, no mangnetic signitre signature rema		Unknown		0	N_014_01550	2	0.4
Frag (light)	YES	6	YES	found multiple small pieces of frag		small pieces of frag		0	N_015_01792	14	0.25
Small Arms Bullet	YES	6	YES	1- 50 cal. cart case		50 cal		0	N_015_01756	6	0.1
Frag (light)	YES	6	YES					0	N_016_02021	5	1
Frag (medium)	YES	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_011_01138	0	0.3
Frag (medium)	NO	8	YES	found 1 inert 20mm		inert 20mm		0	N_035_04787	5	0.4
Nails	NO	LOT 2	YES	found 2 nails		2 nails		0	N_006_00497	2	< 1
Frag (medium)	NO	3	YES	multiple small pieces of frag within meter also		37mm		0	S_012_04295	1	< 1
Small Arms Bullet	YES	3	YES	2 like items dig complete				0	S_016_05864	3	2
Frag (medium)	YES	3	YES	3 37 mm frag all simular size		37 mm		0	S_015_05261	2	1
Frag (light)	YES	3	YES	3 like items dig completed				0	S_017_06219	3	2
Frag (light)	NO	3	YES			Unknown		0		2	< 1
Small Arms Bullet	NO	3	YES	3+bullets		762		0		0	< 1
scrap	NO	LOT 3	YES	3 like items dig complete				0	N_025_03373	5	2
Small Arms Bullet	NO	5	YES	found 1 - 50 cal bullet		50 cal bullet		0	S_063_12471	4	1
	YES	5	YES	3 like items dig complete				0	S_075_12707	0	0
Frag (light)	YES	9	YES			Unknown		0	N_075_05806	2	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05785	SPOILS	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	YES	9	YES			.50 cal		0	N_075_05830	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05826	SPOILS	< 1
Small Arms Bullet	YES	17	YES			.50 cal		0	N_009_00897	6	< 1
Small Arms Bullet	NO	4	YES			.50 cal		0	N_018_02591	4	0.2
Frag (medium)	YES	10	NO			75mm		0	N_009_00829	3	1
Fuze/Fuze Components	NO	10	YES			partial		0	N_015_01836	6	0.1
Casing	YES	10	YES			Small Arms		0	N_015_01838	1	0.1
Cans	NO	4	YES	rusty tin can		tin can		0	N_024_03305	0	1
	NO	4	YES					0	N_0C2_06423	3	0.3
Other	YES	4	YES					0	N_0C2_06321	2	0.1
Wire	YES	4	NO			barbed		0	N_036_04840	3	0.1
Nails	NO	4	YES					0	N_027_03648	6	0.1
Frag (light)	YES	4	YES					0	N_029_03869	3	0.2
	YES	4	YES					0	N_030_03999	3	0.1
Cans	NO	10	YES	tin can		tin can		0	N_013_01414	5	0.25
Casing	YES	10	YES			Small Arms		0	N_017_02469	2	0.02
Wire	YES	10	YES	left in place		fence		0	N_017_02271	0	2
Frag (medium)	YES	10	YES					0	N_00C_06214	1	0.2
Frag (light)	YES	10	YES					0	N_00C_06214	2	0.01
Small Arms Bullet	NO	10	YES					0	N_011_01164	1	0.02
Frag (light)	NO	4	YES	piece of hand grenade fuze				0	N_015_01925	5	0.1
grounding rod	NO	4	YES					0	N_031_04074	4	2
wire	NO	4	YES					0	N_031_04102	4	1
Frag (medium)	NO	6	YES	MV requirement met, no mangnetic signature remains within		Unknown		0	N_013_01431	1	0.3
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_020_02952	1	0.3
Frag (medium)	YES	6	YES	dug beyond 3 like items due to high channel 2 reading				0	N_016_02008	3	1
Frag (light)	YES	6	YES					0	N_016_02008	2	1
Frag (light)	YES	6	YES	dug beyond 3 like items due to high channel 2 reading				0	N_016_02076	2	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02176	2	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02083	2	1
Frag (medium)	NO	6	YES					0	N_016_02072	3	1
frag light	YES	6	YES	3 like items dig complete. items were dug out of the hole beca				0	N_016_01988	3	1
cans	YES	6	YES					0	N_016_01988	5	1
frag medium	YES	6	YES					0	N_016_01983	5	1
frag medium	YES	6	YES					0	N_016_01988	7	2
bullets	YES	6	YES			50 cal		0	N_016_01955	4	1
Frag (medium)	YES	6	YES					0	N_017_02325	2	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_01983	3	1
Frag (light)	YES	6	YES	3 like items dig complete				0	N_016_02039	4	1
Frag (light)	NO	8	YES	multiple small pieces of frag, meets the MV requirement, no m		Unknown		0	N_033_04398	1	0.1
Frag (medium)	NO	8	YES	3 + pieces of frag, meets the MV requirement,no mangnetic si		Unknown		0	N_033_04357	1	0.05
scrap	NO	8	YES	no mangnetic signature remains, does not meet the MV requi				0	N_00A_06046	2	0.001
Frag (light)	NO	8	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_035_04658	0	0.01
Frag (medium)	NO	8	YES			1x4 piece of frag		0	N_033_04347	0	0.4
Frag (medium)	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		Unknown		0	N_033_04421	2	0.03
Frag (light)	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		20 mm		0	N_034_04506	1	0.02
Frag (medium)	NO	8	YES			2x4		0	N_033_04345	1	0.4
Cans	NO	LOT 1	YES					0	N_00C_06223	3	1
Wire	NO	LOT 1	YES	foundva spool of wire		1 foot spool		0	N_017_02379	5	0.1
Small Arms Bullet	NO	LOT 1	YES			.50 cal		0	N_034_04567	3	1
Small Arms Bullet	YES	LOT 1	YES			.30 cal		0	N_032_04230	2	1
Small Arms Bullet	YES	LOT 1	YES			.50 cal		0	N_032_04272	1	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_030_03961	1	1
Small Arms Bullet	YES	LOT 1	YES	1 items dig complete				0	N_028_03769	4	1
rusted piece of metal	NO	LOT 2	YES	found 1 piece of rusty metal		.5x.5		0	N_017_02510	1	4
rusted piece of metal	NO	LOT 2	YES	found 1 piece of rusty metal		.5x.5		0	N_017_02510	4	1
	YES	LOT 1	YES	3 like items dig complete				0	N_00C_06184	1	1
Casing	YES	LOT 1	YES			Small Arms		0	N_036_04899	1	2
2.36 rocket	NO	LOT 2	NO	M6A1 2.36" HEAT Rocket, 13RCR6323231140				0	N_007_00606	5	1 lb
Small Arms Bullet	NO	LOT 2	YES			.50 cal		0	N_006_00504	3	1
Casing	NO	LOT 2	YES			Small Arms		0	N_006_00486	SPOILS	< 1
Frag (medium)	NO	LOT 2	YES	36 nails found within 1 meter, cleared all mangnetic signatures		Unknown		0	N_012_01230	1	< 1
Nails	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains				0	N_005_00327	1	< 1
Nails	NO	LOT 2	YES	found multiple nails		multiple nails		0	N_006_00525	4	1
Small Arms Bullet	YES	LOT 2	YES			.30 cal		0	N_006_00453	2	< 1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_006_00484	3	2
Small Arms Bullet	NO	12	YES			.30 cal		0	S_025_09217	3	1
Frag (medium)	NO	12	YES					0	S_025_09159	1	2
Frag (medium)	NO	3	YES			37mm		0	S_016_05816	1	< 1
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_015_05369	2	4
Small Arms Bullet	NO	12	YES	no mangnetic signature remains		.50 cal		0	S_028_10373	3	< 1
Small Arms Bullet	YES	12	YES	3 like items dig complete		.50 cal		0	S_028_10282	4	2
8 pieces of frag	NO	12	YES			small pieces		0	S_026_09705	1	2
Frag (light)	NO	12	YES			2 pieces of frag		0	S_028_10314	1	< 1
Small Arms Bullet	NO	12	YES			.50 cal		0	S_028_10320	1	1
Small Arms Bullet	YES	3	YES	multiple 762 bullets also		.50 cal		0	S_014_04923	0	< 1
Frag (medium)	NO	3	YES	also 2 small pieces of frag		37mm		0		3	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
rocket parts	NO	LOT 3	YES	1 items dig complete				0	S_008_03306	6	> 1 lb
	YES	LOT 3	YES	3 like items dig complete				0	N_029_03864	2	> 1 lb
Small Arms Bullet	NO	LOT 3	YES			763		0	S_009_03598	SPOILS	< 1
	YES	5	YES	3 like items dig complete				0	S_075_12681	0	6
	YES	5	YES	3 like items dig complete				0	S_075_12690	0	6
	YES	5	YES	3 like items dig complete				0	S_074_12644	0	5
Frag (medium)	NO	LOT 4	YES			Unknown		0	S_100_13287	0	< 1
Small Arms Bullet	NO	LOT 4	YES			7t2		0	S_100_13286	SPOILS	< 1
Frag (medium)	NO	LOT 4	YES			Unknown		0	S_099_13314	1	< 1
Cans	NO	LOT 4	YES			soda		0	S_037_11451	1	< 1
pipe fitting	NO	LOT 4	YES	same as S 040 11613				0	S_040_11613	8	2
Frag (medium)	NO	LOT 4	YES			37mm		0	S_041_11665	1	< 1
Small Arms Bullet	NO	LOT 4	YES			.50 cal		0	S_041_11664	SPOILS	< 1
Frag (medium)	NO	LOT 4	YES			37mm		0	N_080_05885	0	< 1
jacket	NO	13	YES			20 pieces		0	S_019_07271	2	1
nails and bottle caps	NO	13	YES			2 inch nails		0	S_019_07265	1	1
spring	NO	13	YES			25 inches		0	S_019_07262	0	6
construction debris	NO	13	YES			trash pit		0	S_019_07261	2	1 lb
Casing	YES	13	YES			Small Arms		0	S_RoadD_14482	3	< 1
Wire	YES	13	YES	3 like items dig complete				0	S_RoadD_14480	SPOILS	1
Small Arms Bullet	NO	13	YES	3 like items dig complete		.30 cal		0	S_019_07254	3	2
Frag (medium)	YES	13	YES	hot rocks still remaining				0	S_020_07654	1	2
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.50 cal		0	S_020_07658	1	1
Wire	YES	13	YES	hot rocks still remaining				0	S_018_06912	4	1
Frag (light)	NO	13	YES			Unknown		0	S_020_07667	2	< 1
Frag (light)	NO	13	YES			Unknown		0	S_020_07672	3	< 1
Nails	NO	1	YES	didn't meet the mv requirement		4 inch		0	S_036_11413	2	< 1
Small Arms Bullet	YES	1	YES	3 like items dig complete		.30 cal		0	S_012_04439	1	2
frag	YES	1	YES	4x frag ranging from 1x0.5 inch tp 1x3 inches steel ......remain		3x metal frag		0	S_022_08285	2	< 1
Frag (light)	YES	1	YES			Unknown		0	S_021_07829	0	< 1
Frag (light)	NO	1	YES			37mm		0	S_021_07829	0	< 1
Frag (light)	NO	1	YES			Unknown		0	S_022_08192	2	< 1
Frag (light)	NO	1	YES			37mm		0	S_032_10981	0	< 1
Frag (light)	YES	2	YES	3 pieces of frag of simular size, also 3+ .30cal bullets		Unknown		0	S_005_01980	SPOILS	< 1
Frag (light)	YES	2	YES	also found 3 Bullets		Unknown		0	S_006_02607	2	< 1
Frag (medium)	YES	2	YES			Unknown		0	S_005_02149	5	< 1
Frag (light)	NO	2	YES			Unknown		0	S_006_02535	SPOILS	< 1
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02871	1	3
Frag (medium)	YES	2	YES	3 like items dig complete				0	S_007_02798	2	8
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02769	1	5
Frag (light)	NO	9	YES	2 pieces of frag of similar size		Unknown		0	N_075_05822	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_074_05744	1	< 1
Frag (light)	YES	9	YES			Unknown		0	N_074_05744	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05801	SPOILS	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05805	0	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05782	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05783	SPOILS	< 1
Frag (light)	NO	9	YES			1x1.5		0	N_073_05708	1	1
Small Arms Bullet	NO	7	YES	found 3 like items and no rms		.30 cal		0	S_015_05571	5	< 1
Small Arms Bullet	NO	7	YES	found 3 bullets		.30 cal		0	S_015_05569	5	1
gernade pin	YES	17	YES	many small pieces of metal debri				0	N_013_01453	0	< 1
Frag (light)	YES	17	YES	also multiple other pieces of gernade frag and parts		gernade		0	N_012_01246	1	< 1
Nails	YES	17	YES					0	N_0C1_06248	3	< 1
Projectile AP	NO	17	YES	nose was pointing up, full body 37mm		37mm APCT		0	N_010_01042	4	1
bullet and small frag	YES	4	YES	multiple pieces small frag				0	N_030_03930	6	0.04
Frag (medium)	NO	8	YES	found 2 inert 20mm		20mm		0	N_034_04540	4	0.5
Frag (medium)	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		2 pieces		0	N_034_04480	2	0.7
Vehicle parts	NO	LOT 1	YES	found 1 piece of scrap metal		scrap metal		0	N_018_02639	9	0.1
	YES	LOT 1	YES	3 like items dig complete				0	N_028_03769	3	1
gernade pin	NO	LOT 2	YES	found 1 grenade pin		pin		0	N_014_01583	1	6
	NO	LOT 2	YES	found multiple hot rocks				0	N_014_01599	2	
gernade pin	NO	LOT 2	YES	found 1 grenade pin		pin		0	N_014_01583	6	1
	NO	LOT 1	YES	2 like items				0	N_034_04547	1	4
Nails	YES	LOT 2	YES	2 like items dig complete		2		0	N_008_00708	2	5
Casing	YES	12	YES	2 like items dig complete				0	S_025_09134	2	1
	YES	12	YES	3 like items dig complete				0	S_025_09129	0	4
Small Arms Bullet	YES	3	YES	2 like items dig complete				0	S_020_07459	2	2
Frag (light)	YES	3	YES	1 like items dig completed				0	S_018_06659	2	2
Frag (light)	NO	LOT 3	YES	1 items dig complete				0	S_004_01828	4	2
Casing	YES	LOT 4	YES	1 items dig complete				0	S_017_06125	4	1
37mm frag ...50 cal bullet	YES	1	YES	37mm frag with 50 cal bullet		2 inch x1.5 inch frag		0	S_018_06801	4	< 1
Small Arms Bullet	YES	1	YES	3 like items dig complete		.30 cal		0	S_010_03910	2	2
Fuze/Fuze Components	YES	1	YES			37mm base fuse		0	S_022_08226	0	< 1
windshield	NO	1	YES	1 items dig complete				0	S_RoadE_13977	4	4
Frag (light)	YES	2	YES			Unknown		0	S_006_02385	2	< 1
Small Arms Bullet	YES	2	YES	11 like items dig complete				0	S_008_03106	2	2
Small Arms Bullet	YES	9	YES			.50 cal		0	N_075_05785	4	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	NO	9	YES			Unknown		0	N_075_05784	0	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05792	2	< 1
gernade pin	YES	17	YES					0	N_013_01390	1	< 1
Frag (light)	YES	17	YES	gernade frag pieces and gernade fuse component		gernade		0	N_009_00897	SPOILS	< 1
Cans	YES	4	YES			trash		0	N_025_03410	4	1
Barbed Wire		4	YES			12inches		0	N_018_02591	0	0
Frag (heavy)	NO	10	YES	poss 105 frag		Other		0	N_014_01495	0	0.005
Frag (medium)	NO	10	YES			Unknown		0	N_014_01525	4	0.05
Cable	NO	10	YES			24 inches		0	N_014_01578	3	0.05
Small Arms Bullet	NO	10	YES			.30 cal		0	N_013_01336	6	0.005
Small Arms Bullet	YES	10	YES	3 .30 cal. cartridges		.30 cal		0	N_013_01355	4	0.005
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_010_01050	9	1
Frag (light)	NO	10	YES	piece of frag		piece of frag		0	N_016_02185	0	1
Frag (medium)	YES	10	YES			and shell casings		0	N_017_02512	2	0.5
Fuze/Fuze Components	NO	10	YES			t bar		0	N_017_02286	1	1
Other	YES	10	YES					0	N_017_02286	2	0.2
Vehicle parts	NO	10	YES					0	N_017_02307	4	0.1
Casing	YES	10	YES			Small Arms		0	N_017_02343	3	0.1
Other	NO	4	YES	fishing reel		3 inches		0	N_0C2_06294	0	1
nose cone	NO	4	YES			4 in		0	N_021_03011	1	1
Other	NO	4	YES					0	N_0C2_06434	4	0.1
Cans	YES	4	YES					0	N_025_03443	4	1
Frag (light)	NO	4	YES			wp		0	N_035_04664	2	0.5
Small Arms Bullet	YES	4	NO			.50 cal		0	N_063_05396	3	0.25
Small Arms Bullet	NO	4	YES			.50 cal		0	N_063_05396	5	0.25
	NO	4	YES					0	N_027_03648	4	0.1
Wire	YES	4	YES					0	N_036_04816	0	0.3
Small Arms Bullet	YES	4	YES					0	N_036_04816	3	0.1
Wire	YES	4	YES	left in place		very long		0	N_034_04462	0	2
Barbed Wire	YES	10	YES	Double strand barbed wire fence on surface, stretching east to		more than 100		0	N_012_01204	0	0
Nails	YES	10	YES	nail pit		avg nails		0	N_010_00948	2	0.1
Cable	YES	10	YES					0	N_017_02320	2	1
Frag (light)	YES	10	YES			and bullet casing		0	N_017_02313	4	0.1
Other	YES	10	YES	scrap metal				0	N_017_02346	1	0.1
Casing	YES	10	YES			Small Arms		0	N_017_02346	3	0.1
Casing	YES	10	YES			and 2 bullets		0	N_018_02593	4	0.2
Frag (heavy)	YES	10	YES			and 2 bullets		0	N_018_02556	1	3
Other	NO	10	YES	seed n3		seed		0	N3	12	8
Nails	NO	10	YES	2 nails		2		0	N_008_00777	6	0.005
Other	NO	10	YES	battery		battery		0	N_00C_06179	4	0.05
Nails	YES	10	YES					0	N_017_02469	3	0.02
Frag (light)	NO	10	YES					0	N_017_02391	7	0.01
Wire	YES	10	YES	left in place		fence		0	N_017_02249	0	2
Frag (medium)	YES	10	YES					0	N_00C_06182	3	0.5
Other	YES	10	YES			coin		0	N_00C_06214	2	0.01
Casing	YES	10	YES			Small Arms		0	N_012_01260	3	0.04
Other	YES	10	YES	2 M1 clips				0	N_012_01300	1	0.1
Frag (light)	NO	10	YES					0	N_012_01275	2	0.2
Other	NO	10	YES					0	N_012_01275	2	0.04
Casing	YES	10	YES			Small Arms		0	N_012_01274	3	0.02
Frag (medium)	YES	10	YES					0	N_011_01164	2	0.3
frag	NO	4	YES					0	N_032_04217	4	0.2
bullet	YES	4	YES					0	N_026_03490	4	0.03
frag	YES	4	YES					0	N_026_03490	7	0.03
frag	NO	4	YES					0	N_026_03501	5	0
nails	NO	4	YES	hex nut and nail				0	N_032_04314	4	0.05
nails and can	YES	4	YES	3 CD items removed				0	N_036_04850rw	2	0
Frag (heavy)	NO	6	YES	8 inches x 3inch piece of frag		Unknown		0	N_011_01069	4	1
Small Arms Bullet	NO	6	YES	does not meet the MV requirement, no mangnetic signitre sig		.50 cal		0	N_014_01602	0	0.1
Frag (medium)	NO	6	YES	meets the MV requirement		Unknown		0	N_019_02705	0	0.3
Frag (medium)	NO	6	YES					0	N_0A1_06064	6	1
Frag (light)	NO	6	YES					0	N_019_02797	3	1
Fuze/Fuze Components	NO	6	YES	found 1- fuze adapter		adapter		0	N_015_01738	7	0.25
Nails	YES	6	YES					0	N_016_02008	2	1
Frag (heavy)	YES	6	YES					0	N_016_02176	1	1
Frag (medium)	NO	6	YES					0	N_016_02108	3	1
Frag (light)	NO	6	YES	3 like items dig complete				0	N_016_02108	2	1
Frag (medium)	NO	6	YES					0	N_016_02140	4	1
sheet metal	NO	6	YES	piece of sheet metal	no	3inch		0	N_00A_06028	6	0.005
barbed wire	NO	6	YES		no	24 inch		0	N_015_01809	2	0.25
50 cal bullet	NO	6	YES		n	1x.25		0	N_015_01822	2	0.1
frag	NO	6	YES			3 pieces		0	N_013_01415	2	0.1
frag medium	YES	6	YES					0	N_016_01988	6	1
frag medium	YES	6	YES					0	N_016_02001	4	1
nails	YES	6	YES					0	N_016_02001	6	1
casing	YES	6	YES	and aluminum md scrap		50 cal		0	N_016_01955	9	1
frag medium	YES	6	YES	3 like items dig complete				0	N_016_02039	5	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
frag heavy	YES	6	YES					0	N_016_02028	8	1
other	NO	6	YES	1 14 inch by 1 inch piece of metal banding and 1 3 inch by 2 inc		2 different pieces		0	N_008_00715	10	0.5
other	YES	6	YES	seed #n11		12 inches		0	N11	12	1
other	NO	6	YES	30 06 m1 garand clip with 8 unfired blanks		2.5 inch long		0	N_009_00918	4	0.5
other	YES	6	YES	about half dozen can lid...hole carrictorized but still hot		3inch		0	N_010_00936	0	0.005
other	YES	6	YES	3 hinges 4 inch x 1.5 inch hole has been characterized but still		4 inch		0	N_010_00936	2	0.05
other	YES	6	YES	6 grenade spoons with pins hole has been characterized but st		4 inch		0	N_010_00936	6	0.005
Wire	NO	6	YES	bent up piece of plain wire		12 inches		0	N_010_00979	0	0.005
Small Arms Bullet	NO	6	YES			.50 cal		0	N_017_02365	2	1
Frag (medium)	NO	6	YES					0	N_017_02419	2	1
Frag (heavy)	NO	6	YES					0	N_0A1_06068	1	1
Can	NO	6	YES	2 cans 1 beer can (tall boy) and 1 spray paint can full of dirt		8 inches		0	N_011_01130	0.1	1
Wire	NO	6	YES	11 inch piece of metal wire		11 inch		0	N_008_00730	6	0.005
Nails	YES	6	YES	5 8d nails found dig stopped....possible nail pitt		2.5 inch		0	N_013_01378	1	0.005
Wire	NO	6	YES			24 in		0	N_015_01809	0	0.1
m1 clips	NO	6	YES			1x1		0	N_015_01797	21	0.1
Nails	NO	6	YES			3 nails		0	N_014_01651	2	0.1
Frag (medium)	YES	6	YES					0	N_016_01988	2	1
Frag (medium)	YES	6	YES	3 like items dig complete				0	N_016_01955	3	1
	YES	6	YES	possible sampling location		small		0	N_016_02039	2	1
Wire	NO	8	YES	plain piece of wire		2 inch long		0	N_042_05133	3	0.005
Frag (heavy)	NO	8	YES	20mm frag		2 inch long		0	N_0A4_06134	6	1
Frag (heavy)	NO	8	YES	4x2 inch piece of frag		Unknown		0	N_036_04853	0	1
Small Arms Bullet	NO	8	YES	7.62 bullet		7.62		0	N_036_04853	6	0.005
Frag (heavy)	NO	8	YES	unknown piece of frag.....round disk with hole in center		Unknown		0	N_038_05058	8	1
Frag (heavy)	NO	8	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_033_04407	0	0.2
Fuze/Fuze Components	YES	8	YES	3 like items dig complete				0	N_026_03531	5	1
Frag (medium)	YES	8	YES	1 like items dig complete		Unknown		0	N_026_03531	3	1
Frag (medium)	NO	8	YES	1 items dig complete		Unknown		0	N_026_03491	2	1
Vehicle parts	NO	8	YES	1 items dig complete				0	N_026_03505	1	1
Barbed Wire	NO	8	YES	1 items dig complete				0	N_025_03334	1	1
Nails	YES	8	YES	3 like items dig complete				0	N_028_03718	3	1
Frag (light)	NO	8	YES	20mm cartridge case has been fired		cartridge		0	N_036_04847	6	0.05
Small Arms Bullet	NO	8	YES			45 bullet		0	N_035_04796	2	0.1
Barbed Wire	YES	8	YES	buried fences with anchor point				0	N_029_03842	6	10
No further entries- mar	YES	8	YES	3 like items dig complete				0	N_030_04062	1	1
Nails	NO	8	YES					0	N_031_04079	1	1
Fuze/Fuze Components	NO	8	YES					0	N_032_04177	2	1
Tail Fins	NO	8	YES	60mm tail fin, and 1 inch under fin was the boom		60mm Mortar		0	N_036_04946	0	1
Frag (heavy)	NO	8	YES	unknown piece of brass frag		Unknown		0	N_0A3_06116	2	1
Frag (light)	NO	8	YES			1x5		0	N_033_04420	1	0.4
Nails	NO	8	YES			5 inch		0	N_032_04268	4	0.1
Frag (light)	NO	8	YES	1 items dig complete		Unknown		0	N_032_04327	4	1
Frag (light)	NO	8	YES	1 items dig complete				0	N_032_04300	2	1
Frag (light)	NO	8	YES	1 items dig complete				0	N_032_04229	2	1
Frag (light)	NO	8	YES	1 items dig complete				0	N_031_04087	2	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_029_03915	1	1
	YES	LOT 1	YES	found 3 hot rocks				0	N_017_02446	0	0
	YES	LOT 1	YES	3 like items dig complete				0	N_032_04272	1	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_033_04331	1	1
Small Arms Bullet	YES	LOT 1	YES			.50 cal		0	N_030_03961	2	1
Small Arms Bullet	YES	LOT 1	YES			.50 cal		0	N_030_03974	2	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_030_03974	1	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_030_04015	1	1
Vehicle parts	YES	LOT 1	YES	3 like items dig complete				0	N_030_03950	3	1
metal bracket	NO	LOT 1	YES			4 inch		0	N_040_05102	4	0.1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_025_03433	2	1
other	YES	LOT 1	YES	1 items dig complete		12in file		0	N_026_03454	0	1
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_028_03799	2	1
Wire	YES	LOT 2	YES	wire found with minelab		8 inches		0	N_002_00103	1	4
Small Arms Bullet	YES	LOT 2	YES	11 45 cal bullet		45 cal bullet		0	N_007_00603	1	3
Wire	YES	LOT 2	YES	wire found with minelab		8 inches		0	N_002_00103	4	1
Small Arms Bullet	YES	LOT 2	YES	11 45 cal bullet		45 cal bullet		0	N_007_00603	3	1
Nails	NO	LOT 2	YES	3 nails at different depths		3 inches		0	N_00B_06138	4	1
other	NO	LOT 2	YES	8x8x8 u bracket with threaded ends		u bracket		0	N_00B_06159	3	10
Casing	NO	LOT 2	YES			multiple small pieces		0	N_014_01686	1	0.1
Small Arms Bullet	NO	LOT 2	YES			bullet pieces		0	N_014_01683	1	0.1
Cans	NO	LOT 1	YES			12oz		0	N_031_04144	0.1	0
Small Arms Bullet	NO	LOT 1	YES			.50 cal		0	N_036_04863	0.1	1
	YES	LOT 1	NO	1 items dig complete				0	N_030_03973	1	3
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_030_03973	1	2
No further entries- mar	YES	LOT 1	YES	3 like items				0	N_031_04113	1	2
	YES	LOT 1	YES	3 like items dig complete				0	N_032_04317	1	1
Nails	YES	LOT 1	YES	3 like items				0	N_035_04658	1	5
	YES	LOT 1	YES	3 like items				0	N_034_04547	1	6
Nails	YES	LOT 1	YES	3 like items dig complete				0	N_00C_06206	1	2
Nails	NO	LOT 1	YES					0	N_00C_06207	1	2

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
No further entries- mar	YES	LOT 1	YES	3 like items dig complete				0	N_00B_06148	1	1
Casing	NO	LOT 2	YES	grenade pins and nails found in same hole		Small Arms		0	N_013_01345	6	
Wire	NO	LOT 2	YES	2 pieces of wire both about 5 inches		10 inch		0	N_012_01272	1	0.2
Frag (heavy)	NO	LOT 2	YES			4x3x1/2		0	N_012_01217	0	> 1 lb
Nails	YES	LOT 2	YES	11 nails like items dig complete				0	N_010_01010	5	6
Small Arms Bullet	YES	LOT 2	YES	1 items dig complete				0	N_008_00711	4	1
Small Arms Bullet	NO	LOT 2	YES			.50 cal		0	N_006_00486	3	2
other	YES	LOT 2	YES	1st piece tip of a cleaning rod, just under that was a 2x2 what		3.5 inch		0	N_004_00217	2	3
other	YES	LOT 2	YES	ammo can lid....magnetic signature remaining because of hot		10 inch		0	N_004_00188	0	1 lb
Can	YES	LOT 2	YES	a really old beer can they needed a church key to open it....ma		5 inch		0	N_006_00481	0	4
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00954	6	1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00956	3	1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00991	2	1
57mm APT	YES	LOT 2	YES	1 items dig complete				0	N_011_01103	8	> 1 lb
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00986	3	3
	YES	LOT 2	YES	3 like items dig complete				0	N_008_00792	3	2
Frag (light)	YES	LOT 2	YES	1like items dig complete				0	N_006_00471	2	2
Cans	YES	LOT 2	YES	3 like items dig complete				0	N_006_00459	2	4
Small Arms Bullet	YES	12	YES	4 7.62 bullets		7.62 bullet		0	S_029_10636	2	2
Small Arms Bullet	YES	12	YES	from surface down 2 inch found ....magnetic signature still rem		7.62		0	S_029_10626	2	2
Small Arms Bullet	YES	12	YES	4 7.62 bullets...magnetic signature still remaining because of h		7.62		0	S_028_10460	0	1
Frag (light)	YES	12	YES	1 9 inches long rotating band, 2 piece of metal frag unknown 2		other		0	S_028_10450	0	3
Frag (heavy)	YES	12	YES	1 37mm nose , 5 7.62 bullets...magnetic signature still remaini		other		0	S_028_10447	0	1 lb
Small Arms Bullet	NO	12	YES	2 7.62 bullets		7.62		0	S_028_10441	0	1
Small Arms Bullet	YES	12	YES	1 .50 cal bullet , 2 7.62 bullets...magnetic signature still remain		.50 cal		0	S_027_10119	0	4
Fuze/Fuze Components	NO	12	YES			1 inch ring		0	S_025_09238	0	< 1
Small Arms Bullet	NO	12	YES			3 small pieces		0	S_025_09224	2	< 1
	YES	12	YES	3 like items dig complete				0	S_021_07719	2	3
	YES	12	YES	1 items dig complete				0	S_024_08807	0	> 1 lb
Casing	YES	12	YES	1 items dig complete				0	S_025_09126	1	1
Casing	YES	12	YES	3 like items dig complete		Small Arms		0	S_025_09153	SPOILS	< 1
Small Arms Bullet	YES	LOT 1	YES	7.62 bullet found with minelab		7.62		0	N_048_05256	0.005	3
Frag (heavy)	YES	3	YES	2x.5 inch frag unknown .....magnetic signature still remaining b		Unknown		0	S_020_07373	2	6
Small Arms Bullet	YES	3	YES	2 7.62 bullets .....magnetic signature still remaining because of		other		0	S_019_07054	3	2
Small Arms Bullet	NO	3	YES			5 small pieces		0	S_013_04604	1	1
Frag (medium)	NO	3	YES			6x1 inch frag		0	S_013_04622	1	2
	YES	3	YES	3 like items dig complete				0	S_023_08515	5	7
Small Arms Bullet	NO	3	YES	1 items dig complete				0	S_020_07476	2	2
Small Arms Bullet	NO	3	YES	2 like items dig complete				0	S_019_07109	3	3
Projectile HE	YES	3	YES			37mm		0	S_016_05871	0	6
Frag (light)	YES	3	YES	1 items dig complete				0	S_016_05864	1	3
Small Arms Bullet	YES	5	YES	1 7.62 bullet .....magnetic signature still remaining because of		other		0	S_RoadD_14333	3	3
Frag (heavy)	YES	12	YES	4x.5 inch piece of metal frag...magnetic signature still remainir		Unknown		0	S_025_09251	2	8
Small Arms Bullet	YES	12	YES	4 7.62 bullets....magnetic signature still remaining because of l		other		0	S_025_09254	3	2
Small Arms Bullet	YES	12	YES	1 .50 cal , 8 7.62 bullets.......hole charactorized		.50 cal		0	S_026_09796	2	4
Small Arms Bullet	NO	12	YES			.30 cal		0	S_027_10088	1	< 1
Barbed Wire	NO	12	YES	1 items dig complete				0	S_026_09677	0	1 lb
Cans	NO	12	YES	2 like items dig complete				0	S_028_10271	0	4
Frag (light)	NO	12	YES			37mm frag		0	S_025_09194	0	2
Frag (light)	NO	12	YES			1x4 frag		0	S_026_09710	1	1
Frag (light)	NO	12	YES			pieces of frag		0	S_027_10051	1	< 1
bolt and nuts	YES	12	YES	3 like items dig complete				0	S_022_08104	3	3
Frag (heavy)	YES	3	YES	3 pieces of 37mm frag......magnetic signature still remaining be		other		0	S_018_06598	0	8
Small Arms Bullet	YES	3	YES	2 shotgun shells......magnetic signature still remaining because		other		0	S_018_06598	2	1
Frag (heavy)	YES	3	YES	37mm piece of metal frag ....magnetic signature still remaining		other		0	S_020_07368	3	9
37mm	NO	3	YES	37mm tp is md treated as mec auth to move by safety and sux				0	S_022_08143	0	5
Frag (light)	NO	3	YES	1 like items dig completed				0	S_020_07437	2	1
Small Arms Bullet	YES	3	YES	1 like items dig completed				0	S_018_06672	2	2
Small Arms Bullet		3	YES			15 small pieces		0			
Frag (light)	NO	3	YES			75 mm flash tube		0		1	< 1
Small Arms Bullet	YES	LOT 3	YES	3 7.62 bullets and hot rocks		other		0	S_005_02209	3	3
Frag (heavy)	YES	LOT 3	YES	2 pieces of unknown frag 1x.5...hot rocks		Unknown		0	S_005_02210	2	6
Cans	NO	LOT 3	YES	1 like items dig complete				0	N_0C1_06253	4	2
grenade pin	NO	LOT 3	YES	1 items dig complete				0	N_003_00165	5	1
Target/Target Debris	NO	LOT 3	YES	1 items dig complete				0	N_004_00225	3	7
Wire	NO	LOT 3	YES	1 items dig complete				0	S_006_02697	4	1
other	YES	LOT 3	YES	half of a big impact socket....hot rocks found with schonstedt		4 inch		0	S_018_06933	3	> 1 lb
Small Arms Bullet	YES	LOT 3	YES	1 12ga shotgun shell .....hot rocks found with schonstedt		other		0	S_016_06016	2	2
Wire	YES	LOT 3	YES	1 18 inches long piece of metal wire....hot rocks found with scl		18 inches		0	S_012_04447	2	8
links	NO	LOT 3	YES	1 like items dig complete				0	N_025_03381	5	1
Wire	NO	LOT 3	YES	5 like items dig complete				0	N_025_03374	3	2
Wire	NO	LOT 3	NO	3 like items dig complete				0	N_025_03412	4	2
Small Arms Bullet	NO	LOT 3	YES	1 items dig complete				0	N_026_03564	3	1
	NO	LOT 3	YES	3 like items dig complete				0	N_026_03564	0	4
	YES	LOT 3	YES	3 like items dig complete				0	N_026_03568	0	2
Small Arms Bullet	YES	LOT 3	YES	1 items dig complete item				0	N_029_03864	4	3
	YES	LOT 3	YES	3 like items dig complete				0	N_030_04009	0	3

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
scrap metal	NO	LOT 3	YES					0	S_003_01416	0	< 1
Frag (medium)	NO	LOT 3	YES			1x4 frag 37 mm		0	S_005_02266	3	2
rabies tag	NO	LOT 3	YES			1 inch diameter		0	S_004_01777	0	< 1
Wire	NO	LOT 3	YES			60 feet wire		0	S_006_02673	0	1 lb
Small Arms Bullet	NO	LOT 3	YES			30 cal jacket		0	S_003_01428	1	< 1
Small Arms Bullet	YES	5	YES	1 .50 cal bullet ....magnetic signature still remaining because o		.50 cal		0	S_045_11787	0	5
Vehicle parts	YES	5	YES	auto battery hold down frame ....magnetic signature still rema		12 inches		0	S_079_12939	1	1
Small Arms Bullet	NO	5	YES	1 items dig complete				0	S_075_12684	3	1
Cans	NO	LOT 4	YES					0	S_037_11451	1	< 1
Nails	NO	LOT 4	YES	1 items dig complete				0	S_020_07323	5	1
metals	YES	LOT 4	YES	2 like items dig complete				0	S_019_06966	0	4
tin	YES	LOT 4	YES	1 items dig complete				0	S_017_06125	2	1 lb
Buckets	NO	LOT 4	YES					0	S_022_08111	0	4
Small Arms Bullet	NO	LOT 4	YES	4 7.62 bullets ...hot rocks still remaining		other		0	S_RoadE_13944	2	4
Small Arms Bullet	NO	LOT 4	YES	1 squished 7.64 bullet ....hot rocks still remaining		other		0	S_RoadE_13945	2	3
Small Arms Bullet	NO	LOT 4	YES	2 7.62 bullets and 1 .30 carbine bullet....as so there was a alum		other		0	S_RoadE_13946	2	4
Small Arms Bullet	NO	LOT 4	YES			.50 cal		0	S_048_11972	1	< 1
Small Arms Bullet	NO	LOT 4	YES					0	S_015_05247	SPOILS	2
Small Arms Bullet	NO	LOT 4	YES					0	S_016_05695	1	2
other	NO	13	YES	1 bolt.......hot rocks still remaining		1.5 inch long		0	S_RoadD_14485	3	8
Casing	NO	13	YES	multiple small pieces of 30 cal jackets		multiple small pieces of jackets		0	S_019_07274	3	4
Nails	NO	13	YES			4 in nails		0	S_019_07272	0	< 1
Casing	NO	13	YES			Small Arms		0	S_019_07272	0	1
scrap metal	NO	13	YES			1x3		0	S_019_07271	3	1
metal debris	NO	13	YES			2x4		0	S_019_07268	3	2
metal debris	NO	13	YES			3x5		0	S_019_07266	2	1
bottle caps and nails	NO	13	YES			9 items		0	S_019_07266	0	1
can	NO	13	YES			8 inch		0	S_019_07262	2	4
Frag (light)	NO	13	YES			3x1/2 inch		0	S_019_07260	2	1
bolt	NO	13	YES			3x1		0	S_019_07259	3	4
co2 cartridge	NO	13	YES			3 inch		0	S_019_07257	2	3
spark plugs	NO	13	YES			3 inch		0	S_019_07256	3	2
Frag (medium)	YES	13	YES	hot rocks still remaining				0	S_RoadD_14464	1	4
Small Arms Bullet	YES	13	YES	hot rocks still remaining		.30 cal		0	S_020_07656	1	< 1
Nails	YES	13	YES	hot rocks still remaining				0	S_020_07660	1	1
electric motor	NO	13	YES					0	S_020_07664	0	4
washer	YES	1	YES	2 inch diameter washer ...l... remaining magnetic signature be		2.5 inch washer		0	S_018_06799	3	< 1
Frag (heavy)	YES	1	YES	3 piece of metal frag 2x2 inch possibly 37mm frag ...magnetic s		other		0	S_022_08262	2	2
Wire	NO	1	YES	wire was coiled up like a spring				0	S_013_04706	0	< 1
welding rod	NO	1	YES			12 inch		0	S_036_11403	1	1
Small Arms Bullet	YES	1	YES	3 like items dig complete				0	S_026_09918	2	2
bullets	YES	1	YES	4x 50 cal bullet ..... remaining magnetic signature because of h		4x50cal		0	S_022_08340	1	< 1
frag	YES	1	YES	3xfrag 2 inch x 0.25 inch each ..... remaining magnetic signatur		3xfrag		0	S_022_08284	1	< 1
Frag (medium)	YES	1	YES			37mm partial body		0	S_021_07836	2	< 1
Fuze/Fuze Components	NO	1	YES					0	S_031_10831	2	< 1
Frag (light)	YES	1	YES	3 like items dig complete				0	S_003_01345	3	3
Frag (light)	YES	2	YES			Unknown		0	S_005_02133	1	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02102	1	< 1
Frag (heavy)	YES	9	YES	3 and done.....3 piece of metal frag starting at 2.5x1 inch dowr		Unknown		0	N_074_05730	1	1
Frag (heavy)	YES	9	YES	3 and done ....3 piece of metal frag starting 2.5x.25 to .5x.5 inc		Unknown		0	N_074_05756	1	1
Frag (heavy)	YES	9	YES	3 and done .....3 piece of metal frag 1x.05 to .5x.5.....magnetic		Unknown		0	N_074_05733	2	< 1
Frag (heavy)	YES	9	YES	3 and done ....piece of metal frag ranging from 1x.5 down to .5		Unknown		0	N_074_05752	1	< 1
Frag (heavy)	YES	9	YES	3 and done .....3 piece of metal frag 1x.5 inch ......magnetic sig		Unknown		0	N_074_05737	1	1
Frag (heavy)	YES	9	YES	3 and done ..3 piece of metal frag 2.5x1, down to 1x.5 inch		Unknown		0	N_074_05727	1	1
Frag (light)	YES	9	YES			Unknown		0	N_075_05791	0	< 1
Frag (light)	NO	9	YES			1x1.5		0	N_073_05708	1	1
Frag (heavy)	NO	9	YES			37mm frag		0	N_073_05671	1	2
Frag (light)	NO	9	YES			3 pieces of frag		0	N_073_05671	1	1
Frag (light)	YES	9	YES	1 items dig complete				0	N_077_05859	3	2
Frag (heavy)	YES	9	YES	3 and done ....3 piece of metal frag 2x.5 down to 1x.5 inch		Unknown		0	N_073_05704	3	< 1
Frag (heavy)	YES	9	YES	3 and done ...3 piece of metal frag starting at 2.75x1 down to 1		Unknown		0	N_073_05706	1	< 1
Small Arms Bullet	NO	16	YES			.50 cal		0		2	< 1
Frag (light)	NO	16	YES			1x.25		0		1	< 1
Small Arms Bullet	NO	16	YES			.50 cal jacket		0		1	< 1
pop top	NO	16	YES			1 inch diameter		0		1	< 1
Frag (light)	YES	17	YES	gernade pit consisting of frag firing pins and safety pins		gernade frag		0	N_013_01463	SPOILS	< 1
Frag (light)	YES	17	YES			gernade frag		0	N_011_01187	SPOILS	< 1
sign post part	NO	17	YES					0	N_009_00833	3	1
12 gage shell	NO	17	YES			.5x.5		0	N_005_00314	1	< 1
bolt	NO	17	YES			.5x.2		0	N_006_00507	1	< 1
Can	NO	17	YES			12oz		0	N_006_00520	0	1
can lid	NO	17	YES			1 inch x.25 inch		0	N_004_00224	1	< 1
Cans	NO	10	YES					0	N_012_01208	4	0
clip	NO	10	YES					0	N_009_00830	2	0
Casing	YES	10	YES			and bullets		0	N_017_02468	1	0.1
Buckets	NO	6	YES	bucket handle		bucket handle		0	N_013_01344	4	0.4
Frag (light)	NO	6	YES			Unknown		0	N_013_01437	2	0.2

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (medium)	NO	6	YES	MV requirement met, 3 like items, and no magnetic signiture r		Unknown		0	N_013_01349	1	0.5
Frag (medium)	NO	6	YES	meet the MV requirement, no mangnetic signitre signature re		Unknown		0	N_015_01950	1	0.2
Frag (light)	NO	6	YES	does not meet the MV requirement		Unknown		0	N_014_01682	0	0.01
Frag (light)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_018_02611	0	0.3
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_012_01281	1	0.2
Frag (light)	YES	8	YES	does not meet the MV requirement, anomaly anomalys still pr		Unknown		0	N_034_04472	0	0.1
Frag (medium)	YES	8	YES	does not meet the MV requirement		Unknown		0	N_034_04474	0	0.1
Frag (light)	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		Unknown		0	N_033_04369	1	0.02
Casing	NO	8	YES	1 items dig complete				0	N_031_04087	3	1
	YES	LOT 1	YES	found 3 hot rocks				0	N_020_02948	0	0
Casing	YES	LOT 2	YES	1 30 06 cartridge case no bullet , cartridge has been fired		30 06		0	N_007_00603	1	2
Casing	YES	LOT 2	YES	1 30 06 cartridge case no bullet , cartridge has been fired		30 06		0	N_007_00603	2	1
	NO	LOT 1	YES	3 like items				0	N_030_04023	1	2
Target/Target Debris	NO	LOT 1	YES	1 items dig complete				0	N_031_04113	1	3
No further entries- mar	YES	LOT 1	YES	3 like items				0	N_035_04658	1	2
Small Arms Bullet	YES	LOT 2	YES	1 items dig complete				0	N_010_01010	2	3
Frag (light)	YES	LOT 2	YES	4 frag like items dig complete				0	N_010_01010	4	3
machines gunlink	YES	LOT 2	YES	1 items dig complete				0	N_010_01010	3	3
shipping container for smoke	NO	LOT 2	YES	also on surface was 2 handles that would be used for com wir				0	N_010_00934	0	< 1
Wire	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains				0	N_004_00242	1	< 1
scrap metal	NO	LOT 2	YES	no mangnetic signature remains				0	N_00C_06213	SPOILS	< 1
Frag (light)	NO	LOT 2	YES	part of nose cone off a 3.5 in rocket		Unknown		0	N_003_00142	2	< 1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00958	4	1
Casing	YES	LOT 2	YES	8 like items dig complete				0	N_011_01103	5	6
	YES	LOT 2	YES	3llike items dig complete				0	N_008_00797	3	2
Casing	YES	12	YES	2 like items dig complete				0	S_022_08087	2	2
Wire	YES	12	YES	1 items dig complete				0	S_022_08096	2	3
Small Arms Bullet	NO	12	YES	1 items dig complete				0	S_024_08814	2	2
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_024_08912	3	1
Small Arms Bullet	YES	3	YES	4 like items dig complete				0	S_024_08910	3	2
Small Arms Bullet	YES	3	YES	3 like items dig				0	S_024_08905	0	2
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_025_09262	3	2
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_022_08174	3	1
Small Arms Bullet	YES	3	YES	2 like items dig complete				0	S_022_08176	3	1
Small Arms Bullet	NO	3	YES	2 like items dig complete				0	S_020_07464	4	2
Frag (light)	YES	3	YES	1 items dig complete				0	S_020_07459	4	2
Frag (light)	NO	3	YES	1 items dig complete				0	S_017_06288	2	2
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_015_05355	4	2
Frag (medium)	NO	12	YES			Unknown		0	S_028_10354	1	< 1
Frag (medium)	NO	12	YES			37mm		0	S_027_10067	0	< 1
Cable	YES	12	YES	ukn lengths x2 cables buried.				0	S_025_09169	1	> 1 lb
	NO	12	YES	3 like items dig complete				0	S_028_10266	3	8
	YES	12	YES	3 like items dig complete				0	S_027_10016	3	4
Small Arms Bullet	YES	12	YES	1 items dig complete				0	S_022_08104	2	1
Small Arms Bullet	YES	12	YES	3 like items dig complete				0	S_027_10028	4	1
Frag (light)	YES	12	YES	3 like items dig complete				0	S_028_10306	3	2
Frag (light)	YES	3	YES	1 like items dig completed				0	S_019_07060	2	2
Small Arms Bullet	YES	3	YES	4 items dig completed				0	S_018_06659	2	2
Frag (light)	YES	3	YES	2 like items dig completed				0	S_018_06640	3	2
Small Arms Bullet	YES	3	YES	11 like items dig completed				0	S_018_06640	4	4
Frag (light)	YES	3	YES	1 like items dig completed				0	S_017_06198	4	3
Small Arms Bullet	YES	3	YES	2 like items dig completed				0	S_017_06192	3	3
Small Arms Bullet	YES	3	YES	4 like items dig completed				0	S_018_06616	5	2
Frag (light)	YES	3	YES	3 like items dig completed				0	S_018_06616	2	3
Small Arms Bullet	NO	3	YES	10 + bullets		762		0		SPOILS	< 1
Small Arms Bullet	YES	3	YES	3+bullets		762		0		SPOILS	< 1
Small Arms Bullet	NO	3	YES	3+ bullets		762		0		SPOILS	< 1
Small Arms Bullet	NO	3	YES	3+bullets		762		0		0	< 1
scrap	NO	LOT 3	YES	1 items dig complete				0	N_0C1_06257	2	1
Cans	NO	LOT 3	YES	1 items dig complete				0	S_007_03019	2	2
Casing	NO	LOT 3	YES	1 items dig complete				0	S_007_03019	4	1
Wire	NO	LOT 3	YES	1 items dig complete				0	N_0C1_06253	5	6
Nails	NO	LOT 3	YES	1 items dig complete				0	N_004_00225	3	5
rocket part	NO	LOT 3	YES	1 items dig complete				0	S_006_02697	4	2
Tail Fins	NO	LOT 3	YES	1 items dig complete				0	N_025_03381	3	2
Small Arms Bullet	NO	LOT 3	YES			762		0	S_004_01765	SPOILS	< 1
	YES	5	YES	3 like items dig complete				0	S_075_12698	0	4
Small Arms Bullet	NO	13	YES	5+ jackets		.30 cal		0	S_020_07668	SPOILS	< 1
Casing	YES	13	YES	3+		Small Arms		0	S_020_07673	SPOILS	< 1
Frag (medium)	NO	LOT 3	YES			Unknown		0	S_019_07285	0	< 1
rotating band	YES	1	YES					0	S_009_03553	0	< 1
Small Arms Bullet	NO	1	YES			.50 cal		0	S_009_03539	4	< 1
Fuze/Fuze Components	NO	1	YES			37mm dummy fuse		0	S_018_06768	1	< 1
Small Arms Bullet	YES	1	YES	+ multiple 762 small arms bullets		.50 cal		0	S_018_06783	0	< 1
Frag (light)	YES	1	YES			Unknown		0	S_021_07837	4	< 1
Frag (light)	NO	1	YES			Unknown		0	S_031_10832	0	< 1
Fuze/Fuze Components	NO	1	YES			nose portion of fuze		0	S_031_10875	2	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	NO	1	YES			Unknown		0	S_018_06834	SPOILS	< 1
Small Arms Bullet	NO	1	YES	2 bullets		.50 cal		0	S_019_07172	SPOILS	< 1
Frag (light)	YES	2	YES			Unknown		0	S_006_02579	4	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02120	SPOILS	< 1
Frag (light)	YES	2	YES	2 pieces of frag of simular size and 3+Bullets		Unknown		0	S_006_02408	1	< 1
Small Arms Bullet	YES	2	YES	10 like items dig complete				0	S_008_03082	2	3
Small Arms Bullet	YES	2	YES	14 like items dig complete				0	S_010_03684	2	3
Frag (light)	YES	2	YES	multiple hot rocks still remaining		Unknown		0	S_003_01312	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05782	SPOILS	< 1
Small Arms Bullet	YES	17	YES			.50 cal		0	N_012_01256	SPOILS	< 1
Cable	YES	10	YES	one wire left in place		1/8"		0	N_016_02159	1	1
Frag (heavy)	NO	10	YES					0	N_017_02307	1	1
	NO	4	YES					0	N_0C2_06409	0	0.1
Frag (light)	NO	4	YES					0	N_0C2_06428	4	0.1
Frag (medium)	YES	4	YES					0	N_036_04904	2	0
Frag (light)	NO	10	YES			2x1		0	N_019_02736	3	0.2
Frag (light)	YES	10	YES					0	N_017_02469	5	0.1
Nails	YES	10	YES					0	N_012_01260	1	0.05
Casing	YES	10	YES	removed 3 like items		Small Arms		0	N_012_01297	2	0.1
Frag (light)	YES	10	YES					0	N_012_01274	2	0.4
2.36 motor	YES	4	YES	rusted flakes from fins				0	N_030_03930	4	1.5
Frag (light)	NO	6	YES	multiple small pieces of frag, does not meet the MV requireme		Unknown		0	N_014_01540	0	0.4
Small Arms Bullet	NO	6	YES			.50 cal		0	N_019_02797	1	1
Frag (light)	YES	6	YES	found 1 small piece of 1x1in frag		small piece of frag		0	N_015_01756	4	0.1
bullets	YES	6	YES	3 like items hole complete		30 cal		0	N_016_01983	7	1
Frag (medium)	NO	6	YES			2x4		0	N_015_01942	3	0.25
Nails	NO	6	YES			5 inch		0	N_013_01479	2	0.1
Frag (light)	NO	6	YES			1x3		0	N_015_01822	2	1
other	YES	LOT 2	YES	carpet full of, and I bet you can't guess.....ah you did carpet ta		carpet		0	N_002_00060	2	< 1
Cans	YES	LOT 2	YES	under the carpet was beer cans 3 of them....it must have been		4 inch		0	N_002_00060	5	1
Frag (light)	NO	8	YES			.5x.5		0	N_033_04453	1	0.1
Casing	NO	8	YES					0	N_032_04268	2	0.2
metal bracket	NO	LOT 1	YES	same as n00a 05998. targets within a meter of each other		4 inch		0	N_040_05102	3	0.1
Small Arms Bullet	NO	LOT 1	YES			.50 cal		0	N_030_04064	1	0.2
Cans	YES	LOT 2	YES	under the carpet was beer cans 3 of them....it must have been		4 inch		0	N_002_00060	1	5
Wire	YES	LOT 2	YES	some type of wire h frame		12 inches		0	N_006_00448	0	4
hanger	YES	LOT 2	YES	regular wire hanger ...this area is a trash sight		14 inches		0	N_006_00448	0	2
Can	YES	LOT 2	YES	3 beer cans		5 inch		0	N_006_00400	0	1
Small Arms Bullet	NO	LOT 1	YES			.50 cal		0	N_033_04376	0.2	0
No further entries- mar	YES	LOT 1	YES	3 like items dig				0	N_035_04699	1	3
Small Arms Bullet	NO	LOT 2	YES	also in hole nails and multiple small pieces of bullet casing		233		0	N_012_01265	1	< 1
Wire	NO	LOT 2	YES	a 4 ft rod metalinluded w/ wire		barbed wire		0	N_012_01203	0	1 lb
linkage	YES	LOT 2	YES	1 items dig complete				0	N_008_00711	6	1
Nails	YES	LOT 2	YES	18 like items dig complete				0	N_008_00711	7	1
Nails	NO	LOT 2	YES					0	N_006_00504	2	< 1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00966	3	1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00989	3	1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00970	2	1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_0101	2	1
Nails	YES	LOT 2	YES	3 like items dig complete				0	N_010_00987	2	1
	YES	LOT 2	YES	point is 768 but marked 797 also 3 like items dig complete				0	N_008_00768	2	1
Frag (light)		12	YES			2x.5		0	S_024_08865		
Frag (light)	NO	12	YES			4 inch x.25 ynch		0	S_028_10398	4	2
Nails	YES	12	YES	1 items dig complete				0	S_022_08087	1	1
Nails	YES	12	YES	3 like items dig complete				0	S_025_09144	1	2
Barbed Wire fence	YES	12	YES	1 complete buried fence				0	S_025_09135	6	1 lb
Small Arms Bullet	NO	LOT 1	YES	casing and bullet in same hole		.50 cal		0	N_023_03248	0.1	1
Barbed Wire	NO	LOT 1	NO			12 feet		0	N_029_03831	1	0
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_024_08927	2	2
Small Arms Bullet	YES	3	YES	3 like items dig complete				0	S_024_08892	3	2
Nails	NO	5	YES			3 nails		0	S_055_12175	1	0
Can	NO	13	YES	1 crushed coors can.....hot rocks still remaining		3 inch		0	S_018_06923	0	1
Fuze/Fuze Components	YES	12	YES	also multiple small pieces of frag 10+		t bar		0	S_029_10575	0	1
Frag (light)	YES	12	YES	3 like items dig complete				0	S_027_10026	2	3
Frag (light)	YES	12	YES	3 like items dig complete				0	S_028_10273	3	2
	YES	12	YES	3 like items dig complete				0	S_026_09653	0	3
Frag (light)	NO	12	YES			2 pieces of frag		0	S_025_09198	1	1
Frag (light)	YES	12	YES	3 like items dig complete				0	S_023_08427	4	3
Frag (medium)	YES	3	YES	8 762 bullets also		37mm		0	S_014_04911	1	< 1
Frag (medium)	NO	3	YES	multiple 762 bullets 10+		Unknown		0	S_011_04005	1	< 1
Frag (medium)	NO	3	YES	2 pieces of frag simular size multiple 762 bullets 10+		37mm		0	S_011_04007	2	< 1
Small Arms Bullet	YES	3	YES	3 like items dig completed				0	S_022_08143	3	2
Small Arms Bullet	NO	3	YES	3 like items dig completed				0	S_020_07437	3	2
Small Arms Bullet	YES	3	YES	8 like items dig completed				0	S_019_07060	2	2
Small Arms Bullet	YES	3	YES	6 like items dig completed				0	S_018_06694	2	3
Frag (light)	YES	3	YES	1 like items dig completed				0	S_018_06672	3	2
Small Arms Bullet	YES	3	YES	3 like items dig completed				0	S_019_07046	2	2

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	YES	3	YES	1 like items dig completed				0	S_019_07046	2	2
Small Arms Bullet	YES	3	YES	5 like items dig completed				0	S_019_07036	3	1
Small Arms Bullet	YES	3	YES	5 like items dig completed				0	S_019_07027	3	2
Small Arms Bullet	YES	3	YES	14 like items dig completed				0	S_017_06204	2	4
Frag (light)	YES	3	YES	2 like items dig completed				0	S_017_06204	3	2
Small Arms Bullet	YES	3	YES	11like items dig completed				0	S_017_06198	4	4
other	YES	LOT 3	YES	1 piece of sheet metal and 3 nails 3 inches long ....hot rocks fo		4 inch		0	S_RoadE_13997	1	2
Frag (light)	NO	LOT 3	YES	4 like items dig complete				0	N_015_01952	4	1
Wire	NO	LOT 3	YES	3 like items dig complete				0	N_025_03362	4	3
Small Arms Bullet	NO	LOT 3	YES			762		0	S_004_01768	SPOILS	< 1
50 cal ltnk	NO	LOT 3	YES	bullets pieces		1x3		0	S_004_01772	0	1
	YES	5	YES	3 like items dig complete				0	S_076_12758	0	5
	YES	5	YES	3 like items dig complete				0	S_074_12651	3	6
Nails	YES	LOT 4	YES	1 items dig complete				0	S_019_06967	3	1
Small Arms Bullet	NO	LOT 4	YES	6 like items dig complete				0	S_020_07352	3	5
Small Arms Bullet	NO	13	YES	3 .30 cal carbine bullets....hot rocks still remaining		other		0	S_018_06926	1	1
nut and bolt	NO	13	YES			3 inch		0	S_019_07262	4	6
Frag (medium)	YES	13	YES	2.5x.5 inch unknown piece of metal frag .....hot rocks still rema		Unknown		0	S_RoadD_14468	SPOILS	2
Frag (medium)	YES	13	YES	hot rocks still remaining				0	S_020_07655	SPOILS	1
Rocket Motor	YES	1	YES	3.5 inch rocket motor with associated frag .....magnetic signatu		3.5 inch		0	S_023_08671	4	> 1 lb
Fuze/Fuze Components	NO	1	YES			37mm base fuze		0	S_021_07836	1	< 1
Frag (heavy)	YES	2	YES	4 different sizes of frag ......magnetic signature because of hot		Unknown		0	S_003_01010	0	4
Frag (light)	YES	2	YES	2 pieces of frag of simular size		37mm		0	S_005_02045	2	< 1
Cans	YES	2	YES	2 cans		Soda		0	S_006_02408	0	< 1
Small Arms Bullet	YES	2	YES	6 like items dig complete				0	S_009_03446	3	2
Small Arms Bullet	YES	2	YES	16 like items dig complete				0	S_009_03408	3	2
Frag (light)	YES	2	YES	3 piece of frag of similar size, 1 is cone shaped		Unknown		0	S_004_01593	2	< 1
Frag (medium)	YES	9	YES	3xfrag 3x1 to 2x.25 inch magnetic signature remaining becaus				0	N_074_05757	0	< 1
Frag (light)	YES	9	YES	nose portion of an APT		37mm		0	N_074_05719	2	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05816	3	< 1
Small Arms Bullet	YES	9	YES	2 bullets		.50 cal		0	N_075_05826	0	< 1
Frag (light)	NO	9	YES			Unknown		0	N_075_05781	SPOILS	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05782	0	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05783	SPOILS	< 1
	YES	9	YES	3 like items dig complete				0	N_076_05845	0	5
Frag (heavy)	YES	9	YES	3 and done ....3 piece of metal frag starting at 2x.25 down to 1		Unknown		0	N_073_05709	1	< 1
Wire	NO	17	YES			72 inches		0	N_008_00705	0	4
tin tiles	NO	17	YES			5x5		0	N_003_00108	12	10
Frag (light)	NO	10	YES			Unknown		0	N_014_01515	6	0.005
Casing	YES	10	YES	and fuze component		Small Arms		0	N_015_01748	4	0.1
Vehicle parts	NO	10	YES					0	N_017_02307	4	0.1
trash pit	YES	4	YES			hinge/nails		0	N_028_03698	4	5
Small Arms Bullet	NO	4	YES			.50 cal		0	N_034_04585	2	0.25
Other	NO	10	YES	rotating band		rotating band		0	N_015_01944	4	0.2
Other	NO	LOT 2	YES	can lid		can lid		0	N_008_00695	4	0.005
Fuze/Fuze Components	NO	10	YES			1x1		0	N_017_02471	2	0.1
Frag (heavy)	NO	10	YES	big piece of frag		big piece of frag		0	N_012_01205	6	3
Fuze/Fuze Components	NO	10	YES			3 inch diameter		0	N_020_02924	3	0.1
Frag (medium)	NO	10	YES			2x6		0	N_00C_06166	3	2
Nails	NO	10	YES					0	N_00C_06191	4	0.02
Frag (heavy)	NO	6	YES					0	N_019_02724	1	1
Nails	YES	6	YES	assorted nails of starting at a 2d nail and smaller. a total of 5 n		other		0	N_010_01000	12	0.005
Small Arms Bullet	YES	6	YES	3 .22 cal cartridges no bulletes		.22 cal		0	N_010_00967	0	0.005
Frag (medium)	YES	6	YES	found 3in piece of frag along with multiple small pieces of frag		piece of frag		0	N_015_01804	0	0.2
Nail	NO	6	YES	2d nail		4 inch		0	N_00A_06004	2	0.005
Frag (heavy)	NO	8	YES	meets the MV requirement, magnetic signature remains withi		Unknown		0	N_034_04471	0	2
Frag (light)	YES	8	YES			20 mm		0	N_034_04474	1	1
Frag (medium)	NO	8	YES	found an inert 20mm		inert 20mm		0	N_035_04715	10	0.7
Frag (heavy)	NO	8	YES	2x1 inch piece of metal frag unknown		Unknown		0	N_037_05042	2	0.005
Frag (light)	YES	8	YES	multiple anomalys on surface all frag md, magnetic signature r		Unknown		0	N_034_04520	0	0.03
cartridge base	NO	8	YES			4 inch diameter		0	N_033_04395	2	0.3
No further entries- mar	YES	LOT 1	YES	3 like items				0	N_028_03813	2	1
Cans	YES	LOT 2	YES	beer can		5 inch		0	N_006_00448	0	1
Small Arms Bullet	NO	LOT 1	YES	1 items dig complete				0	N_032_04317	1	3
	YES	LOT 2	YES	3 like items dig complete				0	N_006_00531	2	5
Ammo Can lid	YES	LOT 2	YES	1 items dig complete				0	N_006_00397	0	2
link	YES	LOT 2	YES	1 items dig complete				0	N_006_00397	1	1
wingnut	YES	LOT 2	YES	1 items dig complete				0	N_006_00397	2	1
fence post	YES	LOT 2	YES	1 items dig complete				0	N_006_00386	2	> 1 lb
	YES	12	YES	3 like items dig complete				0	S_022_08088	1	2
horse shoe	NO	LOT 1	YES	meets the mv requirement, no mangnetic signature remains		half of one		0	N_043_05171	0.2	0
other	YES	3	YES	looks like surviers spike.....magnetic signature still remaining b		7 inches long		0	S_020_07391	2	7
Small Arms Bullet	YES	3	YES	1 30 06 core, and 1 .50 cal skin .....magnetic signature still rem		other		0	S_022_08135	3	2
Cans	YES	3	YES	3 like items dig complete				0	S_023_08487	3	4
Small Arms Bullet	NO	3	YES	2 like items dig complete				0	S_024_08884	3	2
Fuze/Fuze Components	NO	3	YES	1 items dig complete				0	S_022_08155	3	2
Frag (medium)	YES	5	YES	9 pieces of metal frag 1x1 inch down to flakes.....magnetic sig		Unknown		0	S_049_12007	1	4

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
other	YES	5	YES	pull tab.....magnetic signature still remaining because of hot rc		other		0	S_RoadD_14333	3	0
other	NO	13	YES	2x1 inch bolt.....hot rocks still remaining		2 inch		0	S_018_06922	2	1 lb
Wire	NO	13	YES	2 piece of metal wire ...hot rocks still remaining this flag is 1 fo		12 inch		0	S_019_07250	0	< 1
Wire	NO	13	YES	2 piece of metal wire .....this flag is 12 inch from flag#s_019_07		12 inch		0	S_RoadD_14469	0	1
Frag (medium)	NO	12	YES	2 pieces of frag, no mangnetic signature remains		Unknown		0	S_028_10357	1	< 1
Frag (light)	NO	12	YES	1 items dig complete				0	S_025_09169	2	2
Casing	NO	12	YES	1 items dig complete				0	S_027_10014	1	1
Nails	YES	12	YES	3 like items dig complete				0	S_027_10017	2	2
Casing	YES	12	YES	3 like items dig complete				0	S_027_10005	2	1
lid	NO	12	YES	1 items dig complete				0	S_027_10002	0	2
Casing	NO	12	YES	3 like items dig complete				0	S_029_10543	4	2
Small Arms Bullet	YES	12	YES	3 like items dig complete				0	S_027_10032	3	1
Fuze/Fuze Components	YES	12	YES	1 items dig complete				0	S_027_10031	5	5
Small Arms Bullet	YES	12	YES	3 like items dig complete				0	S_027_10034	3	1
Cans	YES	12	YES	1				0	S_026_09691	1	2
Frag (light)	YES	12	YES	1 items dig complete				0	S_028_10297	2	2
Frag (light)	YES	12	YES	3 like items dig complete				0	S_029_10556	3	2
Frag (heavy)	YES	12	YES	3 like items dig				0	S_028_10303	3	6
Small Arms Bullet	YES	3	YES	2- 7.62 bullets....magnetic signature still remaining because of		other		0	S_020_07368	0	3
Frag (light)	YES	3	YES	3 like items dig completed				0	S_019_07036	4	2
Frag (light)	YES	3	YES	3 like items dig completed				0	S_019_07027	2	4
Frag (light)	YES	3	YES	3 like items dig completed				0	S_017_06192	2	2
Small Arms Bullet	YES	LOT 3	YES	3 like items dig completed .....3 45 cal bullets.....hot rocks foun		other		0	S_004_01721	2	3
	YES	LOT 3	NO	over 50 like items dig complete item was metal banding				0	S_004_01829	12	36
other	YES	LOT 3	YES	funny looking steel plate, in the shape of a house......hot rocks		4 inch long		0	S_007_02996	3	8
other	YES	LOT 4	YES	sproket plate off a 10 speed bike.....magnetic signature still re		10 inches		0	S_010_03650	1	1 lb
clip	YES	LOT 4	YES	1 items dig complete				0	S_019_06967	4	1
Wire	NO	13	YES	1 5 inch long piece of metal wire .....hot rocks still remaining		5 inch long		0	S_RoadD_14481	SPOILS	< 1
other	NO	13	YES	paint roller handle.....hot rocks still remaining		18 inch long		0	S_RoadD_14478	1	9
Frag (light)	NO	LOT 3	YES			Unknown		0	S_021_08021	0	< 1
Frag (heavy)	YES	1	YES	3 piece of metal frag 2x1, 1x1, 1x1 possibly 37mm frag .....mag		other		0	S_RoadD_14401	4	2
scrap	YES	1	YES	6 like items dig complete				0	S_019_07206	0	2
Target/Target Debris	YES	1	YES	2 like items dig complete				0	S_019_07206	0	3
Small Arms Bullet	NO	1	YES			.50 cal		0	S_024_08976	2	< 1
Frag (light)	YES	1	YES	4 like items dig complete				0	S_RoadE_14010	3	3
	YES	1	YES					0	S_010_03886	0	6
Frag (light)	YES	2	YES	3 pieces of frag of simular size in same hole		Unknown		0	S_005_01882	3	< 1
Frag (light)	NO	2	YES			Unknown		0	S_005_02146	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_006_02389	SPOILS	< 1
Frag (heavy)	YES	2	YES	1.5x.5 inch piece of metal frag ....magnetic signature because		Unknown		0	S_003_01098	0	2
frag	YES	9	YES	3 piece of metal frag 2x.5 to 1x.25 magnetic signature remaini				0	N_074_05751	3	< 1
Small Arms Bullet	YES	9	YES			.50 cal		0	N_075_05793	0	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05783	0	< 1
Frag (heavy)	YES	9	YES	3 and done ..3 piece of metal frag 3x.25 down to .5x.5 inch		Unknown		0	N_073_05701	2	< 1
Small Arms Bullet	YES	9	YES	1 items dig complete		.50 cal		0	N_076_05842	2	1
Small Arms Bullet		16	YES			.50 cal		0			
Small Arms Bullet	YES	17	YES			.50 cal		0	N_011_01187	1	< 1
Nails	YES	17	YES					0	N_0C1_06260	0	< 1
Frag (medium)	NO	10	YES			75mm		0	N_013_01364	4	1
Small Arms Bullet	NO	10	YES					0	N_016_02199	5	0.1
Casing	YES	10	YES			Small Arms		0	N_016_02091	2	0.1
Small Arms Bullet	YES	4	NO			.50 cal		0	N_036_04873	2	0.05
Small Arms Bullet	YES	4	NO			.50 cal		0	N_034_04585	3	0.25
Small Arms Bullet	NO	4	YES			.50 cal		0	N_034_04585	8	0.25
Small Arms Bullet	NO	10	YES			.50 cal		0	N_023_03219	2	0.1
horseshoe	NO	10	YES			4x1		0	N_020_02876	2	0.3
metal bar		10	YES			2x36		0	N_006_00392	0	10
Other	NO	10	YES	chair spring		chair spring		0	N_006_00398	0	3
Casing	NO	10	YES			Small Arms		0	N_017_02391	3	0.1
Frag (light)	NO	6	YES	meet the MV requirement, no mangnetic signature remains w		Unknown		0	N_022_03156	1	0.2
Frag (medium)	YES	6	YES	piece of frag right over point		2x5 in piece of frag		0	N_015_01756	2	0.5
Frag (heavy)	NO	8	YES	found 1 big piece of frag that meets the mv requirement		big piece of frag		0	N_034_04497	1	0.5
Target/Target Debris	NO	8	YES			20x15		0	N_033_04329	0	30
Frag (medium)	NO	8	YES	1 items dig complete				0	N_028_03711	3	0
other	YES	LOT 2	YES	several items 1 soldier spool 2.5x2, banding strap 24x1, 3 flexib		other		0	N_006_00412	2	8
Wire	NO	LOT 2	YES			barbed		0	N_012_01206	0	1 lb
	NO	LOT 2	YES	1 items dig complete				0	N_007_00672	0	2
Nails	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		2 nails		0	N_005_00322	1	< 1
can opener	NO	LOT 2	YES	meets the mv requirement		1 time can opener		0	N_004_00241	1	< 1
	YES	LOT 2	YES	2 like items dig complete				0	N_006_00386	2	1
Small Arms Bullet	NO	12	YES			1in		0	S_024_08864	0	< 1
Small Arms Bullet	NO	12	YES	2 like items dig complete				0	S_025_09145	2	4
	YES	12	YES	1 items dig complete				0	S_025_09134	1	3
can lid	NO	LOT 1	YES	meets the mv requirement, no mangnetic signature remains				0	N_0A2_06088	0.002	3
762	NO	12	YES	hot rocks also, does not meet the mv requirement				0	S_027_10079	SPOILS	< 1
Frag (light)	YES	12	YES	3 like items dig complete				0	S_027_10007	2	2
	YES	12	YES	3 like items dig complete				0	S_022_08105	3	3

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	YES	12	YES	3 like items dig complete				0	S_027_10030	3	1
	YES	12	YES	3 like items dig complete				0	S_029_10550	0	4
	YES	12	YES	1 items dig complete				0	S_027_10038	2	2
Frag (medium)	NO	3	YES	2 37mm pieces of frag simular size		37mm		0	S_015_05260	0	< 1
Wire	YES	3	YES	1 like items dig completed				0	S_019_07046	0	2
Small Arms Bullet	NO	3	YES	3+ bullets		762		0		SPOILS	< 1
Wire	NO	LOT 3	YES	1 items dig complete				0	N_007_00620	0	2
2.36 rocket parts	YES	LOT 3	YES	6 like items dig complete				0	S_004_01829	12	10
Rocket HE	YES	LOT 3	YES	5 like items dig complete		2.36 inch		0	S_008_03306	6	> 1 lb
Casing	YES	LOT 4	YES	1 items dig complete				0	S_019_06966		1
Buckets	NO	LOT 4	YES					0	S_019_06975	0	1 lb
shingles w/roofing nals	NO	13	YES	also mirror frame		multiple nails		0	S_019_07270	0	720
Small Arms Bullet	NO	13	YES			.50 cal		0	S_020_07673	3	< 1
Frag (heavy)	YES	1	YES	4 piece of metal frag about a half inch square ....magnetic sign		Unknown		0	S_020_07546	3	< 1
Frag (medium)	YES	1	YES			Unknown		0	S_022_08226	0	< 1
Small Arms Bullet	YES	2	YES	3 like items dig complete		.30 cal		0	S_007_02802	0	4
Frag (light)	YES	9	YES			Unknown		0	N_075_05798	0	< 1
Frag (light)	YES	9	YES	2 pieces of frag of simular size		Unknown		0	N_075_05804	2	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05809	SPOILS	< 1
other	YES	7	YES	some type of pipe coupling.....magnetic signature still remaini		other		0	S_017_06492	4	1
Wire	NO	7	YES	found wire but did not meet mv reading		6 foot wire		0	S_015_05579	0	< 1
Wire	YES	7	YES	found several pieces of cultural debris		wire		0	S_015_05577	3	> 1 lb
Wire	YES	7	YES	found a lot of wire, sheet metal and cable		alot of cd		0	S_015_05575	5	> 1 lb
Small Arms Bullet	NO	16	YES			.50 cal		0		1	2
Small Arms Bullet	NO	16	YES			.50 cal		0		3	1
Projectile TP	NO	16	YES			37mm		0		2	1.5
Casing	YES	17	YES			Small Arms		0	N_009_00897	2	< 1
Wire	NO	17	YES			15 inches		0	N_008_00723	1	1
Barbed Wire	NO	4	YES			240 inch		0	N_020_02857	0	3
Frag (heavy)	NO	10	YES	poss .37mm frag		Other		0	N_014_01508	3	0.5
pipe	YES	10	NO					0	N_009_00830	0	3
Small Arms Bullet	YES	4	YES			.50 cal		0	N_034_04462	2	0.2
Frag (light)	NO	10	YES			1x2		0	N_011_01180	2	0.3
hinge	NO	6	YES	meets the MV requirement, no mangnetic signature remains v				0	N_012_01250	0	0.4
hinge	NO	6	YES	meets the MV requirement, no mangnetic signature remains v				0	N_012_01310	0	0.3
Can	YES	LOT 2	YES	1st item spam can, 2nd item aluminum pie plate, 3rd item met		4 inch		0	N_002_00062	8	2
Nails	YES	8	YES	3 like items dig complete				0	N_0A3_06123	2	1
Frag (medium)	NO	8	YES	does not meet the mv requirement		1x5		0	N_035_04622	2	0.2
Frag (light)	NO	8	YES			1x1		0	N_035_04713	1	0.1
Frag (medium)	NO	8	YES	meets the mv requirement, multiple small pieces of frag remo		Unknown		0	N_034_04485	2	0.5
Can	YES	LOT 2	YES	1st item spam can, 2nd item aluminum pie plate, 3rd item met		4 inch		0	N_002_00062	2	8
Cans	NO	LOT 2	YES	from the surface to 4 inches down 3 beer cans		5 inch		0	N_005_00282	4	1
Small Arms Bullet	NO	LOT 1	YES	45 70 cartridge found without bullet		.45 .70 cartridge		0	N_050_05284	0.005	8
Small Arms Bullet	YES	LOT 1	YES	.30 cal bullet found with minelab		.30 cal bullet		0	N_053_05343	0.005	2
Small Arms Bullet	NO	12	YES			.50 cal		0	S_029_10608	1	< 1
Nails	YES	12	YES	nail pit. 20 plus nails recovered				0	S_028_10267	3	4
Fuze/Fuze Components	NO	3	YES			unknown		0		2	< 1
Small Arms Bullet	NO	3	YES	763 bullets also		.50 cal		0		0	< 1
gernade spoon	NO	LOT 3	YES					0	S_011_04189	0	< 1
aluminum scrap metal	NO	LOT 3	YES					0	S_011_04182	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_006_02588	0	< 1
Fuze/Fuze Components	YES	9	YES			t bar		0	N_075_05777	2	1
Frag (light)	YES	9	YES			Unknown		0	N_075_05781	0	< 1
Small Arms Bullet	NO	11	YES	found 1-50 cal bullet jacket		50 cal jacket		0		2	< 1
Cans	NO	11	YES	found a 4x4 rusty can		4x4 can		0		2	< 1
Cans	NO	11	YES	found a 4x3 can and a soda tab		4x3 soda can		0		2	< 1
Small Arms Bullet	NO	11	YES	found 1-.22 casing		.22 casing		0		1	< 1
Frag (heavy)	NO	11	YES	found a 7x2 piece of frag		7x2		0		1	4
Small Arms Bullet	NO	16	YES			.50 cal		0		2	1
Barbed Wire	NO	10	YES			100 ft long		0	N_013_01336	0	1
Small Arms Bullet	NO	11	YES	1 .50 cal bullet		.50 cal		0		1	1
	NO	4	YES					0	N_016_02212	15	1
Wire	NO	10	YES			50 feet		0	N_013_01374	0	50
Wire	YES	10	YES	4 pieces com wire		com wire		0	N_013_01446	0	0.005
	NO	10	YES					0	N_010_01019	0	0
Wire	NO	4	YES					0	N_019_02665	0	5
Cans	YES	4	NO			4 gal gas can		0	N_035_04607	0	10
Cans	YES	4	NO			drink		0	N_035_04607	8	0.25
Frag (light)	NO	4				75 wp		0	N_035_04607	10	2
Wire	YES	4				barbed		0	N_036_04840	3	0.1
Wire	YES	4				barbed		0	N_036_04840	6	0.1
Frag (light)	YES	4	NO			wp(thin skin)		0	N_063_05396	0	1
Small Arms Bullet	YES	4				.50 cal		0	N_063_05396	3	0.25
Frag (light)	YES	4						0	N_030_03999	0	0.1
Barbed Wire	YES	10				very long		0	N_012_01204	0	0
Cans		10	YES			1 gal		0	N_006_00392	0	1
	NO	4	YES	anomaly previously removed				0	N_020_02887	0	0

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
	NO	4	YES	anomaly previously removed				0	N_022_03155	0	0
		4	YES	anomaly removed previously				0	N_026_03530	0	0
Wire	NO	6	YES	plain piece of 18 inches wire		18 inches		0	N_010_00994	0	0.005
other	NO	6	YES	oil filter		5 inch		0	N_010_00933	0	1
Frag (light)	NO	6	YES	meets the MV requirement, no magnetic signature remains wi				0	N_014_01659	2	0.3
Frag (heavy)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_020_02886	3	1
	NO	6	YES					0	N_014_01607	0	0
No further entries	NO	6	YES	checked with minelab then shaunstat nothing found		none		0	N_011_01133	0	0
No further entries	NO	6	YES	no find with minelab or shaunstat		none		0	N_0A1_06079	0	0
	NO	6	YES	did not find any magnetic signature				0	N_015_01842	0	0
Vehicle parts	YES	6	YES	fastening devices				0	N_016_02076	2	1
	NO	6	YES		no			0	N_015_01797	0	0
	NO	6	YES					0	N_014_01651	0	0.25
762	NO	6	YES	nail in same hole		casings		0	N_013_01479	1	0.1
Nails	YES	6	YES	6 nails of different sizes and 1 screw ...this transect must have		4 inch long		0	N_008_00745	9	0.005
other	NO	6	YES	a button....so the answer to the question is we do		1 inch		0	N_008_00788	0	0.005
Cans	YES	6	YES	official arm picinic sight......c-ration can, beverage cans.....3 an		many different sizes		0	N_010_00974	0	0.005
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_020_02945	1	0.2
Frag (medium)	NO	6	YES	meets the MV requirement, no mangnetic signature remains v		Unknown		0	N_010_01025	0	0.4
No further entries	NO	6	YES	no find with minelab				0	N_016_02167	0	0
No further entries	NO	6	YES	no find with the minelab				0	N_017_02503	0	0
No further entries	NO	6	YES	no find with minelab		other		0	N_006_00551	0	0
other	NO	6	YES	previously removed, also in wash area possible washed away.		no other anomalies found		0	N_00A_05954	0	0
other	NO	6	YES	previously excavated		other		0	N_00A_06011	0	0
other	NO	6	YES	previously excavated		other		0	N_00A_06037	0	0
other	NO	6	YES	previously excavated		other		0	N_00A_06035	0	0
other	NO	6	YES	previously excavated		other		0	N_00A_06005	0	0
other	NO	6	YES	previously excavated		other		0	N_005_00278	0	0
No further entries	NO	6	YES	probably cleared on previous dig				0	N_014_01531	0	0
	NO	6	YES	original dig was accurate				0	N_0A1_06064	0	0
No further entries	NO	6	YES	anomaly already removed in previous dig				0	N_014_01624	0	0
No further entries	NO	6	YES					0	N_014_01548	0	0
No further entries	NO	6	YES	anomaly already removed in previous dig				0	N_013_01415	0	0
No further entries	NO	6	YES	anomaly already removed in previous dig				0	N_013_01397	0	0
No further entries- mar	YES	LOT 2	YES	forgot narrative on other (a) for this number....no anomalies fo				0	N_002_00089		
Can	YES	LOT 2	YES	seems to me to be another home inprovement trash sight to s		2 inch		0	N_002_00079	3	< 1
other	YES	8	YES	barbed wire unremoveable......this number is a duplicate numl		barbed wire		0	N_042_05133_dup	0	1
other	YES	8	YES	barbed wire fence unremoveable		barbed wire		0	N_043_05170	0	1
No further entries	NO	8	YES	this hit was a 2.8, at the bottom of a wash.		0		0	N_041_05115	0	0
other	YES	8	YES	barbed wire fence unremoveable, no other anomalies found d		barbed wire fence		0	N_041_05115_dup	0	1
Can lid	NO	8	YES	8 inche can lid unknown type no other anomalies found		8 inches		0	N_039_05080	0	1
Nails	YES	8	YES	multiple nails within meter, 20 + where found,				0	N_034_04471	0	3
	YES	8	YES	multiple cubes remain within 1 meter and outside 1 meter 100		small cubes		0	N_034_04472	0	0.001
cubes	YES	8	YES	300+ cubes on surface, mangnetic signature remains within 1 r				0	N_034_04467	0	5
fragmentation sleeve cubes	YES	8	YES	multiple cubes remain, cleared 300 +, items are close 2 a suspe				0	N_034_04474	0	5
	NO	8	YES	no mangnetic signature remains within 1 meter				0	N_035_04789	4	0
No further entries	NO	8	YES					0	N_027_03651	0	0
No further entries	NO	8	YES	ignore accidental entries beyond no find				0	N_028_03823	0	0
No further entries	NO	8	YES	flag position in the middle of a was possibly washed down rang		other		0	N_00A_06036	0	0
other	NO	8	YES	a paper bail off either a royal/adler typewriter , or an olympia t		12 inches		0	N_00A_05960	0	0.005
No further entries	NO	8	YES	could not find any anomalies with the minelab		other		0	N_038_05064	0	0
Frag (heavy)	NO	8	YES	what a surprise right on surface and right on flag on surface ...		Unknown		0	N_038_05052	0	1
	NO	8	YES					0	N_035_04781	0	0
	NO	8	YES					0	N_035_04750	0	0
	NO	8	YES					0	N_035_04800	0	0
wire	NO	8	YES	meets the mv requirement, no mangnetic signature remains w		reinforced cocrete		0	N_033_04330	0	30
No further entries	NO	8	YES	no find				0	N_029_03876	0	0
No further entries	NO	8	YES					0	N_029_03895	0	0
No further entries	NO	8	YES	nothing				0	N_030_03995	0	0
No further entries	NO	8	YES	nothing				0	N_030_04049	0	0
other	NO	8	YES	large piece of aluminum scrap		3x3		0	N_036_04823	0	0.025
Frag (heavy)	NO	8	YES	2.5x1.5 inch metal frag		Unknown		0	N_035_04776	0	0.005
other	NO	8	YES	looks like a blown off lugnut		1 inch		0	N_037_05011	0	0.005
Fuze/Fuze Components	NO	8	YES	a round object looks like it came from a large watch		1.5		0	N_029_03900	0	0.005
other	NO	8	YES	oil filter ....by the way it looks possible a fram oil filter		6 inch long		0	N_028_03683	0	0.025
scrap metal	NO	8				3x8		0	N_034_04465	0	0.25
No further entries- mar	NO	LOT 1	YES					0	N_00A_05964	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab, schonstadt found hot rocks		other		0	N_046_05208	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab , schonstadt found hot rocks		other		0	N_046_05205	0	0
No further entries	NO	LOT 1	YES	no find with minelab or schonstedt		other		0	N_048_05245	0	0
No further entries- mar	YES	LOT 1	YES	changed batteries in both minelab and schonstedt no remainir		other		0	N_048_05245	0	0
No further entries- mar	NO	LOT 1	YES	no anomalies found with minelab , hot rocks found with schon		other		0	N_048_05235	0	0
No further entries- mar	NO	LOT 1	YES	no anomalies found with minelab hot rocks found with schons		other		0	N_051_05311	0	0
	YES	LOT 1	YES	found 3 hot rocks				0	N_017_02432	0	0
	YES	LOT 1	YES	found 3 hot rocks				0	N_018_02606	0	0
Frag (light)	NO	LOT 1	YES	found 1 piece of frag		2x1 piece of frag		0	N_018_02609	10	0.2
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons		other		0	N_048_05252	0	0

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_048_05243	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_052_05317	0	0
other	YES	LOT 1	YES	10ft x 3ft metal sign.....sign left in place		10 ft.		0	N_047_05210	0	40
	NO	LOT 1	YES					0	N_040_05097	0	0
	NO	LOT 1	YES					0	N_040_05095	0	0
	NO	LOT 1	YES					0	N_043_05177	0	0
	NO	LOT 1	YES					0	N_044_05187	0	0
	NO	LOT 1	YES					0	N_030_04066	0	0
No further entries- mar	YES	LOT 2	YES	hot rocks found with schonstedt				0	N_002_00103		
No further entries- mar	YES	LOT 2	YES					0	N_002_00089		
		LOT 1		75mm Schrapnel projectile, Mk 1, 13RCR 6250232842				0			
other	YES	LOT 2	YES	ironing board support leg....still in a trash sight		4 foot		0	N_006_00400	0	10
Cans	YES	LOT 2	YES	3 cans 2 beer and 1 weed begone can...still in a trash sight		5 inch		0	N_006_00438	0	1
Nails	NO	LOT 2	YES	galvinized roofing nails, 13 of them a baker's dozen		2 inch		0	N_007_00685	0	1
Can	NO	LOT 2	YES	ice tea can		6 inch		0	N_004_00228	0	1
other	NO	LOT 2	YES	26 inch piece of barbed wire and the barbs on this mean buisn		26 inch		0	N_004_00228	0	3
other	NO	LOT 2	YES	sorry about this.....this should be anomaly a, and the motor an		3 inch		0	N_004_00185	0	< 1
No further entries- mar	YES	LOT 2	YES	no other anomalies found with minelab hot rocks found with s				0	N_002_00094		
Wire	NO	LOT 2	YES	communication wire mixed with fence wire moved outside a n		several yards		0	N_005_00265	0	1 lb
Cans	NO	LOT 2	YES	3 cans starting at frag and moving out about a foot on the surf		5 inch		0	N_005_00333	0	1
other	YES	LOT 2	YES	bundles of chicken wire......exceeds the 4.0 hit		150 inches		0	N_006_00574	0	1 lb
Barbed Wire	NO	LOT 1	YES			15 feet		0	N_033_04332	0	0
Nails	NO	LOT 1	YES	1 items dig				0	N_031_04113	1	2
No further entries- mar	NO	LOT 1						0	N_031_04160	5	4
	NO	LOT 2	YES	found 3 hot rocks				0	N_016_02240		
pipe	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains, p				0	N_013_01328		3
Vehicle parts	NO	LOT 2	YES	1 harmonic balancer, probable from a jeep 4 cylinder		6 inch		0	N_006_00393	0	> 1 lb
Frag (heavy)	YES	LOT 2	YES	possible 105mm frag ....remaining magnetic signature still rem		9 inches		0	N_008_00738	0	> 1 lb
other	YES	LOT 2	YES	5 inch lid to a can....magnetic signature still remaining because		5 inch		0	N_008_00802	0	10
Frag (medium)	NO	LOT 2	YES	meets the mv requirement, no mangnetic signature remains		Unknown		0	N_016_02040	5	< 1
Nails	YES	LOT 2	YES	meets the mv requirement		3 nails		0	N_012_01317	0	< 1
Nails	YES	LOT 2	YES	meets the mv requirement		3 nails		0	N_005_00306	SPOILS	< 1
Nails	NO	LOT 2	YES	no mangnetic signature remains		roofing nails		0	N_005_00380	SPOILS	< 1
Nails	NO	LOT 2	YES	no mangnetic signature remains		16 penny		0	N_005_00318	SPOILS	< 1
	NO	LOT 2	YES	found 3 hot rocks				0	N_006_00530		
Small Arms Bullet	YES	12	YES	1 .50 cal bullet , and 6 7.62 bullets, all on the surface ....magne		.50 cal		0	S_028_10461	0	5
Small Arms Bullet	YES	12	YES	5 7.62 bullets found on surface .....magnetic signature still rem		7.62		0	S_028_10457	0	1
Small Arms Bullet	YES	12	YES	1 .50 cal , 4 7.62 bulletsl....magnetic signature still remaining b		.50 cal		0	S_027_10124	0	4
	NO	12	YES					0	S_026_09763		
	NO	12	YES					0	S_026_09764		
	NO	12	YES					0	S_024_08858		
	YES	12	YES	3 like items dig complete				0	S_025_09126	5	2
No further entries- mar	YES	LOT 1	YES	hot rocks found ...hit was only 4.1		other		0	N_054_05378	0	0
No further entries- mar	YES	LOT 1	YES	hot rocks found no other anomalies found with minelab or sch				0	N_053_05341	0	0
No further entries- mar	YES	LOT 1	YES	hot rocks found with schonstedt no other anomalies found wit				0	N_052_05325	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_052_05320	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_052_05316	0	0
Can	NO	LOT 1	YES	beer/soda can, but my money is on beer		5 inch long		0	N_052_05324	0.005	0
No further entries- mar	YES	LOT 1	YES	hot rocks found with schonstedt				0	N_048_05248	0	0
Can	YES	LOT 1	YES	coors beer can		5 inch		0	N_048_05227	0.005	0
No further entries- mar	YES	LOT 1	YES	hot rocks found with schonstedt				0	N_048_05227	0	0
No further entries- mar	YES	LOT 1	YES	hot rocks found with schonstedt				0	N_048_05256	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_047_05220	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_053_05345	0	0
No further entries- mar	YES	LOT 1	YES	hot rocks found with schonstedt				0	N_053_05343	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_054_05376	0	0
No further entries- mar	YES	LOT 1	YES	no anomalies found with minelab hot rocks found with schons				0	N_053_05347	0	0
other	YES	LOT 1	YES	barbed wire fence not removed		barbed wire fence		0	N_048_05225	1	0
	NO	LOT 1	YES	multiple hot rock 3+				0	N_041_05125	0	0
sheet metal	NO	LOT 1	YES	meets the mv requirement, no mangnetic signature remains		4ft x 4ft		0	N_044_05179	3	0
Nails	NO	LOT 1	YES	no mangnetic signature remains		3 nails		0	N_0A2_06089	0.001	1
	NO	LOT 1	YES			3 rocks		0	N_0A2_06087	0	0
	NO	LOT 1	YES					0	N_019_02833	0	0
	NO	LOT 1	YES					0	N_019_02840	0	0
	NO	LOT 1	YES					0	N_026_03570	0	0
Small Arms Bullet	YES	3	YES	6 7.62 bullets found on surface ...magnetic signature still rema		other		0	S_021_07758	0	4
Small Arms Bullet	YES	3	YES	5 7.62 bullets scattered around flag		other		0	S_020_07414	0	2
Small Arms Bullet	YES	3	YES	2 7.62 and 1 .50 cal bullet .....magnetic signature still remainin		other		0	S_020_07418	0	2
Small Arms Bullet	YES	3	YES	4 7.62 bullets and 1 .50 cal bullet on surface around flag ....ma		other		0	S_020_07433	0	2
concrete walkway	NO	3	YES					0	S_011_03972		
Frag (medium)	NO	3				37mm frag		0	S_014_04978	2	2
	NO	3	YES					0	S_016_05820		
Small Arms Bullet	NO	3	YES	3 bullets		762		0	S_016_05813	SPOILS	< 1
Small Arms Bullet	YES	3	YES	hot rocks also		762		0	S_016_05786	SPOILS	< 1
No further entries- mar	YES	5	YES	1 really big hot rock				0	S_048_11948	0	0
No further entries- mar		5						0	S_Cross5_1346	0	0
No further entries- mar		5						0	S_044_11738	0	0

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
other	YES	5	YES	3 ft piece of rebar.....magnetic signature still remaining becaus		3 ft		0	S_049_11986	18	0
No further entries- mar		5						0	S_050_12019	0	0
	NO	5	YES					0	S_054_12136	0	0
	NO	5	YES					0	S_054_12134	0	0
	NO	5	YES					0	S_053_12100	0	0
	NO	5	YES					0	S_052_12069	0	0
	NO	5	YES					0	S_052_12070	0	0
	NO	5	YES					0	S_054_12146	0	0
	NO	5	YES					0	S_054_12154	0	0
	YES	5	YES					0	S_057_12232	0	0
	NO	5	YES					0	S_058_12295	0	0
	NO	5	YES					0	S_058_12299	0	0
	NO	5	YES					0	S_057_12244	0	0
	NO	5	YES					0	S_057_12252	0	0
	NO	5	YES					0	S_057_12250	0	0
	NO	5	YES					0	S_057_12255	0	0
	NO	5	YES					0	S_059_12341	0	0
	NO	5	YES					0	S_059_12344	0	0
other	YES	12	YES	84 inches long piece of barbed wire ....magnetic signature still		84 inches long		0	S_026_09779	0	10
Small Arms Bullet	YES	12	YES	2 7.62 bullets...magnetic signature still remaining because of hot rocks found with schonstedt							
Wire	NO	13	YES	heavy wire .....hot rocks still remaining		5 inch		0	S_RoadD_14472	0	3
Wire	NO	13	YES	heavy wire ...looks like concrete reinforcement wire....hot rock		10 inches long		0	S_019_07252	0	4
Wire	NO	13	YES	12 long piece of metal wire ...hot rocks still remaining		12 inch long		0	S_018_06920	0	2
other	NO	13	YES	we have here 1 drive shaft with u joints .....hot rocks still rema		48 inches long		0	S_018_06924	0	> 1 lb
Wire	NO	13	YES	1 7 inch long piece of metal wire ...hot rocks still remaining		7 inch		0	S_RoadD_14471	0	< 1
Casing	NO	13	YES	1 bullet casing....hot rocks still remaining		0.5		0	S_RoadD_14471	0	< 1
other	NO	13	YES	1 4 inch long carpet metal, 1 2 inch staple , 1 2 inch nail ...hot r		4 inch long		0	S_RoadD_14470	0	2
No further entries- mar	YES	12	YES	no anomalies found with minelab hot rocks found with schons				0	S_026_09786		
Small Arms Bullet	YES	12	YES	7 7.62 bullets		other		0	S_026_09797	1	2
No further entries- mar	YES	12	YES	hot rocks found with schonstedt				0	S_026_09797		
Small Arms Bullet	YES	12	YES	4 7.62 bullets...magnetic signature still remaining because of h		other		0	S_026_09803	0	2
Small Arms Bullet	NO	12	YES	no mangnetic signature remains,		.50 cal		0	S_028_10375	0	< 1
Frag (medium)	NO	12	YES	whole 37mm body, non hazard, no mangnetic signature remai		37 mm		0	S_028_10358	2	1
Small Arms Bullet	NO	12	YES	does not meet the mv requirement		.50 cal		0	S_029_10598	1	< 1
Frag (medium)	YES	12	YES	multiple small pieces of frag ranging in size from 1in - 4 in long		Unknown		0	S_028_10344	0	< 1
Frag (light)	NO	12				3 small pieces of frag		0	S_025_09180	1	< 1
Frag (light)	NO	12	YES			1x2 inch		0	S_028_10312	1	< 1
Small Arms Bullet	NO	12				.50 cal		0	S_028_10323	3	< 1
	YES	12	YES	3 like items dig complete				0	S_025_09174	0	3
Wire	YES	3	YES	a bundle of wire....magnetic signature still remaining because		12 inches long		0	S_017_06160	0	1 lb
Small Arms Bullet	YES	3	YES	6 7.62 bullets....magnetic signature still remaining because of		7.62		0	S_019_06993	0	1
Small Arms Bullet	YES	3	YES	6- 7.62 bullets....magnetic signature still remaining because of		other		0	S_018_06598	0	2
Small Arms Bullet	YES	3	YES	6- 7.62 bullets scattered around the flag.....magnetic signature		other		0	S_020_07359	0	2
Frag (heavy)	YES	3	YES	2 piece of metal frag unknown , 1 7.62 bullet ....magnetic signa		Unknown		0	S_017_06174	0	3
Fuze/Fuze Components	YES	3	YES	multiple 762 bullets 24+		37 mm		0	S_014_04908	1	< 1
Small Arms Bullet	YES	3	YES	does not meet the mv requirement		762		0	S_016_05728	SPOILS	< 1
Small Arms Bullet	YES	3	YES	multiple 762 bullets 20+		762		0	S_011_04000	SPOILS	< 1
	YES	3	YES	found multiple hot rocks				0			
Small Arms Bullet	YES	LOT 3	YES	3 like items dig completed .....3 45 cal bullets.....magnetic sign		other		0	S_005_02218	1	3
No further entries		LOT 3						0	S_006_02636		
No further entries- mar		LOT 3						0	S_007_02948		
No further entries- mar		LOT 3						0	S_007_02947		
Fuze/Fuze Components	YES	LOT 3	YES	1x.5 inch unknown fuse component ....hot rocks found with sc		1 inch		0	S_009_03524	0	3
Small Arms Bullet	YES	LOT 3	YES	3 like items found......3 7.62 bullets ...hot rocks found with sch		other		0	S_009_03508	0	3
Nails	YES	LOT 3	YES	4 4 inch long nails ....hot rocks found with schonstedt		4 inch		0	S_RoadE_13996	2	3
Nails	YES	LOT 3	YES	3 like items .....3 nails ...hot rocks found with schonstedt		3.5 inch long		0	S_RoadE_13995	1	2
No further entries- mar		LOT 3						0	S_003_01410		
Small Arms Bullet	YES	LOT 3	YES	1 naked .50 cal bullet it lost it's jacket somewhere ....hot rocks		.50 cal		0	S_003_01408	0	4
Nails	YES	LOT 3	YES	nail pit......looks like someone dropped a case of nails on the g		4 inch long		0	S_004_01758	0	3
Cable	YES	LOT 3	YES	twisted cable real length about 50-60 feet, pulled out of way o		.5 wide		0	S_008_03259	0	> 1 lb
Wire	YES	LOT 3	YES	copper wire nonremovable.		30 inches		0	S_013_04838	0	1 lb
No further entries- mar		LOT 3						0	S_015_05561		
other	YES	LOT 3	YES	firing position tube...nonremovable		48 inches		0	S_RoadE_14022	12	> 1 lb
Vehicle parts	YES	LOT 3	YES	1 bolt, 2 nuts, 1 cap to a u joint, 1 clamp....hot rocks found wit		other		0	S_018_06928	1	6
Small Arms Bullet	YES	LOT 3	YES	3 like items dig completed ....3 7.62 bullets .....hot rocks found		other		0	S_018_06927	1	3
other	YES	LOT 3	YES	trash pit...starting with 1st item electric motor for a slot car, th		1 inch		0	S_016_06015	1	3
Barbed Wire	YES	LOT 3	YES	1 piece of barbed wire and 4 staples ....hot rocks found with sc		24 inches long		0	S_016_06013	0	10
No further entries- mar		5						0	S_079_12999	0	0
No further entries- mar		5						0	S_079_12998	0	0
No further entries- mar		5						0	S_079_12969	0	0
No further entries- mar		5						0	S_079_12948	0	0
No further entries- mar		5						0	S_078_12861	0	0
No further entries- mar		5						0	S_078_12901	0	0
No further entries- mar		5						0	S_078_12903	0	0
No further entries- mar		5						0	S_078_12904	0	0
No further entries- mar		5						0	S_078_12911	0	0
No further entries- mar		5						0	S_077_12820	0	0

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
No further entries- mar		5						0	S_077_12808	0	0
No further entries- mar		5						0	S_077_12801	0	0
Small Arms Bullet	YES	LOT 3	YES	oh no oh no we have run acrossed a .50 cal bullet nudist camp		.50 cal		0	N_065_05596	2	5
Casing	YES	LOT 3	YES	ok we found where the .50 cal bullet disrobed for the nudist ca		Small Arms		0	N_065_05600	2	3
Casing	YES	LOT 3	YES	1 .50 cal jacket .....hot rocks found with schonstedt		Small Arms		0	N_068_05609	0	3
Wire	YES	LOT 3	YES	reinforced concrete surrounds they entire area, not a slab but		concrete reinforced wire		0	S_005_02260	1	1
Frag (medium)	NO	LOT 3	YES	nail found		multiple small pieces of frag		0	S_006_02668	24	8
	NO	LOT 3	YES					0	S_004_01786		
	NO	LOT 3	YES					0	S_004_01784		
	NO	LOT 3	YES					0	S_004_01785		
No further entries- mar		5						0	S_Cross3_13447	0	0
No further entries- mar		5						0	S_Cross5152_13478	0	0
No further entries- mar		5						0	S_050_12029	0	0
No further entries- mar		5						0	S_047_11898	0	0
No further entries- mar		5						0	S_044_11754	0	0
No further entries- mar		5						0	S_046_11859	0	0
No further entries- mar		5						0	S_046_11862	0	0
No further entries- mar		5						0	S_047_11910	0	0
	NO	5	YES					0	S_065_12418	0	0
	NO	5	YES					0	S_Cross6465_13504	0	0
	NO	5	YES					0	S_063_12478	0	0
	NO	5	YES					0	S_063_12470	0	0
	NO	5	YES					0	S_063_12462	0	0
	NO	5	YES					0	S_063_12455	0	0
	NO	5	YES					0	S_064_12432	0	0
	NO	5	YES					0	S_064_12427	0	0
	NO	5	YES					0	S_070_12575	0	0
	NO	5	YES					0	S_070_12571	0	0
	NO	5	YES					0	S_070_12570	0	0
	NO	5	YES					0	S_059_12354	0	0
	NO	5	YES					0	S_059_12361	0	0
	NO	5	YES					0	S_059_12363	0	0
	NO	5	YES					0	S_059_12373	0	0
	NO	5	YES					0	S_057_12268	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_068_12511	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_068_12510	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_068_12513	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_068_12514	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_Cross6870_13510	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_070_12540	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_070_12543	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_074_12582	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_074_12594	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_074_12599	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_074_12600	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_074_12604	0	0
No further entries- mar	YES	5	YES	3 like items dig complete				0	S_074_12613	0	0
No further entries- mar		5						0	S_081_13097	0	0
No further entries- mar		5						0	S_081_13082	0	0
No further entries- mar		5						0	S_080_13027	0	0
No further entries- mar		5						0	S_083_13168	0	0
No further entries- mar		5						0	S_086_13254	0	0
No further entries- mar		5						0	S_084_13182	0	0
other	YES	5	YES	a 1 inch nut....magnetic signature still remaining because of ho		1 inch		0	S_085_13193	0	6
other	YES	5	YES	24 inches long piece of metal rebar .....magnetic signature still		24 inches		0	S_Cross8284S_13617	0	0
No further entries- mar		5						0	S_Cross8081S_13594	0	0
No further entries- mar		5						0	S_079_12962	0	0
No further entries- mar		5						0	S_079_12966	0	0
No further entries- mar		5						0	S_079_12980	0	0
No further entries- mar		5						0	S_078_12878	0	0
No further entries- mar		5						0	S_078_12876	0	0
No further entries- mar		5						0	S_079_13002	0	0
other	YES	LOT 4	YES	10x6 inch metal plate......magnetic signature still remaining be		10 inch long		0	S_011_03948	1	> 1 lb
No further entries- mar		LOT 4						0	S_008_03040		
No further entries		LOT 4						0	S_013_04502		
No further entries- mar		LOT 4						0	S_014_04879		
No further entries- mar		LOT 4						0	S_014_04878		
other	NO	2	YES	usace survey marker, installed 2010......station desination CEP		4 inch		0	usacoe	0	1 lb
Nail	NO	LOT 4	YES	1 3 inch nail.....hot rocks remaining		3 inch long		0	S_RoadE_13936	2	3
No further entries- mar		LOT 4						0	S_RoadE_13937		
Small Arms Bullet	NO	LOT 4	YES	3 7.62 bullets and 1 .30 carbine...hot rocks still remaining		other		0	S_014_04889	0	3
Frag (heavy)	NO	LOT 4	YES	1 37mm frag.....hot rocks still remaining		other		0	S_013_04515	3	10
Small Arms Bullet	NO	LOT 4	YES	1 7.62 bullet ....hot rocks still remaining		other		0	S_RoadE3_13891	0	4
	NO	LOT 4	YES					0	S_035_11280		
Frag (medium)	NO	LOT 4	YES			Unknown		0	S_037_11450	2	< 1
	NO	LOT 4	YES					0	S_038_11500		
Small Arms Bullet	NO	LOT 4	YES	does not meet the mv requirement		762		0	S_038_11501	SPOILS	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Small Arms Bullet	YES	LOT 4	YES	1 items dig complete				0	S_019_06967	3	1
	YES	LOT 4	YES					0	S_018_06554		
other	NO	LOT 4	YES	a 4x4 inch piece of galvinized metal.....hot rocks still remaining		4 inch		0	S_006_02315	0	1 lb
other	NO	LOT 4	YES	2x2 inch square washer.....hot rocks still remaining		2 inch		0	S_RoadE_13948	0	9
Small Arms Bullet	NO	LOT 4	YES	7 7.62 bullets scattered around flag .....hot rocks still remainin		other		0	S_013_04524	0	4
Cable	NO	LOT 4	YES	heavyweight wire rope				0	S_038_11509	0	10+
	YES	LOT 4	YES					0	S_051_12047		
	NO	LOT 4	YES					0	S_043_11730		
	NO	LOT 4	YES					0	N_081_05897		
other	NO	13	YES	lets see what we got out of this trash pit ...1 paint can lid, 2 1 i		8 inch		0	S_RoadD_14483	0	6
No further entries- mar	NO	13	YES					0	S_020_07652		
	NO	13	YES					0	S_020_07653		
No further entries- mar	YES	13	YES	hot rocks still remaining				0	S_020_07659		
	YES	13	YES	hot rocks still remaining				0	S_020_07662		
Small Arms Bullet	YES	13	YES	3 bullets		.30 cal		0	S_020_07663	SPOILS	< 1
	NO	13	YES					0	S_020_07669		
	YES	13	YES					0	S_020_07670		
Small Arms Bullet	YES	13	YES			jacket		0	S_020_07671	SPOILS	< 1
Casing	YES	13	YES	3+ small pieces		Small Arms		0	S_020_07674	SPOILS	< 1
Small Arms Bullet	YES	13	YES	3+ does not meet the mv requirement		.30 cal		0	S_020_07675	SPOILS	< 1
	YES	13	YES					0	S_020_07675		
Barbed Wire	NO	13	YES					0	S_018_06916	0	< 1
	NO	13	YES					0	S_018_06915		
Small Arms Bullet	NO	LOT 3	YES	does not meet the mv requirement		.30 cal		0	S_010_03922	SPOILS	< 1
Small Arms Bullet	YES	LOT 3	YES	3+ Bullets		.45 cal		0	S_003_01404	SPOILS	< 1
Small Arms Bullet	YES	LOT 3	YES	3 Bullets + bullet jackets		.45 cal		0	S_003_01405	SPOILS	< 1
other	NO	1	YES	trash pit .....multiple metal cover with rubber tubes of variety (		12 inch		0	trash pile	0	> 1 lb
frag	YES	1	YES	5x37 frag spread around the flag on the surface ....remainin		5x37 frag		0	S_023_08588	0	< 1
No further entries- mar		1						0	S_RoadD1_14250		
Small Arms Bullet	YES	1	YES	5+ .50 cal bullets		.50 cal		0	S_009_03553	0	< 1
Small Arms Bullet	YES	1	YES	5+ .50 cal bullets		.50 cal		0	S_009_03549	SPOILS	< 1
Small Arms Bullet	YES	1	YES	5+ Bullets		.30 cal		0	S_010_03838	SPOILS	< 1
Small Arms Bullet	YES	1	YES	5+ Bullets		.30 cal		0	S_RoadD2_14043	SPOILS	< 1
Small Arms Bullet	YES	1	YES	5+ .50 cal bullets		.50 cal		0	S_RoadD2_14054	SPOILS	< 1
Small Arms Bullet	YES	1	YES	3+ Bullets		762		0	S_015_05397	SPOILS	< 1
	NO	1	YES					0	S_039_11557		
Cans	NO	16	YES	1 soda can				0		4	1
Frag (light)	NO	16	YES	small frag				0		3	1
Frag (light)	NO	16	YES	1 small frag				0		3	2
Small Arms Bullet	NO	16	YES	50 cal bullet		.50 cal		0		3	2
Frag (light)	NO	16	YES	1 small frag				0		0	2
Small Arms Bullet	NO	16	YES	1 bullet		.50 cal		0		3	2
Frag (light)	NO	16	YES	small frag				0		2	1
Cans	NO	16	YES	1 small can				0		0	1
other	NO	17	YES	1 wire staple		1 inch		0		SPOILS	< 1
other	NO	17	YES	1 .30 cal link		1 inch		0		1	< 1
other	NO	17	YES	1 can pop top		1 inch		0		1	< 1
Small Arms Bullet	NO	17	YES	1 7.62 mm fired blank		other		0		2	1
other	NO	17	YES	1 used oil filter		6 inch long		0		2	8
Small Arms Bullet	NO	17	YES	a squished .30 cal jacket		.30 cal		0		1	< 1
Small Arms Bullet	NO	17	YES	1 .22 cal casing		other		0		1	< 1
Casing	NO	17	YES	unknown brass case		Small Arms		0		2	< 1
Nail	NO	17	YES	1 nail		2 inch		0		3	< 1
Bucket	NO	17	YES	some type of bracket 1 part of it is 12x3 inch plate, with 1 6 inc		12 inch		0		4	1 lb
Small Arms Bullet	NO	17	YES	brass piece of a 12ga shotgun shell		other		0		SPOILS	< 1
other	NO	17	YES	a piece of sheet metal		3.5 inch		0		1	< 1
No further entries- mar		17						0			
other	NO	17	YES	a square container lid		8 inch		0		1	2
Casing	NO	17	YES	1 .22 cal case		Small Arms		0		SPOILS	< 1
Casing	NO	17	YES	1 .22 cal case		Small Arms		0		0	< 1
Frag (heavy)	YES	1	YES	3 piece of metal frag ......magnetic signature remaining becaus		Unknown		0	S_021_07873	0	< 1
Small Arms Bullet	YES	1	YES	3+Bullets		762		0	S_018_06768	SPOILS	< 1
Small Arms Bullet	NO	1	YES	3+Bullets		.50 cal		0	S_021_07836	SPOILS	< 1
Small Arms Bullet	YES	1	YES	3+Bullets		.30 cal		0	S_021_07837	SPOILS	< 1
Small Arms Bullet	YES	1	YES	3+Bullets		.50 cal		0	S_022_08226	SPOILS	< 1
	NO	1	YES					0	S_033_11149		
	NO	1	YES					0	S_033_11212		
Small Arms Bullet	YES	1	YES	3+ Bullet		.50 cal		0	S_018_06834	SPOILS	< 1
Small Arms Bullet	YES	2	YES	6 7.62 bullets scattered around flag .....magnetic signature bec		other		0	S_003_01015	0	< 1
Small Arms Bullet	YES	2	YES	21 7.62 bullets scattered around flag....magnetic signature bec		other		0	S_003_01047	0	< 1
Small Arms Bullet	YES	2	YES	3+Bullets		762		0	S_005_01927	SPOILS	< 1
Frag (light)	NO	2	YES	2 pieces of frag of simular size		Unknown		0	S_005_01943	SPOILS	< 1
Small Arms Bullet	YES	2	YES	over 1/2lb of bullets		762		0	S_005_01943	SPOILS	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_01967	SPOILS	1
Small Arms Bullet	YES	2	YES	also 3 .30 cal bullets		.50 cal		0	S_005_01967	SPOILS	< 1
Frag (light)	NO	2	YES			Unknown		0	S_006_02579	0	< 1
Frag (light)	YES	2	YES			Unknown		0	S_005_02155	0	1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	YES	2	YES			Unknown		0	S_005_02120	SPOILS	< 1
	NO	2	YES					0	S_005_02120		
Frag (light)	YES	2	YES			Unknown		0	S_006_02535	SPOILS	< 1
Small Arms Bullet	YES	2	YES	5+Bullets		.30 cal		0	S_006_02497	SPOILS	< 1
Small Arms Bullet	YES	2	YES	10+Bullets		.30 cal		0	S_005_02061	SPOILS	< 1
	YES	2	YES	does not meet the mv requirement				0	S_005_02061		
Small Arms Bullet	YES	2	YES	5+Bullets		.30 cal		0	S_005_02045	SPOILS	< 1
Small Arms Bullet	YES	2	YES	5+Bullets		.30 cal		0	S_006_02389	SPOILS	< 1
Small Arms Bullet	YES	2	YES	5+Bullets		.30 cal		0	S_006_02385	SPOILS	< 1
	YES	2	YES					0	S_007_02918		
	YES	2	YES					0	S_007_02857		
No further entries- mar	YES	2	YES					0	S_RoadE2_13642		
Small Arms Bullet	YES	2	YES	3 7.62 bullets ....magnetic signature because of hot rocks foun		other		0	S_003_01087	1	1
No further entries- mar		2						0	S_RoadE2_13681		
Frag (heavy)	YES	2	YES	5 piece of metal frag from 1 inch to 2.5 inch long ....magnetic s		Unknown		0	S_003_01125	0	2
Small Arms Bullet	YES	2	YES	20 7.62 bullets scattered around flag magnetic signature becau		other		0	S_003_01125	0	< 1
Frag (heavy)	YES	2	YES	14 piece of metal frag from 1 inch to 2 inch long ....magnetic s		Unknown		0	S_003_01148	0	1
Frag (heavy)	YES	2	YES	2x.5 inch long piece of metal frag .....magnetic signature becau		Unknown		0	S_003_01156	0	1
Small Arms Bullet	YES	2	YES	24 7.62 bullets scattered around flag .....magnetic signature be		other		0	S_003_01156	0	< 1
No further entries- mar		2						0	S_003_01162		
Frag (heavy)	YES	2	YES	3 piece of metal frag from 3 inch down to 1 inch long ....3 and		Unknown		0	S_003_01261	0	3
Frag (heavy)	YES	2	YES	3 and done ...3 piece of metal frag from 3 down to 1 inch .....m		Unknown		0	S_003_01269	0	3
	YES	2	YES					0	S_003_01314		
Frag (light)	YES	2	YES	3 piece of frag of similar size		Unknown		0	S_004_01696	SPOILS	< 1
	YES	2	YES					0	S_RoadE2_13659		
Frag (light)	YES	2	YES	3 piece of frag of similar size		Unknown		0	S_004_01506	0	< 1
Frag (heavy)	YES	9	YES	3 and done ....1.5x.25 inch piece of metal frag down to 1x1 inc		Unknown		0	N_074_05723	1	< 1
Frag (heavy)	YES	9	YES	3 and done ...3 piece of metal frag 3x1 down to 1.5x1.....magn		Unknown		0	N_074_05721	0	2
Frag (light)	YES	9	YES			Unknown		0	N_075_05805	0	< 1
Fuze/Fuze Components	YES	9	YES			t bar		0	N_075_05778	4	< 1
Frag (light)	YES	9	YES			Unknown		0	N_075_05809	SPOILS	< 1
Frag (light)	NO	9				2 pieces of frag		0	N_073_05665	3	1
	NO	9	YES	found 3 hot rocks				0	N_079_05874		
Frag (medium)	YES	7	YES	this was a cool find, a 236 graveyard 1 set of fins, 3 wind shield		other		0	S_018_06939	1	> 1 lb
	NO	7	YES					0	S_015_05572		
	YES	7	YES	found hot rocks				0	S_015_05570		
No further entries- mar		11						0			
Small Arms Bullet	YES	11	YES	1 .50 cal bullet ....hot rocks found with schonstedt and minel		.50 cal		0		0	1
No further entries- mar		11						0			
No further entries- mar		11						0			
Small Arms Bullet	YES	11	YES	1 .50 cal jacket....magnetic signature still remaining because o		.50 cal		0		0	< 1
Nail	YES	11	YES	here we go, on the side of a mountain we found a 1 inch piece		1 inch		0		1	< 1
Small Arms Bullet	YES	11	YES	1 .50 cal jacket ....magnetic signature still remaining because o		.50 cal		0		2	< 1
Small Arms Bullet	YES	11	YES	1 .50 cal bullet ....with hot rocks found with schonstedt		.50 cal		0		0	1
Projectile AP	NO	11	YES	we found 1 37mm apct , and in very nice condition		37mm		0		3	> 1 lb
Frag (heavy)	NO	11	YES	1 small piece of metal frag 1x.25 inch		Unknown		0		2	< 1
Small Arms Bullet	NO	11	YES	1 .50 cal bullet		.50 cal		0		2	1
Small Arms Bullet	YES	11	YES	1 .50 cal bullet ....hot rocks still remaining		.50 cal		0		1	1
Small Arms Bullet	YES	11	YES	1 .50 cal bullet with hot rocks remaining		.50 cal		0		1	1
Small Arms Bullet	YES	11	YES	1 .30 cal bullet ....with hot rocks remaining		.30 cal		0		1	< 1
No further entries- mar		11						0			
Small Arms Bullet	YES	11	YES	2 .50 cal bullets...hot rocks still remaining		.50 cal		0		2	1
Small Arms Bullet	NO	11	YES	1 .50 cal bullet		.50 cal		0		1	1
		11						0			
		11						0			
		11						0			
Small Arms Bullet	NO	11	YES	50cal bullet,bullet jacket				0		2	1
Projectile AP	NO	11	YES	a 37mm apt		37mm		0		0	1 lb
Frag (light)	YES	11	YES	small frag				0		0	1
Small Arms Bullet	NO	11	YES	50 cal bullet jacket				0		0	1
Small Arms Bullet	NO	11	YES	50 cal bullet jacket				0		0	1
Projectile AP	NO	11	YES	37mm apt				0		SPOILS	1 lb
Small Arms Bullet	NO	11	YES	50 cal bullet		.50 cal		0		2	2
Frag (heavy)	NO	11	YES	1 1x.025 inch piece of metal frag		Unknown		0		SPOILS	< 1
Frag (medium)	NO	11	YES	a .25x.25 piece of rotating band		other		0		1	< 1
Frag (heavy)	NO	11	YES	a .25x.25 inch piece of metal frag		Unknown		0		1	< 1
other	NO	11	YES	here w go we found a piece of the horse shoe that the nail we		6 inch		0		1	2
Frag (heavy)	NO	11	YES	a 1x.25 inch piece of metal frag		Unknown		0		1	1
Projectile AP	NO	11	YES	1 37mm apt		37mm		0		0	> 1 lb
Frag (heavy)	NO	11	YES	1 40mm aa frag		other		0		0	> 1 lb
Small Arms Bullet	NO	11	YES	1 smashed .50 cal bullet		.50 cal		0		0	1
Projectile AP	NO	11	YES	1 37mm apt		37mm		0		0	> 1 lb
Frag (light)	NO	11	YES	unknown piece of frag		Unknown		0		1	< 1
Projectile AP	NO	11	YES	1 37mm aptc		37mm		0		0	> 1 lb
Small Arms Bullet	NO	11	YES	1 .50 cal bullet		.50 cal		0		0	1
Frag (heavy)	NO	11	YES	1 1.5x.5 inch piece of metal frag		Unknown		0		2	< 1
Frag (heavy)	NO	11	YES	1 1x.5 inch piece of metal frag		Unknown		0		1	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	NO	11	YES			Unknown		0		SPOILS	< 1
Fuze/Fuze Components	NO	11	YES			Unknown		0		1	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		SPOILS	< 1
Frag (light)	NO	11	YES			Unknown		0		SPOILS	< 1
Projectile APCT	NO	11	YES			37mm		0		0	1
Frag (light)	NO	11	YES			Unknown		0		SPOILS	< 1
Frag (light)	NO	11	YES	2 pieces of frag of similar size		Unknown		0		SPOILS	< 1
Frag (light)	NO	11	YES			Unknown		0		SPOILS	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		1	< 1
Projectile APCT	YES	11	YES			37mm		0		1	1
Frag (light)	NO	11	YES	half a body of HE frag		40mm frag		0		0	< 1
Frag (light)	NO	11	YES			Unknown		0		SPOILS	< 1
Projectile APT	NO	11	YES			37mm		0		0	1
Frag (light)	NO	11	YES			Unknown		0		SPOILS	< 1
Frag (light)	NO	11	YES			Unknown		0		2	< 1
Projectile APCT	NO	11	YES			37mm		0		0	1
bottle cap	NO	11	YES					0		1	< 1
tracer element	NO	11	YES			empty		0		SPOILS	< 1
tracer element	NO	11	YES			empty		0		2	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		SPOILS	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		SPOILS	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		SPOILS	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		2	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		1	< 1
Small Arms Bullet	NO	11	YES			.30 cal		0		SPOILS	< 1
Small Arms Bullet	NO	11	YES			.50 cal		0		2	< 1
Small Arms Bullet	NO	11	YES			.30 cal		0		SPOILS	< 1
shotgun shell	NO	11	YES					0		0	< 1
	NO	11	YES					0			
		11						0			
		11						0			
		11						0			
		11						0			
No further entries- mar		14						0			
No further entries- mar		14						0			
No further entries- mar		14						0			
No further entries- mar		14						0			
No further entries- mar		14						0			
No further entries- mar		14						0			
No further entries- mar		14						0			
other	NO	14	YES	1 m1 garand clip		3 inch long		0		1	1
No further entries- mar		14						0			
No further entries- mar		14						0			
Projectile AP	NO	14	YES	1 37mm apt		37mm		0		1	> 1 lb
Small Arms Bullet	NO	14	YES	1 .50 cal bullet		.50 cal		0		1	1
Can	NO	14	YES	1 soda can		4 inch		0		0	< 1
	YES	14	YES	lrg hot rock				0		0	> 1 lb
Cans	NO	14	YES	1 aluminum can				0		0	2
other	NO	15	YES	1 3 inch can ring		3 inch		0		1	< 1
other	NO	15	YES	1 bottle cap		1 inch		0		1	< 1
Small Arms Bullet	NO	15	YES	1 .50 cal jacket		.50 cal		0		0	< 1
Small Arms Bullet	NO	15	YES	1 .50 cal bullet and 1 30.06 case		.50 cal		0		1	1
Small Arms Bullet	NO	15	YES	1 .50 cal jacket		.50 cal		0		1	< 1
Small Arms Bullet	NO	15	YES	1 .50 cal bullet		.50 cal		0		1	1
Small Arms Bullet	NO	15	YES	1 .50 cal bullet		.50 cal		0		1	1
Frag (heavy)	NO	15	YES	1 1x.25 inch piece of metal frag		other		0		1	1
Can	NO	15	YES	1 bud beer can		5 inch		0		0	1
Frag (medium)	NO	15	YES	1 bulistic wind shield		Unknown		0		0	1
Small Arms Bullet	NO	15	YES	1 .50 cal bullet		.50 cal		0		0	1
Small Arms Bullet	NO	15	YES	1 .50 cal bullet		.50 cal		0		0	1
Small Arms Bullet	NO	15	YES	1 .50 cal bullet		.50 cal		0		0	1
Frag (medium)	NO	15	YES	1 squished bulistic windshield		other		0		0	1
other	NO	15	YES	half of a horse shoe		4 inch		0		3	3
Small Arms Bullet	NO	15	YES	1 .50 cal bullet		.50 cal		0		1	1
Small Arms Bullet	NO	15	YES			.50 cal		0		0	< 1
Small Arms Bullet	NO	15	YES			.50 cal		0		2	< 1
soda can	YES	15	YES			12oz		0		0	1
soda can	NO	15	YES			12oz		0		0	< 1
bottle cap	NO	15	YES					0		1	< 1
scrap metal	NO	15	YES					0		0	< 1
Small Arms Bullet	NO	15	YES			.50 cal		0		SPOILS	< 1
Frag (light)	NO	15	YES			Unknown		0		1	< 1
Small Arms Bullet	NO	15	YES			.50 cal jacket		0		SPOILS	< 1
Frag (light)	NO	15	YES			Unknown		0		3	< 1
Casing	NO	15	YES			Small Arms		0		SPOILS	< 1
scrap metal	NO	15	YES					0			< 1
Small Arms Bullet	NO	15	YES			.50 cal		0		0	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
rotating band	NO	15	YES			37mm		0		0	< 1
Small Arms Bullet	NO	15	YES			.50 cal		0		0	< 1
Frag (light)	NO	15	YES			Unknown		0		0	< 1
Projectile AP	NO	15	YES	1/37mm apct		37mm		0		0	1.75 lb
Frag (light)	NO	15	YES	1 small frag				0		0	1
Projectile AP	NO	15	YES	1/37mm apct		37mm		0		0	1.75 lb
Small Arms Bullet	NO	15	YES	small arms bullet		.30 cal		0		0	1
Small Arms Bullet	NO	15	YES	1/50 cal bullet		.50 cal		0		0	2
Small Arms Bullet	NO	15	YES	50 cal bullet jacket		.50 cal		0		2	1
Small Arms Bullet	NO	15	YES	50 cal bullet		.50 cal		0		2	2
Small Arms Bullet	NO	15	YES	50 cal bullet		.50 cal		0		2	2
Small Arms Bullet	NO	16	YES	1 .50 cal bullet		.50 cal		0		1	1
No further entries- mar		16						0			
Frag (heavy)	NO	16	YES	a 1x.25 inch piece of metal frag		Unknown		0		0	1
other	NO	16	YES	1 pull tab		1.5		0		2	< 1
Small Arms Bullet	NO	16	YES	1 30.06 bullet		other		0		SPOILS	< 1
other	NO	16	YES	1 bottle cap		1 inch		0		0	< 1
No further entries- mar		16						0			
Frag (heavy)	NO	16	YES	1 2x1 piece of metal frag		Unknown		0		1	1
Small Arms Bullet	NO	16	YES	1 .50 cal bullet		.50 cal		0		1	1
other	NO	16	YES	1 tin can lid with hot rocks		5 inch		0		1	< 1
other	NO	16	YES	1 pop top tab		1 inch		0		0	< 1
Wire	NO	16	YES	a 12 inch piece of metal wire		12 inch		0		1	1
Wire	NO	16	YES	2 12 inch piece of metal wire in the shape of a triangle		12 inch		0		1	1
screen	NO	16	YES	2 piece of screening about 24x12....in between both dot		24 inch long		0		0	1
Small Arms Bullet	NO	16	YES	1 .50 cal bullet		.50 cal		0		1	1
No further entries- mar		16						0			
other	NO	16	YES	1 pull tab		2 inch		0		1	< 1
Cans	NO	16	YES	small aluminum can				0		3	1
other	NO	17	YES	piece of thin metal		2 inch		0		1	< 1
No further entries- mar		17						0			
Can	NO	17	YES	what looks like a very large tuna fish can, without a lable		4 inch		0		1	1
Barbed Wire	NO	17	YES	nonremovable piece of barbed wire		72 inches long		0		1	9
No further entries- mar		17						0			
other	NO	17	YES	short piece of metal fence post		30 inches long		0		4	5
other	YES	17	YES	1 55gal drum just off transect		36 inches long		0		0	24
uknown	NO	17	YES	1 items dig complete				0		3	3
Frag (light)	NO	17	YES	1 small frag				0		3	2
grenade spoon	NO	17	YES	grenade spoon				0		3	1
	NO	17	YES	hot rock				0		0	> 1 lb
grenade spoon	NO	17	YES	grenade spoon				0		2	2
grenade spoon	NO	17	YES	grenade spoon				0		3	2
grenade spoon	NO	17	YES	grenade spoon				0		1	2
grenade spoon	NO	17	YES	grenade spoon				0		0	2
	YES	17	YES					0			
grenade spoon	NO	17	YES	found 1-grenade spoon		4x1		0		2	1
spoon	NO	17	YES			6in		0		5	2
Vehicle parts	NO	17	YES	found a drive shaft		drive shaft		0		3	22
grill slate	NO	17	YES			1ftx1ft		0		3	2
Nails	NO	17	YES	found 4 nails in one hole		6 inch nails		0		10	1
gernade pin	YES	17	YES					0	N_013_01463	1	< 1
fence post	NO	17	YES					0	N_013_01325	0	< 1
Frag (light)	YES	17	YES	throughout they entire meter		gernade		0	N_013_01438	SPOILS	< 1
gernade spoon	YES	17	YES	gernade spoons and parts are located throughout they entire				0			
Small Arms Bullet	YES	17	YES			.50 cal		0	N_012_01246	SPOILS	< 1
Frag (light)	YES	17	YES			gernade		0	N_012_01256	SPOILS	< 1
Frag (light)	YES	17	YES	throughout they entire meter		gernade		0	N_011_01181	SPOILS	< 1
Frag (light)	YES	17	YES	throughout they entire meter		gernade		0	N_011_01179	SPOILS	< 1
Frag (light)	YES	17	YES	within they entire meter		gernade		0	N_0C1_06260	SPOILS	< 1
Frag (light)	YES	17	YES	throughout they entire meter		gernade		0	N_0C1_06248	SPOILS	< 1
Frag (light)	YES	17	YES	throughout they entire meter		Unknown		0	N_010_01040	SPOILS	< 1
Frag (light)	YES	17	YES	located throughout they entire meter		gernade		0	N_010_01008	SPOILS	< 1
Frag (light)	YES	17	YES	located throughout they entire meter		gernade		0	N_010_01047	SPOILS	< 1
reed bar	NO	17	YES					0	N_010_01009	0	< 1
	NO	17	YES					0	N_009_00889		
Nails	YES	17	YES	spread throughout they entire meter		large		0	N_009_00870	SPOILS	< 1
Nails	YES	17	YES	spread throughout they entire meter		medium		0	N_009_00870	SPOILS	< 1
Frag (light)	YES	17	YES	spread throughout they entire meter		gernade		0	N_009_00870	SPOILS	< 1
Nails	YES	17	YES	spread throughout they entire meter		large		0	N_009_00867	SPOILS	< 1
Nails	YES	17	YES	spread throughout they entire meter		small		0	N_009_00867	SPOILS	< 1
Frag (light)	YES	17	YES	spread throughout they entire meter		gernade		0	N_009_00867	SPOILS	< 1
Nails	NO	17	YES	within they entire meter		large		0	N_009_00909	SPOILS	< 1
Nails	YES	17	YES	spread throughout they entire meter		large		0	N_008_00750	SPOILS	< 1
Frag (light)	YES	17	YES	spread throughout they entire meter		gernade		0	N_008_00750	SPOILS	< 1
fence	NO	17	YES	was covering they entire meter		chain link		0	N_004_00172	0	20lb
other	NO	17	YES	possible 155 crader		10 ft		0		0	< 1
other	NO	17	YES	possible 155 crader		10 ft		0		0	< 1

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Fuze/Fuze Components	NO	17	YES	1 grenade fuse		2.5 inch long		0		0	2
other	NO	17	YES	1 grenade spoon, 1 grenade pin and ring		4.5 inch long		0		0	1
Fuze/Fuze Components	NO	17	YES	4 piece of grenade fuse, 2 grenade spoons, 3 grenade rings and		.5 inch long		0		0	1
other	NO	17	YES	1 chain link fence privacy panel strip		10 inch long		0		0	1
No further entries- mar		17						0			
other	NO	17	YES	1 grenade spoon		4.5 inch long		0		3	< 1
other	NO	17	YES	looks like a crushed square metal box		5 inch long		0		2	1
other	NO	17	YES	1 grenade rings and pin		1 inch		0		2	< 1
No further entries- mar		17						0			
other	NO	17	YES	1 can lid		4 inch		0		1	1
other	NO	17	YES	1 can lid		3 inch		0		1	< 1
other	NO	17	YES	1 grenade rings and pin		1 inch		0		1	< 1
grenade spoon	NO	17	YES	grenade spoon				0		3	1
	YES	17	YES	too large to move				0		0	> 1 lb
grenade spoon	NO	17	YES	grenade spoon				0		12	1
metal pan	NO	17	YES	metal pan				0		0	1 lb
grenade spoon	NO	17	YES	grenade spoon				0		4	1
Wire	NO	17	YES	small wire				0		3	1
grenade spoon	NO	17	YES	grenade spoon				0		3	1
grenade spoon	NO	17	YES	grenade spoon				0		1	1
	YES	17	YES	h0t rock				0		0	> 1 lb
Wire	NO	17	YES	wire				0		5	1
lid	NO	17	YES	can lid				0		2	1
can top	NO	17	YES	can top				0		4	1
Cans	NO	17	YES	found a can lid		3x3		0		4	1
grenade spoon	NO	17	YES	found 2 grenade spoons		spoon		0		2	1
grenade spoon	NO	17	YES	found 3 grenade spoons and a link		5x1		0		3	2
grenade spoon	NO	17	YES	found 1 grenade spoon		5x1		0		1	< 1
	YES	17	YES					0			
grenade pin	NO	17	YES	found 1 grenade pin		1x1		0		4	< 1
Small Arms Bullet	NO	18	YES	1 30.06 case		3 inch long		0		1	1
No further entries- mar		18						0			
Casing	NO	18	YES	1 30.06 case		Small Arms		0		2	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
other	NO	18	YES	1 30.06 clip		3 inch long		0		1	2
Frag (heavy)	NO	18	YES	possible 105 frag		other		0		2	2
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		0	1
other	NO	18	YES	1 30.06 clip		3 inch long		0		1	2
other	NO	18	YES	1 30.06 clip		3 inch long		0		0	2
other	NO	18	YES	1 30.06 clip		3 inch long		0		0	2
		18						0			
Casing	NO	18	YES	1 30.06 case		Small Arms		0		0	1
No further entries- mar		18						0			
Small Arms Bullet	NO	18	YES	2 .50 cal bullets		.50 cal		0		1	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
other	NO	18	YES	1 30.06 case		3 inch long		0		2	2
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		1	1
No further entries- mar		18						0			
other	NO	18	YES	1 30.06 clip		3 inch long		0		2	1
Small Arms Bullet	NO	18	YES	1 .30 cal bullet		.30 cal		0		1	< 1
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		1	1
Small Arms Bullet	NO	18	YES	1 bullet jacket-unknown , an 1 22 cal case		other		0		0	< 1
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		1	1
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		SPOILS	1
No further entries- mar		18						0			
Casing	NO	18	YES	8 30.06 case......he unloaded his clip		Small Arms		0		0	1
other	NO	18	YES	1 spent practice hand grenade, about 3 pounds		5 inch long		0		0	> 1 lb
Casing	NO	18	YES	1 30.06 case		Small Arms		0		0	1
Frag (light)	NO	18	YES			Unknown		0		0	10
Wire	YES	18	YES	fence runs north and south				0			
Projectile HE	NO	18	YES			40mm		0		0	> 1 lb
Projectile APCT	NO	18	YES			37mm		0		0	1 lb
	NO	18	YES					0			
Small Arms Bullet	NO	18	YES			.50 cal		0		2	< 1
Small Arms Bullet	NO	18	YES			.50 cal		0		SPOILS	< 1
Frag (light)	NO	18	YES			Unknown		0		2	2
Frag (light)	NO	18	YES			Unknown		0		3	2
Casing	NO	18	YES			Small Arms		0		0	< 1
Frag (light)	NO	18	YES			Unknown		0		4	1
Frag (light)	NO	18	YES			Unknown		0		0	4
	NO	18	YES					0			

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
Frag (light)	NO	18	YES			Unknown		0		0	4
Frag (light)	NO	18	YES			Unknown		0		0	2
Frag (light)	NO	18	YES			Unknown		0		4	3
Projectile APCT	NO	18	YES			37mm		0		0	1 lb
Casing	NO	18	YES			Small Arms		0		0	1
		18						0			
Small Arms Bullet	NO	18	YES			.50 cal		0		2	3
Frag (light)	NO	18	YES			Unknown		0		3	1
Frag (light)	NO	18	YES			Unknown		0		1	< 1
		18						0			
Frag (light)	NO	18	YES			Unknown		0		1	1
Projectile APCT	NO	18	YES			37mm		0		1	1 lb
Frag (light)	NO	18	YES			Unknown		0		0	2
		18						0			
Frag (light)	NO	18	YES	3 small frag ,2 bullets				0		3	5
	YES	18	YES	hot rock				0		0	> 1 lb
Frag (light)	NO	18	YES	small frag				0		6	1
Frag (light)	NO	18	YES	75mm base frag				0		1	2
	NO	18	YES	frag				0		3	2
Frag (light)	NO	18	YES	found 2 pieces of frag		1x1		0		0	2
Small Arms Bullet	NO	18	YES	found 1-.50 cal bullet		.50 cal		0		2	< 1
Small Arms Bullet	NO	18	YES	found 1-.50 cal slug		.50 cal		0		7	1
	YES	18	YES					0			
can	NO	18	YES	found a rusty can		6x4		0		2	< 1
Small Arms Bullet	NO	18	YES	found 1-50 cal bullet		.50 cal		0		3	< 1
Frag (light)	NO	18	YES	found a small piece of frag		1x.5		0		4	< 1
M1 grand clip	NO	18	YES	found 1-M1 grand clip		3x2		0		5	1
Small Arms Bullet	NO	18	YES	found 1- 50 cal bullet		.50 cal		0		4	1
Small Arms Bullet	NO	18	YES	found 1- 50 cal bullet		.50 cal		0		3	1
	YES	18	YES					0			
Small Arms Bullet	NO	18	YES	found 1- 50 cal slug		.50 cal		0		5	1
Frag (light)	NO	18	YES	found a small piece of frag		3x1		0		2	2
Casing	NO	18	YES	1 30.06 case		Small Arms		0		1	1
other	NO	18	YES	1 30.06 clip		3 inch long		0		0	1
Frag (heavy)	NO	18	YES	1 nose off a 37mm		other		0		1	9
		18						0			
Casing	NO	18	YES	1 spent 7.62 blank		Small Arms		0		0	1
Casing	NO	18	YES	1 30.06 case		Small Arms		0		0	1
No further entries- mar		18						0			
Casing	NO	18	YES	1 22 cal case		Small Arms		0		1	< 1
No further entries- mar		18						0			
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		1	1
Projectile AP	NO	18	YES	1 37mm aptc		37mm		0		0	1 lb
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		1	1
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		1	1
Projectile HE	NO	18	YES	1 squished 40mm he		40mm		0		0	1 lb
No further entries- mar		18						0			
Frag (heavy)	NO	18	YES	1 heavy piece of metal frag		Unknown		0		1	1
Small Arms Bullet	NO	18	YES	1 .50 cal bullet		.50 cal		0		SPOILS	1
Frag (heavy)	NO	18	YES	1 unknown piece of metal frag		Unknown		0		1	1
Frag (heavy)	NO	18	YES	1 nice large piece of metal frag		Unknown		0		1	10
Frag (light)	NO	18	YES			Unknown		0		2	< 1
shotgun shell base	NO	18	YES					0		0	1
Projectile APCT	NO	18	YES			37mm		0		0	> 1 lb
m1 clip	NO	18	YES					0		0	1
		18	YES					0			
Projectile APCT	NO	18	YES			37mm		0		0	> 1 lb
Small Arms Bullet	NO	18	YES			.50 cal		0		0	2
Frag (light)	NO	18	YES			Unknown		0		1	1
Frag (light)	NO	18	YES			Unknown		0		1	1
Frag (light)	NO	18	YES			Unknown		0		0	1
Projectile APT	NO	18	NO			37mm		0		0	> 1 lb
Frag (light)	NO	18	YES			Unknown		0		0	1
Small Arms Bullet	NO	18	YES			.50 cal		0		0	1
Frag (light)	NO	18	YES			Unknown		0		SPOILS	< 1
Frag (light)	NO	18	YES			Unknown		0		2	< 1
Frag (light)	NO	18	YES			Unknown		0		1	< 1
Frag (light)	NO	18	YES			Unknown		0		0	5
Fuze/Fuze Components	NO	18	YES			t bar		0		0	1 lb
Frag (light)	NO	18				Unknown		0		2	1
Frag (light)	NO	18	YES			rotating band		0		1	< 1
Frag (light)	NO	18	YES	small frag				0		0	2
Small Arms Bullet	NO	18	YES	small arms bullet		.50 cal		0		2	2
	YES	18	YES	hot rock				0		0	> 1 lb
Frag (light)	NO	18	YES	small frag				0		0	1
Frag (light)	NO	18	YES	2x small frag				0		3	2
Frag (light)	NO	18	YES	small frag				0		4	2

NMNCLTR	RMS_EXIST	TRGT_AREA	DIG_STATUS	NARRATIVE	CRA	SIZE_DESC	RESOLVED	AVG_EST_ACCURACY	ORIG_ID	DPTH_BELOW	WEIGHT
	YES	18	YES	hot rock				0		0	> 1 lb
Frag (light)	NO	18	YES	small frag				0		5	2
Small Arms Bullet	NO	18	YES	small arms bullet		.50 cal		0		5	2
Small Arms Bullet	NO	18	YES	small arms bullet		.50 cal		0		2	2
Casing	NO	18	YES	small arms casing		Small Arms		0		5	2
Small Arms Bullet	NO	18	YES	small arms bullet		.50 cal		0		2	2
Casing	NO	18	YES	small arms casing		Small Arms		0		3	1
Frag (light)	NO	18	YES	small frag ,bullet case				0		4	2
		18	YES	hot rock				0			
Casing	NO	18	YES	small arms case				0		3	1
Casing	NO	18	YES	small arms jacket		Small Arms		0		3	2
Frag (light)	NO	18	YES	small frag				0		2	1
Frag (light)	NO	18	YES	small frag				0		2	2
Grenade Hand TP	NO	18	YES	practice hand grenade				0		3	> 1 lb
	YES	18	YES	hot rock				0			
Projectile AP	NO	18	YES	37mm apct		37mm		0		3	> 1 lb
Casing	NO	18	YES	small arms case		Small Arms		0		3	1
Frag (light)	NO	18	YES	small frag				0		3	1
Small Arms Bullet	NO	18	YES	small arms bullet		.50 cal		0		2	2
		18	YES	hot rock				0			
	NO	17	YES					0	N_008_00805		
Wire	NO	17	YES			12in		0	N_006_00520	6	1
	NO	17	YES					0	N_004_00209	0	
tin lid	NO	17	YES			5 in dia		0	N_003_00135	3	< 1
construction debris	NO	17	YES			tiles		0	N_003_00128	8	> 1 lb

Appendix E – UXOQCS Daily Quality Control Reports

	DAILY QUALITY CONTROL REPORT	

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 001	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 08-30-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	MOBILIZATION: SUXOS, UXOSO and UXOQCS mobilized for Fort Bliss, El Paso TX on 08-23-10 as per the Work Plan (WP.) All plans, specifications, SOPs, and other applicable documents have been reviewed. All conditions and controls are in place for Mobilization.	
Initial	MOBILIZATION: SUXOS, UXOSO and UXOQCS arrived at Fort Bliss, El Paso, TX on 08-23-10. All actions performed as per the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED**
Follow-Up	.	**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-90 Low-67 20% chance of thunderstorms, Wind W-6mph, Humidity 44%.

