Final
Military Munitions Response Program
Remedial Investigation Report

Iona Island Naval Ammunition Depot
Formerly Used Defense Site
Stony Point, Rockland County, New York

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
%	Percent
AGC	Advanced geophysical classification
Alion	Alion Science and Technology Corporation
ANJV	Acorn SI-NAEVA Joint Venture
AOC	Area of concern
ARAR	Applicable or relevant and appropriate requirement
ASR	Archive Search Report
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHE	CWM Hazard Evaluation
cm	Centimeter(s)
CMUA	Concentrated Munitions Use Area
CSM	Conceptual site model
CWM	Chemical warfare material
DERP	Defense Environmental Restoration Program
DFW	Definable feature of work
DGM	Digital geophysical mapping
DNT	Dinitrotoluene
DoD	Department of Defense
DPIC	Direct-person-in-charge
DQO	Data quality objective
DUA	Data Usability Assessment
DQO	Data quality objective
DUA	Data Usability Assessment
EA	EA Engineering, P.C. and its affiliate EA Science and Technology
EHE	Explosive Hazard Evaluation
EM	Electromagnetic
EMI	Electromagnetic Induction
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ER	Engineer Regulation
FS	Feasibility study
ft	Foot (feet)
ft^2	Square foot (feet)

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

FUDS	Formerly Used Defense Site
GIS	Geographic information system
GPS	Global positioning system
GSA	General Services Administration
GVS	Geophysical systems verification
HE	High explosive
HHE	Health Hazard Evaluation
HTRW	Hazardous, Toxic, and Radioactive Waste
ID	Identification
IMU	Inertial Measurement Unit
in.	Inch(es)
ISO	Industry standard object
IVS	Instrument verification strip
LF	Linear foot (feet)
MC	Munitions constituents
MD	Munitions debris
MDAS	Material documented as safe
MEC	Munitions and explosives of concern
mm	Millimeter(s)
MMRP	Military Munitions Response Program
MM2x2	MetalMapper 2x2
MPC	Measurement of performance criteria
MPPEH	Material potentially presenting an explosive hazard
MQO	Measurement quality objective
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
mV	Millivolt(s)
NGVD	National Geodetic Vertical Datum
NMRD	Non-munitions-related debris
No.	Number
NOAA	National Oceanic and Atmospheric Administration
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
OESS	Ordnance and Explosives Safety Specialist
PIPC	Palisades Interstate Park Commission

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RI	Remedial investigation
RRD	Range related debris
RTK	Real-time kinematic
SI	Site Investigation
SOP	Standard Operating Procedure
SRA	Saturated Response Area
SUXOS	Senior Unexploded Ordnance Supervisor
TNT	Trinitrotoluene
TOI	Target of interest
TPP	Technical Project Planning
UFP	Uniform Federal Policy
USACE	U.S. Army Corps of Engineers
USAGC	U.S. Army Geospatial Center
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
VSP	Visual Sampling Plan

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EXECUTIVE SUMMARY

This Military Munitions Response Program (MMRP) Remedial Investigation (RI) Report presents the results of the activities completed at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (FUDS Project Number C02NY074403) (**Figure ES-1**).

The Iona Island Naval Ammunition Depot FUDS consists of approximately 124 acres of land and inland water. The Navy used the site as an Ammunition Depot from 1900 to 1947. Activities included preparing, assembling, maintaining, inspecting, testing, and issuing ammunition; however, there was no manufacturing conducted on site. Iona Island Naval Ammunition Depot was deactivated in 1947. The former depot was excessed by the Navy in 1957 and transferred to the General Services Administration (GSA). The GSA conveyed the FUDS property to Palisades Interstate Park Commission (PIPC) in 1965. The PIPC currently utilizes a portion of Iona Island as a storage facility; however, the property is closed to the public and use is restricted to park purposes only. The FUDS is part of the much larger Hudson River National Estuarine Research Reserve, a Significant Coastal Fish and Wildlife Habitat Area and National Natural Landmark.

Historical records for the Iona Island Naval Ammunition Depot FUDS include several reports of ordnance items found within the FUDS and the potential for munitions and explosives of concern (MEC) to be found within the FUDS. An explosion in 1903, originating from the approximate center of the depot, is thought to have thrown stored ammunition shells as far as 1,250 feet (ft) from the blast. Anecdotal evidence identifies the potential for MEC to be found around the former loading docks, where munitions may have been intentionally dumped or accidentally dropped into the Hudson River during the loading and unloading of supply vessels. Additionally, several potential munitions items have been reportedly sighted in low-tide conditions in an area just north of Round Island referred to as a "dump site" (Alion 2008). However, based on a review of historical records, no evidence of live munitions (containing explosives) has ever been documented as being found on the Iona Island FUDS.

The purpose of this MMRP RI is to determine whether further response action pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan is warranted at the Iona Island Naval Ammunition Depot FUDS for MEC. The primary objective of this RI is to characterize the nature and extent of MEC attributable to past Department of Defense (DoD) activities, and to assess potential explosive hazard risk to human receptors. Four general areas within the FUDS were identified as requiring investigation during the Site Inspection (Alion Science and Technology Corporation [Alion] 2008) and RI Technical Project Planning meetings, including: (1) Munitions Response Site (MRS) 01 1903 Explosion Area, (2) former loading docks, (3) shoreline downstream from the loading docks, and (4) a previously identified dump site (**Figure ES-2**). All four areas inclusive of land, marsh, fill, and river shoreline environments were included in the investigation for MEC. With the exception of munitions constituents (MC) directly associated with MEC discovered during the execution of the MMRP RI (e.g., explosives from a breached munitions item), soil sampling for MC including explosives constituents and metals associated with the former operational use across the site is being addressed as part of a separate Hazardous,

Toxic and Radioactive Waste (HTRW) RI, which includes the investigation of 19 HTRW areas of concern (AOCs) and MC associated with the operational history of the site. MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation. A separate RI report is being developed for the HTRW RI (EA 2020).

At MRS 01, 6.8 acres were surveyed over 27 grids using digital geophysical mapping (DGM). A total of 1049 DGM anomalies identified as potential MEC and 2.7 acres of saturated response areas (SRAs) were identified. Advanced Geophysical Classification (AGC) methods were used to further investigate 989 of the DGM anomalies. A total of 60 DGM anomalies, 250 AGC anomalies, and 110 potential disposal pit/trench locations were intrusively investigated using hand tools (e.g., shovels) and mechanical equipment (i.e., mini excavator). Of the 420 anomalies and disposal pit/trench locations investigated, 2 anomaly locations contained munitions debris (MD), specifically, two pieces of fragmentation from a 6-pound projectile.

The dive team performed investigations along transects and at "spot dives" on top of and adjacent to the three former dock footprints. The steep riverbed slope on the river channel side of the former docks reduced the diver's ability to survey along the planned transects. No MEC or MD was located, the divers identified only debris from the former docks that included rebar, concrete rubble, pipes, railroad rails, and metal debris. Approximately 1.2 miles of DGM data was collected on parallel transects along the shoreline and 44 individual anomalies were identified as potential targets of interest in addition to SRAs associated with the former dock locations. All the DGM anomalies outside of the former dock footprints were intrusively investigated by the dive team. Again, no MEC or MD was located along the shoreline and only non-munitions related debris was identified.

DGM was collected over 2,360 linear ft of transects spaced 10 ft apart over the Dump Area and 14 individual anomalies and 3,000 square feet (ft^2) of SRAs were identified. The 14 DGM anomalies and 8 locations within the SRAs were intrusively investigated using manual (shovel) and mechanical (mini excavator) methods. The intrusive investigation resulted in only scrap metal, pipes, burn debris/slag, bricks, and concrete slabs, with no MEC or MD identified.

Only two pieces of fragmentation were identified at MRS 01 during the RI, both from 6-pound projectiles located near the 1903 explosion point of origin. No MEC have ever been documented at Iona Island FUDS. No sources for MC were identified during the execution of the MMRP RI (e.g., breached munitions item), therefore, MC sampling was not performed during the MMRP RI.

Based on the findings of the RI and from previous investigations, no MEC has been identified at Iona Island Naval Ammunition Depot FUDS, and MEC are not anticipated to be encountered. A MEC risk assessment was performed as part of this RI in accordance with the guidance document *Trial Period for Risk Management Methodology at FUDS MMRP Projects* (USACE 2017). The risk assessment satisfies the requirements of 40 CFR Part 300.430(d)(4) and uses site-specific CSM data, likelihood of a MEC encounter, severity of a MEC incident, and likelihood of detonation.

Based on the completion of the Risk Management Methodology evaluation of risk from explosive hazards to human health, MRS 01 and the other three areas investigated were identified as having no unacceptable risks. Therefore, no further action for MMRP is recommended at: (1) MRS 01 1903 Explosion Area, (2) former loading docks, (3) shoreline downstream from the loading docks, and (4) the previously identified dump site.

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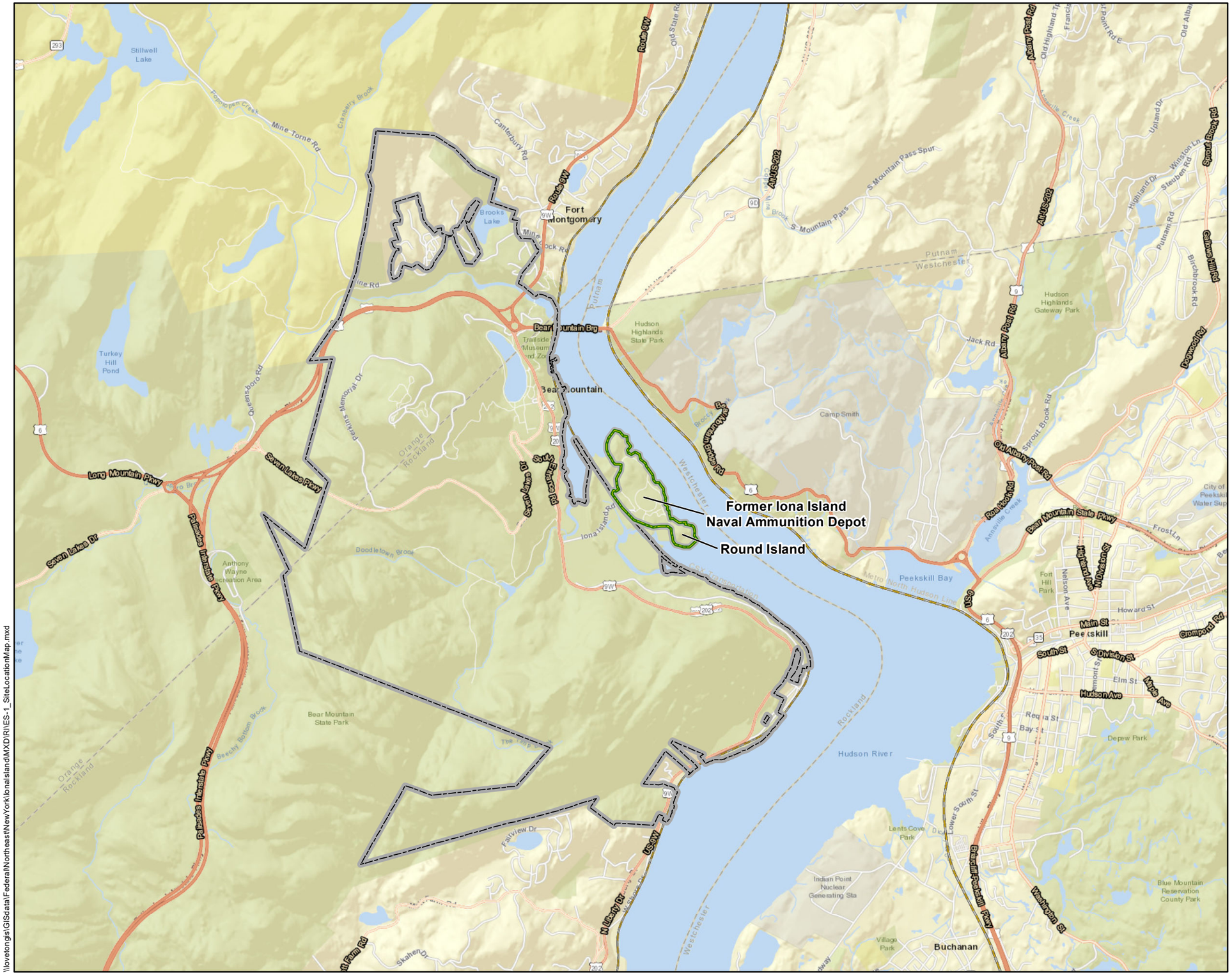
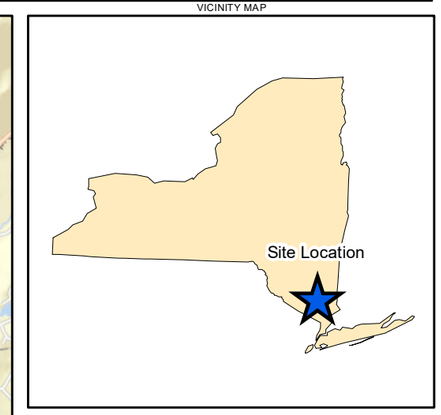


VICINITY MAP



Legend

- FUDS Boundary
- Bear Mountain State Park Boundary

0 0.5 1
Miles
1 in = 1 miles

N

FIGURE ES-1
SITE LOCATION MAP

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Aerial: ESRI ArcGIS Online Map Service

Map Date: 11/19/2020

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0 450 900
Feet

N

Legend

- Dump Site
- Former Dock
- Fill Area
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE **ES**-2
FUDS SITE MAP

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 10/03/2018

Aerial - EA, April 2020

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1. INTRODUCTION

This Remedial Investigation (RI) Report presents the results of the RI completed for the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (FUDS Project Number [No.] C02NY074403).

The Iona Island Naval Ammunition Depot FUDS property consists of approximately 124 total acres of land and inland water located on Iona Island and Round Island along the west side of the Hudson River, in the Town of Stony Point, Rockland County, New York (**Figure 1-1**). The Navy used the Iona Island Naval Ammunition Depot between 1900 and 1947, with the major effort consisting of assembling naval ammunition for World War II. Although no ammunition was manufactured at Iona, various types of explosives were assembled on site. Activities included preparing, assembling, maintaining, inspecting, and testing ammunition; storing bulk explosives, ammunition and ordnance material; and issuing ammunition to the fleet, shore establishments, armed merchantmen, transport and district forces (U.S. Army Geospatial Center [USAGC] 2018).

The RI was completed by EA Engineering, P.C. and its affiliate EA Science and Technology (EA) as the prime contractor for the U.S. Army Corps of Engineers \ (USACE) Baltimore District under Contract No. W912DR-15-D-0014, Task Order (TO) Number 0006. Work was completed in accordance with the Performance Work Statement dated 20 June 2018 issued with the TO. The RI was conducted in support of the Military Munitions Response Program (MMRP) at Iona Island Naval Ammunition Depot FUDS. The MMRP addresses issues related to munitions and explosives of concern (MEC) associated with the Munitions Response Sites (MRSs). Munitions constituents (MC) as well as related hazardous substances, pollutants, and potential contaminants of concern at Iona Island Naval Ammunition Depot FUDS are addressed under the contract C02NY074402 HTRW project.

The USACE conducted this MMRP RI on the Iona Island Naval Ammunition Depot FUDS under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and in accordance with Engineer Regulation (ER) 200-3-1, Defense Environmental Restoration Program (DERP) FUDS Program Policy. USACE conducts munitions response actions at FUDS under the provisions of CERCLA, as amended by the Superfund Amendments and Reauthorization Act, Executive Orders 12580 and 13016, and the safety requirements of the Department of Defense (DoD) Explosives Safety Board. USACE ER 200-3-1 (USACE 2004a), DERP FUDS Program Policy, specifies that the CERCLA remedial process be followed for projects in the MMRP.

By legal definition, the following is encompassed in the MMRP: unexploded ordnance (UXO), discarded military munitions (DMM), and MC at concentrations high enough to present an explosive hazard, together referred to as MEC. With the exception of MC directly associated with MEC identified during the execution of the MMRP RI_(e.g., breached munitions item), soil sampling for MC including explosives constituents and metals associated with the former operational use across the site is addressed as part of a separate Hazardous, Toxic and Radioactive Waste (HTRW) RI, which includes the investigation of 19 HTRW areas of concern (AOCs) and MC associated with the operational history of the site. MC sampling and the exposure risk to

human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation. A separate RI report is being developed for the HTRW RI.

1.1 PURPOSE, SCOPE, AND OBJECTIVES

The purpose of this RI is to determine whether further response action, pursuant to CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan, is warranted at the Iona Island Naval Ammunition Depot FUDS. The primary objective of this RI is to determine the nature and extent of MEC and assess the potential hazards posed to human health and the environment by MEC (if present). If the RI concludes acceptable risk from MEC is present, then the MRS and the FUDS will proceed to No Action via a Proposed Plan and Decision Document; however, if unacceptable risk from MEC is identified, the MRS will proceed to a feasibility study (FS) followed by a Proposed Plan and Decision Document. MC is being addressed under the HTRW RI.

1.2 MUNITIONS RESPONSE SITE DESCRIPTION AND PROBLEM IDENTIFICATION

The Iona Island Naval Ammunition Depot FUDS consists of approximately 124 acres of land and inland water. The Navy used the site as an Ammunition Depot from 1900 to 1947. Activities included preparing, assembling, maintaining, inspecting, testing, and issuing ammunition; however, there was no manufacturing conducted on site. Iona Island Naval Ammunition Depot was deactivated in 1947. The former depot was excessed by the Navy in 1957 and transferred to the General Services Administration (GSA). GSA conveyed the FUDS property to Palisades Interstate Park Commission (PIPC) in 1965. PIPC currently utilizes a portion of Iona Island as a storage facility; however, the property is closed to the public and use is restricted to park purposes only. The FUDS property is part of the much larger Hudson River National Estuarine Research Reserve, a Significant Coastal Fish and Wildlife Habitat Area and National Natural Landmark.

A detailed review of historical documents was conducted, and discussions were held with USACE and the PIPC to confirm historical findings and evaluate the investigation boundaries. Based on these discussions, it was noted that historical records for the Iona Island Naval Ammunition Depot FUDS include several reports of ordnance items found within the FUDS and the potential for MEC to be found within the FUDS; however, no documented findings of MEC were included in the records reviewed that included the Archive Search Report (ASR) (USACE 1998), Explosive Ordnance Disposal (EOD) reports, and a Site Inspection (SI) (Alion Science and Technology Corporation [Alion] 2008). It was reported that an explosion in 1903 originating from the approximate center of the depot may have resulted in munitions being thrown as far as 1,250 feet (ft) from the blast. Munitions debris (MD) have been recovered by PIPC personnel from unspecified areas on the Island, but no MEC has been recovered. Historical finds were reportedly inspected by military EOD and a letter stating that they were inert was provided to PIPC. Additionally, munitions items have reportedly been sighted along the shoreline in low-tide conditions in an area of Round Island referred to as the “dump site” (Alion 2008); however, no evidence of MEC or MD being found was included in historical records. A hand grenade was

reportedly found in the mid-1980s and removed by a Fort Smith EOD team. It is not known if the grenade was live or expended. Lastly, anecdotal evidence identified the potential for MEC to be present around the former loading docks, where munitions may have been intentionally dumped or accidentally dropped into the Hudson River during the loading and unloading of supply vessels.

Four general areas at the Iona Island Naval Ammunition Depot FUDS were identified during the SI (Alion 2008) and Technical Project Planning (TPP) meetings as requiring investigation for MEC, including: (1) MRS 01 1903 Explosion Area, (2) former loading docks, (3) shoreline at and in the vicinity of the loading docks, and (4) a previously identified dump site (Figure 1-2).

1.3 PHYSICAL SETTING

1.3.1 Location

The Iona Island Naval Ammunition Depot FUDS property consists of approximately 124 acres of land and inland water located on Iona Island and Round Island along the west side of the Hudson River, in the Town of Stony Point, Rockland County, New York (**Figure 1-1**). Iona Island is located within the Lower Hudson River Valley region, which includes all of Putnam, Rockland, and Westchester counties and is considered part of the downstate New York region due to its geographical and cultural proximity to New York City. According to the U.S. Census Bureau 2019 population estimate for Rockland County, New York, the population density is approximately 1637 persons per square mile.

Iona Island is in Bear Mountain State Park on the east side of U.S. 202/Route 9W, 6 miles south/downstream of West Point Military Academy, 1 mile south/downstream of the Bear Mountain Bridge, and 41.2 miles north/upstream from the mouth of the Hudson River. Round Island, the southeastern part of Iona Island, was once cut-off by marshes and was attached to Iona Island with fill in the early 20th century (New York State Department of Environmental Conservation [NYSDEC] and U.S. Department of Commerce 1992).

Iona Island is connected to the mainland by a narrow two-lane road off U.S. 202/Route 9W near Doodletown. The Island is accessed by crossing active River Subdivision (CSX Transportation) railroad tracks and entering through an unmanned gate during normal working hours.

Figure 1-2 shows the Iona Island FUDS boundary, MRS 01 1903 Explosion Area, former dock areas, and dump site.

1.3.2 Regional Climate

The climate in Rockland County, New York is classified as humid continental and subjected to some modification by the Atlantic Ocean. Minimum temperatures average 22.9 degrees Fahrenheit (°F) in the winter and maximum temperatures average 82.3 °F in the summer [U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) 2021]. Mean monthly air temperatures below 40 °F occur from December through March and freeze dates with temperatures below 28 °F generally occur from late October to mid-April (NOAA

2021).Precipitation averages from 35 to 49 in. annually, with over half of the precipitation (26.14 in.) falling between May and October (NOAA 2021).

1.3.3 Physiography and Topography

Iona Island is in the Hudson Highlands physiographic province of the New England Uplands. The surface of the New England Upland slopes southeastward from maximum inland altitudes around 2,200 ft to approximately 400 to 500 ft at its riverine edge (USACE 1998).

The Hudson Highlands is part of a northeast-trending mountain mass extending from Pennsylvania to Connecticut. The Hudson River cuts through the Hudson Highlands in a 15 mile long relatively straight, north/south-oriented, narrow, steep-sided gorge with bedrock flanks between West Point and Peekskill, New York. Channel width in the Hudson Highlands region is less than 0.6 miles (Yozzo et al. 2005). Maximum relief is about 1,600 ft where the Hudson River dissects the Hudson Highlands. Topography is relatively rugged with prevalent bedrock-controlled landforms (New York State Department of Transportation 2013). Erosional and depositional effects of glaciation are widespread and conspicuous in the upland.

Iona Island is an approximately 124-acre bedrock island of the Hudson River. The southeastern part of the Island, once cut off by marshes, is known as Round Island. It was attached to the south end of Iona Island with fill in the early 20th century. The hill on the western side, south of the railroad tracks, was also once treated as separate and referred to as Courtland Island. Iona Island has rocky terrain, with varying degrees of slopes. Elevations range from about 0 ft National Geodetic Vertical Datum 1988 (NAVD88) along the immediate shoreline to 75 ft NAVD88 at the high end (USACE 1998).

1.3.4 Soil

Most of the land surface of Iona Island has been filled, built on at one point in time, and/or paved (USACE 1998). Native soil remaining at Iona Island and the mainland is derived from glacial till and is shallow, acidic, and nutrient poor (Yozzo 2005). The following soil mapping units were located on and immediately adjacent to Iona Island (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture 2018).

- Chatfield-Rock outcrop complex; 4 to 16 percent slopes
- Hollis-Rock outcrop complex; 35 to 60 percent slopes
- Ipswich mucky peat; 0 to 2 percent slopes, very frequently flooded.

The Chatfield-Rock outcrop is classified as well-drained gravelly-sandy loam soil, 20 to 40 inches (in.) deep to the restrictive feature. The Hollis-Rock outcrop is somewhat excessively drained with 8 to 23 in. to the restrictive feature. The Ipswich mucky peat soil is classified as very poorly drained, with more than 80 in. to the more restrictive feature, and up to 59 in. of muck and mucky peat (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture 2018).

Muddy sediments dominate the Hudson River, and there is a complicated pattern of dynamic and depositional environments between the non-depositional bedrock outcrops, which are found along the river margins (Nitsche et al. 2007). At Iona Island, the eastern shoreline of the Hudson River is high energy versus the low energy/depositional environment of the western shoreline and tidal marsh area. Sediments in the tidal marshes and shallows west of Iona Island consist of peat and silt and are more than 100 ft deep (NOAA and NYSDEC 1982).

A retaining wall is present along the Hudson River between the northern dock and the Dump Area. The shoreline where the retaining wall is not present is characterized by riprap (at former dock locations), exposed bedrock, gravel/cobble beaches, and boulders in the intertidal zone.

The western and southern portion of the Island is separated from the adjacent marshes by the active River Subdivision (CSX Transportation) railroad tracks. The southern shoreline is separated from Ring Meadow by a fill area emplaced after Navy transfer of the FUDS to PIPC. No culverts are present under the CSX railbed and drainage from Iona Island to the marsh is generally restricted by the CSX railbed.

A limited area of exposed sand and gravel shoreline area is present along the shoreline of the dumping area; sediment was collected from this area during the SI (Alion 2008). This shoreline area changes to cobbles and boulders (riprap) extending southward along Round Island. Additional information on locations of exposed shoreline areas with sediment is not available. In addition, the existence of a shelf extending from the shoreline to the central channel of the Hudson River is unknown.

1.3.5 Geology

Field notes from the 1996 investigation document overburden at Iona Island as fill material overlying fine to coarse sand, with some silt and gravel. Overburden at Iona Island is shallow with bedrock encountered at the ground surface to depths of approximately 25 in. below ground surface (bgs) during the Greeley-Polhemus Group soil sampling event in October 1996 (USACE 1998).

The bedrock of the New England Upland and Hudson Highlands is folded, faulted, and includes metamorphosed sediments that have been intruded by numerous plutonic masses (USACE 1998). The rock is resistant to erosion and forms rocky knobs on Iona Island that project 100 ft above the Hudson River. Based on the bedrock geology map for the Lower Hudson, bedrock at Iona Island consists primarily of biotite-quartz-plagioclase paragneiss (Fisher et al. 1970).

1.3.6 Hydrogeology

Groundwater at and near Iona Island is found in both overburden and underlying bedrock. Groundwater in overburden at Iona Island was encountered at a depth of 2 ft near the former Dump Area between Iona Island and Round Island during the October 1996 soil sampling event, likely because bedrock is close to the surface and infiltration, where possible, is very slow (Greeley-Polhemus 1997). Shallow groundwater is likely influenced by the Hudson River.

Crystalline bedrock of the Hudson Highlands acts as a relatively poor aquifer. Groundwater in the gneiss and granitic rocks only occurs in fractures and joints (Heisig 2010). Bedrock groundwater at Iona Island is likely encountered at depths greater than 6 ft as based on the rock outcrop soil description reported in the Rockland County Soil Survey (Bonnell 1990).

Groundwater recharge is primarily from infiltration of local precipitation, with downward seepage of water through overburden into underlying bedrock and/or direct infiltration of precipitation on exposed bedrock surfaces. Upward seepage of water from bedrock also recharges surficial deposits in low-lying areas. Shallow groundwater flow in surficial deposits and weathered bedrock likely follows topography with discharge to surface water bodies (e.g., Hudson River). Due to the crystalline nature of the bedrock, groundwater flow is restricted to joint and fracture systems that generally trend northeast-southwest (Olcott 1995). Based on fracture data collected by the USACE project geologist in July 2020, most fractures on Iona Island strike northwest and dip to the southwest. Most of the observed transmissive fractures are shallow dipping and persist over 10s of meters, suggesting local bedrock groundwater flow is to the southwest.

Groundwater usage in the Hudson Highlands is largely limited to domestic wells along the periphery of the parklands. Maximum yields of wells completed in the crystalline rocks rarely exceed 70 gallons per minute, and limited aquifer storage in crystalline rock makes such wells susceptible to decreased yields during dry periods unless they are in hydraulic connection with surface water (Heisig 2010).

1.3.7 Surface Waters

Iona Island is bordered on the east by the Hudson River; on the northwest by the mouth of Doodletown Bight, an expanse of shallows and mudflats; on the west and southwest by Iona Island Marsh, a tidal marsh between Iona Island and the mainland. Iona Island is separated from the mainland by Snake Hole Creek on the south and Doodletown Brook on the west and north. The Dump Area and adjoining marshes are tidally influenced by the Hudson River. The Dump Area is a wetland area that is inundated during high tide. Drainage from the Dump Area is to the west and to the south to the Iona Island Marsh.

The Hudson River originates in the Adirondack Mountains of Upstate New York, and flows southward 315 miles to the Atlantic Ocean at New York Harbor, between New York City and Jersey City. Iona Island is located 41.2 miles upstream from New York Harbor and approximately 30 miles upstream of The Bronx, New York. Maximum river depths are found in the Hudson Highlands between West Point and Peekskill, New York, with the deepest point of 196 ft at West Point. The lower half of the Hudson River from Troy to New York Harbor, a distance of 125.5 miles, is an estuary (drowned river valley) affected by semidiurnal tides, with two highs and two lows occurring within a 25-hour period (Yozzo et al. 2005).

The section of the Hudson River at Iona Island is very narrow and deep, with strong currents and a rocky bottom substrate. The width of the Hudson River at Iona Island is approximately 0.3 mile east of Iona Island, and the River in this area has a depth of approximately 165 ft. Tidal influence

at Iona Island is approximately 3.5 ft, and shorelines may not be accessible during high tide conditions (Alion 2008).

1.3.8 Ecological Communities

Habitat types surrounding Iona Island include brackish intertidal mudflats, brackish tidal marsh, freshwater tidal marsh. Terrestrial habitats on the Island consist of deciduous forestland and meadows comprised of both native and invasive herbaceous vegetation and early successional shrubs. Specific habitats are described in more detail in the following paragraphs.

An intertidal marsh (Iona Island Marsh) encompasses approximately 225 acres between Iona Island and the western shore of the Hudson River and is one of the largest, undeveloped tidal wetlands on the Hudson River (Yozzo et al. 2005). The National Wetlands Inventory (U.S. Fish and Wildlife Service [USFWS] 2018) classifies the marsh as an estuarine and marine wetland (E2EM1N6 – estuarine, intertidal, emergent, persistent, regularly flooded, oligohaline 0.5–5 parts per thousand salinity). Tidal mudflats submerged aquatic vegetation beds, and small areas of rocky uplands also occur in the area. In Doodletown Bight, the northern portion of Iona Island Marsh, mudflats are visible at low tide (Yozzo et al. 2005).

The southern end of Iona Island has two areas listed as freshwater forested/shrub wetland (palustrine, scrub-shrub, broad-leaved deciduous, temporary flooded-tidal). The marshes that separate Iona Island and Round Island from the mainland were filled in the early 20th century, with a Navy dumping area located along the Hudson River side of the islands and an area of fill on the western shoreline placed by Palisades Interstate Park Commission following Navy transfer of the FUDS in 1965. There is also a small (0.35 acre) freshwater emergent wetland on the western side of the Island (palustrine, emergent, persistent, semi-permanently flooded) (USFWS 2018).

Native vegetation within the marsh is dominated by narrow leaf cattail (*Typha angustifolia*) with common reed (*Phragmites* spp.) and swamp rose mallow (*Hibiscus moscheutos*). Crack willow (*Salix fragilis*) is present at the mouth of Doodletown Brook within the tidal swamp. Compaction of soil and site disturbance have resulted in a significant presence of invasive species (estimated at 60 percent of the vegetation on the Island). Recent wetland restoration has been conducted in Iona Island Marsh west of the Island, with approximately 50 percent of the marsh restored from invasive species (including *Phragmites* spp.) to native vegetation such as narrow-leaved cattail (Bluestone 2018).

Iona Island Marsh is especially important for marsh-nesting birds. Probable or confirmed breeding species include herons, least bittern (*Ixobrychus exilis*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), wood duck (*Aix sponsa*), Virginia rail (*Rallus limicola*), belted kingfisher (*Ceryle alcyon*), marsh wren (*Cistothorus palustris*), and red-winged blackbird (*Agelaius phoeniceus*). Large concentrations of herons, waterfowl and shorebirds occur during spring and fall migrations (March–April and September–November, respectively). The Island is considered a bald eagle sanctuary (Levine 2011).

The Hudson River is classified as estuarine and marine deep water (estuarine, subtidal, unconsolidated bottom, subtidal, oligohaline 0.5–5 parts per thousand salinity). Migratory birds including osprey (*Pandion haliaetus*) and bald eagles (*Haliaeetus leucocephalus*) are found along the Hudson River shoreline of Iona Island. Here they hunt for the more than 200 species of fish that populate the Hudson River, which serves as a nursery ground for important species such as sturgeon, striped bass, and American shad. Rocks, large boulders, and rip rap form Iona Island's shoreline with the Hudson River. Among these rocks, benthic macroinvertebrates such as snails and amphipods are common.

The upland terrestrial areas of the Island consist of deciduous, rocky woodland communities including oaks (*Quercus* spp.), ashes (*Fraxinus* spp.), birches (*Betula* spp.), willows (*Salix* spp.), red maple (*Acer rubrum*), and elms (*Ulmus* spp.). The woodlands are maintained for their value as cover, perch sites, and buffer zones.

Resident wildlife species in the area include muskrat (*Ondatra zibethicus*), white-tailed deer (*Odocoileus virginianus*), and red fox (*Vulpes Vulpes*),.

Resident herptiles include box turtle (*Terrapene carolina*), green frog (*Rana clamitans*), rat snake (*Pantherophis* spp.), Northern water snake (*Nerodia sipedon*), and timber rattlesnake (*Crotalus horridus*).

1.3.9 Threatened and Endangered Species

Under the Endangered Species Act of 1973 (ESA), threatened species are species that may become endangered if conditions surrounding the species begin, or continue, to deteriorate. Endangered species are species whose prospects for survival in an area are assumed to be in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, or disease. Candidate species are species for which the U.S. Fish and Wildlife Service (FWS) has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. The FWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA.

Numerous aquatic and terrestrial vertebrate and invertebrate species have been observed and/or documented at Iona Island. A complete list of documented species at Iona Island is provided in the New York Natural Heritage Report (NYSDEC 2007). Several of the species that occur within Iona Island are State and/or federally listed as threatened or endangered. In addition to State protection, bald eagles are federally protected under the Bald and Golden Eagle Protection Act. Additionally, there are 10 migratory birds of conservation concern known to use the Island as habitat. Atlantic sturgeon (*Acipenser oxyrhynchus*) and shortnose sturgeon (*Acipenser brevirostrum*) live primarily in the ocean but migrate to coastal rivers for spawning. In New York, spawning and nursery grounds for juveniles are located in the Lower Hudson River. Both species are classified as Endangered by National Marine Fisheries Service and are protected in the State

of New York. Protected animal species at Iona Island and their status are provided in the **Table 1-1**.

1.4 SITE HISTORY

The following history of operational use was obtained from the Naval Ammunition Depot Iona Island FUDS, New York, Historical Photographic Analysis prepared by USAGC in 2018.

Prior to use by the military, Iona Island was utilized as a resort hotel during the Civil War. There was no documented evidence available of past use of ordnance-related items on the Island prior to use by the military. The Navy acquired Iona Island from the L.H. Mace Brokerage Company of New York City in 1899 for construction of the Iona Island Naval Ammunition Depot (USACE 1998). In 1942, an additional approximately 13 acres of marsh and Round Island, was purchased and used for ammunition storage (USACE 1998).

In 1903, at least one 13-in. shell exploded between Shell Houses 3 and 4 (former Buildings 210 and 209, respectively) on Iona Island. The explosion destroyed Shell Houses 3 and 4, and their contents, and damaged Shell Houses 1 and 2 (former Buildings 115 and 116, respectively) (USACE 1998). Other munitions stored in the area during the time of the explosion included 1-pounders, 6-pounders, and 6-in. ammunition). The potential area of contamination resulting from the 1903 explosion was determined to be a 1,250-ft radius area centered on Shell Houses 3 and 4 (USACE 1998).

During World War I, almost all the depth charge bombs, and ammunition used in the Atlantic area passed through Iona. In 1915, over 2 million pounds of powder were made up in charges and about 327 rail carloads of material were handled during the year and large shipments made by transport, tug, and barge. A 1919 annual report to the Secretary of the Navy states that most of the 14-in. ammunition for the Army and Navy Railroad battery was prepared at Iona Island.

After World War I, although Iona Island was one of two of the Navy's main depots on the east coast, a program of reducing personnel and material and keeping active work to a minimum was followed under the United States' general program of limitation of arms treaty. From 1918 to 1940, Iona Island supplied ammunition of all calibers to the fleet for service allowances, target practice, and reserve war requirements.

Between 1941 and 1945, the major activity conducted on Iona Island was assembling naval ammunition for World War II. More than 2,300 Navy ships and 2,300 Merchant ships received their ammunition from Iona Island during World War II. In addition, 77 bases, 500 shore stations and 700 foreign naval ships were serviced with ammunition.

After World War II, use of the Island as an ammunition depot became obsolete because of lack of expansion room to accommodate new types of ammunition. In 1947, the Department of the Navy decided to deactivate the Iona Island Naval Ammunition Depot and made the property available for restricted lease. The FUDS was re-designated as an Annex to the United States Naval Ammunition Depot, Earle, New Jersey, and in 1957, declared the Annex excess. In 1955 and

1960, the GSA utilized the Iona Island Naval Ammunition Depot FUDS through a permit for stockpile materials such as rubber and copper. In 1960, the GSA received official jurisdiction of the property and other agencies under GSA control utilized the property for record storage during the 1960s. These agencies included the following: Maritime Administration, Atomic Energy Commission, Civil Service Commission, Army Corps of Engineers, and the Navy's Bureau of Ships. The Maritime Administration also conducted trans-shipments of heavy freight at the main wharf on an occasional basis. On 30 March 1965, Iona Island was deemed evacuated after the last load of stockpiled materials left the property. In 1965, the PIPC acquired both Iona and Round Islands (USACE 1998).

1.4.1 Site Layout History

At the time of purchase in 1899, Iona Island consisted of 116 acres of rough, rocky, and partly wooded ground and 13 acres of marsh. The Island was transformed into an ordnance depot, first called Naval Magazine, and changed prior to World War I to United States Naval Ammunition Depot (USAGC 2018).

Iona began as a relatively small installation. By 1902 the following buildings had been constructed: four magazines, two fixed ammunition houses, four shell houses (fixed ammunition), three storehouses, one power house with steam, electric, and air-compressing plant, three storehouses; six hose houses, one pumphouse, one testing laboratory and telephone exchange, one locomotive house, a tin, electrical and annealing shop, one house for gunner's residence (inspectors quarters), four double cottages for principal employees, an administrative building, gatehouse, and a stable and barn. In 1903, one shipping house and two magazines were built. By 1910, four additional hose houses, two filling houses (one bombproof), three magazines (one for bulk Explosive D), one quilting house, one primer house, one tank repair house, one pump house located by the dock, a paint and oil storage building, paint and pipe shop, labor office and dispensary, a garage and greenhouse were built. By 1920, an ammunition box storage building and cartridge case storage buildings were built, one hose house, two fuse houses, eight magazines including two subsurface magazines, one gun-cotton magazine and a dynamite magazine, one shell house and D plant, one shipping house, one storehouse, powder tank storage, a standpipe, stone crusher, a heating plant for filling houses No. 2 and No. 5, a paint and oil locket, blacksmith shop, one personnel quarters and a marine barracks, a time-clock house, wagon shed, lumber shed, garden tool house, garage and cow barn.

In 1924, a total of 106 buildings including two water storage tanks and one standpipe were present on Iona Island (USACE 1998). In the late 1920s through the 1930s, various programs of maintenance and remodeling were carried out by the Bureau of Yards and Docks in addition to other several buildings being built. For example, ten magazine buildings were remodeled for fireproofing; three black-powder magazines and a railroad track to serve them were ordered; and two water tanks were provided, the water system enlarged, and two engine-driven generators installed. In addition, a 0.85-acre Dump Area is first identified between Round Island and Iona Island on a 1930-dated U.S. Navy layout plan (USAGC 2018).

Round Island, the southernmost portion of the depot, was utilized by the Navy for ammunition storage. The Navy filled in the area between Iona Island and Round Island to provide a connection between the two islands. Subsurface magazines were quarried out of rock on Round Island, and the rock removed was used to create a blast barrier between the magazine storage and the depot activities on Iona Island (Bluestone 2018). During interviews conducted as part of the 1998 ASR, maintenance personnel from the sign shop reported that suspected ammunition could be seen in the Hudson River during low water conditions in the "dump" area. Aerial photos in the ASR Report locate this "dump" area south of the former piers and east of former waters' edge near Round Island (USACE 1998).

In 1951 when the depot was deactivated, there were 146 buildings on the Island (USAGC 2018). A 22 June 1965 letter presented in the ASR provides information on the site layout at the time of DoD transfer to PIPC; the roads on the Island were in poor condition, with many of the buildings not served by roads. Instead, buildings served by railroad with spurs from the West Shore Railroad leading to each warehouse and to the pier. Most buildings had been built between 1914 and 1918 and were made of brick while additional buildings constructed in 1941 were made of concrete faced cinder block. Most buildings had no natural or artificial lighting, heating, or other utilities; they were large, open warehouses with high ceilings and no partitions or separation of floors. Several homes were also present on the Island, and previously served as residences for naval officers. The homes were vacant but well maintained. Redevelopment for industrial or warehousing use would have required extensive renovation of buildings, clearance of structures, and construction of roads, parking lots, and new sewer system and utility lines (USACE 1998).

Most buildings and structures were demolished and removed between November 1965 and December 1973 (USAGC 2018). It is possible that fill material was used during regrading following demolition and the soil was reworked. The FUDS has remained undeveloped since its transfer from DoD ownership to PIPC in 1965. PIPC developed demolition plans for the remaining buildings and for construction of a recreational park; however, the plans to develop the Island into a recreational park were not executed. The only construction that occurred on the Island was the parking lot located directly west of Iona Island and outside of the FUDS boundary. The contract plans illustrate the locations of the former buildings, which PIPC removed except for a few buildings which currently remain onsite. The plans also illustrate a fill area (believed to be building demolition debris) that currently provides access between Iona Island and Round Island at Ring Meadow Marsh (Alion 2008) (Figure 1-1).

Original structures still standing include Building 201 (Empty Projectile Magazine); Building 212 (former Marine Barracks); Building 217 (Fire Station and Labor Office), Building 222 (Miscellaneous Storage Building), Building 508 (Bag Charge Magazine); and Building 603 (Pyrotechnic Magazine) (Bluestone 2018). Building 222 (Store House) is utilized by Bear Mountain State Park for shipping and receiving. Building 212 is in disrepair but has not been demolished due to concerns with asbestos. The old roads in the main part of the former depot (near former Buildings 123 and 410) are still accessible by vehicle. The fill area between Round Island and Iona Island is vegetated; however, solid ground allows the area to be traversable by foot.

1.5 PREVIOUS INVESTIGATIONS

The summary of previous investigations presented below (1998–2013) provides details on what munitions items were found and where they were located at the MRSs.

ASR (USACE 1998, 2004b)—Through interviews, archive research, and a site investigation conducted by USACE, it was determined that ordnance associated with the Iona Ammunition Depot consisted of small arms; projectiles, projectile fuzes and propellant; rockets; bombs and bomb fuzes; pyrotechnics; bulk black powder, and high explosives. Fillers included high explosives, incendiary and smoke. During the site visit USACE inspectors observed several ordnance items that had been recovered from Iona Island Naval Depot after the Park Service had taken possession. These items were lying in a pile at the Trail Side Museum at Bear Mountain State Park. These items included unfired projectiles ranging from 8 to 16 in. in diameter along with two 10-in. cannonballs. USACE site inspectors were informed that the two cannonballs had come from one of the buildings once occupied by the Marines and speculation is that the cannonballs may have been display pieces. The origin of the other projectiles is unknown. The team recommended to the Park Ranger that he notify the U.S. Army EOD Detachment at Fort Monmouth, New Jersey. The EOD unit determined all items were empty and free of explosives (i.e., empty or sand filled). The ASR inspection team speculated that these items may have been display pieces.

The Park Police and Park Rangers had no past incidents on record of any live munitions being found on the Island. However, in an interview prior to the site inspection, a Bear Mountain State Park Ranger recounted a story of kids finding a grenade near Buildings 311 and 314 and that the demolition team from Fort Smith took care of the grenade. The Park Ranger did not know if the grenade was live or expended. Additionally, the Park Ranger provided anecdotal information (i.e., conversation with his father, who worked at Iona Depot in 1942) that ordnance may have been intentionally dumped or accidentally dropped into the River. Additional anecdotal/hearsay information through interviews with an employee of the New York State Police indicate ammunition had been identified on the shore and removed by the 142nd Explosive Ordnance Detachment (inactivated) from West Point.

The USACE inspection team also spoke to maintenance personnel from the sign shop located on Iona Island, and the personnel were very familiar with the property. The USACE inspection team was shown a collection of ordnance debris that had been found in various locations on the Island. All items were expended and had no visible explosive residue and included: small arms cartridge cases, 6-pounder projectile cartridge case, signal flare, and a fragment from a 3.5-in. rocket warhead. Maintenance personnel stated that during low water conditions suspected ammunition could be seen in the River near the old “dump site” on Round Island. No ordnance was seen in the River at the time of the site visit. However, the team did locate one empty 20-millimeter (mm) practice cartridge case along the River’s edge. This item was an inert casing identified by the inerting holes drilled in the case. No other ordnance or explosive debris was found during the inspection of the site. The USACE inspection team found no indication that any live ordnance or explosives were buried on site.

Based on the 1,250-ft kick-out radius of 13-in. shells that were reportedly part of the 1903 explosion, the ASR determined a range footprint of 124.2 acres for the MRS (**Figure 1-2**). It should be noted that the acreage reported in FUDSMIS is 112.60 acres for the MRS. This discrepancy is likely the result of the FUDSMIS using 1,250-ft radius to calculate the area while the ASR used the 1,250 distance from the exterior footprint of Shell Houses 3 and 4 for the MRS acreage.

***MMRP Site Inspection* (Alion 2008)**—With support from EA, Alion performed an SI under contract to the U.S. Army Engineering and Support Center in Huntsville and USACE Baltimore District. The purpose of this MMRP SI was to evaluate the presence or absence of MEC and MC related to historical use of the site.

During the 2007 SI field visit a qualitative reconnaissance was completed during low tide of the eastern boundaries of the MRS along the former dock areas and at the dump site where it was reported that ordnance items were historically observed at low tide. No MD or MEC was observed on the FUDS or near the shoreline during the SI field visit.

A total of 18 surface soil samples were collected from the 1903 Explosion MRS using a 7-point wheel composite method, from 0 to 2 in. bgs. Five sediment samples were also collected. Five soil and three sediment background samples were collected from an area west and upgradient of the FUDS boundary and outside of the limits of the 1903 Explosion Area. Locations selected were from areas deemed unimpacted by past DoD or current owner operations and were of similar soil characteristics as the biased soil samples. There was no observed visual or magnetic evidence of MEC, MD, or other military-related disturbance at background sample locations.

Prior to sampling, research was conducted to focus the list of analytes to MC potentially associated with the munitions used when the FUDS was active. As a result, the soil and sediment samples were analyzed for:

- Select Target Analyte List Metals—antimony, copper, lead, nickel, and zinc (U.S. Environmental Protection Agency [EPA] Method 6010B) and mercury (EPA Method 7471A). Iron was also a MC of concern for the MRS, but it was not analyzed during the SI sampling event, because it is not a CERCLA hazardous substance (Alion 2008).

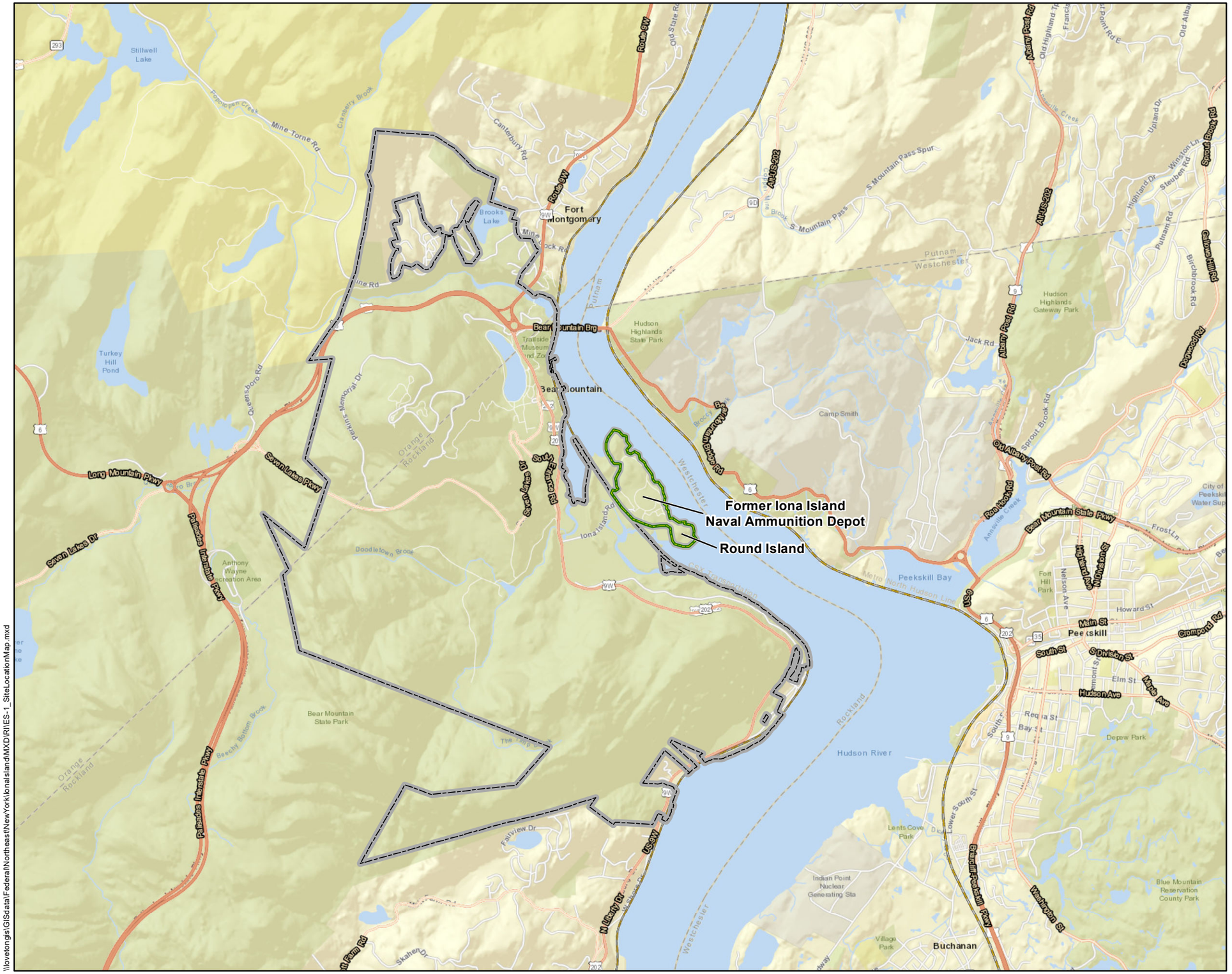
- Explosives—2,4,6-trinitrotoluene (TNT); 4-amino (AM)-2,6-dinitrotoluene (DNT); 2-AM-4,6-DNT; 2,4-DNT; 2,6-DNT; 2-nitrotoluene; 3-nitrotoluene; 4-nitrotoluene (EPA Method 8330A); and nitroglycerin (EPA Method 8330).

Screening-level human health and ecological risk assessments were performed using the SI MC sampling and analysis results. Chemical concentrations were compared to applicable human health criteria (residential for soil, and residential and industrial for sediment), ecological screening values, and background concentrations. No surface water or groundwater samples were collected.

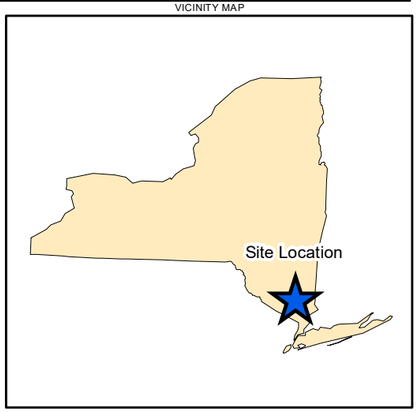
Two explosives (2,4,6-TNT and 4-amino-2,6-DNT) were detected near the center of MRS 01, but at concentrations below applicable human health and ecological screening values in 1 of the 18

surface soil samples (II-EA-SS-02-08). The other 12 explosives were not detected above laboratory reporting limits. There were no explosives detected in the sediment samples.
Lead concentrations exceeded background concentrations and human health screening criteria in sediment samples but were below the industrial soil criteria in surface soil samples. Antimony, copper, and lead exceeded background concentrations and associated ecological screening values in surface soil. In sediment, antimony, copper, lead, nickel, and zinc exceeded background concentrations and ecological screening values.

The SI recommended that a RI/FS be performed for both MEC and MC, based on historical discoveries of MD, potential for MEC to remain on site, and potential for risks to human health and ecological receptors from metals MC in surface soil and sediment (Alion 2008).



VICINITY MAP



Legend

- FUDS Boundary
- Bear Mountain State Park Boundary

0 0.5 1
Miles
1 in = 1 miles

N

FIGURE 1-1
SITE LOCATION MAP

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Aerial: ESRI ArcGIS Online Map Service

Map Date: 11/19/2020

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0 450 900
Feet

N

Legend

- Dump Site
- Former Dock
- Fill Area
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 1-2
FUDS SITE MAP

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 10/03/2018

Aerial - EA, April 2020

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Table 1-1 Protected Animal Species at Iona Island

Group	Species	Common Name	Status	Jurisdiction
Fishes	*Acipenser oxyrhynchus*	Short nose sturgeon	Endangered	Federal/State
Mammals	*Myotis sodalis*	Indiana bat	Endangered	Federal/NA
Mammals	*Myotis septentrionalis*	Northern long-eared bat	Threatened	Federal/State
Reptiles	*Clemmys muhlenbergii*	Bog turtle	Threatened/Endangered	Federal/State
Birds	*Haliaeetus leucocephalus*	Bald eagle	Threatened	NA/State
Birds	*Ixobrychus exilis*	Least bittern	Threatened	NA/State
Fishes	*Acipenser oxyrhynchus*	Atlantic sturgeon	Endangered	NA/State
Reptiles	*Crotalus horridus*	Timber rattlesnake	Threatened	NA/State
Reptiles	*Sceloporus undulatus*	Eastern fence lizard	Threatened	NA/State
Reptiles	*Carphophis amoenus*	Worm snake	Special Concern	NA/State

Source: U.S. Fish and Wildlife Service ECOS-IPaC system Iona Island project request 10/8/2018. NYSDEC Division of Fish & Wildlife Database (3/27/2019).

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2. PROJECT OBJECTIVES

2.1 CONCEPTUAL SITE MODEL AND PROJECT APPROACH

The conceptual site model (CSM) is intended to assist in planning, interpreting data, and communication. The CSM is used as a planning tool to integrate information from a variety of resources, to evaluate the information with respect to project objectives and data needs, and to evolve through an iterative process of further data collection or action.

The interim CSM for the Naval Ammunition Depot Iona Island FUDS was developed during the SI and updated during the planning phase of the RI based on site-specific data and historical information including literature reviews, aerial photographs, maps, training manuals, technical manuals, and field observations. The interim CSM provided the basis for identifying data collection needs.

The CSM is broken out into three sections: Potential Sources, Interactions, and Receptors for MEC and/or MC with complete, potentially complete, and incomplete exposure pathways identified for each receptor. Each section is discussed below.

- **Potential Sources**—Sources are those areas where MEC or MC has entered (or may enter) the environment. An objective of this investigation is to verify and refine these locations. In addition to potential MC sources resulting directly from MEC (e.g., breached munitions), potential MC sources at Iona Island included areas of former DoD usage. MC sampling and the exposure risk associated with explosives and metals MC in environmental media attributed to former DoD usage is being evaluated as a part of the HTRW investigation.

- **Interactions**—Interactions encompass release mechanisms, transport, and exposure pathways. The hazard from MEC and/or MC arises from direct contact as a result of some human activity. Interactions describe ways that receptors come into contact with a source. For MC, this can include physical transportation of the contaminant and transfer from one media to another through various processes such that media other than the source area can become contaminated. Interactions also include exposure routes (ingestion, inhalation, and dermal contact) for each receptor. For MEC, migration movement is not typically significant, and interaction will occur only at the source area, limited by access and activity. However, there can be some movement of MEC through natural processes such as frost heave and erosion.

- **Receptors**—A receptor is an organism (human or ecological) that is able to make contact with MEC (human only) or MC. The pathway evaluation must consider both current and reasonably anticipated future land use, as receptors are determined on that basis. Human receptor subcategories can include site workers, contractors, and visitor/recreational users. Ecological receptors include biota such as nesting and migratory birds, mammals, reptiles, amphibians, fish, and plants. The explosive risk associated with MEC to ecological receptors is not evaluated; only the exposure risk from associated MC (metals and

explosives) is evaluated. MC sampling and the exposure risk associated with explosives and metals MC in environmental media attributed to former DoD usage is being evaluated as a part of the HTRW investigation.

2.2 LAND USE AND EXPOSURE PROFILE

2.2.1 Land Use

Iona Island was designated a National Natural Landmark in 1974 by the National Park Service and is currently under the administration of the PIPC and maintained by staff of Bear Mountain State Park. Public use at the Island is limited to educational outings and history tours. Site access is limited to authorized employees of Bear Mountain State Park who use a few of the remaining buildings for storage, to researchers who work in the marsh areas as well as Iona Island, and to guided tour groups six to eight times a year between May and October. The Island is partially fenced, and the main gate is a vehicular gate and is unmanned and unlocked during normal working hours (7:00 a.m. to 5:00 p.m., Monday through Friday), which allows for unrestricted access to Iona Island from Bear Mountain State Park. The vehicle gate is locked after normal working hours and on weekends. Boating along the Hudson River is open to the public, and because the shoreline of Iona Island is not fenced, there is potential for recreational users of the Hudson River to access the Island via the shoreline. Although the Island was historically used for camping, camping is no longer conducted because the Island is not regularly patrolled by the Park Service and there are physical hazards not related to previous military use of the site.

In 1965, when GSA conveyed the property to the Palisades Interstate Park Commission, it was under a "restrictive clause" (park purposes only). The majority of Iona Island is currently open space. There is a parking lot and scenic overlook on the west side of the Island and the CSX railroad runs north-south along the west side of the Island. Although PIPC developed plans for construction of a recreational park, these plans were not fully executed and only water systems were installed. In addition, while a developer has proposed plans for constructing an environmental center/nature center, these plans have not been approved. There are no current plans to develop the Island for recreational purposes and no anticipated future use of the site other than its current use as a conservation area. There are currently no anticipated construction plans other than the possibility of converting existing buildings for use or constructing a new storehouse.

Groundwater and surface water at Iona Island are not used for domestic supply. The existing storehouse at Iona Island has a defunct water supply/waterline but does have a working well that provides non-potable water. A description of Iona Island from 1965 presented in the ASR states that water at the sewer plant was supplied by a well that pumped to a standpipe (USACE 1998).