Remarks:

*SUXOS Cleared/graded site for placement of Type II Magazine projected for 09-02-10.

*Vendor delivered (3) cu yards of 1.5 inch stone for base of Type II Magazine. Stone will be spread after installation of security fence projected for 08-31-10.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 08/30/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 002	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 08-31-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	MOBILIZATION: Project Geophysicist mobilized and arrived at Fort Bliss, El Paso, TX. . All activities performed as per the WP and in compliance with QC criteria.	INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-90 Low-70 20% chance of thunderstorms, Wind S-mph, Humidity 34%.

Remarks:

*SUXOS escorted fencing vendor to magazine area for site survey.

*UXOSO site safety equipment, tools and supplies in preparation for intrusive operations.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 08/31/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 003	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-01-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-90 Low-70 20% chance of thunderstorms, Wind 5-mph, Humidity 34%.

Remarks:

*Vendor delivered (7) UTVs.

*SUXOS/UXOQCS/Geophysicist performed ops check/off-road test of UTVs.

*UXOSO conducted safety inspection of UTVs. (1) UTV missing Roll Over Protection System (ROPS) and seatbelts. SUXOS notified vendor. Vendor will correct problem.

*Geophysicist assembled, charged batteries and performed function checks on GEO XHs and Minelab Explorer 2s.

*UXOSO escorted fencing vendor to magazine area for fence post installation. Post installation complete.

*UXOSO conducted inventory of site safety equipment, tools and supplies in preparation for intrusive operations.

*UXOQCS prepared Castner FCR 2010-I-001 for submission.

*All site personnel were observed in appropriate PPE as per the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/01/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the	

Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 004	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-02-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

<u>Weather</u>: High-95 Low-65 Partly Cloudy, Wind W 5-mph, Humidity 30%.

<u>Remarks:</u>

*El Paso Animal Control was contacted and responded to call concerning a rattle snake observed in the vicinity of the Geobase control point. The snake had departed the area by the time of response. The area was toughly searched with negative results and the Animal Control Representative departed. This was the second consecutive day of a snake sighting in this area.

*EM-61 and RTK was received.

*Geophysicist commenced reoccupation of IVS.

*UXOSO escorted fencing vendor to magazine site to install fence fabric.

*Weekly conference call was conducted. Among the topics that were discussed were; Ordering and receipt of explosives, Type II magazine delivery, electronic data management, APP 12.20 information omission/FCR submission.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/02/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 005	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-07-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	MOBILIZATION: (10) UXO Technicians mobilized and arrived at Fort Bliss, El Paso, TX. All activities performed as per the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-95 Low-65 Partly Cloudy, Wind W 5-mph, Humidity 30%.

Remarks:

*****All remaining site personnel mobilized and arrived at Fort Bliss, El Paso, TX. All personnel have reported to SUXOS and will arrive on site on 09-08-10.

*Escorted UXOSO to proposed demo sites in area south of Transmountain Drive.

*Vendor delivered Type II Magazine.

*Observed SUXOS and UXOSO offload magazine, deliver magazine to site and stage for final placement scheduled for 09-08-10.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/02/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 006	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-08-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-90 Low-68 Partly Cloudy, Wind ESE 15-mph, Humidity 34%.

Remarks:

***SUXOS/UXOSO conducted Site safety/operations brief for all site personnel.**

*UXOQCS escorted UXOSO and (9) UXO Techs on site orientation.

*Vendor delivered crane to place Type II Magazine.

*Vendor completed security fence enclosing magazine.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/08/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 007	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-09-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-92 Low-65 Partly Cloudy, Wind W 12-mph, Humidity 35%.

Remarks:

*UXOSO conducted Site safety/operations brief for all site personnel.

*UXOQCS conducted QC inspection on completed security fence for Type II Magazine. Contractor installed gate to open inward. During emergency evacuation of magazine, inward opening gate could be problematic. SUXOS notified contractor to correct gate to open outward. Gate was re-hung to open outward.

*Geophysicist continued preparing Minelabs and Trimble XHs for intrusive operations and conducted equipment training with UXOQCS and UXOSO.

*UXOSO escorted electrical contractor to Type II Magazine site to conduct estimate survey.

*Site personnel participated in conference call with URS Management Team. Topics discussed but not limited: Archaeology site survey procedures, anomaly reacquisition procedures, Type II Magazine placement status, and OESS arrival date.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/09/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 008	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-13-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	**TARGET ANOMALY REACQUISITION:** UXO Team conducted an operations brief in preparation for the target anomaly reacquisition task. Applicable plans, SOPs, and the overall process were reviewed and briefed. All personnel in attendance were essential to the task to be conducted.	
Initial	**TARGET ANOMALY REACQUISITION:** UXO Team commenced target anomaly reacquisition operations. All equipment, PPE, materials and supplies are on hand to perform task. All personnel understand their roles and procedures to safely and effectively complete this task. Procedures observed were performed in compliance with the WP, USACE guidance documents, and QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-90 Low-65 Chance of thunderstorms, Wind S 6-mph, Humidity 43%.

Remarks:

*****UXOSO and SUXOS conducted Site safety/operations brief for all site personnel. This report will serve as DHSR I-008. All site safety plans and procedures were followed. No site safety reportable incidents occurred.

*UXOQCS observed UXO Team conducting function test with detectors and Trimble Geo XH. Position check was conducted with Geo XH and submitted with daily data to Geo QC.

*UXO Team observed reacquiring anomalies in Target Area 7. Target data placed anomaly locations for Target Area 7 inside the 447' HFD for the M107 155mm projectile. Project Management was notified and target anomalies within the HFD will not be selected for intrusive investigation.

*UXOQCS escorted Fort Bliss, Environmental Division Archaeologist to selected areas of cultural concern. All selected sites in Target Areas 7, 13, and 17 were inspected and approved for intrusive investigation.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
<tr><td colspan="2">compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</td><td colspan="2">
Daniel Kur UXOQCS 09/13/10</td></tr>
<tr><th colspan="4">CLIENT QUALITY ASSURANCE</th></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td colspan="3"></td></tr>
<tr><td colspan="3">CLIENT QA REPRESENTATIVE</td></tr>
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DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 009	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-14-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued anomaly reacquisition operations. All activities completed were in compliance with the WP and QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-88 Low-67 30% Chance of thunderstorms, Wind SSE 6-mph, Humidity 41%.

Remarks:

*UXOSO and SUXOS conducted Site safety/operations brief for all site personnel. This report will serve as DHSR I-009. All site safety plans and procedures were followed. No site safety reportable incidents occurred.

*UXOQCS observed UXO Team conducting function test with detectors and Trimble Geo XH. Position check was conducted with Geo XH and submitted with daily data to Geo QC.

*UXOQCS observed UXO Team reacquiring anomalies in Target Area 3 and non-target areas.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/13/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 010	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-15-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued anomaly reacquisition operations. All activities completed were in compliance with the WP and QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-90 Low-67 Chance of thunderstorms, Wind W 5-mph, Humidity 32%.

Remarks:

***UXOSO and SUXOS conducted Site safety/operations brief for all site personnel. This report will serve as DHSR I-010. All site safety plans and procedures were followed. No site safety reportable incidents occurred.

*UXOQCS observed UXO Team conducting function test with detectors and Trimble Geo XH. Position check was conducted with Geo XH and submitted with daily data to Geo QC.

*UXOQCS observed UXO Team reacquiring anomalies in non-target areas.

*UXOQCS escorted Fort Bliss, Environmental Division Archaeologist to selected areas of cultural concern. All selected sites in Target Areas 10, and 4 were inspected and approved for intrusive investigation.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/15/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 011	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-16-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued anomaly reacquisition operations. All activities completed were in compliance with the WP and QC criteria.	INSPECTIONS PERFORMED Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-90 Low-67 Chance of thunderstorms, Wind ESE 6-mph, Humidity 42%.

Remarks:

*****UXOSO and SUXOS conducted Site safety/operations brief for all site personnel. This report will serve as DHSR I-011. All site safety plans and procedures were followed. No site safety reportable incidents occurred.

*UXO Team conducted function test with detectors and Trimble Geo XH. Position check was conducted with Geo XH and submitted with daily data to Geo QC.

*UXOQCS escorted Fort Bliss, Environmental Division Archaeologist to selected areas of cultural concern. All selected sites in Target Areas 6 and 8 were surveyed and approved for intrusive investigation.

*UXO Field Team participated in conference call with URS Management Team. Topics of discussion included; Proposal methods of QC sampling in adverse terrain/vegetation, operational schedule for the week of 9-20-10 and revised PDA data entry procedures.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/16/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

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<tr><td></td><td colspan="2">DAILY QUALITY CONTROL REPORT</td><td></td></tr>
<tr><td colspan="2">CONTRACT:W912QR-08-D-0011</td><td colspan="2">PROJECT: Castner Range WAA Field Demonstration</td></tr>
<tr><td colspan="2">REPORT NUMBER: I- 012</td><td>LOCATION: Fort Bliss, El Paso, TX</td><td>DATE: 09-20-10</td></tr>
<tr><td>PHASE</td><td colspan="3">LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT</td></tr>
<tr><td>Preparatory</td><td colspan="3">.</td></tr>
<tr><td>Initial</td><td colspan="2"></td><td>INSPECTIONS PERFORMED</td></tr>
<tr><td>Follow-Up</td><td colspan="2"></td><td>INSPECTIONS PERFORMED</td></tr>
<tr><td colspan="2">REWORK ITEMS IDENTIFIED TODAY</td><td colspan="2">REWORK ITEMS CORRECTED TODAY</td></tr>
<tr><td colspan="2">None</td><td colspan="2">None</td></tr>
</table>

Weather: High-86 Low-65 Partly Cloudy, Wind ESE 8-mph, Humidity 44%.

Remarks:

***UXO Team conducted site specific training. Training included; 1st Aid, Safety, Minelab Explorer II, EM-61/RTK set-up and UTV operations.**

*UXOQCS escorted Fort Bliss, Environmental Division Archaeologist to selected areas of cultural concern. Selected sites in Non-Target Area north of TA 8 were surveyed and approved for intrusive investigation. Due to problem with Trimble data file it was not possible to enter the information regarding these sites with the PDA function. The project Geophysicist was notified and will confirm for the record that the selected targets were cleared for intrusive investigation by the Archaeologist.

*Geophysicist/UXO Team placed non-ferrous test items adjacent to IVS for daily detector function testing. Items were placed centered at 4” below ground surface. Item NF 001, (3) pieces of 6’ x 3/8” aluminum rod was placed parallel to transect, Item NF 002, 6” x 1 ¼” copper pipe connector was placed vertically, Item NF 003, 4” x ¾” brass pipe nipple was placed perpendicular to transect.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/20/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 012	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-20-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	.	
Initial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-86 Low-65 Partly Cloudy, Wind ESE 8-mph, Humidity 44%.

Remarks:

***UXO Team conducted site specific training. Training included; 1st Aid, Safety, Minelab Explorer II, EM-61/RTK set-up and UTV operations.**

*UXOQCS escorted Fort Bliss, Environmental Division Archaeologist to selected areas of cultural concern. Selected sites in Non-Target Area north of TA 8 were surveyed and approved for intrusive investigation. Due to problem with Trimble data file it was not possible to enter the information regarding these sites with the PDA function. The project Geophysicist was notified and will confirm for the record that the selected targets were cleared for intrusive investigation by the Archaeologist.

*Geophysicist/UXO Team placed non-ferrous test items adjacent to IVS for daily detector function testing. Items were placed centered at 4” below ground surface. Item NF 001, (3) pieces of 6’ x 3/8” aluminum rod was placed parallel to transect, Item NF 002, 6” x 1 ¼” copper pipe connector was placed vertically, Item NF 003, 4” x ¾” brass pipe nipple was placed perpendicular to transect.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the Work Plan (WP) and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/20/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 014	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-22-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		INSPECTIONS PERFORMED
Follow-Up		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-85 Low-67 Partly Cloudy, Wind SSE 12-mph, Humidity 58%.

Remarks:

*Electrical vendor completed grounding inspection of Type II Magazine. All applicable ATF and U. S. Army requirements have been met for limited on-site explosive storage. SUXOS/URS Management personnel have made all required notifications. Magazine emplacement has been completed and is ready for initial delivery of explosives.

*UXO Teams received Archaeological/Environmental brief from El Paso Archaeological personnel.

*SUXOS/UXOSO/UXOQCS conducted site field orientation tour, for all site personnel, of site boundaries and northern Target Areas.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the WP and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/22/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 015	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-23-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		INSPECTIONS PERFORMED
Follow-Up		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-85 Low-67 Partly Cloudy, Wind SSE 12-mph, Humidity 58%.

Remarks:

*Geophysicist set up field navigation course.

*UXO Teams conducted field navigation training utilizing the Trimble GEO XH.

*UXOQCS provided MEC avoidance escort for Program Manager while conducting soil survey in TAs 1, 2, 3 and 12

*Site Management Team participated in conference call with URS Project Management Team. Topics discussed were: Emergency communications, data flow of daily data submissions, QC sampling procedures in non-target areas, and status of TAs cleared by Archaeologist for intrusive investigation.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the WP and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/23/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 016	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-24-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	INTRUSIVE INVESTIGATION: SUXOS, UXOSO, UXOQCS and Project Geophysicist have completed site specific training and intrusive investigation operations briefings. Project work plans, SOPs, and other applicable documents were reviewed. PPE and equipment requirements were discussed in addition to specific quality requirements for this definable feature of work. All conditions and controls are in place for commencing the initial phase of intrusive investigation operations.	
Initial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-88 Low-65 Chance of thunder storms, Wind NE 7-mph, Humidity 43%.

Remarks:

*USACE Ordnance and Explosives Safety Specialist arrived on site.

*UXOQCS conducted inspection of site personnel documentation. All site personnel have been assigned in writing to their current position and to alternate positions in case of replacement requirements. All site personnel certifications have been reviewed and found to be current, or have medical screening appointments pending.

*Geophysicist set up field navigation course.

*UXO Teams conducted field navigation training utilizing the Trimble GEO XH.

*UXO Team conducted training with Minelab Explorer II.

*UXOQCS provided site orientation tour for OESS.

*OESS met with SUXOS, UXOSO and UXOQCS to review site safety procedures and expectations.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted as per the WP and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/24/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 017	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-27-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		INSPECTIONS PERFORMED
Follow-Up		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-85 Low-58 Clear, Wind SSE 5-mph, Humidity 37%.

Remarks:

*UXO Teams conducted anomaly reacquisition training utilizing the Trimble GEO XH and Minelab Explorer II.
*UXOQCS completed photographic soil survey in TAs 1, 2, 3, 4, 6, 10, 12. Photos will be sent to URS Program Manager to prepare for future soil sampling operations.
*UXOQCS provided site orientation tour for OESS.
*All site personnel were observed in appropriate PPE as per the WP.
*All definable features of work were conducted as per the WP and in accordance with USACE standards.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/27/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 018	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-28-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

<u>Weather</u>: High-85 Low-58 Clear, Wind SSE 5-mph, Humidity 37%.

<u>Remarks:</u>

*UXO Teams conducted anomaly reacquisition training utilizing the Trimble GEO XH and Minelab Explorer II.

*UXOSO marked highly visible emergency egress routes throughout the site utilizing survey tape/paint.

*Project Geophysicist conducted accuracy testing of selected seed items reacquired by UXO Teams for training purposes. Trimble Geo XH used by UXO Team 3 had incorrect satellite settings and was not producing accurate results. Project Geophysicist corrected the problem. All Trimble Geo XHs have the proper settings in preparation for intrusive operations. UXOQCS will monitor and verify the Geo XHs accuracy throughout the project.

*UXOQCS and OESS observed initial delivery of explosives to Type II Magazine. SUXOS and UXOSO conducted initial inventory. A discrepancy was noted: Two different size/quantities of shape charges, (85) 36 gram and (15) 39 gram, were shipped together with the same manufacturers lot #, H-600. Receipt document listed (100) 36 gram shape charges. SUXOS immediately notified the vendor and the URS Munitions Response Safety Program Manager (MR SPM).- All items were inventoried and properly logged. Magazine lock and key security was properly followed. SUXOS has made all required notifications that limited quantities of explosive material are now being stored on site.

*Conducted afternoon (PM) magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

	compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/28/10

CLIENT QUALITY ASSURANCE		
Quality Assurance Representatives Remarks and/or Exceptions to the Report		
	CLIENT QA REPRESENTATIVE	

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 019	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-29-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial	**INTRUSIVE INVESTIGATION:** UXO Team commenced intrusive investigation in Target Areas 1 and 3. All equipment, materials and supplies are on hand to perform task. All personnel are trained and qualified. All actions were performed in accordance with the WP, Industry Standards, USACE directives, and are in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-92 Low-63 Clear, Wind W 2-mph, Humidity25%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UTV vendor performed maintenance on vehicles. (1) EZ-GO UTV was dead-lined for repairs and replaced.

*UXO Teams commenced intrusive investigation in Target Areas 1 and 3. In order to test equipment and procedures, seed locations, Industry Standard Objects that were placed for Helicopter-borne DGM data collection, were selected for investigation. The UXO Teams investigated (40) seed locations. UXOQCS and project Geophysicist conducted field surveillance of (6) selected excavations. The UXO Teams recovered (5) items within 1.5 meters of reacquired point. (1) Item was not located. UXOQCS and the Geophysicist located the item utilizing the EM-61. The item was located 1.5 meters from the reacquired point. Instrument settings were checked, procedures were reviewed and the UXO Team successfully recovered their remaining items. Intrusive investigation of non-seed anomalies will commence on 9-30-10.

*Conducted morning (AM) and afternoon (PM) magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE as per the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 09/29/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 020	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 09-30-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations. Project Geophysicist and UXOQCS reacquired seed locations in TA 3 and target anomalies in TA 4 utilizing RTK. Locations of points were consistent with DGM data collection points that were collected by Sky and NAEVA geophysicists during prior operations. The Trimble Geo XHs are consistently measuring the point 1 to 1.5 meters east southeast from the point measured with RTK. Project Geophysicist and GIS are working to remedy this problem.	INSPECTIONS PERFORMED Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-90 Low-61 Clear, Wind ESE 15-mph, Humidity25%.

Remarks:

*UXOSO is off site. UXOQCS will assume duties of UXOSO. UXOSO and SUXOS conducted Site safety/operations brief for all site personnel. This report will serve as DHSR I-020. All site safety plans and procedures were followed. No site safety reportable incidents occurred.

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 4.

*The Trimble Geo XH positional accuracy condition will require Operations to re-work affected target anomaly investigations influenced by this condition.

*Field Management Team participated in conference call with URS Project Management Team: Topics of discussion were: Commencement if intrusive operations, effectiveness of Minelab Explorer II, need for RTK repeater equipment, GPS off-set, status of archaeological survey, MEC item discovery process, and demobilization status of project Geophysicist.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE as per the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 09/30/10

Client Quality Assurance	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	Client QA Representative

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 021	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 10-04-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 4.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-83 Low-58 Chance of thunder storm, Wind S 8-mph, Humidity 38%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 4. Due to GPS off-set, reacquire of target anomalies was conducted utilizing RTK. Project Geophysicist continued working on corrective action measures to remedy the off-set issue.

*UXOQCS will prepare nonconformance and corrective action report to document the off-set issue.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/04/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 022	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-05-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	**MEC Disposal Operations:** UXO Teams conducted explosive operation training. Training was conducted by the SUXOS, UXSO, and UXOQCS. Training included MEC disposal safety topics, the URS MEC Disposal SOP and site specific requirements, use of the remote firing device, emergency procedures, and magazine/explosive issue procedures, All requirements to conduct MEC disposal operations were thoroughly discussed ensuring that all personnel were prepared to conduct the actual operation,	
Initial	**MEC Disposal Operations:** All equipment required was onsite, personnel were in the appropriate PPE, and all personnel understood their roles and responsibilities prior to conducting this definable feature of work. UXO teams conducted live fire using shape charges, det cord and electric blasting caps. Appropriate notifications and MSDs were implemented and maintained. MEC disposal operations were in compliance with approved plans and SOPs.	**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-80 Low-62 Rain with Chance of thunder storms, Wind NNE 7-mph, Humidity 56%.

Remarks:

*Project Geophysicist continued with corrective actions for GPS off-set issue.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*Conducted morning (AM) and afternoon (PM) magazine gate lock check, magazine was properly secured.

*All definable features of work were conducted in accordance with WP requirements.

*All site personnel were observed in appropriate PPE in accordance with the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/05/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	PROJECT: Castner Range WAA Field Demonstration	
REPORT NUMBER: I- 023	LOCATION: Fort Bliss, El Paso, TX	DATE: 10-06-10

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 4.	INSPECTIONS PERFORMED Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-83 Low-58 Chance of thunder storm, Wind S 8-mph, Humidity 38%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 4.

*Geo QC prepares FCR to address the Trimble Geo XH positional accuracy issue.

*UXOQCS and Project Geophysicist conducted field surveillance during intrusive operations. Excavations were measured using RTK and were found to be approximately 12” to 18” from the location measured by the Trimble XH. This is consistent with The draft FCR. The EM-61 was used to confirm that the Target anomalies were resolved in accordance with the WP requirements. No discrepancies were noted.

*UXOSO and OESS conducted inventory of explosives stored on site in Type II Magazine.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 10/06/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 024	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-07-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 4.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-85 Low-56 Clear, Wind SE 6-mph, Humidity 18%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 4.

*UXO Team conducted Emergency Evacuation Drill.

*Field Management Team participated in conference call with URS Project Management Team. Among the topics of discussion were: Evacuation drill, QC Sampling status, Minelab Explorer II settings, safety status, explosives inventory, and daily data flow.

*UXO Teams reacquired target anomalies in TA-4 that were previously reacquired with positional offset inaccuracies. The UXO Teams will rework these targets once the FCR addressing this issue is completed.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/07/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 025	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 10-12-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 4 and TA 10.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections. Inspected two sample target anomalies in TA 4. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
TA target anomalies that were flagged using the GEO XH during the time this instrument was experiencing a positional accuracy condition identified in the NCR initiated by QC.	None

Weather: High-83 Low-52 Clear, Wind ENE 2-mph, Humidity 17%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*RTK was having positional issues. Project GEO resolved it - the radio frequency was being stepped on.

*Received NCR from Project Management team, still requires a preventative action to be defined prior to QC verifying the implementation of corrective and preventative actions.

*UXO Teams continued intrusive investigation in TA 4 and TA 10.

*UXOQCS conducted QC sampling of randomly selected targets in TA 4. Anomaly N_034 04585 was accepted having reached required mV reduction. Anomaly N_035 04624 was accepted with anomaly remaining in excavation. The excavation met the acceptance criteria by having (3) like items (pieces of wire) removed, as stated in the *Anomaly Reacquisition, Intrusive Investigation, and Characterization* document.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 10/12/10
CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	 CLIENT QA REPRESENTATIVE

<table>
<tr><td></td><td colspan="3">DAILY QUALITY CONTROL REPORT</td><td></td></tr>
<tr><td colspan="2">CONTRACT:W912QR-08-D-0011</td><td colspan="3">PROJECT: Castner Range WAA Field Demonstration</td></tr>
<tr><td colspan="2">REPORT NUMBER: I- 026</td><td colspan="2">LOCATION: Fort Bliss, El Paso, TX</td><td>DATE: 10-13-10</td></tr>
<tr><td>PHASE</td><td colspan="4">LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT</td></tr>
<tr><td>Preparatory</td><td colspan="4">.</td></tr>
<tr><td>Initial</td><td colspan="2"></td><td colspan="2">INSPECTIONS PERFORMED</td></tr>
<tr><td>Follow-Up</td><td colspan="2">INTRUSIVE INVESTIGATION: UXO Team continued intrusive investigation operations in TA 4 and TA 10.</td><td colspan="2">INSPECTIONS PERFORMED
Conducted final QC acceptance inspections Inspected two sample target anomalies in TA 10 and one” No Find” in TA 10. (see remarks below)</td></tr>
<tr><td colspan="3">REWORK ITEMS IDENTIFIED TODAY</td><td colspan="2">REWORK ITEMS CORRECTED TODAY</td></tr>
<tr><td colspan="3">None</td><td colspan="2">None</td></tr>
</table>

Weather: High-79 Low-50 Clear, Wind ENE 14-mph, Humidity 30%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 10.

*UXOQCS conducted QC sampling of randomly selected targets in TA 10. Anomalies N_009_00923 04585and N_012_01208 were accepted having reached required mV reduction. Anomaly N_010_ 01019 was determined to be a No Find at 1.6mV.

*SUXOS, UXOQCS and OESS inspected seals on Type II Magazine. Seals #1467392 and #1467400 remained intact. Weekly inventory not required.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

<table>
<tr><td>On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</td><td>Daniel Kur UXOQCS 10/13/10</td></tr>
<tr><td colspan="2">CLIENT QUALITY ASSURANCE</td></tr>
<tr><td>Quality Assurance Representatives Remarks and/or Exceptions to the</td><td></td></tr>
</table>

Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 027	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-14-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 4 and TA 10. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-79 Low-49 Partly Cloudy, Wind SE 5-mph, Humidity 32%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 10.

*Field Management Team participated in conference call with URS Project Management Team. Among the topics discussed were: Daily safety and procurement of health and safety supplies, upcoming Project Management site visit, daily QC data flow, off-set FCR and resulting rework requirements, and production schedule.

*UXO Teams reinvestigated (22) excavations in TA 4 that are missing complete PDA data entries, and (10) excavations missing partial data entries. Original data will be updated and resubmitted to GIS Manager.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 10/14/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 028	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-18-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 10. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections. Inspected ten sample target anomalies in TA 10. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	None

Weather: High-79 Low-52 Partly Cloudy, Wind W 8-mph, Humidity 30%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 10.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 10. Anomalies N_006_00392, N_017_02512, N_023_03219, N_013_01364, N_017_02307, N_013_01355, N_013_01446, N_018_02574, N_011_01180, and N_020_02876 were accepted having reached required mV reduction. All Final QC acceptance inspections for TA 10 are complete.

*Continuing RTK Rover/Radio link problem. Contacted Vendor for support. Problem was resolved by correcting radio settings and reducing sensitivity. .

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/18/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 029	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-19-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 10. All activities performed in accordance with the WP and in compliance with QC criteria.	INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	UXO Team investigated (20) target anomalies in TA 4 effected by prior GPS off-set in accordance with NCR 001 and FCR 004.

Weather: High-83 Low-56 Partly Cloudy, Wind E 6-mph, Humidity 29%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*UXO Teams continued intrusive investigation in TA 4 and 10.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 10/19/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 030	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-20-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 10. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections. Inspected seven randomly selected target anomalies in TA 4. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	UXO Team investigated (25) target anomalies in TA 4 effected by prior GPS off-set in accordance with NCR 001 and FCR 004.

Weather: High-81 Low-56 Chance of Thunderstorms, Wind E 12-mph, Humidity 49%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*UXOSO inspected seals on Type II Magazine. Seals #1467392 and #1467400 remained intact. Weekly inventory not required.
*UXO Teams continued intrusive investigation in TA 4, 6 and 10.
*UXOSO, UXOSO and UXQCS escorted Project Management Team and three USACE/CRREL personnel to TAs 1, 3, 4 and 10.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/20/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 031	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-21-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
Initial		INSPECTIONS PERFORMED
Follow-Up		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
None	

Weather: High-72 Low-56 Partly Cloudy, Wind W 13-mph, Humidity 44%.

Remarks:

*UXOSO inspected seals on Type II Magazine. Seals #1467392 and #1467400 remained intact. Weekly inventory not required.

*Site Personnel provided MEC Avoidance escort and vehicle drivers for URS Management Team and site visitors to at TA 1, 4, 5, 6, 10, and 12.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/21/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 032	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-22-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 6. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-72 Low-49 Clear, Wind E 9-mph, Humidity 32%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXOSO, UXOSO and OESS conducted explosive inventory at Type II Magazine. Magazine was locked and sealed with Seals #1467393 and #1467394. Magazine key log was inspected by UXOQCS.

*UXO Teams continued intrusive investigation in TA 6.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/22/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the

Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 033	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-25-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**
None	None

Weather: High-82 Low-56 Partly cloudy, Wind W 35-mph, Humidity 33%.

Remarks:
*Field work canceled due to high wind advisories, afternoon gusts predicted 50-70 mph.
*SUXOS and UXOQCS reconciled discrepancies in final dig results data.
*UXO Tech downloaded revised target data files to all Trimble Geo XHs.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 10/25/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 034	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 10-26-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
2nitial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 6. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
All in points intrusively investigated in TA 6 on 10-22-10 require rework due to GPS off-set issue. (NCR I-002 pending)	None

Weather: High-76 Low-52 Clear, Wind W 9-mph, Humidity34%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*EM 61 has broken cable connector on coil. Equipment in inoperable. PM and Project Geophysicist have been notified to contact vendor for replacement of coil and cable.

*During Final QC Acceptance inspection in TA 6, a positional off-set issue was noted. All inspected points intrusively investigated on 10-22-10 were noted to be off-set approximately 1 to 1.5 meters southeast of position measured with RTK. Random points intrusively investigated on 10-20-10 and 10-26-10 were inspected with no off-set noted. NCR I-002 has been initiated to document and remediate this issue.

*UXO Teams continued intrusive investigation in TA 6.

*SUXOS conducted MPPEH/MD training for all site personnel. Among the topics discussed were proper identification, reporting procedures, chain of custody and legal responsibilities/liabilities.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS	10/26/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 035	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 10-27-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 6. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
All in points intrusively investigated in TA 6 on 10-22-10 require rework due to GPS off-set issue. (NCR I-002 pending)	None

Weather: High-76 Low-52 Clear, Wind W 9-mph, Humidity34%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*UXO Teams continued intrusive investigation in TA 6.
*SUXOS conducted MPPEH/MD training for all site personnel. Among the topics discussed were storage requirements and separation of MD/RRD.
*SUXOS and UXOQCS conducted recon of route to northern target areas. Route is too lengthy to be of use at this time.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 10/27/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 036	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 10-28-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
2nitial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 6. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
	(28) points in TA 6 associated with the GPS off set issue on 10-22-10 were intrusively inspected in accordance with NCR I-002 (pending signature)

Weather: High-72 Low-43 Clear, Wind E 11-mph, Humidity 20%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 6. (28) Points in TA 6 previously identified for rework were reinvestigated. No off set issues were noted.

*SUXOS conducted MPPEH/MD training for all site personnel. Training consisted of hands on identification and sorting of MD/RDD previously collected on site.

*UXOSO and UXOQCS conducted seal inspection at Type II Magazine. Seals #1467393 and #1467394 remain unbroken. Weekly explosive inventory is not required.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS	10/28/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 037	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-01-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 8. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY
	All in points intrusively investigated in TA 6 on 10-22-10 were reworked in accordance with NCR I-002 (pending.)

Weather: High-79 Low-45 Clear, Wind NNW 7-mph, Humidity18%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 8.

*Replacement coil for EM 61 was received on 10-28-10. IVS was reoccupied and data was collected. No discrepancies were noted.

*UXOQCS conducted surveillance of Team Leader logbooks. No discrepancies were noted.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/01/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 038	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-02-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 8. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted QC inspection of six “No Find” target anomalies in TA 8. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-70 Low-43 Clear, Wind N 2-mph, Humidity 27%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 8.

*UXOQCS conducted inspection of the following (6) No Find targets in TA 6 utilizing EM 61; N035_04800/0.7mV, N035_04781/1.0mV, N035_04750, N030_3995/1.5mV, N029_3895/0.3mV, N029_3876/2.1mV.

*Problems in acquiring RTK radio signal occurred. Technical assistance from the vendor was unable to resolve the problem over the phone. Time was not available to correct the problem. Attempt will be made on 11-03-10 to resolve this issue.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/02/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 039	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 11-03-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
2nitial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 8 and NTA Lot 1. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-74 Low-43 Clear, Wind NE 6-mph, Humidity23%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 8and NTA Lot 1.

*ATF conducted explosives storage inspection/inventory of Type II magazine. No discrepancies were noted.

*UXOQCS reoccupied IVS to conduct function check of replacement EM 61coil. All points were reacquired using RTK. The mV response data was delivered to the Project Geophysicist for review.

*Problems continued with acquiring RTK radio signal. Problem was resolved by moving the repeater radio to the North Western boundary, approximately one mile from the nearest inhabited area, which eliminated radio interference.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 11/03/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 040	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-04-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	**INSPECTIONS PERFORMED**
Preparatory	.	
2nitial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 1. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections Inspected two sample target anomalies in TA 6 and one in TA 4. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-70 Low-40 Clear, Wind SE 6-mph, Humidity28%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 1.

* UXOQCS conducted QC sampling of randomly selected targets in TA 10. Anomalies N_018_02527 in TA 4, N_011_01133 and N_005_00278 were accepted having reached required mV reduction. N_011_01133 was also reported a “No Find” by the UX0 Team. The inspected mV value was 3.8 mV. All target anomalies randomly selected for QC acceptance inspection in TA 4 have been accepted.

*MEC Located: (1) 75 mm shrapnel projectile, Mk 1. All required personnel and agencies were notified by the SUXOS. Item was disposed of by detonation in accordance with the WP.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
<tr><td colspan="2">compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</td><td>Daniel Kur UXOQCS 11/04/10</td></tr>
<tr><th colspan="3">CLIENT QUALITY ASSURANCE</th></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td colspan="2"></td></tr>
<tr><td colspan="2">CLIENT QA REPRESENTATIVE</td></tr>
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DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 041	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-08-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 1. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections Inspected two sample target anomalies in TA 10 and two in TA 8. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-77 Low-47 Clear, Wind SW 13-mph, Humidity10%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 1.

* UXOQCS conducted QC sampling of randomly selected targets in TA 6. Anomalies N_007_00638, N _008_00788, N_019_02705, N_02797, N_011_01130, N_012_01263, N_013_01431, N_013_01437, N_014_01523, N_015_01860 were accepted having reached required mV reduction. TA 8, target anomaly N_038_05064 was verified as a "No Find" with an inspected mV value was 3.9 mV. Target anomaly N_041_05115 was verified as RMS remaining with two strands of barbed wire on the surface running through the target area. The All target anomalies randomly selected for QC acceptance inspection in TA 6 have been accepted.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/08/10

Client Quality Assurance	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	Client QA Representative

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 042	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-09-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 1 and NTA Lot 2. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted QC acceptance inspection of six "No Find" target anomalies in TA 8. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-70 Low-40 Partly Cloudy, Wind W 20-mph, Humidity19%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 1 and NTA Lot 2.

*The following target anomalies in TA 8 were inspected and verified as "No Finds" by the UXOQCS; N-027_03651/2.2 mV, N_028_03823/0.7 mV, N_029_03876/2.2 mV, N_029_03895/1.0 mV, N_030_03995/2.0 mV, N_030_04049/1.7 mV.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/09/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the	

Report	Client QA Representative

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 043	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-10-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
2nitial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 2. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted QC acceptance inspection of six “No Find” target anomalies in TA 6 and four in TA 8. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-70 Low-40 Partly Cloudy, Wind W 20-mph, Humidity19%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 1 and NTA Lot 2.

*The following target anomalies in TA 6 were inspected and verified as “No Finds” by the UXOQCS: N_006_00551/1.7 mV, N_014_01531/1.5 mV, N_014_1607/1.1 mV, N_015_01797/1.4 mV, N_016_02167/1.3 mV, N_0A1_0679/2.0 mV.

*The following target anomalies in TA 8 were inspected and verified as “No Finds” by the UXOQCS: N_00A_0636/1.1 mV, N_035_04781/1.7 mV, N_035_04750/1.1mV, N_035_04800/3.1 mV.

*MEC located: (1) M 6 A1, 2.36” rocket, fuzed and fired. Item was disposed of by detonation. SUXOS notified all required personnel/agencies.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/10/10
CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 044	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-11-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 2. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-70 Low-38 Partly Cloudy, Wind WSW 20-mph, Humidity16%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 2.

*Site Management Team participated in conference call with URS Management Team. Among the topics discussed were: Upcoming personnel changes, NCR I-001, and RTK radio frequencies.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 11/11/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the

Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 045	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-15-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	.	
2nitial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA Lot 12. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-65 Low-34 Partly Cloudy, Wind W 26-mph, Humidity16%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*UXO Teams continued intrusive investigation in TA Lot 12.
*UXOSO and UXOQCS marked emergency access routes in TA 12.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 11/15/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 046	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-16-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	.	
2nitial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA Lot 12. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections Inspected eight sample target anomalies in TA 8 and seven" No Find" in TA 6. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-61 Low-36 Clear, Wind WSW 11-mph, Humidity19%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA Lot 12.

*UXOSO and UXOQCS marked emergency access routes in TA 12

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 8. The following target anomalies were inspected and met QC acceptance criteria: N_033_04357, N_033_04362, N_026_03491, N_028_03711, N_035_04645, N_035_04776, N_036_04853, N_00A_05986. All QC acceptance/"No Find" verification inspections in TA 8ares now complete.

*UXOQCS conducted verification inspection of the following "No Find" anomalies in TA 6: N_013_01397/0.51 mV, N_013_01415/0.7 mV, N_014_01548/1.7 mV, N_014_01624/2.3 mV, N_015_01797/2.6 mV, N_015_01842/1.5 mV, N_017_02503/1.9 mV. All QC acceptance/"No Find" verification inspections in TA 6 are now complete.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/16/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 047	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-17-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory	**DEMOBILIZATION:** SUXOS, UXOSO and UXOQCS conducted pre-demobilization meeting in preparation of UXOSO departing on 11-20-10. All plans, specifications, SOPs, and other applicable documents have been reviewed. All conditions and controls are in place for demobilization.	
Initial	**DEMOBILIZATION:** SUXOS, UXOSO and UXOQCS conducted explosives inventory and magazine key inventory in preparation of UXOSO demobilizing on 11-20-10. All actions performed as per the WP and in compliance with ATF and USACE regulations.	
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 12 and TA 3. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections Inspected eleven sample target anomalies in NTA Lot 2. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-65 Low-32 Clear, Wind NNE 6-mph, Humidity13%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 12and TA 3.

*UXOSO marked emergency access routes in TA 12 and TA 3.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 8. The following target anomalies were inspected and met QC acceptance criteria: N_003_00142, N_005_00306, N_005_00333, N_006_00466, N_008_00768, N_009_00902, N_010_00970, N_013_01328, N_016_0204, N_012_01231. All Final QC Inspections in NTA Lot 2 are now complete.

*Received replacement Allegro CX data-logger and cable for the EM 61. Reoccupied IVS and recorded mV response. Data was sent to Geo QC for review.

*SUXOS and UXOSO conducted explosive inventory and magazine key inventory in preparation of UXOSO demobilization on 11-20-10. No discrepancies were noted. These inventories also served as weekly explosives inventory and monthly key inventory. UXOSO has been relieved of all responsibilities involved with explosives inventory/magazine security. UXOQCS has assumed all responsibilities. SUXOS will notify all required personnel and agencies.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

<table>
<tr><td rowspan="2">On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</td><td></td></tr>
<tr><td>Daniel Kur UXOQCS 11/17/10</td></tr>
<tr><th colspan="2">CLIENT QUALITY ASSURANCE</th></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td></td></tr>
<tr><td>CLIENT QA REPRESENTATIVE</td></tr>
</table>

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	PROJECT: Castner Range WAA Field Demonstration	
REPORT NUMBER: I- 048	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-18-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 3. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections Inspected eight sample target anomalies in NTA Lot 1.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-67 Low-34 Clear, Wind SE 7-mph, Humidity15%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 3.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in NTA Lot 1. The following target anomalies were inspected and met QC acceptance criteria: N_018_02609, N_023_03248, N_030_03961, N_040_05095, N_044_05187, N_047_05210, N_054_05378, and N_0A2_06087.

*Field Management Team participated in conference call with URS Management Team. Among the topics discussed were: Upcoming manpower changes completed NCR I-002, final QC inspection status and the possibility/feasibility of GIS removing target anomalies larger than 750 mV from investigation schedule.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.		Daniel Kur UXOQCS 11/18/10
CLIENT QUALITY ASSURANCE		
Quality Assurance Representatives Remarks and/or Exceptions to the Report		CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	PROJECT: Castner Range WAA Field Demonstration	
REPORT NUMBER: I- 049	LOCATION: Fort Bliss, El Paso, TX	DATE: 11-21-10

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 3. All activities performed in accordance with the WP and in compliance with QC criteria. **DEMOBILIZIATION:** UXOSO demobilized and departed Fort Bliss, El Paso, TX on 11-20-10 in accordance with the WP.	INSPECTIONS PERFORMED Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-70 Low-41 Clear, Wind WSW 25-mph, Humidity18%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 3.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 11/21/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 050	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-22-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 3 and TA 5. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections Inspected four sample target anomalies and one “No Find” in NTA Lot 1.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-67 Low-32 Partly Cloudy, Wind W 19-mph, Humidity 20%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 3 and TA 5.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in NTA Lot 1. The following target anomalies were inspected and met QC acceptance criteria: N_033_04376, N_036 _04863, N_041_05179, N_044_05179.

*UXOQCS conducted “No Find” verification inspection of target anomaly N_048_05252/2.5 mV. Target anomaly was accepted having met QC acceptance criteria. All Final QC inspections in NTA Lot 1 have been completed.

*UXO Team 3 conducted demo operations on (1) unidentifiable 37mm projectile. Item proved not to be MEC after shooting with an explosive shape charge.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS	11/22/10
CLIENT QUALITY ASSURANCE		
Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE	

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 051	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-23-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 5. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections Inspected three sample target anomalies in TA 12.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-67 Low-36 Cloudy, Wind SSW 6-mph, Humidity17%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 5.

*During function check of EM 61, it was noted that the mV response for the reference item was outside static repeatability criteria, +/- 10% of the original mV response. Trouble shooting consisted of changing coil cable and checking all connections/settings. IVS was re-occupied with continued elevated mV responses. Original cable was reattached with a still higher mV response for IVS items. Reference item was 37.7 mV (original response 28.0 mV) still outside QC criteria. Geo QC has been contacted for further disposition.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 12. The following target anomalies were inspected and met QC acceptance criteria: S_025_09251, S_028_10435, and S_028_10461.

*Explosives inventory conducted after explosives issue on 11-22-10 will serve as weekly explosives inventory.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 11/23/10
CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 052	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 11-29-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 3 and TA 5. All activities performed in accordance with the WP and in compliance with QC criteria. **DEMOBILIZATION:** (3) UXO Technicians demobilized and departed Fort Bliss, El Paso, TX 0n 11-25-10. All activities performed in accordance with the WP and in compliance with QC criteria. **MOBILIZATION:** (1) UXO Technician mobilized and arrived at Fort Bliss, El Paso, TX. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections. Inspected nine sample target anomalies in TA 12 and twelve sample target anomalies in TA 3.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-49 Low-22 Partly Cloudy, Wind W 20 mph, Humidity 21%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 5.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 12 and TA 3. The following target anomalies were inspected and met QC acceptance criteria: TA 12- S_028_10320, S_028_10375, S_025_09217, S_025_09232, S_029_10598, S_028_10279, S_029_10603, S_029_10597, S_092_13377.

TA 3- S_010_03794, S_022_08145, S_02007391, S_022_08135, S_019_07036, S_017_06251, S_018_06694, S_020_07464, S_016_05850, S_016_05813, S_018_06709, S_012_04223. All Final QC inspections in TA 12 and TA 3 have been completed.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
<tr><td colspan="2">compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</td><td>Daniel Kur UXOQCS 11/29/10</td></tr>
<tr><th colspan="3">CLIENT QUALITY ASSURANCE</th></tr>
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<tr><td colspan="2">CLIENT QA REPRESENTATIVE</td></tr>
</table>

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 053	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 11-30-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 3. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-49 Low-20 Clear, Wind W 8 mph, Humidity 20%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*UXO Teams continued intrusive investigation in NTA Lot 3.
* Site visit by FBFD to view Type II Magazine.
*UXOQCS/SO conducted site safety brief/site orientation for incoming personnel.
* Disposal operation on 2.23" rocket warhead. After perforation with shape charge, item proved to be practice warhead.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 11/30/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 054	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-01-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 3. All activities performed in accordance with the WP and in compliance with QC criteria.	INSPECTIONS PERFORMED Conducted final QC acceptance inspections. Inspected four sample target anomalies in TA 5 and four sample target anomalies in NTA Lot 3.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-56 Low-25 Clear, Wind WNW 5 mph, Humidity 18%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*UXO Teams continued intrusive investigation in NTA Lot 3.
*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 5 and NTA 3. The following target anomalies were inspected and met QC acceptance criteria: TA 5- S_049_12007, S_RoadD_1433, S_047_11898, S_057_12232
NTA Lot 3- S_005_002218, S_005_02219, S_RoadE_13997, S_006_02697.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 12/01/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report		
	CLIENT QA REPRESENTATIVE	

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 055	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-02-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 3. All activities performed in accordance with the WP and in compliance with QC criteria. **MOBILIZATION:** (1) UXO Technician mobilized and arrived at Fort Bliss, El Paso, TX on 12-01-10. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-63 Low-31 Clear, Wind WSW 6 mph, Humidity 9%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 3.

*UXOQCS conducted site safety brief/orientation with incoming UXO team Leader. Conducted field observation of his tailgate safety brief and initial intrusive investigation. Team Leader states he understands all job requirements and is prepared to assume all responsibilities of his billet.

*Field Management Team participated in conference call with URS Project Management Team. Among the topics discussed were: Recent manpower changes, Final QC inspection status and upcoming Christmas demobilization (12-16-10.)

*SUXOS and UXOSO/QCS conducted weekly explosives inventory. No discrepancies were noted.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 12/02/10
CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 056	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-06-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 4. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections. Inspected five sample target anomalies and five "NO FIND" target anomalies in NTA Lot 3.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-67 Low-38 Partly Cloudy, Wind calm, Humidity17%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 4.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in NTA Lot 3. The following target anomalies were inspected and met QC acceptance criteria: S_008_03279, S_012_04454, N_025_03362 and N_029_03864.

*UXOQCS conducted verification inspection/acceptance of the following "No Find" anomalies in NTA Lot 3: S_004_01784/3.8 mV, S_004_01785/3.2 mV, S_004_01786/3.7 mV, S_006_02636/1.2 mV and S_013_04052/0.6 mV.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 12/06/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	PROJECT: Castner Range WAA Field Demonstration	
REPORT NUMBER: I- 057	LOCATION: Fort Bliss, El Paso, TX	DATE: 12-07-10

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 4. All activities performed in accordance with the WP and in compliance with QC criteria.	INSPECTIONS PERFORMED Conducted final QC acceptance inspections. Inspected five sample target anomalies in NTA Lot 3.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-67 Low-31 Clear, Wind NNW 9 mph, Humidity18%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 4.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in NTA Lot 3. The following target anomalies were inspected and met QC acceptance criteria: N_065_05565, N_065_05581and N_065_05605. Final QC/"No Find" Inspection in NTA Lot 3 is complete.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 12/07/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 058	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-08-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 4. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspection. Inspected one sample target anomaly in NTA Lot 4.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-63 Low-32 Clear, Wind S 6 mph, Humidity17%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 13 and NTA Lot 4.

*UXOQCS conducted final QC acceptance inspection of randomly selected target anomaly in NTA Lot 4. The following target anomaly was inspected and met QC acceptance criteria. This target anomaly was also a "No Find": N_081_05897/2.6 mV.

*The following randomly selected target anomalies in TA 5 were intrusively investigated, inspected and verified as "Hot Rock": S_Cross6870_13510, S_079_12904, S_076_12758, S_074_12600, S_080_13027, S_057_12232, S_070_12570. Final QC Acceptance/"No Find" Inspection/Verification in TA 5 is complete.

*PM/GIS Manager/SUXOS removed three target anomalies in the western portion of TA 5from the intrusive investigation list. One of these target anomalies, S_076_12748, was a Final QC target anomaly, and will not be inspected. Production management will generate a memorandum, to be included in the site record, explaining why the target anomalies were not intrusively investigated.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
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<tr><td colspan="3">CLIENT QUALITY ASSURANCE</td></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td colspan="2"></td></tr>
<tr><td colspan="2">CLIENT QA REPRESENTATIVE</td></tr>
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DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 059	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-09-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 13. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-67 Low-36 Clear, Wind W 13 mph, Humidity11%.

Remarks:
*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*SUXOS and UXOQCS conducted weekly explosives inventory on 12-08-10. Seals #1467353 and #1467354 remain intact. Physical inventory not required.
*UXOQCS/SO conducted observation of intrusive operations in TA 13.
*UXO Teams continued intrusive investigation in TA 13.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 12/09/10

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 060	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-13-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in NTA Lot 3 and TA 1. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted final QC acceptance inspections. Inspected twelve sample target anomalies in TA 13 and seven in NTA Lot 4.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-67 Low-36 Clear, Wind WNW 6 mph, Humidity17%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in NTA Lot 3 and TA 1.

* UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 13. The following target anomalies were inspected and met QC acceptance criteria: S_018_06913, S_018_06921, S_019_07251, S_019_07258, S_RoadD_14479, S_RoadD_14470, S_020_07667, S_020_07668, S_020_07671, S_020_07659 andS_020_07655. Target anomaly S_020_07652 was intrusively investigated and noted as RMS Exist, “Hot Rock” remains. Anomaly was verified as having “Hot Rock” remaining. Final QC inspection of TA 13 is complete.

* UXOQCS conducted final QC acceptance inspections of randomly selected targets in NTA Lot 4. The following target anomalies were inspected and met QC acceptance criteria: S_01505246, S_019_06967, S_0190675, S013_04524, S_RoadE3_13907and S_043_11713. S_RoadE3_13885 was intrusively investigated and noted RMS EXIST “survey spike.” Target anomaly was inspected and “survey spike” was verified.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 12/13/10
CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	 CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 061	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-14-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 1. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted final QC acceptance inspections. Inspected four sample target anomalies and two “No Find” target anomalies in NTA Lot 4.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-72 Low-40 Clear, Wind WSW 7 mph, Humidity13%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 1.

* UXOQCS conducted final QC acceptance inspections of randomly selected targets in NTA Lot 4. The following target anomalies were inspected and met QC acceptance criteria: S_Cross_13441, S_037_11450 and S_036_11262.

The following target anomalies were intrusively investigated and noted “No Find.” Target anomalies were inspected and verified as “No Find:” S_038_11500/3.1 mV and S_043_11730/1.0 mV. Final QC acceptance inspection and “No Find” verification for NTA Lot 4 is complete.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 12/14/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 062	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-15-10**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 2. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-72 Low-40 Clear, Wind WSW 16 mph, Humidity13%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams conducted weekly vehicle/equipment PM. Discrepancies noted and submitted to SUXOS.

*UXO Teams continued intrusive investigation in TA 2.

* SUXOS and UXOQCS conducted weekly explosives inventory. Seals #1467353 and #1467354 remain intact. Physical inventory not required. *UXOQCS conducted monthly key inventory. No discrepancies noted.

*UXO Teams conducted final clean-up/pack-up of site prior to demobilization on 12-16-10.

*SUXOS notified required personnel/agencies of demobilization of all site personnel. EPPD will check Type II magazine twice daily.

*All rental vehicles have been returned to vendors.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
<tr><td colspan="2">compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.</td><td>Daniel Kur UXOQCS 12/15/10</td></tr>
<tr><td colspan="3">CLIENT QUALITY ASSURANCE</td></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td colspan="2"></td></tr>
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DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 063	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 12-16-10**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**DEMOBILIZIATION:** (11) UXO Techs demobilized and departed Fort Bliss, El Paso, TX on 12-16-10 in accordance with the WP.	INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-65 Low-38 Partly Cloudy, Wind WSW 13 mph, Humidity25%.

Remarks:

*All site personnel have departed Castner Range. Site is closed down for the remainder of the year. Scheduled date of return is 01-04-11. MERRY CHRISTMAS TO ALL.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 12/16/10

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 064	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-03-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**MOBILIZIATION:** (9) UXO Techs mobilized and arrived Fort Bliss, El Paso, TX.	INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-52 Low-29 Partly Cloudy, Wind N 2 mph, Humidity30%.

Remarks:

*Site personnel have arrived at Fort Bliss/El Paso, TX

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 01/03/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 065	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-04-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 2. All activities performed in accordance with the WP and in compliance with QC criteria. **MOBILIZIATION:** (1) UXO Tech mobilized and arrived Fort Bliss, El Paso, TX.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-58 Low-29 Partly Cloudy, Wind N 2 mph, Humidity25%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 2.

*UXO Team conducted recon/marking of soil-sampling sites and MEC avoidance escort to sampling personnel.

*SUXOS and UXOQCS participated in conference call with Geo QC regarding pending site visit. Among the topics discussed were lodging/transportation requirements, equipment requirements and scope of visit.

* SUXOS and UXOQCS conducted site orientation/safety briefings for USACE visitors.

* SUXOS and UXOQCS conducted weekly explosives inventory. Seals #1467353 and #1467354 remain intact. Physical inventory not required.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
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<tr><td colspan="3">CLIENT QUALITY ASSURANCE</td></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td colspan="2"></td></tr>
<tr><td colspan="2">CLIENT QA REPRESENTATIVE</td></tr>
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DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 066	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-05-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 2. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-56 Low-31 Partly Cloudy, Wind NW 6 mph, Humidity25%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 2.

*UXO Team provided MEC avoidance escort for sampling operation.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/05/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 067	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-06-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 9. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-58 Low-31 Partly Cloudy, Wind WNW 5 mph, Humidity24%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 9.

*SUXOS and UXOQCS/SO participated in conference call with URS Management Team. Among the topics discussed were: Upcoming Geo QC visit, Final QC Inspection status, projected sampling plan and effective dates/manpower and proposed UXO Team consolidation.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/06/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 068	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 01-07-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 9 and TA 7. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-61 Low-36 Partly Cloudy, Wind W 4 mph, Humidity22%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 9 and TA 7.

*SUXOS off-site for AM physical appointment. UXO Team 1 Team Leader assumed all SUXOS responsibilities during this absence. All required personnel were notified by SUXOS prior to his departure.

*All explosives were removed from Type II Magazine and moved out of HFD while intrusive operations were conducted in TA 7. All explosives were returned to Type II Magazine after completion of intrusive operations. Explosive inventory conducted. No discrepancies noted.

* UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 13. The following target anomalies were inspected and met QC acceptance criteria: S_003_01015, S_004_01696, S_003_01294, S_006_02385, S_007_02737, S_004_01506, S_009_03471, S_02045, S_005_02155, S_008_03168, S_007_02802, S_008_03162.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

<table>
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<tr><th colspan="4">CLIENT QUALITY ASSURANCE</th></tr>
<tr><td rowspan="2">Quality Assurance Representatives Remarks and/or Exceptions to the Report</td><td colspan="3"></td></tr>
<tr><td colspan="3">CLIENT QA REPRESENTATIVE</td></tr>
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DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 069	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-10-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 7. All activities performed in accordance with the WP and in compliance with QC criteria.	**INSPECTIONS PERFORMED**
		Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-56 Low-27 Partly Cloudy, Wind WNW 13 mph, Humidity24%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*UXO Teams continued intrusive investigation in TA 7.

*SUXOS off site due to illness. UXO Team 2 Team Leader assumed all SUXOS responsibilities. UXOQC/SO made all required notifications.

*UXOQCS assisted Geo QC conduct TA 5 “Hot Rock” investigation.

*All explosives were removed from Type II Magazine and moved out of HFD while intrusive operations were conducted in TA 7. All explosives were returned to Type II Magazine after completion of intrusive operations. Explosive inventory conducted. No discrepancies noted.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/10/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**

REPORT NUMBER: I- 070	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-11-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	**ANALOG RANGE RECONNAISSANCE:** SUXOS, UXOQC/SO and UXO Team Leaders participated in a conference call with URS Management in preparation for analog operations. The Draft Anomaly, Intrusive Investigation and Characterization document was verified and all conditions and controls are in place to begin operations.	
Initial	**ANALOG RANGE RECONNAISSANCE:** UXO Team commenced analog operations in TA 11. All equipment, PPE, materials and supplies are on hand to perform task. All personnel understand their roles and procedures to safely and effectively complete this task. Procedures observed were performed in compliance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization documents.	**INSPECTIONS PERFORMED** Conducted QC Survey of analog operations in TA 11.
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-50 Low-25 Partly Cloudy, Wind E 13 mph, Humidity23%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*SUXOS off site due to illness. UXO Team 2 Team Leader assumed all SUXOS responsibilities. UXOQC/SO made all required notifications.

*UXO Team assisted Geo QC conduct TA 5 “Hot Rock” investigation.

*UXO Team commenced analog range reconnaissance in TA 11.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/11/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 071	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-12-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 11 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document.	**INSPECTIONS PERFORMED** Conducted QC Survey of analog operations in TA 11.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-45 Low-22 Partly Cloudy, Wind E 6 mph, Humidity36%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*SUXOS off site due to illness. UXO Team 2 Team Leader assumed all SUXOS responsibilities. UXOQC/SO made all required notifications.

*UXO Team continued analog range reconnaissance in TA 11.

*UXO Team supported Geo QC collect DGM data in IVS utilizing litter-borne EM-61 and RTK.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 01/12/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 072	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-13-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 14 and TA15 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document.	**INSPECTIONS PERFORMED** Conducted QC Survey of analog operations in TA 14.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-52 Low-27 Clear, Wind W 1 mph, Humidity26%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*SUXOS off site due to illness. UXO Team 2 Team Leader assumed all SUXOS responsibilities. UXOQC/SO made all required notifications.

*UXO Team continued analog range reconnaissance in TA 14 and TA 15.

*UXOSO and UXOSO conducted explosive inventory at Type II Magazine. Magazine was locked and sealed with Seals #1467359 and #1467 360. Magazine key log was inspected by UXOQCS. No discrepancies were noted.

*SUXOS and UXOQCS/SO participated in conference call with URS Management Team. Among the topics discussed were: Current Geo QC visit, Final QC Inspection status, Analog Range Reconnaissance status, and the reacquisition of high mV value target anomalies in TA 7.

*UXO Team supported Geo QC conduct “Hot Rock” investigation in TA 5, and the reacquisition of selected high mV value targets anomalies in TA 7.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/13/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 073	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-18-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 15 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document.	**INSPECTIONS PERFORMED** Conducted QC Survey of analog operations in TA 15.

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-70 Low-40 Partly Cloudy, Wind W 14 mph, Humidity17%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*UXO Team continued analog range reconnaissance in TA 15.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 1. The following target anomalies were inspected and met QC acceptance criteria: S_015_05475, S_020_07616, S_019_07172, S_031_10831, S_027_10203, S_022_08192, S_RoadD_14354, S_RoadD1_14250. Final QC Acceptance Inspection of TA 1 is complete.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 7. The following target anomalies were inspected and met QC acceptance criteria: S_016_06028, S_016_06051, S_016_06029, S_017_06491, S_015_05572, S_014_05194, S_015_05577, S_016_06033, S_016_06039, S_016_06040, S_017_06486, S_017_06492. Final QC Acceptance Inspection of TA 7 is complete.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/18/11
CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 074	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-19-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 16 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document.	Conducted QC Survey of analog operations in TA 16.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-67 Low-38 Clear, Wind N 6 mph, Humidity20%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*UXO Team continued analog range reconnaissance in TA 16.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 16. The following target anomalies were inspected and met QC acceptance criteria: N_073_05708, N_073_05709, N_05782, N_074_05719, N_074_05750, N_074_05759, N_075_05783, N_076_05846, N_07405752, N-074_05757, N_078_05869, and N_076_05835. Final QC Acceptance/ No Find Inspection of TA 16 is complete.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 01/19/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 075	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 01-20-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 17 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document. **INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 17. All activities performed in accordance with the WP and in compliance with QC criteria.	Conducted QC Survey of analog/intrusive investigation operations in TA 17.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-58 Low-31 Partly Cloudy, Wind E 13 mph, Humidity25%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*UXO Team conducted intrusive investigations in TA 17.

*UXO Team continued analog range reconnaissance in TA 17.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 17. The following target anomalies were inspected and met QC acceptance criteria: N_011_01098, N_011_01179, N_013_01325, N_013_01426.

*SUXOS and UXOQCS/SO participated in conference call with URS Management Team. Among the topics discussed were: Disposition of remaining explosives, Type II Magazine removal, MPPEH inspection procedures, Final QC Acceptance Inspection status, and projected end/start dates for Intrusive Investigation/Soil Sampling operations.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/20/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 076	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-21-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 17 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document. **INTRUSIVE INVESTIGATION:** UXO Team continued intrusive investigation operations in TA 17. All activities performed in accordance with the WP and in compliance with QC criteria.	INSPECTIONS PERFORMED Conducted QC Survey of analog/intrusive investigation operations in TA 17.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-61 Low-31 Partly Cloudy, Wind W 9 mph, Humidity23%.

Remarks:

*UXO Team conducted vehicle PM.

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*UXO Team conducted intrusive investigations in TA 17.

*UXO Team continued analog range reconnaissance in TA 17.

*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 17. The following target anomalies were inspected and met QC acceptance criteria: N_005_00336, N_004_00172, N_009_00833.

*The following "No Find" target anomaly in TA 17 was inspected and verified: N_008_00805/1.0 mV.

*SUXOS and UXOQCS conducted weekly explosives inventory. Seals #1467359 and # 1467360 remain intact. Physical inventory not required. Key log was inspected. No discrepancies were noted.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in	

compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/21/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 077	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-24-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 18 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document.	Conducted QC Survey of analog operations in TA 18 and Final QC Acceptance Inspection in TA 17.

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-56 Low-27 Clear, Wind NNW 11 mph, Humidity18%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.
*Conducted AM and PM magazine gate lock check, magazine was properly secured.
*UXO Team continued analog range reconnaissance in TA 18.
*UXOQCS conducted final QC acceptance inspections of randomly selected targets in TA 18. The following target anomalies were inspected and met QC acceptance criteria: N_003_00137, N_013_01453, N_008_00750, N_010_01008, N_003_00108. Final QC Acceptance Investigation in TA 17 is complete.
*All site personnel were observed in appropriate PPE in accordance with the WP.
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 01/24/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 078	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-25-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**ANALOG RANGE RECONNAISSANCE:** UXO Team continued analog operations in TA 18 in accordance with the WP and Draft Anomaly Reacquisition, Intrusive Investigation, and Characterization Document.	**INSPECTIONS PERFORMED** Conducted QC Survey of analog operations in TA 18

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-52 Low-27 Partly Cloudy, Wind S 7 mph, Humidity23%.

Remarks:

*UXO Teams conducted daily GEO XH position checks and function checks of the Minelab Explorer II.

*Conducted AM and PM magazine gate lock check, magazine was properly secured.

*UXO Team continued analog range reconnaissance in TA 18.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 01/25/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	PROJECT: Castner Range WAA Field Demonstration	
REPORT NUMBER: I- 079	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 01-26-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory	**MPPEH INSPECTION**: SUXOS, UXOQCS/SO, Demo Team Leader and UXO Team Leaders conducted planning session for explosively venting MPPEH, sorting, and inspecting all MPPEH in preparation for shipping from site.. Project work plans, SOPs, and other applicable documents were reviewed. PPE and equipment requirements were discussed in addition to specific quality requirements for this definable feature of work. All conditions and controls are in place for commencing the initial phase of this definable feature of work.	
Initial	**MPPEH INSPECTION**: All equipment, materials and supplies are on hand to perform MPPEH explosive venting operations task. All personnel are properly trained and qualified. All actions were performed in accordance with the WP, Industry Standards, USACE directives, and are in compliance with QC criteria.	**INSPECTIONS PERFORMED** Conducted field surveillance of site operations. (see remarks below)
Follow-Up		**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-56 Low-29 Partly Cloudy, Wind NE 9 mph, Humidity9%.

Remarks:

*Conducted AM magazine gate lock check, magazine was properly secured.

*UXO Demo Team Leader conducted explosive safety/operations brief.

*UXO Team conducted MPPEH explosive venting operations. All site explosives were expended during this operation. There are no explosives left on site. Type II magazine is empty and secure.

*SUXOS will notify all required personnel and agencies that there are no explosives on site.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 01/26/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the	

Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**
REPORT NUMBER: I- 080	**LOCATION: Fort Bliss, El Paso, TX** — **DATE: 01-27-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
Preparatory		
Initial		
Follow-Up	**DEMOBILIZIATION:** (3) UXO Techs demobilized and departed Fort Bliss, El Paso, TX in accordance with the WP.	Conducted field surveillance of site operations. (see remarks below)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-52 Low-27 Partly Cloudy, Wind S 7 mph, Humidity23%.

Remarks:

*UXO Team conducted clean-up operation ant southern demo site.

*UXO Team removed target anomaly marking flags from site.

*UXO Team commenced packing/shipping of site equipment not required for Sampling operations.

*Field Management Team participated in conference call with URS Management Team. Among the topics discussed were Resolution of MPPEH on site, demobilization of UXO Techs, disposition of vendor owned equipment, suspension of DQCRs until DFWs are achieved and up-coming Sampling operations.

*All site personnel were observed in appropriate PPE in accordance with the WP.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Daniel Kur UXOQCS 01/27/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	
	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

<table>
<tr><td colspan="2">CONTRACT:W912QR-08-D-0011</td><td colspan="2">PROJECT: Castner Range WAA Field Demonstration</td></tr>
<tr><td colspan="2">REPORT NUMBER: I- 081</td><td>LOCATION: Fort Bliss, El Paso, TX</td><td>DATE: 02-01-11</td></tr>
<tr><td>PHASE</td><td colspan="3">LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT</td></tr>
<tr><td>Preparatory</td><td colspan="3"></td></tr>
<tr><td>Initial</td><td colspan="2"></td><td>INSPECTIONS PERFORMED</td></tr>
<tr><td>Follow-Up</td><td colspan="2">DEMOBILIZIATION: (1) SUXOS demobilized and departed Fort Bliss, El Paso, TX in accordance with the WP.</td><td>INSPECTIONS PERFORMED</td></tr>
</table>

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-43 Low-14 Snow, Wind ESE 7 mph, Humidity41%.

Remarks:
*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 02/01/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 082	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 02-16-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**DEMOBILIZIATION:** (1) SUXOS demobilized and departed Fort Bliss, El Paso, TX in accordance with the WP. **MPPEH INSPECTION:** SUXOS/UXOSO Commenced certification inspection of all MPPEH on site in accordance with the WP.	INSPECTIONS PERFORMED All MPPEH on site has been verified as Material Documented as Safe (MDAS.) (see remarks)

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-80 Low-49 Snow, Wind SW 16 mph, Humidity14%.

Remarks:

*SUXOS/UXOSO/UXO Team leader commenced certification of all MPPEH in site. All materials have been verified and 100% properly inspected and to the best of our knowledge and belief, do not present an explosive hazard. All required documentation has been prepared prior to shipment for disposal.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 02/16/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 083	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 02-18-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**DEMOBILIZIATION:** (4) UXO Techs demobilized and departed Fort Bliss, El Paso, TX in accordance with the WP. **MPPEH INSPECTION:** SUXOS/UXOSO Shipped all MDAS on site to contractor for disposal in accordance with the WP.	**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-79 Low-46, Clear, Wind SSW 13 mph, Humidity24%.

Remarks:

*SUXOS/UXOSO completed all required documentation for shipment of MDAS to contractor for proper disposal. Fort Bliss Environmental Officer signed Chain of Custody document as generator of MDAS. (2) drums containing approximately (521) lbs. of MDAS were consigned to carrier for transport. Documentation was sealed in drum labeled URS #001 “Documents enclosed.” Seal # 1467366, drum URS-001 and 1467367, drum URS-002 were used to seal drums. SUXOS maintains all copies of MDAS and shipping documents.

*All definable features of work were conducted in accordance with WP requirements.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 02/18/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 084	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 02-20-11**

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
Preparatory		
Initial		INSPECTIONS PERFORMED
Follow-Up	**DEMOBILIZIATION:** (1) UXOSO demobilized and departed Fort Bliss, El Paso, TX in accordance with the WP.	INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY	REWORK ITEMS CORRECTED TODAY

Weather: High-71 Low-50 Partly Cloudy, Wind WSW 20 mph, Humidity 21%.

Remarks:

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 02/20/11

CLIENT QUALITY ASSURANCE

Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

DAILY QUALITY CONTROL REPORT

CONTRACT:W912QR-08-D-0011	**PROJECT: Castner Range WAA Field Demonstration**	
REPORT NUMBER: I- 085	**LOCATION: Fort Bliss, El Paso, TX**	**DATE: 02-23-11**

PHASE	**LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT**	
Preparatory		
Initial		**INSPECTIONS PERFORMED**
Follow-Up	**DEMOBILIZIATION:** (1) UXO Tech III demobilized and departed Fort Bliss, El Paso, TX in accordance with the WP.	**INSPECTIONS PERFORMED**

REWORK ITEMS IDENTIFIED TODAY	**REWORK ITEMS CORRECTED TODAY**

Weather: High-73 Low-46 Clear, Wind WSW 11 mph, Humidity 32%.

Remarks:

*Operations have been completed. There are no personnel, equipment or assets remaining at Closed Castner Range.

*THIS IS THE FINAL DAILY QUALITY CONTROL REPORT.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Daniel Kur UXOQCS 02/23/11

CLIENT QUALITY ASSURANCE	
Quality Assurance Representatives Remarks and/or Exceptions to the Report	CLIENT QA REPRESENTATIVE

REMEDIAL INVESTIGATION DATA USABILITY ASSESSMENT REPORT

MILITARY MUNITIONS RESPONSE PROGRAM
REMEDIAL INVESTIGATION
CLOSED CASTNER FIRING RANGE
FORT BLISS
EL PASO, TEXAS

July 2017

Contract No.: W912DY-10-D-0025
Task Order No.: DS01

Prepared For:

U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 S. 101st E. Avenue
Tulsa, Oklahoma 74128

Prepared By:

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LIST OF APPENDICES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

CA	Corrective Action
BSI	Blind Seed Item
cm	centimeter
CMUA	Concentrated Munition Use Area
CSM	Conceptual Site Model
DGM	Digital Geophysical Mapping
DGPS	Differential Global Positioning System
DQO	Data Quality Objective
DU	Decision Unit
EMI	Electromagnetic Induction
FS	Feasibility Study
FUDS	Formerly Used Defense Site
GPS	Global Positioning System
GSV	Geophysical System Verification
IAVS	Instrument assisted visual survey
IAW	in accordance with
Inc.	Incorporated
ISO	Industry Standard Object
ITS	Instrument Test Strip
IVS	Instrument Verification Strip
JV	Joint Venture (PIKA-Pirnie JV, LLC)
lb	pound

LLC	Limited Liability Corporation
m	meter
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern
MPC	Measurement Performance Criteria
MQO	Measurement Quality Objectives
MRS	Munitions Response Site
µS	microseconds
mV	milliVolt
PLS	Professional Land Surveyor
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCA	Root Cause Analysis
RI	Remedial Investigation
RTK	Real Time Kinematic
TX	Texas
UFP	Uniform Federal Policy
U.S.	United States
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
VSP	Visual Sample Plan
WERS	Worldwide Environmental Remediation Services

1.0 INTRODUCTION

The PIKA-Pirnie JV, LLC[1] (hereafter referred to as the JV [Joint Venture]) has developed this Data Usability Assessment Report as part of the Remedial Investigation (RI) at the Closed Castner Firing Range Munitions Response Site (MRS) in El Paso, Texas (TX) to document that the data met the performance requirements of the RI. The JV performed the Closed Castner Firing Range RI under the United Sates Army Engineering Support Center Huntsville Worldwide Environmental Remediation Services (WERS) contract number W912DY-10-D-0025 task order DS01, under management and oversight from the United States Army Corps of Engineers.

The following sections document the steps involved in the Data Usability Assessment, and reference Worksheets #12 and #37 in the Closed Castner Firing Range Uniform Federal Policy (UFP) – Quality Assurance Project Plan (QAPP).

2.0 MEC USABILITY ASSESSMENT INPUTS

As part of the data usability assessment, MEC usability assessment inputs were assessed to ensure completeness of data, and that the completed data conforms to the measurement performance criteria (MPC) documented in Worksheet #12, and the MEC usability assessment inputs as listed on the UFP-QAPP Worksheet #37. Required documents as well as records subject to the assessment, as well as the result of the assessment are listed in **Table 1**.

Table 1: MEC Usability Assessment Inputs

QC STEP	ITEMS TO BE CHECKED/VERIFIED	PASS/FAIL
QC Step I	Verified Qualifications/Training Checklist has been completed for all personnel	PASS
	Have the Work Plan, MEC SAP, and APP been reviewed by UXO teams during the preparatory phase?	PASS
	Have Personnel Certification Qualifications been documented for UXO team?	PASS
	Discrepancies found in the Preparatory Phase checklist have been corrected prior to Initial Phase Inspections for UXO teams.	PASS
	Verified Preparatory Phase 1 Checklist has been completed for all DFWs/SOPs.	PASS

[1] The JV is comprised of protégé firm PIKA International, Incorporated (Inc.) and its mentor ARCADIS-US, Inc. (formerly Malcolm Pirnie, Inc.).

QC STEP	ITEMS TO BE CHECKED/VERIFIED	PASS/FAIL
	Have the applicable QAPP worksheets and APP been reviewed by DGM teams during the preparatory phase?	PASS
	Have Personnel Certification Qualifications been documented for GEO team?	PASS
	Discrepancies found in the Preparatory Phase 1 checklist have been corrected prior to initial Phase Inspections for GEO teams.	PASS
	Verification of UXO team(s) IVS Certification.	PASS
	Verification of GEO team(s) IVS Certification.	PASS
	Signatures on appropriate documents (SOPs, forms, etc.)?	PASS
QC Step II	Verification that the initial and follow-up three-phase QC checklists have been completed for UXO team(s).	PASS
	Discrepancies found in the initial and follow-up three-phase QC checklists have been corrected and documented for the UXO team(s).	PASS
	Have all personnel assigned to the UXO team been IVS Certified?	PASS
	Have all equipment assigned to the UXO team been IVS Certified?	PASS
	Verification that the initial and follow-up three-phase QC checklists have been completed for DGM team(s).	PASS
	Discrepancies found in the initial and follow-up three-phase QC checklists have been corrected and documented for the GEO team(s).	PASS
	Have all personnel assigned to the DGM team been IVS certified?	PASS
	Have all equipment assigned to the GEO team been IVS Certified?	PASS
	Signatures on appropriate documents?	PASS
QC STEP III	Verified that the Sr. Geophysicist re-processed grid geophysical pick lists.	PASS
	Verified that the Senior geophysicist compared QC and GEO targets.	PASS
	Discrepancies have been investigated and the results have been documented.	PASS
	Appropriate actions have been taken by the Corporate QA Manager regarding the results of the QC Phase III investigation.	PASS
	Signatures on appropriate documents?	PASS
QC STEP IV	Verification of follow-up checklist or QC surveillances has been completed for UXO teams.	PASS
	Discrepancies found in the follow-up three-phase QC checklist or QC surveillances have been corrected and documented.	PASS
	Verify that surveillances for in the QAPP were completed?	PASS
	Signatures on appropriate documents?	PASS
QC STEP V	If non-confirming units were found, corrective actions followed the QAPP.	PASS
	Discrepancies corrected and surveillances written.	PASS
	QC Phase V DGM Random Sampling inspection samples were identified and investigated.	PASS
	Discrepancies have been investigated and the results have been documented for the Phase V surveillance.	PASS
	Signatures on appropriate documents?	PASS

The site-specific data library as listed above were evaluated and found to be complete and in conformance with the specifications outlined in the UFP-QAPP. No unacceptable quality control (QC) results were observed throughout the geophysical data collection effort. However, during intrusive and anomaly resolution operations, five non-conformance reports (NCRs)/root cause analyses (RCAs) were generated and are included in Appendix F of the Closed Castner Firing Range RI report.

2.1 RI Quality Control Program

To ensure conformance with the MPCs documented in Worksheet #12, a QC program was implemented in accordance with (IAW) the RI UFP-QAPP throughout the geophysical data collection phase. This program included daily geophysical system equipment function checks, implementation of a Geophysical System Verification (GSV) program, daily geodetic positioning tests, as well as QC of analog geophysical instrumentation.

2.2 Geophysical Equipment

2.2.1 EM61-MK2A

The EM61-MK2A is an EMI sensor consisting of an air-cored 1.0 x 0.5-meter coil which includes coincident transmit and receive coils. The EM61-MK2A was configured in cart mode, utilizing only the bottom sensor, at a height of 42 centimeters (cm) above the ground surface. The IVS surveys were performed with the 1.0 m edge perpendicular to the direction of travel. The Geonics EM61-MK2A EMI sensor generates an electromagnetic pulse that triggers eddy currents in the subsurface. The eddy current decay produces a secondary magnetic field that is monitored by a receiving coil or coils. These secondary magnetic fields are received as data and stored in a field computer until it can be downloaded to a field laptop for interpretation. The EM61-MK2A data logger collects data at a rate of 10 times per second. The Archer data logger is set to record data received from the coil at four different time gates. For this project, data were logged at a rate of 10 Hz (samples per second) and recorded from the four time gates of the coil.

2.2.2 Geodetic Positioning

DGM sensor positioning was supplied by real time kinematic (RTK) differential global positioning system (DGPS) during all DGM surveys. The RTK DGPS base station used during the surveys was set on a survey control point and checked daily at a second survey control point, that was established by a TX professional licensed surveyor (PLS) to Class I, third order accuracy.

2.2.3 Analog Instrumentation

The JV performed analog transect and instrument assisted visual survey (IAVS) investigations using White's All-Metals Detectors. Analog geophysical anomalies were located using a handheld global positioning system (GPS) (*e.g.*, Trimble GeoXH). Equipment QC checks were conducted by UXO Technicians every day prior to commencing field work.

2.3 DGM INSTRUMENTATION RESULTS

The JV evaluated the RI geophysical data to determine whether it met the MEC Measurement Performance Criteria (MPC) as listed in Table 12-1 on Worksheet #12 of the RI UFP-QAPP. **Table 2** shows the RI DGM performance metrics for the following MPCs:

- Static Repeatability,
- Along-line Measurement Spacing,
- Speed,
- Coverage,
- Dynamic Detection Repeatability (Instrument Verification Strip [IVS]),
- Dynamic Detection Repeatability (Digital Geophysical Mapping [DGM]),
- Dynamic Positioning Repeatability (IVS),
- Dynamic Positioning Repeatability (DGM),
- Target Selection,
- Anomaly Resolution,
- Geodetic Equipment Functionality,
- Geodetic Internal Consistency,
- Geodetic Accuracy.

The following sub-sections present the results of the geophysical data collected in support of the RI, as well as an evaluation of that data against the performance metrics.

Table 2: DGM Measurement Performance Criteria

Requirement	Limited Applicability (Specific to Collection Method/Use)	Procedures	Performance Standard	Frequency	Result
Static Repeatability (Instrument Functionality)	All	Static tests will be performed by positioning the survey equipment within or near the survey boundaries in an area free of metallic contacts and collecting data for (minimally) a 1-minute period. During this time, the instrument will be held in a fixed position without a spike (small industry standard object [ISO]) and then with a small ISO spike. The static background and static spike test will be conducted at the beginning and end of each survey operation.	Response (mean static spike minus mean static background) within +/- 20%	Beginning and End of the day	Pass: All static repeatability tests were within the +/- 20% metric
Along-line measurement spacing	All	The downline data separation will be calculated in Geosoft Oasis Montaj to determine if the performance standard has been met.	98% ≤ 25 centimeters (cm) along line	By dataset	Pass: 100% of along sample separation was ≤ 25 cm
Speed	Transects	The data collection speed will be calculated in Geosoft Oasis Montaj to determine if the performance standard has been met.	95% < 4 mph	By dataset	N/A: No DGM transects were acquired
Coverage	All	The coverage for each grid will be calculated in Geosoft Oasis Montaj to determine if the performance standard has been met.	> 90% coverage at project design line spacing (2.5-ft) and 98% coverage at 1 meter line spacing	By transect/grid or dataset	Pass: >90% coverage at project design line spacing (2.5-ft) and >98% coverage at 1-meter line spacing
Dynamic Detection Repeatability (IVS)	IVS	Seed items will be placed in the IVS using the procedures in Section 17.1.4 of this QAPP. The test will be conducted by following the GSV procedures outlined in Section 17.1.4 of this QAPP.	Peak response repeatable to +/- 25% of expected response	Twice daily	Pass: 100% of IVS responses were greater than the anomaly selection threshold
Dynamic Detection Repeatability (DGM)	DGM Grids	Seed items will be placed in grids using the procedures in Section 17.1.4 of this QAPP. The results of the DGM grid data will be compared to the blind seed anticipated response from the IVS, after accounting for horizontal and vertical positioning error.	Peak response > 75% of minimum expected response	1 per day per team based on expected production rate	Pass: Responses observed from all blind seed items were greater than 75% of the expected response
Dynamic Positioning Repeatability (IVS)	IVS	Seed items will be placed in the IVS using the procedures in Section 17.1.4 of this QAPP. The test will be conducted following the GSV procedures outlined in Section 17.1.4 of this QAPP.	Position offset of seed item targets <= 25 cm	Twice daily	Pass: 100% of IVS seed item offsets were ≤ 25 cm
Dynamic Positioning Repeatability (DGM)	DGM Grids	Seed items will be placed in the grids using the procedures in Section 17.1.4 of this QAPP. The results of the DGM grid data will be compared to the blind seed location	90% positioning offset is <= 1.01 m (25 cm + ½ line spacing) and 100% is <=1.11 m (35cm + ½ line spacing) for digital positioning systems	1 per day per team based on expected production rate	Pass: 100% of blind seed items were detected with an offset ≤ 1.01 m (25 cm + ½ line spacing).
Target Selection	All	The Senior Geophysicist will review the dig list to ensure that all anomalies selected for intrusive investigation are on the dig list.	All dig list targets are selected according to project design	By transect/grid or dataset	Pass: The Senior Geophysicist reviewed all target selections and targets were selected according to project design

Requirement	Limited Applicability (Specific to Collection Method/Use)	Procedures	Performance Standard	Frequency	Result
Anomaly Resolution	Verification checking by DGM remapping or verification checking with original instrument of anomaly footprint after excavation	For DGM targets, the Senior Geophysicist will select an appropriate lot size and select anomalies at random within each lot for field verification by the UXOQCS.	Second party checks open holes to determine: 70% confidence < 10% unresolved anomalies Accept on zero.	Rate varies depending on lot size. See DID WERS-004.01 for Acceptance Sampling Table for Anomaly Resolution amounts	Pass: Anomaly resolution was successfully completed for all DGM Grid Lots.
Geodetic Equipment Functionality	All	The DGM team will reoccupy a known control point with the RTK DGPS rover and collect a GPS point on the know location. The data processor will calculate the offset between each recorded position and the control point location and determine if it meets the performance metric.	Position offset of known/temporary control point ≤ 10 cm.	Daily	Pass: RTK positions recorded daily at known control points were all ≤ 10 cm
Geodetic Accuracy	Points used for RTK base station	Temporary control monuments used for RTK base stations will be installed by a Licensed Professional Surveyor (LPS)	Project network must be tied to HARN, CORS, OPUS or other recognized network. Project control points that are used more than once must be repeatable to within 5 cm.	For points used more than once, repeat occupation of each point used, either monthly (for frequently used points) or before re-use (if used infrequently).	Pass: All temporary control monuments used for the RTK base station were established and occupied by a PLS

Table 3: Analog (Mag and Dig) Meandering Path Measurement Performance Criteria

Requirement	Limited Applicability (Specific to Collection Method/Use)	Procedures	Performance Standard	Frequency	Consequence of Failure
Repeatability (instrument functionality)	All	UXO technicians will sweep the test strip with the handheld instrument and note where detected subsurface anomalies are located. The UXO QC Specialist (UXOQCS) will verify that all UXO technicians are tested at the instrument test strip at the beginning of the day and that each has detected the test strip seed items.	All items in test strip detected (trains ear daily to items of interest)	Min 1 daily	Pass: All instrument tests were completed successfully
Dynamic repeatability	IAVS Meandering Paths used only for density estimates	The UXOQCS will repeat the required amount of transects after the IAVS team has completed the transect and will document each detected anomaly	Repeat a segment of transect and show number of counts repeated within the greater of ±20% or ±8, or within range of adjacent segments.	Second party repeat of 2% per lot	Pass: Required IAVS transect segments were repeated and the number of counts repeated were within the MPC
Dynamic repeatability	Analog Mag and Dig Transects	The UXOQCS will repeat the required amount of transects after the dig team has completed the transect and will intrusively investigate each detected anomaly and record its location and nature in a handheld GPS.	Repeat a segment of transect and show extra flags/digs not greater than the greater of 20% or 8 flags/digs, or within range of adjacent segments.	Second party repeat of 2% per lot	Pass: Required analog transect segments were repeated and extra flags/digs were within the MPC
Anomaly Resolution	Verification checking of excavated WAA DGM Transects (checked with EM61-MK2)	For WAA targets, the Senior Geophysicist will select an appropriate lot size and select anomalies at random within each lot for field verification by the UXOQCS.	70% confidence <10% unresolved anomalies Accept on zero.	12 per lot per DID WERS-004.01	Pass: Anomaly resolution was successfully completed for all Lots. See NCR/RCAs 3, 4 and 5
Anomaly resolution	Verification checking of analog (mag and dig) transects (checked with handheld electromagnetic induction [EMI] instrument)	The UXOQCS will perform anomaly resolution sampling using the handheld EMI sensor by moving it over the anomaly location to verify that the source of the anomaly has been removed or that there is an explanation for the remaining anomaly.	70% confidence <10% unresolved anomalies Accept on zero.	12 per lot per DID WERS-004.01	Pass: 100% of anomalies along analog transects were successfully resolved
Geodetic Equipment Functionality	All	The DGM team will reoccupy a known control point with the RTK DGPS rover and collect a GPS point on the know location. The data processor will calculate the offset between each recorded position and the control point location and determine if it meets the performance metric.	Position offset of known/temporary control point within 10 cm for real time kinematic (RTK) differential global positioning systems (DGPS) or 1.5 meters for handheld Global Positioning System (GPS) units.	Daily	Pass: positions recorded daily at known control points were all ≤10 cm for RTK, or ≤1.5 meters for handheld Global Positioning System (GPS) units.

2.3.1 Static Repeatability

Instrument functionality tests were collected at the beginning and end of each day of DGM data collection. **Appendix A** provides summary tables of the function test results. All the EM61-MK2A static tests pass the ±20% MQO, which is assessed by subtracting the mean static background from the mean static spike and evaluating deviation from the expected response. The results of this QC test support that the sensor was functioning properly throughout the RI field effort.

2.3.2 Along Line Measurement Spacing

The along line measurement QC requirement was established to ensure that data was collected at a frequency sufficient to detect targets of interest within the RI Investigation Area at Closed Castner Firing Range. The performance standard required that 98% of data have an along line spacing of 25 cm or less. The along line measurement spacing is summarized in **Appendix A** of this report. All DGM data met the along line measurement spacing MQOs as set forth in the UFP-QAPP.

2.3.3 Dynamic Detection Repeatability at the IVS

As shown in **Table 2**, the evaluation criteria for determining whether IVS data were acceptable during the RI field effort was that the peak seed item response was repeatable to +/- 25% of the expected response. The IVS was seeded with two small schedule 80 ISOs, and two medium schedule 40 ISOs. The peak responses measured for each seed item traversed during the daily IVS surveys were within 25% of the expected CH2 response. Results of the daily IVS surveys are summarized in **Appendix A**. All IVS data met the IVS dynamic detection repeatability MPC.

Table 4: IVS Seed Item Summary

Item Number	Description	Easting (ft)[1]	Northing (ft)[1]	Depth (in)	Orientation
SEED-01	Small ISO80	363205.73	3530710.81	4.00	Horizontal – Cross Track
SEED-02	Small ISO80	363203.85	3530713.25	7.75	Vertical
SEED-03	Medium ISO40	363201.94	3530715.73	6.00	Horizontal – Cross Track
SEED-04	Medium ISO40	363200.14	3530718.16	11.00	Horizontal – Cross Track

2.3.4 Dynamic Detection Repeatability Within Grids

As shown in **Table 2**, the evaluation criteria for determining whether dynamic detection repeatability of DGM grid data were acceptable during the RI field effort was that the peak CH2 response of any seed items emplaced within the DGM survey areas was greater than 75% of the expected response of the emplaced seed type.

Dynamic detection repeatability data is summarized in **Appendix A**. Dynamic data collected meets the requirement that the observed response was greater than 75% of the expected CH2 response and therefore meets the MPC.

2.3.5 Dynamic Positioning Repeatability at the IVS

As shown in **Table 2**, the evaluation criteria for determining whether IVS data were acceptable during the RI field effort was that the detected location of seed items within the IVS were ≤ 25cm from the actual emplaced location.

IVS Dynamic detection repeatability data is summarized in **Appendix A**. Dynamic data collected meets the requirement that the detected location of seed items within the IVS were ≤ 25cm from the actual emplaced location, and therefore meets the MQO.

2.3.6 Dynamic Positioning Repeatability Within Grids

As shown in **Table 2**, the evaluation criteria for determining whether DGM production data collected within grids were acceptable during the RI field effort was that the detected location of seed items emplaced within grids were ≤1.01-m from the actual emplaced location. 16 of the 30 grids were seeded with Small Schedule 80 ISOs. The seed items were placed in a horizontal orientation at 3-inch depth.

Detection offsets for the seed items encountered during the grid DGM surveys are summarized in **Appendix A**. All BSIs were detected within the 1.01-m search radius. The detected and recovered offsets were within 1.01-m, and this data is acceptable for use in the RI. Dynamic data collected meets the requirement that the detected location of seed items emplaced within grids were ≤1.01-m from the actual emplaced location, and therefore meets the MPC.

2.3.7 Survey Coverage

To determine if the horizontal survey coverage of the DGM data collected during the RI field effort was acceptable, the production DGM grid data were assessed by measuring the deviation, if any, from the planned survey line spacing as specified in the UFP-QAPP. Grid data were acceptable if >90% of DGM coverage was performed at, or less than, the design line spacing of 0.76-m (2.5-ft), and >98% were performed at 1-m line spacing.

Dynamic grid data meets the requirement that >90% of DGM coverage was performed at, or less than, the planned line spacing of 0.76-m (2.5-ft), and that >98% coverage at 1-m line spacing, and therefore meets the MPC. Coverage per grid is detailed in **Appendix A**.

2.3.8 Target Selection

The target selection performance metric is used to ensure that all dig list targets meeting the project's anomaly selection criteria are selected during data processing and interpretation. As per the Castner Range IVS Letter Report (PIKA-Pirnie JV, March 2016) an anomaly selection threshold of 2.8 mV on Channel 2 was established.

The Senior Geophysicist reviewed the target list from each grid to ensure all targets were picked and included in the final dig list. The target selection results meet the MPC set forth in the UFP-QAPP.

The evaluation criteria for verification of DGM transects and grids during the RI field effort was for the UXOQCS to perform anomaly resolution on anomalies intrusively investigated during the DGM transect and grid surveys by using an EM61-MK2A sensor to verify that the source of the anomaly at each excavation had been resolved. For this MPC to be met, a set of anomalies per lot of DGM data were randomly selected to be revisited by the UXOQCS and <10% were to be unresolved per lot.

Three WAA lots of data (Lots 8, 9, 10) were subject to resolution of 100% of the anomalies within each lot due to a QC failure during the initial anomaly resolution process. This process is described in detail within NCR/RCAs 3 and 4. After implementing the corrective action, all anomalies within these lots passed the anomaly resolution process.

This MPC was met, as anomalies selected for anomaly resolution/post-verification sampling within the WAA transects and within the DGM grids were revisited by the UXOQCS and verified to be free of any remaining signal. These results support that the sources of anomalies along transects and within the grids were properly identified, and that DGM data acquired is of sufficient quality to meet the objectives of the RI.

2.3.9 Geodetic Equipment Functionality

The geodetic equipment functionality QC requirement was established to ensure that positioning data were collected at a known control monument at the beginning of each day of data collection and that the positioning offset of the RTK DGPS was within 10 cm. The geodetic functionality test results are summarized in **Appendix A**. All collected geodetic functionality test results were within the 10 cm MPC.

2.3.10 Geodetic Accuracy

The geodetic accuracy QC requirement was established to ensure that positioning data were corrected using an RTK base station set over a temporary control monument which has been occupied and verified by a licensed civil surveyor. Survey control monuments were established IAW the procedures outlined in the Final RI UFP-QAPP (JV, 2015). A Texas PLS established six control monuments within the Closed Castner Range RI project site for use as base station control points for the RTK DGPS used to position DGM data. Points are listed in **Table 5**.

Table 5: Closed Castner Range Temporary Control Monuments

Monument Number	Easting (ft)[1]	Northing (ft)[1]	Elevation (ft)[2]
GPS 1	363,116.79	3,530,680.81	1267.996
GPS 2	363,121.15	3,530,710.96	1268.051
GPS 3	362,804.21	3,527,824.88	1250.493
GPS 4	362,826.35	3,527,845.80	1248.577
GPS 5	362,026.42	3,532,342.50	1372.818
GPS 6	361,997.60	3,532,332.50	1374.802

Notes:
1 – Coordinates are provided in Universal Transverse Mercator, None 13 North, World Geodetic System 1984 (WGS84), in units of Meters (m).

All temporary control monuments used for the RTK base station were established and occupied by a PLS, indicating that the temporary control monuments used for the RI positional data corrections met the performance standards and are of sufficient quality to meet the objectives of the RI.

2.4 Analog Instrumentation Results

The analog data collected during the RI was used to evaluate the potential for MEC in areas that were inaccessible to DGM methods. The following four MPCs were monitored during analog operations to verify data quality:

- Repeatability (Instrument Functionality)
- Dynamic repeatability
- Anomaly resolution
- Geodetic Functionality

2.4.1 Repeatability (Instrument Functionality)

The evaluation criteria for verifying analog instrument functionality during the RI field effort was to sweep daily an Instrument Test Strip (ITS) with handheld instrumentation and note in real time where the detected subsurface anomalies were located. The ITS was seeded with two Small Schedule 40 ISOs, and 2 Schedule 40 Medium ISOs. Results of the daily ITS surveys are summarized in **Appendix A**. All ITS tests met the Instrument Functionality MPC. The results of this QC test support that the functionality and correct operation of analog instrumentation were verified, and therefore meets the MPC set forth in the UFP-QAPP.

2.4.2 Dynamic Repeatability

The evaluation criteria for verifying analog instrument dynamic repeatability during the RI field effort was for the UXOQCS to repeat IAVS and analog transects after the UXO team had completed them. For this MPC to be met, transects were to be repeated while showing extra anomalies at a rate no greater than the greater of 20% or eight anomalies along the transects. The UXOQCS did not perform QC of two lots of IAVS transects: IAVS Lot 04042016_IAVS that covered transect IAVS-40, and IAVS Lot 04192016_IAVS that covered transect IAVS-9c. Because the UXOQCS did not perform QC of these two lots, the IAVS data collected on these days was rejected. The data collected on the remaining IAVS transects totaled 76.36 acres, which exceeded the 70.05 acres of IAVS transects in the final UFP-QAPP; therefore, additional data collected was not required to meet the data quality objectives of the RI and IAVS data was not re-collected to replace the two lots that the UXOQCS did not QC.

This MPC was met, as no quantity of anomalies more than the MPC (20% or eight anomalies) were detected by the UXOQCS along the IAVS or analog transects. These results support that the proper coverage and identification of anomalies along transects were verified, no additional anomalies were identified during QC of the transects, and that data acquired along these transects meets the MPC and is of sufficient quality to meet the objectives of the RI.

2.4.3 Anomaly Resolution

The evaluation criteria for verification of analog transects during the RI field effort was for the UXOQCS to perform anomaly resolution on anomalies intrusively investigated during the analog transect surveys by using a handheld EMI sensor to verify that the source of the anomaly at each excavation had been removed or explained. For this MPC to be met anomalies were to be revisited by the UXOQCS and <10% were to be unresolved per lot. The MPC was performed by verifying intrusive locations along a portion of each transect traversed by the analog UXO teams. This MQO was met, as no additional anomalies were detected by the UXOQCS along these transect segments, and all intrusive locations revisited by the UXOQCS were verified to be free of any remaining signal. These results support that the sources of anomalies along transects were properly identified, and that data acquired along these transects is of sufficient quality to meet the objectives of the RI.

2.4.4 Geodetic Equipment Functionality

The geodetic equipment functionality QC requirement was established to ensure that positioning data were collected at a known control monument at the beginning of each day of data collection and that the positioning offset of the handheld DGPS was within 1.5-m. The geodetic functionality test results are summarized in **Appendix A**. All collected geodetic functionality test results were within the 1.5-m MPC.

3.0 CONCLUSIONS

The JV performed this MEC data usability assessment to determine whether the QC measures emplaced, and geophysical data collected in support of the Closed Castner Firing Range RI field effort was of sufficient quality to meet the objectives of the RI. QC measures and documentation were verified and validated, and all DGM and analog geophysical MPCs monitored during this usability assessment were evaluated against the MPCs established in the UFP-QAPP. Where data did not meet the MPCs established in the UFP-QAPP, the JV performed a RCA/CA to correct the identified issues. One exception is that two lots of IAVS transects were rejected due to a lack of QC of the lots. After rejecting these lots, the amount of IAVS transects still exceeds the amount required in the UFP-QAPP. Therefore, the JV concludes that the data acquired and documented are of sufficient quality and meets the objectives of the RI.