Land use surrounding Iona Island is recreational and military, with Bear Mountain State Park along the western shore of the Hudson River and Camp Smith along the eastern shore. The site is also surrounded by the Iona Island/Doodletown Bird Conservation Area (NYSDEC 2017). For the portions of the adjacent Bear Mountain State Park that are open to the public, recreational opportunities include hiking, boating, and bird watching. There is no public canoeing or kayaking

allowed in the marshes surrounding Iona Island. Access to the marsh is limited to guided canoe and kayak trips.

Iona Island is part of the much larger Hudson River National Estuarine Research Reserve and Significant Coastal Fish and Wildlife Habitat Area, managed under New York's Coastal Management Program (Alion 2008). In addition, the Iona Island Marsh became a registered National Natural Landmark in 1971. The Island is considered a bald eagle sanctuary (Levine 2011).

2.2.2 Potential Human Receptors

Potential human receptors may be exposed to explosive hazards from MEC. Based on the identified preliminary CSM, the current and potential human receptors at the site are the following:

- Bear Mountain State Park employees
- Researchers
- Recreational users
- Construction workers
- Trespassers.

The future use of Iona Island is anticipated to remain consistent with current use and will continue to be maintained by park employees and will continue to be an important area for research. Communication with the Director of Development and Special Projects at PIPC indicates that there are no plans for construction or redevelopment at the site for the foreseeable future; however, it is possible that existing structures could be renovated or improved. Construction workers in this limited future scenario could be potential receptors. Though not currently planned, hypothetical future plans for the Island may include recreational use and construction of a nature or retreat center.

The Island is currently used by a limited number of recreational canoers, which must obtain a permit for access. Current and future recreational users include canoers and potential campers. Potential campers who would have a higher level of direct exposure to onsite soil than recreational users are considered a separate category of use.

The exposure risk associated from potential MC is being evaluated as a part of the HTRW Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP) (EA 2020).

2.2.3 Potential Ecological Receptors

The explosive risk associated with potential MEC to ecological receptors is not evaluated; only the exposure risk from associated MC (metals and explosives constituents). MC sampling and the exposure risk associated with explosives and metals MC in environmental media attributed to former DoD usage is being evaluated as a part of the HTRW investigation.

2.2.4 Exposure Pathways

Munitions and Explosives of Concern

Potential human receptors may be exposed to the explosive hazard associated with remaining MEC on the surface and in the subsurface both on the land and aquatic portions of the site as a result of historic operational use and the 1903 explosion. In addition to trespassers, the FUDS is not DoD controlled and is used by different entities including visitors/recreational users and workers of Bear Mountain State Park, who have access areas where a potential MEC hazard may exist.

Future access restrictions are unlikely as the reasonable future site use is expected to remain the same. Potential MEC may migrate to the surface as a result of natural processes such as frost heave, wind and water erosion and storm events. Because current and future receptors present at the site will have limited access, and there is a potential for finding MEC on the land surface, in the subsurface, or in sediments, there is a potentially complete pathway for exposure to the hazard of MEC to human receptors at the FUDS.

Munitions Constituents

In addition to explosives hazards, both human and ecological receptors may be exposed to MC in environmental media attributed to former DoD usage of the site. Exposure to MC (metals and explosives constituents) in environmental media associated with historical DoD usage of the site is being evaluated under the HTRW RI. For an MC exposure pathway to be considered under this MMRP RI, an MC source (e.g., breached MEC item) would have to be found.

Human and ecological receptors may be exposed to MC in soils, sediment, and surface water by incidental ingestion, inhalation of particulates (humans only), and dermal absorption. Ecological receptors might also be exposed indirectly to MC in surface soil, sediment, and surface water by ingestion of biota, soil, sediment, and surface water, etc. that has been exposed to MC.

If breached MEC is identified in surface or subsurface soils or sediments; the result may be MC in the surface soil/sediment/water (defined as 0 to 6 in. bgs) or the subsurface soil/sediment depending on the depth of which the breached MEC item was identified. Because a breached MEC item is an isolated occurrence, any MC would be located directly below or surrounding the breached MEC item depending on the orientation. Construction workers and ecological receptors would have the greatest potential for exposure as the potential MC would be located bgs.

2.3 PRELIMINARY IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable or relevant and appropriate requirements (ARARs) are environmental and/or public health statutes, regulations, and ordinances pertaining to all aspects of potential cleanup actions. ARARs influence the development of remedial action alternatives by establishing numerical cleanup levels, siting, disposal, operating parameters, and health and safety standards.

There are five criteria that must be met for a standard, requirement, criteria, or limitation to be considered an ARAR:

1. The requirement must be promulgated.

2. The requirement must be related to a federal or state environmental or siting law.

3. The requirement must be substantive.

4. The requirement must be a cleanup standard, standard of control, or requirement that specifically addresses a CERCLA hazardous substance, pollutant, or contaminant; remedial action; or remedial location.

5. The requirement must be applicable or relevant and appropriate.

In addition, non-promulgated advisories or guidance issued by federal or state governments that are not legally binding and do not have the status of ARARs may be identified as "To Be Considered". To Be Considered (40 Code of Federal Regulations [CFR] §300.400[g][3]) complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

EPA identifies three basic types of ARARs: chemical-, location-, and action-specific. The definitions of chemical-, location-, and action-specific ARARs and their applicability to the MRSs are defined below along with To Be Considered criteria. The potential ARARs identified for Iona Island FUDS are summarized in **Table 2-1**.

- **Chemical**—Chemical-specific ARARs govern the level or extent of site cleanup in relation to a specific constituent. Chemical-specific ARARs are usually health- or risk-based standards that limit constituent concentrations found in or discharged to the environment. These ARARs govern the extent of site cleanup by providing cleanup levels or a basis for calculating cleanup levels. Preliminary chemical-specific ARARs are typically identified in the RI to provide benchmarks with which to compare environmental sampling results (e.g., for MC). Chemical specific ARARS are evaluated as part of the HTRW RI which encompasses sampling for MC.

- **Location**—Location-specific ARARs pertain to existing site features. Location-specific ARARs place restrictions on constituent concentrations or remedial activities solely based on site setting or location (e.g., within or adjacent to wetlands, flood plains, existing landfills, disposal areas, and places of historical or archeological significance). Typical examples of location-specific ARARs include protection of historical and archaeological resources and protection of wildlife and habitat resources including endangered species, fish, migratory birds, and wetlands. Four location-specific ARARs were identified.

- **Action**—Action-specific ARARs pertain to proposed site removal actions and govern implementation of the selected site remedy. Action-specific ARARs set controls or

restrictions on activities related to the management of contaminated and/or hazardous materials. After remedial alternatives are developed, action-specific ARARs pertaining to proposed site remedies provide a basis for assessing their feasibility and effectiveness. These action-specific requirements do not themselves determine the cleanup alternative but define how the chosen cleanup alternative should be achieved. One potential action-specific ARAR was identified.

- **To Be Considered**—Non-promulgated policies, criteria, advisories, guidance, and proposed standards developed by federal and state environmental and public health agencies that are not legally enforceable but contain helpful information are collectively referred to as To Be Considered criteria. They can be helpful in carrying out selected remedies or in determining the level of protectiveness of selected remedies. One action-specific criteria relevant to MEC that is To Be Considered was identified.

2.4 DATA NEEDS AND DATA QUALITY OBJECTIVES

The data needs and data quality objectives (DQOs) were determined at the planning stage and are outlined in the MMRP UFP-QAPP (EA 2019). The data needs included characterization of the nature and extent of MEC contamination associated with former military munitions activities. DQOs were developed to ensure: (1) the collection of sufficient data; (2) the quality of data generated was acceptable for its intended use; and (3) valid assumptions could be inferred from the data.

MEC, if present, may present an unacceptable physical risk from explosive hazards to current and anticipated future land users. For MEC, data needs included determining the types, locations, depths, condition, and numbers of MEC present (if any) at the site so that the hazard to human health can be assessed and remedial decisions can be made. DQOs were developed based on USACE guidance and past experience with sites containing MEC. It should be noted that MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals attributed to former DoD usage is being evaluated as a part of the HTRW investigation. A separate RI report is being developed for the HTRW RI (EA 2020). The DQOs for the RI presented below were presented in the MMRP UFP-QAPP (EA 2019).

Step 1: State the problem.

Previous investigations have indicated that MEC in the form of discarded military munitions may be present at Iona Island resulting from its use as an ammunition depot from 1900 to 1947 that included the 1903 shell house explosion (MRS 01 1903 Explosion Area) and the potential dumping and/or dropping of munitions at the loading docks and a previously identified dump site between Iona Island and Round Island. Munitions that have been found within the study area during previous studies are discussed in Section 1.5. These materials, if present, may present an unacceptable physical risk from explosive hazards to current and anticipated future land users. The problem to be addressed during the RI is to identify the extent of MEC that may remain at Iona Island on the surface and in the subsurface through the collection of data within the MRS 01 1903 Explosion Area and the other areas within the FUDS where discarded military munitions is

suspected (i.e., former loading docks, shoreline at and in the vicinity of former loading docks, and the previously identified dump site). Depending on the types and distribution of MEC remaining at the site, an FS to evaluate remedial action may be required to mitigate the MEC hazard to current or reasonably anticipated future receptors. Results of the investigation will be used to evaluate site hazards from MEC.

Step 2: Identify the goals of the study.

The primary goal for the RI is to determine if MEC presents a potential hazard to human health at the site. MEC data collected will be sufficient to support accurate cost estimating for remedial actions presented in the FS, if required.

Principal study questions:

- What is the nature and extent of MEC on Iona Island, specifically at MRS 01 1903 Explosion Area, at the former munitions loading docks, along the shoreline at and in the vicinity of the loading docks, and at the dump site?

- What current and potential future threats may be posed to human health by MEC?

Study Goals for MEC:

- Establish the nature and extent of MEC across MRS 01 within the statistical confines presented in Step 5 of the DQOs using digital geophysical mapping (DGM), AGC, and intrusive investigations.

- Establish the nature and extent of MEC at the former loading docks using divers to perform an instrument assisted surface search and using underwater analog instruments perform intrusive investigations of detected subsurface contacts.

- Establish the nature and extent of MEC at the former loading docks and along the upstream and downstream shoreline of the Hudson River using DGM and intrusive investigations.

- Establish the nature and extent of MEC at the previously identified dump site using DGM and intrusive investigations.

- Support determinations of non-impacted areas.

- If MEC is present, or if it has been determined that the potential for MEC at the site is present, determine whether MEC poses a potential hazard to human receptors. To evaluate if there are acceptable or unacceptable human health hazards due to MEC at the site, a risk assessment will be performed in accordance with the guidance document *Trial Period for Risk Management Methodology at FUDS MMRP Projects* (USACE 2017) and will include a review of historical and RI MEC-related findings. The risk assessment satisfies the

requirements of 40 CFR Part 300.430(d)(4) and uses site-specific CSM data, likelihood of a MEC encounter, severity of a MEC incident, and likelihood of detonation.

- If development of an FS is necessary, collect sufficient data to support the development of an FS and evaluate remedial alternatives for potential future remedial actions, if necessary.

Study Goals for MC

MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation. If a potential MC source (e.g., breached MEC, bulk explosives) is identified in surface or subsurface soils or sediments during the MMRP RI, the MC study goal is to evaluate the nature and extent of explosives resulting from the MC source.

Step 3: Identify information inputs.

To fill the data gaps in the preliminary CSM and answer the study questions, the primary data inputs for the RI include the types, locations, and depths of MEC identified at Iona Island during the MMRP investigation and current and anticipated future land-use of the MRS.

RI field investigation and assessment inputs for MEC include:

- Results of the DGM detection survey, AGC survey, and instrument-aided geophysical surveys (if necessary) to characterize MEC and areas indicative of munitions use identified by the investigation including:

  - Grid and transect coverage and locations
  - Anomaly locations, amplitudes, and densities
  - AGC anomaly classifications (i.e., MEC, non-MEC, cannot determine).

- Results of intrusive investigation of DGM and AGC anomalies identified as targets of interest (TOIs) and non-TOIs, and dive anomalies investigated including:

  - Anomaly type (MEC, MD, non-munitions-related debris [NMRD], seed, etc.)
  - Quantity
  - Depth of the item(s)
  - Munitions size (e.g., caliber), type (e.g., mortar, projectile, etc.), condition (e.g., fuzed, unfuzed, inert, etc.) and era (e.g., World War II)
  - Munitions' explosive hazard (e.g., type of filler).

- Data obtained during the ASR, SI, and MMRP UFP-QAPP development

- A preliminary CSM based on previous studies, including details regarding current and potential future land use and activities, and human receptors, exposure pathways and exposure areas.

- An updated horizontal and vertical CSM based on results of previous investigations summarizing types and quantities of MEC known or suspected to be present and expected vertical distribution of MEC present (expected depth and density). The purpose of this CSM is to show the maximum expected depth, maximum depth of detection, and maximum depth of exposure for each anticipated MEC item to determine the potential risk from undetected MEC.

Step 4: Define the boundaries of the project.

The horizontal boundary of the study area includes the accessible land portions of the MRS 01 1903 Explosion Area boundary and four areas within the Iona Island Naval Ammunitions Depot FUDS boundary where dumping and/or dropping of munitions is suspected (Figure 3-1). Areas where dumping and/or dropping of munitions is suspected include the three former loading docks. A 50-ft buffer around the footprint of each of the former loading docks will bound the lateral extent of the underwater investigation of these areas. The 50-ft buffer area would encompass the most likely areas where suspected dumping and/or dropping may have occurred. The shoreline immediately upstream and downstream from the northern two docks (i.e., 50 ft to the north of the docks as well as to the south by 50 ft) will also be included in the boundary of the investigation to include a 40-ft-wide buffer along the water's edge. The fourth area includes the footprint of the dump site between Iona Island and Round Island previously identified through the photo analysis performed by the U.S. Army Geospatial Center (USAGC 2018).

Areas that will be excluded from the investigation (and rationale) include:

- Existing buildings in MRS 01 (no expectation of MEC, inaccessible)

- Marsh areas in MRS 01 that have been filled in with riprap (unusable data due to metallic debris and the presence of riprap prevents a pathway to MEC)

- Steep/rocky slopes in MRS 01 (inaccessible)

- Marsh water channels in MRS 01 (adjacent accessible areas to be used for characterization)

- Areas adjacent to the docks where the water depth is greater than 60 ft (inaccessible, unlikely receptors). Dives will be limited to 60 ft

- Areas where the River bottom exceeds 30 degrees slope or determined unacceptable by Direct-Person-in-Charge (DPIC)

- Areas that are outside of the MRS 01 and where there have been no indications of dumping and/or dropping of MEC (no expectation of MEC)

- Steep shorelines including riprap/break walls (inaccessible).

The 1903 explosion and potential dumping and/or dropping of munitions are the mechanisms for MEC sources, which indicate the depths for MEC are shallow. Additionally, the vertical subsurface boundary of the project is anticipated to be restricted by the relatively shallow bedrock (0–2 ft).

If breached MEC is identified in surface or subsurface soils or sediments, the result may be MC in the surface soil/sediment (defined as 0 to 6 in. bgs) or the subsurface soil/sediment depending on the depth of which the breached MEC item was identified. Because a breached MEC item is an isolated occurrence, any MC would be located directly below or surrounding (within 3 feet) the breached MEC item depending on the orientation.

The temporal boundary for Iona Island includes the time it was used as an ammunition depot (1900–1947). Additionally, the temporal boundary for the investigation will be phased and include multiple mobilizations to account for seasonal considerations such as vegetation (DGM and AGC will be performed during spring prior to marsh and island growth), avoidance of the key time periods and sensitive locations for wintering bald eagles (mid-December through early March, depending on winter severity), marsh bird breeding (the nesting/fledging of the least bitten in the marsh grasses to the west of Iona Island during mid-April to mid-July), and Hudson River tides (e.g., diving will be performed during slack tide when possible for safety considerations).

Step 5: Develop the project data collection and analysis approach.

The data collection and analysis for the MMRP RI at Iona Island will involve four steps:

1. Characterizing the MRS 01 1903 Explosion Area

2. Characterizing the three former loading docks

3. Characterizing the riverbank at, upstream, and downstream of the two northern loading docks

4. Characterizing the previously identified dump site.

The project team will perform DGM on land and along the shoreline, and analog (dive) surveys in the Hudson River around the former docks to locate anomalies that may be representative of MEC, followed by intrusive investigations. In areas where building debris may be significant, or where intrusive investigations are not permitted, AGC will be performed to reduce unnecessary intrusive investigations.

Characterizing MRS 01 1903 Explosion Area

DGM will be performed within grids throughout the MRS 01 boundary, followed by AGC and intrusive investigations to determine the nature and extent of MEC over the MRS. MRS 01 will be treated as a Non-Concentrated Munitions Use Area as the CSM for the site is that during the explosion munitions may have been randomly distributed across the site. The explosion in 1903, originating from the approximate center of the depot, is thought to have thrown stored ammunition shells as far as 1,250 ft from the blast. However, during demolition of buildings, construction debris may also have been distributed over the same areas and would now likely be intermixed with the blast contents. Because the explosion location coincides with the area where the former ammunition depot buildings were demolished and DGM anomalies from the explosion and the demolished buildings are likely intermixed, it is unlikely a density analysis of DGM transects would be useful to define the extent of MEC contamination. A more prudent approach is to place grids throughout the MRS using a semi-biased placement to characterize the subsurface. Grids will be placed near the Explosion Area as well as at the furthest extent of the MRS to facilitate determination of MEC density and extent. To avoid intrusively investigating an expected high number of demolished building debris, AGC will be utilized to classify DGM anomalies as being MEC versus non-MEC. The "moderate" public use parameter within the Visual Sampling Plan (VSP) statistical software tool (version 7.11) (PNNL 2018) has been used to determine the number of grids required to characterize MRS 01. If no MEC is found within 6 acres of intrusively investigated DGM/AGC grids, then it can be concluded with 95 percent (%) confidence that the true rate for MEC at MRS 01 ranges from 0 to no greater than 0.5 MEC/acre. If MEC is found, then a new MEC/acre rate can be calculated at the 95 percent confidence.

Digital Geophysical Mapping Survey

Parameters of interest—Geophysical anomalies exceeding the project-specific detection threshold (e.g., measurements that possess amplitudes greater than 5 to 7 times the root-mean-squared background response).

Type of inference—Measurements meeting the criteria noted above may represent MEC and will be considered for further evaluation during the Intrusive Investigation or AGC Cued Phase.

Decision rules—If a measurement meeting the criteria noted above is present in the DGM data, the anomaly will be placed on the DGM TOI list and will be selected for further evaluation during the Intrusive Investigation or AGC Cued Phase.

AGC Survey

Parameters of interest—Spatial extent of detected anomaly, cued measurement signal to noise ratio, inversion fit coherence, and inversion outputs of magnetic polarizabilities, x, y, and z.

Type of inference—The following criteria will be used to classify the anomaly:

1. If the polarizability matches (within specifications established on Worksheet #22 of the MMRP UFP-QAPP) that of an item in the project-specific TOI library (based on Step 4).

2. If the inverted polarizabilities indicate a source item large enough to be a 1-pounder, by fitting to the closest item currently within the library.

3. If four or more anomalies group (cluster) due to having similar polarizabilities, they will be added to the list under the "Priority 2" portion of the TOI list.

4. If anomalies with poor fit coherence that, after considering all available information, cannot be ruled as non-TOI will be added under the "Priority 2" portion of the TOI list.

Decision rules—The criteria above will then, in turn, lead into three simple decision rules:

1. If a portion of the study area is determined to have an anomaly density too high for cued analysis, then the area will be avoided and recommended for other investigation methods.

2. Objects classified as Priority 0, 1, and 2 will be recommended for excavation.

3. Priority 3 will remain in place, with the exception that some may be investigated under the scope of a future project or as part of quality assurance (QA)/quality control (QC).

Intrusive Investigation

Parameters of interest—The sources of anomalies to determine whether the anomalies are munitions related, and if so, the horizontal and vertical distribution of munitions-related anomalies to determine the lateral and vertical extent.

Inference—The presence of MEC would indicate that the 1903 Explosion distributed MEC in the MRS.

Decision rule—If MEC is present, the distribution of the MEC observed from the investigation will be used to determine the horizontal and vertical extent (using VSP) and the CSM refined accordingly.

Post-Survey/Intrusive Analysis

Parameter of interest—DGM survey data locations, DGM anomaly locations, AGC locations and classifications, intrusive results. This data will be used to run various post-survey spatial analysis using the VSP software to determine densities across the site for each anomaly type including total DGM anomalies, total AGC anomalies, AGC non-MEC anomalies (Priority 3), MEC, and MD.

Type of inference—Density maps from VSP will be used to define lateral extent and density of MEC contamination.

Decision rules—If MEC is identified within the MRS and the density maps define the lateral extent of MEC, a new MEC density calculation will be performed using the VSP TOI post-survey module and the CSM revised (e.g., elevated MEC density area is a Concentrated Munitions Use Area [CMUA]). If the MEC/MD density maps indicate the MEC density may be higher than what is expected for a non-CMUA (i.e., munitions related density is approximately 20 anomalies per acre above background), the elevated area will be considered a CMUA and approximately 4 to 6 investigation grids will be placed within the elevated munitions area to ensure the area is characterized with respect to MEC nature and vertical and horizontal extent. Additionally, if the density maps indicate that MEC may extend beyond the MRS boundary, additional investigations will be implemented in these areas to determine the new lateral extent of MEC. If no MEC are found, the team will use the initial VSP design conclusion that the MEC density for the site ranges from 0 to no greater than 0.5 MEC per acre at the 95 percent confidence level. The CSM will be refined accordingly.

Characterizing the Three Former Loading Docks

The area surrounding the former loading docks will be treated as potential CMUAs resulting from the possible dumping and/or dropping of munitions during loading operations. Underwater dive teams will perform intrusive investigations using underwater hand-held detectors along transects spaced 10 ft apart over each of the former loading dock footprints, including a 50-ft buffer to characterize areas adjacent to the docks where dumping or dropping of munitions would most likely occur. If evidence of MEC is found within 25 ft of the edge of the buffer area surrounding the former dock footprint, the transect on which the MEC was found, and the two adjacent transects, will be extended 25 ft. Dives will be limited to 60 ft or where the River bottom exceeds 30 degrees slope or determined acceptable by DPIC. If no evidence of MEC is identified on those transects, the extent of MEC will be considered determined.

Parameter of interest—The sources of anomalies to determine whether the anomalies are munitions related, and if so, the horizontal and vertical distribution of munitions-related anomalies to determine the lateral and vertical extent.

Type of inference—The presence of MEC or MD would indicate that dumping and/or dropping of munitions along the loading docks, or kickout from the 1903 explosion.

Decision rule—If MEC is present, the distribution of the MEC observed from the investigation will be used to determine the horizontal and vertical extent and the CSM refined accordingly (e.g., site determined to be a CMUA). If MEC or MD is not present, the team will presume the area is not impacted by MEC and revise the CSM.

Characterizing the Shoreline at and in the vicinity of the Former Loading Docks

The area along the shoreline at, upstream, and downstream of the former loading docks will be treated as potential CMUAs resulting from the migration of munitions possibly dumped or dropped at the former loading docks. DGM surveys will be conducted along the shoreline 50 ft upstream

as well as 50 ft downstream of each of the two northern former loading docks along transects spaced 10 ft apart and resulting anomalies intrusively investigated.

Digital Geophysical Mapping Survey

Parameters of interest—Geophysical anomalies exceeding the project-specific detection threshold (i.e., measurements that possess amplitudes greater than 5 to 7 times the root-mean-squared background response).

Type of inference—Measurements meeting the criteria noted above may represent MEC and will be considered for further evaluation during the intrusive investigation.

Decision rules—If a measurement meeting the criteria noted above is present in the DGM data, the anomaly will be placed on the DGM TOI list and will be selected for further evaluation during the intrusive investigation.

Intrusive Investigation

Parameter of interest—The sources of anomalies to determine whether the anomalies are munitions related, and if so, the horizontal and vertical distribution of munitions-related anomalies to determine the lateral and vertical extent.

Type of inference—The presence of MEC or MD would indicate that dumping of munitions occurred at the loading docks and was transported downstream.

Decision rule—If MEC is present, the distribution of the MEC observed from the investigation will be used to determine the horizontal and vertical extent and the CSM refined accordingly (e.g., site determined to be a CMUA). If MEC or MD is not present, the team will presume the area is not impacted by MEC and revise the CSM.

Characterizing the Previously Identified Dump Site

The previously identified dump site will be treated as potential CMUA resulting from possible dumping of munitions. DGM will be collected within the previously identified Dump Area between Iona Island and Round Island along transects spaced 10 ft apart and resulting anomalies intrusively investigated.

Digital Geophysical Mapping Survey

Parameters of interest—Geophysical anomalies exceeding the project-specific detection threshold (i.e., measurements that possess amplitudes greater than 5 to 7 times the root-mean-squared background response), or spatially indicative of disposal pits/trenches.

Type of inference—Measurements meeting the criteria noted above may represent MEC or disposal pits/trenches containing MEC and will be considered for further evaluation during the intrusive investigation.

Decision rules—If a measurement meeting the criteria noted above is present in the DGM data, then the anomaly will be placed on the DGM TOI list and will be selected for further evaluation during the intrusive investigation. If an inordinate number of DGM TOIs are identified in the dump site following the DGM survey, then AGC may be utilized to reduce the number of intrusive investigations. EA management will evaluate the dump site for number of TOIs and make recommendations to the Product Delivery Team on whether to perform intrusive only activities or supplement the investigation with AGC.

Intrusive Investigation

Parameter of interest—The sources of anomalies to determine whether the anomalies are munitions related, and if so, the horizontal and vertical distribution of munitions-related anomalies to determine the lateral and vertical extent.

Type of inference—The presence of MEC or MD would indicate that dumping or disposal of munitions occurred at the dump site.

Decision rule—If MEC is present, the distribution of the MEC observed from the investigation will be used to determine the horizontal and vertical extent and the CSM refined accordingly (e.g., site determined to be a CMUA). If MEC or MD is not present, the team will presume the area is not impacted by MEC and revise the CSM.

Step 6: Specify project-specific measurement performance criteria (MPC).

Overall, the baseline condition for MEC characterization during the RI is that "MEC is potentially present," and that if MEC is present it is characteristic of the type of munitions historically stored/used at the site, whereas the alternative condition is "MEC is not present". Conclusive data indicating that no MEC is present will be obtained prior to rejecting the baseline condition.

Project-specific MPCs, based on DFWs, are presented in Worksheet #12 of the MMRP UFP-QAPP. Project-specific MPCs are the criteria that collected data must meet to satisfy the DQOs and include specifications for site preparation (e.g., vegetation removal, grid establishment, field surface sweeps, blind QC seeding, IVS establishment) DGM surveys (e.g., survey coverage, detection thresholds, QC seed detection), AGC classification surveys (munitions library, background data collection, validation seed classification, MEC classification) intrusive investigation (e.g., anomaly resolution, database completeness), site restoration, and deliverables. Failure to achieve the MPCs may have an impact on end uses of the data, which will be discussed in the Data Usability Assessment (DUA) Report included in Appendix C of the RI Report. The DUA involves a qualitative and quantitative evaluation of data to determine if the project data are of the right type, quality, and quantity to support the decisions that need to be made. The DUA evaluated whether underlying assumptions used during systematic planning for DGM operations

are supported, sources of uncertainty have been accounted for and are acceptable, data are representative of the population of interest, DQOs have been met, and the results can be used as intended, with the acceptable level of confidence.

Step 7: Develop the design.

The MPCs established during Step 6 of the DQO process were used to develop the sample design. The sample design is broken down into a series of specific processes and data collection steps, termed DFWs. The project DFWs are presented in **Table 2-2**.

Table 2-1 Potential Federal and State Applicable and Relevant and Appropriate Requirements

Federal or State Statute, Regulation or Guidance	Summary of Requirement	Comment
Chemical-Specific ARARs		
Not applicable.	Not applicable.	Not applicable.
Location-Specific ARARs		
Endangered Species Act (16 U.S.C. § 1538(a)(1)(B) and 16 U.S.C. §1538(a)(2)(B)	No action may be taken that would jeopardize the continued existence of a listed species, result in destruction or adverse modification of critical habitat, or result in the take of a listed species.	Applicable when endangered or threatened species or designated critical habitats are present where remediation activities may occur.[a]
Endangered and Threatened Species of Fish and Wildlife Species of Special Concern (6 NYCRR Part 182)	Requires action to conserve endangered or threatened species and their critical habitats.	Multiple birds, mammals are NYSDEC listed as a threatened species and known to inhabit the MRS (Section 1.3.8 of RI Report).
NYSDEC Division of Water – Freshwater Wetlands Regulations (6 NYCRR Parts 662 – 665)	Regulates uses of freshwater wetlands and areas adjacent to ensure use is compatible with the preservation, protection, and enhancement of the wetlands' present and potential values.	Freshwater wetland areas exist within the MRS.
Action-Specific ARARs		
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 264 Subpart X)	Establishes standards for owners and operators of hazardous waste treatment, storage, and disposal facilities.	Applicable to detonation of multiple MEC onsite using a consolidated shot.
To Be Considered		
Executive Order 13693	Encourage the preferred remedial alternative to support sustainability.	To be considered during remedial alternative development (i.e., FS).

a. Short nose and Atlantic Sturgeon may be present if the remedial action extends into the Hudson River.
NOTES:
NYCRR = New York Codes, Rules and Regulations

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Table 2-2 Definable Features of Work (DFW) and Associated Tasks

DFW	Associated Activities
1. Pre-Mobilization Activities	Prepare UFP-QAPP with APP, Site Safety and Health Plan (SSHP), including an Activity Hazard Analyses (Appendix B). USACE preparation of the ESP. Set up GIS. Participate in TPP process. Subcontracting.
2. Site Preparation	Mobilize staff, equipment, and supplies. Kickoff/Safety Meeting. Provide training to field personnel. Establish control points. Stake grids and transects. Surface sweep and clear debris from grids. Brush cutting in grids and along transects.
3. Establish IVS, Blind Seeding	Install IVS. Install blind seeds in DGM grids.
4. DGM Equipment Set Up and Testing	Assemble and test DGM equipment at IVS.
5. DGM Surveys	DGM of transects along shoreline. DGM of transects at the dump site. DGM of grids in MRS 01. Processing of DGM data. Target list for AGC and/or intrusive investigation.
6. AGC Equipment Set Up and Testing	Assemble and test AGC equipment at IVS.
7. Cued Surveys	Cued survey of DGM anomalies in MRS 01 using AGC equipment. Processing/analysis of cued data. Target list for intrusive investigation. Data usability assessment.
8. Intrusive Investigation	Reacquire and intrusively investigate DGM TOIs along shoreline and in dump site. Reacquire and intrusively investigate AGC TOIs in MRS 01. Mag and Dig grids not suitable for DGM in MRS 01. MPPEH Inspection, Verification, and Certification. Demolition of MEC. Dispose of material documented as safe (MDAS).
9. Underwater Intrusive Investigation	Reacquire geophysical anomalies selected for intrusive investigation. Investigate geophysical anomalies selected for reacquisition. MPPEH Inspection, Verification, and Certification. Demolition of MEC. Dispose of MDAS.

DFW	Associated Activities
11. Cued Data Threshold Verification and Data Classification Validation	Check all data collection, analysis activities completed and documented. Validate data as conforming to SOPs and MPCs
12. Post Intrusive VSP Analysis	Use VSP to create MEC, MD, and anomaly density maps for MRS 01, former loading docks, shoreline, and the dump site with intent to define lateral extent of MEC. Determine if NCMUA determination for MRS-1 is valid.
13. Final Data Usability Assessment	Review project data requirements (data, completeness, and archiving). Verify accuracy of the project database. Verify the DQOs were met.
14. Site Restoration and Demobilization	Restore excavations, demobilize personnel and equipment.

3. CHARACTERIZATION OF MUNITIONS AND EXPLOSIVES OF CONCERN

This section describes the methodology and procedures followed for RI field activities to characterize the nature and extent of MEC at the Iona Island Naval Munitions Depot FUDS. Phase I and II activities primarily included site preparation, DGM, and AGC. These activities were completed between 9 March and 22 April 2020. Phase III activities included intrusive investigations and diving on the former dock and along the shoreline and were completed between 25 July and 10 August 2020. All activities were completed in accordance with the MMRP UFP-QAPP and schedule (EA 2019). Daily Field Reports are provided in **Appendix A**, and a Photographic Log is provided in **Appendix B**.

In accordance with the MMRP UFP-QAPP and VSP, it was determined during the planning process that 6 acres would require investigation at MRS 01 with no MEC found to make the conclusion that the upper bound for MEC contamination at the site ranges from 0 to no more than 0.5 MEC per acre with a 95 percent confidence level. The initial input assumption of 0.5 MEC per acre was chosen based on the software module guidance for sites where public usage is moderate (e.g., a hiking or hunting area, large subdivision). A total of 26 grids (~0.25 acres) was initially planned during the MMRP UFP-QAPP development; however, a 27th grid was added to ensure the 6-acre VSP metric was met should data gaps occur in the planned grids due to accessibility issues. Grids were located throughout the MRS randomly using VSP; however, some grids were repositioned based on aerial photography and historical maps to avoid inaccessible areas or areas that were backfilled with construction debris and to ensure adequate sampling in the marsh area and near the center of the 1903 explosion.

3.1 GEOPHYSICAL SURVEY

EA mobilized for land-based field activities on 9 March 2020. Land-based activities included site-specific training, establishment of investigation grids, brush clearance, blind seeding, installation of an Instrument Verification Strip (IVS), DGM surveys, and AGC surveys.

Grid staking, vegetation clearance, surface sweeps, and blind seeding began on 9 March 2020 within 27 grids located throughout MRS 01 and along the transects within the Dump Area. Grid and transect endpoints were located and marked using a VRS-enabled Trimble R10 Global Position System (GPS) and each land grid was cleared using a skid steer with a mulch-head adapter. In coordination with the PIPC natural resource advisor, EA cleared grids and transects in a manner that avoided unnecessary overcutting of vegetation and avoided sensitive species. In the marsh area on the west side of MRS 01 and in the Dump Area, the phragmites and cattails were "flattened" using an ARGO all-terrain vehicle and a Marshmaster vehicle. As practicable, grids were located and cleared corresponding to the locations determined from VSP and depicted in the MMRP UFP-QAPP (EA 2019). During grid stakeout several grids were shifted, or their shapes were modified (e.g., from square to rectangular), to ensure each grid covered the minimum expected acreage (approximately 0.23 acres) and to avoid large obstacles or rock outcrops. A total of 6.7 acres spread across 27 grids within MRS 01 were mapped during the DGM survey. **Figure 3-1** shows the DGM grid locations within MRS 01, and the transect locations within the Dump Area and along the shoreline. It should be noted that although there are 27 grids, the grids are

numbered 1 through 28. Grid 23 was located on a rock outcrop and subsequently dropped and replaced with Grid 28. Detector-aided visual surface sweeps were performed within each grid and along each transect to identify and remove any material potentially presenting an explosive hazard (MPPEH) that posed a hazard to the DGM crew and surface metal that could interfere with the DGM equipment. Only NMRD and no MEC or MD was identified during the vegetation clearance and surface sweeps. The following sections summarize each subtask associated with the geophysical surveys. Further detail on each subtask can be found in the DGM and AGC reports presented in **Appendix C**.

3.1.1 Digital Geophysical Mapping

Concurrent with establishment of grid locations, EA's subcontractor, Acorn SI and NAEVA Joint Venture (ANJV) conducted DGM surveys of grids in MRS 01, transects in the Dump Area, and transects along the Hudson River shoreline. This section details the various methods and procedures used during the land-based geophysical investigation.

3.1.1.1 Digital Geophysical Mapping Data Acquisition Equipment and Procedures

The Geonics EM61-MK2 time domain electromagnetic sensor was used to collect DGM data at the Iona Island Naval Munitions Depot FUDS. Time domain electromagnetic technology was used because it provides highly effective detection capabilities, can detect both ferrous and nonferrous metallic objects, is less prone to geologic influences therefore producing fewer "false positives" (e.g., no finds), and provides a more simplistic response for buried objects than often complex magnetic responses, making it easier to identify and locate individual targets.

The EM61-MK2 transmitter generates a pulsed primary electromagnetic field that induces eddy currents in nearby metallic objects. The eddy currents produce a secondary electromagnetic field, which then induces a secondary voltage inside the EM61-MK2 receiver coil that is measured at four distinct intervals (time gates) with measurements recorded in millivolts (mV). The earlier time gates provide enhanced detection of smaller metallic objects while the later time gates provide for the identification of larger, more massive metal objects associated with disposal areas. The survey platform utilized for the RI was a hand-pulled cart equipped with standard tires and a standard EM61-MK2 coil, measuring 1.0 by 0.5 meters with the long axis perpendicular to the direction of travel, 42 centimeters (cm) above ground surface.

Positioning of the EM61-MK2 was accomplished using a real-time kinematic (RTK) GPS. A Trimble R8 RTK GPS base station, Trimble TDL 450 series radio, and Trimble R8/R7/5700 receiver rovers were used for the real-time acquisition of positional data during geophysical data collection with the EM61-MK2. All coordinates reported in this document and in the IVS data are listed in North American Datum 1983 Universal Transverse Mercator Zone 18 North, meters. Marked survey ropes were placed laterally across the survey area at 25-ft intervals to facilitate straight-line profiling.

DGM data were collected in accordance with the MMRP UFP-QAPP and met all MMRP UFP-QAPP Measurement Quality Objectives (MQOs) for DGM. The MQOs included daily function

checks for repeatability and accuracy of the DGM and AGC sensors and GPS units, maximum line spacing requirements, minimum sensor sampling rates, minimum grid coverage statistics, and blind QC seed detection rates as well as other survey checks. The geophysical team began data acquisition by performing all specified pre-mapping instrument checks. Once the morning QC tests were completed and the instruments were determined to be operating within performance metrics specified in the MMRP UFP-QAPP, the geophysical team collected data within the survey grids along parallel data acquisition lines spaced 0.5-meters apart, moving around any major obstacles. Obstacles include objects such as larger diameter trees, large shrubs, and steep terrain. For grids located within the marsh area, tide charts for the Hudson River were used to determine the lowest tide conditions to schedule data collection.

3.1.1.2 Digital Geophysical Mapping Data Processing and Target Selection

ANJV used TrackMaker61MK2 to interpolate GPS readings for each electromagnetic measurement and project the coordinates into the project coordinate system. The data were imported into Geosoft's Oasis montaj processing environment and the Dynamic Detection Survey MQOs were checked to meet the acceptance criteria for in-line spacing, coverage, GPS quality, and valid position data. The EM61-MK data were leveled using a windowed demedian filter and lag corrected. The processed DGM data for the entire FUDS is presented in **Figure 3-2** and individual DGM grid and transect maps are presented in the DGM Report located in **Appendix C**.

The targeting threshold was determined during the initial collection of the IVS and documented in the Iona Island Naval Ammunition Depot IVS Letter Report, presented in **Appendix C**. It was determined that a Channel 2 response of 6 mV would be the most appropriate targeting threshold for detecting and collecting cued data over the largest number of potential munitions at the site, the smallest of which is expected to be the 1-pounder projectile. This threshold is slightly below 5x root-mean-squared at the IVS location and slightly above 7x root-mean-squared in the first 3 production grids, which by industry standards is considered the noise floor. Additional target picks were selected by the processor depending on characteristics of the response (including shape and decay).

Saturated Response Areas (SRAs) were defined for this project as an anomaly that is larger in size than 100 ft^2. The selection of individual point targets is not appropriate for anomalies of this size. All SRA boundaries were reviewed and approved by the QC geophysicist before targeting of the grid was complete. The boundaries of an SRA were outlined on the geophysical contour map, but individual anomalies were not identified within SRAs.

3.1.2 Digital Geophysical Mapping Data Analysis

An approved Phase I and Phase II MEC Characterization Memorandum was submitted to USACE on 23 July 2020 that provided an analysis of the DGM data and refined the follow-on AGC and intrusive activities for the RI (presented in **Appendix C**). This section presents a summary of the memorandum.

VSP was utilized to create an anomaly density map using the DGM data and is presented in **Figure 3-3**. **Figure 3-3** shows the MRS boundary and includes an aerial view of the MRS, the DGM grid locations, the DGM anomaly locations that met the selection criteria presented in the IVS Report, and a color-shaded contour map of the DGM anomaly density. Based on the anomaly density map and grid statistics, each grid was categorized in relation to anomaly density and location as follows:

- Low-TOI-Density (e.g., wetlands grids, density less than 100 anomalies/acre)
- Medium-TOI-Density (e.g., wetlands grid near railroad tracks but away from former building locations, density greater than 100 and less than 500 anomalies/acre)
- High-TOI-Density/SRA (e.g., upland grids with significant SRAs, density greater than 500 anomalies/acre).

Low and Medium-TOI-Density Grids—These 8 grids (7 low density and 1 medium density) are in the wetlands in the western portion of the MRS and are outside of the historically developed area of the depot. Therefore, the Low and Medium-TOI-Density grids are not influenced by the construction debris associated with the former buildings. These grids may be more representative of potential MEC that may have been distributed throughout the MRS from the 1903 explosion. The wetlands make up roughly 30 percent of the MRS, and 30 percent of the investigation grids are located within the wetlands. All of the DGM TOIs in the Low and Medium-TOI-Density grids in the wetlands were selected for intrusive investigation. AGC was used on 3 Low-TOI-Density grids to assess the effectiveness of AGC in saturated soil conditions. An example low density grid is presented in **Figure 3-4**.

High-TOI-Density Grids—These 19 grids are located in the upland portion of the MRS and are near the footprints of the former ammunition depot buildings. Based on the historical photographs and surface sweep results it was anticipated the High-TOI-Density grids were likely to contain a large number of anomalies that are related to demolished building debris. The average density for these grids is approximately 1,000 anomalies per acre. In accordance with the MMRP UFP-QAPP, cued AGC was used in high-density grids to reduce the number of anomalies selected for intrusive investigation where a high percentage of anomalies are likely the result of building debris. Cued AGC was initially used in 9 High-TOI-Density grids. Most of the munition items that are related to the 1903 explosion (6-pound projectiles, 6-in. projectiles, and 13-in. projectiles) are significantly larger than typical construction debris that is present throughout the formerly developed portion of the site (e.g., rebar and nails). In an effort to focus the intrusive investigation towards those anomalies that are less likely to be construction debris and more likely to be MEC, the TOI selection criteria were modified to identify 6-pound projectiles and larger in the 10 remaining high density grids that had not already been investigated with AGC methods. The TOI revised selection criteria was 27 mV on Channel 2 based on the Naval Research Laboratory minimum response estimate for a 6-pound projectile (57-mm mortar equivalent) buried at a depth of 1 ft. An example high density grid is presented in **Figure 3-5**.

SRAs—These are the areas within the High-TOI-Density grids where the anomaly density is so high that it was not feasible to identify individual targets and AGC was not performed in SRAs.

Within the SRAs, a pothole trenching approach will be used to determine the nature of these potential disposal areas. The number of pothole trenches was based on the percentage of the grid's area contained in the SRA, with one pothole trench for each 10 percent (rounded) of the grid's area. For example, if a 100-ft x 100-ft grid (10,000 ft^2) contained SRAs totaling 4,000 ft^2 (i.e., 40 percent), then four pothole trenches were semi-randomly placed within the SRAs. An example of SRAs is presented in **Figure 3-5**.

Dump Area—The Dump Area is in the marsh/wetlands located between Iona Island and Round Island (**Figure 3-6**). Approximately 2,360 linear feet (LF) of DGM data were collected in the Dump Area along transects spaced approximately 10 ft apart. The area is almost entirely characterized as an SRA and no AGC surveys were performed. There were 15 Priority 1 targets identified and 8 SRA locations that were selected for intrusive investigation.

Shoreline: Approximately 5,200 LF of EM61-MK2 data were collected in the Hudson River between the northern former dock and south of the Dump Area, along transects spaced approximately 10 ft to approximately 20 ft out from the shoreline (**Figure 3-7**). In general, the transects indicate the areas adjacent to the Dump Area and the former docks are characterized as SRAs. The remainder of the transects are generally characterized as low density. Nineteen DGM targets identified in the low-density areas outside of the former dock footprints were selected for intrusive investigation at the same time as the dive operations of the former docks during Phase III.

Table 3-1 presents the grid and transect DGM summary and investigation approach.

3.1.3 Advanced Geophysical Classification Surveys

3.1.3.1 MetalMapper 2x2 Cued Data Acquisition Equipment

The MetalMapper 2x2 (MM2x2) is an advanced electromagnetic induction sensor designed for the detection and classification of buried metal objects. The sensor consists of four sensor elements arranged on 40-cm centers in a 2x2 array. Each sensor element consists of a 35-cm square transmit coil for target illumination with a 10-cm three-axis receive cube centered in the transmitter coil.

Positioning of the MM2x2 was accomplished using an RTK GPS. A Trimble R8 RTK GPS base station, Trimble TDL 450 series radio, and Trimble R8/R7/5700 receiver rovers were used for the real-time acquisition of positional data during geophysical data collection with the MM2x2. The MM2x2 orientation was measured using a six-degree-of-freedom inertial measurement unit (IMU).

3.1.3.2 MetalMapper 2x2 Cued Data Acquisition

The MM2x2 cued survey data collection over 22 quarter acre grids began on April 10 and was completed on 22 April 2020. The same field crew that conducted the initial IVS survey and DGM survey performed the MM2x2 grid surveys. ANJV performed daily data calibration activities to document that the MM2x2 system was operating correctly prior to data collection within the

production area. The data calibration activities included ongoing static IVS survey and sensor function tests. The background measurement was used to level the IVS data and after modeling, the results were compared to the initial reference polarizations and location. A GPS QC check was also performed at the beginning of each day to validate the spatial position accuracy. Cued MM2x2 data collection over the grid anomalies were performed as described in ANJV Standard Operating Procedure (SOP)-07 of the MMRP UFP-QAPP (collect cued target measurements). Generally, the data were collected with the MM2x2 sensor directly over the flag. After data were collected, the field team confirmed the validity of the data by checking the measured electromagnetic induction (EMI) response, IMU, and GPS.

3.1.3.3 MetalMapper 2x2 Cued Data Processing

The cued MM2x2 data were processed daily as described in ANJV SOP-08 of the MMRP UFP-QAPP (process cued geophysical data). Following the import of the raw MM2x2 into Geosoft Oasis montaj mapping software the data were inspected and assessed against the MQOs provided in MMRP UFP-QAPP Worksheet #22 of the MMRP UFP-QAPP for transmit current, valid RTK GPS, valid IMU data, and EMI response. All data that did not pass these initial MQOs were flagged for recollection. Daily QC notes from the field crews were also merged into their respective databases.

Ongoing background readings were evaluated to ensure consistent response and only valid backgrounds were used to correct the cued data prior to inversion and parameter extraction. Finally, the IVS data were background corrected, modeled, and compared to the initial IVS measurements using the Process IVS data bundle in UX-Analyze. QC results of the background validation, ongoing background points, sensor function and IVS data are detailed in the QC Results section of ANJV's Classification Report located in **Appendix C**.

After the cued anomaly data were leveled using the validated backgrounds, the data were modeled using a 1, 2, and 3 source solver creating a total of six sources for each target. After the daily QC of the cued data was complete, the daily QC databases were merged into a master classification database.

3.1.3.4 MetalMapper 2x2 Cued Data Classification

Classification of targets was based upon objective, numeric criteria. Using these criteria, a prioritized list was created with high likelihood TOIs placed at the top of the dig list (just after digs classified as "cannot analyze") and high likelihood non-TOI placed at the bottom of the list. The primary method for classification was library matching, supplemented by cluster analysis, and feature space analysis. A key factor in the success of the library matching classification process is the munitions library used for the comparisons. Based on the MMRP UFP-QAPP (and ASR), the items that may be encountered due to the 1903 explosion include the following projectiles:

- 1 pounders (approximately 37 mm equivalent)
- 6 pounders (approximately 57 mm equivalent)
- 6 in. (approximately 152mm or approximately 155mm equivalent)

- 13 in. (no equivalent).

The DOD library does not contain any of these specific items because they are all pre-World War I but items that best represented the suspected items (shown above) at Iona Island were used in the library matching process. Based on the decision statistics, cluster analysis and feature analysis, each target was placed into one of the following categories with Category 0,1, and 2 targets being placed on the dig list:

- Category 0—Cannot Analyze
- Category 1—TOI (higher confidence TOI)
- Category 2—Unsure whether the TOI is TOI or non-TOI
- Category 3—Non-TOI (highly unlikely to be TOI).

The ranked dig list was visually inspected a final time and submitted to the QC geophysicist. The QC geophysicist verified that all QC blind seeds were detected within the project's MQO performance criteria prior to submittal of the dig list to USACE for final validation. The USACE geophysicist confirmed the correct classification of all validation seeds and selected 18 non-TOI targets (Category 3) to validate the classification process. The remaining 32 Category 3 validation targets were selected in ranked order beginning immediately after the stop-dig threshold. A summary of the AGC classification results is presented in **Table 3-2**. A full discussion on the AGC equipment, data collection, data processing, and analysis/classification can be found in ANJV's Classification Report located in **Appendix C**.

Geophysical System Verification (GSV)—The GSV process was implemented to ensure that the geophysical MQOs were achieved. The GSV process consists of an IVS and a blind-seeding program in the production area. The purpose of the IVS is to ensure the DGM and AGC equipment is functioning properly prior to the collection of data in the production area, determine background noise levels, and to quantify variations in expected responses due to site-specific variables including location, depth, and orientation of buried seed items, instrument in-line and cross-line offsets, and instrument platform noise. The purpose of the blind-seeding program is to evaluate the dynamic detection and positioning repeatability within the production area.

Instrument Verification Strips—ANJV's geophysicists established a DGM/AGC IVS within MRS 01. The IVS was installed in the central area of the site (**Figure 3-1**). Pre-seeded and initial seeded surveys were conducted on 16 March 2020. A pre-seed background survey was performed to demonstrate the planned seed locations were free of anomalous response prior to burial. The IVS and background survey lines are approximately 15 meters long and were used for the EM61 MK2 DGM detection survey and MM2x2 AGC survey. Three industry standard objects (ISOs), two small ISO 80s and one medium ISO 40, were spaced downline 3 meters apart from each other.

Single-sensor EM61-MK2 data were collected over the IVS, and data analysts compared the measured responses over the test items with expected values to verify that the EM61-MK2 sensor was functioning correctly. Geophysical anomaly locations were compared the actual ISO burial locations to confirm the accuracy of the RTK GPS. The expected responses from the initial IVS

tests were used for twice-daily IVS test comparisons during the production phase of the DGM survey to confirm that the sensors were functioning correctly. There were no IVS QC test failures during the DGM survey. The daily production DGM IVS QC test results are presented in **Appendix D**.

The cued MM2x2 IVS survey for the RI at the Iona Island Naval Ammunition Depot was performed on 10 April 2020 by ANJV personnel. A sensor function test, background validation test and the initial IVS static test over each item were conducted. The daily production AGC IVS QC test results are presented in **Appendix D**. One daily AGC IVS test resulted in a failure on 22 April 2020 and is documented in a Non-Conformance/Corrective Action Report #2 located in **Appendix D**. The data was deemed usable by ANJV in concurrence with the USACE geophysicist and no corrective actions were required.

A detailed description of the DGM and AGC IVS results is provided in the DGM and AGC IVS Memorandums located in **Appendix C**.

Blind Seeding—A blind-seeding program was instituted to provide ongoing monitoring of the geophysical survey detection performance. During the RI, small and medium ISOs were used as blind QC seeds to verify that the geophysical systems were functioning properly and that the performance requirements for detection and positioning were in accordance with the project MQOs.

The QC seeds were placed in the survey area at similar depths and orientations as those placed in the IVS at a rate such that each geophysical team encountered at least one seed item each day (i.e., one blind seed per grid). Upon placement, the specific location, depth, orientation, and azimuth of the ISO seeds were recorded by the QC geophysicist. The locations of the blind QC seeds were not shared with personnel performing DGM surveys or data processing tasks until these respective tasks were completed and approved by USACE. Government Quality Assurance (QA) seeds were placed within the DGM grids as part of the Blind Seed program.

After each dig package was completed, the QC geophysicist reviewed the dig package and compared the data against the blind-seed information to verify that the detection and positioning MQOs were being met. All 27 blind QC seeds placed ahead of surveys in MRS 01 were successfully detected and identified. It should be noted that some of the blind seeds were located within SRAs and as such were not selected as individual TOIs for AGC or intrusive investigation. The blind-seeding tracking log is presented in **Appendix C**.

Feed-Back Process—The project geophysicist reviewed 100 percent of the dig results and compared what was found by the intrusive teams with the geophysical anomalies selected from the DGM data to establish whether the stated source is representative of the identified anomaly. Any anomalies that the project geophysicist determined were not representative of the intrusive results were rechecked in the field and the dig sheet was updated. A DUA for the DGM and for AGC data were completed and are located in **Appendix C** and discussed in Section 4.6 of this report.

AGC MQO Failures—Two grids (DGM2 and DGM10) were without a validated AGC background location due to one of the surrounding measurements used to validate a background location failing the MQO. For these 2 grids all ongoing backgrounds were in the immediate vicinity of initial center background measurement and not near the failed measurement. For this reason, it was recommended and accepted by the USACE that the background data collected over the background locations at DGM2 and DGM10 are valid and could be used to level the production cued data. Additional details of the process and results can be found in the ANJV Non-Conformance/Corrective Actions Report #1 in **Appendix C**.

3.2 INTRUSIVE INVESTIGATION

EA remobilized to the site on 25 July 2020 to begin the intrusive investigation of DGM and AGC anomalies and perform dive operations on the three former docks and DGM anomalies along the shoreline. All selected anomalies were provided to the field crew for target reacquisition, and the locations were field marked with yellow pin-flags prior to intrusive investigation. These specific locations were reacquired and marked using a Trimble R10 VRS-enabled, RTK GPS unit. RTK GPS accuracy was checked daily against a control point located near the Conex storage area and crew tail-gate meeting point.

Intrusive investigations were conducted on 27 July through 5 August 2020. A five-person field crew of UXO technicians investigated re-acquired single-point anomalies and SRA test pits. The location and surrounding ground surface were cleared using an analog magnetometer (Schonstedt Model GA-52Cx). If surface clearance did not resolve the anomaly, UXO technicians dug the location with hand tools (e.g., shovels, dig bars), clearing the excavation area with magnetometers at 6-in. intervals until the metallic anomaly was identified and removed. At locations in the marsh area, tide charts for the Hudson River were used to determine the lowest tide conditions for safe access and investigation. Intrusive investigations were conducted in accordance with EA Standard Operating Procedure 05 in the MMRP UFP-QAPP (EA 2019) and EM 385-1-97 (USACE 2013).

Manual excavations ranged in depth from 0 to 24 in. bgs. For anomalies deeper than 24 in., the mini excavator was utilized. For each investigated anomaly, the following information was recorded on the iPad and uploaded to the project database:

- Date/time
- Transect ID
- Target ID
- Anomaly type
- Categorization as geology, cultural, MEC/MPPEH, or MD
- Item description

- Mark/model/nomenclature
- Condition of MEC/MPPEH (e.g., fuzed, unfuzed)
- Quantity
- Depth recovered
- Approximate weight
- Offsets from flagged reacquire location
- Digital photograph taken of each MD item, NMRD on a per grid basis, test pits, significant cultural items, or unusual items (**Appendix B**).

During investigation of SRAs, a mini excavator was used to scrape an approximately 8 ft long by 24 in. wide test pit in 6-in. lifts. Each lift was inspected for MEC or MD prior to the excavation of the next 6-in. lift. This continued until the mini excavator encountered bedrock or undisturbed native soils at which point the excavation was considered complete. In the Dump Area, information was recorded from the pothole trench excavations that included the type of material encountered, depth of fill material, and water or soil staining. Mechanical excavations ranged in depth from 1 to 60 in. bgs.

At the conclusion of intrusive investigations, all pin flags in the grids and the IVS were removed, IVS seed items were removed, and holes and excavation test pits were backfilled to restore the Site. The site was inspected by the PIPC site manager prior to demobilization.

Dive Investigation—The initial diving effort was performed between 3 and 7 August 2020. A dive team provided by AOR International, Inc. was mobilized to the worksite to intrusively investigate the area surrounding the former dock footprints and DGM anomalies adjacent to the former docks. During the dive operations, the Ordnance and Explosives Safety Specialist (OESS) was present either on the boat or onshore to observe the operations.

The five-person dive team included a boat coxswain (captain), DPIC/dive supervisor (marine Senior Unexploded Ordnance Supervisor [SUXOS], one diver, one standby diver, and one tender. AOR International Inc.'s UXO-qualified dive team investigated the River bottom along pre-determined transects. Each former pier location was investigated using underwater EMI detectors on 10-ft transects and select DGM anomaly locations along the shoreline. Dives were limited to less than 60 ft or where the River bottom is less than 30 degrees slope or determined acceptable by the DPIC/dive supervisor.

Diving was completed in Surface Supplied Dive Mode. Each diver was equipped with an emergency air supply, a Shark Marine Navigation tablet, and an Underwater Ebinger 725K analog detector fitted with a 230 mm coil. Transects of each loading dock area were pre-loaded into the Shark Marine Navigation tablet prior to diving operations. The tablet was connected to a global

navigation satellite system buoy for locating and tracking divers along transects. The global navigation satellite system GPS was tested daily at a project established control point at the loading dock to ensure the positioning systems were functioning as designed and within the planned parameters for the project.

After entering the water, the diver viewed the underwater transects on the Shark Marine Navigation tablet and navigate towards the outer edge of the pre-planned investigation area, as needed to begin investigation activities. Planned routes were displayed on the Shark Marine Navigation tablet, in one color for the diver to follow while actual diver's routes were plotted in another color. Route plotting and contact information was recorded and reviewed daily.

Divers used hand-held underwater detectors during the survey to locate metallic items. Anomalies found to be non-munitions related debris, such as concrete rubble, rebar, metal strapping, cans, bolts, and other debris, were left onsite, and the diver continued along the transect. In the areas containing dense anomalies, the diver circumnavigated the area and collected GPS points to delineate the edges of the debris field. For the shallow transects close to the shoreline and the DGM targets, the diver "walked" the transects. EA provided a UXO technician and a GPS technician for target reacquisition of the near-shore DGM targets. A 4-ft survey lathe was used to stake the near shore DGM targets. The targets in water too deep for the EA reacquisition team to locate were reacquired by the dive team using the Shark Marine Navigation tablets.

For much of the survey area, the River bottom was covered with former dock debris that included concrete rubble, rebar, and pipes. As a result of the debris, it became dangerous to dive along the transects where the debris tended to "foul", or tangle, the air and communication lines attached to the diver. Rather than attempt to dive along the transects that covered the debris field, the divers performed "spot" dives at various locations surrounding the former dock footprint to document the debris field extent. In addition to the lateral limits of dock debris, only suspect MEC/MPPEH or significant MD was to be recorded by the diver. No MEC/MPPEH or MD was identified during the diving of the former docks or shoreline. **Figure 3-8** shows the results of the diving conducted at the former docks and along the shoreline. The 65-degree riverbed slope line is also shown on the figure.

At the conclusion of intrusive investigations, all pin flags and flagging tape along the transects and the IVS at MRS03 were removed to restore the site.

3.3 MATERIAL MANAGEMENT AND DISPOSAL

All recovered MPPEH were deemed material documented as safe (MDAS) following inspections and final certification by the SUXOS and Unexploded Ordnance Safety Officer (UXOSO). Digital photographs of munition-related items and significant or unusual items recovered during the intrusive investigation were taken and entered into the geographic information system (GIS) database. Photographs of items recovered during the intrusive investigation are presented in **Appendix B**.