Appendix A – Measurement Quality Objective Summary Tables

Table A-1: Static Repeatability Summary

Date	Time	Sensor	CH2 Mean Response	CH2 Deviation	Result	Comment
3/8/2016	AM	EM61MKII	2195.3	713.07%	Pass	Different Spike Height and Orientation
3/9/2016	AM	EM61MKII	495.93	83.68%	Pass	Different Spike Height and Orientation
3/9/2016	PM	EM61MKII	502.94	86.27%	Pass	Different Spike Height and Orientation
3/10/2016	AM	EM61MKII	272.92	1.08%	Pass	
3/10/2016	PM	EM61MKII	255.56	-5.35%	Pass	
3/11/2016	AM	EM61MKII	263.02	-2.59%	Pass	
3/11/2016	PM	EM61MKII	264.18	-2.16%	Pass	
3/14/2016	AM	EM61MKII	278.5	3.15%	Pass	
3/14/2016	PM	EM61MKII	270.09	0.03%	Pass	
3/15/2016	AM	EM61MKII	264.41	-2.07%	Pass	
3/15/2016	PM	EM61MKII	265.94	-1.50%	Pass	
3/16/2016	PM	EM61MKII	268.29	-0.63%	Pass	
3/16/2016	AM	EM61MKII	266.48	-1.30%	Pass	
3/17/2016	PM	EM61MKII	262.85	-2.65%	Pass	
3/17/2016	AM	EM61MKII	270.96	0.36%	Pass	
3/18/2016	AM	EM61MKII	279.16	3.39%	Pass	
3/18/2016	PM	EM61MKII	260.76	-3.42%	Pass	
3/21/2016	AM	EM61MKII	269.93	-0.03%	Pass	
3/21/2016	PM	EM61MKII	269.02	-0.36%	Pass	
3/23/2016	AM	EM61MKII	269.76	-0.09%	Pass	
3/23/2016	PM	EM61MKII	262.5	-2.78%	Pass	
3/24/2016	AM	EM61MKII	260.13	-3.66%	Pass	
3/24/2016	PM	EM61MKII	261.67	-3.09%	Pass	
3/25/2016	PM	EM61MKII	274.05	1.50%	Pass	
5/25/2016	AM	EM61MKII	285.25	5.65%	Pass	
5/25/2016	PM	EM61MKII	274.16	1.54%	Pass	
5/26/2016	AM	EM61MKII	270.14	0.05%	Pass	
5/26/2016	PM	EM61MKII	273.82	1.41%	Pass	
5/27/2016	AM	EM61MKII	265.95	-1.50%	Pass	
5/27/2016	PM	EM61MKII	267.27	-1.01%	Pass	
5/31/2016	AM	EM61MKII	267.03	-1.10%	Pass	
5/31/2016	PM	EM61MKII	270.98	0.36%	Pass	
6/1/2016	AM	EM61MKII	286.72	6.19%	Pass	
6/1/2016	PM	EM61MKII	286.72	6.19%	Pass	
6/1/2016	PM	EM61MKII	288.85	6.98%	Pass	
6/1/2016	PM	EM61MKII	288.85	6.98%	Pass	
6/1/2016	AM	EM61MKII	269.14	-0.32%	Pass	
6/1/2016	PM	EM61MKII	264.29	-2.11%	Pass	
6/2/2016	PM	EM61MKII	273.31	1.23%	Pass	
6/2/2016	AM	EM61MKII	273.31	1.23%	Pass	
6/2/2016	PM	EM61MKII	272.27	0.84%	Pass	
6/2/2016	PM	EM61MKII	272.27	0.84%	Pass	
6/2/2016	AM	EM61MKII	266.16	-1.42%	Pass	
6/2/2016	PM	EM61MKII	265.96	-1.50%	Pass	
6/6/2016	AM	EM61MKII	276.74	2.50%	Pass	
6/6/2016	PM	EM61MKII	268.13	-0.69%	Pass	
6/7/2016	AM	EM61MKII	269.55	-0.17%	Pass	
6/7/2016	PM	EM61MKII	271.49	0.55%	Pass	
6/7/2016	AM	EM61MKII	278.96	3.32%	Pass	
6/7/2016	PM	EM61MKII	274.71	1.74%	Pass	
6/8/2016	AM	EM61MKII	273.22	1.19%	Pass	
6/8/2016	PM	EM61MKII	268.24	-0.65%	Pass	
6/8/2016	AM	EM61MKII	294.95	9.24%	Pass	
6/8/2016	PM	EM61MKII	275.09	1.89%	Pass	

6/9/2016	AM	EM61MKII	272.77	1.03%	Pass	
6/9/2016	PM	EM61MKII	264.77	-1.94%	Pass	
6/9/2016	PM	EM61MKII	274.33	1.60%	Pass	
6/10/2016	AM	EM61MKII	257.1	-4.78%	Pass	
6/10/2016	PM	EM61MKII	268.35	-0.61%	Pass	
6/10/2016	PM	EM61MKII	270.69	0.26%	Pass	
6/13/2016	AM	EM61MKII	281.14	4.13%	Pass	
6/13/2016	PM	EM61MKII	271.36	0.50%	Pass	
10/17/2016	AM	EM61MKII	275.65	2.09%	Pass	
10/17/2016	PM	EM61MKII	272.45	0.91%	Pass	
10/18/2016	AM	EM61MKII	271.13	0.42%	Pass	
10/18/2016	PM	EM61MKII	279.92	3.67%	Pass	
10/19/2016	AM	EM61MKII	274.17	1.54%	Pass	
10/19/2016	PM	EM61MKII	273.86	1.43%	Pass	
10/20/2016	AM	EM61MKII	279.17	3.40%	Pass	
10/20/2016	PM	EM61MKII	273.91	1.45%	Pass	

Table A-2: Along Line Measurement Spacing Summary

Survey Type	Dataset ID	Collection Date	Maximum Separation (m)	Mean Separation (m)	Percent <0.25m	Result
Grid	G01	3/23/2016	0.18	0.07	100.00%	Pass
Grid	G02	3/23/2016	0.29	0.06	99.90%	Pass
Grid	G03	3/25/2016	0.19	0.07	100.00%	Pass
Grid	G04	3/21/2016	0.21	0.07	100.00%	Pass
Grid	G05	3/24/2016	0.2	0.07	100.00%	Pass
Grid	G06	3/18/2016	0.19	0.07	100.00%	Pass
Grid	G07	3/21/2016	0.29	0.06	99.90%	Pass
Grid	G08	3/24/2016	0.39	0.06	99.90%	Pass
Grid	G09	3/24/2016	0.25	0.07	100.00%	Pass
Grid	G10	3/18/2016	0.36	0.06	99.90%	Pass
Grid	G11	3/18/2016	0.32	0.06	99.90%	Pass
Grid	G12	3/16/2016	0.35	0.06	99.90%	Pass
Grid	G13	3/16/2016	0.4	0.07	99.90%	Pass
Grid	G14	3/16/2016	0.16	0.06	100.00%	Pass
Grid	G15	3/15/2016	0.22	0.08	100.00%	Pass
Grid	G16	3/11/2016	0.16	0.07	100.00%	Pass
Grid	G17	3/10/2016	0.32	0.05	99.90%	Pass
Grid	G18	3/11/2016	0.19	0.08	100.00%	Pass
Grid	G19	3/15/2016	0.14	0.06	100.00%	Pass
Grid	G20	3/17/2016	0.17	0.05	100.00%	Pass
Grid	G21	3/14/2016	0.16	0.06	100.00%	Pass
Grid	G22	3/14/2016	0.18	0.07	100.00%	Pass
Grid	G23	5/31/2016	0.37	0.06	100.00%	Pass
Grid	G24	5/31/2016	0.34	0.04	100.00%	Pass
Grid	G25	6/1/2016	0.39	0.05	100.00%	Pass
Grid	G26	5/31/2016	0.34	0.05	100.00%	Pass
Grid	G27	6/1/2016	0.42	0.04	100.00%	Pass
Grid	G28	6/2/2016	1.71	0.04	100.00%	Pass
Grid	G29	6/2/2016	0.12	0.05	100.00%	Pass
Grid	G30	6/1/2016	0.37	0.05	100.00%	Pass

Table A-3: IVS Dynamic Detection and Positioning Repeatability Summary

Date	Teams	IVS Positioning	IVS Response
3/9/2016	T1	PASS	PASS
3/10/2016	T1	PASS	PASS
3/11/2016	T1	PASS	PASS
3/14/2016	T1	PASS	PASS
3/15/2016	T1	PASS	PASS
3/16/2016	T1	PASS	PASS
3/17/2016	T1	PASS	PASS
3/18/2016	T1	PASS	PASS
3/21/2016	T1	PASS	PASS
3/23/2016	T1	PASS	PASS
3/24/2016	T1	PASS	PASS
3/25/2016	T1	PASS	PASS
5/25/2016	T1	PASS	PASS
5/26/2016	T1	PASS	PASS
5/27/2016	T1	PASS	PASS
5/31/2016	T1, T4	PASS	PASS
6/1/2016	T1, T4	PASS	PASS
6/2/2016	T1, T4	PASS*	PASS
6/6/2016	T4	PASS	PASS
6/7/2016	T3, T4	PASS*	PASS
6/8/2016	T3, T4	PASS*	PASS
6/9/2016	T3, T4	PASS*	PASS
6/10/2016	T3, T4	PASS*	PASS
6/13/2016	T3, T4	PASS	PASS
10/17/2016	T1	PASS	PASS
10/18/2016	T1	PASS	PASS
10/19/2016	T1	PASS	PASS
10/20/2016	T1	PASS	PASS

* see RCA04 for details on IVS positioning for these dates

Table A-4: Grid Dynamic Detection and Positioning Repeatability Summary

Dataset ID	Target ID	Target Easting	Target Northing	CH2 Response (mv)	Offset (m)	Result
G01	G01-0009	360634.26	3532748.09	15.18	0.40	Pass
G03	G03-0014	361708.68	3533241.96	20.91	0.14	Pass
G06	G06-0007	363444.04	3532863.06	13.00	0.17	Pass
G07	G07-0003	362407.08	3532506.80	68.96	0.79	Pass
G09	G09-0003	362985.42	3532705.51	21.99	0.26	Pass
G11	G11-0029	363473.39	3532417.77	16.05	0.24	Pass
G12	G12-0005	361907.74	3532011.01	20.51	0.11	Pass
G14	G14-0012	362426.99	3531754.88	16.23	0.09	Pass
G16	G16-0022	363355.98	3531298.60	15.89	0.07	Pass
G17	G17-0039	362973.55	3530812.60	14.33	0.44	Pass
G19	G19-0007	363173.62	3529958.68	15.68	0.23	Pass
G21	G21-0030	362515.10	3527610.88	25.58	0.30	Pass
G23	G23-0012	361492.04	3529177.47	11.15	0.29	Pass
G25	G25-0005	361284.32	3529035.36	26.85	0.29	Pass
G27	G27-0015	361133.47	3529164.99	33.69	0.14	Pass
G30	G30-0004	362710.86	3530314.83	43.26	0.35	Pass

Table A-5: Survey Coverage

Dataset ID	Percent Coverage @ 2.5ft spacing	Result
G01	98.89%	PASS
G02	98.68%	PASS
G03	98.65%	PASS
G04	97.33%	PASS
G05	98.73%	PASS
G06	99.31%	PASS
G07	96.01%	PASS
G08	98.47%	PASS
G09	97.13%	PASS
G10	98.87%	PASS
G11	98.59%	PASS
G12	98.33%	PASS
G13	96.76%	PASS
G14	98.78%	PASS
G15	96.42%	PASS
G16	99.65%	PASS
G17	95.88%	PASS
G18	98.64%	PASS
G19	98.68%	PASS
G20	98.41%	PASS
G21	98.31%	PASS
G22	97.17%	PASS
G23	99.14%	PASS
G24	99.28%	PASS
G25	98.54%	PASS
G26	99.47%	PASS
G27	98.47%	PASS
G28	99.43%	PASS
G29	99.67%	PASS
G30	99.61%	PASS

Table A-6: Geodetic Equipment Functionality

Date	Geodetic Functionality GPS Receiver	Control Point ID	Measured Easting	Measured Northing	Measurement Offset (m)	QC Status
3/8/2016	030816amgps	10006	363121.13	3530710.97	0.02	PASS
3/8/2016	030816pmgps1	10006	363121.13	3530710.97	0.02	PASS
3/9/2016	030916_R1_GPSPM	10006	363121.13	3530710.97	0.02	PASS
3/9/2016	030916r1amgpst31	10006	363121.14	3530710.96	0.01	PASS
3/10/2016	031016_R1_GPSAM	10006	363121.16	3530710.98	0.02	PASS
3/10/2016	031016_R1_GPSPM	10006	363121.15	3530710.98	0.02	PASS
3/11/2016	031116_R1_GPSPM	10006	363121.13	3530710.96	0.02	PASS
3/11/2016	031116_R1_GPSPM	10006	363121.13	3530710.96	0.02	PASS
3/11/2016	031116_R1_GPSAM	10006	363121.15	3530710.96	0.00	PASS
3/14/2016	031416_R1_GPSAM	10006	363121.13	3530710.98	0.03	PASS
3/14/2016	031416_R1_GPSPM	10006	363121.14	3530710.97	0.02	PASS
3/15/2016	031516_R1_GPSAM	10006	363121.13	3530710.99	0.04	PASS
3/15/2016	031516_R1_GPSPM	10006	363121.13	3530710.97	0.03	PASS
3/16/2016	031616_R1_GPSAM	10006	363121.15	3530710.99	0.03	PASS
3/16/2016	031616_R1_GPSPM	10006	363121.15	3530710.98	0.02	PASS
3/17/2016	031716_R1_GPSPM	10006	363121.13	3530710.98	0.03	PASS
3/17/2016	031716_R1_GPSAM	10006	363121.13	3530710.96	0.02	PASS
3/18/2016	031816_R1_GPSPM	10006	363121.13	3530710.98	0.03	PASS
3/18/2016	031816_R1_GPSAM	10006	363121.14	3530710.97	0.02	PASS
3/21/2016	032116_R1_GPSPM	10006	363121.13	3530710.97	0.02	PASS
3/21/2016	032116_R1_GPSAM	10006	363121.13	3530710.96	0.02	PASS
3/22/2016	032216_R1_GPSAM	10006	363121.12	3530710.97	0.04	PASS
3/22/2016	032216_R1NB_GPSAN	10009	362026.42	3532342.52	0.02	PASS
3/23/2016	032316_R1_GPSPM	10006	363121.12	3530710.97	0.03	PASS
3/23/2016	032216_R1NB_GPSAN	10009	362026.40	3532342.51	0.02	PASS
3/23/2016	032316_R1_GPSAM	10006	363121.13	3530710.96	0.02	PASS
3/24/2016	032416_R1_GPSPM	10006	363121.14	3530710.98	0.02	PASS
3/24/2016	032416_R1_GPSAM	10006	363121.14	3530710.94	0.02	PASS
3/24/2016	032216_R1NB_GPSAN	10009	362026.42	3532342.51	0.01	PASS
3/25/2016	032516_R1NC_GPSA	10009	362026.43	3532342.52	0.03	PASS
3/25/2016	032516_R1_GPSAM	10006	363121.14	3530710.98	0.02	PASS
3/25/2016	032516_R1_GPSPM	10006	363121.14	3530710.97	0.02	PASS
3/26/2016	032816_R1_GPSAM	10006	363121.14	3530710.96	0.01	PASS
3/28/2016	032816_R1_GPSAM	10006	363121.14	3530710.96	0.01	PASS
4/4/2016	040416_R1_GPSAM	10006	363121.13	3530710.96	0.02	PASS
4/5/2016	040516_R1_GPS	10006	363121.13	3530710.98	0.03	PASS
4/5/2016	040516_R2GPS	10006	363121.13	3530710.98	0.02	PASS
4/6/2016	040616GPSR2	10006	363121.15	3530711.03	0.07	PASS
4/6/2016	040616_R1_GPT	10006	363121.13	3530710.98	0.03	PASS
4/6/2016	040616GPSR2_T2	10006	363121.15	3530710.97	0.01	PASS
4/7/2016	040716_R1_GPU	10008	362826.37	3527845.82	0.03	PASS
4/7/2016	040716_R2_GPU	10008	362826.36	3527845.81	0.02	PASS
4/8/2016	040816R2GPS	10008	362826.34	3527845.82	0.02	PASS
4/8/2016	040816R1GPS	10008	362826.35	3527845.82	0.02	PASS
4/11/2016	041116_GPS_R1	10008	362826.36	3527845.81	0.02	PASS
4/12/2016	041216_GPS_R1	10008	362826.35	3527845.81	0.01	PASS
4/13/2016	041316_GPS_R1	10008	362826.36	3527845.81	0.02	PASS
4/14/2016	041416_GPS_R1	10008	362826.35	3527845.81	0.01	PASS

4/15/2016	041516_GPS_R1	10008	362826.36	3527845.81	0.02	PASS
4/18/2016	041816-GPS-R1	10008	362826.36	3527845.83	0.03	PASS
4/18/2016	041816-GPS-R2	10008	362826.35	3527845.82	0.02	PASS
4/19/2016	041916_GPS_R2	10008	362826.33	3527845.80	0.01	PASS
4/19/2016	041916_GPS_R1	10008	362826.33	3527845.80	0.01	PASS
4/20/2016	042016_GPS_R2	10008	362826.34	3527845.81	0.01	PASS
4/20/2016	042016_GPS_R1	10008	362826.34	3527845.80	0.00	PASS
4/21/2016	042116_GPS_R2	10008	362826.35	3527845.81	0.01	PASS
4/21/2016	042116_GPS_R1	10008	362826.34	3527845.81	0.01	PASS
4/22/2016	042216_GPS_R1	10008	362826.36	3527845.83	0.03	PASS
4/22/2016	042216_R3_gps	10006	363121.14	3530710.98	0.02	PASS
4/22/2016	042216_GPS_R2	10008	362826.35	3527845.82	0.02	PASS
4/25/2016	042516_R2_GPS C	10006	363121.14	3530710.98	0.03	PASS
4/25/2016	042516_gps_r3	10006	363121.14	3530710.98	0.02	PASS
4/26/2016	042616_GPS_R2	10006	363121.13	3530710.98	0.03	PASS
4/26/2016	042616_GPS_R1	10006	363121.14	3530710.99	0.03	PASS
4/26/2016	042616_GPS_R1C	10006	363121.12	3530710.97	0.03	PASS
4/26/2016	042616_GPS_R1A	10006	363121.13	3530710.97	0.03	PASS
4/26/2016	042616_GPS_R1AA	10006	363121.13	3530710.96	0.02	PASS
4/27/2016	042716_gps_r3	10006	363121.12	3530710.98	0.03	PASS
4/27/2016	042716_GPS_R1	10006	363121.14	3530710.98	0.03	PASS
4/27/2016	042716_GPS_R2	10006	363121.14	3530710.98	0.03	PASS
4/28/2016	042816_gps_r4ab	10006	363121.15	3530711.01	0.05	PASS
4/28/2016	042816_gps_r4ab	10006	363121.15	3530711.01	0.05	PASS
4/28/2016	042816_gps_r3	10006	363121.14	3530711.00	0.04	PASS
4/28/2016	042816_GPS_R1	10006	363121.13	3530710.99	0.04	PASS
4/28/2016	042816_gps_r4g	10006	363121.12	3530710.98	0.04	PASS
4/28/2016	042816_gps_r4e	10006	363121.15	3530710.99	0.04	PASS
4/28/2016	042816_gps_r4f	10006	363121.13	3530710.98	0.03	PASS
4/28/2016	042816_gps_r4aa	10006	363121.14	3530710.99	0.03	PASS
4/28/2016	042816_gps_r4b	10006	363121.14	3530710.99	0.03	PASS
4/28/2016	042816_gps_r4c	10006	363121.15	3530710.99	0.03	PASS
4/28/2016	042816_GPS_R2	10006	363121.14	3530710.98	0.03	PASS
4/28/2016	042816_gps_r4d	10006	363121.14	3530710.98	0.02	PASS
4/29/2016	042916_GPS_R1	10006	363121.12	3530710.99	0.04	PASS
4/29/2016	042916_GPS_R2	10006	363121.13	3530710.98	0.03	PASS
4/29/2016	042916_GPS_R2	10006	363121.13	3530710.98	0.03	PASS
4/29/2016	042916_gps_r3	10006	363121.14	3530710.98	0.03	PASS
4/29/2016	042916_gps_r3	10006	363121.14	3530710.98	0.03	PASS
4/29/2016	042916_gps_r4b	10006	363121.14	3530710.98	0.02	PASS
4/29/2016	042916_gps_r4b	10006	363121.14	3530710.98	0.02	PASS
5/1/2016	05116-gps_pm_r1	10006	363121.13	3530710.99	0.04	PASS
5/1/2016	05116-gps_pm_r1a	10006	363121.12	3530710.98	0.04	PASS
5/1/2016	05116-gps_am_r1	10006	363121.13	3530710.99	0.03	PASS
5/2/2016	05022016_gps_r3	10006	363121.14	3530710.99	0.04	PASS
5/2/2016	050216_GPS_R2	10006	363121.14	3530710.99	0.03	PASS
5/2/2016	050216_GPS_R1	10006	363121.14	3530710.98	0.02	PASS
5/3/2016	050316_gps_r3	10006	363121.14	3530710.99	0.03	PASS
5/3/2016	050316_GPS_R2	10006	363121.13	3530710.98	0.03	PASS
5/3/2016	050316_GPS_R1	10006	363121.13	3530710.97	0.02	PASS
5/4/2016	050416_GPS_R1	10006	363121.12	3530710.99	0.04	PASS

5/4/2016	050416_GPS_R2	10006	363121.13	3530710.98	0.03	PASS
5/4/2016	050416_GPS_R1A	10006	363121.13	3530710.98	0.03	PASS
5/4/2016	050416_gps_r3	10006	363121.14	3530710.97	0.02	PASS
5/5/2016	050516_GPS_R2	10006	363121.12	3530710.95	0.03	PASS
5/5/2016	050516_gps_r3	10006	363121.13	3530710.96	0.02	PASS
5/5/2016	0505016_GPS_R1	10006	363121.13	3530710.96	0.02	PASS
5/6/2016	050616_GPS_R2	10006	363121.12	3530710.98	0.04	PASS
5/9/2016	050916_gps_r3	10006	363121.13	3530710.98	0.03	PASS
5/9/2016	050916-GPS_R1	10006	363121.12	3530710.97	0.03	PASS
5/9/2016	050916_GPS_R2	10006	363121.12	3530710.97	0.03	PASS
5/9/2016	050916-GPS_R1A	10006	363121.13	3530710.97	0.03	PASS
5/10/2016	051016_GPS_R2	10006	363121.13	3530710.97	0.02	PASS
5/10/2016	051016_gps_r3	10006	363121.15	3530710.98	0.02	PASS
5/10/2016	051016_GPS_R1	10006	363121.14	3530710.97	0.02	PASS
5/11/2016	051116_gps_r3	10006	363121.13	3530710.99	0.03	PASS
5/11/2016	051116_R2_QC	10006	363121.14	3530710.98	0.02	PASS
5/11/2016	051116_GPS_R1	10006	363121.14	3530710.97	0.02	PASS
5/12/2016	051216_GPS_R2	10006	363121.15	3530710.98	0.02	PASS
5/12/2016	051216_GPS_R3	10006	363121.14	3530710.97	0.02	PASS
5/12/2016	051216_gps_r1	10006	363121.14	3530710.97	0.01	PASS
5/13/2016	051316_GPS_R2	10006	363121.12	3530710.97	0.03	PASS
5/13/2016	051316_gps_r3B	10006	363121.13	3530710.98	0.03	PASS
5/13/2016	051316_gps_r1	10006	363121.13	3530710.96	0.01	PASS
5/24/2016	052416_r1	10006	363121.13	3530710.97	0.03	PASS
5/25/2016	052516-gps_r1	10006	363121.13	3530710.99	0.03	PASS
5/25/2016	052516_GPS_R2	10006	363121.14	3530710.98	0.03	PASS
5/25/2016	052516-gps_r1a	10006	363121.13	3530710.97	0.03	PASS
5/25/2016	052516_gps_am	10006	363121.16	3530710.98	0.03	PASS
5/25/2016	052516_gps_am	10006	363121.15	3530710.98	0.02	PASS
5/25/2016	052516_gps_pm	10006	363121.16	3530710.98	0.02	PASS
5/25/2016	052516_gps_amb	10006	363121.15	3530710.98	0.02	PASS
5/26/2016	052616_gps_ame	10006	363121.12	3530710.99	0.05	PASS
5/26/2016	052616_gps_am	10006	363121.13	3530711.00	0.04	PASS
5/26/2016	052616_GPS_R2	10006	363121.13	3530710.99	0.04	PASS
5/26/2016	052616_gps_amg	10006	363121.12	3530710.98	0.04	PASS
5/26/2016	052616_gps_amf	10006	363121.12	3530710.99	0.04	PASS
5/26/2016	052616_gps_amc	10006	363121.12	3530710.99	0.04	PASS
5/26/2016	052616_gps_amd	10006	363121.12	3530710.98	0.04	PASS
5/26/2016	052616_gps_amb	10006	363121.13	3530710.99	0.04	PASS
5/26/2016	052616_gps_pm	10006	363121.13	3530710.99	0.04	PASS
5/26/2016	052616-gps_r1	10006	363121.12	3530710.98	0.04	PASS
5/26/2016	052616-gps_r1a	10006	363121.13	3530710.98	0.03	PASS
5/26/2016	052616-gps_r2	10006	363121.13	3530710.98	0.03	PASS
5/27/2016	052716_gps_pm	10006	363121.13	3530710.98	0.03	PASS
5/27/2016	052716_gps_am	10006	363121.13	3530710.98	0.03	PASS
5/27/2016	052716-gps_r1pm	10006	363121.12	3530710.97	0.03	PASS
5/27/2016	052716_GPS_R2AM	10006	363121.12	3530710.96	0.03	PASS
5/27/2016	052716-gps_r1am	10006	363121.12	3530710.96	0.03	PASS
5/31/2016	053116-gps_r1pm	10006	363121.13	3530710.99	0.04	PASS
5/31/2016	053116_GPS_R2pm	10006	363121.14	3530710.99	0.03	PASS
5/31/2016	053116_GPS_R2pm1	10006	363121.13	3530710.98	0.03	PASS

5/31/2016	053116_GPS_R2	10006	363121.13	3530710.98	0.03	PASS
6/1/2016	060116_gps_pm_r3	10006	363121.13	3530710.99	0.04	PASS
6/1/2016	060116_gps_pmr3a	10006	363121.14	3530710.99	0.03	PASS
6/2/2016	060216_gps_am_r3	10006	363121.14	3530711.00	0.04	PASS
6/2/2016	06216-gps-pm_r1	10006	363121.12	3530710.98	0.04	PASS
6/2/2016	06216-gps-am_r1a	10006	363121.12	3530710.98	0.04	PASS
6/2/2016	06216-gps-am_r1	10006	363121.12	3530710.98	0.03	PASS
6/2/2016	060216_gps_pm_r3	10006	363121.13	3530710.98	0.03	PASS
6/3/2016	060316_gps_pm_r3	10006	363121.14	3530710.99	0.04	PASS
6/3/2016	06316-gps-am_r1	10006	363121.12	3530710.98	0.03	PASS
6/3/2016	060316_gps_am_r3	10006	363121.13	3530710.98	0.03	PASS
6/3/2016	06316-gps-pm_r1a	10006	363121.13	3530710.98	0.03	PASS
6/6/2016	060616_gps_am_r3	10006	363121.14	3530710.97	0.01	PASS
6/6/2016	060616_gps_pm_r3	10006	363121.14	3530710.96	0.01	PASS
6/7/2016	060716_gps_am_r3	10006	363121.14	3530710.99	0.03	PASS
6/7/2016	060716_gps_pm_r3	10006	363121.14	3530710.99	0.03	PASS
6/8/2016	060816_gps_am_r3	10006	363121.15	3530710.98	0.02	PASS
6/8/2016	060816_gps_pm_r3	10006	363121.16	3530710.96	0.01	PASS
6/8/2016	060816_gps_pm_r4	10006	363121.15	3530710.96	0.01	PASS
6/9/2016	060916_gps_pm_r4	10006	363121.15	3530710.98	0.02	PASS
6/9/2016	060916_gps_pm_r3	10006	363121.14	3530710.97	0.01	PASS
6/9/2016	060916_gps_am_r3	10006	363121.14	3530710.97	0.01	PASS
6/9/2016	060916_gps_am_r4	10006	363121.15	3530710.96	0.00	PASS
6/10/2016	061016_gps_pm_r3	10006	363121.14	3530710.99	0.04	PASS
6/10/2016	061016_gps_pm_r4	10006	363121.15	3530710.99	0.04	PASS
6/10/2016	061016_gps_am_r3	10006	363121.14	3530710.99	0.03	PASS
6/10/2016	061016_gps_am_r4	10006	363121.14	3530710.99	0.03	PASS
10/17/2016	101716_GPS_AM	10006	363121.13	3530710.98	0.03	PASS
10/17/2016	101716_GPS_PM	10006	363121.13	3530710.97	0.02	PASS
10/18/2016	101816_GPS_AM	10006	363121.13	3530710.97	0.02	PASS
10/18/2016	101816_GPS_PM	10006	363121.14	3530710.97	0.02	PASS
10/19/2016	101916_GPS_PM	10006	363121.13	3530710.97	0.02	PASS
10/19/2016	101916_GPS_AM	10006	363121.13	3530710.97	0.02	PASS
10/20/2016	102016_GPS_AM	10006	363121.12	3530710.97	0.03	PASS
10/20/2016	102016_GPS_PM	10006	363121.14	3530710.97	0.02	PASS

Table A-7: Analog Repeatability (Instrument Functionality)

Date	Instrument test strip	Instrument-Remarks	Result
3/14/2016	ITS	White	PASS
3/14/2016	ITS	White	PASS
3/14/2016	ITS	White	PASS
3/14/2016	ITS	White	PASS
3/14/2016	ITS	White	PASS
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3/14/2016	ITS	White	PASS
3/15/2016	ITS	White	PASS
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3/16/2016	ITS	White	PASS
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6/1/2016	ITS	White	PASS
6/1/2016	ITS	White	PASS

Table A-8: Analog Dynamic Repeatability

QC_Date	LOT_ID	Lot_type	QC_PercentCoverage	Result
3/17/2016	03152016_An	Analog	18.42%	PASS
3/17/2016	03162016_An	Analog	11.69%	PASS
3/25/2016	03172016_An	Analog	10.82%	PASS
3/25/2016	03182016_An	Analog	7.13%	PASS
4/1/2016	04012016_An	Analog	11.01%	PASS
4/5/2016	04042016_An	Analog	21.15%	PASS
4/7/2016	04052016_An	Analog	19.94%	PASS
4/11/2016	04062016_An	Analog	12.17%	PASS
4/13/2016	04112016_An	Analog	12.27%	PASS
4/14/2016	04082016_An	Analog	22.19%	PASS
4/18/2016	04122016_An	Analog	17.06%	PASS
4/18/2016	04132016_An	Analog	18.24%	PASS
4/19/2016	04142016_An	Analog	10.91%	PASS
4/19/2016	04152016_An	Analog	16.01%	PASS
4/19/2016	04182016_An	Analog	20.77%	PASS
4/20/2016	04192016_An	Analog	11.08%	PASS
4/22/2016	04212016_An	Analog	35.99%	PASS
6/1/2016	05242016_An	Analog	60.60%	PASS
4/12/2016; 4/13/2016	04072016_An	Analog	15.04%	PASS
3/21/2016	03212016_IAVS	IAVS	30.23%	PASS
3/22/2016	03222016_IAVS	IAVS	20.03%	PASS
3/24/2016	03232016_IAVS	IAVS	16.25%	PASS
3/25/2016	03242016_IAVS	IAVS	53.30%	PASS
3/28/2016	03252016_IAVS	IAVS	4.11%	PASS
3/29/2016	03282016_IAVS	IAVS	8.16%	PASS
3/30/2016	03282016_IAVS	IAVS	7.43%	PASS
3/30/2016	03302016_IAVS	IAVS	6.44%	PASS
3/31/2016	03292016_IAVS	IAVS	3.93%	PASS
4/1/2016	04012016_IAVS	IAVS	64.78%	PASS
4/5/2016	04052016_IAVS	IAVS	19.36%	PASS
4/11/2016	03312016_IAVS	IAVS	1.42%	PASS

Table A-9: Geodetic Functionality (DGPS)

Date	Team	Control Point ID	Measured Easting	Measured Northing	Measurement Offset (m)	QC Status
3/15/2016	Team 1	10006	363121.21	3530710.96	0.06	Pass
3/16/2016	Team 1	10006	363121.12	3530710.96	0.03	Pass
3/17/2016	Team 1	10006	363121.16	3530710.99	0.03	Pass
3/18/2016	Team 1	10006	363121.11	3530710.89	0.08	Pass
3/18/2016	Team 1	10006	363121.23	3530710.95	0.08	Pass
3/21/2016	Team 1	10006	363121.23	3530711.09	0.15	Pass
3/21/2016	Team 1	10006	363121.29	3530711.06	0.17	Pass
3/22/2016	Team 1	10006	363121.23	3530710.95	0.08	Pass
3/23/2016	Team 1	10006	363121.38	3530710.93	0.23	Pass
3/24/2016	Team 1	10006	363121.19	3530710.96	0.04	Pass
3/25/2016	Team 1	10006	363121.30	3530710.94	0.16	Pass
3/28/2016	Team 1	10006	363121.31	3530710.84	0.20	Pass
3/29/2016	Team 1	10006	363121.30	3530710.84	0.19	Pass
3/30/2016	Team 1	10006	363121.49	3530710.71	0.42	Pass
3/31/2016	Team 1	10006	363121.23	3530710.86	0.13	Pass
4/1/2016	Team 1	10006	363121.28	3530710.99	0.14	Pass
4/1/2016	Team 1	10006	363121.30	3530710.89	0.17	Pass
4/4/2016	Team 1	10006	363121.06	3530710.78	0.20	Pass
4/4/2016	Team 1	10006	363121.07	3530710.74	0.23	Pass
4/5/2016	Team 1	10006	363121.28	3530710.90	0.14	Pass
4/5/2016	Team 1	10006	363121.27	3530710.87	0.15	Pass
4/6/2016	Team 1	10006	363121.27	3530710.90	0.13	Pass
4/6/2016	Team 1	10006	363121.27	3530710.88	0.14	Pass
4/7/2016	Team 1	10006	363121.34	3530711.01	0.20	Pass
4/7/2016	Team 1	10006	363121.39	3530711.05	0.26	Pass
4/8/2016	Team 1	10006	363121.28	3530710.79	0.21	Pass
4/8/2016	Team 1	10006	363121.36	3530711.02	0.22	Pass
4/11/2016	Team 1	10006	363121.34	3530711.09	0.24	Pass
4/12/2016	Team 1	10006	363121.22	3530710.76	0.21	Pass
4/13/2016	Team 1	10006	363121.35	3530710.81	0.25	Pass
4/14/2016	Team 1	10006	363121.37	3530710.86	0.24	Pass
4/15/2016	Team 1	10006	363121.24	3530710.92	0.09	Pass
4/18/2016	Team 1	10006	363121.29	3530710.66	0.33	Pass
4/19/2016	Team 1	10006	363121.28	3530710.86	0.16	Pass
4/20/2016	Team 1	10006	363121.30	3530710.89	0.17	Pass
5/24/2016	Team 1	10006	363121.42	3530711.02	0.28	Pass
3/15/2016	Team 1	10006	363121.13	3530710.87	0.08	Pass
3/16/2016	Team 1	10006	363121.21	3530710.92	0.07	Pass
3/17/2016	Team 1	10006	363121.31	3530710.85	0.20	Pass
3/18/2016	Team 1	10006	363121.21	3530710.95	0.06	Pass
3/18/2016	Team 1	10006	363121.29	3530710.92	0.15	Pass
3/21/2016	Team 1	10006	363121.26	3530710.96	0.11	Pass
3/22/2016	Team 1	10006	363121.29	3530710.92	0.14	Pass
3/23/2016	Team 1	10006	363121.28	3530710.93	0.13	Pass
3/24/2016	Team 1	10006	363121.30	3530711.01	0.16	Pass
3/25/2016	Team 1	10006	363121.42	3530710.84	0.30	Pass
3/28/2016	Team 1	10006	363121.24	3530711.03	0.12	Pass
3/29/2016	Team 1	10006	363121.28	3530710.97	0.13	Pass
3/31/2016	Team 1	10006	363121.26	3530711.10	0.18	Pass

4/1/2016	Team 1	10006	363121.22	3530711.00	0.08	Pass
4/1/2016	Team 1	10006	363121.24	3530710.90	0.11	Pass
4/4/2016	Team 1	10006	363121.21	3530710.89	0.09	Pass
4/4/2016	Team 1	10006	363121.33	3530710.94	0.18	Pass
4/5/2016	Team 1	10006	363121.31	3530710.97	0.16	Pass
4/5/2016	Team 1	10006	363121.35	3530710.99	0.21	Pass
4/6/2016	Team 1	10006	363121.17	3530711.00	0.05	Pass
4/6/2016	Team 1	10006	363121.19	3530711.08	0.13	Pass
4/7/2016	Team 1	10006	363121.35	3530711.03	0.22	Pass
4/7/2016	Team 1	10006	363121.39	3530710.96	0.24	Pass
4/8/2016	Team 1	10006	363121.29	3530710.78	0.22	Pass
4/8/2016	Team 1	10006	363121.40	3530711.06	0.27	Pass
4/11/2016	Team 1	10006	363121.38	3530710.87	0.25	Pass
4/12/2016	Team 1	10006	363121.30	3530711.06	0.18	Pass
4/13/2016	Team 1	10006	363121.19	3530711.04	0.09	Pass
4/14/2016	Team 1	10006	363121.27	3530711.09	0.18	Pass
4/15/2016	Team 1	10006	363121.35	3530710.86	0.22	Pass
4/18/2016	Team 1	10006	363121.23	3530711.11	0.18	Pass
4/19/2016	Team 1	10006	363121.20	3530710.99	0.06	Pass
4/19/2016	Team 1	10006	363121.27	3530710.96	0.12	Pass
4/21/2016	Team 1	10006	363121.17	3530711.04	0.09	Pass
4/22/2016	Team 1	10006	363121.26	3530710.90	0.12	Pass
5/24/2016	Team 1	10006	363121.37	3530710.94	0.22	Pass
3/22/2016	Team 1	10006	363121.35	3530710.85	0.23	Pass
3/23/2016	Team 1	10006	363121.30	3530711.08	0.20	Pass
4/21/2016	Team 1	10006	363121.66	3530712.11	1.26	Pass
3/17/2016	QC	10006	363121.17	3530710.88	0.08	Pass
3/21/2016	QC	10006	363121.22	3530711.00	0.09	Pass
3/22/2016	QC	10006	363121.25	3530710.84	0.16	Pass
3/24/2016	QC	10006	363121.20	3530710.97	0.05	Pass
3/25/2016	QC	10006	363121.16	3530710.93	0.03	Pass
3/25/2016	QC	10006	363121.30	3530710.94	0.16	Pass
3/28/2016	QC	10006	363121.12	3530710.88	0.08	Pass
3/29/2016	QC	10006	363121.30	3530710.86	0.18	Pass
3/30/2016	QC	10006	363121.30	3530710.92	0.15	Pass
3/31/2016	QC	10006	363121.16	3530711.06	0.11	Pass
4/1/2016	QC	10006	363121.29	3530710.93	0.14	Pass
4/5/2016	QC	10006	363121.16	3530711.08	0.12	Pass
4/11/2016	QC	10006	363121.30	3530710.94	0.15	Pass
4/12/2016	QC	10006	363121.30	3530710.87	0.18	Pass
4/13/2016	QC	10006	363121.32	3530711.05	0.19	Pass
4/14/2016	QC	10006	363121.29	3530710.87	0.17	Pass
4/18/2016	QC	10006	363121.22	3530710.96	0.07	Pass
4/19/2016	QC	10006	363121.36	3530710.99	0.21	Pass
4/20/2016	QC	10006	363121.34	3530710.85	0.21	Pass
4/22/2016	QC	10006	363121.25	3530710.89	0.12	Pass
6/1/2016	QC	10006	363121.21	3530710.93	0.07	Pass
3/21/2016	Team 2	10006	363121.49	3530711.05	0.35	Pass
3/22/2016	Team 2	10006	363121.34	3530711.00	0.20	Pass
3/28/2016	Team 2	10006	363121.35	3530710.96	0.20	Pass
3/29/2016	Team 2	10006	363121.36	3530710.92	0.21	Pass

3/30/2016	Team 2	10006	363121.38	3530710.94	0.23	Pass
3/31/2016	Team 2	10006	363121.42	3530710.91	0.28	Pass
3/18/2016	Team 2	10006	363121.32	3530710.89	0.19	Pass
3/22/2016	Team 2	10006	363121.27	3530710.97	0.12	Pass
3/24/2016	Team 2	10006	363121.53	3530710.80	0.41	Pass
3/25/2016	Team 2	10006	363121.40	3530710.92	0.26	Pass
3/28/2016	Team 2	10006	363121.46	3530710.81	0.34	Pass
3/24/2016	Team 2	10006	363121.31	3530710.95	0.16	Pass
3/25/2016	Team 2	10006	363121.41	3530710.89	0.27	Pass
3/29/2016	Team 2	10006	363121.19	3530710.95	0.04	Pass
3/30/2016	Team 2	10006	363121.16	3530710.99	0.03	Pass

APPENDIX D
DAILY REPORTS AND FIELD FORMS
(CONTAINED ON DVD)

APPENDIX E

MEC INVESTIGATION DATA AND MS ACCESS DATABASES

(CONTAINED ON DVD)

APPENDIX F
IVS LETTER REPORT

DRAFT
INSTRUMENT VERIFICATION STRIP LETTER REPORT

MILITARY MUNITIONS RESPONSE PROGRAM
REMEDIAL INVESTIGATION
CLOSED CASTNER FIRING RANGE
FORT BLISS
EL PASO, TEXAS

March 2016

Contract No.: W912DY-10-D-0025
Task Order No.: DS01

Prepared For:

U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
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LIST OF ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
DGM	Digital Geophysical Mapping
DGPS	Differential Global Positioning System
DID	Data Item Description
Ft	feet
GPS	Global Positioning System
GSV	Geophysical System Verification
Hz	Hertz
IAW	in accordance with
Inc.	Incorporated
ISO	Industry Standard Object
IVS	Instrument Verification Strip
JV	Joint Venture
LFO	Least Favorable Orientation
LLC	Limited Liability Corporation
m	meter
MEC	Munitions and Explosives of Concern
MFO	Most Favorable Orientation
mm	millimeter
µS	microseconds
mV	millivolt
NA	Not Applicable
NRL	Naval Research Laboratory
PIKA	PIKA International, Inc.
PLS	Professional Land Surveyor
RIFS	Remedial Investigation Feasibility Study
RMS	Root Mean Square
RTK	Real Time Kinematic
SNR	Signal to Noise Ratio
STD DEV	Standard Deviation
TX	Texas

The JV	PIKA International, Inc. /Arcadis, Inc. Joint Venture, LLC
U.S.	United States
UTM	Universal Transverse Mercator
WERS	Worldwide Environmental Remediation Services
WGS84	World Geodetic System 1984

1.0 INTRODUCTION

The PIKA International, Inc. (PIKA) Arcadis, Inc. Joint Venture, LLC (the JV) has developed this Instrument Verification Strip (IVS) Letter Report in accordance with (IAW) Data Item Description (DID) Worldwide Environmental Remediation Services (WERS)-004.01 and the Final Remedial Investigation (RI) Quality Assurance Project Plan (QAPP). This IVS Letter Report documents the initial design and procedures established at the IVS for the RI at the Closed Castner Firing Range located at Fort Bliss in El Paso, Texas (TX) under WERS contract number W912DY-10-D-0025 task order DS01.

This letter report discusses the procedures, results, and analysis of the initial IVS data collected on 8, 9 and 11 March 2016. On subsequent days of the RI geophysical investigation, the JV will collect daily IVS data with the geophysical instrument used for that day IAW the Geophysical System Verification (GSV) process.

2.0 INSTRUMENT VERIFICATION STRIP DESIGN AND SETUP

The JV established an IVS for use during the digital geophysical mapping (DGM) performed in support of the RI. A state of TX Professional Land Surveyor (PLS), established 6 temporary survey monuments within the Closed Castner Firing Range MRS for use as control points for the real time kinematic (RTK) differential global positioning system (DGPS) system that will be used to position DGM data. **Table 1** presents the location and elevation of the 6 temporary control monuments, all of which were iron rods with 2" caps.

Table 1: Closed Castner Range Temporary Control Monuments

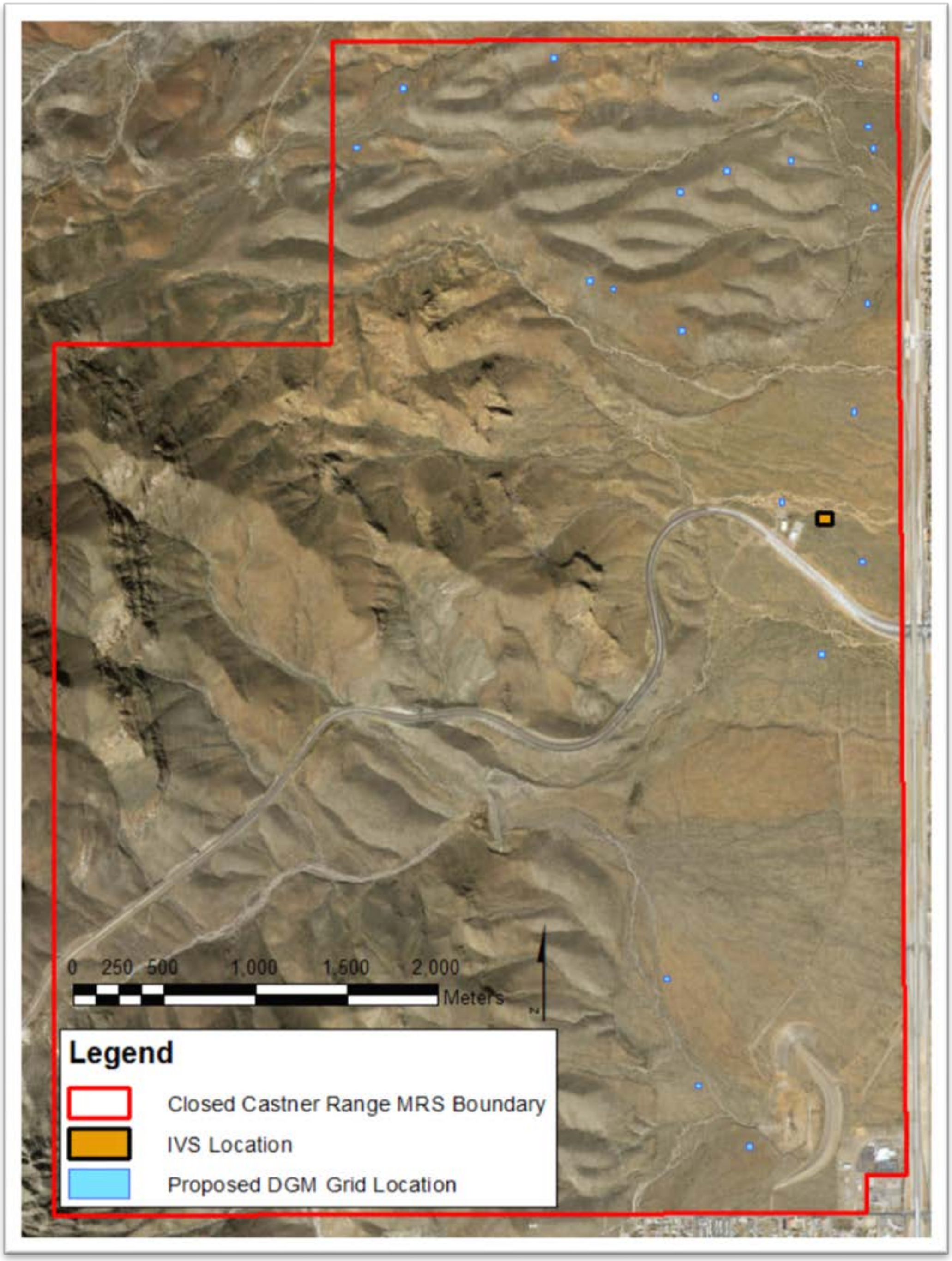
Monument Number	Easting (ft)[1]	Northing (ft)[1]	Elevation (ft)[2]
GPS 1	363,116.79	3,530,680.81	1267.996
GPS 2	363,121.15	3,530,710.96	1268.051
GPS 3	362,804.21	3,527,824.88	1250.493
GPS 4	362,826.35	3,527,845.80	1248.577
GPS 5	362,026.42	3,532,342.50	1372.818
GPS 6	361,997.60	3,532,332.50	1374.802

Notes:
1 – Coordinates are provided in Universal Transverse Mercator, Zone 13 North, World Geodetic System 1984 (WGS84), in units of Meters (m).

2.1 IVS LOCATION

The JV established the IVS on 9 March 2016 in an area within the MRS relatively free of obstructions and background anomalies. **Figure 1** shows the location of the IVS relative to the MRS footprint.

Figure 1: Closed Castner Range RI IVS Location



Prior to establishing the IVS, the JV conducted a background survey using the EM61-MK2A electromagnetic induction (EMI sensor. The background data then were processed, and suitable locations for seed item emplacement were determined from the data (see **Figure A-1** in **Appendix A**).

The IVS was seeded with two Small Schedule 80 Industry Standard Objects (ISO80s) and 2 Medium Schedule 40 ISOs (ISO40s). The seed items were buried and the depth and orientation of each seed item was documented for each seed item. **Table 2** details the characteristics of each emplaced IVS seed item.

The horizontal location of each seed item was measured at the center of each item using an RTK DGPS rover. Seed items were not placed near anomalies identified within the background survey dataset. The item parameters (*i.e.*, the surveyed location, size, depth, orientation) were recorded and entered into the database.

Table 2: IVS Seed Item Summary

Item Number	Description	Easting (ft)[1]	Northing (ft)[1]	Depth (in)	Orientation
SEED-01	**Small ISO80**	**363205.73**	**3530710.81**	**4.00**	**Horizontal – Cross Track**
SEED-02	**Small ISO80**	**363203.85**	**3530713.25**	**7.75**	**Vertical**
SEED-03	**Medium ISO40**	**363201.94**	**3530715.73**	**6.00**	**Horizontal – Cross Track**
SEED-04	**Medium ISO40**	**363200.14**	**3530718.16**	**11.00**	**Horizontal – Cross Track**

Notes:
1 – Coordinates are provided in Universal Transverse Mercator, None 13 North, World Geodetic System 1984 (WGS84), in units of Meters (m).

3.0 IVS SURVEY

After the IVS was established, the JV surveyed the IVS using the EM61-MK2A EMI sensor. The goal of the initial IVS survey was to:

- Verify seed item response – establishes baseline response for subsequent twice daily checks;
- Verify positioning accuracy for RTK GPS;
- Establish dynamic root mean square (RMS) noise levels (RMS Noise Line);

After IVS surveys, MS Access databases IAW DID WERS-004.01 for the DGM data were posted on the ARCADIS ftp site.

3.1 EM61-MK2A IVS SURVEYS

3.1.1 EM61-MK2A Description

The EM61-MK2A is an EMI sensor consisting of an air-cored 1.0 x 0.5-meter coil, which includes coincident transmit and receive coils. The EM61-MK2A was configured in cart mode, utilizing only the bottom sensor, at a height of 42 centimeters (cm) above the ground surface. The IVS surveys were performed with the 1.0 m edge perpendicular to the direction of travel. The Geonics EM61-MK2A EMI sensor generates an electromagnetic pulse that triggers eddy currents in the subsurface. The eddy current decay produces a secondary magnetic field that is monitored by a receiving coil or coils. These secondary magnetic fields are received as data and stored in a field computer until it can be downloaded to a field laptop for interpretation. The EM61-MK2A data logger collects data at a rate of 10 times per second. The Archer data logger is set to record data received from the coil at four different time gates. For this project, data were logged at a rate of 10 Hz (samples per second) and recorded from the four time gates of the coil.

3.1.2 EM61-MK2A IVS Survey Data Collection Procedures

On the first day of data collection (9 March 2016), the JV collected EM61-MK2A data along the following five transects at the IVS location (see **Figure A-2 Appendix A**):

- Transect spaced one full line spacing (2.5 ft for DGM grids) to the left of the centerline
- IVS Centerline (seed line)
- Transect spaced ½ line spacing (1.25 ft) to the right of the centerline
- Transect spaced one full line spacing (2.5 ft) to the right of the centerline
- Root mean square (RMS) noise line (approximately 15 ft from centerline)

To assess background noise conditions at the site, the JV collected data on the RMS noise line near the seed lane in an area that was relatively free of anomalous sources (see **Figure A-2** in **Appendix A**). RMS statistics were calculated from these background data and were used to determine an appropriate preliminary target selection threshold in which items can be reliably detected outside of the noise envelope. RMS background analysis and results are discussed in detail in **Section 4.3**.

4.0 IVS DATA PROCESSING AND ANALYSIS

The IVS data were then processed and analyzed to evaluate performance against the established measurement quality objectives (MQOs).

IVS data were imported into Geosoft's Oasis montaj for processing and analysis. Datasets positioned with RTK DGPS were converted from geographic coordinates to UTM Zone 13N, WGS84, with units of meters (m). The EM61-MK2A response data for the 4 time gates were leveled with a median filter and positional data were lag corrected. The 4 time gates were then gridded using Geosoft's Minimum Curvature module at 0.0762m node and plotted.

The steps for processing and analyzing the EM61-MK2A data were as follows:

1. Raw data was imported into a Geosoft database.
2. The Longitude and Latitude coordinates were converted to WGS84/UTM Zone 13N (meters) coordinates.
3. Calculate the data density and flag any readings exceeding the MQOs
4. Apply an initial lag correction of -2 fiducials (This could change based off of matching the IVS seed item locations to the responses in the DGM data)
5. Derive a statistical background model and level the CH1 through CH4 responses to remove instrument drift. Manual level if required.
6. Grid CH1 through CH4 responses using a grid cell size of 0.0762m
7. Create a Geosoft map and display leveled data as colored contours. Refine lag corrections if required.
8. Select Targets using the "Pick Peaks Along Profiles" (uceanompick.gx). Refine targets if needed by removing duplicates or ones that are not deemed valid
9. Print final map(s) as pdf and pack Geosoft map(s).

10. Create submittals folder and upload to ftp site

Gridded data were displayed with a color scheme that uses shades of gray from 0 to 4 mV for the EM61-MK2A Channel 2 response, with colors of blue to pink for response values greater 4 mV. Targets were selected using the "pick peaks along profile" method.

4.1 IVS RESULTS

The results of the initial IVS surveys are presented in **Table 3** and maps of the data are presented in **Appendix B**. The initial IVS surveys collected on 9 and 11 March 2016 included four 5-line IVS surveys and a 2-line IVS survey. Two additional team members each performed an initial IVS survey on 11 March 2016. Included in the table are the selected target locations, the resultant Channel 2 responses and the offset of the measured response to the surveyed ISO location. The locations of each seed item detection location were compared to the "as built" seed item locations measured during installation to determine whether the offsets between the target locations and the known seed item locations were less than 0.25 meters IAW the Final QAPP. The maximum offset of the peak response to the actual location of a seed item as observed within the data is 0.20 m, with the typical offset being less than 0.10 m from the known seed location.

Table 3 –Results of initial IVS Surveys

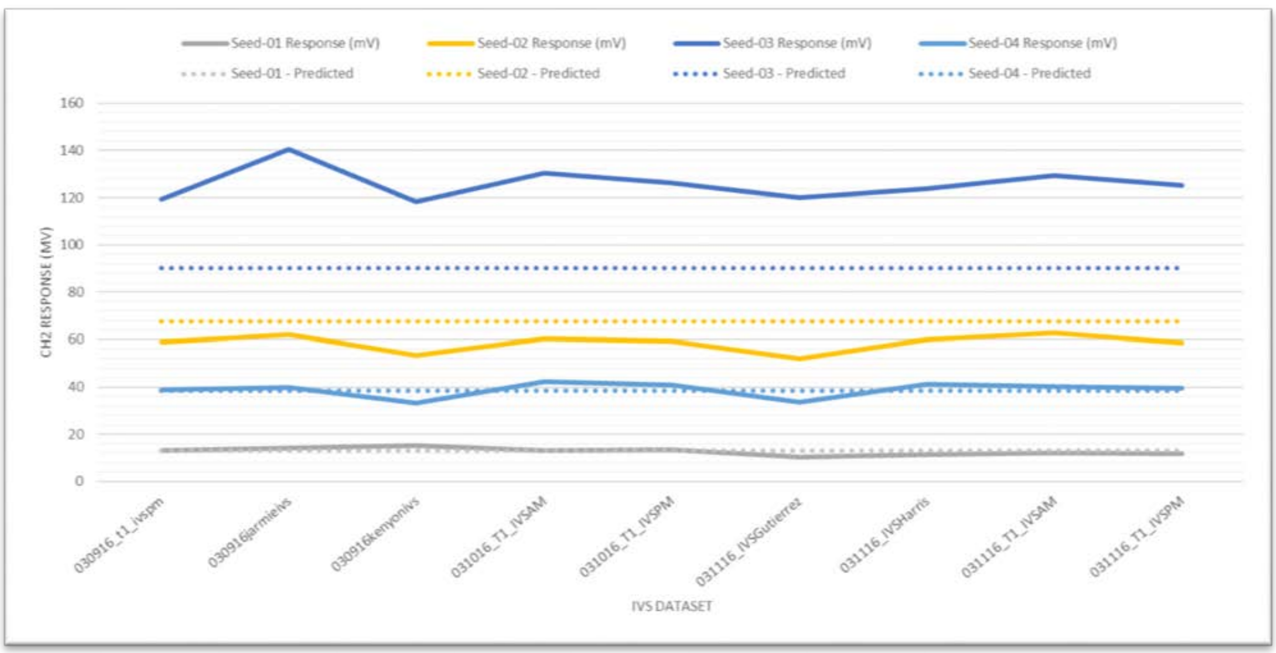
Times new roman	Seed Item	Seed Type	Offset (m)	Predicted CH2 Response (mV)	Measured CH2 Response (mV)
030916jarmieivs	SEED-01	Small ISO80	0.20	13.3	14.11
	SEED-02	Small ISO80	0.09	67.5	61.91
	SEED-03	Medium ISO40	0.13	90.0	140.59
	SEED-04	Medium ISO40	0.17	38.3	39.83
030916kenyonivs	SEED-01	Small ISO80	0.18	13.3	15.23
	SEED-02	Small ISO80	0.07	67.5	53.27
	SEED-03	Medium ISO40	0.03	90.0	118.21
	SEED-04	Medium ISO40	0.10	38.3	33.2
030916_t1_ivspm	SEED-01	Small ISO80	0.07	13.3	13.15
	SEED-02	Small ISO80	0.07	67.5	58.79
	SEED-03	Medium ISO40	0.09	90.0	119.24
	SEED-04	Medium ISO40	0.16	38.3	38.7
031116_IVSGutierrez	SEED-01	Small ISO80	0.13	13.3	10.2
	SEED-02	Small ISO80	0.08	67.5	51.9
	SEED-03	Medium ISO40	0.06	90.0	120.18
	SEED-04	Medium ISO40	0.09	38.3	33.47
031116_IVSHarris	SEED-01	Small ISO80	0.05	13.3	11.55
	SEED-02	Small ISO80	0.08	67.5	59.94
	SEED-03	Medium ISO40	0.09	90.0	123.96
	SEED-04	Medium ISO40	0.2	38.3	41.1

Notes:
1 – Coordinates are provided in UTM, Zone 13 North, WGS84, in units of m.

Within the initial IVS datasets it was observed that seed-03 (Medium ISO40, 6” horizontal) consistently exhibited higher than expected responses throughout the 5 initial IVS datasets. The expected response for a horizontal Medium ISO40 at 6” is 90 mV on Channel 2. Responses in the initial IVS surveys averaged 126 mV on Channel 2, which is an average deviation of 40%. It was noted during seed item emplacement that there is approximately a 15% slope at the location of seed item 3. The seed item depth of 6 inches below ground surface (bgs) was measured to the center of the seed item; however, due to the slope present, one end is slightly less than and the other end is slightly greater than 6 inches bgs. The increased response is believed to be due to the sloping ground surface and the fact that the object is not parallel to the EM61-MK2A coil when the EMI sensor traverses the seed item.

Accuracy of seed item responses compared to the expected response observed at the IVS for the first 3 days of data collection are summarized in **Figure 2** and **Table 3**. Data portrayed are the observed responses in relation to the expected responses for each seed item as derived from the item-specific response curves generated through the NRL EM61-MK2 response calculator.

Figure 2: IVS Seed Item Response Accuracy - 03/09/2016 - 03/11/2016



Seed-01, 02, and 04 exhibit a high degree of accuracy in relation to the expected response, however, Seed-03 does not. Again, this is believed to be related to the sloping ground surface and the fact that the seed, while buried horizontally, is not parallel to the EM61-MK2A coil, which is the assumption of the NRL response calculation for horizontal orientation. Seed-03 exhibits a consistently high response which is repeatable across individual IVS datasets. The percent deviation from the expected response, or accuracy, of Seed-03 are in bold in **Table 3**.

Table 3: IVS Seed Item Response Accuracy - 03/09/2016 - 03/11/2016

Dataset	Seed-01 Response (mV)	Seed-01 Accuracy	Seed-02 Response (mV)	Seed-02 Accuracy	Seed-03 Response (mV)	Seed-03 Accuracy	Seed-04 Response (mV)	Seed-04 Accuracy
030916_t1_ivspm	13.15	-1.13%	58.79	-12.90%	119.24	**32.49%**	38.7	1.04%
030916jarmieivs	14.11	6.09%	61.91	-8.28%	140.59	**56.21%**	39.83	3.99%
030916kenyonivs	15.23	14.51%	53.27	-21.08%	118.21	**31.34%**	33.2	-13.32%
031016_T1_IVSAM	13.01	-2.18%	60.46	-10.43%	130.29	**44.77%**	42.3	10.44%
031016_T1_IVSPM	13.56	1.95%	59.41	-11.99%	126.39	**40.43%**	40.92	6.84%
031116_IVSGutierrez	10.2	-23.31%	51.9	-23.11%	120.18	**33.53%**	33.47	-12.61%
031116_IVSHarris	11.55	-13.16%	59.94	-11.20%	123.96	**37.73%**	41.1	7.31%
031116_T1_IVSAM	12.04	-9.47%	62.74	-7.05%	129.49	**43.88%**	40.11	4.73%
031116_T1_IVSPM	11.8	-11.28%	58.5	-13.33%	125.1	**39.00%**	39.5	3.13%

To further demonstrate repeatability of responses for each seed item across individual IVS datasets, the ongoing precision of responses were calculated, and are summarized in **Figure 3** and further detailed in **Table 4**.

Figure 3: IVS Seed Item Response Precision - 03/09/2016 - 03/11/2016

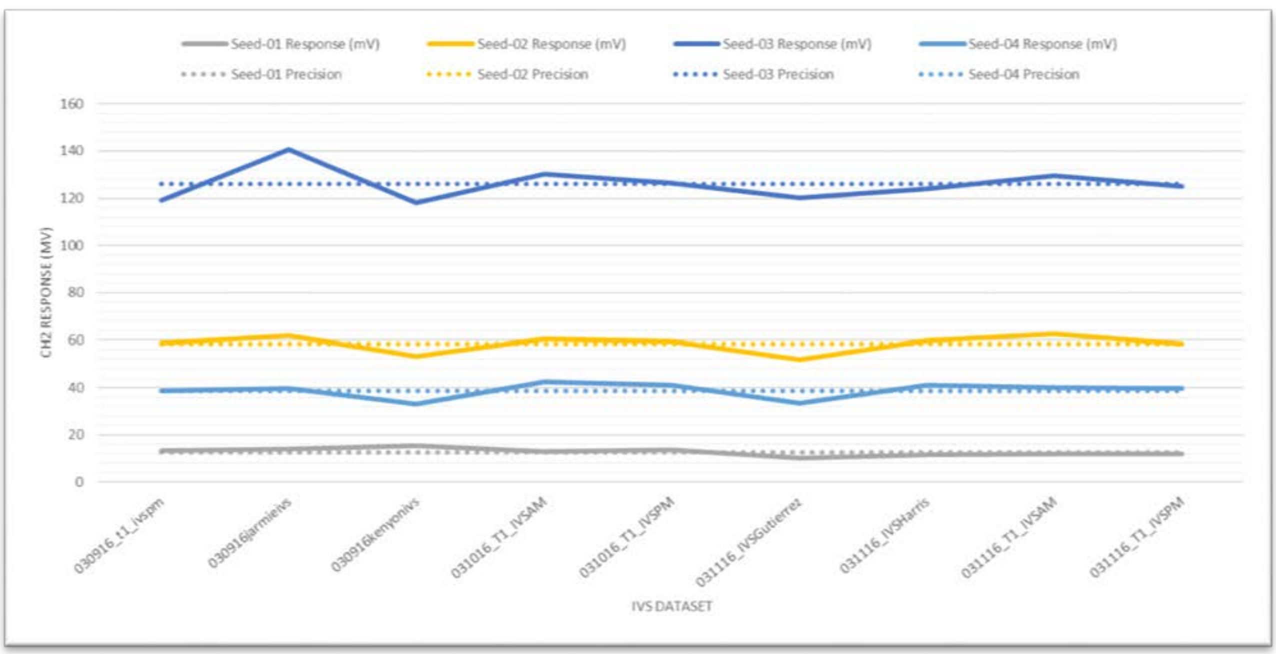


Table 4: IVS Seed Item Response Precision - 03/09/2016 - 03/11/2016

Dataset	Seed-01 Response (mV)	Seed-01 Precision	Seed-02 Response (mV)	Seed-02 Precision	Seed-03 Response (mV)	Seed-03 Precision	Seed-04 Response (mV)	Seed-04 Precision
030916_t1_ivspm	13.15	3.23%	58.79	0.42%	119.24	-5.32%	38.7	-0.24%
030916jarmieivs	14.11	10.76%	61.91	5.74%	140.59	11.63%	39.83	2.68%
030916kenyonivs	15.23	19.56%	53.27	-9.01%	118.21	-6.14%	33.2	-14.42%
031016_T1_IVSAM	13.01	2.13%	60.46	3.27%	130.29	3.45%	42.3	9.04%
031016_T1_IVSPM	13.56	6.45%	59.41	1.47%	126.39	0.36%	40.92	5.49%
031116_IVSGutierrez	10.2	-19.93%	51.9	-11.35%	120.18	-4.57%	33.47	-13.72%
031116_IVSHarris	11.55	-9.33%	59.94	2.38%	123.96	-1.57%	41.1	5.95%
031116_T1_IVSAM	12.04	-5.49%	62.74	7.16%	129.49	2.82%	40.11	3.40%
031116_T1_IVSPM	11.8	-7.37%	58.5	-0.08%	125.1	-0.67%	39.5	1.82%

The observed responses for all four seed items exhibit a high degree of precision (i.e., repeatability) across the 3 days of data from which calculations were derived. This indicates that the geophysical sensor and data collection procedures are working properly, and that the cause of the increased response is strictly related to the orientation of the seed item relative to the EM61-MK2 coil. It is proposed that the ongoing response value for Seed-03 be assessed against the average response from the first 3 days of IVS data collection instead of the expected value from the NRL response curves. As a secondary measure of consistency, and to demonstrate the performance of the sensor and data collection procedures being employed, precision of observed responses, in addition to accuracy in relation to expected responses, will be monitored for each seed item for the duration of the DGM effort.

4.2 Static Repeatability

The daily static test was carried out with a small Schedule 80 ISO on a jig to ensure consistent geometry between the ISO and the coil. Mean static background and spike results from the initial IVS data collection days are provided in **Appendix C**. The data from the EM61-MK2A passes, with minimal noise or data spikes observed in either the static background or static spike readings.

Static data for each of the 3 days of background and initial IVS data collection were collected using a different test item geometry each day, as the field team were testing different distances and orientations to determine an optimal test item placement. The resulting geometry used on 11 March with the Small ISO80 test item placed horizontally at a fixed 12.24 cm distance from the coil will be the baseline for the duration of the project.

4.3 IVS Measurement Quality Objectives and Results Summary

The QC program included verification that the measurement quality objectives (MQOs), designed to ensure the proper operation of the system and that standard operating procedures were being followed, were successfully achieved during the initial dynamic IVS survey. The complete SOPs and associated MQOs can be found in the QAPP. A summary of the MQOs, the associated measurement performance criteria (MPC), and the results of the initial IVS survey are summarized in **Table 5.** The individual values for each IVS dataset are incorporated into the MS Access database that is in accordance with DID WERS-004.01, which is provided on the Arcadis ftp site. All MQOs defined in the QAPP were achieved during the initial IVS data collection activities.

Table 5: Measurement Quality Objectives and Results Summary

MQO	Measurement Performance Criteria	Results
Static Repeatability (Instrument Functionality)	Response (mean static spike minus mean static background) within +/- 20%	Pass: Maximum deviation = 11.54% All static spike responses recorded with object at a fixed distance from sensor were within +/- 20%
Dynamic detection Repeatability (IVS)	Peak response repeatable to +/- 25% of expected response	Pass: Maximum deviation = -19.9% See discussion in Section 4.1 “IVS Results”
Along-line measurement spacing	98% <= 25 cm along line	Pass: 100% of along-line data <=0.25 cm
Dynamic Positioning Repeatability (IVS)	Position offset of seed item targets <= 0.25 m	Pass: Maximum observed offset = 0.20 m
Geodetic Equipment Functionality	Position offset of known/temporary control point ≤ 10 cm.	Pass: Reacquired positions of known control points all ≤ 10 cm

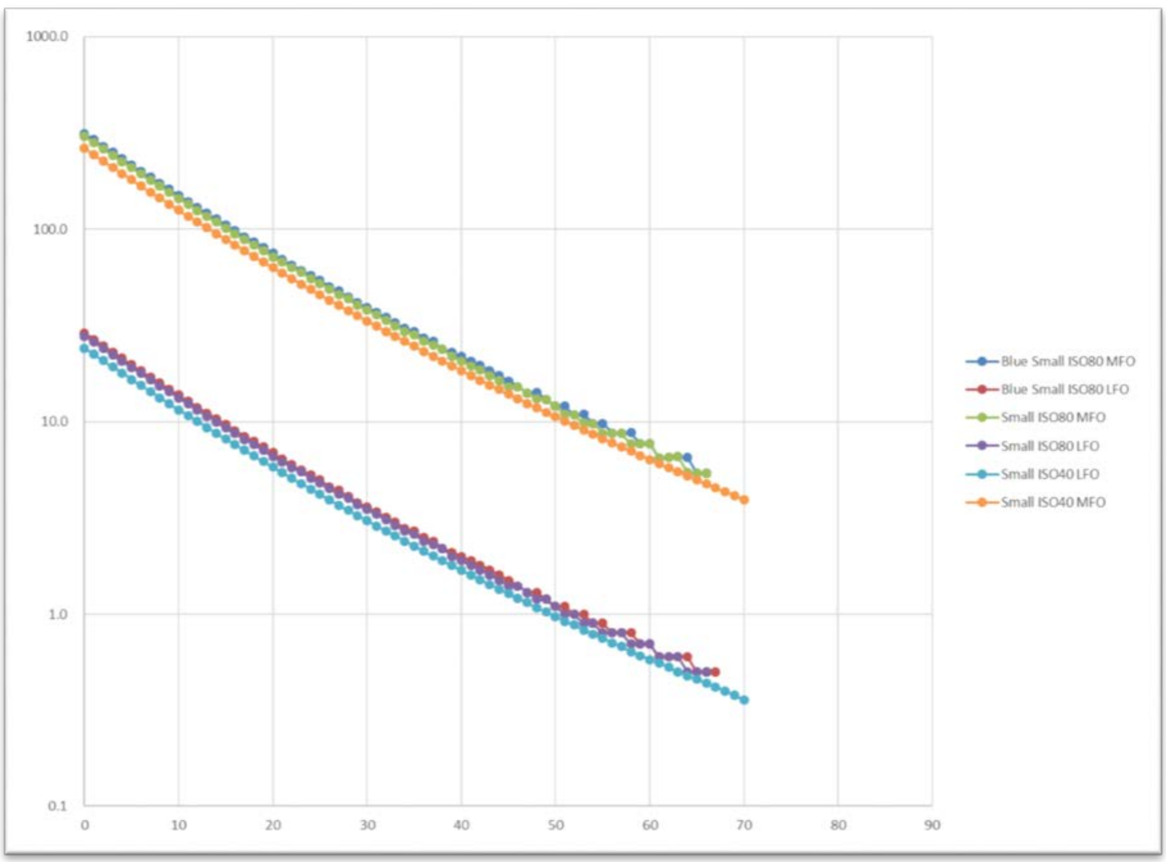
4.4 Test Stand Measurements

Test stand measurements were performed with the EM61-MK2A sensor to determine expected responses for the Small ISO 80 used as seed items in the IVS and the “Blue” Small ISO80s being used in the blind seeding program. Both seed items being used in the IVS and the blind seeding program are Small ISO80s, however, they were acquired at different times (the “Blue” ISOs had been used in a previous seeding program, the others were new), so test stand measurements were performed on one of each item to ensure consistent responses were obtained. The test stand measurements were conducted with the sensor resting on a static platform in an area free of external noise or anomalous sources. Two different Small ISO80 test items were documented by measuring the CH1 through 4 responses at fixed distances from the EM61-MK2A sensor in both horizontal and vertical orientations for each item. Response curves for each Small ISO80 in each orientation were derived using the EM61-MK2 Response Calculator (Naval Research Lab, 2008). Each test item was sampled at 3 distances from the sensor for each orientation. The measurements acquired for each test item are summarized in **Table 6. Figure 4** shows the response curves for the two small ISO80s calculated from the test stand measurements and the small ISO40 in the NRL guidance in the most favorable orientation (i.e., vertical) and least favorable orientation (i.e., horizontal). As shown on **Figure 4**, the responses for the two small ISO80s are very similar and the minor variations exhibited between the two test objects are likely due to measurement errors in the depth of the test item.

Table 6: Test Stand Measurement Summary

Seed Type	Distance from Coil (cm)	Orientation	CH2 Response (mV)
ISO80	40.73	Horizontal	30.76
ISO80	45.05	Horizontal	22.21
ISO80	50.89	Horizontal	17.11
ISO80	42.64	Vertical	219.54
ISO80	48.35	Vertical	138.10
ISO80	58.51	Vertical	71.27
ISO80 (Blue)	40.73	Horizontal	31.85
ISO80 (Blue)	45.18	Horizontal	23.05
ISO80 (Blue)	50.26	Horizontal	18.01
ISO80 (Blue)	42.64	Vertical	192.91
ISO80 (Blue)	47.72	Vertical	142.44
ISO80 (Blue)	57.88	Vertical	68.24

Figure 4: Response Curves for 3 Small ISO Surrogates



4.5 BACKGROUND RMS NOISE

RMS noise statistics were derived from background data collected in each initial IVS dataset. **Table 6** presents the mean, standard deviation (STD DEV), RMS Noise, and 7x RMS Noise for CH2. The mean values provide estimates of the average of the background noise, while the RMS values estimate the variation of the noise response. The 7xRMS values were calculated to aid in choosing an anomaly selection threshold.

Table 6 – IVS Background Results

Sensor	Date File	Mean	RMS Noise[2]	7x RMS Noise (mV)[1]
EM61-MK2A	030816bkglineonly	0.03	0.31	2.13
EM61-MK2A	030916_t1_isvpm	0.10	0.41	2.84
EM61-MK2A	030916jarmieivs_bkg	0.11	0.42	2.94
EM61-MK2A	030916kenyonivs_bkg	0.10	0.41	2.90
EM61-MK2A	031116_IVSGutierrez_bkg	0.12	0.39	2.75
EM61-MK2A	031116_T1_IVSHARRIS_bkg	0.10	0.41	2.86
	Average	0.09	0.39	2.75

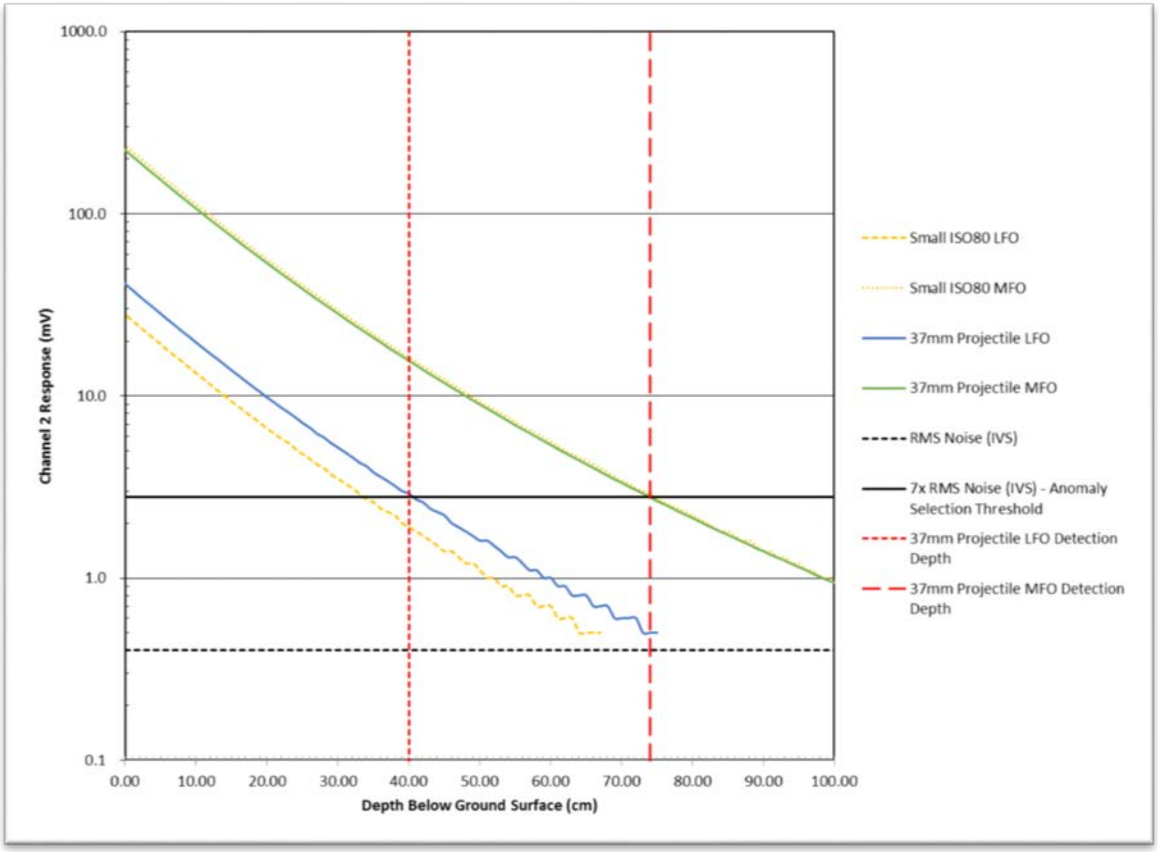
Notes:

1) All values are from Channel 2 response.
2) RMS Noise is calculated as the square root of the mean squared plus the standard deviation squared

The initial IVS datasets from 8, 9 and 11 March, 2016 were used to derive RMS noise statistics within background areas free of anomalous sources. The project team recommends a preliminary target selection threshold of 2.8 mV on the CH2 response derived from the average of the 7xRMS noise values observed within the initial IVS datasets. It is recommended that the data from the production grids be analyzed for noise throughout the survey to determine if noise levels are commensurate with those measured at the IVS. If the noise levels within individual grids are significantly different than those measured in the IVS, then the data should be evaluated to determine an appropriate anomaly selection threshold to avoid selecting a significant number of anomalies due to noise.

Site specific response characteristics for the Small ISO80s being used in the blind seeding program (Blue Small ISO80), as well as site-and EM61-MK2A instrument specific background noise levels, are detailed in **Figure 5.** Response curves for a 37mm Projectile are also included on the plot to outline estimated detection depths for a smaller munition. Response curves for test items were calculated using the results of the test stand measurements.

Figure 5: EM61-MK2A Site Specific Response Performance



Results indicate that a 37mm Projectile will be reliably detected to a distance below ground surface of approximately 40 cm at the center of the coil. Reliable detection distance from the coil can be influenced by factors such as external noise induced by terrain, geologic variation across the MRS, or lateral proximity of items to the sensor footprint.

5.0 IVS CONCLUSIONS

The JV demonstrated that the EM61-MK2A sensor is capable of meeting the project's objective of detecting targets of interest anticipated within the Closed Castner Range MRS. A minimum target selection threshold of 2.8 mV on the Channel 2 response was calculated based on a statistical analysis of the background measurements acquired within the initial IVS datasets.

Appendix A – IVS Geophysical Maps

Figure A1 – EM61-MK2A Background IVS Results

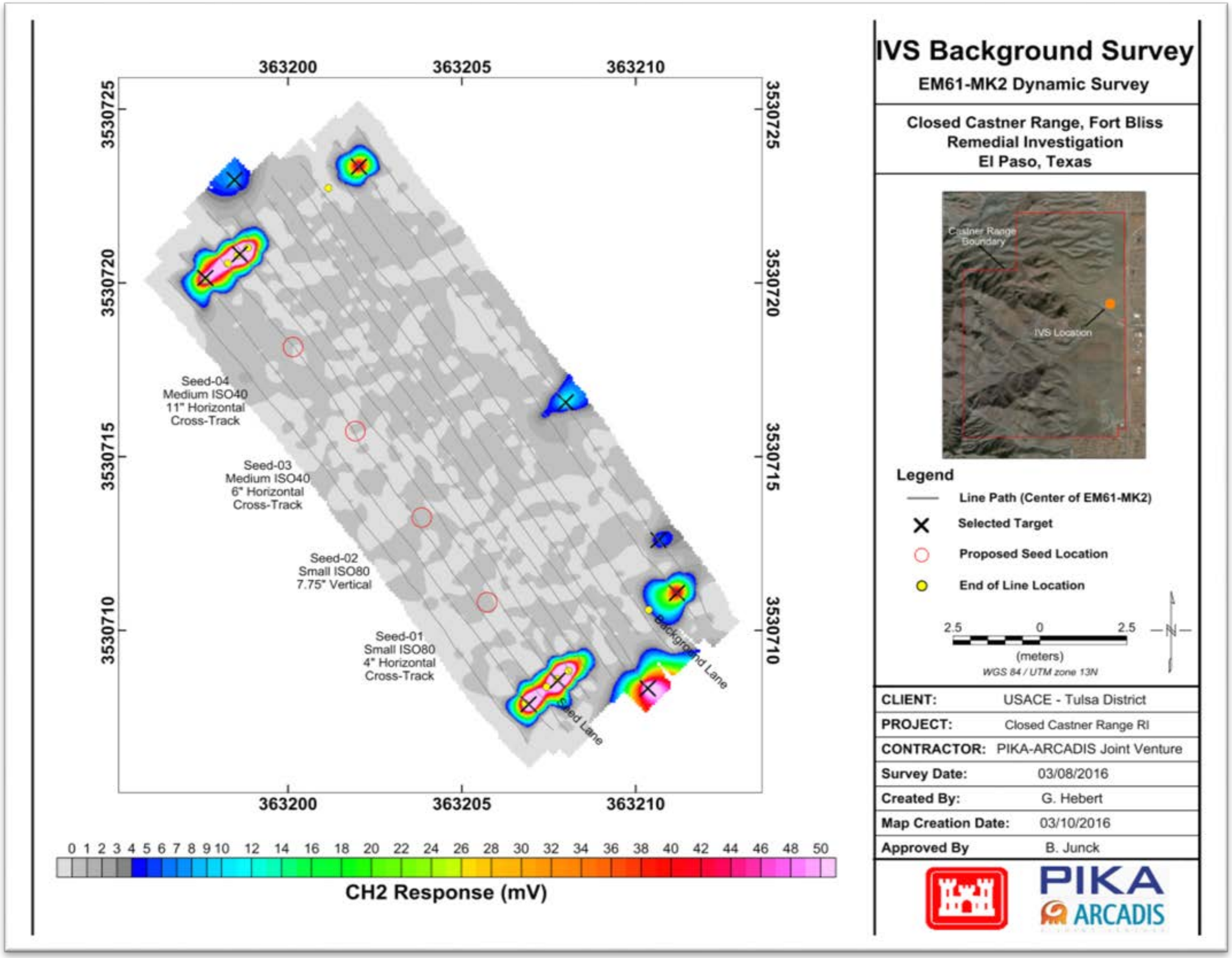


Figure A2 – EM61-MK2A Initial IVS – Operator 1

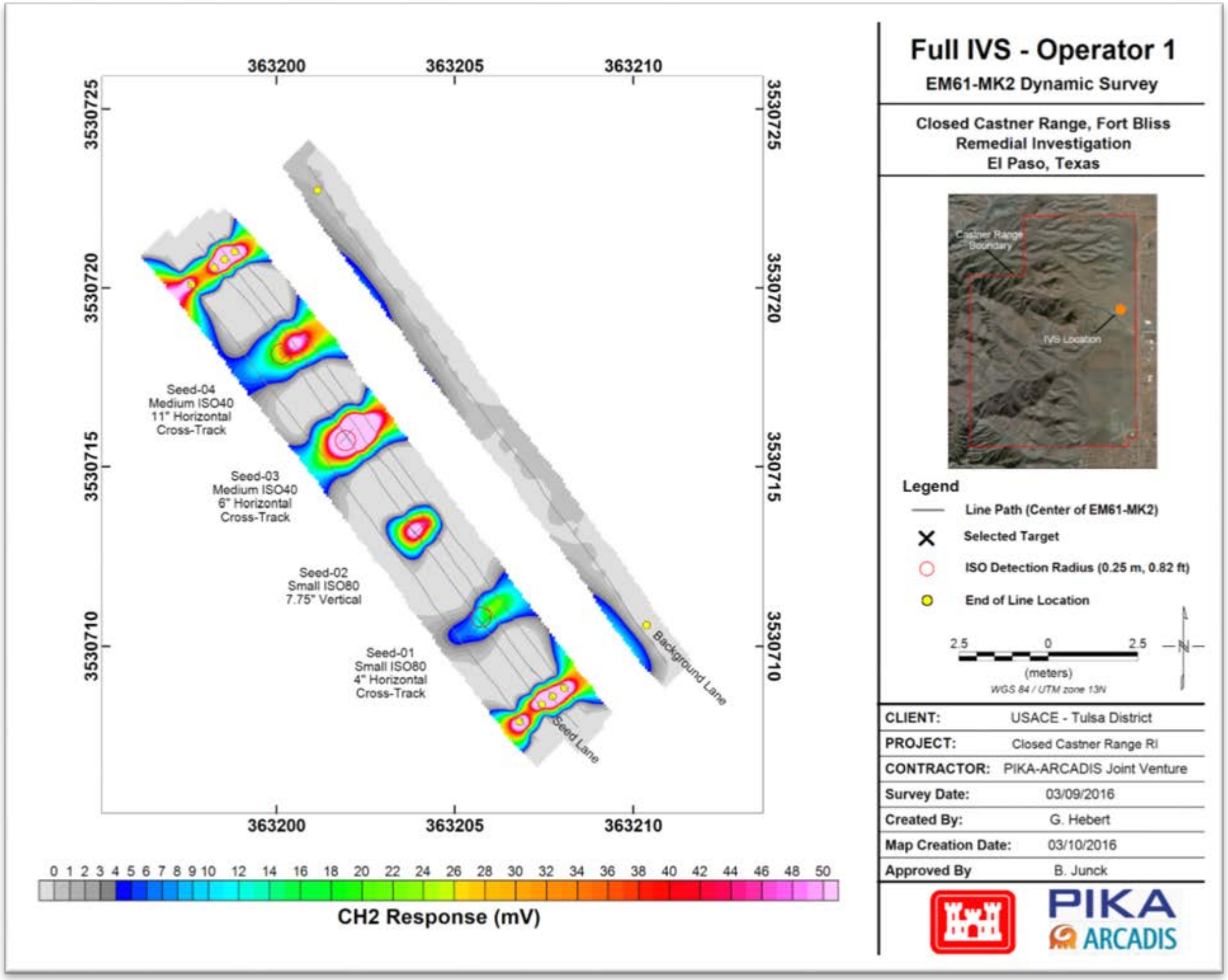


Figure A3 – EM61-MK2A Initial IVS – Operator 2

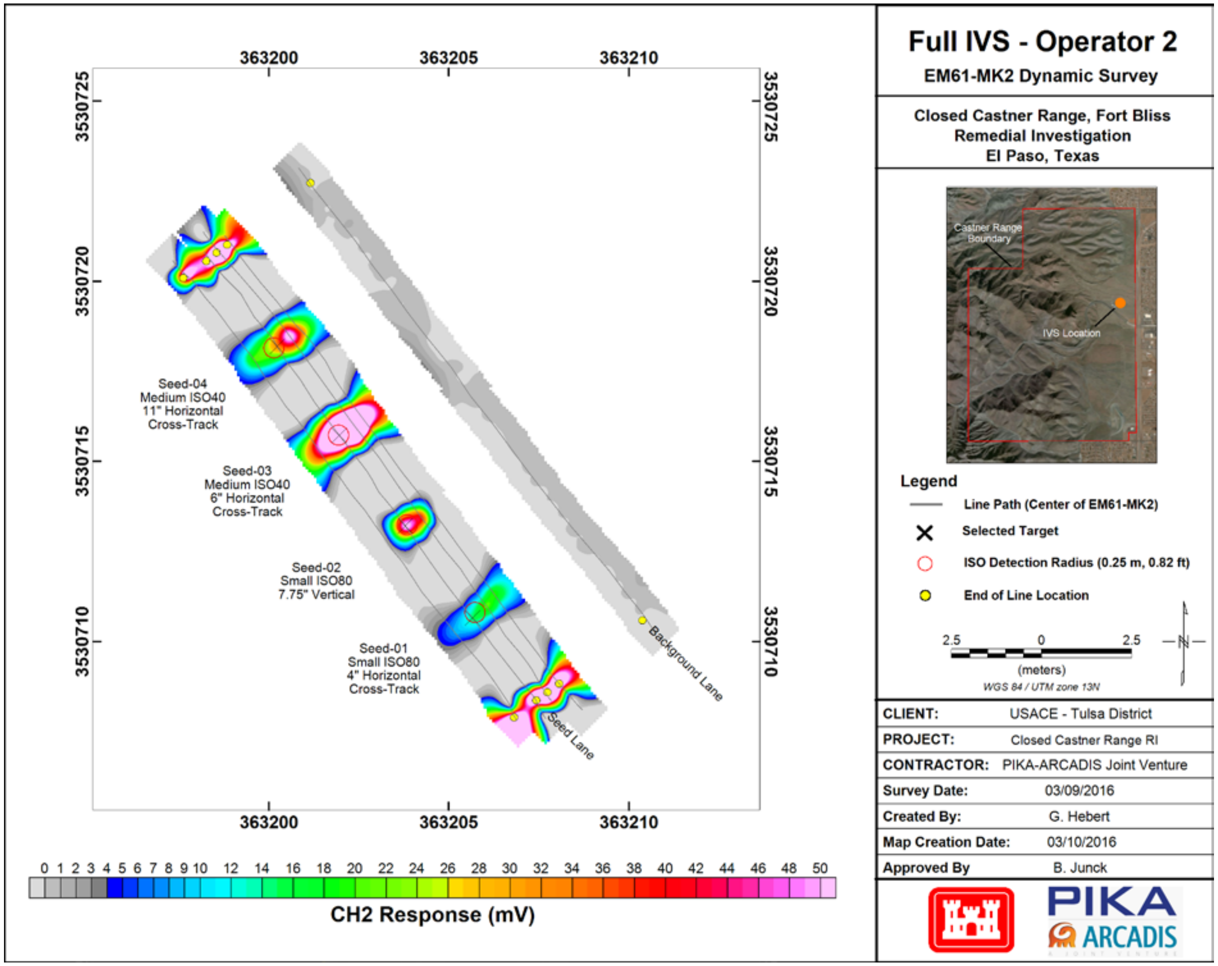


Figure A4 – EM61-MK2A Initial IVS – Operator 3

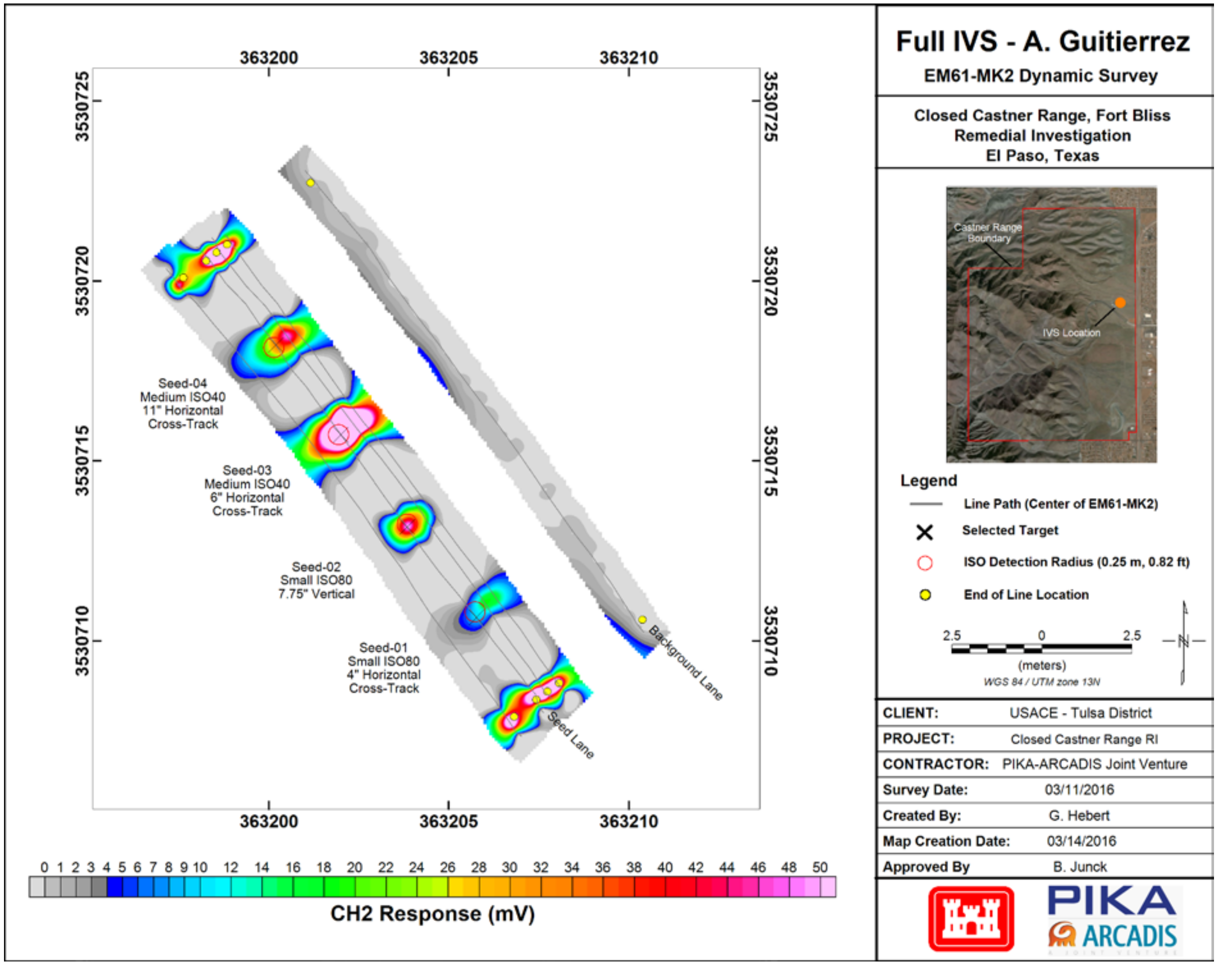
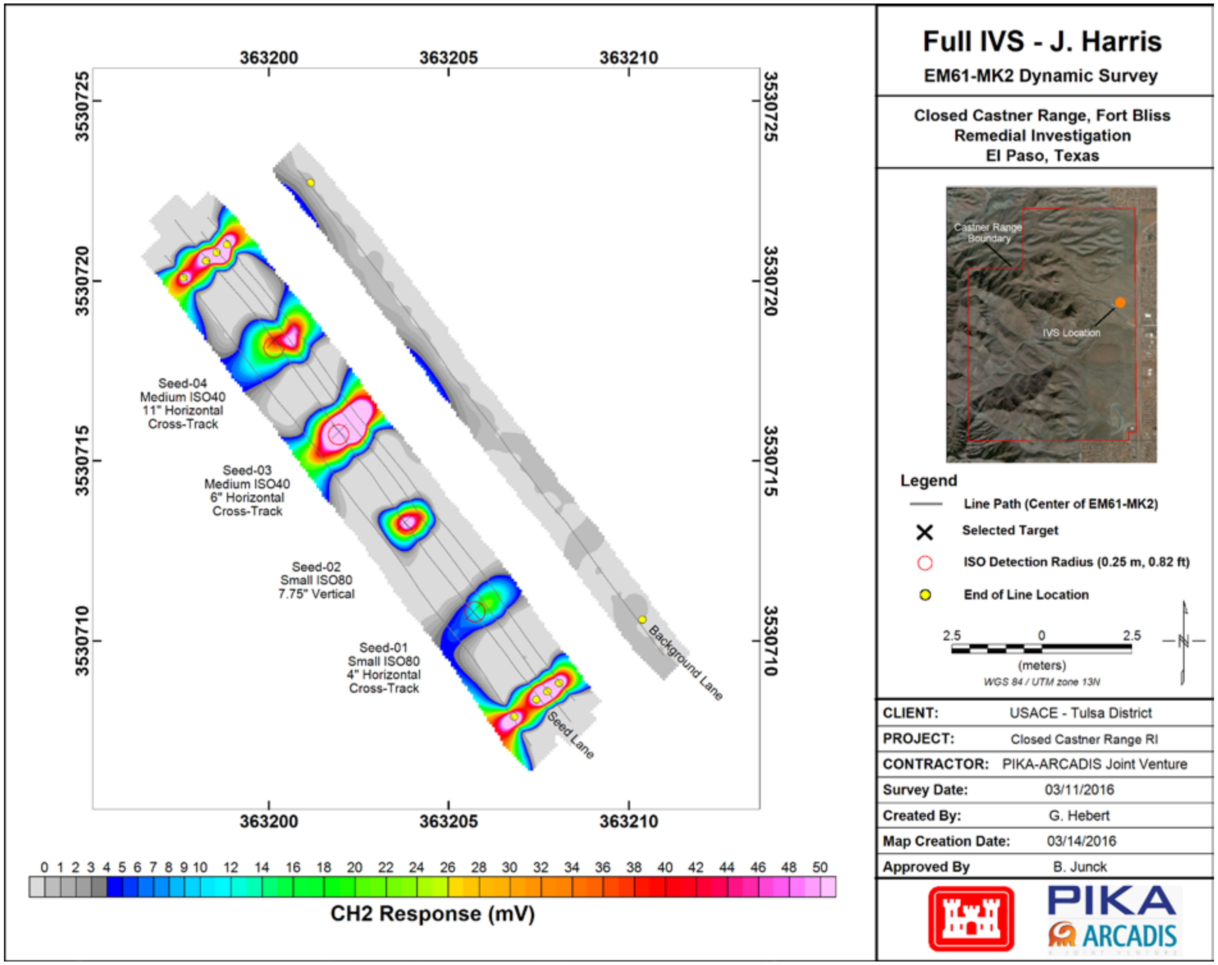


Figure A5 – EM61-MK2A Initial IVS – Operator 4



Appendix B –Seed Item and Data Collection Photos

Photo B-1: IVS Seed-01 - Small ISO80 - 4” Horizontal

Photo B-2: IVS Seed-02 - Small ISO80 – 7.75" Vertical

Photo B-3: IVS Seed-03 - Medium ISO40 - 6” Horizontal

Photo B-4: IVS Seed-04 - Medium ISO40 - 11” Horizontal

Photo B-5: Seed Item Installation and Location Survey

Appendix C – Static Test Results

Figure C-1: Static QC – 03/08/2016 (part 1)

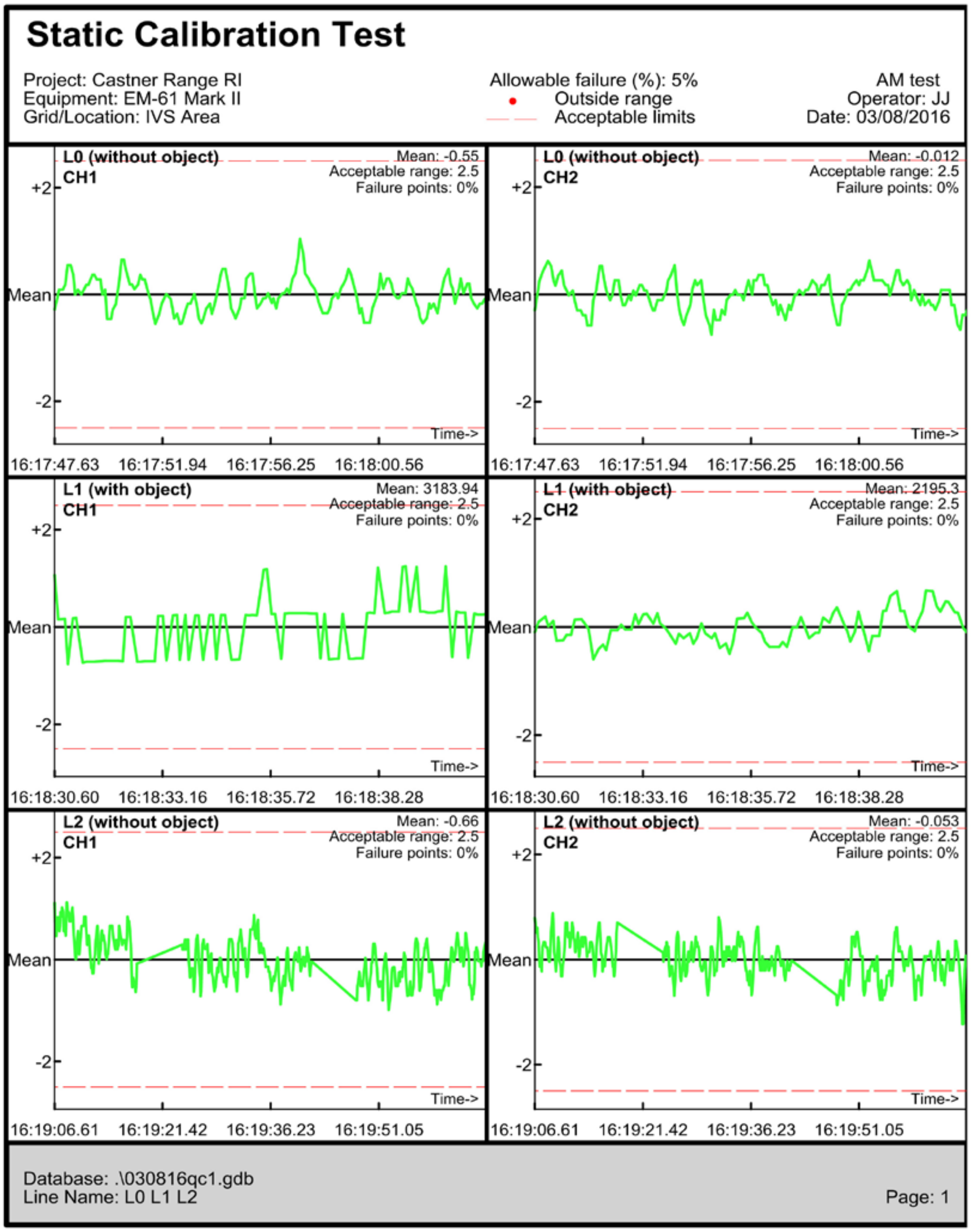


Figure C-1: Static QC – 03/08/2016 (part 2)

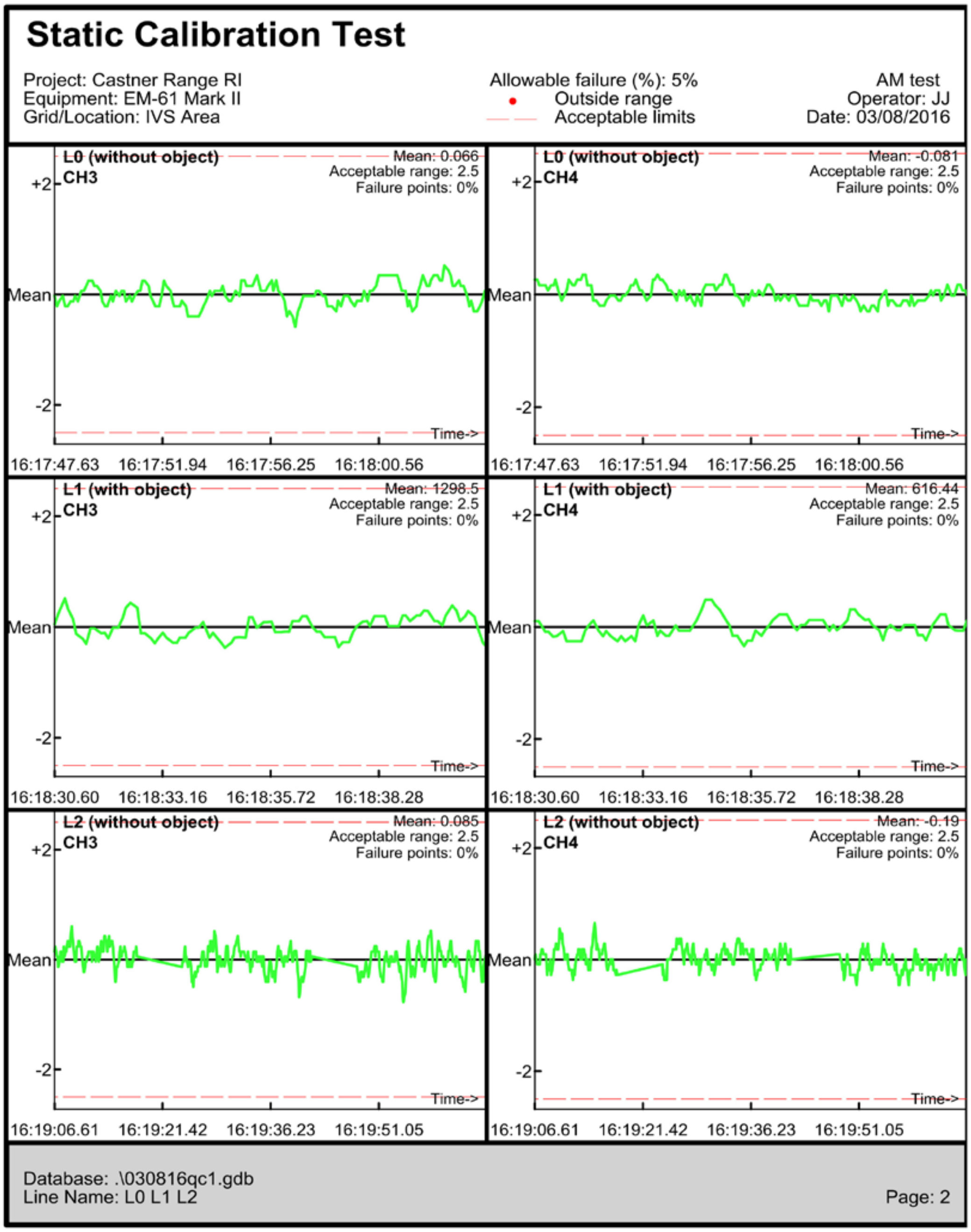


Figure C-2: Static QC – 03/09/2016 (part 1)

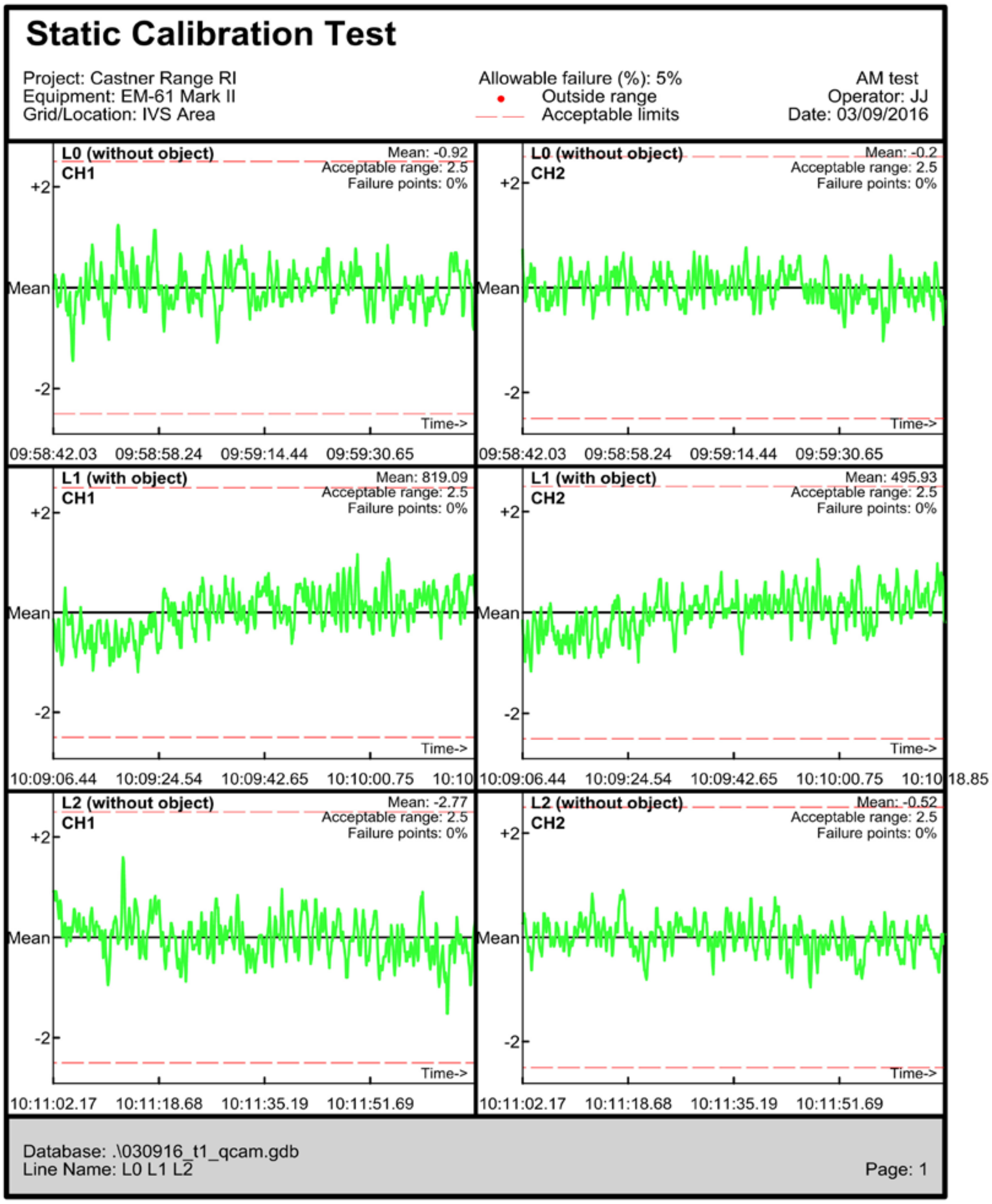


Figure C-2: Static QC – 03/09/2016 (part 2)

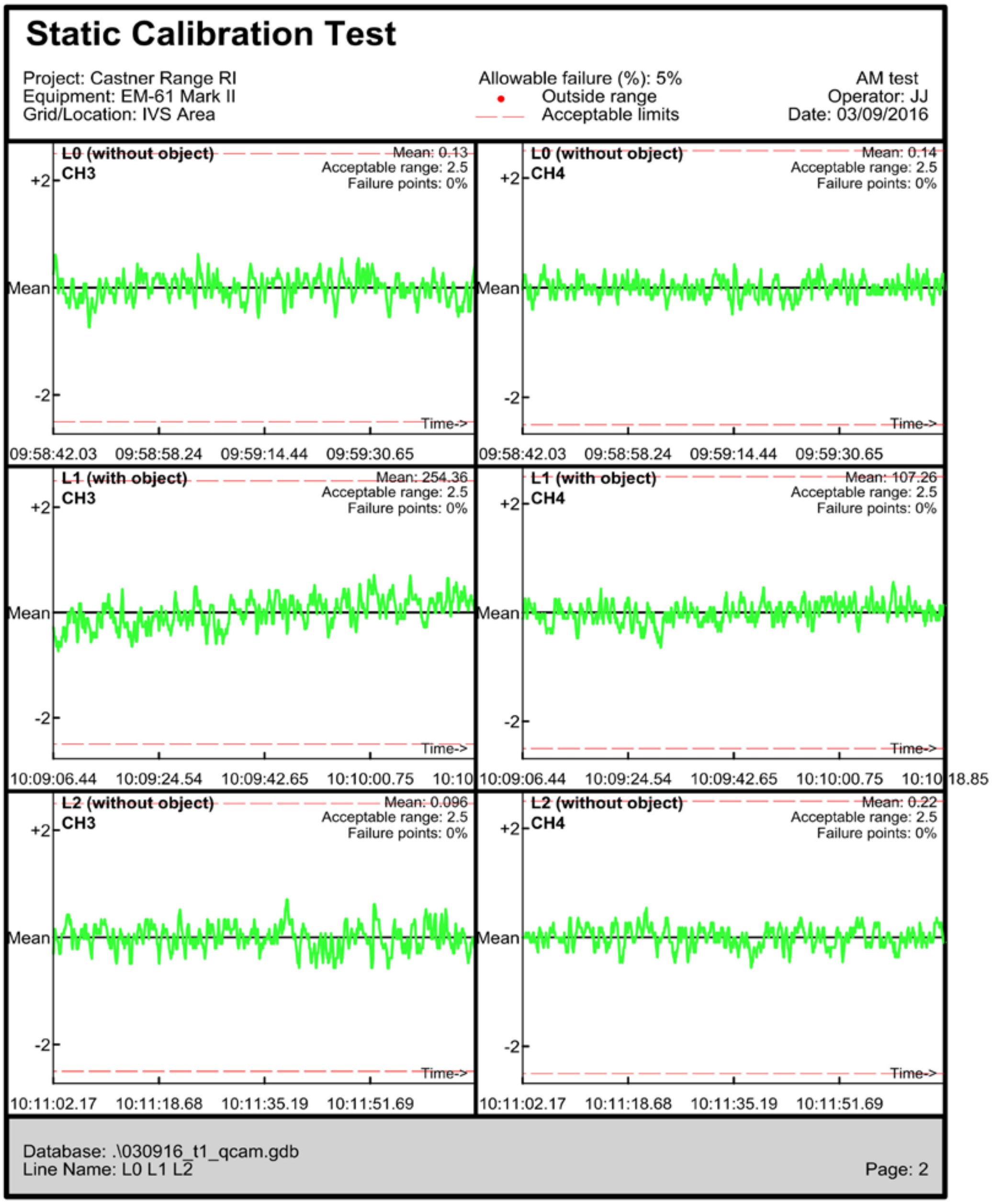


Figure C-2: Static QC – 03/09/2016 (part 3)

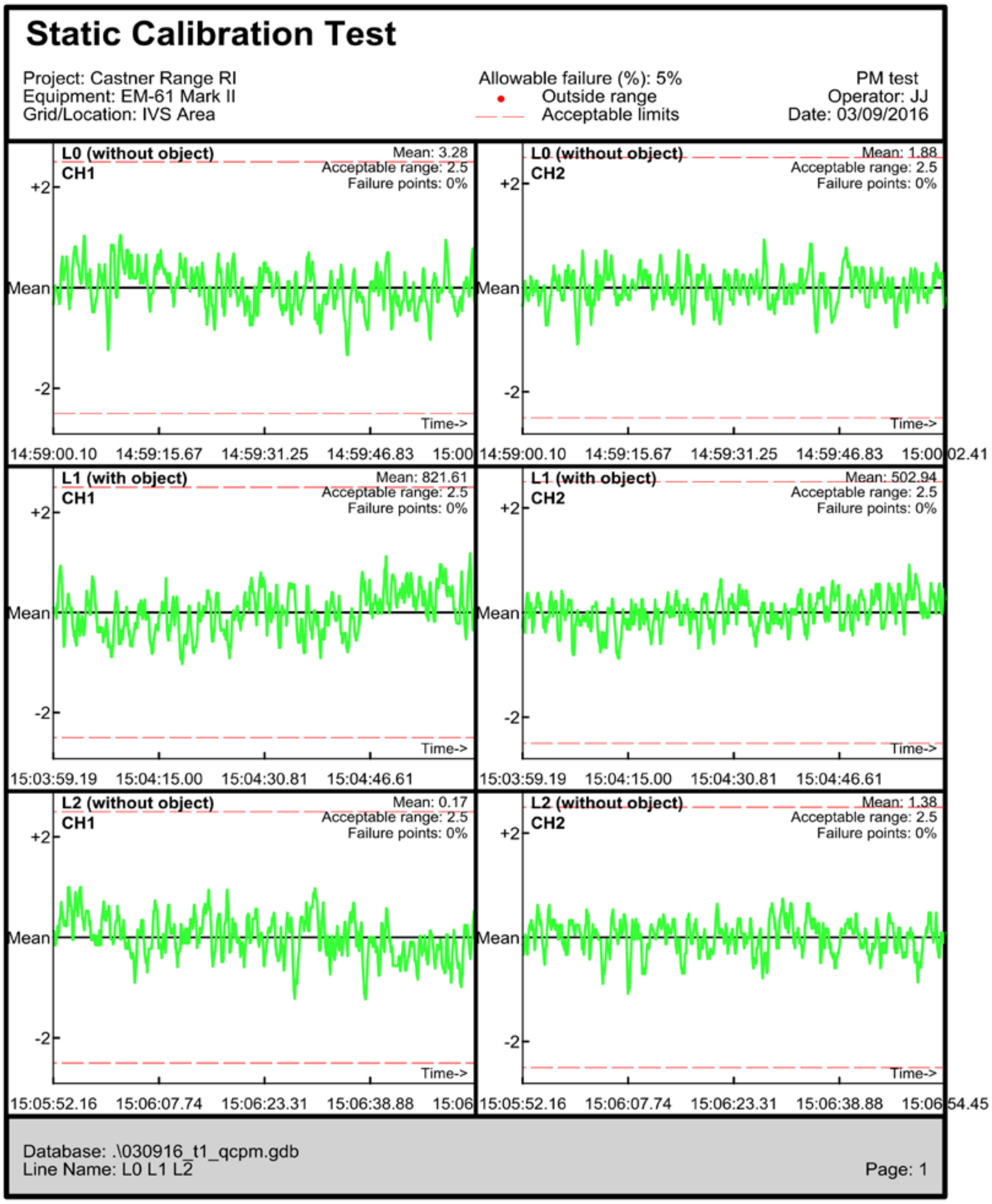


Figure C-2: Static QC – 03/09/2016 (part 4)

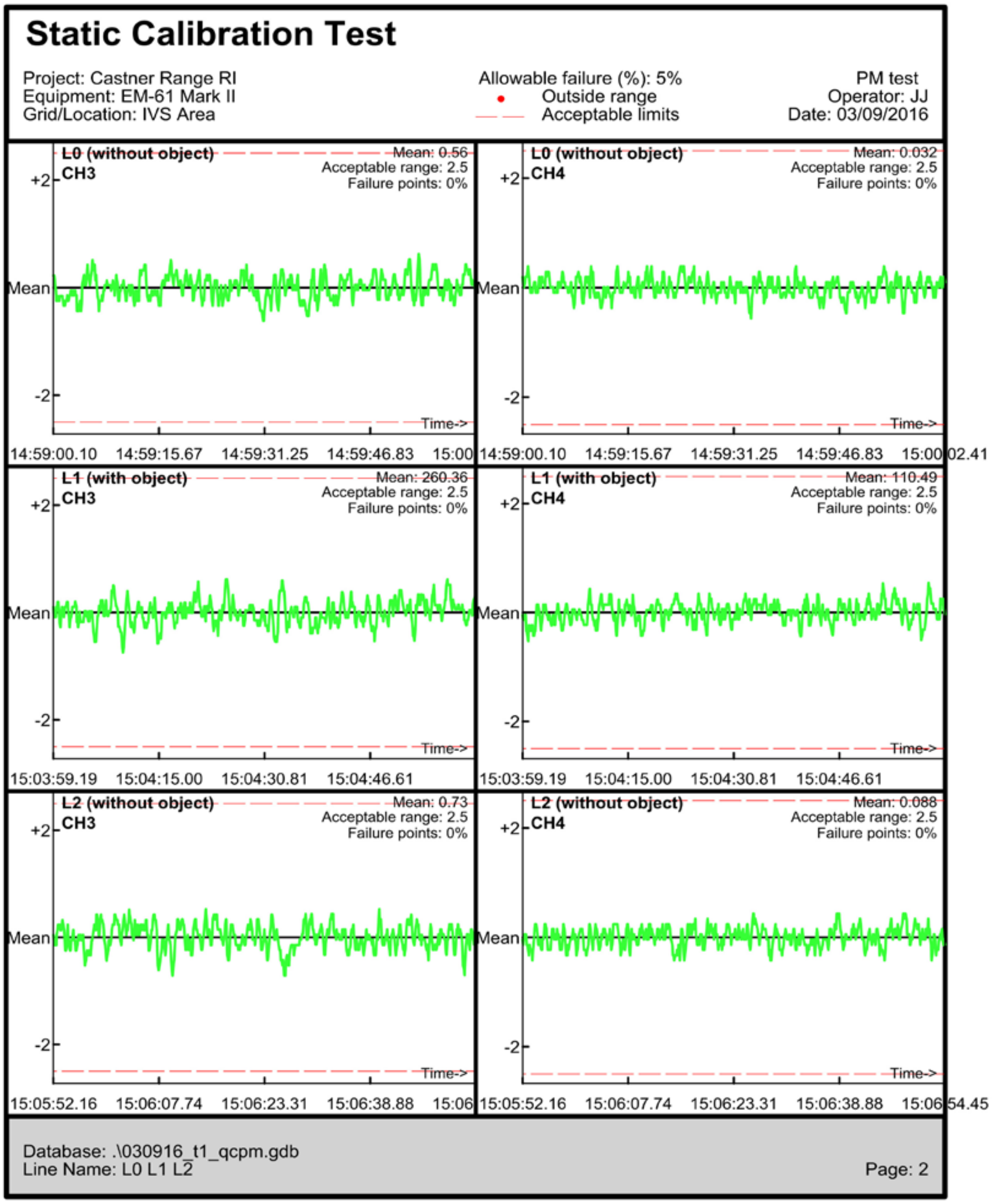


Figure C-3: Static QC – 03/11/2016 (part 1)

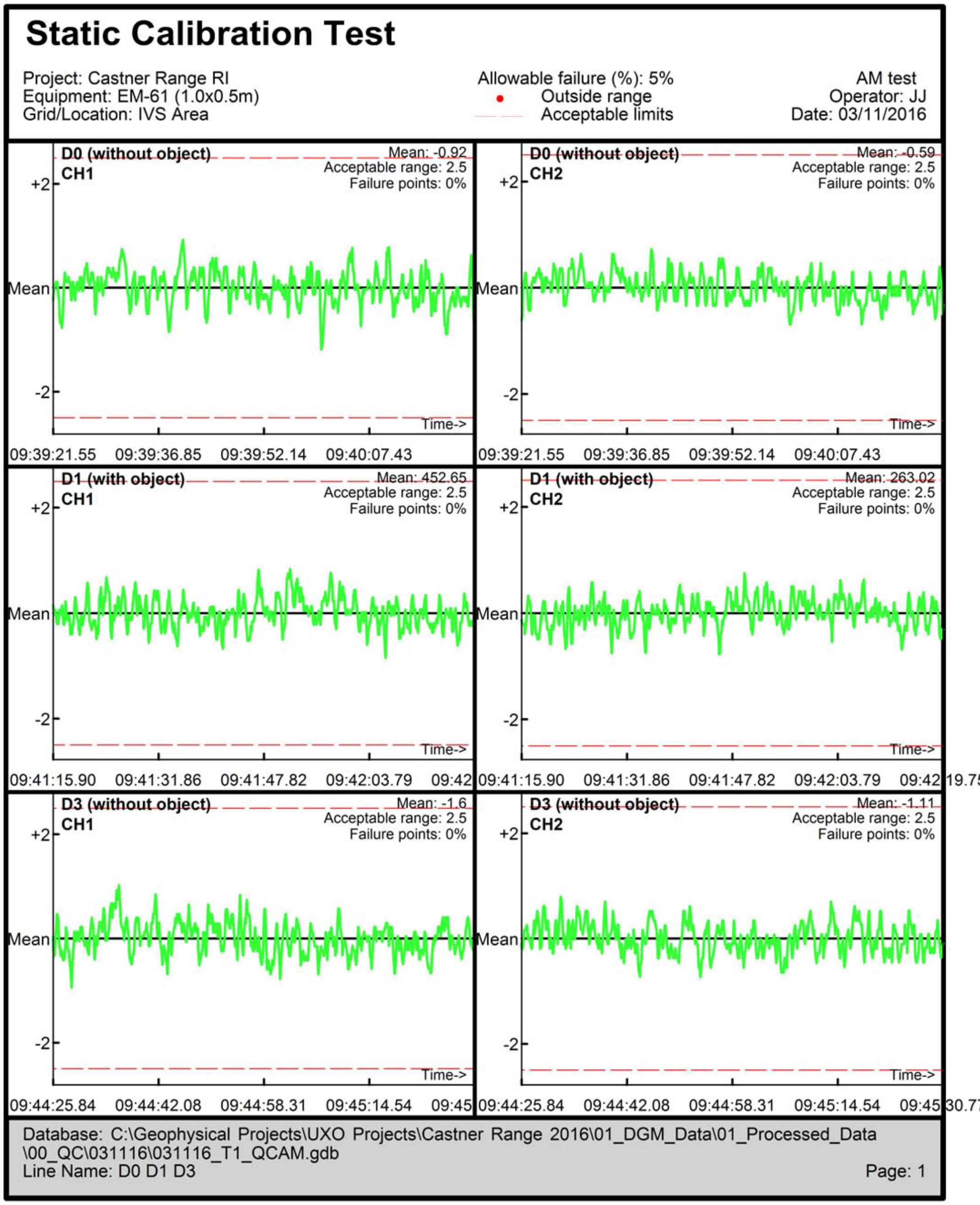


Figure C-3: Static QC – 03/11/2016 (part 2)

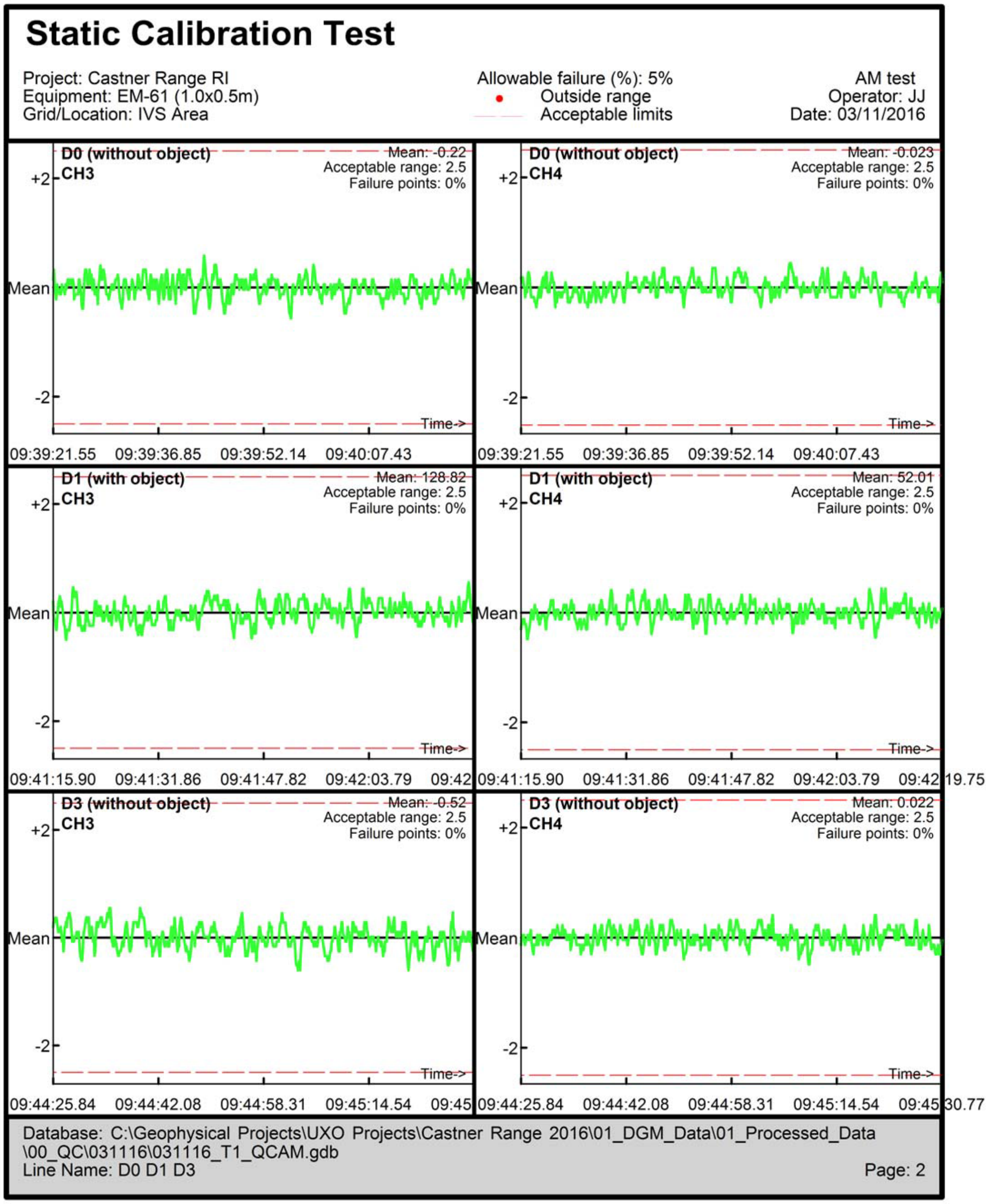


Figure C-3: Static QC – 03/11/2016 (part 3)

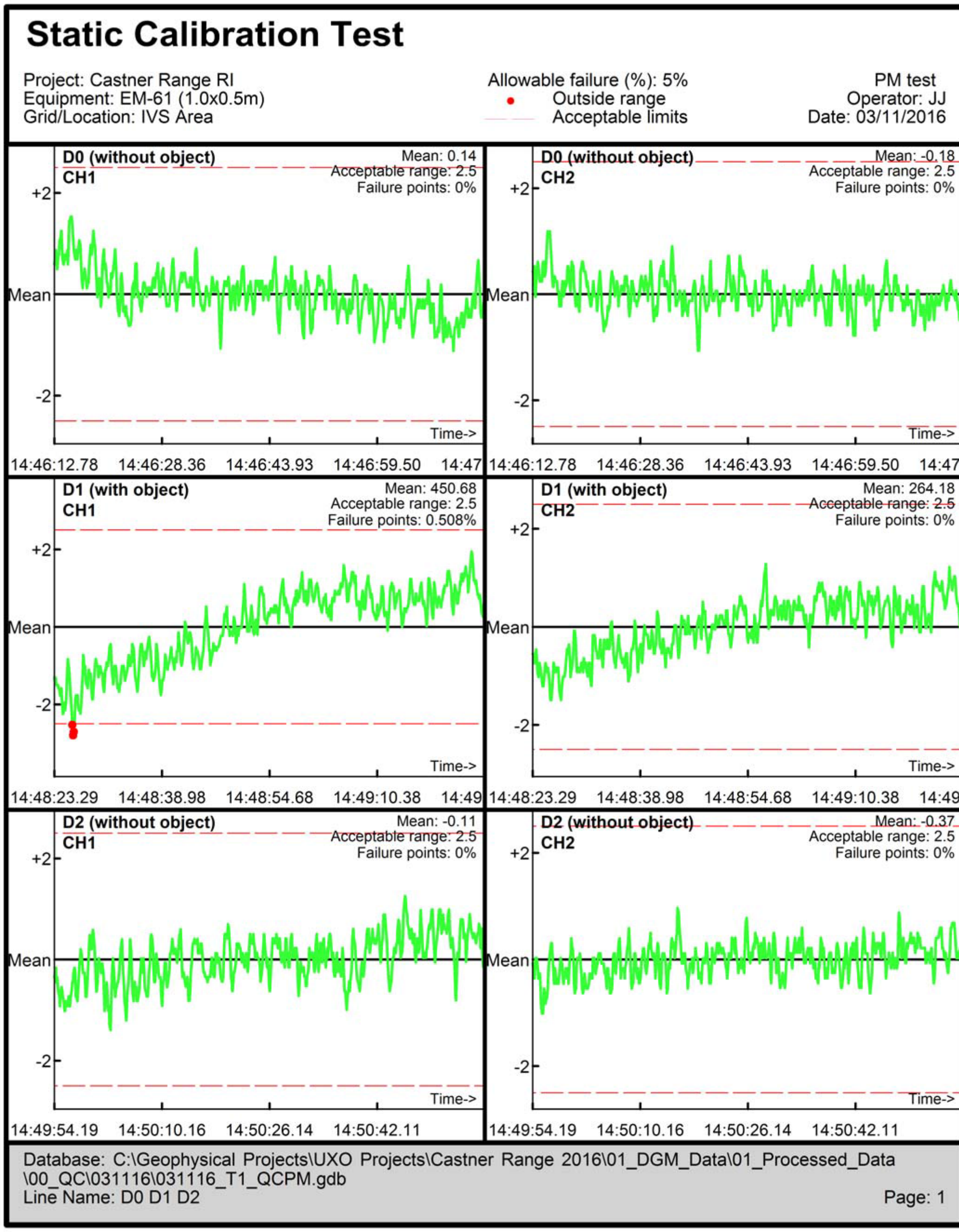
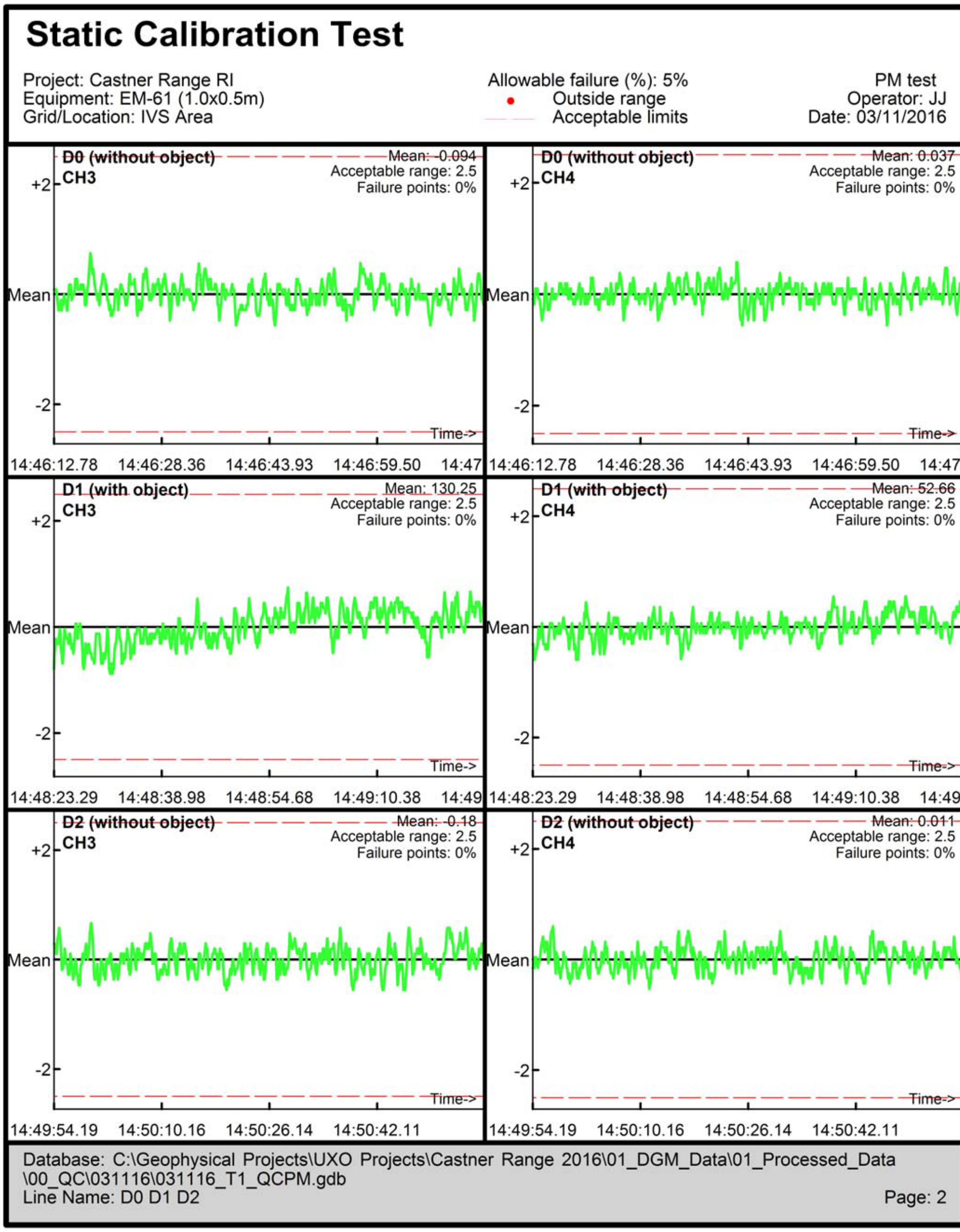


Figure C-3: Static QC – 03/11/2016 (part 4)



APPENDIX G

FIELD CHANGE REQUEST FORMS

FIELD CHANGE REQUEST

Part 1 (to be completed by personnel requesting change)

Document Title: Final QAPP MMRP RI Closed Castner Firing Range Fort Bliss El Paso, Texas	**Affected Paragraph(s): Figure 17-1**

☒ **New** ☐ **Revision** ☐ **Expedited** ☐ **Cancellation**

Original Paragraph(s):
Figure 17-1 shows the location of the proposed DGM grids.

Other citations: None

Proposed Change: After initial reconnaissance of DGM grid locations, DGM Grids 2, 5, and 9 are recommended to be moved as follows:

- DGM grid 2 will be shifted to the southwest such that the southwest corner of the proposed grid in the QAPP is now the NE corner of the revised grid location as shown on attachment 1.
- DGM grid 5 will be shifted to the southeast approximately 150 meters to a flatter area as shown on attachment 1.
- DGM grid 9 will be shifted to the northwest such that the northwest corner of the proposed grid in the QAPP is now the southeast corner of the revised grid location as shown on attachment 1.

Should site conditions at the new locations remain incompatible with data collection activities, the grids will be moved to an area of acceptable topography as close to the original grid location as possible.

Other citations: None

Justification for Request: Request moving the grids for the following reasons:

- DGM grid 2 has an arroyo with deep sidewalls that cuts through it, which will result in a large data gap where DGM data can't be collected.
- DGM grid 5 is on the side of a steep hill that is unsafe for the DGM team to traverse for DGM data collection.
- DGM grid 9 has steep terrain on the southern half of the grid that is unsafe for the DGM team to traverse for DGM data collection.

Aside from the terrain/arroyo presence, the requested locations for the grids are not significantly different from the original locations and will produce the required data.

Supervisor Approval for Expediting Request: Steve Stacy	**Date:** 18 March 2016

Part 2 (To be completed by the PIKA-Arcadis JV)

☒ **Approved** ☐ **Disapproved**	**FCR# 001**

Comments: None.

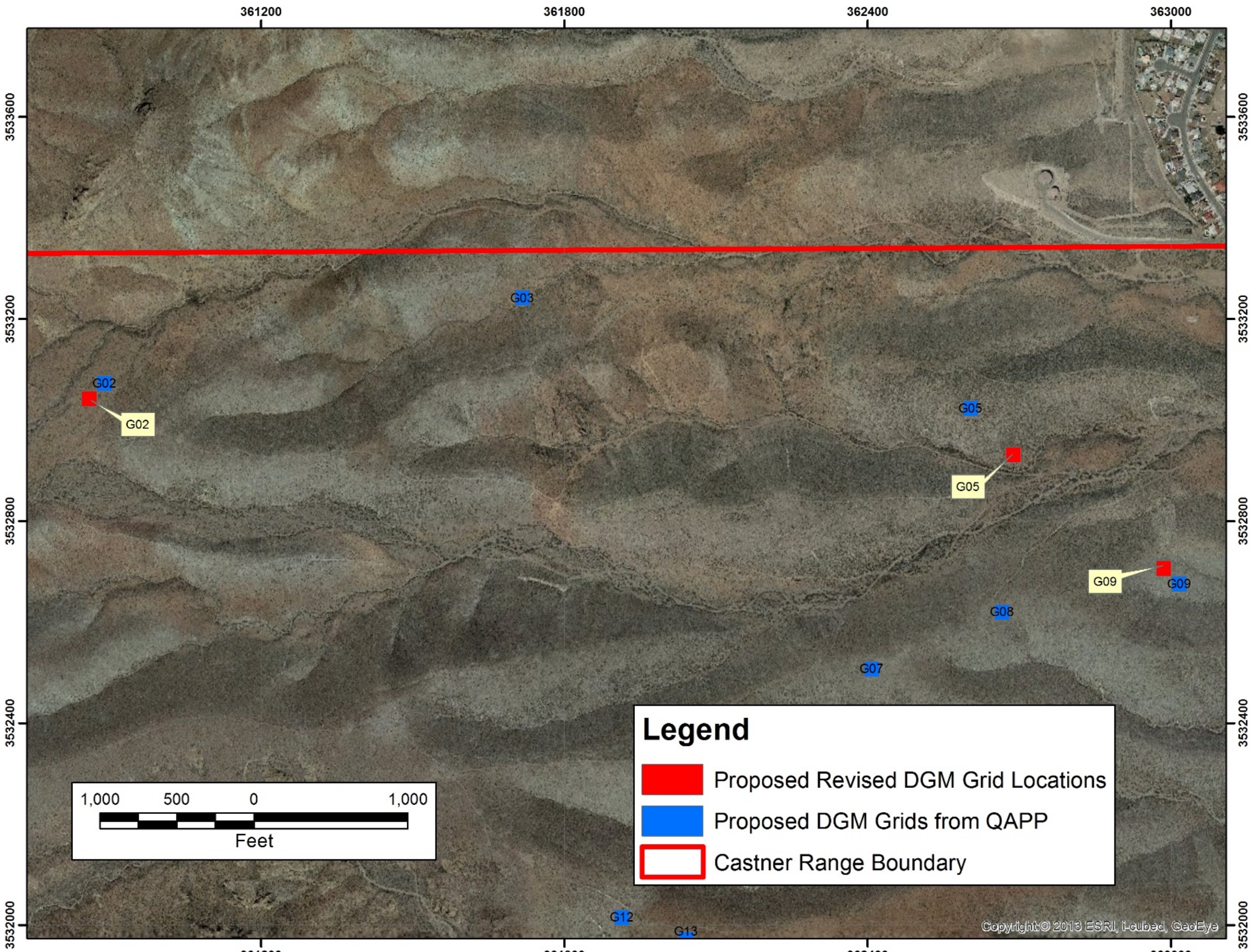
Procedure No. / Title (if new):

Approvals

PIKA-Arcadis JV Project Manager	**USACE OESS, <u>QA Geophysicist</u>, or Technical Manager**
Signature:	**Signature:**
Date: 18 March 2016	**Date:** 22 March 2016

USACE PM	USACE COR
Signature: **Date:** 22 Mar 16	**Signature:** **Date:**

Attachment 1: Proposed Revisions to DGM Grid Locations



FIELD CHANGE REQUEST	
Part 1 (to be completed by personnel requesting change)	
Document Title: Final QAPP MMRP RI Closed Castner Firing Range Fort Bliss El Paso, Texas	**Affected Paragraph(s): Section 17.1.9**

☒ **New** ☐ **Revision** ☐ **Expedited** ☐ **Cancellation**

Original Paragraph(s):
The JV will perform two types of post-dig anomaly resolution sampling IAW Attachment D of DID WERS-004.01 and QAPP Worksheet #12-1 of this QAPP:

1) The UXOQCS will check up to 10% of all WAA and DGM anomalies selected for investigation to verify the dig team has removed the anomaly source. These post-dig checks will be used with the handheld EMI sensor (*e.g.*, White's all metals detector).
2) The UXOQCS will perform post-dig anomaly verification sampling with the EM61-MK2 IAW DID WERS-004.01 on WAA and DGM targets to ensure there is 70% confidence that no more than 10% of the anomalies are unresolved.

Other citations: None

Proposed Change: The JV proposes to remove the requirement to perform 10% quality control (QC) of WAA and DGM anomalies using the hand-held White's all-metals detector.

Other citations: None

Justification for Request: The JV recommends removing the post-dig anomaly resolution with the White's all-metals detector for the following reasons:

1) DID WERS-004.01 and Table 11-3 of EM 200-1-15 only require that post-dig anomaly resolution be conducted with the instrument originally used to detect the anomalies (*i.e.*, the EM61-MK2).
2) Performing the anomaly resolution sampling with only the EM61-MK2 in a frequency in accordance with the work plan, DID WERS-004.01, and EM 200-1-15, provides the necessary QC check to determine whether the dig teams have successfully removed the sources of EM61-MK2 anomalies. It also provides recordable measurements (e.g., millivolt response) that provide the most reliable method for verifying anomaly resolution.
3) Performing additional post-dig anomaly resolution with the hand-held White's does not demonstrate that the intrusive investigation team has removed the source of the EM61-MK2 anomaly.
    a. The hand-held White's can detect small, metallic items that are either not detected by the EM61-MK2 or below the anomaly selection threshold.
    b. The hand-held White's is more susceptible than the EM61-MK2 in detecting geologic noise due to ferromagnesian minerals that are present within the Closed Castner Firing Range MRS, potentially skewing the anomaly resolution conclusions.

Supervisor Approval for Expediting Request: Greg Peterson	**Date:** 28 April 2016
Part 2 (To be completed by the PIKA-Arcadis JV)	
☒ **Approved** ☐ **Disapproved**	**FCR# 002**
Comments: None.	
Procedure No. / Title (if new):	

Approvals	
PIKA-Arcadis JV Technical Lead	**USACE OESS, QA Geophysicist, or Technical Manager**
Signature: Stephen M. Stacy **Date:** 28 April 2016	**Signature:** **Date: 28 April 2016**
USACE PM	**USACE COR**
Signature: **Date:**	**Signature:** **Date:**

APPENDIX H

PHOTOLOGS

H.1 - MEC INVESTIGATION PHOTOLOG

	PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 1	**Date:** 3-15-16

Direction Photo Taken:

Northwest

Description:

Surface clearance DGM grids

	PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 2	**Date:** 3-15-16

Direction Photo Taken:

North

Description:

Vegetation clearing in DGM grid

PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**		
Property Name: Closed Castner Firing Range		**Location:** Fort Bliss, El Paso, Texas
Photo No. 3	**Date:** 3-16-16	
Direction Photo Taken: Northwest		
Description: Grid 12 – DGM surveys		

PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**		
Property Name: Closed Castner Firing Range		**Location:** Fort Bliss, El Paso, Texas
Photo No. 4	**Date:** 3-16-16	
Direction Photo Taken: South		
Description: Team conducting analog transect collection in sheet 51 area		

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE		
Property Name: Closed Castner Firing Range		**Location:** Fort Bliss, El Paso, Texas
Photo No. 1	**Date:** 3-21-16	
Direction Photo Taken: Northeast		
Description: Vegetative clearance DGM grids		

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE		
Property Name: Closed Castner Firing Range		**Location:** Fort Bliss, El Paso, Texas
Photo No. 2	**Date:** 3-22-16	
Direction Photo Taken: Southeast		
Description: DGM Grid Mapping		

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	**Date:**
3	3-24-16

Direction Photo Taken:

South

Description:

IAVS Transect

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	**Date:**
4	3-24-16

Direction Photo Taken:

Close up

Description:

Tablet Training

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 1	**Date:** 3-30-16

Direction Photo Taken:

Northeast

Description:

View from Northwest corner of Castner

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 2	**Date:** 4-1-16

Direction Photo Taken:

Southwest

Description:

Hiking to North Castner to reach IAVS transects on western boundary.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No.	**Date:**
3	4-1-16

Direction Photo Taken:

West

Description:

Preparation for the demolition of M19 grenade

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No.	**Date:**
4	4-1-16

Direction Photo Taken:

Close up

Description:

Demolition shop set and ready to fire on M19 grenade.

	PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No.	**Date:**	
1	4-4-16	
Direction Photo Taken: Closeup		
Description: DGM Grid 18 MD		

	PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No.	**Date:**	
2	4-5-16	
Direction Photo Taken: Closeup		
Description: Reacquisition team laying flags and spray paint on WAA anomalies.		