All MPPEH underwent a thorough inspection and re-inspection process to determine that the item was free of explosives. These items were then segregated and classified as MDAS upon final inspection. Items were then containerized and secured until released to a subcontractor for demilitarization and disposition. The completed DD 1348-1A Form, MDAS certification (signed by the SUXOS and UXOSO), and certification of destruction are provided in **Appendix E**.

No MEC were identified during field activities. All items were determined to be MDAS or NMRD. During the RI, 1 pound of MDAS were identified, recovered, and shipped offsite for demilitarization. Approximately 1,216 pounds of NMRD were identified, recovered, and recycled. Material from the test pit excavations were placed back in the excavations following inspections by the UXO team lead and Unexploded Ordnance Quality Control Specialist (UXOQCS). Additional details regarding the types of items found are provided in Section 4.2.

3.4 DATA MANAGEMENT

Information pertaining to all data collected during DGM surveys are stored in a Microsoft Access project management database. The database(s) were maintained throughout the duration of the project and contains records of all daily QC test results, DGM anomalies identified in the survey area, anomalies selected for intrusive investigation, and the results of the intrusive investigation. The project database was updated and posted to the FTP site on a weekly basis. The project database is included on the DVD in **Appendix D**.

Raw and processed geophysical data were transmitted to the USACE Baltimore District geophysicist via FTP site. A header line in the ASCII files identify the data contained in each column, and the file names reflect the data collection date (raw data) or transect number (final data) for the data being transmitted. A DVD that includes all DGM data including raw and processed ASCII files, Geosoft maps, databases, dig packages and "Explanation of Files" Microsoft Word document are included in **Appendix D**.

Field-ruggedized electronic tablets (iPads) were used during surface clearance and intrusive investigation to record item details, with locations confirmed by the tablet GPS. The UXO team leader ensured proper collection, recording, and storage of field data. GPS and other spatial data were transferred to and stored as GIS databases. GIS files were stored on a separate directory and backed-up on a regular basis. The electronic files produced are securely stored in a project specific directory on EA's server. Access to these files is limited to personnel with key responsibilities to the project. These electronic files are backed up on a regular schedule.
Hardcopy data, such as logbooks, were scanned into electronic format as a backup. Field documentation is provided in **Appendix A** and Dig Sheets are provided hard copy in **Appendix F** and electronically in **Appendix D**. Representative project photographs are presented in **Appendix B** and electronically in **Appendix D**.

3.5 INTRUSIVE QUALITY CONTROL

In addition to the GSV QC program discussed in Section 3.1.4, other QC checks were performed for intrusive operations. These included daily testing of instruments (e.g., metal detectors, GPS,

etc.), 100 percent excavation area checks by the team leader, and 10 percent QC checks performed by the UXOQCS. As defined in the MMRP UFP-QAPP, a failure was defined as an occurrence where an excavation had more than five metal pieces or metal greater than 3 in. in any dimension remaining at the anomaly location. Additionally, in accordance with the MMRP UFP-QAPP, the UXOQCS implemented the three-phase control process for each DFW. The UXOQCS performed inspections and completed initial and follow-up forms documenting the completion of this QC process (**Appendix A**).

No QC failures were identified during intrusive activities on land or water.

The USACE OESS provided oversight and performed QA throughout the RI field activities. Upon completion of QC by the UXOQCS following intrusive investigation, the USACE OESS completed a QA inspection. Final QA of the intrusive data was performed by the USACE geophysicist through review and approval of the AGC DUA, AGC Validation Report, AGC Verification Report, and Intrusive DUA provided in **Appendix C**.

3.6 FIELD CHANGE REQUESTS

No field change requests were completed during this project.

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0 450 900
Feet

N

Legend

- Approximate 60 Foot Depth Line
- IVS Location
- DGM Grid (100ft x 100ft)
- DGM Marine Area (Former Docks)
- DGM Shoreline Area
- Dump SIte
- Fill Area
- Former Dock
- Former Causeway
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 3-1
FUDS GEOPHYSICAL SURVEY AREAS

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 10/03/2018
Aerial - EA, April 2020

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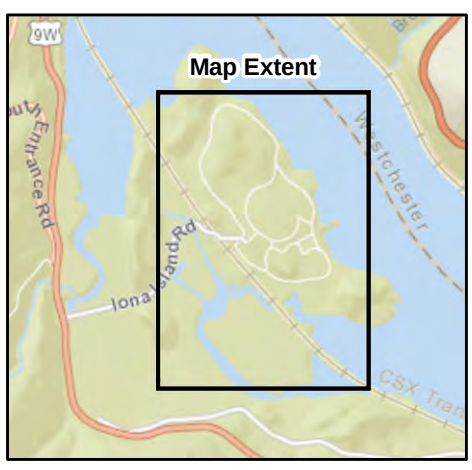

0 250 500
Feet

N

Legend

- IVS Location
- DGM Grid (100ft x 100ft)
- DGM Marine Area
- DGM Shoreline Area
- Dump Site
- Fill Area
- Former Dock
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 3-2
MRS-01 EM61 DATA

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 01/16/2019
Aerial - EA, April 2020

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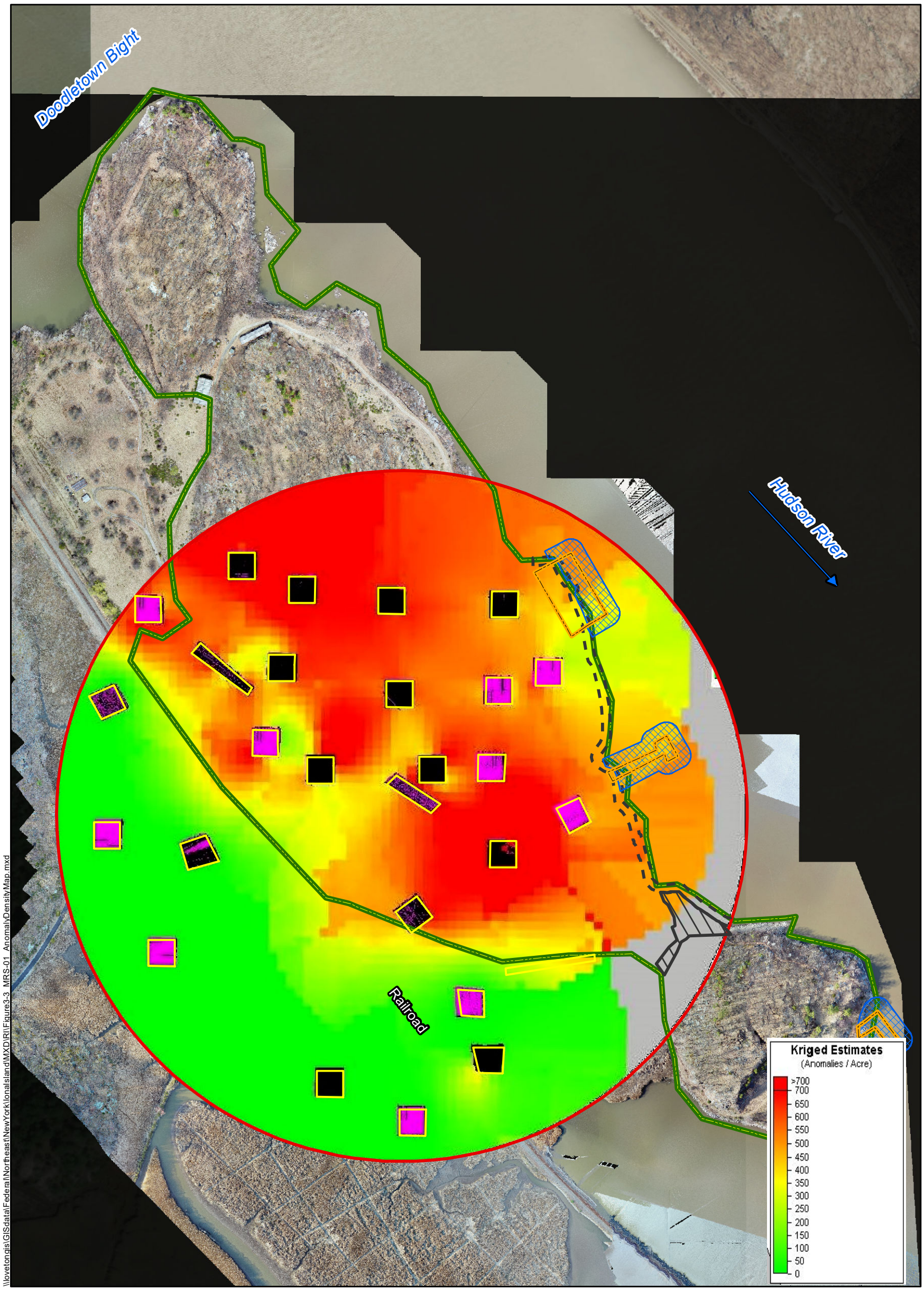

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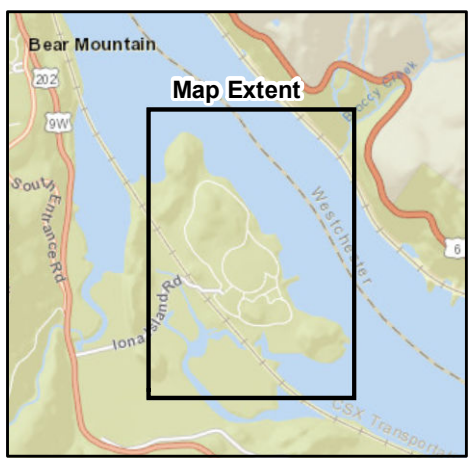

0 450 900
Feet

N

Legend

- DGM Marine Area
- DGM Shoreline Area
- Dump Site
- Former Dock
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 3-3
MRS-01 ANOMALY DENSITY MAP

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 11/19/2020
Aerial - EA, April 2020

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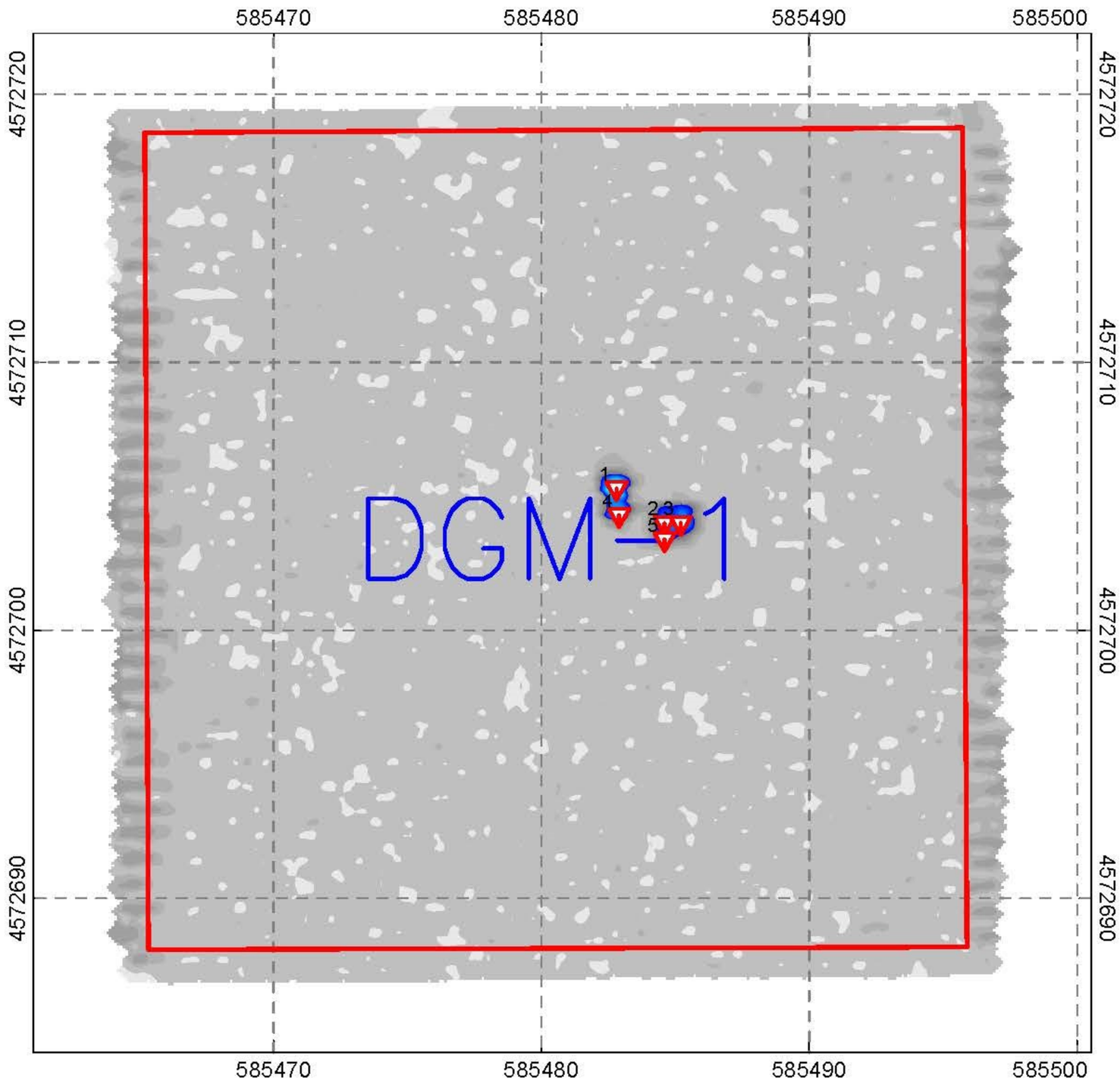
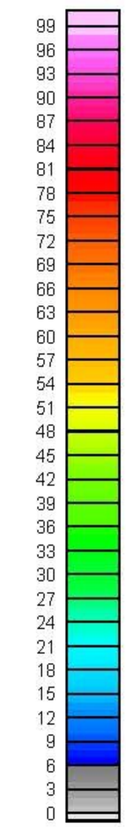
NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Underground Geophysical Surveys





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-1XXX, eg. DGM-1002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Figure 3-4 DGM Map of Grid #1

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200331_G01_DGM1_E01A
Grid DGM-1
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/08/2020
Date of Survey: 03/31/2020

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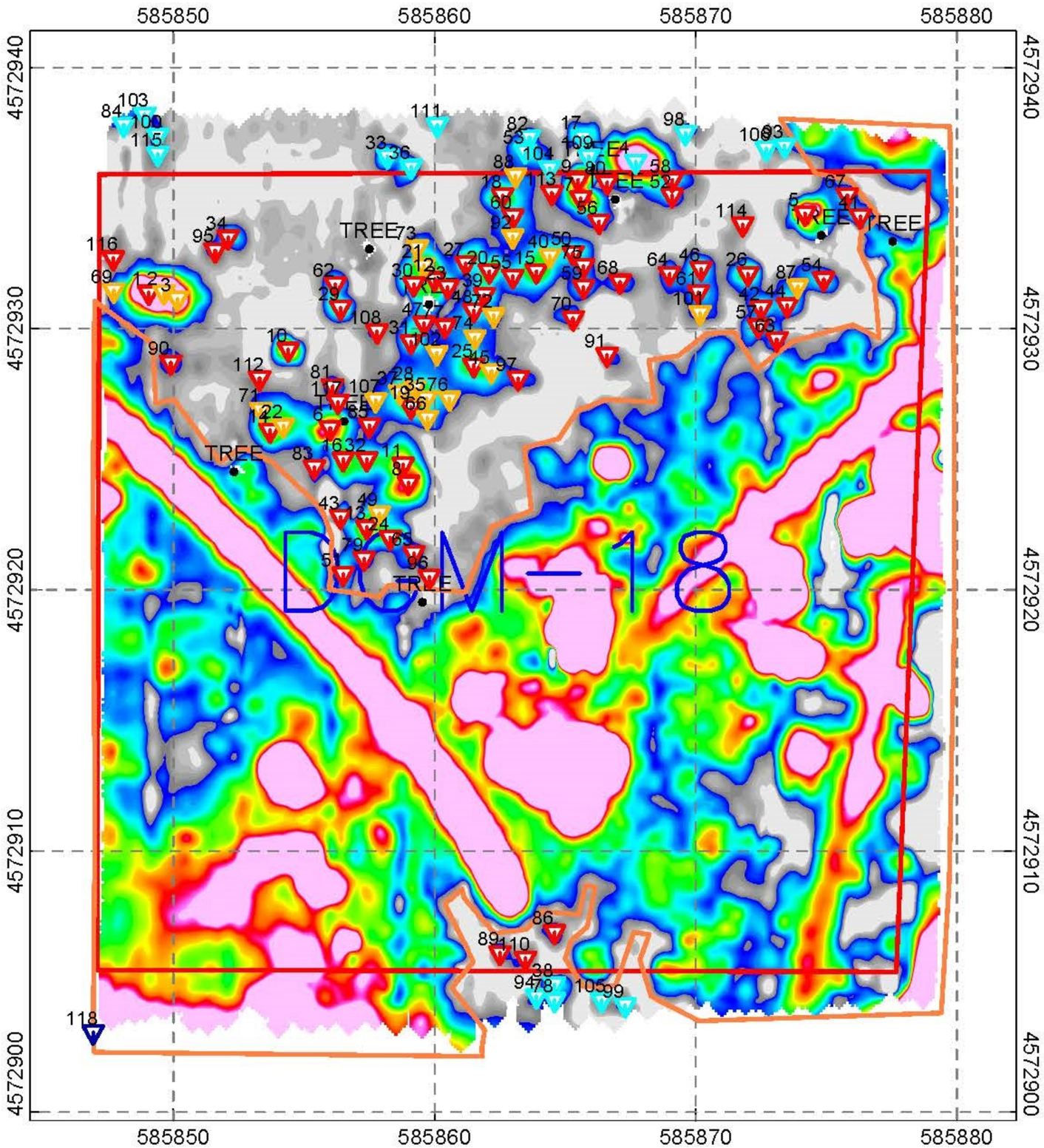
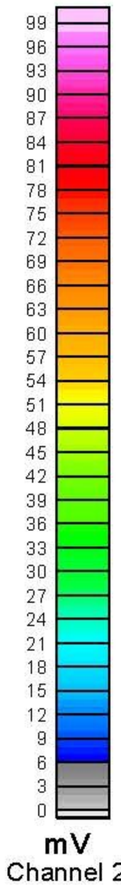
NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Subsurface Geophysical Surveys





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-18XXX, eg. DGM-18002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Figure 3-5 DGM Map of Grid #18

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200320_G01_DGM18_E01A
Grid DGM-18
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/07/2020
Date of Survey: 03/20/2020

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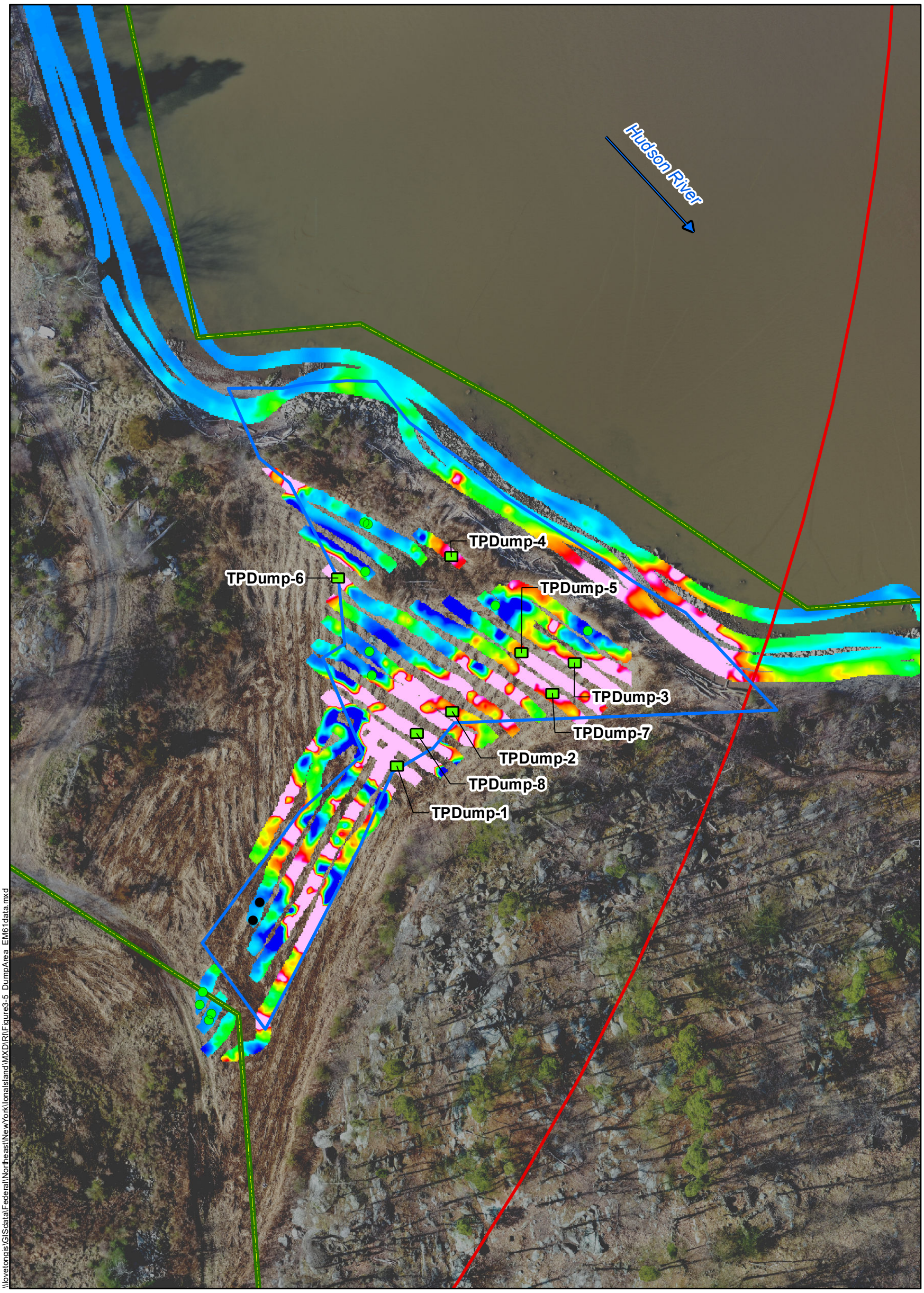

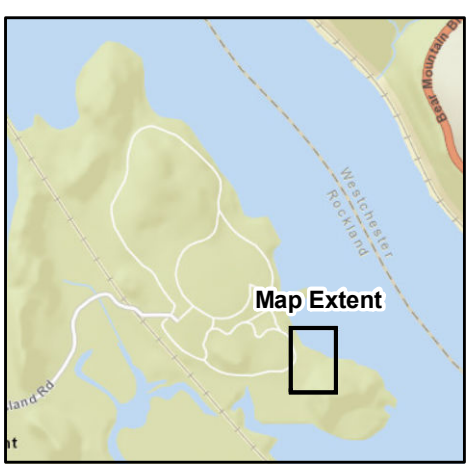

0 50 100
Feet

N

Legend

Anomaly Type

- MD
- NMRD
- OTHER
- Test Pit
- DGM Dump Survey Area
- FUDS Boundary
- MRS-01 1903 Explosion Area

149, 143, 137, 132, 126, 121, 115, 109, 104, 98, 92, 87, 81, 75, 70, 64, 58, 53, 47, 41, 36, 30, 25, 19, 13, 8, 2, -4, -9

CH4 (mV)

FIGURE 3-6
DUMP AREA EM61 DATA

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 11/19/2020
Aerial - EA, April 2020

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\R\IFigure3-5_DumpArea_EM61data.mxd

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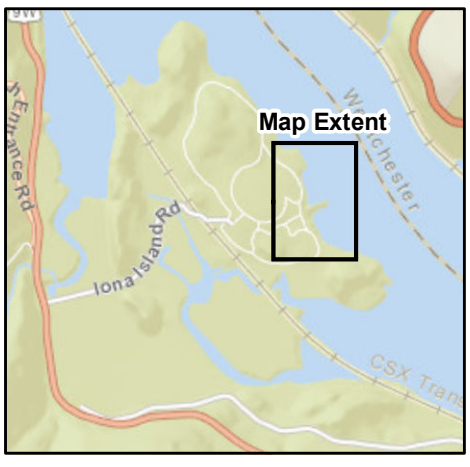

0 100 200
Feet

N

Legend

Anomaly Type

- MD
- NMRD
- OTHER
- Test Pit
- DGM Grid (100ft x 100ft)
- Dump Site
- Former Causeway
- Former Dock
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 3-7
SHORELINE EM61 DATA

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 11/19/2020
Aerial - EA, April 2020

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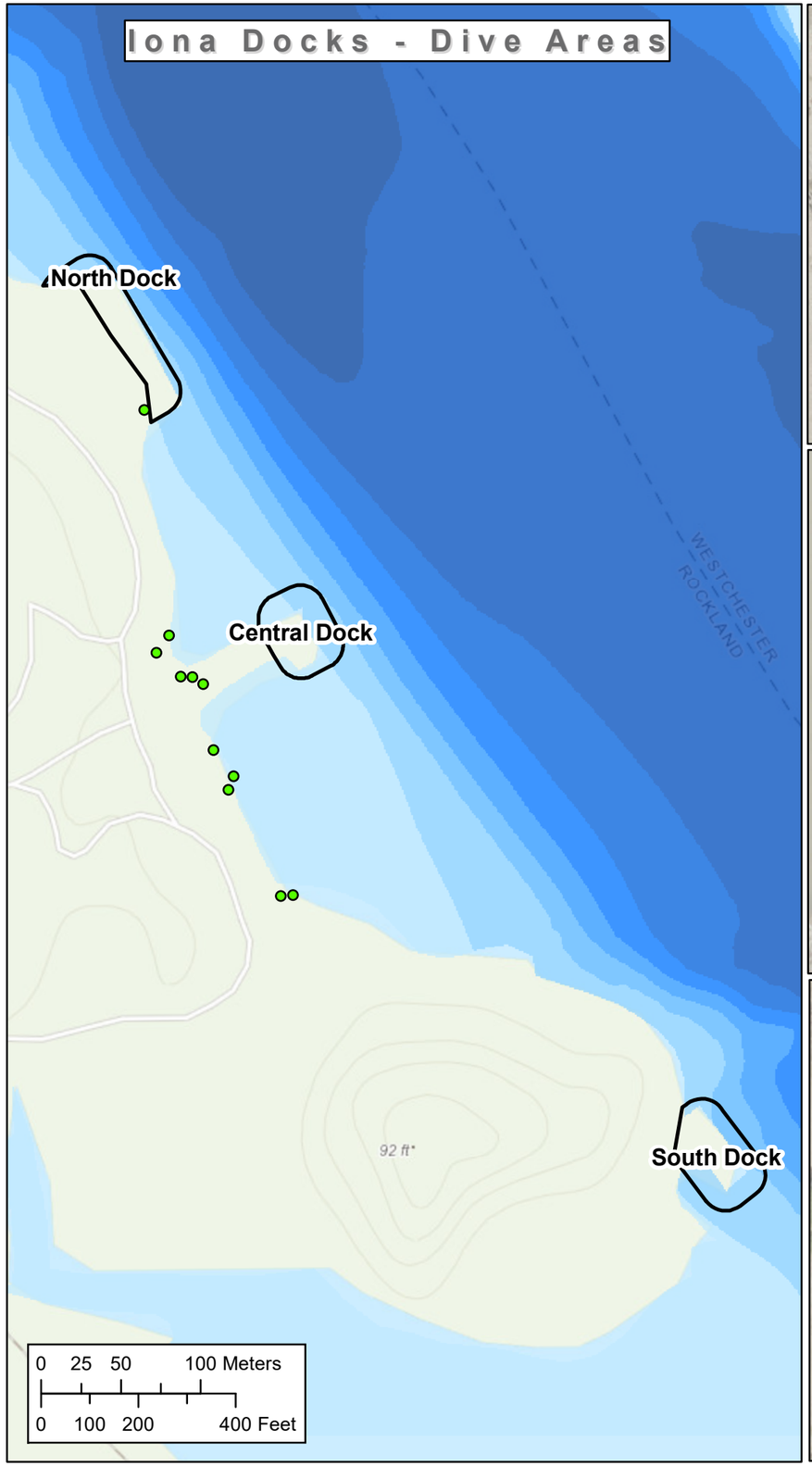

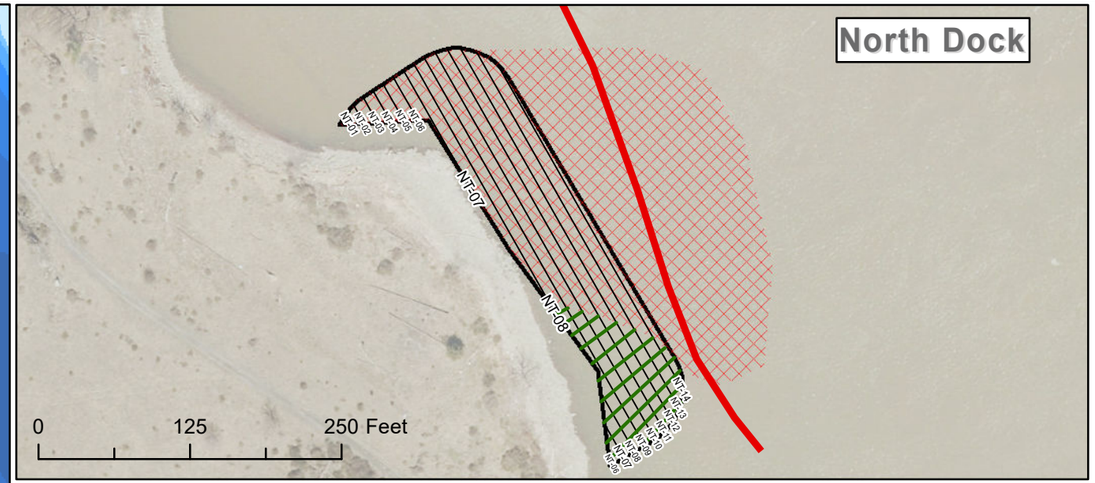

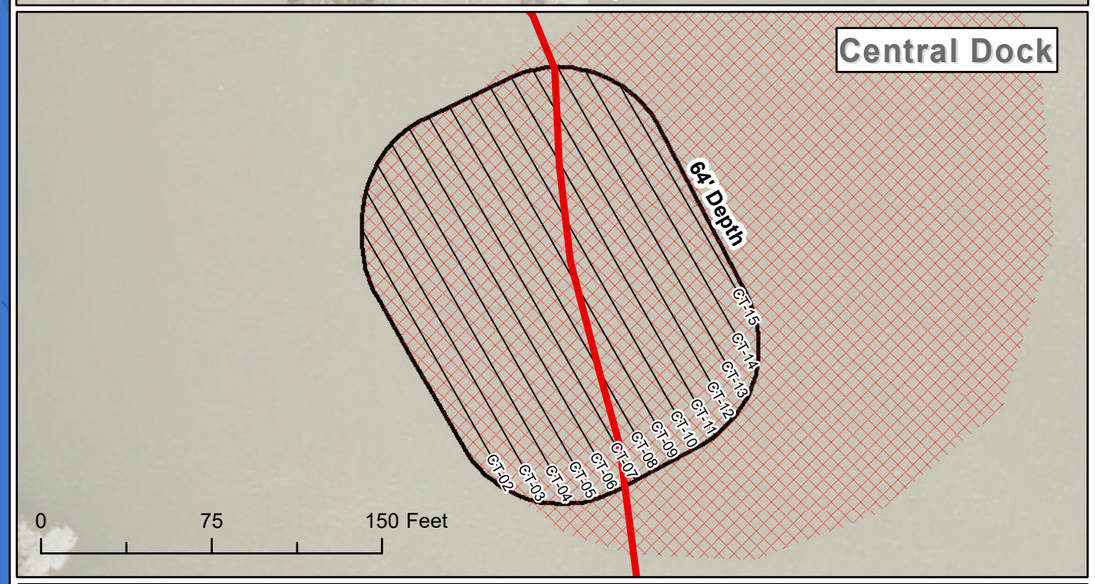

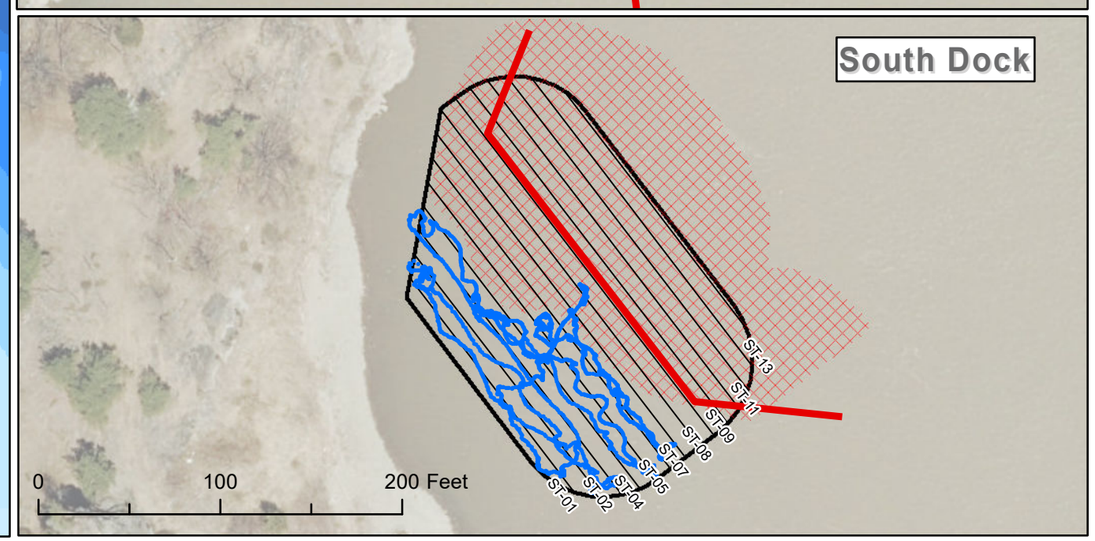

N

Scale Varies

Data is projected to the UTM Coordinate System: WGS 1984 UTM Zone 18N

Figure 3-8

Transects and Dive Targets

Iona Island Naval Ammunition Depot
Bear Mountain State Park

LEGEND

- Dive Areas
- Transects - 10ft
- Reacquisition Targets
- Walked Transects
- Diver Tracklogs
- Beginning of 65 Degree Slope
- Debris Field / Rubble

Bathymetry (meters NAVD88)

40m+	15-20
35-40m	10-15m
30-35m	5-10m
25-30m	0-5m
20-25m	Source - NYDEC 2013

US Army Corps of Engineers

Drawn By: NBrautigam	Scale: Scale Varies	Rev:	
Checked By:	Date Drawn: 9/29/2020		
Submitted By: NBrautigam	Revision Date:		

Path: Y:\Iona\GIS\MXD\ProductionMap_09092020.mxd

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Table 3-1 Digital Geophysical Mapping Data Analysis Grid Summary (Figure 3-2)

Grid ID	Grid Density Type	Area Mapped (Acres)	Area of SRAs (Acres)	Total Point Targets	Number of Type 1 TOIs	Total Type 1 Targets/Acre	TOIs to AGC	TOIs Intrusive	% SRA	No. SRA Pothole Trenches (10%)
1	Low	0.253	0.000	5	5	20	5	2	0%	0
2º	High	0.249	0.129	161	61	552	61	19	52%	5
3	High	0.238	0.187	95	62	1214	62	11	79%	8
4º	High	0.255	0.159	76	5	52	5	2	62%	6
5	Low	0.255	0.000	2	2	8	2	1	0%	0
6	High	0.247	0.096	197	133	880	133	32	39%	4
7º	High	0.254	0.017	226	82	352	82	24	7%	0
8	Low	0.247	0.000	3	2	8	0	2	0%	0
9	High	0.258	0.229	19	16	554	16	4	89%	9
10	High	0.252	0.167	121	74	869	74	13	66%	7
11º	High	0.235	0.232	27	6	1714	6	2	99%	10
12º	High	0.246	0.000	301	89	362	89	18	0%	0
13	Low	0.250	0.000	10	7	28	0	7	0%	0
14	High	0.261	0.069	200	123	643	123	30	27%	3
15	High	0.245	0.195	57	38	837	38	7	80%	8
16º	High	0.257	0.000	254	57	222	57	23	0%	0
17	Low	0.264	0.000	3	3	11	3	2	0%	0
18	High	0.261	0.191	117	73	1037	73	13	73%	7
19º	High	0.248	0.114	203	46	344	46	12	46%	5
20	High	0.205	0.200	56	30	5660	30	9	97%	10
21	Low	0.254	0.000	12	10	39	0	10	0%	0
22	High	0.256	0.246	26	12	1165	12	7	96%	10
24º	High	0.252	0.018	251	55	330	55	13	7%	1
25º	High	0.251	0.180	99	12	171	12	3	72%	7
26º	High	0.250	0.241	46	5	538	5	3	96%	10
27	Low	0.286	0.000	17	10	35	0	10	0%	0
28	Medium	0.255	0.000	53	31	122	0	31	0%	0
Totals	**27**	**6.783**	**2.669**	**2637**	**1049**	**260**	**989**	**310**	**39%**	**110**
Low Density	7	1.809	0.000	52	39	22	10	34	0%	0
Medium Density	1	0.255	0.000	53	31	122	0	31	0%	0
High Density	19	4.719	2.669	2532	979	606	979	245	57%	110
Dump Area	High	0.090	0.068	49	15	674	0	14	75%	8
Shoreline	Mix	0.420	0.130	45	33	114	0	33	31%	0

Note: º denotes grids where 6-pounder was used for the Target of Interest selection criteria

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Table 3-2 Advanced Geophysical Classification Summary

Grid ID	No. Cued	Category 0	Category 1	Category 2	Category 3	Flags with 2+ sources	No. "same as"	Percent to dig*
DGM1	5	0	5	0	0	0	5	100.0
DGM2	61	0	2	14	45	0	8	26.2
DGM3	62	0	2	5	55	0	8	11.3
DGM4	5	0	0	2	3	0	0	40.0
DGM5	2	0	2	0	0	0	2	100.0
DGM6	133	0	6	22	107	2	22	19.5
DGM7	82	0	4	16	63	1	5	23.2
DGM9	16	0	0	4	12	0	3	25.0
DGM10	74	0	2	10	62	0	12	16.2
DGM11	6	0	1	0	5	0	0	16.7
DGM12	89	0	3	16	71	1	28	20.2
DGM14	123	2	3	23	98	3	11	19.0
DGM15	38	0	2	3	34	1	4	10.5
DGM16	57	4	7	13	36	3	6	32.1
DGM17	3	0	3	0	0	0	2	100.0
DGM18	73	0	1	8	64	0	9	12.3
DGM19	46	4	1	6	35	0	1	16.7
DGM20	30	0	3	6	21	0	4	30.0
DGM22	12	1	1	3	7	0	0	36.4
DGM24	55	0	3	7	45	0	5	18.2
DGM25	12	0	2	2	8	0	4	33.3
DGM26	5	0	1	2	2	0	0	60.0
Total	**989**	**11**	**54**	**162**	**773**	**11**	**139**	**21.0**

***** Percent to dig does not include category 0 targets

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4. REMEDIAL INVESTIGATION RESULTS AND REVISED CONCEPTUAL SITE MODEL

The RI was performed as discussed in Section 3 during two mobilizations from March to August 2020. A discussion of the results is provided below. The dig sheets summarizing the intrusive data is provided in **Appendix F**. Intrusive results are summarized in **Tables 4-1** and **4-2**. **Figure 4-1** shows the anomaly distribution, by anomaly type (i.e., MD, NMRD, Other). All MPPEH discovered during the RI was ultimately inspected and certified as MDAS.

4.1 INTRUSIVE INVESTIGATION RESULTS

MRS 01

The only grids in MRS 01 that contained material related to past munitions use were DGM-2 and DGM-25, which are located near the 1903 explosion point-of-detonation (**Figure 4-2**). Each of these grids contained one piece of fragment from a 6-pounder projectile at 3 inches and 5 inches bgs, respectively. It should be noted that for these two grids, the 6-pounder projectile was used for the TOI selection criteria. It is likely these pieces of MD resulted from the 1903 explosion. None of the other grids surrounding the explosion or within MRS 01 resulted in munitions related material. The remaining anomalies that were intrusively investigated at MRS 01 resulted in blind seeds, or NMRD consisting primarily of former ammunition depot infrastructure related debris such as reinforced concrete, pipes, nails, cables, railroad spikes and other miscellaneous construction debris. The depths of debris ranged between surface to 48 inches bgs. Although not recorded as part of the intrusive investigation, depth to bedrock in the MRS 01 grids (upland portion) was observed to be from ground surface to 48 inches bgs. Based on the distribution of fragmentation, the impacted area from the explosion is likely very limited to the area immediately surrounding the point of detonation.

Dump Area

No MEC or MD were found during the intrusive investigations at the Dump Area. Only NMRD was identified that included metal debris that appeared to have been thermally destroyed (i.e., burn debris and ash), concrete slabs, and pipes. This area is considered not impacted by MEC. Bedrock was not encountered during intrusive operations at the Dump Area.

Water Investigation

No MEC or MD were found during the dive operations at the three former docks or along the shoreline. Only NMRD was identified that included metal debris, concrete rubble, rebar, and pipes. These areas are considered not impacted by MEC.

4.2 TYPES OF MUNITIONS RELATED ITEMS FOUND

The MD found during the RI included fragmentation from 6-pounder projectiles within MRS 01. No MEC was identified during the RI at any of the investigation areas. **Table 4-3** summarizes the

MEC and MD found during the RI. In addition to the two pieces of fragmentation, the land-based grids in MRS 01 contained NMRD that included former building and infrastructure debris such as wire, nails, metal scrap, sections of pipe, reinforced concrete, bolts, railroad spikes, machine parts, bricks, and other debris. The entire former dock footprints and the 50-ft buffer surrounding the former dock footprints were comprised of dock rubble, reinforced concrete, metal debris, and sections of pipe. The shoreline anomalies resulted in only metal debris and pipes being found. The Dump Area resulted in concrete slabs, pipes, burned metal debris, and ash.

4.3 DGM ANOMALY, MEC, AND MD DISTRIBUTION AND DENSITY

The distribution and density of anomalies identified during the DGM survey at MRS 01 is shown on **Figure 4-1** and **Figure 3-3**, respectively. There are two distinct areas within MRS 01 with different anomaly densities. The 67-acre upland area that has an average anomaly density of greater than 600 anomalies/acre and an estimated 38 acres of SRAs (extrapolating the data from the DGM grids to the entire upland area). The 43-acre marsh area has an average anomaly density of 4.5 anomalies/acre after accounting for blind seeds and duplicate targets, and no SRAs.

All the MD identified during the RI were found near the 1903 explosion point-of-detonation (**Figure 4-2**). A total of 313 subsurface anomalies and 110 test pits were intrusively investigated in MRS 01. Of the 423 anomaly locations, 2 anomaly locations were attributed to MD. Based on the intrusive data collected during the RI, the VSP rate estimate for MEC is zero MEC per acre over the MRS 01 footprint, and 4 MD items per acre immediately surrounding the 1903 explosion area point-of-detonation. No MEC or MD was identified at the former docks, the shoreline, and the Dump Area; therefore, the rate estimate for MEC at each of those sites is zero MEC per acre.

4.4 MUNITIONS CONSTITUENTS

No sources for MC were identified during the MMRP RI (e.g., breached munitions) and therefore MC sampling was not conducted during the execution of the MMRP RI. MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation.

4.5 REVISED CONCEPTUAL SITE MODEL

The information collected during the RI was used to update the CSM and identify all actual, potentially complete, or incomplete source-receptor interactions for the site, for both current and reasonably anticipated future land uses. An exposure pathway is the mechanism by which a chemical or physical agent takes from a source to a receptor. Each pathway includes a source, activity, access, and receptors. A summary of the updated CSM is presented in **Figure 4-3**.
The activity, access, and receptors have not changed from the Interim CSM (refer to Section 2.1); however, an exposure pathway is contingent on a source being present. At MRS 01, historically and during the RI, only MD were identified and none of the items found were determined to be MEC. Based on the results of the RI, it is anticipated that future encounters with similar munitions related material identified at MRS 01 would also be MD, however, the occurrence of fragmentation

from the 1903 explosion is indicative of potential MEC and as such the presence of MEC at MRS 01 cannot be ruled out. There is no evidence of CWM being used or present at this FUDS.

At the former docks, the entire former dock footprints and the 50-ft buffer areas surrounding the former docks are saturated with former dock debris (concrete rubble, rebar, railroad rails, and pipes), and no MEC or MD was identified. Anecdotal information presented in the ASR implied munitions may have been dumped or accidentally dropped during the loading of ships, however, no evidence of discarded military munitions was identified during the dive operations and the area is presumed not to be impacted by MEC.

Similar to the former docks, no MEC or MD was identified along the shoreline downstream from the former docks or adjacent to the former docks and all of the anomalies investigated resulted in debris from the former docks or depot infrastructure (pipes, railroad rails, miscellaneous metal debris) and a MEC source does not appear to be present and the shoreline is presumed not to be impacted by MEC.

At the Dump Area, no MEC or MD was identified and only concrete slabs, pipes, burned metal debris, and ash were present. Based on the proximity of the Dump Area to the former incinerator, it appears that the material buried in the Dump Area is primarily composed of burned debris from the incinerator. Based on a lack of evidence of MEC or MD, the Dump Area is presumed not to be impacted by MEC.

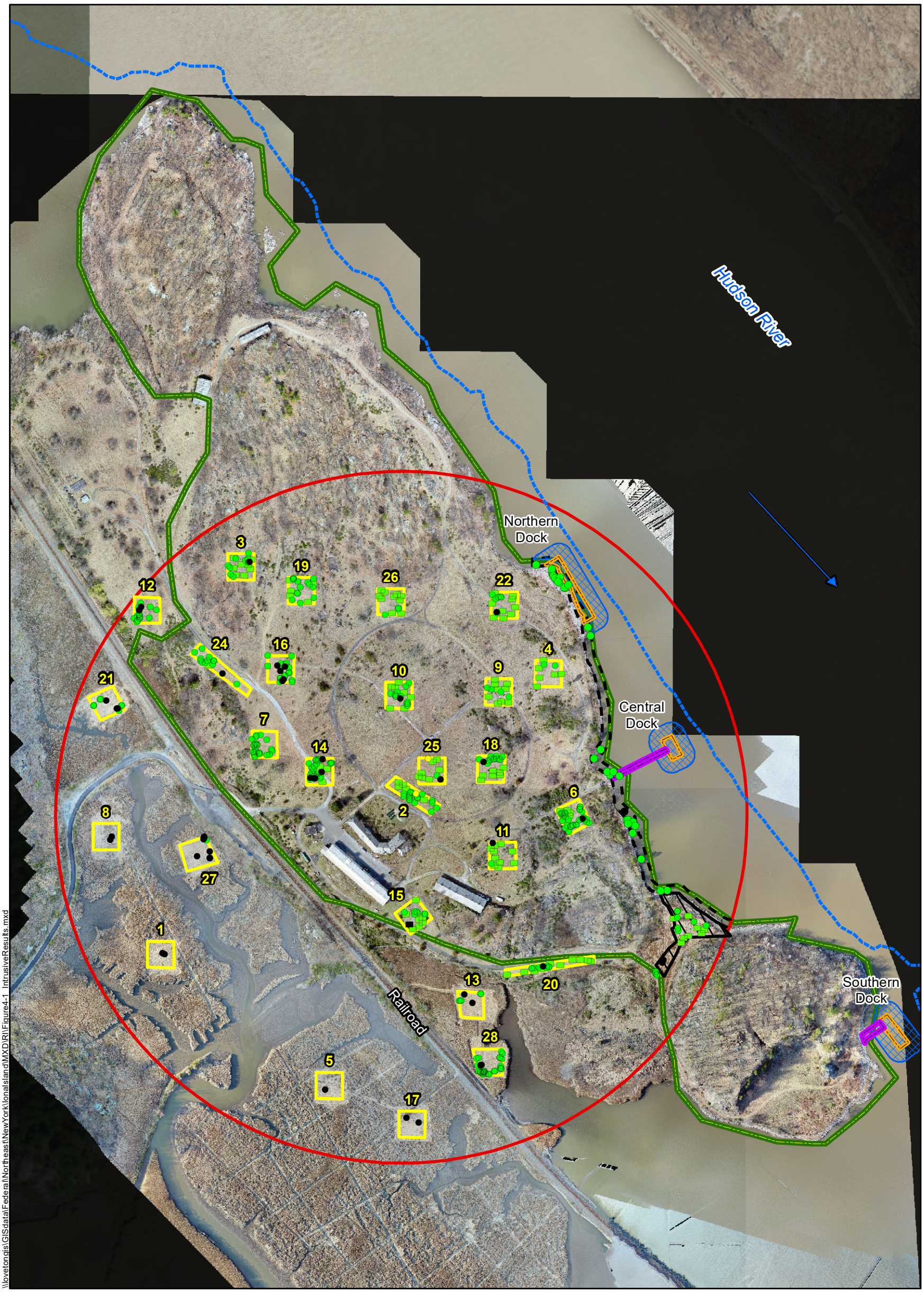
Based on the results of the RI, the presence of fragmentation is indicative that MEC may potentially be present at MRS 01 Explosion Area. Therefore, the exposure pathway for MEC at MRS 01 is potentially complete. No sources for MC were identified during the MMRP RI (e.g., breached munitions). MC sampling and the exposure risk to human and ecological receptors associated with explosives and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation.

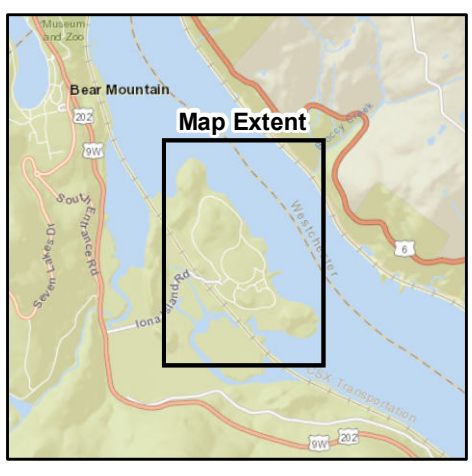
4.6 DATA USABILITY ASSESSMENT

This section documents the DUAs for each phase or stage of investigation namely, dynamic detection survey, cued survey, and intrusive investigation. The DUAs were performed following each phase, using the outputs from data verification and data validation. It is the data interpretation part of each phase, which involves a qualitative and quantitative evaluation of data to determine if the project data are of the right type, quality, and quantity to support the decisions that need to be made. The DUA evaluates whether underlying assumptions used during systematic planning for DGM operations are supported, sources of uncertainty have been accounted for and are acceptable, data are representative of the population of interest, DQOs have been met, and the results can be used as intended, with the acceptable level of confidence.

The DUAs performed after each phase of the field investigation (presented in **Appendix C**) support the conclusion that the data is usable and can be used as intended. These DUAs included reviews of various reports and data outputs for completeness and conformance with SOPs and the

UFP-QAPP such as the instrument assembly checklists, IVS Memorandum, field data sheets/field notes, daily processing reports, QC Seed Report, Anomaly Selection Report, DGM and AGC raw and processed data deliverables, ranked dig list, completed dig packages, Target Classification Report, SUXOS and UXOQC/SO daily reports and inspection reports, MDAS destruction forms, and the project database. A review was performed of the each of the individual DUAs and MMRP UFP-QAPP Worksheet #11 DQOs (Step 1 of the DUA) and Worksheet #12 MPCs (Step 2 of the DUA). All of the DQOs were met and all underlying assumptions were valid. A review of the data verification and data validation reports and MPCs indicate the data is in conformance with the MMRP UFP-QAPP (just two MPC failures the RCA/CAs determined did not affect data quality). The data is considered usable as intended and the updated CSM is presented in Section 4.5 of this report (Step 3 of the DUA). Step 4 includes the preparation of the data usability summary report(s), which is included in **Appendix C**. No changes to the DQOs or sampling design were recommended as a result of the DUA.





0 450 900
Feet

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Anomaly Type

- MD
- NMRD
- OTHER
- Test Pit
- Approximate 60 Foot Depth Line
- DGM Grid (100ft x 100ft)
- DGM Marine Area (Former Docks)
- DGM Shoreline Area
- Dump SIte
- Former Dock
- Former Causeway
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 4-1
INTRUSIVE RESULTS

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 11/19/2020
Aerial - EA, April 2020

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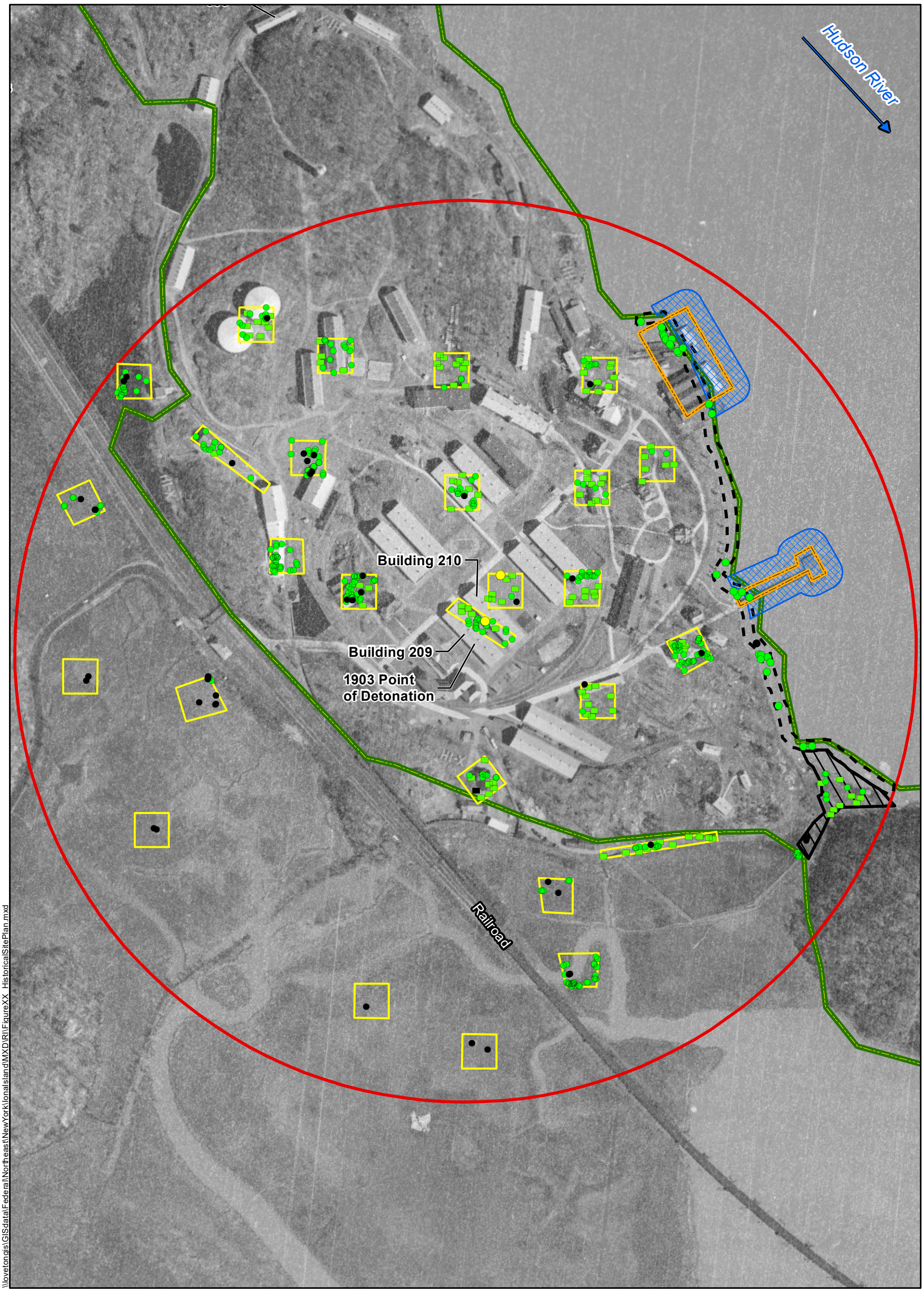

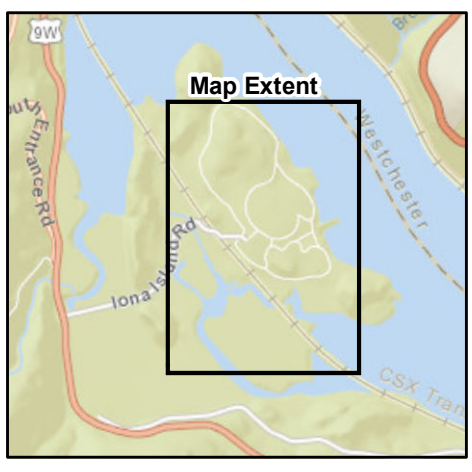

0 250 500
Feet

N

Legend

Anomaly Type

- MD
- NMRD
- OTHER
- Test Pit
- DGM Grid (100ft x 100ft)
- DGM Marine Area
- DGM Shoreline Area
- Dump Site
- Former Dock
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE 4-2
HISTORIC SITE PLAN

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 11/19/2020
Aerial - 1940

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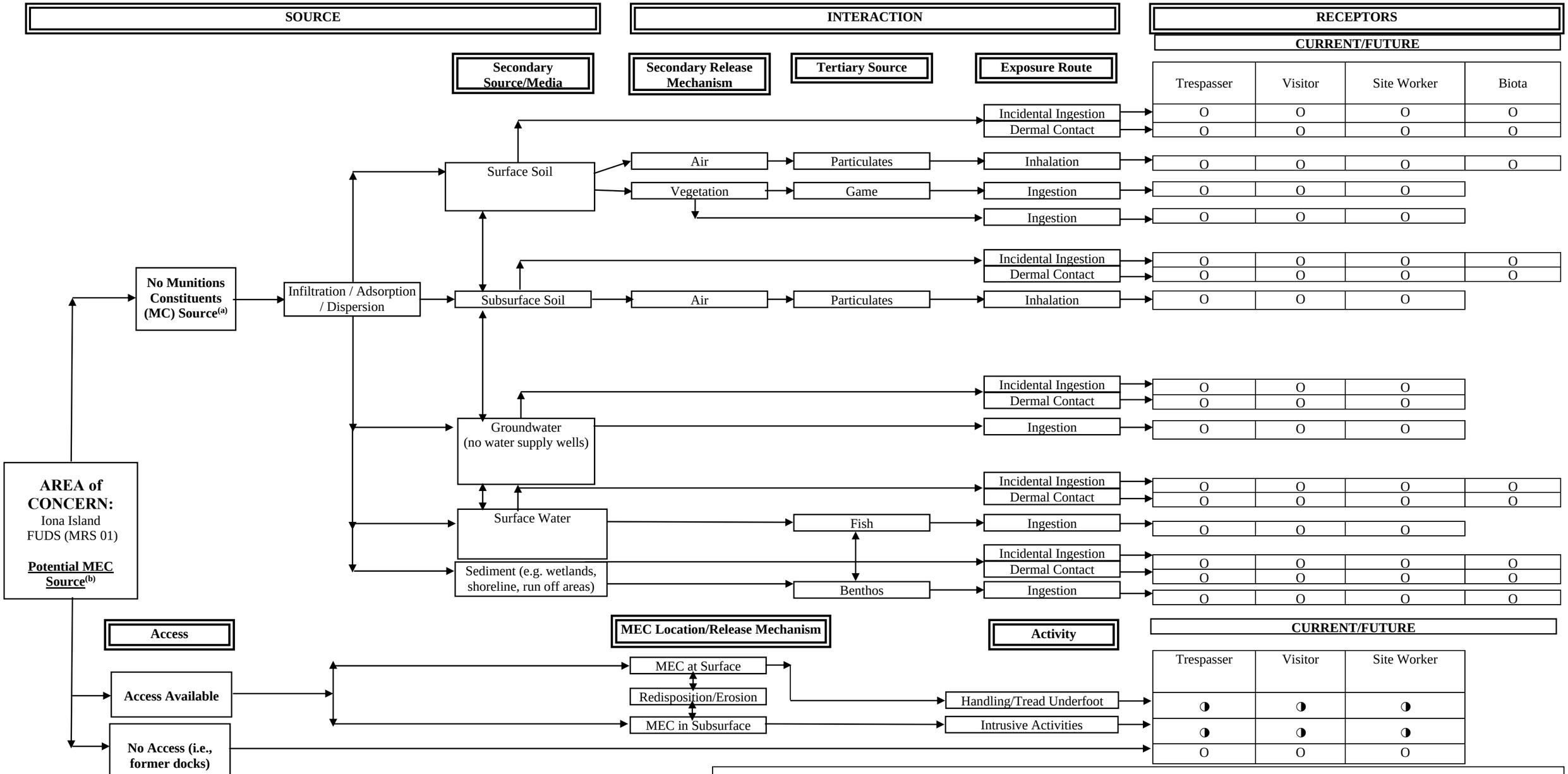

LEGEND

● Complete Pathway

◑ Potentially Complete Pathway

O Incomplete Pathway (no expected exposure)

FIGURE 4-3 REVISED CONCEPTUAL SITE MODEL FOR IONA ISLAND NAVAL DEPOT MMRP FUDS

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM1110-1-1200.