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 3	**Date:** 4-6-16

Direction Photo Taken:

Closeup

Description:

WAA Lot 9 MD

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 4	**Date:** 4-7-16

Direction Photo Taken:

Northeast

Description:

WAA reacquisition team locating anomaly with Whites instrument.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

<table>
<tr><td colspan="2">Property Name:
Closed Castner Firing Range</td><td>Location:
Fort Bliss, El Paso, Texas</td></tr>
<tr><td>Photo No.
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4-12-16</td><td rowspan="3"></td></tr>
<tr><td colspan="2">Direction Photo Taken:
North</td></tr>
<tr><td colspan="2">Description:
Reacquisition and dig team working WAA points.</td></tr>
</table>

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

<table>
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Closed Castner Firing Range</td><td>Location:
Fort Bliss, El Paso, Texas</td></tr>
<tr><td>Photo No.
2</td><td>Date:
4-13-16</td><td rowspan="3"></td></tr>
<tr><td colspan="2">Direction Photo Taken:
West</td></tr>
<tr><td colspan="2">Description:
Reacquisition team locating WAA anomalies.</td></tr>
</table>

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:

Closed Castner Firing Range

Location:

Fort Bliss, El Paso, Texas

Photo No. 3

Date: 4-13-16

Direction Photo Taken:

West

Description:

GPS base station setup in southern Castner.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:

Closed Castner Firing Range

Location:

Fort Bliss, El Paso, Texas

Photo No. 4

Date: 4-14-16

Direction Photo Taken:

Southwest

Description:

Dig team collecting data at a WAA anomaly dig location

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No. 1 | **Date:** 4-19-16

Direction Photo Taken:

Closeup

Description:

WAA point 2777 intrusive investigation complete.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No. 2 | **Date:** 4-20-16

Direction Photo Taken:

East

Description:

Tailgate meeting prior to deploying teams for the day.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 3 | **Date:** 4-21-16

Direction Photo Taken:

West

Description:

SUXOS and UXOQC checking and sorting MD scrap

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 4 | **Date:** 4-22-16

Direction Photo Taken:

Closeup

Description:

Debris collected from WAA lot 14

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE	
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas
Photo No. 1 **Date:** 4-25-16 **Direction Photo Taken:** West **Description:** WAA reacquisition and dig team in Fusselman Canyon	

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE	
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas
Photo No. 2 **Date:** 4-26-16 **Direction Photo Taken:** West **Description:** Reacquisition team south of Transmountain Road.	

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	**Date:**
3	4-28-16

Direction Photo Taken:

West

Description:

Reacquisition and dig team south of Transmountain.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	**Date:**
4	4-29-16

Direction Photo Taken:

West

Description:

Dig team in arroyo north of Transmountain Road.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No. 1 **Date:** 5-2-16

Direction Photo Taken:

North

Description:

WAA reacquisition and dig team south of Transmountain Road

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No. 2 **Date:** 5-2-16

Direction Photo Taken:

South

Description:

Dig team working in arroyo south of Transmountain Road

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	Location:
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	Date:
3	5-3-16

Direction Photo Taken:

North

Description:

Reacquisition team south of Transmountain Road.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	Location:
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	Date:
4	5-3-16

Direction Photo Taken:

Close up.

Description:

Munitions Debris found in Lot 17. Scale shown at bottom of white board.

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range		**Location:** Fort Bliss, El Paso, Texas
Photo No. 1	**Date:** 5-12-16	
Direction Photo Taken: North		
Description: Dig team north of Transmountain Road		

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range		**Location:** Fort Bliss, El Paso, Texas
Photo No. 2	**Date:** 5-12-16	
Direction Photo Taken: West		
Description: Reacquisition and dig teams working WAA points north of Transmountain Road.		

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No. 3	**Date:** 5-12-16
Direction Photo Taken: Close up	
Description: WAA dig location	

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No. 4	**Date:** 5-12-16
Direction Photo Taken: Close up.	
Description: Debris found from WAA dig points.	

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	**Date:**
1	5-17-16

Direction Photo Taken:

East

Description:

Reacquisition and dig teams travelling to WAA locations south of Transmountain Road

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name:	**Location:**
Closed Castner Firing Range	Fort Bliss, El Paso, Texas

Photo No.	**Date:**
2	5-17-16

Direction Photo Taken:

East

Description:

Dig team investigating WAA point

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE	
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 3 | **Date:** 5-17-16

Direction Photo Taken:

North

Description:

WAA dig location

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE	
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 4 | **Date:** 5-17-16

Direction Photo Taken:

South

Description:

Reacquisition and dig team working WAA points

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No.	**Date:**
1	5-26-16

Direction Photo Taken:

Southeast

Description:

Vegetation clearance in new DGM grids

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No.	**Date:**
2	5-26-16

Direction Photo Taken:

Closeup

Description:

Blind seed installation

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 3	**Date:** 5-26-16

Direction Photo Taken:

North

Description:

WAA dig location

PHOTOGRAPHIC LOG
CLOSED CASTNER FIRING RANGE

Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 4	**Date:** 5-26-16

Direction Photo Taken:

NA

Description:

Vegetation clearance in new DGM grids

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE	
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas
Photo No. 1 / **Date:** 6-2-16 **Direction Photo Taken:** North **Description:** Vegetation clearance in new DGM grids	

PHOTOGRAPHIC LOG CLOSED CASTNER FIRING RANGE	
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas
Photo No. 2 / **Date:** 6-2-16 **Direction Photo Taken:** West **Description:** Mobilizing to WAA resolution points.	

	PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 3	**Date:** 6-2-16
Direction Photo Taken: North	
Description: WAA dig location	

	PHOTOGRAPHIC LOG **CLOSED CASTNER FIRING RANGE**
Property Name: Closed Castner Firing Range	**Location:** Fort Bliss, El Paso, Texas

Photo No. 4	**Date:** 6-3-16
Direction Photo Taken: Close up	
Description: ISM sampling location in DU-10 in southern Castner	

H.2 - MC INVESTIGATION PHOTOLOG

ISM Sampling

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	Date: 6/22/2016
Direction Photo Taken: Close up	
Description: Incremental Sampling Methodology using an ISM tool.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	Date: 6/24/2016
Direction Photo Taken: Close up	
Description: Decontamination procedures applied before every composite sample.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 3

Date: 6/24/2016

Direction Photo Taken:

Close up

Description:

Liquinox used as soap to decontaminate the ISM tool before sampling.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 4

Date: 7/6/2016

Direction Photo Taken:

Close up

Description:

One hundred composite sample points were collected on each grid using the ISM tool.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 5

Date: 7/6/2016

Direction Photo Taken:

East

Description:

Packing cooler with samples and ice to ship every day after sampling.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 6

Date: 7/7/2016

Direction Photo Taken:

Close up

Description:

Bucket and 1 Gallon bag used to retain the 100 soil sample locations.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **7**

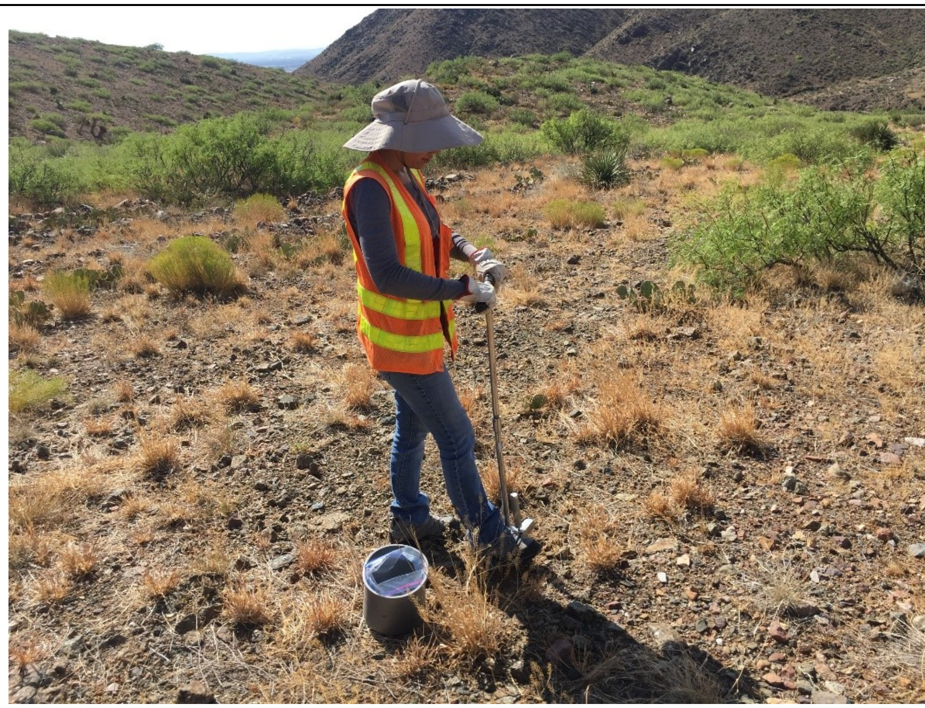
Date: 7/8/2016

Direction Photo Taken:

Close up

Description:

Image of ISM tool being used to sample.



PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **8**

Date: 7/7/2016

Direction Photo Taken:

Close up

Description:

Image of ISM tool being used to sample.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **9**

Date: 7/8/2016

Direction Photo Taken:

Northeast

Description:

Packing coolers to ship.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **10**

Date: 6/17/2016

Direction Photo Taken:

East

Description:

Image of ISM tool being used to sample.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 11	Date: 6/17/2016
Direction Photo Taken: East	
Description: Image of ISM tool being used to sample.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 12	Date: 6/6/2016
Direction Photo Taken: Close up	
Description: Close up of type of terrain sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **13**	**Date:** 6/21/2016	
Direction Photo Taken: Close up		
Description: Close up of type of terrain sampled.		

Discrete Soil Sampling

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	Date: 2-7-17

Direction Photo Taken:

West

Description:

Typical set up around discrete boring locations.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	Date: 2-7-17

Direction Photo Taken:

West

Description:

Drilling at DG070_SB-1.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **3**

Date: 2-8-17

Direction Photo Taken:

Northeast

Description:

Drilling at CN073_SB-2.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **4**

Date: 2-8-17

Direction Photo Taken:

East

Description:

Drilling at CN073_SB-2 attempt two.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 5 | **Date:** 2-8-17

Direction Photo Taken:

Northeast

Description:

Drilling at BF052_SB-3.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 6 | **Date:** 2-9-17

Direction Photo Taken:

South

Description:

Drilling at BF052_SB-3.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 7	Date: 2-9-17
Direction Photo Taken: West	
Description: Hard drilling and sampling effort on BF052_SB-3 at 28 ft. Split spoon went down approximately 2 inches for the first 50 blow counts.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 8	Date: 2-8-17
Direction Photo Taken: Closeup	
Description: Split spoon sample at 28 ft. on BF052_SB-3.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 9	Date: 2-8-17

Direction Photo Taken:

Closeup

Description:

Typical hydrating of bentonite hole plug in each boring.

Berm Sampling

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	Date: 7/26/2016
Direction Photo Taken: West	
Description: View of berm sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	Date: 7/26/2016
Direction Photo Taken: Close up	
Description: When unable to collect sample at 3 feet deep, two other random locations within 1 foot radius of the original boring were attempted to sample or confirm auger refusal.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 3

Date: 7/26/2016

Direction Photo Taken:

Close up

Description:

Example of sample collection using a hand auger. Bucket and sample bag used to retain sample before being transferred to a 4 ounce jar.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 4

Date: 7/26/2016

Direction Photo Taken:

Close up

Description:

Third attempts to collect sample down to 3 feet deep. Orange tape used as depth marks.

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. 5	**Date:** 7/26/2016	
Direction Photo Taken: Close up		
Description: Three attempts to collect sample down to 3 feet deep.		

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. 6	**Date:** 7/26/2016	
Direction Photo Taken: Close up		
Description: Successful attempt to sample from 0-1 feet, 1-2 feet and 2-3 feet deep.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 7	Date: 7/26/2016

Direction Photo Taken:

Close up

Description:

Third attempt to collect sample down to 3 feet deep.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 8	Date: 7/18/2016

Direction Photo Taken:

Northwest

Description:

Method used to collect berm samples.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 9	Date: 7/18/2016
Direction Photo Taken: Close up	
Description: Decontamination procedures before each sample collection point.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 10	Date: 7/26/2016
Direction Photo Taken: Close up	
Description: Third attempt to collect sample down to 3 feet deep.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 11	Date: 7/26/2016

Direction Photo Taken:

Close up

Description:

Third attempt to collect sample down to 3 feet deep.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 12	Date: 7/26/2016

Direction Photo Taken:

Northeast

Description:

Attempt to sample from 0-1 feet, 1-2 feet and 2-3 feet deep.

Berm Re-sampling

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	Date: 4/19/2017
Direction Photo Taken: East	
Description: Berm 4	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	Date: 4/19/2017
Direction Photo Taken: Southeast	
Description: Berm 4	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 3	**Date:** 4/19/2017
Direction Photo Taken: South	
Description: Berm 4	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 4	**Date:** 4/19/2017
Direction Photo Taken: Southeast	
Description: Berm 4	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 5	Date: 4/19/2017
Direction Photo Taken: West	
Description: Berm 4	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 6	Date: 4/19/2017
Direction Photo Taken: Northwest	
Description: Berm 4	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 7	Date: 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 4 – 1 of the 2 bullets observed		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 8	Date: 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 4 – 2 of the 2 bullets observed		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **9**	**Date:** 4/19/2017	
Direction Photo Taken: East		
Description: Berm 3		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **10**	**Date:** 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 3 – Shotgun shell observed		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 11	Date: 4/19/2017
Direction Photo Taken: East	
Description: Berm 3	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 12	Date: 4/19/2017
Direction Photo Taken: East	
Description: Berm 3	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 13	Date: 4/19/2017
Direction Photo Taken: West	
Description: Berm 3	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 14	Date: 4/19/2017
Direction Photo Taken: South	
Description: Berm 5	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 15	Date: 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 5		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 16	Date: 4/19/2017	
Direction Photo Taken: North		
Description: Berm 5		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **17**	Date: 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 5		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **18**	Date: 4/19/2017	
Direction Photo Taken: West		
Description: Berm 5		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **19**	**Date:** 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 5		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **20**	**Date:** 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 5		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
21	4/19/2017

Direction Photo Taken:

North

Description:

Berm 6

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
22	4/19/2017

Direction Photo Taken:

Close up

Description:

Berm 6

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 23	Date: 4/19/2017
Direction Photo Taken: North	
Description: Berm 6	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 24	Date: 4/19/2017
Direction Photo Taken: Northwest	
Description: Berm 6	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 25	**Date:** 4/19/2017

Direction Photo Taken:

Southwest

Description:

Berm 6

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 26	**Date:** 4/19/2017

Direction Photo Taken:

Close up

Description:

Berm 6

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 27	Date: 4/19/2017
Direction Photo Taken: Close up	
Description: Berm 7	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 28	Date: 4/19/2017
Direction Photo Taken: Close up	
Description: Berm 7 – Bullet observed	

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. **29**	**Date:** 4/19/2017	
Direction Photo Taken: Northwest		
Description: Berm 7		

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. **30**	**Date:** 4/19/2017	
Direction Photo Taken: South		
Description: Berm 7		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 31	Date: 4/19/2017
Direction Photo Taken: Close up	
Description: Berm 7	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 32	Date: 4/19/2017
Direction Photo Taken: North	
Description: Berm 7	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 33	Date: 4/19/2017
Direction Photo Taken: Close up	
Description: Berm 7	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 34	Date: 4/19/2017
Direction Photo Taken: West	
Description: Berm 8	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 35	Date: 4/19/2017
Direction Photo Taken: South	
Description: Berm 8	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 36	Date: 4/19/2017
Direction Photo Taken: North	
Description: Berm 8	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 37	Date: 4/19/2017	
Direction Photo Taken: South		
Description: Berm 8		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 38	Date: 4/19/2017	
Direction Photo Taken: Close up		
Description: Berm 8		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 40	Date: 4/19/2017
Direction Photo Taken: North	
Description: Berm 8	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 41	Date: 4/19/2017
Direction Photo Taken: Northwest	
Description: Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 42	Date: 4/19/2017
Direction Photo Taken: South	
Description: Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 43	Date: 4/19/2017
Direction Photo Taken: Close Up	
Description: Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 44	Date: 4/19/2017
Direction Photo Taken: Close up	
Description: Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 45	Date: 4/19/2017
Direction Photo Taken: West	
Description: Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
46	4/19/2017

Direction Photo Taken:

Southwest

Description:

Berm 10

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
47	4/19/2017

Direction Photo Taken:

Close up

Description:

Berm 10

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **48**	**Date:** 4/19/2017 **Direction Photo Taken:** West **Description:** Berm 10	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **49**	**Date:** 4/19/2017 **Direction Photo Taken:** Close up **Description:** Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 50	Date: 4/19/2017
Direction Photo Taken: West	
Description: Berm 10	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 51	Date: 4/19/2017
Direction Photo Taken: Close up	
Description: Berm 9	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 52	**Date:** 4/20/2017
Direction Photo Taken: Southwest	
Description: Berm 9	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 53	**Date:** 4/20/2017
Direction Photo Taken: Close up	
Description: Berm 9	

		PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE
Photo No. **54**	**Date:** 4/20/2017	
Direction Photo Taken: Close up		
Description: Berm 9		

		PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE
Photo No. **55**	**Date:** 4/20/2017	
Direction Photo Taken: Close up		
Description: Berm 9		

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE	
Photo No. 56 / **Date:** 4/20/2017 **Direction Photo Taken:** Southwest **Description:** Berm 9	

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE	
Photo No. 57 / **Date:** 4/20/2017 **Direction Photo Taken:** North **Description:** Berm 9	

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE	
Photo No. 58 / **Date:** 4/20/2017 **Direction Photo Taken:** Close up **Description:** Berm 9	

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE	
Photo No. 59 / **Date:** 4/20/2017 **Direction Photo Taken:** South **Description:** Berm 9	

Seep Sampling

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	Date: 06/15/2016
Direction Photo Taken: East	
Description: Seep #7: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	Date: 06/15/2016
Direction Photo Taken: West	
Description: Seep #7: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **3**	**Date:** 06/15/2016
Direction Photo Taken: West	
Description: Seep #8: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **4**	**Date:** 06/15/2016
Direction Photo Taken: East	
Description: Seep #8: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

<table>
<tr><td>Photo No.
5</td><td>Date:
06/15/2016</td><td rowspan="3"></td></tr>
<tr><td colspan="2">Direction Photo Taken:

Close up</td></tr>
<tr><td colspan="2">Description:

Seep #9: no water present.</td></tr>
</table>

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

<table>
<tr><td>Photo No.
6</td><td>Date:
06/15/2016</td><td rowspan="3"></td></tr>
<tr><td colspan="2">Direction Photo Taken:

West</td></tr>
<tr><td colspan="2">Description:

Seep #9: no water present, upstream.</td></tr>
</table>

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 7	Date: 06/15/2016	
Direction Photo Taken: West		
Description: Seep #10: no water present, upstream.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 8	Date: 06/15/2016	
Direction Photo Taken: Close up		
Description: Seep #10: no water present.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **9**	**Date:** 6/15/2016

Direction Photo Taken:

West

Description:

Seep #12: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **10**	**Date:** 6/15/2016

Direction Photo Taken:

West

Description:

Seep #12: no water present.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
11	6/15/2016

Direction Photo Taken:

West

Description:

Seep #12: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
12	6/15/2016

Direction Photo Taken:

Close up

Description:

Seep #13: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 13	Date: 6/15/2016
Direction Photo Taken: West	
Description: Seep #13: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 14	Date: 6/15/2016
Direction Photo Taken: South	
Description: Seep #16: no water present, upstream	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 15	Date: 6/15/2016

Direction Photo Taken:

Close up

Description:

Seep# 16: no water present

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 16	Date: 6/15/2016

Direction Photo Taken:

North

Description:

Seep# 16: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 17	Date: 6/15/2016

Direction Photo Taken:

North

Description:

Seep# 17: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 18	Date: 6/15/2016

Direction Photo Taken:

South

Description:

Seep# 17: no water present

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 19	Date: 6/15/2016

Direction Photo Taken:

North

Description:

Seep# 17: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 20	Date: 6/16/2016

Direction Photo Taken:

Close up

Description:

Seep # 18: no water present

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 21	Date: 6/16/2016

Direction Photo Taken:

South

Description:

Seep # 18: no water present, upstream

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 22	Date: 6/16/2016

Direction Photo Taken:

North

Description:

Seep # 18: no water present, downstream

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 23	Date:
Direction Photo Taken: Close up	
Description: Seep # 19: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 24	Date:
Direction Photo Taken: Southeast	
Description: Seep # 19: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 25	Date:
Direction Photo Taken: Northwest	
Description: Seep # 19: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 26	Date: 6/20/2016
Direction Photo Taken: South	
Description: Seep # 20: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 27	**Date:** 6/20/2016	
Direction Photo Taken: Close up		
Description: Seep # 20: no water present		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 28	**Date:** 6/20/2016	
Direction Photo Taken: North		
Description: Seep # 20: no water present, downstream.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **29**	**Date:** 6/16/2016	
Direction Photo Taken: South		
Description: Seep # 21: no water present, upstream.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **30**	**Date:** 6/16/2016	
Direction Photo Taken: Close up		
Description: Seep # 21: no water present		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
31	6/16/2016

Direction Photo Taken:

North

Description:

Seep # 21: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
32	6/16/2016

Direction Photo Taken:

Southeast

Description:

Seep # 22: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 33	**Date:** 6/16/2016
Direction Photo Taken: North	
Description: Seep # 22: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 34	**Date:** 6/16/2016
Direction Photo Taken: Close up	
Description: Seep # 22: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
35	6-15-2016

Direction Photo Taken:

West

Description:

Seep #24: water present, sample collected.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
36	6-15-2016

Direction Photo Taken:

Close up

Description:

Seep #24: water present, sample collected.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 37	**Date:** 6-15-2016
Direction Photo Taken: Close up	
Description: Seep #24: water present, sample collected.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 38	**Date:** 6/24/2016
Direction Photo Taken: North	
Description: Seep # 38: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 39	Date: 6/24/2016
Direction Photo Taken: South	
Description: Seep # 38: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 40	Date: 6/24/2016
Direction Photo Taken: Southeast	
Description: Seep # 38: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 41	Date: 6/17/2016
Direction Photo Taken: Close up	
Description: Seep # 39: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 42	Date: 6/17/2016
Direction Photo Taken: Southeast	
Description: Seep # 39: no water present, downstrem.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 43	Date: 6/17/2016

Direction Photo Taken:

Northwest

Description:

Seep # 39: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 44	Date: 6/17/2016

Direction Photo Taken:

Close up

Description:

Seep # 40: no water present

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 45	**Date:** 6/17/2016
Direction Photo Taken: Northwest	
Description: Seep # 40: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 46	**Date:** 6/17/2016
Direction Photo Taken: Southeast	
Description: Seep # 40: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 47	Date: 6/17/2016
Direction Photo Taken: Close up	
Description: Seep # 41: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 48	Date: 6/17/2016
Direction Photo Taken: Southeast	
Description: Seep # 41: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 49	Date: 6/17/2016	
Direction Photo Taken: Northwest		
Description: Seep # 41: no water present, downstream.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 50	Date: 6/21/2016	
Direction Photo Taken: Close up		
Description: Seep #35: no water present		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 51	**Date:** 6/21/2016
Direction Photo Taken: Northwest	
Description: Seep #35: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 52	**Date:** 6/21/2016
Direction Photo Taken: Southeast	
Description: Seep #35: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 53	Date: 6/17/2016

Direction Photo Taken:

North

Description:

Seep #36: no water present

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 54	Date: 6/17/2016

Direction Photo Taken:

North

Description:

Seep #36: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 55	Date: 6/17/2016
Direction Photo Taken: South	
Description: Seep #36: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 56	Date: 6/17/2016
Direction Photo Taken: Close up	
Description: Seep #37: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 57	Date: 6/17/2016

Direction Photo Taken:

Northwest

Description:

Seep #37: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 58	Date: 6/17/2016

Direction Photo Taken:

southeast

Description:

Seep #37: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **59**	**Date:** 6/17/2016
Direction Photo Taken: Close up	
Description: Seep #43: water present, sample collected.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **60**	**Date:** 6/17/2016
Direction Photo Taken: Northwest	
Description: Seep #43: water present, sample collected.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 61	Date: 6/17/2016
Direction Photo Taken: Southeast	
Description: Seep #43: water present, sample collected.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 62	Date: 6/20/2016
Direction Photo Taken: Close up	
Description: Seep # 47: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 63	Date: 6/20/2016

Direction Photo Taken:

Southeast

Description:

Seep # 47: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 64	Date: 6/20/2016

Direction Photo Taken:

Northwest

Description:

Seep # 47: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 65	Date: 6/20/2016
Direction Photo Taken: Close up	
Description: Seep # 48: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 66	Date: 6/20/2016
Direction Photo Taken: East	
Description: Seep # 48: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **67**	**Date:** 6/20/2016
Direction Photo Taken: West	
Description: Seep # 48: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **68**	**Date:** 6/20/2016
Direction Photo Taken: Close up	
Description: Seep # 49: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 69	Date: 6/20/2016

Direction Photo Taken:

West

Description:

Seep # 49: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 70	Date: 6/20/2016

Direction Photo Taken:

East

Description:

Seep # 49: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE	
Photo No. 71 / **Date:** 6/20/2016	
Direction Photo Taken: Close up	
Description: Seep # 50: no water present	

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE	
Photo No. 72 / **Date:** 6/20/2016	
Direction Photo Taken: Northwest	
Description: Seep # 50: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 73	Date: 6/20/2016
Direction Photo Taken: Southeast	
Description: Seep # 50: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 74	Date: 6/22/2016
Direction Photo Taken: Close up	
Description: Seep #54: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 75	Date: 6/22/2016
Direction Photo Taken: Southeast	
Description: Seep #54: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 76	Date: 6/22/2016
Direction Photo Taken: Northwest	
Description: Seep #54: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 77	Date: 6/22/2016
Direction Photo Taken: Close up	
Description: Seep #55: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 78	Date: 6/22/2016
Direction Photo Taken: North	
Description: Seep #55: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 79	Date: 6/22/2016
Direction Photo Taken:	
South	
Description:	
Seep #55: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 80	Date: 6/22/2015
Direction Photo Taken:	
Close up	
Description:	
Seep #56: no water present	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 81	Date: 6/22/2015
Direction Photo Taken: North	
Description: Seep #56: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 82	Date: 6/22/2015
Direction Photo Taken: South	
Description: Seep #56: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. **83**	**Date:** 06/20/2016	
Direction Photo Taken: Close up		
Description: Seep# 57: no water present		

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. **84**	**Date:** 06/20/2016	
Direction Photo Taken: South		
Description: Seep# 57: no water present, upstream.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 85	**Date:** 06/20/2016	
Direction Photo Taken: North		
Description: Seep# 57: no water present, downstream.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 86	**Date:** 6/22/2016	
Direction Photo Taken: Close up		
Description: Seep# 58: no water present		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 87	**Date:** 6/22/2016
Direction Photo Taken: North	
Description: Seep# 58: no water present, upstream.	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 88	**Date:** 6/22/2016
Direction Photo Taken: South	
Description: Seep# 58: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	Date: 8-24-2016
Direction Photo Taken: Close up	
Description: Seep #8: water present, seep sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	Date: 8-24-2016
Direction Photo Taken: Close up	
Description: Seep #8: water present, seep sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 3	Date: 8-24-2016
Direction Photo Taken: West	
Description: Seep #8: water present, seep sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 4	Date: 8-24-2016
Direction Photo Taken: North	
Description: Seep #9: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 5	Date: 8-24-2016
Direction Photo Taken: Close up	
Description: Seep #9: no water present.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 6	Date: 8-24-2016
Direction Photo Taken: East	
Description: Seep #9: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 7	Date: 8-24-2016
Direction Photo Taken: Close up	
Description: Seep #10: no water present.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 8	Date: 8-24-2016
Direction Photo Taken: East	
Description: Seep #10: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 9	Date: 8-24-2016
Direction Photo Taken: West	
Description: Seep #10: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 10	Date: 8-24-2016
Direction Photo Taken: Close up	
Description: Seep #11: no water present.	

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **11**	**Date:** 8-24-2016	
Direction Photo Taken: West		
Description: Seep #11: no water present, upstream.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **12**	**Date:** 8-24-2016	
Direction Photo Taken: East		
Description: Seep #11: no water present, downstream.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. 13	**Date:** 8-29-2016	
Direction Photo Taken: Close up		
Description: Seep #24: water present, seep sampled.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. 14	**Date:** 8-29-2016	
Direction Photo Taken: Close up		
Description: Seep #24: water present, seep sampled.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 15	Date: 8-29-2016
Direction Photo Taken: Close up	
Description: Seep #24: water present, seep sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 16	Date: 8-31-2016
Direction Photo Taken: West	
Description: Seep #35: not enough water present.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 17	Date: 8-31-2016
Direction Photo Taken: East	
Description: Seep #35: not enough water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 18	Date: 8-31-2016
Direction Photo Taken: Close up	
Description: Seep #35: not enough water present, downstream. Stick shows depth of water, ~0.5 inches.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 19	Date: 8-31-2016	
Direction Photo Taken: Close up		
Description: Seep #36: no water present.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 20	Date: 8-31-2016	
Direction Photo Taken: Northwest		
Description: Seep #36: no water present, upstream.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 21	Date: 8-31-2016
Direction Photo Taken: East	
Description: Seep #36: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 22	Date: 8-31-2016
Direction Photo Taken: West	
Description: Seep #37: no water present.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 23	Date: 8-31-2016

Direction Photo Taken:

Close up

Description:

Seep #37: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 24	Date: 8-31-2016

Direction Photo Taken:

West

Description:

Seep #37: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 25	Date: 8-31-2016	
Direction Photo Taken: Close up		
Description: Seep #39: no water present, upstream.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 26	Date: 8-31-2016	
Direction Photo Taken: Close up		
Description: Seep #39: no water present.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 27	Date: 8-31-2016

Direction Photo Taken:

Southeast

Description:

Seep #39: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 28	Date: 8-31-2016

Direction Photo Taken:

East

Description:

Seep #40: not enough water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 29	Date: 8-31-2016
Direction Photo Taken: Close up	
Description: Seep #40: not enough water present.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 30	Date: 8-31-2016
Direction Photo Taken: Close up	
Description: Seep #40: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
31	8-31-2016

Direction Photo Taken:

East

Description:

Seep #41: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
32	8-31-2016

Direction Photo Taken:

West

Description:

Seep #41: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 33	Date: 8-31-2016	
Direction Photo Taken: West		
Description: Seep #41: no water present.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 34	Date: 8-29-2016	
Direction Photo Taken: Close up		
Description: Seep #43: water present, seep sampled.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **35**	**Date:** 8-29-2016
Direction Photo Taken: Close up	
Description: Seep #43: water present, seep sampled.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **36**	**Date:** 8-30-2016
Direction Photo Taken: Close up	
Description: Seep #47: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 37	Date: 8-30-2016
Direction Photo Taken: East	
Description: Seep #47: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 38	Date: 8-30-2016
Direction Photo Taken: Close up	
Description: Seep #47: no water present.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 39	Date: 8-30-2016

Direction Photo Taken:

Close up

Description:

Seep #48: no water present.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 40	Date: 8-30-2016

Direction Photo Taken:

Close up

Description:

Seep #48: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 41	Date: 8-30-2016

Direction Photo Taken:

Close up

Description:

Seep #48: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 42	Date: 8-30-2016

Direction Photo Taken:

Northeast

Description:

Seep #49: no water present, downstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 43	Date: 8-30-2016

Direction Photo Taken:

West

Description:

Seep #49: no water present, upstream.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 44	Date: 8-30-2016

Direction Photo Taken:

East

Description:

Seep #49: no water present.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 45	Date: 8-30-2016
Direction Photo Taken: Southeast	
Description: Seep #50: no water present, downstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 46	Date: 8-30-2016
Direction Photo Taken: Close up	
Description: Seep #50: no water present, upstream.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **47**	**Date:** 8-30-2016
Direction Photo Taken: Close up	
Description: Seep #50: no water present.	

Surface Sampling

Dry Season

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 1	**Date:** 06/28/2016
Direction Photo Taken:	
Description: SW1, Downstream. Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 2	**Date:** 06/28/2016
Direction Photo Taken:	
Description: SW1 Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 3	Date: 06/28/2016
Direction Photo Taken:	
Description: SW1, Upstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 4	Date: 06/28/2016
Direction Photo Taken:	
Description: SW2 Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 5	Date: 06/28/2016
Direction Photo Taken:	
Description: SW2, Upstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 6	Date: 06/28/2016
Direction Photo Taken:	
Description: SW2, Downstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
7	06/28/2016

Direction Photo Taken:

Description:

SW3
Dry Season.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
8	06/28/2016

Direction Photo Taken:

Description:

SW3, Upstream
Dry Season.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 9	Date: 06/28/2016
Direction Photo Taken:	
Description: SW3, Downstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 10	Date: 06/27/2016
Direction Photo Taken:	
Description: SW4 Dry Season.	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **11**	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW4, Downstream Dry Season.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **12**	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW4, Upstream Dry Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 13	Date: 06/27/2016	
Direction Photo Taken:		
Description: SW5 Dry Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 14	Date: 06/27/2016	
Direction Photo Taken:		
Description: SW5, Downstream Dry Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 15	Date: 06/27/2016
Direction Photo Taken:	
Description: SW5, Upstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 16	Date: 06/27/2016
Direction Photo Taken:	
Description: SW6 Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 17	Date: 06/27/2016
Direction Photo Taken:	
Description: SW6, Upstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 18	Date: 06/27/2016
Direction Photo Taken:	
Description: SW6, Downstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 19	Date: 06/27/2016
Direction Photo Taken:	
Description: SW7 Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 20	Date: 06/27/2016
Direction Photo Taken:	
Description: SW7, Upstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 21	Date: 06/27/2016
Direction Photo Taken:	
Description: SW7, Downstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 22	Date: 06/28/2016
Direction Photo Taken:	
Description: SW8 Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 23	Date: 06/28/2016	
Direction Photo Taken:		
Description: SW8, Upstream Dry Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 24	Date: 06/28/2016	
Direction Photo Taken:		
Description: SW8, Downstream Dry Season.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 25	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW9 Dry Season.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 26	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW9, Upstream Dry Season.		

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		
Photo No. **27**	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW9, Downstream Dry Season.		

PHOTOGRAPHIC DOCUMENTATION CLOSED CASTNER FIRING RANGE		

Photo No. **28**	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW10 Dry Season.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 29	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW10, Upstream Dry Season.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. 30	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW10, Downstream Dry Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 31	Date: 06/27/2016
Direction Photo Taken:	
Description: SW11 Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 32	Date: 06/27/2016
Direction Photo Taken:	
Description: SW11, Upstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 33	Date: 06/27/2016
Direction Photo Taken:	
Description: SW11, Downstream Dry Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 34	Date: 06/27/2016
Direction Photo Taken:	
Description: SW12 Dry Season.	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **35**	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW12, Upstream Dry Season.		

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **36**	**Date:** 06/27/2016	
Direction Photo Taken:		
Description: SW12, Downstream Dry Season.		

Surface Sampling

Wet Season

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
37	8-25-2016

Direction Photo Taken:

Description:

SW-1, Upstream
Wet Season.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
38	8-25-2016

Direction Photo Taken:

Description:

SW-1, Downstream
Wet Season.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 39	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-1 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 40	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-2, Downstream Wet Season.	

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **41**	**Date:** 8-25-2016	
Direction Photo Taken:		
Description: SW-2 Wet Season.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **42**	**Date:** 8-25-2016	
Direction Photo Taken:		
Description: SW-2, Upstream Wet Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **43**	**Date:** 8-25-2016
Direction Photo Taken:	
Description: SW-3, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. **44**	**Date:** 8-25-2016
Direction Photo Taken:	
Description: SW-3, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 45	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-3 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 46	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-4 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 47	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-4, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 48	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-4, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 49	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-5, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 50	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-5 Wet Season.	

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **51**	**Date:** 8-26-2016	
Direction Photo Taken:		
Description: SW-5, Upstream Wet Season.		

		PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**
Photo No. **52**	**Date:** 8-26-2016	
Direction Photo Taken:		
Description: SW-6, Downstream Wet Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 53	Date: 8-26-2016
Direction Photo Taken:	
Description: SW-6, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 54	Date: 8-26-2016
Direction Photo Taken:	
Description: SW-6 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 55	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-7, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 56	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-7, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 57	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-7 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 58	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-8, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 59	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-8 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 60	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-8, Downstream Wet Season.	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **61**	**Date:** 8-25-2016
Direction Photo Taken:	
Description: SW-9, Downstream Wet Season.	

	PHOTOGRAPHIC DOCUMENTATION **CLOSED CASTNER FIRING RANGE**

Photo No. **62**	**Date:** 8-25-2016
Direction Photo Taken:	
Description: SW-9, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 63	Date: 8-25-2016	
Direction Photo Taken:		
Description: SW-9 Wet Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 64	Date: 8-24-2016	
Direction Photo Taken:		
Description: SW-10, Upstream Wet Season.		

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 65	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-10 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 66	Date: 8-24-2016
Direction Photo Taken:	
Description: SW-10, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 67	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-11 Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 68	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-11, Upstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 69	Date: 8-25-2016
Direction Photo Taken:	
Description: SW-11, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 70	Date: 8-26-2016
Direction Photo Taken:	
Description: SW-12, Downstream Wet Season.	

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 71	Date: 8-26-2016

Direction Photo Taken:

Description:

SW-12
Wet Season.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No. 72	Date: 8-26-2016

Direction Photo Taken:

Description:

SW-12, Upstream
Wet Season.

Surface Sediment Sampling

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
1	5/10/2016

Direction Photo Taken:

Close up

Description:

Sediment sampling using a disposable plastic scoop.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
2	5/11/2016

Direction Photo Taken:

Close up

Description:

A number of samples were collected at 2 depths, 0-6 and 12-18 inches.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
3	5/9/2016

Direction Photo Taken:

Close up

Description:

Field duplicates and Quality Assurance samples were taken every 10 samples.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
4	

Direction Photo Taken:

Close up

Description:

A number of samples were collected at 2 depths, 0-6 and 12-18 inches.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
5	5/12/2016

Direction Photo Taken:

Close up

Description:

Surface Sediment Sampling at a depth of 0-6 inches.

PHOTOGRAPHIC DOCUMENTATION
CLOSED CASTNER FIRING RANGE

Photo No.	Date:
6	5/12/2016

Direction Photo Taken:

Close up

Description:

Surface Sediment Sampling at a depth of 0-6 inches.

APPENDIX I

DD FORM 1348-1A

PIKA – ARCADIS, JV, LLC

12723 Capricorn Drive, Suite 500, Stafford, TX 77477

Date: 13 June 2016

To: Rick McCoskey, TRI State Metals, 1725 E. 9th Street, Texarkana, AR 71854

Subject: One 55 Gallon Steel Drum with 300 lbs. of Material Documented as Safe (MDAS), Mixed Metal, Serial Number: Closed Castner Firing Range / PIKA – ARCADIS JV / 0001 / 798835

Mr. McCoskey on receipt and after the material has been properly recycled as listed below please sign, date and send a copy of this document back to the PIKA – ARCADIS JV at the address provided above attention: Aakash Gupta.

To: PIKA – ARCADIS, JV, LLC, 12723 Capricorn Drive, Suite 500, Stafford, TX 77477

RE: Receipt of MDAS

I certify that the contents of the subject 55 gallon drum of 100% inspected MDAS, serial number: Closed Castner Firing Range / PIKA – ARCADIS JV / 0001 / 798835 received on Date: 6 / 17, 2016 was further inspected by me to verify that the drum was still sealed with seal number 798835 when it arrived and that there was no explosive hazard before acceptance it into my facility. This material will not be sold, traded or otherwise given to another party until the entire contents have been smelted or shredded and are only identifiable by their basic content.

Name of Recycler: TRI State Metals

Address: 1725 E. 9th Street, Texarkana, AR 71854

Phone No.: 870-773-8409

Printed Name of receiver: Rick McCloskey

Signature: R McCloskey

Date material was smelted or shredded: 6/20/16

Printed name: Rick McCloskey

Signature: Rick McCloskey

CLEAR

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1. TOTAL PRICE	
2. SHIP FROM	PIKA - ARCADIS, JV
3. SHIP TO	TRI State Metals
4. MARK FOR	Rick McCoskey
5. DOC DATE	20160613
6. NMFC	
7. FRT RATE	
8. TYPE CARGO	
9. PS	
10. QTY. REC'D	1
11. UP	
12. UNIT WEIGHT	300.00
13. UNIT CUBE	55 gal drum
14. UFC	
15. SL	
16. FREIGHT CLASSIFICATION NOMENCLATURE	
17. ITEM NOMENCLATURE	Material Documented as Safe (MDAS) Mixed Metal
18. TY CONT	Drum
19. NO CONT	1
20. TOTAL WEIGHT	300 lb
21. TOTAL CUBE	55 gal drum
22. RECEIVED BY	Rick McCoskey
23. DATE RECEIVED	

1 2 3 4 5 6 7 23 24 25 26 27 28 29 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

DOC IDEN | RI FROM | M & S | UI | NSLT | QUANTITY | SER | SUPPLEMENTARY ADDRESS | SIG | FUND | DISTRIBUTION | PROJECT | PRI | REQD DEL DATE | ADV | RI | O/P | COND | MGT | UNIT PRICE DOLLARS CTS | TOTAL PRICE DOLLARS CTS

24. DOCUMENT NUMBER & SUFFIX (30-44)

FM: PIKA - ARCADIS, JV, LLC, 12723 Capricorn Drive, Suite 500, Stafford, TX 77477 / 817-877-9978 / 102 - Mike Madl

TO: TRI State Metals, 1725 E. 9th Street, Texarkana, AR 71854

25. NATIONAL STOCK NO. & ADD (8-22)

Container Serial # and Drum weight:

Closed Castner Firing Range/PIKA - ARCADIS JV/0001/798835
Drum 0001 Est Wt. = 300 lb

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

Drum 0001 contains 300 lbs. of Material Documented as Safe (MDAS) Mixed Metal, recovered during field operations while conducting Military Munitions Response e.g. Remedial Investigation at the Closed Castner Firing Range at Ft Bliss, El Paso TX.

Drum 0001 Serial # 798835.

27. ADDITIONAL DATA

"This certifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief are inert and/or free of explosive or related materials."

Drum 0001 contains "Non - Hazardous Metal Waste"

Certifier: 760-888-7400
Greg Peterson SUXOS: ____ Date: 6/13/16

Verifier: 719-306-2043
Neil Roulier, UXOQC: ____ Date: 6/13/16

PREVIOUS EDITION MAY BE USED

FormFlow (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1. TOTAL PRICE	
2. SHIP FROM	PIKA - ARCADIS, JV
3. SHIP TO	TRI State Metals
4. MARK FOR	Rick McCoskey
5. DOC DATE	20160613
6. NMFC	
7. FRT RATE	
8. TYPE CARGO	
9. PS	
10. QTY. REC'D	1
11. UP	
12. UNIT WEIGHT	300.00
13. UNIT CUBE	55 gal drum
14. UFC	
15. SL	
16. FREIGHT CLASSIFICATION NOMENCLATURE	
17. ITEM NOMENCLATURE	Material Documented as Safe (MDAS) Mixed Metal
18. TY CONT	Drum
19. NO CONT	1
20. TOTAL WEIGHT	300 lb
21. TOTAL CUBE	55 gal drum
22. RECEIVED BY	Rick McCoskey
23. DATE RECEIVED	

1 2 3 4 5 6 7 23 24 25 26 27 28 29 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

DOC IDEN | RI FROM | M & S | UI | NSLT | QUANTITY | SER | SUPPLEMENTARY ADDRESS | SIG | FUND | DISTRIBUTION | PROJECT | PRI | REQD DEL DATE | ADV | RI | O/P | COND | MGT | UNIT PRICE DOLLARS CTS | TOTAL PRICE DOLLARS CTS

24. DOCUMENT NUMBER & SUFFIX (30-44)

FM: PIKA - ARCADIS, JV, LLC, 12723 Capricorn Drive, Suite 500, Stafford, TX 77477 / 817-877-9978 / 102 - Mike Madl

TO: TRI State Metals, 1725 E. 9th Street, Texarkana, AR 71854

25. NATIONAL STOCK NO. & ADD (8-22)

Container Serial # and Drum weight:

Closed Castner Firing Range/PIKA - ARCADIS JV/0001/798835
Drum 0001 Est Wt. = 300 lb

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

Drum 0001 contains 300 lbs. of Material Documented as Safe (MDAS) Mixed Metal, recovered during field operations while conducting Military Munitions Response e.g. Remedial Investigation at the Closed Castner Firing Range at Ft Bliss, El Paso TX.

Drum 0001 Serial # 798835.

27. ADDITIONAL DATA

"This certifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief are inert and/or free of explosive or related materials."

Drum 0001 contains "Non - Hazardous Metal Waste"

Certifier: 760-888-7400
Greg Peterson SUXOS: ____ Date: 6/13/16

Verifier: 719-306-2043
Neil Roulier, UXOQC: ____ Date: 6/13/16

PREVIOUS EDITION MAY BE USED

FormFlow (DLA)

PIKA INTERNATIONAL, INC. MALCOLM PIRNIE

INSPECTION, CERTIFICATION, AND CHAIN OF CUSTODY FORM-205A

Project Location: **Ft Bliss, Castner Firing Range, El Paso, TX 79904**	Contract No: **W912DY-10-D-0025 Task Order: DS01**		DO No: **0001**	Page _**1**_ of _**1**_

Line	Description	Source (e.g., Grid or Range Identifier)	Container/Serial Number	Container Type	Unit Wt./Vol.
1	**Mixed Metal Munitions Debris (MDAS)**	**Closed Castner Firing Range Ft Bliss, TX**	**Container #1 Seal# XXXXXX**	**55 Gallon Drum**	**300 lbs.**
2	************************************	************************	**Nothing follows**	************	**********
3					
4					
5					
7					

Inspector's certification: "This certifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief are inert and/or free of explosive or related materials."

Printed/typed name: **Gregory Peterson**	Signature: [signature]	Date: **06/13/2016**

Verifier certification: "This certifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief are inert and/or free of explosive or related materials."

Printed/typed name: **Neil Roulier**	Signature: [signature]	Date: **06/13/2016**

Transporter(s)

Transporter 1 acknowledgment of receipt of materials properly sealed/secured.

Printed/typed name: STEVE SANDOVAL	Signature:	Date:

Transporter 2 acknowledgment of receipt of materials properly sealed/secured.

Printed/typed name:	Signature:	Date:

Final Disposition

Facility owner or operator: Certification of receipt of Munitions Debris/Range Residue materials, except as noted above. Acknowledgment of receipt of materials properly sealed/secured.

Printed/typed name: **Rick McCoskey, TRI – State Metals, 1725 E. 9th St, Texarkana, AR 71854 / 903-280-1520**	Signature: R M Closkey	Date: 6/20/16

ORIGIN ID:ELPR (719) 306-2043
NEIL ROULIER
PIKA INTERNATIONAL INC/FT. CASTNER
4315 WOODROW BEAN TRANSMOUNTAIN DR.

EL PASO, TX 79924
UNITED STATES US

SHIP DATE: 14JUN16
ACTWGT: 300.00 LB
CAD: 7200495/INET3730
DIMS: 40x40x40 IN

BILL SENDER
BOOKING#: 00044444

TO RICK MCCLOSKEY
TRI-STATE METALS
1725 E 9TH ST

TEXARKANA AR 71854
(903) 280-1520 REF:
INV:
PO: 1397147 DEPT:

540J2/30BD/727F

FedEx Express

E

FRI - 17 JUN H3
3 DAY FRT

TRK# 0201 7765 1367 0548

B8 SHVR

71854
AR-US SHV

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

TRI-STATE IRON & METAL COMPANY

1725 East 9th Street
Texarkana, AR 71854
(800)773-8409 FAX (870)772-3086

Scale Ticket
Receiving Ticket

Receiving Ticket #:	**144115**
Scale:	Truck Scale - In
Started At:	6/17/2016 11:49:33AM
by Weighmaster:	Crystal Walker
Completed At:	6/17/2016 12:39:09PM
by Weighmaster:	Crystal Walker

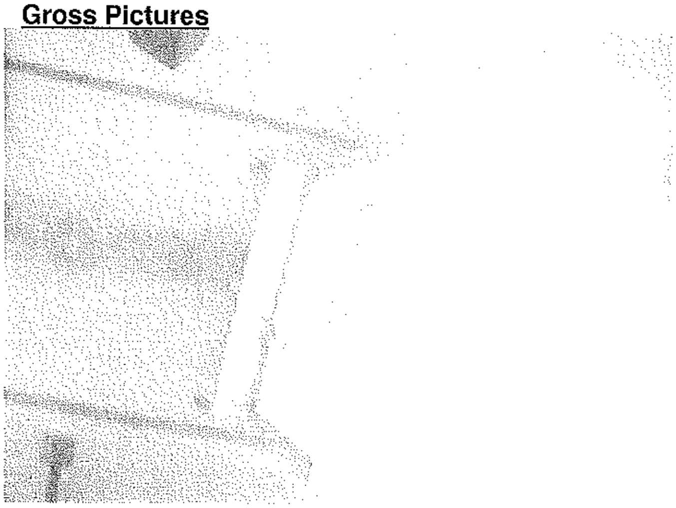
Received From:

Pika International
12723 Capricorn Dr. Ste #500
Stafford, TX 77477

Driver:	fed ex
Account Rep:	**Rick Futrell**
Internal PO:	2878

Item Name		Packaging	Gross (lbs)	Tare (lbs)	Adj (lbs)	Net (lbs)
Light Shreddables			12,300.0	11,820.0	90.00	390.0
Contamination:	Pallet	**90.00** Lbs				

Gross Pictures



Tare Pictures

12,300.0	**11,820.0**		**390.0**

Full Truck Weights (lbs)

Gross:	12,300.0
Tare:	11,820.0
Net:	480.0

Tri-State Iron & Metal Co.
Weigh-in

Deputy ____________________
Crystal Walker

Tri-State Iron & Metal Co.
Complete

Deputy ____________________
Crystal Walker

APPENDIX J

MEC AND MDEH FINDS AND DISPOSITION DOCUMENTATION

Table J-1
MEC and MDEH Finds and Disposition Documentation Log

Report No.	No. of Items	Record #	Category	Transect/Grid Found	Location	Initial Disposition	Final Disposition	Item Name
1	1	CCFR-001	MEC (UXO)	Grid 20	Castner Range	Left in Place with Guard 3/11/2016	Destroyed in original location 3/16/2016	37 mm MK I
2	1	CCFR-002	MEC (DMM)	WAA Lot # 8	Castner Range	Left in Place 4/1/2016	Destroyed in original location 4/1/2016	M19/M19A1 WP Rifle Grenade
3	1	CCFR-003	MEC (DMM)	WAA Lot #9	Castner Range	Left in Place 4/5/2016	Destroyed in original location 4/5/2016	81A1 ATP 40mm Projectile
4	2	CCFR-004	MEC (UXO)	WAA Lot # 2	Castner Range	Left in Place 5/16/2016	Destroyed in original location 5/16/2016	37mm HEI; MK27 PD Fuze
5	1	CCFR-005	MEC (UXO)	Near Lot # 15	Castner Range	Left in Place 5/17/2016	Destroyed in original location 5/17/2016	3-in Stokes HE Mortar*
6	1	CCFR-006	MEC (UXO)	Grid 24	Castner Range	Left in Place 6/3/2016	Destroyed in original location 6/3/2016	M49 Series (A2) 60mm/Fuzed
7**	41	CCFR-007	MDEH	N/A	Castner Range	MPPEH	Consolidated Shot 6/13/2016	37mm TP (24 total) 40 mm TP (5 total) Miscellaneous fuze parts (12 total)

NOTES
* This MEC item was discovered outside of the investigation area, while the UXO teams were transiting between lots. Due to the explosive hazard, the item was destroyed through demolition. However, it is not factored into the investigation results (e.g., the calculations of MEC density in the NCMUA) because it was located outside of the investigation area.
** The seventh and final demolition event was performed on 41 items identified as Material Documented as an Explosive Hazard (MDEH). During the inspection and certification process, these items contained residual tracer material that prevented designation as MDAS. Therefore, they were classified as MDEH and subjected to demolition. After the demolition event, the munitions were inspected, the explosive hazard determined to be removed, and the items certified as MDAS.

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location:	Closed Castner Firing Range, Fort Bliss, El Paso, TX	**Consecutive Record No:**	CCFR-001	**Date:**	3/16/2016
Shot Location:	BIP *(use dropdown menu to select shot type/location)*	**Demolition Supervisor:**	Bruce Freeman	**Federal/State License:**	5-TX-157-33-7J-01046
Type of MEC Destroyed, Vented or Burned:	See Below	**Initiation:**	Electric	**Time of Shot:**	1421
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		**Temperature:**	72	**Wind Speed/Direction:**	NE 8mph
4371 feet to housing on Hondo Road		**Ceiling:**	Unlimited	**Clouds/Sun:**	Clear
Type/Amount of Tamping or Sandbag Mitigation Used:	None	**Material or Other Protection Used:**	3ea 1 gallon water bags to mitigate potential fire		
Seismographic /Sound Level Meter Used:	No	If yes, provide Make and Model No:	N/A	**Readings / Results:**	N/A

DONOR/DEMOLITION MATERIALS USED

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
Perforator 19.5 gram	RDX			1.46	1	ea	0.063	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	5	ft	0.091	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	Lead Azide			0.44	2	ea	0.002					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-
														TOTAL DONOR N.E.W. lbs. (A) =	**0.156**

MPPEH/MEC DESTROYED

Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
37 mm Mk I, LE	Black Powder	0.034	100%	0.43	1	ea	0.015			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
														TOTAL MEC N.E.W. lbs. (B) =	**0.015**

		TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =	**0.171**
		K328 Blast Overpressure Distance (feet) for Shot =	183
MGFD for Site/Shot:	37 mm Mk I, LE	MFD-H (in feet) for MGFD =	838
		Is K328 Distance for Consolidated Shot < MFD-H of MGFD?	YES/ACCEPTABLE

Certification:

I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor		Demolition Technician	
Printed Name:	Bruce Freeman	Printed Name:	Dave Guenthner
Signature:		Signature:	
Senior UXO Supervisor		**Bar Code (if applicable)**	
Printed Name:	Greg Peterson		
Signature:			

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location:	Closed Castner Firing Range, Fort Bliss, El Paso, TX	**Consecutive Record No:**	CCFR-002	**Date:**	4/1/2016
Shot Location:	BIP *(use dropdown menu to select shot type/location)*	**Demolition Supervisor:**	Steve Racich	**Federal/State License:**	5-TX-157-33-7J-01046
Type of MEC Destroyed, Vented or Burned:	See Below	**Initiation:**	Electric	**Time of Shot:**	1622
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		**Temperature:**	82	**Wind Speed/Direction:**	8-12 SSW
500 yards NE of Office Area; Utility 150 yards; Hwy 700 yards		**Ceiling:**	Unlimited	**Clouds/Sun:**	30%
Type/Amount of Tamping or Sandbag Mitigation Used:	None	**Material or Other Protection Used:**	None		
Seismographic /Sound Level Meter Used:	No	If yes, provide Make and Model No:	N/A	**Readings / Results:**	N/A

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
DONOR/DEMOLITION MATERIALS USED															
Perforator 19.5 gram	RDX			1.46	2	ea	0.126	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	6	ft	0.109	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	PETN			1.27	2	ea	0.005					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-
														TOTAL DONOR N.E.W. lbs. (A) =	**0.239**
MPPEH/MEC DESTROYED															
Grenade, Rifle Smoke WP M19/19A1	Multiple	0.059	100%	1.00	1	ea	0.059			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
														TOTAL MEC N.E.W. lbs. (B) =	**0.059**
														TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =	**0.298**
														K328 Blast Overpressure Distance (feet) for Shot =	220
MGFD for Site/Shot:	Grenade, Rifle Smoke WP M19/19A1													MFD-H (in feet) for MGFD =	390
														Is K328 Distance for Consolidated Shot < MFD-H of MGFD?	YES/ACCEPTABLE

Certification:
I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor		Demolition Technician	
Printed Name:	Steve Racich	Printed Name:	Dave Guenther
Signature:		Signature:	
Senior UXO Supervisor		**Bar Code (if applicable)**	
Printed Name:	Greg Peterson		
Signature:			

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location:	Closed Castner Firing Range, Fort Bliss, El Paso, TX	**Consecutive Record No:**	CCFR-003	**Date:**	4/5/2016
Shot Location:	BIP *(use dropdown menu to select shot type/location)*	**Demolition Supervisor:**	Steve Racich	**Federal/State License:**	5-TX-157-33-7J-01046
Type of MEC Destroyed, Vented or Burned:	See Below	**Initiation:**	Electric	**Time of Shot:**	1645
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		**Temperature:**	85	**Wind Speed/Direction:**	8-12 SSW
1350 ft from HWY 54, 3000 ft. from HWY 375		**Ceiling:**	Unlimited	**Clouds/Sun:**	0%
Type/Amount of Tamping or Sandbag Mitigation Used:	None	**Material or Other Protection Used:**	None		
Seismographic /Sound Level Meter Used:	No	If yes, provide Make and Model No:	N/A	**Readings / Results:**	N/A

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
DONOR/DEMOLITION MATERIALS USED															
Perforator 19.5 gram	RDX			1.46	1	ea	0.063	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	6	ft	0.109	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	PETN			1.27	2	ea	0.005					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-
												TOTAL DONOR N.E.W. lbs. (A) =			**0.177**
MPPEH/MEC DESTROYED															
40mm 81A1 APT Projectile	Black Powder	0.066	100%	0.43	1	ea	0.028			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
												TOTAL MEC N.E.W. lbs. (B) =			**0.028**
												TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =			**0.205**
												K328 Blast Overpressure Distance (feet) for Shot =			194
MGFD for Site/Shot:	40mm 81A1 APT Projectile											MFD-H (in feet) for MGFD =			390
												Is K328 Distance for Consolidated Shot < MFD-H of MGFD?			YES/ACCEPTABLE

Certification:
I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor		Demolition Technician	
Printed Name:	Steve Racich	Printed Name:	Dave Guenthner
Signature:		Signature:	
Senior UXO Supervisor		**Bar Code (if applicable)**	
Printed Name:	Greg Peterson		
Signature:			

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location:	Closed Castner Firing Range, Fort Bliss, El Paso, TX	**Consecutive Record No:**	CCFR-004
Shot Location:	BIP *(use dropdown menu to select shot type/location)*	**Demolition Supervisor:**	Steve Racich
Type of MEC Destroyed, Vented or Burned:	See Below	**Initiation:**	Electric
Direction and Distance to Nearest Building, Road, Utility Line, etc.:	LOT #2 near point 391	**Temperature:**	85
		Ceiling:	Unlimited
Type/Amount of Tamping or Sandbag Mitigation Used:	None	**Material or Other Protection Used:**	None
Seismographic /Sound Level Meter Used:	No	If yes, provide Make and Model No:	N/A

Date:	5/16/2016
Federal/State License:	5-TX-157-33-7J-01046
Time of Shot:	1612
Wind Speed/Direction:	8-12 SSW
Clouds/Sun:	0%
Readings / Results:	N/A

DONOR/DEMOLITION MATERIALS USED

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
Perforator 19.5 gram	RDX			1.46	2	ea	0.126	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	10	ft	0.181	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	PETN			1.27	2	ea	0.005					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-

TOTAL DONOR N.E.W. lbs. (A) = 0.312

MPPEH/MEC DESTROYED

Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
37mm HEI	TNT	0.100	100%	1.00	1	ea	0.100			0.000	100%	0.00		ea	-
MK 27 PDSQ	Tetrytol	0.050	100%	1.06	1	ea	0.053			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-

TOTAL MEC N.E.W. lbs. (B) =	0.153
TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =	0.465
K328 Blast Overpressure Distance (feet) for Shot =	255
MFD-H (in feet) for MGFD =	390
Is K328 Distance for Consolidated Shot < MFD-H of MGFD?	YES/ACCEPTABLE

MGFD for Site/Shot: 37mm HEI

Certification:

I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor	Demolition Technician
Printed Name: Steve Racich	Printed Name: Dave Guenthner
Signature:	Signature:
Senior UXO Supervisor	**Bar Code (if applicable)**
Printed Name: Greg Peterson	
Signature:	

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location: Closed Castner Firing Range, Fort Bliss, El Paso, TX		**Consecutive Record No:**	CCFR-005	**Date:**	5/17/2016
Shot Location: BIP *(use dropdown menu to select shot type location)*		**Demolition Supervisor:**	Steve Racich	**Federal/State License:**	5-TX-157-33-7J-01046
Type of MEC Destroyed, Vented or Burned: See Below		**Initiation:**	Electric	**Time of Shot:**	1047
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		**Temperature:**	85	**Wind Speed/Direction:**	8-12 SSW
.5 miles from Transmountain Hwy. Near water holding area		**Ceiling:**	Unlimited	**Clouds/Sun:**	5%
Type/Amount of Tamping or Sandbag Mitigation Used: None		**Material or Other Protection Used:**	None		
Seismographic /Sound Level Meter Used: No	If yes, provide Make and Model No: N/A			**Readings / Results:**	N/A

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
DONOR/DEMOLITION MATERIALS USED															
Perforator 19.5 gram	RDX			1.46	2	ea	0.126	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	10	ft	0.181	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	PETN			1.27	2	ea	0.005					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-
												TOTAL DONOR N.E.W. lbs. (A) =			**0.312**
MPPEH/MEC DESTROYED															
3 inch Stokes HE	TNT	2.150	100%	1.00	1	ea	2.150			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
												TOTAL MEC N.E.W. lbs. (B) =			**2.150**
								TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =							**2.462**
								K328 Blast Overpressure Distance (feet) for Shot =							443
MGFD for Site/Shot:	3 inch Stokes HE							MFD-H (in feet) for MGFD =							1,379
								Is K328 Distance for Consolidated Shot < MFD-H of MGFD?							YES/ACCEPTABLE

Certification:

I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor
Printed Name: Steve Racich
Signature:

Demolition Technician
Printed Name: Dave Guenthner
Signature:

Senior UXO Supervisor
Printed Name: Greg Peterson
Signature:

Bar Code (if applicable)

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location:	Closed Castner Firing Range, Fort Bliss, El Paso, TX	**Consecutive Record No:**	CCFR-006	**Date:**	6/3/2016
Shot Location:	BIP *(use dropdown menu to select shot type/location)*	**Demolition Supervisor:**	Steve Racich	**Federal/State License:**	5-TX-157-33-7J-01046
Type of MEC Destroyed, Vented or Burned:	See Below	**Initiation:**	Electric	**Time of Shot:**	1525
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		**Temperature:**	91	**Wind Speed/Direction:**	1-5/west
1225 meters west from 375 Transmountain Hwy		**Ceiling:**	Unlimited	**Clouds/Sun:**	Clear
Type/Amount of Tamping or Sandbag Mitigation Used:	sand bags 6ea for roadside mitigation	**Material or Other Protection Used:**	None		
Seismographic /Sound Level Meter Used:	No	If yes, provide Make and Model No:	N/A	**Readings / Results:**	N/A

DONOR/DEMOLITION MATERIALS USED

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
Perforator 19.5 gram	RDX			1.46	1	ea	0.063	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	63	ft	1.143	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	PETN			1.27	2	ea	0.005					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-
														TOTAL DONOR N.E.W. lbs. (A) =	**1.211**

MPPEH/MEC DESTROYED

Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
60mm M49 series (A2)	TNT	0.340	100%	1.00	1	ea	0.340			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
														TOTAL MEC N.E.W. lbs. (B) =	**0.340**

	TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =	**1.551**
	K328 Blast Overpressure Distance (feet) for Shot =	380
MGFD for Site/Shot: 60mm M49 series (A2)	MFD-H (in feet) for MGFD =	1,379
	Is K328 Distance for Consolidated Shot < MFD-H of MGFD?	YES/ACCEPTABLE

Certification:

I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor Printed Name: Steve Racich Signature:	Demolition Technician Printed Name: Dave Gu[illegible] Signature:
Senior UXO Supervisor Printed Name: Greg F[illegible] Signature:	**Bar Code (if applicable)**

DEMOLITION SHOT RECORD FORM-205B

Site Name/Location:	Closed Castner Firing Range, Fort Bliss, El Paso, TX	**Consecutive Record No:**	CCFR-007	**Date:**	6/13/2016
Shot Location:	Consolidated *(use dropdown menu to select shot type/location)*	**Demolition Supervisor:**	Neil Roulier	**Federal/State License:**	5-TX-157-33-7J-01046
Type of MEC Destroyed, Vented or Burned:	See Below	**Initiation:**	Electric	**Time of Shot:**	1700
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		**Temperature:**	95	**Wind Speed/Direction:**	1-5 W/SW
No Buildings withing 1500 feet of the demo area		**Ceiling:**	NONE	**Clouds/Sun:**	Clear
Type/Amount of Tamping or Sandbag Mitigation Used:	None	**Material or Other Protection Used:**	None		
Seismographic /Sound Level Meter Used:	No	If yes, provide Make and Model No:	N/A	**Readings / Results:**	N/A

DONOR/DEMOLITION MATERIALS USED

Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type (use dropdown menu)	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
Perforator 19.5 gram	RDX			1.46	41	ea	2.574	Booster 150 gram				0.00		ea	-
Perforator 21-21.5 gram				0.00		ea	-	Booster 200 gram				0.00		ea	-
Perforator 23-25 gram				0.00		ea	-	Booster 350 gram				0.00		ea	-
Det Cord 25 grain				0.00		ft	-	Booster 450 gram				0.00		ea	-
Det Cord 50 grain				0.00		ft	-	Booster 1/3 lb				0.00		ea	-
Det Cord 80 grain				0.00		ft	-	Booster 1/2 lb				0.00		ea	-
Det Cord 100 grain	PETN			1.27	700	ft	12.702	Booster 3/4 lb				0.00		ea	-
Det Cord 200 grain				0.00		ft	-	Booster 1 lb				0.00		ea	-
Electric Detonator/Cap	PETN			1.27	13	ea	0.028					0.00			-
Daveyfire, Electric Igniter (Squib)				0.00		ea	-					0.00			-
Helix (Activator + Nitromethane)				0.00		gal	-					0.00			-
Smokeless Powder				0.00		lb	-					0.00			-
														TOTAL DONOR N.E.W. lbs. (A) =	**15.304**

MPPEH/MEC DESTROYED

Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.	Description	Explosive Type	Explosive Wt (lbs)	% Fill	TNT Eq. Wt. (Pressure)	Qnty	Unit	NEW lbs.
37 mm TP		0.000	100%	0.00	24	ea	-			0.000	100%	0.00		ea	-
40 mm TP		0.000	100%	0.00	5	ea	-			0.000	100%	0.00		ea	-
Misc. Fuze Parts		0.000	100%	0.00	12	ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
		0.000	100%	0.00		ea	-			0.000	100%	0.00		ea	-
														TOTAL MEC N.E.W. lbs. (B) =	**-**

TOTAL SHOT N.E.W. lbs. = Donor Charge + MEC = (A) + (B) =	**15.304**
K328 Blast Overpressure Distance (feet) for Shot =	815
MGFD for Site/Shot: MFD-H (in feet) for MGFD =	1,379
Is K328 Distance for Consolidated Shot < MFD-H of MGFD?	YES/ACCEPTABLE

Certification:

I certify that the explosives listed were used for their intended purpose, and that the MEC listed were rendered inert/destroyed.

Demolition Supervisor		Demolition Technician	
Printed Name:	Neil Roulier	Printed Name:	Dan Hains
Signature:	*Neil Roulier*	Signature:	*Dan Hains*
Senior UXO Supervisor		**Bar Code (if applicable)**	
Printed Name:	Greg Peterson		
Signature:	*Greg Peterson*		

APPENDIX K
BORING LOGS

PIKA ARCADIS	Boring ID: DG070-SB-01 Permit No.: NA	**Project Name: Closed Castner Firing Range** **Site Address: El Paso, Texas** **Project No. 06261038.0001**

Drilling Co. **Yellow Jacket** Logged By: **Isaac Castro**

Drilling Crew: **Steve, Mitch, Daniel** PID: **N/A** Calibration Gas/Conc: **N/A**

Drilling Method: **Hollow Stem Auger** Drill Bit and Size: **6"** Borehole Diam: **6"**

Total Depth Drilled (ft bgs): **7'**

Begin Date: **2/7/2017**

End Date: **2/7/2017**

Description of Boring Location: Within south Castner Range parallel to Highway 54

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0		50		**FTBL-SB01-0-0.5-020717**			NA	
				FTBL-SB01-0.5-2-020717			NA	Silty SAND with gravel and cobbles, slight moisture, brown
		50					NA	
		75			SM		NA	Silty SAND with gravel and cobbles, slight moisture, light brown
							NA	
5		75		**FTBL-SB-01-4-6-020717**			NA	
							NA	
							NA	
								Auger refusal at 7 ft.
10								
15								
20								
25								
30								

STATE OF TEXAS
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GEOLOGY
10850
LICENSED
PROFESSIONAL GEOSCIENTIST

Notes: Registered Geologist Reviewing Logs: Garett Ferguson #10850

Depth in feet below ground surface (bgs)

Geotechnical Bulk sample collected from 0-2 interval for Tier 2 PCL calculations

PIKA ARCADIS	Boring ID: DG070-SB-01B Permit No.: NA	**Project Name: Closed Castner Firing Range** **Site Address: El Paso, Texas** **Project No. 06261038.0001**

Drilling Co. **Yellow Jacket** Logged By: **Isaac Castro**
Drilling Crew: **Steve, Mitch, Daniel** PID: **N/A** Calibration Gas/Conc: **N/A**
Drilling Method: **Hollow Stem Auger** Drill Bit and Size: **6"** Borehole Diam: **6"**
Total Depth Drilled (ft bgs): **7'**
Begin Date: **2/7/2017**
End Date: **2/7/2017**
Description of Boring Location: Within south Castner Range parallel to Highway 54

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0		75						
							NA	Silty SAND with gravel and cobbles, slight moisture, brown
		50		No Samples Collected			NA	
		50			SM		NA	Silty SAND with gravel and cobbles, slight moisture, light brown
							NA	
5		50					NA	
								Auger refusal at 5 ft.
10								
15								
20								
25								
30								

Notes:
Depth in feet below ground surface (bgs)

Registered Geologist Reviewing Logs: Garett Ferguson #10850

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PIKA ARCADIS

Boring ID: DG070-SB-01C Permit No.: NA		**Project Name: Closed Castner Firing Range** **Site Address: El Paso, Texas** **Project No. 06261038.0001**

Drilling Co. **Yellow Jacket** | Logged By: **Isaac Castro**

Drilling Crew: **Steve, Mitch, Daniel** | PID: **N/A** | Calibration Gas/Conc: **N/A**

Drilling Method: **Hollow Stem Auger** | Drill Bit and Size: **6"** | Borehole Diam: **6"**

Total Depth Drilled (ft bgs): **7'**

Begin Date: **2/7/2017**

End Date: **2/7/2017**

Description of Boring Location: Within south Castner Range parallel to Highway 54

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0		50						
							NA	Silty SAND with gravel and cobbles, slight moisture, brown
		75		No Samples Collected	SM		NA	
		50					NA	Silty SAND with gravel and cobbles, slight moisture, light brown
							NA	
5		50						
								Auger refusal at 4.5 ft.
10								
15								
20								
25								
30								

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Notes:
Depth in feet below ground surface (bgs)

Registered Geologist Reviewing Logs: Garett Ferguson #10850

PIKA ARCADIS

Boring ID: DG070-SB-01D

Permit No.: NA

Project Name: Closed Castner Firing Range
Site Address: El Paso, Texas
Project No. 06261038.0001

Drilling Co. **Yellow Jacket**	Logged By: **Isaac Castro**	
Drilling Crew: **Steve, Mitch, Daniel**	PID: **N/A**	Calibration Gas/Conc: **N/A**
Drilling Method: **Hollow Stem Auger**	Drill Bit and Size: **6"**	Borehole Diam: **6"**
Total Depth Drilled (ft bgs): **7'**		
Begin Date: **2/7/2017**		
End Date: **2/7/2017**		

Description of Boring Location: Within south Castner Range parallel to Highway 54

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0	-	75		**FTBL-SB01D-0-0.5-020717**			NA	
	-			**FTBL-SB01D-0.5-2-020717**			NA	
	-	75			SM		NA	Silty SAND with gravel and cobbles, slight moisture, brown
	-	50					NA	
	-						NA	
5	-	75		**FTBL-SB-01D-4-6-020717**			NA	
	-							Auger refusal at 5 ft. Split spoon driven to 6 ft.
	-							
	-							
	-							
10	-							
	-							
	-							
	-							
	-							
15	-							
	-							
	-							
	-							
	-							
20	-							
	-							
	-							
	-							
	-							
25	-							
	-							
	-							
	-							
	-							
30	-							

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Notes:
Depth in feet below ground surface (bgs)

Registered Geologist Reviewing Logs: Garett Ferguson #10850

PIKA ARCADIS	Boring ID: CN073-SB-02 Permit No.: NA	**Project Name: Closed Castner Firing Range** **Site Address: El Paso, Texas** **Project No. 06261038.0001**

Drilling Co. **Yellow Jacket**	Logged By: **Isaac Castro**		
Drilling Crew: **Steve, Mitch, Daniel**	PID: **N/A**	Calibration Gas/Conc: **N/A**	
Drilling Method: **Hollow Stem Auger**	Drill Bit and Size: **6"**	Borehole Diam: **6"**	
Total Depth Drilled (ft bgs): **7'**			
Begin Date: **2/8/2017**			
End Date: **2/8/2017**			

Description of Boring Location: Within south Castner Range parallel to Highway 54

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0		50		**FTBL-SB01-0-0.5-020817**			NA	
				FTBL-SB01-0.5-2-020817			NA	Silty SAND with gravel and cobbles, slight moisture, brown
		50					NA	
		75			SM		NA	Silty SAND with gravel and cobbles, slight moisture, light brown
							NA	
5		75		**FTBL-SB-01-4-5.5-020817**			NA	
							~~NA~~	
								Auger refusal at 5.5 ft.
10								
15								
20								
25								
30								

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Notes:	Registered Geologist Reviewing Logs: Garett Ferguson #10850
Depth in feet below ground surface (bgs)	

PIKA ARCADIS	Boring ID: CN073-SB-02B Permit No.: NA	**Project Name: Closed Castner Firing Range** **Site Address: El Paso, Texas** **Project No. 06261038.0001**

Drilling Co. **Yellow Jacket**	Logged By: **Isaac Castro**	
Drilling Crew: **Steve, Mitch, Daniel**	PID: **N/A**	Calibration Gas/Conc: **N/A**
Drilling Method: **Hollow Stem Auger**	Drill Bit and Size: **6"**	Borehole Diam: **6"**
Total Depth Drilled (ft bgs): **7'**		
Begin Date: **2/8/2017**		
End Date: **2/8/2017**		

Description of Boring Location: Within south Castner Range parallel to Highway 54

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0		50					NA	
							NA	Silty SAND with gravel and cobbles, slight moisture, brown
		50		No Samples Collected	SM		NA	
		75					NA	Silty SAND with gravel and cobbles, slight moisture, light brown
							NA	
5								Auger refusal at 4 ft.
10								
15								
20								
25								
30								

Notes:
Depth in feet below ground surface (bgs)

Registered Geologist Reviewing Logs: Garett Ferguson #10850

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PIKA ARCADIS	Boring ID: BF052-SB-03 Permit No.: NA	**Project Name: Closed Castner Firing Range** **Site Address: El Paso, Texas** **Project No. 06261038.0001**

Drilling Co. **Yellow Jacket** Logged By: **Isaac Castro**

Drilling Crew: **Steve, Mitch, Daniel** PID: **N/A** Calibration Gas/Conc: **N/A**

Drilling Method: **Hollow Stem Auger** Drill Bit and Size: **6"** Borehole Diam: 6"

Total Depth Drilled (ft bgs): **30'**

Begin Date: **2/8/2017**

End Date: **2/9/2017**

Description of Boring Location: Within north Castner Range northwest of the City of El Paso Archeological Museum.

Depth	Drive Interval	Recovery %	Sample Int.	Sample ID	Time	Blows/ft	OVA	USCS Class	USCS Symbol	Well Const.	Description: Major Material, Density/Consistency, Color, Moisture, Additional Descriptions
0		75		FTBL-SB-03-0-2-020817							
		75						SM		NA	Silty sand with gravel, some moisture, brown
										NA	
		90						CL		NA	clay with gravel, dry, low plasticity, brown
										NA	
5		75								NA	Silty sand with gravel, dry, light brown
										NA	
		75		FTBL-SB-03-6-8-020817						NA	
								SM		NA	
		75								NA	
10										NA	
		75		FTBL-SB-03-10-12-020817						NA	
										NA	Silty sand with some gravel, <30% gravel, dry, light brown
		75								NA	
										NA	
15		50								NA	
										NA	
		50								NA	
								SC		NA	
		75								NA	Silty sand, <10% gravel, dry, light brown
20										NA	
										NA	
										NA	
										NA	
										NA	Caliche/clay mixture, light brown to milky white, dry, hard, some granite gravel
25										NA	
								CL		NA	Weathered granite around 25 ft.
										NA	Caliche/clay mixture, light brown to milky white, dry, hard, some granite gravel
										NA	Weathered granite around 28 ft.
										NA	
30		50		FTBL-SB-03-28-30-020917						NA	Caliche/clay mixture, light brown to milky white, dry, hard, some granite gravel

Notes:

Depth in feet below ground surface (bgs)

Geotechnical Bulk sample collected from 0-2 and 28-30 intervals for Tier 2 PCL calculations

Registered Geologist Reviewing Logs: Garett Ferguson #10850

STATE OF TEXAS
GARETT J. FERGUSON
GEOLOGY
10850
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APPENDIX L

ANALYTICAL LABORATORY REPORTS AND DATA VALIDATION REPORTS (DATA USABILITY SUMMARY REPORTS)

(CONTAINED ON DVD)

APPENDIX M

USGS MINERAL RESOURCES ON-LINE SPATIAL DATA PAGE FOR EL PASO COUNTY, TEXAS

Mineral Resources On-Line Spatial Data

Counties page > Zn in Conterminous US > Zn in south-central US > Averages in El Paso County

Average concentrations of elements in El Paso County, Texas

(Calculated from cells in the geochemical grid plotting in this area.)

Element	Symbol	Mean	Std. dev.	Minimum	Maximum
Aluminum	Al (wt%)	4.805	0.324	4.067	5.415
Arsenic	As (ppm)	4.503	1.198	2.242	6.339
Calcium	Ca (wt%)	3.273	1.281	0.680	6.107
Copper	Cu (ppm)	22.904	15.828	1.212	77.162
Iron	Fe (wt%)	2.483	0.331	1.995	3.859
Mercury	Hg (ppm)	0.014	0.003	0.010	0.020
Magnesium	Mg (wt%)	0.782	0.307	0.251	1.619
Manganese	Mn (ppm)	424.807	119.371	295.869	1230.900
Sodium	Na (wt%)	1.169	0.148	0.914	1.520
Phosphorus	P (wt%)	0.035	0.010	0.015	0.067
Lead	Pb (ppm)	35.723	17.722	14.095	95.478
Selenium	Se (ppm)	0.120	0.021	0.100	0.177
Titanium	Ti (wt%)	0.363	0.034	0.306	0.507
Zinc	Zn (ppm)	65.304	15.889	37.440	107.322

Click here to download point data

U.S. Department of the Interior | U.S. Geological Survey
URL: http://mrdata.usgs.gov/geochem/county.php?place=f48141&el=Zn&rf=south-central
Page Contact Information: pschweitzer@usgs.gov
Page Last modified: 14:22 on 20-Dec-2016

APPENDIX N

BASELINE HUMAN HEALTH RISK ASSESSMENT

TABLE N-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Site Wide	**Explosives**												
	99-35-4	1,3,5-Trinitrobenzene	0.032	0.05	mg/kg	2/377	0.5	0.079 - 8.6	0.041	--	200	No	Max < Screening Level
	99-65-0	1,3-Dinitrobenzene	0	0	mg/kg	0/391	0	0.04 - 4.3	0	--	0.67	ND	
	118-96-7	2,4,6-Trinitrotoluene	0.088	0.088	mg/kg	1/391	0.3	0.04 - 4.3	0.088	--	3.3	No	Max < Screening Level
	121-14-2	2,4-Dinitrotoluene	0.072	4.7	mg/kg	5/391	1	0.08 - 8.6	1.41	--	0.69	**Yes**	Max > Screening Level
	606-20-2	2,6-Dinitrotoluene	0.0059	0.3	mg/kg	8/391	2	0.02 - 3.1	0.0606	--	0.69	No	Max < Screening Level
	35572-78-2	2-Amino-4,6-dinitrotoluene	0.0087	0.013	mg/kg	2/391	0.5	0.02 - 2.2	0.0109	--	1.1	No	Max < Screening Level
	88-72-2	2-Nitrotoluene	0.0092	0.015	mg/kg	3/391	0.8	0.02 - 2.2	0.0124	--	2.1	No	Max < Screening Level
	618-87-1	3,5-Dinitroaniline	0	0	mg/kg	0/270	0	0.08 - 22	0	--	--	ND	
	99-08-1	3-Nitrotoluene	0.019	0.032	mg/kg	10/391	3	0.04 - 11	0.0246	--	67	No	Max < Screening Level
	19406-51-0	4-Amino-2,6-dinitrotoluene	0.0084	0.017	mg/kg	3/391	0.8	0.02 - 2.2	0.0131	--	1.1	No	Max < Screening Level
	99-99-0	4-Nitrotoluene	0	0	mg/kg	0/391	0	0.04 - 4.3	0	--	27	ND	
	121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.11	1.3	mg/kg	3/391	0.8	0.08 - 22	0.67	--	4.3	No	Max < Screening Level
	98-95-3	Nitrobenzene	0.0047	0.017	mg/kg	21/391	5	0.02 - 2.2	0.0108	--	3.4	No	Max < Screening Level
	55-63-0	Nitroglycerin	0.06	1	mg/kg	22/387	6	0.085 - 22	0.178	--	0.67	**Yes**	Max > Screening Level
	2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	0.011	0.13	mg/kg	4/391	1	0.02 - 2.2	0.0438	--	160	No	Max < Screening Level
	78-11-5	Pentaerythritol Tetranitrate	0.16	0.6	mg/kg	2/391	0.5	0.2 - 22	0.38	--	13	No	Max < Screening Level
	479-45-8	Tetryl	0	0	mg/kg	0/357	0	0.08 - 8.6	0	--	15	ND	
	Metals												
	7429-90-5	Aluminum	2870	8750	mg/kg	162/162	100	-	5580	8630	6400	**Yes**	Max > Screening Level
	7440-36-0	Antimony	0.093	50.4	mg/kg	271/390	70	0.024 - 0.22	0.884	0.354	1.5	**Yes**	Max > Screening Level
	7440-38-2	Arsenic	0.2	19.6	mg/kg	369/388	95	0.088 - 0.088	5.27	5.68	2.4	**Yes**	Max > Screening Level
	7440-39-3	Barium	33.6	850	mg/kg	162/162	100	-	58.1	74.3	810	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	0.4	8.36	mg/kg	386/386	100	-	1.24	0.619	3.8	**Yes**	Max > Screening Level
	7440-43-9	Cadmium	0.11	1.4	mg/kg	162/162	100	-	0.36	0.401	5.1	No	Max < Screening Level
	7440-70-2	Calcium	1120	52700	mg/kg	162/162	100	-	6310	--	--	No	Essential Nutrient
	7440-47-3	Chromium	3	22	mg/kg	162/162	100	-	6.86	11.9	2700	No	Max < Screening Level
	7440-48-4	Cobalt	1.5	5.8	mg/kg	162/162	100	-	3.29	4.9	37	No	Max < Screening Level
	7440-50-8	Copper	6.6	296	mg/kg	389/389	100	-	19.9	19.9	130	**Yes**	Max > Screening Level
	7439-89-6	Iron	111	20900	mg/kg	161/162	99	14 - 14	12000	--	--	No	Essential Nutrient
	7439-92-1	Lead	8.5	5030	mg/kg	401/401	100	-	76.2	20.83	500	**Yes**	Max > Screening Level
	7439-95-4	Magnesium	831	18900	mg/kg	162/162	100	-	2520	--	--	No	Essential Nutrient
	7439-96-5	Manganese	114	433	mg/kg	162/162	100	-	188	231	380	**Yes**	Max > Screening Level
	7439-97-6	Mercury	0.011	0.13	mg/kg	160/162	99	0.01 - 0.01	0.0224	0.0235	0.21	No	Max < Screening Level
	7439-98-7	Molybdenum	0.086	2.9	mg/kg	159/162	98	0.074 - 0.074	0.432	0.41	16	No	Max < Screening Level

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
	7440-02-0	Nickel	3.2	24.7	mg/kg	386/386	100	-	8.22	8.1	84	No	Max < Screening Level
	7440--09-27	Potassium	726	3320	mg/kg	162/162	100	-	1600	--	--	No	Essential Nutrient
	7782-49-2	Selenium	0.25	0.66	mg/kg	50/162	31	0.244 - 0.244	0.405	0.393	31	No	Max < Screening Level
	7440-22-4	Silver	0.072	6.8	mg/kg	3/162	2	0.036 - 0.036	2.32	--	9.7	No	Max < Screening Level
	7440-23-5	Sodium	15.8	264	mg/kg	162/162	100	-	126	--	--	No	Essential Nutrient
	7440-28-0	Thallium	0.21	0.96	mg/kg	50/162	31	0.206 - 0.206	0.375	--	0.53	**Yes**	Max > Screening Level
	7440-62-2	Vanadium	6.9	31	mg/kg	162/162	100	-	13.3	26.7	7.5	**Yes**	Max > Screening Level
	7440-66-6	Zinc	17.5	353	mg/kg	390/390	100	-	60.8	40.4	990	No	Max < Screening Level

Notes:
Max - maximum detected concentration.
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
"ND" denotes not detected.
UPL - Background upper prediction limit.
Footnotes:

(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg). The PCLs were multiplied by 0.1 to account for a target excess lifetime cancer risk of 1-in-1,000,000 (1×10^{-6}) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - DELINEATION
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Downgradient Delineation	**Metals**												
	7440-36-0	Antimony	0.058	0.394	mg/kg	5/6	83.3	0.04 - 0.04	0.187	0.354	1.5	No	Max<Screening Level
	7440-38-2	Arsenic	3.38	5.26	mg/kg	6/6	100	--	4.22	5.68	2.4	No	Max<Bkg
	7440-41-7	Beryllium	0.974	1.84	mg/kg	6/6	100	--	1.29	0.619	3.8	No	Max<Screening Level
	7440-50-8	Copper	2.79	24.4	mg/kg	6/6	100	--	10.8	19.9	130	No	Max<Screening Level
	7439-92-1	Lead	7.02	62.2	mg/kg	6/6	100	--	26	20.83	500	No	Max<Screening Level
	7440-02-0	Nickel	2.39	10.2	mg/kg	6/6	100	--	6.46	8.1	84	No	Max<Screening Level
	7440-66-6	Zinc	33	64.7	mg/kg	6/6	100	--	48.2	40.4	990	No	Max<Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 1
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 1	**Metals**												
	7440-36-0	Antimony	0.111	0.228	mg/kg	5/5	100	--	0.18	0.354	1.5	No	Max<Screening Level
	7440-38-2	Arsenic	4.3	6.56	mg/kg	5/5	100	--	5.56	5.68	2.4	No	Max<Screening Level
	7440-41-7	Beryllium	3.12	7.21	mg/kg	5/5	100	--	5.17	0.619	3.8	**Yes**	Max>Screening Level
	7440-50-8	Copper	12.9	60.6	mg/kg	5/5	100	--	28.9	19.9	130	No	Max<Screening Level
	7439-92-1	Lead	11.1	25.4	mg/kg	5/5	100	--	19.8	20.8	500	No	Max<Screening Level
	7440-02-0	Nickel	6.74	36.2	mg/kg	5/5	100	--	17.6	8.1	84	No	Max<Screening Level
	7440-66-6	Zinc	45.1	119	mg/kg	5/5	100	--	81.0	40.4	990	No	Max<Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 2
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 2	**Metals**												
	7440-36-0	Antimony	0.088	0.228	mg/kg	8/8	100	--	0.173	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	3.44	5.98	mg/kg	8/8	100	--	4.87	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	1.85	5.7	mg/kg	8/8	100	--	3.26	0.619	3.8	**Yes**	Max > Screening Level
	7440-50-8	Copper	5.08	20.4	mg/kg	8/8	100	--	14.4	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	15.3	29.4	mg/kg	8/8	100	--	23	20.8	500	No	Max < Screening Level
	7440-02-0	Nickel	3.02	10.5	mg/kg	8/8	100	--	7.19	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	38.3	80.6	mg/kg	8/8	100	--	67.3	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 3
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 3	**Metals**												
	7440-36-0	Antimony	0.275	0.4	mg/kg	7/7	100	--	0.337	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	5.79	60.1	mg/kg	12/12	100	--	15.7	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	2.61	4.47	mg/kg	7/7	100	--	3.47	0.619	3.8	**Yes**	Max > Screening Level
	7440-50-8	Copper	17.8	27.2	mg/kg	7/7	100	--	21.2	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	26.1	76.3	mg/kg	7/7	100	--	41.8	20.8	500	No	Max < Screening Level
	7440-02-0	Nickel	6.21	17.6	mg/kg	7/7	100	--	11.8	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	83.5	924	mg/kg	12/12	100	--	245	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 4
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 4	**Metals**												
	7440-36-0	Antimony	0.156	0.263	mg/kg	5/6	100	--	0.195	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	4.92	9.13	mg/kg	6/6	100	--	6.93	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	1.25	2.08	mg/kg	6/6	100	--	1.63	0.619	3.8	No	Max < Screening Level
	7440-50-8	Copper	15.9	32.2	mg/kg	6/6	100	--	23.0	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	15.4	36	mg/kg	6/6	100	--	24.1	20.83	500	No	Max < Screening Level
	7440-02-0	Nickel	9.13	15.3	mg/kg	6/6	100	--	11.9	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	48.2	318	mg/kg	13/13	100	--	136	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 5
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 5	**Metals**												
	7440-36-0	Antimony	0.07	0.127	mg/kg	5/5	100	--	0.111	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	3.09	10.7	mg/kg	5/5	100	--	5.83	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	0.943	1.57	mg/kg	5/5	100	--	1.24	0.619	3.8	No	Max < Screening Level
	7440-50-8	Copper	18.5	27.5	mg/kg	5/5	100	--	24.3	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	10.4	15.1	mg/kg	5/5	100	--	13.7	20.83	500	No	Max < Screening Level
	7440-02-0	Nickel	26.3	43.3	mg/kg	5/5	100	--	35.8	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	72.2	118	mg/kg	7/7	100	--	96.1	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 6
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 6	**Metals**												
	7440-36-0	Antimony	0.125	0.368	mg/kg	5/5	100	--	0.21	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	4.05	10.4	mg/kg	5/5	100	--	5.70	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	1.31	2.12	mg/kg	5/5	100	--	1.73	0.619	3.8	No	Max < Screening Level
	7440-50-8	Copper	10.7	22	mg/kg	5/5	100	--	15.4	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	11.7	30.9	mg/kg	5/5	100	--	21.0	20.8	500	No	Max < Screening Level
	7440-02-0	Nickel	6.69	15.5	mg/kg	5/5	100	--	10.1	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	44.4	85	mg/kg	5/5	100	--	65.1	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-9
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 7
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 7	**Metals**												
	7440-36-0	Antimony	0.13	0.45	mg/kg	5/5	100	--	0.25	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	4.62	15.6	mg/kg	5/5	100	--	7.63	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	0.923	2.8	mg/kg	5/5	100	--	1.5	0.619	3.8	No	Max < Screening Level
	7440-50-8	Copper	7.92	44.1	mg/kg	5/5	100	--	20.7	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	11.9	57.6	mg/kg	5/5	100	--	28.0	20.8	500	No	Max < Screening Level
	7440-02-0	Nickel	6.66	24.8	mg/kg	5/5	100	--	12.6	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	44.1	190	mg/kg	7/7	100	--	85.5	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-10
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 8
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 8	**Metals**												
	7440-36-0	Antimony	0.154	0.36	mg/kg	7/7	100	--	0.25	0.354	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	5.9	8.9	mg/kg	7/7	100	--	7.03	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	1.27	1.6	mg/kg	7/7	100	--	1.44	0.619	3.8	No	Max < Screening Level
	7440-50-8	Copper	6.51	33.2	mg/kg	7/7	100	--	17.9	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	15.6	86.4	mg/kg	9/9	100	--	36.5	20.8	500	No	Max < Screening Level
	7440-02-0	Nickel	5.53	26.5	mg/kg	7/7	100	--	12.1	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	58.8	129	mg/kg	9/9	100	--	84.8	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-11
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN ARROYO SOIL - REACH 9
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Arithmetic Average	Background UPL	Soil Screening Level (mg/kg) (a)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Reach 9	**Metals**												
	7440-36-0	Antimony	0.173	1.5	mg/kg	10/10	100	-	0.47	0.35	1.5	No	Max < Screening Level
	7440-38-2	Arsenic	6	13.5	mg/kg	10/10	100	--	9.34	5.68	2.4	**Yes**	Max > Screening Level
	7440-41-7	Beryllium	0.804	1.5	mg/kg	10/10	100	--	1.02	0.62	3.8	No	Max < Screening Level
	7440-50-8	Copper	12.6	30.1	mg/kg	10/10	100	--	20.5	19.9	130	No	Max < Screening Level
	7439-92-1	Lead	15.7	483	mg/kg	13/13	100	--	71.9	20.8	500	No	Max < Screening Level
	7440-02-0	Nickel	7.83	32.7	mg/kg	10/10	100	--	17.9	8.1	84	No	Max < Screening Level
	7440-66-6	Zinc	35.8	129	mg/kg	13/13	100	--	88.0	40.4	990	No	Max < Screening Level

Notes:
mg/kg - milligrams per kilogram.
COPC - Constituent of potential concern.
UPL - Background upper prediction limit.
Footnotes:
(a) Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

TABLE N-12
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE WATER
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Seep/Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Detection Frequency	Detection Frequency (Percent)	Range of Detection Limits	Screening Level (mg/L) (a, b)	Maximum Concentration Exceeds Screening Level?	Rationale for COPC Selection or Deletion
Site Wide	**Total Metals**										
	7440-36-0	Antimony	0.000086	0.00105	mg/L	6/6	100	--	0.02	No	Max < Screening Level
	7440-38-2	Arsenic	0.0007	0.0025	mg/L	6/6	100	--	0.0029	No	Max < Screening Level
	7440-41-7	Beryllium	0.000007	0.00303	mg/L	6/6	100	--	0.009	No	Max < Screening Level
	7440-50-8	Copper	0.00167	0.00482	mg/L	6/6	100	--	3.31	No	Max < Screening Level
	7439-92-1	Lead	0.000069	0.0068	mg/L	6/6	100	--	1.0	No	Max < Screening Level
	7440-02-0	Nickel	0.00092	0.00178	mg/L	6/6	100	--	1.13	No	Max < Screening Level
	7440-66-6	Zinc	0.00362	0.023	mg/L	3/3	100	--	20.1	No	Max < Screening Level

Notes:
mg/L - milligrams per liter.
COPC - Constituent of potential concern.
"ND" denotes not detected.
Footnotes:
(a) Screening level is based on the TRRP Tier 1 Contact Recreation Water PCL (mg/L).The PCLs were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.

(b) The lead screening level is based on a California EPA cancer toxicity value and calculated using the RAIS Preliminary Remediation Goals (PRGs) Calculator for a recreator.

TABLE N-13
EXPOSURE POINT CONCENTRATION SUMMARY FOR DECISION UNITS - SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

				Explosives		Metals									
Location ID	Sample Date	Sample ID	Analyte	2,4-Dinitrotoluene	Nitroglycerin	Aluminum	Antimony	Arsenic	Barium	Beryllium	Copper	Lead	Manganese	Thallium	Vanadium
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			HHRA SLs	0.69	0.67	8630	1.5	5.68	810	3.8	130	500	380	0.53	26.7
AA035	2/7/2011	CR-MIS-AA035-01_02072011		4.7							296				
AC033	7/5/2016	FTBL-IS-141-070516						6.93							
AC041	2/7/2011	CR-MIS-AC041-01_02072011					2.1								
AD035	7/5/2016	FTBL-IS-142-070516						6.25							
AD037	7/5/2016	FTBL-IS-143-070516						5.84							
AH016	1/25/2017	FTBL-IS-156-012517						5.74							
AI018	2/7/2011	CR-MIS-AI018-01_02072011		1.9	1										
AI022	1/25/2017	FTBL-IS-157-012517						5.98							
AJ025	*1/26/2017*	*FTBL-IS-158-012617-A*						*5.98*							
AJ025	*1/26/2017*	*FTBL-IS-158-012617-B*						*6.71*							
AJ025	*1/26/2017*	*FTBL-IS-158-012617-C*						*5.68*							
AJ025	1/26/2017	95% UCL (student's t)						7.02							
AK010	2/7/2011	CR-MIS-AK010-01_02072011						5.80							31
AK016	7/14/2016	FTBL-IS-150-071416						6.41							
AM022	1/25/2017	FTBL-IS-159-012517						5.97							
AQ038	9/12/2012	CR-IS-AQ038-01_09122012									185				
AR008	2/7/2011	CR-MIS-AR008-01_02072011						7.20		7.2					
AS038	1/27/2017	FTBL-IS-163-012717						7.08							
AU034	1/27/2017	FTBL-IS-164-012717						11.20							
AY031	*1/28/2017*	*FTBL-IS-165-012817-A*						*9.56*							
AY031	*1/28/2017*	*FTBL-IS-165-012817-B*						*9.86*							
AY031	*1/28/2017*	*FTBL-IS-165-012817-C*						*9.84*							
AY031	1/28/2017	95% UCL (student's t)						10.04							
AY041	1/27/2017	FTBL-IS-166-012717						5.89							
BA048	2/7/2011	CR-MIS-BA048-01_02072011						6.00							
BB060	1/28/2017	FTBL-IS-169-012817						6.53							
BE043	*6/28/2016*	*FTBL-IS-135-062816-A*						*7.98*							
BE043	*6/28/2016*	*FTBL-IS-135-062816-B*						*7.80*							
BE043	*6/28/2016*	*FTBL-IS-135-062816-C*						*7.98*							
BE043	6/28/2016	95% UCL (student's t)						8.095							
BE050	6/29/2016	FTBL-IS-138-062916						6.35							
BF052	2/3/2011	CR-MIS-BF052-01_02032011					2.1					1580			
BG042	6/30/2016	FTBL-IS-127-063016						5.99							
BH041	6/30/2016	FTBL-IS-126-063016						6.00							
BJ034	7/1/2016	FTBL-IS-117-070116						5.72							
BK036	6/30/2016	FTBL-IS-118-063016						8.72							
BK043	*6/27/2016*	*FTBL-IS-121-062716-A*						*6.27*							
BK043	*6/27/2016*	*FTBL-IS-121-062716-B*						*5.91*							
BK043	*6/27/2016*	*FTBL-IS-121-062716-C*						*5.84*							
BK043	6/27/2016	95% UCL (student's t)						6.40							
BK050	6/29/2016	FTBL-IS-125-062916						5.82							

TABLE N-13
EXPOSURE POINT CONCENTRATION SUMMARY FOR DECISION UNITS - SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

				Explosives		**Metals**									
Location ID	**Sample Date**	**Sample ID**	**Analyte**	2,4-Dinitrotoluene	Nitroglycerin	Aluminum	Antimony	Arsenic	Barium	Beryllium	Copper	Lead	Manganese	Thallium	Vanadium
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			HHRA SLs	0.69	0.67	8630	1.5	5.68	810	3.8	130	500	380	0.53	26.7
BK063	**1/26/2017**	**FTBL-IS-173-012617**						6.00							
BL030	**7/1/2016**	**FTBL-IS-116-070116**						8.07							
BL038	**6/30/2016**	**FTBL-IS-119-063016**						6.70							
BM046	**6/30/2016**	**FTBL-IS-123-063016**						8.30							
BQ067	**1/24/2017**	**FTBL-IS-174-012417**						6.07							
BR060	**2/4/2011**	**CR-MIS-BR060-01_02042011**							850						
BS069	***1/24/2017***	***FTBL-IS-175-012417-A***						*5.14*							
BS069	***1/24/2017***	***FTBL-IS-175-012417-B***						*7.04*							
BS069	***1/24/2017***	***FTBL-IS-175-012417-C***						*5.07*							
BS069	**1/24/2017**	**95% UCL (student's t)**						7.63							
BW057	**1/25/2017**	**FTBL-IS-176-012517**										2650			
BY064	**7/14/2016**	**FTBL-IS-152-071416**						7.35							
CA057	**6/13/2016**	**FTBL-IS-110-061316**						8.86		4.34					
CC046	**7/12/2016**	**FTBL-IS-109-071216**						16.00							
CD045	**7/11/2016**	**FTBL-IS-108-071116**						8.61		4.51					
CD047	**1/26/2017**	**FTBL-IS-180-012617**						11.40							
CD061	**2/9/2011**	**CR-MIS-CD061-01_02092011**						5.80							
CD061	**6/13/2016**	**FTBL-IS-105-061316**						7.54							
CD068	**2/7/2011**	**CR-MIS-CD068-01_02072011**						6.20							
CE047	**2/9/2011**	**CR-MIS-CE047-01_02092011**											433	0.96	
CE059	**6/23/2016**	**FTBL-IS-104-062316**						7.65							
CE063	**6/13/2016**	**FTBL-IS-106-061316**						7.09							
CF045	**7/11/2016**	**FTBL-IS-092-071116**						9.22							
CF048	**2/9/2011**	**CR-MIS-CF048-01_02092011**												0.56	
CF053	**6/22/2016**	**FTBL-IS-099-062216**						8.23							
CF057	**6/17/2016**	**FTBL-IS-103-061716**						6.27							
CF074	**7/6/2016**	**FTBL-IS-107-070616**						6.42							
CG044	**7/11/2016**	**FTBL-IS-091-071116**						9.83							
CG046	**7/12/2016**	**FTBL-IS-095-071216**						19.60		8.36					
CG047	**2/9/2011**	**CR-MIS-CG047-01_02092011**				8750		6.00					402	0.71	
CG048	**7/12/2016**	**FTBL-IS-094-071216**						5.90							
CG052	**6/22/2016**	**FTBL-IS-098-062216**						10.10		3.81					
CG052	**11/11/2016**	**FTBL-IS-098-111116-R**						8.42							
CG058	**2/9/2011**	**CR-MIS-CG058-01_02092011**						5.90							
CG063	**2/9/2011**	**CR-MIS-CG063-01_02092011**						5.80							
CG065	**6/17/2016**	**FTBL-IS-102-061716**						6.54							
CG069	**2/8/2011**	**CR-MIS-CG069-01_02082011**					3	6.30							
CG071	**7/14/2016**	**FTBL-IS-153-071416**						7.18							
CH043	**7/8/2016**	**FTBL-IS-090-070816**						8.49							
CH046	**7/8/2016**	**FTBL-IS-093-070816-A**						9.48							
CH046	**7/8/2016**	**FTBL-IS-093-070816-B**						9.90							

TABLE N-13
EXPOSURE POINT CONCENTRATION SUMMARY FOR DECISION UNITS - SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

				Explosives		Metals									
Location ID	**Sample Date**	**Sample ID**	**Analyte**	2,4-Dinitrotoluene	Nitroglycerin	Aluminum	Antimony	Arsenic	Barium	Beryllium	Copper	Lead	Manganese	Thallium	Vanadium
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			HHRA SLs	0.69	0.67	8630	1.5	5.68	810	3.8	130	500	380	0.53	26.7
CH046	**7/8/2016**	**FTBL-IS-093-070816-C**						9.19							
CH046	**7/8/2016**	**95% UCL (student's t)**						10.13							
CH054	**9/13/2012**	**CR-IS-CH054-01_09132012**				8640									
CH056	**6/21/2016**	**FTBL-IS-100-062116**						6.72							
CH060	**6/17/2016**	**FTBL-IS-101-061716**						6.76							
CI039	**2/8/2011**	**CR-MIS-CI039-01_02082011**						7.60						0.65	
CI053	***6/22/2016***	***FTBL-IS-097-062216-A***						*7.73*							
CI053	***6/22/2016***	***FTBL-IS-097-062216-B***						*7.96*							
CI053	***6/22/2016***	***FTBL-IS-097-062216-C***						*8.10*							
CI053	**6/22/2016**	**95% UCL (student's t)**						8.25							
CJ041	**7/6/2016**	**FTBL-IS-084-070616**						8.32							
CJ049	**6/23/2016**	**FTBL-IS-087-062316**						6.62							
CJ061	**6/17/2016**	**FTBL-IS-089-061716**						6.46							
CJ062	**2/9/2011**	**CR-MIS-CJ062-01_02092011**						5.80							
CJ071	**1/25/2017**	**FTBL-IS-183-012517**					1.72								
CK042	**2/8/2011**	**CR-MIS-CK042-01_02082011**						6.10							
CK045	**7/6/2016**	**FTBL-IS-085-070616**						7.65							
CK047	**7/6/2016**	**FTBL-IS-086-070616**						7.17							
CK052	**6/22/2016**	**FTBL-IS-088-062216**						7.47							
CL052	**6/22/2016**	**FTBL-IS-081-062216**						6.03							
CL054	**2/9/2011**	**CR-MIS-CL054-01_02092011**						6.60							
CL057	**6/21/2016**	**FTBL-IS-083-062116**						7.19							
CL071	**6/9/2016**	**FTBL-IS-076-060916**					17.5	6.47				805			
CM048	**6/22/2016**	**FTBL-IS-080-062216**						7.06							
CM054	***6/21/2016***	***FTBL-IS-082-062116-A***						*7.38*							
CM054	***6/21/2016***	***FTBL-IS-082-062116-B***						*7.88*							
CM054	***6/21/2016***	***FTBL-IS-082-062116-C***						*7.18*							
CM054	**6/21/2016**	**95% UCL (student's t)**						8.09							
CM063	**6/9/2016**	**FTBL-IS-073-060916**						7.70							
CM068	**6/9/2016**	**FTBL-IS-075-060916**					6.41	6.12							
CN022	***7/8/2016***	***FTBL-IS-114-070816-A***						*7.06*							
CN022	***7/8/2016***	***FTBL-IS-114-070816-B***						*7.04*							
CN022	***7/8/2016***	***FTBL-IS-114-070816-C***						*7.60*							
CN022	**7/8/2016**	**95% UCL (student's t)**						7.77							
CN044	**6/23/2016**	**FTBL-IS-078-062316**						7.59							
CN046	**7/6/2016**	**FTBL-IS-079-070616**					2.03	7.35							
CN060	**6/10/2016**	**FTBL-IS-072-061016**						7.07							
CN064	***6/9/2016***	***FTBL-IS-074-060916-A***						*6.92*							
CN064	***6/9/2016***	***FTBL-IS-074-060916-B***						*6.74*							
CN064	***6/9/2016***	***FTBL-IS-074-060916-C***						*6.54*							
CN064	**6/9/2016**	**95% UCL (student's t)**						7.05							

TABLE N-13
EXPOSURE POINT CONCENTRATION SUMMARY FOR DECISION UNITS - SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

				Explosives		Metals									
Location ID	Sample Date	Sample ID	Analyte	2,4-Dinitrotoluene	Nitroglycerin	Aluminum	Antimony	Arsenic	Barium	Beryllium	Copper	Lead	Manganese	Thallium	Vanadium
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			HHRA SLs	0.69	0.67	8630	1.5	5.68	810	3.8	130	500	380	0.53	26.7
CN073	*6/9/2016*	*FTBL-IS-077-060916-A*					*40.4*					*1070*			
CN073	*6/9/2016*	*FTBL-IS-077-060916-B*					*14.1*					*552*			
CN073	*6/9/2016*	*FTBL-IS-077-060916-C*					*50.4*					*1320*			
CN073	6/9/2016	95% UCL (student's t)					66.58					1641			
CO022	7/8/2016	FTBL-IS-113-070816						6.49							
CO038	7/14/2016	FTBL-IS-154-071416						8.23							
CO042	6/23/2016	FTBL-IS-065-062316						6.16							
CO045	6/23/2016	FTBL-IS-067-062316						6.18							
CP043	6/23/2016	FTBL-IS-066-062316						5.81							
CP047	7/6/2016	FTBL-IS-068-070616						6.01							
CP050	6/22/2016	FTBL-IS-069-062216						7.79							
CP054	2/8/2011	CR-MIS-CP054-01_02082011						5.80							
CP064	6/10/2016	FTBL-IS-070-061016						6.37							
CQ048	7/6/2016	FTBL-IS-063-070616						5.76							
CR025	7/11/2016	FTBL-IS-112-071116						6.03							
CR045	7/7/2016	FTBL-IS-056-070716						6.73							
CR051	2/9/2011	CR-MIS-CR051-01_02092011									165				
CR052	6/21/2016	FTBL-IS-058-062116						5.69							
CT047	7/7/2016	FTBL-IS-048-070716						6.04							
CT065	*1/23/2017*	*FTBL-IS-187-012317-A*						*5.70*							
CT065	*1/23/2017*	*FTBL-IS-187-012317-B*						*6.11*							
CT065	*1/23/2017*	*FTBL-IS-187-012317-C*						*5.98*							
CT065	1/23/2017	95% UCL (student's t)						6.28							
CU048	7/7/2016	FTBL-IS-049-070716						5.71							
CV050	7/7/2016	FTBL-IS-050-070716						5.77							
CV053	6/21/2016	FTBL-IS-052-062116-A						6.03							
CV066	1/23/2017	FTBL-IS-188-012317						6.05							
CW048	6/23/2016	FTBL-IS-047-062316						6.03							
CW061	6/20/2016	FTBL-IS-043-062016						5.84							
CX044	1/20/2017	FTBL-IS-189-012017						8.02							
CY049	6/23/2016	FTBL-IS-039-062316						6.85							
CY052	6/23/2016	FTBL-IS-040-062316						6.57							
CZ054	1/23/2017	FTBL-IS-190-012317						7.35							
CZ058	2/14/2011	CR-MIS-CZ058-01_02142011						2.30						0.55	
CZ062	2/14/2011	CR-MIS-CZ062-01_02142011						5.80							
DA074	6/8/2016	FTBL-IS-038-060816						5.70							
DB048	7/7/2016	FTBL-IS-034-070716						7.20							
DB052	1/23/2017	FTBL-IS-191-012317						8.32							
DB057	*6/15/2016*	*FTBL-IS-035-061516-A*						*6.51*							
DB057	*6/15/2016*	*FTBL-IS-035-061516-B*						*6.87*							
DB057	*6/15/2016*	*FTBL-IS-035-061516-C*						*6.26*							

TABLE N-13
EXPOSURE POINT CONCENTRATION SUMMARY FOR DECISION UNITS - SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

				Explosives		Metals									
Location ID	**Sample Date**	**Sample ID**	**Analyte**	2,4-Dinitrotoluene	Nitroglycerin	Aluminum	Antimony	Arsenic	Barium	Beryllium	Copper	Lead	Manganese	Thallium	Vanadium
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			HHRA SLs	0.69	0.67	8630	1.5	5.68	810	3.8	130	500	380	0.53	26.7
DB057	**6/15/2016**	**95% UCL (student's t)**						7.06							
DC046	**1/20/2017**	**FTBL-IS-192-012017**						10.30							
DC074	**6/8/2016**	**FTBL-IS-033-060816**						6.10							
DD048	**6/7/2016**	**FTBL-IS-026-060716**						7.52							
DD050	**6/7/2016**	**FTBL-IS-027-060716**						7.00							
DD054	**7/14/2016**	**FTBL-IS-155-071416**						6.83							
DE072	**2/14/2011**	**CR-MIS-DE072-01_02142011**												0.54	
DF047	**1/19/2017**	**FTBL-IS-193-011917**						8.72							
DF049	**6/7/2016**	**FTBL-IS-024-060716**						8.14							
DG050	**6/7/2016**	**FTBL-IS-025-060716**						7.68							
DG065	**6/7/2016**	**FTBL-IS-021-060716**						6.05							
DG070	**2/11/2011**	**CR-MIS-DG070-01_02112011**					14.1					5030			
DH050	**1/19/2017**	**FTBL-IS-195-011917**						8.21							
DH058	**1/19/2017**	**FTBL-IS-196-011917**						8.17							
DH061	**1/19/2017**	**FTBL-IS-197-011917**						6.21							
DH072	**6/8/2016**	**FTBL-IS-022-060816**						6.32							
DJ051	**6/6/2016**	**FTBL-IS-017-060616**						8.35							
DK049	**1/20/2017**	**FTBL-IS-198-012017**						9.48							
DK053	**6/6/2016**	**FTBL-IS-018-060616**						8.51							
DK069	**6/7/2016**	**FTBL-IS-019-060716**						6.11							
DK074	**6/8/2016**	**FTBL-IS-020-060816**					2.64	5.20				754			
DM051	**6/6/2016**	**FTBL-IS-013-060616**						9.43							
DM051	**11/10/2016**	**FTBL-IS-013-111016R**						8.14							
DM053	**6/6/2016**	**FTBL-IS-014-060616**						8.67							
DN072	**6/7/2016**	**FTBL-IS-015-060716**						5.79							
DP051	**1/20/2017**	**FTBL-IS-199-012017**						6.85							
DS053	**1/19/2017**	**FTBL-IS-200-011917**						8.15							
DV051	**9/14/2012**	**CR-IS-DV051-01_09142012**					1.9								
DV055	**6/3/2016**	**FTBL-IS-004-060316**						7.32							
DV059	**6/2/2016**	**FTBL-IS-007-060216**						6.95							
DW050	**6/3/2016**	**FTBL-IS-002-060316**						6.68							
DW056	**6/3/2016**	**FTBL-IS-005-060316**						7.41							
DW058	**6/3/2016**	**FTBL-IS-006-060316**						7.41							
DW061	**6/2/2016**	**FTBL-IS-008-060216**						6.31							
DW064	**6/2/2016**	**FTBL-IS-010-060216**						7.17							
DW067	**6/2/2016**	**FTBL-IS-012-060216**						7.41							
DX049	**6/3/2016**	**FTBL-IS-001-060316**						6.05							
DX053	***6/6/2016***	***FTBL-IS-003-060616-A***						*6.52*							
DX053	***6/6/2016***	***FTBL-IS-003-060616-B***						*6.79*							
DX053	***6/6/2016***	***FTBL-IS-003-060616-C***						*6.79*							
DX053	**6/6/2016**	**95% UCL (student's t)**						6.96							

TABLE N-13
EXPOSURE POINT CONCENTRATION SUMMARY FOR DECISION UNITS - SURFACE SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

				Explosives		Metals									
Location ID	Sample Date	Sample ID	**Analyte**	2,4-Dinitrotoluene	Nitroglycerin	Aluminum	Antimony	Arsenic	Barium	Beryllium	Copper	Lead	Manganese	Thallium	Vanadium
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			HHRA SLs	0.69	0.67	8630	1.5	5.68	810	3.8	130	500	380	0.53	26.7

Notes:
ft bgs = feet below ground surface.
HHRA SL = Screening level is based on the TRRP TotSoilComb PCL for Soil (mg/kg).The PCL values were multiplied by 0.1 to account for a target lifetime excess cancer risk of 1-in-1,000,000 (10-6) for carcinogenic COPCs and to account for exposure to multiple non-carcinogenic toxins.
mg/kg = milligram(s) per kilogram.
Footnotes:
(a) 95% UCL = 95 percent upper confidence limit on the arithmetic average concentration.
(b) Exposure point concentration is the reported concentration or the 95% UCL if triplicate samples were collected.

TABLE N-14
EXPOSURE POINT CONCENTRATION SUMMARY FOR ARROYO SOIL
CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Maximum Detected Concentration	95% UCL[a]			Exposure Point Concentration[b]
					Distribution	95% UCL Method	Value	95% UCL/Max
Reach 1	Metals							
	7440-41-7	Beryllium	mg/kg	7.21	Normal	95% Student's-t UCL	6.113	6.1
Reach 2	Metals							
	7440-38-2	Arsenic	mg/kg	5.98	Normal	95% Student's-t UCL	5.413	5.4
	7440-41-7	Beryllium	mg/kg	5.7	Normal	95% Student's-t UCL	4.063	4.1
Reach 3	Metals							
	7440-38-2	Arsenic	mg/kg	60.1	Nonparametric	95% Chebyshev (Mean, Sd) UCL	33.37	33.4
	7440-41-7	Beryllium	mg/kg	4.47	Normal	95% Student's-t UCL	3.881	3.9
Reach 4	Metals							
	7440-38-2	Arsenic	mg/kg	17.2	Normal	95% Student's-t UCL	12.37	12.4
Reach 5	Metals							
	7440-38-2	Arsenic	mg/kg	10.7	Normal	95% Student's-t UCL	8.575	8.6
Reach 6	Metals							
	7440-38-2	Arsenic	mg/kg	10.4	Normal	95% Student's-t UCL	7.543	7.5
Reach 7	Metals							
	7440-38-2	Arsenic	mg/kg	15.6	Normal	95% Student's-t UCL	10.69	10.7
Reach 8	Metals							
	7440-38-2	Arsenic	mg/kg	8.89	Normal	95% Student's-t UCL	7.82	7.8
Reach 9	Metals							
	7440-38-2	Arsenic	mg/kg	13.5	Normal	95% Student's-t UCL	10.51	10.5

Notes:
ft bgs = feet below ground surface.
mg/kg = milligram(s) per kilogram.

Footnotes:
(a) 95% UCL = 95 percent upper confidence limit on the arithmetic average concentration. Calculated using USEPA software ProUCL 5.1.
(b) Exposure point concentration is the lesser of the maximum detected concentration and the 95% UCL.

TABLE N-15
CURRENT LIFETIME EXCESS CANCER RISK AND NON-CANCER TOXICITY HAZARDS FROM EXPOSURE TO COPCS IN SURFACE SOIL AT THE CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

		Explosive EPCs		Metal EPCs										Total Residential Lifetime Excess Cancer Risk	Residential Hazard Index
	Analyte **Units**	2,4-Dinitrotoluene mg/kg	Nitroglycerin mg/kg	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg	Thallium mg/kg	Vanadium mg/kg		
Location ID	**Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg)[1,2]**	6.9	280	—	—	34	—	4800	—	—	—	—	—	EPC/ Carcinogenic PCL x $1x10^{-5}$	
	Non-Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg) [2]	130	6.7	64000	15	24	8100	38	1300	500	3800	5.3	75		EPC/ Non-Carcinogenic PCL
AA035		4.7							296					6.81E-06	0.3
AC033						6.93								2.04E-06	0.3
AC041					2.1									NC	0.1
AD035						6.25								1.84E-06	0.3
AD037						5.84								1.72E-06	0.2
AH016						5.74								1.69E-06	0.2
AI018		1.9	1											2.79E-06	0.2
AI022						5.98								1.76E-06	0.2
AJ025 (3)						7.02								2.06E-06	0.3
AK010						5.80							31	1.71E-06	0.7
AK016						6.41								1.89E-06	0.3
AM022						5.97								1.76E-06	0.2
AQ038									185					NC	0.1
AR008						7.20		7.2						2.13E-06	0.5
AS038						7.08								2.08E-06	0.3
AU034						11.20								3.29E-06	0.5
AY031 (3)						10.04								2.95E-06	0.4
AY041						5.89								1.73E-06	0.2
BA048						6.00								1.76E-06	0.3
BB060						6.53								1.92E-06	0.3
BE043 (3)						8.095								2.38E-06	0.3
BE050						6.35								1.87E-06	0.3
BF052					2.1					1580				NC	3
BG042						5.99								1.76E-06	0.2
BH041						6.00								1.76E-06	0.3
BJ034						5.72								1.68E-06	0.2
BK036						8.72								2.56E-06	0.4
BK043 (3)						6.40								1.88E-06	0.3
BK050						5.82								1.71E-06	0.2
BK063						6.00								1.76E-06	0.3
BL030						8.07								2.37E-06	0.3
BL038						6.70								1.97E-06	0.3
BM046						8.30								2.44E-06	0.3
BQ067						6.07								1.79E-06	0.3
BR060							850							NC	0.1
BS069 (3)						7.63								2.25E-06	0.3
BW057										2650				NC	5
BY064						7.35								2.16E-06	0.3
CA057						8.86		4.34						2.61E-06	0.5

TABLE N-15
CURRENT LIFETIME EXCESS CANCER RISK AND NON-CANCER TOXICITY HAZARDS FROM EXPOSURE TO COPCS IN SURFACE SOIL AT THE CLOSED CASTNER FIRING RANGE FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

		Explosive EPCs		Metal EPCs										Total Residential Lifetime Excess Cancer Risk	Residential Hazard Index
	Analyte Units	2,4-Dinitrotoluene mg/kg	Nitroglycerin mg/kg	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg	Thallium mg/kg	Vanadium mg/kg		
Location ID	**Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg)[1,2]**	6.9	280	—	—	34	—	4800	—	—	—	—	—	EPC/ Carcinogenic PCL x $1x10^{-5}$	
	Non-Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg) [2]	130	6.7	64000	15	24	8100	38	1300	500	3800	5.3	75		EPC/ Non-Carcinogenic PCL
CC046						16.00								4.71E-06	0.7
CD045						8.61		4.51						2.54E-06	0.5
CD047						11.40								3.35E-06	0.5
CD061						5.80								1.71E-06	0.2
CD061						7.54								2.22E-06	0.3
CD068						6.20								1.82E-06	0.3
CE047											433	0.96		NC	0.3
CE059						7.65								2.25E-06	0.3
CE063						7.09								2.09E-06	0.3
CF045						9.22								2.71E-06	0.4
CF048												0.56		NC	0.1
CF053						8.23								2.42E-06	0.3
CF057						6.27								1.84E-06	0.3
CF074						6.42								1.89E-06	0.3
CG044						9.83								2.89E-06	0.4
CG046						19.60		8.36						5.78E-06	1
CG047				8750		6.00					402	0.71		1.76E-06	0.6
CG048						5.90								1.74E-06	0.2
CG052						10.10		3.81						2.98E-06	0.5
CG052						8.42								2.48E-06	0.4
CG058						5.90								1.74E-06	0.2
CG063						5.80								1.71E-06	0.2
CG065						6.54								1.92E-06	0.3
CG069					3	6.30								1.85E-06	0.5
CG071						7.18								2.11E-06	0.3
CH043						8.49								2.50E-06	0.4
CH046 (3)						10.13								2.98E-06	0.4
CH054				8640										NC	0.1
CH056						6.72								1.98E-06	0.3
CH060						6.76								1.99E-06	0.3
CI039						7.60						0.65		2.24E-06	0.4
CI053 (3)						8.25								2.43E-06	0.3
CJ041						8.32								2.45E-06	0.3
CJ049						6.62								1.95E-06	0.3
CJ061						6.46								1.90E-06	0.3
CJ062						5.80								1.71E-06	0.2
CJ071					1.72									NC	0.1
CK042						6.10								1.79E-06	0.3
CK045						7.65								2.25E-06	0.3

TABLE N-15
CURRENT LIFETIME EXCESS CANCER RISK AND NON-CANCER TOXICITY HAZARDS FROM EXPOSURE TO COPCS
IN SURFACE SOIL AT THE CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

		Explosive EPCs		Metal EPCs										Total Residential Lifetime Excess Cancer Risk	Residential Hazard Index
	Analyte Units	2,4-Dinitrotoluene mg/kg	Nitroglycerin mg/kg	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg	Thallium mg/kg	Vanadium mg/kg		
Location ID	**Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg)[1,2]**	6.9	280	—	—	34	—	4800	—	—	—	—	—	EPC/ Carcinogenic PCL x $1x10^{-5}$	
	Non-Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg) [2]	130	6.7	64000	15	24	8100	38	1300	500	3800	5.3	75		EPC/ Non-Carcinogenic PCL
CK047						7.17								2.11E-06	0.3
CK052						7.47								2.20E-06	0.3
CL052						6.03								1.77E-06	0.3
CL054						6.60								1.94E-06	0.3
CL057						7.19								2.11E-06	0.3
CL071					17.5	6.47				805				1.90E-06	3
CM048						7.06								2.08E-06	0.3
CM054 (3)						8.09								2.38E-06	0.3
CM063						7.70								2.26E-06	0.3
CM068					6.41	6.12								1.80E-06	0.7
CN022 (3)						7.77								2.29E-06	0.3
CN044						7.59								2.23E-06	0.3
CN046					2.03	7.35								2.16E-06	0.4
CN060						7.07								2.08E-06	0.3
CN064 (3)						7.05								2.07E-06	0.3
CN073 (3)					66.58					1641				NC	8
CO022						6.49								1.91E-06	0.3
CO038						8.23								2.42E-06	0.3
CO042						6.16								1.81E-06	0.3
CO045						6.18								1.82E-06	0.3
CP043						5.81								1.71E-06	0.2
CP047						6.01								1.77E-06	0.3
CP050						7.79								2.29E-06	0.3
CP054						5.80								1.71E-06	0.2
CP064						6.37								1.87E-06	0.3
CQ048						5.76								1.69E-06	0.2
CR025						6.03								1.77E-06	0.3
CR045						6.73								1.98E-06	0.3
CR051									165					NC	0.1
CR052						5.69								1.67E-06	0.2
CT047						6.04								1.78E-06	0.3
CT065 (3)						6.28								1.85E-06	0.3
CU048						5.71								1.68E-06	0.2
CV050						5.77								1.70E-06	0.2
CV053						6.03								1.77E-06	0.3
CV066						6.05								1.78E-06	0.3
CW048						6.03								1.77E-06	0.3
CW061						5.84								1.72E-06	0.2
CX044						8.02								2.36E-06	0.3

TABLE N-15
CURRENT LIFETIME EXCESS CANCER RISK AND NON-CANCER TOXICITY HAZARDS FROM EXPOSURE TO COPCS
IN SURFACE SOIL AT THE CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

		Explosive EPCs		Metal EPCs										Total Residential Lifetime Excess Cancer Risk	Residential Hazard Index
	Analyte **Units**	2,4-Dinitrotoluene mg/kg	Nitroglycerin mg/kg	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg	Thallium mg/kg	Vanadium mg/kg		
Location ID	**Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg)^{1,2}**	6.9	280	—	—	34	—	4800	—	—	—	—	—	EPC/ Carcinogenic PCL x $1x10^{-5}$	
	Non-Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg)^{2}	130	6.7	64000	15	24	8100	38	1300	500	3800	5.3	75		EPC/ Non-Carcinogenic PCL
CY049						6.85								2.01E-06	0.3
CY052						6.57								1.93E-06	0.3
CZ054						7.35								2.16E-06	0.3
CZ058						2.30						0.55		6.76E-07	0.2
CZ062						5.80								1.71E-06	0.2
DA074						5.70								1.68E-06	0.2
DB048						7.20								2.12E-06	0.3
DB052						8.32								2.45E-06	0.3
DB057 (3)						7.06								2.08E-06	0.3
DC046						10.30								3.03E-06	0.4
DC074						6.10								1.79E-06	0.3
DD048						7.52								2.21E-06	0.3
DD050						7.00								2.06E-06	0.3
DD054						6.83								2.01E-06	0.3
DE072												0.54		NC	0.1
DF047						8.72								2.56E-06	0.4
DF049						8.14								2.39E-06	0.3
DG050						7.68								2.26E-06	0.3
DG065						6.05								1.78E-06	0.3
DG070					14.1					5030				NC	11
DH050						8.21								2.41E-06	0.3
DH058						8.17								2.40E-06	0.3
DH061						6.21								1.83E-06	0.3
DH072						6.32								1.86E-06	0.3
DJ051						8.35								2.46E-06	0.3
DK049						9.48								2.79E-06	0.4
DK053						8.51								2.50E-06	0.4
DK069						6.11								1.80E-06	0.3
DK074					2.64	5.20				754				1.53E-06	2
DM051						9.43								2.77E-06	0.4
DM051						8.14								2.39E-06	0.3
DM053						8.67								2.55E-06	0.4
DN072						5.79								1.70E-06	0.2
DP051						6.85								2.01E-06	0.3
DS053						8.15								2.40E-06	0.3
DV051					1.9									NC	0.1
DV055						7.32								2.15E-06	0.3
DV059						6.95								2.04E-06	0.3
DW050						6.68								1.96E-06	0.3

TABLE N-15
CURRENT LIFETIME EXCESS CANCER RISK AND NON-CANCER TOXICITY HAZARDS FROM EXPOSURE TO COPCS IN SURFACE SOIL AT THE CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Soil (ISM)
Exposure Medium: Surface Soil (0-0.5 ft bgs)

		Explosive EPCs		Metal EPCs										Total Residential Lifetime Excess Cancer Risk	Residential Hazard Index
	Analyte Units	2,4-Dinitrotoluene mg/kg	Nitroglycerin mg/kg	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg	Thallium mg/kg	Vanadium mg/kg		
Location ID	**Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg)[1,2]**	6.9	280	—	—	34	—	4800	—	—	—	—	—	EPC/ Carcinogenic PCL x $1x10^{-5}$	
	Non-Carcinogenic $^{Tot}Soil_{Comb}$ PCL (mg/kg) [2]	130	6.7	64000	15	24	8100	38	1300	500	3800	5.3	75		EPC/ Non-Carcinogenic PCL
DW056						7.41								2.18E-06	0.3
DW058						7.41								2.18E-06	0.3
DW061						6.31								1.86E-06	0.3
DW064						7.17								2.11E-06	0.3
DW067						7.41								2.18E-06	0.3
DX049						6.05								1.78E-06	0.3
DX053 (3)						6.96								2.05E-06	0.3

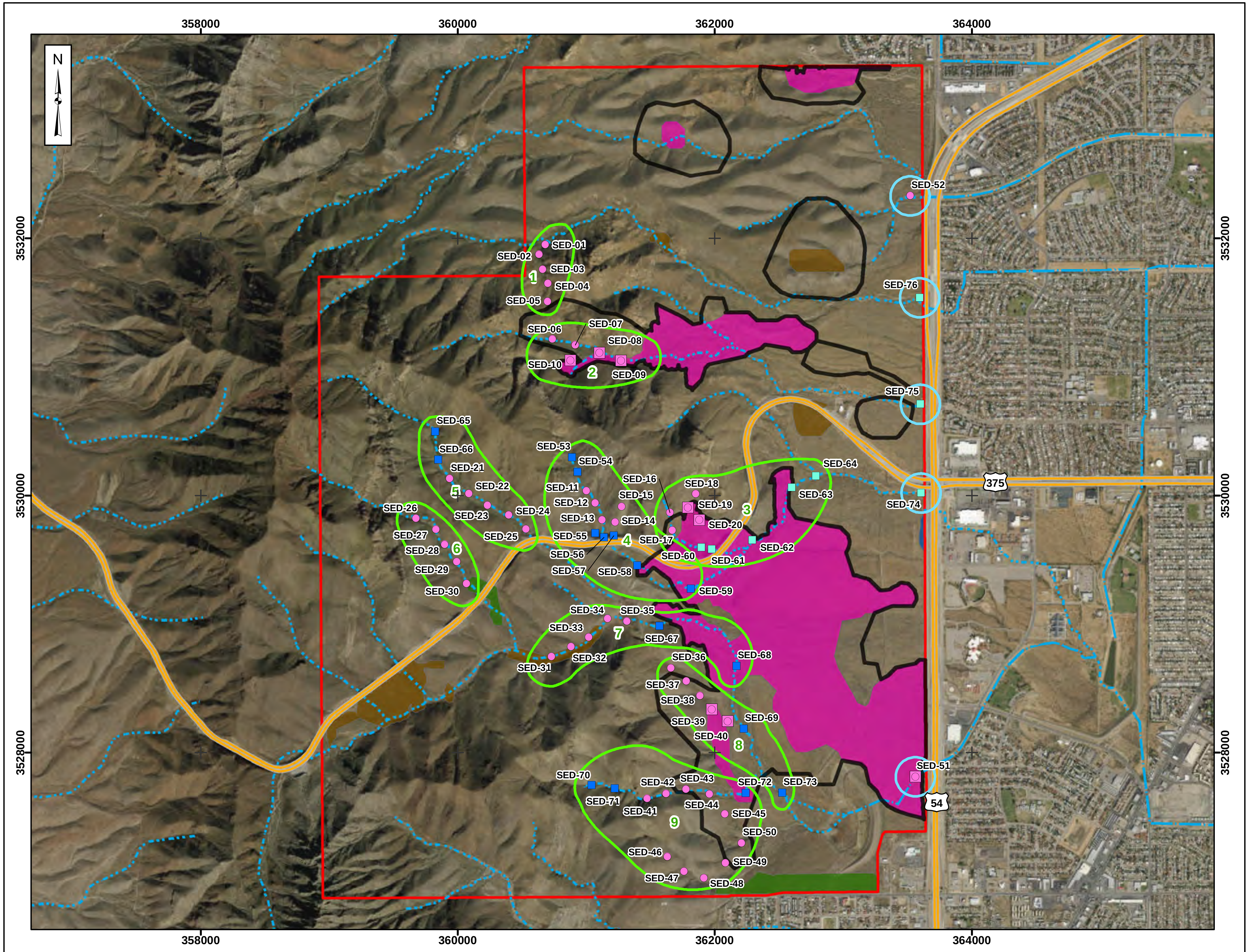
Notes:
Risks and hazards were calcuated for DUs reporting at least one screening level exceedance.
Exposure Point Concentrations (EPCs) are equal to the reported concentrations for each DU with the exception of DUs where triplicate sampling was conducted. Upper Confidence Limts for DUs sampled in triplicate were calcuated uisng ITRC ISM guidance and USEPA's ProUCL 5.1 software.
COPC - Constituent of potential concern (Table N-1).
mg/kg - milligrams per kilogram.
Shaded cells indicate a HI greater than the target HI of 1.
Footnotes:
1 - Carcinogenic PCLs based on 1-in-100,000 (10^{-5}) Lifetime Excess Cancer Risk.
2 - $^{Tot}Soil_{Comb}$ PCLs based on values published by Texas Commission on Environmental Quality (TCEQ) dated April 2017.
3 - Cancer risks and hazard quotients for DUs sampled in triplicate are based on the Student's t UCL, as the data appear to have a normal distribution.