NOTE:

(a) A primary MC source such as breached MEC has not been identified onsite. MC attributed to former DoD usage is being evaluated as a part of the HTRW investigation

(b) A primary MEC source has not been identified onsite following the RI, however, MD indicative of MEC was identified.

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Table 4-1 Summary of Single-Point Anomaly Intrusive Results

Location	Total TOIs Investigated	MEC	MD	NMRD	Other[a]	QC/QA Seeds
MRS 01	313	0	2	268	11	32
Dump Area	13	0	0	11	2	NA
Shoreline	33	0	0	19	14	NA
Total	**359**	**0**	**2**	**298**	**27**	**32**

a. Other also includes No Finds, Same As, TOIs that were too deep to excavate (i.e., greater than 48 in.), and the TOIs within the former dock footprints (shoreline anomalies only).

Table 4-2 Summary of Saturated Response Area Test Pit Excavation Results

Location	Total Test Pits Investigated	MEC	MD	NMRD	No Finds
MRS 01	110	0	0	110	0
Dump Area	8	0	0	8	0
Total	**118**	**0**	**0**	**118**	**0**

Table 4-3 Summary of Munitions Items Found During the Remedial Investigation

Description	Surface		Subsurface		Total
	MEC	MD	MEC	MD	
Land-MRS 01					
6-pounder projectile fragmentation	0	0	0	2	2
Land-Dump Area					
No munitions items found	0	0	0	0	0
Water-Former Docks					
No munitions items found	0	0	0	0	0
Water-Shoreline					
No munitions items found	0	0	0	0	0
Total	**0**	**0**	**0**	**2**	**2**

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5. RISK MANAGEMENT METHODOLOGY EVALUATION

This section presents the Risk Management Methodology that was completed for MRS 01. The Risk Management Feedback Form and Risk Management Methodology Matrixes completed for the MRS are provided in **Appendix G**. For reference, the munitions technical data sheets for the types of munitions associated with the MD identified at the MRSs are provided in **Appendix H**.

5.1 RISK MANAGEMENT METHODOLOGY

The MEC risk characterization was conducted using the methodology included in the study paper *Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop Remedial Action Objectives for MRS* (USACE 2016). This methodology has three main purposes: to provide decision logic to differentiate acceptable versus unacceptable site conditions at MRSs; to establish a systematic approach for developing remedial action objectives; and to assist in developing acceptable response alternatives to meet the remedial action objectives. The methodology utilizes MRS characteristics of Accessibility, Sensitivity, and Severity to illustrate site-specific conditions, and assign acceptable versus unacceptable scenarios for each MRS.

The methodology contains a series of risk matrices that use site-specific CSM data to relate accessibility, munitions sensitivity, and severity of an explosive event if it were to occur, to determine baseline risks. The following matrices are included as **Appendix G**:

- **Matrix 1—**The "Likelihood to Encounter" relates the site characterization data for the amount of MEC potentially present to site use, including accessibility, in order to determine the likelihood of encountering MEC at a specific site. "Amount of MEC" is determined using site-specific characterization data or anticipated or completed results of a remedial action. "Access Conditions" are selected based on considerations of the access and frequency of use for the MRS.

- **Matrix 2—**The "Severity of an Incident" relates the "Likelihood of Encounter" from Matrix 1 to the severity of an unintentional detonation. Unlike the two factors affecting the "Likelihood of Encounter" in Matrix 1, the "Severity" factor in Matrix 2 is a static characteristic of each of the munitions known or suspected to exist at the property.

- **Matrix 3—**The "Likelihood of Detonation" relates the sensitivity of site-specific munitions items to the likelihood for energy to be imparted on an item, such that the interaction results in detonation (an incident). The "sensitivity" of a munitions item is alone a static component, inherent to the known or suspected munitions present at the site. The likelihood to impart energy is selected from the known activities at the site that may cause an interaction that results in energy being imparted on a munitions item by human activity.

- **Matrix 4—**represents the overall risk for the site and differentiates "acceptable" from "unacceptable" conditions. This is determined based on the likelihood of an encounter

(Matrix 1), with consideration given to the severity of the incident (Matrix 2), combined with the likelihood of an interaction that results in detonation (Matrix 3). This matrix identifies acceptable conditions, which become possible remedial action goals that are ultimately achievable (via remedial response actions) for all portions of the MRS.

5.2 SUMMARY OF RISK EVALUATION FOR MUNITIONS RESPONSE SITE 01

During previous investigations and during the RI, no MEC was identified at MRS 01. MD from a 6-pounder projectile was identified at MRS 01 during the RI. Historically and during previous investigations at MRS 01, only empty, inert, or expended munitions have been documented and no live munitions nor explosives of concern have been found. Based on the results of the RI that no MEC and very little MD has been found over the 120 years since the 1903 explosion and the limited access conditions at Iona Island, it is anticipated that future encounters with munitions related items identified at MRS 01 are unlikely and would also be MD and unlikely to result in MEC.

In accordance with the DQOs presented in the MMRP UFP-QAPP, sufficient area was investigated during the RI to support the conclusions presented in the Risk Management Methodology. **Appendix G** includes the matrix tables for MRS 01, and the explanation of the justification used for each matrix choice. Below is a summary of the evaluation of MRS 01 for Matrixes 1 through 4 of the Risk Management Methodology.

For Matrix 1—Likelihood of Encounter— No MEC has been found and all MD identified to date has been empty and free of explosives. VSP was used to determine the upper limit of MEC density at the 1903 explosion MRS 01. Approximately 6.8 acres were investigated and no MEC were identified. Based on the VSP parameters and RI results, the upper limit of MEC at the site is no greater than 0.44 MEC per acre at 95 percent confidence. Additionally, potential MEC presence at MRS 01 is based on a one-time event (1903 explosion) rather than continuous use such as a firing range, and as such the potential amount of MEC is likely much lower than the upper limit of the VSP calculation. Combined with the low percentage of munitions debris encountered during the RI (0.2 percent of all anomalies characterized with AGC or intrusive investigations) the number of residual MEC present is likely much closer to zero. Site access is limited to authorized employees of Bear Mountain State Park who use a few of the remaining buildings for storage, to researchers who work in the marsh areas, to guided tour groups six to eight times a year between May and October, and to trespassers. The Island is partially fenced, and the main gate is unmanned during normal working hours, which allows for limited access to Iona Island from Bear Mountain State Park. Boating along the Hudson River is open to the public, and because the shoreline of Iona Island is not fenced, there is potential for recreational users of the Hudson River/trespassers to access the Island via the shoreline. Based on current and anticipated future users, and access conditions, MRS 01 frequency of use is considered “Intermittent” (e.g., some irregular use, or access limited). Based on these factors, the likelihood of encounter with MEC is considered “Unlikely” for this matrix. The Matrix 1 output of an “Unlikely” encounter of MEC at Iona Island is used as an input for Matrix 2.

For Matrix 2—Severity of Explosive Incident— No MEC has been documented at MRS 01 in the 117 years since the 1903 explosion and all MD identified to date has been inert or expended. However, if based on the "Unlikely" occurrence that a 6-pounder high explosive (HE) projectile was encountered and it exploded, injury would be considered "Critical" resulting in potential death. Based on these factors, the severity of an explosive incident results in a Category "D" for this matrix. The Matrix 2 output of "D" for Severity of Incident is used as an input for Matrix 4.

For Matrix 3—Likelihood of Detonation— No MEC has been documented at MRS 01 and all MD identified to date has been inert or expended. The types of munitions potentially associated with the 1903 explosion (i.e., 1-pounder, 6-pounder, 6-inch and 13-inch HE projectiles) are not considered sensitive and would therefore be classified as "Moderate" sensitivity. Based on the current use of MRS 01, which is a state park not planned for development and where digging is manual or limited, the likelihood to impart energy on an item is considered "Modest". Based on these factors, the likelihood of detonation results in a Category "2" for this matrix. The Matrix 3 output of "2" for Likelihood of Detonation is used as an input for Matrix 4.

For Matrix 4—Acceptable and Unacceptable Site Conditions—Based on I result from Matrix 2 ("D") and the result from Matrix 3 ("2"), the Matrix 4 output indicates current conditions at MRS 01 are *"***Acceptable" (i.e., no unacceptable risk)**.

Based on the completion of the Risk Management Methodology evaluation, MRS 01 was identified as having **Acceptable** site conditions **(i.e., no unacceptable risk)**.

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6. MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL

This section presents application of the Munitions Response Site Prioritization Protocol (MRSPP) for MRS 01 based on the RI findings. The MRSPP tables are provided in **Appendix I**. A summary of the MRSPP tables is provided in Table 6-1.

6.1 BACKGROUND

In 2005, DoD published the MRSPP as a Federal Rule (32 CFR Part 179) to assign a relative risk priority to each defense site in the MMRP Inventory for response activities. These response activities are based on the overall conditions at each MRS, taking into consideration various factors related to explosive safety and environmental hazards. The application of the MRSPP applies to all the following locations:

- Locations that are or were owned, leased to, or otherwise possessed or used by the DoD.
- Locations that are known to or are suspected of containing MEC or MC.
- Locations that are included in the MMRP Inventory.

In assigning a relative priority for response activities, the DoD generally considers MRSs posing the greatest hazard as being the highest priority. The MRSPP priority will be one factor in determining the sequence in which munitions response actions are funded. The following sections are a brief summary of the modules of the MRSPP and the results of the evaluations for this RI. As noted in Section 2, no potential sources of MC were identified during the MMRP RI (e.g., breached munitions). Analytical sampling results and the exposure risk to human and ecological receptors associated with explosives constituents and metals attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation and included in the HTRW RI Report.

6.2 EXPLOSIVE HAZARD EVALUATION MODULE

The Explosive Hazard Evaluation (EHE) module assesses the explosive hazards of a site based on the known or suspected presence of an explosive hazard. The EHE Module is composed of three factors, each of which has two to four data elements that were intended to assess the specific conditions at an MRS. Based on the site-specific information, each data element is assigned a numeric score and the sum of these values is the EHE Module score and is used to determine the corresponding EHE Module rating. The data elements are as follows:

- **Explosive Hazard Factor**—This factor includes the data elements Munitions Type and Source of Hazard and constitutes 40 percent of the EHE Module score.

- **Accessibility Factor**—This factor includes the data elements Location of Munitions, Ease of Access, and Status of Property and constitutes 40 percent of the EHE Modules score.

- **Receptor Factor**—This factor includes the data elements Population Density, Population Near Hazard, Types of Activities/Structures, and Ecological and/or Cultural Resources and constitutes 20 percent of the EHE Module Score.

Based on RI results, there is very little evidence that MEC may be present at MRS 01; therefore, the MRS received the EHE Module rating No Known or Suspected Explosive Hazard.

6.3 CHEMICAL WARFARE MATERIEL HAZARD EVALUATION MODULE

The Chemical Warfare Material (CWM) Hazard Evaluation (CHE) module provides an evaluation of the chemical hazards associated with the physiological effects of CWM. The CHE Module is used only when CWM in the form of MEC or MC are known or suspected of being present at an MRS.

Similar to the EHE Module, each data element is assigned a numeric value, and the sum of these values is the CHE Module score that is used to determine the corresponding CHE Module rating. If CWM is not known or suspected, then the CHE Module rating is No Known of Suspected CWM Hazard.

No historical or physical evidence was found during the RI that indicates CWM was present at MRS 01. Based on RI results, MRS 01 received the alternative CHE Module ratings of No Known or Suspected CWM Hazard for the CHE module.

6.4 HEALTH HAZARD EVALUATION MODULE

The Health Hazard Evaluation (HHE) module provides a consistent DoD-wide approach for evaluating the relative risk to human health and the environment posed by contaminants (i.e., MC) present at an MRS. The module has three factors that are as follows:

- **Contamination Hazard Factor—**This factor evaluates potential risk posed by contaminants and contributes a level of High (H), Medium (M), or Low (L) based on Significant, Moderate, or Minimal contaminants present.

- **Migration Pathway Factor**—This factor assesses the potential for MC or incidental contaminants to migrate from an MRS and contributes a level of H, M, or L based on Evident, Potential, or Confined pathways.

- **Receptor Factor**—This factor evaluates the presence of receptors that may be exposed and contributes a level of H, M, or L based on Identified, Potential, or Limited receptors.

The HHE builds on the DoD Relative Risk Site Evaluation framework. The HHE evaluation factors are based on quantitative evaluation of MC and/or CERCLA hazardous substances. It also includes a qualitative evaluation of pathways, human receptors, and ecological receptors in the surface soil, groundwater, surface water, and sediment. The HHE does not address subsurface

soils. In addition, the HHE does not consider air as a pathway due to the generally minimal risk through this medium from DoD munitions sites.

The H, M, and L levels for the three factors are combined in a matrix to obtain composite three-letter combination levels that integrate considerations of all three factors. The three-letter combination levels are organized by frequency and the combination of the frequencies result in the HHE Module Rating.

MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation. Therefore, the rating of "Evaluation Pending" was assigned to the HHE module.

6.5 MRSPP SCORES

Typically, an MRS is assigned an MRSPP Priority ranging from 1 to 8. Priority 1 indicates the highest potential hazard and Priority 8 indicates the lowest potential hazard. Only a site with a potential CWM Hazard can receive a Priority 1 rating. If no hazards are identified, an alternative rating of No Known or Suspected Hazard is assigned. The priority is determined by selecting the highest rating among the EHE, CHE, and HHE Modules. The overall MRSPP priorities for MRS 01 was determined as follows:

- EHE Rating of No Known or Suspected Explosive Hazard
- CHE Rating of No Known or Suspected CWM Hazard
- HHE Rating of Evaluation Pending.

Therefore, MRS 01 was assigned the MRS Priority rating Evaluation Pending.

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Table 6-1 MRSPP Summary[1]

MRSPP Table	Module	Classification	Description	Score
1	EHE	Evidence of no MEC	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
10	**EHE Module Total**			**No Known or Suspected Explosive Hazard**
11	CHE	Evidence of no CWM	Following investigation of the MRS, the physical evidence indicates that CWM are not present, or the historical evidence indicates that CWM are not present at the MRS	0
20	**CHE Module Total**			**No Known or Suspected CWM Hazard**
21-26	HHE		MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation.	Evaluation Pending
28	**HHE Module Total**		MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation.	**Evaluation Pending**
29	**MRS Priority**		The results from Tables 10 (EHE), 20 (CHE) and 28 (HHE) are presented in this table, and MRS Priority or Alternative MRS Rating results from the single highest priority result from these tables.	**Evaluation Pending**

[1]The complete MRSPP tables are presented in Appendix I.

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7. SUMMARY AND RECOMMENDATIONS

This section summarizes the key findings of the RI and presents recommendations based on the results of the RI at the Iona Island Former Naval Depot FUDS.

7.1 SUMMARY OF KEY FINDINGS

7.1.1 Munitions Response Site 01

The RI resulted in the collection, evaluation, and analysis of a large amount of data to characterize the Iona Island MRS 01 by determining the nature and extent of MEC resulting from the 1903 explosion. The information collected during the RI was used to revise the CSM and identify all actual, potentially complete, or incomplete source-receptor interactions for the site. In summary:

- At MRS 01, a DGM survey was performed to support the finding, at a 95 percent confidence level, that the upper limit of MEC is 0.44 MEC per acre within the MRS.
- A total of 2,637 single-point anomalies and 2.7 acres of SRAs were identified from the DGM data.
- VSP anomaly density kriging was utilized to identify high-anomaly density areas (upland/formerly developed areas of the Island) and low anomaly density areas (marsh).
- A total of 65 single-point anomalies were identified for intrusive investigation in the low and medium-anomaly density grids and 979 single point anomalies were identified for additional investigation using AGC in the high-anomaly density grids.
- AGC identified 245 additional anomalies for intrusive investigation in the high-anomaly density grids.
- A total of 310 single-point anomalies and 110 SRA test pits were intrusively investigated.
- Two MD fragments from 6-pounder projectiles were found in DGM grids near the 1903 explosion point-of-detonation.
- The remainder of intrusive results were primarily debris from former ammunition depot buildings and infrastructure (e.g., concrete, rebar, pipes, nails, bolts, railroad spikes and other miscellaneous debris) that ranged in depth from ground surface to 48 inches bgs.
- The depth to bedrock ranged from ground surface to greater than 48 inches bgs.
- No MEC was identified in MRS 01. Because no MEC was identified, no MC samples were collected or analyzed.

- No source for MC as a result of MEC (e.g., breached munition) was identified during the MMRP RI Phase I activities.

- MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation.

- A MEC baseline risk assessment using the Risk Management Module was performed resulting in a determination of no unacceptable risk for the site.

- Using the RI results to update the MRSPP, an alternative rating of Evaluation Pending was assigned to the MRS.

7.1.2 Former Docks and Shoreline

Based on anecdotal information it was alleged that munitions may have been dumped or accidentally dropped at the former loading docks during loading of supply ships. The RI resulted in the collection, evaluation, and analysis of a DGM and intrusive dive data to characterize the former docks and shoreline by determining the nature and extent of MEC. In summary:

- The debris from the former docks extends more than 50 ft away from the former dock footprints.

- There were 33 DGM targets identified along the shoreline transects, of which 19 were outside of the former dock footprints and were investigated by the dive team.

- No MEC or MD were identified during the dive operations. Because no MEC was identified, no MC samples were collected or analyzed.

7.1.3 Dump Area

Based on the ASR site visit, a 20-mm projectile casing was found along the shoreline where the Dump Area is located, and park maintenance workers reported sighting suspected munitions along the shoreline during low tide. The RI resulted in the collection, evaluation, and analysis of a DGM and intrusive data to characterize the Dump Area by determining the nature and extent of MEC. In summary:

- There were 13 DGM targets and 0.28 acres of SRAs within the survey area.

- All 13 DGM targets and 8 test pits within the SRAs were intrusively investigated.

- Intrusive investigation resulted in concrete slabs, pipes, burned metal debris and ash.

- Intrusive data indicates the depth of disposal in the Dump Area is greater than 3 ft bgs in certain areas (excavations could not go beyond 36 to 48 inches due to test pits filling with water).

- No MEC or MD were identified during the surface sweeps, DGM surveys, or intrusive investigation.

- Because no MEC was identified, no MC samples were collected or analyzed during the MMRP RI.

To date, no MEC has been identified at the Iona Island Naval Depot FUDS and the only MD documented were two pieces of fragmentation from 6-pound projectiles (found during the RI), a 6-pound projectile cartridge case, a signal flare, a 20-mm practice casing, and a fragment from a 3.5-in. rocket warhead (reported during the ASR). All items were expended or empty and had no visible explosive residue. Based on the results of the RI and all the previous findings at the FUDS, no MEC has ever been identified at Iona Island, nor is it anticipated in the future that MEC will be encountered.

7.2 RECOMMENDATIONS

Based on the MEC risk assessment performed as part of this RI, it is concluded that there are no unacceptable risks for the site (i.e., negligible risk is posed by the FUDS) . For unacceptable risks, and in accordance with 40 CFR Part 300.43(c)(i), the Lead Agency shall establish remedial action objectives; however, as there are no unacceptable risks associated with the current or reasonably anticipated future site conditions, no remedial action objectives were developed and no further action is recommended for the Iona Island Naval Depot FUDS under the MMRP. It is further recommended that the project bypass the FS and proceed directly to a No Action Proposed Plan and No Action Decision Document. MC sampling and the exposure risk to human and ecological receptors associated with explosives constituents and metals MC attributed to former DoD usage in environmental media is being evaluated as a part of the HTRW investigation.

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8. REFERENCES

Alion Science and Technology (Alion). 2008. *Final Site Inspection Report for the Iona Island Naval Ammunition Depot. DERP FUDS No. C02NY074403*. Prepared for US Army Engineering and Support Center, Huntsville and US Army Corps of Engineers (USACE) Baltimore District.

Bluestone Environmental Group, Inc. (Bluestone). 2018. Technical Memorandum Records Review and Site Visit; Former Iona Island Naval Ammunition Depot FUDS Project Number C02NY074402. February.

Bonnell, S.M. 1990. *Soil Survey of Rockland County, New York*. US Department of Agriculture, Soil Conservation Service, in cooperation with Cornell University Agricultural Experiment Station.

EA Engineering, P.C. and its affiliate EA Science and Technology (EA). 2019. *Uniform Federal Policy - Quality Assurance Project Plan, Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.* November. Prepared for US Army Corps of Engineers (USACE) New England and Baltimore Districts.

———. 2020. *Uniform Federal Policy - Quality Assurance Project Plan, Hazardous Toxic and Radioactive Waste, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.* January. Prepared for US Army Corps of Engineers (USACE) New England and Baltimore Districts.

Fisher, D.W., Isachsen, Y.W., and Richard, L.V. 1970. Geologic Map of New York; Lower Hudson Sheet, 1:250,000.

Greeley-Polhemus Group. 1997. *Data Collection Activities at DERP-FUDS Sites: Iona Island Naval Ammunition Depot, Stony Point, New York (DERP-FUDS Site No. C02NY0744) and US Naval Training Device Center, Sands Point, New York (DERP-FUDS Site No. C02NY0758).* Prepared for USACE New York District. [FUDS Document No. C02NY074402_01.09_1000_a]

Heisig. 2010. *Water Resources of Rockland County, New York, 2005-07, with Emphasis on the Newark Basin Bedrock Aquifer*. Scientific Investigations Report 2010-5245.

Levine, David. 2011. *Iona Island: A History of Bear Mountain State 1 Park's Most Mysterious Island in Rockland County, NY*. Hudson Valley Magazine, July 2011. http://www.hvmag.com/Hudson-Valley-Magazine/July-2011/Iona-Island-A-History-of-Bear-Mountain-State-Parks-Most-Mysterious-Isle-in-Rockland-County-NY/index.php?cparticle=2&siarticle=1

New York State Department of Environmental Conservation (NYSDEC) and U.S. Department of Commerce. 1992. *Hudson River National Estuarine Research Reserve Draft Management Plan.* August.

———. 2019. Division of Fish & Wildlife Database (3/27/2019).

———. 2013. Hudson River Action Plan Benthic Habitat Mapping Project. In 1996, the New York State Department of Environmental Conservation (DEC) initiated an effort to map the benthic habitat of the Hudson River Estuary as part of a larger Hudson River Action Plan. This project includes extensive mapping using sidescan sonar, subbottom profiling, single and multi-beam bathymetry, as well as collecting ground truth data with sediment cores, grab samples, and sediment profiling imagery (SPI).

———. 2007. Iona Island /Doodletown Bird Conservation Area http://www.dec.ny.gov/animals/30779.html. Website accessed in September 2017.

———. 2017. Iona Island National Estuarine Sanctuary and Research Reserve. http://www.dec.ny.gov/outdoor/55673.html. Website accessed in September 2017.

New York State Department of Transportation (NYSDOT). 2013. *Geotechnical Design Manual. Chapter 3; Geology of New York State.* June.

Olcott, P.G. 1995. U.*S. Geological Survey Ground Water Atlas of the United States: Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont. HA-730-M*.

Pacific Northwest National Laboratories Visual Sampling Plan (PNNL) 2018. http://vsp.pnnl.gov. October version 7.11.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2018. *Web Soil Survey.* Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/. Accessed November 2018.

U S. Army Corps of Engineers (USACE). 1998. *Defense Environmental Restoration Program for Formerly Used Defense Sites, Ordnance and Explosives, Chemical Warfare Materials, Archives Search Report, Iona Island Naval Ammunition Depo, Rockland County, New York, Project No. C02NY074403. March.*

———. 2004a. EM 200-3-1, *Formerly Used Defense Sites (FUDS) Program Policy*. May.

———. 2004b. ASR Supplement *Iona Island Naval Ammunition Depot FUDS Property Number: C02NY0744*. November.

———. 2013. EM 385-1-97 – *Safety Explosives Safety and Health Requirements Manual*. May.

———. 2017. Memorandum. *Trial Period for Risk management methodology at Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Projects*. January.

———. 2016. *Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop Remedial Action Objectives (RAOs) for Munition Response Sites (MRS).* 7 December.

U.S. Army Geospatial Center (USAGC). 2018. *Former Naval Ammunition Depot Iona Island, New York Historical Photographic Analysis.* September.

U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA). 2021. *Data Tools: 1981-2010 Normals*. https://www.ncdc.noaa.gov/cdo-web/datatools/normals. Website accessed in March 2021.

U.S. Department of Commerce, NOAA and NYSDEC. 1982. *Final Environmental Impact Statement Proposed Estuarine Sanctuary Grant Award to the State of New York for A Hudson River Estuarine Sanctuary*. August.

U.S. Department of Agriculture, Soil Conservation Service. 1990. *Soil Survey of Rockland County, New York: U.S. Department of Agriculture, Soil Conservation Service., 179 p*

U.S. Fish and Wildlife Service ECOS-IPaC system Iona Island project request 10/8/2018.

U.S. Fish and Wildlife Service (USFWS). 2018. *National Wetlands Inventory Wetlands Mapper*. https://www.fws.gov/wetlands/data/Mapper.html. Website accessed in December 2018.

Yozzo, D.J., Andersen, J.L., Cianciola, M.M., Nieder, W.C., Miller, D.E., Ciparis, S., and McAvoy, J. 2005. Ecological Profile of the Hudson River National Estuarine Research Reserve. December.

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Appendix A

Field Documentation

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Daily Reports

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Tailgate Safety Briefs Daily Report

Project **Iona** **07-Aug-20**

Team **UXO Dive Team 1** ***Team Leader*** **Ryan Salazar** ***Grid*** N/A

Task Operation and Remarks

Slow down, extract self

Safety Topics Discussed

Injury_Reporting Safe_Work_Practices

Other Safety Topics

Fouled in debris	

Attendees

Name	Company
Alex Glikman	AOR
Dale Park	AOR
Ivan Stubblefield	AOR
Mariono Lorde	AOR
Ryan Salazar	AOR

Personnel and Equipment Daily Report

Project **Iona** | **07-Aug-20**

Team ***UXO Dive Team 1*** | ***Team Leader*** ***Ryan Salazar***

Name	Organization	Position	Onsite	AM BT	Mid BT	PM BT	Hours
Alex Glikman	AOR	Tech 2	Yes	Normal	Normal	Normal	10
Dale Park	AOR	Tender	Yes	Normal	Normal	Normal	10
Ivan Stubblefield	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Mariono Lorde	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Ryan Salazar	AOR	Tech 3	Yes	Normal	Normal	Normal	10

Equipment	Vendor	Serial Number	Issues	Checked by	AM P/F	PM P/F
Air Control Box		2151165	N/A		Pass	Yes
Dive Battery 1	Shark Marine	HRSU-91651 #831	N/A		Pass	Yes
Dive Battery 2	Shark Marine	HAHS-82000 #831	N/A		Pass	Yes
Dive Battery 3	Shark Marine	HRSN-89333 #N/A	N/A		Pass	Yes
Ebinger - 161	Ebinger	161	N/A		Pass	Yes
Ebinger - 162	Ebinger	162	N/A		Pass	Yes
Floating GNSS Hea	Shark Marine	HMHS-76205	N/A		Pass	Yes
KM37 1	Kirby Morgan	19021SS	N/A		Pass	Yes
KM37 2	Kirby Morgan	K122	N/A		Pass	Yes
Navigator D197	Shark Marine	HMSM-74393	N/A		Pass	Yes

Field Team Leaders' Logbooks Daily Report

Project **Iona** | **07-Aug-20**

Team ***UXO Dive Team 1*** ***Team Leader*** ***Ryan Salazar***

Time	*Log Entry*
7:00 AM	Arrive at dock
7:16 AM	Setup boat
7:31 AM	Safety meeting
7:17 AM	N12 AM QC point
7:30 AM	Boat underway to site
8:38 AM	RED DIVER(Ryan Salazar) LS.
8:40 AM	RED On Bottom. Landed in concrete debris
8:41 AM	Point N_13 marks beginning of debris
8:51 AM	N-14 marks North edge of debris.
8:58 AM	N-15 Marks farthest point North that diver
9:02 AM	Diver RS
9:37 AM	Move boat to center dock
10:17 AM	Start reacquire targets
11:48 AM	Reacquire targets complete
12:49 PM	N16 is a mark for a missing stake
12:59 PM	Boat leaves site
1:19 PM	Boat arrives at dock
1:26 PM	Begin dismantling boat for transport
3:56 PM	Quit boat dismantle for day
4:09 PM	N17 PM QC point
4:28 PM	Leave dock. Boat prepared for trailer load
4:41 PM	Trucks loaded and day complete

Weather_Conditions

Overcast Rain
Light_Breeze

Tailgate Safety Briefs Daily Report

Project Iona | **03-Aug-20**

Team **UXO Dive Team 1** | ***Team Leader*** **Ryan Salazar** | ***Grid*** N/A

Task Operation and Remarks

Site introduction

Safety Topics Discussed

Site_Description Site_Controls Personal_Protective_Equipment
Emergency_Procedures_Equipment Site_Evacuation
Physical_Biological_Hazards Heat_or_Cold_Stress
Communication_Radio_Procedure
Environmental_Concerns_Hazards
Emergency_Procedures_Route First_Aid_P

Other Safety Topics

Site introduction	

Attendees

Name	Company
Alex Glikman	AOR
Dale Park	AOR
Ivan Stubblefield	AOR
Mariono Lorde	AOR
Ryan Salazar	AOR

Personnel and Equipment Daily Report

Project **Iona** | **03-Aug-20**

Team ***UXO Dive Team 1*** | ***Team Leader*** ***Ryan Salazar***

Name	Organization	Position	Onsite	AM BT	Mid BT	PM BT	Hours
Alex Glikman	AOR	Tech 2	Yes	Normal	Normal	Normal	10
Dale Park	AOR	Tender	Yes	Normal	Normal	Normal	10
Ivan Stubblefield	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Mariono Lorde	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Ryan Salazar	AOR	Tech 3	Yes	Normal	Normal	Normal	10

Equipment	Vendor	Serial Number	Issues	Checked by	AM P/F	PM P/F
Navigator D197	Shark Marine	HMSM-74393	N/A	Glikman	Pass	Yes
Ebinger - 161	Ebinger	161	N/A	Glikman	Pass	Yes
Floating GNSS Hea	Shark Marine	HMHS-76205	N/A	Glikman	Pass	Yes
GPS Extension Cab	Shark Marine	GPSX001-0	N/A	Glikman	Pass	Yes
KM37 1	Kirby Morgan	19021SS	N/A	Glikman	Pass	Yes
Air Control Box		2151165	N/A	Glikman	Pass	Yes

Field Team Leaders' Logbooks Daily Report

Project Iona | **03-Aug-20**

Team *UXO Dive Team 1* ***Team Leader*** *Ryan Salazar*

Time	*Log Entry*
12:22 PM	Arrive at work site
12:24 PM	Begin demonstrations operations
12:27 PM	Begin work in grid
12:31 PM	Finish work in grid. Complete b/c of weather
12:47 PM	Perform boat maintenance

Weather_Conditions

Overcast Rain Wind

Tailgate Safety Briefs Daily Report

Project **Iona** **04-Aug-20**

Team **UXO Dive Team 1** ***Team Leader*** **Ryan Salazar** ***Grid*** N/A

Task Operation and Remarks

How to use shark marine

Safety Topics Discussed

Safe_Work_Practices

Other Safety Topics

Shark marine training	

Attendees

Name	Company
Alex Glikman	AOR
Dale Park	AOR
Ivan Stubblefield	AOR
Mariono Lorde	AOR
Ryan Salazar	AOR

Personnel and Equipment Daily Report

Project **Iona** | **04-Aug-20**

Team ***UXO Dive Team 1*** | ***Team Leader*** ***Ryan Salazar***

Name	Organization	Position	Onsite	AM BT	Mid BT	PM BT	Hours
Alex Glikman	AOR	Tech 2	Yes	Normal	Normal	Normal	10
Dale Park	AOR	Tender	Yes	Normal	Normal	Normal	10
Ivan Stubblefield	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Mariono Lorde	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Ryan Salazar	AOR	Tech 3	Yes	Normal	Normal	Normal	10

Equipment	Vendor	Serial Number	Issues	Checked by	AM P/F	PM P/F
Navigator D197	Shark Marine	HMSM-74393	N/A	Glikman	Pass	Yes
Floating GNSS Hea	Shark Marine	HMHS-76205	N/A	Glikman	Pass	Yes
Tablet 1	Vanquisher	867613020836195	N/A	Salazar	Pass	Yes

Tailgate Safety Briefs Daily Report

Project **Iona** **05-Aug-20**

Team **UXO Dive Team 1** ***Team Leader*** **Ryan Salazar** ***Grid*** N/A

Task Operation and Remarks

Dive inspection day

Safety Topics Discussed

Site_Description Physical_Biological_Hazards
Emergency_Procedures_Route First_Aid_Procedures
Injury_Reporting

Other Safety Topics

Emergency drill	

Attendees

Name	Company	Name	Company
Alex Glikman	AOR	Dave Holland	USACE
Dale Park	AOR		
Ivan Stubblefield	AOR		
Mariono Lorde	AOR		
Ryan Salazar	AOR		

Personnel and Equipment Daily Report

Project **Iona** | **05-Aug-20**

Team ***UXO Dive Team 1*** | ***Team Leader*** ***Ryan Salazar***

Name	Organization	Position	Onsite	AM BT	Mid BT	PM BT	Hours
Alex Glikman	AOR	Tech 2	Yes	Normal	Normal	Normal	10
Dale Park	AOR	Tender	Yes	Normal	Normal	Normal	10
Mariano Lorde	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Ivan Stubblefield	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Ryan Salazar	AOR	Tech 3	Yes	Normal	Normal	Normal	10

Equipment	Vendor	Serial Number	Issues	Checked by	AM P/F	PM P/F
Air Control Box		2151165	N/A	Stubblefield	Pass	Yes
Dive Battery 1	Shark Marine	HRSU-91651 #831	N/A	Stubblefield	Pass	Yes
Ebinger - 161	Ebinger	161	N/A	Stubblefield	Pass	Yes
Floating GNSS Hea	Shark Marine	HMHS-76205	N/A	Stubblefield	Pass	Yes
KM37 1	Kirby Morgan	19021SS	N/A	Lorde	Pass	Yes
KM37 2	Kirby Morgan	K122	N/A	Lorde	Pass	Yes
Navigator D197	Shark Marine	HMSM-74393	N/A	Glikman	Pass	Yes
Tablet 1	Vanquisher	867613020836195	N/A	Salazar	Pass	Yes

Field Team Leaders' Logbooks Daily Report

Project **Iona** | **05-Aug-20**

Team ***UXO Dive Team 1*** ***Team Leader*** ***Ryan Salazar***

Time	*Log Entry*
7:00 AM	Arrive at dock
7:20 AM	Prep boat for launch
11:39 AM	Boat launched and arrive with boat at dock
12:19 PM	Load boat and safety brief
12:44 PM	Underway with boat to work site
1:32 PM	On site, anchors set
1:32 PM	Dressing out divers
1:39 PM	Diver Glickman leaves surface
1:43 PM	Start emergency drill. Penetration injury
1:47 PM	Diver leaves bottom.
1:58 PM	Leave site to drop off USACE representative
2:20 PM	Arrive at dock
2:30 PM	Unload boat
2:50 PM	Remove unnecessary equipment from boat
3:22 PM	Assemble and test Shark Marine
3:45 PM	Take test QC point N1
4:07 PM	Rearrange equipment on boat
4:40 PM	Tie strain relief on Shark antenna
4:53 PM	Leave dock. Day complete

Weather_Conditions

Clear Light_Breeze

Tailgate Safety Briefs Daily Report

Project Iona | **06-Aug-20**

Team **UXO Dive Team 1** | ***Team Leader*** **Ryan Salazar** | ***Grid*** N/A

Task Operation and Remarks

Dive operations

Safety Topics Discussed

Personal_Protective_Equipment
Emergency_Procedures_Equipment Site_Evacuation
Physical_Biological_Hazards Heat_or_Cold_Stress

Other Safety Topics

Ladder useage	

Attendees

Name	Company
Alex Glikman	AOR
Dale Park	AOR
Ivan Stubblefield	AOR
Mariono Lorde	AOR
Ryan Salazar	AOR

Personnel and Equipment Daily Report

Project **Iona** | **06-Aug-20**

Team ***UXO Dive Team 1*** | ***Team Leader*** ***Ryan Salazar***

Name	Organization	Position	Onsite	AM BT	Mid BT	PM BT	Hours
Alex Glikman	AOR	Tech 2	Yes	Normal	Normal	Normal	10
Dale Park	AOR	Tender	Yes	Normal	Normal	Normal	10
Ivan Stubblefield	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Mariono Lorde	AOR	Tech 1	Yes	Normal	Normal	Normal	10
Ryan Salazar	AOR	Tech 3	Yes	Normal	Normal	Normal	10

Equipment	Vendor	Serial Number	Issues	Checked by	AM P/F	PM P/F
Air Control Box		2151165	N/A	Lorde	Pass	Yes
Dive Battery 1	Shark Marine	HRSU-91651 #831	N/A	Lorde	Pass	Yes
Ebinger - 161	Ebinger	161	N/A	Glikman	Pass	Yes
Ebinger - 162	Ebinger	162	N/A	Glikman	Pass	Yes
Floating GNSS Hea	Shark Marine	HMHS-76205	N/A	Salazar	Pass	Yes
KM37 1	Kirby Morgan	19021SS	N/A	Lorde	Pass	Yes
KM37 2	Kirby Morgan	K122	N/A	Lorde	Pass	Yes
Navigator D197	Shark Marine	HMSM-74393	N/A	Salazar	Pass	Yes
Tablet 1	Vanquisher	867613020836195	N/A	Stubblefield	Pass	Yes

Field Team Leaders' Logbooks Daily Report

Project Iona | **06-Aug-20**

Team *UXO Dive Team 1* ***Team Leader*** *Ryan Salazar*

Time	*Log Entry*
7:00 AM	Arrive at dock
7:10 AM	Safety brief
7:15 AM	Load boat
7:41 AM	Boat underway
8:25 AM	Arrive at dive site, anchoring boat
8:46 AM	Diver Glickman leaves surface
9:10 AM	Diver reaches surface
9:39 AM	Diver leaves surface
9:44 AM	Diver reaches surface
10:04 AM	N3 edge of rubble pile outside of grid. N4 6
10:25 AM	Switching to central dock
10:44 AM	Diver Stubblefield leaves surface
10:51 AM	Diver encounters rubble outside the grid
11:01 AM	Diver reaches 60 Ft. depth limit
11:04 AM	Diver reaches surface
11:06 AM	N5 edge of rubble. N6 60 Ft depth limit
11:48 AM	Diver leaves surface at south end of center
11:56 AM	N7-N9 southern edge of debris field
12:03 PM	Diver reaches surface
12:11 PM	Move to south dock
12:36 PM	Diver leaves surface
12:38 PM	Diver starting transect ST-1
1:54 PM	Diver finds edge of debris field N10
2:03 PM	Diver says slope too steep to safely dive
2:08 PM	Diver reaches surface
2:39 PM	Leave work site
3:03 PM	Arrive at dock
3:25 PM	Maintenance and clean gear
4:22 PM	Leave site

Weather_Conditions

Clear Light Breeze

Report Date: 3/9/2020
Project No: 63029587.01
Report No: 1

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Isand, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny	73	39	54	0.00

GOVERNMENT PERSONNEL (Name/Organization):

Edwin McGowan, PARKS; Max Garfinkle, PARKS.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SSO / EA Engineering	9.0		
Lee Peterson		UXO Tech 3 / EA Engineering	9.0		
Joshua Harris		UXO Tech 2 / Ea Engineering	0.0		

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	Lee Peterson	WHO115	6.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No

Report Date: 3/9/2020
Project No: 63029587.01
Report No: 1

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Reviewed UFP-QAPP, APP, Site Safety and Health Plan, ESP and AHA, met with PARKS personnel.
- Received portable washroom facilities, rental skid steer and conex for material/equipment storage.
- Began vegetation removal in grids, skid steer broke down with over heat problems, mechanic onsite for repair, decision made to replace skid steer next work day.

Report Date: 3/9/2020
Project No: 63029587.01
Report No: 1

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Inspections

- Conducted Initial Inspection of site preparation, mobilization of equipment, and storage container, plus review of UFP-QAPP, APP, Site Safety and Health Plan, AHA, and ESP.
- Conducted Initial Inspection of brush removal in grids.

Summary of Deficiencies

- None

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Site vehicles equipped with current fire extinguishers, first aid kits, eye wash, emergency contact numbers, hospital directions.
- All site personnel checked for use of safety glasses, vests, footwear, and clothing.
- Cell phone and walkie talkie communications checked out serviceable.
- Review of UFP-QAPP, APP, Site Safety and Health Plan, AHA, ESP.

Summary of Deficiencies

- None

Corrective Actions

- None

Reinspection Results

- None

Additional Notes

-None

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/9/2020 6:01:47 PM

UXOQCS/SSO

Report Date: 3/10/2020
Project No: 63029587.01
Report No: 2

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy with pm lite rain	66	46	63	0.00

GOVERNMENT PERSONNEL (Name/Organization):

Max Garfinkle, PARKS.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SSO / EA Engineering	10.5		
Lee Peterson		UXO Tech 3 / EA Engineering	10.5		
Joshua Harris		UXO Tech 2 / EA Engineering	10.5		
Tim Reese		EA Project Manager / EA Engineering	5.5		
Conor O'Hara		EA GIS / EA Engineering	5.5		

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/10/2020
Project No: 63029587.01
Report No: 2

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	9.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No
GPS Receiver		5711470171	5.5	Yes
GPS Contoller		es72d20801	5.5	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- New site members, conducted UFP-QAPP, SSHP, ESP, AHA briefings.
- GIS completed staking 8 grids in MRS, (15, 25, 18, 4, 9, 10, 26, 22).
- Skid steer was replaced mid-day.
- Vegetation removed from 7 grids in MRS, (22, 19, 26, 12, 3, 12, 16).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Inspections

- Initial Inspection of GIS staking grid corners in MRS, IAW UFP-QAPP Table17-1, Section 2.
- Follow up Inspection of brush clearing of grids 22 and 19 in MRS., IAW UFP-APP Table17-1, Section 2.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- UFP-QAPP, SSHP, ESP, APP briefings to new site personnel.
- Inspected proper use of brushing equipment and appropriate PPE for the task at hand.
- Teams observed moving through rocky areas safely.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/10/2020 9:21:12 PM

UXOQCS/SSO

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 3/10/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:
UFP-QAPP, Table 17-1, Section 2

DESCRIPTION AND LOCATION OF WORK INSPECTION
Inspection of GIS grid staking

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.		SUXOS	EA
2.		Tech I	USACE
3.		Tech II	
4.		Tech III	
5.	Conor O'Ohara	GIS	EA
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/10/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/10/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC P

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Brush clearing in Grids 22 and 19, Lee Peterson, Joshua Harris.

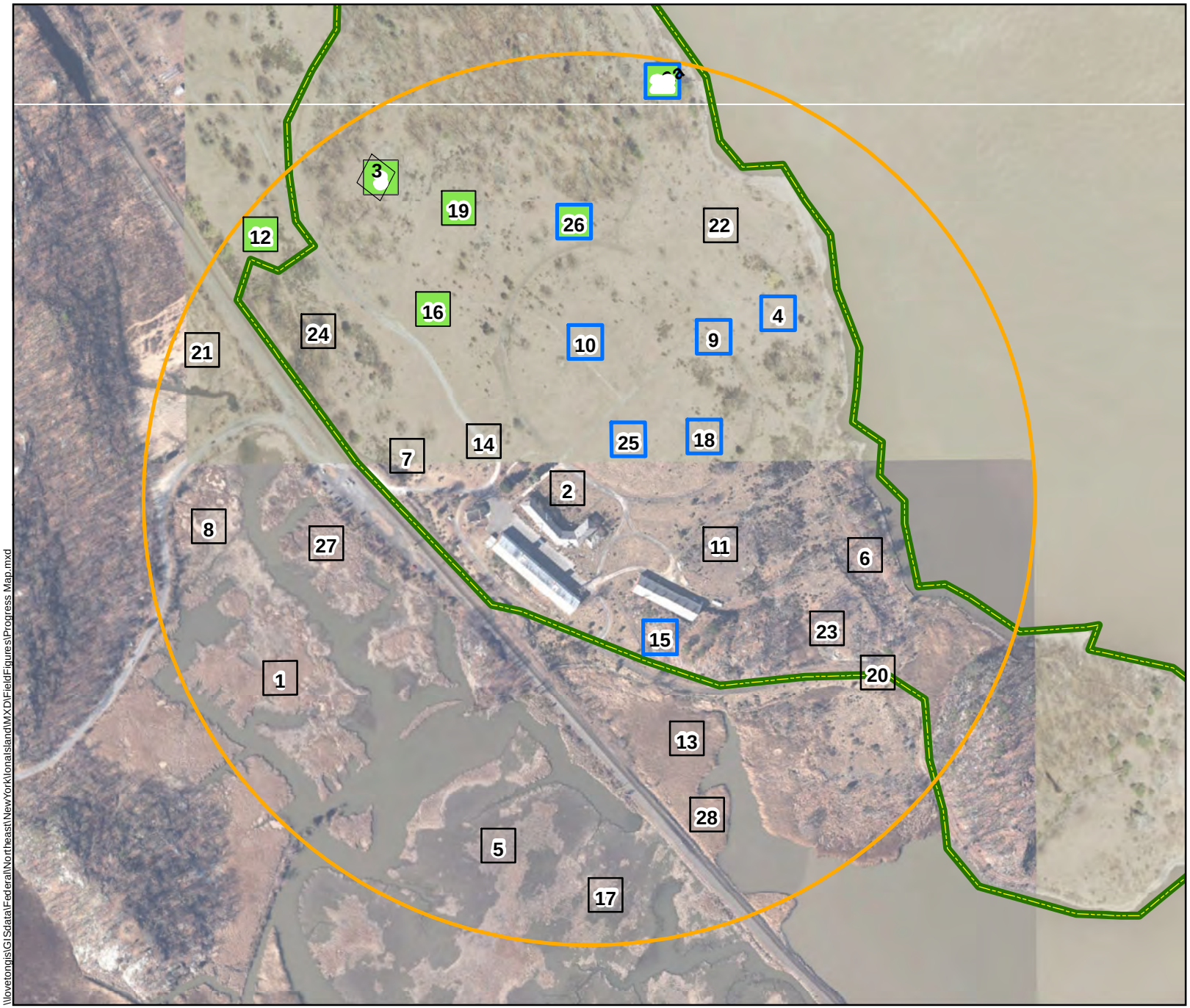
INSPECTION PERFORMED & WHO PERFORMED TEST

Area coverage of grid in preparation for DGM operations.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/10/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

MRS Grid (100x100 ft) Status

- Grid Staked
- Grid Not Yet Staked
- Vegetation Cleared
- MRS-01 1903 Explosion Area
- FUDS Boundary

DRAFT

N

0 200 400
Feet

Map Date: 3/11/2020
Source:
Projection: NY State Plane Feet

Figure
Progress Map - MRS 01
Date: 11 March 2020
Iona Island Naval Ammunition Depot FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIslandMXD\FieldFigures\Progress Map.mxd

Report Date: 3/11/2020
Project No: 63029587.01
Report No: 3

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy	53	38	72	0.00

GOVERNMENT PERSONNEL (Name/Organization):

Max Garfinkle, Palisades Interstate Parks Commission (PIPC)

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	10.5		UXOQCS/SO duties
Lee Peterson		UXO Tech 3 / EA Engineering	10.5		Grid vegetation removal
Joshua Harris		UXO Tech 2 / EA Engineering	10.5		Grid vegetation removal
Tim Reese		EA Project Manager / EA Engineering	10.5		PM duties
Conor O'Hara		EA GIS / EA Engineering	10.5		GIS Grid marking
Jeffery Horn		Supervisor / Solitude	8.0		Grid vegetation removal
Chris Chevien		Laborer / Solitude	8.0		Grid vegetation removal

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/11/2020
Project No: 63029587.01
Report No: 3

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	9.0	Yes
Schonstedt		WHO223	9.0	Yes
Schonstedt		WHO177	0.0	No
GPS Receiver		5711470171	9.5	Yes
GPS Contoller		es72d20801	9.5	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety brief to site workers, APP/SSHP/UXO briefed to new site personnel.
- Solitude on-site to conduct mowing operations in swamp and landfill areas.
- GIS team flagged 15 DGM grids (19, 3, 16, 12, 24, 7, 14, 2, 11, 13, 17, 28, 5, 20, 25), 5 EXDU grids (1, 2, 3, 5, 6), and 3 DU grids (23, 6, 7).
- 14 DGM grids brush cleared (13, 28, 21, 5, 17, 4, 9, 18, 25, 15, 20, 7, 24, 2).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Inspections

- Initial inspection of Solitude during marsh mowing operations.
- Site communications observed through cell/portable radios.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Cell phone and portable radios serviceable and in use.
- Safety glasses and Hi Vis vests used in mowing operations.
- Emergency contact numbers and hospital route posted and in site vehicles.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/12/2020 8:01:44 AM

UXOQCS/SSO

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 3/11/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:
Site Preparation - UFP-QAPP, Figure 17-2, Section 2

DESCRIPTION AND LOCATION OF WORK INSPECTION
Sub-contractor Solitude conducting mowing operations in DGM marsh grids and landfill.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	Jeffery Horn	Supervisor	Solitude
2.	Chris Chirere	Laborer	Solitude
3.	Joshua Harris	Tech II	EA
4.			
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/11/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

C:\Users\cohara\Desktop\EA\IonaIsland\MXD\Figure XX - Progress Map 03112020.mxd

0 450 900
Feet

N

Legend

- Approximate 60 Foot Depth Line
- DGM Grid (100ft x 100ft)
- Building DU
- Explosive Building DU
- Underwater Investigation Area (Former Docks)
- DGM Shoreline Area
- Dump SIte
- Former Dock
- Former Causeway
- FUDS Boundary
- MRS-01 1903 Explosion Area

PROGRESS MAP
03/11/2020

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 10/03/2018
Dock Aerial - June 18 1948

Report Date: 3/12/2020
Project No: 63029587
Report No: 4 (SUXOS Report # 1)

EA Engineering, Science, and Technology, Inc., PBC

SUXOS Daily Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High {°F)	Low {°F)	Humidity (%)	Rainfall (in)
Cloudy	48	34	75	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None

SITE VISITORS (Name/Organization):

Max Garfinkle, Palisades Interstate Parks Commission (PIPC)

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
John Monk	Iona Island	SUXOS / EA	10.0		Supervise all personnel during site activities.
John D. Marlow	Iona Island	UXOQCS/SO / EA	10.0		Perform QC/SO procedures and insured all activities were completed in accordance with the WP/HASP/APP.
William Lee. Peterson	Iona Island	UXOTIII / EA	10.0		Brush cutting grids, surface sweep all DGM grids and Landfill Dump Area.
Joshua Harris	Iona Island	UXOTII / EA	10.5		Brush cutting, surface sweep DGM grids and landfill, escort for staking sample locations.
Tim Reese	Iona Island	EA PM / EA	10.5		Supervise site activities.
Conner O'Hara	Iona Island	GIS Operator / EA	10.5		GPS all sample stakes and grid boundaries.
Ben Dameron	Iona Island	DGM operator / NAEVA	10.0		ARGO operator, prep marsh grids, setup and test RTK equipment and EM61.

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/12/2020
Project No: 63029587
Report No: 4 (SUXOS Report # 1)

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	William Lee Peterson	WH0115	9.0	Yes
Schonstedt	Joshua Harris	WH0223	9.0	Yes
Schonstedt	John D Marlow	WH0177	9.0	Yes
Schonstedt	John Monk	WH0353	5.0	Yes
GPS Receiver	Conner O'Hara	5711470171	9.0	Yes
GPS Controller	Conner O'Hara	es72d20801	9.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Status	MRS	Phase	Grid
Completed	01	SS	27 Grids- See list under Additional Remarks

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No MEC, MD, or NMRD found

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

Continued brush cutting 7 final DGM grids. Establish Grids 1, 8 and 27 in the marsh area with the ARGO. Surface Sweep 27 DGM grids and landfill dump area. Stakeout soil sample locations grids. NAEVA personnel setup and test RTK system and setup EM61. Performed site walk with PM, NAEVA and UXOQCS/SO.

Report Date: 3/12/2020
Project No: 63029587
Report No: 4 (SUXOS Report # 1)

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

Clearance Phase	MRS	Grid/Transect	QA/QC Status
SS	01	1	QC
SS	01	2	QC
SS	01	3	QC
SS	01	4	QC
SS	01	5	QC
SS	01	6	QC
SS	01	7	QC
SS	01	8	QC
SS	01	9	QC
SS	01	10	QC
SS	01	11	QC
SS	01	12	QC
SS	01	13	QC
SS	01	14	QC
SS	01	15	QC
SS	01	16	QC
SS	01	17	QC
SS	01	18	QC
SS	01	19	QC
SS	01	20	QC
SS	01	21	QC
SS	01	22	QC
SS	01	24	QC
SS	01	25	QC
SS	01	26	QC
SS	01	27	QC
SS	01	28	QC

Grid 23 was not established due to rock outcropping.
QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Report Date: 3/12/2020
Project No: 63029587
Report No: 4 (SUXOS Report # 1)

Inspections

- Initial inspection on Surface Sweep MEC operations.
- Follow-up Inspection of stake landfill grids and transects.
- QC Inspections carried out in Dump Area and DGM Grids
1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,24,25,26,27 and 28 with Pass in all grids.
Note: DGM Grid 23 was not established.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Conducted site safety brief, and SSHP, AHA to new site personnel.
- Communications checked and in use with cell phone and portable radios.
- Safety brief given for precautions on active railway.
- Safety inspection while conducting MEC operations (Surface Sweep).

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

John Monk 3/13/2020 7:56:59 AM

SUXOS

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 3/12/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:
UFP-QAPP, Table 17-2, Section 2

DESCRIPTION AND LOCATION OF WORK INSPECTION
MEC Surface Sweep of DGM Grids and Landfill Dump Area. Areas inspected - Landfill Dump Area and DGM Grids 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,24,25,26,27, and 28.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	John Monk	SUXOS	EA
2.	J.D. Marlowe	UXOQCS/SSO	EA
3.	Joshua Harris	Tech II	EA
4.	Lee Peterson	Tech III	EA
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/12/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/12/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC P

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Stake grids and transects, Conor O'Hara, Joshua Harris

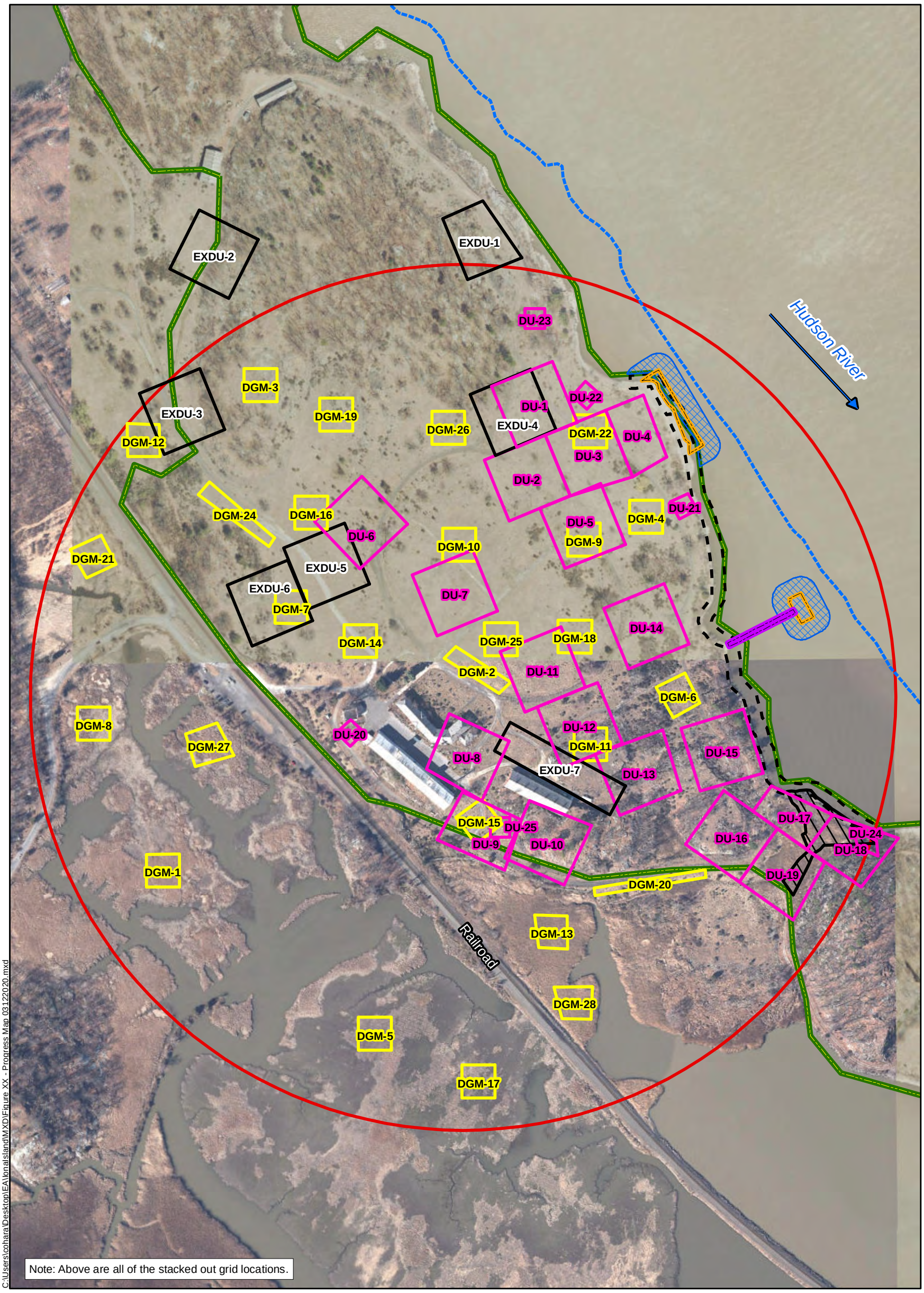
INSPECTION PERFORMED & WHO PERFORMED TEST

- flagging soil sample grid locations, UXOQCS

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/12/2020

SIGNATURE OF PROJECT QC SPECIALIST:



C:\Users\cohara\Desktop\EA\IonaIsland\MXD\Figure XX - Progress Map 03122020.mxd

0 200 400
Feet

N

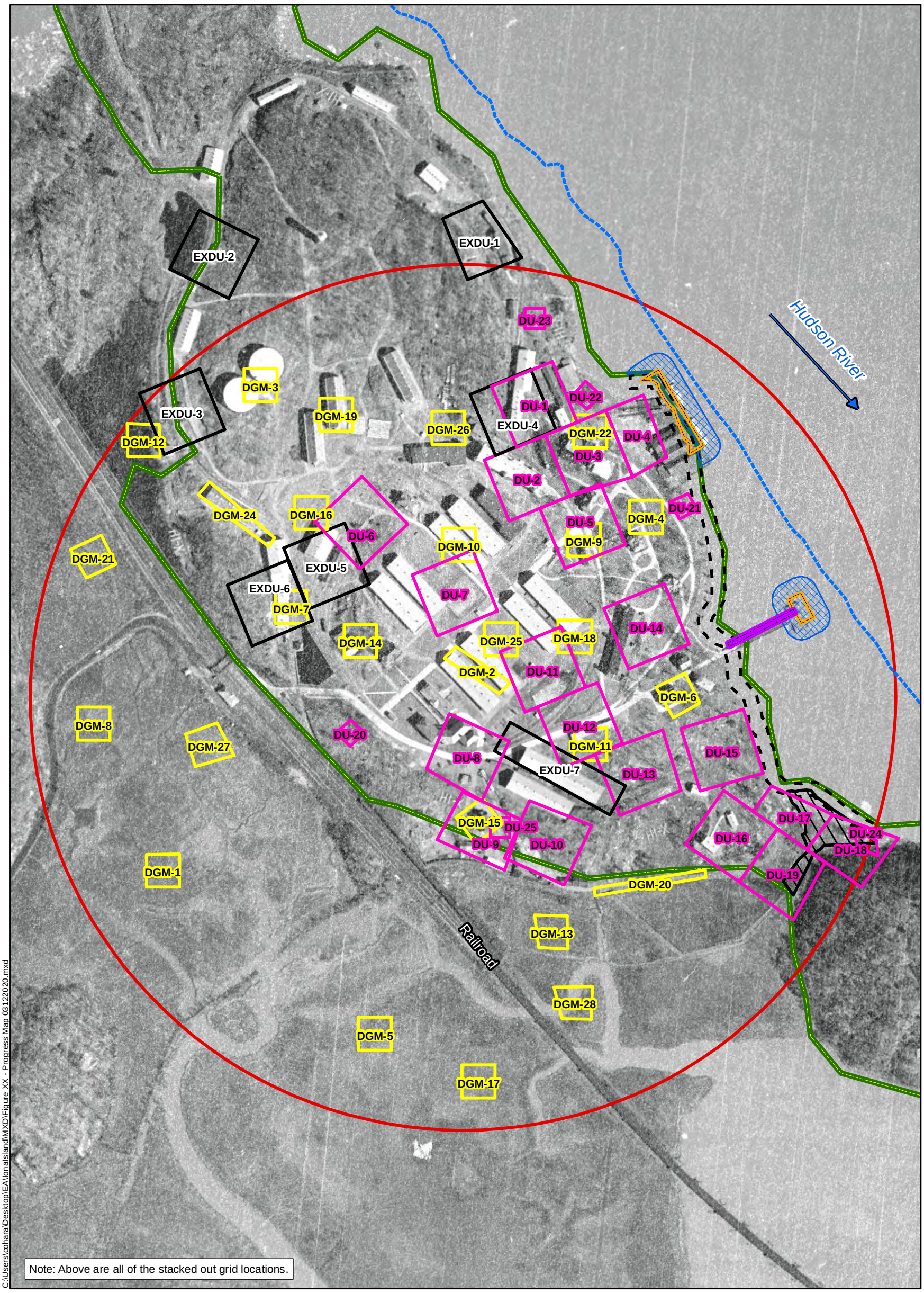
Legend

- Approximate 60 Foot Depth Line
- DGM Grid (100ft x 100ft)
- Building DU
- Explosive Building DU
- Underwater Investigation Area (Former Docks)
- DGM Shoreline Area
- Dump SIte
- Former Dock
- Former Causeway
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE XX
STACKED GRID LOCATIONS
03/13/2020L

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 03/013/2020



C:\Users\cohara\Desktop\EA\IonaIsland\MXD\Figure_XX - Progress Map_03122020.mxd

0 200 400
Feet

N

Legend

- Approximate 60 Foot Depth Line
- DGM Grid (100ft x 100ft)
- Building DU
- Explosive Building DU
- Underwater Investigation Area (Former Docks)
- DGM Shoreline Area
- Dump SIte
- Former Dock
- Former Causeway
- FUDS Boundary
- MRS-01 1903 Explosion Area

FIGURE XX
STACKED GRID LOCATIONS
1940'S AERIAL

IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

Map Date: 03/013/2020

Report Date: 3/12/2020

Project No: 63029587

Report No: 4

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island MEC Clearance

Iona, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	N/A	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

Status	MRS	Phase	Grid
Completed	01	SS	27 Grids- See list under Additional Remarks

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

SEED Results

No SEED Results Collected

OTHER INSPECTIONS:

- Initial inspection on Surface Sweep MEC operations.
- Follow-up Inspection of stake grids and transects.
- QC Inspections carried out in Dump Area and DGM Grids 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,24,25,26,27 and 28 with Pass in all grids.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

Report Date: 3/12/2020

Project No: 63029587

Report No: 4

- None.

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/12/2020 7:35:00 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/12/2020

Project No: 63029587

Report No: 4

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island MEC Clearance

Iona, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Conducted site safety brief, and SSHP, AHA to new site personnel.
- Communications checked and in use with cell phone and portable radios.
- Safety brief given for precautions on active railway.
- Safety inspection while conducting MEC operations (Surface Sweep).

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/12/2020 6:54:50 PM

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/13/2020
Project No: 63029587.01
Report No: 5

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain am, sunny pm	69	42	29	0.25

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SSO / EA	10.0		UXOQCS/SSO Duites
Joshua Harris		UXO Tech 2 / EA	10.0		Blind Seeding DGM Grids
Ben Dameron		Geo QC/ NAEVA	10.0		Blind Seeding DGM Grids

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	J. Harris	WHO115	9.5	Yes
Schonstedt		WHO223	0.0	No
Schonstedt	J.D. Marlowe	WHO177	5.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Blind Seeding in 19 DGM Grids (see list under additional remarks).

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 3/13/2020
Project No: 63029587.01
Report No: 5

Grid/Transect Results

No UXO Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check.
- NAEVA assembled EM-61, RTK, carried out functional checks.
- NAEVA installed Blind Seeds in 19 DGM Grids (15, 20, 6, 4, 9, 22, 26, 10, 25, 18, 2, 11, 14, 7, 24, 16, 19, 3, 12).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

QA = Quality Assurance QC = Quality Control

SEED Results

See Inspections below.

Inspections

- Initial inspection of Blind Seeding conducted by NAEVA in DGM Grids #6, #2, and #11 - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- NAEVA completed blind seeding in a total of 19 DGM Grids.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Weekly inspection carried out on EA Truck #1303.
- Weekly inspection carried out on site first aid kits, eye wash kits, burn kit, trauma kit.
- Observed UXO Tech 2 and NAEVA representative working in MRS-1 area installing blind seeds.. All personnel were observed using the proper precautions for terrain, digging technics and appropriate PPE.
All were wearing their PPE. Personnel were using proper digging techniques on unknown anomalies (i.e., using avoidance).

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None

Additional Notes

None

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/13/2020 7:54:03 PM

UXOQCS/SSO

Report Date: 3/13/2020

Project No: 63029587.01

Report No: 5

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

OTHER INSPECTIONS:

- Initial inspection of Blind Seeding conducted by NAEVA in DGM Grids #6, #2, and #11 - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

Report Date: 3/13/2020

Project No: 63029587.01

Report No: 5

- NAEVA completed blind seeding in a total of 19 DGM Grids..

CONTRACTOR'S VERIFICATION:

JD Marlowe	3/13/2020 6:56:32 PM	I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).
UXOQCS		

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/13/2020

Project No: 63029587.01

Report No: 5

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Weekly inspection carried out on EA Truck #1303.
- Weekly inspection carried out on site first aid kits, eye wash kits, burn kit, trauma kit.
- Observed UXO Tech 2 and NAEVA representative working in MRS-1 area installing blind QC seeds. All personnel were observed using the proper precautions for terrain and utilized appropriate PPE.
- Personnel were using proper digging techniques on unknown anomalies (i.e., using avoidance).

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None

ADDITIONAL NOTES:

- None

CONTRACTOR'S VERIFICATION:

JD Marlowe 3/13/2020 7:05:22 PM

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 3/13/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:
Blind Seeding of DGM Grids, UFP-QAPP, Table 17-1, Section 3

DESCRIPTION AND LOCATION OF WORK INSPECTION
Blind seeding in DGM Grid #6 #2, #11.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	Ben Dameron	Geophysicist	NAEVA
2.	Joshua Harris	UXO Tech 2	EA
3.	J.D. Marlowe	UXOQCS/SSO	EA
4.			
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

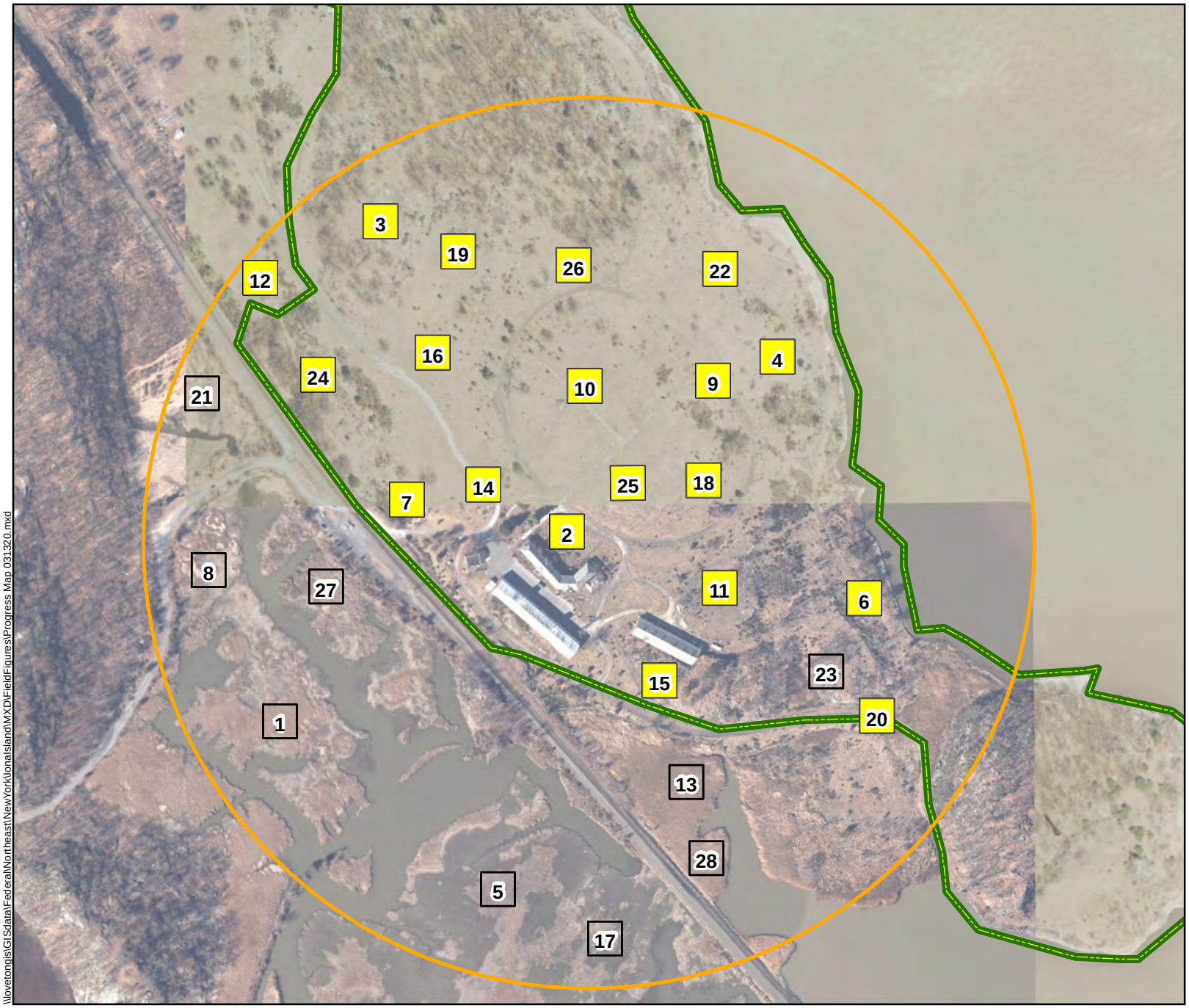
_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/13/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- MRS Grids (100 x100 feet)

Seed Status

- Seed Installed
- Not Seeded

N

0 200 400
Feet

Map Date: 3/15/2020
Source:
Projection: NY State Plane Feet

Figure
Progress Map - MRS 01
Date: 13 March 2020
Iona Island Naval Ammunition Depot FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIslandMXD\FieldFigures\Progress Map 031320.mxd

Report Date: 3/14/2020
Project No: 63029587.01
Report No: 6

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny	47	39	52	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SSO / EA	4.0		UXOQCS/SSO Duites
Joshua Harris		UXO Tech 2 / EA	4.0		Blind Seeding DGM Grids
Ben Dameron		NAEVA QC Supervisor / EA	4.0		Blind Seeding DGM Grids

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	Joshua Harris	WHO115	3.5	Yes
Schonstedt		WHO223	0.0	No
Schonstedt	J.D. Marlowe	WHO177	2.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Blind seeding in 8 DGM grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 3/14/2020
Project No: 63029587.01
Report No: 6

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check.
- NAEVA assembled EM-61, RTK unit, carried out functional checks.
- NAEVA installed Blind Seeds in 8 DGM Grids (21, 13, 28, 17, 5, 8, 1, 27).
- All DGM Grids are Blind Seeded by NAEVA Contractor.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Inspections

- Follow Up Inspection of NAEVA installing Blind Seeds in DGM Grids - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- NAEVA has completed Blind Seeding in all DGM Grids.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Personnel were observed using good "footing techniques" while transversing through marsh areas to avoid slipping through root matte.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

None.

Additional Notes

- None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/14/2020 1:46:48 PM

UXOQCS/SSO

Report Date: 3/14/2020

Project No: 63029587.01

Report No: 6

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

OTHER INSPECTIONS:

- Follow Up Inspection of NAEVA installing Blind Seeds in DGM Grids - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- NAEVA has completed Blind Seeding in all DGM Grids.

Report Date: 3/14/2020

Project No: 63029587.01

Report No: 6

CONTRACTOR'S VERIFICATION:

JD Marlowe	3/14/2020 1:48:48 PM	I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).
UXOQCS		

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/14/2020

Project No: 63029587.01

Report No: 6

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Personnel were observed using good "footing technics" while transversing through marsh areas to avoid slipping through root mate.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

3/14/2020
10:26:44 AM

UXOSO

SUXOS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/14/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC P

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Blind Seeding of DGM Grids, DGM Grid #21, Joshua Harris, UXO T2 EA, Ben Dameron NAEVA.

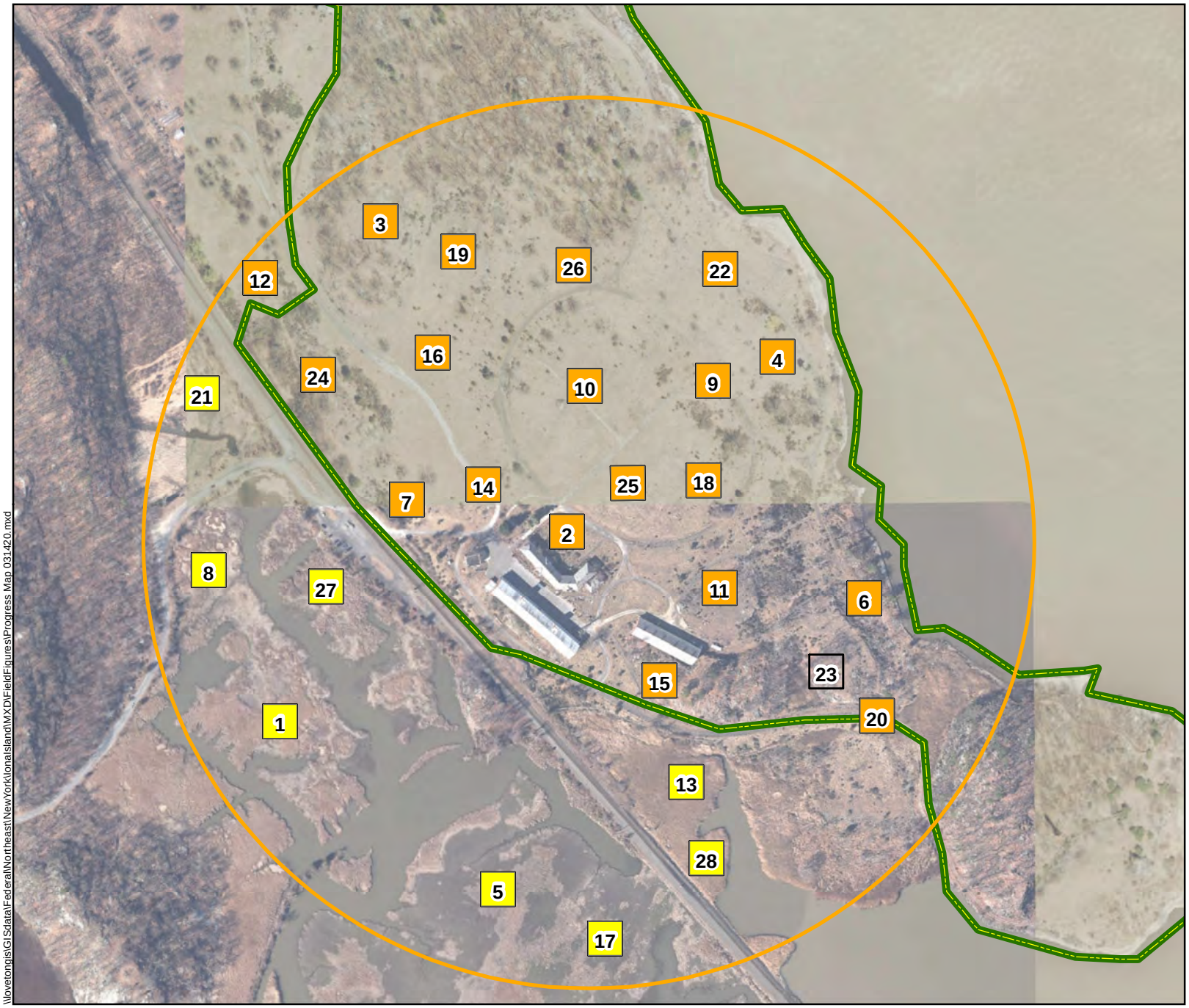
INSPECTION PERFORMED & WHO PERFORMED TEST

Inspection of seed depths pertaining to size of ISO installed.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/14/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- MRS Grids (100 x100 feet)

Seed Status

- Installed on 03/14/2020
- Previously Installed
- Not Seeded

N

0 200 400
Feet

Map Date: 3/16/2020
Source:
Projection: NY State Plane Feet

Figure
Progress Map - MRS 01
Date: 14 March 2020
Iona Island Naval Ammunition Depot FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIslandMXD\FieldFigures\Progress Map 031420.mxd

Report Date: 3/16/2020
Project No: 63029587.01
Report No: 7

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Mixture of sun and clouds	45	25	66	0.00

GOVERNMENT PERSONNEL (Name/Organization):

David King, USACE Geophysicist, Baltimore District.

SITE VISITORS (Name/Organization):

- None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	10.5		UXOQCS/SSO duties
Joshua Harris		UXO Tech 2 / EA Engineering	10.5		Grid vegetation removal
Tim Reese		EA Project Manager / EA Engineering	7.5		PM duties
Amanda Kohn		Field Tech Sup. - Geo / EA Engineering	6.5		Soil sampling
Derek Hendricks		Field Tech / EA Engineering	7.5		Soil sampling
Alex Kosters		Supervisor / NAEVA	10.0		IVS and DGM set up
Ben Dameron		QC Supervisor / NAEVA	10.0		IVS and DGM set up
Nash Stevens		Tech / NAEVA	10.0		IVS and DGM set up
Nesgibv Sibhat		Tech / NAEVA	10.0		IVS and DGM set up
Mike McGuire		Geophysicist / EA Engineering	7.5		Sr. Geophysicist duties

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/16/2020
Project No: 63029587.01
Report No: 63029587

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	J. Harris	WHO115	9.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt	J.D. Marlowe	WHO177	9.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

QA blind seeding installed in 14 DGM grids. Soil Samples were collected at 2 DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, communications checks.
- Conducted AHA/SSHP/UXO briefings to 7 new site personnel.
- IVS was installed by NAEVA, DGM equipment assembled and checked at IVS.
- QA Blind Seeds installed in 14 DGM grids.
- Conducted soil sampling of 2 grids (20, 22).
- USACE Geophysicist was recalled by Baltimore due to coronavirus restrictions.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

- Initial Inspection carried out on IVS installation - Conformance.
- Initial Inspection carried out on DGM Equipment set up and Testing - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Seven new site personnel on-site, conducted AHA/SSHP/UXO briefings, checked for required PPE, railway crossing safety, site communications.

Summary of Deficiencies

- None.

Corrective Actions

- None

Reinspection Results

- None.

Additional Notes

None

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/16/2020 7:39:59 PM

UXOQCS/SSO

Report Date: 3/16/2020

Project No: 63029587.01

Report No: 63029587

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Initial Inspection carried out on IVS installation - Conformance.
- Initial Inspection carried out on DGM Equipment set up and Testing - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 3/16/2020

Project No: 63029587.01

Report No: 63029587

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

JD Marlowe	3/16/2020 6:53:56 PM	I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).
UXOQCS		

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/16/2020

Project No: 63029587.01

Report No: 63029587

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Seven new site personnel on-site, conducted AHA/SSHP/UXO briefings, checked for required PPE, railway crossing safety, site communications.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

None

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/16/2020 7:02:15 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 3/16/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:
Install IVS, UFP - QAPP Figure 17 - 1, Section 3

DESCRIPTION AND LOCATION OF WORK INSPECTION
NAEVA installing IVS in MRS-1.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	Alex Kosters	Supervisor	NAEVA
2.	Ben Dameron	QC Supervisor	NAEVA
3.	Nash Steven	Tech	NAEVA
	Neiva Sibha	Tech	NAEVA
5.	J.D. Marlowe	UXOQCS	EA
6.	Mike McGuire	Sr. Geophysicist	EA

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/16/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 3/16/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:
DGM Equipment Set Up and Testing, UFP-QAPP, Figure 17-4, Section 4.

DESCRIPTION AND LOCATION OF WORK INSPECTION
Assembly of EM-61 equipment and functional check through IVS.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	Ben Dameron	Supervisor	NAEVA
2.	Alex Kostern	Supervisor	NAEVA
3.	Mike McGuire	Geophysicist	EA
4.	J.D. Marlowe	UXOQCS	EA
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

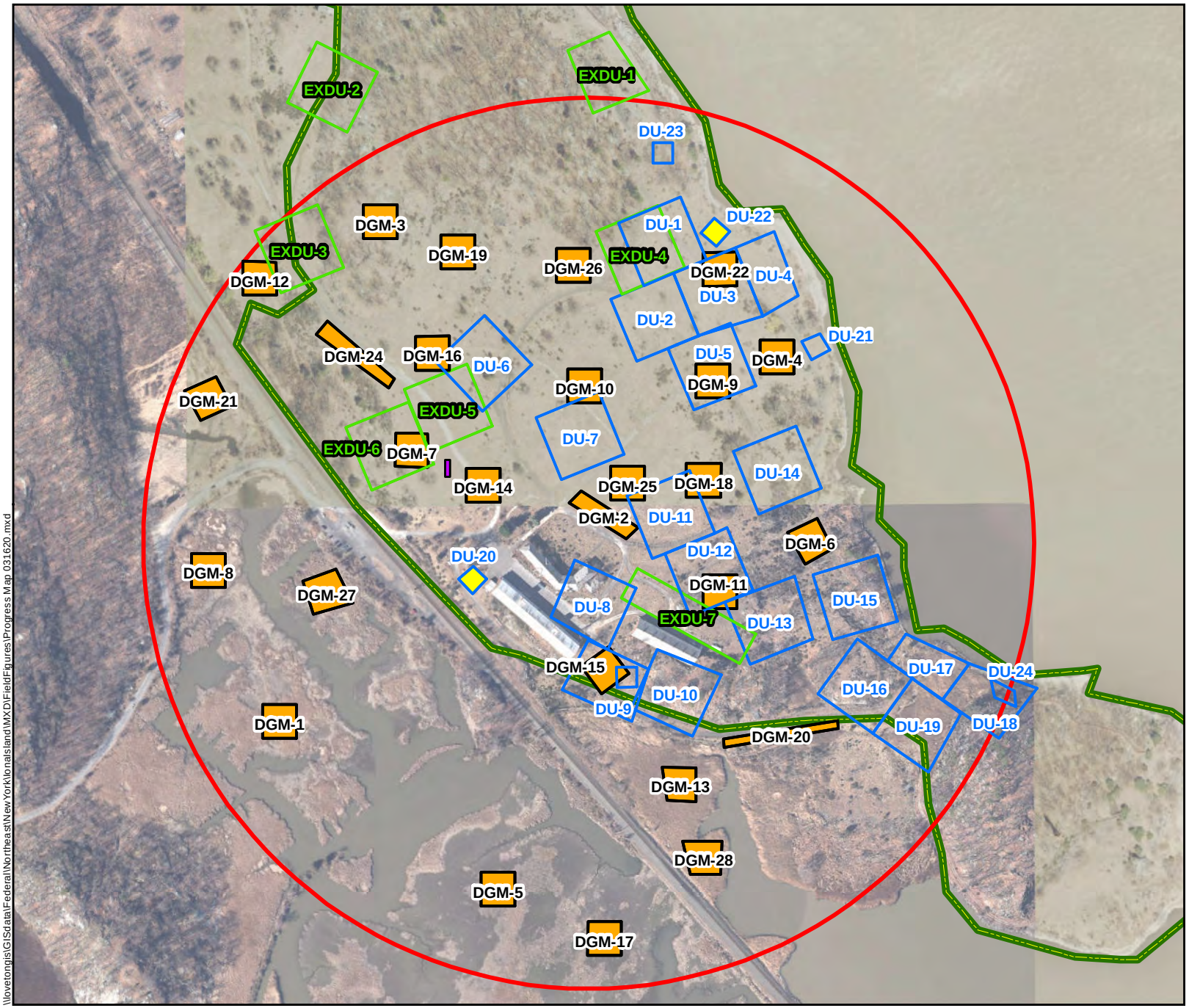
_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/17/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location

Grid Type

- DGM
- DU
- EXDU

Seed Status

- Installed

Soil Sampling Status

- Complete
- Incomplete

N

0 200 400
Feet

Map Date: 3/17/2020
Source:
Projection: NY State Plane Feet

Figure
Progress Map - MRS 01
Date: 16 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\Progress Map 031620.mxd

Report Date: 3/17/2020
Project No: 63029587.01
Report No: 8

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain AM, Cloudy PM.	51	34	98	0.11

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	10.5		UXOQCS/SO duties
Joshua Harris		UXO Tech 2 / EA Engineering	10.5		Soil sampling
Tim Reese		EA Project Manager / EA Engineering	10.5		PM duties
Amanda Kohn		Field Tech Supervisor / EA Engineering	10.5		Soil sampling
Derek Hendricks		Field Tech / EA Engineering	10.5		Soil sampling
Alex Kosters		Supervisor / NAEVA	10.0		Data collection
Ben Dameron		QA Supervisor / NAEVA	10.0		Data collection
Nash Stevens		Tech / NAEVA	10.0		Data collection
Nesgibv Sibhat		Tech / NAEVA	10.0		Data collection
Mike McGuire		Geophysicist / EA Engineering	10.5		Sr. Geophysicist duties

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/17/2020
Project No: 63029587.01
Report No: 8

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	9.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil sampling was completed in five DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, EM-61 and Schonstedts functional check through IVS.
- NAEVA DGM Team collected data in3 DGM Grids (7, 14, 21).
- Soil samples were collected in 5 grids (EXDU-1, EXDU-2, EXDU-4, DU-20, DU-21).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

- Initial Phase Inspection of NAEVA DGM Team collecting Data in DGM Grids 7 and 14 - Conformance.
- Follow-Up Phase Inspection of NAEVA Team during set up and testing of DGM equipment at IVS - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Observed soil sampling team utilizing good footing techniques over rough terrain, all wearing Hi Vis, safety glasses, and leather palm gloves while dealing with thorns.
- DGM team was observed traversing through marsh areas in a safe and proficient manner.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/17/2020 7:28:26 PM

UXOQCS/SSO

Report Date: 3/17/2020

Project No: 63029587.01

Report No: 8

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Initial Phase Inspection of NAEVA DGM Team collecting Data in DGM Grids 7 and 14 - Conformance.
- Follow-Up Phase Inspection of NAEVA Team during set up and testing of DGM equipment at IVS - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 3/17/2020

Project No: 63029587.01

Report No: 8

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/17/2020 6:42:00 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/17/2020

Project No: 63029587.01

Report No: 8

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Observed soil sampling team utilizing good footing techniques over rough terrain, all wearing Hi Vis, safety glasses, and leather palm gloves while dealing with thorns.
- DGM team was observed traversing through marsh areas in a safe and proficient manner.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/17/2020 6:48:07 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE:_____

TITLE AND NO. OF THE TECHNICIAL SECTION:

DGM Surveys, UFP-QAPP, Table 17-1, Section 5

DESCRIPTION AND LOCATION OF WORK INSPECTION

NAEVA DGM Team collecting date, Grid 7 and 14.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	Ben Dameron	Geologists	NAEVA
2.	Nash Stevens	Tech	NAEVA
3.	J.D. Marlowe	UXOQCS	EA
4.			
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/17/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/17/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC P

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Equipment Set Up and Testing, IVS, Ben Dameron, NAEVA; Nash Stevens,
NAEVA; J.D. Marlowe, EA.

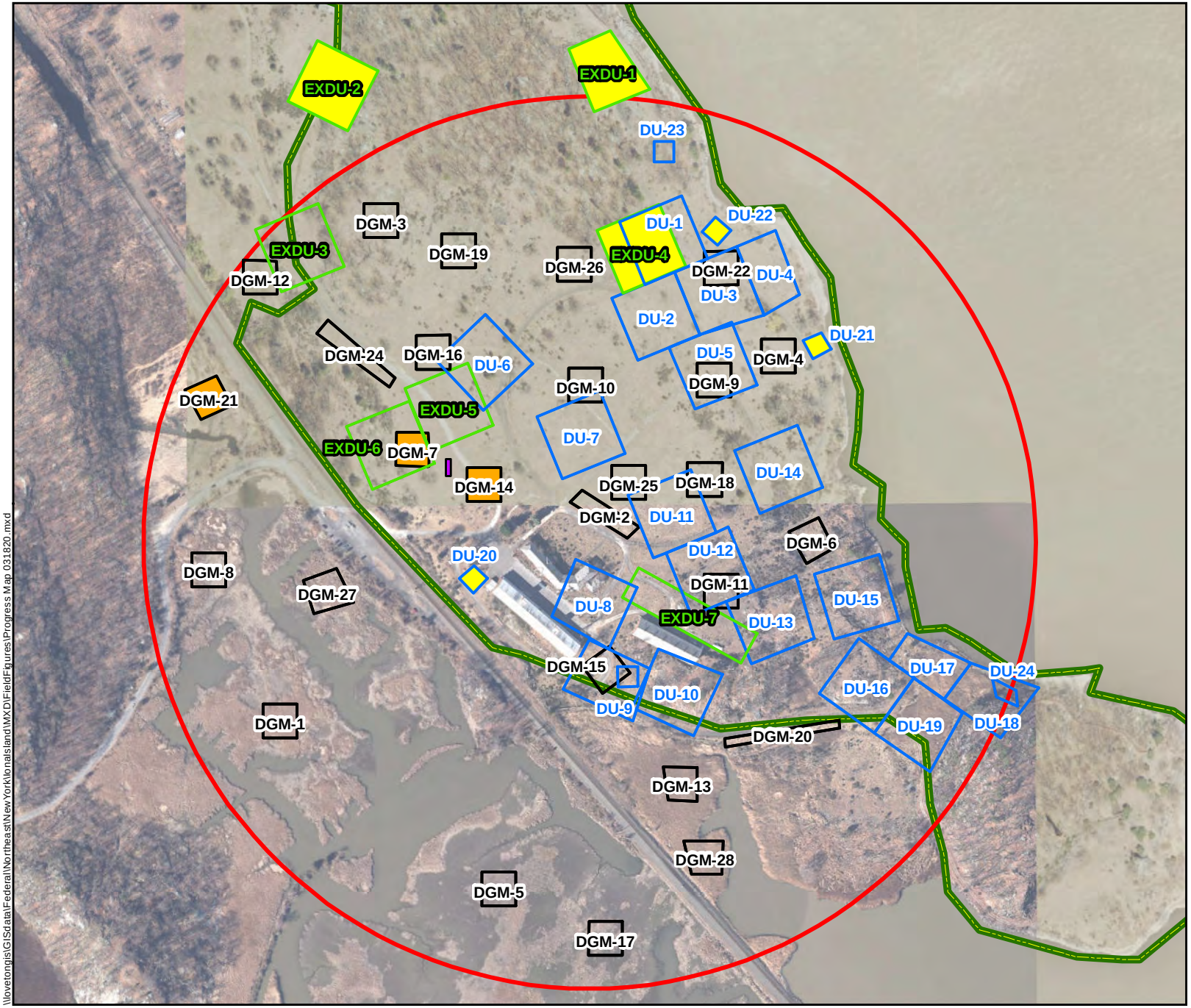
INSPECTION PERFORMED & WHO PERFORMED TEST

Functional check of Em-61 at IVS.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/17/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete

N

0 200 400
Feet

Map Date: 3/18/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 17 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYorkIonaIsland\MXD\FieldFigures\Progress Map 031820.mxd

Report Date: 3/18/2020
Project No: 63029587.01
Report No: 9

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Mix of sun and clouds.	54	36	52	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None

SITE VISITORS (Name/Organization):

None

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	11.5		UXOQCS/SO duties
Joshua Harris		UXO Tech 2 / EA Engineering	10.5		Soil sampling
Tim Reese		EA Project Manager / EA Engineering	11.0		PM duties
Amanda Kohn		Field Tech Supervisor / EA Engineering	10.5		Soil sampling
Derek Hendricks		Field Tech / EA Engineering	10.5		Soil sampling
Nash Stevens		Tech / NAEVA	11.5		Data collection
Nesgibv Sibhat		Tech / NAEVA	11.5		Data collection
Mike McGuire		Geophysicist / EA Engineering	11.0		Sr. Geophysicist duties

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/18/2020
Project No: 63029587.01
Report No: 9

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	9.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil Sampling was completed in seven DU grids. See grids list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, Schonsedt and DGM functional check at IVS.
- Soil collection completed in 7 Grids (EXDU-3, EXDU-5, EXDU-6, EXDU-7, DU-1, DU-4, DU-3).
- Data collection completed in 3 DGM grids (16, 24, 27).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

- Follow-Up Phase Inspection carried on DGM data collection in MRS-01, Grid 27 - Conformance.
- Follow-Up Phase Inspection of IVS testing of DGM equipment before and after Data collection - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

-Daily Safety Inspection conducted on soil collection operations - No Deficiencies Noted.

Summary of Deficiencies

None

Corrective Actions

None

Reinspection Results

None

Additional Notes

- Conducted daily tailgate safety brief.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/18/2020 8:07:52 PM

UXOQCS/SO

Report Date: 3/18/2020

Project No: 63029587.01

Report No: 9

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

OTHER INSPECTIONS:

- Follow-Up Phase Inspection carried on DGM data collection in MRS-01, Grid 27 - Conformance.
- Follow-Up Phase Inspection of IVS testing of DGM equipment before and after Data collection - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 3/18/2020

Project No: 63029587.01

Report No: 9

ADDITIONAL NOTES:

None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/18/2020 7:38:14 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/18/2020

Project No: 63029587.01

Report No: 9

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

-Daily Safety Inspection conducted on soil collection operations - No Deficiencies Noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

- Conducted daily tailgate safety brief.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

UXOSO

Report Date: 3/18/2020

Project No: 63029587.01

Report No: 9

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/18/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

INSPECTION PERFORMED & WHO PERFORMED TEST

Functional test of EM-61 before and after data collection in MRS-01, N. Stevens, NAVEA; N. Sibhat, NAVEA .

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/18/2020

SIGNATURE OF PROJECT QC SPECIALIST:

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/18/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01 Grid 27, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

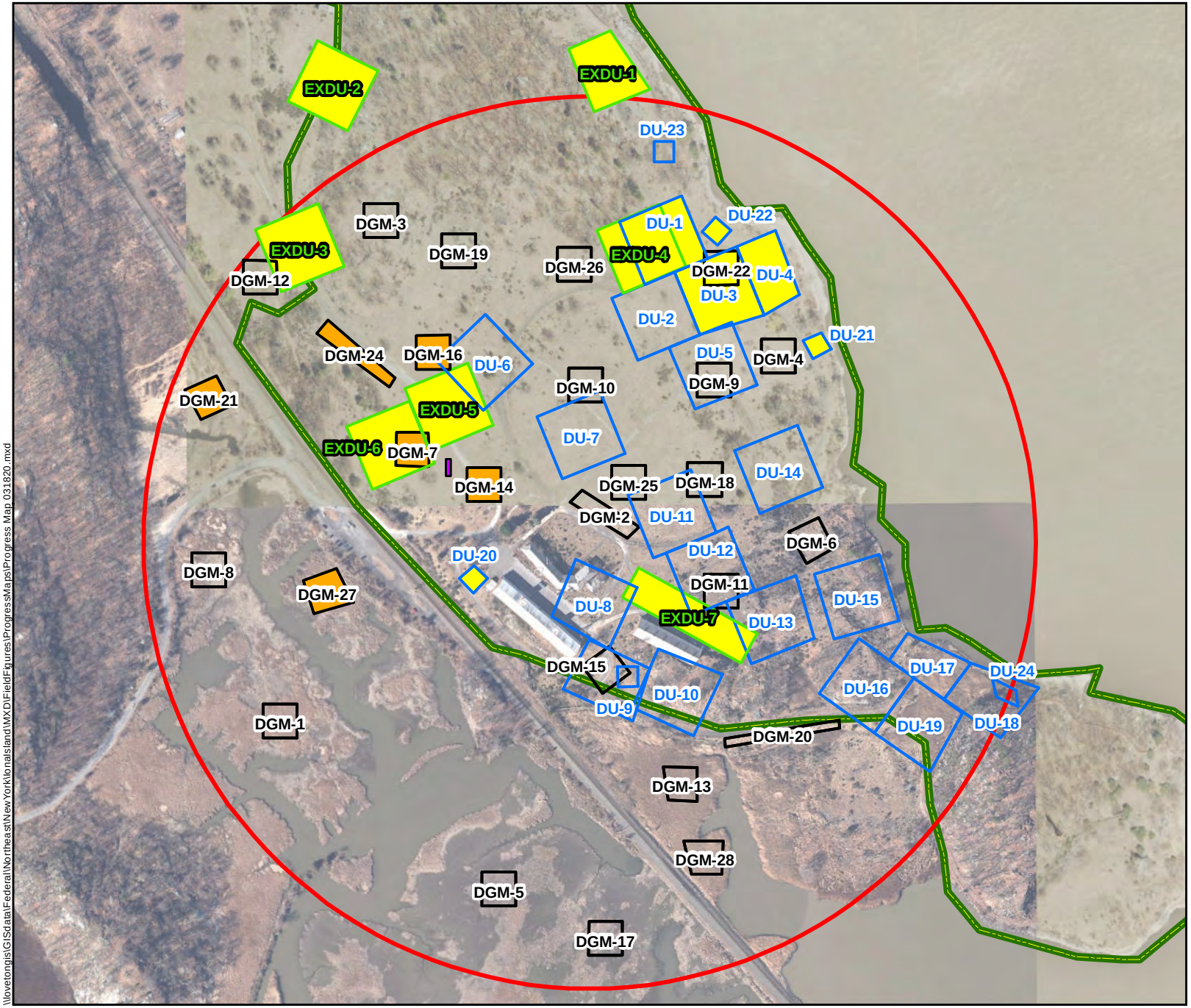
INSPECTION PERFORMED & WHO PERFORMED TEST

Inspection of Data Collection inside MRS-01 Grid 27, N. Stevens, NAVEA;
N. Sibhat, NAVEA .

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/18/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete

N

0 200 400
Feet

Map Date: 3/19/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 18 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 031820.mxd

Report Date: 3/19/2020
Project No: 63029587.01
Report No: 10

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain am, cloudy pm.	47	38	90	0.30

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	10.0		UXOQCS/SO duties
Joshua Harris		UXO Tech 2 / EA Engineering	10.0		Soil sampling
Tim Reese		EA Project Manager / EA Engineering	1.0		PM duties
Amanda Kohn		Field Tech Supervisor / EA Engineering	10.0		Soil sampling
Derek Hendricks		Field Tech / EA Engineering	10.0		Soil sampling
Nash Stevens		Tech / NAEVA	10.0		Data collection
Nesgibv Sibhat		Tech / NAEVA	10.0		Data collection
Mike McGuire		Geophysicist / EA Engineering	1.0		Sr. Geophysicist duties

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 3/19/2020
Project No: 63029587.01
Report No: 10

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	9.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil Sampling was completed in six DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, update on virus, Schonstedt and EM-61 functional check at IVS.
- NAEVA collected data in 3 DGM Grids (3,12, 19).
- EA soil sample team completed sampling in 6 locations (DU-2, DU-5, DU-6, DU-7, DU-9, DU-10).
- Tim Reese and Mike McGuire discussed project activities with team prior to demobilizing from site.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Inspections

- Follow-Up Phase Inspection carried out NAEVA Team in DGM collecting data in Grids 12, and 19 - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Performed Daily Safety Inspection of Soil Sampling Team working in DU-6 and DU-10. - No Deficiencies Noted.

Summary of Deficiencies

None

Corrective Actions

None

Reinspection Results

None

Additional Notes

Conducted Morning Tailgate Safety Meeting. Topics included: footing on wet/rocky surfaces do to the rain and update on the present virus situation.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/19/2020 7:03:19 PM

UXOQCS/SO

Report Date: 3/19/2020

Project No: 63029587.01

Report No: 10

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Follow-Up Phase Inspection carried out NAEVA DGM Team ollecting data in Grids 12, and 19 - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- None.

Report Date: 3/19/2020

Project No: 63029587.01

Report No: 10

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/19/2020 7:40:54 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/19/2020

Project No: 63029587.01

Report No: 10

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

-Perform Daily Safety Inspection of Soil Sampling Team working in DU-6 and DU-10. - No Deficiencies Noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted Morning Tailgate Safety Meeting. Topics included: footing on wet/rocky surfaces do to the rain and update on the present virus situation.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/19/2020 6:18:10 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/19/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01 Grids 12 and 19, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

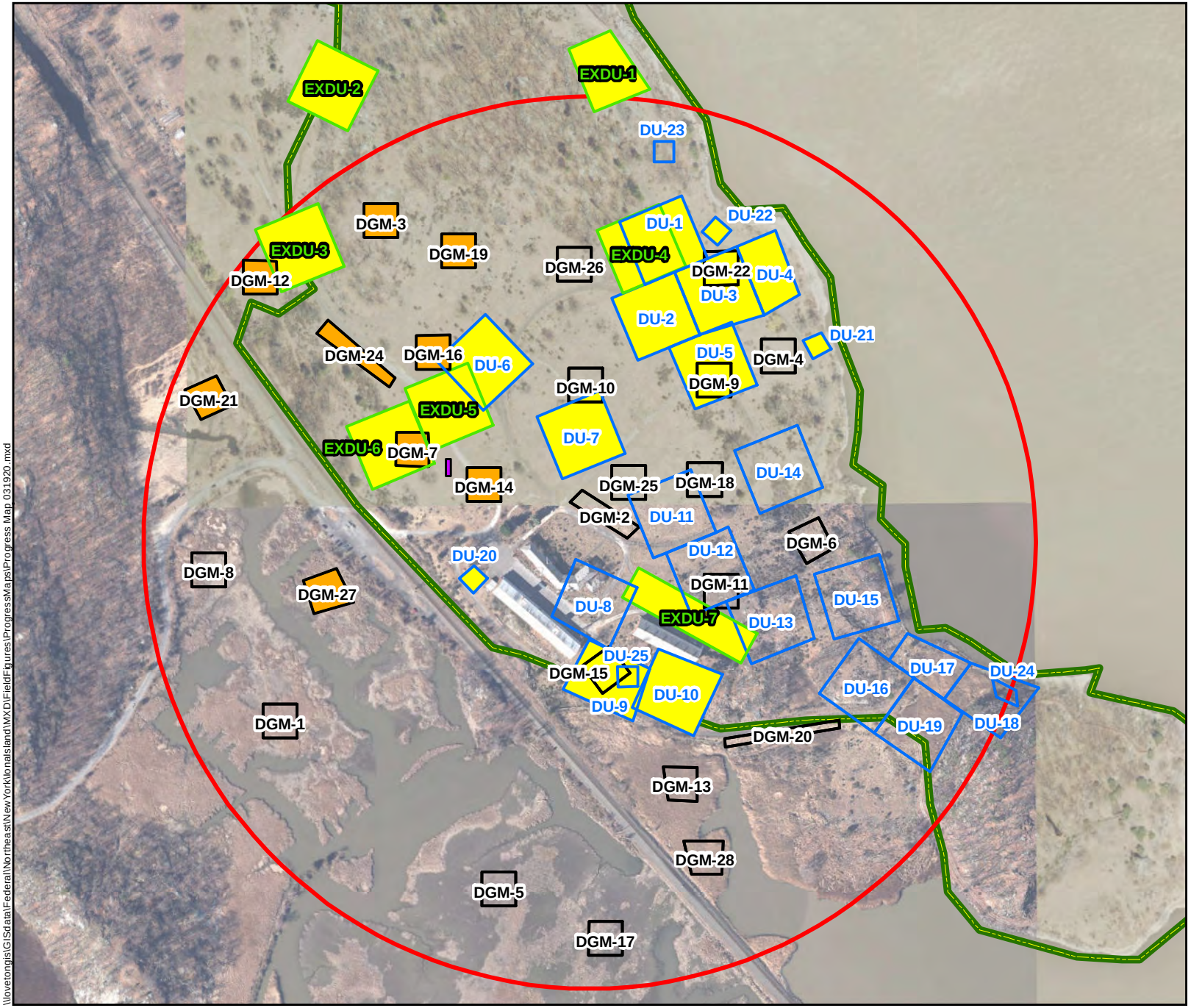
INSPECTION PERFORMED & WHO PERFORMED TEST

Inspected grid coverage, J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/19/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete

N

0 200 400
Feet

Map Date: 3/20/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 19 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 031920.mxd

Report Date: 3/20/2020
Project No: 63029587.01
Report No: 11

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain am, cloudy pm	72	44	63	0.02

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	9.0		UXOQCS/SO duties
Joshua Harris		UXO Tech 2 / EA Engineering	6.0		Soil sampling
Amanda Kohn		Field Tech Supervisor / EA Engineering	6.0		Soil sampling
Derek Hendricks		Field Tech / EA Engineering	6.0		Soil sampling
Nash Stevens		Tech / NAEVA	9.0		Data collection
Nesgibv Sibhat		Tech / NAEVA	9.0		Data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	5.0	Yes
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No

Report Date: 3/20/2020
Project No: 63029587.01
Report No: 11

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil Sampling was completed in three DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, schonstedt and EM-61 functional checks.
- NAEVA collected data in 3 DGM grids (2, 18, 25).
- EA personnel completed soil sampling in 3 areas (DU-14, DU-23, DU-25).
- Site personnel prepared to de-mob worksite due to NY State Governor's decision to close non-essential work places. All personnel to de-mob by 21 March 2020.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

Conducted Follow-Up Phase Inspection while NAEVA conducted functional test before and after DGM Grid data collection - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None

Additional Notes

Prepared for possible de-mob from work site in response to NY State Governor's decision to close down non-essential work due the current situation of the virus.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection of NAEVA personnel working in DGM Grid 25. No deficiencies observed.
Vehicle, fire extinguishers, first aid, trauma, eye wash, and burn kits inspected.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted Morning Tailgate Safety Meeting. Topics included: footing on wet/rocky surfaces do to the current rain, update on the present virus situation in the state of New York with the possibility of the Governor closing the state down, ticks have been noticed and brushed up on tick defense.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/20/2020 6:15:47 PM

UXOQCS/SO

Report Date: 3/20/2020

Project No: 63029587.01

Report No: 11

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection while NAEVA conducted functional test before and after DGM Grid data collection - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None

Report Date: 3/20/2020

Project No: 63029587.01

Report No: 11

ADDITIONAL NOTES:

Prepared for possible de-mob from work site due to N.Y. State Governor's decision on the current situation of the virus, to close down non-essential workers.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/20/2020 5:59:29 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/20/2020

Project No: 63029587.01

Report No: 11

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection of NAEVA personnel working in DGM Grid 25. No deficiencies observed.
Vehicle,fire extinguishers, first aid, trauma, eye wash, and burn kits inspected.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted Morning Tailgate Safety Meeting. Topics included: footing on wet/rocky surfaces do to the current rain, update on the present virus situation in the state of New York with the possibility of the Governor closing the state down, and tick defense.

Report Date: 3/20/2020

Project No: 63029587.01

Report No: 11

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/20/2020 5:35:11 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/20/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Equipment Set Up Testing, MRS-01 IVS, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

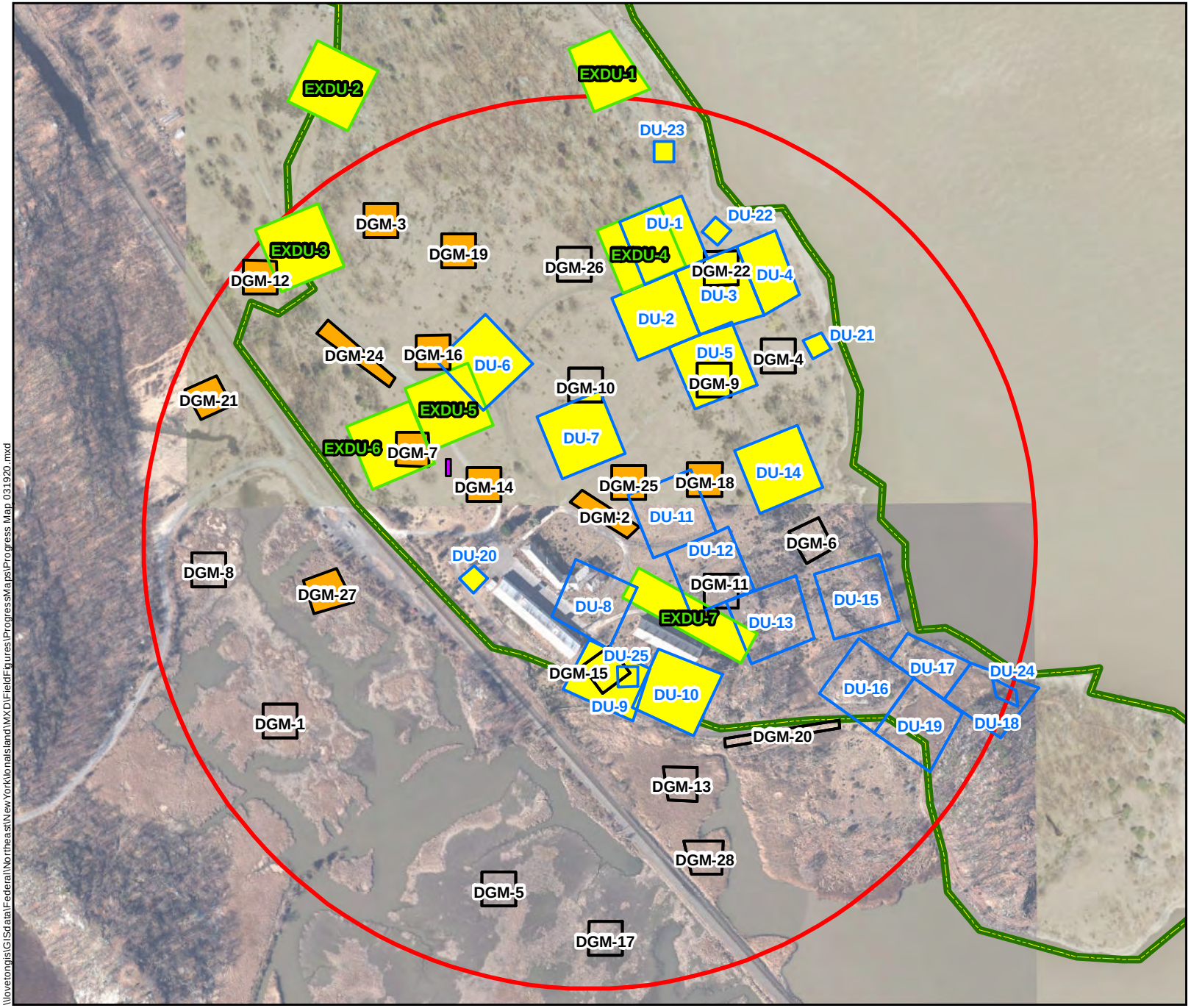
INSPECTION PERFORMED & WHO PERFORMED TEST

Functional test of EM-61 before and after data collection in MRS-01, N. Stevens, NAEVA; N. Sibhat, NAEVA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/20/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete

N

0 200 400
Feet

Map Date: 3/20/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 20 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 031920.mxd

Report Date: 3/21/2020
Project No: 63029587.01
Report No: 12

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny	54	34	57	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA Engineering	0.0		UXOQCS/SO duties
Joshua Harris		UXO Tech 2 / EA Engineering	0.0		Soil sampling
Amanda Kohn		Field Tech Supervisor / EA Engineering	0.0		Soil sampling
Derek Hendricks		Field Tech / EA Engineering	0.0		Soil sampling
Nash Stevens		Tech / NAEVA	0.0		Data collection
Nesgibv Sibhat		Tech / NAEVA	0.0		Data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No
Schonstedt		WHO223	0.0	No
Schonstedt		WHO177	0.0	No

Report Date: 3/21/2020
Project No: 63029587.01
Report No: 12

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids or Data was collected due to de-mobbing.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- All personnel de-mobbed from hotel due to NY State Governor closing the state in account of the Corona Virus.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

None.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

None.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/22/2020 3:37:53 PM

UXOQCS/SO

Report Date: 3/30/2020
Project No: 63029587.01
Report No: 13

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy am, rain pm.	50	43	89	0.02

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.5		UXOQCS/SO Duties
Alex Shaub		Field Leader / EA	6.0		Soil sampling
Derek Hendricks		Field Tech / EA	6.0		Soil sampling
Nash Stevens		Tech / NAEVA	10.5		DGM data collection
Nesibo Sibhat		Tech / NAEVA	10.5		DGM data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil Sampling was completed in three DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 3/30/2020
Project No: 63029587.01
Report No: 13

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief with new AHA on COVID-19, EM-61 functional check through IVS, and communications check.
- New personnel were briefed on AHA/ESP/SSHP.
- NAEVA completed 3 DGM Grids (26,10,8).
- Soil sampling was completing in DU-11, DU-12, and DU-13.

Report Date: 3/30/2020
Project No: 63029587.01
Report No: 13

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

- Conducted Follow-Up Phase Inspection on NAEVA while collecting data in MRS-01, DGM-8 - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- New site personnel. Conducted ESP briefing.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Conducted safety inspection on Soil Sample Team in DU-12, checked PPE, and no deficiencies were observed.

Summary of Deficiencies

-None.

Corrective Actions

-None.

Reinspection Results

-None.

Additional Notes

- Conducted daily safety briefing covering new AHA on virus and AHA/SSHP/ESP briefing to new personnel.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/30/2020 7:51:34 PM

UXOQCS/SO

Report Date: 3/30/2020

Project No: 63029587.01

Report No: 13

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Conducted Follow-Up Phase Inspection on NAEVA while collecting data in DGM-8 - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 3/30/2020

Project No: 63029587.01

Report No: 13

ADDITIONAL NOTES:

- New site personnel. Conducted ESP briefing.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/30/2020 7:24:27 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/30/2020

Project No: 63029587.01

Report No: 13

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Conducted safety inspection on Soil Sample team in DU-12 and checked PPE. No deficiencies observed.

SUMMARY OF DEFICIENCIES:

-None.

CORRECTIVE ACTIONS RECOMMENDED:

-None.

REINSPECTION RESULTS:

-None.

ADDITIONAL NOTES:

- Conducted daily safety briefing covering new AHA on virus and AHA/SSHP/ESP briefing to new personnel.