TABLE N-16
FUTURE LIFETIME EXCESS CANCER RISK AND NON-CANCER TOXICITY HAZARDS FROM EXPOSURE TO COPCS IN ARROYO SOIL AT THE CLOSED CASTNER FIRING RANGE
FORT BLISS, TEXAS

Scenario Timeframe: Future
Medium: Arroyo Soil
Exposure Medium: Soil

COPC	EPC (mg/kg)	Carcinogenic PCL $^{Tot}Soil_{Comb}$ (mg/kg)[1,2]	Residential Lifetime Excess Cancer Risk	Non-Carcinogenic PCL $^{Tot}Soil_{Comb}$ (mg/kg)	Residential Hazard Quotients
Reach 1					
Beryllium	6.1	4800	1E-08	38	0.2
Total Cancer Risk			**1E-08**		
Hazard Index					**0.2**
Reach 2					
Arsenic	5.4	34	2E-06	24	0.2
Beryllium	4.1	4800	8E-09	38	0.1
Total Cancer Risk			**2E-06**		
Hazard Index					**0.3**
Reach 3					
Arsenic	33.4	34	1E-05	24	1.4
Beryllium	3.9	4800	8E-09	38	0.1
Total Cancer Risk			**1E-05**		
Hazard Index					**1.5**
Reach 4					
Arsenic	12.4	34	4E-06	24	0.5
Total Cancer Risk			**4E-06**		
Hazard Index					**0.5**
Reach 5					
Arsenic	8.6	34	3E-06	24	0.4
Total Cancer Risk			**3E-06**		
Hazard Index					**0.4**
Reach 6					
Arsenic	7.5	34	2E-06	24	0.3
Total Cancer Risk			**2E-06**		
Hazard Index					**0.3**
Reach 7					
Arsenic	10.7	34	3E-06	24	0.4
Total Cancer Risk			**3E-06**		
Hazard Index					**0.4**
Reach 8					
Arsenic	7.8	34	2E-06	24	0.3
Total Cancer Risk			**2E-06**		
Hazard Index					**0.3**
Reach 9					
Arsenic	10.5	34	3E-06	24	0.4
Total Cancer Risk			**3E-06**		
Hazard Index					**0.4**

Notes:
Shaded cells indicate a HI greater than the target HI of 1.
COPC - Constituent of potential concern (Tables N-2 through N-11).
mg/kg - milligrams per kilogram.
Footnotes:
1 - Carcinogenic PCLs based on 1-in-100,000 (10^5) Lifetime Excess Cancer Risk.
2 - $^{Tot}Soil_{Comb}$ PCLs based on values published by Texas Commission on Environmental Quality (TCEQ) dated April 2017.



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure N-1
Arroyo Soil Reaches

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch
- Sampling Reach
- Downgradient Delineation Sample

Soil Sample (0-6")

- Phase I
- Phase II (Zinc Testing Only)
- Phase II (Zinc and Arsenic Testing)

Soil Sample (12-18")

- Phase I

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

UCL Statistics for Uncensored Full Data Sets - ISM

User Selected Options	
Date/Time of Computation	ProUCL 5.16/6/2017 10:22:14 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	10000

AJ025_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	5.68	Mean	6.123
Maximum	6.71	Median	5.98
SD	0.53	Std. Error of Mean	0.306
Coefficient of Variation	0.0865	Skewness	1.128

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.273	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.016	95% Adjusted-CLT UCL (Chen-1995)	6.839
		95% Modified-t UCL (Johnson-1978)	7.05

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	204.3	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.03	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1226	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.265	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.737	Mean of logged Data	1.81
Maximum of Logged Data	1.904	SD of logged Data	0.0853

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.027
95% Chebyshev (MVUE) UCL	7.437	97.5% Chebyshev (MVUE) UCL	8.005
99% Chebyshev (MVUE) UCL	9.122		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6.626	95% Jackknife UCL	7.016
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.041	95% Chebyshev(Mean, Sd) UCL	7.457
97.5% Chebyshev(Mean, Sd) UCL	8.033	99% Chebyshev(Mean, Sd) UCL	9.167

Suggested UCL to Use

95% Student's-t UCL	7.016		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

AY031_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	9.56	Mean	9.753
Maximum	9.86	Median	9.84
SD	0.168	Std. Error of Mean	0.0968
Coefficient of Variation	0.0172	Skewness	-1.704

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

	A	B	C	D	E	F	G	H	I	J	K	L
105	**Normal GOF Test**											
106					Shapiro Wilk Test Statistic	0.8	**Shapiro Wilk GOF Test**					
107					5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level					
108					Lilliefors Test Statistic	0.364	**Lilliefors GOF Test**					
109					5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level					
110	**Data appear Normal at 5% Significance Level**											
111												
112	**Assuming Normal Distribution**											
113	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
114					95% Student's-t UCL	10.04					95% Adjusted-CLT UCL (Chen-1995)	9.811
115											95% Modified-t UCL (Johnson-1978)	10.02
116												
117	**Gamma GOF Test**											
118	**Not Enough Data to Perform GOF Test**											
119												
120	**Gamma Statistics**											
121					k hat (MLE)	5039					k star (bias corrected MLE)	N/A
122					Theta hat (MLE)	0.00194					Theta star (bias corrected MLE)	N/A
123					nu hat (MLE)	30231					nu star (bias corrected)	N/A
124					MLE Mean (bias corrected)	N/A					MLE Sd (bias corrected)	N/A
125											Approximate Chi Square Value (0.05)	N/A
126					Adjusted Level of Significance	N/A					Adjusted Chi Square Value	N/A
127												
128	**Assuming Gamma Distribution**											
129					95% Approximate Gamma UCL (use when n>=50))	N/A					95% Adjusted Gamma UCL (use when n<50)	N/A
130												
131	**Lognormal GOF Test**											
132					Shapiro Wilk Test Statistic	0.799	**Shapiro Wilk Lognormal GOF Test**					
133					5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level					
134					Lilliefors Test Statistic	0.364	**Lilliefors Lognormal GOF Test**					
135					5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level					
136	**Data appear Lognormal at 5% Significance Level**											
137												
138	**Lognormal Statistics**											
139					Minimum of Logged Data	2.258					Mean of logged Data	2.278
140					Maximum of Logged Data	2.288					SD of logged Data	0.0173
141												
142	**Assuming Lognormal Distribution**											
143					95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	10.05
144					95% Chebyshev (MVUE) UCL	10.18					97.5% Chebyshev (MVUE) UCL	10.36
145					99% Chebyshev (MVUE) UCL	10.72						
146												
147	**Nonparametric Distribution Free UCL Statistics**											
148	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
149												
150	**Nonparametric Distribution Free UCLs**											
151					95% CLT UCL	9.913					95% Jackknife UCL	10.04
152					95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A
153					95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A
154					95% BCA Bootstrap UCL	N/A						
155					90% Chebyshev(Mean, Sd) UCL	10.04					95% Chebyshev(Mean, Sd) UCL	10.18
156					97.5% Chebyshev(Mean, Sd) UCL	10.36					99% Chebyshev(Mean, Sd) UCL	10.72

Suggested UCL to Use

95% Student's-t UCL	10.04

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

BE043_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	7.8	Mean	7.92
Maximum	7.98	Median	7.98
SD	0.104	Std. Error of Mean	0.06
Coefficient of Variation	0.0131	Skewness	-1.732

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8.095	95% Adjusted-CLT UCL (Chen-1995)	7.955
		95% Modified-t UCL (Johnson-1978)	8.085

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	8668	k star (bias corrected MLE)	N/A
Theta hat (MLE)	9.1374E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	52006	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.385	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.054	Mean of logged Data	2.069
Maximum of Logged Data	2.077	SD of logged Data	0.0132

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	8.101
95% Chebyshev (MVUE) UCL	8.183	97.5% Chebyshev (MVUE) UCL	8.296
99% Chebyshev (MVUE) UCL	8.519		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	8.019	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	8.1	95% Chebyshev(Mean, Sd) UCL	8.182
97.5% Chebyshev(Mean, Sd) UCL	8.295	99% Chebyshev(Mean, Sd) UCL	8.517

Suggested UCL to Use

95% Student's-t UCL	8.095		

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

BK043_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3

		Number of Missing Observations	0
Minimum	5.84	Mean	6.007
Maximum	6.27	Median	5.91
SD	0.231	Std. Error of Mean	0.133
Coefficient of Variation	0.0384	Skewness	1.554

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.329	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6.396	95% Adjusted-CLT UCL (Chen-1995)	6.354
		95% Modified-t UCL (Johnson-1978)	6.416

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1030	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00583	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6178	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.327	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.765	Mean of logged Data	1.792
Maximum of Logged Data	1.836	SD of logged Data	0.038

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	6.402
95% Chebyshev (MVUE) UCL	6.582	97.5% Chebyshev (MVUE) UCL	6.831
99% Chebyshev (MVUE) UCL	7.319		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6.226	95% Jackknife UCL	6.396
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	6.406	95% Chebyshev(Mean, Sd) UCL	6.587
97.5% Chebyshev(Mean, Sd) UCL	6.839	99% Chebyshev(Mean, Sd) UCL	7.332

Suggested UCL to Use

95% Student's-t UCL	6.396		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

BS069_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	5.07	Mean	5.75
Maximum	7.04	Median	5.14
SD	1.118	Std. Error of Mean	0.645
Coefficient of Variation	0.194	Skewness	1.724

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.777	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.374	Lilliefors GOF Test
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	7.634	95% Adjusted-CLT UCL (Chen-1995)	7.498
		95% Modified-t UCL (Johnson-1978)	7.741

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	42.3	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.136	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	253.8	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.781	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.372	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.623	Mean of logged Data	1.737
Maximum of Logged Data	1.952	SD of logged Data	0.186

Assuming Lognormal Distribution

95% H-UCL	8.801	90% Chebyshev (MVUE) UCL	7.588
95% Chebyshev (MVUE) UCL	8.422	97.5% Chebyshev (MVUE) UCL	9.579
99% Chebyshev (MVUE) UCL	11.85		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6.811	95% Jackknife UCL	7.634
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.686	95% Chebyshev(Mean, Sd) UCL	8.563
97.5% Chebyshev(Mean, Sd) UCL	9.78	99% Chebyshev(Mean, Sd) UCL	12.17

Suggested UCL to Use

95% Student's-t UCL	7.634		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CH046_arsenic

General Statistics			
Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	9.19	Mean	9.523
Maximum	9.9	Median	9.48
SD	0.357	Std. Error of Mean	0.206
Coefficient of Variation	0.0375	Skewness	0.538
Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use			
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.			
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).			
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1			
Normal GOF Test			
Shapiro Wilk Test Statistic	0.989	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	10.13	95% Adjusted-CLT UCL (Chen-1995)	9.931
		95% Modified-t UCL (Johnson-1978)	10.14
Gamma GOF Test			
Not Enough Data to Perform GOF Test			
Gamma Statistics			
k hat (MLE)	1072	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00889	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6431	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.991	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.21	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.218	Mean of logged Data	2.253
Maximum of Logged Data	2.293	SD of logged Data	0.0374
Assuming Lognormal Distribution			
95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	10.14

95% Chebyshev (MVUE) UCL	10.42	97.5% Chebyshev (MVUE) UCL	10.81
99% Chebyshev (MVUE) UCL	11.57		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	9.862	95% Jackknife UCL	10.13
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	10.14	95% Chebyshev(Mean, Sd) UCL	10.42
97.5% Chebyshev(Mean, Sd) UCL	10.81	99% Chebyshev(Mean, Sd) UCL	11.57

Suggested UCL to Use

95% Student's-t UCL	10.13		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CI053_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	7.73	Mean	7.93
Maximum	8.1	Median	7.96
SD	0.187	Std. Error of Mean	0.108
Coefficient of Variation	0.0236	Skewness	-0.704

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8.245	95% Adjusted-CLT UCL (Chen-1995)	8.061
		95% Modified-t UCL (Johnson-1978)	8.238

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	2692	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00295	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	16154	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.979	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.233	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.045	Mean of logged Data	2.07
Maximum of Logged Data	2.092	SD of logged Data	0.0236

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	8.255
95% Chebyshev (MVUE) UCL	8.402	97.5% Chebyshev (MVUE) UCL	8.606
99% Chebyshev (MVUE) UCL	9.006		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	8.107	95% Jackknife UCL	8.245
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	8.254	95% Chebyshev(Mean, Sd) UCL	8.4
97.5% Chebyshev(Mean, Sd) UCL	8.604	99% Chebyshev(Mean, Sd) UCL	9.003

Suggested UCL to Use

95% Student's-t UCL	8.245		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be

reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

CM054_arsenic

General Statistics			
Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	7.18	Mean	7.48
Maximum	7.88	Median	7.38
SD	0.361	Std. Error of Mean	0.208
Coefficient of Variation	0.0482	Skewness	1.152

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test			
Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.276	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8.088	95% Adjusted-CLT UCL (Chen-1995)	7.97
		95% Modified-t UCL (Johnson-1978)	8.111

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics			
k hat (MLE)	653.1	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0115	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3918	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.947	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.271	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.971	Mean of logged Data	2.011
Maximum of Logged Data	2.064	SD of logged Data	0.0478

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	8.099
95% Chebyshev (MVUE) UCL	8.379	97.5% Chebyshev (MVUE) UCL	8.769
99% Chebyshev (MVUE) UCL	9.533		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	7.822	95% Jackknife UCL	8.088
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	8.104	95% Chebyshev(Mean, Sd) UCL	8.387
97.5% Chebyshev(Mean, Sd) UCL	8.78	99% Chebyshev(Mean, Sd) UCL	9.551

Suggested UCL to Use

95% Student's-t UCL	8.088		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CN022_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	7.04	Mean	7.233
Maximum	7.6	Median	7.06
SD	0.318	Std. Error of Mean	0.183
Coefficient of Variation	0.0439	Skewness	1.724

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.777	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

677	Assuming Normal Distribution			
678	95% Normal UCL		95% UCLs (Adjusted for Skewness)	
679	95% Student's-t UCL	7.769	95% Adjusted-CLT UCL (Chen-1995)	7.73
680			95% Modified-t UCL (Johnson-1978)	7.799
681				
682	Gamma GOF Test			
683	Not Enough Data to Perform GOF Test			
684				
685	Gamma Statistics			
686	k hat (MLE)	790.3	k star (bias corrected MLE)	N/A
687	Theta hat (MLE)	0.00915	Theta star (bias corrected MLE)	N/A
688	nu hat (MLE)	4742	nu star (bias corrected)	N/A
689	MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
690			Approximate Chi Square Value (0.05)	N/A
691	Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A
692				
693	Assuming Gamma Distribution			
694	95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A
695				
696	Lognormal GOF Test			
697	Shapiro Wilk Test Statistic	0.778	Shapiro Wilk Lognormal GOF Test	
698	5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
699	Lilliefors Test Statistic	0.374	Lilliefors Lognormal GOF Test	
700	5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	
701	Data appear Lognormal at 5% Significance Level			
702				
703	Lognormal Statistics			
704	Minimum of Logged Data	1.952	Mean of logged Data	1.978
705	Maximum of Logged Data	2.028	SD of logged Data	0.0434
706				
707	Assuming Lognormal Distribution			
708	95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.777
709	95% Chebyshev (MVUE) UCL	8.023	97.5% Chebyshev (MVUE) UCL	8.365
710	99% Chebyshev (MVUE) UCL	9.036		
711				
712	Nonparametric Distribution Free UCL Statistics			
713	Data appear to follow a Discernible Distribution at 5% Significance Level			
714				
715	Nonparametric Distribution Free UCLs			
716	95% CLT UCL	7.535	95% Jackknife UCL	7.769
717	95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
718	95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
719	95% BCA Bootstrap UCL	N/A		
720	90% Chebyshev(Mean, Sd) UCL	7.784	95% Chebyshev(Mean, Sd) UCL	8.033
721	97.5% Chebyshev(Mean, Sd) UCL	8.379	99% Chebyshev(Mean, Sd) UCL	9.058
722				
723	Suggested UCL to Use			
724	95% Student's-t UCL	7.769		
725				
726	Recommended UCL exceeds the maximum observation			
727				
728	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CN064_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	6.54	Mean	6.733
Maximum	6.92	Median	6.74
SD	0.19	Std. Error of Mean	0.11
Coefficient of Variation	0.0282	Skewness	-0.158

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.999	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.054	95% Adjusted-CLT UCL (Chen-1995)	6.903
		95% Modified-t UCL (Johnson-1978)	7.052

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1880	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00358	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11278	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.999	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.878	Mean of logged Data	1.907
Maximum of Logged Data	1.934	SD of logged Data	0.0283

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.063
95% Chebyshev (MVUE) UCL	7.212	97.5% Chebyshev (MVUE) UCL	7.419
99% Chebyshev (MVUE) UCL	7.826		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6.914	95% Jackknife UCL	7.054
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.063	95% Chebyshev(Mean, Sd) UCL	7.212
97.5% Chebyshev(Mean, Sd) UCL	7.419	99% Chebyshev(Mean, Sd) UCL	7.825

Suggested UCL to Use

95% Student's-t UCL	7.054		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

CT065_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	5.7	Mean	5.93
Maximum	6.11	Median	5.98
SD	0.21	Std. Error of Mean	0.121
Coefficient of Variation	0.0353	Skewness	-1.013

**Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1**

Normal GOF Test

Shapiro Wilk Test Statistic	0.957	Shapiro Wilk GOF Test	

833	5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
834	Lilliefors Test Statistic	0.261	**Lilliefors GOF Test**	
835	5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	
836	**Data appear Normal at 5% Significance Level**			
837				
838	**Assuming Normal Distribution**			
839	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
840	95% Student's-t UCL	6.283	95% Adjusted-CLT UCL (Chen-1995)	6.053
841			95% Modified-t UCL (Johnson-1978)	6.271
842				
843	**Gamma GOF Test**			
844	**Not Enough Data to Perform GOF Test**			
845				
846	**Gamma Statistics**			
847	k hat (MLE)	1191	k star (bias corrected MLE)	N/A
848	Theta hat (MLE)	0.00498	Theta star (bias corrected MLE)	N/A
849	nu hat (MLE)	7149	nu star (bias corrected)	N/A
850	MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
851			Approximate Chi Square Value (0.05)	N/A
852	Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A
853				
854	**Assuming Gamma Distribution**			
855	95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A
856				
857	**Lognormal GOF Test**			
858	Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**	
859	5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
860	Lilliefors Test Statistic	0.265	**Lilliefors Lognormal GOF Test**	
861	5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	
862	**Data appear Lognormal at 5% Significance Level**			
863				
864	**Lognormal Statistics**			
865	Minimum of Logged Data	1.74	Mean of logged Data	1.78
866	Maximum of Logged Data	1.81	SD of logged Data	0.0356
867				
868	**Assuming Lognormal Distribution**			
869	95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	6.295
870	95% Chebyshev (MVUE) UCL	6.461	97.5% Chebyshev (MVUE) UCL	6.69
871	99% Chebyshev (MVUE) UCL	7.141		
872				
873	**Nonparametric Distribution Free UCL Statistics**			
874	**Data appear to follow a Discernible Distribution at 5% Significance Level**			
875				
876	**Nonparametric Distribution Free UCLs**			
877	95% CLT UCL	6.129	95% Jackknife UCL	6.283
878	95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
879	95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
880	95% BCA Bootstrap UCL	N/A		
881	90% Chebyshev(Mean, Sd) UCL	6.293	95% Chebyshev(Mean, Sd) UCL	6.457
882	97.5% Chebyshev(Mean, Sd) UCL	6.685	99% Chebyshev(Mean, Sd) UCL	7.134
883				
884	**Suggested UCL to Use**			

95% Student's-t UCL	6.283

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

DB057_arsenic

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	6.26	Mean	6.547
Maximum	6.87	Median	6.51
SD	0.307	Std. Error of Mean	0.177
Coefficient of Variation	0.0468	Skewness	0.53

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.989	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.064	95% Adjusted-CLT UCL (Chen-1995)	6.896
		95% Modified-t UCL (Johnson-1978)	7.073

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	686.9	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00953	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4121	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.992	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.208	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.834	Mean of logged Data	1.878
Maximum of Logged Data	1.927	SD of logged Data	0.0467
Assuming Lognormal Distribution			
95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.076
95% Chebyshev (MVUE) UCL	7.316	97.5% Chebyshev (MVUE) UCL	7.648
99% Chebyshev (MVUE) UCL	8.302		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	6.838	95% Jackknife UCL	7.064
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.078	95% Chebyshev(Mean, Sd) UCL	7.318
97.5% Chebyshev(Mean, Sd) UCL	7.652	99% Chebyshev(Mean, Sd) UCL	8.308
Suggested UCL to Use			
95% Student's-t UCL	7.064		
Recommended UCL exceeds the maximum observation			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
DX053_arsenic			
General Statistics			
Total Number of Observations	3	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	6.52	Mean	6.7
Maximum	6.79	Median	6.79
SD	0.156	Std. Error of Mean	0.09
Coefficient of Variation	0.0233	Skewness	-1.732
Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use			
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.			

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6.963	95% Adjusted-CLT UCL (Chen-1995)	6.752
		95% Modified-t UCL (Johnson-1978)	6.948

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	2746	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00244	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	16475	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.385	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.875	Mean of logged Data	1.902
Maximum of Logged Data	1.915	SD of logged Data	0.0234

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	6.972
95% Chebyshev (MVUE) UCL	7.095	97.5% Chebyshev (MVUE) UCL	7.266
99% Chebyshev (MVUE) UCL	7.602		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6.848	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A

	A–E	F	G–K	L
1041	95% BCA Bootstrap UCL	N/A		
1042	90% Chebyshev(Mean, Sd) UCL	6.97	95% Chebyshev(Mean, Sd) UCL	7.092
1043	97.5% Chebyshev(Mean, Sd) UCL	7.262	99% Chebyshev(Mean, Sd) UCL	7.595
1044				
1045	**Suggested UCL to Use**			
1046	95% Student's-t UCL	6.963		
1047				
1048	**Recommended UCL exceeds the maximum observation**			
1049				
1050	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
1051	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			
1052				
1053	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
1054	Recommendations are based upon data size, data distribution, and skewness.			
1055	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
1056	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
1057				
1058	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**			
1059	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**			
1060				

UCL Statistics for Uncensored Full Data Sets - ISM

User Selected Options	
Date/Time of Computation	ProUCL 5.14/27/2017 12:23:33 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	10000

Antimony CN073

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	14.1	Mean	34.97
Maximum	50.4	Median	40.4
SD	18.75	Std. Error of Mean	10.83
Coefficient of Variation	0.536	Skewness	-1.195

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.937	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.281	Lilliefors GOF Test
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	66.58	95% Adjusted-CLT UCL (Chen-1995)	44.8
		95% Modified-t UCL (Johnson-1978)	65.33

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	3.926	k star (bias corrected MLE)	N/A
Theta hat (MLE)	8.907	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	23.56	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

	A–E	F	G–K	L
53	Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk Lognormal GOF Test**	
54	5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
55	Lilliefors Test Statistic	0.325	**Lilliefors Lognormal GOF Test**	
56	5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	
57	**Data appear Lognormal at 5% Significance Level**			
58				
59	**Lognormal Statistics**			
60	Minimum of Logged Data	2.646	Mean of logged Data	3.422
61	Maximum of Logged Data	3.92	SD of logged Data	0.681
62				
63	**Assuming Lognormal Distribution**			
64	95% H-UCL	2752	90% Chebyshev (MVUE) UCL	75.18
65	95% Chebyshev (MVUE) UCL	93.14	97.5% Chebyshev (MVUE) UCL	118.1
66	99% Chebyshev (MVUE) UCL	167		
67				
68	**Nonparametric Distribution Free UCL Statistics**			
69	**Data appear to follow a Discernible Distribution at 5% Significance Level**			
70				
71	**Nonparametric Distribution Free UCLs**			
72	95% CLT UCL	52.77	95% Jackknife UCL	66.58
73	95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
74	95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
75	95% BCA Bootstrap UCL	N/A		
76	90% Chebyshev(Mean, Sd) UCL	67.44	95% Chebyshev(Mean, Sd) UCL	82.15
77	97.5% Chebyshev(Mean, Sd) UCL	102.6	99% Chebyshev(Mean, Sd) UCL	142.7
78				
79	**Suggested UCL to Use**			
80	95% Student's-t UCL	66.58		
81				
82	**Recommended UCL exceeds the maximum observation**			
83				
84	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
85	Recommendations are based upon data size, data distribution, and skewness.			
86	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
88				
89	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**			
90	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**			
91				
171				
329				
330	Lead CN073			
331				
332	**General Statistics**			
333	Total Number of Observations	3	Number of Distinct Observations	3
334			Number of Missing Observations	0
335	Minimum	552	Mean	980.7
336	Maximum	1320	Median	1070
337	SD	391.7	Std. Error of Mean	226.2
338	Coefficient of Variation	0.399	Skewness	-0.973
339				
340	**Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use**			

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.257	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1641	95% Adjusted-CLT UCL (Chen-1995)	1217
		95% Modified-t UCL (Johnson-1978)	1620

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	8.043	k star (bias corrected MLE)	N/A
Theta hat (MLE)	121.9	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	48.26	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.918	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.296	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.314	Mean of logged Data	6.825
Maximum of Logged Data	7.185	SD of logged Data	0.455

Assuming Lognormal Distribution

95% H-UCL	6816	90% Chebyshev (MVUE) UCL	1742
95% Chebyshev (MVUE) UCL	2085	97.5% Chebyshev (MVUE) UCL	2561
99% Chebyshev (MVUE) UCL	3495		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1353	95% Jackknife UCL	1641
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A

	A	B	C	D	E	F	G	H	I	J	K	L
393	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
394	95% BCA Bootstrap UCL					N/A						
395	90% Chebyshev(Mean, Sd) UCL					1659	95% Chebyshev(Mean, Sd) UCL					1966
396	97.5% Chebyshev(Mean, Sd) UCL					2393	99% Chebyshev(Mean, Sd) UCL					3231
397												
398	**Suggested UCL to Use**											
399	95% Student's-t UCL					1641						
400												
401	**Recommended UCL exceeds the maximum observation**											
402												
403	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
404	Recommendations are based upon data size, data distribution, and skewness.											
405	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
406	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
407												
408	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
409	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
410												

UCL Statistics for Uncensored Full Data Sets _- Arroyo Reaches

User Selected Options	
Date/Time of Computation	ProUCL 5.15/7/2017 5:21:46 PM
From File	ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	10000

DD_lead

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	7.02	Mean	25.98
Maximum	62.2	Median	19
SD	21.67	Std. Error of Mean	8.849
Coefficient of Variation	0.834	Skewness	1.084

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.878	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	43.81	95% Adjusted-CLT UCL (Chen-1995)	44.71
		95% Modified-t UCL (Johnson-1978)	44.46

Gamma GOF Test

A-D Test Statistic	0.278	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.191	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.767	k star (bias corrected MLE)	0.995
Theta hat (MLE)	14.7	Theta star (bias corrected MLE)	26.11
nu hat (MLE)	21.21	nu star (bias corrected)	11.94
MLE Mean (bias corrected)	25.98	MLE Sd (bias corrected)	26.04
		Approximate Chi Square Value (0.05)	5.186
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	3.702

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	59.79	95% Adjusted Gamma UCL (use when n<50)	83.76

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.949	Mean of logged Data	2.948
Maximum of Logged Data	4.13	SD of logged Data	0.879

Assuming Lognormal Distribution

95% H-UCL	120.7	90% Chebyshev (MVUE) UCL	53.62
95% Chebyshev (MVUE) UCL	66.15	97.5% Chebyshev (MVUE) UCL	83.54
99% Chebyshev (MVUE) UCL	117.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	40.53	95% Jackknife UCL	43.81
95% Standard Bootstrap UCL	39.27	95% Bootstrap-t UCL	63.57
95% Hall's Bootstrap UCL	131.6	95% Percentile Bootstrap UCL	40.02
95% BCA Bootstrap UCL	42.35		
90% Chebyshev(Mean, Sd) UCL	52.52	95% Chebyshev(Mean, Sd) UCL	64.55
97.5% Chebyshev(Mean, Sd) UCL	81.24	99% Chebyshev(Mean, Sd) UCL	114

Suggested UCL to Use

95% Student's-t UCL	43.81		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1_beryllium

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	3.12	Mean	4.842
Maximum	7.21	Median	4.94
SD	1.545	Std. Error of Mean	0.631
Coefficient of Variation	0.319	Skewness	0.347

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

105	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1			
106				
107	**Normal GOF Test**			
108	Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**	
109	5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
110	Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**	
111	5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	
112	**Data appear Normal at 5% Significance Level**			
113				
114	**Assuming Normal Distribution**			
115	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
116	95% Student's-t UCL	6.113	95% Adjusted-CLT UCL (Chen-1995)	5.975
117			95% Modified-t UCL (Johnson-1978)	6.128
118				
119	**Gamma GOF Test**			
120	A-D Test Statistic	0.336	**Anderson-Darling Gamma GOF Test**	
121	5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level	
122	K-S Test Statistic	0.222	**Kolmogorov-Smirnov Gamma GOF Test**	
123	5% K-S Critical Value	0.332	Detected data appear Gamma Distributed at 5% Significance Level	
124	**Detected data appear Gamma Distributed at 5% Significance Level**			
125				
126	**Gamma Statistics**			
127	k hat (MLE)	11.58	k star (bias corrected MLE)	5.901
128	Theta hat (MLE)	0.418	Theta star (bias corrected MLE)	0.821
129	nu hat (MLE)	138.9	nu star (bias corrected)	70.81
130	MLE Mean (bias corrected)	4.842	MLE Sd (bias corrected)	1.993
131			Approximate Chi Square Value (0.05)	52.43
132	Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	46.77
133				
134	**Assuming Gamma Distribution**			
135	95% Approximate Gamma UCL (use when n>=50))	6.538	95% Adjusted Gamma UCL (use when n<50)	7.33
136				
137	**Lognormal GOF Test**			
138	Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk Lognormal GOF Test**	
139	5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
140	Lilliefors Test Statistic	0.222	**Lilliefors Lognormal GOF Test**	
141	5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	
142	**Data appear Lognormal at 5% Significance Level**			
143				
144	**Lognormal Statistics**			
145	Minimum of Logged Data	1.138	Mean of logged Data	1.533
146	Maximum of Logged Data	1.975	SD of logged Data	0.328
147				
148	**Assuming Lognormal Distribution**			
149	95% H-UCL	6.823	90% Chebyshev (MVUE) UCL	6.788
150	95% Chebyshev (MVUE) UCL	7.668	97.5% Chebyshev (MVUE) UCL	8.889
151	99% Chebyshev (MVUE) UCL	11.29		
152				
153	**Nonparametric Distribution Free UCL Statistics**			
154	**Data appear to follow a Discernible Distribution at 5% Significance Level**			
155				
156	**Nonparametric Distribution Free UCLs**			

95% CLT UCL	5.879	95% Jackknife UCL	6.113
95% Standard Bootstrap UCL	5.782	95% Bootstrap-t UCL	6.145
95% Hall's Bootstrap UCL	6.096	95% Percentile Bootstrap UCL	5.802
95% BCA Bootstrap UCL	5.873		
90% Chebyshev(Mean, Sd) UCL	6.734	95% Chebyshev(Mean, Sd) UCL	7.592
97.5% Chebyshev(Mean, Sd) UCL	8.782	99% Chebyshev(Mean, Sd) UCL	11.12
Suggested UCL to Use			
95% Student's-t UCL	6.113		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	3.44	Mean	4.873
Maximum	5.98	Median	5.07
SD	0.808	Std. Error of Mean	0.286
Coefficient of Variation	0.166	Skewness	-0.596

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test			
Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.183	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5.413	95% Adjusted-CLT UCL (Chen-1995)	5.278
		95% Modified-t UCL (Johnson-1978)	5.403
Gamma GOF Test			
A-D Test Statistic	0.286	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.715	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.205	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	38.59	k star (bias corrected MLE)	24.2

Theta hat (MLE)	0.126	Theta star (bias corrected MLE)	0.201
nu hat (MLE)	617.5	nu star (bias corrected)	387.3
MLE Mean (bias corrected)	4.873	MLE Sd (bias corrected)	0.99
		Approximate Chi Square Value (0.05)	342.7
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	332

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	5.507	95% Adjusted Gamma UCL (use when n<50)	5.684

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.235	Mean of logged Data	1.571
Maximum of Logged Data	1.788	SD of logged Data	0.176

Assuming Lognormal Distribution

95% H-UCL	5.55	90% Chebyshev (MVUE) UCL	5.787
95% Chebyshev (MVUE) UCL	6.201	97.5% Chebyshev (MVUE) UCL	6.774
99% Chebyshev (MVUE) UCL	7.901		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5.342	95% Jackknife UCL	5.413
95% Standard Bootstrap UCL	5.311	95% Bootstrap-t UCL	5.346
95% Hall's Bootstrap UCL	5.294	95% Percentile Bootstrap UCL	5.296
95% BCA Bootstrap UCL	5.255		
90% Chebyshev(Mean, Sd) UCL	5.729	95% Chebyshev(Mean, Sd) UCL	6.117
97.5% Chebyshev(Mean, Sd) UCL	6.656	99% Chebyshev(Mean, Sd) UCL	7.713

Suggested UCL to Use

95% Student's-t UCL	5.413		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be

reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

2_beryllium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8

		Number of Missing Observations	0
Minimum	1.85	Mean	3.258
Maximum	5.7	Median	3.12
SD	1.202	Std. Error of Mean	0.425
Coefficient of Variation	0.369	Skewness	1.162

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.17	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	4.063	95% Adjusted-CLT UCL (Chen-1995)	4.143
		95% Modified-t UCL (Johnson-1978)	4.092

Gamma GOF Test

A-D Test Statistic	0.202	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.125	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.198	k star (bias corrected MLE)	5.832
Theta hat (MLE)	0.354	Theta star (bias corrected MLE)	0.559
nu hat (MLE)	147.2	nu star (bias corrected)	93.32
MLE Mean (bias corrected)	3.258	MLE Sd (bias corrected)	1.349
		Approximate Chi Square Value (0.05)	72.04
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	67.32

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	4.22	95% Adjusted Gamma UCL (use when n<50)	4.515

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.132	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.615	Mean of logged Data	1.126
Maximum of Logged Data	1.74	SD of logged Data	0.352

Assuming Lognormal Distribution			
95% H-UCL	4.351	90% Chebyshev (MVUE) UCL	4.474
95% Chebyshev (MVUE) UCL	5.027	97.5% Chebyshev (MVUE) UCL	5.794
99% Chebyshev (MVUE) UCL	7.302		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	3.956	95% Jackknife UCL	4.063
95% Standard Bootstrap UCL	3.904	95% Bootstrap-t UCL	4.365
95% Hall's Bootstrap UCL	7.844	95% Percentile Bootstrap UCL	3.96
95% BCA Bootstrap UCL	4.114		
90% Chebyshev(Mean, Sd) UCL	4.532	95% Chebyshev(Mean, Sd) UCL	5.11
97.5% Chebyshev(Mean, Sd) UCL	5.911	99% Chebyshev(Mean, Sd) UCL	7.485
Suggested UCL to Use			
95% Student's-t UCL	4.063		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
3_arsenic			
General Statistics			
Total Number of Observations	13	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	5.79	Mean	14.99
Maximum	60.1	Median	9.68
SD	15.2	Std. Error of Mean	4.217
Coefficient of Variation	1.014	Skewness	2.655
Normal GOF Test			
Shapiro Wilk Test Statistic	0.581	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.866	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.377	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.234	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	22.5	95% Adjusted-CLT UCL (Chen-1995)	25.24
		95% Modified-t UCL (Johnson-1978)	23.02
Gamma GOF Test			
A-D Test Statistic	1.656	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.34	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.239	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.037	k star (bias corrected MLE)	1.618
Theta hat (MLE)	7.356	Theta star (bias corrected MLE)	9.26
nu hat (MLE)	52.97	nu star (bias corrected)	42.08
MLE Mean (bias corrected)	14.99	MLE Sd (bias corrected)	11.78
		Approximate Chi Square Value (0.05)	28.21
Adjusted Level of Significance	0.0301	Adjusted Chi Square Value	26.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	22.35	95% Adjusted Gamma UCL (use when n<50)	23.71

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.791	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.866	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.296	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.234	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.756	Mean of logged Data	2.442
Maximum of Logged Data	4.096	SD of logged Data	0.656

Assuming Lognormal Distribution

95% H-UCL	22.07	90% Chebyshev (MVUE) UCL	21.93
95% Chebyshev (MVUE) UCL	25.53	97.5% Chebyshev (MVUE) UCL	30.52
99% Chebyshev (MVUE) UCL	40.34		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	21.92	95% Jackknife UCL	22.5
95% Standard Bootstrap UCL	21.6	95% Bootstrap-t UCL	56.93
95% Hall's Bootstrap UCL	61.45	95% Percentile Bootstrap UCL	22.54
95% BCA Bootstrap UCL	26.45		
90% Chebyshev(Mean, Sd) UCL	27.64	95% Chebyshev(Mean, Sd) UCL	33.37
97.5% Chebyshev(Mean, Sd) UCL	41.32	99% Chebyshev(Mean, Sd) UCL	56.94

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	33.37		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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General Statistics

	A–E	F	G–K	L
417	Total Number of Observations	7	Number of Distinct Observations	7
418			Number of Missing Observations	6
419	Minimum	2.61	Mean	3.47
420	Maximum	4.47	Median	3.41
421	SD	0.559	Std. Error of Mean	0.211
422	Coefficient of Variation	0.161	Skewness	0.496
423				
424	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use			
425	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.			
426	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).			
427	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1			
428				
429	**Normal GOF Test**			
430	Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**	
431	5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
432	Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**	
433	5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	
434	**Data appear Normal at 5% Significance Level**			
435				
436	**Assuming Normal Distribution**			
437	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
438	95% Student's-t UCL	3.881	95% Adjusted-CLT UCL (Chen-1995)	3.86
439			95% Modified-t UCL (Johnson-1978)	3.887
440				
441	**Gamma GOF Test**			
442	A-D Test Statistic	0.394	**Anderson-Darling Gamma GOF Test**	
443	5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level	
444	K-S Test Statistic	0.218	**Kolmogorov-Smirnov Gamma GOF Test**	
445	5% K-S Critical Value	0.311	Detected data appear Gamma Distributed at 5% Significance Level	
446	**Detected data appear Gamma Distributed at 5% Significance Level**			
447				
448	**Gamma Statistics**			
449	k hat (MLE)	45.32	k star (bias corrected MLE)	25.99
450	Theta hat (MLE)	0.0766	Theta star (bias corrected MLE)	0.133
451	nu hat (MLE)	634.5	nu star (bias corrected)	363.9
452	MLE Mean (bias corrected)	3.47	MLE Sd (bias corrected)	0.681
453			Approximate Chi Square Value (0.05)	320.7
454	Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	308.4
455				
456	**Assuming Gamma Distribution**			
457	95% Approximate Gamma UCL (use when n>=50))	3.938	95% Adjusted Gamma UCL (use when n<50)	4.095
458				
459	**Lognormal GOF Test**			
460	Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk Lognormal GOF Test**	
461	5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
462	Lilliefors Test Statistic	0.225	**Lilliefors Lognormal GOF Test**	
463	5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	
464	**Data appear Lognormal at 5% Significance Level**			
465				
466	**Lognormal Statistics**			
467	Minimum of Logged Data	0.959	Mean of logged Data	1.233
468	Maximum of Logged Data	1.497	SD of logged Data	0.161

Assuming Lognormal Distribution

95% H-UCL	3.949	90% Chebyshev (MVUE) UCL	4.104
95% Chebyshev (MVUE) UCL	4.391	97.5% Chebyshev (MVUE) UCL	4.79
99% Chebyshev (MVUE) UCL	5.572		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.818	95% Jackknife UCL	3.881
95% Standard Bootstrap UCL	3.792	95% Bootstrap-t UCL	3.984
95% Hall's Bootstrap UCL	4.388	95% Percentile Bootstrap UCL	3.796
95% BCA Bootstrap UCL	3.839		
90% Chebyshev(Mean, Sd) UCL	4.104	95% Chebyshev(Mean, Sd) UCL	4.391
97.5% Chebyshev(Mean, Sd) UCL	4.79	99% Chebyshev(Mean, Sd) UCL	5.573

Suggested UCL to Use

95% Student's-t UCL	3.881		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

3_lead

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	6
Minimum	26.1	Mean	41.77
Maximum	76.3	Median	33.8
SD	17.45	Std. Error of Mean	6.596
Coefficient of Variation	0.418	Skewness	1.623

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.798	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.329	Lilliefors GOF Test
5% Lilliefors Critical Value	0.304	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	54.59	95% Adjusted-CLT UCL (Chen-1995)	56.94
		95% Modified-t UCL (Johnson-1978)	55.26

Gamma GOF Test

A-D Test Statistic	0.622	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.709	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.311	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.312	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	8.201	k star (bias corrected MLE)	4.782
Theta hat (MLE)	5.093	Theta star (bias corrected MLE)	8.736
nu hat (MLE)	114.8	nu star (bias corrected)	66.94
MLE Mean (bias corrected)	41.77	MLE Sd (bias corrected)	19.1
		Approximate Chi Square Value (0.05)	49.11
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	44.54

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	56.94	95% Adjusted Gamma UCL (use when n<50)	62.79

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.288	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.262	Mean of logged Data	3.67
Maximum of Logged Data	4.335	SD of logged Data	0.364

Assuming Lognormal Distribution

95% H-UCL	58.84	90% Chebyshev (MVUE) UCL	58.74
95% Chebyshev (MVUE) UCL	66.53	97.5% Chebyshev (MVUE) UCL	77.35
99% Chebyshev (MVUE) UCL	98.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	52.62	95% Jackknife UCL	54.59
95% Standard Bootstrap UCL	51.77	95% Bootstrap-t UCL	89.01
95% Hall's Bootstrap UCL	135.5	95% Percentile Bootstrap UCL	52.29
95% BCA Bootstrap UCL	56.3		
90% Chebyshev(Mean, Sd) UCL	61.56	95% Chebyshev(Mean, Sd) UCL	70.52
97.5% Chebyshev(Mean, Sd) UCL	82.96	99% Chebyshev(Mean, Sd) UCL	107.4

Suggested UCL to Use

95% Adjusted Gamma UCL	62.79		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4_arsenic

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	7
Minimum	4.92	Mean	8.64
Maximum	17.2	Median	7.775
SD	4.539	Std. Error of Mean	1.853
Coefficient of Variation	0.525	Skewness	1.684

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.818	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.29	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	12.37	95% Adjusted-CLT UCL (Chen-1995)	13.05
		95% Modified-t UCL (Johnson-1978)	12.59

Gamma GOF Test

A-D Test Statistic	0.389	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.226	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.339	k star (bias corrected MLE)	2.781
Theta hat (MLE)	1.618	Theta star (bias corrected MLE)	3.107
nu hat (MLE)	64.07	nu star (bias corrected)	33.37
MLE Mean (bias corrected)	8.64	MLE Sd (bias corrected)	5.181
		Approximate Chi Square Value (0.05)	21.16
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	17.74

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	13.62	95% Adjusted Gamma UCL (use when n<50)	16.25

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors Lognormal GOF Test**

5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.593	Mean of logged Data	2.06
Maximum of Logged Data	2.845	SD of logged Data	0.463

Assuming Lognormal Distribution

95% H-UCL	14.82	90% Chebyshev (MVUE) UCL	13.43
95% Chebyshev (MVUE) UCL	15.63	97.5% Chebyshev (MVUE) UCL	18.68
99% Chebyshev (MVUE) UCL	24.68		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	11.69	95% Jackknife UCL	12.37
95% Standard Bootstrap UCL	11.42	95% Bootstrap-t UCL	15.54
95% Hall's Bootstrap UCL	24.4	95% Percentile Bootstrap UCL	11.72
95% BCA Bootstrap UCL	12.48		
90% Chebyshev(Mean, Sd) UCL	14.2	95% Chebyshev(Mean, Sd) UCL	16.72
97.5% Chebyshev(Mean, Sd) UCL	20.21	99% Chebyshev(Mean, Sd) UCL	27.08

Suggested UCL to Use

95% Student's-t UCL	12.37		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

5_arsenic

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	2
Minimum	3.09	Mean	5.826
Maximum	10.7	Median	5.29
SD	2.883	Std. Error of Mean	1.289
Coefficient of Variation	0.495	Skewness	1.619

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.839	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.346	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Data Not Normal at 5% Significance Level	

	A–E	F	G–K	L
677	Data appear Approximate Normal at 5% Significance Level			
678				
679	**Assuming Normal Distribution**			
680	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
681	95% Student's-t UCL	8.575	95% Adjusted-CLT UCL (Chen-1995)	8.944
682			95% Modified-t UCL (Johnson-1978)	8.73
683				
684	**Gamma GOF Test**			
685	A-D Test Statistic	0.387	**Anderson-Darling Gamma GOF Test**	
686	5% A-D Critical Value	0.68	Detected data appear Gamma Distributed at 5% Significance Level	
687	K-S Test Statistic	0.303	**Kolmogorov-Smirnov Gamma GOF Test**	
688	5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level	
689	**Detected data appear Gamma Distributed at 5% Significance Level**			
690				
691	**Gamma Statistics**			
692	k hat (MLE)	6.014	k star (bias corrected MLE)	2.539
693	Theta hat (MLE)	0.969	Theta star (bias corrected MLE)	2.295
694	nu hat (MLE)	60.14	nu star (bias corrected)	25.39
695	MLE Mean (bias corrected)	5.826	MLE Sd (bias corrected)	3.656
696			Approximate Chi Square Value (0.05)	14.91
697	Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	11.55
698				
699	**Assuming Gamma Distribution**			
700	95% Approximate Gamma UCL (use when n>=50))	9.921	95% Adjusted Gamma UCL (use when n<50)	12.8
701				
702	**Lognormal GOF Test**			
703	Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk Lognormal GOF Test**	
704	5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
705	Lilliefors Test Statistic	0.277	**Lilliefors Lognormal GOF Test**	
706	5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	
707	**Data appear Lognormal at 5% Significance Level**			
708				
709	**Lognormal Statistics**			
710	Minimum of Logged Data	1.128	Mean of logged Data	1.677
711	Maximum of Logged Data	2.37	SD of logged Data	0.449
712				
713	**Assuming Lognormal Distribution**			
714	95% H-UCL	11.08	90% Chebyshev (MVUE) UCL	9.261
715	95% Chebyshev (MVUE) UCL	10.83	97.5% Chebyshev (MVUE) UCL	13.01
716	99% Chebyshev (MVUE) UCL	17.3		
717				
718	**Nonparametric Distribution Free UCL Statistics**			
719	**Data appear to follow a Discernible Distribution at 5% Significance Level**			
720				
721	**Nonparametric Distribution Free UCLs**			
722	95% CLT UCL	7.947	95% Jackknife UCL	8.575
723	95% Standard Bootstrap UCL	7.719	95% Bootstrap-t UCL	10.98
724	95% Hall's Bootstrap UCL	19.07	95% Percentile Bootstrap UCL	7.95
725	95% BCA Bootstrap UCL	8.39		
726	90% Chebyshev(Mean, Sd) UCL	9.694	95% Chebyshev(Mean, Sd) UCL	11.45
727	97.5% Chebyshev(Mean, Sd) UCL	13.88	99% Chebyshev(Mean, Sd) UCL	18.65
728				

Suggested UCL to Use

95% Student's-t UCL	8.575

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

6_arsenic

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	4.05	Mean	5.57
Maximum	10.4	Median	4.915
SD	2.399	Std. Error of Mean	0.979
Coefficient of Variation	0.431	Skewness	2.299

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.641	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.437	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.543	95% Adjusted-CLT UCL (Chen-1995)	8.163
		95% Modified-t UCL (Johnson-1978)	7.697

Gamma GOF Test

A-D Test Statistic	1.015	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.698	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.426	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.333	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	8.813	k star (bias corrected MLE)	4.518
Theta hat (MLE)	0.632	Theta star (bias corrected MLE)	1.233
nu hat (MLE)	105.8	nu star (bias corrected)	54.21
MLE Mean (bias corrected)	5.57	MLE Sd (bias corrected)	2.621
		Approximate Chi Square Value (0.05)	38.3

Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	33.53
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	7.885	95% Adjusted Gamma UCL (use when n<50)	9.006
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.714	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.405	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.399	Mean of logged Data	1.66
Maximum of Logged Data	2.342	SD of logged Data	0.345
Assuming Lognormal Distribution			
95% H-UCL	7.972	90% Chebyshev (MVUE) UCL	7.86
95% Chebyshev (MVUE) UCL	8.918	97.5% Chebyshev (MVUE) UCL	10.39
99% Chebyshev (MVUE) UCL	13.27		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	7.181	95% Jackknife UCL	7.543
95% Standard Bootstrap UCL	7.046	95% Bootstrap-t UCL	12.37
95% Hall's Bootstrap UCL	17.22	95% Percentile Bootstrap UCL	7.397
95% BCA Bootstrap UCL	7.663		
90% Chebyshev(Mean, Sd) UCL	8.508	95% Chebyshev(Mean, Sd) UCL	9.839
97.5% Chebyshev(Mean, Sd) UCL	11.69	99% Chebyshev(Mean, Sd) UCL	15.31
Suggested UCL to Use			
95% Student's-t UCL	7.543	or 95% Modified-t UCL	7.697
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
7_arsenic			
General Statistics			
Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	4.62	Mean	7.225
Maximum	15.6	Median	5.385
SD	4.208	Std. Error of Mean	1.718
Coefficient of Variation	0.582	Skewness	2.2
Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use			

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.675	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.324	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	10.69	95% Adjusted-CLT UCL (Chen-1995)	11.7
		95% Modified-t UCL (Johnson-1978)	10.94

Gamma GOF Test

A-D Test Statistic	0.836	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.698	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.325	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.05	k star (bias corrected MLE)	2.636
Theta hat (MLE)	1.431	Theta star (bias corrected MLE)	2.741
nu hat (MLE)	60.6	nu star (bias corrected)	31.64
MLE Mean (bias corrected)	7.225	MLE Sd (bias corrected)	4.45
		Approximate Chi Square Value (0.05)	19.78
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	16.49

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	11.55	95% Adjusted Gamma UCL (use when n<50)	13.86

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.771	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.302	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.53	Mean of logged Data	1.875
Maximum of Logged Data	2.747	SD of logged Data	0.455

Assuming Lognormal Distribution

95% H-UCL	12.11	90% Chebyshev (MVUE) UCL	11.06
95% Chebyshev (MVUE) UCL	12.85	97.5% Chebyshev (MVUE) UCL	15.34
99% Chebyshev (MVUE) UCL	20.22		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	10.05	95% Jackknife UCL	10.69
95% Standard Bootstrap UCL	9.81	95% Bootstrap-t UCL	31.49
95% Hall's Bootstrap UCL	27.09	95% Percentile Bootstrap UCL	10.37
95% BCA Bootstrap UCL	11.17		
90% Chebyshev(Mean, Sd) UCL	12.38	95% Chebyshev(Mean, Sd) UCL	14.71
97.5% Chebyshev(Mean, Sd) UCL	17.95	99% Chebyshev(Mean, Sd) UCL	24.32

Suggested UCL to Use

95% Student's-t UCL	10.69		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

7_lead

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	11.9	Mean	25.93
Maximum	57.6	Median	14.95
SD	19.17	Std. Error of Mean	7.826
Coefficient of Variation	0.739	Skewness	1.229

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.757	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	41.7	95% Adjusted-CLT UCL (Chen-1995)	43
		95% Modified-t UCL (Johnson-1978)	42.36

Gamma GOF Test

A-D Test Statistic	0.79	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.702	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.378	**Kolmogorov-Smirnov Gamma GOF Test**

5% K-S Critical Value	0.335	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.646	k star (bias corrected MLE)	1.434
Theta hat (MLE)	9.8	Theta star (bias corrected MLE)	18.08
nu hat (MLE)	31.75	nu star (bias corrected)	17.21
MLE Mean (bias corrected)	25.93	MLE Sd (bias corrected)	21.65
		Approximate Chi Square Value (0.05)	8.823
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	6.768

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	50.59	95% Adjusted Gamma UCL (use when n<50)	65.95

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.795	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.348	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.477	Mean of logged Data	3.055
Maximum of Logged Data	4.054	SD of logged Data	0.665

Assuming Lognormal Distribution

95% H-UCL	65.89	90% Chebyshev (MVUE) UCL	45.97
95% Chebyshev (MVUE) UCL	55.29	97.5% Chebyshev (MVUE) UCL	68.23
99% Chebyshev (MVUE) UCL	93.65		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	38.81	95% Jackknife UCL	41.7
95% Standard Bootstrap UCL	37.69	95% Bootstrap-t UCL	186.4
95% Hall's Bootstrap UCL	218.8	95% Percentile Bootstrap UCL	38.18
95% BCA Bootstrap UCL	40.75		
90% Chebyshev(Mean, Sd) UCL	49.41	95% Chebyshev(Mean, Sd) UCL	60.05
97.5% Chebyshev(Mean, Sd) UCL	74.81	99% Chebyshev(Mean, Sd) UCL	103.8

Suggested UCL to Use

95% H-UCL	65.89		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

8_arsenic

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	4
Minimum	5.9	Mean	7.03
Maximum	8.89	Median	6.45
SD	1.076	Std. Error of Mean	0.407
Coefficient of Variation	0.153	Skewness	0.977

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.277	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.82	95% Adjusted-CLT UCL (Chen-1995)	7.859
		95% Modified-t UCL (Johnson-1978)	7.845

Gamma GOF Test

A-D Test Statistic	0.452	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.287	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.311	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	52.75	k star (bias corrected MLE)	30.24
Theta hat (MLE)	0.133	Theta star (bias corrected MLE)	0.233
nu hat (MLE)	738.4	nu star (bias corrected)	423.3
MLE Mean (bias corrected)	7.03	MLE Sd (bias corrected)	1.278
		Approximate Chi Square Value (0.05)	376.6
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	363.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	7.902	95% Adjusted Gamma UCL (use when n<50)	8.193

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.905	**Shapiro Wilk Lognormal GOF Test**

5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.27	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.775	Mean of logged Data	1.941
Maximum of Logged Data	2.185	SD of logged Data	0.147
Assuming Lognormal Distribution			
95% H-UCL	7.899	90% Chebyshev (MVUE) UCL	8.2
95% Chebyshev (MVUE) UCL	8.731	97.5% Chebyshev (MVUE) UCL	9.468
99% Chebyshev (MVUE) UCL	10.92		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	7.699	95% Jackknife UCL	7.82
95% Standard Bootstrap UCL	7.654	95% Bootstrap-t UCL	8.635
95% Hall's Bootstrap UCL	8.462	95% Percentile Bootstrap UCL	7.686
95% BCA Bootstrap UCL	7.806		
90% Chebyshev(Mean, Sd) UCL	8.25	95% Chebyshev(Mean, Sd) UCL	8.802
97.5% Chebyshev(Mean, Sd) UCL	9.569	99% Chebyshev(Mean, Sd) UCL	11.07
Suggested UCL to Use			
95% Student's-t UCL	7.82		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
8_lead			
General Statistics			
Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	2
Minimum	15.6	Mean	36.46
Maximum	86.4	Median	30.1
SD	24.8	Std. Error of Mean	8.268
Coefficient of Variation	0.68	Skewness	1.379
Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use			
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.			
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).			
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1			
Normal GOF Test			
Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	

Lilliefors Test Statistic	0.258	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	51.83	95% Adjusted-CLT UCL (Chen-1995)	54.12
		95% Modified-t UCL (Johnson-1978)	52.46
Gamma GOF Test			
A-D Test Statistic	0.486	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.178	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.281	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.991	k star (bias corrected MLE)	2.068
Theta hat (MLE)	12.19	Theta star (bias corrected MLE)	17.63
nu hat (MLE)	53.85	nu star (bias corrected)	37.23
MLE Mean (bias corrected)	36.46	MLE Sd (bias corrected)	25.35
		Approximate Chi Square Value (0.05)	24.26
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	22.08
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	55.94	95% Adjusted Gamma UCL (use when n<50)	61.48
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.146	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.747	Mean of logged Data	3.42
Maximum of Logged Data	4.459	SD of logged Data	0.608
Assuming Lognormal Distribution			
95% H-UCL	62.31	90% Chebyshev (MVUE) UCL	58.19
95% Chebyshev (MVUE) UCL	68.28	97.5% Chebyshev (MVUE) UCL	82.28
99% Chebyshev (MVUE) UCL	109.8		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	50.06	95% Jackknife UCL	51.83
95% Standard Bootstrap UCL	49.42	95% Bootstrap-t UCL	72.37
95% Hall's Bootstrap UCL	132	95% Percentile Bootstrap UCL	50.07
95% BCA Bootstrap UCL	53.14		
90% Chebyshev(Mean, Sd) UCL	61.26	95% Chebyshev(Mean, Sd) UCL	72.49

97.5% Chebyshev(Mean, Sd) UCL	88.09	99% Chebyshev(Mean, Sd) UCL	118.7

Suggested UCL to Use

95% Student's-t UCL	51.83		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

9_arsenic

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	5
Minimum	6	Mean	9.032
Maximum	13.5	Median	8.1
SD	2.697	Std. Error of Mean	0.813
Coefficient of Variation	0.299	Skewness	0.748

Normal GOF Test

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	10.51	95% Adjusted-CLT UCL (Chen-1995)	10.57
		95% Modified-t UCL (Johnson-1978)	10.54

Gamma GOF Test

A-D Test Statistic	0.406	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.162	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.255	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.19	k star (bias corrected MLE)	9.656
Theta hat (MLE)	0.685	Theta star (bias corrected MLE)	0.935
nu hat (MLE)	290.2	nu star (bias corrected)	212.4
MLE Mean (bias corrected)	9.032	MLE Sd (bias corrected)	2.907
		Approximate Chi Square Value (0.05)	179.7
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	174.8

Assuming Gamma Distribution

1197	95% Approximate Gamma UCL (use when n>=50))	10.68	95% Adjusted Gamma UCL (use when n<50)	10.98
1198				
1199	**Lognormal GOF Test**			
1200	Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk Lognormal GOF Test**	
1201	5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
1202	Lilliefors Test Statistic	0.143	**Lilliefors Lognormal GOF Test**	
1203	5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	
1204	**Data appear Lognormal at 5% Significance Level**			
1205				
1206	**Lognormal Statistics**			
1207	Minimum of Logged Data	1.792	Mean of logged Data	2.162
1208	Maximum of Logged Data	2.603	SD of logged Data	0.287
1209				
1210	**Assuming Lognormal Distribution**			
1211	95% H-UCL	10.8	90% Chebyshev (MVUE) UCL	11.38
1212	95% Chebyshev (MVUE) UCL	12.45	97.5% Chebyshev (MVUE) UCL	13.93
1213	99% Chebyshev (MVUE) UCL	16.84		
1214				
1215	**Nonparametric Distribution Free UCL Statistics**			
1216	**Data appear to follow a Discernible Distribution at 5% Significance Level**			
1217				
1218	**Nonparametric Distribution Free UCLs**			
1219	95% CLT UCL	10.37	95% Jackknife UCL	10.51
1220	95% Standard Bootstrap UCL	10.33	95% Bootstrap-t UCL	10.82
1221	95% Hall's Bootstrap UCL	10.65	95% Percentile Bootstrap UCL	10.34
1222	95% BCA Bootstrap UCL	10.47		
1223	90% Chebyshev(Mean, Sd) UCL	11.47	95% Chebyshev(Mean, Sd) UCL	12.58
1224	97.5% Chebyshev(Mean, Sd) UCL	14.11	99% Chebyshev(Mean, Sd) UCL	17.12
1225				
1226	**Suggested UCL to Use**			
1227	95% Student's-t UCL	10.51		
1228				
1229	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
1230	Recommendations are based upon data size, data distribution, and skewness.			
1231	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
1232	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
1233				
1234				
1235	9_lead			
1236				
1237	**General Statistics**			
1238	Total Number of Observations	14	Number of Distinct Observations	14
1239			Number of Missing Observations	2
1240	Minimum	15.7	Mean	70.36
1241	Maximum	483	Median	37.2
1242	SD	119.9	Std. Error of Mean	32.05
1243	Coefficient of Variation	1.705	Skewness	3.617
1244				
1245	**Normal GOF Test**			
1246	Shapiro Wilk Test Statistic	0.424	**Shapiro Wilk GOF Test**	
1247	5% Shapiro Wilk Critical Value	0.874	Data Not Normal at 5% Significance Level	
1248	Lilliefors Test Statistic	0.419	**Lilliefors GOF Test**	

1249	5% Lilliefors Critical Value	0.226	Data Not Normal at 5% Significance Level	
1250	**Data Not Normal at 5% Significance Level**			
1251				
1252	**Assuming Normal Distribution**			
1253	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
1254	95% Student's-t UCL	127.1	95% Adjusted-CLT UCL (Chen-1995)	156.2
1255			95% Modified-t UCL (Johnson-1978)	132.3
1256				
1257	**Gamma GOF Test**			
1258	A-D Test Statistic	1.775	**Anderson-Darling Gamma GOF Test**	
1259	5% A-D Critical Value	0.758	Data Not Gamma Distributed at 5% Significance Level	
1260	K-S Test Statistic	0.296	**Kolmogorov-Smirnov Gamma GOF Test**	
1261	5% K-S Critical Value	0.235	Data Not Gamma Distributed at 5% Significance Level	
1262	**Data Not Gamma Distributed at 5% Significance Level**			
1263				
1264	**Gamma Statistics**			
1265	k hat (MLE)	1.119	k star (bias corrected MLE)	0.927
1266	Theta hat (MLE)	62.87	Theta star (bias corrected MLE)	75.9
1267	nu hat (MLE)	31.34	nu star (bias corrected)	25.95
1268	MLE Mean (bias corrected)	70.36	MLE Sd (bias corrected)	73.08
1269			Approximate Chi Square Value (0.05)	15.34
1270	Adjusted Level of Significance	0.0312	Adjusted Chi Square Value	14.27
1271				
1272	**Assuming Gamma Distribution**			
1273	95% Approximate Gamma UCL (use when n>=50))	119	95% Adjusted Gamma UCL (use when n<50)	128
1274				
1275	**Lognormal GOF Test**			
1276	Shapiro Wilk Test Statistic	0.819	**Shapiro Wilk Lognormal GOF Test**	
1277	5% Shapiro Wilk Critical Value	0.874	Data Not Lognormal at 5% Significance Level	
1278	Lilliefors Test Statistic	0.196	**Lilliefors Lognormal GOF Test**	
1279	5% Lilliefors Critical Value	0.226	Data appear Lognormal at 5% Significance Level	
1280	**Data appear Approximate Lognormal at 5% Significance Level**			
1281				
1282	**Lognormal Statistics**			
1283	Minimum of Logged Data	2.754	Mean of logged Data	3.744
1284	Maximum of Logged Data	6.18	SD of logged Data	0.831
1285				
1286	**Assuming Lognormal Distribution**			
1287	95% H-UCL	106.9	90% Chebyshev (MVUE) UCL	99
1288	95% Chebyshev (MVUE) UCL	117.6	97.5% Chebyshev (MVUE) UCL	143.5
1289	99% Chebyshev (MVUE) UCL	194.2		
1290				
1291	**Nonparametric Distribution Free UCL Statistics**			
1292	**Data appear to follow a Discernible Distribution at 5% Significance Level**			
1293				
1294	**Nonparametric Distribution Free UCLs**			
1295	95% CLT UCL	123.1	95% Jackknife UCL	127.1
1296	95% Standard Bootstrap UCL	120.8	95% Bootstrap-t UCL	382.6
1297	95% Hall's Bootstrap UCL	351.5	95% Percentile Bootstrap UCL	133
1298	95% BCA Bootstrap UCL	167.1		
1299	90% Chebyshev(Mean, Sd) UCL	166.5	95% Chebyshev(Mean, Sd) UCL	210.1
1300	97.5% Chebyshev(Mean, Sd) UCL	270.5	99% Chebyshev(Mean, Sd) UCL	389.3

	A	B	C	D	E	F	G	H	I	J	K	L
1301												
1302	**Suggested UCL to Use**											
1303					95% H-UCL	106.9						
1304												
1305	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1306	Recommendations are based upon data size, data distribution, and skewness.											
1307	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1308	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1309												
1310	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
1311	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											
1312	**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**											
1313	**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**											
1314												

APPENDIX O

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

TIER 1: Exclusion Criteria Checklist

PART I. Affected Property Identification and Background Information

1) Provide a description of the specific area of the response action and the nature of the release. Include estimated acreage of the affected property and the facility property, and a description of the type of facility and/or operation associated with the affected property. Also, describe the location of the affected property with respect to the facility property boundaries and public roadways.

The Closed Castner Firing Range munitions response site (MRS) on Fort Bliss is located in El Paso, Texas, between U.S. Highway 54 and the Franklin Mountains State Park, and is approximately 8 miles south of the border with New Mexico.

Acquisition of the Closed Castner Range MRS by Fort Bliss began in 1926 with approximately 3,500 acres; by 1939, additional land was acquired to bring the total size of the range to 8,328 acres. From 1926 through 1966, the Closed Castner Firing MRS was heavily used for small arms, artillery firing, and impact areas. A wide variety of munitions were used at the MRS, including: large caliber high explosive (HE) munitions, mortars, pyrotechnics, illumination flares, grenades, and small arms.

In 1966, all ordnance use at the Closed Castner Range MRS was discontinued. Range operations were then transferred to the Meyer Range Complex. In 1971, the Department of the Army declared the Closed Castner Range MRS excess to its needs. Several parcels of the Closed Castner Range MRS totaling approximately 1,230 acres have been transferred to non-Department of Defense entities. The remaining acreage of the MRS was declared unsuitable for transfer, and remains under the ownership of the Department of the Army in a closed range status.

Attach available USGS topographic maps and/or aerial or other affected property photographs to this form to depict the affected property and surrounding area. Indicate attachments:

☒ Topo map ☒ Aerial photo ☐ Other

2) Identify environmental media known or suspected to contain chemicals of concern (COCs) at the present time. Check all that apply:

Known/Suspected COC Location	Based on sampling data?	
☒ Soil < 5 ft below ground surface	☒ Yes	☐ No
☐ Soil >5 ft below ground surface	☒ Yes	☐ No
☐ Groundwater	☐ Yes	☒ No
☒ Surface Water/Sediments	☒ Yes	☐ No

Explain (previously submitted information may be referenced):

Antimony and lead have been identified at concentrations above residential assessments levels in surface soils within the evaluated decision units (DUs). ISM sampling reported a maximum lead concentration of 5,030 mg/kg in surface soil at DU DG070, and a maximum antimony concentration of 50.4 mg/kg at CN073.

Groundwater was not encountered during investigation activities and the soil to groundwater pathway is considered incomplete.

3) Provide the information below for the nearest surface water body which has become or has the potential to become impacted from migrating COCs via surface water runoff, air deposition, groundwater seepage, etc. Exclude wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit. Also exclude conveyances, decorative ponds, and those portions of process facilities which are:

a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and

b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

The nearest surface water body is approximately 8 feet/miles from the affected property and is named Rio Grande River. The water body is best described as a:

☒ freshwater stream: X perennial (has water all year)
_____ intermittent (dries up completely for at least 1 week a year)
______ intermittent with perennial pools

☐ freshwater swamp/marsh/wetland
☐ saltwater or brackish marsh/swamp/wetland
☐ reservoir, lake, or pond; approximate surface acres:
☐ drainage ditch
☐ tidal stream ☐ bay ☐ estuary
☐ other; specify

Is the water body listed as a State classified segment in Appendix C of the current Texas Surface Water Quality Standards; ''307.1 - 307.10?

☒ Yes Segment # 2308 Use Classification: Noncontact recreation, aquatic life use, general use, fish consumption use

☐ No

If the water body is not a State classified segment, identify the first downstream classified segment.

Name:

Segment #:

Use Classification:

As necessary, provide further description of surface waters in the vicinity of the affected property:

There are no known perennial surface water flows on the Castner Range MRS. Natural drainage channels are well defined in the steeper foothill areas of the Franklin Mountains, providing channels for heavy stormwater flow. As the drainage reaches the flatter eastern alluvial fans below the foothills, they become shallow and variable in their courses. Fusselman Dam, located in the south-central part of the Closed Castner Range MRS, a retention basin owned by the Texas Department of Transportation (TxDOT) in the northeast corner of the site, and other engineered drainage, diversion, and retention features have been constructed to help manage runoff during heavy precipitation events.

The only significant surface water body near Fort Bliss is the Rio Grande River.

PART II. Exclusion Criteria and Supportive Information

Subpart A. Surface Water/Sediment Exposure

1) Regarding the affected property where a response action is being pursued under the TRRP, have COCs migrated and resulted in a release or imminent threat of release to either surface waters or to their associated sediments via surface water runoff, air deposition, groundwater seepage, etc.? Exclude wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit. Also exclude conveyances, decorative ponds, and those portions of process facilities which are:

   a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and

   b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

☒ Yes ☐ No

Explain:

Constituents of concern (COCs) have been detected in seeps and in samples collected from on-site arroyos. Therefore, the potential exists for impacts from soil to migrate to surface water features.

If the answer is Yes to Subpart A above, the affected property does not meet the exclusion criteria. However, complete the remainder of Part II to determine if there is a complete and/or significant soil exposure pathway, then complete PART III - Qualitative Summary and Certification . If the answer is No, go to Subpart B.

Subpart B. Affected Property Setting

In answering "Yes" to the following question, it is understood that the affected property is not attractive to wildlife or livestock, including threatened or endangered species (i.e., the affected property does not serve as valuable habitat, foraging area, or refuge for ecological communities). (May require consultation with wildlife management agencies.)

1) Is the affected property wholly contained within contiguous land characterized by: pavement, buildings, landscaped area, functioning cap, roadways, equipment storage area, manufacturing or process area, other surface cover or structure, or otherwise disturbed ground?

☐ Yes ☒ No

Explain:

The Closed Castner Firing Range lies within the Low Mountains and Bajadas ecoregion. The mountainous terrain has shallow soil, exposed bedrock, and coarse rocky substrates. Alluvial fans of rubble, sand, and gravel build at the base of the mountains and often coalesce to form bajadas. Vegetation includes mostly desert shrubs, such as sotol, lechuguilla, yucca, ocotillo, lotebush, tarbush, and pricklypear. Considering the available habitat and lack of military activities, the affected property may be attractive to wildlife, including threatened or endangered species.

If the answer to Subpart B above is Yes, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No. Skip Subparts C and D and complete PART III - Qualitative Summary and Certification. If the answer to Subpart B above is No, go to Subpart C.

Subpart C. Soil Exposure

1) Are COCs which are in the soil of the affected property solely below the first 5 feet beneath ground surface **or** does the affected property have a physical barrier present to prevent exposure of receptors to COCs in surface soil?

☐ Yes ☒ No

Explain:

Elevated concentrations of metals (e.g., lead, antimony, arsenic, zinc) are present within the top 5 feet of soil within the decision units and the arroyos.

If the answer to Subpart C above is Yes, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No. Skip Subpart D and complete PART III - Qualitative Summary and Certification. If the answer to Subpart C above is No, proceed to Subpart D.

Subpart D. *De Minimus* Land Area

In answering "Yes" to the question below, it is understood that all of the following conditions apply:

☐ The affected property is not known to serve as habitat, foraging area, or refuge to threatened/endangered or otherwise protected species. (Will likely require consultation with wildlife management agencies.)

☐ Similar but unimpacted habitat exists within a half-mile radius.

☐ The affected property is not known to be located within one-quarter mile of sensitive environmental areas (e.g., rookeries, wildlife management areas, preserves). (Will likely require consultation with wildlife management agencies.)

☐ There is no reason to suspect that the COCs associated with the affected property will migrate such that the affected property will become larger than one acre.

1) Using human health protective concentration levels as a basis to determine the extent of the COCs, does the affected property consist of one acre or less and does it meet all of the conditions above?

☐ Yes ☒ No

Explain how conditions are met/not met:

The total affected property across the site covers an area larger than 1 acre.

If the answer to Subpart D above is Yes, then no further ecological evaluation is needed at this affected property, assuming the answer to Subpart A was No. Complete PART III - Qualitative Summary and Certification. If the answer to Subpart D above is No, proceed to Tier 2 or 3 or comparable ERA.

Figure: 30 TAC '350.77(b) continued

PART III. Qualitative Summary and Certification (Complete in all cases.)

Attach a brief statement (not to exceed 1 page) summarizing the information you have provided in this form. This summary should include sufficient information to verify that the affected property meets or does not meet the exclusion criteria. The person should make the initial decision regarding the need for further ecological evaluation (i.e., Tier 2 or 3) based upon the results of this checklist. After review, TNRCC will make a final determination on the need for further assessment. **Note that the person has the continuing obligation to re-enter the ERA process if changing circumstances result in the affected property not meeting the Tier 1 exclusion criteria.**

Completed by: Rebecca Heslep *(Typed/Printed Name)*
Ecological Risk Assessor *(Title)*
May 30, 2017 *(Date)*

I believe that the information submitted is true, accurate, and complete, to the best of my knowledge.

______________________________________ *(Typed/Printed Name of Person)*

______________________________________ *(Title of Person)*

______________________________________ *(Signature of Person)*

______________________________________ *(Date Signed)*

Tier 1 Ecological Exclusion Criteria
Supporting Documentation

The Closed Castner Firing Range MRS on Fort Bliss is located in El Paso, Texas, between U.S. Highway 54 and the Franklin Mountains State Park, and is approximately 8 miles south of the border with New Mexico.

The Closed Castner Firing Range lies within the Low Mountains and Bajadas ecoregion. The mountainous terrain has shallow soil, exposed bedrock, and coarse rocky substrates. Alluvial fans of rubble, sand, and gravel build at the base of the mountains and often coalesce to form bajadas. Vegetation includes mostly desert shrubs, such as sotol, lechuguilla, yucca, ocotillo, lotebush, tarbush, and pricklypear. Considering the available habitat and lack of military activities currently at the MRS, the affected property may be attractive to wildlife, including threatened or endangered species.

Several metals have been identified at concentrations above residential assessments levels in surface soils within the evaluated decision units. ISM sampling reported a maximum lead concentration of 5,030 mg/kg in surface soil at DG070, and a maximum antimony concentration of 50.4 mg/kg at CN073. The total affected property covers an area greater than 1 acre. Metals were also detected in seeps and arroyo soil.

Given this information, the Closed Castner Firing Range MRS does not meet the Tier 1 Exclusion Criteria and further ecological evaluation is warranted.

U.S. Army Corp of Engineers

APPENDIX O

TIER 2 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

Military Munitions Response Program
Remedial Investigation
Closed Castner Firing Range
Fort Bliss, El Paso, Texas

June 2017; Revised June 2018

TIER 2 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

Closed Castner Firing Range

Fort Bliss, El Paso, Texas

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Date:

June 8, 2017; Revised June 2018

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EXECUTIVE SUMMARY

This Tier 2 Screening Level Ecological Risk Assessment (SLERA) has been prepared on behalf of the U.S. Army Corps of Engineers (USACE), Tulsa District for the affected property at the Closed Castner Firing Range Munitions Response Site (MRS). The SLERA has been conducted in accordance with the Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas (TCEQ 2017). A Tier 1 Exclusion Checklist was completed for the MRS indicating that habitat for ecological receptors was present at the Closed Castner Firing Range triggering the completion of this SLERA. The results of the SLERA indicate that the calculation of ecological-based protective concentration levels (PCLs) was appropriate for the protection of ecological receptors. These ecological PCLs are incorporated into the Remedial Investigation (RI) Report for the MRS.

The Tier 2 SLERA was conducted to:

1. identify and demonstrate which constituents of concern (COCs) do not pose an unacceptable ecological risk
2. develop protective concentration levels (PCLs) for the COCs that may pose an unacceptable risk to potential ecological receptors (as needed)
3. provide recommendations for managing ecological risk at the MRS based on the final PCLs.

The Closed Castner Firing Range MRS on Fort Bliss is located in El Paso, Texas, between U.S. Highway 54 and the Franklin Mountains State Park and is approximately 8 miles south of the border with New Mexico.

Based on the results of the Tier 1 checklist, communities of ecological receptors potentially exposed to explosives and metals in soil are limited to terrestrial receptors. The desert shrew, scaled quail, mourning dove, desert cottontail, coyote, red-tailed hawk, and the federally threatened Texas horned lizard are the selected terrestrial receptors for this SLERA. Data from historical and present site investigations have been used to identify COCs and calculate exposure point concentrations in soil. The consumption of food sources potentially affected by soil COCs is the primary exposure pathway for terrestrial receptors. Incidental ingestion of soil is also evaluated as a complete pathway.

Based on the HQ analyses and uncertainty analysis for terrestrial vegetation, soil-dwelling invertebrates, and for herbivorous, invertivorous and carnivorous wildlife receptors, the SLERA for the MRS resulted in the following conclusions:

- No significant risks were identified for upper trophic level receptors that may be exposed to pooled seep water.
    - No significant risks were identified for upper trophic level receptors that may be exposed to dry arroyo soil.

    - No significant risks were identified for terrestrial carnivorous bird populations, for terrestrial herbivorous, invertivorous and carnivorous mammal populations, and for the sensitive Texas horned lizard and other reptiles from any of the COCs in decision units (DU).

- COCs in surface soil that may cause potential adverse effects to ecological receptor populations include:
  - terrestrial plants/terrestrial invertebrates – antimony, barium, chromium, copper, lead, manganese and zinc in DU soil
  - terrestrial plants/terrestrial invertebrates – arsenic and zinc in Arroyo Reach 3 and zinc in Arroyo Reach 4
  - wildlife receptors scaled quail (and other invertivorous birds) and mourning dove (and other herbivorous birds) – lead in DU soil.

- An evaluation of the data and HQs for the desert shrew, a small-ranging wildlife receptor, indicates that the potential for hot spots to exist at the MRS is negligible, and therefore a risk management recommendation relative to hot spots is not warranted for the MRS.
- Comparative PCLs protective of herbivorous, invertivorous and carnivorous bird and mammal populations and invertivorous and carnivorous reptiles were developed for lead that resulted in HQs greater than 1 in the Less Conservative analysis.

This Tier 2 SLERA is presented as part of the RI. Ecological PCLs will be considered, along with the human health PCLs, in selecting critical PCLs for the RI. Based on the results of the RI, if a critical PCL is determined to be an ecological PCL, USACE will consider the following courses of action:

- perform remedial action to prevent or eliminate applicable ecological exposure pathways
- conduct a Tier 3 Site Specific Ecological Risk Assessment (SSERA).

1 INTRODUCTION

1.1 Purpose

This Tier 2 Screening Level Ecological Risk Assessment (SLERA) has been prepared on behalf of the U.S. Army Corps of Engineers (USACE), Tulsa District for the affected property at the Closed Castner Firing Range Munitions Response Site (MRS). The purpose of this SLERA is to evaluate whether chemicals of concern (COCs) detected in soil, sediment, and surface water seep samples collected from the Closed Castner Firing Range MRS pose a potential risk to ecological receptors and to determine whether the calculation of Tier 2 ecological protective concentration levels (PCLs) is required for the protection of these receptors.

This SLERA incorporates all 10 required elements defined in the Texas Risk Reduction Program (TRRP) (§350.77[c]):

1. Compare concentrations of non-bioaccumulative chemicals of concern (COCs) at the affected property against established ecological benchmarks or use approved methodologies to develop benchmarks to determine potential effects and to eliminate COCs that pose no unacceptable ecological risk. If all COCs are eliminated at this point, the assessment ends.
2. Identify communities (e.g., soil invertebrates, benthic invertebrates) and major feeding guilds (e.g., omnivorous mammals, piscivorous birds) and their representative species that are supported by habitats on the affected property for each exposure pathway that is complete or reasonably anticipated to be complete.
3. Develop a conceptual model that graphically depicts the movement of COCs through media to communities and the feeding guilds.
4. Discuss COC fate and transport and toxicological profiles.
5. Prepare a list of input data including values from the literature (e.g., exposure factors, intake equations that account for total exposure, values for the no observed adverse effect level [NOAEL] and lowest observed adverse effect level [LOAEL], references), any available site-specific data, and reasonably conservative exposure assumptions, then calculate the total exposure to selected ecological receptors from each COC not eliminated according to Required Element (1). Present these calculations in tables or spreadsheets.
6. Use an ecological hazard quotient (HQ) methodology to compare exposures to the NOAELs in order to eliminate COCs that pose no unacceptable risk (i.e., NOAEL HQ ≤ 1); however, when multiple members of a class of COCs that exert additive effects, an ecological hazard index (HI) methodology is also appropriate. If all COCs are eliminated at this point, the assessment ends.
7. Justify the use of less conservative assumptions (e.g., a larger home range) to adjust the exposure and repeat the HQ exercise in Required Element (6), again eliminating COCs that pose no unacceptable risk based on comparisons to the NOAELs and adding another set of comparisons, this time to the LOAELs for those COCs indicating a potential risk (i.e., a NOAEL HQ > 1); however, when multiple members of a class of COCs are present whose effects are additive, an ecological HI

methodology is also appropriate. If all COCs are eliminated at this point, the assessment process ends.

8. Analyze the major areas of uncertainty associated with the SLERA, including a justification for not developing PCLs for particular COCs and pathways, if appropriate (e.g., a statement that the NOAEL HQ > 1 > LOAEL HQ, an evaluation of the likelihood of ecological risk, a discussion of the half-life of the COCs). However, when multiple members of a class of COCs with additive effects are present, an ecological HI methodology is also appropriate. If all COCs are eliminated at this point, the ecological risk assessment process ends.
9. Calculate medium-specific protective concentration levels (PCLs) bounded by the NOAEL and the LOAEL used in item 7 for those COCs that are not eliminated as a result of the HQ exercises or the uncertainty analysis.
10. Make a recommendation for managing ecological risk at the affected property based on the final ecological PCLs, unless proceeding under Tier 3 (this procedure may be included as part of the affected property assessment report, the self-implementation notice, or the response action plan).

1.2 Site Location and Description

Fort Bliss is located in three counties, Dona Ana and Otero counties in New Mexico and El Paso County in Texas. The cantonment area is situated adjacent to the city of El Paso, Texas north of the city of Juarez, Chihuahua, Mexico. The installation encompasses approximately 1.1 million acres. A location map is presented as Figure 1-1.

The MRS (designated in the AEDB-R as FTBLS-004-R-01) on Fort Bliss is located between U.S. Highway 54 and the Franklin Mountains State Park and is approximately 8 miles south of the border with New Mexico. Figure 1-2 is a map of the MRS.

1.3 Background

Acquisition of the MRS by Fort Bliss began in 1926 with approximately 3,500 acres; by 1939, additional land was acquired to bring the total size of the range to 8,328 acres. From 1926 through 1966, the MRS was heavily used for small arms, artillery firing, and impact areas. A wide variety of munitions were used at the MRS, including: large caliber high explosive (HE) munitions, mortars, pyrotechnics, illumination flares, grenades, and small arms. Historical range boundaries and identified features from the 1930s through the 1960s are shown on Figure 1-3.

In 1966, all ordnance use at the MRS was discontinued. Range operations were then transferred to the Meyer Range Complex. In 1971, the Department of the Army declared the MRS excess to its needs. Several parcels of the MRS totaling approximately 1,230 acres have been transferred to non-Department of Defense (DoD) entities. The remaining acreage of the MRS was declared unsuitable for transfer and remains under the ownership of the Department of the Army in a closed range status.

1.4 Overview of MC Investigation

The RI Report provides an overview of the munitions constituents (MC) sampling program.

The MC RI investigation was performed in a phased approach to collect the data required to perform delineation of MC in environmental media and to complete the human health and ecological risk assessments. The sampling program during each of the phases included the following:

Phase I:

- Surface soil samples were collected using Incremental Sampling Methodology (ISM) to characterize MC concentrations within concentrated munitions use areas (CMUAs) and to delineate exceedances of MC assessment levels identified in the 2013 ISM Field Demonstration Report (URS 2013). Performed in June/July 2016, with resampling of some decision units (DUs) for explosives in October/November 2016.
- Discrete soil samples collected from potential small arms range backstop berms and from arroyo depositional areas. Performed in July 2016, with resampling of some berms in April 2017.
- Discrete surface water samples from arroyos and seep locations.

Phase II:

- Collection of additional samples in January 2017, based on the results of the Phase I MC sampling and the Munitions and Explosives of Concern (MEC) RI, including:
    - o ISM samples to complete delineation around Phase I MC areas with exceedances of the assessment levels.
    - o ISM samples to obtain data from newly identified/expanded CMUAs based on the results of the MEC RI.
    - o Berm samples and arroyo soil samples to complete delineation and obtain a large enough data set to allow calculation of the 95% upper confidence limit (UCL) concentration.
- Performance of a soil boring program in February 2017, including collection of discrete soil samples for vertical delineation of MC (to the method detection limit or background) and for demonstration that the potential soil-to-groundwater pathway is incomplete.

Figure 1-4 presents the DUs which were sampled by ISM during the 2012 ISM Field Demonstration and during Phase I and II of the RI. Figure 1-5 presents the arroyo soil sample locations. Arroyo soil was evaluated by reach in an effort to appropriately characterize the risks to ecological receptors that may only be exposed to COCs in a particular reach. Arroyo samples were also collected at the property boundary to confirm COCs are not being carried offsite. Figure 1-6 presents the seep locations. Discrete samples collected from the berms were not evaluated in this SLERA because berm delineation samples indicate the same source as the surrounding ISM samples.

1.5 Environmental Setting

This section describes the environmental setting of the MRS, including the topography, geology, hydrology and ecological receptors that occur or may occur on site.

1.5.1 Topography

The Franklin Mountains' northernmost reaches extend into the Castner Range MRS and are composed primarily of lower slopes and alluvial fans, which range in elevation from 4,265 mean sea level to slightly over 5,000 feet above mean sea level. Extending east to west, the terrain across the MRS varies between rolling terrain (approximately 40% or 2,800 acres), heavily rolling terrain (approximately 20% or 1,400 acres), and mountainous terrain (approximately 40% or 1,400 acres) (URS 2013).

1.5.2 Soils

Based on the U.S. Department of Agriculture Natural Resource Conservation Services Soil Survey Geographic database (USDA 2009), the dominant soil series at the MRS are the Missile, Crotalus, and Chaparral in the northern portion of the MRS, while the Missile and the Chipotle series dominate the southern extent.

The Missile, Crotalus, and Chaparral soil found within the northern portion of the MRS are all part of the Aridisol soil order. Aridisols are primarily located within arid regions, which limit percolation of water into the soils due to either sparse rainfall or another restricting factor. As such, these soils are characterized by a lack of water available to mesophilic plants for extended periods, one or more pedogenic horizons, a surface horizon or horizons not significantly darkened by humus, and an absence of deep, wide cracks or andic soil properties. Each of these series are slightly alkaline.

The Chipotle soil found in the southern portion of the MRS is an Entisol. Entisols can be found in any climate under any vegetation. Some unique properties of soils found in this order are the dominance of mineral soil materials and absence of distinct pedogenic horizons. The absence of distinct pedogenic horizons is in itself an important distinction to soils of this order and may be due to causes such as the results of inert parent material, slowly soluble hard rock, insufficient time for horizons to form, or their occurrence on slopes where the rate of erosion exceeds the rate of formation of pedogenic horizons. The Chipotle series is mostly acidic.

A significant portion of the MRS is rock outcrop. The rocky and gravelly nature of the MRS results in a thin soil cover over much of the range, even in areas showing specific soil types. This is especially true closer to the Franklin Mountains.

1.5.3 Climatology

The climate across Fort Bliss, including the Closed Castner Range MRS, is typified by low relative humidity, hot summers, and moderate temperatures during the spring and winter months. Higher elevations on the installation receive more precipitation and can, therefore, display semi- and sub-humid climatic zones.

The average annual precipitation at Fort Bliss ranges from 8 inches in the valley to 20 inches in the mountains. Warm, moist air from the Gulf of Mexico (and occasionally from the Pacific Ocean) causes thunderstorms in the region. Thunderstorm activity is prevalent between July and September, accounting for a majority of the area's annual rainfall. A dry season occurs from winter to early summer. Snowfall averages 4.6 inches per year; however, snow on the ground rarely lasts for more than a day.

Fort Bliss experiences a highly variable range of temperatures throughout the year, ranging from -8 degrees Fahrenheit (°F) to 114°F, with a daily average of 64°F. Temperatures drop below freezing an average of 34 days per year and rise above 90°F an average of 87 days per year. Evaporation rates are very high, averaging a 97-inch precipitation deficit each year (Fort Bliss 2001).

Wind speeds at Fort Bliss average 9 to 12 miles per hour (mph) with gusts over 60 mph in March and April. Dust and sandstorms occur in March and April due to these stronger winds and lack of precipitation. Spring winds are typically from the west while summer and winter usually bring a more southerly and northerly flow, respectively (Fort Bliss 2001).

1.5.4 Surface Water

There are no known perennial surface water flows on the Closed Castner Firing Range MRS. Natural drainage channels are well defined in the steeper foothill areas of the Franklin Mountains, providing channels for heavy stormwater flow. As the drainage reaches the flatter eastern alluvial fans below the foothills, they become shallow and variable in their courses. Fusselman Dam, located in the south-central part of the MRS, a retention basin owned by the Texas Department of Transportation (TxDOT) in the northeast corner of the MRS, and other engineered drainage, diversion, and retention features have been constructed to help manage runoff during heavy precipitation events (URS 2013).

The only significant surface water body near Fort Bliss is the Rio Grande River. The Rio Grande is used by local municipalities and industries to partially fulfill their water needs. Water from the Rio Grande is part of a U.S. Bureau of Reclamation irrigation project that regulates and administers the flow of the Rio Grande below Elephant Butte Reservoir in New Mexico (Fort Bliss 2001).

1.5.5 Geology

The MRS and vicinity sit on a relatively shallow marine shelf from late Cambrian (500 to 600 million years before present [MYBP]) through early Pennsylvanian (280 to 310 MYBP) time. The strata consist of limestone, sandstone, dolomite, and shale, which were deposited in the shallow marine environment. Tectonic disturbances in Virgilian time (late Pennsylvanian) altered the sedimentation origin from marine to terrestrial (URS 2012). The tectonic movement resulted in the subject area becoming a large depression with landmasses to the east, west, and southwest. In later Pennsylvanian and early Permian time, the Hueco Basin (where the Castner Range MRS is located) received a thick sequence of land-derived sediments. Most sedimentary rocks in the area consist of limestone strata of the San Andres formation (URS 2013).

The southern portion of the Hueco Basin contains more than 6,000 feet of valley fill, stream sand, and gravel. Any rainfall or melted snowfall that occurs in the valley either seeps into the porous valley deposits or evaporates from small pools. Fault lines along the edge of the Hueco Basin are potentially active, although no movement has been recorded in recent time.

1.5.6 Hydrogeology

Groundwater at Fort Bliss is obtained from both fluvial and lacustrine deposits, although fluvial aquifers are the primary source for the area. The groundwater originates from two major basins, the Hueco Bolson and the Mesilla Bolson, which are separated by the Franklin Mountains. Thirty-nine deep wells from the Hueco Bolson aquifer provide most of the water used at Fort Bliss. The Hueco Bolson is located in the southern half of the Tularosa Basin paralleling the eastern base of the Franklin Mountains. It contains fill material consisting primarily of fluvial and lacustrine deposits with a maximum thickness of 9,000 feet. Groundwater recharge is provided by the runoff of precipitation percolating through alluvial deposits at nearby mountain bases. The fresh water aquifers in the Hueco Bolson are of very high quality and require only chlorination for use.

No groundwater wells exist on the Closed Castner Range MRS and groundwater has not been encountered on the MRS. Below El Paso, the depth to groundwater of the Hueco Bolson on the east side of the Franklin Mountains ranges from 250 feet to 400 feet below ground surface (bgs) (Sheng et al. 2001). A public well about 1 mile east of Highway 54 reports a static water depth of 324 feet bgs. During site investigation activities in 2004, a test boring was drilled to a depth of 48.5 feet bgs and groundwater was not encountered (URS 2013). Additionally, during the RI, a soil boring was installed to 30 feet bgs, and groundwater was not encountered.

1.5.7 **Ecological Habitat**

The Closed Castner Firing Range MRS lies within the Low Mountains and Bajadas ecoregion. This region includes areas scattered across West Texas that have a mixed geology. The mountainous terrain has shallow soil, exposed bedrock, and coarse rocky substrates. Alluvial fans of rubble, sand, and gravel build at the base of the mountains and often coalesce to form bajadas (Griffith et al. 2004). Vegetation includes mostly desert shrubs, such as sotol, lechuguilla, yucca, ocotillo, lotebush, tarbush, and pricklypear, with a sparse intervening cover of black grama and other grasses. One-seeded juniper and pinyon pine can occur at higher elevations and gray oak, velvet ash, and little walnut can be found along intermittent and ephemeral drainages. Oaks can occur along north-facing slopes from the riparian zones. The varied habitats provide cover for mule deer, bobcat, collared peccary, and Montezuma quail (Griffith et al 2004).

1.5.7.1 Flora and Fauna

Vegetation types found on the MRS include barren and low grass (approximately 35%), low grass with brush (approximately 64%), and brush with some trees (approximately 1%). The MRS has three primary plant communities: agave-lechugilla, alluvial fan-creosotebush, and draw yucca grassland. The mountainous areas of the MRS are characterized by the agave-lechugilla community, which form dense clonal clumps on colluvial slopes, rides, and benches of hills and mountains. This community also extends down slope onto erosional piedmont surfaces. The agave-lechugilla community's predominant species include acacia (*Acacia neovernicosa*), lechuguilla (*Agave lechuguilla*), common sotol (*Dasylirion wheeleri*), ocotillo (*Foquieria splendens*), and catclaw mimosa (*Mimosa aculeaticarpa*).

The alluvial fan of the Franklin Mountains are home to the alluvial fan-creosote community, characterized by creosotebush (*Larrea tridentate*), whitethorn (*Acacia constricta*), American tarbush (*Flourensia cernua*), Spanish dagger (*Yucca torreyi*), broom snakeweed (*Gutierrezia sarothrae*), and lechugilla.

Grasses are rare and where present, basal coverage is low at less than 0.5%. Arroyos and drainage areas are moister than other areas and support different vegetation types, including desert willow (*Chilopsis linearis*), Apache plume (*Fallugia paradoxa*), and little leaf sumac (*Rhus microphylla*) (Fort Bliss 2001).

While there are no known threatened or endangered flora species on the MRS, a high outcropping rock formation on the southwest corner of the MRS exemplifies a preferred habitat and substrate for the Sneed Pincushion Cactus (*Coryphantha sneedii var. sneedii*), a federal and state endangered species.

The borderlands region of New Mexico and Texas is a center of biodiversity in temperate North America for birds, mammals, amphibians, and reptiles, so the diversity of terrestrial invertebrates on Fort Bliss is high. There are approximately 335 species of birds, 58 species of mammals, 39 species of reptiles, and eight species of amphibians known to occur at Fort Bliss. No invertebrate surveys have been conducted at Fort Bliss; however, several groups of arthropods have their centers of diversity for North America in the region (Fort Bliss 2001).

Habitat for two threatened fauna may potentially occur at the Closed Castner Firing Range MRS: the Texas horned lizard and the Texas lyre snake (Locke 2011). The Texas Parks and Wildlife Department El Paso County List of Rare Species is provided in Attachment 1.

2 PROBLEM FORMULATION

The first step of a SLERA addresses elements of problem formulation (TCEQ 2017; USEPA 1992, 1997 and 1998). The problem formulation phase of the SLERA for the MRS establishes the breadth and focus of the assessment and includes data evaluation and Tier 2 SLERA Elements 1 through 4, as described in this section. Data used in this report are described in Section 2.1, and constituents were screened against ecological benchmarks and COCs were identified as part of SLERA Element 1 (Section 2.1). Potential ecological receptors and exposure pathways were identified as part of SLERA Element 2 (Section 2.2). A conceptual site model (CSM) was developed as part of SLERA Element 3 (Section 2.3).

2.1 Identification and Selection of COCs (SLERA Element 1)

Statistical summaries of constituents in soil, arroyo soil and surface water seep samples of the MRS are identified in Tables 2-1 through 2-12. Samples collected from 2012 through 2017 within the range boundaries are presented in Attachment 2. Surface soil collected by ISM, arroyo soil sampling locations and seep sampling locations are identified on Figures 1-4 through 1-6.

2.1.1 Surface Soil

ISM was employed at the MRS and the data were used to evaluate the potential risk to ecological receptors from COCs in surface soil at the firing range. Guidance for ISM (USACE 2009; ITRC 2012) states that this sampling methodology is recommended for sites that have clearly defined DUs based on investigation goals. The investigation of surface soil within the boundaries of the MRS is limited to the top six inches of surface soil as defined in the Texas Commission on Environmental Quality (TCEQ) ecological risk assessment guidance (RG-263; TCEQ 2017). The DUs sampled during the RI were 1-acre square grids (approximately 200 feet on each side). The sizes of the DUs are consistent with the definition of "de minimus" under the Texas Risk Reduction Program (TRRP: 30 TAC 350.4(23)), which states that areas of one-acre or less are considered insignificant due to the small extent of contamination.

The United States Environmental Protection Agency (USEPA) provides guidance on development of sampling plans including the application of composite sampling approaches (USEPA 1995, 2002). A detailed comparison of IS to traditional composite sampling is presented below. USEPA guidance documents state that composite sampling is appropriate for sites with the following conditions:

- COCs include inorganic compounds and persistent, nonvolatile organic compounds (e.g., PCBs), and some semi-volatile organic compounds and pesticides.
- Distribution of compounds is expected or known to be random (no identifiable source areas).
- Variability is expected or known to be low.
- Laboratory costs are substantially higher than field sampling costs.
- Compositing will not affect sample integrity (sample loss due to volatility is not an issue for sample collection, homogenization, grinding, and sieving approaches).
- No conflicts limiting spatial collection of sample increments.

- Analytical methodologies have low method detection limits.
- Sample collection includes replicate samples to provide data on variance that is lost in the compositing process.
- Heterogeneity of sample increments in composites expected to be minimized and managed in preparation.

The source of the COCs at the MRS is munitions use. The distribution of COCs in the surface soil, therefore, is anticipated to be random. Additionally, there were no impediments on the surface of the MRS to impede sample collection. Based on the characteristics of the MRS surface and the composition of COCs, the Closed Castner Firing Range provides an excellent site for the application of IS to achieve the investigation goals.

ISM was developed to address issues of error introduced by sample and spatial heterogeneity. The methodology includes collection of replicate samples providing information on variance of the average COC concentrations represented by the incremental sampling (IS) results. A detailed discussion of the ISM with respect to controlling error introduced by spatial and sample heterogeneity is presented below.

IS can lose some information on maximum point concentrations of COCs in individual increments; however, ISM has been designed to provide the best data for making risk management decisions for large sites with random distributions of COCs. Under TRRP, hot spots are determined based on a site-specific basis for the purpose of ecological risk assessment (30 TAC 350.51(l)(5). Ecological risk assessment guidance (RG-263; TCEQ 2017) states that the issue of defining hot spots is based on site-specific evaluations. Guidance on composite sampling within ecological assessments (USEPA 2008; FAQ No.8) states that composite samples may yield a more defined exposure point concentration than a few discrete samples over a larger area. The guidance states ecological exposure points based on composite sampling could be compared to benchmark concentrations based on chronic exposures.

From a risk assessment perspective, therefore, the only “hot spots” of valid concern would be concentrations of a COC sufficiently high to pose unacceptable risk from acute or sub-chronic exposure or is located within a preferential exposure area (e.g., feeding, nesting, or breeding) relative to the surrounding habitat. Characterization of COC concentrations in the surface soil at the MRS indicates that COC concentrations rarely exceed chronic benchmarks. Since the surface soil at the MRS does not pose an acute risk to ecological receptors and the MRS does not provide critical habitat, the presence of hot spots with significantly elevated concentrations of COCs is unlikely.

The DU size and placement is based on the CSM for the MRS. The CSM does not provide a mechanism for localized hot spot contamination such as spills, leaks, chemical handling, or on-site processing. Under this CSM, IS provides an increased sensitivity for the identification of hot spots due to the high number of increment collection locations within each DU. Discrete random sampling at four to eight samples per acre would have a much lower probability of detecting a hot spot with COC concentrations at an acutely toxic level over a limited aerial extent.

Consistent with USACE guidance on IS plans, all samples collected by ISM had 30 incremental samples. Ten percent of all samples were collected in triplicate. Soil samples were analyzed for explosives and metals. Table 2-1 provides a summary of the COCs detected in soil samples from the MRS.

Maximum detected concentrations were screened against site-specific background upper tolerance limits (UTLs) established in the Active Army Military Munitions Response Program Field Demonstration Report of Incremental Sampling Methodology at the Closed Castner Firing Range (URS 2013), and ecological screening levels. Screening levels consist of the lower of the TCEQ benchmarks protective of plants and soil-dwelling invertebrates (TCEQ 2017), or screening levels identified from other sources (e.g., minimum soil screening levels from Los Alamos National Laboratory) for individual COCs that do not have established TCEQ benchmarks.

The COCs identified in surface soil include the following metals: antimony, barium, chromium, copper, lead, manganese, and zinc.

2.1.2 Arroyo Soil

No perennial surface water flows on the MRS and no permanent water bodies exist. However, there are several distinct arroyos located throughout the MRS that are dry except during precipitation events. Therefore, the quantitative risk assessment for COCs in samples collected from the arroyos within the firing range is based on soil exposure pathways due to the typical lack of surface water in the arroyos.

Discrete samples of native surface soils from 0 to 6 inches and 12 to 18 inches bgs were collected from the arroyos and analyzed for metals. Data were divided into downgradient delineation samples and nine separate reaches. Maximum detected concentrations for each reach were compared to the lower of the TCEQ benchmarks protective of plants and soil-dwelling invertebrates and site-specific background UTLs (Tables 2-2 through 2-11).

Tables 2-2 through 2-11 provide a summary of arroyo soil data and screening benchmarks for each reach. Reaches are presented in Figure 2-1. Maximum concentrations collected from the downgradient delineation samples did not exceed benchmarks and therefore no COCs were identified for the downgradient area. Arroyo reaches where COCs were identified include: Reach 3 (arsenic and zinc), Reach 4 (zinc), Reach 7 (zinc), and Reach 9 (lead).

2.1.3 Surface Water Seeps

Seep samples were evaluated as surface water in this SLERA. Small, isolated areas within the MRS contain surface water sourced from seeps. The seeps are not of sufficient volume to flow beyond the above ground location however surface water does pool and could be a source of drinking water for local wildlife. Water samples were collected and analyzed for dissolved and total metals however only the total metals were evaluated in this SLERA. Surface water data are summarized in Table 2-12.

Surface water at the seep locations is not present for a long enough duration to support aquatic life. Therefore, the only complete exposure pathway is via drinking water of upper trophic level receptors. Exposure to COCs via surface water from the MRS was assumed to be minimal for wildlife, especially for birds as they do not ingest significant quantities of water. Thus, a screening was conducted to determine if COCs in surface water could pose significant adverse effects to wildlife. The maximum detected concentrations of metals in surface water were screened against no observed adverse effect level (NOAEL) and lowest observed adverse effect level (LOAEL) -based drinking water benchmarks for wildlife from Oak Ridge National Laboratory (ORNL; Sample et. al., 1996), as presented in Table 2-12. Maximum concentrations of antimony and arsenic exceed the NOAEL-based benchmark but do not exceed the LOAEL-based benchmark. Considering the limited potential of exposure based on the size of the pools within the area influenced by the firing range, and the potential seasonal and/or temporal use factor(s), the probability that seep water within the MRS represents a concern to wildlife is low. Therefore, surface water is not further evaluated in this SLERA.

2.1.4 Identification of Bioaccumulative COCs

Bioaccumulative COCs are identified and presented in the COC selection tables (Tables 2-1 through 2-11). The TCEQ has identified media-specific inorganic and organic constituents that may pose substantial risk to ecological receptors due to bioaccumulation (TCEQ 2017). Bioaccumulative constituents detected in each media were selected as COCs even if they were not present at concentrations that exceeded screening benchmarks (e.g., plant and invertebrate screening benchmarks), unless the bioaccumulative constituent was below background (TCEQ 2017). After completing the background screening, all detected constituents were compared to the bioaccumulative COCs listed in the TCEQ guidance (TCEQ 2017). Chromium, copper, lead, mercury, nickel, selenium, and zinc in soil were identified to have the potential to bioaccumulate into higher trophic levels.

2.2 Representative Species (SLERA Element 2)

The MRS is located in an area generally considered foothills desert scrub habitat. The affected property is limited to surface soil and therefore the communities of potentially exposed ecological receptors are limited to terrestrial receptors. Terrestrial receptors are exposed to COCs in soils and via the food chain.

The desert shrew, mourning dove, scaled quail, desert cottontail, coyote, and red-tailed hawk were selected as terrestrial receptors for this SLERA. These receptors represent mammalian and avian invertivores, herbivores, and carnivores. Species were selected based on the availability of exposure data presented in the TCEQ Ecological PCL Database (TCEQ 2017).

In addition, habitat exists at the MRS for the federally threatened Texas horned lizard and the Texas lyre snake, and toxicity information is available in the TCEQ Ecological PCL Database. Therefore, a Texas horned lizard was evaluated as a reptilian invertivore and as the representative receptor for all reptilian feeding guilds. There is, however, less toxicological data for reptiles and amphibians compared to mammalian and avian species. Due to the high degree of uncertainty associated with the quantitative assessment of reptile and amphibian receptors, an additional assessment is presented in the uncertainty analysis section.

2.2.1 Desert Shrew

The desert shrew (*Notiosorex crawfordi*) is representative of the invertivore mammals feeding guild. Omnivorous mammals are an important prey item for higher trophic level predators. The shrew was selected as a representative species for the reasons listed below:

- The shrew is found in the arid southwest habitat similar to that described for the MRS.
- The shrew is a food source for carnivorous birds, mammals, and reptiles.
- The shrew provides a vector for COCs to enter the food chain through the consumption of invertebrates.

- The shrew has an extremely high metabolic rate and provides an environmental receptor with relatively greater exposure to COCs in soils compared to other species.
- Biological and toxicological information for the shrew are readily available.

Plentiful ground litter and abundant insect prey are part of an ideal habitat for desert shrew (TCEQ 2017). Habitats reported for this shrew include agave-grassland, mesquite-cactus, creosote- and salt-bush, desert sagebrush, lower edge of pinon-juniper, lower edge oak-mimosa, and yucca-cactus. The desert shrew is small with body weights ranging from 3 to 6 grams (TCEQ 2017) The desert shrew has a limited home range similar to short-tail shrew between 0.03 hectare (0.074 acre) and 0.36 hectare (0.889 acre).

The shrew is primarily an insectivore, but its diet can consist of insects, earthworms, snails, slugs, fungi, plants, arachnids, centipedes, millipedes, and small mammals. The desert shrew consumes about 75 percent of its body weight per day. For this SLERA, a diet of 100 percent arthropods was assumed for the desert shrew.

2.2.2 Mourning Dove

The mourning dove (*Zenaida macroura*) represents the herbivorous bird feeding guild.

The mourning dove was selected as a representative species for the reasons listed below:

- It is among the most widespread terrestrial bird endemic to North and Middle America as well as the leading game bird in North America.
- The dove provides a vector for COCs to enter the food chain through the consumption of vegetation.
- Biological and toxicological information for the mourning dove are readily available.

Z. macroura are very adaptable and consequently live in a variety of ecological habitats including urban and rural locations (USACHPPM 2004). Generally, dove avoid heavily forested areas and prefer more open woodland. They nest in open areas such as edges, between forest and prairie biomes, and agricultural areas (USACHPPM 2004). The average distance traveled from nesting sites to feeding or loafing sites was 3.7 km. The farthest a dove was reported to travel was 6 km. Mourning doves breed as far north as southern Canada, but primarily breed throughout the United States and south into Mexico, Bermuda, the Bahamas, the Greater Antilles, and into some parts of Central America (USACHPPM 2004). Although the main breeding period is from April to September, breeding can begin in March and extend to October. In fact, breeding has been found to occur during the entire year along the Gulf Coast (USACHPPM 2004).

The diet of mourning doves consists mainly of seeds. Incidental ingestion of animal matter, mainly snails, and green forage may occur. Agricultural cereal grains such as corn, wheat, grain sorghum, millet, buckwheat and peanuts serve as the major food items if available. For this SLERA, a diet of 100 percent plants was assumed for the mourning dove.

2.2.3 Scaled Quail

The scaled quail (*Callipepla squamata*) is representative of the invertivorous birds feeding guild. Invertivorous birds are an important prey item for higher trophic level predators. The scaled quail was selected as a representative species for the reasons listed below:

- The scaled quail is prevalent in West Texas.
- The scaled quail is a food source for carnivorous birds, mammals, and reptiles.
- The scaled quail is adapted to live in the arid southwest.
- Biological and toxicological information for the scaled quail are readily available.

Scaled quail inhabit arid and semi-arid lowlands of sparse low-growing shrubs in level or rugged terrain (Cantu et al., 2006).They are found throughout West Texas, except in the higher elevations (above 6,500 feet).). The home range of scaled quail varies from 30 to 300 acres in size, depending on the availability of food and cover and time of year. Winter home ranges are typically larger than summer ranges (Cantu et al., 2006)..

Scaled quail feed on a mixture of seeds, succulent fruits, green leafy material and insects (Cantu et al., 2006). . Seeds of forbs and woody plants are generally the most important in the quail's diet and consumption of fruits and leafy material is highest during the spring and summer months. Insects provide protein, energy, and water and are especially important during the summer and fall (Cantu et al., 2006). . Over the typical year, the scaled quail's diet consists of 75 percent plants (plant vegetation and seeds) and approximately 25 percent is attributed to invertebrates (TCEQ 2017). For this SLERA, a diet of 100 percent arthropods was conservatively assumed for the scaled quail.

2.2.4 Desert Cottontail

The desert cottontail (*Sylvilagus audubonii*) is representative of the herbivorous mammals feeding guild. Herbivorous mammals are an important prey item for many higher trophic level predators. They generally comprise the majority of the terrestrial tissue biomass and are important in seed dispersal and pollination for many plant species. The desert cottontail was selected as a representative species for the reasons listed below:

- The desert cottontail is found in the cactus and creosote brush desert common to El Paso.
- The desert cottontail is a food source for many predators, including hawks, owls, foxes, bobcats, and coyotes.
- The desert cottontail is abundant and edible, making it a prominent game species. It is hunted for sport, meat, and fur.
- The desert cottontail has a high metabolic rate, which results in greater ingestion per body weight. This increases the potential for exposure to COCs.

The desert cottontail is a relatively small cottontail with body weights averaging between 0.5 and 1.4 kg (TTU 2016). It is adapted to a variety of habitats, varying from grassland to creosote brush and cactus deserts. It frequents brushy areas or, where the vegetation is short, the underground burrows of other animals such as skunks, ground squirrels and so forth. The desert cottontail is crepuscular (active at dawn and dusk) and nocturnal and is active all winter. Its home range is dependent on terrain and food supply, but generally is between five and eight acres.

The desert cottontail is exclusively herbivorous; however, its diet varies between the seasons due to food availability. In the spring and summer, its diet consists of herbaceous plants, especially grasses. In the fall and winter, its diet consists of bark, twigs, and buds. For this SLERA, a diet of 100 percent plants was assumed for the desert cottontail.

2.2.5 Coyote

The coyote (*Canis latrans*) is identified as a prominent species at the MRS. The coyote was selected as a representative species for the following reasons:

- The coyote is found in habitats across the United States.
- The coyote is abundant.
- The coyotes preys upon the selected lower trophic level, representative species that increases the potential for exposure to COCs.

The coyote ranges over most of the United States inhabiting chaparral, open forests, arid desert, and rim rock regions. It is a widely distributed carnivore in the southwestern United States. It prefers areas with broken and diverse habitats associated with areas having urban and suburban development. The territory size of the coyote ranges from approximately 57 hectares (141 acres) to over 3,600 hectares (8,892 acres) (USCHPPM [2004]).

Coyotes represent an upper trophic level predatory mammal that primarily hunts small mammals, birds, and large insects. For this SLERA, a diet of 100 percent small mammals was assumed for the coyote.

2.2.6 Red-tailed Hawk

The red-tailed hawk (*Buteo jamaicensis*) is the most common Buteo hawk species in the United States and is distributed throughout most wooded, semi-wooded, and arid regions. The red-tailed hawk was selected as a representative species for the following reasons:

- The red-tailed hawk is found in the arid mountain foothill and riparian habitat along the Rio Grande.
- The red-tailed hawk represents a predator similar to protected species such as the bald eagle and peregrine falcon.
- The red-tailed hawk is common in El Paso County.
- The red-tailed hawk preys upon the selected lower trophic level, representative species that increases the potential for exposure to COCs.
- Biological and toxicological information for the red-tailed hawk is readily available.

The red-tailed hawk prefers mixed landscapes with fields, wetlands, and pastures for foraging interspersed with groves of woodlands. In Texas, red-tailed hawks are primarily year-round residents of local habitats. The territory size of the red-tailed hawk ranges from 381 hectares (941 acres) to 2,465 hectares (6,100 acres) (USEPA 1993).

Red-tailed hawks represent an upper trophic level predatory bird that primarily hunts small mammals, birds, reptiles, and large insects. For this SLERA, a diet of 100% small mammals was assumed for the red-tailed hawk.

2.2.7 Texas Horned Lizard

The Texas horned lizard (*Phrynosoma cornutum*) can be found in arid and semiarid habitats in open areas with sparse plant cover. The Texas horned lizard currently is listed as a threatened species in Texas. The Texas horned lizard was selected as a representative species for the following reasons:

- The lizard's habitat is found across the MRS.
- The Texas horned lizard is federally threatened.
- The lizard preys upon insects that are found across the MRS increasing the potential for exposure to COCs.

Because horned lizards dig for hibernation, nesting and insulation purposes, they commonly are found in loose sand or loamy soils (TPWD 2017). Texas horned lizards range from the south-central United States to northern Mexico, throughout much of Texas, Oklahoma, Kansas and New Mexico (TPWD 2017). The lizard length ranges from 3.5 to 5 inches and averages 32 grams in weight (TCEQ 2017).

Texas horned lizards feed primarily on harvester ants. For this SLERA, a diet of 100% arthropods was assumed for the Texas horned lizard. The Texas horned lizard is also evaluated as the representative species for all reptile (invertivore and carnivore) feeding guilds because a diet consisting of 100 percent arthropods is considered protective of the Texas lyre snake and other carnivorous and invertivorous reptiles.

The evaluation of the reptiles and amphibians is presented in the Uncertainty Analysis of Section 6

2.3 Conceptual Site Model (SLERA Element 3)

The COCs present in the soil at the Closed Castner Firing Range include metals and explosives in soil. The source of the COCs at the MRS is munitions use.

Terrestrial ecological receptors can be exposed to COCs in surface soil by direct contact and by uptake in the food chain. The movement of potential COCs through the environment with respect to exposure to ecological receptors includes:

- Direct incidental ingestion of soil
- Uptake from soil by plants and animals
- Movement through the food chain

Figure 2-2 provides an illustration of the conceptual model for the MRS.

2.4 Exposure Routes

Food sources potentially contaminated by affected soil are considered the primary, complete exposure pathways. Dermal and inhalation exposure routes are not considered in this SLERA due to limited toxicity information and the lesser significance of these exposure routes relative to ingestion of food and soil. Intake estimates of COCs from drinking water are not included in the risk assessment, as exposure to COCs via surface water from the MRS was assumed to be minimal for wildlife.

Exposure routes quantitatively evaluated in the SLERA include:

Surface Soil:

- Incidental ingestion by direct contact
- Ingestion of plants and soil-dwelling invertebrates that have taken up COCs from soil
- Ingestion of animals (prey) that have taken up COCs from soil and food sources

Arroyo Soil:

- Incidental ingestion by direct contact
- Ingestion of plants and soil-dwelling invertebrates that have taken up COCs from soil
- Ingestion of animals (prey) that have taken up COCs from soil and food sources.

3 TOXICITY ASSESSMENT

This section discusses the toxicity of the COCs and information used to assess risk at the Closed Castner Firing Range MRS. Toxicological profiles are provided for all identified COCs with an emphasis on terrestrial ecological receptors (SLERA Element 4). Much of the toxicological information presented in this section was obtained from the Oak Ridge National Laboratory, Toxicological Benchmarks for Wildlife (Sample et al., 1996) and the TCEQ Ecological PCL Database.

3.1 Toxicity Profiles (SLERA Element 4)

3.1.1 Antimony

Antimony is naturally present in the earth's crust and is released to the environment in windblown dust, from volcanic eruptions, sea spray, forest fires, and biogenic sources. The majority of antimony released to the environment arises from anthropogenic sources. Antimony has also been found in shooting ranges, as the metal is used in bullets for hardening (TCEQ 2017).

The sorption and mobility of antimony released to soil is determined by the nature of the soil, the form of antimony deposited on the soil, and the pH. A few leaching studies indicate that antimony is strongly adsorbed to most soils. After prolonged leaching, the residual antimony appears to convert to a less mobile form, thereby reducing the potential for future leaching. Antimony has no known essential biological function and can be moderately toxic at elevated concentrations (Tschan et al 2009).

3.1.1.1 Plants

A potentially important antimony exposure pathway of animals to antimony in areas with impacted soils is through food and feed plants. However, little is known also about the factors determining the phyto-availability of antimony in soils and its uptake by crop plants (Tschan et al 2009). Extensive studies at a smelter site indicate that the uptake of antimony from soil in grass and subsequent translocation in shoots is slight (Ainsworth 1988). Baek et al (2013) however found that plant growth was adversely affected in antimony-contaminated soils, and the content of antimony in plant tissues increased with increasing antimony concentration in soil. Although soil impacts by antimony may be rarely so severe as to cause toxicity problems to animals consuming plants growing on impacted sites, such risks also cannot be excluded in all cases.

3.1.1.2 Mammals and Birds

Antimony is poorly absorbed following inhalation and oral exposure (ATSDR 1992). However, dermal exposure to high levels of antimony trioxide resulted in death in rabbits (Myers et al. 1978). The application area was occluded in the Myers study, suggesting that at least some forms of antimony can be absorbed through the skin. Another study (Ainsworth 1988) showed that there is no bioaccumulation of antimony in small mammals compared with their food. Accordingly, there is little indication that antimony would bioconcentrate in the food chain.

Toxic effects ranging from gastrointestinal disorders to death have been documented for animals following acute oral exposure to antimonials. Bradley and Frederick (1941) reported that a single dose (300 mg Sb/kg) of the organic antimonial, potassium antimony tartrate, induced myocardial infarction and death in rats. However, several studies using inorganic antimonials (metallic antimony, antimony oxide, or antimony trioxide) reported that doses as high as 27,410 mg Sb/kg were not fatal to rats (ATSDR 1992).

3.1.2 **Arsenic**

Arsenic is a naturally occurring metalloid found widely in nature and most abundantly in sulfide ores. Copper and lead ores also contain small amounts of arsenic. Arsenic accounts for 0.0005% of the earth's crust. It occurs in the environment as either arsenic (III) or arsenic (V). Arsenic (III) is more toxic than arsenic (V), and both are considerably more toxic than organic forms (Peterson et al., 1981). Arsenic enters the environment mainly from its use as a pesticide, from coal-fired power plant emissions, and from copper and lead smelting. Other potential sources of arsenic include: pyrotechnic devices, solder, glass manufacturing, lead shot, wood preservatives, ceramic glazes, semiconductor devices, paints, and dyes. Arsenic adsorption into the soil increases as a function of soil pH, iron content, aluminum content, and organic matter (Woolson 1977).

3.1.2.1 Plants

Arsenic is not essential for plant growth. It is taken up actively by roots, with arsenic (V) being more easily absorbed then arsenic (III). In experiments with toxic levels of arsenic, rice and legumes appear to be more sensitive than other plants. Symptoms of toxicity include wilting of new-cycle leaves, retardation of root and top growth, root discoloration, cell plasmolysis, and leaf necrosis (Aller et al. 1990). Arsenic is chemically similar to phosphorus; it is translocated in the plant in a similar manner and is able to replace phosphorus in many cell reactions. Arsenic (III) probably reacts with sulfhydryl enzymes leading to membrane degradation and cell death. Arsenic (V) is known to uncouple phosphorylation and affect enzyme systems (Peterson et al. 1981). Will and Suter (1995) reported LOAEL and NOAEL values for the effects of arsenic derived from experiments conducted in soil. The soil NOAEL values ranged from 10 to 62.7 mg/kg and the soil LOAEL values ranged from 2 mg/kg (barley) to 1000 mg/kg (spruce) for the phytotoxicity of arsenic. Where soil arsenic content is high, growth and crop yields can be decreased.

3.1.2.2 Mammals and Birds

Arsenic may be a required micronutrient for animals. Growth, survival, and reproduction of goats are poor if the diet contains less than 0.05 mg/kg arsenic (NAS 1977). Arsenic is a known carcinogen and teratogen. Toxic effects include reduced growth, hearing and sight loss, liver and kidney damage, and death (Eisler 1988a). Inorganic arsenic is usually more toxic to animals than organic arsenic compounds. Wildlife mortality and malformations have been observed for chronic doses of 1 to 10 mg/kg arsenic and dietary concentrations of 5 to 50 mg/kg arsenic (Eisler 1988a). Acute LD50s (lethal dose to 50 percent of the exposed population) to for arsenic compounds range from 10 to 100 mg/kg for mammals (Eisler 1988a) and from 17.4 to 3,300 mg/kg for birds (Eisler 1988a).

3.1.3 Barium

Barium is a silvery-white metal which exists in nature only in ores containing mixtures of elements. It combines with other chemicals such as sulfur or carbon and oxygen to form barium compounds (ATSDR 2007). Soluble barium compounds such as barium nitrate, barium cyanide, barium permanganate, and barium chloride, are expected to be mobile in the environment. The solubility and mobility of barium is greater in sandy soil than sandy loam and increases with decreasing pH and decreasing organic matter content. Barium can react with metal oxides and hydroxides in soils thus limiting its mobility and increasing adsorption. Barium mobility decreases in soils with high sulfate and calcium carbonate content.

3.1.3.1 Plants

Relative to the amount of barium found in soils, little is typically bioconcentrated by plants (Schroeder 1970). For example, a bioconcentration factor of 0.4 has been estimated for plants in a Virginia floodplain with a barium soil concentration of 104.2 mg/kg (Hope et al. 1996). However, there are some plants, such as legumes, forage plants, Brazil nuts, and mushrooms that accumulate barium (Aruguete et al. 1998; IPCS 1991; WHO 2001). Bioconcentration factors from 2 to 20 have been reported for tomatoes and soybeans (WHO 2001).

3.1.3.2 Mammals and Birds

The soluble salts of barium are toxic in mammalian systems. They are absorbed rapidly from the gastrointestinal tract and are deposited in the muscles, lungs, and bone (Chen 2017). The extent to which barium uptake occurs in terrestrial animals is not well characterized. Further studies on the bioconcentration of barium by terrestrial animals and on the biomagnification of barium in terrestrial food chains would be useful to better characterize the environmental fate of barium.

It was found that one week old chickens (male and female) could tolerate barium concentrations (hydroxide or acetate salt) up to 1,000 ppm in their diets for three weeks without apparent ill effects. Assuming that 1 ppm barium in food equals 0.125 mg barium/day for 21 days, the estimated total barium dosage was 2,625 mg/kg. A slight depression of growth was seen at 2,000 ppm (5,250 mg/kg total) and 4,000 ppm (10,500 mg/kg total), but no increase in mortality was apparent. More than half of the chickens receiving 8,000 ppm (21,000 mg/kg total) barium during the feeding period died. All chickens receiving 16,000 ppm and 32,000 ppm barium died after an average of seven days (14,000 mg/g total) and five days (20,000 mg/kg total), respectively (HSDB 2012).

3.1.4 Chromium

Chromium occurs at a concentration of about 150 mg/kg in the earth's crust, as either trivalent chromium (chromium III) or hexavalent chromium (chromium VI). Chromium III is an essential metal in animals, playing an important role in insulin metabolism (Langard and Norseth 1979). Chromium VI is more toxic than chromium III because of its high oxidation potential and the ease with which it penetrates biological membranes (Steven et al. 1976; Taylor and Parr 1978). Chromium III, the predominant form in the environment, exhibits decreasing solubility with increasing pH, and is commonly precipitated at a pH above 5.5. In most soils, chromium is primarily present as precipitated chromium III, which is not bioavailable and has not been known to biomagnify through food chains in its inorganic form (Eisler 1986).

The two largest sources of anthropogenic chromium in the atmosphere are chemical manufacturing and the combustion of fossil fuels. Chromium is used in the preparation of alloy steels to enhance corrosion and heat resistance; as catalysts; in production at tanning and textile plants; in the production of pigments, varnishes, and glazes; as chemical intermediates; and in electroplating.

3.1.4.1 Plants

Chromium is not an essential element in plants. Chromium VI is more soluble and available to plants than chromium III. Chromium VI is also considered the more toxic form (Smith et al. 1989). In soils within a normal Eh and pH range, chromium VI, a strong oxidant, is likely to be reduced to the less available chromium III form (Bartlett and James 1979). The greatest chromium toxicity risk to plants is posed in acidic sandy soil with low organic content (NRCC 1976). After plant uptake, chromium generally remains in the roots (Smith et al. 1989). Within the plant, chromium VI may be reduced to chromium III and complexed as an anion with organic molecules. Symptoms of toxicity include stunted growth, poorly developed roots, and leaf curling. Chromium may interfere with enzyme reactions, as well as carbon, nitrogen, phosphorus, iron, and molybdenum metabolism (Kabata-Pendias and Pendias 1984).

Experiments by Turner and Rust (1971) demonstrated the ameliorating effects of organic matter on chromium VI toxicity. Will and Suter (1995) reported soil NOAEL and LOAEL values for the toxicity of chromium to plants in soil. The NOAEL values ranged from 0.35 to 11 mg/kg, and the LOAEL values ranged from 1.8 to 31 mg/kg.

3.1.4.2 Mammals and Birds

The oral LD50 for chromium III nitrate in rats is 3,250 mg/kg (NIOSH 1995). Chromium III oxide administered to rats at concentrations from 2 percent to 5 percent of the diet had no effect on reproductive capacity (NLM 1995). Although chromium III has the capacity to damage DNA, it is not thought to be an effective mutagen due to its poor cellular uptake (ATSDR 2012a).

Chromium III compounds have a relatively low-order of toxicity in experimental animals as compared to chromium VI compounds. The LD50 for chromium III in mice is 260 mg/kg and 5 mg/kg for chromium VI. Tissue accumulation of chromium VI in rats was nine times higher than chromium III.

3.1.4.3 Soil Invertebrates

Abbasi and Soni (1983) assessed the effect of chromium VI on survival and reproduction of the earthworm *Octochaetus pattoni.* Survival was the most sensitive measure with a 75% decrease resulting from 2 mg/kg chromium VI, the lowest concentration tested.

3.1.5 **Copper**

Copper is widely distributed in nature in its elemental state, as well as in sulfides, arsenites, chlorides, and carbonates. The concentration of copper in the earth’s crust is 70 parts per million (ppm). Copper is present in concentrations averaging about 4 ppm in limestones, 55 ppm in igneous rocks, 50 ppm in sandstones, and 45 ppm in shales. Alkaline conditions in the soil and surface water favor the precipitation of copper. Acid conditions promote the solubility of copper and increase the concentration of ionic copper.