Report Date: 3/30/2020

Project No: 63029587.01

Report No: 13

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/30/2020 7:24:37 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/30/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01, DGM Grid #8, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

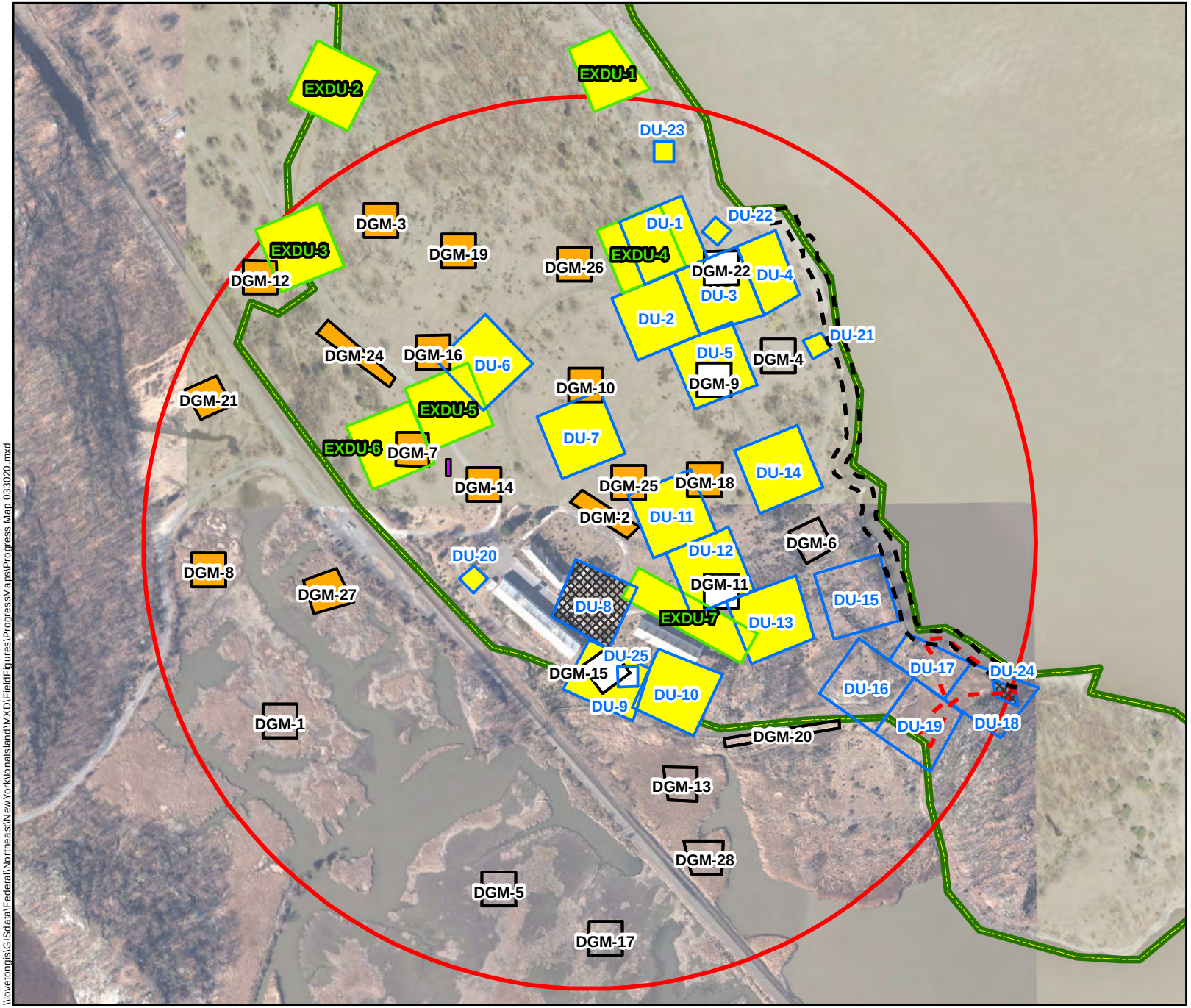
INSPECTION PERFORMED & WHO PERFORMED TEST

DGM of grids in MRS-01, J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/30/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 3/30/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 30 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYorkIonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 033020.mxd

Decision Unit #	Sample Type	Sample Identification Code[3]	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
DU-1	Surface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1500	MS/MSD	031820-B	5.6
		IINY-DU-1B-SSIS-20200318		3/18/2020	1500		031820-B	6.5
		IINY-DU-1C-SSIS-20200318		3/18/2020	1500		031820-B	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-1. Soil depth to refusal ranged from 6 to 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-1B-SBIS1-YYYYMMDD						
		IINY-DU-1C-SBIS1-YYYYMMDD						
DU-2	Surface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	815		031920-A	5.6
		IINY-DU-2B-SSIS-20200319		3/19/2020	815		031920-A	6.6
		IINY-DU-2C-SSIS-20200319		3/19/2020	815		031920-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-2. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-2B-SBIS1-YYYYMMDD						
		IINY-DU-2C-SBIS1-YYYYMMDD						
DU-3	Surface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1545		031820-B	7.0
		IINY-DU-3B-SSIS-20200318		3/18/2020	1545		031820-B	7.0
		IINY-DU-3C-SSIS-20200318		3/18/2020	1545		031820-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-3. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-3B-SBIS1-YYYYMMDD						
		IINY-DU-3C-SBIS1-YYYYMMDD						
DU-4	Surface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1430		031820-B	6.9
		IINY-DU-4B-SSIS-20200318		3/18/2020	1430		031820-B	7.0
		IINY-DU-4C-SSIS-20200318		3/18/2020	1430		031820-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-4. Significant anomalies in 1-acre DU. Soil depth to refusal at one boring was 12 inches bgs, soil depth to refusal at remaining borings ranged from 4 to 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-4B-SBIS1-YYYYMMDD						
		IINY-DU-4C-SBIS1-YYYYMMDD						
DU-5	Surface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	900		031920-A	7.1
		IINY-DU-5B-SSIS-20200319		3/19/2020	900		031920-A	7.1
		IINY-DU-5C-SSIS-20200319		3/19/2020	900		031920-A	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-5. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-5B-SBIS1-YYYYMMDD						
		IINY-DU-5C-SBIS1-YYYYMMDD						
DU-6	Surface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1500		031920-B	7.5
		IINY-DU-6B-SSIS-20200319		3/19/2020	1500		031920-B	7.5
		IINY-DU-6C-SSIS-20200319		3/19/2020	1500		031920-B	7.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-6. Exposed bedrock / bedrock wall in DU-6. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-6B-SBIS1-YYYYMMDD						
		IINY-DU-6C-SBIS1-YYYYMMDD						
DU-7	Surface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1345		031920-B	7.4
		IINY-DU-7B-SSIS-20200319		3/19/2020	1345		031920-B	7.4
		IINY-DU-7C-SSIS-20200319		3/19/2020	1345		031920-B	7.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-7. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-7B-SBIS1-YYYYMMDD						
		IINY-DU-7C-SBIS1-YYYYMMDD						
DU-8	Surface Soil Incremental Sample collected in triplicate	IINY-DU-8A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	DU-8 Deletion – DU-8 was placed at former Building 207 that was a small garage located between existing Buildings 222, 201, and 212. Building 207 is also known as HTRW AOC #5. DU-8 is a 200x200 ft decision unit that was established around former Building 207 to determine whether former operations at this building served as a source of contaminants to the environment at concentrations that may result in potential risks to human and ecological receptors. Following mark-out DU-8 in the field and site reconnaissance conducted on 11 March 2020, numerous rusted and deteriorating 55-gallon drums, deteriorating pallets, piles of roofing shingles, chain link fencing, and other debris were observed in DU-8. Several empty 55-gallon drums were lying on their sides, while other drums were upright and filled with fluid. The material contained within the drums is not known. Residue indicative of roofing tar was observed on the outside of several drums, and staining was noted on the ground surface. Per discussion with USACE on 24 March 2020, DU-8 will not be sampled because it would not be possible to separate metals and PAH contaminants originating from former Building 207, from contaminants originating from drums and other debris observed in DU-8.					
		IINY-DU-8B-SSIS-YYYYMMDD						
		IINY-DU-8C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-8A-SBIS1-YYYYMMDD						
		IINY-DU-8B-SBIS1-YYYYMMDD						
		IINY-DU-8C-SBIS1-YYYYMMDD						
DU-9	Surface Soil Incremental Sample collected in triplicate	IINY-DU-9A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	1040		031920-A	7.1
		IINY-DU-9B-SSIS-20200319		3/19/2020	1040		031920-B	6.9
		IINY-DU-9C-SSIS-20200319		3/19/2020	1040	MS/MSD	031920-B	7.0
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-9A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-9. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-9B-SBIS1-YYYYMMDD						
		IINY-DU-9C-SBIS1-YYYYMMDD						
DU-10	Surface Soil Incremental Sample collected in triplicate	IINY-DU-10A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1120		031920-B	7.1
		IINY-DU-10B-SSIS-20200319		3/19/2020	1120		031920-B	7.1
		IINY-DU-10C-SSIS-20200319		3/19/2020	1120		031920-B	7.2
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-10A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-10. Exposed bedrock and bedrock wall within DU. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-10B-SBIS1-YYYYMMDD						
		IINY-DU-10C-SBIS1-YYYYMMDD						
DU-11	Surface Soil Incremental Sample collected in triplicate	IINY-DU-11A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1115	MS/MSD	033020-A	7.0
		IINY-DU-11B-SSIS-20200330		3/30/2020	1115		033020-A	7.0
		IINY-DU-11C-SSIS-20200330		3/30/2020	1115		033020-A	7.2
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-11A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-11. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-11B-SBIS1-YYYYMMDD						

	collected in triplicate	IINY-DU-11C-SBIS1-YYYYMMDD						
DU-12	Surface Soil Incremental Sample collected in triplicate	IINY-DU-12A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1215		033020-A	5.5
		IINY-DU-12B-SSIS-20200330		3/30/2020	1215		033020-A	6.1
		IINY-DU-12C-SSIS-20200330		3/30/2020	1215		033020-A	6.3
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-12A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-12. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-12B-SBIS1-YYYYMMDD						
		IINY-DU-12C-SBIS1-YYYYMMDD						
DU-13	Surface Soil Incremental Sample collected in triplicate	IINY-DU-13A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1340		033020-A	6.8
		IINY-DU-13B-SSIS-20200330		3/30/2020	1340		033020-A	7.0
		IINY-DU-13C-SSIS-20200330		3/30/2020	1340		033020-A	6.9
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-13A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-13. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-13B-SBIS1-YYYYMMDD						
		IINY-DU-13C-SBIS1-YYYYMMDD						
DU-14	Surface Soil Incremental Sample collected in triplicate	IINY-DU-14A-SSIS-20200320	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, pH (screened in the field with pH meter)	3/20/2020	830		032020-A	6.7
		IINY-DU-14B-SSIS-20200320		3/20/2020	830		302020-A	6.9
		IINY-DU-14C-SSIS-20200320		3/20/2020	830		032020-A	7.0
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-14A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-9. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-14B-SBIS1-YYYYMMDD						
		IINY-DU-14C-SBIS1-YYYYMMDD						
DU-15	Surface Soil Incremental Sample collected in triplicate	IINY-DU-15A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, pH (screened in the field with pH meter)					
		IINY-DU-15B-SSIS-YYYYMMDD						
		IINY-DU-15C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-15A-SBIS1-YYYYMMDD						
		IINY-DU-15B-SBIS1-YYYYMMDD						
		IINY-DU-15C-SBIS1-YYYYMMDD						
DU-16	Surface Soil Incremental Sample collected in triplicate	IINY-DU-16A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)					
		IINY-DU-16B-SSIS-YYYYMMDD						
		IINY-DU-16C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-16A-SBIS1-YYYYMMDD						
		IINY-DU-16B-SBIS1-YYYYMMDD						
		IINY-DU-16C-SBIS1-YYYYMMDD						
DU-17	Surface Soil Incremental Sample collected in triplicate	IINY-DU-17A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)					
		IINY-DU-17B-SSIS-YYYYMMDD						
		IINY-DU-17C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-17A-SBIS1-YYYYMMDD						
		IINY-DU-17B-SBIS1-YYYYMMDD						
		IINY-DU-17C-SBIS1-YYYYMMDD						
DU-18	Surface Soil Incremental Sample collected in triplicate	IINY-DU-18A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)					
		IINY-DU-18B-SSIS-YYYYMMDD						
		IINY-DU-18C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-18A-SBIS1-YYYYMMDD						
		IINY-DU-18B-SBIS1-YYYYMMDD						
		IINY-DU-18C-SBIS1-YYYYMMDD						
DU-19	Surface Soil Incremental Sample collected in triplicate	IINY-DU-19A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)					
		IINY-DU-19B-SSIS-YYYYMMDD						
		IINY-DU-19C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-19A-SBIS1-YYYYMMDD						
		IINY-DU-19B-SBIS1-YYYYMMDD						
		IINY-DU-19C-SBIS1-YYYYMMDD						
DU-20	Surface Soil Incremental Sample collected in triplicate	IINY-DU-20A-SSIS-20200316	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/16/2020	1530		031620-A	6.1
		IINY-DU-20B-SSIS-20200316		3/16/2020	1530		031620-A	6.5
		IINY-DU-20C-SSIS-20200316		3/16/2020	1530		031620-A	6.6
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-20A-SBIS1-20200317		3/17/2020	930	MS/MSD	031720-A / 031720-C	6.8
		IINY-DU-20B-SBIS1-20200317		3/17/2020	930		031720-A / 031720-C	6.9
		IINY-DU-20C-SBIS1-20200317		3/17/2020	930		031720-A / 031720-C	6.8
DU-21	Surface Soil Incremental Sample collected in triplicate	IINY-DU-21A-SSIS-20200317	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/17/2020	1240		031720-A	6.3
		IINY-DU-21B-SSIS-20200317		3/17/2020	1240		031720-A	6.8
		IINY-DU-21C-SSIS-20200317		3/17/2020	1240		031720-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-21A-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.0
		IINY-DU-21B-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.1
		IINY-DU-21C-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.3
DU-22	Surface Soil Incremental Sample collected in triplicate	IINY-DU-22A-SSIS-20200316	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/16/2020	1530		031620-A	6.7
		IINY-DU-22B-SSIS-20200316		3/16/2020	1530		031620-A	6.8
		IINY-DU-22C-SSIS-20200316		3/16/2020	1530		031620-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-22A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-22. Soil depth to refusal ranged from 6 to 8 inches bgs (<1 ft). Will not collect subsurface soil.E124				
		IINY-DU-22B-SBIS1-YYYYMMDD						
		IINY-DU-22C-SBIS1-YYYYMMDD						
DU-23	Surface Soil Incremental Sample collected in triplicate	IINY-DU-23A-SSIS-20200320	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH	3/20/2020	915		032020-A	6.0
		IINY-DU-23B-SSIS-20200320		3/20/2020	915		032020-A	5.4
		IINY-DU-23C-SSIS-20200320		3/20/2020	915		032020-A	5.5

DU-23	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-23A-SBIS1-YYYYMMDD	meter)	Soil depth to refusal less than 6 inches bgs (<1 ft). Majority of DU is exposed bedrock. Very shallow soil. Will not collect subsurface soil.				
		IINY-DU-23B-SBIS1-YYYYMMDD						
		IINY-DU-23C-SBIS1-YYYYMMDD						
DU-24	Surface Soil Incremental Sample collected in triplicate	IINY-DU-24A-SSIS-YYYYMMDD	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	DU-24 Deletion – Historical documents indicate that a former transformers on a pole was located along the former eastern sentry path from Iona Island onto Round Island. A 60x60 ft decision unit, DU-24, was established on Round Island to evaluate the presence/absence of PCBs associated with the former transformer. DU-24 was one of three transformer decision units that is known as HTRW AOC #19 on Iona Island (Note: the other two transformer decision units were collect). DU-24 is bounded by the Hudson River to east/northeast and the former dump area between Iona and Round Islands to the northwest. A downed former electric pole was noted during a reconnaissance on 20 March 2020. The majority of DU-24 is exposed bedrock with little thin soil cover. Sediment and soil was noted along the northeastern edge of DU-24 off the bedrock outcrop of Round Island, however this sediment/soil is along the shoreline of the tidally influenced Hudson River. Per a call with USACE on 24 March 2020, DU-24 will not be sampled. There is little/no soil available for sampling in the area of the former transformer. Any PCBs that may have been released from former transformers would have been transported via runoff and overland flow across the bedrock outcrop of Round Island to the Hudson River. However, as the Hudson River itself is a PCB source, collecting PCBs from soil/sediment along the Hudson River will not provide information that could be used to evaluate a potential release related to former transformers.				
		IINY-DU-24B-SSIS-YYYYMMDD						
		IINY-DU-24C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-24A-SBIS1-YYYYMMDD						
		IINY-DU-24B-SBIS1-YYYYMMDD						
		IINY-DU-24C-SBIS1-YYYYMMDD						
DU-25	Surface Soil Incremental Sample collected in triplicate	IINY-DU-25A-SSIS-20200320	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	3/20/2020	1030	MS/MSD	032020-A	6.2
		IINY-DU-25B-SSIS-20200320		3/20/2020	1030	032020-A	032020-A	6.4
		IINY-DU-25C-SSIS-20200320		3/20/2020	1030		032020-A	6.4
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-25A-SBIS1-YYYYMMDD		Advanced 5 hand auger borings at DU-25. Exposed bedrock and bedrock wall within DU. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-25B-SBIS1-YYYYMMDD						
		IINY-DU-25C-SBIS1-YYYYMMDD						
Former Buildings Identified as Having Significant Potential for Explosive Hazard (EXDU; pending direction of contracting offer): Surface and Subsurface Soil								
EXDU-1	Surface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1535		031720-B	7.0
		IINY-DU-1B-SSIS-20200317		3/17/2020	1535		031720-B	6.9
		IINY-DU-1C-SSIS-20200317		3/17/2020	1535		031720-B	6.9
EXDU-2	Surface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1610		031720-B	7.0
		IINY-DU-2B-SSIS-20200317		3/17/2020	1610		031720-B	6.8
		IINY-DU-2C-SSIS-20200317		3/17/2020	1610		031720-B	6.9
EXDU-3	Surface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	800		031820-A	6.3
		IINY-DU-3B-SSIS-20200318		3/18/2020	800		031820-A	6.5
		IINY-DU-3C-SSIS-20200318		3/18/2020	800		031820-A	5.5
EXDU-4	Surface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1430	MS/MSD	031720-A	6.5
		IINY-DU-4B-SSIS-20200317		3/17/2020	1430		031720-B	6.3
		IINY-DU-4C-SSIS-20200317		3/17/2020	1430		031720-B	6.8
EXDU-5	Surface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	930		031820-A	7.1
		IINY-DU-5B-SSIS-20200318		3/18/2020	930		031820-A	7.2
		IINY-DU-5C-SSIS-20200318		3/18/2020	930		031820-A	7.3
EXDU-6	Surface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	1015		031820-A	7.2
		IINY-DU-6B-SSIS-20200318		3/18/2020	1015		031820-A	7.3
		IINY-DU-6C-SSIS-20200318		3/18/2020	1015		031820-A	7.3
EXDU-7	Surface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	1145	MS/MSD	031820-A	7.0
		IINY-DU-7B-SSIS-20200318		3/18/2020	1145		031820-A	7.0
		IINY-DU-7C-SSIS-20200318		3/18/2020	1145		031820-A	7.1
Phase I Background: Surface and Subsurface Soil								
BDU-1	Surface Soil Incremental Sample	IINY-BADU-1-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-1-SBIS1-YYYYMMDD						
BDU-2	Surface Soil Incremental Sample	IINY-BADU-2-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-2-SBIS1-YYYYMMDD						
BDU-3	Surface Soil Incremental Sample	IINY-BADU-3-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-3-SBIS1-YYYYMMDD						
BDU-4	Surface Soil Incremental Sample	IINY-BADU-4-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-4-SBIS1-YYYYMMDD						
BDU-5	Surface Soil Incremental Sample	IINY-BADU-5-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-5-SBIS1-YYYYMMDD						
BDU-6	Surface Soil Incremental Sample	IINY-BADU-6-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-6-SBIS1-YYYYMMDD						
BDU-7	Surface Soil Incremental Sample	IINY-BADU-7-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-7-SBIS1-YYYYMMDD						
BDU-8	Surface Soil Incremental Sample	IINY-BADU-8-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM					
	Subsurface Soil Incremental Sample	IINY-BADU-8-SBIS1-YYYYMMDD						
Shoreline Reconnaissance Survey Sediment Sampling								
SD-01	Discrete Sediment Sample	IINY-SD01-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-02	Discrete Sediment Sample	IINY-SD02-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-03	Discrete Sediment Sample	IINY-SD03-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-04	Discrete Sediment Sample	IINY-SD04-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-05	Discrete Sediment Sample	IINY-SD05-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-06	Discrete Sediment Sample	IINY-SD06-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
TB	Grab	TB03172020	VOCs by 8260B	3/17/2020	1500	Trip Blank (VOCs)	031720-C	N/A
FB	Grab	FB03172020	VOCs by 8260B	3/17/2020	1545	Field Blank (VOCs)	031720-C	N/A

Report Date: 3/31/2020
Project No: 63029587.01
Report No: 14

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain am, cloudy pm	48	38	95	0.02

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.5		UXOQCS/SO Duties
Alex Shaub		Field Leader / EA	9.0		Soil sampling
Derek Hendricks		Field Tech / EA	9.0		Soil sampling
Nash Stevens		Tech / NAEVA	10.5		DGM data collection
Nesibo Sibhat		Tech / NAEVA	10.5		DGM data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil Sampling was completed in four DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 3/31/2020
Project No: 63029587.01
Report No: 14

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted daily safety brief to NAEVA and EA personnel, communications check, and EM-61 functional check at IVS.
- NAEVA DGM Team completed data collection in 3 DGM Grids (1, 15, 20).
- Soil Sampling Team completed sampling in 4 DU Grids (DU-16, DU-17, DU-18, DU-19).
- NAEVA DGM Technician reported at end of day that on the previous work day (03-30-2020) that he twisted his left knee while traversing the marsh area in DGM-8, he stated he did not require medical attention, and will monitor the injury. He did not miss any work. EA Near-Miss Report initiated and attached to Daily Report. Site personnel will again be reminded to report of all injuries in a timely manner, no matter how insignificant.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

- Conducted Follow-Up Inspection of NAEVA conducting functional testing of EM-61 at IVS before and after daily data collection. - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- NAEVA technician reported at end of todays work a left knee sprain that occurred the previous day. EA Near-Miss Report completed and sent to NAEVA and EA Supervisors.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Daily Safety Inspection of Soil Sampling Team in DU-16. No deficiencies noted.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

- NAEVA DGM Tech N. Sibhat reported this afternoon (end of day) that yesterday (3/30/2020) he twisted his left knee while pulling the EM-61 through marsh area of DGM Grid #8. Individual declined medical attention and stated he would monitor the injury. Individual did not miss any work.
- Conducted daily safety brief, update news of COVID-19 in N.Y. State, and briefed personnel on reporting of site injuries (i.e., tick bites, sprains, etc.).

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 3/31/2020 7:44:44 PM

UXOQCS/SO

Report Date: 3/31/2020

Project No: 63029587.01

Report No: 14

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Conducted Follow-Up Inspection of NAEVA conducting functional testing of EM-61 at MRS-01 IVS before and after daily data collection. - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 3/31/2020

Project No: 63029587.01

Report No: 14

ADDITIONAL NOTES:

- NAEVA technician reported at end of day's work a left knee sprain that occurred the previous day. EA Near-Miss Report completed and sent to NAEVA and EA Supervisors.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/31/2020 7:13:32 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 3/31/2020

Project No: 63029587.01

Report No: 14

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Daily Safety Inspection of Soil Sampling Team in DU-16. No deficiencies noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

- NAEVA DGM Tech N. Sibhat reported this afternoon (end of day) that yesterday (03/30/2020) he twisted his left knee while pulling the EM-61 through marsh area of DGM-8. Individual declined medical attention and stated he would monitor the injury. Individual did not miss any work.
- Conducted daily safety brief, update news of COVID-19 in N.Y. State, and briefed personnel on reporting of site injuries (i.e., tick bites, sprains, etc.).

Report Date: 3/31/2020

Project No: 63029587.01

Report No: 14

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 3/31/2020 7:03:19 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 3/31/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; J. D. Marlowe, EA.

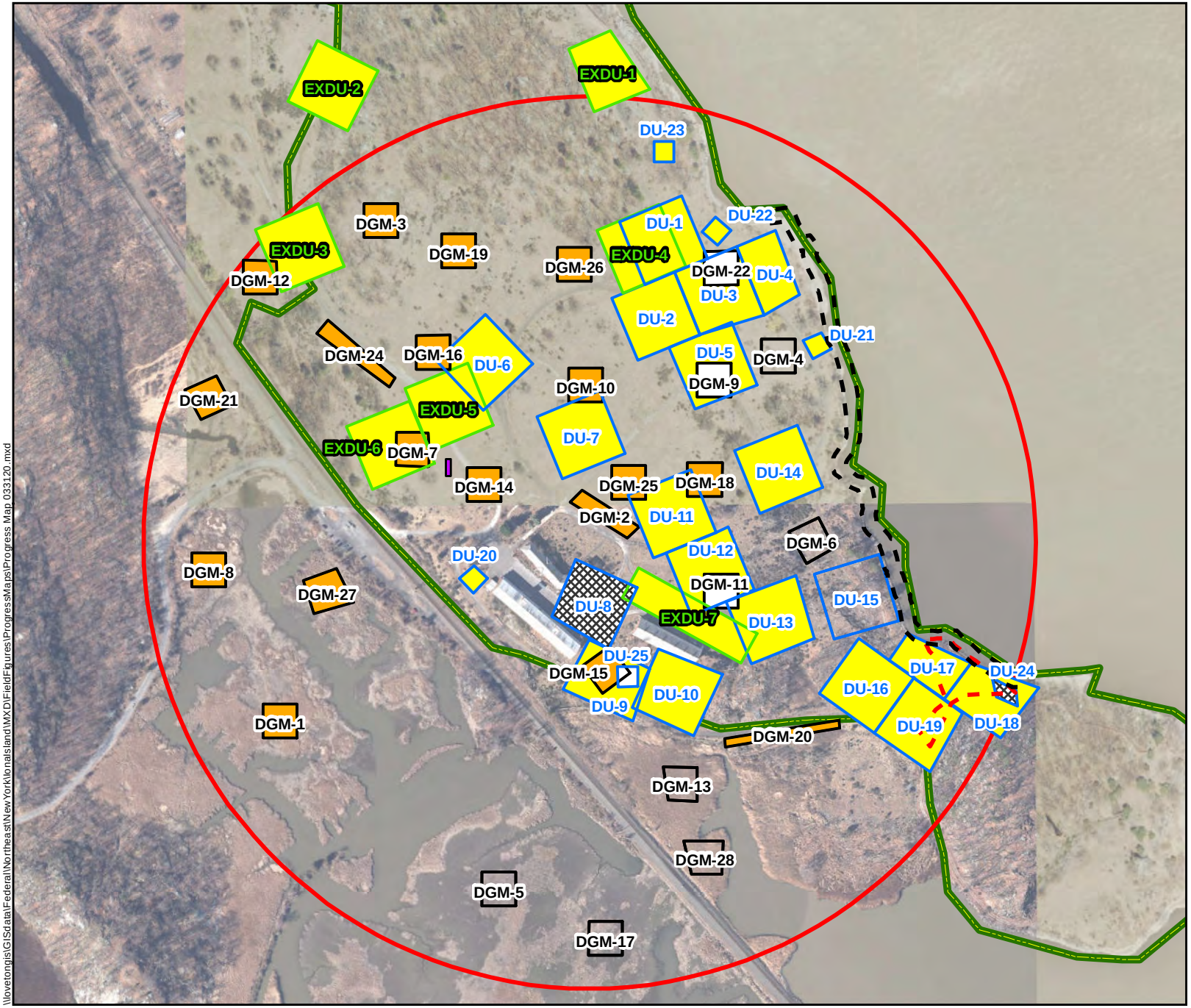
INSPECTION PERFORMED & WHO PERFORMED TEST

EM-61 Functional Test before/after Data collection; J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 3/31/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/1/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 31 March 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 033120.mxd

NEAR MISS INCIDENT REPORT (G-25)

A near miss is a potential hazard or incident that has not resulted in any personal injury or property damage. Unsafe working conditions, unsafe employee work habits, improper use of equipment, or use of malfunctioning equipment have the potential to cause work-related injuries. It is everyone's responsibility to report and correct these potential accidents/incidents immediately.

Please complete this form as a means to report these near miss situations.

Department/Location Joan Island Date: 03/30/2020 Time: 10:30 a.m./p.m.

Please check all appropriate conditions:

___	Unsafe act	___	Unsafe equipment	___	Other
✓	Unsafe condition	___	Unsafe use of equipment		

Description of incident or potential hazard left leg twist at knee working at DGM 8

Employee Signature [illegible] Date 03/31/20

NEAR MISS INVESTIGATION

Description of the Near Miss Condition TECHNICIAN WAS PULLING EM-61 CART THRU MARSH AREA WHEN HIS LEFT LEG CAUGHT A SINKHOLE CAUSING LEFT KNEE TO TWIST.

Causes (primary and contributing) ENVIRONMENT - THAT AREA IS A PARAMITE MARSH WHICH WAS MOWED TO REMOVE VEGETATION AND COVERED POSSIBLE VOULDS IN MARSH SURFACES.

Corrective Action Taken (i.e., remove the hazard; replace, repair, or retrain in the proper procedures for the task) ALL SITE PERSONNEL BRIEFED ON TAKING EXTREME CARE WHEN TRANSVERSING HAZARDOUS AREAS (MARSH, SLOPES, ROCKS)

Signed JD MARLOWE UXOQCS/SO Date Completed 03/31/2020

Form not completed within 4 hours of incident for the following reason(s) ___

Corporate Director of Safety and Health Date

Forward to Corporate Director of Safety and Health when completed.

Report Date: 4/1/2020
Project No: 63029587.01
Report No: 15

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny with clouds	52	35	39	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.0		UXOQCS/SO Duties
Alex Shaub		Field Leader / EA	8.0		Soil sampling
Derek Hendricks		Field Tech / EA	8.0		Soil sampling
Nash Stevens		Tech / NAEVA	10.0		DGM data collection
Nesibo Sibhat		Tech / NAEVA	10.0		DGM data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. Soil Sampling was completed in nine DU grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 4/1/2020

Project No: 63029587.01

Report No: 15

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted daily site safety brief, communications check, and EM-61 functional test at IVS.
- Soil sample team completed sampling in 9 DU grids (DU-15, BADU-1, BADU-2, BADU-3, BADU-4, BADU-5, BADU-6, BADU-7, BADU-8). Note: Background DU's were collected as single 50 increment DUs rather than in triplicate as other DUs.
- NAEVA completed collecting data in 3 DGM Grids (DGM-5, DGM-6, DGM-17).
- NAEVA technician that reported injury on the previous work day stated he did not require medical attention.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

Conducted Follow-Up Phase Inspection on NAEVA data collection in DGM Grid 05. - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Conducted Daily Safety Inspection on NAEVA DGM Team in DGM Grid 06, during their traversing the cut vegetation mat in the marsh area - No discrepancies noted.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted Daily Site Safety Brief with EA and NAEVA personnel, updated COVID-19 situation in N.Y. State, and injury reporting promptness.

NAEVA technician that reported injury on the previous work day stated he did not need medical attention and will monitor it himself.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/1/2020 6:08:33 PM

UXOQCS/SO

Report Date: 4/1/2020

Project No: 63029587.01

Report No: 15

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection on NAEVA data collection in DGM Grid 05. - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Report Date: 4/1/2020

Project No: 63029587.01

Report No: 15

ADDITIONAL NOTES:

None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/2/2020 7:35:38 AM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/1/2020

Project No: 63029587.01

Report No: 15

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Conducted Daily Safety Inspection on NAEVA DGM Team in DGM Grid 06 during their traversing of the cut vegetation mat in marsh area. - No discrepancies noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted Daily Site Safety Brief with EA and NAEVA personnel, updated COVID-19 situation in N.Y. State, and injury reporting promptness.
NAEVA technician that reported injury on the previous work day stated he still did not need medical attention and will monitor it himself.

Report Date: 4/1/2020

Project No: 63029587.01

Report No: 15

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

4/1/2020 5:53:12 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/1/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01, DGM Grid 05, N. Stevens, NAEVA; N. Sibhat, NAEVA; J. D. Marlowe, EA.

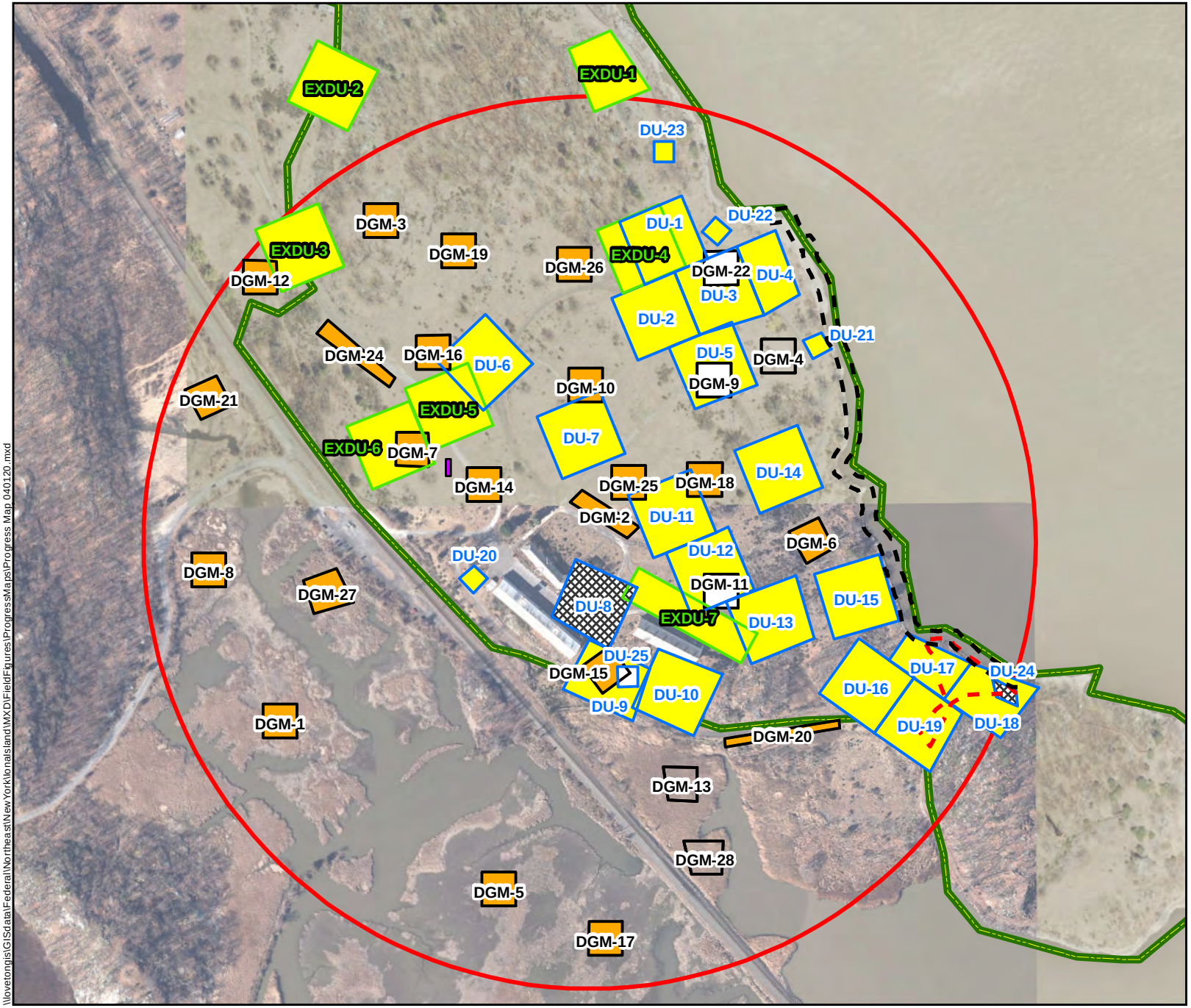
INSPECTION PERFORMED & WHO PERFORMED TEST

DGM of Grids in MRS-01, J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/1/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

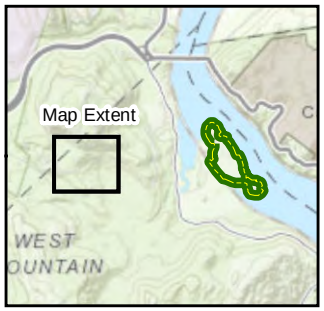
0 200 400
Feet

N

Map Date: 4/1/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 01 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 040120.mxd



Legend

Grid Type

BADU

Soil Sampling Status

Complete

N

0 200 400
Feet

Map Date: 4/2/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - Background Soil Samples
Date: 01 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

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Decision Unit #	Sample Type	Sample Identification Code	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
DU-1	Surface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1500	MS/MSD	031820-B	5.6
		IINY-DU-1B-SSIS-20200318		3/18/2020	1500		031820-B	6.5
		IINY-DU-1C-SSIS-20200318		3/18/2020	1500		031820-B	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-1. Soil depth to refusal ranged from 6 to 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-1B-SBIS1-YYYYMMDD						
		IINY-DU-1C-SBIS1-YYYYMMDD						
DU-2	Surface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	815		031920-A	5.6
		IINY-DU-2B-SSIS-20200319		3/19/2020	815		031920-A	6.6
		IINY-DU-2C-SSIS-20200319		3/19/2020	815		031920-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-2. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-2B-SBIS1-YYYYMMDD						
		IINY-DU-2C-SBIS1-YYYYMMDD						
DU-3	Surface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1545		031820-B	7.0
		IINY-DU-3B-SSIS-20200318		3/18/2020	1545		031820-B	7.0
		IINY-DU-3C-SSIS-20200318		3/18/2020	1545		031820-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-3. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-3B-SBIS1-YYYYMMDD						
		IINY-DU-3C-SBIS1-YYYYMMDD						
DU-4	Surface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1430		031820-B	6.9
		IINY-DU-4B-SSIS-20200318		3/18/2020	1430		031820-B	7.0
		IINY-DU-4C-SSIS-20200318		3/18/2020	1430		031820-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-4. Significant anomalies in 1-acre DU. Soil depth to refusal at one boring was 12 inches bgs, soil depth to refusal at remaining borings ranged from 4 to 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-4B-SBIS1-YYYYMMDD						
		IINY-DU-4C-SBIS1-YYYYMMDD						
DU-5	Surface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	900		031920-A	7.1
		IINY-DU-5B-SSIS-20200319		3/19/2020	900		031920-A	7.1
		IINY-DU-5C-SSIS-20200319		3/19/2020	900		031920-A	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-5. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-5B-SBIS1-YYYYMMDD						
		IINY-DU-5C-SBIS1-YYYYMMDD						
DU-6	Surface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1500		031920-B	7.5
		IINY-DU-6B-SSIS-20200319		3/19/2020	1500		031920-B	7.5
		IINY-DU-6C-SSIS-20200319		3/19/2020	1500		031920-B	7.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-6. Exposed bedrock / bedrock wall in DU-6. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-6B-SBIS1-YYYYMMDD						
		IINY-DU-6C-SBIS1-YYYYMMDD						
DU-7	Surface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1345		031920-B	7.4
		IINY-DU-7B-SSIS-20200319		3/19/2020	1345		031920-B	7.4
		IINY-DU-7C-SSIS-20200319		3/19/2020	1345		031920-B	7.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-7. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-7B-SBIS1-YYYYMMDD						
		IINY-DU-7C-SBIS1-YYYYMMDD						
DU-8	Surface Soil Incremental Sample collected in triplicate	IINY-DU-8A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	DU-8 Deletion – DU-8 was placed at former Building 207 that was a small garage located between existing Buildings 222, 201, and 212. Building 207 is also known as HTRW AOC #5. DU-8 is a 200x200 ft decision unit that was established around former Building 207 to determine whether former operations at this building served as a source of contaminants to the environment at concentrations that may result in potential risks to human and ecological receptors. Following mark-out DU-8 in the field and site reconnaissance conducted on 18 March 2020, numerous rusted and deteriorating 55-gallon drums, deteriorating pallets, piles of roofing shingles, chain link fencing, and other debris were observed in DU-8. Several empty 55-gallon drums were lying on their sides, while other drums were upright and filled with fluid. The material contained within the drums is not known. Residue indicative of roofing tar was observed on the outside of several drums, and staining was noted on the ground surface. Per discussion with USACE on 24 March 2020, DU-8 will not be sampled because it would not be possible to separate metals and PAH contaminants originating from former Building 207, from contaminants originating from drums and other debris observed in DU-8.				
		IINY-DU-8B-SSIS-YYYYMMDD						
		IINY-DU-8C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-8A-SBIS1-YYYYMMDD						
		IINY-DU-8B-SBIS1-YYYYMMDD						
		IINY-DU-8C-SBIS1-YYYYMMDD						
DU-9	Surface Soil Incremental Sample collected in triplicate	IINY-DU-9A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	1040		031920-A	7.1
		IINY-DU-9B-SSIS-20200319		3/19/2020	1040		031920-B	6.9
		IINY-DU-9C-SSIS-20200319		3/19/2020	1040	MS/MSD	031920-B	7.0
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-9A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-9. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-9B-SBIS1-YYYYMMDD						
		IINY-DU-9C-SBIS1-YYYYMMDD						
DU-10	Surface Soil Incremental Sample collected in triplicate	IINY-DU-10A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1120		031920-B	7.1
		IINY-DU-10B-SSIS-20200319		3/19/2020	1120		031920-B	7.1
		IINY-DU-10C-SSIS-20200319		3/19/2020	1120		031920-B	7.2
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-10A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-10. Exposed bedrock and bedrock wall within DU. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-10B-SBIS1-YYYYMMDD						
		IINY-DU-10C-SBIS1-YYYYMMDD						
DU-11	Surface Soil Incremental Sample collected in triplicate	IINY-DU-11A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1115	MS/MSD	033020-A	7.0
		IINY-DU-11B-SSIS-20200330		3/30/2020	1115		033020-A	7.0
		IINY-DU-11C-SSIS-20200330		3/30/2020	1115		033020-A	7.2
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-11A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-11. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-11B-SBIS1-YYYYMMDD						
		IINY-DU-11C-SBIS1-YYYYMMDD						
DU-12	Surface Soil Incremental Sample collected in triplicate	IINY-DU-12A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1215		033020-A	5.5
		IINY-DU-12B-SSIS-20200330		3/30/2020	1215		033020-A	6.1
		IINY-DU-12C-SSIS-20200330		3/30/2020	1215		033020-A	6.3
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-12A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-12. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-12B-SBIS1-YYYYMMDD						
		IINY-DU-12C-SBIS1-YYYYMMDD						

Decision Unit #	Sample Type	Sample Identification Code	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
DU-13	Surface Soil Incremental Sample collected in triplicate	IINY-DU-13A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1340		033020-A	6.8
		IINY-DU-13B-SSIS-20200330		3/30/2020	1340		033020-A	7.0
		IINY-DU-13C-SSIS-20200330		3/30/2020	1340		033020-A	6.9
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-13A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-13. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-13B-SBIS1-YYYYMMDD						
		IINY-DU-13C-SBIS1-YYYYMMDD						
DU-14	Surface Soil Incremental Sample collected in triplicate	IINY-DU-14A-SSIS-20200320	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, pH (screened in the field with pH meter)	3/20/2020	830		032020-A	6.7
		IINY-DU-14B-SSIS-20200320		3/20/2020	830		302020-A	6.9
		IINY-DU-14C-SSIS-20200320		3/20/2020	830		032020-A	7.0
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-14A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-9. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-14B-SBIS1-YYYYMMDD						
		IINY-DU-14C-SBIS1-YYYYMMDD						
DU-15	Surface Soil Incremental Sample collected in triplicate	IINY-DU-15A-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, pH (screened in the field with pH meter)	4/1/2020	820		040120-A	6.2
		IINY-DU-15B-SSIS-20200401		4/1/2020	820		040120-A	6.3
		IINY-DU-15C-SSIS-20200401		4/1/2020	820		040120-A	6.6
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-15A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-15. Soil depth to refusal less than 12 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-15B-SBIS1-YYYYMMDD						
		IINY-DU-15C-SBIS1-YYYYMMDD						
DU-16	Surface Soil Incremental Sample collected in triplicate	IINY-DU-16A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/31/2020	950		033120-B	6.9
		IINY-DU-16B-SSIS-20200331		3/31/2020	950		033120-B	6.9
		IINY-DU-16C-SSIS-20200331		3/31/2020	950		033120-B	7.4
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-16A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-16. Soil depth to refusal less than 12 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-16B-SBIS1-YYYYMMDD						
		IINY-DU-16C-SBIS1-YYYYMMDD						
DU-17	Surface Soil Incremental Sample collected in triplicate	IINY-DU-17A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)	3/31/2020	815		033120-B	7.2
		IINY-DU-17B-SSIS-20200331		3/31/2020	815		033120-B	7.2
		IINY-DU-17C-SSIS-20200331		3/31/2020	815		033120-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-17A-SBIS1-20200331		3/31/2020	845		033120-A	7.0
		IINY-DU-17B-SBIS1-20200331		3/31/2020	845		033120-A	7.4
		IINY-DU-17C-SBIS1-20200331		3/31/2020	845		033120-A	7.7
DU-18	Surface Soil Incremental Sample collected in triplicate	IINY-DU-18A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)	3/31/2020	1345		033120-B	7.5
		IINY-DU-18B-SSIS-20200331		3/31/2020	1345		033120-B	8.0
		IINY-DU-18C-SSIS-20200331		3/31/2020	1345		033120-B	7.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-18A-SBIS1-20200331		3/31/2020	1420		033120-B	8.1
		IINY-DU-18B-SBIS1-20200331		3/31/2020	1420		033120-B	8.1
		IINY-DU-18C-SBIS1-20200331		3/31/2020	1420		033120-b	8.0
DU-19	Surface Soil Incremental Sample collected in triplicate	IINY-DU-19A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)	3/31/2020	1045	MS/MSD	033120-A	7.7
		IINY-DU-19B-SSIS-20200331		3/31/2020	1045		033120-A	7.5
		IINY-DU-19C-SSIS-20200331		3/31/2020	1045		033120-A	7.4
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-19A-SBIS1-20200331		3/31/2020	1100		033120-A	7.0
		IINY-DU-19B-SBIS1-20200331		3/31/2020	1100		033120-A	7.4
		IINY-DU-19C-SBIS1-20200331		3/31/2020	1100		033120-A	7.7
DU-20	Surface Soil Incremental Sample collected in triplicate	IINY-DU-20A-SSIS-20200316	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/16/2020	1530		031620-A	6.1
		IINY-DU-20B-SSIS-20200316		3/16/2020	1530		031620-A	6.5
		IINY-DU-20C-SSIS-20200316		3/16/2020	1530		031620-A	6.6
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-20A-SBIS1-20200317		3/17/2020	930	MS/MSD	031720-A / 031720-C	6.8
		IINY-DU-20B-SBIS1-20200317		3/17/2020	930		031720-A / 031720-C	6.9
		IINY-DU-20C-SBIS1-20200317		3/17/2020	930		031720-A / 031720-C	6.8
DU-21	Surface Soil Incremental Sample collected in triplicate	IINY-DU-21A-SSIS-20200317	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/17/2020	1240		031720-A	6.3
		IINY-DU-21B-SSIS-20200317		3/17/2020	1240		031720-A	6.8
		IINY-DU-21C-SSIS-20200317		3/17/2020	1240		031720-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-21A-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.0
		IINY-DU-21B-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.1
		IINY-DU-21C-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.3
DU-22	Surface Soil Incremental Sample collected in triplicate	IINY-DU-22A-SSIS-20200316	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/16/2020	1530		031620-A	6.7
		IINY-DU-22B-SSIS-20200316		3/16/2020	1530		031620-A	6.8
		IINY-DU-22C-SSIS-20200316		3/16/2020	1530		031620-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-22A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-22. Soil depth to refusal ranged from 6 to 8 inches bgs (<1 ft). Will not collect subsurface soil.E124				
		IINY-DU-22B-SBIS1-YYYYMMDD						
		IINY-DU-22C-SBIS1-YYYYMMDD						
DU-23	Surface Soil Incremental Sample collected in triplicate	IINY-DU-23A-SSIS-20200320	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	3/20/2020	915		032020-A	6.0
		IINY-DU-23B-SSIS-20200320		3/20/2020	915		032020-A	5.4
		IINY-DU-23C-SSIS-20200320		3/20/2020	915		032020-A	5.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-23A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-23. Soil depth to refusal less than 6 inches bgs (<1 ft). Majority of DU is exposed bedrock. Very shallow soil. Will not collect subsurface soil.				
		IINY-DU-23B-SBIS1-YYYYMMDD						
		IINY-DU-23C-SBIS1-YYYYMMDD						
DU-24	Surface Soil Incremental Sample collected in triplicate	IINY-DU-24A-SSIS-YYYYMMDD	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	DU-24 Deletion – Historical documents indicate that a former transformers on a pole was located along the former eastern sentry path from Iona Island onto Round Island. A 60x60 ft decision unit, DU-24, was established on Round Island to evaluate the presence/absence of PCBs associated with the former transformer. DU-24 was one of three transformer decision units that is known as HTRW AOC #19 on Iona Island (Note: the other two transformer decision units were collect). DU-24 is bounded by the Hudson River to east/northeast and the former dump area between Iona and Round Islands to the northwest. A downed former electric pole was noted during a reconnaissance on 20 March 2020. The majority of DU-24 is exposed bedrock with little to thin soil cover. Sediment and soil was noted along the northeastern edge of DU-24 off the bedrock outcrop of Round Island, however this sediment/soil is along the shoreline of the tidally influenced Hudson River. Per a call with USACE on 24 March 2020, DU-24 will not be sampled. There is little/no soil available for sampling in the area of the former transformer. Any PCBs that may have been released from former transformers would have been transported via runoff and overland flow across the bedrock outcrop of Round Island to the Hudson River. However, as the Hudson River itself					
		IINY-DU-24B-SSIS-YYYYMMDD						
		IINY-DU-24C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-24A-SBIS1-YYYYMMDD						
		IINY-DU-24B-SBIS1-YYYYMMDD						

Decision Unit #	Sample Type	Sample Identification Code	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
		IINY-DU-24C-SBIS1-YYYYMMDD		Released from former transformers would have been transported via runoff and overland flow across the bedrock outcrop of Round Island to the Hudson River. However, as the Hudson River itself is a PCB source, collecting PCBs from soil/sediment along the Hudson River will not provide information that could be used to evaluate a potential release related to former transformers.				
DU-25	Surface Soil Incremental Sample collected in triplicate	IINY-DU-25A-SSIS-20200320	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	3/20/2020	1030	MS/MSD	032020-A	6.2
		IINY-DU-25B-SSIS-20200320		3/20/2020	1030	032020-A	032020-A	6.4
		IINY-DU-25C-SSIS-20200320		3/20/2020	1030		032020-A	6.4
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-25A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-25. Exposed bedrock and bedrock wall within DU. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-25B-SBIS1-YYYYMMDD						
		IINY-DU-25C-SBIS1-YYYYMMDD						
Former Buildings Identified as Having Significant Potential for Explosive Hazard (EXDU; pending direction of contracting offer): Surface and Subsurface Soil								
EXDU-1	Surface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1535		031720-B	7.0
		IINY-DU-1B-SSIS-20200317		3/17/2020	1535		031720-B	6.9
		IINY-DU-1C-SSIS-20200317		3/17/2020	1535		031720-B	6.9
EXDU-2	Surface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1610		031720-B	7.0
		IINY-DU-2B-SSIS-20200317		3/17/2020	1610		031720-B	6.8
		IINY-DU-2C-SSIS-20200317		3/17/2020	1610		031720-B	6.9
EXDU-3	Surface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	800		031820-A	6.3
		IINY-DU-3B-SSIS-20200318		3/18/2020	800		031820-A	6.5
		IINY-DU-3C-SSIS-20200318		3/18/2020	800		031820-A	5.5
EXDU-4	Surface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1430	MS/MSD	031720-A	6.5
		IINY-DU-4B-SSIS-20200317		3/17/2020	1430		031720-B	6.3
		IINY-DU-4C-SSIS-20200317		3/17/2020	1430		031720-B	6.8
EXDU-5	Surface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	930		031820-A	7.1
		IINY-DU-5B-SSIS-20200318		3/18/2020	930		031820-A	7.2
		IINY-DU-5C-SSIS-20200318		3/18/2020	930		031820-A	7.3
EXDU-6	Surface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	1015		031820-A	7.2
		IINY-DU-6B-SSIS-20200318		3/18/2020	1015		031820-A	7.3
		IINY-DU-6C-SSIS-20200318		3/18/2020	1015		031820-A	7.3
EXDU-7	Surface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	1145	MS/MSD	031820-A	7.0
		IINY-DU-7B-SSIS-20200318		3/18/2020	1145		031820-A	7.0
		IINY-DU-7C-SSIS-20200318		3/18/2020	1145		031820-A	7.1
Phase I Background: Surface and Subsurface Soil								
BDU-1	Surface Soil Incremental Sample	IINY-BADU-1-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1145		040120-A	6.3
	Subsurface Soil Incremental Sample	IINY-BADU-1-SBIS1-YYYYMMDD		<12" to refusal. Did not collect subsurface soil.				
BDU-2	Surface Soil Incremental Sample	IINY-BADU-2-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1215		040120-A	6.7
	Subsurface Soil Incremental Sample	IINY-BADU-2-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-3	Surface Soil Incremental Sample	IINY-BADU-3-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1245		040120-A	6.0
	Subsurface Soil Incremental Sample	IINY-BADU-3-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-4	Surface Soil Incremental Sample	IINY-BADU-4-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1320		040120-A	6.1
	Subsurface Soil Incremental Sample	IINY-BADU-4-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-5	Surface Soil Incremental Sample	IINY-BADU-5-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	955	MS/MSD	040120-A	6.1
	Subsurface Soil Incremental Sample	IINY-BADU-5-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-6	Surface Soil Incremental Sample	IINY-BADU-6-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	920		040120-A	5.9
	Subsurface Soil Incremental Sample	IINY-BADU-6-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-7	Surface Soil Incremental Sample	IINY-BADU-7-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	900		040120-A	6.1
	Subsurface Soil Incremental Sample	IINY-BADU-7-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-8	Surface Soil Incremental Sample	IINY-BADU-8-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	925		040120-A	6.0
	Subsurface Soil Incremental Sample	IINY-BADU-8-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
Shoreline Reconnaissance Survey Sediment Sampling								
SD-01	Discrete Sediment Sample	IINY-SD01-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-02	Discrete Sediment Sample	IINY-SD02-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-03	Discrete Sediment Sample	IINY-SD03-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-04	Discrete Sediment Sample	IINY-SD04-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-05	Discrete Sediment Sample	IINY-SD05-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
SD-06	Discrete Sediment Sample	IINY-SD06-YYYYMMDD	TOC by Walkley-Black, grain size by ASTM D422					
TB	Grab	TB03172020	VOCs by 8260B	3/17/2020	1500	Trip Blank (VOCs)	031720-C	N/A
FB	Grab	FB03172020	VOCs by 8260B	3/17/2020	1545	Field Blank (VOCs)	031720-C	N/A

Report Date: 4/2/2020
Project No: 63029587.01
Report No: 16

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Mixture sun and clouds	54	37	45	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.5		UXOQCS/SO Duties
Alex Shaub		Field Leader / EA	2.0		Clean up conex box
Derek Hendricks		Field Tech / EA	2.0		Clean up conex box
Nash Stevens		Tech / NAEVA	10.5		DGM data collection
Nesibo Sibhat		Tech / NAEVA	10.5		DGM data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in two DGM grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 4/2/2020
Project No: 63029587.01
Report No: 16

Grid/Transect Results

No Field Data Collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief, update on COVID-19 for N.Y. State, and EM-61 functional check at IVS.
- NAEVA had technical problems with GPS unit receiver, but did complete data collection in DGM Grids 11 and 28.
- EA soil sample team de-mobbed from Iona Island.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

Conducted Follow-Up Phase Inspection while NAEVA carried out EM-61 functional checks at IVS - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Inspected site fire extinguishers, first aid kits, eye wash kits, and EA Truck # 1303.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- Conducted site safety brief, COVID-19 N.Y. State update, and tick precautions.
- NAEVA technician that reported knee injury stated no ill effects.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/2/2020 6:28:26 PM

UXOQCS/SO

Report Date: 4/2/2020

Project No: 63029587.01

Report No: 16

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	N/A
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection while NAEVA carried out EM-61 functional checks at IVS - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 4/2/2020

Project No: 63029587.01

Report No: 16

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/2/2020 6:13:20 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/2/2020

Project No: 63029587.01

Report No: 16

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Inspected site fire extinguishers, first aid kits, eye wash kits, and EA Truck # 1303.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- Conducted site safety brief, COVID-19 N.Y. State update, and tick precautions.
- NAEVA technician that reported knee injury stated no ill effects.

Report Date: 4/2/2020

Project No: 63029587.01

Report No: 16

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/2/2020 12:16:45 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/2/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

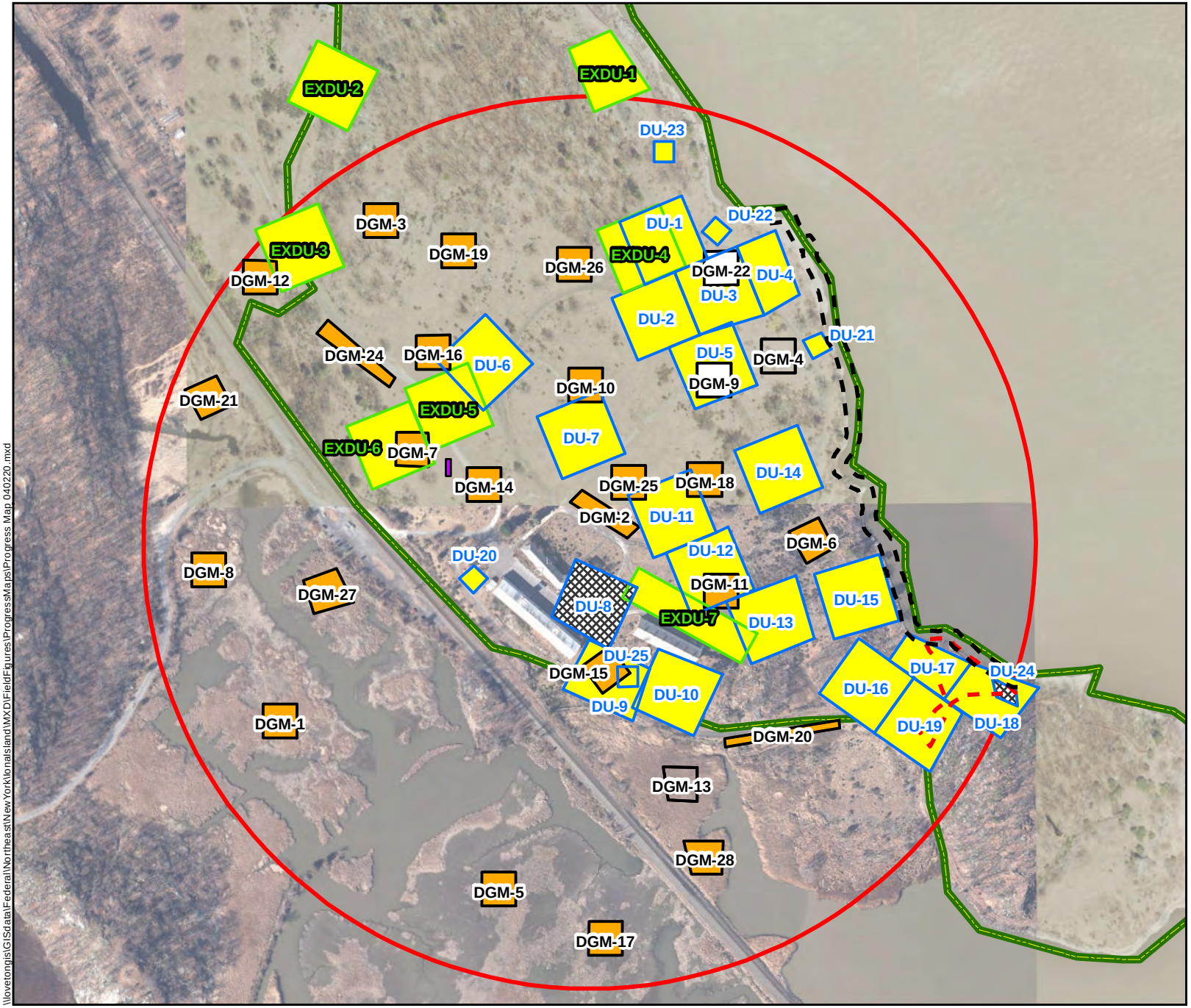
INSPECTION PERFORMED & WHO PERFORMED TEST

Functional test of EM-61 before and after data collection, N.Stevens, NAEVA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/2/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/2/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 02 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 040220.mxd

Report Date: 4/3/2020
Project No: 63029587.01
Report No: 17

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain am, cloudy pm.	52	43	87	0.06

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	8.0		UXOQCS/SO Duties
Nash Stevens		Tech / NAEVA	8.0		DGM data collection
Nesibo Sibhat		Tech / NAEVA	8.0		DGM data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data was collected in three DGM grids. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 4/3/2020
Project No: 63029587.01
Report No: 17

Grid/Transect Results

No intrusive data collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found.