Common copper salts, such as the sulfate, carbonate, cyanide, oxide, and sulfide are used in electroplating, batteries, fungicides, ceramics, pigments, and pyrotechnics (ACGIH 1986). The largest anthropogenic releases of copper to the environment result from copper mining and smelting works.

3.1.5.1 Plants

Copper is a micronutrient essential for plant nutrition. It is required as a co-factor for many enzymes and is an essential part of a copper protein involved in photosynthesis. The most common toxicity symptoms include reduced growth, poorly developed root systems, and leaf chlorosis (Wong and Bradshaw 1982). Copper interferes with enzyme functioning in the root system (Mukherji and Das Gupta 1972) and also strongly interferes with photosynthesis and fatty acid synthesis (Smith et al. 1985).

3.1.5.2 Mammals and Birds

Copper is a component of a number of metalloenzymes and is essential for the utilization of iron (Goyer 1991; Stokinger 1981). Although most copper salts occur in two valence states, as cuprous (Cu^{+}) or cupric (Cu^{+2}) ions, the biological availability and toxicity of copper is most likely associated with the divalent state (ATSDR 2004). The liver is one of the main organs involved in the storage and metabolism of copper. Absorption of ingested copper occurs primarily in the upper gastrointestinal tract (ATSDR 2004). Soluble copper compounds (oxides, hydroxides, citrates) are readily absorbed, but water-insoluble compounds (sulfides) are poorly absorbed (Venugopal and Luckey 1978). In animal studies, oral exposure to copper caused hepatic and renal accumulation of copper, liver and kidney necrosis at doses of greater than 100 mg/kg/day, and hematological effects at doses of 40 mg/kg/day.

3.1.5.3 Soil Invertebrates

The effects of copper to the earthworm *Octolasion cyaneum* were evaluated by Streit and Jaggy (1983). The LC50 concentrations ranged from 180 mg/kg (3.2% soil organic carbon) to 2,500 mg/kg copper (43% soil organic carbon).

3.1.6 **Lead**

Lead occurs naturally in the earth's crust (0.002%), most commonly as galena (lead sulfide), cerrusite (lead carbonate) and anglesite (lead sulfate). It may enter the environment during its mining, ore processing, or smelting. Lead has been used in batteries, solder, paint, and ceramic glazes. A former major source of exposure to lead was from the use of tetraethyl lead as an antiknock agent in gasoline.

Lead is neither essential nor beneficial in living organisms (Eisler 1988b). Lead has adverse effects on survival, growth, reproduction, development, behavior, learning, and metabolism. In general, organic lead compounds are more toxic than inorganic compounds, biomagnification of lead is minimal, and younger organisms are more susceptible to lead toxicity (Eisler 1988b).

The adsorption or precipitation of lead in soils is promoted by the presence of organic matter, carbonates, and phosphate minerals. Lead usually accumulates in topsoil due to complexation with organic matter and the transformation of soluble lead compounds to relatively insoluble sulfate or phosphate derivatives. The efficient fixation of lead by most soils greatly limits the transfer of lead to aquatic systems and also inhibits absorption of lead by plants (USEPA 1982).

3.1.6.1 Mammals and Birds

Birds (fowls, ducks, geese, and pigeons) are all susceptible to lead poisoning. Toxic symptoms include anorexia and ataxia. Lead poisoning increases mortality and decreases egg production and fertility (Thornton, et al. 2001).

3.1.7 **Manganese**

Manganese compounds are found in the earth's crust in the form of numerous minerals such as pyrolusite, romanechite, manganite, hausmannite. Manganese 2+ is the most stable oxidation state under environmental conditions. Soluble manganese 2+ compounds do not form strong complexes to soil organic matter but may bind to cation exchange sites in the mineral fraction of soil. Thus manganese 2+ compounds are relatively mobile and may potentially leach into surface and groundwater. As ions or insoluble solids, manganese compounds do not volatilize from water and moist soil surfaces. Manganese compounds do not bioconcentrate in animals. However, manganese is an essential nutrient for most plants and animals (ATSDR 2012b).

3.1.7.1 Plants

Manganese accumulates in various kinds of plants such as legumes, nuts, heather, and tea. Bioaccumulation of manganese by plants was examined using oats (*Avena nova*) and beans (*Phaseolus vularis*) (Brault et al. 1994). These plants were grown in sandy and organic soil at a control site (greenhouse) and at two outdoor sites near <20,000 and 132,000 vehicles/day respectively. The highest manganese accumulation was found in the fruits and stems of oats grown in the organic and sandy soils at the station with the highest traffic density.

In the field survey conducted by Lytle et al. (1994), terrestrial and aquatic plant samples were collected along motorways and local urban roadways throughout Utah during 1992 and 1993. Manganese was detected in the plant samples, with concentrations ranging from 30.2 to 13,680 μg/g dry weight.

3.1.7.2 Mammals and Birds

Manganese has been shown to cross the blood-brain barrier and a limited amount of manganese is also able to cross the placenta during pregnancy, enabling it to reach a developing fetus. Nervous system disturbances have been observed in animals after very high oral doses of manganese, including changes in behavior. Sperm damage and adverse changes in male reproductive performance were observed in laboratory animals fed high levels of manganese. Impairments in fertility were observed in female rodents provided with oral manganese before they became pregnant. Illnesses involving the kidneys and urinary tract have been observed in laboratory rats fed very high levels of manganese. These illnesses included inflammation of the kidneys and kidney stone formation. (ATSDR 2012b).

The few available inhalation and oral studies in humans and animals indicate that inorganic manganese exposure does not cause significant injury to the heart, stomach, blood, muscle, bone, liver, kidney, skin, or eyes. However, if manganese is in the (VII) oxidation state (as in potassium permanganate), then ingestion may lead to severe corrosion at the point of contact. Studies in pigs have revealed a potential for adverse coronary effects from excess manganese exposure (ATSDR 2012b).

3.1.8 Selenium

Selenium is an essential nutrient for some plants and animals when present in trace amounts. The earth's crust contains an average of 0.05 to 0.09 ppm selenium. In nature, selenium usually occurs in the sulfide ores of heavy metals. Selenium occurs in volcanic rock, sandstone, carbonaceous rocks, and some types of coal and mineral oil. In nature, selenium is found in the -2 (selenide), 0 (selenium), +4 (selenite), and +6 (selenate) oxidation states.

The behavior of selenium in soils is affected by redox conditions, pH, hydrous oxide content, clay content, organic materials and the presence of competing anions. Heavy metal selenides, which are insoluble, predominate in acidic soils and soils with high amounts of organic matter. Sodium and potassium selenites dominate in neutral, well-drained mineral soils. Selenium (IV) is soluble but can strongly adsorb to soil minerals and organic material. Iron and manganese oxides sorb selenium (IV), with iron oxides sorbing more than manganese. In alkaline, well-oxidized soil environments, selenium (VI) predominates. The selenium (VI) is very mobile because of its high water solubility and low tendency to adsorb onto soil particles (ATSDR 2003).

Anthropogenic sources include mining and milling operations, smelting and refining, and the combustion of fossil fuels. Selenium is used in glass manufacturing, electronics, pigments, iron and steel alloying, veterinary medicines, and as a fungicide.

3.1.8.1 Plants

Selenium is absorbed by plants as selenium (IV), selenium (VI), or in organic form. Plants convert inorganic selenium to organic selenium compounds. Selenium (VI) is considered to be the most toxic form. The mechanism of toxicity is thought to be indiscriminate replacement of sulfur by selenium in proteins and nucleic acids with disruptions in metabolism (Trelease et al. 1960). Selenium toxicity is often characterized by chlorosis.

3.1.8.2 Mammals and Birds

While selenium is an essential nutrient that interacts with Vitamin E and maintains muscle integrity, it has a very narrow tolerance range (Eisler 1985b). In mammals, chronic selenium poisoning is induced by diets containing 1 to 44 mg/kg selenium (Harr 1978). Symptoms include liver cirrhosis, lameness, loss of hair, emaciation, and reduced conception.

Selenium is both embryotoxic and teratogenic to birds, with organic selenium being more toxic than inorganic selenium. Birds exposed to agricultural wastewater containing 0.3 mg/L selenium at a wildlife refuge experienced poor reproductive success, increased embryo mortality, and developmental abnormalities (Ohlendorf et al. 1986). Metabolism of selenium may be significantly modified through interactions with heavy metals, and selenium may reduce the toxicity of several heavy metals, including cadmium and mercury (Eisler 1985b).

3.1.9 Zinc

Zinc is an essential trace element in both plants and animals; it assures the stability of biological molecules and structures such as DNA, membranes, and ribosomes (Eisler 1993). Zinc makes up about 0.002% of the earth's crust (NAS 1980). Zinc compounds occur in the +2 oxidation state, often as zinc sulfide (sphalerite), zinc carbonate (smithsonite) and zinc oxide (zincite). Zinc can be adsorbed to clay minerals or metallic oxides and forms stable complexes with organic substances such as humic acids. Zinc oxides, carbonates, phosphates, and silicates are insoluble, whereas, zinc sulphates and chlorides are extremely soluble.

The primary anthropogenic sources of zinc in the environment are metal smelters and mining activities. Zinc compounds are also used in rubber, paints, pigments, catalysts, animal feeds, soldering fluxes, wood preservatives, mildew inhibitors, smoke bombs, deodorants, antiseptics, and astringents. Zinc phosphide is used as a rodenticide.

3.1.9.1 Plants

Zinc is an essential element for plant growth. Zinc is involved in chlorophyll synthesis, the regulation of enzymatic reactions, disease protection, and the metabolism of carbohydrates and proteins. Zinc is actively taken up by roots in ionic form, and less so in organically chelated form (Collins 1981). It is fairly uniformly distributed between roots and shoots being transported in the xylem in ionic form (Wallace and Romney 1977). Transport in the phloem appears to be as an anionic complex (van Goor and Wiersma 1976). Toxicity symptoms include chlorosis and depressed plant growth (Chapman 1966). Zinc inhibits carbon dioxide fixation, alters membrane permeability, and inhibits phloem transport of carbohydrates (Collins 1981). Copper, iron, and manganese can inhibit plant uptake of zinc.

3.1.9.2 Mammals and Birds

Zinc is a vital component of many metalloenzymes such as carbonic anhydrase, which regulates carbon dioxide exchange (Stokinger 1981). Zinc is relatively nontoxic in mammals, but excessive intake can cause a variety of effects. In animals, gastrointestinal and hepatic lesions, pancreatic lesions, anemia, and diffuse nephrosis have been observed following subchronic oral exposures. It is not known to be carcinogenic by normal exposure routes (Eisler 1993). Teratogenic effects have not been observed in animals exposed to zinc; however, high oral doses can affect reproduction and fetal growth. Zinc may diminish the toxic effects of cadmium and protect against lead toxicosis in terrestrial animals (Eisler 1993).

3.1.9.3 Soil Invertebrates

Invertebrate studies of earthworms resulted in a decrease in cocoon production or growth rate at levels ranging from 136 to 300 mg/kg zinc. Effects on other invertebrates included death, decreased population size, and decreased growth.

3.2 Toxicity Reference Values

Toxicity reference values (TRVs) for avian and mammalian species used in this SLERA are primarily from studies examined by TCEQ and included in the TCEQ Ecological PCL Database. Table 5-1 provides a summary of the TRVs for avian receptors and mammalian receptors for both NOAEL end points and LOAEL end points. TRVs were selected from those presented in the TCEQ Ecological PCL Database using professional judgement. Unless discussed below, the selected TRVs equal the most conservative values available in the PCL database, or if TCEQ selected critical TRVs in the database, those were used in the SLERA.

The mammalian TRVs used in the SLERA for antimony (NOAEL of 5.6 mg/kg-day and LOAEL of 42 mg/kg-day [Poon et al. 1998]) were used in the SLERA instead of the most conservative mammalian NOAEL TRV of 0.59 mg/kg-day obtained from a Rossi et al., 1987 study where only a NOAEL was reported and the dosing regimen consisted of drinking water. The TRVs used in the SLERA are more appropriate for the MRS because of the following reasons:

- The TRVs are from the USEPA (2005) Eco-SSL dataset for mammalian growth.
- Both a NOAEL and bounding LOAEL were reported.
- As described in the TCEQ database, the lower NOAEL-LOAEL pair from Poon et al. (1998) was selected for the growth endpoint because it was based on a longer exposure duration and incorporated a larger range of doses compared to a Dieter (1992) study.
- Due to the arid habitat conditions it is unlikely that surface water represents an important exposure medium at the site. The dosing regime in the Poon et al. (1998) study was *ad libitum* in diet which is more representative of the potential exposure at the site (i.e., via incidental ingestion of soil and uptake through the food chain), as opposed to dosing via drinking water in the Rossi et al., 1987 study.

Toxicity information is limited for reptiles or amphibians however, reptilian TRVs are available for lead in the TCEQ Ecological PCL Database (Table 5-1). Reptilian TRVs are not available for the other metal COCs and therefore those TRVs were estimated using avian TRVs multiplied by an uncertainty factor (UF) of 0.1. The uncertainty associated with using avian data in lieu of reptile data is discussed in Section 6.

4 EXPOSURE ASSESSMENT (SLERA ELEMENT 5)

Exposure was determined using reasonably conservative assumptions to minimize the potential for overlooking ecological risks. Applicable exposure variables (e.g., food ingestion rates and body weight) were determined using information from the TCEQ Ecological PCL Database (TCEQ 2017) and the Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas (TCEQ 2017).

4.1 Exposure Point Concentrations

DUs were evaluated individually using a single ISM sample result and therefore surface soil EPCs were not calculated for the majority of DUs. However, for three of the DUs that reported a benchmark exceedance of one or more COC, sampling was conducted in triplicate and therefore surface soil EPCs based on the 95 percent upper confidence limit (95% UCL) on the mean were calculated using the USEPA ProUCL software (version 5.1, USEPA 2015) and evaluated using Interstate Technology Regulatory Council (ITRC) Incremental Sampling Methodology guidance (ITRC 2012). Two UCL calculation methods were evaluated for use with the ISM sample: Student's-t UCL and Chebyshev UCL. For the remaining DUs, the reported concentration for each COC in each ISM sample was used as the EPC. EPCs for surface soil are presented in Table 4-1.

EPCs for COCs in arroyo reaches that exhibited a benchmark exceedance are based on the 95% UCL on the mean. Arroyo soil samples are discrete samples and the UCL concentrations were calculated using the USEPA ProUCL software (version 5.1, USEPA 2015). Tables 4-2 through 4-5 provides the statistical summaries for COCs in each arroyo reach. The statistical output from the ProUCL software is presented in Attachment 3.

4.2 COC Concentrations in Exposure Media

Complete exposure pathways for terrestrial ecological receptors to COCs at the Closed Castner Firing Range are through historically impacted surface soil and uptake into the food chain. EPCs are either based on the 95% UCL on the mean or maximum concentrations. Soil concentrations and bioaccumulation factors (BAFs) were used to estimate the concentrations of COCs in on-site plants, soil-dwelling invertebrates and small mammals to serve as the basis for COC intake for individual representative species. Table 4-6 summarizes the exposure parameters used in the food chain model. These parameters were obtained from the TCEQ Ecological PCL Database. The food chain models (Attachment 4) for each receptor provide the EPCs in surface soil, the plant, invertebrate, and/or mammal BAFs, and the concentrations of COCs estimated in plants, soil-dwelling invertebrates, and small mammals.

No attempt has been made in this SLERA to modify uptake of metals into plants or prey based on the characteristics of the soil or on the bioavailability of the metals following ingestion. This SLERA, therefore, represents a conservative approach to estimating potential dose to ecological receptors.

4.3 Oral Doses for Receptor Species

4.3.1 Calculation of Food Intake Rates by Receptor Species

Food intake rates and soil ingestion rates for terrestrial receptors were obtained directly from the TCEQ Ecological PCL Database. In addition, all body weights, ingestion rates, diet fractions and home ranges are from the TCEQ Ecological PCL Database (TCEQ 2017). Exceptions include the diet of the desert shrew and scaled quail which are assumed to be 100% arthropods in this SLERA. Parameters for the eastern cottontail are used as surrogates for the desert cottontail.

4.3.2 Dose Equations

To calculate the oral dose, the concentrations of COCs in each exposure medium (i.e., plants, invertebrates, small mammals, surface soil) were multiplied by the respective intake factors. The dose was calculated using the equation presented in Section 10.4 of the TCEQ ecological risk assessment guidance (TCEQ 2017). Body weight is accounted for in the ingestion rates (in units of Kg/Kg body weight-day).

Equation 1:

$$Dose = (IR_{Food} * F_{Invert} * C_{Invert}) + (IR_{Food} * F_{Plant} * C_{Plant}) + (IR_{Food} * F_{Mammal} * C_{Mammal}) + (IR_{Soil} * C_{Soil})$$

where:

IR_{Food} = Food ingestion rate for (Kg/Kg-day)

F_{Invert} = Fraction of diet composed of invertebrates

C_{Invert} = Concentration of COC in soil invertebrates (mg/Kg)

F_{Plant} = Fraction of diet composed of plant material

C_{Plant} = Concentration of COC in plants (mg/Kg)

F_{Mammal} = Fraction of diet composed of small mammals

C_{Mammal} = Concentration of COC in small mammals (mg/Kg)

IR_{Soil} = Incidental ingestion rate of soil (Kg/Kg-day)

C_{Soil} = Concentration of COC in soil (mg/Kg)

Attachment 4 presents the daily doses of each individual COC for each receptor.

5 RISK CHARACTERIZATION (SLERA ELEMENTS 6 AND 7)

5.1 Hazard Quotient Analysis for Terrestrial Receptors

The potential for ecological risk was quantified using the hazard quotient (HQ) method. The hazard quotient is the ratio of the predicted exposure to an acceptable exposure. When the HQ is such that the predicted exposure is greater than the acceptable exposure (i.e., HQ > 1), then the potential exists for the specific COC to cause adverse ecological effects.

5.1.1 Most Conservative Hazard Quotient Analysis

This section presents the Conservative risk estimates (HQs) for terrestrial ecological communities and wildlife receptors based on exposure to surface soil and arroyo soil. HQs are presented in Tables 2-1 through 2-11 (plants and soil-dwelling invertebrates) and in Attachment 4 (food chain).

HQs were calculated using site wide maximum detected concentrations across all DUs and across all arroyos as a worse-case scenario. This scenario uses conservative benchmarks or NOAEL-based TRVs to estimate risks.

5.1.1.1 Plants and Invertebrates

Soil benchmarks are available for all DU COCs with the exception of 3,5-dinitroaniline. For the explosive COCs that do have ecological screening benchmarks, HQs are less than 1. For inorganic COCs that have ecological screening benchmarks, antimony (HQ=10), barium (HQ=3), chromium (HQ=2), copper (HQ=4), lead (HQ=40), manganese (HQ=2), and zinc (HQ=3) HQs are greater than 1.

Soil benchmarks are available for all arroyo soil COCs. At the downgradient delineation areas, and at Reach 1, Reach 2, Reach 5, Reach 6 and Reach 8, HQs ae less than 1. At Reach 3, arsenic (HQ=3) and zinc (HQ=8) HQs are greater than 1. At Reach 4 and Reach 7, the zinc (HQ=3) HQs are greater than 1. At Reach 9, the lead (HQ=4) HQ is greater than 1.

5.1.1.2 Wildlife

The NOAEL represents a toxicity reference value TRV at which no potential toxic response is anticipated for an exposed population. NOAEL HQs of each COC for the seven receptor species are provided in Attachment 4. Hazard indices (HIs) have been calculated for metals separately based on combined exposure to multiple COCs. The initial HQ evaluation under the TCEQ guidelines is termed as the “conservative hazard quotient” and is one of the required elements in a SLERA under the TRRP.

The results of the conservative evaluation indicate that HQ values exceed 1 (unity) based on NOAEL endpoints. HQs exceed 1 in the scaled quail (copper, lead and zinc), mourning dove (barium, lead and zinc), red-tailed hawk (lead) and the threatened Texas horned lizard (lead and zinc). The lead HQs are the highest of all metals and range from 14 (red-tailed hawk) to 83 (mourning dove). HI values corresponded closely to the HQ values reported for all receptors ranging from 4 for the desert shrew to 88 for the mourning dove.

The arroyo soil maximum concentrations resulted in lower HQs compared to the ISM dataset. HQs for lead and zinc slightly exceed 1 in the scaled quail, mourning dove and threatened Texas horned lizard. HI values corresponded closely to the HQ values reported for all receptors ranging from 2 in the shrew and red-tailed hawk to 13 in the mourning dove.

5.1.2 Less Conservative Hazard Quotient Analysis

This section presents the Less Conservative risk estimates (HQs) for terrestrial ecological communities and wildlife receptors based on exposure to surface soil and arroyo soil. HQs are provided in Tables 4-1 through 4-5 (plants and soil-dwelling invertebrates) and Attachment 4 (food chain).

EPCs for this exposure scenario were based on EPCs that, when possible, are reflective of central tendency exposures (95% UCL). For COCs where 95% UCLs could not be calculated due to small sample size (i.e., sample collected by ISM), the EPC is equal to the reported concentration for each DU.

To estimate potential risk to larger ranging wildlife receptors through the food chain, a site wide ISM 95% UCL was used as the EPC. To estimate potential risk to wildlife receptors potentially exposed to soils within the arroyos, EPCs were conservatively based on the maximum concentration across all arroyos.

5.1.2.1 Plants and Invertebrates

Alternative benchmarks were not used in the SLERA nor were UCLs calculated for most DUs. Table 4-1 presents the HQs for all COCs at each DU with at least one or more benchmark exceedance.

The Less Conservative HQs for many of the COCs are only marginally above 1 (i.e., <10) and therefore may not represent a significant risk to the terrestrial plant or invertebrate community within the DUs.

Based on the HQ analysis, the following COCs may cause potential adverse effects to the terrestrial plant or invertebrate community within the DUs, if all exposure assumptions are met (e.g., chronic exposure to the EPC):

- Antimony at CN073 (HQ=13)
- Lead at BF052 (HQ=13), BW057 (HQ=22), DG070 (HQ=42), and CN073 (HQ=14)

The Less Conservative HQs (Tables 4-2 through 4-5) for all COCs at Arroyo Reaches 7 and 9 are less than 1 and therefore do not represent a significant risk to the terrestrial plant or invertebrate community. The Less Conservative HQs for arsenic and zinc at Reach 3 and 4 are only marginally above 1 (i.e., <4) and therefore likely do not represent a significant risk to the terrestrial plant or invertebrate community within the arroyos.

5.1.2.2 Wildlife

TRRP allows for calculation of Less Conservative HQs based on the application of area use factors (AUFs), exposure factors (EFs), and alternative TRVs such as LOAELs in addition to NOAELs (30 TAC 350.77(c)(7)). Less Conservative risk characterizations were performed for all COCs with NOAEL HQs greater than 1 (i.e., lead) using the NOAEL and the LOAEL endpoints based on TRVs presented in Table 5-1.

The Less Conservative evaluations using the NOAEL and the LOAEL based TRVs incorporate the AUFs, which equal the acreage of the MRS (approximately 7,000 acres)or arroyo segment acreage (1 acre) divided by the receptor home range (Table 4-6). Home ranges are from the TCEQ Ecological PCL Database (TCEQ 2017). EFs were conservatively assumed to equal 1 for all receptors except the Texas horned lizard. A EF of 0.58 (7 months /12 months = 0.58) was applied to the Texas horned lizard dose calculation to account for a 5-month period of inactivity (brumation).

The Less Conservative HQ analysis based on NOAEL and LOAEL TRVs for COCs carried into the less conservative analysis (i.e., barium, copper, lead and zinc) are provided in Attachment 4. The lead NOAEL HQ marginally exceeds 1 for avian receptors scaled quail (HQ=2) and mourning dove (HQ=2).. LOAEL HQs for the avian receptors are less than 1. Due to its federal status, the Texas horned lizard is evaluated only using the NOAEL TRV and those less conservative HQs are all less than 1.

The Less Conservative HQs for lead and zinc in the arroyos are also provided in Attachment 4 using NOAEL and LOAEL-based TRVs. Less Conservative, NOAEL-based HQs are less than 1 for the scaled quail and the mourning dove. The NOAEL-based HQs for the Texas horned lizard are 0.1 for lead and 0.3 for zinc.

6 UNCERTAINTY ANALYSIS (SLERA ELEMENT 8)

6.1.1 Hot Spot Analysis

As described in the TCEQ risk assessment guidance (TCEQ 2017), the purpose of a hot spot evaluation is to identify any risks to wildlife receptors that would not be identified and mitigated through the standard risk evaluation, which is based on averaging COC concentrations across larger areas. However, due to the nature of this SLERA as part of an RI, COC concentrations at each individual DU were compared to the Tier 2 PCLs and PCLE zones were identified. The calculated Tier 2 PCLs are protective and appropriate for the MRS, and it is unlikely a hot spot exists that was not identified during the evaluation.

6.1.2 Bioavailability

Metals in soil at the Closed Castner Firing Range are largely associated with historical munitions use. Although widely accepted that lead and arsenic have a relative bioavailability less than 100 percent, the food chain modelling presented in this SLERA treats all metals in soil as being 100 percent available for uptake by ecological receptors. This assumption is likely to result in an overestimation of potential exposure to metals in soil by ecological receptors. The overestimations of risk from lead may drive risk management decisions.

6.1.3 Risk from Exposure to Lead in Surface Soil

The site wide lead EPC (95% UCL) resulted in Less Conservative HQs greater than 1 for the scaled quail and mourning dove, indicating that avian insectivores and herbivores could be at potential risk from exposure to lead in surface soil at several DUs across the MRS. Based on the CSM, the principal exposure of these receptors to lead is through uptake in the food chain. Bioavailability is related to the solubility of metals in the digestive tract. The low pH conditions in the stomach liberate metals and make them more soluble for absorption in the small intestines. Reduced bioavailability in the acid conditions of the stomach is related to the highly insoluble form of the metal in the soil substrate. The uptake of metals from soil by plants is also related to the metal's solubility.

Studies conducted on firing range sites indicate that lead from ammunition may contribute to soil in any of three forms: metallic lead, Pb+2 (dissolved from the crust of the ammunition), and as a variety of oxidized compounds (largely hydroxycarbonates, carbonates, and sulfates). Lead accounts for more than 85% of the weight of a projectile and constitutes the greatest environmental concern. If the projectile fragments upon impact, it creates lead dust, which can be carried off site by either wind or water erosion. The heat of firing bullet projectiles can also atomize lead in a vapor, which can precipitate or condense on soil particles at the firing line. Wildlife may ingest fragments of lead ammunition, although metallic lead is largely insoluble (USEPA 2000b). Lead speciation within the soil matrix, soil type, mineralogy, and soil particle size have been shown to affect soil-lead bioavailability (USEPA 2000a). Therefore, lead bioavailability at firing range sites may differ depending on the interaction of the ammunition with chemical reactants in the soil (ITRC 2003).

Bannon et al., 2009 presented work that qualitatively and quantitatively examined metals in small arms ranges soils, followed by measurements of bioavailability using two established methods. The predominant metals in a study of eight small arms range soils from diverse regions of the U.S. were lead and copper with other metals at significantly lower concentrations. The relative bioavailability of lead at these ranges was 100 percent, whether measured by an in vivo or in vitro method. Bannon et al (2009) concluded that risk assessment and/or remediation of small arms ranges should therefore assume a high relative bioavailability of lead.

Considering the form of lead at the Closed Castner Firing Range is unknown, there is uncertainty related with the potential uptake of lead into the food chain and the resulting risk.

6.1.4 Exposure Assessment Uncertainty

Uncertainties associated with the exposure assessment include the use of the 95% UCL or maximum concentrations as the source concentration terms, the extent of affected site soil impacted by COCs, and routes of exposure. The 95% UCL is calculated statistically from the analytical data and is typically higher than the average concentration due to the statistical distribution of the data sets. The use of the 95% UCL likely leads to an overestimation of potential risk by raising the average concentration to a level where there is only a 5 percent chance of underestimating the average concentration of a COC.

As described in Sections 1.4 and 2.1.1, samples were collected by ISM from each DU at the Closed Castner Firing Range to characterize the presence and nature of COCs in surface soil over the MRS. The analytical results for IS samples are presented in Attachment 1. Ten percent of the IS results were sampled in triplicate to provide validation of the results. These concentrations, therefore, can be compared directly to risk-based criteria without statistical analysis. However, as with any estimate derived from sampling, IS results are subject to error, and understanding this error is accomplished with statistical analysis.

Two candidate UCL equations that accommodate IS data sets and which are expected to "bracket" the range of UCLs that may be calculated from a data set are the Student's-t (representing the low end of the range) and Chebyshev (representing the high end of the range) UCLs (ITRC 2012). For this SLERA, the most appropriate UCL based on the estimated distribution was used as the EPC. Since both UCLs are higher than the maximum detected concentrations for each DU, the EPCs used in the SLERA for those DUs are conservative and likely overestimate the risk.

Uncertainties in exposure pathways are also inherent in the SLERA process. Exposure of receptor species to COCs in soil is limited to the ingestion route of exposure through ingestion of food web vectors and incidental ingestion of soil. Ingestion of water, inhalation and dermal exposure to COCs in soil are not accounted for in the SLERA exposure model. The limited exposure routes for COCs in soil could result in an underestimation of potential risk.

6.1.5 Extent of Affected Area

The Closed Castner Firing Range does not offer desirable habitat that would attract receptors such as open water bodies. By assuming receptors are onsite 100 percent of the time, potential exposure and resulting risk are likely to be overestimated. No EF was applied to adjust COC intake for avian and mammalian receptors.

6.1.6 COC Concentrations in Biota

Concentrations of COCs in biota are estimated based on published life history and exposure factors rather than directly measured data. Bioaccumulation factors for soil to plant, soil to arthropod, and soil to mammal were obtained from the TCEQ Ecological PCL Database (TCEQ 2017). The COC concentrations in site flora, fauna, and invertebrates, therefore, are likely to be overestimated.

6.1.7 Reptile Receptors

Receptor species selected for quantitative analysis were limited to mammalian species, avian species and an invertivorous reptile. Amphibian species were not evaluated at the MRS due to the lack of open water bodies. Toxicity information for reptiles in the TCEQ database is only available for lead. Therefore, TRVs for the remaining metal COCs were estimated using avian TRVs multiplied by an UF of 0.1 which ultimately leads to uncertainty in the risk estimate.

In general, quantitative evaluations of risk to reptile receptors have a much higher degree of uncertainty compared to the evaluation of mammalian and avian species. The high degree of uncertainty is related to the relatively small toxicity database for reptile species compared to the data available for mammals and birds. Few literature reviews have been conducted that evaluate whether toxicity data from birds could be extrapolated to protect reptiles. Differences in physiology and cellular processes suggest relationships are extraneous at best. In general, reptile receptors have metabolic rates that are below those of the avian receptor species evaluated in this SLERA. The lower metabolic rates associated with reptiles typically result in lower food ingestion rates for these animals; therefore, lower doses of COCs can be anticipated. As a result, applying a UF to avian TRVs to evaluate toxicity in reptiles likely results in an overestimation of potential risk.

7 PCL DEVELOPMENT (SLERA ELEMENT 9)

PCL development is required element 9 of the SLERA based on TCEQ guidance. The results of this SLERA indicate that residual concentrations of lead in surface soil at DUs DG070, BW057, BF052, CL071, CM068, CZ071, DG050, DK074, CN073, and BK043 (Figure 9-1) which reported the highest concentrations at the MRS, may pose an unacceptable risk to ecological receptors.

The PCL calculation is performed based on the average of the NOAEL and the LOAEL-based PCLs for each COC.

NOAEL-based PCL = EPC / NOAEL HQ

LOAEL-based PCL = EPC / LOAEL HQ

Tier 2 PCL = (NOAEL-based PCL + LOAEL-based PCL) / 2

Lead is the only COC that requires calculation of a Tier 2 PCL based on the results of the SLERA, and therefore it is the only COC where ecological PCLE zones were developed. Based on results of the SLERA, the other COCs (antimony, barium, chromium, copper, manganese, mercury, nickel, selenium and zinc) do not pose an unacceptable ecological risk. However, Tier 2 PCLs for these COCs were also calculated for use in the RI. A summary of the numeric inputs and calculated Tier 2 ecological PCLs are presented in Table 7-1.

The recommended Tier 2 ecological PCLs for surface soil at the Closed Castner Firing Range are the lowest of the PCLs calculated for each COC and are as follows:

COC	Receptor	Tier 2 PCL (mg/kg)
Antimony	Desert Shrew	1,746
Barium	Mourning Dove	889
Chromium	Texas Horned Lizard	63
Copper	Scaled Quail	263
Lead	Mourning Dove	334
Manganese	Desert Shrew	2,006
Mercury	Mourning Dove	6
Nickel	Scaled Quail	795
Selenium	Desert Shrew	2
Zinc	Texas Horned Lizard	381

8 ECOLOGICAL RISK MANAGEMENT RECOMMENDATIONS (SLERA ELEMENT 10)

Based on the results of the SLERA for the MRS, the calculated HQs from potential exposure to COCs for the following receptors are greater than 1:

- Terrestrial plants or invertebrates (based on direct contact HQs) – antimony, barium, chromium, copper, lead, manganese and zinc in DU soil.
- Terrestrial plants or invertebrates (based on direct contact HQs) – arsenic and zinc in Arroyo Reach 3 and zinc in Arroyo Reach 4.
- Invertivorous bird populations (based on food chain HQs) – lead in DU soil
- Herbivorous bird populations (based on food chain HQs) – lead in DU soil

This SLERA evaluates the COC concentrations at the MRS to determine potential risk assuming equal distribution of wildlife exposure to COCs across the DUs and within each arroyo. However, to address the potential existence of hot spots, particularly in regard to small-ranging wildlife receptors (i.e., animals with home ranges less than or equal to 2.5 acres [TCEQ 2017]), the data were evaluated in accordance with TRRP-15eco guidance (TCEQ 2013). The only receptor evaluated in this SLERA that is considered a small-ranging receptor is the desert shrew, which has a home range of 0.73 acre. Therefore, wildlife exposure to soil was evaluated consistent with the approach recommended in the TRRP-15eco guidance for hot spot analysis (TCEQ 2013), as discussed below:

- Are any LOAEL-based HQs > 1?
  - No, all NOAEL HQs for the desert shrew based on site wide maximum detected concentrations (for the DUs and the arroyos) are less than 1, and therefore all LOAEL-based HQs, which are less conservative than the NOAEL-based HQs, are less than 1.
- Is any 95% UCL > PCL for the desert shrew?
  - No, the site wide 95% UCLs for all COCs are below the PCLs developed for the desert shrew.
- Are any single point LOAEL HQs > 10?
  - No, all single point HQs based on the LOAEL PCLs developed for the desert shrew are less than 1.

Based on this evaluation the potential for a hot spot to exist at the MRS is negligible.

ISM provides an increased sensitivity for the identification of hot spots due to the high number of increment collection locations within each DU. However, in the unlikely event a limited area with significantly elevated concentrations is present within a DU, it is anticipated that the hot spot area would be located within an existing PCLE zone that was identified by comparing the lead concentrations at each individual DU to the Tier 2 PCL protective of the desert shrew (and other small-ranging mammals). Based on these considerations, a risk management recommendation for hot spots is not warranted for the MRS.

A final ecological PCL was developed for lead and PCLE zones were delineated (Figure 9-1). As discussed previously, ecological PCLs are considered, along with the human health PCLs, in selecting critical PCLs for the RI. Based on the results of the RI, if a critical PCL is determined to be an ecological PCL, USACE will consider the following courses of action:

- perform remedial action to prevent or eliminate applicable ecological exposure pathways
- conduct a Tier 3 site-specific ecological risk assessment (SSERA).

The risk management of all PCLE zones will be addressed in the Feasibility Study.

9 SUMMARY AND CONCLUSIONS

Based on the HQ analyses and uncertainty analysis for terrestrial vegetation, soil-dwelling invertebrates, and for herbivorous, invertivorous, piscivorous and carnivorous wildlife receptors, the Tier 2 SLERA for the Closed Castner Firing Range resulted in the following conclusions:

- No significant risks were identified for upper trophic level receptors that may be exposed to pooled seep water.
- No significant risks were identified for upper trophic level receptors that may be exposed to arroyo soil.
- No significant risks were identified for terrestrial carnivorous bird populations, for terrestrial herbivorous, invertivorous and carnivorous mammal populations, and for the sensitive Texas horned lizard and other reptiles from any of the COCs in DU soil.
- COCs in surface soil that may cause potential adverse effects to ecological receptor populations include:
  - terrestrial plants/terrestrial invertebrates – antimony, barium, chromium, copper, lead, manganese and zinc in DU soil
  - terrestrial plants/terrestrial invertebrates – arsenic and zinc in Arroyo Reach 3 and zinc in Arroyo Reach 4
  - wildlife receptors scaled quail (and other invertivorous birds) and the mourning dove (and other herbivorous birds) – lead in DU soil
- Comparative PCLs protective of herbivorous, invertivorous and carnivorous bird and mammal populations, and invertivorous and carnivorous reptiles were developed for lead that resulted in HQs greater than 1 in the Less Conservative analysis.
- An evaluation of the data and HQs for the desert shrew, a small-ranging wildlife receptor, indicates that the potential for hot spots to exist at the MRS is negligible, and therefore a risk management recommendation relative to hot spots is not warranted for the MRS.
- Final ecological PCLs based on the lowest comparative PCL calculated for each COC were developed for use in the RI. The final ecological PCLs are summarized below and in Table 7-1.

COC	Receptor	Tier 2 PCL (mg/kg)
Antimony	Desert Shrew	1,746
Barium	Mourning Dove	889
Chromium	Texas Horned Lizard	63
Copper	Scaled Quail	263
Lead	Mourning Dove	334

Manganese	Desert Shrew	2,006
Mercury	Mourning Dove	6
Nickel	Scaled Quail	795
Selenium	Desert Shrew	2
Zinc	Texas Horned Lizard	381

A PCLE zone was identified for lead and is presented on Figure 9-1.

This SLERA is presented as part of the RI and the ecological PCLs will be considered, along with the human health PCLs, in selecting critical PCLs for the RI. Based on the results of the RI, if a critical PCL is determined to be an ecological PCL, USACE will consider the following courses of action:

- perform remedial action to prevent or eliminate applicable ecological exposure pathways
- conduct a Tier 3 SSERA.

The risk management of all PCLE zones will be addressed in the Feasibility Study.

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TABLES

Table 2-1
Screening Level - Chemicals of Concern in Surface Soil
Site Wide
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection		Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)	Benchmark Source [a]	Background UPL [b] (mg/kg)	Conservative HQ [c] (unitless)	Screening Level Chemical of Concern? [d]		Bioaccumulative in Soil [f] (YES/no)
								(YES/no)	Rationale	
Explosives										
1,3,5-Trinitrobenzene	2 - 377	1%	0.05	9	TCEQ, plants	--	0.006	no	HQ < 1	no
1,3-Dinitrobenzene	0 - 391	0%	ND	0.073	LANL	--	NA	NA	HQ < 1	no
2,4,6-Trinitrotoluene	1 - 391	0%	0.088	8	TCEQ, plants	--	0.01	no	ND	no
2,4-Dinitrotoluene	5 - 391	1%	4.7	6	TCEQ, plants	--	0.8	no	HQ < 1	no
2,6-Dinitrotoluene	8 - 391	2%	0.3	5	TCEQ, plants	--	0.06	no	HQ < 1	no
2-Amino-4,6-dinitrotoluene	2 - 391	1%	0.013	14	TCEQ, plants	--	0.0009	no	HQ < 1	no
2-Nitrotoluene	3 - 391	1%	0.015	9.9	LANL	--	0.002	no	HQ < 1	no
3,5-Dinitroaniline	0 - 270	0%	ND	--	--	--	NA	no	ND	no
3-Nitrotoluene	10 - 391	3%	0.032	12	LANL	--	0.003	no	HQ < 1	no
4-Amino-2,6-dinitrotoluene	3 - 391	1%	0.017	18	TCEQ, invertebrates	--	0.0009	no	HQ < 1	no
4-Nitrotoluene	0 - 391	0%	ND	22	LANL	--	NA	no	ND	no
Hexahydro-1,3,5-trinitro-1,3,5-triazine	3 - 391	1%	1.3	71	TCEQ, plants	--	0.02	no	HQ < 1	no
Nitrobenzene	21 - 391	5%	0.017	40	TCEQ, invertebrates	--	0.0004	no	HQ < 1	no
Nitroglycerin	22 - 387	6%	1	13	TCEQ, invertebrates	--	0.08	no	HQ < 1	no
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	4 - 391	1%	0.13	16	TCEQ, invertebrates	--	0.008	no	HQ < 1	no
Pentaerythritol Tetranitrate	2 - 391	1%	0.6	100	LANL	--	0.006	no	HQ < 1	no
Tetryl	0 - 357	0%	ND	11.8	LANL	--	NA	no	ND	no
Metals										
Aluminum	162 - 162	100%	8,750	8,630	Background UPL	8630	1	no	[e]	no
Antimony	271 - 390	69%	50.4	5	TCEQ, plants	0.354	10	**YES**	**HQ > 1**	no
Arsenic	369 - 388	95%	19.6	18	TCEQ, plants	5.68	1	no	HQ < 1	no
Barium	162 - 162	100%	850	330	TCEQ, invertebrates	74.3	3	**YES**	**HQ > 1**	no
Beryllium	386 - 386	100%	8.36	10	TCEQ, plants	0.619	0.8	no	HQ < 1	no
Cadmium	162 - 162	100%	1.4	32	TCEQ, plants	0.401	0.04	no	HQ < 1	**YES**
Calcium	162 - 162	100%	52,700	--	--	--	--	no	ESN	no
Chromium	162 - 162	100%	22	11.9	Background UPL	11.9	2	**YES**	**HQ > 1**	**YES**
Cobalt	162 - 162	100%	5.8	13	TCEQ, plants	4.9	0.4	no	HQ < 1	no
Copper	389 - 389	100%	296	70	TCEQ, plants	19.9	4	**YES**	**HQ > 1**	**YES**
Iron	161 - 162	99%	20,900	--	--	--	--	no	ESN	no
Lead	401 - 401	100%	5,030	120	TCEQ, plants	20.83	40	**YES**	**HQ > 1**	**YES**
Magnesium	162 - 162	100%	18,900	--	--	--	--	no	ESN	no
Manganese	162 - 162	100%	433	231	Background UPL	231	2	**YES**	**HQ > 1**	no
Mercury	160 - 162	99%	0.13	0.1	TCEQ, invertebrates	0.0235	1	no	HQ < 1	**YES**
Molybdenum	159 - 162	98%	2.9	2	TCEQ, plants	0.41	1	no	HQ < 1	no
Nickel	386 - 386	100%	24.7	38	TCEQ, plants	8.1	0.7	no	HQ < 1	**YES**
Potassium	162 - 162	100%	3,320	--	--	--	--	no	ESN	no
Selenium	50 - 162	31%	0.66	0.52	TCEQ, plants	0.393	1	no	HQ < 1	**YES**
Silver	3 - 162	2%	6.8	560	TCEQ, plants	--	0.01	no	HQ < 1	no [g]
Sodium	162 - 162	100%	264	--	--	--	--	no	ESN	no
Thallium	50 - 162	31%	0.96	1	TCEQ, plants	--	1	no	HQ < 1	no
Vanadium	162 - 162	100%	31	26.7	Background UPL	26.7	1	no	HQ < 1	no
Zinc	390 - 390	100%	353	120	TCEQ, invertebrates	40.4	3	**YES**	**HQ > 1**	**YES**

Notes:

–	Not available.
mg/kg	Milligrams per kilogram.
NA	Not applicable.
[a]	Ecological soil screening levels were from: TCEQ Ecological Soil Benchmarks. If a benchmark was not available, Los Alamos National Laboratory (LANL) minimum soil screening levels were used.
[b]	Site-specific background Upper Prediction Limit (UPL).
[c]	The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the screening level. HQs are rounded to one significant figure.
[d]	Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemical of concern (COCs) for screening level assessment.
[e]	Aluminum was not retained because site soils have a pH greater than 5.5. Soils in El Paso County are generally around a soil pH of 8 (TAMU 2000).
[f]	Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).
[g]	Silver is not bioaccumulative in soil but is listed in Table 5.1 of TCEQ 2017 to address sensitivity in birds and mammals not captured in the soil benchmark. Due to its low detection frequency (2%), retainment is unwarrante

Table 2-2
Screening Level - Chemicals of Concern in Arroyo Soil
Downgradient Delineation
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	5	-	6	83%	0.394	78	5	0.354	0.08	no	HQ < 1	no
Arsenic	6	-	6	100%	5.26	60	18	5.68	0.3	no	HQ < 1	no
Beryllium	6	-	6	100%	1.84	40	10	0.619	0.2	no	HQ < 1	no
Copper	6	-	6	100%	24.4	80	70	19.9	0.3	no	HQ < 1	**YES**
Lead	6	-	6	100%	62.2	1,700	120	20.83	0.5	no	HQ < 1	**YES**
Nickel	6	-	6	100%	10.2	280	38	8.1	0.3	no	HQ < 1	**YES**
Zinc	6	-	6	100%	64.7	120	160	40.4	0.5	no	HQ < 1	**YES**

Notes:

– Not available.
mg/kg Milligrams per kilogram.
NA Not applicable.
UPL Upper Prediction Limit.
[a] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[b] The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c] Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e] Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-3
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 1
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	5	-	5	100%	0.228	78	5	0.354	0.05	no	HQ < 1	no
Arsenic	5	-	5	100%	6.56	60	18	5.68	0.4	no	HQ < 1	no
Beryllium	5	-	5	100%	7.21	40	10	0.619	0.7	no	HQ < 1	no
Copper	5	-	5	100%	60.6	80	70	19.9	0.9	no	HQ < 1	**YES**
Lead	5	-	5	100%	25.4	1,700	120	20.83	0.2	no	HQ < 1	**YES**
Nickel	5	-	5	100%	36.2	280	38	8.1	1	no	HQ < 1	**YES**
Zinc	5	-	5	100%	119	120	160	40.4	1	no	HQ < 1	**YES**

Notes:
– Not available.
mg/kg Milligrams per kilogram.
NA Not applicable.
UPL Upper Prediction Limit.
[a] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[b] The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c] Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.

[e] Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-4
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 2
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e]
						Soil Invertebrates	Plants			(YES/no)	Rationale	(YES/no)
Metals												
Antimony	8	-	8	100%	0.228	78	5	0.354	0.05	no	HQ < 1	no
Arsenic	8	-	8	100%	5.98	60	18	5.68	0.3	no	HQ < 1	no
Beryllium	8	-	8	100%	5.7	40	10	0.619	0.6	no	HQ < 1	no
Copper	8	-	8	100%	20.4	80	70	19.9	0.3	no	HQ < 1	**YES**
Lead	8	-	8	100%	29.4	1,700	120	20.83	0.2	no	HQ < 1	**YES**
Nickel	8	-	8	100%	10.5	280	38	8.1	0.3	no	HQ < 1	**YES**
Zinc	8	-	8	100%	80.6	120	160	40.4	0.7	no	HQ < 1	**YES**

Notes:

–	Not available.
mg/kg	Milligrams per kilogram.
NA	Not applicable.
UPL	Upper Prediction Limit.
[a]	Ecological screening benchmarks are from: TCEQ Ecological Soil Benchmarks.
[b]	The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c]	Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e]	Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-5
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 3
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	7	-	7	100%	0.4	78	5	0.354	0.08	no	HQ < 1	no
Arsenic	12	-	12	100%	60.1	60	18	5.68	3	**YES**	**HQ > 1**	no
Beryllium	7	-	7	100%	4.47	40	10	0.619	0.4	no	HQ < 1	no
Copper	7	-	7	100%	27.2	80	70	19.9	0.4	no	HQ < 1	**YES**
Lead	7	-	7	100%	76.3	1,700	120	20.83	0.6	no	HQ < 1	**YES**
Nickel	7	-	7	100%	17.6	280	38	8.1	0.5	no	HQ < 1	**YES**
Zinc	12	-	12	100%	924	120	160	40.4	8	**YES**	**HQ > 1**	**YES**

Notes:

–	Not available.
mg/kg	Milligrams per kilogram.
NA	Not applicable.
UPL	Upper Prediction Limit.
[a]	Ecological screening benchmarks are from: TCEQ Ecological Soil Benchmarks.
[b]	The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c]	Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e]	Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-6
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 4
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	5	-	5	100%	0.263	78	5	0.354	0.05	no	HQ < 1	no
Arsenic	5	-	5	100%	9.13	60	18	5.68	0.5	no	HQ < 1	no
Beryllium	5	-	5	100%	2.08	40	10	0.619	0.2	no	HQ < 1	no
Copper	5	-	5	100%	32.2	80	70	19.9	0.5	no	HQ < 1	**YES**
Lead	5	-	5	100%	36	1,700	120	20.83	0.3	no	HQ < 1	**YES**
Nickel	5	-	5	100%	15.3	280	38	8.1	0.4	no	HQ < 1	**YES**
Zinc	12	-	12	100%	318	120	160	40.4	3	**YES**	**HQ > 1**	**YES**

Notes:
– Not available.
mg/kg Milligrams per kilogram.
NA Not applicable.
UPL Upper Prediction Limit.
[a] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[b] The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c] Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e] Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-7
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 5
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e]
						Soil Invertebrates	Plants			(YES/no)	Rationale	(YES/no)
Metals												
Antimony	5	-	5	100%	0.127	78	5	0.354	0.03	no	HQ < 1	no
Arsenic	5	-	5	100%	10.7	60	18	5.68	0.6	no	HQ < 1	no
Beryllium	5	-	5	100%	1.57	40	10	0.619	0.2	no	HQ < 1	no
Copper	5	-	5	100%	27.5	80	70	19.9	0.4	no	HQ < 1	**YES**
Lead	5	-	5	100%	15.1	1,700	120	20.83	0.1	no	HQ < 1	**YES**
Nickel	5	-	5	100%	43.3	280	38	8.1	1	no	HQ < 1	**YES**
Zinc	7	-	7	100%	118	120	160	40.4	1	no	HQ < 1	**YES**

Notes:

–	Not available.
mg/kg	Milligrams per kilogram.
NA	Not applicable.
UPL	Upper Prediction Limit.
[a]	Ecological screening benchmarks are from: TCEQ Ecological Soil Benchmarks.
[b]	The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c]	Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e]	Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-8
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 6
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	5	-	5	100%	0.368	78	5	0.354	0.07	no	HQ < 1	no
Arsenic	5	-	5	100%	10.4	60	18	5.68	0.6	no	HQ < 1	no
Beryllium	5	-	5	100%	2.12	40	10	0.619	0.2	no	HQ < 1	no
Copper	5	-	5	100%	22	80	70	19.9	0.3	no	HQ < 1	**YES**
Lead	5	-	5	100%	30.9	1,700	120	20.83	0.3	no	HQ < 1	**YES**
Nickel	5	-	5	100%	15.5	280	38	8.1	0.4	no	HQ < 1	**YES**
Zinc	5	-	5	100%	85	120	160	40.4	0.7	no	HQ < 1	**YES**

Notes:

–	Not available.
mg/kg	Milligrams per kilogram.
NA	Not applicable.
UPL	Upper Prediction Limit.
[a]	Ecological screening benchmarks are from: TCEQ Ecological Soil Benchmarks.
[b]	The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c]	Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e]	Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-9
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 7
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	5	-	5	100%	0.445	78	5	0.354	0.09	no	HQ < 1	no
Arsenic	5	-	5	100%	15.6	60	18	5.68	0.9	no	HQ < 1	no
Beryllium	5	-	5	100%	2.81	40	10	0.619	0.3	no	HQ < 1	no
Copper	5	-	5	100%	44.1	80	70	19.9	0.6	no	HQ < 1	**YES**
Lead	5	-	5	100%	57.6	1,700	120	20.83	0.5	no	HQ < 1	**YES**
Nickel	5	-	5	100%	24.8	280	38	8.1	0.7	no	HQ < 1	**YES**
Zinc	7	-	7	100%	190	120	160	40.4	2	**YES**	**HQ > 1**	**YES**

Notes:

– Not available.
mg/kg Milligrams per kilogram.
NA Not applicable.
UPL Upper Prediction Limit.
[a] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[b] The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c] Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e] Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-10
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 8
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	7	-	7	100%	0.36	78	5	0.354	0.07	no	HQ < 1	no
Arsenic	7	-	7	100%	8.89	60	18	5.68	0.5	no	HQ < 1	no
Beryllium	7	-	7	100%	1.63	40	10	0.619	0.2	no	HQ < 1	no
Copper	7	-	7	100%	33.2	80	70	19.9	0.5	no	HQ < 1	**YES**
Lead	9	-	9	100%	86.4	1,700	120	20.83	0.7	no	HQ < 1	**YES**
Nickel	7	-	7	100%	26.5	280	38	8.1	0.7	no	HQ < 1	**YES**
Zinc	9	-	9	100%	129	120	160	40.4	1	no	HQ < 1	**YES**

Notes:
– Not available.
mg/kg Milligrams per kilogram.
NA Not applicable.
UPL Upper Prediction Limit.
[a] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[b] The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c] Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e] Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-11
Screening Level - Chemicals of Concern in Arroyo Soil
Reach 9
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Ecological Screening Benchmark [a] (mg/kg)		Background UPL (mg/kg)	Conservative HQ [b] (unitless)	Screening Level Chemical of Concern? [c]		Bioaccumulative in Soil [e] (YES/no)
						Soil Invertebrates	Plants			(YES/no)	Rationale	
Metals												
Antimony	10	-	10	100%	1.5	78	5	0.354	0.3	no	HQ < 1	no
Arsenic	10	-	10	100%	13.5	60	18	5.68	0.8	no	HQ < 1	no
Beryllium	10	-	10	100%	1.48	40	10	0.619	0.1	no	HQ < 1	no
Copper	10	-	10	100%	30.1	80	70	19.9	0.4	no	HQ < 1	**YES**
Lead	13	-	13	100%	483	1,700	120	20.83	4	**YES**	**HQ > 1**	**YES**
Nickel	10	-	10	100%	32.7	280	38	8.1	0.9	no	HQ < 1	**YES**
Zinc	13	-	13	100%	129	120	160	40.4	1	no	HQ < 1	**YES**

Notes:

–	Not available.
mg/kg	Milligrams per kilogram.
NA	Not applicable.
UPL	Upper Prediction Limit.
[a]	Ecological screening benchmarks are from: TCEQ Ecological Soil Benchmarks.
[b]	The conservative hazard quotient (HQ) is the ratio of the maximum constituent concentration to the lowest screening benchmark. HQs are rounded to one significant figure.
[c]	Constituents with a hazard quotient (HQ) greater than 1 (HQ > 1) or without a screening level (NSL) were considered chemicals of concern (COCs) for screening level assessment.
[e]	Bioaccumulative COCs in soil (Table 5.1 of TCEQ 2017).

Table 2-12
Screening Level - Chemicals of Concern in Seep Surface Water
Site Wide
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/L)	Drinking Water Benchmarks [a] (mg/L)			NOAEL HQ [b] (unitless)	LOAEL HQ [b] (unitless)	Screening Level Chemical of Concern? [c]	
						NOAEL	LOAEL	*Endpoint Species*			(YES/no)	Rationale
Total Metals												
Antimony	6	-	6	100%	1.05	0.29	2.90	White-tailed deer	4	0.4	no	HQ < 1
Arsenic	6	-	6	100%	2.5	0.29	2.92	White-tailed deer	9	0.9	no	HQ < 1
Beryllium	6	-	6	100%	3.03	2.8	NA	White-tailed deer	1	NA	no	HQ < 1
Copper	6	-	6	100%	4.82	65.2	85.8	White-tailed deer	0.07	0.1	no	HQ < 1
Lead	6	-	6	100%	6.8	4.9	48.6	Rough-winged swallow	1	0.1	no	HQ < 1
Nickel	6	-	6	100%	1.78	171.4	342.7	White-tailed deer	0.01	0.01	no	HQ < 1
Zinc	3	-	3	100%	23	62.3	562.9	Rough-winged swallow	0.4	0.04	no	HQ < 1

Notes:
– Not available.
LOAEL Lowest observed adverse effect level.
mg/L Milligrams per liter.
NA Not available.
NOAEL No observed adverse effect level.

[a] Lowest of the NOAEL and LOAEL -based benchmarks for drinking water reported in Sample et al 1996.
[b] The maximum hazard quotient (HQ) is the ratio of the maximum constituent concentration to the benchmark. HQs are rounded to one significant figure.
[c] Constituents with a LOAEL hazard quotient (HQ) greater than 1 (HQ > 1) were considered constituents of chemicals of concern (COCs) for screening level assessment.

Table 4-1.
Refined HQ Analysis in ISM Surface Soil
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Decision Unit [a]	ISM Sample ID [a]	Sample Date	Antimony mg/kg	Antimony HQ	Barium mg/kg	Barium HQ	Chromium mg/kg	Chromium HQ	Copper mg/kg	Copper HQ	Lead mg/kg	Lead HQ	Manganese mg/kg	Manganese HQ	Zinc mg/kg	Zinc HQ
	ISM Soil COC / Ecological Benchmark		5		330		11.9		70		120		231		120	
AA035	CR-MIS-AA035-01_02072011	2/7/2011	< 0.095	ND	67.0	0.2	7.6	0.6	296	4	40.1	0.3	155.0	0.7	80.3	0.7
AH003	CR-MIS-AH003-01_02072011	2/7/2011	0.1	0.03	71.2	0.2	8.7	0.7	14.0	0.2	20.0	0.2	287	1	63.7	0.5
AQ038	CR-IS-AQ038-01_09122012	9/12/2012	1.0	0.2	43.2	0.1	3.0	0.3	185	3	133	1	139.0	0.6	39.6	0.3
AR008	CR-MIS-AR008-01_02072011	2/7/2011	0.4	0.1	61.7	0.2	16.5	1	15.7	0.2	22.2	0.2	228.0	1	51.8	0.4
AU005	CR-IS-AU005-01_09112012	9/11/2012	0.1	0.02	61.2	0.2	4.0	0.3	9.3	0.1	11.0	0.1	321	1	32.3	0.3
BA048	CR-MIS-BA048-01_02072011	2/7/2011	0.3	0.1	60.6	0.2	17.1	1	13.7	0.2	20.1	0.2	212.0	0.9	49.8	0.4
BF052	CR-MIS-BF052-01_02032011	2/3/2011	2.1	0.4	51.7	0.2	8.1	0.7	11.9	0.2	1580	13	151.0	0.7	42.4	0.4
BK036	FTBL-IS-118-063016	6/30/2016	0.2	0.05	---	---	---	---	21.2	0.3	48.4	0.4	---	---	226	2
BQ072	CR-MIS-BQ072-01_02152011	2/15/2011	< 0.095	ND	63.2	0.2	4.8	0.4	10.0	0.1	17.8	0.1	253	1	50.1	0.4
BR060	CR-MIS-BR060-01_02042011	2/4/2011	< 0.095	ND	850	3	5.3	0.4	9.1	0.1	19.0	0.2	155.0	0.7	48.0	0.4
BW057	FTBL-IS-176-012517	1/25/2017	---	---	---	---	---	---	---	---	2650	22	---	---	---	---
BY057	CR-MIS-BY057-01_02082011	2/8/2011	0.1	0.03	74.2	0.2	7.4	0.6	17.0	0.2	129	1	242	1	68.7	0.6
BY064	FTBL-IS-152-071416	7/14/2016	0.2	0.03	---	---	---	---	20.3	0.3	32.9	0.3	---	---	122	1
CA057	FTBL-IS-110-061316	6/13/2016	0.3	0.1	---	---	---	---	22.9	0.3	143	1	---	---	115.0	1
CA070	CR-IS-CA070-01_09142012	9/14/2012	0.3	0.1	59.2	0.2	5.8	0.5	8.6	0.1	23.6	0.2	260	1	59.0	0.5
CB046	FTBL-IS-179-012617	1/26/2017	---	---	---	---	---	---	---	---	---	---	---	---	317	3
CC046	FTBL-IS-109-071216	7/12/2016	0.3	0.1	---	---	---	---	24.8	0.4	58.4	0.5	---	---	353	3
CD047	FTBL-IS-180-012617	1/26/2017	0.3	0.1	---	---	---	---	26.7	0.4	48.4	0.4	---	---	291	2
CD068	CR-MIS-CD068-01_02072011	2/7/2011	1.4	0.3	71.0	0.2	8.3	0.7	18.7	0.3	66.2	0.6	318	1	110	0.9
CE047	CR-MIS-CE047-01_02092011	2/9/2011	< 0.095	ND	94.0	0.3	7.4	0.6	17.5	0.3	17.3	0.1	433	2	49.9	0.4
CE056	CR-IS-CE056-01_09132012	9/13/2012	0.2	0.03	54.6	0.2	4.0	0.3	10.1	0.1	13.3	0.1	264	1	54.0	0.5
CE059	FTBL-IS-104-062316	6/23/2016	0.1	0.03	---	---	---	---	17.5	0.3	28.4	0.2	---	---	128	1
CE065	CR-MIS-CE065-01_02072011	2/7/2011	0.3	0.1	68.2	0.2	9.0	0.8	17.9	0.3	27.2	0.2	261	1	74.3	0.6
CF048	CR-MIS-CF048-01_02092011	2/9/2011	< 0.095	ND	64.8	0.2	6.0	0.5	14.7	0.2	15.2	0.1	255	1	34.0	0.3
CF053	FTBL-IS-099-062216	6/22/2016	0.1	0.03	---	---	---	---	17.1	0.2	28.7	0.2	---	---	154	1
CG046	FTBL-IS-095-071216	7/12/2016	0.2	0.04	---	---	---	---	33.3	0.5	22.2	0.2	---	---	153	1
CG047	CR-MIS-CG047-01_02092011	2/9/2011	< 0.095	ND	91.0	0.3	8.3	0.7	20.6	0.3	21.4	0.2	402	2	65.0	0.5
CG052	FTBL-IS-098-062216	6/22/2016	0.2	0.04	---	---	---	---	20.5	0.3	37.6	0.3	---	---	139	1
CG058	CR-MIS-CG058-01_02092011	2/9/2011	< 0.095	ND	63.8	0.2	9.1	0.8	17.2	0.2	23.1	0.2	233	1	54.6	0.5
CG063	CR-MIS-CG063-01_02092011	2/9/2011	< 0.095	ND	66.2	0.2	11.3	0.9	18.2	0.3	26.7	0.2	256	1	64.1	0.5
CG069	CR-MIS-CG069-01_02082011	2/8/2011	3.0	0.6	67.4	0.2	8.9	0.7	19.9	0.3	113.0	0.9	243	1	57.2	0.5
CH054	CR-IS-CH054-01_09132012	9/13/2012	0.5	0.1	61.8	0.2	9.4	0.8	23.6	0.3	31.8	0.3	242	1	46.8	0.4
CH072	CR-MIS-CH072-01_02082011	2/8/2011	0.9	0.2	34.7	0.1	5.3	0.4	14.3	0.2	134	1	131	1	33.5	0.3
CI039	CR-MIS-CI039-01_02082011	2/8/2011	< 0.095	ND	77.6	0.2	6.1	0.5	17.9	0.3	34.9	0.3	331	1	85.1	0.7
CJ071	FTBL-IS-183-012517	1/25/2017	1.7	0.3	---	---	---	---	---	---	124	1	---	---	---	---
CK040	CR-IS-CK040-01_09142012	9/14/2012	0.3	0.1	70.4	0.2	12.8	1	15.5	0.2	23.6	0.2	258	1	50.1	0.4
CK042	CR-MIS-CK042-01_02082011	2/8/2011	< 0.095	ND	73.1	0.2	7.9	0.7	14.9	0.2	21.8	0.2	257	1	66.7	0.6
CL054	CR-MIS-CL054-01_02092011	2/9/2011	< 0.095	ND	68.3	0.2	10.9	0.9	20.7	0.3	31.6	0.3	233	1	43.5	0.4
CL071	FTBL-IS-076-060916	6/9/2016	17.5	4	---	---	---	---	59.4	0.8	805	7	---	---	61.2	0.5
CM068	FTBL-IS-075-060916	6/9/2016	6.4	1	---	---	---	---	39.5	0.6	378	3	---	---	59.5	0.5
CQ072	CR-IS-CQ072-01_09132012	9/13/2012	0.5	0.1	56.9	0.2	7.2	0.6	15.9	0.2	33.6	0.3	236	1	39.9	0.3
CR051	CR-MIS-CR051-01_02092011	2/9/2011	< 0.095	ND	67.5	0.2	8.0	0.7	165	2	37.8	0.3	245	1	75.1	0.6

Table 4-1.
Refined HQ Analysis in ISM Surface Soil
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Decision Unit [a]	ISM Soil COC / Ecological Benchmark / ISM Sample ID [a]	Sample Date	Antimony mg/kg 5	Antimony HQ	Barium mg/kg 330	Barium HQ	Chromium mg/kg 11.9	Chromium HQ	Copper mg/kg 70	Copper HQ	Lead mg/kg 120	Lead HQ	Manganese mg/kg 231	Manganese HQ	Zinc mg/kg 120	Zinc HQ
CS059	CR-IS-CS059-01_09132012	9/13/2012	0.4	0.1	55.9	0.2	7.4	0.6	16.1	0.2	35.5	0.3	236	1	41.7	0.3
CU060	CR-MIS-CU060-01_02082011	2/8/2011	0.1	0.02	68.0	0.2	8.0	0.7	21.1	0.3	48.2	0.4	242	1	63.2	0.5
CV063	CR-IS-CV063-01_09132012	9/13/2012	0.7	0.1	58.2	0.2	7.6	0.6	16.7	0.2	38.1	0.3	243	1	41.8	0.3
CW058	CR-MIS-CW058-01_02092011	2/9/2011	< 0.095	ND	67.3	0.2	7.6	0.6	20.7	0.3	34.3	0.3	251	1	55.5	0.5
CZ071	CR-MIS-CZ071-01_02102011	2/10/2011	< 0.095	ND	50.1	0.2	6.7	0.6	13.8	0.2	415	3	183	0.8	42.4	0.4
DD072	CR-MIS-DD072-01_02142011	2/14/2011	0.3	0.1	55.4	0.2	6.8	0.6	37.8	0.5	194	2	206	0.9	49.6	0.4
DE071	CR-MIS-DE071-01_02142011	2/14/2011	0.4	0.1	48.1	0.1	6.6	0.6	31.8	0.5	218	2	185	0.8	41.9	0.3
DE072	CR-MIS-DE072-01_02142011	2/14/2011	0.8	0.2	51.1	0.2	22.0	2	37.8	0.5	327	3	193	0.8	48.1	0.4
DF047	FTBL-IS-193-011917	1/19/2017	0.3	0.1	---	---	---	---	23.7	0.3	41.7	0.3	---	---	122	1
DF049	FTBL-IS-024-060716	6/7/2016	0.2	0.05	---	---	---	---	24.8	0.4	47.0	0.4	---	---	142	1
DF074	FTBL-IS-032-060816	6/8/2016	0.5	0.1	---	---	---	---	26.3	0.4	151	1	---	---	62.5	0.5
DG050	FTBL-IS-025-060716	6/7/2016	1.4	0.3	---	---	---	---	35.0	0.5	376	3	---	---	120	1
DG070	CR-MIS-DG070-01_02112011	2/11/2011	14.1	3	38.5	0.1	5.6	0.5	17.2	0.2	5030	42	136	0.6	35.8	0.3
DH072	FTBL-IS-022-060816	6/8/2016	0.5	0.1	---	---	---	---	25.7	0.4	132	1	---	---	52.6	0.4
DH072	FTBL-IS-022-110716R	11/7/2016	---	---	---	---	---	---	---	---	128	1	---	---	---	---
DK069	FTBL-IS-019-060716	6/7/2016	0.7	0.1	---	---	---	---	22.1	0.3	189	2	---	---	55.0	0.5
DK074	FTBL-IS-020-060816	6/8/2016	2.6	0.5	---	---	---	---	26.0	0.4	754	6	---	---	47.8	0.4
DO066	CR-IS-DO066-01_09122012	9/12/2012	0.2	0.04	119	0.4	5.7	0.5	16.6	0.2	16.3	0.1	401	2	38.0	0.3
DV051	CR-IS-DV051-01_09142012	9/14/2012	1.9	0.4	54.2	0.2	5.3	0.4	18.3	0.3	132	1	164	0.7	28.3	0.2
DF052	*FTBL-IS-194-012017-A*	*1/20/2017*	0.2	*0.05*	---	---	---	---	20.4	*0.3*	39.9	*0.3*	---	---	126	*1*
DF052	*FTBL-IS-194-012017-B*	*1/20/2017*	0.3	*0.1*	---	---	---	---	16.8	*0.2*	36.9	*0.3*	---	---	121	*1*
DF052	*FTBL-IS-194-012017-C*	*1/20/2017*	0.3	*0.1*	---	---	---	---	19.7	*0.3*	40.3	*0.3*	---	---	122	*1*
CN064	*FTBL-IS-074-060916-A*	6/9/2016	0.4	0.1	---	---	---	---	23.0	*0.3*	63.6	*0.5*	---	---	48.5	*0.4*
CN064	*FTBL-IS-074-060916-B*	6/9/2016	0.5	0.1	---	---	---	---	22.8	*0.3*	89.1	*0.7*	---	---	48.8	*0.4*
CN064	*FTBL-IS-074-060916-C*	6/9/2016	0.9	0.2	---	---	---	---	21.8	*0.3*	146	*1*	---	---	46.9	*0.4*
CT065	FTBL-IS-187-012317-A	*1/23/2017*	0.7	0.1	---	---	---	---	22.1	*0.3*	80.2	*1*	---	---	63.5	*0.5*
CT065	FTBL-IS-187-012317-B	*1/23/2017*	0.4	0.1	---	---	---	---	21.7	*0.3*	67.4	*1*	---	---	60.0	*0.5*
CT065	FTBL-IS-187-012317-C	*1/23/2017*	0.8	0.2	---	---	---	---	24.4	*0.3*	138	*1*	---	---	65.0	*0.5*
CN073	*FTBL-IS-077-060916-A*	*6/9/2016*	40.4	*8*	---	---	---	---	38.3	*1*	1070	*9*	---	---	67.0	*0.6*
CN073	*FTBL-IS-077-060916-B*	*6/9/2016*	14.1	*3*	---	---	---	---	31.7	*0.5*	552	*5*	---	---	66.3	*0.6*
CN073	*FTBL-IS-077-060916-C*	*6/9/2016*	50.4	*10*	---	---	---	---	34.7	*0.5*	1320	*11*	---	---	66.3	*0.6*
CN073	95% Student's-t UCL [b]		66.6	13							1641	14				
DF068	*FTBL-IS-030-061516-A*	*6/15/2016*	0.5	*0.1*	---	---	---	---	22.5	*0.3*	103	*1*	---	---	52.9	*0.4*
DF068	*FTBL-IS-030-061516-B*	*6/15/2016*	1.4	*0.3*	---	---	---	---	23.3	*0.3*	211	*2*	---	---	54.9	*0.5*
DF068	*FTBL-IS-030-061516-C*	*6/15/2016*	0.4	*0.1*	---	---	---	---	22.3	*0.3*	73.8	*1*	---	---	54.9	*0.5*
DF068	95% Student's-t UCL [b]										251	2				
BK043	*FTBL-IS-121-062716-A*	*6/27/2016*	0.4	*0.1*	---	---	---	---	35.9	*0.5*	473	*4*	---	---	81.5	*1*
BK043	*FTBL-IS-121-062716-B*	*6/27/2016*	0.3	*0.1*	---	---	---	---	73.9	*1*	74.1	*0.6*	---	---	81.2	*1*
BK043	*FTBL-IS-121-062716-C*	*6/27/2016*	0.3	*0.1*	---	---	---	---	30.7	*0.4*	73.1	*0.6*	---	---	76.2	*1*
BK043	95% Student's-t UCL [b]										596	5				

Table 4-1.
Refined HQ Analysis in ISM Surface Soil
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Decision Unit [a]	ISM Soil COC / Ecological Benchmark / ISM Sample ID [a] / Sample Date	Antimony mg/kg 5	Antimony HQ	Barium mg/kg 330	Barium HQ	Chromium mg/kg 11.9	Chromium HQ	Copper mg/kg 70	Copper HQ	Lead mg/kg 120	Lead HQ	Manganese mg/kg 231	Manganese HQ	Zinc mg/kg 120	Zinc HQ

Notes:
[a]Incremental Sampling Methodology (ISM) samples with one or more ecological benchmark exceedance are presented. Blue shading indicates ecological benchmark exceedance.
[b] 95% Upper confidence limits (UCL) were calculated using ProUCL 5.1 for DUs sampled in triplicate (CN073, DF068, BK043).
The hazard quotient (HQ) is the ratio of the constituent concentration to the screening level. HQs are rounded to one significant figure. Orange shading indicates HQ is greater than 1.
COC - chemical of concern.
mg/kg - milligrams per kilogram.

Table 4-2
Less Conservative - Chemicals of Concern in Arroyo Soil
Reach 3
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Refined Exposure Point Concentration [a] (mg/kg)		Background UPL (mg/kg)	Ecological Screening Benchmark [b] (mg/kg)		Less Conservative HQ [c] (unitless)	Chemical of Concern? [d]		Bioaccumulative ? In Soil [e] (YES/no)
									Soil Invertebrates	Plants		(YES/no)	Rationale	
Metals														
Arsenic	12	-	12	100%	60.1	35.4	UCL	5.68	60	18	2	**YES**	**HQ > 1**	no
Zinc	12	-	12	100%	924	396.3	UCL	40.4	120	160	3	**YES**	**HQ > 1**	**YES**

Notes:
mg/kg Milligrams per kilogram.

[a] Exposure point concentration (EPCs) are the minimum of the upper confidence limit (UCL) on the mean and the maximum concentration.
[b] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[c] The less conservative hazard quotient (HQ) is the ratio of the EPC to the screening level. HQs are rounded to one significant figure.
[d] Constituents with a less conservative hazard quotient (HQ) greater than 1 (HQ > 1) were considered chemicals of concern (COCs).
[e] The following source was consulted to identify bioaccumulation potential: TCEQ 2017.

Table 4-3
Less Conservative - Chemicals of Concern in Arroyo Soil
Reach 4
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection			Maximum Concentration (mg/kg)	Refined Exposure Point Concentration [a] (mg/kg)		Background UPL (mg/kg)	Ecological Screening Benchmark [b] (mg/kg)		Less Conservative HQ [c] (unitless)	Chemical of Concern? [d]		Bioaccumulative ? In Soil [e] (YES/no)
								Soil Invertebrates	Plants		(YES/no)	Rationale	
Metals													
Zinc	12	- 12	100%	318	181.9	UCL	40.4	120	160	2	**YES**	**HQ > 1**	**YES**

Notes:

mg/kg Milligrams per kilogram.

[a] Exposure point concentration (EPCs) are the minimum of the upper confidence limit (UCL) on the mean and the maximum concentration.

[b] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.

[c] The less conservative hazard quotient (HQ) is the ratio of the EPC to the screening level. HQs are rounded to one significant figure.

[d] Constituents with a less conservative hazard quotient (HQ) greater than 1 (HQ > 1) were considered chemicals of concern (COCs).

[e] The following source was consulted to identify bioaccumulation potential: TCEQ 2017.

Table 4-4
Less Conservative - Chemicals of Concern in Arroyo Soil
Reach 7
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection			Maximum Concentration (mg/kg)	Refined Exposure Point Concentration [a] (mg/kg)		Background UPL (mg/kg)	Ecological Screening Benchmark [b] (mg/kg)		Less Conservative HQ [c] (unitless)	Chemical of Concern? [d]		Bioaccumulative ? In Soil [e] (YES/no)
								Soil Invertebrates	Plants		(YES/no)	Rationale	
Metals													
Zinc	7 - 7		100%	190	122	UCL	40.4	120	160	1	no	HQ < 1	**YES**

Notes:

mg/kg Milligrams per kilogram.

[a] Exposure point concentration (EPCs) are the minimum of the upper confidence limit (UCL) on the mean and the maximum concentration.
[b] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.
[c] The less conservative hazard quotient (HQ) is the ratio of the EPC to the screening level. HQs are rounded to one significant figure.
[d] Constituents with a less conservative hazard quotient (HQ) greater than 1 (HQ > 1) were considered chemicals of concern (COCs).
[e] The following source was consulted to identify bioaccumulation potential: TCEQ 2017.

Table 4-5
Less Conservative - Chemicals of Concern in Arroyo Soil
Reach 9
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Constituent	Frequency of Detection				Maximum Concentration (mg/kg)	Refined Exposure Point Concentration [a] (mg/kg)		Background UPL (mg/kg)	Ecological Screening Benchmark [b] (mg/kg)		Less Conservative HQ [c] (unitless)	Chemical of Concern? [d]		Bioaccumulative ? In Soil [e] (YES/no)
									Soil Invertebrates	Plants		(YES/no)	Rationale	
Metals														
Lead	13	-	13	100%	483	116.2	UCL	20.83	1,700	120	1	no	HQ < 1	**YES**

Notes:

mg/kg Milligrams per kilogram.

[a] Exposure point concentration (EPCs) are the minimum of the upper confidence limit (UCL) on the mean and the maximum concentration.

[b] Ecological screening benchmarks are from:
TCEQ Ecological Soil Benchmarks.

[c] The less conservative hazard quotient (HQ) is the ratio of the EPC to the screening level. HQs are rounded to one significant figure.

[d] Constituents with a less conservative hazard quotient (HQ) greater than 1 (HQ > 1) were considered chemicals of concern (COCs).

[e] The following source was consulted to identify bioaccumulation potential: TCEQ 2017.

Table 4-6
Exposure Parameters for Wildlife Receptors
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Receptor Species	Body Weight (kg)	Normalized Food Ingestion Rate (IRfood) to body weight (kg /kg BW-day)	Soil Ingestion Fractions	Soil Ingestion Rate (IRsoil) (kg/kg BW-day)	Diet Fraction			Home Range (acres)
					Plants	Invertebrates	Small Mammals	
Desert Shrew	0.004	0.180	0.070	0.0126	0.0	**1.0**	0.0	0.73
Scaled Quail	0.180	0.0972	0.093	0.00904	0.0	**1.0**	0.0	63.2
Desert Cottontail	1.20	0.061	0.063	0.00387	**1.0**	0.0	0.0	7.0
Mourning Dove	0.12	0.141	0.093	0.0131	**1.0**	0.0	0.0	40
Coyote	13	0.032	0.028	0.0009	0.0	0.0	**1.0**	5485
Red-tailed Hawk	1.14	0.032	0.028	0.0009	0.0	0.0	**1.0**	1722
Texas Horned Lizard	0.032	0.0081	0.045	0.00036	0.0	**1.0**	0.0	9.2

Notes:
All body weights, ingestion rates, diet fractions and home ranges are from the TCEQ Protective Concentration Levels Calculator (TCEQ 2017). Exceptions include the diet of the desert shrew and scaled quail which are assumed to be 100% arthopods in this SLERA. The eastern cottontail is used as a surrogate for the desert cottontail.
BW - body weight.
kg - kilograms
IR - Ingestion rate.
mg/kg-day - milligrams per kilogram per day.

Table 5-1
NOAEL and LOAEL Toxicity Factors for Chemicals of Concern
Screening Level Ecological Risk Assessment
Closed Castner Firing Range
Fort Bliss, Texas

Avian TRVs (mg/kg-day)				
COC	CAS	Test Species	Reported NOAEL TRV (mg/kg-day)	Reported LOAEL TRV (mg/kg-day)
Antimony	7440-36-0	--	NA	NA
Arsenic	7440-38-2	Mallard Duck	3.72	17.3
Barium	7440-39-3	Chicken	20.8	41.7
Cadmium	7440-43-9	Chicken	1.55	4.66
Chromium	7440-47-3	Black Duck	0.557	2.78
Copper	7440-50-8	Chicken	23.2	29.9
Lead	7439-92-1	Japanese Quail	1.13	11.3
Manganese	7439-96-5	Chicken	215	431
Mercury	7439-97-6	Japanese Quail	0.45	0.9
Nickel	7440-02-0	Chicken	10.4	20.8
Selenium	7782-49-2	Duck	0.219	0.438
Zinc	7440-66-6	Chicken	14.5	131
Mammalian TRVs (mg/kg-day)				
COC	CAS	Test Species	Reported NOAEL TRV (mg/kg-day)	Reported LOAEL TRV (mg/kg-day)
Antimony	7440-36-0	Rat	5.6	42
Arsenic	7440-38-2	Rat	2.25	5.62
Barium	7440-39-3	Rat	61	121
Cadmium	7440-43-9	Rat	1	10
Chromium	7440-47-3	Rat	20	40
Copper	7440-50-8	Rat	82.5	165
Lead	7439-92-1	Rat	87.5	163
Manganese	7439-96-5	Rat	21	71
Mercury	7439-97-6	Mink	1.0	1.5
Nickel	7440-02-0	Rat	9.12	91.2
Selenium	7782-49-2	Rat	0.432	0.577
Zinc	7440-66-6	Rat	160	320
Reptilian TRVs (mg/kg-day) [a]				
COC	CAS	Test Species	Reported NOAEL TRV (mg/kg-day)	Reported LOAEL TRV (mg/kg-day)
Antimony	7440-36-0	--	NA	NA
Arsenic	7440-38-2	Mallard Duck	0.372	1.73
Barium	7440-39-3	Chicken	2.08	4.17
Cadmium	7440-43-9	Chicken	0.155	0.466
Chromium	7440-47-3	Black Duck	0.0557	0.278
Copper	7440-50-8	Chicken	2.32	2.99
Lead	7439-92-1	Western Fence Lizard	0.2	2
Manganese	7439-96-5	Chicken	21.5	43.1
Mercury	7439-97-6	Japanese Quail	0.045	0.09
Nickel	7440-02-0	Chicken	1.04	2.08
Selenium	7782-49-2	Duck	0.0219	0.0438
Zinc	7440-66-6	Chicken	1.45	13.1

Notes:
[a] Reptile TRVs are only available from the TCEQ database for lead (western fence lizard). Avian TRVs were adjusted using an uncertainty factor of 0.1 to conservatively estimate reptile TRVs for the remaining metals.
COC - chemical of concern.
mg/kg-day - milligrams per kilogram per day.
TRV - toxicity reference value; from TCEQ 2017.
LOAEL = lowest observed adverse effect level.
NOAEL = no observed adverse effect level.

Table 7-1
Tier 2 Ecological Protective Concentration Levels for Terrestrial Wildlife
Closed Castner Firing Range
Fort Bliss, Texas

COC & Receptor	EPC[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL-based PCL[b] (mg/kg)	LOAEL-based PCL[b] (mg/kg)	Tier 2 PCL [c] (mg/kg)
Terrestrial Tier 2 PCLs						
Desert Shrew						
Antimony	50	0.1	0.02	411	3080	**1746**
Barium	850	0.3	0.1	3355	6656	5006
Chromium	22	0.03	0.01	822	1645	1234
Copper	296	0.7	0.3	451	902	677
Lead	5030	1	0.7	3603	6713	5158
Manganese	433	0.5	0.1	916	3096	**2006**
Mercury	0.13	0.02	0.01	7	10	9
Nickel	25	0.09	0.009	283	2831	1557
Selenium	0.66	0.5	0.4	1	2	**2**
Zinc	353	0.3	0.2	1063	2127	1595
Desert Cottontail						
Antimony	50	0.05	0.006	1037	7775	4406
Barium	850	0.2	0.09	4533	8991	6762
Chromium	22	0.007	0.004	3129	6259	4694
Copper	296	0.04	0.02	7179	14358	10769
Lead	5030	0.4	0.2	13973	26030	20002
Manganese	433	0.2	0.05	2403	8125	5264
Mercury	0.13	0.006	0.004	23	34	29
Nickel	25	0.01	0.001	1832	18322	10077
Selenium	0.66	0.07	0.05	10	13	11
Zinc	353	0.06	0.03	6069	12138	9104
Coyote						
Antimony	50	0.02	0.003	2563	19226	10895
Barium	850	0.04	0.02	22708	45044	33876
Chromium	22	0.004	0.002	5594	11188	8391
Copper	296	0.03	0.02	9652	19303	14477
Lead	5030	0.2	0.1	27075	50437	38756
Manganese	433	0.03	0.009	13636	46104	29870
Mercury	0.13	0.0003	0.0002	386	574	480
Nickel	25	0.01	0.001	2024	20241	11133
Selenium	0.66	0.03	0.02	25	33	29
Zinc	353	0.04	0.02	8426	16853	12640
Scaled Quail						
Antimony	50	NA	NA	NA	NA	NA
Barium	850	0.5	0.2	1726	3460	2593
Chromium	22	0.6	0.1	36	181	109
Copper (less conservative)	21.6	0.09	0.07	230	296	**263**
Lead (less conservative)	144	2	0.2	74	736	405
Manganese	433	0.03	0.01	14707	29482	22095
Mercury	0.13	0.02	0.01	6	11	8
Nickel	25	0.05	0.02	530	1059	**795**
Selenium	0.66	0.5	0.3	1	3	2
Zinc (less conservative)	64	0.4	0.04	174	1569	**871**
Mourning Dove						
Antimony	50	NA	NA	NA	NA	NA
Barium (less conservative)	67	0.1	0.06	592	1186	**889**
Chromium	22	0.7	0.1	29	147	88
Copper	296	0.4	0.3	757	976	866
Lead (less conservative)	144	2	0.2	61	607	**334**
Manganese	433	0.05	0.02	8842	17724	13283
Mercury	0.13	0.03	0.02	4	9	**6**
Nickel	25	0.04	0.02	663	1327	995
Selenium	0.66	0.3	0.2	2	4	3
Zinc (less conservative)	64	0.3	0.03	224	2021	1122
Red Tailed Hawk						
Antimony	50	NA	NA	NA	NA	NA
Barium	850	0.1	0.05	7789	15615	11702
Chromium	22	0.1	0.03	157	782	469
Copper	296	0.1	0.08	2730	3519	3124
Lead (less conservative)	144	0.4	0.04	352	3517	1934
Manganese	433	0.003	0.002	140433	281518	210975
Mercury	0.13	0.0008	0.0004	173	346	260
Nickel	25	0.01	0.005	2322	4644	3483
Selenium	0.66	0.05	0.03	13	25	19
Zinc	353	0.5	0.05	768	6940	3854

Table 7-1
Tier 2 Ecological Protective Concentration Levels for Terrestrial Wildlife
Closed Castner Firing Range
Fort Bliss, Texas

COC & Receptor	EPC[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL-based PCL[b] (mg/kg)	LOAEL-based PCL[b] (mg/kg)	Tier 2 PCL [c] (mg/kg)
Terrestrial Tier 2 PCLs						
Texas Horned Lizard						
Antimony	50	NA	--	NA	NA	NA
Barium	850	0.3	--	3383	NA	3383
Chromium	22	0.4	--	63	NA	**63**
Copper (less conservative)	22	0.04	--	499	NA	499
Lead (less conservative)	144	0.4	--	386	NA	386
Manganese	433	0.02	--	25953	NA	25953
Mercury	0.13	0.02	--	7.2	NA	7
Nickel	25	0.03	--	835	NA	835
Selenium	0.66	0.4	--	1.6	NA	2
Zinc (less conservative)	64	0.2	--	381	NA	**381**

Notes:
a. From Attachment 4.
b. NOAEL-based PCL = EPC/NOAEL HQ
LOAEL-based PCL = EPC/LOAEL HQ
c. Tier 2 PCLs based on the midpoint between the NOAEL-based PCL and the LOAEL-based PCL.
Shaded cells indicate lowest calculated Tier 2 PCL for that metal.

Acronyms and Abbreviations:
COC - chemical of concern.
EPC - reasonable maximum exposure point concentration.
HQ - Hazard Quotient.
LOAEL - lowest observed adverse effect level.
mg/kg - milligrams per kilogram.
NA - not applicable/not available.
NOAEL - no observed adverse effect level.
PCL - protective concentration level.

FIGURES

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

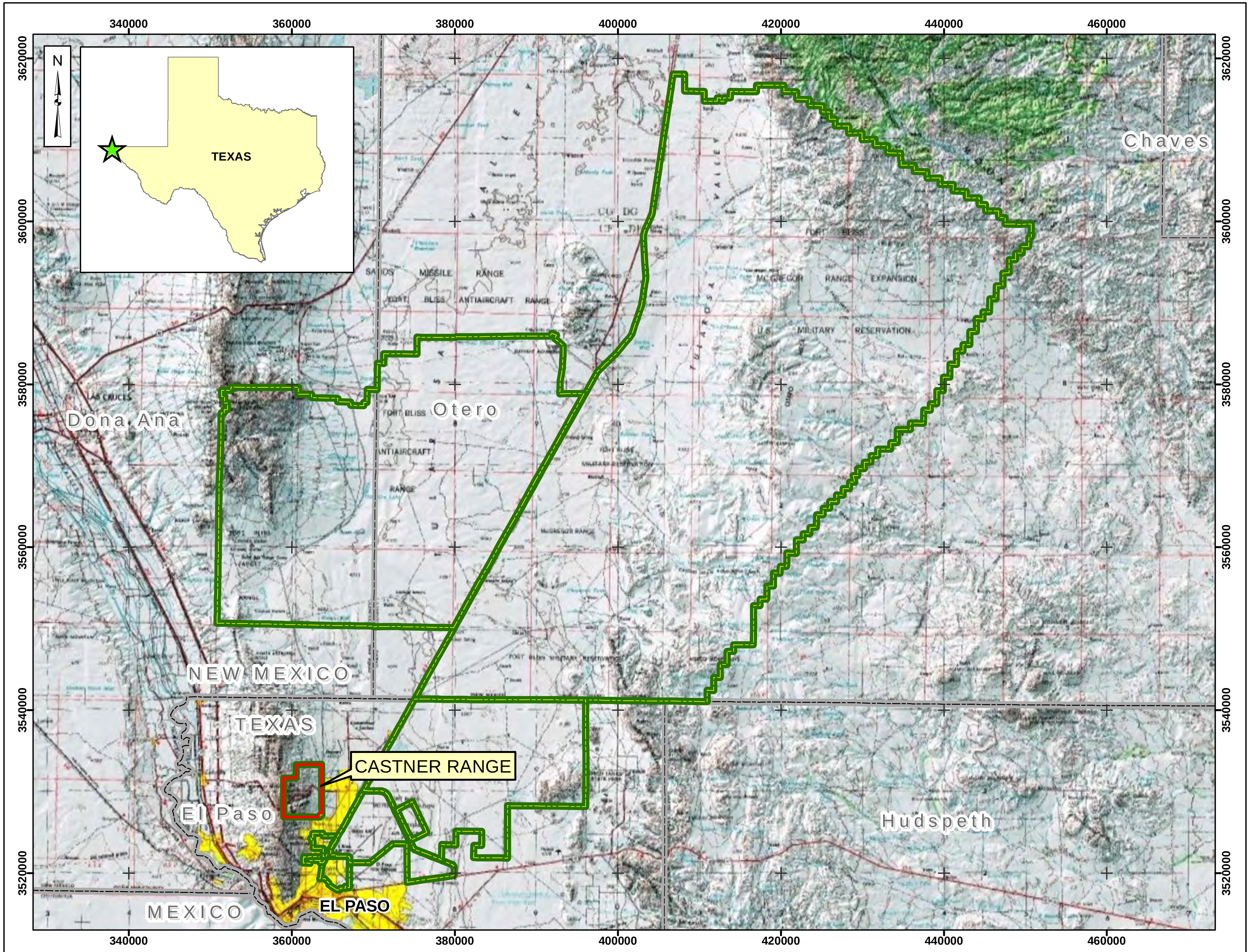


Figure 1-1
Site Location Map

Legend

- Fort Bliss Boundary
- MRS Boundary
- County Boundary
- State Boundary

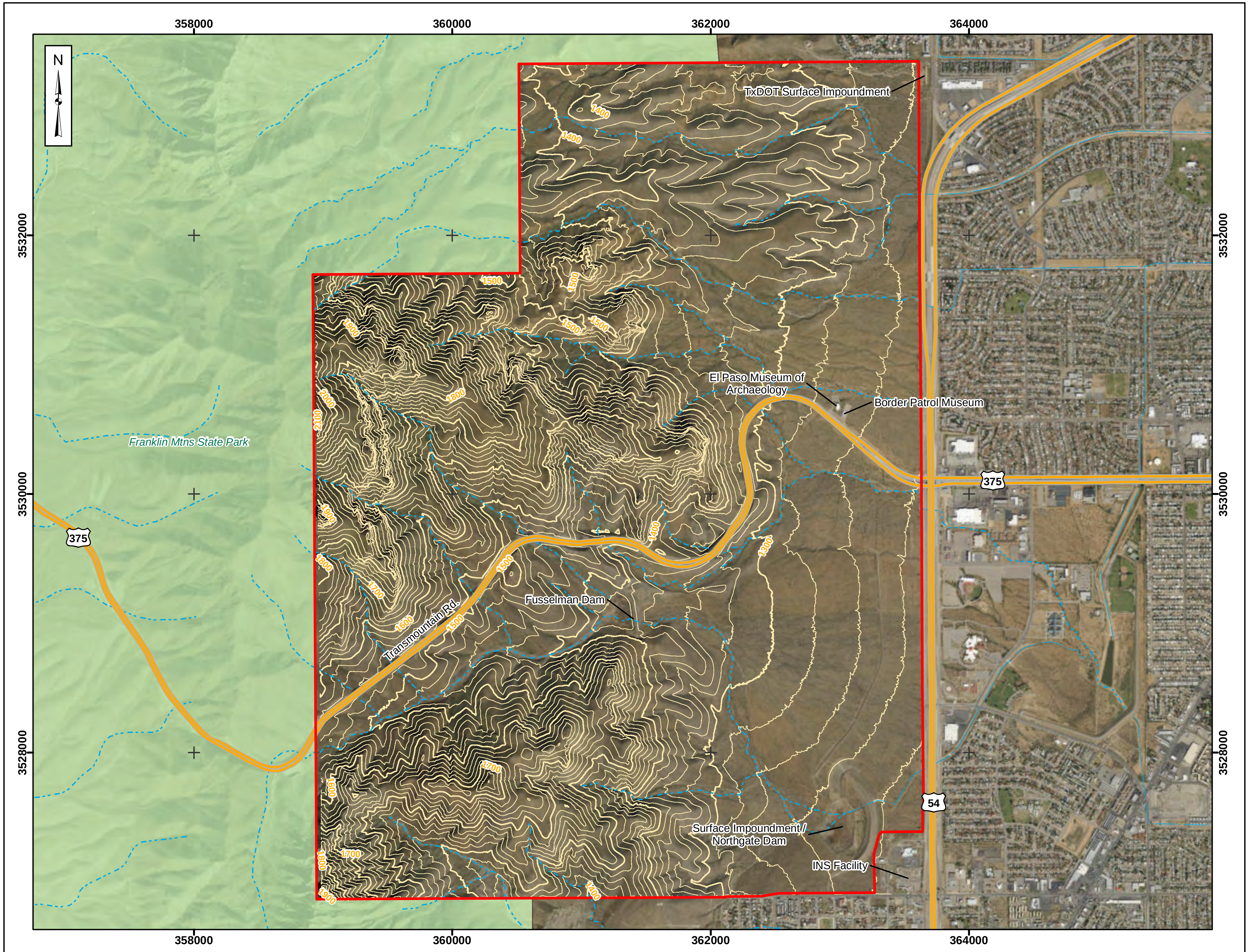
0 5 10
Miles

Data Sources: ESRI, ArcGIS Online, USGS Topo

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-2
Site Overview



Legend

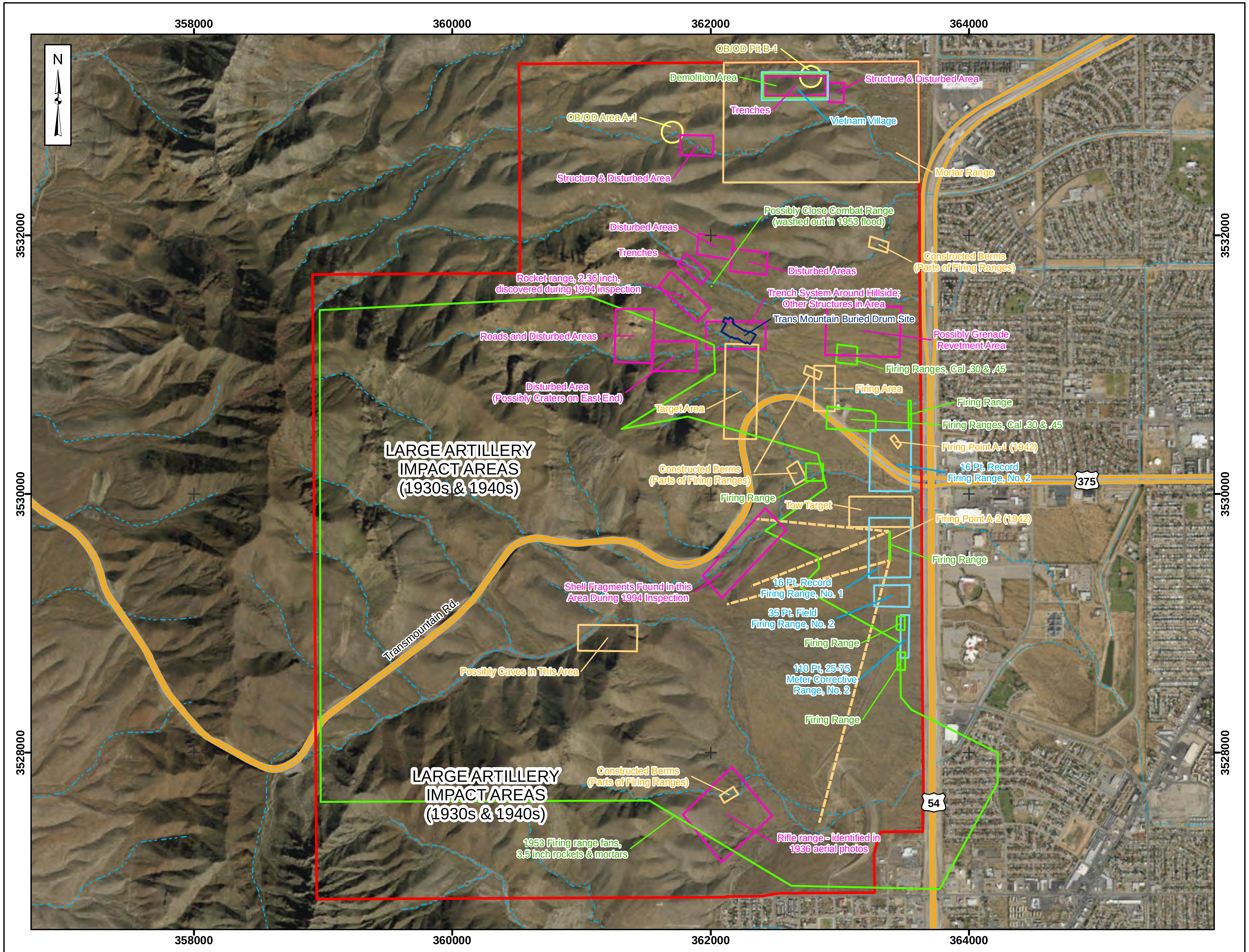
- MRS Boundary
- Intermittent Stream
- Canal/Ditch
- Franklin Mtns. State Park
- Elevation Contour (m)

0 0.5 1

Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation Report
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-3
Historical Range Boundaries and Identified Features

Legend

MRS Boundary
Intermittent Stream
Canal/Ditch

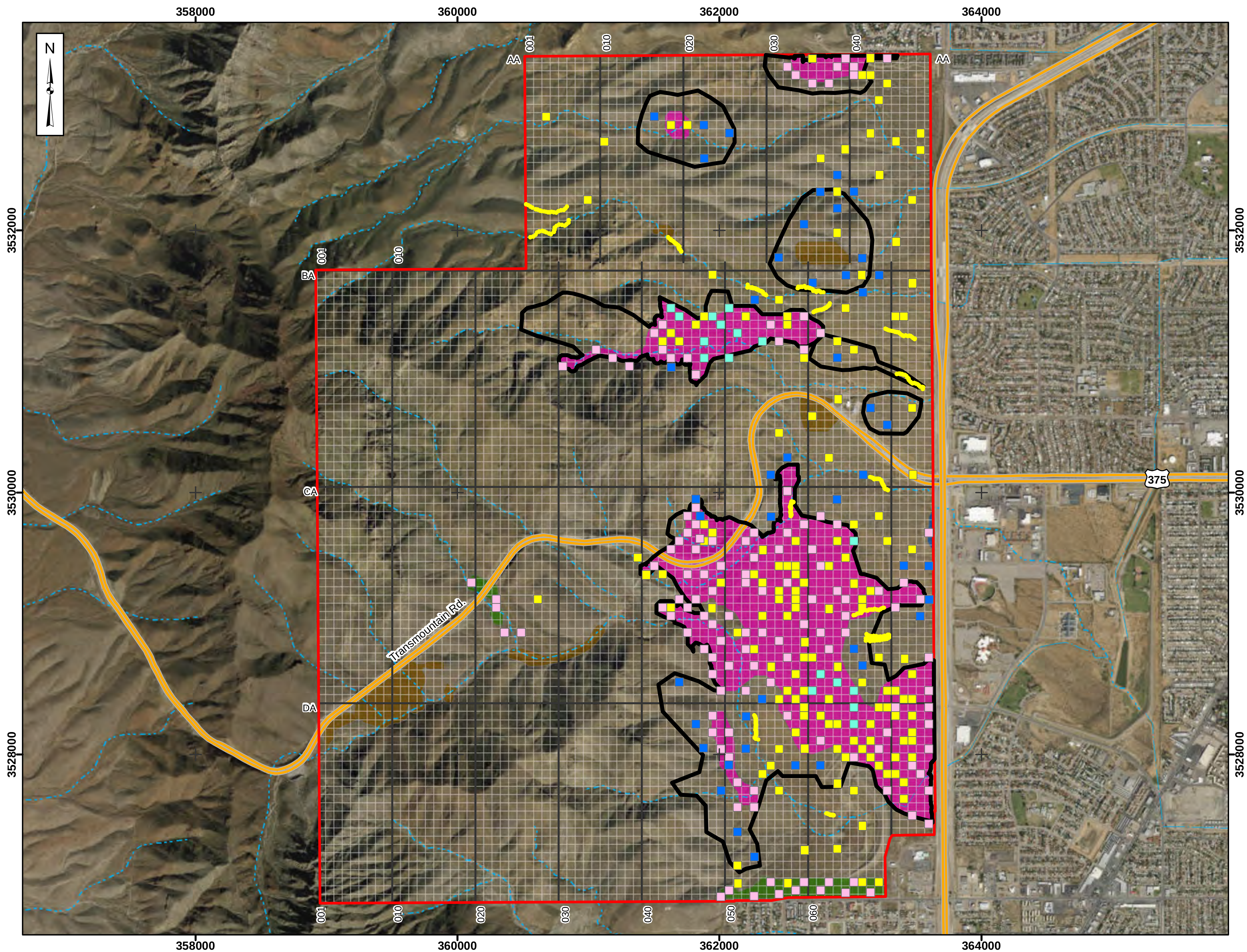
Historical Features

1930s Range Feature
1940s Range Feature
1950s Range Feature
1960s Range Feature
OB/OD Area
1940s Firing Range Fan
Other Range Feature

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-4
ISM Sampling Locations

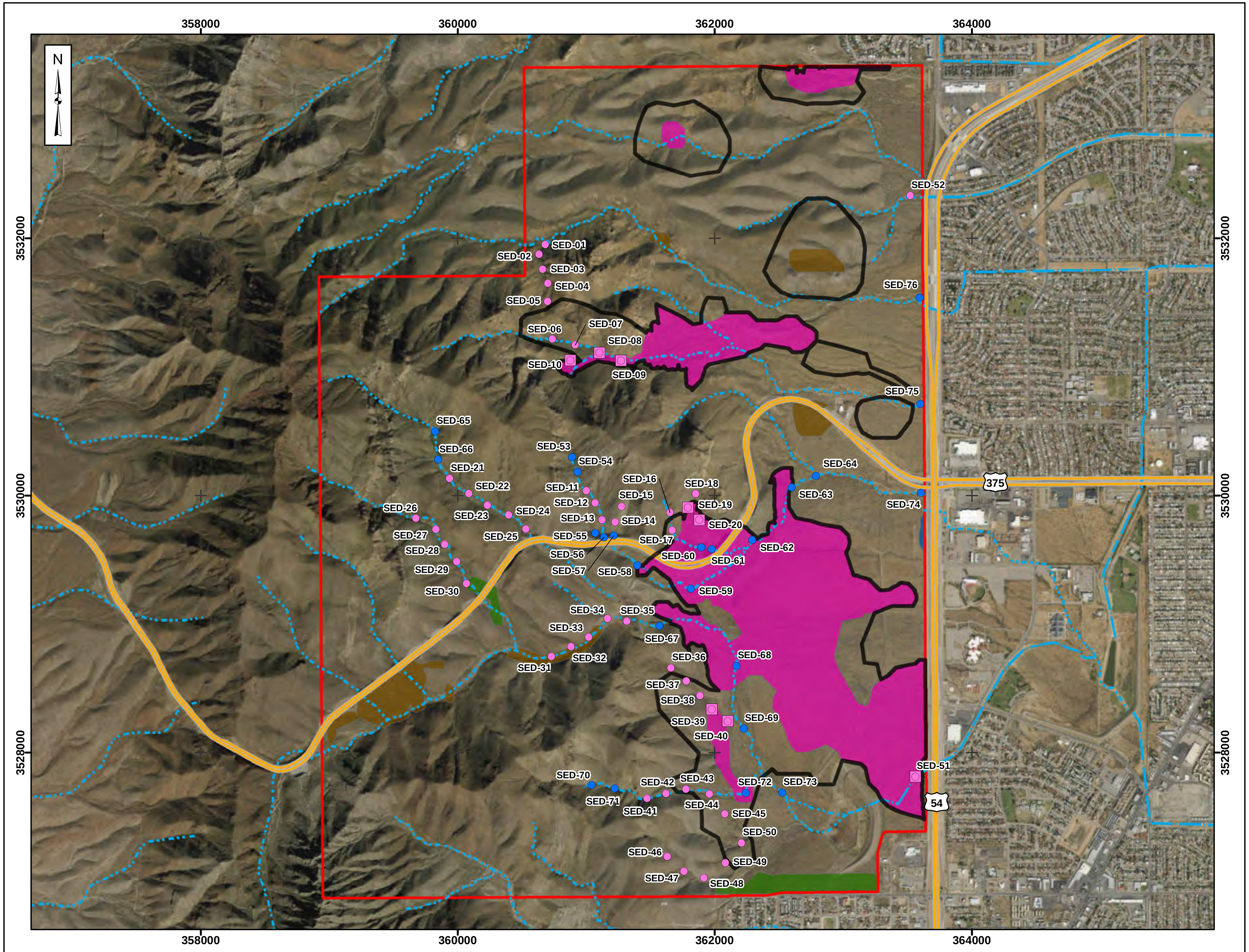
Legend

- MRS Boundary
- Revised CMUA based on RI MEC data collection
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch
- Phase I RI ISM Sample - Metals & Explosives
- Phase I RI ISM Sample - Metals, Explosives, & Perchlorate
- Phase II ISM Grid Location
- ISM Sample from 2011-2012 ISM Study
- Arroyo ISM sample from 2011-2012 ISM Study

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-5
Arroyo Soil Sample Locations

Legend

- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch

Soil Sample (0-6")

- Phase I
- Phase II

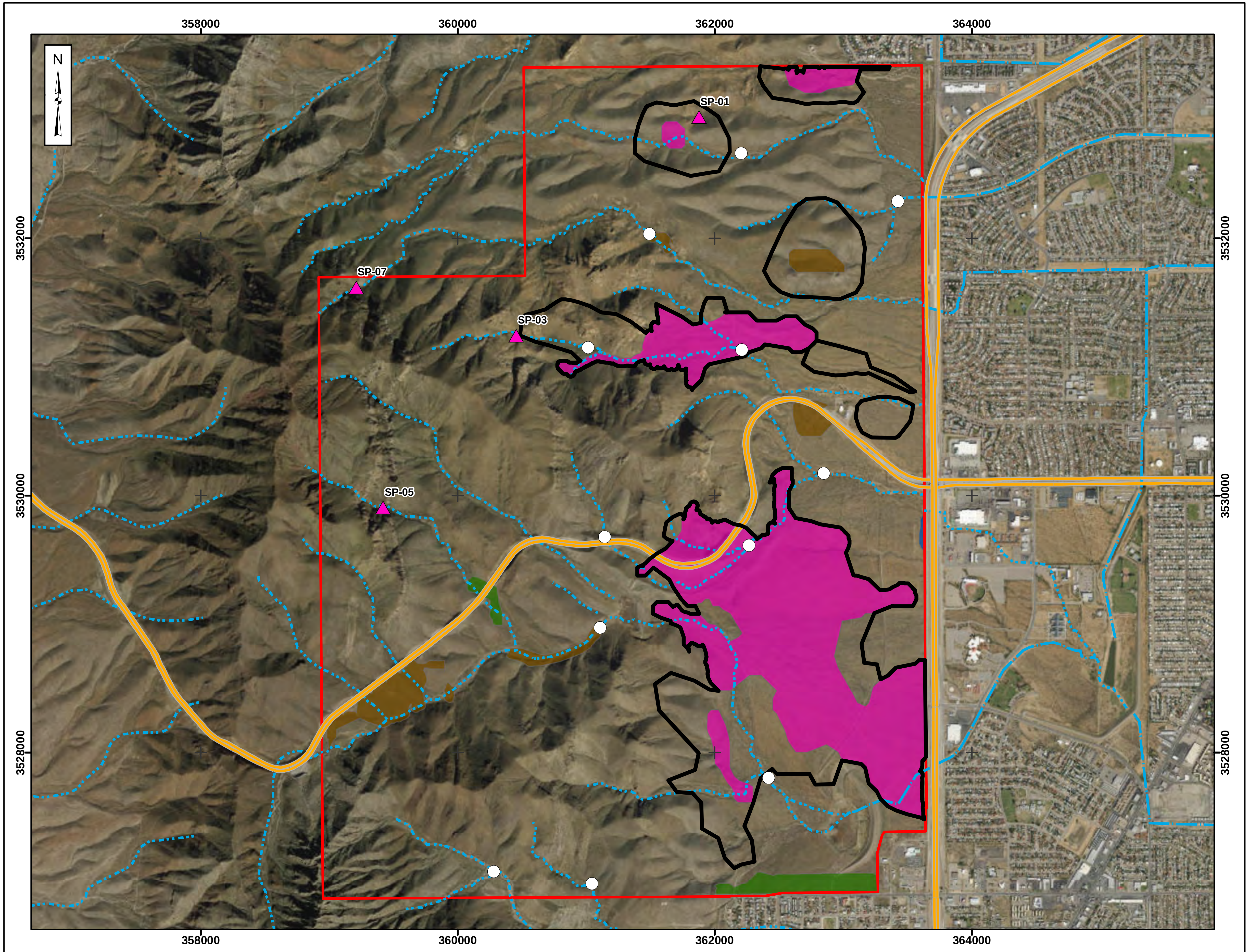
Soil Sample (12-18")

- Phase I

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 1-6
Surface Water Sampling Locations

Legend

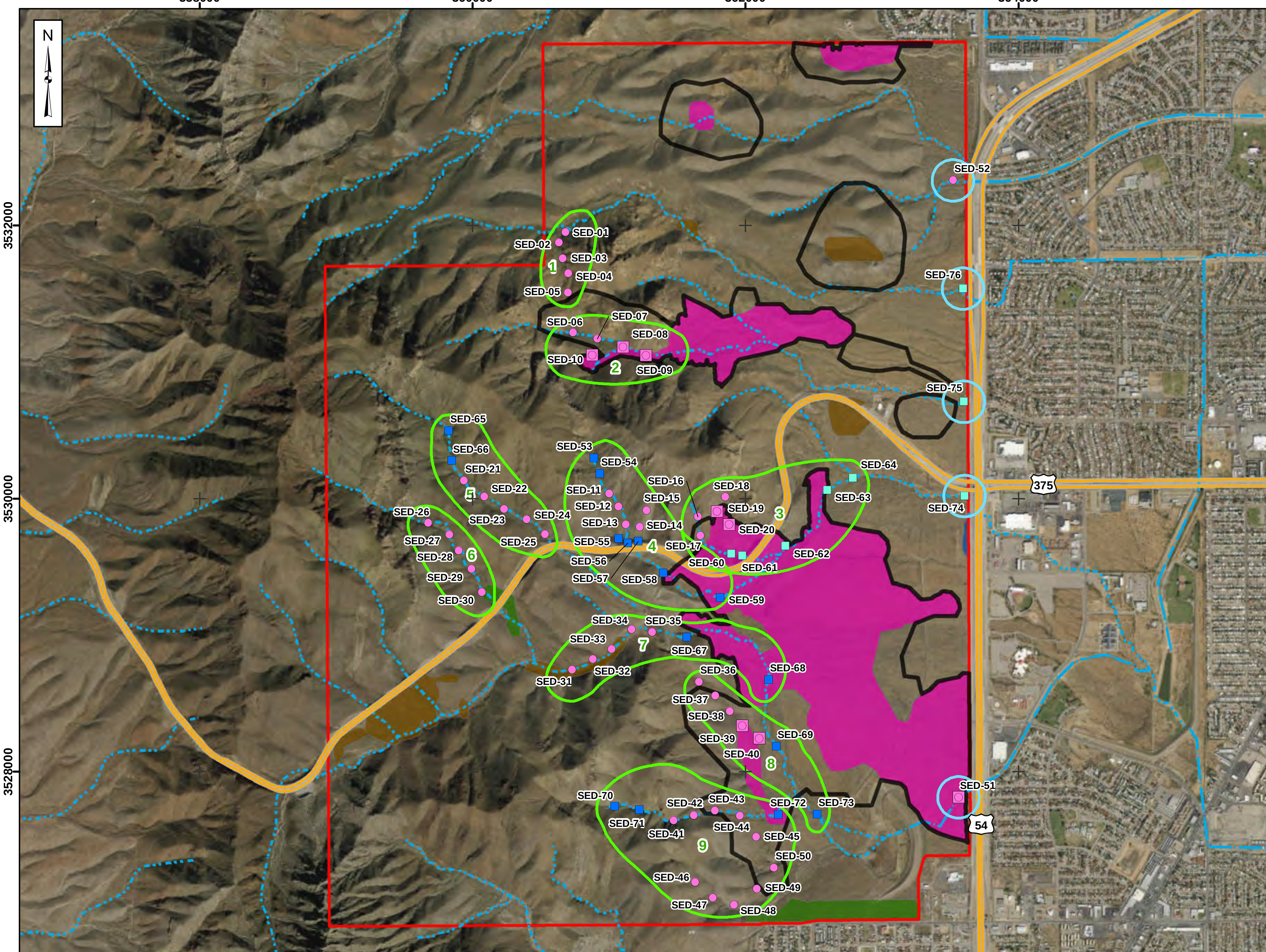
- MRS Boundary
- Revised CMUA
- CMUA Prior to RI Field Investigation - MC Investigation Performed
- NCMUA Prior to RI Field Investigation - No MC Investigation Performed
- Potential CMUA - MC Investigation Performed
- NCMUA - MC Investigation Performed
- Intermittent Stream
- Canal/Ditch
- Surface Water (Seep) Sample Location
- Arroyo Surface Water Sample Location, visited during wet and dry sampling events (no water present)

0 0.5 1

Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters



Remedial Investigation
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 2-1
Arroyo Soil Reaches

Legend

MRS Boundary
Revised CMUA
CMUA Prior to RI Field Investigation - MC Investigation Performed
NCMUA Prior to RI Field Investigation - No MC Investigation Performed
Potential CMUA - MC Investigation Performed
NCMUA - MC Investigation Performed
Intermittent Stream
Canal/Ditch
Sampling Reach
Downgradient Delineation Sample

Soil Sample (0-6")
Phase I
Phase II (Zinc Testing Only)
Phase II (Zinc and Arsenic Testing)

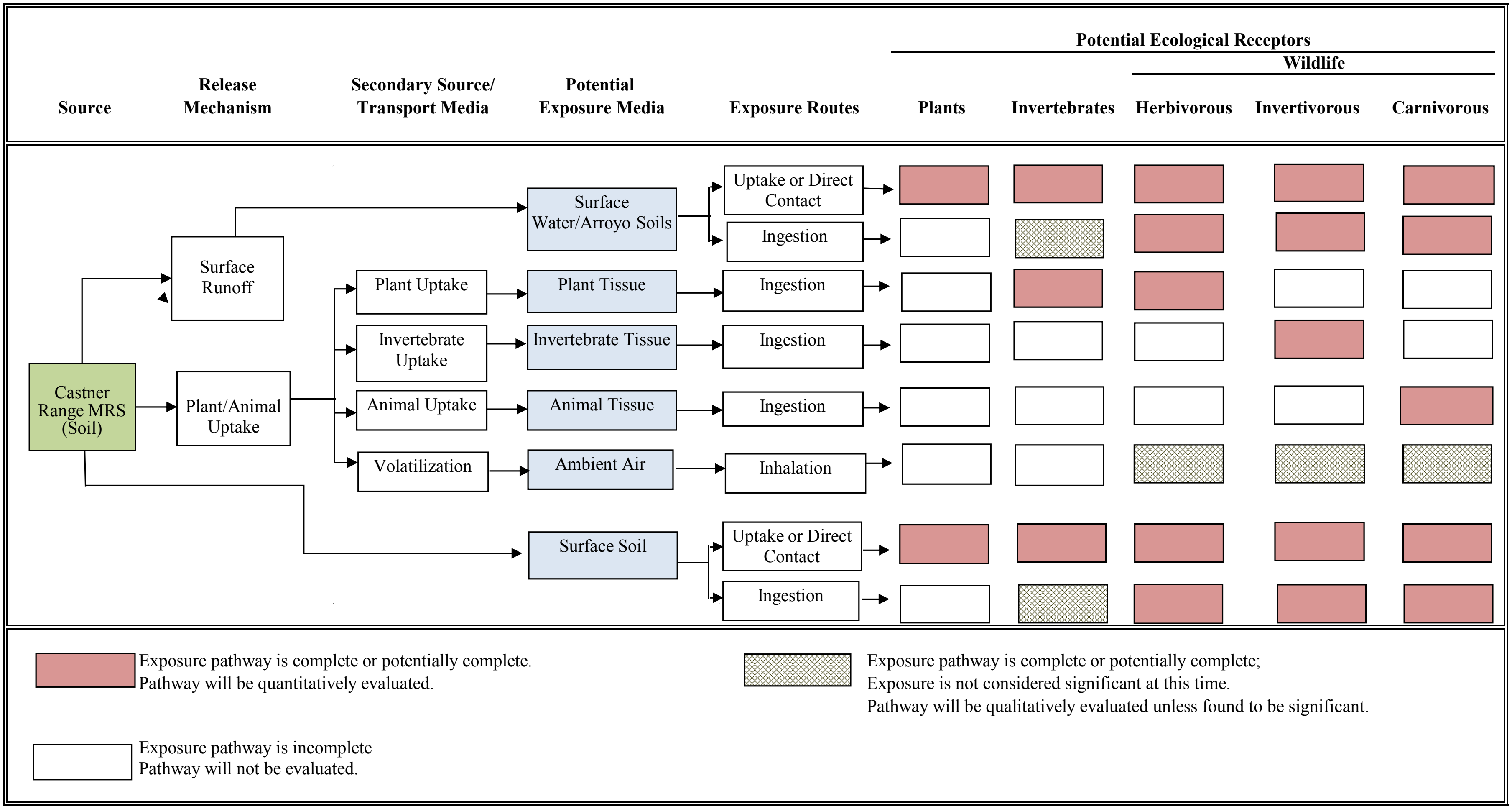
Soil Sample (12-18")
Phase I

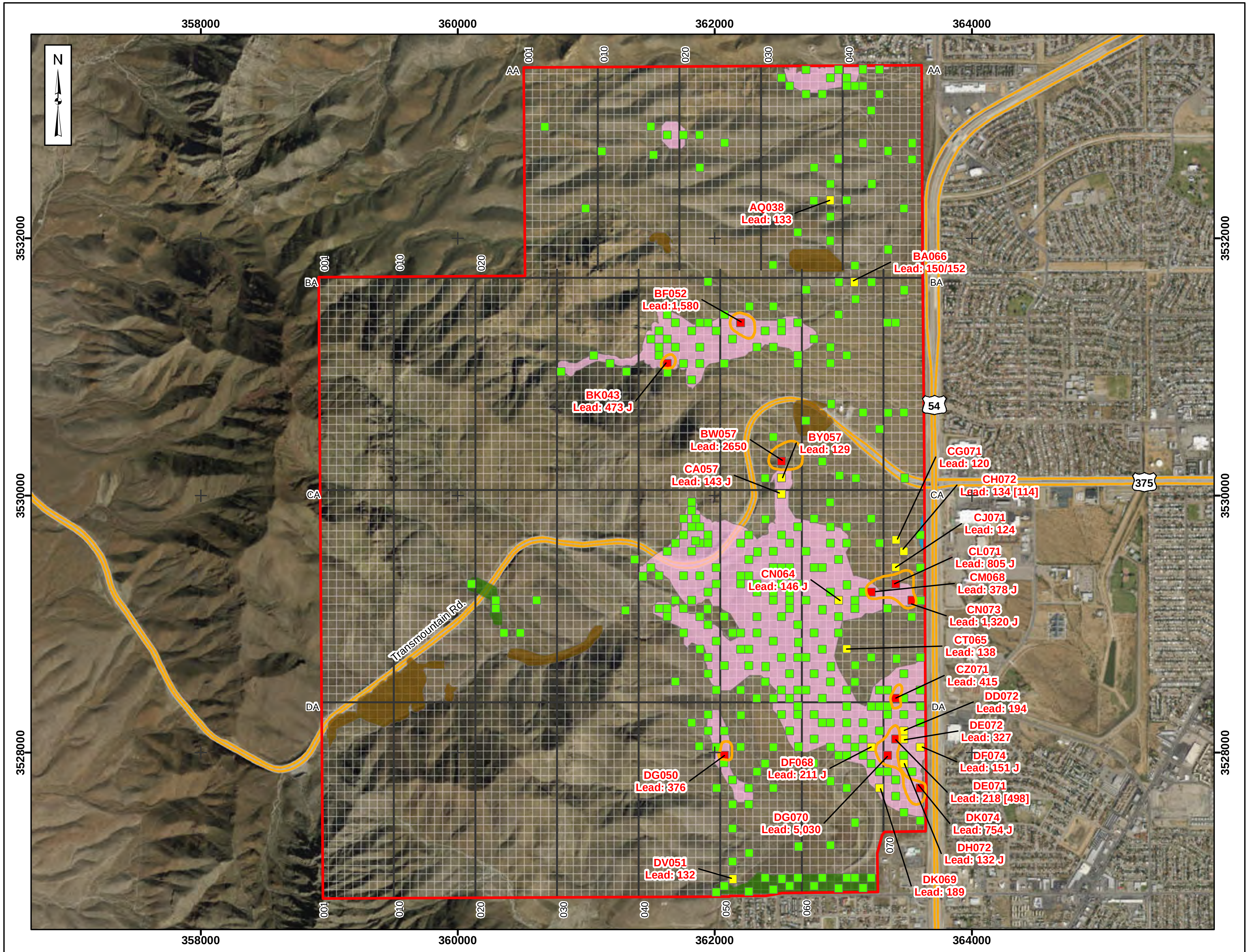
0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery

Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters

Figure 2-2
Ecological Conceptual Site Model (CSM)
Closed Castner Firing Range Munitions Response Site





Tier 2 Screening Level Ecological Risk Assessment
Closed Castner Firing Range MRS
Fort Bliss, TX

Figure 9-1
Lead Tier 2 Ecological PCL Exceedance Zones

Legend

- MRS Boundary
- CMUA - Additional MC Investigation Required
- NCMUA - No Additional MC Investigation Required
- Potential CMUA - Additional MC Investigation Required
- NCMUA - Additional MC Investigation
- Ecological Tier 2 Lead PCL Exceedance Zone
- Lead Concentration above Tier 2 PCL of 334 mg/kg
- Lead Concentration above TCEQ benchmark of 120 mg/kg and below Tier 2 PCL
- Lead Concentration below TCEQ benchmark of 120 mg/kg

CMUA = Concentration Munitions Use Area
RAL = Residential Assessment Level
PCL = Protective Concentration Level
NMCUA = Non Concentrated Munitions Use Area
All results are in mg/kg.