ADDITIONAL REMARKS:

- Conducted site safety brief with update of COVID-19 in N.Y. State, tick prevention , communications check, and functional check of EM-61 at IVS.
- NAEVA conducted data collection in 3 DGM Grids (4, 9, 22).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted.

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected.

Inspections

- Conducted Follow-Up Phase Inspection of NAEVA assembled and functional tested EM-61 at IVS - Conformance.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection on NAEVA technicians in MRS-01 DGM Grid 9 - No Deficiencies.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- Conducted daily site safety brief with NAEVA personnel, updated COVID-19 N.Y. State info, and tick precaution methods.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/5/2020 6:38:37 PM

UXOQCS/SO

Report Date: 4/3/2020

Project No: 63029587.01

Report No: 17

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Conducted Follow-Up Phase Inspection of NAEVA assembled and functional test of EM-61 at IVS - Conformance.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

Report Date: 4/3/2020

Project No: 63029587.01

Report No: 17

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/5/2020 6:32:34 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/3/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01 DGM Grid 04, N. Sibhat, NAEVA; N. Stevens, NAEVA; J. D. Marlowe, EA.

INSPECTION PERFORMED & WHO PERFORMED TEST

DGM of Grids in MRS-01; J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe, EA.

DATE: 4/3/2020

SIGNATURE OF PROJECT QC SPECIALIST:

Report Date: 4/3/2020

Project No: 63029587.01

Report No: 17

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection on NAEVA technicians in MRS-01 DGM Grid #09 - No Deficiencies.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- Conducted daily site safety brief with NAEVA personnel, updated COVID-19 N.Y. State info, and tick precaution methods.

Report Date: 4/3/2020

Project No: 63029587.01

Report No: 17

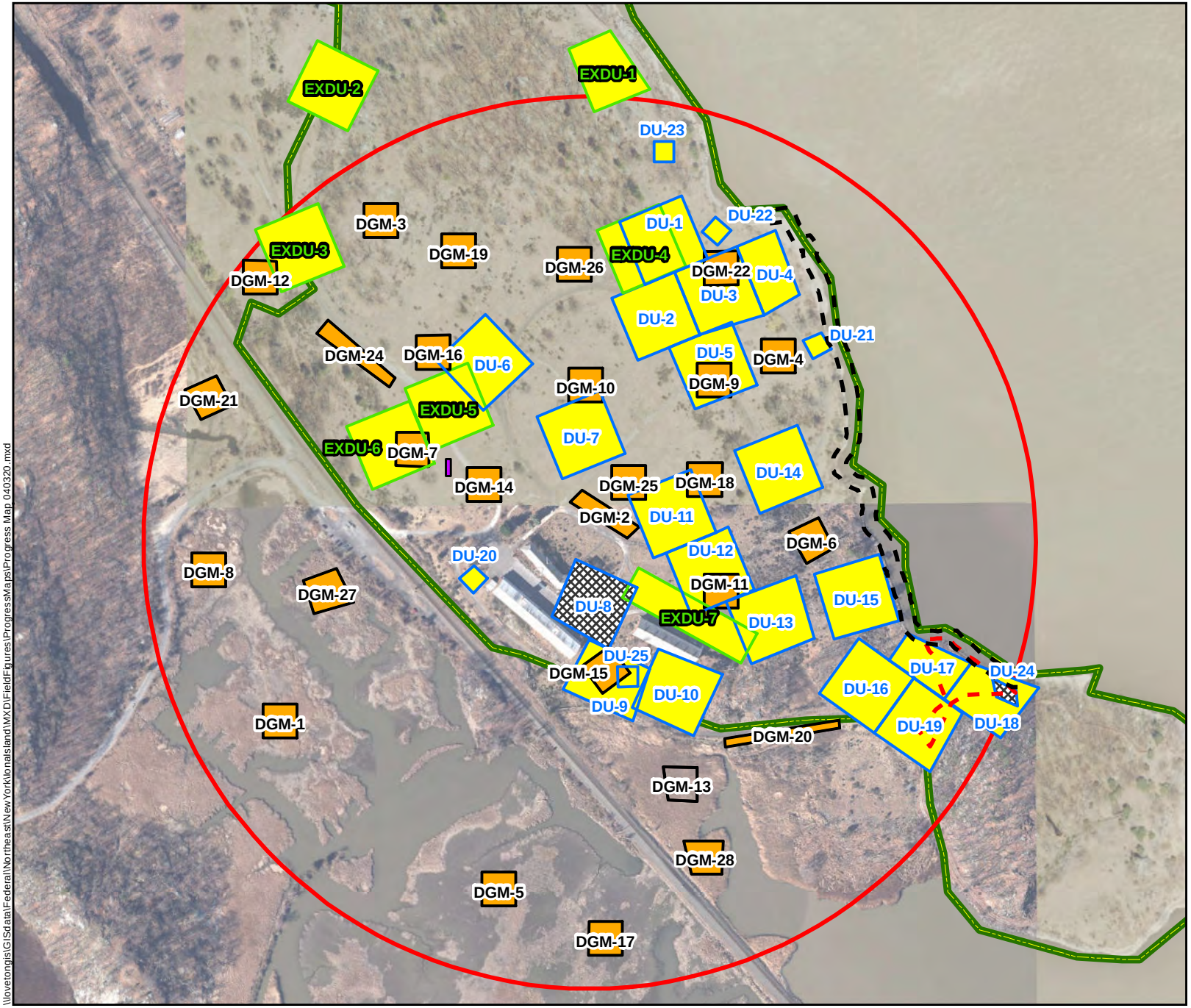
CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/5/2020 6:29:30 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/6/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 03 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 040320.mxd

Report Date: 4/6/2020
Project No: 63029587.01
Report No: 18

EA Engineering, Science, and Technology, Inc., PBC

SUXOS Daily Report
Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny	63	44	65	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe	MRS-01	UXOQCS/SO / EA	11.5		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	6.0	DGM 13	DGM data collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	6.0	DGM 13	DGM data collection
Tom King	MRS--01	Scientists / EA	5.5		Shoreline Reconnaissance Survey
Melissa Beauchemin	MRS-01	Scientists / EA	5.0		Shoreline Reconnaissance Survey

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM data collected from one DGM grid. See grid list under Additional Remarks.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Report Date: 4/6/2020
Project No: 63029587.01
Report No: 18

Grid/Transect Results

No intrusive data collected.

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, and EM-61 functional check through MRS-01 IVS.
- New EA personnel received briefing on AHA/SSHP/ESP/COVID-19 for N.Y. State.
- NAEVA postponed morning operations due to high water in DGM Grid 13, during afternoon, NAEVA completed data collection in DGM Grid 13.
- EA personnel conducted Shoreline Reconnaissance Survey in Area 1 (Hudson Shoreline), Area 2 (Marsh Side Railway), Area 3 (Landfill IONA/Round Island), and Area 4 (Railway Tracks).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

QA = Quality Assurance QC = Quality Control

SEED Results

No SEED Results Collected

Inspections

Conducted Follow-Up Phase Inspection

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection while EA personnel perform a Shoreline Reconnaissance Survey. No deficiencies observed.

Summary of Deficiencies

None

Corrective Actions

None

Reinspection Results

None

Additional Notes

Conducted site safety brief with COVID-19 update with NAEVA, site safety brief with AHA/ESP/SSHP and N.Y. State COVID-19 to new EA site personnel.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/7/2020 7:06:28 AM

UXOQCS/SO

Report Date: 4/6/2020

Project No: 63029587.01

Report No: 18

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

None.

Report Date: 4/6/2020

Project No: 63029587.01

Report No: 18

None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/6/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Site Preparation, IONA Island, N.Y., Safety Meeting, Thomas King, EA; Melissa Beauchemin, EA.

INSPECTION PERFORMED & WHO PERFORMED TEST

Conducted Site Safety Briefing including AHA, SSHP, ESP, by J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/6/2020

SIGNATURE OF PROJECT QC SPECIALIST:

Report Date: 4/6/2020

Project No: 63029587.01

Report No: 18

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection while EA personnel perform a Shoreline Reconnaissance Survey. No deficiencies observed.

SUMMARY OF DEFICIENCIES:

None

CORRECTIVE ACTIONS RECOMMENDED:

None

REINSPECTION RESULTS:

None

ADDITIONAL NOTES:

Conducted site safety brief with COVID-19 update with NAEVA, site safety brief with AHA/ESP/SSHP and N.Y. State COVID-19 to new EA site personnel.

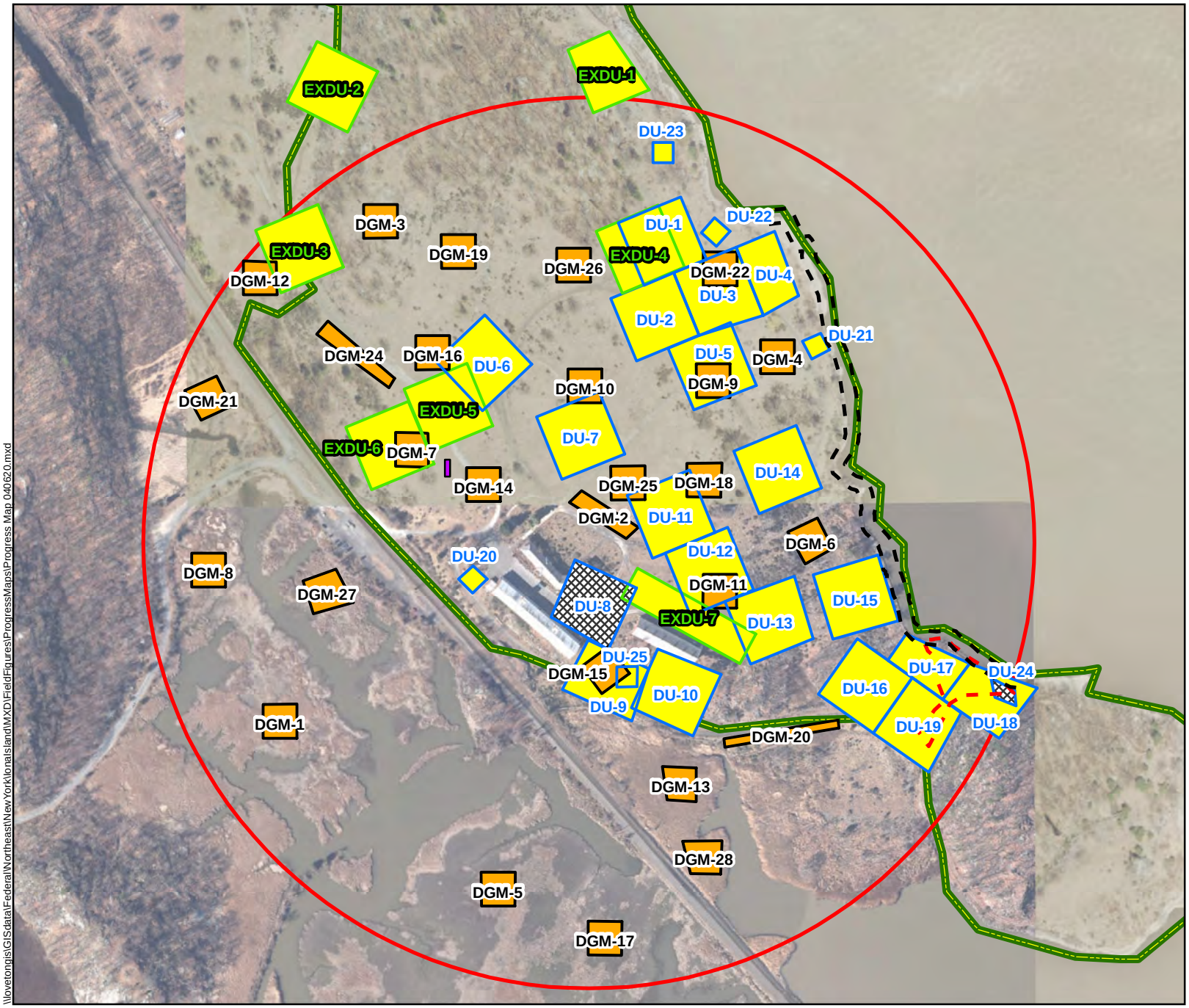
CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/6/2020 7:34:10

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/7/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 06 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GIS data\Federal\Northeast\New York\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 040620.mxd

Report Date: 4/7/2020
Project No: 63029587.01
Report No: 19

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds	71	52	32	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	11.5		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	5.0	Landfill	DGM data collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	5.0	Landfill	DGM data collection
Tom King	MRS-01	Scientist / EA	8.5		Shoreline Reconnaissance Survey
Melissa Beauchemin	MRS-01	Scientist / EA	8.5		Shoreline Reconnaissance Survey
Conor O'Hara	MRS-01	Drone Pilot / EA	10.0		Drone Flight Operations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, N.Y. State COVID-19 update, and NAEVA functional check of EM-61 through IVS.
- EA Shoreline Reconnaissance Survey personnel collected, processed and shipped sediment samples from all 4 areas of interest (Hudson River Shoreline, Marsh side of Railway, Landfill, Railway Tracks).
- EA conducted aerial drone flights of Iona Island to collect topography data.
- NAEVA did not collect DGM data in the landfill area due to high water tidal influence.
- PPE (6 EA medical masks) were given to site personnel to follow N.Y. State guidelines when out in public and cannot social distance.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

None.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

NAEVA canceled DGM data collection today due to high water in the landfill area.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection on the Sediment Sampling Team - No deficiencies noted.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted Site Safety Brief, N.Y. State update of COVID-19, water safety operations for sediment sample crew, and issued 6 EA personal medical masks.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/8/2020 8:36:11 AM

UXOSO

Report Date: 4/7/2020

Project No: 63029587.01

Report No: 19

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

None.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/7/2020

Project No: 63029587.01

Report No: 19

ADDITIONAL NOTES:

NAEVA canceled DGM data collection today due to high water in the landfill area.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/8/2020 8:14:09 AM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/7/2020

Project No: 63029587.01

Report No: 19

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	N/A
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection on the Sediment Sampling Team - No deficiencies noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted Site Safety Brief, N.Y. State update of COVID-19, water safety operations for sediment sample crew, and issued 6 EA personal medical masks.

Report Date: 4/7/2020

Project No: 63029587.01

Report No: 19

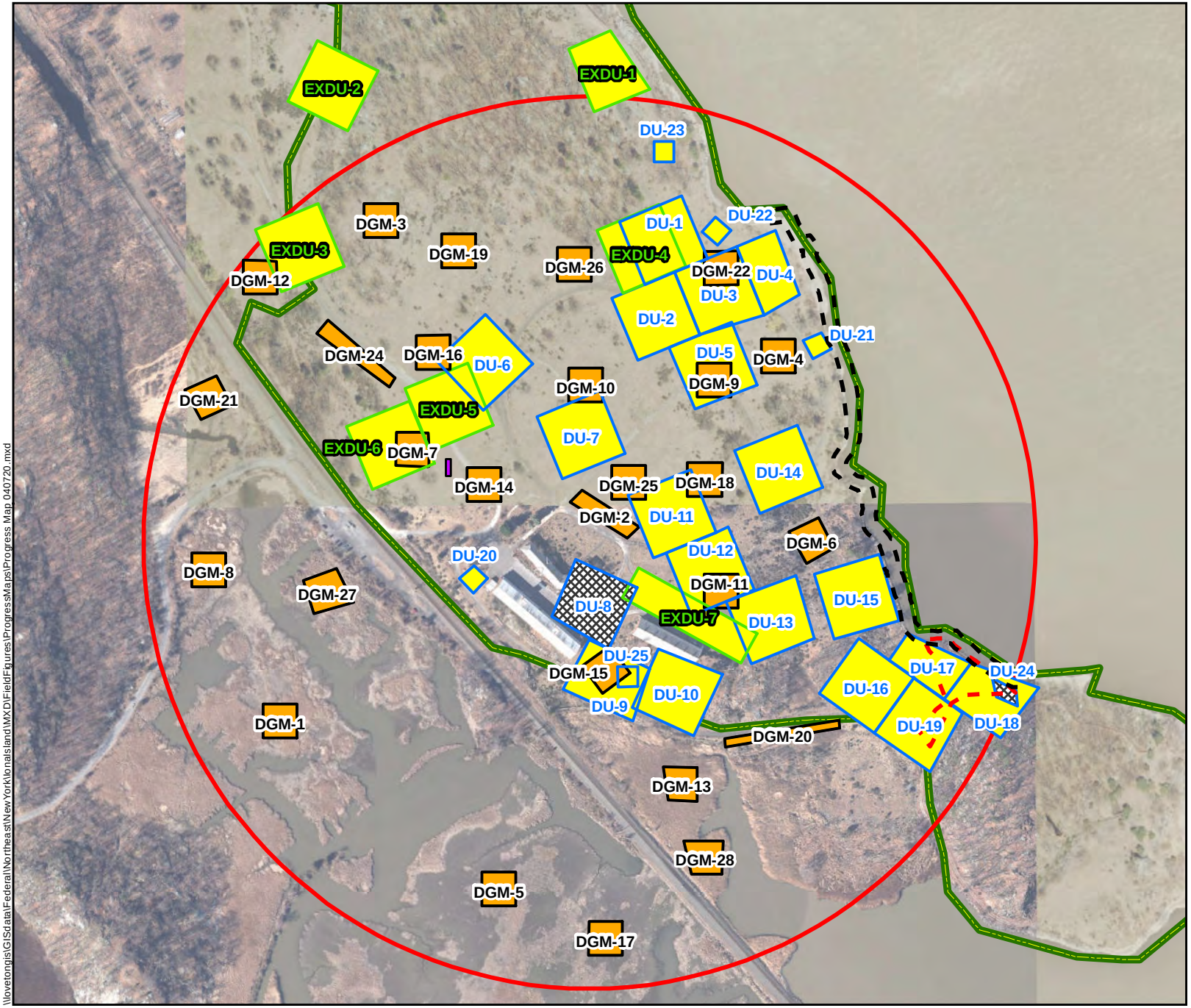
CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/8/2020 8:09:35 AM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/7/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 07 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map 040720.mxd

Report Date: 4/8/2020
Project No: 63029587.01
Report No: 20

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Clouds am, mix sun and clouds pm.	59	45	41	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	9.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	9.0	Shoreline	DGM survey of shoreline transects
Nesibo Sibhat	MRS-01	Tech / NAEVA	9.0	Shoreline	DGM survey of shoreline transects
Mark Howard	MRS-01	Technical Supervisor / NAEVA	9.0	Shoreline	DGM survey of shoreline transects

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, and N.Y. State COVID-19 update.
- AHA/SSHP review (including kayaking AHA) for current and new NAEVA personnel.
- NAEVA conducted and completed DGM data collection along Hudson River shoreline transects.
- NAEVA investigated a reported data gap in DGM Grid 10 and it proved to be caused by a tree.
- Revised Sample Tracking Table with sediment samples information, is attached to end of daily.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

Conducted Follow - Up Phase Inspection of DGM Surveys while NAEVA conducted data collection along transects of Hudson River shoreline.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- Reviewed AHA/SSHP for water operations to current and new NAEVA personnel.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection as NAEVA conducted DGM data collection along Hudson River shoreline transects - No Deficiencies.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted site safety brief and review of AHA/SSHP with current and new NAEVA personnel for water operations.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/8/2020 6:26:17 PM

UXOQCS/SO

Report Date: 4/8/2020

Project No: 63029587.01

Report No: 20

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow - Up Phase Inspection of DGM Surveys while NAEVA conducted data collection along transects of Hudson River shoreline.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 4/8/2020

Project No: 63029587.01

Report No: 20

ADDITIONAL NOTES:

- Reviewed AHA/SSHP for water operations to current and new NAEVA personnel.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/8/2020 6:36:12 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/8/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01 Hudson River, M. Howard, NAEVA.

INSPECTION PERFORMED & WHO PERFORMED TEST

DGM transects along shoreline of Hudson River, J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe, EA.

DATE: 4/8/2020

SIGNATURE OF PROJECT QC SPECIALIST:

Report Date: 4/8/2020

Project No: 63029587.01

Report No: 20

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	N/A
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	N/A
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection as NAEVA conducted DGM data collection along Hudson River shoreline transects - No Deficiencies.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief and review of AHA/SSHP, including kayaking AHA, with current and new NAEVA personnel for water operations.

Report Date: 4/8/2020

Project No: 63029587.01

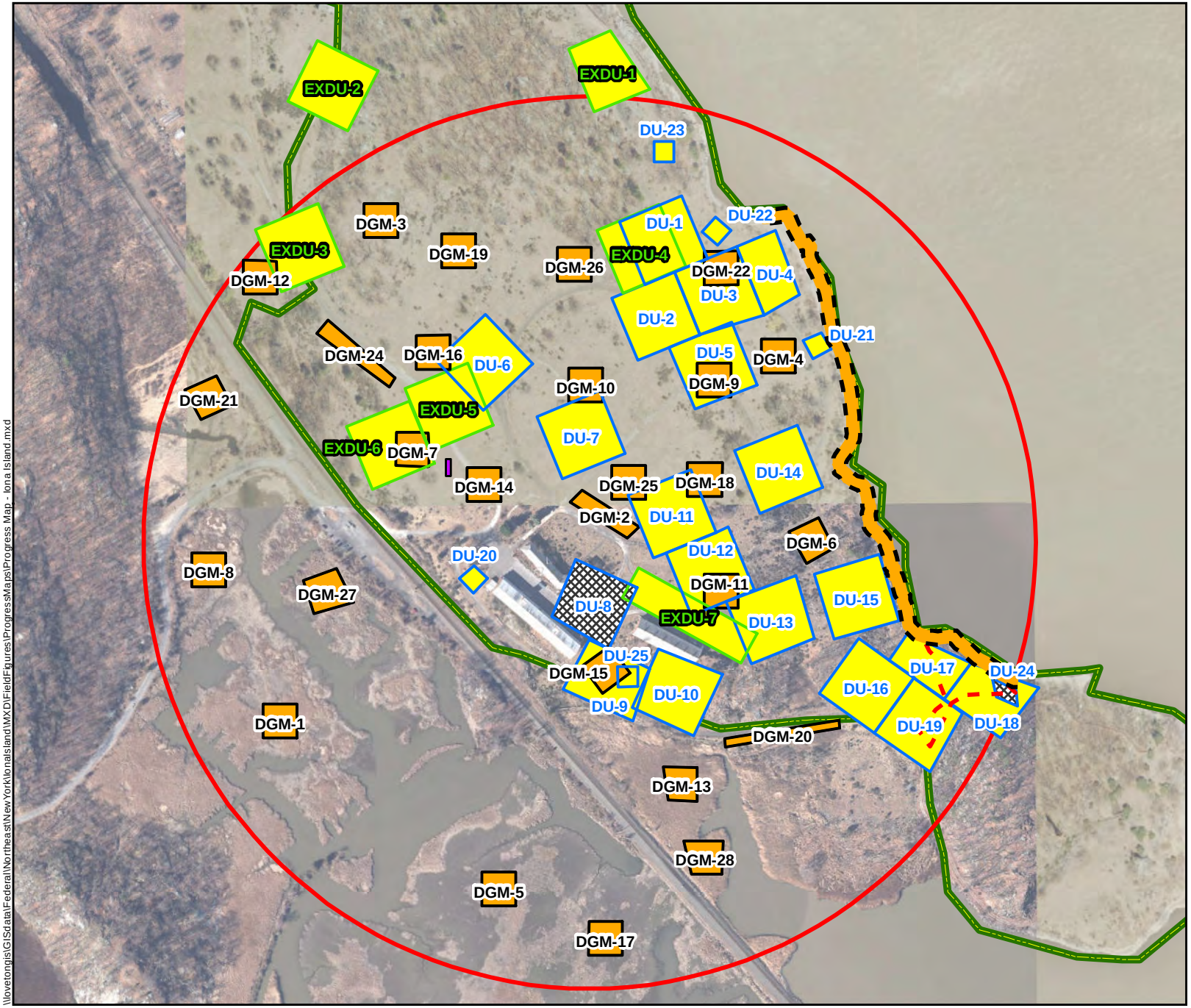
Report No: 20

CONTRACTOR'S VERIFICATION:

JD Marlowe 4/8/2020 6:31:59 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- In Progress
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/9/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 08 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Decision Unit #	Sample Type	Sample Identification Code	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
DU-1	Surface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1500	MS/MSD	031820-B	5.6
		IINY-DU-1B-SSIS-20200318		3/18/2020	1500		031820-B	6.5
		IINY-DU-1C-SSIS-20200318		3/18/2020	1500		031820-B	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SBIS1-YYYYMMDD	Advanced 6 hand auger borings at DU-1. Soil depth to refusal ranged from 6 to 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-1B-SBIS1-YYYYMMDD						
		IINY-DU-1C-SBIS1-YYYYMMDD						
DU-2	Surface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	815		031920-A	5.6
		IINY-DU-2B-SSIS-20200319		3/19/2020	815		031920-A	6.6
		IINY-DU-2C-SSIS-20200319		3/19/2020	815		031920-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-2. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-2B-SBIS1-YYYYMMDD						
		IINY-DU-2C-SBIS1-YYYYMMDD						
DU-3	Surface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1545		031820-B	7.0
		IINY-DU-3B-SSIS-20200318		3/18/2020	1545		031820-B	7.0
		IINY-DU-3C-SSIS-20200318		3/18/2020	1545		031820-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-3. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-3B-SBIS1-YYYYMMDD						
		IINY-DU-3C-SBIS1-YYYYMMDD						
DU-4	Surface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SSIS-20200318	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/18/2020	1430		031820-B	6.9
		IINY-DU-4B-SSIS-20200318		3/18/2020	1430		031820-B	7.0
		IINY-DU-4C-SSIS-20200318		3/18/2020	1430		031820-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SBIS1-YYYYMMDD	Advanced 6 hand auger borings at DU-4. Significant anomalies in 1-acre DU. Soil depth to refusal at one boring was 12 inches bgs, soil depth to refusal at remaining borings ranged from 4 to 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-4B-SBIS1-YYYYMMDD						
		IINY-DU-4C-SBIS1-YYYYMMDD						
DU-5	Surface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	900		031920-A	7.1
		IINY-DU-5B-SSIS-20200319		3/19/2020	900		031920-A	7.1
		IINY-DU-5C-SSIS-20200319		3/19/2020	900		031920-A	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-5. Hard to locate areas to advance borings due to exposed bedrock and shallow bedrock/refusal. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-5B-SBIS1-YYYYMMDD						
		IINY-DU-5C-SBIS1-YYYYMMDD						
DU-6	Surface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1500		031920-B	7.5
		IINY-DU-6B-SSIS-20200319		3/19/2020	1500		031920-B	7.5
		IINY-DU-6C-SSIS-20200319		3/19/2020	1500		031920-B	7.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-6. Exposed bedrock / bedrock wall in DU-6. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-6B-SBIS1-YYYYMMDD						
		IINY-DU-6C-SBIS1-YYYYMMDD						
DU-7	Surface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1345		031920-B	7.4
		IINY-DU-7B-SSIS-20200319		3/19/2020	1345		031920-B	7.4
		IINY-DU-7C-SSIS-20200319		3/19/2020	1345		031920-B	7.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-7. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-7B-SBIS1-YYYYMMDD						
		IINY-DU-7C-SBIS1-YYYYMMDD						
DU-8	Surface Soil Incremental Sample collected in triplicate	IINY-DU-8A-SSIS-YYYYMMDD	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	DU-8 Deletion – DU-8 was placed at former Building 207 that was a small garage located between existing Buildings 222, 201, and 212. Building 207 is also known as HTRW AOC #5. DU-8 is a 200x200 ft decision unit that was established around former Building 207 to determine whether former operations at this building served as a source of contaminants to the environment at concentrations that may result in potential risks to human and ecological receptors. Following mark-out DU-8 in the field and site reconnaissance conducted on 18 March 2020, numerous rusted and deteriorating 55-gallon drums, deteriorating pallets, piles of roofing shingles, chain link fencing, and other debris were observed in DU-8. Several empty 55-gallon drums were lying on their sides, while other drums were upright and filled with fluid. The material contained within the drums is not known. Residue indicative of roofing tar was observed on the outside of several drums, and staining was noted on the ground surface. Per discussion with USACE on 24 March 2020, DU-8 will not be sampled because it would not be possible to separate metals and PAH contaminants originating from former Building 207, from contaminants originating from drums and other debris observed in DU-8.					
		IINY-DU-8B-SSIS-YYYYMMDD						
		IINY-DU-8C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-8A-SBIS1-YYYYMMDD						
		IINY-DU-8B-SBIS1-YYYYMMDD						
		IINY-DU-8C-SBIS1-YYYYMMDD						
DU-9	Surface Soil Incremental Sample collected in triplicate	IINY-DU-9A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/19/2020	1040		031920-A	7.1
		IINY-DU-9B-SSIS-20200319		3/19/2020	1040		031920-B	6.9
		IINY-DU-9C-SSIS-20200319		3/19/2020	1040	MS/MSD	031920-B	7.0
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-9A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-9. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-9B-SBIS1-YYYYMMDD						
		IINY-DU-9C-SBIS1-YYYYMMDD						
DU-10	Surface Soil Incremental Sample collected in triplicate	IINY-DU-10A-SSIS-20200319	TAL Metals by EPA Methods 6010C/6020A, pH (screened in the field with pH meter)	3/19/2020	1120		031920-B	7.1
		IINY-DU-10B-SSIS-20200319		3/19/2020	1120		031920-B	7.1
		IINY-DU-10C-SSIS-20200319		3/19/2020	1120		031920-B	7.2
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-10A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-10. Exposed bedrock and bedrock wall within DU. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-10B-SBIS1-YYYYMMDD						
		IINY-DU-10C-SBIS1-YYYYMMDD						
DU-11	Surface Soil Incremental Sample collected in triplicate	IINY-DU-11A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1115	MS/MSD	033020-A	7.0
		IINY-DU-11B-SSIS-20200330		3/30/2020	1115		033020-A	7.0
		IINY-DU-11C-SSIS-20200330		3/30/2020	1115		033020-A	7.2
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-11A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-11. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-11B-SBIS1-YYYYMMDD						
		IINY-DU-11C-SBIS1-YYYYMMDD						
DU-12	Surface Soil Incremental Sample collected in triplicate	IINY-DU-12A-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1215		033020-A	5.5
		IINY-DU-12B-SSIS-20200330		3/30/2020	1215		033020-A	6.1
		IINY-DU-12C-SSIS-20200330		3/30/2020	1215		033020-A	6.3
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-12A-SBIS1-YYYYMMDD	Advanced >5 hand auger borings at DU-12. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.					
		IINY-DU-12B-SBIS1-YYYYMMDD						
		IINY-DU-12C-SBIS1-YYYYMMDD						
	Surface Soil Incremental Sample collected in triplicate	IINY-DU-13A-SSIS-20200330		3/30/2020	1340		033020-A	6.8
		IINY-DU-13B-SSIS-20200330		3/30/2020	1340		033020-A	7.0

Decision Unit #	Sample Type	Sample Identification Code	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
DU-13	Surface Soil Incremental Sample collected in triplicate	IINY-DU-13C-SSIS-20200330	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/30/2020	1340		033020-A	6.9
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-13A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-13. Soil depth to refusal less than 2 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-13B-SBIS1-YYYYMMDD						
		IINY-DU-13C-SBIS1-YYYYMMDD						
DU-14	Surface Soil Incremental Sample collected in triplicate	IINY-DU-14A-SSIS-20200320	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, pH (screened in the field with pH meter)	3/20/2020	830		032020-A	6.7
		IINY-DU-14B-SSIS-20200320		3/20/2020	830		302020-A	6.9
		IINY-DU-14C-SSIS-20200320		3/20/2020	830		032020-A	7.0
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-14A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-9. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-14B-SBIS1-YYYYMMDD						
		IINY-DU-14C-SBIS1-YYYYMMDD						
DU-15	Surface Soil Incremental Sample collected in triplicate	IINY-DU-15A-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, pH (screened in the field with pH meter)	4/1/2020	820		040120-A	6.2
		IINY-DU-15B-SSIS-20200401		4/1/2020	820		040120-A	6.3
		IINY-DU-15C-SSIS-20200401		4/1/2020	820		040120-A	6.6
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-15A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-15. Soil depth to refusal less than 12 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-15B-SBIS1-YYYYMMDD						
		IINY-DU-15C-SBIS1-YYYYMMDD						
DU-16	Surface Soil Incremental Sample collected in triplicate	IINY-DU-16A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, pH (screened in the field with pH meter)	3/31/2020	950		033120-B	6.9
		IINY-DU-16B-SSIS-20200331		3/31/2020	950		033120-B	6.9
		IINY-DU-16C-SSIS-20200331		3/31/2020	950		033120-B	7.4
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-16A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-16. Soil depth to refusal less than 12 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-16B-SBIS1-YYYYMMDD						
		IINY-DU-16C-SBIS1-YYYYMMDD						
DU-17	Surface Soil Incremental Sample collected in triplicate	IINY-DU-17A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)	3/31/2020	815		033120-B	7.2
		IINY-DU-17B-SSIS-20200331		3/31/2020	815		033120-B	7.2
		IINY-DU-17C-SSIS-20200331		3/31/2020	815		033120-B	7.1
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-17A-SBIS1-20200331		3/31/2020	845		033120-A	7.0
		IINY-DU-17B-SBIS1-20200331		3/31/2020	845		033120-A	7.4
		IINY-DU-17C-SBIS1-20200331		3/31/2020	845		033120-A	7.7
DU-18	Surface Soil Incremental Sample collected in triplicate	IINY-DU-18A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)	3/31/2020	1345		033120-B	7.5
		IINY-DU-18B-SSIS-20200331		3/31/2020	1345		033120-B	8.0
		IINY-DU-18C-SSIS-20200331		3/31/2020	1345		033120-B	7.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-18A-SBIS1-20200331		3/31/2020	1420		033120-B	8.1
		IINY-DU-18B-SBIS1-20200331		3/31/2020	1420		033120-B	8.1
		IINY-DU-18C-SBIS1-20200331		3/31/2020	1420		033120-b	8.0
DU-19	Surface Soil Incremental Sample collected in triplicate	IINY-DU-19A-SSIS-20200331	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM, Aroclor PCBs by EPA Method 8082A, explosives by EPA Method 8330B, and pH (screened in the field with pH meter)	3/31/2020	1045	MS/MSD	033120-A	7.7
		IINY-DU-19B-SSIS-20200331		3/31/2020	1045		033120-A	7.5
		IINY-DU-19C-SSIS-20200331		3/31/2020	1045		033120-A	7.4
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-19A-SBIS1-20200331		3/31/2020	1100		033120-A	7.0
		IINY-DU-19B-SBIS1-20200331		3/31/2020	1100		033120-A	7.4
		IINY-DU-19C-SBIS1-20200331		3/31/2020	1100		033120-A	7.7
DU-20	Surface Soil Incremental Sample collected in triplicate	IINY-DU-20A-SSIS-20200316	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/16/2020	1530		031620-A	6.1
		IINY-DU-20B-SSIS-20200316		3/16/2020	1530		031620-A	6.5
		IINY-DU-20C-SSIS-20200316		3/16/2020	1530		031620-A	6.6
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-20A-SBIS1-20200317		3/17/2020	930	MS/MSD	031720-A / 031720-C	6.8
		IINY-DU-20B-SBIS1-20200317		3/17/2020	930		031720-A / 031720-C	6.9
		IINY-DU-20C-SBIS1-20200317		3/17/2020	930		031720-A / 031720-C	6.8
DU-21	Surface Soil Incremental Sample collected in triplicate	IINY-DU-21A-SSIS-20200317	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/17/2020	1240		031720-A	6.3
		IINY-DU-21B-SSIS-20200317		3/17/2020	1240		031720-A	6.8
		IINY-DU-21C-SSIS-20200317		3/17/2020	1240		031720-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-21A-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.0
		IINY-DU-21B-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.1
		IINY-DU-21C-SBIS1-20200317		3/17/2020	1145		031720-A / 031720-C	7.3
DU-22	Surface Soil Incremental Sample collected in triplicate	IINY-DU-22A-SSIS-20200316	PAHs by EPA Method 8270 SIM (surface and subsurface soil), BTEX by EPA Method 8260B (subsurface soil only), and pH (screened in the field with pH meter)	3/16/2020	1530		031620-A	6.7
		IINY-DU-22B-SSIS-20200316		3/16/2020	1530		031620-A	6.8
		IINY-DU-22C-SSIS-20200316		3/16/2020	1530		031620-A	6.8
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-22A-SBIS1-YYYYMMDD		Advanced 6 hand auger borings at DU-22. Soil depth to refusal ranged from 6 to 8 inches bgs (<1 ft). Will not collect subsurface soil.E124				
		IINY-DU-22B-SBIS1-YYYYMMDD						
		IINY-DU-22C-SBIS1-YYYYMMDD						
DU-23	Surface Soil Incremental Sample collected in triplicate	IINY-DU-23A-SSIS-20200320	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	3/20/2020	915		032020-A	6.0
		IINY-DU-23B-SSIS-20200320		3/20/2020	915		032020-A	5.4
		IINY-DU-23C-SSIS-20200320		3/20/2020	915		032020-A	5.5
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-23A-SBIS1-YYYYMMDD		Advanced >5 hand auger borings at DU-23. Soil depth to refusal less than 6 inches bgs (<1 ft). Majority of DU is exposed bedrock. Very shallow soil. Will not collect subsurface soil.				
		IINY-DU-23B-SBIS1-YYYYMMDD						
		IINY-DU-23C-SBIS1-YYYYMMDD						
DU-24	Surface Soil Incremental Sample collected in triplicate	IINY-DU-24A-SSIS-YYYYMMDD	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH meter)	DU-24 Deletion – Historical documents indicate that a former transformers on a pole was located along the former eastern sentry path from Iona Island onto Round Island. A 60x60 ft decision unit, DU-24, was established on Round Island to evaluate the presence/absence of PCBs associated with the former transformer. DU-24 was one of three transformer decision units that is known as HTRW AOC #19 on Iona Island (Note: the other two transformer decision units were collect). DU-24 is bounded by the Hudson River to east/northeast and the former dump area between Iona and Round Islands to the northwest. A downed former electric pole was noted during a reconnaissance on 20 March 2020. The majority of DU-24 is exposed bedrock with little to thin soil cover. Sediment and soil was noted along the northeastern edge of DU-24 off the bedrock outcrop of Round Island, however this sediment/soil is along the shoreline of the tidally influenced Hudson River. Per a call with USACE on 24 March 2020, DU-24 will not be sampled. There is little/no soil available for sampling in the area of the former transformer. Any PCBs that may have been released from former transformers would have been transported via runoff and overland flow across the bedrock outcrop of Round Island to the Hudson River. However, as the Hudson River itself is a PCB source, collecting PCBs from soil/sediment along the Hudson River will not provide information that could be used to evaluate a potential release related to former transformers.					
		IINY-DU-24C-SSIS-YYYYMMDD						
	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-24A-SBIS1-YYYYMMDD						
		IINY-DU-24B-SBIS1-YYYYMMDD						
		IINY-DU-24C-SBIS1-YYYYMMDD						
DU-25	Surface Soil Incremental Sample collected in triplicate	IINY-DU-25A-SSIS-20200320	Aroclor PCBs by EPA Method 8082A, and pH (screened in the field with pH	3/20/2020	1030	MS/MSD	032020-A	6.2
		IINY-DU-25B-SSIS-20200320		3/20/2020	1030	032020-A	032020-A	6.4
		IINY-DU-25C-SSIS-20200320		3/20/2020	1030		032020-A	6.4

Decision Unit #	Sample Type	Sample Identification Code	Analyses	Sample Date	Sample Time	QA/QC Sample	COC ID	Soil pH
Phase I Investigation Area: Surface and Subsurface Soil, Groundwater								
DU-25	Subsurface Soil Incremental Sample collected in triplicate	IINY-DU-25A-SBIS1-YYYYMMDD	meter)	Advanced >5 hand auger borings at DU-25. Exposed bedrock and bedrock wall within DU. Soil depth to refusal less than 8 inches bgs (<1 ft). Will not collect subsurface soil.				
		IINY-DU-25B-SBIS1-YYYYMMDD						
		IINY-DU-25C-SBIS1-YYYYMMDD						
Former Buildings Identified as Having Significant Potential for Explosive Hazard (EXDU; pending direction of contracting offer): Surface and Subsurface Soil								
EXDU-1	Surface Soil Incremental Sample collected in triplicate	IINY-DU-1A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1535		031720-B	7.0
		IINY-DU-1B-SSIS-20200317		3/17/2020	1535		031720-B	6.9
		IINY-DU-1C-SSIS-20200317		3/17/2020	1535		031720-B	6.9
EXDU-2	Surface Soil Incremental Sample collected in triplicate	IINY-DU-2A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1610		031720-B	7.0
		IINY-DU-2B-SSIS-20200317		3/17/2020	1610		031720-B	6.8
		IINY-DU-2C-SSIS-20200317		3/17/2020	1610		031720-B	6.9
EXDU-3	Surface Soil Incremental Sample collected in triplicate	IINY-DU-3A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	800		031820-A	6.3
		IINY-DU-3B-SSIS-20200318		3/18/2020	800		031820-A	6.5
		IINY-DU-3C-SSIS-20200318		3/18/2020	800		031820-A	5.5
EXDU-4	Surface Soil Incremental Sample collected in triplicate	IINY-DU-4A-SSIS-20200317	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/17/2020	1430	MS/MSD	031720-A	6.5
		IINY-DU-4B-SSIS-20200317		3/17/2020	1430		031720-B	6.3
		IINY-DU-4C-SSIS-20200317		3/17/2020	1430		031720-B	6.8
EXDU-5	Surface Soil Incremental Sample collected in triplicate	IINY-DU-5A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	930		031820-A	7.1
		IINY-DU-5B-SSIS-20200318		3/18/2020	930		031820-A	7.2
		IINY-DU-5C-SSIS-20200318		3/18/2020	930		031820-A	7.3
EXDU-6	Surface Soil Incremental Sample collected in triplicate	IINY-DU-6A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	1015		031820-A	7.2
		IINY-DU-6B-SSIS-20200318		3/18/2020	1015		031820-A	7.3
		IINY-DU-6C-SSIS-20200318		3/18/2020	1015		031820-A	7.3
EXDU-7	Surface Soil Incremental Sample collected in triplicate	IINY-DU-7A-SSIS-20200318	Explosives residues by EPA Method 8330B, and pH (screened in the field with pH meter)	3/18/2020	1145	MS/MSD	031820-A	7.0
		IINY-DU-7B-SSIS-20200318		3/18/2020	1145		031820-A	7.0
		IINY-DU-7C-SSIS-20200318		3/18/2020	1145		031820-A	7.1
Phase I Background: Surface and Subsurface Soil								
BDU-1	Surface Soil Incremental Sample	IINY-BADU-1-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1145		040120-A	6.3
	Subsurface Soil Incremental Sample	IINY-BADU-1-SBIS1-YYYYMMDD		<12" to refusal. Did not collect subsurface soil.				
BDU-2	Surface Soil Incremental Sample	IINY-BADU-2-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1215		040120-A	6.7
	Subsurface Soil Incremental Sample	IINY-BADU-2-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-3	Surface Soil Incremental Sample	IINY-BADU-3-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1245		040120-A	6.0
	Subsurface Soil Incremental Sample	IINY-BADU-3-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-4	Surface Soil Incremental Sample	IINY-BADU-4-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	1320		040120-A	6.1
	Subsurface Soil Incremental Sample	IINY-BADU-4-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-5	Surface Soil Incremental Sample	IINY-BADU-5-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	955	MS/MSD	040120-A	6.1
	Subsurface Soil Incremental Sample	IINY-BADU-5-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-6	Surface Soil Incremental Sample	IINY-BADU-6-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	920		040120-A	5.9
	Subsurface Soil Incremental Sample	IINY-BADU-6-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-7	Surface Soil Incremental Sample	IINY-BADU-7-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	900		040120-A	6.1
	Subsurface Soil Incremental Sample	IINY-BADU-7-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
BDU-8	Surface Soil Incremental Sample	IINY-BADU-8-SSIS-20200401	TAL Metals by EPA Methods 6010C/6020A, Mercury by EPA Method 7471B, PAHs by EPA Method 8270 SIM	4/1/2020	925		040120-A	6.0
	Subsurface Soil Incremental Sample	IINY-BADU-8-SBIS1-YYYYMMDD		<12" to refusal. Portions of DU is rock outcrop. Soil typically only 3" to 8" in depth. Did not collect subsurface soil.				
Shoreline Reconnaissance Survey Sediment Sampling								
SD-01	Discrete Sediment Sample	IINY-SD01-20200407	TOC by Walkley-Black, grain size by ASTM D422	4/7/2020	1040		SN2805	N/A
SD-02	Discrete Sediment Sample	IINY-SD02-20200407	TOC by Walkley-Black, grain size by ASTM D422	4/7/2020	1700		SN2805	N/A
SD-03	Discrete Sediment Sample	IINY-SD03-20200407	TOC by Walkley-Black, grain size by ASTM D422	4/7/2020	1600		SN2805	N/A
SD-04	Discrete Sediment Sample	IINY-SD04-20200407	TOC by Walkley-Black, grain size by ASTM D422	4/7/2020	1435		SN2805	N/A
SD-05	Discrete Sediment Sample	IINY-SD05-20200407	TOC by Walkley-Black, grain size by ASTM D422	4/7/2020	1519		SN2805	N/A
SD-06	Discrete Sediment Sample	IINY-SD06-20200407	TOC by Walkley-Black, grain size by ASTM D422	4/7/2020	1447		SN2805	N/A
SD-07	Discrete Sediment Sample	IINY-SD07-20200407	TOC by Walkley-Black, grain size by ASTM D423	4/7/2020	1630		SN2805	N/A
QA/QC samples								
TB	Grab	TB03172020	VOCs by 8260B	3/17/2020	1500	Trip Blank (VOCs)	031720-C	N/A
FB	Grab	FB03172020	VOCs by 8260B	3/17/2020	1545	Field Blank (VOCs)	031720-C	N/A

Report Date: 4/9/2020
Project No: 63029587.01
Report No: 21

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Rain	50	45	97	0.20

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	3.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	3.0	Landfill	Pin flag transects
Nesibo Sibhat	MRS-01	Tech / NAEVA	3.0	Landfill	Pin flag transects

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, and N.Y. State COVID-19 update.
- NAEVA pin flagged new transects in Landfill area for DGM operations. Then called it a day due to high water and continual rainfall.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

None.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

NAEVA pin flagged new transects in Landfill area but due to rain and high water levels canceled DGM data collection operations for the day.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection on NAEVA while pin flagging new transects in Landfill area.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted site safety brief, communications check, N.Y. State COVID-19 update, and trans-versing through marsh areas.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/9/2020 12:46:19 PM

UXOQCS/SO

Report Date: 4/9/2020

Project No: 63029587.01

Report No: 21

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	N/A
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

None.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/9/2020

Project No: 63029587.01

Report No: 21

ADDITIONAL NOTES:

NAEVA pin flagged new transects in Landfill area but due to rain and high water levels cancelled DGM data collection operations for the day.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/9/2020 12:31:10 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/9/2020

Project No: 63029587.01

Report No: 21

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection on NAEVA while pin flagging new transects in Landfill area.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief, communications check, N.Y. State COVID-19 update, and trans-versing through marsh areas.

Report Date: 4/9/2020

Project No: 63029587.01

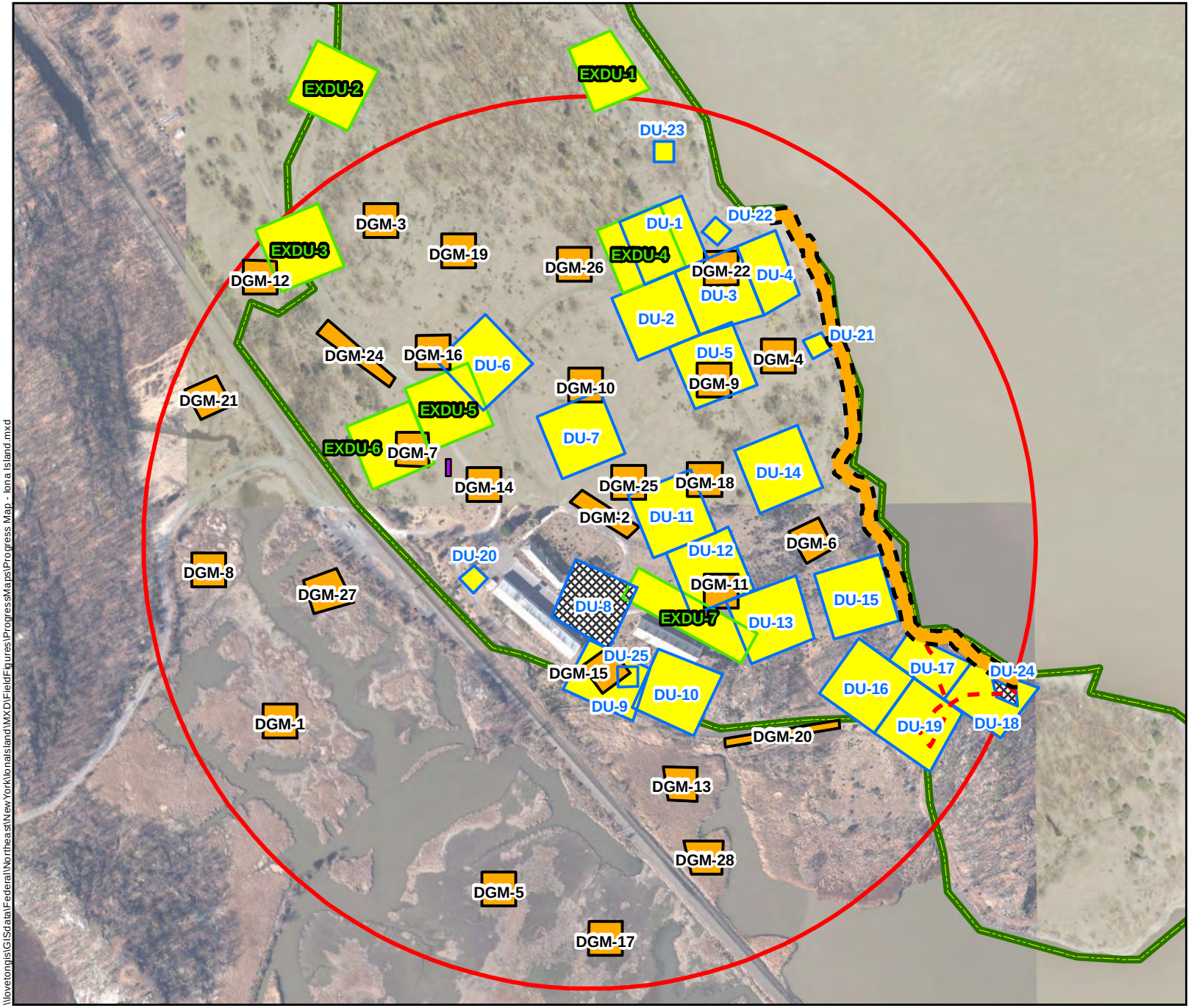
Report No: 21

CONTRACTOR'S VERIFICATION:

JD Marlowe 4/9/2020 12:26:53 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- In Progress
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/10/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 09 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/10/2020
Project No: 63029587.01
Report No: 22

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy with intermittent snow squalls.	44	37	71	0.01

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.0	IVS, DGM-06	AGC Data collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.0	IVS, DGM-06	AGC Data collection
Mark Howard	MRS-01	Technical Supervisor / NAEVA	10.0	IVS,DGM-06	AGC data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, N.Y. State COVID-19 update, and revisited topic of safely traversing grids while pulling cart over rocky surfaces.
- NAEVA conducted AGC data collection in DGM Grid-06, acquiring 74 targets.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

Conducted Initial Phase Inspection while NAEVA assembled and functional test of AGC metal mapper at IVS. - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

NAEVA moved to new phase of project, the collection of data with the AGC metal mapper.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted daily safety inspection while NAEVA collected AGC data in DGM Grid 06.- No Deficiencies.

Summary of Deficiencies

None

Corrective Actions

None

Reinspection Results

None

Additional Notes

Conducted site safety brief, N.Y. State COVID-19 update, vehicle inspection, first aid, eye wash, fire extinguisher, burn kit, blood borne pathogen kit, trauma kit weekly inspection.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/10/2020 6:28:28 PM

UXOQCS/SO

Report Date: 4/10/2020

Project No: 63029587.01

Report No: 22

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Initial Phase Inspection while NAEVA assembled and functional test of AGC metal mapper at IVS. - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/10/2020

Project No: 63029587.01

Report No: 22

ADDITIONAL NOTES:

NAEVA moved to new phase of project, the collection of data with AGC metal mapper.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/10/2020 6:13:15 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/10/2020

Project No: 63029587.01

Report No: 22

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted daily safety inspection while NAEVA collected AGC data in DGM Grid 06.- No Deficiencies.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief, N.Y. State COVID-19 update, vehicle inspection, first aid, eye wash, fire extinguisher, burn kit, blood borne pathogen kit, and trauma kit weekly inspection.

Report Date: 4/10/2020

Project No: 63029587.01

Report No: 22

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

4/10/2020 6:04:44 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 4/10/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:

AGC Equipment Set Up and Testing, UFP-QAPP, Table 17-1, Section 6.

DESCRIPTION AND LOCATION OF WORK INSPECTION

Assembly and Functional Test of AGC Metal Mapper, MRS-01 IVS.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	M. Howard	Field Supervisor	NAEVA
2.	N. Stevens	Technician	NAEVA
3.	J. D. Marlowe	UXOQCS	EA
4.			
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

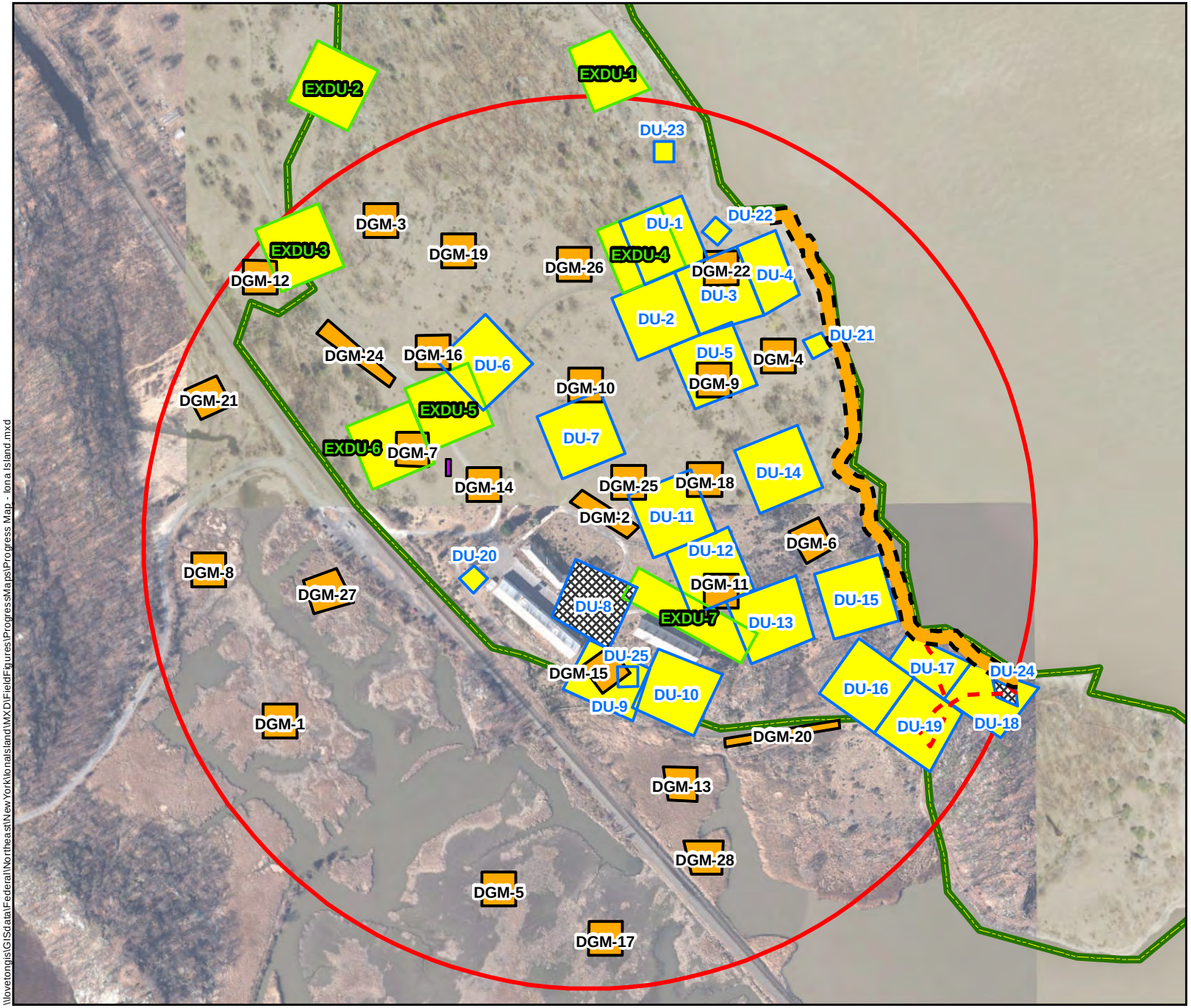
_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/10/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/13/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 10 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/11/2020
Project No: 63029587.01
Report No: 23

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds	51	36	42	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	9.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	9.0	DGM 06, 14	AGC Data collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	9.0	DGM 06, 14	AGC Data collection
Mark Howard	MRS-01	Technical Supervisor / NAEVA	3.0	DGM 06	AGC data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, N.Y. State COVID-19 update, and revisited safety pointers while traversing grid collecting data.
- AGC functional checks at IVS.
- NAEVA continued to collect AGC data in DGM Grid 06 (74 points) and completed the grid with a Total of 148 points.
- NAEVA moved to DGM Grid 14 and collected 76 points before ending the day.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

- Conducted Initial Phase Inspection on NAEVA while conducting the survey of DGM anomalies using the AGC equipment.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection in DGM Grid 14 while NAEVA collected data with AGC metal mapper. - No Discrepancies noted.

Summary of Deficiencies

- None.

Corrective Actions

- None.

Reinspection Results

- None.

Additional Notes

- Conducted daily safety brief, communications check, N.Y. State COVID-19 update, and revisited safety while traversing grids.

CONTRACTOR'S VERIFICATION:

Report Date: 4/11/2020
Project No: 63029587.01
Report No: 23

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/12/2020 9:57:49 AM

UXOQCS/SO

Report Date: 4/11/2020

Project No: 63029587.01

Report No: 23

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Conducted Initial Phase Inspection on NAEVA conducting survey of DGM anomalies using AGC equipment.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 4/11/2020

Project No: 63029587.01

Report No: 23

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/12/2020 9:37:40 AM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/11/2020

Project No: 63029587.01

Report No: 23

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection at DGM Grid 14 while NAEVA collected data with AGC metal mapper. - No Discrepancies noted.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

ADDITIONAL NOTES:

- Conducted daily safety brief, communications check, N.Y. State COVID-19 update, and revisited safety while traversing grids.