0 0.5 1
Miles

Data Sources: ESRI, ArcGIS Online, Aerial Imagery
Coordinate System: UTM, Zone 13N
Datum: NAD 83
Units: Meters
Contract: W912DY-10-D-0025-DS01

ATTACHMENT 1

El Paso County List of Rare Species

Last Revision: 7/25/2016 4:52:00 PM

EL PASO COUNTY

AMPHIBIANS		Federal Status	State Status
Northern leopard frog	*Rana pipiens*		

streams, ponds, lakes, wet prairies, and other bodies of water; will range into grassy, herbaceous areas some distance from water; eggs laid March-May and tadpoles transform late June-August; may have disappeared from El Paso County due to habitat alteration

BIRDS		Federal Status	State Status
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon *Falco peregrinus tundrius* DL

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Baird's Sparrow *Ammodramus bairdii*

shortgrass prairie with scattered low bushes and matted vegetation; mostly migratory in western half of State, though winters in Mexico and just across Rio Grande into Texas from Brewster through Hudspeth counties

Ferruginous Hawk *Buteo regalis*

open country, primarily prairies, plains, and badlands; nests in tall trees along streams or on steep slopes, cliff ledges, river-cut banks, hillsides, power line towers; year-round resident in northwestern high plains, wintering elsewhere throughout western 2/3 of Texas

Interior Least Tern *Sterna antillarum athalassos* LE E

subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Mexican Spotted Owl *Strix occidentalis lucida* LT T

remote, shaded canyons of coniferous mountain woodlands (pine and fir); nocturnal predator of mostly small rodents and insects; day roosts in densely vegetated trees, rocky areas, or caves

Montezuma Quail *Cyrtonyx montezumae*

open pine-oak or juniper-oak with ground cover of bunch grass on flats and slopes of semi-desert mountains and hills; travels in pairs or small groups; eats succulents, acorns, nuts, and weed seeds, as well as various invertebrates

Northern Aplomado Falcon *Falco femoralis septentrionalis* LE E open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species

Peregrine Falcon *Falco peregrinus* DL T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Prairie Falcon *Falco mexicanus*

open, mountainous areas, plains and prairie; nests on cliffs

Snowy Plover *Charadrius alexandrinus*

formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast

Southwestern Willow Flycatcher *Empidonax traillii extimus* LE E

thickets of willow, cottonwood, mesquite, and other species along desert streams

Sprague's Pipit *Anthus spragueii*

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl *Athene cunicularia hypugaea*

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Western Snowy Plover *Charadrius alexandrinus nivosus*

uncommon breeder in the Panhandle; potential migrant; winter along coast

Western Yellow-billed Cuckoo *Coccyzus americanus occidentalis* T

status applies only to western population beyond the Pecos River Drainage; breeds in riparian habitat and associated drainages; springs, developed wells, and earthen ponds supporting mesic vegetation; deciduous woodlands with cottonwoods and willows; dense understory foliage is important for nest site selection; nests in willow, mesquite, cottonwood, and hackberry; forages in similar riparian woodlands; breeding season mid-May-late Sept

FISHES Federal Status State Status

Bluntnose shiner *Notropis simus simus* T

extinct; Rio Grande; main river channel, often below obstructions over substrate of sand, gravel, and silt; damming and irrigation practices presumed major factors contributing to decline

Rio Grande silvery minnow *Hybognathus amarus* LE E

extirpated; historically Rio Grande and Pecos River systems and canals; reintroduced in Big Bend area; pools and backwaters of medium to large streams with low or moderate gradient in mud, sand, or gravel bottom; ingests mud and bottom ooze for algae and other organic matter; probably spawns on silt substrates of quiet coves

INSECTS

		Federal Status	State Status
A Royal moth	*Sphingicampa raspa*		

woodland - hardwood; with oaks, junipers, legumes and other woody trees and shrubs; good density of legume caterpillar foodplants must be present; Prairie acacia (Acacia augustissima) is the documented caterpillar foodplant, but there could be a few other woody legumes used

A tiger beetle	*Cicindela hornii*		

grassland/herbaceous; burrowing in or using soil; dry areas on hillside or mesas where soil is rocky or loamy and covered with grasses, invertivore; diurnal, hibernates/aestivates, active mostly for several days after heavy rains. the life cycle probably takes two years so larvae would always be present in burrows in the soil

Barbara Ann's tiger beetle	*Cicindela politula barbarannae*		

limestone outcrops in arid treeless environments or in openings within less arid pine-juniper-oak communities; open limestone substrate itself is almost certainly an essential feature; roads and trails

Poling's hairstreak	*Fixsenia polingi*		

oak woodland with Quercus grisea as substantial component, probably also uses Q. emoryi; larvae feed on new growth of Q. grisea, adults utilize nectar from a variety of flowers including milkweed and catslaw acacia; adults fly mid May - Jun, again mid Aug - early Sept

MAMMALS

		Federal Status	State Status
Big free-tailed bat	*Nyctinomops macrotis*		

habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Black bear	*Ursus americanus*		T

bottomland hardwoods and large tracts of inaccessible forested areas

Black-footed ferret	*Mustela nigripes*	LE	

extirpated; inhabited prairie dog towns in the general area

Black-tailed prairie dog	*Cynomys ludovicianus*		

dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Cave myotis bat	*Myotis velifer*		

colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore

Desert pocket gopher	*Geomys arenarius*		

cottonwood-willow association along the Rio Grande in El Paso and Hudspeth counties; live underground, but build large and conspicuous mounds; life history not well documented, but presumed to eat mostly vegetation, be active year round, and bear more than one litter per year

Gray wolf	*Canis lupus*	LE	E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Long-legged bat *Myotis volans*

in Texas, Trans-Pecos region; high, open woods and mountainous terrain; nursery colonies (which may contain several hundred individuals) form in summer in buildings, crevices, and hollow trees; apparently do not use caves as day roosts, but may use such sites at night; single offspring born June-July

Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens*

roosts in caves, abandoned mine tunnels, and occasionally old buildings; hibernates in groups during winter; in summer months, males and females separate into solitary roosts and maternity colonies, respectively; single offspring born May-June; opportunistic insectivore

Pecos River muskrat *Ondatra zibethicus ripensis*

creeks, rivers, lakes, drainage ditches, and canals; prefer shallow, fresh water with clumps of marshy vegetation, such as cattails, bulrushes, and sedges; live in dome-shaped lodges constructed of vegetation; diet is mainly vegetation; breed year round

Western red bat *Lasiurus blossevillii*

roosts in tree foliage in riparian areas, also inhabits xeric thorn scrub and pine-oak forests; likely winter migrant to Mexico; multiple pups born mid-May - late Jun

Western small-footed bat *Myotis ciliolabrum*

mountainous regions of the Trans-Pecos, usually in wooded areas, also found in grassland and desert scrub habitats; roosts beneath slabs of rock, behind loose tree bark, and in buildings; maternity colonies often small and located in abandoned houses, barns, and other similar structures; apparently occurs in Texas only during spring and summer months; insectivorous

MOLLUSKS — Federal Status — State Status

Franklin Mountain talus snail *Sonorella metcalfi*

terrestrial; bare rock, talus, scree; inhabits igneous talus most commonly of rhyolitic origin

Franklin Mountain wood snail *Ashmunella pasonis*

terrestrial; bare rock, talus, scree; talus slopes, usually of limestone, but also of rhyolite, sandstone, and siltstone, in arid mountain ranges

REPTILES — Federal Status — State Status

Big Bend slider *Trachemys gaigeae*

almost exclusively aquatic, sliders (Trachemys spp.) prefer quiet bodies of fresh water with muddy bottoms and abundant aquatic vegetation, which is their main food source; will bask on logs, rocks or banks of water bodies; breeding March-July

Chihuahuan Desert lyre snake *Trimorphodon vilkinsonii* — State Status: T

mostly crevice-dwelling in predominantly limestone-surfaced desert northwest of the Rio Grande from Big Bend to the Franklin Mountains, especially in areas with jumbled boulders and rock faults/fissures; secretive; egg-bearing; eats mostly lizards

Mountain short-horned lizard *Phrynosoma hernandesi* — State Status: T diurnal, usually in open, shrubby, or openly wooded areas with sparse vegetation at ground level; soil may vary from rocky to sandy; burrows into soil or occupies rodent burrow when inactive; eats ants, spiders, snails, sowbugs, and other invertebrates; inactive during cold weather; breeds March-September

New Mexico garter snake *Thamnophis sirtalis dorsalis*

nearly any type of wet or moist habitat; irrigation ditches, and riparian-corridor farmlands, less often in running water; home range about 2 acres; active year round in warm weather, both diurnal and nocturnal, more nocturnal during hot weather; bears litter July-August

Texas horned lizard *Phrynosoma cornutum* T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

PLANTS   Federal Status   State Status

Bigelow's desert grass *Blepharidachne bigelovii*

GLOBAL RANK: G4; Restricted to xeric limestone or various gypsum-influenced habitats; Perennial; Flowering March-Dec; Fruiting March-Dec

Comal snakewood *Colubrina stricta*

in El Paso County, found in a patch of thorny shrubs in colluvial deposits and sandy soils at the base of an igneous rock outcrop; the historic Comal County record does not describe the habitat; in Mexico ,found in shrublands on calcareous, gravelly, clay soils with woody associates; flowering late spring or early summer

Desert night-blooming cereus *Peniocereus greggii var greggii*

Chihuahuan Desert shrublands or shrub invaded grasslands in alluvial or gravelly soils at lower elevations, 1200-1500 m (3900-4900 ft), on slopes, benches, arroyos, flats, and washes; flowering synchronized over a few nights in early May to late June when almost all mature plants bloom, flowers last only one day and open just after dark, may flower as early as April

Fleshy tidestromia *Tidestromia carnosa*

GLOBAL RANK: G2G4; Occurs in saline or gypseous soils in open situations; Annual; Flowering March-Nov; Fruiting April-Nov

Great sage *Salvia summa*

GLOBAL RANK: G3?; Limestone cliffs and slopes in the Guadalupe and Franklin Mountains; Perennial; Flowering April-June; Fruiting May-Oct

Hawksworth's mistletoe *Phoradendron hawksworthii*

GLOBAL RANK: G3; Parasitic on Juniperus in the mountains of the Trans-Pecos and at lower elevations on the western Edwards Plateau; Perennial; Flowering/Fruiting April-Dec

Hueco rock-daisy *Perityle huecoensis*

north-facing or otherwise mostly shaded limestone cliff faces within relatively mesic canyon system; flowering spring-fall

Mt. Davis brickellbush *Brickellia parvula*

GLOBAL RANK: G3; Occurs on rocky slopes and ridges in the mountains of the southwestern U.S. at elevations between 1200 and 2100 m; Perennial; Flowering Aug-Sept; Fruiting Sept-Oct

Payson's hiddenflower *Cryptantha paysonii*

GLOBAL RANK: G3; Rocky limestone slopes in mountains; Perennial; Flowering May; Fruiting May-June

Plank's catchfly *Silene plankii*

GLOBAL RANK: G2; Franklin Mountains of El Paso County, occurring in crevices on shaded igneous cliff faces above ca. 5000 ft.; Perennial; Flowering summer-early autumn

Sand prickly-pear *Opuntia arenaria*

deep, loose or semi-stabilized sands in sparsely vegetated dune or sandhill areas, or sandy floodplains in arroyos; flowering May-June

Sand sacahuista *Nolina arenicola*

Texas endemic; mesquite-sand sage shrublands on windblown Quarternary reddish sand in dune areas; flowering time uncertain May-June, June-September

Sneed's pincushion cactus *Escobaria sneedii var sneedii* LE E

xeric limestone outcrops on rocky, usually steep slopes in desert mountains, in the Chihuahuan Desert succulent shrublands or grasslands; flowering April-September (peak usually in April, sometimes opportunistically after summer rains; fruiting August - November

Texas false saltgrass *Allolepis texana*

Sandy to silty soils of valley bottoms and river floodplains, not generally on alkaline or saline sites; Perennial; Flowering (May-) July-October depending on rainfall

Waterfall's milkvetch *Astragalus waterfallii*

GLOBAL RANK: G3?; Rocky limestone slopes; Perennial; Flowering Feb-May; Fruiting April- May

Wheeler's spurge *Chamaesyce geyeri var wheeleriana*

sparingly vegetated, loose eolian quartz sand on reddish sand dunes or coppice mounds; flowering and fruiting at least August-September, probably earlier and later, as well

ATTACHMENT 2

Data Summary

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

Location ID	Sample ID	Sample Type	Sample Date	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
AA035	CR-MIS-AA035-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	4.7	0.3	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA039	FTBL-IS-148-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AA039	FTBL-IS-148-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	0.0059 NJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
AA042	CR-IS-AA042-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA042	CR-IS-AA042-01B_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA042	CR-IS-AA042-01C_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AA044	FTBL-IS-149-070116-A	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.083 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AA044	FTBL-IS-149-070116-B	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.067 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AA044	FTBL-IS-149-070116-C	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.078 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	0.16 NJ	< 0.081 UJ
AB032	FTBL-IS-145-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AB032	FTBL-IS-145-110216R	N	11/2/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	0.084 NJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
AB038	FTBL-IS-146-070116-A	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	0.32	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.075 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
AB038	FTBL-IS-146-070116-B	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.072 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AB038	FTBL-IS-146-070116-C	N	7/1/2016	< 0.081 U	< 0.041 U	< 0.041 U	0.076 NJ	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.091 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
AB040	FTBL-IS-147-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AB040	FTBL-IS-147-110116R	N	11/1/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	0.0080 NJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	0.014 NJ	0.32	< 0.020 UJ	< 0.20 U	< 0.080 U
AC033	FTBL-IS-141-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AC033	FTBL-IS-141-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
AC040	FTBL-IS-144-070516	N	7/5/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
AC040	FTBL-IS-144-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.33	< 0.021 UJ	< 0.21 U	< 0.081 U
AC041	CR-MIS-AC041-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AC042	CR-MIS-AC042-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AD035	FTBL-IS-142-070516	N	7/5/2016	< 0.082 UJ	< 0.041 U	< 0.041 UJ	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.077 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.082 UJ
AD035	FTBL-IS-142-110116R	N	11/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
AD037	FTBL-IS-143-070516	N	7/5/2016	< 0.081 UJ	< 0.041 U	< 0.041 UJ	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.071 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
AD037	FTBL-IS-143-110116R	N	11/1/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 UJ	< 0.20 U	< 0.080 U
AD044	CR-MIS-AD044-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	0.6	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AF043	CR-MIS-AF043-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AF043	CR-MIS-AF043-01B_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AF043	CR-MIS-AF043-01C_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AH003	CR-MIS-AH003-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AI018	CR-MIS-AI018-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	1.9	0.1	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	1	< 0.08 ND	< 0.579 ND	< 0.091 ND
AI020	CR-MIS-AI020-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AI022	FTBL-IS-157-012517	N	1/25/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	0.027 JN	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
AJ042	CR-IS-AJ042-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AJ048	CR-IS-AJ048-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AK010	CR-MIS-AK010-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AK016	FTBL-IS-150-071416	N	7/14/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.059 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
AK045	CR-IS-AK045-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AL039	CR-IS-AL039-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AL048	CR-MIS-AL048-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AM036	CR-MIS-AM036-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AO043	CR-IS-AO043-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AQ038	CR-IS-AQ038-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AR008	CR-MIS-AR008-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AR047	CR-MIS-AR047-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AT004	CR-IS-AT004-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AU005	CR-IS-AU005-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AV017	CR-IS-AV017-01_09112012	N	9/11/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AV038	CR-IS-AV038-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AW045	CR-IS-AW045-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
AY041	FTBL-IS-166-012717	N	1/27/2017	< 0.081 U	< 0.041 U	< 0.041 U	0.072 NJ	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.0092 NJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
BA048	CR-MIS-BA048-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BA066	CR-IS-BA066-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BB051	CR-IS-BB051-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BB072	CR-IS-BB072-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BC058	CR-IS-BC058-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BD056	CR-MIS-BD056-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.1	< 0.08 ND	< 0.579 ND	< 0.091 ND

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
BE043	FTBL-IS-135-062816-A	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE043	FTBL-IS-135-062816-B	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE043	FTBL-IS-135-062816-C	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE043	FTBL-IS-135-110316A-R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	R
BE043	FTBL-IS-135-110316B-R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BE043	FTBL-IS-135-110316C-R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BE050	FTBL-IS-138-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BE050	FTBL-IS-138-110316R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.015 J	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BE058	CR-IS-BE058-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BE064	CR-MIS-BE064-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF044	FTBL-IS-136-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.17 J	< 0.021 U	< 0.21 U	< 0.081 UJ
BF047	CR-MIS-BF047-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.1	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF048	FTBL-IS-137-062716	N	6/27/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.051 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.11 NJ	< 0.021 U	< 0.21 U	< 0.082 UJ
BF052	CR-MIS-BF052-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.2	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF057	CR-MIS-BF057-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF059	FTBL-IS-140-062716-A	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.022 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.054 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.023 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BF059	FTBL-IS-140-062716-B	N	6/27/2016	0.050 NJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.063 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.097 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BF059	FTBL-IS-140-062716-C	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.024 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.045 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BF070	CR-MIS-BF070-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BF071	CR-MIS-BF071-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BG042	FTBL-IS-127-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 U	< 0.21 U	< 0.081 UJ
BG049	FTBL-IS-129-062716	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.073 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.099 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BG055	FTBL-IS-139-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BG055	FTBL-IS-139-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.013 NJ	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BH041	FTBL-IS-126-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 U	< 0.21 U	< 0.081 UJ
BH043	CR-MIS-BH043-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BH051	FTBL-1S-130-103116R	N	10/31/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 U	< 0.021 U	0.069 NJ	< 0.021 UJ	< 0.21 U	< 0.081 U
BH051	FTBL-IS-130-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BH061	FTBL-IS-134-062816	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BH061	FTBL-IS-134-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.029 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BI042	CR-MIS-BI042-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.3	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI044	CR-MIS-BI044-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.1	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI047	FTBL-IS-128-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BI047	FTBL-IS-128-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.081 UJ
BI054	FTBL-1S-131-103116R	N	10/31/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 UJ	< 0.020 U	< 0.020 UJ	--	< 0.040 U	< 0.020 U	< 0.040 UJ	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 UJ	< 0.20 U	< 0.080 U
BI054	FTBL-IS-131-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BI056	FTBL-IS-132-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BI056	FTBL-IS-132-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BI063	CR-MIS-BI063-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BI072	CR-IS-BI072-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BJ034	FTBL-IS-117-070116	N	7/1/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.062 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
BJ042	FTBL-IS-120-063016	N	6/30/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.032 U	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	0.12 NJ	< 0.020 U	< 0.20 U	< 0.080 UJ
BJ059	FTBL-IS-133-062816	N	6/28/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BJ059	FTBL-IS-133-110216R	N	11/2/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.013 NJ	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
BJ065	CR-MIS-BJ065-01_02172011	N	2/17/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BK036	FTBL-IS-118-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 U	< 0.21 U	< 0.081 UJ
BK043	FTBL-IS-121-062716-A	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.11 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BK043	FTBL-IS-121-062716-B	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.037 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.38 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.23 UJ
BK043	FTBL-IS-121-062716-C	N	6/27/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.026 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.13 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BK045	FTBL-IS-122-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.11 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
BK047	FTBL-IS-124-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BK047	FTBL-IS-124-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	0.088 J	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.080 UJ
BK050	FTBL-IS-125-062916	N	6/29/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
BK050	FTBL-IS-125-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.081 UJ
BK059	CR-MIS-BK059-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BL030	FTBL-IS-116-070116	N	7/1/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.079 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
BL038	FTBL-IS-119-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	0.11 NJ	< 0.021 U	< 0.21 U	< 0.081 UJ
BM046	FTBL-IS-123-063016	N	6/30/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.056 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
BM073	CR-IS-BM073-01_09102012	N	9/10/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BP063	CR-IS-BP063-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BQ067	FTBL-IS-174-012417	N	1/24/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
BQ070	FTBL-IS-151-071416	N	7/14/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.081 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
BQ072	CR-MIS-BQ072-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.2	< 0.08 ND	< 0.579 ND	< 0.091 ND
BR060	CR-MIS-BR060-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BT056	CR-MIS-BT056-01_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BT056	CR-MIS-BT056-01B_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BT056	CR-MIS-BT056-01C_02042011	N	2/4/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BW062	CR-MIS-BW062-01_02032011	N	2/3/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BY057	CR-MIS-BY057-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
BY064	FTBL-IS-152-071416	N	7/14/2016	< 0.08 U	< 0.04 U	< 0.04 U	< 0.08 U	< 0.02 UJ	< 0.02 U	< 0.02 U	< 0.2 UJ	< 0.06 U	< 0.02 U	< 0.04 U	< 0.2 U	< 0.02 U	< 0.2 U	< 0.02 UJ	< 0.2 UJ	< 0.08 UJ
BY072	CR-IS-BY072-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CA057	FTBL-IS-110-061316	N	6/13/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CA057	FTBL-IS-110-110316R	N	11/3/2016	< 0.083 UJ	< 0.042 UJ	< 0.042 UJ	< 0.083 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.042 U	< 0.021 U	< 0.042 U	< 0.21 U	0.014 NJ	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.083 UJ
CA070	CR-IS-CA070-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CC046	FTBL-IS-109-071216	N	7/12/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.076 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
CC046	FTBL-IS-109-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CD045	FTBL-IS-108-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.030 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.083 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CD061	CR-MIS-CD061-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CD061	FTBL-IS-105-061316	N	6/13/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CD061	FTBL-IS-105-110316R	N	11/3/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.022 UJ	0.0087 J	0.0092 J	--	< 0.041 U	0.014 NJ	< 0.041 U	< 0.21 U	0.014 J	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.080 UJ
CD068	CR-MIS-CD068-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE046	FTBL-IS-096-071216	N	7/12/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.013 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
CE046	FTBL-IS-096-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CE047	CR-MIS-CE047-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE056	CR-IS-CE056-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CE059	FTBL-IS-104-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CE063	FTBL-IS-106-061316	N	6/13/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CE063	FTBL-IS-106-110316R	N	11/3/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.021 UJ	0.013 NJ	0.015 NJ	--	< 0.040 U	0.017 NJ	< 0.040 U	< 0.20 U	0.012 NJ	< 0.20 UJ	< 0.020 U	< 0.20 U	< 0.081 UJ
CE065	CR-MIS-CE065-01_02072011	N	2/7/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CF045	FTBL-IS-092-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.067 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CF048	CR-MIS-CF048-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CF053	FTBL-IS-099-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CF053	FTBL-IS-099-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	0.0099 NJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.013 J	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CF057	FTBL-IS-103-061716	N	6/17/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.042 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	R	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CF074	FTBL-IS-107-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CF074	FTBL-IS-107-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	0.0052 NJ	0.11 J	< 0.021 UJ	< 0.21 UJ	R
CG044	FTBL-IS-091-071116	N	7/11/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 U	< 0.028 UJ	< 0.021 UJ	< 0.021 U	< 0.21 UJ	< 0.071 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CG044	FTBL-IS-091-111416R	N	11/14/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 U	--	< 0.040 U	< 0.020 UJ	< 0.040 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
CG046	FTBL-IS-095-071216	N	7/12/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.071 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
CG046	FTBL-IS-095-111416R	N	11/14/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 U	--	< 0.040 U	< 0.020 UJ	< 0.040 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
CG047	CR-MIS-CG047-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG048	FTBL-IS-094-071216	N	7/12/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
CG048	FTBL-IS-094-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	0.0084 NJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CG052	FTBL-IS-098-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CG052	FTBL-IS-098-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.017 J	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CG058	CR-MIS-CG058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG058	CR-MIS-CG058-01B_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG058	CR-MIS-CG058-01C_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG063	CR-MIS-CG063-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG065	FTBL-IS-102-061716	N	6/17/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CG065	FTBL-IS-102-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.044 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CG069	CR-MIS-CG069-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CG071	FTBL-IS-153-071416	N	7/14/2016	< 0.08 U	< 0.04 U	< 0.04 U	< 0.08 U	< 0.02 UJ	< 0.02 U	< 0.02 U	< 0.2 UJ	< 0.12 U	< 0.02 U	< 0.04 U	< 0.2 U	< 0.02 U	< 0.2 U	< 0.02 UJ	< 0.2 UJ	< 0.08 UJ
CH043	FTBL-IS-090-070816	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.026 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.093 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH043	FTBL-IS-090-111416R	N	11/14/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
CH046	FTBL-IS-093-070816-A	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.024 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.11 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
CH046	FTBL-IS-093-070816-B	N	7/8/2016	0.032 NJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.081 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CH046	FTBL-IS-093-070816-C	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.085 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH046	FTBL-IS-093-111416A-R	N	11/14/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
CH046	FTBL-IS-093-111416B-R	N	11/14/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
CH046	FTBL-IS-093-111416C-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CH054	CR-IS-CH054-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CH056	FTBL-IS-100-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	0.013 NJ	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CH060	FTBL-IS-101-061716	N	6/17/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	0.030 NJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CH072	CR-MIS-CH072-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CI039	CR-MIS-CI039-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CI053	FTBL-IS-097-062216-A	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CI053	FTBL-IS-097-062216-B	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CI053	FTBL-IS-097-062216-C	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CI053	FTBL-IS-097-111116A-R	N	11/11/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.080 UJ
CI053	FTBL-IS-097-111116B-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CI053	FTBL-IS-097-111116C-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CI064	CR-MIS-CI064-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ041	FTBL-IS-084-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CJ041	FTBL-IS-084-102716R	N	10/27/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.027 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CJ049	FTBL-IS-087-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CJ056	CR-MIS-CJ056-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-03_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-03B_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ056	CR-MIS-CJ056-03C_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ057	CR-MIS-CJ057-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ058	CR-MIS-CJ058-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CJ061	FTBL-IS-089-061716	N	6/17/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CJ062	CR-MIS-CJ062-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK040	CR-IS-CK040-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK042	CR-MIS-CK042-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK045	FTBL-IS-085-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CK045	FTBL-IS-085-102716R	N	10/27/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CK047	FTBL-1S-086-103116R	N	10/31/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 U
CK047	FTBL-IS-086-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CK052	FTBL-IS-088-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CK052	FTBL-IS-088-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.0047 NJ	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CK053	CR-MIS-CK053-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CK058	CR-MIS-CK058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL019	FTBL-IS-115-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.081 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CL049	CR-MIS-CL049-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL052	FTBL-IS-081-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CL052	FTBL-IS-081-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CL054	CR-MIS-CL054-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL057	FTBL-IS-083-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CL059	CR-MIS-CL059-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL065	CR-IS-CL065-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL065	CR-IS-CL065-01B_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL065	CR-IS-CL065-01C_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CL071	FTBL-IS-076-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CL071	FTBL-IS-076-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CM048	FTBL-1S-080-103116R	N	10/31/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 U	0.0063 NJ	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.081 U
CM048	FTBL-IS-080-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CM054	FTBL-IS-082-062116-A	N	6/21/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CM054	FTBL-IS-082-062116-B	N	6/21/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.20 UJ	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 U	< 0.080 UJ
CM054	FTBL-IS-082-062116-C	N	6/21/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CM056	CR-MIS-CM056-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM058	CR-MIS-CM058-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM063	FTBL-IS-073-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
CM063	FTBL-IS-073-110916R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CM067	CR-MIS-CM067-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CM068	FTBL-IS-075-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CM068	FTBL-IS-075-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.012 NJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CM072	CR-IS-CM072-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN022	FTBL-IS-114-070816-A	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.098 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	0.060 NJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CN022	FTBL-IS-114-070816-B	N	7/8/2016	< 8.6 UJ	< 4.3 U	< 4.3 U	< 8.6 U	< 3.1 UJ	< 2.2 U	< 2.2 U	< 22 UJ	< 11 U	< 2.2 UJ	< 4.3 U	< 22 U	< 2.2 U	< 22 UJ	< 2.2 UJ	< 22 U	< 8.6 UJ
CN022	FTBL-IS-114-070816-C	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.090 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CN022	FTBL-IS-114-111416A-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CN022	FTBL-IS-114-111416B-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CN022	FTBL-IS-114-111416C-R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CN027	CR-MIS-CN027-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN044	FTBL-IS-078-062316	N	6/23/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
CN046	FTBL-IS-079-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN046	FTBL-IS-079-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	0.023 NJ	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CN056	CR-MIS-CN056-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN058	CR-MIS-CN058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN060	FTBL-IS-072-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN060	FTBL-IS-072-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
CN064	FTBL-IS-074-060916-A	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN064	FTBL-IS-074-060916-B	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN064	FTBL-IS-074-060916-C	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN064	FTBL-IS-074-110916A-R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CN064	FTBL-IS-074-110916B-R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CN064	FTBL-IS-074-110916C-R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CN066	CR-MIS-CN066-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CN073	FTBL-IS-077-060916-A	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN073	FTBL-IS-077-060916-B	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN073	FTBL-IS-077-060916-C	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CN073	FTBL-IS-077-110416A-R	N	11/4/2016	< 0.080 UJ	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 UJ	< 0.020 U	< 0.020 U	--	0.028 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 UJ	< 0.20 U	< 0.080 UJ
CN073	FTBL-IS-077-110416B-R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.022 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
CN073	FTBL-IS-077-110416C-R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 U
CO022	FTBL-IS-113-070816	N	7/8/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.086 U	< 0.021 UJ	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 U	< 0.081 UJ
CO022	FTBL-IS-113-111416R	N	11/14/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 U	--	< 0.041 U	< 0.021 UJ	< 0.041 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CO038	FTBL-IS-154-071416	N	7/14/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.057 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
CO042	FTBL-IS-065-062316	N	6/23/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
CO043	CR-MIS-CO043-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO045	FTBL-IS-067-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CO048	CR-IS-CO048-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO058	CR-MIS-CO058-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO062	CR-IS-CO062-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO066	CR-MIS-CO066-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CO070	FTBL-IS-071-060916	N	6/9/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CO070	FTBL-IS-071-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.023 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CP043	FTBL-IS-066-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CP047	FTBL-IS-068-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CP047	FTBL-IS-068-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CP050	FTBL-IS-069-062216	N	6/22/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CP050	FTBL-IS-069-111116-R	N	11/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.0098 NJ	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CP054	CR-MIS-CP054-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CP057	CR-MIS-CP057-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CP064	FTBL-IS-070-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CP064	FTBL-IS-070-110916R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CQ048	FTBL-IS-063-070616	N	7/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CQ048	FTBL-IS-063-111116-R	N	11/11/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 U	< 0.20 UJ	< 0.080 UJ
CQ059	FTBL-IS-064-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CQ059	FTBL-IS-064-110916R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CQ072	CR-IS-CQ072-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroanilin e	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
CR023	FTBL-IS-111-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.077 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CR025	FTBL-IS-112-071116	N	7/11/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.090 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CR045	FTBL-IS-056-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.084 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CR051	CR-MIS-CR051-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CR052	FTBL-IS-058-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CR054	FTBL-IS-059-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CR061	FTBL-IS-061-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CR061	FTBL-IS-061-110916R	N	11/9/2016	< 0.081 UJ	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.081 UJ
CR064	FTBL-IS-062-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CR064	FTBL-IS-062-110916R	N	11/9/2016	< 0.082 UJ	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.082 UJ
CS049	FTBL-IS-057-070716	N	7/7/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	1.3	< 0.021 U	< 0.21 U	0.13 J	< 0.21 U	< 0.081 UJ
CS056	FTBL-IS-060-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CS059	CR-IS-CS059-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CT047	FTBL-IS-048-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.024 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.080 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CT052	FTBL-IS-051-062116	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CT053	CR-MIS-CT053-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CT062	FTBL-IS-054-061016	N	6/10/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CT062	FTBL-IS-054-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.092 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
CU048	FTBL-IS-049-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.091 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
CU057	FTBL-IS-053-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	0.017 NJ	< 0.21 U	< 0.081 UJ
CU059	CR-MIS-CU059-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU060	CR-MIS-CU060-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU068	CR-MIS-CU068-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU071	CR-IS-CU071-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CU074	FTBL-IS-055-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CU074	FTBL-IS-055-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	0.012 NJ	< 0.020 U	< 0.020 U	--	0.025 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CV050	FTBL-IS-050-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	0.11 J	< 0.021 U	< 0.21 U	0.011 NJ	< 0.21 U	< 0.082 UJ
CV053	FTBL-IS-052-062116-A	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CV053	FTBL-IS-052-062116-B	N	6/21/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CV053	FTBL-IS-052-062116-C	N	6/21/2016	< 0.081 U	< 0.041 UJ	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 U	< 0.21 U	< 0.081 UJ
CV055	CR-IS-CV055-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CV063	CR-IS-CV063-01_09132012	N	9/13/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CV066	FTBL-IS-188-012317	N	1/23/2017	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 U
CW048	FTBL-IS-047-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.14 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CW058	CR-MIS-CW058-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CW061	FTBL-IS-043-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	0.017 NJ	< 0.21 U	< 0.081 UJ
CW072	CR-MIS-CW072-01_02092011	N	2/9/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CX055	FTBL-IS-041-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CX063	FTBL-IS-044-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CX066	CR-MIS-CX066-01_02082011	N	2/8/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY049	FTBL-IS-039-062316	N	6/23/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 UJ
CY052	FTBL-IS-040-062316	N	6/23/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CY057	CR-MIS-CY057-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY059	CR-MIS-CY059-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY060	FTBL-IS-042-062016	N	6/20/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	0.019 NJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CY065	FTBL-IS-045-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CY065	FTBL-IS-045-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
CY069	CR-MIS-CY069-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY070	CR-MIS-CY070-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CY074	FTBL-IS-046-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CY074	FTBL-IS-046-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.019 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
CZ056	CR-MIS-CZ056-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ058	CR-MIS-CZ058-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ062	CR-MIS-CZ062-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ071	CR-MIS-CZ071-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
CZ072	CR-MIS-CZ072-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA053	CR-IS-DA053-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA059	CR-MIS-DA059-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
DA059	CR-MIS-DA059-01B_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA059	CR-MIS-DA059-01C_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA065	FTBL-IS-036-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DA065	FTBL-IS-036-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
DA068	CR-MIS-DA068-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA069	CR-MIS-DA069-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DA070	FTBL-IS-037-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DA070	FTBL-IS-037-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
DA074	FTBL-IS-038-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DA074	FTBL-IS-038-110416R	N	11/4/2016	< 0.081 U	< 0.041 U	< 0.041 U	< 0.081 U	< 0.021 U	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	0.011 NJ	< 0.21 U	< 0.021 U	< 0.21 U	< 0.081 UJ
DB048	FTBL-IS-034-070716	N	7/7/2016	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 UJ	< 0.021 U	< 0.021 U	< 0.21 UJ	< 0.077 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 UJ	< 0.21 U	< 0.082 UJ
DB052	FTBL-IS-191-012317	N	1/23/2017	< 0.082 U	< 0.041 U	< 0.041 U	< 0.082 U	< 0.021 U	< 0.021 U	< 0.021 U	--	0.020 JN	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.021 U	< 0.21 U	< 0.082 U
DB057	FTBL-IS-035-061516-A	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DB057	FTBL-IS-035-061516-B	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DB057	FTBL-IS-035-061516-C	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DB057	FTBL-IS-035-111016A-R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0081 J	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DB057	FTBL-IS-035-111016B-R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DB057	FTBL-IS-035-111016C-R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DB059	CR-MIS-DB059-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DB061	CR-MIS-DB061-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DB070	CR-MIS-DB070-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DB072	CR-MIS-DB072-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC062	CR-MIS-DC062-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC063	CR-MIS-DC063-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC065	FTBL-IS-029-061516	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DC065	FTBL-IS-029-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DC067	CR-MIS-DC067-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DC074	FTBL-IS-033-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DC074	FTBL-IS-033-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.027 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
DD048	FTBL-IS-026-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD048	FTBL-IS-026-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DD050	FTBL-IS-027-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD050	FTBL-IS-027-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DD054	FTBL-IS-155-071416	N	7/14/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD054	FTBL-IS-155-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DD058	CR-MIS-DD058-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DD069	FTBL-IS-031-061616	N	6/16/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DD069	FTBL-IS-031-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DD072	CR-MIS-DD072-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE061	FTBL-IS-028-061516	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DE061	FTBL-IS-028-110816R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.093 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DE065	CR-MIS-DE065-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE067	CR-MIS-DE067-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE071	CR-MIS-DE071-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE071	CR-MIS-DE071-01B_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE071	CR-MIS-DE071-01C_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DE072	CR-MIS-DE072-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF049	FTBL-IS-024-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF049	FTBL-IS-024-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF056	CR-MIS-DF056-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF059	CR-IS-DF059-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF063	CR-MIS-DF063-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF066	CR-MIS-DF066-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DF068	FTBL-IS-030-061516-A	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF068	FTBL-IS-030-061516-B	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF068	FTBL-IS-030-061516-C	N	6/15/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF068	FTBL-IS-030-110816A-R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF068	FTBL-IS-030-110816B-R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
DF068	FTBL-IS-030-110816C-R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DF074	FTBL-IS-032-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DF074	FTBL-IS-032-110416R	N	11/4/2016	< 0.080 U	< 0.040 U	< 0.040 U	< 0.080 U	< 0.020 U	< 0.020 U	< 0.020 U	--	0.032 NJ	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.020 U	< 0.20 U	< 0.080 UJ
DG050	FTBL-IS-025-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DG050	FTBL-IS-025-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DG064	CR-MIS-DG064-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG065	FTBL-IS-021-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DG065	FTBL-IS-021-110716R	N	11/7/2016	< 0.081 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 U	< 0.020 U	--	< 0.040 U	< 0.020 U	< 0.040 U	< 0.20 U	< 0.020 U	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.081 UJ
DG067	CR-MIS-DG067-01_02152011	N	2/15/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG070	CR-MIS-DG070-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG072	CR-MIS-DG072-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG072	CR-MIS-DG072-01B_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DG072	CR-MIS-DG072-01C_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH055	CR-MIS-DH055-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH055	CR-MIS-DH055-01B_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH055	CR-MIS-DH055-01C_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH068	CR-MIS-DH068-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DH072	FTBL-IS-022-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DH072	FTBL-IS-022-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.042 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DI054	CR-MIS-DI054-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	0.6	< 0.091 ND
DI069	CR-MIS-DI069-01_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI069	CR-MIS-DI069-01B_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI069	CR-MIS-DI069-01C_02142011	N	2/14/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI070	CR-MIS-DI070-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DI073	FTBL-IS-023-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DI073	FTBL-IS-023-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.049 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DJ051	FTBL-IS-017-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DJ051	FTBL-IS-017-111016R	N	11/10/2016	R	< 0.042 UJ	< 0.042 UJ	< 0.083 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.042 UJ	< 0.021 UJ	< 0.042 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DJ063	CR-IS-DJ063-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DJ071	CR-MIS-DJ071-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK053	FTBL-IS-018-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DK053	FTBL-IS-018-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DK056	CR-MIS-DK056-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK065	CR-MIS-DK065-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DK069	FTBL-IS-019-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DK069	FTBL-IS-019-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.063 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DK074	FTBL-IS-020-060816	N	6/8/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DK074	FTBL-IS-020-110716R	N	11/7/2016	< 0.080 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.080 UJ
DL071	CR-MIS-DL071-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DM051	FTBL-IS-013-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DM051	FTBL-IS-013-111016R	N	11/10/2016	R	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DM053	FTBL-IS-014-060616	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DM053	FTBL-IS-014-111016R	N	11/10/2016	R	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DN062	CR-IS-DN062-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DN062	CR-IS-DN062-01B_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DN062	CR-IS-DN062-01C_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DN072	FTBL-IS-015-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DN072	FTBL-IS-015-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 U	< 0.021 U	< 0.041 UJ	< 0.21 UJ	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DO066	CR-IS-DO066-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DO074	FTBL-IS-016-060716	N	6/7/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DO074	FTBL-IS-016-110716R	N	11/7/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.081 UJ
DR059	CR-IS-DR059-01_09122012	N	9/12/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DR063	CR-MIS-DR063-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	0.09	< 0.08 ND	< 0.579 ND	< 0.091 ND
DT051	CR-MIS-DT051-01_02102011	N	2/10/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV051	CR-IS-DV051-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV055	FTBL-IS-004-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV055	FTBL-IS-004-110816R	N	11/8/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.082 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DV057	CR-IS-DV057-01_09142012	N	9/14/2012	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND

Attachment 2 Table 1
ISM Sample Results - Explosives
Closed Castner Firing Range

			Analyte	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3,5-Dinitroaniline	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	RDX	Nitro-benzene	Nitro-glycerin	HMX	Pentaerythritol Tetranitrate	Tetryl
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																	
DV059	FTBL-IS-007-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV059	FTBL-IS-007-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DV062	FTBL-IS-009-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV062	FTBL-IS-009-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 U	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0084 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DV065	FTBL-IS-011-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DV065	FTBL-IS-011-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.023 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DV066	CR-MIS-DV066-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DV068	CR-MIS-DV068-01_02112011	N	2/11/2011	< 0.079 ND	< 0.063 ND	< 0.083 ND	< 0.083 ND	< 0.083 ND	< 0.075 ND	< 0.066 ND	< 0.08 ND	< 0.071 ND	< 0.075 ND	< 0.08 ND	< 0.08 ND	< 0.075 ND	< 0.085 ND	< 0.08 ND	< 0.579 ND	< 0.091 ND
DW050	FTBL-IS-002-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW050	FTBL-IS-002-110816R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.074 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DW056	FTBL-IS-005-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW056	FTBL-IS-005-110816R	N	11/8/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DW058	FTBL-IS-006-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW058	FTBL-IS-006-110716R	N	11/7/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 Ui	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
DW061	FTBL-IS-008-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW061	FTBL-IS-008-110716R	N	11/7/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 U	< 0.021 U	--	< 0.041 U	< 0.021 U	< 0.041 U	< 0.21 U	< 0.021 U	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.082 UJ
DW064	FTBL-IS-010-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW064	FTBL-IS-010-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0066 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DW067	FTBL-IS-012-060216	N	6/2/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DW067	FTBL-IS-012-102816R	N	10/28/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	0.0074 NJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.080 UJ
DX049	FTBL-IS-001-060316	N	6/3/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX049	FTBL-IS-001-110816R	N	11/8/2016	< 0.080 UJ	< 0.040 UJ	< 0.040 UJ	< 0.080 UJ	< 0.020 UJ	< 0.020 UJ	< 0.020 UJ	--	< 0.040 UJ	< 0.020 UJ	< 0.040 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	< 0.020 UJ	< 0.20 UJ	R
DX053	FTBL-IS-003-060616-A	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX053	FTBL-IS-003-060616-B	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX053	FTBL-IS-003-060616-C	N	6/6/2016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
DX053	FTBL-IS-003-110816A-R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R
DX053	FTBL-IS-003-110816B-R	N	11/8/2016	< 0.081 UJ	< 0.041 UJ	< 0.041 UJ	< 0.081 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.041 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	0.067 NJ	< 0.021 UJ	< 0.21 UJ	R
DX053	FTBL-IS-003-110816C-R	N	11/8/2016	< 0.082 UJ	< 0.041 UJ	< 0.041 UJ	< 0.082 UJ	< 0.021 UJ	< 0.021 UJ	< 0.021 UJ	--	< 0.073 UJ	< 0.021 UJ	< 0.041 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	< 0.021 UJ	< 0.21 UJ	R

Notes
HMX Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
mg/kg milligram/kilogram
RDX Hexahydro-1,3,5-trinitro-1,3,5-triazine

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																								
AA035	CR-MIS-AA035-01_02072011	N	2/7/2011	5890	< 0.095 ND	4	67	1.2	1.4	11500	7.6	3.2	**296**	13300	40.1	3010	155	**0.13**	0.8	7.7	1420	< 0.244 ND	6.8	220	< 0.206 ND	13.5	80.3
AA039	FTBL-IS-148-070516	N	7/5/2016	--	0.119 J	3.95	--	1.48	--	--	--	--	10.8	--	18.3	--	--	--	--	7.15	--	--	--	--	--	--	54.4
AA042	CR-IS-AA042-01_09112012	N	9/11/2012	5370	0.17	0.31	58.1	0.91	0.32	35800	4.2	2.3	8.5	9140	10.7	5630	150	0.014	0.53	4.6	1120	0.29	< 0.036 ND	28.5	< 0.206 ND	13.4	33.8
AA044	FTBL-IS-149-070116-A	N	7/1/2016	--	< 0.025 U	4.44	--	1.22	--	--	--	--	10.8	--	16.7 J	--	--	--	--	7.76	--	--	--	--	--	--	50.6
AA044	FTBL-IS-149-070116-B	N	7/1/2016	--	< 0.025 U	4.22	--	1.24	--	--	--	--	10.8	--	15.9 J	--	--	--	--	7.67	--	--	--	--	--	--	49.2
AA044	FTBL-IS-149-070116-C	N	7/1/2016	--	< 0.025 U	4.15	--	1.23	--	--	--	--	10.6	--	16.2 J	--	--	--	--	7.19	--	--	--	--	--	--	50.3
AB032	FTBL-IS-145-070516	N	7/5/2016	--	0.127 J	4.85	--	1.54	--	--	--	--	9.76	--	16.4	--	--	--	--	7.53	--	--	--	--	--	--	66.7
AB038	FTBL-IS-146-070116-A	N	7/1/2016	--	< 0.025 U	4.75	--	1.36	--	--	--	--	14.9	--	23.9 J	--	--	--	--	8.51	--	--	--	--	--	--	51.8
AB038	FTBL-IS-146-070116-B	N	7/1/2016	--	< 0.025 U	4.65	--	1.26	--	--	--	--	13.8	--	21.9 J	--	--	--	--	9.06	--	--	--	--	--	--	48.1
AB038	FTBL-IS-146-070116-C	N	7/1/2016	--	< 0.025 U	4.9	--	1.2	--	--	--	--	13	--	20.4 J	--	--	--	--	8.25	--	--	--	--	--	--	45.9
AB040	FTBL-IS-147-070516	N	7/5/2016	--	0.129 J	4.25	--	1.94	--	--	--	--	12.4	--	24.2	--	--	--	--	8.43	--	--	--	--	--	--	63
AC033	FTBL-IS-141-070516	N	7/5/2016	--	0.165 J	6.93	--	1.57	--	--	--	--	16.9	--	20.9	--	--	--	--	10.1	--	--	--	--	--	--	52
AC040	FTBL-IS-144-070516	N	7/5/2016	--	0.178 J	4.5	--	1.14	--	--	--	--	13.3	--	34.8	--	--	--	--	7.9	--	--	--	--	--	--	59.2
AC041	CR-MIS-AC041-01_02072011	N	2/7/2011	4640	2.1	4.5	50.9	0.94	0.26	3330	7.5	4	13.3	12500	54.5	1870	155	0.019	0.7	6.6	1410	< 0.244 ND	< 0.036 ND	261	< 0.206 ND	17.3	38.1
AC042	CR-MIS-AC042-01_02072011	N	2/7/2011	4630	0.097	3.7	48.2	0.99	0.27	4730	7.5	3.3	12.4	12000	22.8	2370	165	0.015	0.88	6.8	1320	< 0.244 ND	< 0.036 ND	264	< 0.206 ND	15.6	48.8
AD035	FTBL-IS-142-070516	N	7/5/2016	--	0.163 J	6.25	--	1.49	--	--	--	--	18.4	--	24	--	--	--	--	9.66	--	--	--	--	--	--	51.5
AD037	FTBL-IS-143-070516	N	7/5/2016	--	< 0.024 U	5.84	--	1.46	--	--	--	--	18.2	--	24.8	--	--	--	--	8.36	--	--	--	--	--	--	51.3
AD044	CR-MIS-AD044-01_02042011	N	2/4/2011	3780	< 0.095 ND	3.3	37.1	1	0.17	3760	5	2.7	9.3	11400	13.4	2040	137	0.013	0.88	5.6	1110	< 0.244 ND	< 0.036 ND	196	< 0.206 ND	13.8	43.8
AF043	CR-MIS-AF043-01_02042011	N	2/4/2011	5640	< 0.095 ND	3.2	52.9	1	0.15	8490	10.5	3.8	10.5	13900	18.3	3650	171	0.011 0.011	0.72	10.4	1450	< 0.244 ND	< 0.036 ND	187	< 0.206 ND	16.2	45.1
AH003	CR-MIS-AH003-01_02072011	N	2/7/2011	6510	0.14	4.9	71.2	1.2	0.35	3470	8.7	5.7	14	20900	20	3060	**287**	0.019	1.1	9.4	1800	< 0.244 ND	< 0.036 ND	226	< 0.206 ND	23.9	63.7
AH016	FTBL-IS-156-012517	N	1/25/2017	--	0.147 J	5.74	--	1.48	--	--	--	--	15.7	--	21.2	--	--	--	--	9.55	--	--	--	--	--	--	43.7
AI018	CR-MIS-AI018-01_02072011	N	2/7/2011	6650	0.85	4.9	68.6	1.1	0.35	15700	9.5	4.5	32.1	15500	35.2	4810	198	0.018	0.89	8.9	1880	< 0.244 ND	< 0.036 ND	200	< 0.206 ND	20.3	56.2
AI020	CR-MIS-AI020-01_02072011	N	2/7/2011	5060	< 0.095 ND	5	49.5	0.9	0.3	5020	7.2	3.1	13.2	13300	22.6	2030	164	0.015	**2.9**	6.1	1280	< 0.244 ND	< 0.036 ND	195	< 0.206 ND	16.2	44.9
AI022	FTBL-IS-157-012517	N	1/25/2017	--	0.175 J	5.98	--	1.47	--	--	--	--	14.2	--	19.6	--	--	--	--	8.34	--	--	--	--	--	--	43.9
AJ025	FTBL-IS-158-012617-A	N	1/26/2017	--	0.158	5.98	--	1.23	--	--	--	--	14.1	--	19.5	--	--	--	--	9.69	--	--	--	--	--	--	43.7
AJ025	FTBL-IS-158-012617-B	N	1/26/2017	--	0.161	6.71	--	1.4	--	--	--	--	14.4	--	20.2	--	--	--	--	10.3	--	--	--	--	--	--	46.9
AJ025	FTBL-IS-158-012617-C	N	1/26/2017	--	0.177	5.68	--	1.12	--	--	--	--	13.3	--	19	--	--	--	--	8.49	--	--	--	--	--	--	39.3
AJ042	CR-IS-AJ042-01_09112012	N	9/11/2012	5150	0.13	0.64	45.5	0.66	0.26	5240	3.6	1.8	10.9	13300	10.5	2440	183	0.027	0.14	3.8	1060	0.31	< 0.036 ND	30.8	< 0.206 ND	11.2	20.6
AJ048	CR-IS-AJ048-01_09112012	N	9/11/2012	6030	0.16	0.2	46.9	0.75	0.37	3610	4.7	2.7	10.4	12700	11.7	3380	206	0.017	0.38	5.4	1150	0.36	< 0.036 ND	32.7	< 0.206 ND	14	31.2
AK010	CR-MIS-AK010-01_02072011	N	2/7/2011	7170	0.1	5.8	81.6	1.3	0.23	24100	9.1	5.8	14.9	18500	16.4	4330	223	0.019	0.97	9	1850	< 0.244 ND	< 0.036 ND	227	< 0.206 ND	**31**	41.7
AK016	FTBL-IS-150-071416	N	7/14/2016	--	0.11 J	6.41	--	1.5	--	--	--	--	16.7	--	19.6	--	--	--	--	9.85	--	--	--	--	--	--	44.2
AK045	CR-IS-AK045-01_09122012	N	9/12/2012	3630	0.15	1.4	40.2	0.61	0.23	8670	3.6	2	7.8	8640	9.7	3060	158	0.014	0.3	4.2	808	0.26	< 0.036 ND	18	< 0.206 ND	10.5	21.9
AL039	CR-IS-AL039-01_09122012	N	9/12/2012	8120	0.22	< 0.088 ND	68.4	0.74	0.36	25600	5.8	2.1	11.8	12000	9.8	5020	180	0.031	0.24	5.1	1580	0.31	< 0.036 ND	40.9	< 0.206 ND	15.1	23.6
AL048	CR-MIS-AL048-01_02042011	N	2/4/2011	5220	< 0.095 ND	3.1	46.5	0.92	0.21	5770	10.7	3.3	8.5	12600	11.7	2890	173	0.011	0.56	9	1250	0.42	< 0.036 ND	134	< 0.206 ND	12.6	36.6
AM022	FTBL-IS-159-012517	N	1/25/2017	--	0.168 J	5.97	--	1.46	--	--	--	--	16	--	23.2	--	--	--	--	10	--	--	--	--	--	--	44.9
AM036	CR-MIS-AM036-01_02072011	N	2/7/2011	5350	0.19	4	68.3	1.1	0.23	38400	5.8	3.4	12.8	11200	14.4	6400	167	0.023	0.39	6.3	1450	< 0.244 ND	< 0.036 ND	199	< 0.206 ND	16.8	33.4
AO038	FTBL-IS-160-012717	N	1/27/2017	--	--	--	--	--	--	--	--	--	15.3	--	20.3	--	--	--	--	--	--	--	--	--	--	--	--
AO043	CR-IS-AO043-01_09112012	N	9/11/2012	5720	0.17	1.4	61.6	0.7	0.31	34100	3.9	2	11.2	10400	14	6180	169	0.024	0.17	4.1	1090	0.33	< 0.036 ND	31.9	< 0.206 ND	12.2	21.5
AQ036	FTBL-IS-161-012717	N	1/27/2017	--	0.461 J	5.62	--	1.24	--	--	--	--	16.9	--	111	--	--	--	--	8.2	--	--	--	--	--	--	38.2
AQ038	CR-IS-AQ038-01_09122012	N	9/12/2012	3580	1	1.5	43.2	0.53	0.18	20200	3	1.8	**185**	7030	**133**	4010	139	0.015	0.17	3.7	726	< 0.244 ND	< 0.036 ND	18.1	< 0.206 ND	9.2	39.6
AQ040	FTBL-IS-162-012717	N	1/27/2017	--	--	--	--	--	--	--	--	--	17.6	--	38	--	--	--	--	--	--	--	--	--	--	--	--
AR008	CR-MIS-AR008-01_02072011	N	2/7/2011	5910	0.36	7.2	61.7	7.2	0.42	4420	**16.5**	4.2	15.7	20000	22.2	2150	228	0.027	1.3	11	1820	< 0.244 ND	< 0.036 ND	206	< 0.206 ND	18.2	51.8
AR047	CR-MIS-AR047-01_02072011	N	2/7/2011	4640	0.19	3.3	51.7	0.81	0.33	22600	5.5	3.2	13.4	11000	21.5	5180	152	0.016	0.42	5.5	1420	< 0.244 ND	< 0.036 ND	195	< 0.206 ND	15.3	37.3
AS038	FTBL-IS-163-012717	N	1/27/2017	--	0.171 J	7.08	--	1.1	--	--	--	--	14.6	--	23.2	--	--	--	--	7.58	--	--	--	--	--	--	35.6
AT004	CR-IS-AT004-01_09112012	N	9/11/2012	5250	0.14	2.1	56	1.4	0.42	8390	4.7	3.1	10.5	13000	10.4	3300	195	0.022	0.45	4.9	1190	**0.54**	< 0.036 ND	28.7	< 0.206 ND	15.9	24.4
AU005	CR-IS-AU005-01_09112012	N	9/11/2012	4970	0.098	< 0.088 ND	61.2	1.4	0.38	2130	4	2.6	9.3	12600	11	1300	**321**	0.018	0.8	4.1	1200	**0.58**	< 0.036 ND	37.4	< 0.206 ND	13.2	32.3
AU034	FTBL-IS-164-012717	N	1/27/2017	--	0.229 J	11.2	--	1.12	--	--	--	--	18.9	--	25.4	--	--	--	--	10.8	--	--	--	--	--	--	37
AV017	CR-IS-AV017-01_09112012	N	9/11/2012	4920	< 0.095 ND	0.58	44.4	1.6	0.39	2810	3.5	2.3	8.1	13500	12.5	1460	202	0.014	0.78	3.7	1190	0.45	< 0.036 ND	33.7	< 0.206 ND	11.7	37.3
AV038	CR-IS-AV038-01_09122012	N	9/12/2012	4910	0.14	1.9	69.8	0.59	0.22	43700	3	1.6	10	7500	9.2	5920	169	0.022	< 0.074 ND	3.6	997	0.27	0.072	25.8	< 0.206 ND	8.9	17.5
AW045	CR-IS-AW045-01_09122012	N	9/12/2012	4010	0.19	1.6	50.1	0.58	0.28	11400	4	2.2	10	9010	11.4	3080	162	0.015	0.23 0.24	4.5	1010	0.29	< 0.036 ND	23.7	< 0.206 ND	11.4	22.8
AY031	FTBL-IS-165-012817-A	N	1/28/2017	--	0.242	9.56	--	1.26	--	--	--	--	18.7	--	27.9	--	--	--	--	8.87	--	--	--	--	--	--	37.9
AY031	FTBL-IS-165-012817-B	N	1/28/2017	--	0.265	9.86	--	1.33	--	--	--	--	20.2	--	28.4	--	--	--	--	9.76	--	--	--	--	--	--	39.1
AY031	FTBL-IS-165-012817-C	N	1/28/2017	--	0.292	9.84	--	1.32	--	--	--	--	19	--	26.9	--	--	--	--	9.58	--	--	--	--	--	--	38.1
AY041	FTBL-IS-166-012717	N	1/27/2017	--	0.253 J	5.89	--	1.32	--	--	--	--	13.2	--	24.5	--	--	--	--	8.35	--	--	--	--	--	--	44.3
BA048	CR-MIS-BA048-01_02072011	N	2/7/2011	5520	0.25	6	60.6	1.8	0.32	3750	**17.1**	3.6	13.7	15600	20.1	1770	212	0.016	1.4	10.6	1670	< 0.244 ND	< 0.036 ND	179	< 0.206 ND	18	49.8
BA064	FTBL-IS-167-012717	N	1/27/2017	--	0.184 J	5.51	--	1.29	--	--	--	--	11.7	--	33.8	--	--	--	--	6.87	--	--	--	--	--	--	43.1
BA066	CR-IS-BA066-01_09102012	N	9/10/2012	4760	1.7	1.2	47.3	0.72	0.28	13200	4	1.9	15	8920	91.3	3010	135	0.02	0.25	3.9	1110	< 0.244 ND	< 0.036 ND	25.1	< 0.206 ND	11	23
BA068	FTBL-IS-168-012817	N	1/28/2017	--	--	--	--	--	--	--	--	--	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--
BB051	CR-IS-BB051-01_09122012	N	9/12/2012	4680	0.12	0.2	42.9	1.3	0.34	3480	3.5	2.2	7.5	12400	10.4	1480	159	0.012	0.6 0.66	3.8	1210	0.36	< 0.036 ND	30.4	< 0.206 ND	12	29

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte Result Units	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Calcium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																								
BB060	FTBL-IS-169-012817	N	1/28/2017	--	0.157	6.53	--	1.32	--	--	--	--	13.1	--	18.6	--	--	--	--	7.82	--	--	--	--	--	--	43.3
BB072	CR-IS-BB072-01_09102012	N	9/10/2012	4250	0.11	0.86	39.5	1.1	0.27	1250	4	2.1	7.4	10200	9.3	1160	170	0.015	0.46	3.8	1080	0.25	< 0.036 ND	21.3	< 0.206 ND	11.4	24.5
BC058	CR-IS-BC058-01_09102012	N	9/10/2012	4070	< 0.095 ND	0.2	36.5	1	0.26	5490	3.5	1.8	7.1	10000	8.5	1520	129	0.014	0.5	3.3	1010	< 0.244 ND	< 0.036 ND	27.6	< 0.206 ND	10.6	23.8
BC066	FTBL-IS-170-012817	N	1/28/2017	--	--	--	--	--	--	--	--	--	--	--	18.3	--	--	--	--	--	--	--	--	--	--	--	--
BD053	FTBL-IS-171-012617	N	1/26/2017	--	--	--	--	--	--	--	--	--	--	--	20.1	--	--	--	--	--	--	--	--	--	--	--	--
BD056	CR-MIS-BD056-01_02042011	N	2/4/2011	4680	< 0.095 ND	4	38.5	1.2	0.18	2300	5	2.6	10.1	16500	13.5	1340	131	0.014	0.55	4.4	1350	< 0.244 ND	< 0.036 ND	158	0.25	11.5	35.2
BE043	FTBL-IS-135-062816-A	N	6/28/2016	--	0.176 U	7.98	--	2.79	--	--	--	--	14.8	--	36.5	--	--	--	--	4.82	--	--	--	--	--	--	83.8
BE043	FTBL-IS-135-062816-B	N	6/28/2016	--	0.166 U	7.8	--	2.89	--	--	--	--	15.7	--	39.6	--	--	--	--	5.1	--	--	--	--	--	--	90.1
BE043	FTBL-IS-135-062816-C	N	6/28/2016	--	0.161 U	7.98	--	2.68	--	--	--	--	15	--	41.9	--	--	--	--	5.11	--	--	--	--	--	--	83.1
BE050	FTBL-IS-138-062916	N	6/29/2016	--	0.110 U	6.35	--	2.36	--	--	--	--	14.7	--	22.2	--	--	--	--	6.92	--	--	--	--	--	--	60.2
BE058	CR-IS-BE058-01_09102012	N	9/10/2012	4210	< 0.095 ND	0.51	37.7	1.4	0.32	2380	3.3	2.1	6.7	12900	8.5	1330	162	< 0.01 ND	0.77	3.5	1030	< 0.244 ND	< 0.036 ND	32.2	< 0.206 ND	12.4	28.4
BE064	CR-MIS-BE064-01_02042011	N	2/4/2011	5080	< 0.095 ND	3.8	51	0.9	0.23	6630	6.2	2.8	10.8	7640	16.6	1740	129	0.017	0.29	5.6	1520	< 0.244 ND	< 0.036 ND	126	< 0.206 ND	10.6	29.9
BF044	FTBL-IS-136-063016	N	6/30/2016	--	< 0.025 U	5.59	--	2.22	--	--	--	--	10.1	--	24.5 J	--	--	--	--	6.31	--	--	--	--	--	--	67
BF047	CR-MIS-BF047-01_02032011	N	2/3/2011	4110	< 0.095 ND	4.3	46.6	1.4	0.26	1560	4.6	2.1	8.9	9900	15.7	955	154	0.017	0.57	4.2	1380	< 0.244 ND	< 0.036 ND	111	< 0.206 ND	8.2	40.5
BF048	FTBL-IS-137-062716	N	6/27/2016	--	0.155 J	5.62	--	2.4	--	--	--	--	12.3	--	25	--	--	--	--	6.55	--	--	--	--	--	--	67.9
BF052	CR-MIS-BF052-01_02032011	N	2/3/2011	6420	2.1	4.7	51.7	1.9	0.25	6850	8.1	2.3	11.9	11200	**1580**	1840	151	0.018	0.72	6.2	1530	< 0.244 ND	< 0.036 ND	87.9	< 0.206 ND	10	42.4
BF057	CR-MIS-BF057-01_02042011	N	2/4/2011	5220	< 0.095 ND	4.7	45.8	1.5	0.2	2280	5.3	2.8	9.5	17100	13.4	1350	157	0.015	0.65	4.9	1450	< 0.244 ND	< 0.036 ND	156	0.24	12	40.9
BF059	FTBL-IS-140-062716-A	N	6/27/2016	--	0.163 J	5.1	--	2.03	--	--	--	--	16.8	--	23.5	--	--	--	--	7.68	--	--	--	--	--	--	68.2
BF059	FTBL-IS-140-062716-B	N	6/27/2016	--	0.150 J	4.96	--	1.95	--	--	--	--	16.8	--	22.9	--	--	--	--	7.91	--	--	--	--	--	--	67.5
BF059	FTBL-IS-140-062716-C	N	6/27/2016	--	0.139 J	5.05	--	1.97	--	--	--	--	16.5	--	24	--	--	--	--	7.97	--	--	--	--	--	--	68.3
BF070	CR-MIS-BF070-01_02042011	N	2/4/2011	3950	< 0.095 ND	3.2	38	1.2	0.2	1530	8.2	2.1	7.8	9510	12.8	1030	127	0.011	0.61	5.9	1190	0.29	< 0.036 ND	100	< 0.206 ND	8.7	33.8
BF071	CR-MIS-BF071-01_02042011	N	2/4/2011	4450	< 0.095 ND	4.1	42.9	1.5	0.11	1220	6.4	2.3	7.5	14400	15.3	1010	144	0.011	0.69	5.1	1210	< 0.244 ND	< 0.036 ND	130	0.34	10.3	31.9
BG042	FTBL-IS-127-063016	N	6/30/2016	--	0.312 J	5.99	--	3.75	--	--	--	--	18.8	--	66.0 J	--	--	--	--	5.22	--	--	--	--	--	--	60.5
BG049	FTBL-IS-129-062716	N	6/27/2016	--	0.165 J	5.57	--	2.37	--	--	--	--	11	--	29	--	--	--	--	4.81	--	--	--	--	--	--	99.7
BG055	FTBL-IS-139-062916	N	6/29/2016	--	0.180 J	5.65	--	2.9	--	--	--	--	19.4	--	28.6	--	--	--	--	7.76	--	--	--	--	--	--	71.7
BH041	FTBL-IS-126-063016	N	6/30/2016	--	0.873 J	6	--	3.45	--	--	--	--	12.2	--	95.6 J	--	--	--	--	4.95	--	--	--	--	--	--	65
BH043	CR-MIS-BH043-01_02042011	N	2/4/2011	4230	< 0.095 ND	4.8	49.9	1.4	0.27	1240	5.4	2	9.8	10100	27.1	898	160	0.023	0.67	4	1270	< 0.244 ND	< 0.036 ND	90	< 0.206 ND	7.9	42.9
BH051	FTBL-IS-130-062916	N	6/29/2016	--	0.104 U	3.92	--	2.34	--	--	--	--	9.29	--	21.7	--	--	--	--	5.45	--	--	--	--	--	--	57.7
BH061	FTBL-IS-134-062816	N	6/28/2016	--	0.093 U	4.72	--	2.31	--	--	--	--	9.49	--	14.6	--	--	--	--	6.67	--	--	--	--	--	--	50.8
BI042	CR-MIS-BI042-01_02042011	N	2/4/2011	4420	< 0.095 ND	3.8	47.5	1.3	0.3	1580	4.4	2.1	12.8	9670	38.4	943	163	0.021	0.55	3.7	1250	0.3	< 0.036 ND	123	< 0.206 ND	8	48.3
BI044	CR-MIS-BI044-01_02042011	N	2/4/2011	4330	< 0.095 ND	4	38.6	1.1	0.26	1230	5.1	2.4	11.7	9140	21.9	911	129	0.023	0.4	4.3	1220	< 0.244 ND	< 0.036 ND	83.9	< 0.206 ND	9.7	36.5
BI047	FTBL-IS-128-062916	N	6/29/2016	--	0.157 J	5.49	--	1.78	--	--	--	--	14.1	--	34	--	--	--	--	7.13	--	--	--	--	--	--	50.3
BI054	FTBL-IS-131-062916	N	6/29/2016	--	0.215 J	3.83	--	2.19	--	--	--	--	9.06	--	15.7	--	--	--	--	5.83	--	--	--	--	--	--	54.6
BI056	FTBL-IS-132-062916	N	6/29/2016	--	0.111 U	4.37	--	2.3	--	--	--	--	9.33	--	15.7	--	--	--	--	5.44	--	--	--	--	--	--	53.4
BI063	CR-MIS-BI063-01_02032011	N	2/3/2011	4140	< 0.095 ND	4.9	39.1	1.3	0.35	1160	4.1	1.9	6.6	7540	11.5	831	126	0.012	0.48	4.1	1050	< 0.244 ND	< 0.036 ND	120	< 0.206 ND	7.6	42.2
BI072	CR-IS-BI072-01_09122012	N	9/12/2012	2900	0.11	1.3	38.5	0.86	0.23	1450	3.3	1.7	6.7	8040	10	963	140	0.013	0.38	3.3	850	0.25	< 0.036 ND	17.4	< 0.206 ND	8.5	22.1
BJ034	FTBL-IS-117-070116	N	7/1/2016	--	< 0.025 U	5.72	--	2.67	--	--	--	--	12.9	--	23.6 J	--	--	--	--	8.01	--	--	--	--	--	--	80.5
BJ042	FTBL-IS-120-063016	N	6/30/2016	--	0.165 J	5.18	--	2.13	--	--	--	--	15.5	--	38.5 J	--	--	--	--	6.62	--	--	--	--	--	--	77.1
BJ059	FTBL-IS-133-062816	N	6/28/2016	--	0.104 U	4.52	--	2	--	--	--	--	9.57	--	15.2	--	--	--	--	5.38	--	--	--	--	--	--	49.3
BJ065	CR-MIS-BJ065-01_02172011	N	2/17/2011	3490	< 0.095 ND	0.71	39.9	1.2	0.17	1190	4.2	2.1	7.2	7290	11.1	925	133	0.016	0.48	4.6	1050	< 0.244 ND	< 0.036 ND	112	< 0.206 ND	7.3	29.8
BK036	FTBL-IS-118-063016	N	6/30/2016	--	0.247 J	8.72	--	2.29	--	--	--	--	21.2	--	48.4 J	--	--	--	--	7.13	--	--	--	--	--	--	**226**
BK043	FTBL-IS-121-062716-A	N	6/27/2016	--	0.362 J	6.27	--	1.58	--	--	--	--	35.9 J	--	**473 J**	--	--	--	--	6.73	--	--	--	--	--	--	81.5
BK043	FTBL-IS-121-062716-B	N	6/27/2016	--	0.312 J	5.91	--	1.65	--	--	--	--	**73.9 J**	--	74.1 J	--	--	--	--	6.41	--	--	--	--	--	--	81.2
BK043	FTBL-IS-121-062716-C	N	6/27/2016	--	0.306 J	5.84	--	1.56	--	--	--	--	30.7 J	--	73.1 J	--	--	--	--	6.25	--	--	--	--	--	--	76.2
BK045	FTBL-IS-122-063016	N	6/30/2016	--	< 0.025 U	5.31	--	1.87	--	--	--	--	12.1	--	26.3 J	--	--	--	--	5.93	--	--	--	--	--	--	76.7
BK047	FTBL-IS-124-062916	N	6/29/2016	--	0.116 U	5.19	--	2.15	--	--	--	--	13.4	--	23.7	--	--	--	--	6.72	--	--	--	--	--	--	72.8
BK050	FTBL-IS-125-062916	N	6/29/2016	--	0.155 U	5.82	--	2	--	--	--	--	14.9	--	31.6	--	--	--	--	6.52	--	--	--	--	--	--	83.4
BK059	CR-MIS-BK059-01_02152011	N	2/15/2011	3910	< 0.095 ND	1	42	1.2	0.12	1380	6.2	2	8.1	9640	11.8	876	135	0.014	0.6	4.6	1110	< 0.244 ND	< 0.036 ND	107	< 0.206 ND	8.4	31.8
BK063	FTBL-IS-173-012617	N	1/26/2017	--	0.108	6	--	2.05	--	--	--	--	18.4	--	19.9	--	--	--	--	6.13	--	--	--	--	--	--	75.8
BL030	FTBL-IS-116-070116	N	7/1/2016	--	0.287 J	8.07	--	2.88	--	--	--	--	38.4	--	55.4 J	--	--	--	--	19.7	--	--	--	--	--	--	71.4
BL038	FTBL-IS-119-063016	N	6/30/2016	--	0.259 J	6.7	--	2.16	--	--	--	--	21	--	49.9 J	--	--	--	--	6.42	--	--	--	--	--	--	111
BL043	FTBL-IS-172-012417	N	1/24/2017	--	--	--	--	--	--	--	--	--	22.2	--	54.8	--	--	--	--	--	--	--	--	--	--	--	--
BM046	FTBL-IS-123-063016	N	6/30/2016	--	0.181 J	8.3	--	1.76	--	--	--	--	16.6	--	33.2 J	--	--	--	--	5.4	--	--	--	--	--	--	71.3
BM073	CR-IS-BM073-01_09102012	N	9/10/2012	3810	< 0.095 ND	0.47	38.1	1.1	0.26	1620	3.7	1.5	6.9	9460	9.8	962	133	0.013	0.5	3.2	1070	0.27	< 0.036 ND	18.1	< 0.206 ND	9.3	25.1
BP063	CR-IS-BP063-01_09122012	N	9/12/2012	3570	< 0.095 ND	0.82	55.5	1.2	0.35	2180	3.2	1.7	9	9430	15.9	1120	204	0.015	0.55	3.3	1120	0.38	< 0.036 ND	22.1	< 0.206 ND	8.2	39.1
BQ067	FTBL-IS-174-012417	N	1/24/2017	--	0.161 J	6.07	--	2.1	--	--	--	--	24.4	--	31.3	--	--	--	--	6.39	--	--	--	--	--	--	75.4
BQ070	FTBL-IS-151-071416	N	7/14/2016	--	0.093 J	4.53	--	2.27	--	--	--	--	11.7	--	18.5	--	--	--	--	6.11	--	--	--	--	--	--	73.6
BQ072	CR-MIS-BQ072-01_02152011	N	2/15/2011	5040	< 0.095 ND	< 0.088 ND	63.2	1.5	0.23	1950	4.8	2.6	10	12600	17.8	1160	**253**	0.016	0.76	4.5	1580	0.32	< 0.036 ND	155	< 0.206 ND	10.4	50.1
BR060	CR-MIS-BR060-01_02042011	N	2/4/2011	3880	< 0.095 ND	3.9	**850**	1.3	0.24	1930	5.3	2.2	9.1	9440	19	933	155	0.012 0.012	0.68	4.5	1180	< 0.244 ND	< 0.036 ND	100	< 0.206 ND	7.7	48
BS069	FTBL-IS-175-012417-A	N	1/24/2017	--	0.224 J	5.14	--	1.96	--	--	--	--	14.5	--	32.5	--	--	--	--	5.37	--	--	--	--	--	--	69.3
BS069	FTBL-IS-175-012417-B	N	1/24/2017	--	0.200 J	7.04	--	1.89	--	--	--	--	11.9	--	30.3	--	--	--	--	4.81	--	--	--	--	--	--	63.8

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte Result Units	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Calcium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg
Location ID	**Sample ID**	**Sample Type**	**Sample Date**																								
BS069	FTBL-IS-175-012417-C	N	1/24/2017	--	0.213 J	5.07	--	1.74	--	--	--	--	13.7	--	31.2	--	--	--	--	5.73	--	--	--	--	--	--	62.6
BT056	CR-MIS-BT056-01_02042011	N	2/4/2011	4300	< 0.095 ND	4	53.3	1.5	0.25	2200	7.8	2	8.7	10100	18.2	947	188	0.015	0.65	5.5	1260	0.27	< 0.036 ND	97.5	< 0.206 ND	7.2	45.4
BW057	FTBL-IS-176-012517	N	1/25/2017	--	--	--	--	--	--	--	--	--	--	--	**2650**	--	--	--	--	--	--	--	--	--	--	--	--
BW062	CR-MIS-BW062-01_02032011	N	2/3/2011	4040	< 0.095 ND	3	46.5	1.3	0.25	1550	4.5	1.8	7.9	9980	27.3	909	168	0.011	0.67	3.6	1300	0.37	< 0.036 ND	99	< 0.206 ND	6.9	59
BY055	FTBL-IS-177-012417	N	1/24/2017	--	--	--	--	--	--	--	--	--	--	--	79.1	--	--	--	--	--	--	--	--	--	--	--	--
BY057	CR-MIS-BY057-01_02082011	N	2/8/2011	7250	0.13	5.1	74.2	2.3	0.3	6220	7.4	3.8	17	18300	**129**	2310	**242**	0.028	0.51	6.7	2090	< 0.244 ND	< 0.036 ND	167	0.46	14.9	68.7
BY064	FTBL-IS-152-071416	N	7/14/2016	--	0.161 J	7.35	--	1.84	--	--	--	--	20.3	--	32.9	--	--	--	--	8.53	--	--	--	--	--	--	**122**
BY066	FTBL-IS-178-011917	N	1/19/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	114
BY072	CR-IS-BY072-01_09122012	N	9/12/2012	2870	0.38	1	40.9	0.96	0.28	1360	3.6	1.6	13.8	7780	32	870	160	0.016	0.41	3.2	921	< 0.244 ND	< 0.036 ND	15.8	< 0.206 ND	8	32.7
CA057	FTBL-IS-110-061316	N	6/13/2016	--	0.346 J	8.86	--	4.34	--	--	--	--	22.9	--	**143 J**	--	--	--	--	13.4	--	--	--	--	--	--	115
CA057	FTBL-IS-110-110316R	N	11/3/2016	--	--	--	--	--	--	--	--	--	--	--	66.2 J	--	--	--	--	--	--	--	--	--	--	--	--
CA070	CR-IS-CA070-01_09142012	N	9/14/2012	5340	0.26	4.1	59.2	1	0.33	9400	5.8	2.4	8.6	15100	23.6	2600	**260**	< 0.01 ND	0.58	4.5	1480	< 0.244 ND	< 0.036 ND	67	< 0.206 ND	17.3	59
CB046	FTBL-IS-179-012617	N	1/26/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**317**
CB063	FTBL-IS-182-011917	N	1/19/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	95
CC046	FTBL-IS-109-071216	N	7/12/2016	--	0.260 J	16	--	2.7	--	--	--	--	24.8	--	58.4	--	--	--	--	13.5	--	--	--	--	--	--	**353**
CD045	FTBL-IS-108-071116	N	7/11/2016	--	0.145 J	8.61	--	4.51	--	--	--	--	16.5	--	24.8 J	--	--	--	--	5.12	--	--	--	--	--	--	101
CD047	FTBL-IS-180-012617	N	1/26/2017	--	0.26	11.4	--	2.25	--	--	--	--	26.7	--	48.4	--	--	--	--	10	--	--	--	--	--	--	**291**
CD055	FTBL-IS-181-012417	N	1/24/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	87.7
CD061	CR-MIS-CD061-01_02092011	N	2/9/2011	7510	< 0.095 ND	5.8	59.8	0.8	0.32	2100	9.1	4.3	16.8	14000	21.8	1820	202	0.027	0.35	7.5	2390	< 0.244 ND	< 0.036 ND	199	< 0.206 ND	16.1	37.9
CD061	FTBL-IS-105-061316	N	6/13/2016	--	0.173 J	7.54	--	1.66	--	--	--	--	18.5	--	35.3 J	--	--	--	--	9.44	--	--	--	--	--	--	116
CD068	CR-MIS-CD068-01_02072011	N	2/7/2011	4950	1.4	6.2	71	1.2	0.53	10600	8.3	4.9	18.7	15900	66.2	3760	**318**	0.017	0.99	7.9	2010	0.32	< 0.036 ND	194	< 0.206 ND	17.4	110
CE046	FTBL-IS-096-071216	N	7/12/2016	--	0.136 J	5.67	--	1.25	--	--	--	--	23.1	--	22.5	--	--	--	--	9.33	--	--	--	--	--	--	61.4
CE047	CR-MIS-CE047-01_02092011	N	2/9/2011	7140	< 0.095 ND	4.6	94	1.4	0.31	44900	7.4	4.1	17.5	11400	17.3	11400	**433**	0.035	0.086	6.3	2660	< 0.244 ND	< 0.036 ND	166	0.96	12.9	49.9
CE056	CR-IS-CE056-01_09132012	N	9/13/2012	3060	0.16	1.3	54.6	0.76	0.38	16100	4	2.4	10.1	10400	13.3	3170	**264**	0.012	0.44	4.5	1070	0.44	< 0.036 ND	37.5	< 0.206 ND	10.8	54
CE059	FTBL-IS-104-062316	N	6/23/2016	--	0.146 U	7.65	--	1.7	--	--	--	--	17.5	--	28.4	--	--	--	--	9.45	--	--	--	--	--	--	**128**
CE063	FTBL-IS-106-061316	N	6/13/2016	--	0.212 J	7.09	--	1.57	--	--	--	--	19.4	--	32.2 J	--	--	--	--	9.6	--	--	--	--	--	--	81.6
CE065	CR-MIS-CE065-01_02072011	N	2/7/2011	5120	0.34	5.4	68.2	1	0.41	3900	9	4.4	17.9	14900	27.2	2240	**261**	0.022	0.74	7.7	1960	< 0.244 ND	< 0.036 ND	185	< 0.206 ND	19.3	74.3
CF045	FTBL-IS-092-071116	N	7/11/2016	--	0.168 J	9.22	--	3.11	--	--	--	--	19.2	--	25.3 J	--	--	--	--	6.81	--	--	--	--	--	--	91.1
CF048	CR-MIS-CF048-01_02092011	N	2/9/2011	7110	< 0.095 ND	2.2	64.8	0.66	0.27	52700	6	3.1	14.7	6750	15.2	18900	**255**	0.032	< 0.074 ND	4.5	2450	< 0.244 ND	0.099	154	0.56	11.3	34
CF053	FTBL-IS-099-062216	N	6/22/2016	--	0.131 U	8.23	--	2.14	--	--	--	--	17.1	--	28.7	--	--	--	--	11.9	--	--	--	--	--	--	**154**
CF057	FTBL-IS-103-061716	N	6/17/2016	--	0.218 J	6.27	--	1.38	--	--	--	--	23	--	59.6	--	--	--	--	9.01	--	--	--	--	--	--	83.5
CF074	FTBL-IS-107-070616	N	7/6/2016	--	0.353 J	6.42	--	1.72	--	--	--	--	16.3	--	65	--	--	--	--	8.97	--	--	--	--	--	--	104
CG044	FTBL-IS-091-071116	N	7/11/2016	--	0.197 J	9.83	--	2.59	--	--	--	--	29.4	--	48.5 J	--	--	--	--	10.7	--	--	--	--	--	--	97.8
CG046	FTBL-IS-095-071216	N	7/12/2016	--	0.185 J	**19.6**	--	8.36	--	--	--	--	33.3	--	22.2	--	--	--	--	11.7	--	--	--	--	--	--	**153**
CG047	CR-MIS-CG047-01_02092011	N	2/9/2011	8750	< 0.095 ND	6	91	2.4	0.54	38700	8.3	4.8	20.6	19900	21.4	10600	**402**	0.035	0.56	6.8	3320	< 0.244 ND	< 0.036 ND	203	0.71	18.9	65
CG048	FTBL-IS-094-071216	N	7/12/2016	--	0.164 J	5.9	--	3.74	--	--	--	--	30.8	--	25.2	--	--	--	--	9.65	--	--	--	--	--	--	69.2
CG052	FTBL-IS-098-062216	N	6/22/2016	--	0.220 U	10.1	--	3.81	--	--	--	--	20.5	--	37.6	--	--	--	--	13.2	--	--	--	--	--	--	**139**
CG052	FTBL-IS-098-111116-R	N	11/11/2016	--	--	8.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CG058	CR-MIS-CG058-01_02092011	N	2/9/2011	7520	< 0.095 ND	5.9	63.8	1	0.3	2260	9.1	4.4	17.2	15300	23.1	2150	**233**	0.026	0.54	7.9	2220	< 0.244 ND	< 0.036 ND	187	< 0.206 ND	17.1	54.6
CG063	CR-MIS-CG063-01_02092011	N	2/9/2011	6820	< 0.095 ND	5.8	66.2	1.1	0.31	2560	11.3	4.4	18.2	16000	26.7	2290	**256**	0.031	0.67	9.2	2030	< 0.244 ND	< 0.036 ND	215	0.27	16.6	64.1
CG065	FTBL-IS-102-061716	N	6/17/2016	--	0.343 J	6.54	--	1.55	--	--	--	--	19.7	--	47.4	--	--	--	--	9.22	--	--	--	--	--	--	73.6
CG069	CR-MIS-CG069-01_02082011	N	2/8/2011	6100	3	6.3	67.4	1.1	0.33	2510	8.9	4.3	19.9	17300	113	1890	**243**	0.026	0.41	7.9	1850	< 0.244 ND	< 0.036 ND	164	0.37	16.9	57.2
CG071	FTBL-IS-153-071416	N	7/14/2016	--	1.41 J	7.18	--	1.4	--	--	--	--	24.1	--	120	--	--	--	--	9.21	--	--	--	--	--	--	93.1
CH043	FTBL-IS-090-070816	N	7/8/2016	--	0.233 J	8.49	--	1.54	--	--	--	--	29.3	--	49.9	--	--	--	--	10.8	--	--	--	--	--	--	108
CH046	FTBL-IS-093-070816-A	N	7/8/2016	--	0.243 J	9.48	--	1.58	--	--	--	--	24.1	--	37	--	--	--	--	13.5	--	--	--	--	--	--	95
CH046	FTBL-IS-093-070816-B	N	7/8/2016	--	0.258 J	9.9	--	1.64	--	--	--	--	28.9	--	39.1	--	--	--	--	13.1	--	--	--	--	--	--	101
CH046	FTBL-IS-093-070816-C	N	7/8/2016	--	0.204 J	9.19	--	1.86	--	--	--	--	23.6	--	35.4	--	--	--	--	12.5	--	--	--	--	--	--	91.1
CH054	CR-IS-CH054-01_09132012	N	9/13/2012	8640	0.47	< 0.088 ND	61.8	0.69	0.64	2490	9.4	3.2	23.6	14400	31.8	2240	**242**	0.038	0.38	6.4	1850	**0.59**	< 0.036 ND	47	< 0.206 ND	20.8	46.8
CH056	FTBL-IS-100-062116	N	6/21/2016	--	0.390 J	6.72	--	1.1	--	--	--	--	30.1	--	99.8	--	--	--	--	10.6	--	--	--	--	--	--	71.8
CH060	FTBL-IS-101-061716	N	6/17/2016	--	0.175 J	6.76	--	1.3	--	--	--	--	22.7	--	37.6	--	--	--	--	10	--	--	--	--	--	--	66.5
CH072	CR-MIS-CH072-01_02082011	N	2/8/2011	3350	0.89	3.4	34.7	0.56	0.21	1120	5.3	2.4	14.3	7210	**134**	973	131	0.02	0.32	4.6	1080	< 0.244 ND	< 0.036 ND	116	0.21	10	33.5
CI039	CR-MIS-CI039-01_02082011	N	2/8/2011	5610	< 0.095 ND	7.6	77.6	1.7	0.53	11700	6.1	3.4	17.9	20600	34.9	2450	**331**	0.029	1.8	5.6	1710	< 0.244 ND	< 0.036 ND	209	0.65	12.6	85.1
CI053	FTBL-IS-097-062216-A	N	6/22/2016	--	0.147 U	7.73	--	1.3	--	--	--	--	21.3	--	28.5	--	--	--	--	11.5	--	--	--	--	--	--	95.5
CI053	FTBL-IS-097-062216-B	N	6/22/2016	--	0.162 U	7.96	--	1.3	--	--	--	--	20.3	--	28.2	--	--	--	--	11	--	--	--	--	--	--	96.5
CI053	FTBL-IS-097-062216-C	N	6/22/2016	--	0.145 U	8.1	--	1.35	--	--	--	--	20.5	--	27.1	--	--	--	--	10.9	--	--	--	--	--	--	95.3
CI064	CR-MIS-CI064-01_02142011	N	2/14/2011	6890	< 0.095 ND	2.6	59.3	0.79	0.44	1910	8.5	4	18.5	10600	21.6	1660	208	0.023	0.27	7.2	2190	< 0.244 ND	< 0.036 ND	141	0.38	14.4	39.4
CJ041	FTBL-IS-084-070616	N	7/6/2016	--	0.216 J	8.32	--	1.96	--	--	--	--	17.7	--	25	--	--	--	--	10.1	--	--	--	--	--	--	96.3
CJ049	FTBL-IS-087-062316	N	6/23/2016	--	0.203 U	6.62	--	1.34	--	--	--	--	20.3	--	30.8	--	--	--	--	11.5	--	--	--	--	--	--	72.5
CJ056	CR-MIS-CJ056-01_02082011	N	2/8/2011	7380	< 0.095 ND	4.9	58.6	0.76	0.29	2570	9.1	4.1	15.2	13500	20	1910	191	0.029	0.35	7.7	2180	< 0.244 ND	< 0.036 ND	165	< 0.206 ND	16.5	39.7
CJ056	CR-MIS-CJ056-03_02082011	N	2/8/2011	5900	< 0.095 ND	4.9	57.5	0.77	0.3	2360	8	4.2	15.7	15400	24.1	1700	187	0.029 0.03	0.37	7.7	1860	< 0.244 ND	< 0.036 ND	157	0.34	14.2	38.2
CJ057	CR-MIS-CJ057-01_02082011	N	2/8/2011	4840	< 0.095 ND	3.8	36.1	0.53	0.2	1130	5.7	2.7	10.1	7450	14.2	1120	125	0.028	0.27	5	1430	< 0.244 ND	< 0.036 ND	116	< 0.206 ND	10.7	27.1

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte Result Units	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Calcium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg
Location ID	Sample ID	Sample Type	Sample Date																								
CJ058	CR-MIS-CJ058-01_02082011	N	2/8/2011	6140	< 0.095 ND	4.7	47.2	0.67	0.27	1490	7.6	3.6	14.7	11800	19.9	1440	155	0.052	0.31	6.1	1760	< 0.244 ND	< 0.036 ND	142	< 0.206 ND	14.2	32.6
CJ061	FTBL-IS-089-061716	N	6/17/2016	--	0.152 J	6.46	--	1.01	--	--	--	--	18.9	--	27.4	--	--	--	--	9.47	--	--	--	--	--	--	46.6
CJ062	CR-MIS-CJ062-01_02092011	N	2/9/2011	7240	< 0.095 ND	5.8	61	0.85	0.39	1860	9.3	4.4	18	14600	22.9	1770	201	0.031	0.34	7.8	2230	< 0.244 ND	< 0.036 ND	182	0.21	16.8	39.3
CJ071	FTBL-IS-183-012517	N	1/25/2017	--	1.72 J	--	--	--	--	--	--	--	--	--	**124**	--	--	--	--	--	--	--	--	--	--	--	--
CJ074	FTBL-IS-184-012517	N	1/25/2017	--	0.363 J	--	--	--	--	--	--	--	--	--	53.1	--	--	--	--	--	--	--	--	--	--	--	--
CK040	CR-IS-CK040-01_09142012	N	9/14/2012	8430	0.34	4.5	70.4	0.72	0.43	3360	**12.8**	3.7	15.5	15200	23.6	2610	**258**	0.028	0.27	7.1	2270	0.3	< 0.036 ND	56.6	< 0.206 ND	26.4	50.1
CK042	CR-MIS-CK042-01_02082011	N	2/8/2011	6120	< 0.095 ND	6.1	73.1	0.97	0.33	5610	7.9	4.2	14.9	16400	21.8	2330	**257**	0.026	0.67	8.1	1840	< 0.244 ND	< 0.036 ND	174	0.47	15.9	66.7
CK045	FTBL-IS-085-070616	N	7/6/2016	--	0.196 J	7.65	--	1.41	--	--	--	--	16.4	--	22	--	--	--	--	12.7	--	--	--	--	--	--	72
CK047	FTBL-IS-086-070616	N	7/6/2016	--	0.364 J	7.17	--	1.26	--	--	--	--	20.1	--	32.9	--	--	--	--	11.6	--	--	--	--	--	--	69.6
CK052	FTBL-IS-088-062216	N	6/22/2016	--	0.199 U	7.47	--	1.61	--	--	--	--	19.3	--	28.2	--	--	--	--	10.8	--	--	--	--	--	--	68
CK053	CR-MIS-CK053-01_02092011	N	2/9/2011	7130	< 0.095 ND	5.4	67.4	0.92	0.38	9390	9.3	4.6	21.2	15200	25	3010	214	0.023	0.42	9.3	2400	< 0.244 ND	< 0.036 ND	230	0.26	16.3	49.3
CK058	CR-MIS-CK058-01_02092011	N	2/9/2011	7510	< 0.095 ND	5.3	56.7	0.83	0.29	1830	8.7	4	16	13400	20	1710	186	0.032	0.34	7.3	2090	< 0.244 ND	< 0.036 ND	172	0.22	15.9	37.3
CL019	FTBL-IS-115-071116	N	7/11/2016	--	0.123 J	5.3	--	1.75	--	--	--	--	17.4	--	23.7 J	--	--	--	--	9.44	--	--	--	--	--	--	76.9
CL049	CR-MIS-CL049-01_02092011	N	2/9/2011	8380	< 0.095 ND	5.6	77	0.93	0.34	16300	8.5	4.3	18.6	15400	20.9	3280	215	0.031	0.61	8.1	2100	< 0.244 ND	< 0.036 ND	203	0.25	17.7	49.3
CL052	FTBL-IS-081-062216	N	6/22/2016	--	0.185 U	6.03	--	1.3	--	--	--	--	17.1	--	26.9	--	--	--	--	11.4	--	--	--	--	--	--	58.8
CL054	CR-MIS-CL054-01_02092011	N	2/9/2011	7990	< 0.095 ND	6.6	68.3	0.96	0.43	2290	10.9	4.9	20.7	16200	31.6	2000	**233**	0.035	0.4	9.1	2310	< 0.244 ND	< 0.036 ND	192	0.23	18.2	43.5
CL057	FTBL-IS-083-062116	N	6/21/2016	--	0.217 J	7.19	--	1.06	--	--	--	--	27.5	--	31.1	--	--	--	--	10.1	--	--	--	--	--	--	53.5
CL059	CR-MIS-CL059-01_02082011	N	2/8/2011	6700	< 0.095 ND	4.7	49	0.7	0.23	2270	9.1	3.8	12.6	12600	20.2	1550	169	0.026	0.34	7.6	1930	< 0.244 ND	< 0.036 ND	145	< 0.206 ND	14.2	33.2
CL065	CR-IS-CL065-01_09132012	N	9/13/2012	7930	0.47	< 0.088 ND	45.6	0.63	0.46	1590	8.4	2.8	15.9	12600	30.5	1630	182	0.028	0.25	5.7	1890	**0.55**	< 0.036 ND	37.8	< 0.206 ND	17.9	36.5
CL071	FTBL-IS-076-060916	N	6/9/2016	--	**17.5 J**	6.47	--	1.15	--	--	--	--	59.4	--	**805 J**	--	--	--	--	9.16	--	--	--	--	--	--	61.2
CM048	FTBL-IS-080-062216	N	6/22/2016	--	0.147 U	7.06	--	1.22	--	--	--	--	19.7	--	29.8	--	--	--	--	10.5	--	--	--	--	--	--	65.5
CM054	FTBL-IS-082-062116-A	N	6/21/2016	--	0.194 J	7.38	--	1.14	--	--	--	--	17	--	26.1	--	--	--	--	10.8	--	--	--	--	--	--	53.7
CM054	FTBL-IS-082-062116-B	N	6/21/2016	--	0.151 J	7.88	--	1.17	--	--	--	--	17.8	--	26.9	--	--	--	--	11	--	--	--	--	--	--	55.3
CM054	FTBL-IS-082-062116-C	N	6/21/2016	--	0.204 J	7.18	--	1.15	--	--	--	--	17.3	--	27.3	--	--	--	--	10.6	--	--	--	--	--	--	55.1
CM056	CR-MIS-CM056-01_02102011	N	2/10/2011	5510	0.18	1.3	42.9	0.65	0.3	1430	6.2	3	12.4	9330	19.6	1290	133	0.024	0.23	5.4	1510	< 0.244 ND	< 0.036 ND	69.7	< 0.206 ND	11	34.7
CM058	CR-MIS-CM058-01_02102011	N	2/10/2011	6010	< 0.095 ND	5.1	53.8	0.74	0.35	1700	8	3.9	17.6	12000	24.3	1540	182	0.045	0.35	7	1960	< 0.244 ND	< 0.036 ND	158	< 0.206 ND	14	36.2
CM063	FTBL-IS-073-060916	N	6/9/2016	--	0.283 J	7.7	--	0.911	--	--	--	--	24.4	--	34.3 J	--	--	--	--	10.3	--	--	--	--	--	--	54.9
CM067	CR-MIS-CM067-01_02152011	N	2/15/2011	5640	0.39	1.2	41	0.57	0.29	1260	6.7	3.1	19.1	9860	60.3	1240	137	0.033	0.27	5.3	1610	0.41	< 0.036 ND	124	< 0.206 ND	11.9	35.4
CM068	FTBL-IS-075-060916	N	6/9/2016	--	**6.41 J**	6.12	--	1	--	--	--	--	39.5	--	**378 J**	--	--	--	--	8.97	--	--	--	--	--	--	59.5
CM072	CR-IS-CM072-01_09142012	N	9/14/2012	7320	0.65	3.5	52.7	0.66	0.4	3540	7.8	3.2	14.8	13700	33.2	2720	198	0.019	0.21	6.4	2110	< 0.244 ND	< 0.036 ND	63	< 0.206 ND	20.3	36.8
CN022	FTBL-IS-114-070816-A	N	7/8/2016	--	0.172 J	7.06	--	1.81	--	--	--	--	19.8	--	27.1	--	--	--	--	11	--	--	--	--	--	--	62.8
CN022	FTBL-IS-114-070816-B	N	7/8/2016	--	0.156 J	7.04	--	1.86	--	--	--	--	20.1	--	26.6	--	--	--	--	11.5	--	--	--	--	--	--	64.8
CN022	FTBL-IS-114-070816-C	N	7/8/2016	--	0.178 J	7.6	--	1.99	--	--	--	--	22.1	--	29.8	--	--	--	--	11.9	--	--	--	--	--	--	70.2
CN027	CR-MIS-CN027-01_02082011	N	2/8/2011	6430	< 0.095 ND	4.1	60.9	0.68	0.34	6840	6.8	3.5	14.7	8110	21.7	1960	160	0.031	0.24	6.8	1940	< 0.244 ND	< 0.036 ND	185	0.31	11.2	32.8
CN044	FTBL-IS-078-062316	N	6/23/2016	--	0.129 U	7.59	--	1.77	--	--	--	--	23.1	--	25.2	--	--	--	--	14.5	--	--	--	--	--	--	71
CN046	FTBL-IS-079-070616	N	7/6/2016	--	2.03 J	7.35	--	1.28	--	--	--	--	17.8	--	58	--	--	--	--	10.6	--	--	--	--	--	--	56.5
CN056	CR-MIS-CN056-01_02102011	N	2/10/2011	5610	0.19	1.7	42.7	0.7	0.31	1330	6.6	3.4	13.5	10200	20.3	1290	148	0.022	0.23	5.9	1570	< 0.244 ND	< 0.036 ND	131	< 0.206 ND	10.7	32.9
CN058	CR-MIS-CN058-01_02092011	N	2/9/2011	6930	< 0.095 ND	4.9	52.2	0.74	0.32	1640	8.4	3.7	14.9	12600	19.5	1600	170	0.026	0.29	7	2060	< 0.244 ND	< 0.036 ND	176	< 0.206 ND	14.7	36.5
CN060	FTBL-IS-072-061016	N	6/10/2016	--	0.221 J	7.07	--	0.983	--	--	--	--	18.5	--	26.6	--	--	--	--	9.84	--	--	--	--	--	--	47.9
CN064	FTBL-IS-074-060916-A	N	6/9/2016	--	0.361 J	6.92	--	0.963	--	--	--	--	23	--	63.6 J	--	--	--	--	9.18	--	--	--	--	--	--	48.5
CN064	FTBL-IS-074-060916-B	N	6/9/2016	--	0.470 J	6.74	--	0.965	--	--	--	--	22.8	--	89.1 J	--	--	--	--	8.79	--	--	--	--	--	--	48.8
CN064	FTBL-IS-074-060916-C	N	6/9/2016	--	0.920 J	6.54	--	0.935	--	--	--	--	21.8	--	**146 J**	--	--	--	--	8.54	--	--	--	--	--	--	46.9
CN066	CR-MIS-CN066-01_02092011	N	2/9/2011	6570	0.31	4.8	50.4	0.71	0.4	1700	8.5	4.5	20.4	< 14 ND	61.5	1520	170	0.03	0.35	6.7	1930	< 0.244 ND	< 0.036 ND	127	0.21	14.1	38.3
CN073	FTBL-IS-077-060916-A	N	6/9/2016	--	**40.4 J**	5.02	--	1.7	--	--	--	--	38.3	--	**1070 J**	--	--	--	--	7.76	--	--	--	--	--	--	67
CN073	FTBL-IS-077-060916-B	N	6/9/2016	--	**14.1 J**	4.56	--	1.73	--	--	--	--	31.7	--	**552 J**	--	--	--	--	7.68	--	--	--	--	--	--	66.3
CN073	FTBL-IS-077-060916-C	N	6/9/2016	--	**50.4 J**	5.61	--	1.71	--	--	--	--	34.7	--	**1320 J**	--	--	--	--	7.89	--	--	--	--	--	--	66.3
CN074	FTBL-IS-185-012517	N	1/25/2017	--	0.950 J	--	--	--	--	--	--	--	--	--	76.5	--	--	--	--	--	--	--	--	--	--	--	--
CO022	FTBL-IS-113-070816	N	7/8/2016	--	0.169 J	6.49	--	1.81	--	--	--	--	20.3	--	25.5	--	--	--	--	10.3	--	--	--	--	--	--	74.3
CO038	FTBL-IS-154-071416	N	7/14/2016	--	0.177 J	8.23	--	2.1	--	--	--	--	25.1	--	27	--	--	--	--	20.5	--	--	--	--	--	--	110
CO042	FTBL-IS-065-062316	N	6/23/2016	--	0.121 U	6.16	--	1.23	--	--	--	--	18.6	--	21.7	--	--	--	--	12.6	--	--	--	--	--	--	61.5
CO043	CR-MIS-CO043-01_02082011	N	2/8/2011	5620	< 0.095 ND	4.6	59.2	0.88	0.27	9840	7.9	4.5	14	17400	16.8	3210	194	0.021	0.35	8.7	1780	< 0.244 ND	< 0.036 ND	202	0.4	14.9	48.9
CO045	FTBL-IS-067-062316	N	6/23/2016	--	0.181 U	6.18	--	1.29	--	--	--	--	19.8	--	24.1	--	--	--	--	14	--	--	--	--	--	--	76.4
CO048	CR-IS-CO048-01_09132012	N	9/13/2012	8380	0.43	< 0.088 ND	48.4	0.67	0.47	1970	8.9	2.9	13.4	13800	16.5	1860	187	0.025	0.25	6.1	1850	0.51	< 0.036 ND	36.4	< 0.206 ND	19.9	31.8
CO058	CR-MIS-CO058-01_02082011	N	2/8/2011	6250	< 0.095 ND	5.1	54.4	0.76	0.29	1850	8.3	4	14.3	14300	19.7	1590	179	0.025	0.29	7.2	1920	< 0.244 ND	< 0.036 ND	154	0.23	15.4	37.2
CO062	CR-IS-CO062-01_09132012	N	9/13/2012	6990	0.29	< 0.088 ND	45.8	0.62	0.4	1450	7.9	2.8	11.7	11800	13.7	1570	177	0.023	0.23	5.6	1830	0.37	< 0.036 ND	28.4	< 0.206 ND	16.8	28.7
CO066	CR-MIS-CO066-01_02092011	N	2/9/2011	5670	< 0.095 ND	4.1	42.8	0.6	0.25	1830	6.7	3.4	12.7	10600	19.5	1750	148	0.023 0.024	0.3	5.8	1690	< 0.244 ND	< 0.036 ND	139	< 0.206 ND	13	32.4
CO070	FTBL-IS-071-060916	N	6/9/2016	--	0.998 J	5.02	--	1.3	--	--	--	--	19.6	--	65.0 J	--	--	--	--	10	--	--	--	--	--	--	61.7
CP043	FTBL-IS-066-062316	N	6/23/2016	--	0.136 U	5.81	--	1.59	--	--	--	--	23.5	--	25.8	--	--	--	--	16.8	--	--	--	--	--	--	98.2
CP047	FTBL-IS-068-070616	N	7/6/2016	--	0.143 J	6.01	--	1.54	--	--	--	--	17.1	--	21.1	--	--	--	--	13.2	--	--	--	--	--	--	74.7
CP050	FTBL-IS-069-062216	N	6/22/2016	--	0.677 J	7.79	--	1.13	--	--	--	--	22.6	--	48.9	--	--	--	--	8.84	--	--	--	--	--	--	58.2
CP054	CR-MIS-CP054-01_02082011	N	2/8/2011	6730	0.32	5.8	69.3	0.94	0.47	3960	8.6	5	20.6	16800	40.8	2870	223	0.026	0.4	8.7	1960	< 0.244 ND	< 0.036 ND	199	0.39	16.8	55.1

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	Sample ID	Sample Type	Sample Date																								
CP057	CR-MIS-CP057-01_02082011	N	2/8/2011	6550	< 0.095 ND	4.7	64.3	0.92	0.42	4820	7.9	5.1	18.3	16000	24.1	3560	223	0.023	0.38	9.3	2010	< 0.244 ND	< 0.036 ND	207	0.38	16	53.8
CP064	FTBL-IS-070-061016	N	6/10/2016	--	0.209 J	6.37	--	1.06	--	--	--	--	22.3	--	33.2	--	--	--	--	11.3	--	--	--	--	--	--	66.7
CP073	FTBL-IS-186-012317	N	1/23/2017	--	0.532 J	--	--	--	--	--	--	--	--	--	61.4	--	--	--	--	--	--	--	--	--	--	--	--
CQ048	FTBL-IS-063-070616	N	7/6/2016	--	0.163 J	5.76	--	1.31	--	--	--	--	20.6	--	28.9	--	--	--	--	12.5	--	--	--	--	--	--	79.8
CQ059	FTBL-IS-064-061016	N	6/10/2016	--	0.252 J	5.63	--	1.16	--	--	--	--	22	--	31.4	--	--	--	--	13.6	--	--	--	--	--	--	77.7
CQ072	CR-IS-CQ072-01_09132012	N	9/13/2012	7180	0.48	< 0.088 ND	56.9	0.64	0.59	4710	7.2	3.3	15.9	14700	33.6	3650	**236**	0.021	0.25	6.7	1750	**0.55**	< 0.036 ND	77.4	< 0.206 ND	17.4	39.9
CR023	FTBL-IS-111-071116	N	7/11/2016	--	0.128 J	5.68	--	1.32	--	--	--	--	18.1	--	23.2 J	--	--	--	--	9.02	--	--	--	--	--	--	59.6
CR025	FTBL-IS-112-071116	N	7/11/2016	--	0.165 J	6.03	--	1.41	--	--	--	--	20.2	--	27.9 J	--	--	--	--	9.55	--	--	--	--	--	--	62.2
CR045	FTBL-IS-056-070716	N	7/7/2016	--	0.313 J	6.73	--	1.06	--	--	--	--	24.3	--	36.4	--	--	--	--	11	--	--	--	--	--	--	74.3
CR051	CR-MIS-CR051-01_02092011	N	2/9/2011	6320	< 0.095 ND	4.3	67.5	0.89	0.69	6740	8	5.3	**165**	16800	37.8	4430	**245**	0.027	0.44	10.3	2020	< 0.244 ND	< 0.036 ND	227	0.36	16.7	75.1
CR052	FTBL-IS-058-062116	N	6/21/2016	--	0.707 J	5.69	--	1.15	--	--	--	--	22.8	--	83	--	--	--	--	13.1	--	--	--	--	--	--	86.3
CR054	FTBL-IS-059-062116	N	6/21/2016	--	0.199 J	4.86	--	1.07	--	--	--	--	18.7	--	33	--	--	--	--	11.5	--	--	--	--	--	--	76.5
CR061	FTBL-IS-061-061016	N	6/10/2016	--	0.508 J	5.27	--	1.07	--	--	--	--	22.7	--	44.8	--	--	--	--	11.5	--	--	--	--	--	--	72.1
CR064	FTBL-IS-062-061016	N	6/10/2016	--	0.394 J	5.46	--	0.947	--	--	--	--	18.7	--	38.2	--	--	--	--	9.55	--	--	--	--	--	--	59.3
CS049	FTBL-IS-057-070716	N	7/7/2016	--	0.159 J	4.89	--	1.1	--	--	--	--	16.5	--	26.4	--	--	--	--	9.35	--	--	--	--	--	--	63.4
CS056	FTBL-IS-060-062016	N	6/20/2016	--	0.323 J	5.48	--	1.22	--	--	--	--	22.4	--	45.4	--	--	--	--	13.9	--	--	--	--	--	--	87.3
CS059	CR-IS-CS059-01_09132012	N	9/13/2012	7150	0.43	< 0.088 ND	55.9	0.65	0.58	4240	7.4	3.5	16.1	14600	35.5	3570	**236**	0.022	0.26	6.9	1680	**0.58**	< 0.036 ND	84.8	< 0.206 ND	18.4	41.7
CT047	FTBL-IS-048-070716	N	7/7/2016	--	0.276 J	6.04	--	1.08	--	--	--	--	25.9	--	33.8	--	--	--	--	10.9	--	--	--	--	--	--	60.4
CT052	FTBL-IS-051-062116	N	6/21/2016	--	0.330 J	5.29	--	1.18	--	--	--	--	21.9	--	51.9	--	--	--	--	12.3	--	--	--	--	--	--	89
CT053	CR-MIS-CT053-01_02102011	N	2/10/2011	5250	0.12	< 0.088 ND	50.1	0.72	0.5	4500	6.2	3.6	19.9	11700	40	3020	179	0.021	0.35	7.4	1500	< 0.244 ND	< 0.036 ND	132	< 0.206 ND	11.1	53.2
CT062	FTBL-IS-054-061016	N	6/10/2016	--	0.364 J	5.12	--	1.07	--	--	--	--	20.3	--	56.6	--	--	--	--	11.4	--	--	--	--	--	--	68.2
CT065	FTBL-IS-187-012317-A	N	1/23/2017	--	0.725 J	5.7	--	1.02	--	--	--	--	22.1	--	80.2	--	--	--	--	10.1	--	--	--	--	--	--	63.5
CT065	FTBL-IS-187-012317-B	N	1/23/2017	--	0.419 J	6.11	--	1.05	--	--	--	--	21.7	--	67.4	--	--	--	--	9.89	--	--	--	--	--	--	60
CT065	FTBL-IS-187-012317-C	N	1/23/2017	--	0.762 J	5.98	--	1.08	--	--	--	--	24.4	--	**138**	--	--	--	--	10	--	--	--	--	--	--	65
CU048	FTBL-IS-049-070716	N	7/7/2016	--	0.248 J	5.71	--	0.949	--	--	--	--	21.6	--	34.4	--	--	--	--	9.34	--	--	--	--	--	--	49.8
CU057	FTBL-IS-053-062016	N	6/20/2016	--	0.394 J	5.35	--	1.13	--	--	--	--	25.1	--	61.1	--	--	--	--	11.7	--	--	--	--	--	--	84.7
CU059	CR-MIS-CU059-01_02102011	N	2/10/2011	4250	0.21	0.31	44.1	0.65	0.43	3500	5.1	3.5	15.7	8030	43.2	2400	162	0.022	0.3	6	1350	< 0.244 ND	< 0.036 ND	109	< 0.206 ND	9.3	45.5
CU060	CR-MIS-CU060-01_02082011	N	2/8/2011	6550	0.11	< 0.088 ND	68	0.89	0.56	3980	8	5	21.1	16800	48.2	3400	**242**	0.022 0.022	0.4	9.1	2020	< 0.244 ND	< 0.036 ND	201	< 0.206 ND	17.4	63.2
CU068	CR-MIS-CU068-01_02082011	N	2/8/2011	4680	< 0.095 ND	3.3	45.1	0.63	0.29	1750	8	3.4	12.9	16100	33	1830	159	0.018	0.35	7.2	1460	< 0.244 ND	< 0.036 ND	136	0.27	11.6	39.5
CU071	CR-IS-CU071-01_09132012	N	9/13/2012	6830	1	< 0.088 ND	48.8	0.63	0.52	1870	7.7	3.2	15.1	14200	101	2270	212	0.017	0.27 0.27	6.1	1720	**0.66**	< 0.036 ND	45.1	< 0.206 ND	17.9	36.6
CU074	FTBL-IS-055-060816	N	6/8/2016	--	0.512 J	4.62	--	0.966	--	--	--	--	21.7	--	73.6 J	--	--	--	--	9.91	--	--	--	--	--	--	69.2
CV050	FTBL-IS-050-070716	N	7/7/2016	--	0.263 J	5.77	--	1.01	--	--	--	--	18.4	--	32.2	--	--	--	--	9.74	--	--	--	--	--	--	51
CV053	FTBL-IS-052-062116-A	N	6/21/2016	--	0.189 J	6.03	--	1.1	--	--	--	--	16.1 J	--	25.8 J	--	--	--	--	11.1	--	--	--	--	--	--	64.6
CV053	FTBL-IS-052-062116-B	N	6/21/2016	--	0.369 J	5.67	--	1.17	--	--	--	--	22.4 J	--	60.2 J	--	--	--	--	13.2	--	--	--	--	--	--	86.9
CV053	FTBL-IS-052-062116-C	N	6/21/2016	--	0.318 J	5.52	--	1.16	--	--	--	--	27.0 J	--	42.2 J	--	--	--	--	12.4	--	--	--	--	--	--	85.1
CV055	CR-IS-CV055-01_09132012	N	9/13/2012	6980	0.5	< 0.088 ND	57.2	0.6	0.66	4490	7.3	3.1	17.9	13900	33.7	3460	226	0.029	0.27	6.4	1690	**0.63**	< 0.036 ND	72.6	< 0.206 ND	17.1	40.8
CV063	CR-IS-CV063-01_09132012	N	9/13/2012	7140	0.7	< 0.088 ND	58.2	0.68	0.64	3700	7.6	3.3	16.7	14500	38.1	3230	**243**	0.028	0.28	6.6	1750	**0.56**	< 0.036 ND	73.7	< 0.206 ND	18.3	41.8
CV066	FTBL-IS-188-012317	N	1/23/2017	--	0.194 J	6.05	--	1.05	--	--	--	--	17.8	--	30.5	--	--	--	--	9.48	--	--	--	--	--	--	55.5
CW048	FTBL-IS-047-062316	N	6/23/2016	--	0.240 J	6.03	--	1.02	--	--	--	--	24.9	--	37.8	--	--	--	--	9.56	--	--	--	--	--	--	59.6
CW058	CR-MIS-CW058-01_02092011	N	2/9/2011	6840	< 0.095 ND	4.4	67.3	0.84	0.52	3950	7.6	4.6	20.7	15600	34.3	3440	**251**	0.024	0.39	8.6	2070	< 0.244 ND	< 0.036 ND	229	0.27	14.9	55.5
CW061	FTBL-IS-043-062016	N	6/20/2016	--	0.570 J	5.84	--	1.06	--	--	--	--	22.1	--	47.7	--	--	--	--	11.4	--	--	--	--	--	--	76.4
CW072	CR-MIS-CW072-01_02092011	N	2/9/2011	3990	< 0.095 ND	3.3	37.2	0.53	0.25	1470	5.3	3.1	11.5	10200	17.8	1540	145	0.018	0.3	5.4	1300	< 0.244 ND	< 0.036 ND	165	0.25	10.4	35.2
CX044	FTBL-IS-189-012017	N	1/20/2017	--	0.271	8.02	--	1.09	--	--	--	--	25.3	--	40.7	--	--	--	--	9.36	--	--	--	--	--	--	70
CX055	FTBL-IS-041-062316	N	6/23/2016	--	0.194 U	5.3	--	1.1	--	--	--	--	22.5	--	33.4	--	--	--	--	11.2	--	--	--	--	--	--	73.4
CX063	FTBL-IS-044-062016	N	6/20/2016	--	0.219 J	5.3	--	1.06	--	--	--	--	16.6	--	30.7	--	--	--	--	10.5	--	--	--	--	--	--	64.2
CX066	CR-MIS-CX066-01_02082011	N	2/8/2011	5950	< 0.095 ND	4.1	55.3	0.73	0.35	2600	7.6	4	15.8	16800	24.6	2110	192	0.021	0.32	7.9	1680	< 0.244 ND	< 0.036 ND	176	0.32	15.2	45.3
CY049	FTBL-IS-039-062316	N	6/23/2016	--	0.196 U	6.85	--	1.15	--	--	--	--	24	--	33.1	--	--	--	--	10.2	--	--	--	--	--	--	60.6
CY052	FTBL-IS-040-062316	N	6/23/2016	--	0.152 U	6.57	--	1.14	--	--	--	--	19.7	--	28	--	--	--	--	10.9	--	--	--	--	--	--	65.4
CY057	CR-MIS-CY057-01_02142011	N	2/14/2011	6920	< 0.095 ND	0.4	63.1	0.76	0.51	3000	7.4	4.1	19.4	13400	24.5	2890	213	0.026	0.23	8	2150	< 0.244 ND	< 0.036 ND	167	0.53	13.3	50
CY059	CR-MIS-CY059-01_02142011	N	2/14/2011	6160	< 0.095 ND	1.7	56.9	0.68	0.47	2350	6.7	4	17.1	9520	24.8	2180	194	0.019	0.17	7.6	1820	< 0.244 ND	< 0.036 ND	191	0.47	11.2	42.9
CY060	FTBL-IS-042-062016	N	6/20/2016	--	0.163 J	4.96	--	1.02	--	--	--	--	14.1	--	24.6	--	--	--	--	10	--	--	--	--	--	--	61.9
CY065	FTBL-IS-045-061616	N	6/16/2016	--	0.203 J	5.41	--	0.953	--	--	--	--	19.2	--	31.1	--	--	--	--	9.69	--	--	--	--	--	--	63.5
CY069	CR-MIS-CY069-01_02102011	N	2/10/2011	5680	< 0.095 ND	4.5	58.5	0.76	0.49	2830	8.9	4	17.7	14300	27.5	2360	207	0.022	0.43	8.2	1800	< 0.244 ND	< 0.036 ND	193	< 0.206 ND	13.4	49.6
CY070	CR-MIS-CY070-01_02152011	N	2/15/2011	4040	< 0.095 ND	< 0.088 ND	36.7	0.49	0.26	1670	11	2.8	11.2	7580	16.9	1550	133	0.022	0.38	7.9	1220	0.33	< 0.036 ND	107	< 0.206 ND	9.5	33.5
CY074	FTBL-IS-046-060816	N	6/8/2016	--	0.180 J	4.84	--	0.934	--	--	--	--	17.6	--	32.7 J	--	--	--	--	8.67	--	--	--	--	--	--	54.9
CZ054	FTBL-IS-190-012317	N	1/23/2017	--	0.175 J	7.35	--	1.01	--	--	--	--	14.5	--	21.6	--	--	--	--	9.36	--	--	--	--	--	--	46.3
CZ056	CR-MIS-CZ056-01_02142011	N	2/14/2011	6780	< 0.095 ND	1.2	60.5	0.74	0.59	3430	7	4.3	20.2	12500	31.7	2960	204	0.029	0.18	8	1960	< 0.244 ND	< 0.036 ND	202	0.47	12.2	51.3
CZ058	CR-MIS-CZ058-01_02142011	N	2/14/2011	6210	< 0.095 ND	2.3	58	0.72	0.53	2500	8.1	3.8	19.4	9400	28.2	2310	207	0.022	0.26	7.8	1830	< 0.244 ND	< 0.036 ND	180	0.55	11.4	45.7
CZ062	CR-MIS-CZ062-01_02142011	N	2/14/2011	6310	< 0.095 ND	5.8	59.2	0.73	0.56	2660	6.9	3.8	26.4	13500	28.7	2470	206	0.021	0.28	7.6	1920	< 0.244 ND	< 0.036 ND	164	0.47	13.7	49.5
CZ071	CR-MIS-CZ071-01_02102011	N	2/10/2011	5340	< 0.095 ND	4.7	50.1	0.7	0.33	2120	6.7	3.9	13.8	12900	**415**	1990	183	0.021	0.32	6.7	1670	< 0.244 ND	< 0.036 ND	173	0.26	13.3	42.4

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte Result Units	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Calcium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg
Location ID	Sample ID	Sample Type	Sample Date																								
CZ072	CR-MIS-CZ072-01_02102011	N	2/10/2011	4700	< 0.095 ND	4	48.9	0.7	0.36	1880	6.3	3.7	14.1	12000	22.8	1650	176	0.02	0.33	6.2	1590	< 0.244 ND	< 0.036 ND	176	< 0.206 ND	12.2	41.1
DA053	CR-IS-DA053-01_09142012	N	9/14/2012	3580	0.23	1.3	42.2	0.55	0.39	6690	4.2	2.7	11.6	9490	13.4	3090	174	0.023	0.23	4.9	1090	0.32	< 0.036 ND	35	< 0.206 ND	11.4	27.8
DA059	CR-MIS-DA059-01_02152011	N	2/15/2011	4650	< 0.095 ND	0.9	41.1	0.57	0.35	1400	5.8	3	15.5	10800	26.4	1250	143	0.027 0.03	0.27	5	1340	0.41	< 0.036 ND	118	< 0.206 ND	11.2	35.3
DA065	FTBL-IS-036-061616	N	6/16/2016	--	0.185 J	4.94	--	0.957	--	--	--	--	17.7	--	28.7	--	--	--	--	9.73	--	--	--	--	--	--	59.8
DA068	CR-MIS-DA068-01_02102011	N	2/10/2011	3970	0.18	0.65	40	0.59	0.32	1830	5.1	3	12.7	7650	25	1590	145	0.022	0.27	5.4	1270	< 0.244 ND	< 0.036 ND	96.5	< 0.206 ND	9	37.4
DA069	CR-MIS-DA069-01_02102011	N	2/10/2011	3600	0.26	0.38	38.2	0.55	0.34	1560	6.3	2.9	12.1	7740	20.9	1570	153	0.02	0.33	6	1220	< 0.244 ND	< 0.036 ND	135	< 0.206 ND	8.5	37.3
DA070	FTBL-IS-037-061616	N	6/16/2016	--	0.158 J	4.95	--	0.967	--	--	--	--	19.4	--	31.7	--	--	--	--	9.52	--	--	--	--	--	--	60.7
DA074	FTBL-IS-038-060816	N	6/8/2016	--	0.224 J	5.7	--	0.96	--	--	--	--	17.4	--	38.9 J	--	--	--	--	8.62	--	--	--	--	--	--	55.8
DB048	FTBL-IS-034-070716	N	7/7/2016	--	0.199 J	7.2	--	1.09	--	--	--	--	24	--	37	--	--	--	--	10.2	--	--	--	--	--	--	87.3
DB052	FTBL-IS-191-012317	N	1/23/2017	--	0.232 J	8.32	--	1.29	--	--	--	--	20.1	--	28.2	--	--	--	--	11.9	--	--	--	--	--	--	59.5
DB057	FTBL-IS-035-061516-A	N	6/15/2016	--	0.189 J	6.51	--	0.951	--	--	--	--	18.5	--	26.3 J	--	--	--	--	8.86	--	--	--	--	--	--	50.9
DB057	FTBL-IS-035-061516-B	N	6/15/2016	--	0.208 J	6.87	--	1.01	--	--	--	--	19.9	--	29.4 J	--	--	--	--	9.41	--	--	--	--	--	--	55
DB057	FTBL-IS-035-061516-C	N	6/15/2016	--	0.186 J	6.26	--	0.964	--	--	--	--	19.2	--	28.1 J	--	--	--	--	8.96	--	--	--	--	--	--	53.4
DB059	CR-MIS-DB059-01_02152011	N	2/15/2011	5270	< 0.095 ND	< 0.088 ND	47.6	0.64	0.32	2380	6.2	3.6	14.4	11900	25	2120	169	0.023	0.32	6.3	1540	0.51	< 0.036 ND	136	< 0.206 ND	11.5	42.6
DB061	CR-MIS-DB061-01_02142011	N	2/14/2011	7540	1.5	1.7	54.7	0.79	0.54	2060	7.7	3.6	21.6	13300	82	1870	195	0.022	0.24	6.8	2050	< 0.244 ND	< 0.036 ND	155	0.38	14.3	45.5
DB070	CR-MIS-DB070-01_02102011	N	2/10/2011	3940	0.25	0.42	40.2	0.67	0.32	1610	5.4	3.1	13	10300	98.9	1640	147	0.017	0.26	5.5	1360	< 0.244 ND	< 0.036 ND	107	< 0.206 ND	9.3	36.5
DB072	CR-MIS-DB072-01_02102011	N	2/10/2011	4500	0.2	0.58	50.7	0.8	0.41	2480	5.7	3.9	17	12000	27.7	2180	182	0.019	0.34	6.8	1570	< 0.244 ND	< 0.036 ND	137	< 0.206 ND	10.6	46.1
DC046	FTBL-IS-192-012017	N	1/20/2017	--	0.27	10.3	--	0.936	--	--	--	--	24.6	--	40.3	--	--	--	--	10.9	--	--	--	--	--	--	110
DC062	CR-MIS-DC062-01_02142011	N	2/14/2011	7370	< 0.095 ND	1.3	56	0.75	0.56	2030	7.8	3.7	26.7	13800	35.3	1860	204	0.023	0.21	6.8	2040	< 0.244 ND	< 0.036 ND	150	0.52	14.3	47.6
DC063	CR-MIS-DC063-01_02142011	N	2/14/2011	6890	< 0.095 ND	2.2	57.1	0.78	0.61	2030	8.2	4	47.3	11200	41.6	1820	208	0.022	0.3	7.2	1990	< 0.244 ND	< 0.036 ND	138	0.49	15	52.2
DC065	FTBL-IS-029-061516	N	6/15/2016	--	0.220 J	5	--	0.867	--	--	--	--	18.6	--	39.8 J	--	--	--	--	8.63	--	--	--	--	--	--	52.6
DC067	CR-MIS-DC067-01_02112011	N	2/11/2011	3260	< 0.095 ND	2.6	33.6	0.45	0.24	1630	4.4	2.5	11.6	6910	25.4	1470	124	0.019	0.26	4.6	1120	< 0.244 ND	< 0.036 ND	145	0.22	8.2	30.6
DC074	FTBL-IS-033-060816	N	6/8/2016	--	0.239 J	6.1	--	1.05	--	--	--	--	21.2	--	41.1 J	--	--	--	--	10.4	--	--	--	--	--	--	66.8
DD048	FTBL-IS-026-060716	N	6/7/2016	--	0.231 J	7.52	--	1.11	--	--	--	--	24.4	--	39.6	--	--	--	--	10.2	--	--	--	--	--	--	100
DD050	FTBL-IS-027-060716	N	6/7/2016	--	0.223 J	7	--	1.04	--	--	--	--	18.8	--	31.9	--	--	--	--	9.72	--	--	--	--	--	--	99.6
DD054	FTBL-IS-155-071416	N	7/14/2016	--	0.152 J	6.83	--	1.15	--	--	--	--	15.8	--	21.6	--	--	--	--	8.18	--	--	--	--	--	--	47.3
DD058	CR-MIS-DD058-01_02102011	N	2/10/2011	3950	0.21	1.5	36.3	0.58	0.31	1390	5.4	2.8	12.2	7120	20.3	1200	129	0.021	0.22	4.7	1240	< 0.244 ND	< 0.036 ND	120	< 0.206 ND	9.1	33.7
DD069	FTBL-IS-031-061616	N	6/16/2016	--	0.172 J	5.19	--	0.978	--	--	--	--	19.3	--	31.5	--	--	--	--	9.46	--	--	--	--	--	--	61.4
DD072	CR-MIS-DD072-01_02142011	N	2/14/2011	6350	0.3	0.2	55.4	0.69	0.5	2690	6.8	3.7	37.8	10200	**194**	2310	206	0.019	0.21	7.3	1890	< 0.244 ND	< 0.036 ND	148	0.47	12.6	49.6
DE061	FTBL-IS-028-061516	N	6/15/2016	--	0.201 J	4.78	--	0.856	--	--	--	--	20.6	--	36.5 J	--	--	--	--	8.94	--	--	--	--	--	--	56.4
DE065	CR-MIS-DE065-01_02112011	N	2/11/2011	4700	0.53	0.41	48.7	0.58	0.32	2590	6	3.4	14.5	10400	110	1540	193	0.022	0.36	6	1420	0.49	< 0.036 ND	124	< 0.206 ND	11.4	36.5
DE067	CR-MIS-DE067-01_02142011	N	2/14/2011	6420	0.13	< 0.088 ND	54.5	0.7	0.5	3070	7.3	3.9	23.9	13000	64.9	2450	202	0.019	0.23	8	1910	< 0.244 ND	< 0.036 ND	188	0.4	13.6	48.9
DE071	CR-MIS-DE071-01_02142011	N	2/14/2011	5720	0.4	0.3	48.1	0.63	0.41	1960	6.6	3.5	31.8	10200	**218**	2010	185	0.019 0.02	0.21	7	1680	< 0.244 ND	< 0.036 ND	161	0.33	11.7	41.9
DE072	CR-MIS-DE072-01_02142011	N	2/14/2011	5930	0.76	0.41	51.1	0.68	0.56	2260	**22**	3.7	37.8	13100	**327**	2390	193	0.015	0.61	14.8	1820	< 0.244 ND	< 0.036 ND	155	0.54	11.6	48.1
DF047	FTBL-IS-193-011917	N	1/19/2017	--	0.316	8.72	--	0.863	--	--	--	--	23.7	--	41.7	--	--	--	--	8.62	--	--	--	--	--	--	**122**
DF049	FTBL-IS-024-060716	N	6/7/2016	--	0.244 J	8.14	--	0.996	--	--	--	--	24.8	--	47	--	--	--	--	9.18	--	--	--	--	--	--	**142**
DF052	FTBL-IS-194-012017-A	N	1/20/2017	--	0.239	9.38 J	--	0.894	--	--	--	--	20.4	--	39.9	--	--	--	--	8.28	--	--	--	--	--	--	**126**
DF052	FTBL-IS-194-012017-B	N	1/20/2017	--	0.315	8.51 J	--	0.891	--	--	--	--	16.8	--	36.9	--	--	--	--	8	--	--	--	--	--	--	**121**
DF052	FTBL-IS-194-012017-C	N	1/20/2017	--	0.265	13.1 J	--	0.892	--	--	--	--	19.7	--	40.3	--	--	--	--	8.32	--	--	--	--	--	--	**122**
DF056	CR-MIS-DF056-01_02152011	N	2/15/2011	5820	< 0.095 ND	1.8	46.4	0.67	0.34	1470	7.2	3.5	15.6	11500	25.7	1390	156	0.026	0.27	5.7	1670	0.52	< 0.036 ND	129	< 0.206 ND	13.2	36.4
DF059	CR-IS-DF059-01_09142012	N	9/14/2012	6500	0.4	4.2	47.1	0.63	0.43	1580	7.6	3	32.5	12600	39.5	1560	185	0.022	0.19	5.3	1590	0.3	< 0.036 ND	32.2	< 0.206 ND	19.4	33.4
DF063	CR-MIS-DF063-01_02112011	N	2/11/2011	4900	0.11	0.29	45.2	0.63	0.33	2920	6.1	3.5	15.2	11400	43.1	1790	155	0.017	0.29	6.4	1450	0.37	< 0.036 ND	145	< 0.206 ND	11.4	41.9
DF066	CR-MIS-DF066-01_02142011	N	2/14/2011	5170	< 0.095 ND	1.2	46.6	0.63	0.51	1800	5.8	3.5	20.9	111	52.1	1840	174	0.021	0.2	6.1	1620	< 0.244 ND	< 0.036 ND	205	0.33	10.7	44.8
DF068	FTBL-IS-030-061516-A	N	6/15/2016	--	0.493 J	5	--	0.924 J	--	--	--	--	22.5	--	103 J	--	--	--	--	9.15	--	--	--	--	--	--	52.9
DF068	FTBL-IS-030-061516-B	N	6/15/2016	--	1.38 J	5.25	--	0.873 J	--	--	--	--	23.3	--	**211 J**	--	--	--	--	9.06	--	--	--	--	--	--	54.9
DF068	FTBL-IS-030-061516-C	N	6/15/2016	--	0.356 J	5.28	--	1.42 J	--	--	--	--	22.3	--	73.8 J	--	--	--	--	9.54	--	--	--	--	--	--	54.9
DF074	FTBL-IS-032-060816	N	6/8/2016	--	0.468 J	5.25	--	0.972	--	--	--	--	26.3	--	**151 J**	--	--	--	--	9.84	--	--	--	--	--	--	62.5
DG050	FTBL-IS-025-060716	N	6/7/2016	--	1.39 J	7.68	--	0.956	--	--	--	--	35	--	**376**	--	--	--	--	11.1	--	--	--	--	--	--	120
DG064	CR-MIS-DG064-01_02112011	N	2/11/2011	5420	< 0.095 ND	0.36	50	0.65	0.37	2020	6.9	3.8	16	12400	28.8	1760	170	0.021	0.38	6.6	1630	**0.58**	< 0.036 ND	100	< 0.206 ND	13.4	41
DG065	FTBL-IS-021-060716	N	6/7/2016	--	0.249 J	6.05	--	1.12	--	--	--	--	19.4	--	42.5	--	--	--	--	9.93	--	--	--	--	--	--	55.5
DG067	CR-MIS-DG067-01_02152011	N	2/15/2011	4800	< 0.095 ND	0.23	45	0.6	0.32	1820	6.6	3.8	16.4	12100	29.6	1690	164	0.023	0.38	6.5	1540	0.33	< 0.036 ND	110	< 0.206 ND	12.4	39.8
DG070	CR-MIS-DG070-01_02112011	N	2/11/2011	5070	**14.1**	0.88	38.5	0.62	0.3	1470	5.6	3.3	17.2	10000	**5030**	1480	136	0.021	0.23	5.9	1450	< 0.244 ND	< 0.036 ND	118	< 0.206 ND	10.5	35.8
DG072	CR-MIS-DG072-01_02112011	N	2/11/2011	4920	0.33	0.41	39.6	0.64	0.29	1630	5.8	3.2	17.5	7980	69.2	1550	141	0.019	0.23	5.6	1450	< 0.244 ND	< 0.036 ND	101	< 0.206 ND	10.2	37.2
DH050	FTBL-IS-195-011917	N	1/19/2017	--	0.309	8.21	--	0.887	--	--	--	--	22.2	--	35.3	--	--	--	--	11.2	--	--	--	--	--	--	90.8
DH055	CR-MIS-DH055-01_02102011	N	2/10/2011	4510	< 0.095 ND	4.3	49.3	0.72	0.39	6850	5.6	3.7	14.6	12200	23	3170	191	0.02	0.36	6.8	1430	< 0.244 ND	< 0.036 ND	158	0.28	11.9	48.9
DH058	FTBL-IS-196-011917	N	1/19/2017	--	0.463	8.17	--	1.02	--	--	--	--	19.1	--	30.5	--	--	--	--	9.18	--	--	--	--	--	--	49.1
DH061	FTBL-IS-197-011917	N	1/19/2017	--	0.254	6.21	--	0.964	--	--	--	--	18.4	--	29.9	--	--	--	--	8.67	--	--	--	--	--	--	55.6
DH068	CR-MIS-DH068-01_02142011	N	2/14/2011	5820	< 0.095 ND	0.59	48.6	0.62	0.41	1880	6.1	3.5	10.1	12500	26.3	2010	176	0.016 0.016	0.13	6.5	1840	< 0.244 ND	< 0.036 ND	144	0.39	11.1	27.8
DH072	FTBL-IS-022-060816	N	6/8/2016	--	0.526 J	6.32	--	0.938	--	--	--	--	25.7	--	**132 J**	--	--	--	--	9.07	--	--	--	--	--	--	52.6

Attachment 2 Table 2
ISM Sample Results - Inorganics
Closed Castner Firing Range

			Analyte Result Units	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Calcium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Mercury mg/kg	Molybdenum mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg
Location ID	Sample ID	Sample Type	Sample Date																								
DH072	FTBL-IS-022-110716R	N	11/7/2016	--	--	--	--	--	--	--	--	--	--	--	**128**	--	--	--	--	--	--	--	--	--	--	--	--
DI054	CR-MIS-DI054-01_02102011	N	2/10/2011	4360	0.29	1.2	44.1	0.54	0.32	3260	5.5	3.7	10.9	10100	19	1900	157	0.017	0.29	7.4	1410	< 0.244 ND	< 0.036 ND	139	< 0.206 ND	10.5	61.9
DI069	CR-MIS-DI069-01_02142011	N	2/14/2011	5620	< 0.095 ND	1.5	46.7	0.62	0.42	1730	6.3	3.6	23.5	11300	44	1760	162	0.018	0.17	6.4	1740	< 0.244 ND	< 0.036 ND	153	< 0.206 ND	10.9	40
DI070	CR-MIS-DI070-01_02112011	N	2/11/2011	4120	0.12	0.52	37.2	0.56	0.29	1450	5.3	2.9	14.5	7390	54.9	1410	127	0.017 0.017	0.25	5	1360	< 0.244 ND	< 0.036 ND	114	< 0.206 ND	8.8	35.1
DI073	FTBL-IS-023-060816	N	6/8/2016	--	0.456 J	4.68	--	0.963	--	--	--	--	20	--	93.4 J	--	--	--	--	7.84	--	--	--	--	--	--	46.1
DJ051	FTBL-IS-017-060616	N	6/6/2016	--	0.354 J	8.35	--	0.932	--	--	--	--	29.1	--	44.3	--	--	--	--	10.7	--	--	--	--	--	--	77.6
DJ063	CR-IS-DJ063-01_09142012	N	9/14/2012	6090	0.22	3.2	52	0.61	0.37	6500	6.6	3.1	15	12700	23	2840	192	0.019	0.18	5.6	1530	< 0.244 ND	< 0.036 ND	48	< 0.206 ND	17.7	32.9
DJ071	CR-MIS-DJ071-01_02112011	N	2/11/2011	5470	0.25	< 0.088 ND	43.6	0.7	0.25	1990	6.3	3.2	13	12100	28.5	1740	144	0.016	0.26	6.3	1600	< 0.244 ND	< 0.036 ND	140	< 0.206 ND	11.3	38.5
DK049	FTBL-IS-198-012017	N	1/20/2017	--	0.407	9.48	--	0.849	--	--	--	--	25.6	--	44.4	--	--	--	--	12	--	--	--	--	--	--	96.6
DK053	FTBL-IS-018-060616	N	6/6/2016	--	0.292 J	8.51	--	1.06	--	--	--	--	21.4	--	32.5	--	--	--	--	24.7	--	--	--	--	--	--	120
DK056	CR-MIS-DK056-01_02102011	N	2/10/2011	5400	0.15	1.1	51	0.63	0.46	3060	8	5	16	12600	25.9	2260	195	0.02	0.34	9.8	1610	0.35	< 0.036 ND	137	< 0.206 ND	13.8	73.7
DK065	CR-MIS-DK065-01_02112011	N	2/11/2011	4550	< 0.095 ND	< 0.088 ND	41.6	0.6	0.17	5630	5.1	2.9	10.7	9780	13.5	1920	132	0.015	0.31	5.4	1400	< 0.244 ND	< 0.036 ND	153	< 0.206 ND	10.2	36
DK069	FTBL-IS-019-060716	N	6/7/2016	--	0.652 J	6.11	--	1.02	--	--	--	--	22.1	--	**189**	--	--	--	--	8.61	--	--	--	--	--	--	55
DK069	FTBL-IS-019-110716R	N	11/7/2016	--	--	--	--	--	--	--	--	--	--	--	40.6	--	--	--	--	--	--	--	--	--	--	--	--
DK074	FTBL-IS-020-060816	N	6/8/2016	--	2.64 J	5.2	--	0.858	--	--	--	--	26	--	**754 J**	--	--	--	--	8.73	--	--	--	--	--	--	47.8
DL071	CR-MIS-DL071-01_02102011	N	2/10/2011	3790	0.13	0.47	35.7	0.55	0.19	1720	4.8	2.6	9.1	6680	15.2	1310	114	0.015	0.21	4.8	1280	< 0.244 ND	< 0.036 ND	105	< 0.206 ND	8.3	28.8
DM051	FTBL-IS-013-060616	N	6/6/2016	--	0.453 J	9.43	--	0.865	--	--	--	--	32.2	--	65.9	--	--	--	--	11	--	--	--	--	--	--	93.7
DM051	FTBL-IS-013-111016R	N	11/10/2016	--	--	8.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DM053	FTBL-IS-014-060616	N	6/6/2016	--	0.448 J	8.67	--	0.911	--	--	--	--	38.5	--	70	--	--	--	--	14.8	--	--	--	--	--	--	112
DN062	CR-IS-DN062-01_09142012	N	9/14/2012	7600	0.27	3.8	57.5	0.67	0.46	4320	10.5	3.5	15.7	15400	24.5	3060	214	0.016	0.21	7.1	2120	< 0.244 ND	< 0.036 ND	67.8	< 0.206 ND	23.1	52.1
DN072	FTBL-IS-015-060716	N	6/7/2016	--	0.187 J	5.79	--	0.974	--	--	--	--	17	--	52.9	--	--	--	--	9.35	--	--	--	--	--	--	57
DO066	CR-IS-DO066-01_09122012	N	9/12/2012	8170	0.2	3.8	119	0.88	0.43	35300	5.7	4.2	16.6	12200	16.3	7560	**401**	0.043	0.12	7.2	1900	**0.56**	< 0.036 ND	44.5	< 0.206 ND	14.8	38
DO074	FTBL-IS-016-060716	N	6/7/2016	--	0.180 J	5.04	--	0.877	--	--	--	--	14.1	--	27.3	--	--	--	--	9.32	--	--	--	--	--	--	59.2
DP051	FTBL-IS-199-012017	N	1/20/2017	--	0.608	6.85	--	0.694	--	--	--	--	24.6	--	89.4	--	--	--	--	10.1	--	--	--	--	--	--	52
DR059	CR-IS-DR059-01_09122012	N	9/12/2012	3860	0.3	3.1	48.6	0.43	0.41	2530	5.1	2.5	14.4	8190	18.2	1610	187	0.026	0.24	5	1070	0.33	< 0.036 ND	16	< 0.206 ND	11.3	23.6
DR063	CR-MIS-DR063-01_02112011	N	2/11/2011	6830	< 0.095 ND	4.4	61.6	0.67	0.27	30200	6.9	3.5	15.3	11600	16	6860	190	0.027	0.21	7	1920	< 0.244 ND	< 0.036 ND	168	0.3	12.4	38.6
DS053	FTBL-IS-200-011917	N	1/19/2017	--	0.322	8.15	--	0.85	--	--	--	--	19.3	--	44.8	--	--	--	--	9.87	--	--	--	--	--	--	48.6
DT051	CR-MIS-DT051-01_02102011	N	2/10/2011	6440	0.28	1.1	59	0.51	0.29	30400	5.6	2.5	13.3	6480	28.5	4770	130	0.027	< 0.074 ND	5.4	1600	< 0.244 ND	< 0.036 ND	115	< 0.206 ND	9.2	30.8
DV051	CR-IS-DV051-01_09142012	N	9/14/2012	4510	1.9	2.3	54.2	0.4	0.37	5550	5.3	2.8	18.3	8180	**132**	2070	164	0.021	0.2 0.2	6	1240	**0.55**	< 0.036 ND	23.3	< 0.206 ND	12.8	28.3
DV055	FTBL-IS-004-060316	N	6/3/2016	--	0.314 J	7.32	--	0.91	--	--	--	--	25.4	--	51.4	--	--	--	--	10.4	--	--	--	--	--	--	68.4
DV057	CR-IS-DV057-01_09142012	N	9/14/2012	3690	0.32	2.7	41	0.41	0.46	1970	5.3	2.4	15.6	8250	26.1	1420	152	0.028	0.24	4.7	1030	0.37	< 0.036 ND	20.1	< 0.206 ND	12	27.1
DV059	FTBL-IS-007-060216	N	6/2/2016	--	0.244 J	6.95	--	0.83	--	--	--	--	21.7	--	34	--	--	--	--	9.66	--	--	--	--	--	--	52.1
DV062	FTBL-IS-009-060216	N	6/2/2016	--	0.243 J	5.58	--	0.793	--	--	--	--	21.8	--	35	--	--	--	--	9.17	--	--	--	--	--	--	56.4
DV065	FTBL-IS-011-060216	N	6/2/2016	--	0.216 J	5.35	--	0.706	--	--	--	--	17.8	--	27.5	--	--	--	--	9.28	--	--	--	--	--	--	50.4
DV066	CR-MIS-DV066-01_02112011	N	2/11/2011	6130	< 0.095 ND	4.4	60.6	0.59	0.46	11800	7.9	3.5	18.6	11900	27.5	4720	200	0.024	0.36	7.5	1850	< 0.244 ND	< 0.036 ND	207	0.29	11.9	46.6
DV068	CR-MIS-DV068-01_02112011	N	2/11/2011	6610	< 0.095 ND	5.1	57.7	0.64	0.45	8800	7.4	4.1	19.1	14000	26.9	4870	202	0.022	0.34	7.9	1920	< 0.244 ND	< 0.036 ND	216	0.27	13.4	43.8
DW050	FTBL-IS-002-060316	N	6/3/2016	--	0.336 J	6.68	--	0.742	--	--	--	--	32.3	--	51.8	--	--	--	--	9.57	--	--	--	--	--	--	61.1
DW056	FTBL-IS-005-060316	N	6/3/2016	--	0.363 J	7.41	--	0.801	--	--	--	--	27.1	--	47.3	--	--	--	--	9.73	--	--	--	--	--	--	59.5
DW058	FTBL-IS-006-060316	N	6/3/2016	--	0.283 J	7.41	--	0.85	--	--	--	--	26.2	--	42.4	--	--	--	--	10	--	--	--	--	--	--	56.6
DW061	FTBL-IS-008-060216	N	6/2/2016	--	0.279 J	6.31	--	0.875	--	--	--	--	25.8	--	45.1	--	--	--	--	10.3	--	--	--	--	--	--	62.9
DW064	FTBL-IS-010-060216	N	6/2/2016	--	0.272 J	7.17	--	0.922	--	--	--	--	28.1	--	52.8	--	--	--	--	11	--	--	--	--	--	--	64.8
DW067	FTBL-IS-012-060216	N	6/2/2016	--	0.438 J	7.41	--	0.855	--	--	--	--	29.1	--	55.5	--	--	--	--	11.4	--	--	--	--	--	--	65.2
DX049	FTBL-IS-001-060316	N	6/3/2016	--	0.302 J	6.05	--	1.18	--	--	--	--	29.2	--	43.9	--	--	--	--	9.94	--	--	--	--	--	--	57
DX053	FTBL-IS-003-060616-A	N	6/6/2016	--	0.329 J	6.52	--	0.864	--	--	--	--	22.6	--	42.8	--	--	--	--	9.64	--	--	--	--	--	--	59.3
DX053	FTBL-IS-003-060616-B	N	6/6/2016	--	0.391 J	6.79	--	0.916	--	--	--	--	23.2	--	40.8	--	--	--	--	10.1	--	--	--	--	--	--	62.5
DX053	FTBL-IS-003-060616-C	N	6/6/2016	--	0.371 J	6.79	--	0.877	--	--	--	--	20.8	--	36	--	--	--	--	9.82	--	--	--	--	--	--	57.6

Notes
mg/kg milligram/kilogram

Attachment 2 Table 3
Arroyo Soil Sample Results
Closed Castner Firing Range

			Analyte Result Units	**Antimony mg/kg**	**Arsenic mg/kg**	**Beryllium mg/kg**	**Copper mg/kg**	**Lead mg/kg**	**Nickel mg/kg**	**Zinc mg/kg**
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-01	FTBL-SED-01-0-6-051216	N	5/12/2016	0.173 J	4.3	5.03	12.9	11.1	8.13	56.8
FTBL-SED-02	FD051216	FD	5/12/2016	0.204 J	6.18	3.04	13.9	18.5	6.58	45.8
FTBL-SED-02	FTBL-SED-02-0-6-051216	N	5/12/2016	0.228 J	6.21	3.12	13.9	20.3	6.74	45.1
FTBL-SED-02	FTBL-SED-02-0-6-051216-QA	N	5/12/2016	< 38 U	8.0 J	3.2 J	13.1 J	20.8	7.1 J	60.3
FTBL-SED-03	FTBL-SED-03-0-6-051216	N	5/12/2016	0.211 J	6.56	4.85	44.1	25.4	26.7	119
FTBL-SED-04	FTBL-SED-04-0-6-051216	N	5/12/2016	0.111 J	4.43	7.21	13	17.4	10	67.2
FTBL-SED-05	FTBL-SED-05-0-6-051216	N	5/12/2016	0.188 J	6.28	5.64	60.6	24.8	36.2	117
FTBL-SED-06	FTBL-SED-06-0-6-050616	N	5/6/2016	0.088 J	3.44	2.16	5.08	15.3	3.02	38.3 J
FTBL-SED-07	FTBL-SED-07-0-6-050616	N	5/6/2016	0.228 J	5.98	3.5	20.4	29.4	8.87	73.5 J
FTBL-SED-08	FTBL-SED-08-0-6-050616	N	5/6/2016	0.112 J	4.99	3.14	15.8	20.1	10.5	80.6 J
FTBL-SED-08	FTBL-SED-08-12-18-050616	N	5/6/2016	0.174 J	4.42	5.7	11.3	20.6	7.53	68.4 J
FTBL-SED-09	FTBL-SED-09-0-6-050616	N	5/6/2016	0.190 J	5.15	3.1	14.3	25.3	6.24	72.4 J
FTBL-SED-09	FTBL-SED-09-12-18-050616	N	5/6/2016	0.211 J	5.45	3.96	14.1	22.1	6.75	75.0 J
FTBL-SED-10	FTBL-SED-10-0-6-050616	N	5/6/2016	0.186 J	4.21	1.85	17	26.8	6.6	59.6 J
FTBL-SED-10	FTBL-SED-10-12-18-050616	N	5/6/2016	0.191 J	5.34	2.65	17.4	24.7	8.01	70.3 J
FTBL-SED-11	FTBL-SED-11-0-6-051016	N	5/10/2016	0.183 J	7	1.81	16.8	21.6	10.3	**185**
FTBL-SED-12	FD051016	FD	5/10/2016	0.214 J	8.43	1.98	28.9	29.5	16.8	**352**
FTBL-SED-12	FTBL-SED-12-0-6-051016	N	5/10/2016	0.263 J	9.13 J	2.08	32.2	36	15.3	**318**
FTBL-SED-12	FTBL-SED-12-0-6-051016-QA	N	5/10/2016	< 8.3 U	17.2 J	1.5 J	29.3	34.8	13.9 J	**309**
FTBL-SED-13	FTBL-SED-13-0-6-051016	N	5/10/2016	0.156 J	8.55	1.25	18.5	22.7	13.3	**137**
FTBL-SED-14	FTBL-SED-14-0-6-050916	N	5/9/2016	0.206 J	5.04	1.26	31.8	24.6	11.3	63.1 J
FTBL-SED-15	FTBL-SED-15-0-6-050916	N	5/9/2016	0.168 J	4.92	1.73	15.9	15.4	9.13	50.5 J
FTBL-SED-16	FTBL-SED-16-0-6-051116	N	5/11/2016	0.328 J	**60.1**	4.47	17.8	26.1	6.21	**146**
FTBL-SED-17	FTBL-SED-17-0-6-051116	N	5/11/2016	0.275 J	9.06	3.41	22.3	33.8	6.36	98.9
FTBL-SED-18	FTBL-SED-18-0-6-051116	N	5/11/2016	0.4 J	13.8	2.61	27.2	76.3	17.6	**924**
FTBL-SED-19	FTBL-SED-19-0-6-051116	N	5/11/2016	0.315 J	10.3	3.25	19.8	32.5	12.9	**257**
FTBL-SED-19	FTBL-SED-19-12-18-051116	N	5/11/2016	0.393 J	**33**	3.74	18.9	53.7	12.3	**378**
FTBL-SED-20	FTBL-SED-20-0-6-051116	N	5/11/2016	0.342 J	10.5	3.44	22.1	36.7	14.3	**271**
FTBL-SED-20	FTBL-SED-20-12-18-051116	N	5/11/2016	0.308 J	9.68	3.37	20	33.3	13.2	**247**
FTBL-SED-21	FTBL-SED-21-0-6-051016	N	5/10/2016	0.116 J	5.29	1.24	27.5	13.9	**43.3**	102 J
FTBL-SED-22	FTBL-SED-22-0-6-051016	N	5/10/2016	0.127 J	4.56	1.25	25.1	14.2	**38.8**	92.2 J
FTBL-SED-23	FTBL-SED-23-0-6-051016	N	5/10/2016	0.123 J	10.7	1.19	26.4	14.9	37	90.5 J
FTBL-SED-24	FTBL-SED-24-0-6-051016	N	5/10/2016	0.119 J	5.49	1.57	23.8	15.1	33.7	93.0 J
FTBL-SED-25	FTBL-SED-25-0-6-051016	N	5/10/2016	0.07 J	3.09	0.943	18.5	10.4	26.3	72.2
FTBL-SED-26	FTBL-SED-26-0-6-050916	N	5/9/2016	0.188 J	4.93	1.92	18.2	19.3	10	85.0 J
FTBL-SED-27	FTBL-SED-27-0-6-050916	N	5/9/2016	0.187 J	4.94	1.72	15.3	18	10.6	75.5 J
FTBL-SED-28	FTBL-SED-28-0-6-050916	N	5/9/2016	0.195 J	4.05	1.31	11	30.9	7.74	54.7 J
FTBL-SED-29	FD050916	FD	5/9/2016	0.185 J	5.21	2	12.3	13.2	8.33	54.3 J
FTBL-SED-29	FTBL-SED-29-0-6-050916	N	5/9/2016	0.125 J	4.2	1.56	10.7	11.7	6.69	44.4 J
FTBL-SED-29	FTBL-SED-29-0-6-050916-QA	N	5/9/2016	-- R	4.9	1.6 J	13	15.1	8.9 J	57.8
FTBL-SED-30	FTBL-SED-30-0-6-050916	N	5/9/2016	0.368 J	10.4	2.12	22	25.2	15.5	65.7 J
FTBL-SED-31	FTBL-SED-31-0-6-050516	N	5/5/2016	0.13 J	5.04	0.923	11.7	14.2	12	66
FTBL-SED-32	FTBL-SED-32-0-6-050516	N	5/5/2016	0.352 J	7.32	1.39	28.8	42	10.8	79.2
FTBL-SED-33	FTBL-SED-33-0-6-050516	N	5/5/2016	0.176 J	4.62	1.02	11.1	14.4	8.64	44.1

Attachment 2 Table 3
Arroyo Soil Sample Results
Closed Castner Firing Range

			Analyte	Antimony	Arsenic	Beryllium	Copper	Lead	Nickel	Zinc
			Result Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-34	FD050516	FD	5/5/2016	0.156 J	5.07	1.23	11.2	14.1	10.4	56
FTBL-SED-34	FTBL-SED-34-0-6-050516	N	5/5/2016	0.135 J	5.57	1.43	7.92	11.9	6.66	57.6
FTBL-SED-34	FTBL-SED-34-0-6-050516-QA	N	5/5/2016	< 4.3 U	5.2	1.0 J	9.5	15.5	8.7	52.9
FTBL-SED-35	FTBL-SED-35-0-6-050516	N	5/5/2016	0.445 J	15.6	2.81	44.1	57.6	24.8	**190**
FTBL-SED-36	FTBL-SED-36-0-6-050316	N	5/3/2016	0.226 J	7.2	1.63	33.2 J	32.8	26.5	85.6
FTBL-SED-37	FTBL-SED-37-0-6-050316	N	5/3/2016	0.288 J	6.39	1.35	19 J	22.3	10.1	61.6
FTBL-SED-38	FTBL-SED-38-0-6-050316	N	5/3/2016	0.203 J	6.36	1.27	12.6 J	17.1	11.2	61.6
FTBL-SED-39	FTBL-SED-39-0-6-050316	N	5/3/2016	0.36 J	8.89	1.48	26 J	37.7	12.7	89.1
FTBL-SED-39	FTBL-SED-39-12-18-050316	N	5/3/2016	0.273 J	8.02	1.43	20.9 J	30.1	13.1	74.3
FTBL-SED-40	FTBL-SED-40-0-6-050316	N	5/3/2016	0.244 J	5.9	1.42	6.51 J	17.8	5.53	**129**
FTBL-SED-40	FTBL-SED-40-12-18-050316	N	5/3/2016	0.154 J	6.45	1.5	6.99 J	15.6	5.6	102
FTBL-SED-41	FTBL-SED-41-0-6-050416	N	5/4/2016	0.299 J	9.38	0.855	23.8 J	32.8	32.7	**129**
FTBL-SED-42	FTBL-SED-42-0-6-050416	N	5/4/2016	0.185 J	7.63	0.982	18.1 J	27.2	24.3	101
FTBL-SED-43	FTBL-SED-43-0-6-050416	N	5/4/2016	0.173 J	7.29	0.848	17.8 J	23.9	24.6	102
FTBL-SED-44	FTBL-SED-44-0-6-050416	N	5/4/2016	0.899 J	8.1	1.04	21.6 J	20.1	32.3	115
FTBL-SED-45	FTBL-SED-45-0-6-050416	N	5/4/2016	1.5 J	13.4	0.929	30 J	73.2	13.2	97.2
FTBL-SED-46	FTBL-SED-46-0-6-050416	N	5/4/2016	0.385 J	11.5	1.34	30.1 J	44.6	12.4	85.6
FTBL-SED-47	FTBL-SED-47-0-6-050416	N	5/4/2016	0.349 J	13.5	1.48	20.5 J	33	13.7	84.2
FTBL-SED-48	FTBL-SED-48-0-6-050416	N	5/4/2016	0.18 J	6.33	0.804	12.6 J	15.7	7.83	35.8
FTBL-SED-49	FD050416	FD	5/4/2016	0.463 J	9	0.919	21.1 J	43.6	10.5	41.8
FTBL-SED-49	FTBL-SED-49-0-6-050416	N	5/4/2016	0.47 J	9.42	0.93	16.4 J	41.4	9.39	41.7
FTBL-SED-49	FTBL-SED-49-0-6-050416-QA	N	5/4/2016	< 3.1 U	6	0.77	13.5	50.7	8.6	36.7
FTBL-SED-50	FTBL-SED-50-0-6-050416	N	5/4/2016	0.246 J	6.8	1	14.1 J	23.8	9.03	52.4
FTBL-SED-51	FTBL-SED-51-0-6-050316	N	5/3/2016	0.237 J	4.05	0.974	17.3 J	40.9	8.26	51.6
FTBL-SED-51	FTBL-SED-51-12-18-050316	N	5/3/2016	0.394 J	5.26	1.11	24.4 J	62.2	10.2	61.8
FTBL-SED-52	FTBL-SED-52-0-6-051116	N	5/11/2016	0.164 J	3.98	1.14	10.2	15.5	8.67	37.5
FTBL-SED-053	FTBL-SED-053-0-6-011817	N	1/18/2017	--	--	--	--	--	--	**186**
FTBL-SED-054	FTBL-SED-054-0-6-011817	N	1/18/2017	--	--	--	--	--	--	**271**
FTBL-SED-055	FTBL-SED-055-0-6-011817	N	1/18/2017	--	--	--	--	--	--	65.9
FTBL-SED-056	FTBL-SED-056-0-6-011817	N	1/18/2017	--	--	--	--	--	--	109
FTBL-SED-057	FTBL-SED-057-0-6-011817	N	1/18/2017	--	--	--	--	--	--	48.2
FTBL-SED-058	FTBL-SED-058-0-6-012417	N	1/24/2017	--	--	--	--	--	--	96.9
FTBL-SED-059	FTBL-SED-059-0-6-012417	N	1/24/2017	--	--	--	--	--	--	106
FTBL-SED-060	FTBL-SED-060-0-6-011817	N	1/18/2017	--	5.79	--	--	--	--	83.5
FTBL-SED-061	FTBL-SED-061-0-6-011817	N	1/18/2017	--	11	--	--	--	--	118
FTBL-SED-062	FTBL-SED-062-0-6-012417	N	1/24/2017	--	8.94	--	--	--	--	**141**
FTBL-SED-063	FTBL-SED-063-0-6-011817	N	1/18/2017	--	7.35	--	--	--	--	107
FTBL-SED-64	FD-011817-1	FD	1/18/2017	--	7.03	--	--	--	--	110
FTBL-SED-64	FTBL-SED-064-0-6-011817-QA	N	1/18/2017	--	6.2	--	--	--	--	**124 J**
FTBL-SED-064	FTBL-SED-064-0-6-011817	N	1/18/2017	--	9.1	--	--	--	--	**166**
FTBL-SED-065	FTBL-SED-065-0-6-011817	N	1/18/2017	--	--	--	--	--	--	118
FTBL-SED-066	FTBL-SED-066-0-6-011817	N	1/18/2017	--	--	--	--	--	--	105
FTBL-SED-067	FTBL-SED-067-0-6-012417	N	1/24/2017	--	--	--	--	--	--	103
FTBL-SED-068	FTBL-SED-068-0-6-012417	N	1/24/2017	--	--	--	--	--	--	58.4

Attachment 2 Table 3
Arroyo Soil Sample Results
Closed Castner Firing Range

			Analyte Result Units	Antimony mg/kg	Arsenic mg/kg	Beryllium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/kg	Zinc mg/kg
Location ID	**Sample ID**	**Sample Type**	**Sample Date**							
FTBL-SED-069	FTBL-SED-069-0-6-011717	N	1/17/2017	--	--	--	--	--	--	58.8
FTBL-SED-070	FTBL-SED-070-0-6-011717	N	1/17/2017	--	--	--	--	--	--	102
FTBL-SED-071	FTBL-SED-071-0-6-011717	N	1/17/2017	--	--	--	--	--	--	120
FTBL-SED-072	FTBL-SED-072-0-6-011717	N	1/17/2017	--	--	--	--	--	--	77.7
FTBL-SED-073	FTBL-SED-073-0-6-011717	N	1/17/2017	--	--	--	--	--	--	101
FTBL-SED-72	FD-011717-1	FD	1/17/2017	--	--	--	--	--	--	80.6
FTBL-SED-74	FTBL-SED-074-0-6-012817	N	1/28/2017	0.082	4.33	1.45	5.39	22.5	5.14	64.7
FTBL-SED-75	FTBL-SED-075-0-6-012817	N	1/28/2017	0.040 U	3.38	1.24	2.79	7.02	2.39	40.4
FTBL-SED-76	FTBL-SED-076-0-6-012817	N	1/28/2017	0.058	4.34	1.84	4.7	7.73	4.12	33

Notes

mg/kg milligram/kilogram

ATTACHMENT 3

ProUCL Statistical Summaries and Output

UCL Statistics for Uncensored Full Data Sets				
User Selected Options				
Date/Time of Computation	ProUCL 5.15/17/2017 10:39:33 AM			
From File	WorkSheet.xls			
Full Precision	OFF			
Confidence Coefficient	95%			
Number of Bootstrap Operations	10000			
CN073_antimony				
General Statistics				
Total Number of Observations	3		Number of Distinct Observations	3
			Number of Missing Observations	0
Minimum	14.1		Mean	34.97
Maximum	50.4		Median	40.4
SD	18.75		Std. Error of Mean	10.83
Coefficient of Variation	0.536		Skewness	-1.195
Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use				
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.				
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).				
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1				
Normal GOF Test				
Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk GOF Test**		
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level		
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**		
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level		
Data appear Normal at 5% Significance Level				
Assuming Normal Distribution				
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**		
95% Student's-t UCL	66.58		95% Adjusted-CLT UCL (Chen-1995)	44.8
			95% Modified-t UCL (Johnson-1978)	65.33
Gamma GOF Test				
Not Enough Data to Perform GOF Test				
Gamma Statistics				
k hat (MLE)	3.926		k star (bias corrected MLE)	N/A
Theta hat (MLE)	8.907		Theta star (bias corrected MLE)	N/A
nu hat (MLE)	23.56		nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		MLE Sd (bias corrected)	N/A
			Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A		Adjusted Chi Square Value	N/A
Assuming Gamma Distribution				
95% Approximate Gamma UCL (use when n>=50))	N/A		95% Adjusted Gamma UCL (use when n<50)	N/A
Lognormal GOF Test				

Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.325	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.646	Mean of logged Data	3.422
Maximum of Logged Data	3.92	SD of logged Data	0.681

Assuming Lognormal Distribution

95% H-UCL	2752	90% Chebyshev (MVUE) UCL	75.18
95% Chebyshev (MVUE) UCL	93.14	97.5% Chebyshev (MVUE) UCL	118.1
99% Chebyshev (MVUE) UCL	167		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	52.77	95% Jackknife UCL	66.58
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	67.44	95% Chebyshev(Mean, Sd) UCL	82.15
97.5% Chebyshev(Mean, Sd) UCL	102.6	99% Chebyshev(Mean, Sd) UCL	142.7

Suggested UCL to Use

95% Student's-t UCL	66.58		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

CN073_lead

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	552	Mean	980.7
Maximum	1320	Median	1070
SD	391.7	Std. Error of Mean	226.2
Coefficient of Variation	0.399	Skewness	-0.973

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.257	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1641	95% Adjusted-CLT UCL (Chen-1995)	1217
		95% Modified-t UCL (Johnson-1978)	1620

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	8.043	k star (bias corrected MLE)	N/A
Theta hat (MLE)	121.9	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	48.26	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.918	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.296	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.314	Mean of logged Data	6.825
Maximum of Logged Data	7.185	SD of logged Data	0.455

Assuming Lognormal Distribution

95% H-UCL	6816	90% Chebyshev (MVUE) UCL	1742
95% Chebyshev (MVUE) UCL	2085	97.5% Chebyshev (MVUE) UCL	2561
99% Chebyshev (MVUE) UCL	3495		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1353	95% Jackknife UCL	1641
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A

95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	1659	95% Chebyshev(Mean, Sd) UCL	1966
97.5% Chebyshev(Mean, Sd) UCL	2393	99% Chebyshev(Mean, Sd) UCL	3231

Suggested UCL to Use

95% Student's-t UCL	1641		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

DF068_lead

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	73.8	Mean	129.3
Maximum	211	Median	103
SD	72.27	Std. Error of Mean	41.73
Coefficient of Variation	0.559	Skewness	1.419

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.309	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	251.1	95% Adjusted-CLT UCL (Chen-1995)	234.4
		95% Modified-t UCL (Johnson-1978)	256.8

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	5.2	k star (bias corrected MLE)	N/A
Theta hat (MLE)	24.86	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	31.2	nu star (bias corrected)	N/A

MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.261	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.301	Mean of logged Data	4.763
Maximum of Logged Data	5.352	SD of logged Data	0.537

Assuming Lognormal Distribution

95% H-UCL	1908	90% Chebyshev (MVUE) UCL	244
95% Chebyshev (MVUE) UCL	296.3	97.5% Chebyshev (MVUE) UCL	368.9
99% Chebyshev (MVUE) UCL	511.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	197.9	95% Jackknife UCL	251.1
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	254.4	95% Chebyshev(Mean, Sd) UCL	311.2
97.5% Chebyshev(Mean, Sd) UCL	389.9	99% Chebyshev(Mean, Sd) UCL	544.4

Suggested UCL to Use

95% Student's-t UCL	251.1		

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

BK043_lead

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	73.1	Mean	206.7
Maximum	473	Median	74.1

SD	230.6	Std. Error of Mean	133.1
Coefficient of Variation	1.115	Skewness	1.732

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.752	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.384	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	595.5	95% Adjusted-CLT UCL (Chen-1995)	568
		95% Modified-t UCL (Johnson-1978)	617.7

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1.354	k star (bias corrected MLE)	N/A
Theta hat (MLE)	152.7	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8.125	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.755	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.383	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.292	Mean of logged Data	4.919
Maximum of Logged Data	6.159	SD of logged Data	1.074

Assuming Lognormal Distribution

95% H-UCL	10286587	90% Chebyshev (MVUE) UCL	513.3
95% Chebyshev (MVUE) UCL	657.6	97.5% Chebyshev (MVUE) UCL	857.9
99% Chebyshev (MVUE) UCL	1251		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
313												
314	Nonparametric Distribution Free UCLs											
315	95% CLT UCL					425.7	95% Jackknife UCL					595.5
316	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
317	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
318	95% BCA Bootstrap UCL					N/A						
319	90% Chebyshev(Mean, Sd) UCL					606.1	95% Chebyshev(Mean, Sd) UCL					787
320	97.5% Chebyshev(Mean, Sd) UCL					1038	99% Chebyshev(Mean, Sd) UCL					1531
321												
322	Suggested UCL to Use											
323	95% Student's-t UCL					595.5						
324												
325	Recommended UCL exceeds the maximum observation											
326												
327	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
328	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
329												
330	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
331	Recommendations are based upon data size, data distribution, and skewness.											
332	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
333	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
334												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.15/17/2017 1:04:52 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	10000

R3_arsenic

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	5.79	Mean	15.72
Maximum	60.1	Median	9.99
SD	15.64	Std. Error of Mean	4.514
Coefficient of Variation	0.995	Skewness	2.553

Normal GOF Test

Shapiro Wilk Test Statistic	0.591	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.382	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	23.83	95% Adjusted-CLT UCL (Chen-1995)	26.7
		95% Modified-t UCL (Johnson-1978)	24.38

Gamma GOF Test

A-D Test Statistic	1.625	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.741	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.346	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.248	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.065	k star (bias corrected MLE)	1.604
Theta hat (MLE)	7.613	Theta star (bias corrected MLE)	9.799
nu hat (MLE)	49.55	nu star (bias corrected)	38.5
MLE Mean (bias corrected)	15.72	MLE Sd (bias corrected)	12.41
		Approximate Chi Square Value (0.05)	25.29
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	23.66

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	23.93	95% Adjusted Gamma UCL (use when n<50)	25.57

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.783	**Shapiro Wilk Lognormal GOF Test**

5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.308	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.243	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.756	Mean of logged Data	2.494
Maximum of Logged Data	4.096	SD of logged Data	0.657

Assuming Lognormal Distribution

95% H-UCL	23.92	90% Chebyshev (MVUE) UCL	23.39
95% Chebyshev (MVUE) UCL	27.32	97.5% Chebyshev (MVUE) UCL	32.78
99% Chebyshev (MVUE) UCL	43.51		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	23.14	95% Jackknife UCL	23.83
95% Standard Bootstrap UCL	22.8	95% Bootstrap-t UCL	64.86
95% Hall's Bootstrap UCL	66.64	95% Percentile Bootstrap UCL	23.43
95% BCA Bootstrap UCL	27.58		
90% Chebyshev(Mean, Sd) UCL	29.26	95% Chebyshev(Mean, Sd) UCL	35.4
97.5% Chebyshev(Mean, Sd) UCL	43.91	99% Chebyshev(Mean, Sd) UCL	60.64

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	35.4		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

R3_zinc

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	83.5	Mean	244.8
Maximum	924	Median	156
SD	231.4	Std. Error of Mean	66.8
Coefficient of Variation	0.945	Skewness	2.652

Normal GOF Test

Shapiro Wilk Test Statistic	0.661	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

	A	B	C	D	E	F	G	H	I	J	K	L
105	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
106					95% Student's-t UCL	364.7					95% Adjusted-CLT UCL (Chen-1995)	409.3
107											95% Modified-t UCL (Johnson-1978)	373.3
108												
109	**Gamma GOF Test**											
110					A-D Test Statistic	0.693	**Anderson-Darling Gamma GOF Test**					
111					5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.198	**Kolmogorov-Smirnov Gamma GOF Test**					
113					5% K-S Critical Value	0.248	Detected data appear Gamma Distributed at 5% Significance Level					
114	**Detected data appear Gamma Distributed at 5% Significance Level**											
115												
116	**Gamma Statistics**											
117					k hat (MLE)	2.104					k star (bias corrected MLE)	1.633
118					Theta hat (MLE)	116.4					Theta star (bias corrected MLE)	149.9
119					nu hat (MLE)	50.49					nu star (bias corrected)	39.2
120					MLE Mean (bias corrected)	244.8					MLE Sd (bias corrected)	191.5
121											Approximate Chi Square Value (0.05)	25.86
122					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	24.21
123												
124	**Assuming Gamma Distribution**											
125					95% Approximate Gamma UCL (use when n>=50)	371.1					95% Adjusted Gamma UCL (use when n<50)	396.3
126												
127	**Lognormal GOF Test**											
128					Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**					
129					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.16	**Lilliefors Lognormal GOF Test**					
131					5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level					
132	**Data appear Lognormal at 5% Significance Level**											
133												
134	**Lognormal Statistics**											
135					Minimum of Logged Data	4.425					Mean of logged Data	5.244
136					Maximum of Logged Data	6.829					SD of logged Data	0.681
137												
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	389.7					90% Chebyshev (MVUE) UCL	376.7
140					95% Chebyshev (MVUE) UCL	441.5					97.5% Chebyshev (MVUE) UCL	531.6
141					99% Chebyshev (MVUE) UCL	708.4						
142												
143	**Nonparametric Distribution Free UCL Statistics**											
144	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
145												
146	**Nonparametric Distribution Free UCLs**											
147					95% CLT UCL	354.7					95% Jackknife UCL	364.7
148					95% Standard Bootstrap UCL	349.6					95% Bootstrap-t UCL	539.9
149					95% Hall's Bootstrap UCL	796.6					95% Percentile Bootstrap UCL	361.1
150					95% BCA Bootstrap UCL	420.9						
151					90% Chebyshev(Mean, Sd) UCL	445.2					95% Chebyshev(Mean, Sd) UCL	536
152					97.5% Chebyshev(Mean, Sd) UCL	661.9					99% Chebyshev(Mean, Sd) UCL	909.4
153												
154	**Suggested UCL to Use**											
155					95% Adjusted Gamma UCL	396.3						
156												

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

R4_zinc

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	1
Minimum	48.2	Mean	136.4
Maximum	318	Median	107.5
SD	87.73	Std. Error of Mean	25.32
Coefficient of Variation	0.643	Skewness	1.049

Normal GOF Test

Shapiro Wilk Test Statistic	0.878	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	181.9	95% Adjusted-CLT UCL (Chen-1995)	186.2
		95% Modified-t UCL (Johnson-1978)	183.1

Gamma GOF Test

A-D Test Statistic	0.321	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.149	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.248	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.887	k star (bias corrected MLE)	2.221
Theta hat (MLE)	47.24	Theta star (bias corrected MLE)	61.41
nu hat (MLE)	69.29	nu star (bias corrected)	53.3
MLE Mean (bias corrected)	136.4	MLE Sd (bias corrected)	91.51
		Approximate Chi Square Value (0.05)	37.53
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	35.52

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	193.7	95% Adjusted Gamma UCL (use when n<50)	204.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.875	Mean of logged Data	4.732
Maximum of Logged Data	5.762	SD of logged Data	0.632

Assuming Lognormal Distribution

95% H-UCL	215.7	90% Chebyshev (MVUE) UCL	213.2
95% Chebyshev (MVUE) UCL	248.2	97.5% Chebyshev (MVUE) UCL	296.7
99% Chebyshev (MVUE) UCL	392		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	178	95% Jackknife UCL	181.9
95% Standard Bootstrap UCL	176.1	95% Bootstrap-t UCL	198.5
95% Hall's Bootstrap UCL	204.5	95% Percentile Bootstrap UCL	178.4
95% BCA Bootstrap UCL	185		
90% Chebyshev(Mean, Sd) UCL	212.4	95% Chebyshev(Mean, Sd) UCL	246.8
97.5% Chebyshev(Mean, Sd) UCL	294.5	99% Chebyshev(Mean, Sd) UCL	388.4

Suggested UCL to Use

95% Student's-t UCL	181.9		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

R7_zinc

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	44.1	Mean	85.47
Maximum	190	Median	66
SD	49.79	Std. Error of Mean	18.82
Coefficient of Variation	0.583	Skewness	1.943

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.779	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.264	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
261						Assuming Normal Distribution						
262				95% Normal UCL					95% UCLs (Adjusted for Skewness)			
263					95% Student's-t UCL	122					95% Adjusted-CLT UCL (Chen-1995)	131.2
264											95% Modified-t UCL (Johnson-1978)	124.3
265												
266						Gamma GOF Test						
267					A-D Test Statistic	0.486			Anderson-Darling Gamma GOF Test			
268					5% A-D Critical Value	0.71			Detected data appear Gamma Distributed at 5% Significance Level			
269					K-S Test Statistic	0.217			Kolmogorov-Smirnov Gamma GOF Test			
270					5% K-S Critical Value	0.313			Detected data appear Gamma Distributed at 5% Significance Level			
271						Detected data appear Gamma Distributed at 5% Significance Level						
272												
273						Gamma Statistics						
274					k hat (MLE)	4.61					k star (bias corrected MLE)	2.729
275					Theta hat (MLE)	18.54					Theta star (bias corrected MLE)	31.32
276					nu hat (MLE)	64.54					nu star (bias corrected)	38.21
277					MLE Mean (bias corrected)	85.47					MLE Sd (bias corrected)	51.74
278											Approximate Chi Square Value (0.05)	25.05
279					Adjusted Level of Significance	0.0158					Adjusted Chi Square Value	21.89
280												
281						Assuming Gamma Distribution						
282					95% Approximate Gamma UCL (use when n>=50))	130.4					95% Adjusted Gamma UCL (use when n<50)	149.2
283												
284						Lognormal GOF Test						
285					Shapiro Wilk Test Statistic	0.913			Shapiro Wilk Lognormal GOF Test			
286					5% Shapiro Wilk Critical Value	0.803			Data appear Lognormal at 5% Significance Level			
287					Lilliefors Test Statistic	0.19			Lilliefors Lognormal GOF Test			
288					5% Lilliefors Critical Value	0.304			Data appear Lognormal at 5% Significance Level			
289						Data appear Lognormal at 5% Significance Level						
290												
291						Lognormal Statistics						
292					Minimum of Logged Data	3.786					Mean of logged Data	4.336
293					Maximum of Logged Data	5.247					SD of logged Data	0.482
294												
295						Assuming Lognormal Distribution						
296					95% H-UCL	138.3					90% Chebyshev (MVUE) UCL	130.6
297					95% Chebyshev (MVUE) UCL	151.6					97.5% Chebyshev (MVUE) UCL	180.7
298					99% Chebyshev (MVUE) UCL	237.9						
299												
300						Nonparametric Distribution Free UCL Statistics						
301						Data appear to follow a Discernible Distribution at 5% Significance Level						
302												
303						Nonparametric Distribution Free UCLs						
304					95% CLT UCL	116.4					95% Jackknife UCL	122
305					95% Standard Bootstrap UCL	114					95% Bootstrap-t UCL	188.6
306					95% Hall's Bootstrap UCL	261.4					95% Percentile Bootstrap UCL	117.3
307					95% BCA Bootstrap UCL	128.5						
308					90% Chebyshev(Mean, Sd) UCL	141.9					95% Chebyshev(Mean, Sd) UCL	167.5
309					97.5% Chebyshev(Mean, Sd) UCL	203					99% Chebyshev(Mean, Sd) UCL	272.7
310												
311						Suggested UCL to Use						
312					95% Student's-t UCL	122						

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

R9_lead

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13
		Number of Missing Observations	3
Minimum	15.7	Mean	71.87
Maximum	483	Median	33
SD	124.7	Std. Error of Mean	34.58
Coefficient of Variation	1.735	Skewness	3.489

Normal GOF Test

Shapiro Wilk Test Statistic	0.434	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.866	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.419	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.234	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	133.5	95% Adjusted-CLT UCL (Chen-1995)	164.5
		95% Modified-t UCL (Johnson-1978)	139.1

Gamma GOF Test

A-D Test Statistic	1.71	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.757	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.287	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.243	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.054	k star (bias corrected MLE)	0.862
Theta hat (MLE)	68.2	Theta star (bias corrected MLE)	83.39
nu hat (MLE)	27.4	nu star (bias corrected)	22.41
MLE Mean (bias corrected)	71.87	MLE Sd (bias corrected)	77.41
		Approximate Chi Square Value (0.05)	12.65
Adjusted Level of Significance	0.0301	Adjusted Chi Square Value	11.61

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	127.4	95% Adjusted Gamma UCL (use when n<50)	138.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.815	**Shapiro Wilk Lognormal GOF Test**

	A	B	C	D	E	F	G	H	I	J	K	L
365					5% Shapiro Wilk Critical Value	0.866	Data Not Lognormal at 5% Significance Level					
366					Lilliefors Test Statistic	0.185	**Lilliefors Lognormal GOF Test**					
367					5% Lilliefors Critical Value	0.234	Data appear Lognormal at 5% Significance Level					
368	**Data appear Approximate Lognormal at 5% Significance Level**											
369												
370	**Lognormal Statistics**											
371					Minimum of Logged Data	2.754					Mean of logged Data	3.73
372					Maximum of Logged Data	6.18					SD of logged Data	0.863
373												
374	**Assuming Lognormal Distribution**											
375					95% H-UCL	116.2					90% Chebyshev (MVUE) UCL	102.9
376					95% Chebyshev (MVUE) UCL	123.1					97.5% Chebyshev (MVUE) UCL	151.2
377					99% Chebyshev (MVUE) UCL	206.2						
378												
379	**Nonparametric Distribution Free UCL Statistics**											
380	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
381												
382	**Nonparametric Distribution Free UCLs**											
383					95% CLT UCL	128.8					95% Jackknife UCL	133.5
384					95% Standard Bootstrap UCL	125.9					95% Bootstrap-t UCL	414.8
385					95% Hall's Bootstrap UCL	363					95% Percentile Bootstrap UCL	138.7
386					95% BCA Bootstrap UCL	175.3						
387					90% Chebyshev(Mean, Sd) UCL	175.6					95% Chebyshev(Mean, Sd) UCL	222.6
388					97.5% Chebyshev(Mean, Sd) UCL	287.8					99% Chebyshev(Mean, Sd) UCL	416
389												
390	**Suggested UCL to Use**											
391					95% H-UCL	116.2						
392												
393	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
394	Recommendations are based upon data size, data distribution, and skewness.											
395	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
396	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
397												
398	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
399	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											
400	**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**											
401	**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**											
402												

Site Wide UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.13/1/2018 10:06:31 AM
From File	ISM ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (antimony)

General Statistics

Total Number of Observations	390	Number of Distinct Observations	203
Number of Detects	271	Number of Non-Detects	119
Number of Distinct Detects	191	Number of Distinct Non-Detects	28
Minimum Detect	0.093	Minimum Non-Detect	0.024
Maximum Detect	50.4	Maximum Non-Detect	0.22
Variance Detects	17.71	Percent Non-Detects	30.51%
Mean Detects	0.884	SD Detects	4.209
Median Detects	0.247	CV Detects	4.762
Skewness Detects	9.632	Kurtosis Detects	100.6
Mean of Logged Detects	-1.198	SD of Logged Detects	0.906

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.176	Normal GOF Test on Detected Observations Only
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.425	Lilliefors GOF Test
5% Lilliefors Critical Value	0.0542	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.625	KM Standard Error of Mean	0.179
KM SD	3.524	95% KM (BCA) UCL	0.98
95% KM (t) UCL	0.92	95% KM (Percentile Bootstrap) UCL	0.949
95% KM (z) UCL	0.919	95% KM Bootstrap t UCL	1.33
90% KM Chebyshev UCL	1.161	95% KM Chebyshev UCL	1.404
97.5% KM Chebyshev UCL	1.741	99% KM Chebyshev UCL	2.404

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	48.08	Anderson-Darling GOF Test
5% A-D Critical Value	0.814	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.325	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.0583	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.578	k star (bias corrected MLE)	0.574
Theta hat (MLE)	1.528	Theta star (bias corrected MLE)	1.539
nu hat (MLE)	313.4	nu star (bias corrected)	311.3
Mean (detects)	0.884		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.617
Maximum	50.4	Median	0.18
SD	3.529	CV	5.718
k hat (MLE)	0.378	k star (bias corrected MLE)	0.377
Theta hat (MLE)	1.631	Theta star (bias corrected MLE)	1.637
nu hat (MLE)	295.1	nu star (bias corrected)	294.2
Adjusted Level of Significance (β)	0.0494		
Approximate Chi Square Value (294.18, α)	255.4	Adjusted Chi Square Value (294.18, β)	255.3
95% Gamma Approximate UCL (use when n>=50)	0.711	95% Gamma Adjusted UCL (use when n<50)	0.711

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.625	SD (KM)	3.524
Variance (KM)	12.42	SE of Mean (KM)	0.179
k hat (KM)	0.0315	k star (KM)	0.0329
nu hat (KM)	24.54	nu star (KM)	25.69
theta hat (KM)	19.86	theta star (KM)	18.98
80% gamma percentile (KM)	0.0125	90% gamma percentile (KM)	0.457
95% gamma percentile (KM)	2.625	99% gamma percentile (KM)	15.72

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.69, α)	15.14	Adjusted Chi Square Value (25.69, β)	15.11
95% Gamma Approximate KM-UCL (use when n>=50)	1.061	95% Gamma Adjusted KM-UCL (use when n<50)	1.063

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.773	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.164	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0542	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.629	Mean in Log Scale	-1.781
SD in Original Scale	3.527	SD in Log Scale	1.197
95% t UCL (assumes normality of ROS data)	0.924	95% Percentile Bootstrap UCL	0.954
95% BCA Bootstrap UCL	1.058	95% Bootstrap t UCL	1.369
95% H-UCL (Log ROS)	0.397		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.91	KM Geo Mean	0.148
KM SD (logged)	1.344	95% Critical H Value (KM-Log)	2.435
KM Standard Error of Mean (logged)	0.0749	95% H-UCL (KM -Log)	0.431
KM SD (logged)	1.344	95% Critical H Value (KM-Log)	2.435
KM Standard Error of Mean (logged)	0.0749		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.63	Mean in Log Scale	-1.766
SD in Original Scale	3.527	SD in Log Scale	1.17
95% t UCL (Assumes normality)	0.924	95% H-Stat UCL	0.388

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	1.404

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (arsenic)

General Statistics

Total Number of Observations	388	Number of Distinct Observations	244
Number of Detects	369	Number of Non-Detects	19
Number of Distinct Detects	243	Number of Distinct Non-Detects	1
Minimum Detect	0.2	Minimum Non-Detect	0.088
Maximum Detect	19.6	Maximum Non-Detect	0.088
Variance Detects	6.681	Percent Non-Detects	4.897%
Mean Detects	5.267	SD Detects	2.585
Median Detects	5.52	CV Detects	0.491
Skewness Detects	0.359	Kurtosis Detects	2.726
Mean of Logged Detects	1.44	SD of Logged Detects	0.835

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.945	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.0907	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0465	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.013	KM Standard Error of Mean	0.14
KM SD	2.754	95% KM (BCA) UCL	5.229
95% KM (t) UCL	5.244	95% KM (Percentile Bootstrap) UCL	5.251
95% KM (z) UCL	5.243	95% KM Bootstrap t UCL	5.264
90% KM Chebyshev UCL	5.433	95% KM Chebyshev UCL	5.623
97.5% KM Chebyshev UCL	5.887	99% KM Chebyshev UCL	6.406

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	21.48	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.763	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.0478	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.415	k star (bias corrected MLE)	2.397
Theta hat (MLE)	2.181	Theta star (bias corrected MLE)	2.197
nu hat (MLE)	1782	nu star (bias corrected)	1769
Mean (detects)	5.267		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.2	Mean	5.096
Maximum	19.6	Median	5.33
SD	2.631	CV	0.516
k hat (MLE)	2.321	k star (bias corrected MLE)	2.304
Theta hat (MLE)	2.196	Theta star (bias corrected MLE)	2.211
nu hat (MLE)	1801	nu star (bias corrected)	1788
Adjusted Level of Significance (β)	0.0494		
Approximate Chi Square Value (N/A, α)	1691	Adjusted Chi Square Value (N/A, β)	1691
95% Gamma Approximate UCL (use when n>=50)	5.389	95% Gamma Adjusted UCL (use when n<50)	5.39

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.013	SD (KM)	2.754
Variance (KM)	7.585	SE of Mean (KM)	0.14
k hat (KM)	3.313	k star (KM)	3.289
nu hat (KM)	2571	nu star (KM)	2552
theta hat (KM)	1.513	theta star (KM)	1.524
80% gamma percentile (KM)	7.072	90% gamma percentile (KM)	8.719
95% gamma percentile (KM)	10.25	99% gamma percentile (KM)	13.55

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	2436	Adjusted Chi Square Value (N/A, β)	2436
95% Gamma Approximate KM-UCL (use when n>=50)	5.253	95% Gamma Adjusted KM-UCL (use when n<50)	5.253

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.755	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0465	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.049	Mean in Log Scale	1.359
SD in Original Scale	2.698	SD in Log Scale	0.892
95% t UCL (assumes normality of ROS data)	5.275	95% Percentile Bootstrap UCL	5.266
95% BCA Bootstrap UCL	5.268	95% Bootstrap t UCL	5.271
95% H-UCL (Log ROS)	6.355		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.251	KM Geo Mean	3.493
KM SD (logged)	1.166	95% Critical H Value (KM-Log)	2.271
KM Standard Error of Mean (logged)	0.0593	95% H-UCL (KM -Log)	7.885
KM SD (logged)	1.166	95% Critical H Value (KM-Log)	2.271
KM Standard Error of Mean (logged)	0.0593		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.011	Mean in Log Scale	1.217
SD in Original Scale	2.762	SD in Log Scale	1.279
95% t UCL (Assumes normality)	5.242	95% H-Stat UCL	8.926

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5.623

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (barium)

General Statistics

Total Number of Observations	162	Number of Distinct Observations	137
		Number of Missing Observations	0
Minimum	33.6	Mean	58.06
Maximum	850	Median	51
SD	63.84	Std. Error of Mean	5.016
Coefficient of Variation	1.1	Skewness	12.01

Normal GOF Test

Shapiro Wilk Test Statistic	0.204	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.363	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.07	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	66.36	95% Adjusted-CLT UCL (Chen-1995)	71.36
		95% Modified-t UCL (Johnson-1978)	67.14

Gamma GOF Test

A-D Test Statistic	6.173E+28	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.755	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.208	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0736	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.357	k star (bias corrected MLE)	5.262
Theta hat (MLE)	10.84	Theta star (bias corrected MLE)	11.03
nu hat (MLE)	1736	nu star (bias corrected)	1705
MLE Mean (bias corrected)	58.06	MLE Sd (bias corrected)	25.31
		Approximate Chi Square Value (0.05)	1610
Adjusted Level of Significance	0.0485	Adjusted Chi Square Value	1609

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	61.48	95% Adjusted Gamma UCL (use when n<50)	61.51

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.744	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.113	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.07	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.515	Mean of logged Data	3.965
Maximum of Logged Data	6.745	SD of logged Data	0.311

Assuming Lognormal Distribution

95% H-UCL	57.73	90% Chebyshev (MVUE) UCL	59.47
95% Chebyshev (MVUE) UCL	61.34	97.5% Chebyshev (MVUE) UCL	63.95
99% Chebyshev (MVUE) UCL	69.06		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	66.31	95% Jackknife UCL	66.36
95% Standard Bootstrap UCL	66.14	95% Bootstrap-t UCL	91.31
95% Hall's Bootstrap UCL	100.4	95% Percentile Bootstrap UCL	67.53
95% BCA Bootstrap UCL	73.86		
90% Chebyshev(Mean, Sd) UCL	73.1	95% Chebyshev(Mean, Sd) UCL	79.92
97.5% Chebyshev(Mean, Sd) UCL	89.38	99% Chebyshev(Mean, Sd) UCL	108

Suggested UCL to Use

95% Student's-t UCL	66.36	or 95% Modified-t UCL	67.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (chromium)

General Statistics

Total Number of Observations	162	Number of Distinct Observations	64
		Number of Missing Observations	0
Minimum	3	Mean	6.865
Maximum	22	Median	6.7
SD	2.516	Std. Error of Mean	0.198
Coefficient of Variation	0.366	Skewness	2.104

Normal GOF Test

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.101	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.07	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.192	95% Adjusted-CLT UCL (Chen-1995)	7.225
		95% Modified-t UCL (Johnson-1978)	7.197

Gamma GOF Test

A-D Test Statistic	0.98	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.752	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0745	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0734	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	8.883	k star (bias corrected MLE)	8.723
Theta hat (MLE)	0.773	Theta star (bias corrected MLE)	0.787
nu hat (MLE)	2878	nu star (bias corrected)	2826
MLE Mean (bias corrected)	6.865	MLE Sd (bias corrected)	2.324
		Approximate Chi Square Value (0.05)	2704
Adjusted Level of Significance	0.0485	Adjusted Chi Square Value	2703

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	7.176	95% Adjusted Gamma UCL (use when n<50)	7.179

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0457	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.07	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.07	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.099	Mean of logged Data	1.869
Maximum of Logged Data	3.091	SD of logged Data	0.336

Assuming Lognormal Distribution

95% H-UCL	7.181	90% Chebyshev (MVUE) UCL	7.414
95% Chebyshev (MVUE) UCL	7.666	97.5% Chebyshev (MVUE) UCL	8.017
99% Chebyshev (MVUE) UCL	8.705		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	7.19	95% Jackknife UCL	7.192
95% Standard Bootstrap UCL	7.187	95% Bootstrap-t UCL	7.221
95% Hall's Bootstrap UCL	7.258	95% Percentile Bootstrap UCL	7.201
95% BCA Bootstrap UCL	7.245		
90% Chebyshev(Mean, Sd) UCL	7.458	95% Chebyshev(Mean, Sd) UCL	7.726
97.5% Chebyshev(Mean, Sd) UCL	8.099	99% Chebyshev(Mean, Sd) UCL	8.831

Suggested UCL to Use

95% Student's-t UCL	7.192	or 95% Modified-t UCL	7.197
or 95% H-UCL	7.181		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Result (copper)

General Statistics

Total Number of Observations	389	Number of Distinct Observations	202
		Number of Missing Observations	0
Minimum	6.6	Mean	19.87
Maximum	296	Median	17.7
SD	19.41	Std. Error of Mean	0.984
Coefficient of Variation	0.976	Skewness	10.22

Normal GOF Test

Shapiro Wilk Test Statistic	0.354	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.273	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0453	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	21.5	95% Adjusted-CLT UCL (Chen-1995)	22.04
		95% Modified-t UCL (Johnson-1978)	21.58

Gamma GOF Test

A-D Test Statistic	2.571E+28	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.759	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.139	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0461	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.019	k star (bias corrected MLE)	3.99
Theta hat (MLE)	4.945	Theta star (bias corrected MLE)	4.981
nu hat (MLE)	3127	nu star (bias corrected)	3104
MLE Mean (bias corrected)	19.87	MLE Sd (bias corrected)	9.95
		Approximate Chi Square Value (0.05)	2976
Adjusted Level of Significance	0.0494	Adjusted Chi Square Value	2975

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	20.73	95% Adjusted Gamma UCL (use when n<50)	20.74

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0796	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0453	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.887	Mean of logged Data	2.86
Maximum of Logged Data	5.69	SD of logged Data	0.43

Assuming Lognormal Distribution

95% H-UCL	19.91	90% Chebyshev (MVUE) UCL	20.46
95% Chebyshev (MVUE) UCL	21.05	97.5% Chebyshev (MVUE) UCL	21.88
99% Chebyshev (MVUE) UCL	23.49		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	21.49	95% Jackknife UCL	21.5
95% Standard Bootstrap UCL	21.52	95% Bootstrap-t UCL	22.78
95% Hall's Bootstrap UCL	26.43	95% Percentile Bootstrap UCL	21.62
95% BCA Bootstrap UCL	22.23		
90% Chebyshev(Mean, Sd) UCL	22.83	95% Chebyshev(Mean, Sd) UCL	24.16
97.5% Chebyshev(Mean, Sd) UCL	26.02	99% Chebyshev(Mean, Sd) UCL	29.67

Suggested UCL to Use

95% Student's-t UCL	21.5	or 95% Modified-t UCL	21.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (lead)

General Statistics

Total Number of Observations	401	Number of Distinct Observations	284
		Number of Missing Observations	0
Minimum	8.5	Mean	76.25
Maximum	5030	Median	28.8
SD	310.7	Std. Error of Mean	15.52
Coefficient of Variation	4.075	Skewness	12.22

Normal GOF Test

Shapiro Wilk Test Statistic	0.189	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.414	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0446	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	101.8	95% Adjusted-CLT UCL (Chen-1995)	111.9
		95% Modified-t UCL (Johnson-1978)	103.4

Gamma GOF Test

A-D Test Statistic	2.494E+28	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.797	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.276	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0469	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.759	k star (bias corrected MLE)	0.755
Theta hat (MLE)	100.4	Theta star (bias corrected MLE)	101
nu hat (MLE)	608.9	nu star (bias corrected)	605.6
MLE Mean (bias corrected)	76.25	MLE Sd (bias corrected)	87.74
		Approximate Chi Square Value (0.05)	549.6
Adjusted Level of Significance	0.0494	Adjusted Chi Square Value	549.4

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	84.03	95% Adjusted Gamma UCL (use when n<50)	84.06

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.834	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.147	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0446	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.14	Mean of logged Data	3.547
Maximum of Logged Data	8.523	SD of logged Data	0.84

Assuming Lognormal Distribution

95% H-UCL	53.68	90% Chebyshev (MVUE) UCL	56.52
95% Chebyshev (MVUE) UCL	59.77	97.5% Chebyshev (MVUE) UCL	64.3
99% Chebyshev (MVUE) UCL	73.18		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	101.8	95% Jackknife UCL	101.8
95% Standard Bootstrap UCL	100.8	95% Bootstrap-t UCL	130
95% Hall's Bootstrap UCL	201.1	95% Percentile Bootstrap UCL	104.9
95% BCA Bootstrap UCL	114.7		
90% Chebyshev(Mean, Sd) UCL	122.8	95% Chebyshev(Mean, Sd) UCL	143.9
97.5% Chebyshev(Mean, Sd) UCL	173.1	99% Chebyshev(Mean, Sd) UCL	230.6

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	143.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (manganese)

General Statistics			
Total Number of Observations	162	Number of Distinct Observations	95
		Number of Missing Observations	0
Minimum	114	Mean	187.7
Maximum	433	Median	179
SD	51.81	Std. Error of Mean	4.071
Coefficient of Variation	0.276	Skewness	1.871

Normal GOF Test		
Shapiro Wilk Test Statistic	0.857	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.119	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.07	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	194.5	95% Adjusted-CLT UCL (Chen-1995)	195.1
		95% Modified-t UCL (Johnson-1978)	194.6

Gamma GOF Test		
A-D Test Statistic	1.806	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0804	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0733	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics			
k hat (MLE)	15.94	k star (bias corrected MLE)	15.65
Theta hat (MLE)	11.78	Theta star (bias corrected MLE)	11.99
nu hat (MLE)	5166	nu star (bias corrected)	5071
MLE Mean (bias corrected)	187.7	MLE Sd (bias corrected)	47.45
		Approximate Chi Square Value (0.05)	4907
Adjusted Level of Significance	0.0485	Adjusted Chi Square Value	4905

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	194	95% Adjusted Gamma UCL (use when n<50)	194.1

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	3.7081E-5	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0629	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.07	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics			
Minimum of Logged Data	4.736	Mean of logged Data	5.203
Maximum of Logged Data	6.071	SD of logged Data	0.244

Assuming Lognormal Distribution

95% H-UCL	193.6	90% Chebyshev (MVUE) UCL	198.3
95% Chebyshev (MVUE) UCL	203.2	97.5% Chebyshev (MVUE) UCL	210.1
99% Chebyshev (MVUE) UCL	223.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	194.4	95% Jackknife UCL	194.5
95% Standard Bootstrap UCL	194.3	95% Bootstrap-t UCL	195.3
95% Hall's Bootstrap UCL	195	95% Percentile Bootstrap UCL	194.7
95% BCA Bootstrap UCL	195.3		
90% Chebyshev(Mean, Sd) UCL	199.9	95% Chebyshev(Mean, Sd) UCL	205.5
97.5% Chebyshev(Mean, Sd) UCL	213.2	99% Chebyshev(Mean, Sd) UCL	228.2

Suggested UCL to Use

95% Student's-t UCL	194.5	or 95% Modified-t UCL	194.6
or 95% H-UCL	193.6		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Result (mercury)

General Statistics

Total Number of Observations	162	Number of Distinct Observations	30
Number of Detects	160	Number of Non-Detects	2
Number of Distinct Detects	29	Number of Distinct Non-Detects	1
Minimum Detect	0.011	Minimum Non-Detect	0.01
Maximum Detect	0.13	Maximum Non-Detect	0.01
Variance Detects	1.1860E-4	Percent Non-Detects	1.235%
Mean Detects	0.0224	SD Detects	0.0109
Median Detects	0.021	CV Detects	0.485
Skewness Detects	6.327	Kurtosis Detects	59.85
Mean of Logged Detects	-3.861	SD of Logged Detects	0.333

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.618	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.161	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0704	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0223	KM Standard Error of Mean	8.5720E-4
KM SD	0.0109	95% KM (BCA) UCL	0.024
95% KM (t) UCL	0.0237	95% KM (Percentile Bootstrap) UCL	0.0237
95% KM (z) UCL	0.0237	95% KM Bootstrap t UCL	0.0243
90% KM Chebyshev UCL	0.0249	95% KM Chebyshev UCL	0.026
97.5% KM Chebyshev UCL	0.0276	99% KM Chebyshev UCL	0.0308

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.115	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.753	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.107	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.074	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.951	k star (bias corrected MLE)	7.806
Theta hat (MLE)	0.00282	Theta star (bias corrected MLE)	0.00288
nu hat (MLE)	2544	nu star (bias corrected)	2498
Mean (detects)	0.0224		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0223
Maximum	0.13	Median	0.021
SD	0.0109	CV	0.489
k hat (MLE)	7.679	k star (bias corrected MLE)	7.541
Theta hat (MLE)	0.0029	Theta star (bias corrected MLE)	0.00296
nu hat (MLE)	2488	nu star (bias corrected)	2443
Adjusted Level of Significance (β)	0.0485		
Approximate Chi Square Value (N/A, α)	2329	Adjusted Chi Square Value (N/A, β)	2328
95% Gamma Approximate UCL (use when n>=50)	0.0234	95% Gamma Adjusted UCL (use when n<50)	0.0234

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0223	SD (KM)	0.0109
Variance (KM)	1.1829E-4	SE of Mean (KM)	8.5720E-4
k hat (KM)	4.2	k star (KM)	4.127
nu hat (KM)	1361	nu star (KM)	1337
theta hat (KM)	0.00531	theta star (KM)	0.0054
80% gamma percentile (KM)	0.0306	90% gamma percentile (KM)	0.037
95% gamma percentile (KM)	0.0429	99% gamma percentile (KM)	0.0553

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	1253	Adjusted Chi Square Value (N/A, β)	1252
95% Gamma Approximate KM-UCL (use when n>=50)	0.0238	95% Gamma Adjusted KM-UCL (use when n<50)	0.0238

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.951	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	4.4878E-5	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0761	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0704	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0223	Mean in Log Scale	-3.872
SD in Original Scale	0.0109	SD in Log Scale	0.344
95% t UCL (assumes normality of ROS data)	0.0237	95% Percentile Bootstrap UCL	0.0238
95% BCA Bootstrap UCL	0.0243	95% Bootstrap t UCL	0.0243
95% H-UCL (Log ROS)	0.0232		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.87	KM Geo Mean	0.0209
KM SD (logged)	0.34	95% Critical H Value (KM-Log)	1.735
KM Standard Error of Mean (logged)	0.0268	95% H-UCL (KM -Log)	0.0231
KM SD (logged)	0.34	95% Critical H Value (KM-Log)	1.735
KM Standard Error of Mean (logged)	0.0268		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0222	Mean in Log Scale	-3.879
SD in Original Scale	0.011	SD in Log Scale	0.367
95% t UCL (Assumes normality)	0.0237	95% H-Stat UCL	0.0233

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.0237	KM H-UCL	0.0231
95% KM (BCA) UCL	0.024		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (nickel)

General Statistics			
Total Number of Observations	386	Number of Distinct Observations	208
		Number of Missing Observations	0
Minimum	3.2	Mean	8.224
Maximum	24.7	Median	8.055
SD	2.785	Std. Error of Mean	0.142
Coefficient of Variation	0.339	Skewness	1.034
Normal GOF Test			
Shapiro Wilk Test Statistic	0.947	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0456	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0455	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8.458	95% Adjusted-CLT UCL (Chen-1995)	8.465
		95% Modified-t UCL (Johnson-1978)	8.459
Gamma GOF Test			
A-D Test Statistic	1.423	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.755	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0619	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0462	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	8.969	k star (bias corrected MLE)	8.901
Theta hat (MLE)	0.917	Theta star (bias corrected MLE)	0.924
nu hat (MLE)	6924	nu star (bias corrected)	6871
MLE Mean (bias corrected)	8.224	MLE Sd (bias corrected)	2.757
		Approximate Chi Square Value (0.05)	6680
Adjusted Level of Significance	0.0494	Adjusted Chi Square Value	6679
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	8.46	95% Adjusted Gamma UCL (use when n<50)	8.461
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.971	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	5.3103E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0786	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0455	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.163	Mean of logged Data	2.05
Maximum of Logged Data	3.207	SD of logged Data	0.343

Assuming Lognormal Distribution

95% H-UCL	8.492	90% Chebyshev (MVUE) UCL	8.682
95% Chebyshev (MVUE) UCL	8.882	97.5% Chebyshev (MVUE) UCL	9.161
99% Chebyshev (MVUE) UCL	9.709		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	8.457	95% Jackknife UCL	8.458
95% Standard Bootstrap UCL	8.453	95% Bootstrap-t UCL	8.46
95% Hall's Bootstrap UCL	8.459	95% Percentile Bootstrap UCL	8.47
95% BCA Bootstrap UCL	8.481		
90% Chebyshev(Mean, Sd) UCL	8.649	95% Chebyshev(Mean, Sd) UCL	8.842
97.5% Chebyshev(Mean, Sd) UCL	9.109	99% Chebyshev(Mean, Sd) UCL	9.634

Suggested UCL to Use

95% Student's-t UCL	8.458	or 95% Modified-t UCL	8.459

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (selenium)

General Statistics

Total Number of Observations	162	Number of Distinct Observations	27
Number of Detects	50	Number of Non-Detects	112
Number of Distinct Detects	26	Number of Distinct Non-Detects	1
Minimum Detect	0.25	Minimum Non-Detect	0.244
Maximum Detect	0.66	Maximum Non-Detect	0.244
Variance Detects	0.014	Percent Non-Detects	69.14%
Mean Detects	0.405	SD Detects	0.119
Median Detects	0.37	CV Detects	0.293
Skewness Detects	0.535	Kurtosis Detects	-1.091
Mean of Logged Detects	-0.944	SD of Logged Detects	0.286

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.891	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.125	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.294	KM Standard Error of Mean	0.00785
KM SD	0.099	95% KM (BCA) UCL	0.308
95% KM (t) UCL	0.307	95% KM (Percentile Bootstrap) UCL	0.306
95% KM (z) UCL	0.307	95% KM Bootstrap t UCL	0.308
90% KM Chebyshev UCL	0.317	95% KM Chebyshev UCL	0.328
97.5% KM Chebyshev UCL	0.343	99% KM Chebyshev UCL	0.372

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.491	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.749	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.147	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.125	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	12.48	k star (bias corrected MLE)	11.74
Theta hat (MLE)	0.0325	Theta star (bias corrected MLE)	0.0345
nu hat (MLE)	1248	nu star (bias corrected)	1174
Mean (detects)	0.405		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.198
Maximum	0.66	Median	0.167
SD	0.168	CV	0.852
k hat (MLE)	0.962	k star (bias corrected MLE)	0.949
Theta hat (MLE)	0.205	Theta star (bias corrected MLE)	0.208
nu hat (MLE)	311.8	nu star (bias corrected)	307.3
Adjusted Level of Significance (β)	0.0485		
Approximate Chi Square Value (307.34, α)	267.7	Adjusted Chi Square Value (307.34, β)	267.4
95% Gamma Approximate UCL (use when n>=50)	0.227	95% Gamma Adjusted UCL (use when n<50)	0.227

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.294	SD (KM)	0.099
Variance (KM)	0.00979	SE of Mean (KM)	0.00785
k hat (KM)	8.81	k star (KM)	8.651
nu hat (KM)	2854	nu star (KM)	2803
theta hat (KM)	0.0333	theta star (KM)	0.034
80% gamma percentile (KM)	0.373	90% gamma percentile (KM)	0.427
95% gamma percentile (KM)	0.475	99% gamma percentile (KM)	0.574

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	2681	Adjusted Chi Square Value (N/A, β)	2680
95% Gamma Approximate KM-UCL (use when n>=50)	0.307	95% Gamma Adjusted KM-UCL (use when n<50)	0.307

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.125	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.239	Mean in Log Scale	-1.582
SD in Original Scale	0.137	SD in Log Scale	0.556
95% t UCL (assumes normality of ROS data)	0.257	95% Percentile Bootstrap UCL	0.257
95% BCA Bootstrap UCL	0.259	95% Bootstrap t UCL	0.259
95% H-UCL (Log ROS)	0.26		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.267	KM Geo Mean	0.282
KM SD (logged)	0.267	95% Critical H Value (KM-Log)	1.709
KM Standard Error of Mean (logged)	0.0212	95% H-UCL (KM -Log)	0.303
KM SD (logged)	0.267	95% Critical H Value (KM-Log)	1.709
KM Standard Error of Mean (logged)	0.0212		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.209	Mean in Log Scale	-1.746
SD in Original Scale	0.147	SD in Log Scale	0.56
95% t UCL (Assumes normality)	0.228	95% H-Stat UCL	0.221

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.307	KM H-UCL	0.303
95% KM (BCA) UCL	0.308		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (zinc)

General Statistics

Total Number of Observations	390	Number of Distinct Observations	297
		Number of Missing Observations	0
Minimum	17.5	Mean	60.78
Maximum	353	Median	54.5
SD	34.13	Std. Error of Mean	1.728
Coefficient of Variation	0.562	Skewness	4.094

Normal GOF Test

Shapiro Wilk Test Statistic	0.71	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.153	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0452	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	63.63	95% Adjusted-CLT UCL (Chen-1995)	64
		95% Modified-t UCL (Johnson-1978)	63.69

Gamma GOF Test

A-D Test Statistic	4.161	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.757	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0786	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.046	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.118	k star (bias corrected MLE)	5.08
Theta hat (MLE)	11.88	Theta star (bias corrected MLE)	11.96
nu hat (MLE)	3992	nu star (bias corrected)	3962
MLE Mean (bias corrected)	60.78	MLE Sd (bias corrected)	26.97
		Approximate Chi Square Value (0.05)	3817
Adjusted Level of Significance	0.0494	Adjusted Chi Square Value	3817

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	63.09	95% Adjusted Gamma UCL (use when n<50)	63.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.00279	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0446	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0452	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.862	Mean of logged Data	4.006
Maximum of Logged Data	5.866	SD of logged Data	0.426

Assuming Lognormal Distribution

95% H-UCL	62.5	90% Chebyshev (MVUE) UCL	64.21
95% Chebyshev (MVUE) UCL	66.05	97.5% Chebyshev (MVUE) UCL	68.6
99% Chebyshev (MVUE) UCL	73.62		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	63.62	95% Jackknife UCL	63.63
95% Standard Bootstrap UCL	63.68	95% Bootstrap-t UCL	64.12
95% Hall's Bootstrap UCL	64.02	95% Percentile Bootstrap UCL	63.78
95% BCA Bootstrap UCL	64.2		
90% Chebyshev(Mean, Sd) UCL	65.96	95% Chebyshev(Mean, Sd) UCL	68.31
97.5% Chebyshev(Mean, Sd) UCL	71.57	99% Chebyshev(Mean, Sd) UCL	77.97

Suggested UCL to Use

95% Student's-t UCL	63.63	or 95% Modified-t UCL	63.69
or 95% H-UCL	62.5		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

ATTACHMENT 4

Food Chain Models

Table 4-1
Conservative Scenario Food Chain Modeling for the Desert Shrew
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	5.75E-03	2.90E-01	6.87E-01	5.6	0.1
Barium	850	m	3.10E-02	2.64E+01	1.55E+01	61	0.3
Chromium	22	m	6.51E-02	1.43E+00	5.35E-01	20	0.03
Copper	296	m	9.46E-01	2.80E+02	5.41E+01	82.5	0.7
Lead	5,030	m	6.49E-02	3.26E+02	1.22E+02	87.5	1
Manganese	433	m	5.74E-02	2.49E+01	9.93E+00	21	0.5
Mercury	0.13	m	7.29E-01	9.48E-02	1.87E-02	1.01	0.02
Nickel	24.7	m	1.09E-01	2.69E+00	7.96E-01	9.12	0.09
Selenium	0.66	m	1.67E+00	1.10E+00	2.07E-01	0.432	0.5
Zinc	353	m	7.66E-01	2.70E+02	5.31E+01	160	0.3
Hazard Index (HI)							**4**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-2
Conservative Scenario Food Chain Modeling for the Desert Cottontail
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Vegetation	Estimated Dietary Tissue Concentrations [c] (mg/kg) Vegetation	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	2.49E-02	1.25E+00	2.72E-01	5.6	0.05
Barium	850	m	1.56E-01	1.33E+02	1.14E+01	61	0.2
Chromium	22	m	4.10E-02	9.02E-01	1.41E-01	20	0.007
Copper	296	m	1.24E-01	3.67E+01	3.40E+00	82.5	0.04
Lead	5,030	m	3.89E-02	1.96E+02	3.15E+01	87.5	0.4
Manganese	433	m	7.92E-02	3.43E+01	3.78E+00	21	0.2
Mercury	0.13	m	6.52E-01	8.48E-02	5.71E-03	1.01	0.006
Nickel	24.7	m	1.80E-02	4.45E-01	1.23E-01	9.12	0.01
Selenium	0.66	m	6.72E-01	4.44E-01	2.98E-02	0.432	0.07
Zinc	353	m	3.66E-01	1.29E+02	9.31E+00	160	0.06
Hazard Index (HI)							**1**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-3
Conservative Scenario Food Chain Modeling for the Coyote
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Mammal	Estimated Dietary Tissue Concentrations [c] (mg/kg) Mammal	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	4.08E-02	2.06E+00	1.10E-01	5.6	0.02
Barium	850	m	5.66E-02	4.81E+01	2.28E+00	61	0.04
Chromium	22	m	8.46E-02	1.86E+00	7.87E-02	20	0.004
Copper	296	m	2.41E-01	7.14E+01	2.53E+00	82.5	0.03
Lead	5,030	m	7.38E-02	3.71E+02	1.63E+01	87.5	0.2
Manganese	433	m	2.05E-02	8.88E+00	6.67E-01	21	0.03
Mercury	0.13	m	5.43E-02	7.06E-03	3.40E-04	1.01	0.0003
Nickel	24.7	m	1.14E-01	2.81E+00	1.11E-01	9.12	0.01
Selenium	0.66	m	5.22E-01	3.44E-01	1.15E-02	0.432	0.03
Zinc	353	m	5.70E-01	2.01E+02	6.70E+00	160	0.04
Hazard Index (HI)							**0.4**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-4
Conservative Scenario Food Chain Modeling for the Scaled Quail
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	5.75E-03	2.90E-01	4.84E-01	NA	NA
Barium	850	m	3.10E-02	2.64E+01	1.02E+01	20.8	0.5
Chromium	22	m	6.51E-02	1.43E+00	3.38E-01	0.557	0.6
Copper	296	m	9.46E-01	2.80E+02	2.99E+01	23.2	1.3
Lead	5,030	m	6.49E-02	3.26E+02	7.72E+01	1.13	68
Manganese	433	m	5.74E-02	2.49E+01	6.33E+00	215	0.03
Mercury	0.13	m	7.29E-01	9.48E-02	1.04E-02	0.45	0.02
Nickel	24.7	m	1.09E-01	2.69E+00	4.85E-01	10.4	0.05
Selenium	0.66	m	1.67E+00	1.10E+00	1.13E-01	0.219	0.5
Zinc	353	m	7.66E-01	2.70E+02	2.95E+01	14.5	2
Hazard Index (HI)							**73**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-5
Less Conservative Scenario Food Chain Modeling for the Scaled Quail
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b]	Estimated Dietary Tissue Concentrations [c] (mg/kg)	Maximum Estimated Dietary Ingestion [d]	Toxicity Reference Values [b] mg/kg-BW-day		Less Conservative Scenario HQ [e]	
			Invertebrate	Invertebrate	mg/kg-BW-day	LOAEL	NOAEL	LOAEL	NOAEL
Metals									
Copper	21.58	UCL	9.46E-01	2.04E+01	2.18E+00	29.9	23.2	0.07	0.09
Lead	143.9	UCL	6.49E-02	9.34E+00	2.21E+00	11.3	1.13	0.2	2
Zinc	63.69	UCL	7.66E-01	4.88E+01	5.32E+00	131	14.5	0.04	0.4

Notes:

HQ	Hazard Quotient.
LOAEL	Lowest observed adverse effect level.
mg/kg	Milligrams per kilogram.
mg/kg-BW-day	Milligrams per kilogram of body weight each day.
NOAEL	No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the site wide upper confidence limit (UCL).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-6
Conservative Scenario Food Chain Modeling for the Mourning Dove
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Vegetation	Estimated Dietary Tissue Concentrations [c] (mg/kg) Vegetation	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	2.49E-02	1.25E+00	8.39E-01	NA	NA
Barium	850	m	1.56E-01	1.33E+02	2.99E+01	20.8	1.4
Chromium	22	m	4.10E-02	9.02E-01	4.16E-01	0.557	0.7
Copper	296	m	1.24E-01	3.67E+01	9.07E+00	23.2	0.4
Lead	5,030	m	3.89E-02	1.96E+02	9.37E+01	1.13	83
Manganese	433	m	7.92E-02	3.43E+01	1.05E+01	215	0.05
Mercury	0.13	m	6.52E-01	8.48E-02	1.37E-02	0.45	0.03
Nickel	24.7	m	1.80E-02	4.45E-01	3.87E-01	10.4	0.04
Selenium	0.66	m	6.72E-01	4.44E-01	7.13E-02	0.219	0.3
Zinc	353	m	3.66E-01	1.29E+02	2.29E+01	14.5	2
Hazard Index (HI)							**88**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate)
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-7
Less Conservative Scenario Food Chain Modeling for the Mourning Dove
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Vegetation	Estimated Dietary Tissue Concentrations [c] (mg/kg) Vegetation	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day		Less Conservative Scenario HQ [e]	
						LOAEL	NOAEL	LOAEL	NOAEL
Metals									
Barium	67.14	UCL	1.56E-01	1.05E+01	2.36E+00	41.7	20.8	0.06	0.1
Lead	143.9	UCL	3.89E-02	5.60E+00	2.68E+00	11.3	1.13	0.2	2
Zinc	63.69	UCL	3.66E-01	2.33E+01	4.13E+00	131	14.5	0.03	0.3

Notes:

HQ Hazard Quotient.
LOAEL Lowest observed adverse effect level.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the site wide upper confidence limit (UCL).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-8
Conservative Scenario Food Chain Modeling for the Red-tailed Hawk
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Mammal	Estimated Dietary Tissue Concentrations [c] (mg/kg) Mammal	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	4.08E-02	2.06E+00	1.09E-01	NA	NA
Barium	850	m	5.66E-02	4.81E+01	2.27E+00	20.8	0.1
Chromium	22	m	8.46E-02	1.86E+00	7.82E-02	0.557	0.1
Copper	296	m	2.41E-01	7.14E+01	2.52E+00	23.2	0.1
Lead	5,030	m	7.38E-02	3.71E+02	1.62E+01	1.13	14
Manganese	433	m	2.05E-02	8.88E+00	6.63E-01	215	0.003
Mercury	0.13	m	5.43E-02	7.06E-03	3.38E-04	0.45	0.0008
Nickel	24.7	m	1.14E-01	2.81E+00	1.11E-01	10.4	0.01
Selenium	0.66	m	5.22E-01	3.44E-01	1.15E-02	0.219	0.05
Zinc	353	m	5.70E-01	2.01E+02	6.66E+00	14.5	0.5
Hazard Index (HI)							**15**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-9
Less Conservative Scenario Food Chain Modeling for the Red-tailed Hawk
Surface Soil
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b]	Estimated Dietary Tissue Concentrations [c] (mg/kg)	Maximum Estimated Dietary Ingestion [d]	Toxicity Reference Values [b] mg/kg-BW-day		Less Conservative Scenario HQ [e]	
			Mammal	Mammal	mg/kg-BW-day	LOAEL	NOAEL	LOAEL	NOAEL
Metals									
Lead	143.9	m	7.38E-02	1.06E+01	4.62E-01	11.3	1.13	0.04	0.4

Notes:

HQ Hazard Quotient.
LOAEL Lowest observed adverse effect level.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the site wide upper confidence limit (UCL).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-10
Conservative Scenario Food Chain Modeling for the Texas Horned Lizard
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Antimony	50.4	m	5.75E-03	2.90E-01	2.07E-02	NA	NA
Barium	850	m	3.10E-02	2.64E+01	5.23E-01	2.08	0.3
Chromium	22	m	6.51E-02	1.43E+00	1.96E-02	0.0557	0.4
Copper	296	m	9.46E-01	2.80E+02	2.37E+00	2.32	1
Lead	5,030	m	6.49E-02	3.26E+02	4.47E+00	0.2	20
Manganese	433	m	5.74E-02	2.49E+01	3.59E-01	21.5	0.02
Mercury	0.13	m	7.29E-01	9.48E-02	8.14E-04	0.045	0.02
Nickel	24.7	m	1.09E-01	2.69E+00	3.08E-02	1.04	0.03
Selenium	0.66	m	1.67E+00	1.10E+00	9.16E-03	0.0219	0.4
Zinc	353	m	7.66E-01	2.70E+02	2.32E+00	1.45	2
Hazard Index (HI)							**24**

Notes:

HQ	Hazard Quotient.
mg/kg	Milligrams per kilogram.
mg/kg-BW-day	Milligrams per kilogram of body weight each day.
NOAEL	No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the site wide maximum ISM concentrations (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-11
Less Conservative Scenario Food Chain Modeling for the Texas Horned Lizard
Decision Units
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Less Conservative Scenario HQ [e] NOAEL
Metals							
Copper	21.58	UCL	9.46E-01	2.04E+01	1.00E-01	2.32	0.04
Lead	143.9	UCL	6.49E-02	9.34E+00	7.42E-02	0.2	0.4
Zinc	63.69	UCL	7.66E-01	4.88E+01	2.42E-01	1.45	0.2

Notes:
The Texas horned lizard is a federally threatened species.

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the site wide upper confidence limit (UCL).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1) x Exposure Factor (7 months / 12 months = 0.58).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-12
Conservative Scenario Food Chain Modeling for the Desert Shrew
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	7.03E-02	4.23E+00	1.52E+00	2.25	0.7
Copper	60.6	m	9.46E-01	5.73E+01	1.11E+01	82.5	0.1
Lead	483	m	6.49E-02	3.13E+01	1.17E+01	87.5	0.1
Nickel	43.3	m	1.09E-01	4.72E+00	1.40E+00	9.12	0.2
Zinc	924	m	7.66E-01	7.08E+02	1.39E+02	160	0.9
Hazard Index (HI)							**2**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-13
Conservative Scenario Food Chain Modeling for the Desert Cottontail
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Vegetation	Estimated Dietary Tissue Concentrations [c] (mg/kg) Vegetation	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	3.75E-02	2.25E+00	3.71E-01	2.25	0.2
Copper	60.6	m	1.24E-01	7.51E+00	6.96E-01	82.5	0.008
Lead	483	m	3.89E-02	1.88E+01	3.02E+00	87.5	0.03
Nickel	43.3	m	1.80E-02	7.79E-01	2.16E-01	9.12	0.02
Zinc	924	m	3.66E-01	3.38E+02	2.44E+01	160	0.2
Hazard Index (HI)							**0.4**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-14
Conservative Scenario Food Chain Modeling for the Coyote
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Mammal	Estimated Dietary Tissue Concentrations [c] (mg/kg) Mammal	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	2.50E-03	1.50E-01	5.82E-02	2.25	0.03
Copper	60.6	m	2.41E-01	1.46E+01	5.18E-01	82.5	0.006
Lead	483	m	7.38E-02	3.56E+01	1.56E+00	87.5	0.02
Nickel	43.3	m	1.14E-01	4.93E+00	1.95E-01	9.12	0.02
Zinc	924	m	5.70E-01	5.27E+02	1.75E+01	160	0.1
Hazard Index (HI)							**0.2**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-15
Conservative Scenario Food Chain Modeling for the Scaled Quail
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	7.03E-02	4.23E+00	9.54E-01	3.72	0.3
Copper	60.6	m	9.46E-01	5.73E+01	6.12E+00	23.2	0.3
Lead	483	m	6.49E-02	3.13E+01	7.41E+00	1.13	7
Nickel	43.3	m	1.09E-01	4.72E+00	8.50E-01	10.4	0.08
Zinc	924	m	7.66E-01	7.08E+02	7.71E+01	14.5	5
Hazard Index (HI)							**12**

Notes:

HQ — Hazard Quotient.
mg/kg — Milligrams per kilogram.
mg/kg-BW-day — Milligrams per kilogram of body weight each day.
NOAEL — No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-16
Less Conservative Scenario Food Chain Modeling for the Scaled Quail
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day		Less Conservative Scenario HQ [e]	
						LOAEL	NOAEL	LOAEL	NOAEL
Metals									
Lead	483	m	6.49E-02	3.13E+01	1.17E-01	11.3	1.13	0.01	0.1
Zinc	924	m	7.66E-01	7.08E+02	1.22E+00	131	14.5	0.009	0.08

Notes:

HQ Hazard Quotient.
LOAEL Lowest observed adverse effect level.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the maximum concentration for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1 acre/ 63.2 acres = 0.016).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-17
Conservative Scenario Food Chain Modeling for the Mourning Dove
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Vegetation	Estimated Dietary Tissue Concentrations [c] (mg/kg) Vegetation	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	3.75E-02	2.25E+00	1.11E+00	3.72	0.3
Copper	60.6	m	1.24E-01	7.51E+00	1.86E+00	23.2	0.08
Lead	483	m	3.89E-02	1.88E+01	9.00E+00	1.13	8
Nickel	43.3	m	1.80E-02	7.79E-01	6.79E-01	10.4	0.07
Zinc	924	m	3.66E-01	3.38E+02	5.99E+01	14.5	4
Hazard Index (HI)							**13**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-18
Less Conservative Scenario Food Chain Modeling for the Mourning Dove
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b]	Estimated Dietary Tissue Concentrations [c] (mg/kg)	Maximum Estimated Dietary Ingestion [d]	Toxicity Reference Values [b] mg/kg-BW-day		Less Conservative Scenario HQ [e]	
			Vegetation	Vegetation	mg/kg-BW-day	LOAEL	NOAEL	LOAEL	NOAEL
Metals									
Lead	483	m	3.89E-02	1.88E+01	2.25E-01	11.3	1.13	0.02	0.2
Zinc	924	m	3.66E-01	3.38E+02	1.50E+00	131	14.5	0.01	0.1

Notes:

HQ Hazard Quotient.
LOAEL Lowest observed adverse effect level.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the maximum concentration for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1 acre/ 40 acres = 0.025).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-19
Conservative Scenario Food Chain Modeling for the Red-tailed Hawk
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Mammal	Estimated Dietary Tissue Concentrations [c] (mg/kg) Mammal	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	2.50E-03	1.50E-01	5.79E-02	3.72	0.02
Copper	60.6	m	2.41E-01	1.46E+01	5.15E-01	23.2	0.02
Lead	483	m	7.38E-02	3.56E+01	1.55E+00	1.13	1
Nickel	43.3	m	1.14E-01	4.93E+00	1.94E-01	10.4	0.02
Zinc	924	m	5.70E-01	5.27E+02	1.74E+01	14.5	1
Hazard Index (HI)							**3**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-20
Conservative Scenario Food Chain Modeling for the Texas Horned Lizard
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Conservative Scenario HQ [e] NOAEL
Metals							
Arsenic	60.1	m	7.03E-02	4.23E+00	5.61E-02	0.372	0.2
Copper	60.6	m	9.46E-01	0.00E+00	6.89E-01	2.32	0.3
Lead	483	m	6.49E-02	3.13E+01	4.29E-01	0.2	2
Nickel	43.3	m	1.09E-01	0.00E+00	4.93E-01	1.04	0.5
Zinc	924	m	7.66E-01	0.00E+00	1.05E+01	1.45	7
Hazard Index (HI)							**10**

Notes:

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the conservative scenario were set at the maximum concentrations for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate).
[e] Conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

Table 4-21
Less Conservative Scenario Food Chain Modeling for the Texas Horned Lizard
Arroyos
Closed Castner Firing Range
Fort Bliss, Texas

Chemical	Less Conservative Scenario EPC [a] (mg/kg)		Soil Bioconcentration Factors [b] Invertebrate	Estimated Dietary Tissue Concentrations [c] (mg/kg) Invertebrate	Maximum Estimated Dietary Ingestion [d] mg/kg-BW-day	Toxicity Reference Values [b] mg/kg-BW-day NOAEL	Less Conservative Scenario HQ [e] NOAEL
Metals							
Lead	483	m	6.49E-02	3.13E+01	2.72E-02	0.2	0.1
Zinc	924	m	7.66E-01	7.08E+02	3.84E-01	1.45	0.3

Notes:
The Texas horned lizard is a federally threatened species.

HQ Hazard Quotient.
mg/kg Milligrams per kilogram.
mg/kg-BW-day Milligrams per kilogram of body weight each day.
NOAEL No observed effect level.

[a] The exposure point concentrations (EPCs) for the less conservative scenario were set at the maximum concentration for all arroyos (m).
[b] Bioconcentration factors and toxicity reference values are from TCEQ 2017.
[c] Estimated tissue concentration = concentration in exposure medium x bioaccumulation factor.
[d] Estimated dietary ingestion = (soil concentration x soil ingestion rate) + (biota concentration x food ingestion rate) x Area Use Factor (1 acre /9.2 acres = 0.11) x Exposure Factor (7 months/12 months = 0.58).
[e] Less conservative hazard quotient (HQ) = (estimated dietary ingestion)/(toxicity reference value). HQs are rounded to one significant figure.

APPENDIX P

MEC HA WORKSHEETS

MEC HA Summary Information

		Comments
Site ID:	FTBL-004-R-01	
Date:	6/26/2017	

Please identify the single specific area to be assessed in this hazard assessment. From this point forward, all references to "site" or "MRS" refer to the specific area that you have defined.

A. Enter a unique identifier for the site:

Closed Castner Ragne MRS (FTBL-004-R-01)

Provide a list of information sources used for this hazard assessment. As you are completing the worksheets, use the "Select Ref(s)" buttons at the ends of each subsection to select the applicable information sources from the list below.

Ref. No.	Title (include version, publication date)	Comments
1	PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017.	
2	PIKA/ARCADIS JV, 2015. Quality Assurance Project Plan, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, February 2015.	
3	e2M, 2007. Final Site Inspection Report, Fort Bliss, Texas, Military Munitions Response Program Site Inspection Munitions Response Sites, April 2007 (Revised).	

B. Briefly describe the site:

		Comments
1. Area (include units):	7,007 acres	
2. Past munitions-related use:	Target Area	From 1926 through 1966, the Closed Castner Range MRS was heavily used for small arms, artillery firing, and impact areas.
3. Current land-use activities (list all that occur):	1. Undeveloped 2. Transmountain Road 3. El Paso Museum of Archaeology 4. Border Patrol Museum 5. Fusselman Canyon Dam	The land is currently managed by the Army as a closed military training range with no authorized public access. However, trespassing frequently occurs on the range as evidenced by numerous unofficial hiking trails. Except for Transmountain Road, the El Paso Museum of Archaeology and the Border Patrol Museum, and the Fusselman Canyon Dam, the MRS is undeveloped and subject to trespassing. Approximately 40% of the site is gently rolling terrain, progressing to heavily rolling (approximately 20%) and mountainous (approximately 40%) terrain from east to west.

4. Are changes to the future land-use planned?	Yes	Future land use for the Closed Castner Firing Range MRS is currently undetermined. In the absence of a documented planned future land use, the most conservative future land use (unrestricted) will be assumed for the purpose of evaluating risk as part of the RI. Interest in future land use of the Closed Castner Range MRS has been expressed by various local and TX stakeholders including the Texas Parks and Wildlife Department (TPWD), the City of El Paso, local residents, recreationalists, and Native American tribes.
5. What is the basis for the site boundaries?		
Site boundaries are defined by the Army and maintained in the current GIS database.		
6. How certain are the site boundaries?		
The site boundaries are established and well documented.		US Hwy 54/ Martin Luther King Jr. Blvd forms the eastern boundary of the MRS and the Franklin Mountains State Park is located on the western boundary of the MRS. Hondo Pass Drive is located at the southeast portion of the MRS, with the remaining portion of the southern MRS boundary being adjacent to undeveloped land. The North Hills West residential community is located on the northeast MRS boundary, with the remaining portion of the northern MRS boundary being adjacent to undeveloped land.

Reference(s) for Part B:

PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017. [redacted]

C. Historical Clearances

1. Have there been any historical clearances at the site?	Yes, subsurface clearance	
2. If a clearance occurred:		
a. What year was the clearance performed?	Numerous (1971-2004)	
b. Provide a description of the clearance activity (e.g., extent, depth, amount of munitions-related items removed, types and sizes of removed items, and whether metal detectors were used):		

1971; Surface Investigation, covered of 200 acres of land on the Castner Range MRS. Thirty MEC items were found, including: 75-millimeter (mm) shrapnel rounds, a 40mm HE round, 37mm HE rounds, and 37mm Armor Piercing (AP) projectiles. The items were removed from the area and destroyed (USACE, 1994).

1979; Surface Sweep; Performed 200 feet on either side of Transmountain Road and along a two-mile stretch of US Highway 54 right of way. MEC was discovered, including six, M52 series fuzes; a pop flare; 14, 37mm shot rounds; 12, 75mm illumination rounds; five, 75mm HE projectiles; two, 7.62mm balls; three, 7.62mm blanks; one, 57mm HE projectile; one, 40mm “Duster”; three powder train time fuzes; and one Stokes mortar. (USACE, 1994).

1981; Surface Sweep; Performed along 30-ft wide power line easement running perpendicular from US Highway 54 to the El Paso Museum of Archaeology on Transmountain Road. Small arms ammunition was found (USACE, 1994).

1986; Fort Bliss Letter Documenting a Surface Sweep at Northgate Dam Site; Surface sweep of 7.5 acres performed January 7, 1986. Various metal fragments from 90mm and 37mm HE rounds and 10, 7.62mm ball rounds were found (Carlson, 1986).

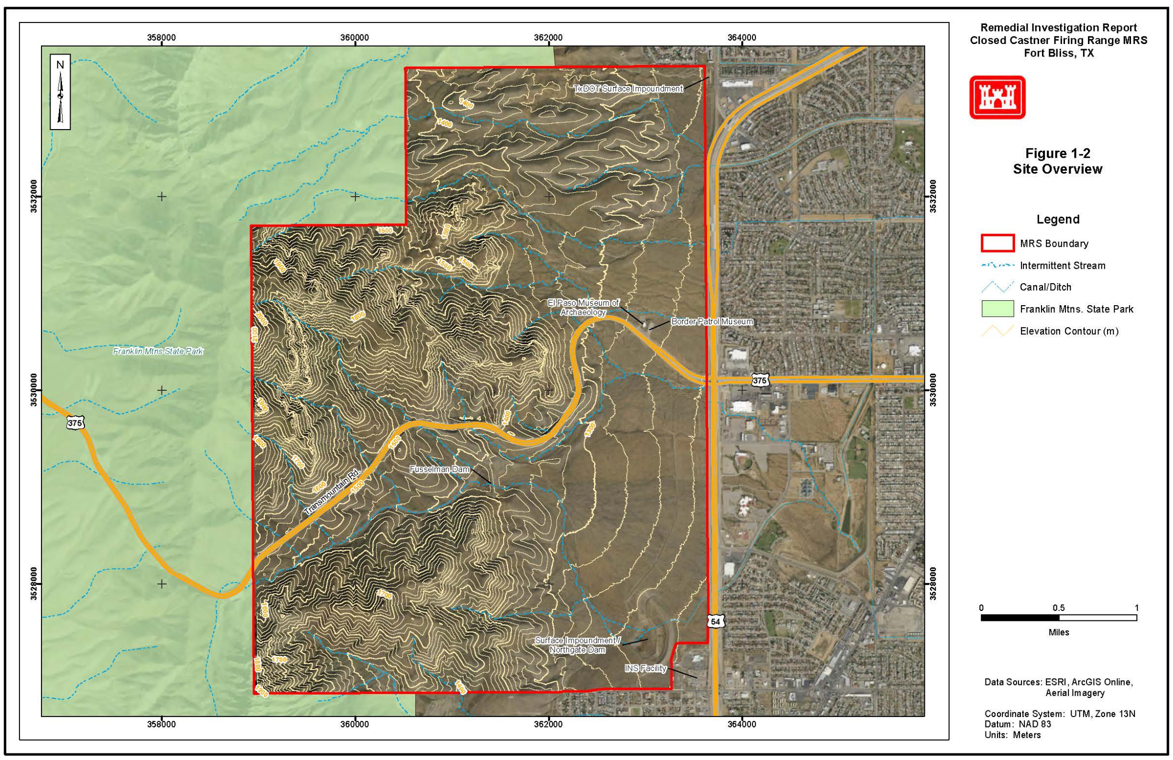
1994; UXO Site Investigation, Environmental Hazard Specialists International, Inc. (EHSI); Approximately 6,700 acres were investigated. A few items were detonated, but the majority of items were left on site. Recommended that light ordnance impact areas needed surface and subsurface clearance to six inches; heavy ordnance impact areas required subsurface clearance to three feet. (EHSI, 1994).

1997; Final Report Surface Removal Action, UXB International, Inc. (UXB); The report documented the UXB surface ordnance removal action conducted in 1995 for five areas. The surface removal action took place on areas that were determined to pose an immediate risk to the public

Reference(s) for Part C:

PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017. [redacted]

D. Attach maps of the site below (select 'Insert/Picture' on the menu bar.)



Site ID: **FTBL-004-R-01**
Date: **6/26/2017**

Cased Munitions Information

Item No.	Munition Type (e.g., mortar, projectile, etc.)	Munition Size	Munition Size Units	Mark/ Model	Energetic Material Type	Is Munition Fuzed?	Fuzing Type	Fuze Condition	Minimum Depth for Munition (ft)	Location of Munitions	Comments (include rationale for munitions that are "subsurface only")
1	Artillery	37	mm	Unknown	High Explosive	UNK	UNK	Unarmed	0	Surface and Subsurface	
2	Fuzes	0	Fuze (N/A)	MK27	High Explosive	UNK	Impact	Unarmed	0	Surface and Subsurface	
3	Artillery	40	mm	M81	High Explosive	UNK	UNK	Unarmed	0.08	Subsurface Only	One item was found at 1 inch bbgs.
4	Grenades	1.8	inches	M19A1	White Phosphorus	UNK	UNK	Unarmed	0.16	Subsurface Only	One item was found at 2 inches bgs.
5	Artillery	155	mm	M107	High Explosive	UNK	UNK	UNK			This item was not found btu was used as the MGFD in the ESP.
6	Mortars	60	mm	UNknown	High Explosive	Yes	UNK	UNK	0.67	Surface and Subsurface	
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Reference(s) for table above:
PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017.

[redacted]

Bulk Explosive Information

Item No.	Explosive Type	Comments
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Reference(s) for table above:

[redacted]

Site ID: **FTBL-004-R-01**
Date: **6/26/2017**

Activities Currently Occurring at the Site

Activity No.	Activity	Number of people per year who participate in the activity	Number of hours per year a single person spends on the activity	Potential Contact Time (receptor hours/year)	Maximum intrusive depth (ft)	Comments
1	Transmountain Road	1,000	30	**30,000**	0	5 minutes per day
2	El Paso Museum of Archaeology	1,000	1	**1,000**	0	One Visit a year at oen hour per visit
3	Border Patrol Museum	1,000	1	**1,000**	0	One Visit a year at one hour per visit
4	Illegal Hikers and Bikers	1,000	2	**2,000**	0	One Visit a year at two hours per visit
5	Police Conducting Security Patrols	20	2,080	**41,600**	0	40 hours per week for 52 weeks
6	Performing Investigation, Maintenance, and Other Work	100	40	**4,000**	3	One 40 hour week per year
			Total Potential Contact Time (receptor hrs/yr):	**79,600**		
				Maximum intrusive depth at site (ft):	**3**	

Reference(s) for table above:
PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017.

[redacted]

Activities Planned for the Future at the Site (If any are planned: see 'Summary Info' Worksheet, Question 4)

Activity No.	Activity	Number of people per year who participate in the activity	Number of hours per year a single person spends on the activity	Potential Contact Time (receptor hours/year)	Maximum intrusive depth (ft)	Comments
1	Transmountain Road	1,000	30	**30,000**	0	5 minutes per day
2	El Paso Museum of Archaeology	1,000	1	**1,000**	0	One Visit a year at oen hour per visit
3	Border Patrol Museum	1,000	1	**1,000**	0	One Visit a year at one hour per visit
4	Illegal Hikers and Bikers	1,000	2	**2,000**	0	One Visit a year at two hours per visit
5	Army Workers and Military Police Conducting Security Patrols	20	2,080	**41,600**	0	40 hours per week for 52 weeks
6	Contract Workers Performing Investigation, Maintenance, and Other Work	100	40	**4,000**	3	One 40 hour week per year
	Total Potential Contact Time (receptor hrs/yr):			**79,600**		
	Maximum intrusive depth at site (ft):				**3**	

Reference(s) for table above:

PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Prog[redacted]

Site ID: **FTBL-004-R-01**

Date: **6/26/2017**

Energetic Material Type Input Factor Categories

The following table is used to determine scores associated with the energetic materials. Materials are listed in order from most hazardous to least hazardous.

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
High Explosive and Low Explosive Filler in Fragmenting Rounds	100	100	100
White Phosphorus	70	70	70
Pyrotechnic	60	60	60
Propellant	50	50	50
Spotting Charge	40	40	40
Incendiary	30	30	30

The most hazardous type of energetic material listed in the 'Munitions, Bulk Explosive Info' Worksheet falls under the category 'High Explosive and Low Explosive Filler in Fragmenting Rounds'.

	Score
Baseline Conditions:	**100**
Surface Cleanup:	**100**
Subsurface Cleanup:	**100**

Comments

Location of Additional Human Receptors Input Factor Categories

1. What is the Explosive Safety Quantity Distance (ESQD) from the Explosive Siting Plan or the Explosive Safety Submission for the MRS? 443 feet

2. Are there currently any features or facilities where people may congregate within the MRS, or within the ESQD arc? Yes

3. Please describe the facility or feature.

The city of El Paso, TX is located adjacent to Castner Range. Businesses and residences are located southeast of the MRS. Additionally, the El Paso Museum of Archaeology, Border Patrol Museum, and INS Border Patrol Headquarters are located within the MRS.

MEC Item(s) used to calculate the ESQD for current use activities

Item #5. Artillery (155mm, High Explosive)

The following table is used to determine scores associated with the location of additional human receptors (current use activities):

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Inside the MRS or inside the ESQD arc	30	30	30
Outside of the ESQD arc	0	0	0

4. Current use activities are 'Inside the MRS or inside the ESQD arc', based on Question 2.'

	Score
Baseline Conditions:	**30**
Surface Cleanup:	**30**
Subsurface Cleanup:	**30**

5. Are there future plans to locate or construct features or facilities where people may congregate within the MRS, or within the ESQD arc? Yes

6. Please describe the facility or feature.

The city of El Paso, TX is located adjacent to Castner Range. Businesses and residences are located southeast of the MRS.

MEC Item(s) used to calculate the ESQD for future use activities

[redacted]

Item #5. Artillery (155mm, High Explosive)

The following table is used to determine scores associated with the location of additional human receptors (future use activities):

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Inside the MRS or inside the ESQD arc	30	30	30
Outside of the ESQD arc	0	0	0

7. Future use activities are 'Inside the MRS or inside the ESQD arc', based on Question 5.'

	Score
Baseline Conditions:	**30**
Surface Cleanup:	**30**
Subsurface Cleanup:	**30**

Site Accessibility Input Factor Categories

The following table is used to determine scores associated with site accessibility:

	Description	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Full Accessibility	No barriers to entry, including signage but no fencing	80	80	80
Moderate Accessibility	Some barriers to entry, such as barbed wire fencing or rough terrain	55	55	55
Limited Accessibility	Significant barriers to entry, such as unguarded chain link fence or requirements for special transportation to reach the site	15	15	15
Very Limited Accessibility	A site with guarded chain link fence or terrain that requires special equipment and skills (e.g., rock climbing) to access	5	5	5

Current Use Activities	*Score*
Select the category that best describes the site accessibility under the current use scenario:	
Moderate Accessibility	
Baseline Conditions:	**55**
Surface Cleanup:	**55**
Subsurface Cleanup:	**55**

Future Use Activities	
Select the category that best describes the site accessibility under the future use scenario:	
Full Accessibility	
Baseline Conditions:	**80**
Surface Cleanup:	**80**
Subsurface Cleanup:	**80**

Reference(s) for above information:

PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017.

[redacted]

Potential Contact Hours Input Factor Categories

The following table is used to determine scores associated with the total potential contact time:

	Description	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Many Hours	≥1,000,000 receptor-hrs/yr	120	90	30
Some Hours	100,000 to 999,999 receptor hrs/yr	70	50	20
Few Hours	10,000 to 99,999 receptor-hrs/yr	40	20	10
Very Few Hours	<10,000 receptor-hrs/yr	15	10	5

Current Use Activities :

Input factors are only determined for baseline conditions for current use activities. Based on the 'Current and Future Activities' Worksheet, the Total Potential Contact Time is: **79,600** receptor hrs/yr

Based on the table above, this corresponds to a input factor score for baseline conditions of: **40** Score

Future Use Activities :

Input factors are only determined for baseline conditions for future use activities. Based on the 'Current and Future Activities' Worksheet, the Total Potential Contact Time is: **79,600** receptor hrs/yr

Based on the table above, this corresponds to a input factor score of: **40** Score

Amount of MEC Input Factor Categories

The following table is used to determine scores associated with the Amount of MEC:

	Description	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Target Area	Areas at which munitions fire was directed	180	120	30
OB/OD Area	Sites where munitions were disposed of by open burn or open detonation methods. This category refers to the core activity area of an OB/OD area. See the "Safety Buffer Areas" category for safety fans and kick-outs.	180	110	30
Function Test Range	Areas where the serviceability of stored munitions or weapons systems are tested. Testing may include components, partial functioning or complete functioning of stockpile or developmental items.	165	90	25
Burial Pit	The location of a burial of large quantities of MEC items.	140	140	10
Maneuver Areas	Areas used for conducting military exercises in a simulated conflict area or war zone	115	15	5
Firing Points	The location from which a projectile, grenade, ground signal, rocket, guided missile, or other device is to be ignited, propelled, or released.	75	10	5
Safety Buffer Areas	Areas outside of target areas, test ranges, or OB/OD areas that were designed to act as a safety zone to contain munitions that do not hit targets or to contain kick-outs from OB/OD areas.	30	10	5
Storage	Any facility used for the storage of military munitions, such as earth-covered magazines, above-ground magazines, and open-air storage areas.	25	10	5
Explosive-Related Industrial Facility	Former munitions manufacturing or demilitarization sites and TNT production plants	20	10	5

Select the category that best describes the ***most hazardous*** amount of MEC: ***Score***

Target Area

Baseline Conditions:	**180**
Surface Cleanup:	**120**
Subsurface Cleanup:	**30**

Minimum MEC Depth Relative to the Maximum Intrusive Depth Input Factor Categories

Current Use Activities

The shallowest minimum MEC depth, based on the 'Cased Munitions Information' Worksheet: **0** ft

The deepest intrusive depth: **3** ft

The table below is used to determine scores associated with the minimum MEC depth relative to the maximum intrusive depth:

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.	240	150	95
Baseline Condition: MEC located surface and subsurface, After Cleanup: Intrusive depth does not overlap with subsurface MEC.	240	50	25
Baseline Condition: MEC located only subsurface. Baseline Condition or After Cleanup: Intrusive depth overlaps with minimum MEC depth.	150	N/A	95
Baseline Condition: MEC located only subsurface. Baseline Condition or After Cleanup: Intrusive depth does not overlap with minimum MEC depth.	50	N/A	25

Because the shallowest minimum MEC depth is less than or equal to the deepest intrusive depth, the intrusive depth will overlap after cleanup. MECs are located at both the surface and subsurface, based on the 'Munitions, Bulk Explosive Info' Worksheet. Therefore, the category for this input factor is 'Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.' For 'Current Use Activities', only Baseline Conditions are considered.

240 *Score*

Future Use Activities

Deepest intrusive depth: **3** ft

Because the shallowest minimum MEC depth is less than or equal to the deepest intrusive depth, the intrusive depth overlaps. MECs are located at both the surface and subsurface, based on the 'Munitions, Bulk Explosive Info' Worksheet. Therefore, the category for this input factor is 'Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.'. For 'Future Use Activities', only Baseline Conditions are considered.

240 *Score*

Migration Potential Input Factor Categories

Is there any physical or historical evidence that indicates it is possible for natural physical forces in the area (e.g., frost heave, erosion) to expose subsurface MEC items, or move surface or subsurface MEC items?

Yes

If "yes", describe the nature of natural forces. Indicate key areas of potential migration (e.g., overland water flow) on a map as appropriate (attach a map to the bottom of this sheet, or as a separate worksheet).

surface water run-off. Ecological activity (e.g. nesting/burrowing animals).

The following table is used to determine scores associated with the migration potential:

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Possible	30	30	10
Unlikely	10	10	10

Based on the question above, migration potential is 'Possible.'

	Score
Baseline Conditions:	**30**
Surface Cleanup:	**30**
Subsurface Cleanup:	**10**

Reference(s) for above information:

PIKA/ARCADIS JV, 2017. Draft Remedial Investigation Report, Military Munitions Response Program Remedial Investigation Closed Castner Firing Range, Fort Bliss, El Paso Texas, June 2017.

[redacted]

MEC Classification Input Factor Categories

Cased munitions information has been inputed into the 'Munitions, Bulk Explosive Info' Worksheet; therefore, bulk explosives do not comprise all MECs for this MRS.

The 'Amount of MEC' category is 'Target Area'. It cannot be automatically assumed that the MEC items from this category are DMM. Therefore, the conservative assumption is that the MEC items in this MRS are UXO.

Has a technical assessment shown that MEC in the OB/OD Area is DMM?

Are any of the munitions listed in the 'Munitions, Bulk Explosive Info' Worksheet:

Yes

M19A1 Rifle Grenade, white phosphorous (WP) and a 60mm mortar.

- Submunitions
- Rifle-propelled 40mm projectiles (often called 40mm grenades)
- Munitions with white phosphorus filler
- High explosive anti-tank (HEAT) rounds
- Hand grenades
- Fuzes
- Mortars

At least one item listed in the 'Munitions, Bulk Explosive Info' Worksheet was identified as 'fuzed'.

The following table is used to determine scores associated with MEC classification categories:

UXO Special Case

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
UXO Special Case	180	180	180
UXO	110	110	110
Fuzed DMM Special Case	105	105	105
Fuzed DMM	55	55	55
Unfuzed DMM	45	45	45
Bulk Explosives	45	45	45

Based on your answers above, the MEC classification is 'UXO Special Case'.

	Score
Baseline Conditions:	**180**
Surface Cleanup:	**180**
Subsurface Cleanup:	**180**

MEC Size Input Factor Categories

The following table is used to determine scores associated with MEC Size:

	Description	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Small	Any munitions (from the 'Munitions, Bulk Explosive Info' Worksheet) weigh less than 90 lbs; small enough for a receptor to be able to move and initiate a detonation	40	40	40
Large	All munitions weigh more than 90 lbs; too large to move without equipment	0	0	0

Based on the definitions above and the types of munitions at the site (see 'Munitions, Bulk Explosive Info' Worksheet), the MEC Size Input Factor is: Small

	Score
Baseline Conditions:	**40**
Surface Cleanup:	**40**
Subsurface Cleanup:	**40**

Scoring Summary

Site ID:	FTBL-004-R-01	a. Scoring Summary for Current Use Activities	
Date:	6/26/2017	Response Action Cleanup:	No Response Action
Input Factor		**Input Factor Category**	**Score**
I. Energetic Material Type		High Explosive and Low Explosive Filler in Fragmenting Rounds	100
II. Location of Additional Human Receptors		Inside the MRS or inside the ESQD arc	30
III. Site Accessibility		Moderate Accessibility	55
IV. Potential Contact Hours		10,000 to 99,999 receptor-hrs/yr	40
V. Amount of MEC		Target Area	180
VI. Minimum MEC Depth Relative to Maximum Intrusive Depth		Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.	240
VII. Migration Potential		Possible	30
VIII. MEC Classification		UXO Special Case	180
IX. MEC Size		Small	40
		Total Score	**895**
		Hazard Level Category	**1**

Site ID:	FTBL-004-R-01	b. Scoring Summary for Future Use Activities	
Date:	6/26/2017	Response Action Cleanup:	No Response Action
Input Factor		**Input Factor Category**	**Score**
I. Energetic Material Type		High Explosive and Low Explosive Filler in Fragmenting Rounds	100
II. Location of Additional Human Receptors		Inside the MRS or inside the ESQD arc	30
III. Site Accessibility		Full Accessibility	80
IV. Potential Contact Hours		10,000 to 99,999 receptor-hrs/yr	40
V. Amount of MEC		Target Area	180
VI. Minimum MEC Depth Relative to Maximum Intrusive Depth		Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.	240
VII. Migration Potential		Possible	30
VIII. MEC Classification		UXO Special Case	180
IX. MEC Size		Small	40
		Total Score	**920**
		Hazard Level Category	**1**

MEC HA Hazard Level Determination		
Site ID: FTBL-004-R-01		
Date: 6/26/2017		
	Hazard Level Category	Score
a. Current Use Activities	1	895
b. Future Use Activities	1	920
Characteristics of the MRS		
Is critical infrastructure located within the MRS or within the ESQD arc?	Yes	
Are cultural resources located within the MRS or within the ESQD arc?	Yes	
Are significant ecological resources located within the MRS or within the ESQD arc?	Yes	

APPENDIX Q

MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL

Table A
MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site Name: Castner Range MRS

Component: RI

Installation/Property Name: Fort Bliss

Location (City, County, State): El Paso, El Paso County, Texas

Site Name (RMIS ID)/Project Name (Project No.): FTBL-004-R-01

Date Information Entered/Updated: 26 June 2017

Point of Contact (Name/Phone):

Project Phase (check only one):

☐ PA	☐ SI	☒ RI	☐ FS	☐ RD
☐ RA-C	☐ RIP	☐ RA-O	☐ RC	☐ LTM

Media Evaluated (check all that apply):

☐ Groundwater	☐ Sediment (human receptor)
☒ Surface soil	☒ Surface Water (ecological receptor)
☐ Sediment (ecological receptor)	☒ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type munition, if known) or munitions constituents (by type, if known) known or suspected to be present): According to the SI Report, the Closed Castner Range MRS, potentially contains munitions items related to flares; signaling items; training simulator devices; screening smoke; grenades (hand, rifle, smoke); small, medium, and large projectiles (20mm-155mm); mortars (3-in. Stokes, 4.2 in., and 81 mm); rockets (2.36 in. and 3.5 in.); and small arms.

Description of Pathways for Human and Ecological Receptors: MEC: The primary exposure pathway for human and ecological receptors is through surface contact with MEC. Subsurface exposure is possible during excavation or other intrusive activities. MC: The primary exposure pathway for human and ecological receptors is through surface contact with MC. Subsurface exposure is possible during excavation or other intrusive activities. Contact with surface water is possible during rain events.

Description of Receptors (Human and Ecological): Human receptors include workers and guests to the Border Patrol Museum, El Paso Museum of Archeology, TxDOT and INS Border Patrol Headquarters; illegal hikers and bikers trespassing on the site; Army workers and Military Police conducting security patrols; and contract workers performing investigation, maintenance, and other work within the MRS. The region along the state line that separates New Mexico and TX is a center of biodiversity in temperate North America, and wildlife is abundant at Fort Bliss. There are 58 mammalian species, 39 reptilian species, eight amphibian species and 335 species of birds which are either resident or transient at Fort Bliss. Two threatened fauna occur on the Closed Castner Range MRS: the Texas horned lizard and the Texas lyre snake.

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with **all** munitions types found at the MRS.

Note: The terms *practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	♦ All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorus (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions]. ♦ All hand grenades containing energetic filler. ♦ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	**30**
High explosive (used or damaged)	♦ All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ♦ All DMM containing a high-explosive filler that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	25
Pyrotechnic (used or damaged)	♦ All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades). ♦ All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	20
High explosive (unused)	♦ All DMM containing a high explosive filler that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	15
Propellant	♦ All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ♦ All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrotechnics, or propellant	♦ All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated. ♦ Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	♦ All DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	10
Practice	♦ All UXO that are practice munitions that are not associated with a sensitive fuze. ♦ All DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	5
Riot control	♦ All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	♦ All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	2
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**30**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

The MEC items found included the following:

- 37mm High Explosive (HE) Projectile (UXO);
- M19A1 Rifle Grenade, WP (DMM);
- 40mm M81 Projectile still in cartridge (DMM);

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with **all** munitions types found at the MRS.

Note: The terms *practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

- 37mm HE Projectile (DMM);
- MK27 Point Detonating (PD) fuze (DMM);
- and a 60mm Mortar fuzed (UXO).

Also, a 3-inch Stokes Mortar was observed on Fusselman Canyon Dam while RI field teams were transiting through the area.

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with **all** sources of explosive hazard found at the MRS.

Note: The terms *former range, practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	♦ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	**10**
Former munitions treatment (i.e., OB/OD) unit	♦ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	♦ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	♦ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	♦ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	♦ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	♦ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	♦ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	♦ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	♦ The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS into this category.].	1
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**10**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

The Closed Castner Range was operational from 1926 to 1966 and was the site of a variety of range types and uses including the following: rifle and small arms ranges, fire power demonstrations, artillery firing, mortar range, 37mm sub-caliber range, moving target courses, field firing courses, demolition (OB/OD), 3.5 inch rocket range, live hand grenade range, live fire and target detection courses, bulk explosives and booby-trap training courses.

Range maps from 1943 identify 17 ranges. Most ranges were small arms ranges with the exception of a 37mm sub-caliber range, a mortar range, and moving target and field firing courses. Three field artillery firing points were identified in addition to the ranges. These firing points were located in the eastern portion of the range, and firing was to the west

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with **all** sources of explosive hazard found at the MRS.

Note: The terms *former range, practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

or southwest. A report from the Commander of Fort Bliss, dated 11 May 1971, states the western mountainous portions of the range had been used for large artillery impact areas during the 1930's and 1940's.

Army Military Service maps updated in 1947 and 1948 show a firing range and a demolition area in the northeast portion in addition to the firing ranges located in the southeast area. Range firing fans from 1953 show firing points located along the eastern edge of the range using the Franklin Mountains as a backstop. By 1955, 27 ranges existed on the Closed Castner Range. The ranges were mostly small arms ranges with the exception of a 3.5-inch rocket range, a live hand grenade range, and a demolition range. The exact location of the grenade range was not identified but the course contained 10 throwing revetments. The demolition range consisted of pits for blowing demolitions. The entire Closed Castner Range area west of US Highway 54 was a potential impact area for 3.5-inch rockets and grenades.

Documents from 1961 indicate a complex of firing ranges identified as Trainfire I was located along the eastern edge of the Closed Castner Range. It included 8 live firing courses and 10 target detection courses. The only operations specified for these ranges were rifle and other small arms firing. Target detection courses do not involve live munitions firing. A Vietnam Village was constructed for close combat training in the same area as the demolition range in the northern portion of the Closed Castner Range. The Vietnam Village occupied 20 acres and probably involved operations for live hand grenades, bulk explosives, and explosive booby-traps

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	♦ Physical evidence indicates that there are UXO or DMM on the surface of the MRS ♦ Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	**25**
Confirmed subsurface, active	♦ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ♦ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20
Confirmed subsurface, stable	♦ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ♦ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	♦ There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10
Suspected (historical evidence)	♦ There is historical evidence indicating that UXO or DMM may be present at the MRS.	5
Subsurface, physical constraint	♦ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	♦ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.].	1
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**25**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

Numerous UXO have been removed from the Closed Castner Range MRS during several surface and subsurface clearance operations conducted at the site. During the RI, three MEC items were found on the ground surface.

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	♦ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	♦ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	**8**
Barrier to MRS access is complete but not monitored	♦ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	♦ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0
EASE OF ACCESS	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 10).	**8**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space provided.

Although portions of the Closed Castner Range MRS are fenced and warning signs are posted, the MRS remains largely open to trespassers.

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (the Department) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by the Department. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	5
Scheduled for transfer from DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by the Department, and the Department plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3
DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by the Department. With respect to property that is leased or otherwise possessed, the Department must control access to the MRS 24 hours per day, every day of the calendar year.	**0**
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space provided.

The Closed Castner Range has been declared excess and is currently undeveloped. It consists of rugged mountains and canyons to the west and rounded foothills and gently sloping desert floor to the east. It is heavily vegetated and the vast majority of the land remains untouched since most range activity was confined to firing points and roads. Current site activities include traffic on Trans Mountain Road and activities at the Border Patrol Museum, Wilderness Park Museum, TxDOT, and INS Border Patrol Headquarters. Illegal hiking and biking also occurs on the Closed Castner Range.

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and circle the score that corresponds with the associated population density.

Note: If an MRS is located in more that one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	**5**
100–500 persons per square mile	♦ There are 100 to 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	3
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space provided.

The Closed Castner Range MRS is located within the City limits of El Paso, Texas between US Highway 54 to the east, the Franklin Mountains State Park to the west, by a residential and business district to the southeast; and by undeveloped area to the northeast. According to the US Census Bureau (2010 statistics), the city of El Paso had a population of 649,121. El Paso county had a population of 800,647 during the 2010 census period.

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the associated population near the hazard.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	♦ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	**5**
16 to 25 inhabited structures	♦ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	♦ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	♦ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	♦ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	♦ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space provided.

The city of El Paso, TX is located adjacent to the Closed Castner Range. Businesses and residences are located southeast of the MRS.

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the score(s) that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	**5**
Parks and recreational areas	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	♦ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	♦ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

The city of El Paso, TX is located adjacent to the Closed Castner Range. Businesses and residences are located southeast of the MRS.

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	**5**
Ecological resources present	♦ There are ecological resources present on the MRS.	3
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space provided.

As of November 24, 1997, the Fort Bliss cultural resource database contained information on over 15,405 cultural resource sites on Fort Bliss. The Closed Castner Range contains numerous prehistoric and historic resources ranging from pueblos to ranching-related sites, a Spanish Salt Trail, and military training locations including a theodolite station from the 1800s and Vietnam War-era simulated village sites. No architectural resources or traditional cultural properties (TCPs) have been identified within the Closed Castner Range, but both could potentially occur.

The region along the state line that separates New Mexico and TX is a center of biodiversity in temperate North America, and wildlife is abundant at Fort Bliss. There are 58 mammalian species, 39 reptilian species, eight amphibian species and 335 species of birds which are either resident or transient at Fort Bliss. Two threatened fauna occur on the Closed Castner Range MRS: the Texas horned lizard and the Texas lyre snake.

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	30	40
Source of Hazard	Table 2	10	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	25	33
Ease of Access	Table 4	8	
Status of Property	Table 5	0	
Receptors Factor Data Elements			
Population Density	Table 6	5	20
Population Near Hazard	Table 7	5	
Types of Activities/Structures	Table 8	5	
Ecological and/or Cultural Resources	Table 9	5	
EHE MODULE TOTAL			**93**

EHE Module Total	**EHE Module Rating**
92 to 100	A
82 to 91	**B**
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
Less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**A**

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the score(s) that correspond to **all** CWM configurations present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is: ♦ Explosively configured CWM that are UXO (i.e., CWM/UXO). ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is: ♦ Nonexplosively configured CWM/DMM. ♦ Bulk CWM/DMM (e.g., ton container).	15
CAIS K941 and CAIS K942	♦ The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	♦ Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**N/A**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

There is no clear evidence of chemical warfare materiel (CWM) storage, usage, or disposal at the Cosed Castner Range and no documentation of use has been encountered during previous investigations. No CWM was encountered during the RI field activities. Following investigation, both the physical and historical evidence indicates that CWM are not present at the MRS; therefore, Tables 11 through 20 are Not Applicable

Tables 12-19

No known or suspected CWM hazard is expected at this site. Therefore, Tables 12 through 19 have been intentionally omitted according to Active Army Guidance.

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	-	
Accessibility Factor Data Elements			
Location of CWM	Table 13	-	-
Ease of Access	Table 14	-	
Status of Property	Table 15	-	
Receptors Factor Data Elements			
Population Density	Table 16	-	-
Population Near Hazard	Table 17	-	
Types of Activities/Structures	Table 18	**-**	
Ecological and/or Cultural Resources	Table 19	-	
		CHE MODULE TOTAL	**0**

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
Less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios

A third investigation phase, for installation of monitoring wells and collection of groundwater samples (if groundwater is present), was planned, if necessary during the RI. However, because data collected during the Phase II investigation demonstrated that the soil-to-groundwater pathway is incomplete, a groundwater assessment was not required and no groundwater samples were collected or analyzed as part of the RI. As a result, Table 21 has not been evaluated and "No Known or Suspected Groundwater Hazard" has been selected.

CHF Scale	CHF Value	Sum The Ratios	-
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		-

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

Receptors Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTORS FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

No Known or Suspected Groundwater MC Hazard ☒

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios

No metals were detected at concentrations that exceed the RALs. Since no exceedances of the screening levels were identified, "No Known or Suspected Surface water MC Hazard" has been selected.

CHF Scale	CHF Value	Sum The Ratios	-
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		-

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

Receptors Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTORS FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

No Known or Suspected Surface Water (Human Endpoint) MC Hazard ☒

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
Sediment samples were not collected during the RI. Since no sediment data is available, Table 23 was not evaluated.			

CHF Scale	CHF Value	Sum The Ratios	-
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		-

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

Receptors Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTORS FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

No Known or Suspected Sediment (Human Endpoint) MC Hazard ☐

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios

No metals were detected at concentrations that exceed the RALs. Since no exceedances of the screening levels were identified, "No Known or Suspected Surface water MC Hazard" has been selected.

CHF Scale	CHF Value	Sum The Ratios	-
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		-

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

Receptors Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTORS FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard ☒

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios

Sediment samples were not collected during the RI. Since no sediment data is available, Table 25 was not evaluated.

CHF Scale	CHF Value	Sum The Ratios	-
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		-

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

Receptors Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTORS FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	-

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard ☐

Table 26

HHE Module: Surface Soil – Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value.** If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
ISM			
Antimony	50.4	15	3.36
Barium	947	889	1.07
Lead	5030	500	10.06
Arroyo Soil Sampling			
Arsenic	60.1	24	2.49
Potential Backstop Berm			
Antimony	57.5	15	3.81
Lead	12600	500	25.2
CHF Scale	**CHF Value**	**Sum The Ratios**	**45.99**
CHF > 100	**H (High)**	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**M**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	H

Receptors Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M

Table 26

HHE Module: Surface Soil – Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTORS FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	**H**

No Known or Suspected Surface Soil MC Hazard ☐

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptors Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)	-	-	-	-	-
Surface Water/Human Endpoint (Table 22)	-	-	-	-	No Known or Suspected MC Hazard
Sediment/Human Endpoint (Table 23)	-	-	-	-	-
Surface Water/Ecological Endpoint (Table 24)	-	-	-	-	No Known or Suspected MC Hazard
Sediment/Ecological Endpoint (Table 25)	-	-	-	-	-
Surface Soil (Table 26)	M	H	H	MHH	B

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box below.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING: B

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	**B**
HHL	C
HMM	C
HML	D
MMM	D
HLL	E
MML	E
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	**2**	B	2	A	2
B	3	C	3	**B**	**3**
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		**No Known or Suspected CWM Hazard**		No Known or Suspected MC Hazard	
MRS or ALTERNATIVE PRIORITY				**2**	