Report Date: 4/11/2020

Project No: 63029587.01

Report No: 23

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/12/2020 9:19:21 AM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/11/2020

Project No: 63029587.01

Report No: 23

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Conducted Initial Phase Inspection on NAEVA conducting survey of DGM anomalies using AGC equipment.

SUMMARY OF DEFICIENCIES:

- None.

CORRECTIVE ACTIONS RECOMMENDED:

- None.

REINSPECTION RESULTS:

- None.

Report Date: 4/11/2020

Project No: 63029587.01

Report No: 23

ADDITIONAL NOTES:

- None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/12/2020 9:37:40 AM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island, New York DATE: 4/11/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:

Cued Surveys, UFP-QAPP, Table 17-1, Section 7

DESCRIPTION AND LOCATION OF WORK INSPECTION

Cued survey of DGM anomalies in MRS-01using AGC equipment, MRS-01, DGM Grid 14.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	N. Stevens	Technician	NAEVA
2.	J.D. Marlowe	UXOQCS	EA
3.			
4.			
5.			
6.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

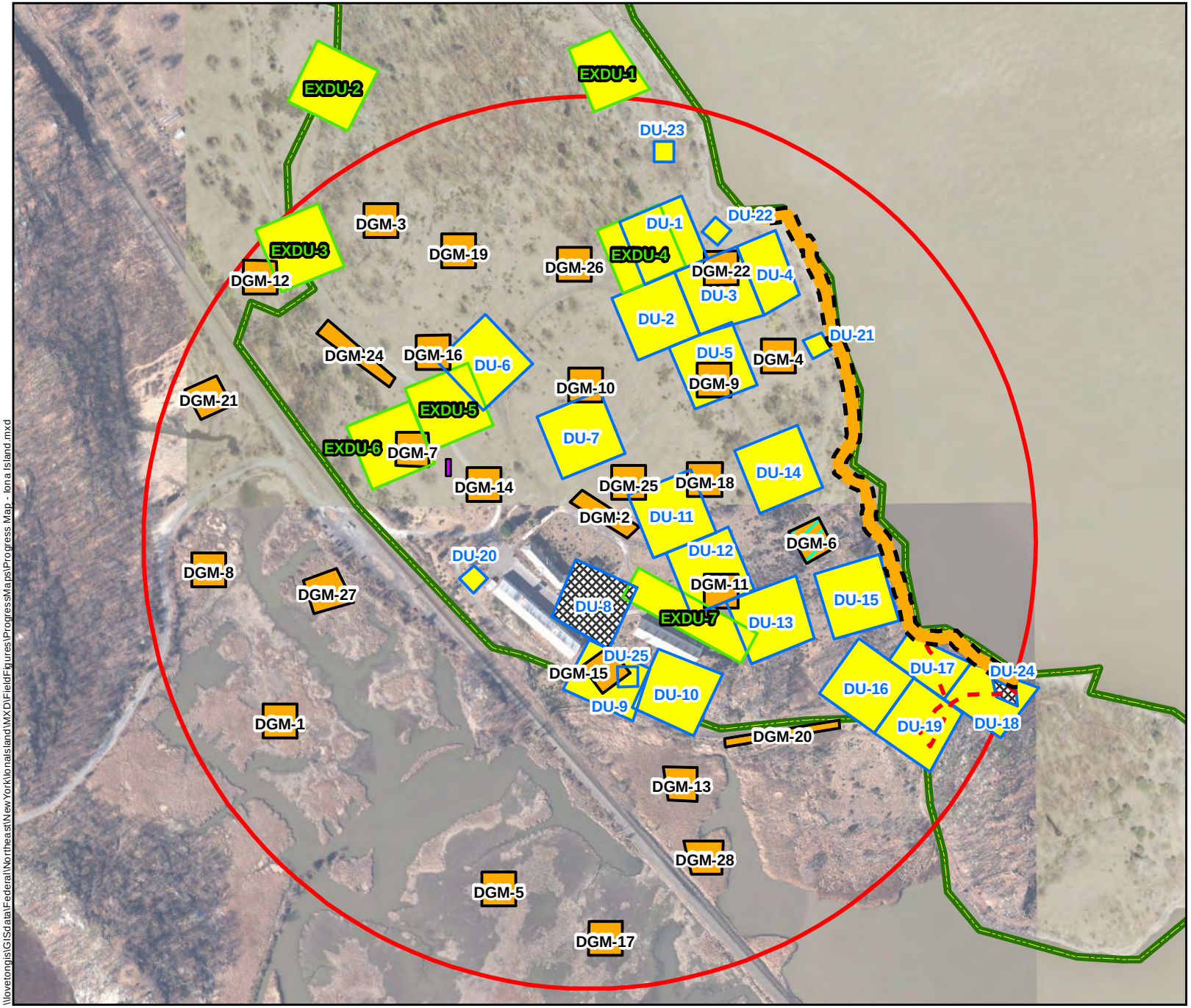
_____

_____

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/11/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/13/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 11 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/13/2020
Project No: 63029587.01
Report No: 24

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Heavy Rain.	58	55	100	0.23

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	0.0		UXOQCS/SO Duties
Nash Stevens		Tech / NAEVA	0.0		AGC Data collection
Nesibo Sibhat		Tech / NAEVA	0.0		AGC Data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Due to heavy rain at Iona Island, NY, today's field operations have been canceled.
- Data collection will resume operations tomorrow (i.e., next work day).
- Field team discussed remaining tasks with management team.

Report Date: 4/13/2020
Project No: 63029587.01
Report No: 24

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections
-None.

Summary of Deficiencies
-None.

Corrective Actions
-None.

Reinspection Results
-None.

Additional Notes
-None.

SAFETY INSPECTIONS AND RESULTS:

Inspections
-None.

Summary of Deficiencies
-None.

Corrective Actions
-None.

Reinspection Results
-None.

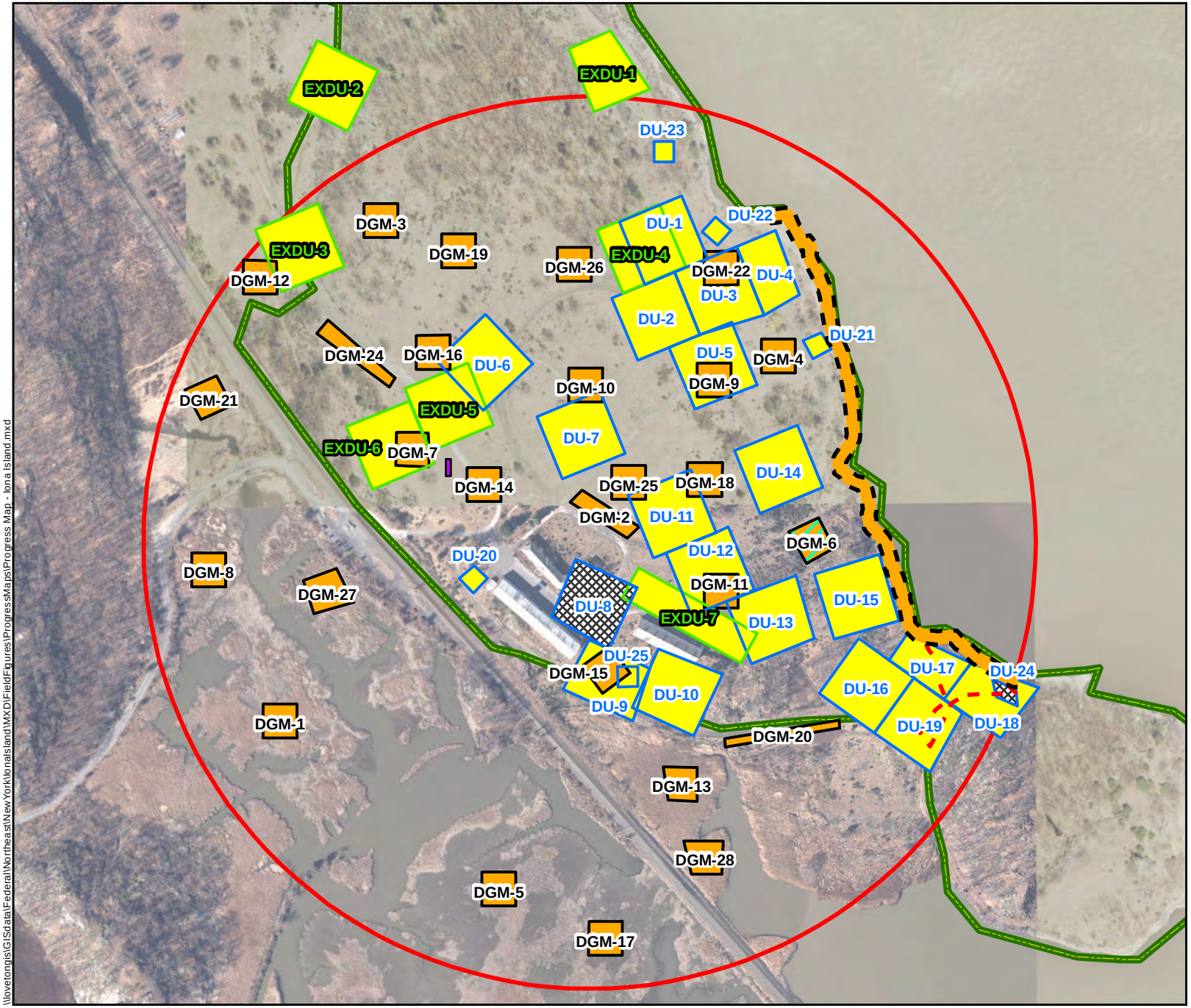
Additional Notes
-None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/13/2020 7:07:03 AM

UXOQCS/SO



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/13/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 13 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/14/2020
Project No: 63029587.01
Report No: 25

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Mixture sun and clouds	54	44	32	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.0	DGM Grids 14, 18, 10, 09	AGC Data collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.0	DGM Grids 14, 18, 10, 09	AGC Data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, and NY State COVID-19 update.
- NAEVA conducted functional checks of AGC Metal Mapper before and after DGM grid data collection.
- NAEVA completed AGC data collection in DGM Grid 14 (47 contacts), DGM Grid 18 (73 targets), DGM Grid 10 (74 targets) and DGM Grid 09 (16 targets).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

- Conducted Follow-Up Phase Inspection of NAEVA functional checks of AGC Metal Mapper before and after DGM data collection at MRS-01 IVS. Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Daily Safety Inspection of NAEVA traversing through DGM Grid 10 during data collection. No Deficiencies.

Summary of Deficiencies

None.

Corrective Actions

None

Reinspection Results

None.

Additional Notes

Conducted site safety brief with NAEVA personnel and NY State COVID-19 updates.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/14/2020 5:58:31 PM

UXOQCS/SO

Report Date: 4/14/2020

Project No: 63029587.01

Report No: 25

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Conducted Follow-Up Phase Inspection of NAEVA functional checks of AGC Metal Mapper before and after DGM data collection at IVS. Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/14/2020

Project No: 63029587.01

Report No: 25

ADDITIONAL NOTES:

None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/14/2020 6:07:41 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/14/2020

Project No: 63029587.01

Report No: 25

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Daily Safety Inspection of NAEVA trans-versing through DGM Grid 10 during data collection. No Deficiencies.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief with NAEVA personnel and NY State COVID-19 updates.

Report Date: 4/14/2020

Project No: 63029587.01

Report No: 25

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/14/2020 6:07:41 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/14/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

AGC Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

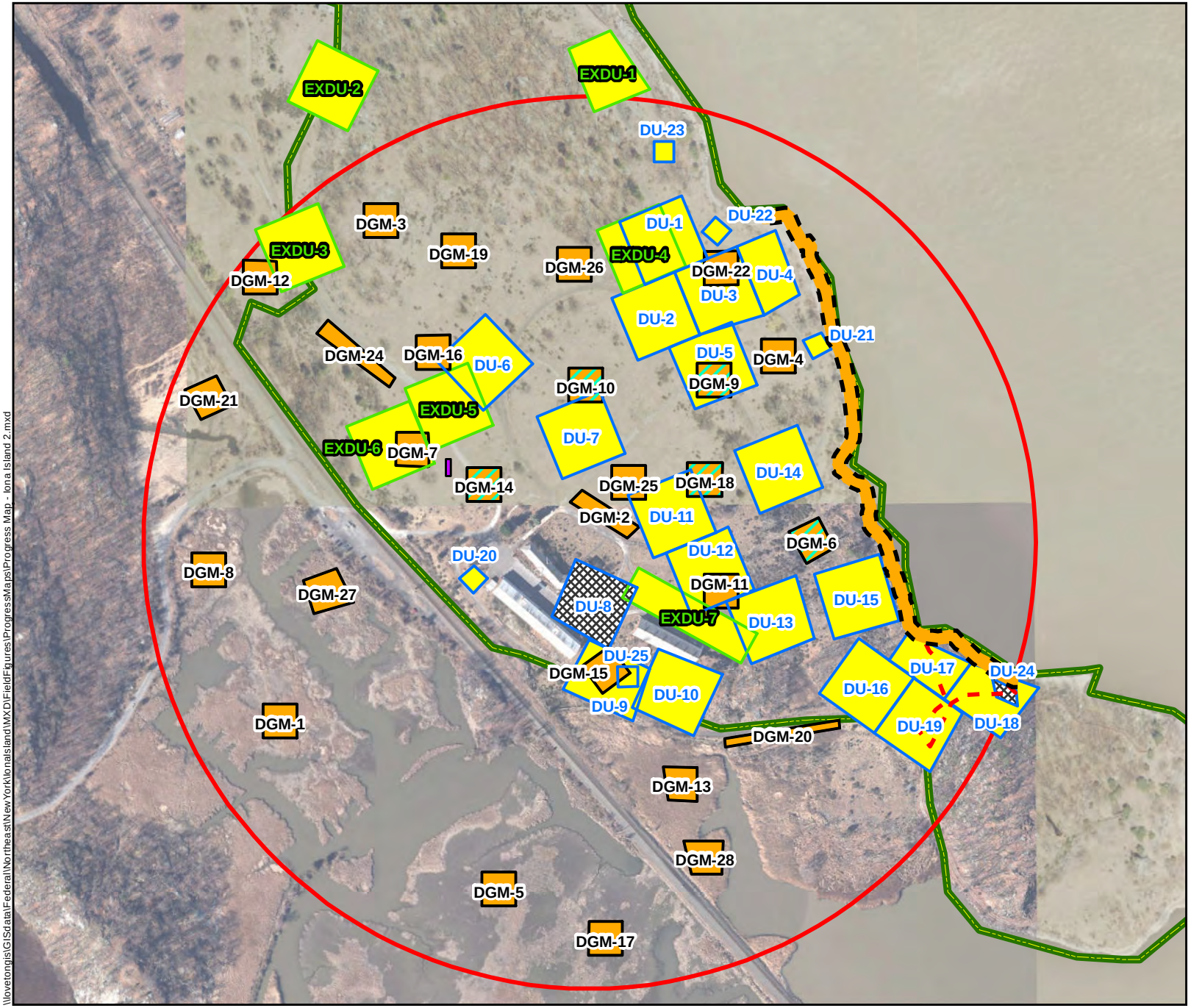
INSPECTION PERFORMED & WHO PERFORMED TEST

Assemble and test AGC equipment at IVS before and after data collection, N. Stevens, NAEVA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/14/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/15/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 14 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island 2.mxd

Report Date: 4/15/2020
Project No: 63029587.01
Report No: 26

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds.	50	38	26	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.0	Landfill transect, 3,22	AGC/DGM Data collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.0	Landfill transect, 3,22	AGC/DGM Data collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, and NY State COVID-19 update.
- NAEVA carried out functional checks at IVS for both the DGM EM-61 and AGC Metal Mapper in preparation for the day's operations.
- NAEVA identified 12 targets in DGM Grid-22, 62 targets in DGM Grid-03, and completed collecting DGM data in the Landfill area.

Report Date: 4/15/2020
Project No: 63029587.01
Report No: 26

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

Conducted Follow-Up Phase Inspection while NAEVA personnel carried out DGM functional checks on the EM-61 before and after daily data collection.- Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

With the completion of data collection at the Landfill transects, all DGM areas have been completed.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Safety inspection while NAEVA traversed through the marsh area of Landfill transects. No deficiencies noted.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted site safety brief to NAEVA personnel and NY State COVID-19 update.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/15/2020 7:20:44 PM

UXOQCS/SO

Report Date: 4/15/2020

Project No: 63029587.01

Report No: 26

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection while NAEVA personnel carried out DGM functional checks on the EM-61 before and after daily data collection.- Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/15/2020

Project No: 63029587.01

Report No: 26

ADDITIONAL NOTES:

With the completion of data collection at the Landfill transects, all DGM areas have been completed.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/15/2020 7:07:46 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/15/2020

Project No: 63029587.01

Report No: 26

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Safety inspection while NAEVA traversed through marsh area Landfill transects. No deficiencies noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief to NAEVA personnel and NY State COVID-19 update.

Report Date: 4/15/2020

Project No: 63029587.01

Report No: 26

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/15/2020 7:01:11 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/15/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; J.D. Marlowe, EA.

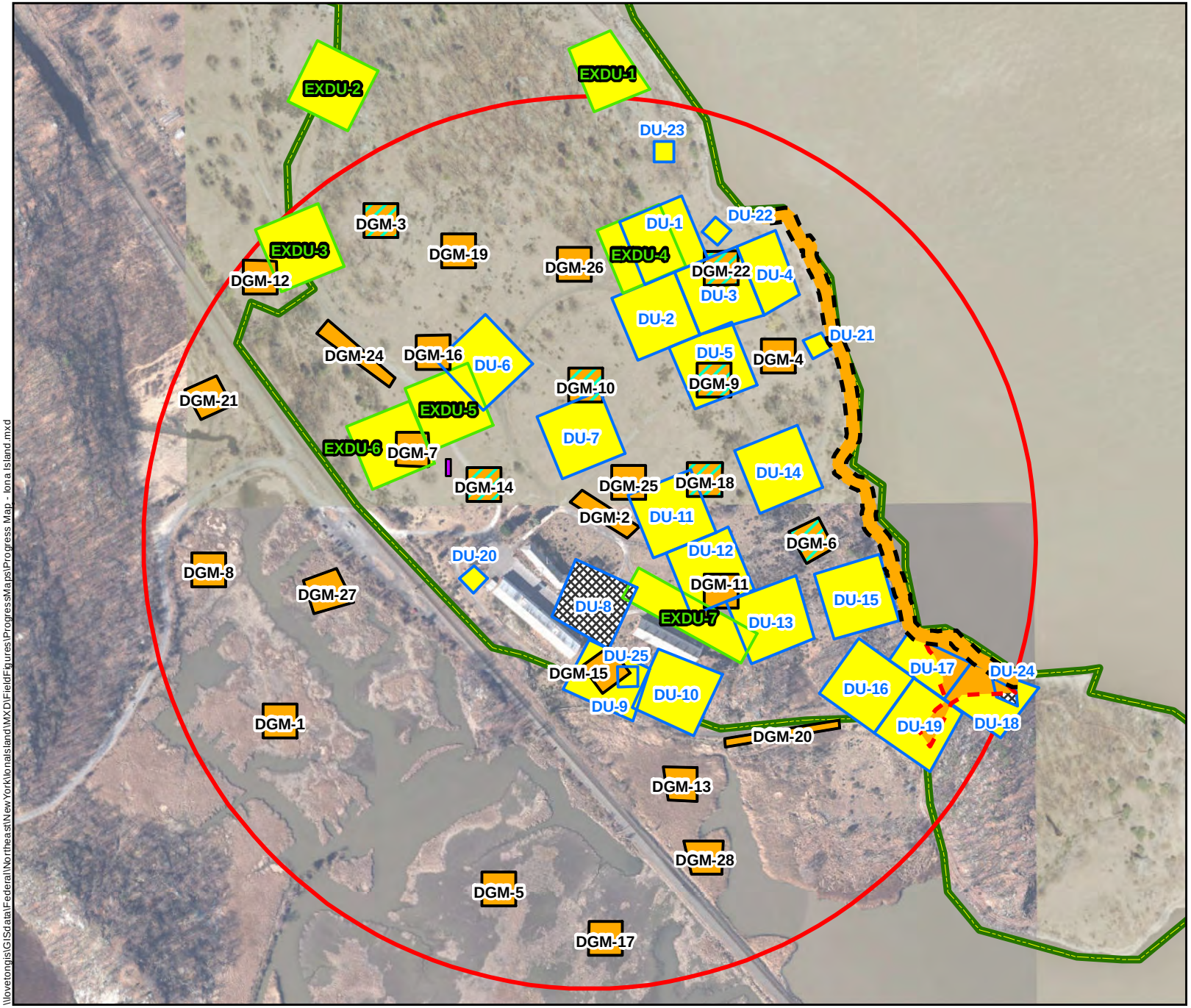
INSPECTION PERFORMED & WHO PERFORMED TEST

EM-61 functional test before and after data collection, N. Stevens, NAEVA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/15/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/15/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 15 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/16/2020
Project No: 63029587.01
Report No: 27

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Snow flurries am, sun and clouds pm.	44	34	85	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.0	DGM Grids 15, 20, 01, 17, 05, 25	AGC cue collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.0	DGM Grids 15, 20, 01, 17, 05, 25	AGC cue collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

Conducted site safety brief, communications check, NY State COVID-19 update, NY Governor mandated facial covering will be worn when in public, and ensured site personnel were briefed and supplied with PPE.
- NAEVA conducted functional checks on AGC equipment at IVS before and after the day's cuing operation.
- NAEVA completed AGC data collection in DGM Grids 15 (38 points), 20 (30 points), 01 (5 points), 17 (3 points), 05 (2 points), and 25 (12 points).
- The collection of points in the marsh with the AGC (DGM Grids 01, 05, 17) took approx. twice as much time due to distance between the grids, the loading/unloading of AGC equipment into/out of ARGO, and movement of AGC equipment through the grid (vegetation/stubble resistance).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

Conducted Follow-Up Phase Inspection at IVS while NAEVA carried out functional checks of AGC equipment before and after data collection.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

NY State Governor declared that masks must be worn while out in public. Ensured site personnel had ample supply of PPE.

Report Date: 4/16/2020
Project No: 63029587.01
Report No: 27

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Safety Inspection while NAEVA personnel traversed through the marsh in DGM Grid 01. No deficiencies noted.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted site safety brief, communications check, NY State COVID-19 Update, NY Governor issued a declaration that everyone out in public must wear a face covering, and handed out additional masks.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/16/2020 6:37:43 PM

UXOQCS/SO

Report Date: 4/16/2020

Project No: 63029587.01

Report No: 27

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection at IVS while NAEVA carried out functional checks of AGC equipment before and after data collection.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/16/2020

Project No: 63029587.01

Report No: 27

ADDITIONAL NOTES:

N.Y. State Governor declared that masks must be worn while out in public. Ensured site personnel had ample supply of PPE.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/16/2020 6:14:08 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/16/2020

Project No: 63029587.01

Report No: 27

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Safety Inspection while NAEVA personnel traversed through the marsh in DGM Grid 01. No deficiencies noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief, communications check, NY State COVID-19 Update, NY Governor issued a declaration that everyone out in public must wear a face covering, and handed out additional masks.

Report Date: 4/16/2020

Project No: 63029587.01

Report No: 27

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

4/16/2020 6:07:08 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/16/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

AGC Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

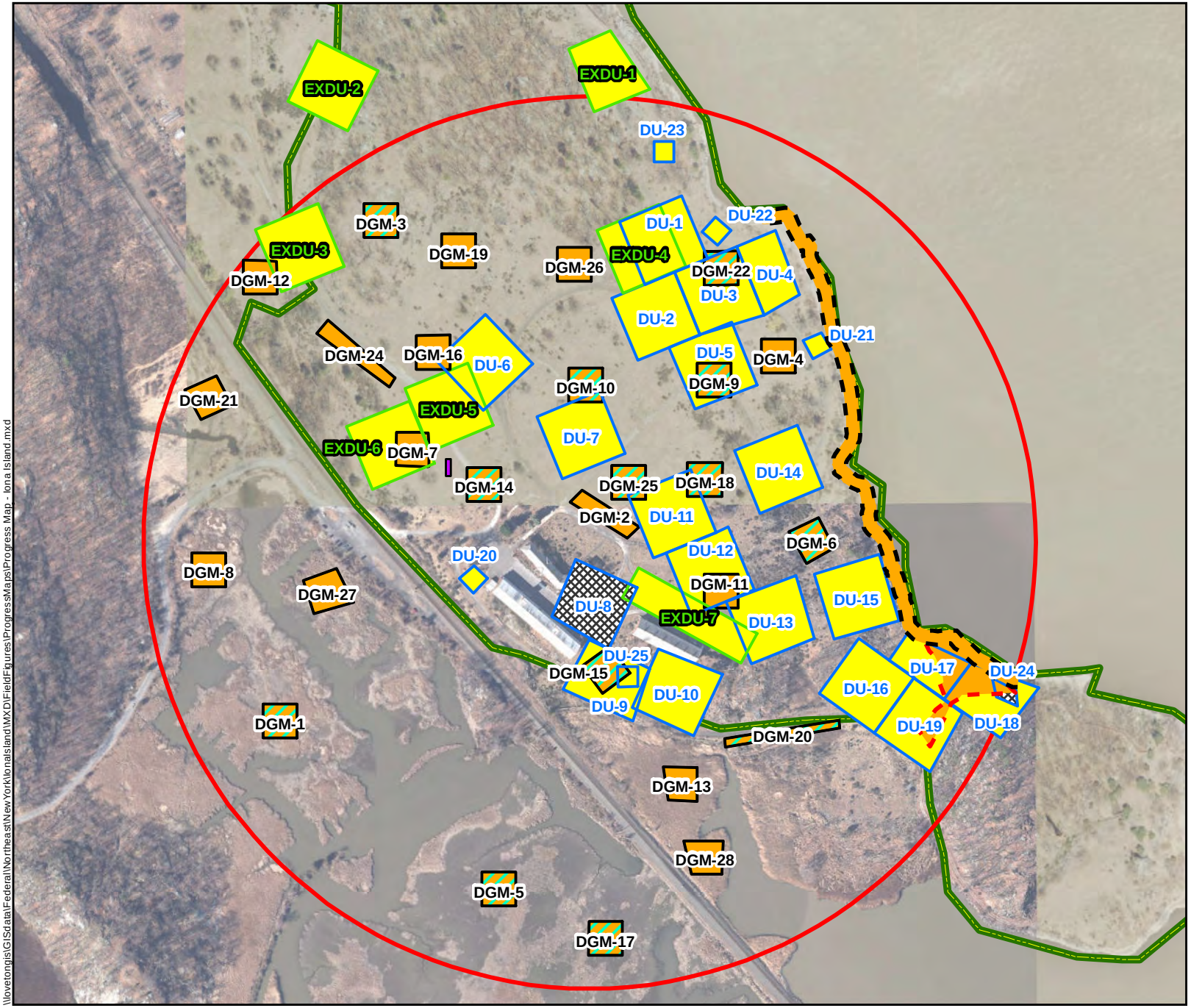
INSPECTION PERFORMED & WHO PERFORMED TEST

Functional testing of AGC equipment before and after data collection in MRS-01, N. Stevens, NAEVA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe, EA.

DATE: 4/16/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/17/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 16 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/17/2020
Project No: 63029587.01
Report No: 28

EA Engineering, Science, and Technology **Iona Island**

Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds	49	33	64	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.0	DGM Grid 10, 02, 06, 14, 07.	AGC cue collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.0	DGM Grid 10, 02, 06, 14, 07.	AGC cue collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

-Conducted site safety brief, communications check, and NAEVA carried out functional check of AGC equipment at IVS.
-NAEVA conducted AGC Metal Mapper operations in DGM Grid 02 (61 points), DGM Grid 07 (18 points), and had to redo operations in DGM 10 (22 points), DGM 06 (46 points), and DGM Grid 14 (23 points).
-During afternoon operations NAEVA experienced signal problems with equipment, fixed the source of problem (battery issue), and continued operations.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

Conducted Follow-Up Phase Inspection while NAEVA acquired DGM targets with AGC equipment in DGM Grid 02. - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Safety Inspection while NAEVA surveyed in DGM Grid 02. No deficiencies observed.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Conducted site safety brief, communications check, and NY State COVID-19 update.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/17/2020 7:21:57 PM

UXOQCS/SO

Report Date: 4/17/2020

Project No: 63029587.01

Report No: 28

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection while NAEVA surveyed DGM targets with AGC equipment in DGM Grid 02, - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/17/2020

Project No: 63029587.01

Report No: 28

ADDITIONAL NOTES:

None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/17/2020 7:05:09 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/17/2020

Project No: 63029587.01

Report No: 28

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Safety Inspection while NAEVA surveyed in DGM Grid 02. No deficiencies observed.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Conducted site safety brief, communications check, and NY State COVID-19 update.

Report Date: 4/17/2020

Project No: 63029587.01

Report No: 28

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/17/2020 6:59:29 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/17/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Cued Surveys, MRS-01 DGM Grid 02, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

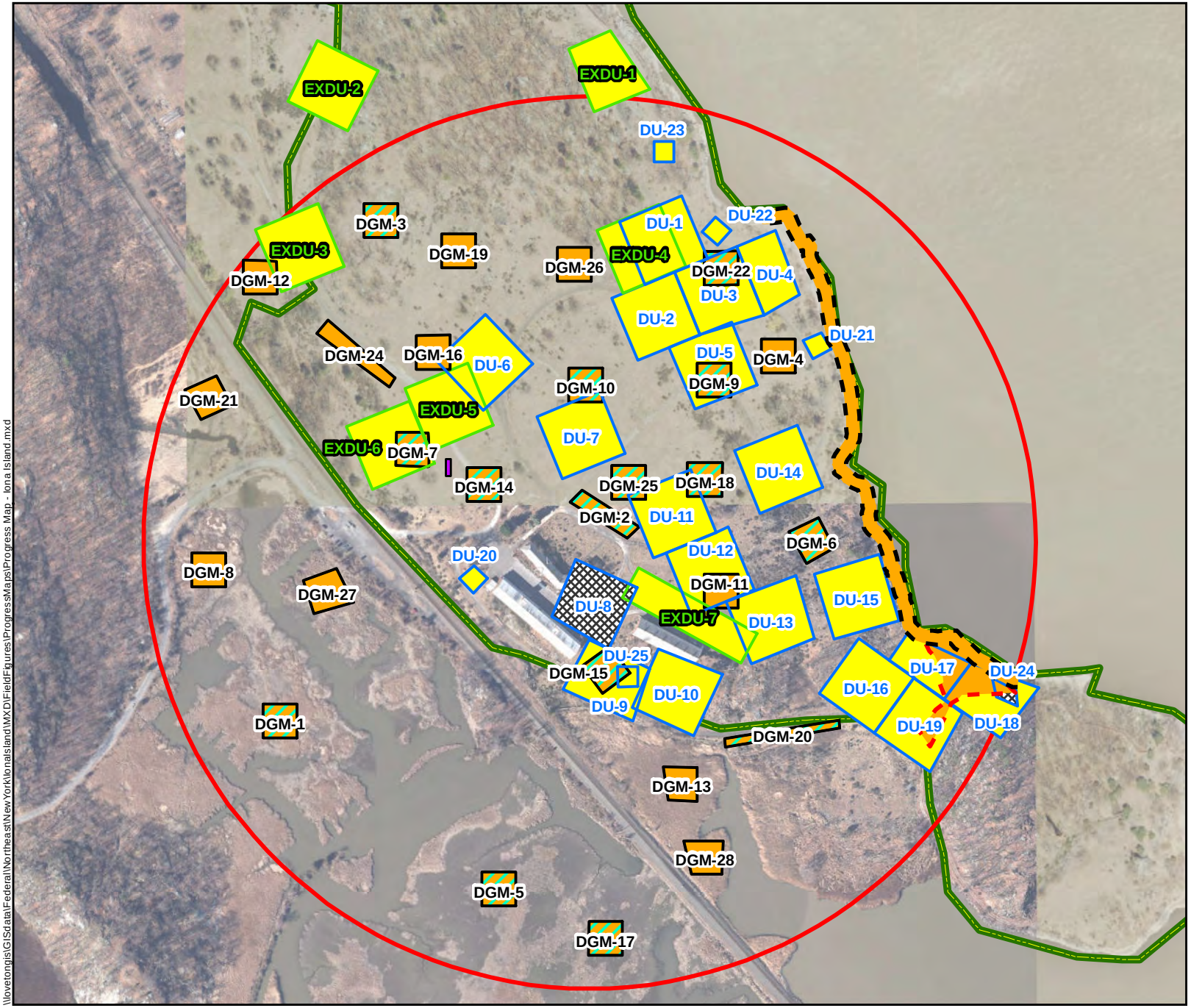
INSPECTION PERFORMED & WHO PERFORMED TEST

Cued survey of DGM anomalies in MRS-01 using AGC equipment, N.Stevens, NAEVA; J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe

DATE: 4/17/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/17/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 17 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/20/2020
Project No: 63029587.01
Report No: 29

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds	55	42	32	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.5		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.5	DGM Grid 07,16,24,12	AGC cue collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.5	DGM Grid 07,16,24,12	AGC cue collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, NY State COVID-19 update, and NAEVA functional check of AGC equipment at IVS.
- NAEVA surveyed targets in 4 DGM grids, DGM Grid-07 (64 targets); DGM Grid-16 (57 targets), DGM Grid-24 (55 targets), and DGM Grid-12 (89 targets) for a total of 265 targets.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

- Follow-Up Phase Inspection of NAEVA conducted functional check of AGC equipment before and after daily data collection.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

- Conducted Safety Inspection of NAEVA collecting data in DGM Grid-16. No Deficiencies observed.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

- Conducted site safety brief, communications check, and NY State COVID-19 update.

Additional Notes

None.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/21/2020 7:06:24 AM

UXOQCS/SO

Report Date: 4/20/2020

Project No: 63029587.01

Report No: 29

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Follow-Up Phase Inspection of NAEVA conducted functional check of AGC equipment before and after daily data collection.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Report Date: 4/20/2020

Project No: 63029587.01

Report No: 29

ADDITIONAL NOTES:

None.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/21/2020 6:58:49 AM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/20/2020

Project No: 63029587.01

Report No: 29

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	N/A
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

- Conducted Safety Inspection of NAEVA collecting data in DGM Grid-16. No Deficiencies observed.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

- Conducted site safety brief, communications check, and NY State COVID-19 update.

ADDITIONAL NOTES:

None

Report Date: 4/20/2020

Project No: 63029587.01

Report No:29

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

4/21/2020 6:54:46 AM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/20/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

AGC Equipment Set Up and Testing, MRS-01 IVS, N. Stevens, NAEVA; N. Sibhat, NAEVA; J.D. Marlowe, EA.

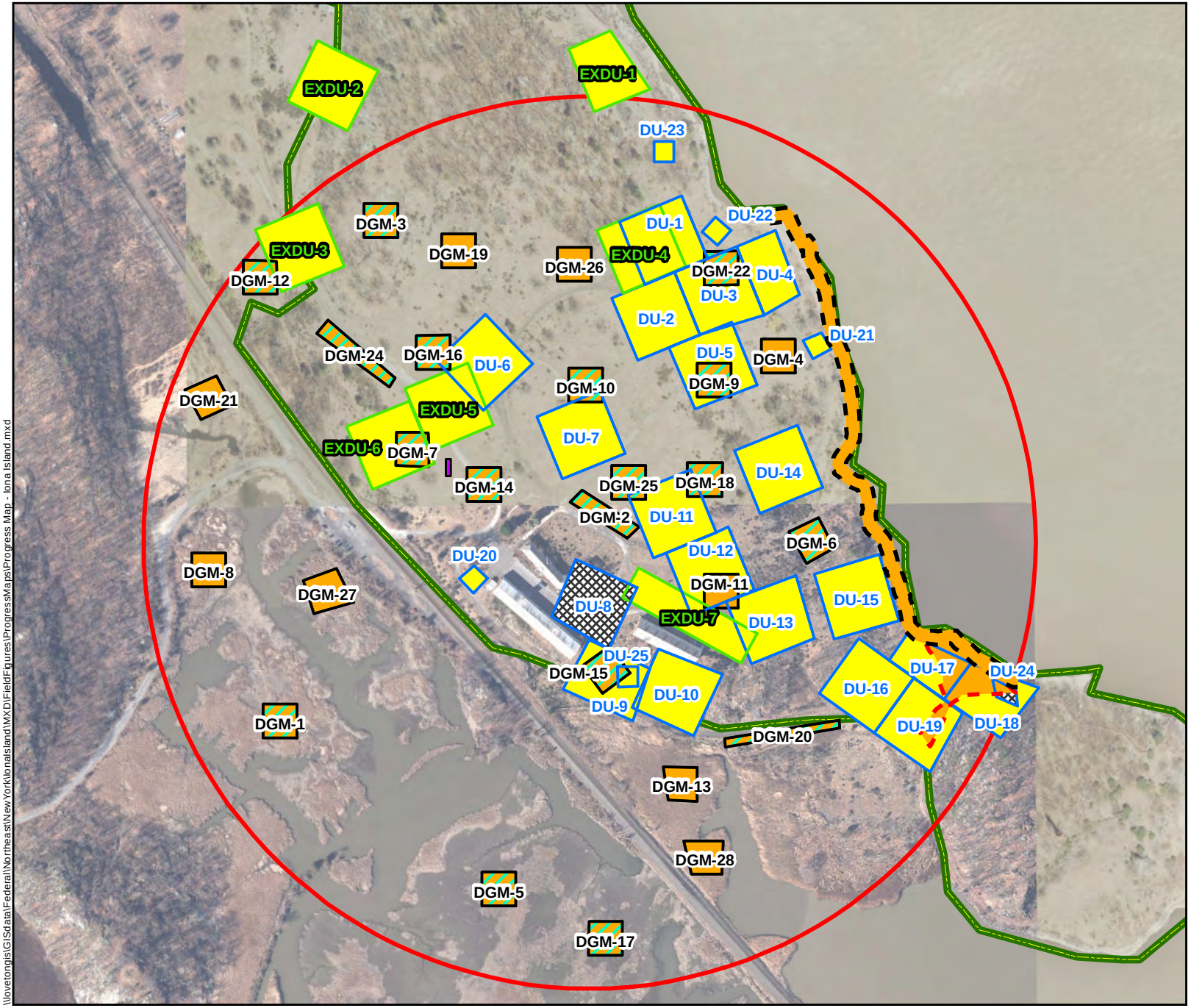
INSPECTION PERFORMED & WHO PERFORMED TEST

Assemble and Test AGC Equipment at IVS, N. Stevens, NAEVA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe, EA.

DATE: 4/20/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/20/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 20 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/21/2020
Project No: 63029587.01
Report No: 30

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Mix of clouds, rain and thunderstorms.	54	39	85	0.14

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	5.0		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	5.0	DGM Grid 19, 26	AGC cue collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	5.0	DGM Grid 19, 26	AGC cue collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, NY State COVID-19 update, and NAEVA functional check of AGC equipment.
- NAEVA cued 2 DGM Grids before rain and thunderstorms started. DGM Grid-19 (46 points) and DGM Grid-26 (5 points) were completed.
- Heavy rain and thunderstorms moved into area at mid-day resulting in the shutting down of data collection for the day.

Report Date: 4/21/2020
Project No: 63029587.01
Report No: 30

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

None.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

None.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Follow-Up Phase inspection on NAEVA while cueing of DGM anomalies in DGM Grid-19 using AGC equipment. - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

Heavy rain and thunderstorms moved into area at mid-day resulting in shutting down of data collection for the day. AGC equipment was able to be functionally checked at IVS at end of work.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/21/2020 2:32:08 PM

UXOQCS/SO

Report Date: 4/21/2020

Project No: 63029587.01

Report No: 30

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

Conducted Follow-Up Phase Inspection while NAEVA cued DGM anomalies in DGM Grid-19 with AGC equipment.-Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

Report Date: 4/21/2020

Project No: 63029587.01

Report No: 30

ADDITIONAL NOTES:

- Heavy rain and thunderstorms (within 6 miles) shut down AGC operations for the day.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/22/2020 10:17:35 AM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/21/2020

Project No: 63029587.01

Report No: 30

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Follow-Up Phase inspection on NAEVA while cueing of DGM anomalies in DGM Grid-19 using AGC equipment. - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

Report Date: 4/21/2020

Project No: 63029587.01

Report No: 30

ADDITIONAL NOTES:

Heavy rain and thunderstorms moved into area at mid-day period resulting in the shutting down of data collection for the day. AGC equipment was able to be functionally checked at IVS at end of work.

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

4/21/2020 1:57:44 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/21/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Cued Surveys, MRS-01 DGM Grid-19, N. Stevens, NAEVA; J.D. Marlowe, EA.

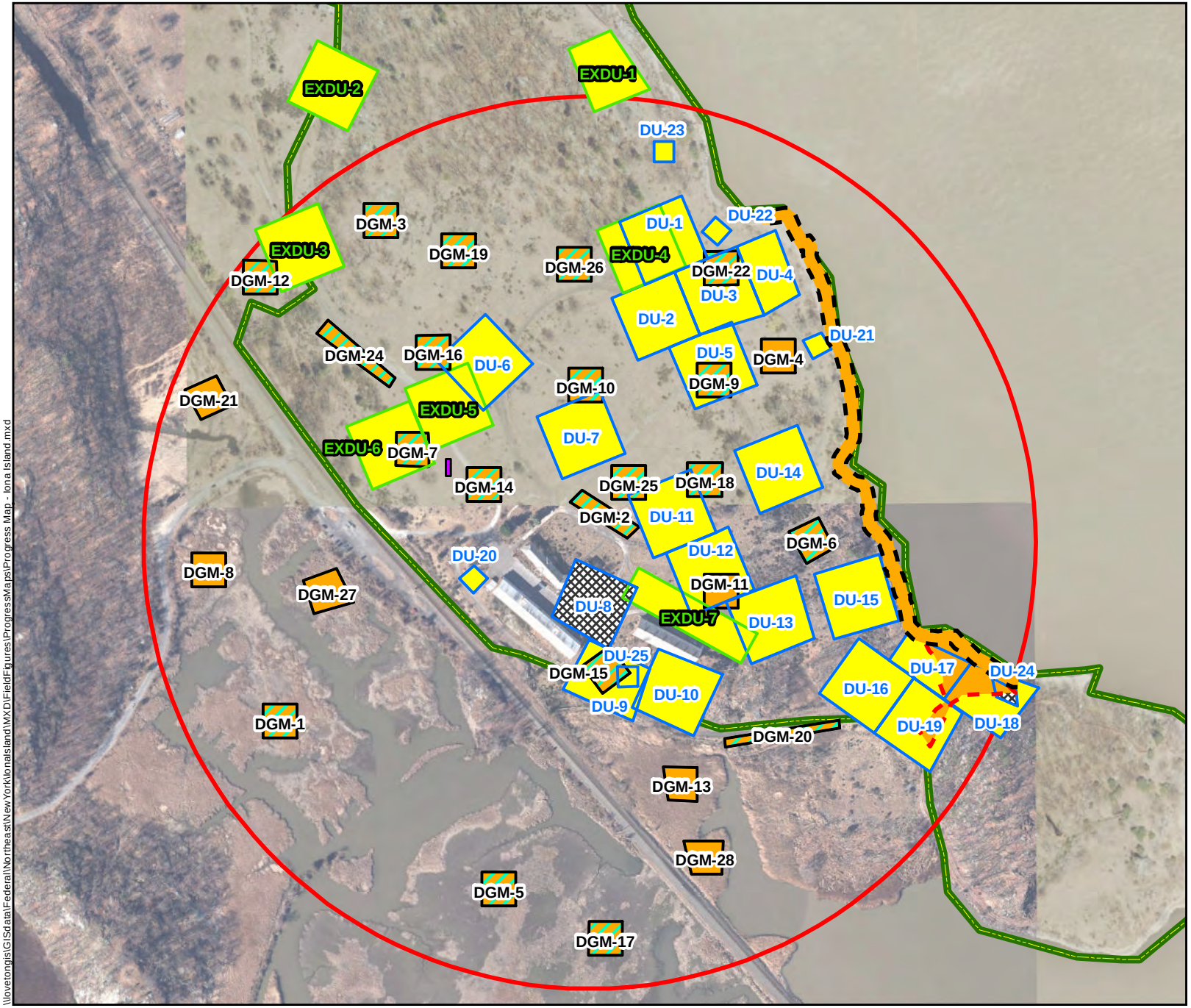
INSPECTION PERFORMED & WHO PERFORMED TEST

Cued survey of DGM anomalies in MRS-01 using AGC equipment, J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe, EA.

DATE: 4/21/2020

SIGNATURE OF PROJECT QC SPECIALIST:



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/20/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 21 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 4/22/2020
Project No: 63029587.01
Report No: 31

EA Engineering, Science, and Technology, Inc., PBC

Iona Island Daily Activities

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds	45	32	29	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		UXOQCS/SO / EA	10.5		UXOQCS/SO Duties
Nash Stevens	MRS-01	Tech / NAEVA	10.5	DGM Grid 11,4,2,18,26,22,3,9,7, 12,16,24,19,20,15,2	AGC cue collection
Nesibo Sibhat	MRS-01	Tech / NAEVA	10.5	DGM Grid 11,4,2,18,26,22,3,9,7, 12,16,24,19,20,15,2	AGC cue collection

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO115	0.0	No

ADDITIONAL REMARKS:

- Conducted site safety brief, communications check, NY State COVID-19 update, and NAEVA conducted functional check of AGC equipment at IVS.
- NAEVA cued new targets in DGM Grid-11 (6), DGM Grid-4 (5), and redo's in DGM Grid-2 (10), DGM Grid-18 (14), DGM Grid-26 (5), DGM Grid-22 (12), DGM Grid-3 (17), DGM Grid-9 (3), DGM Grid-7 (8), DGM Grid-12 (15), DGM Grid-16 (10), DGM Grid-24 (10), DGM Grid-19 (13), DGM Grid-20 (3), DGM Grid-15 (1), and DGM Grid-25 (2).
- NAEVA completed AGC cueing collection of all DGM Grids.
- EA and NAEVA personnel will de-mob from Iona Island work site next work day (04-23-2020).

QUALITY CONTROL INSPECTIONS AND RESULTS:

Inspections

- Final Inspection on DGM Equipment Set Up and Testing - Conformance.
- Final Inspection on DGM Surveys - Conformance.
- Final Inspection on AGC Equipment Set Up and Testing - Conformance.
- Final Inspection of Cued Surveys - Conformance.

Summary of Deficiencies

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

EA and NAEVA personnel will de-mob from Iona Island work site next work day (04-23-2020).

Report Date: 4/22/2020
Project No: 63029587.01
Report No: 31

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Safety Inspection while NAEVA collected data in DGM Grid-11. No Deficiencies

Noted. **Summary of Deficiencies**

None.

Corrective Actions

None.

Reinspection Results

None.

Additional Notes

- Conducted site safety brief, communications check, and NY State COVID-19 update
- EA and NAEVA site personnel will be de-mobbing from Iona Island next work day (04-24-2020).

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 4/22/2020 8:17:53 PM

UXOQCS/SO

Report Date: 4/22/2020

Project No: 63029587.01

Report No: 31

EA Engineering, Science, and Technology, Inc., PBC

QUALITY CONTROL DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	Areas Inspected	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE = Material Handling Equipment

QA/QC Grid/Transect Status

No QA/QC Data Collected.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected.

OTHER INSPECTIONS:

- Final Inspection on DGM Equipment Set Up and Testing - Conformance.
- Final Inspection on DGM Surveys - Conformance.
- Final Inspection on AGC Equipment Set Up and Testing - Conformance.
- Final Inspection of Cued Surveys - Conformance.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

Report Date: 4/22/2020

Project No: 63029587.01

Report No: 31

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

EA and NAEVA personnel will de-mob from IONA Island work site next work day (04-23-2020).

CONTRACTOR'S VERIFICATION:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe 4/22/2020 7:54:53 PM

UXOQCS

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.

Report Date: 4/22/2020

Project No: 63029587.01

Report No: 31

EA Engineering, Science, and Technology, Inc., PBC

SAFETY INSPECTION DAILY REPORT

Iona Island Daily Activities

Iona Island, New York

INSPECTION RESULTS:

Item Description	Pass/Fail	Item Description	Pass/Fail
PPE	Pass	MSDS & Container Labeling per APP or SS	Pass
Compliance with Approved SOP	Pass	UXO/MEC Precautions Observed	Pass
Compliance with Approved Safety Plan	Pass	UXO/MEC Disposal Operations	N/A
Safety/Support Equipment	Pass	Motor Vehicles/MHE	Pass
On-site and Off-site Communications	Pass	First Aid Kit/Trauma Kit	Pass
Explosives/Ordnance Reference Materials	Pass		

SOP = Standard Operating Procedure UXO = Unexploded Ordnance PPE = Personal Protective Equipment
MEC = Munitions and Explosives of Concern MHE Material Handling Equipment

OTHER INSPECTIONS:

Conducted Safety Inspection while NAEVA collected data in DGM Grid-11. No Deficiencies Noted.

SUMMARY OF DEFICIENCIES:

None.

CORRECTIVE ACTIONS RECOMMENDED:

None.

REINSPECTION RESULTS:

None.

ADDITIONAL NOTES:

- Conducted site safety brief, communications check, and NY State update.
- EA and NAEVA site personnel will be de-mobbing from Iona Island next work day (04-23-2020).

Report Date: 4/22/2020

Project No: 63029587.01

Report No: 31

CONTRACTOR'S VERIFICATION:

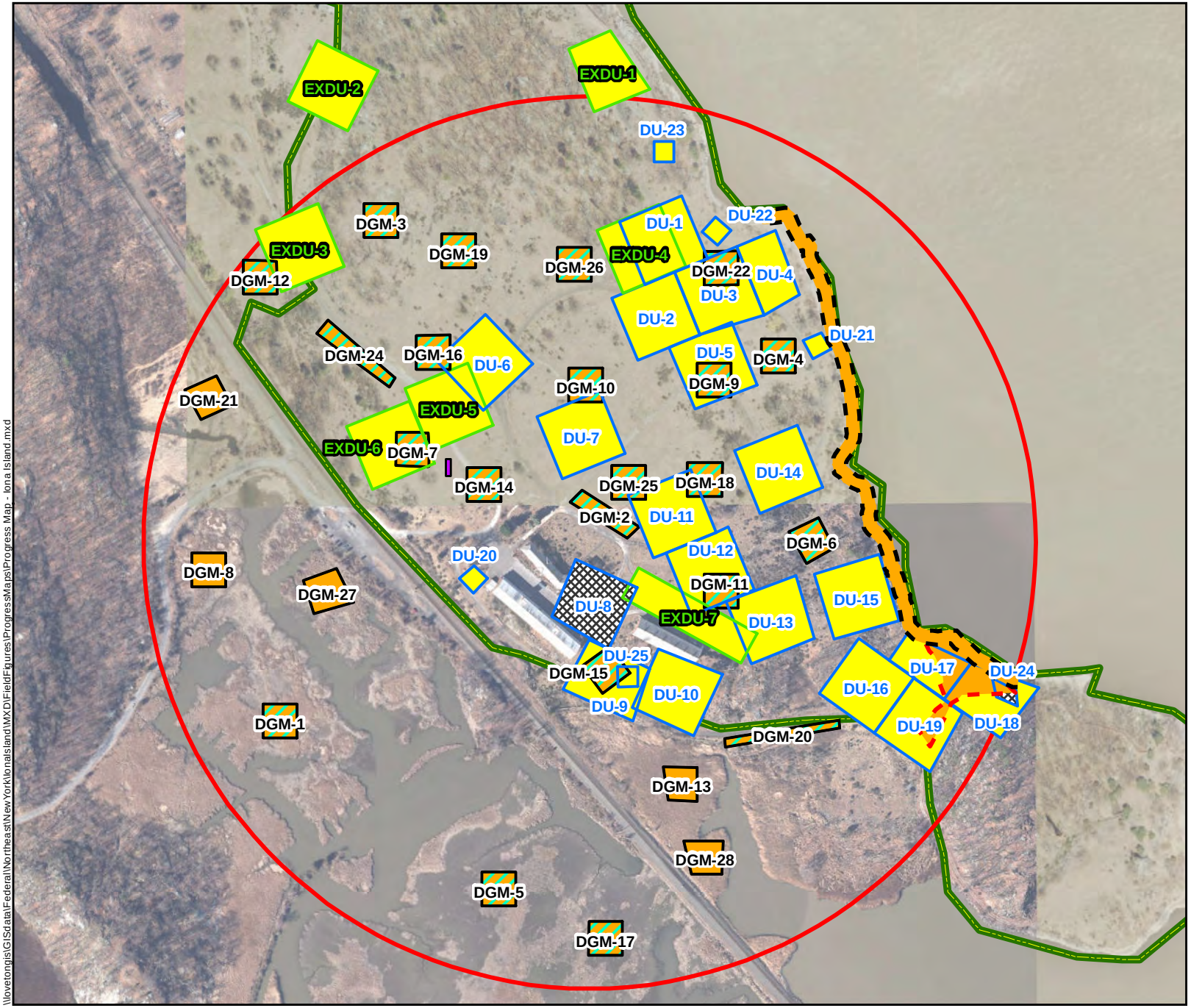
I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

JD Marlowe

4/22/2020 7:44:23 PM

UXOSO

Note: Safety Inspections are to be conducted and documented on this form. This form will also be used to document the present status of the site/site operations, and will also be used to note the current status of deficiencies noted during daily inspections. Any daily inspection forms where deficiencies have been noted will be forwarded to the Site Manager and the Corporate QA/QC Manager.



Legend

- MRS-01 1903 Explosion Area
- FUDS Boundary
- Approximate IVS Location
- DGM Dump SIte
- DGM Shoreline Area

Grid Type

- DGM
- DU
- EXDU

DGM Data Collection Status

- Complete
- Incomplete

AGC Data Collection Status

- Complete

Soil Sampling Status

- Complete
- Incomplete
- DU Deleted

0 200 400
Feet

N

Map Date: 4/23/2020
Projection: WGS 1984 UTM Zone 18N

Figure
Progress Map - MRS 01
Date: 22 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

\\lovetongis\GISdata\Federal\Northeast\NewYork\IonaIsland\MXD\FieldFigures\ProgressMaps\Progress Map - Iona Island.mxd

Report Date: 7/25/2020
Project No: 63029587
Report No: 1

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy	81	72	69	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe		SUXOS / EA	5.0		SUXOS Duties

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

No Equipment Used

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

Report Date: 7/25/2020
Project No: 63029587
Report No: 1

ADDITIONAL REMARKS:

- Arrived on site, unloaded equipment from Hunt Valley, conducted equipment/supply inventory.
- Conducted vegetation growth inspection in areas of concern, noting that the majority of grids in MRS have regrown since the past spring's vegetation reduction efforts.
- Marsh grids also have bulrush/ phragmites regrowth.
- Received mini excavator from United Rentals.
- EA's UXO and GIS personnel scheduled to be onsite 27 July 2020.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

Inspections

Summary of Deficiencies

Corrective Actions

Reinspection Results

Additional Notes

Report Date: 7/25/2020
Project No: 63029587
Report No: 1

SAFETY INSPECTIONS AND RESULTS:

Inspections

Summary of Deficiencies

Corrective Actions

Reinspection Results

Additional Notes

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

SUXOS

Site Manager

Report Date: 7/27/2020
Project No: 63029587
Report No: 1

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sun and clouds	95	70	67	0.00

GOVERNMENT PERSONNEL (Name/Organization):

- Ed McGowan, PARKS.

SITE VISITORS (Name/Organization):

- None

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire		PM / EA	10.0	DGM-14, DGM-7	PM Duties
J.D. Marlowe		SUXOS / EA	10.0	DGM-14, DGM-7	SUXOS Duties
Ward Stern		UXOSO/QCS / EA	10.0	DGM-14, DGM-7	UXOSO/QCS Duties
Shawn Lucas		UXO TIII / EA	10.0	DGM-14, DGM-7	Site briefings/Intrusive investigation
Dane McCarthy		UXO TII / EA	10.0	DGM-14, DGM-7	Site briefings/Intrusive investigation
Ryan Martin		UXO TII / EA	10.0	DGM-14, DGM-7	Site briefings/Intrusive investigation
Matt Fortune		UXO TII / EA	10.0	DGM-14, DGM-7	Site briefings/Intrusive investigation
Mike Depriest		UXO TI / EA	10.0	DGM-14, DGM-7	Site briefings/Intrusive investigation
Conor O'Hara		GIS Field Tech / EA	10.0	DGM-14,-7,-3,-24,-12,-19,-16,-26,-22,-4,-9,-6,-11	Pin flag DGM grid locations
Brian Pawley		GIS Field Tech / EA	10.0	DGM-14,-7,-3,-24,-12,-19,-16,-26,-22,-4,-9,-6,-11	Pin flag DGM grid locations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	M Fortune	WHO168	7.0	Yes
Schonstedt	D McCarthy	WHO547	7.0	Yes

Report Date: 7/27/2020
Project No: 63029587
Report No: 1

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	R Martin	WHO546	7.0	Yes
Schonstedt	M Depriest	WHO213	7.0	Yes
Tremble R10	C O'Hara	WHO339	7.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

DGM-14

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS 01	DGM14	33	0	0	0	297.10	0	0	3

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Reviewed UFP-QAPP, APP, Site Safety and Health Plan, ESP and AHA with EA personnel.
- GIS team located and pin flagged 13 DGM grids (DGM-14, DGM-7, DGM-3, DGM-24, DGM-12, DGM-19, DGM-16, DGM-26, DGM-22, DGM-4, DGM-9, DGM-6, DGM-11).
- UXO team completed intrusive investigation of single point anomalies and pot hole trenches (SRA's) in DGM-14, and partially DGM-7.
- SUXOS and UXOSO/QCS inspected 382 lbs. of NMRD, which was turned in for recycle.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM14		
Intrusive	MRS 01	DGM14	Unspecified	

Inspections

Initial Phase Inspection of Intrusive Investigation - Grid, DGM-14.

Summary of Deficiencies

None noted

Corrective Actions

N/A

Reinspection Results

N/A

Additional Notes

None

SAFETY INSPECTIONS AND RESULTS:

Inspections

Provided new employees initial site safety orientation.

Summary of Deficiencies

None noted

Corrective Actions

N/A

Reinspection Results

N/A

Additional Notes

None

CONTRACTOR'S VERIFICATION:

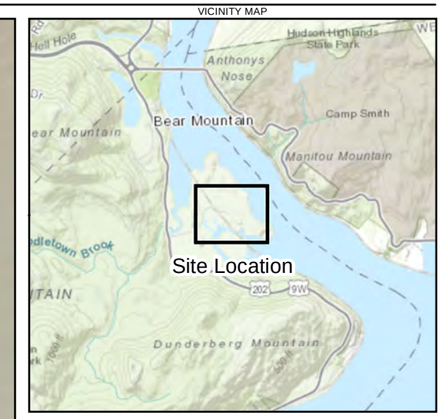
I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 7/27/2020 7:11:05 PM

SUXOS

Site Manager

VICINITY MAP



Legend

- Grid
- Flagging Complete
- QC Complete

Map Date: 7/28/2020

N

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Feet

1 inch = 250 feet

Progress Map
27 July 2020
IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

\\lincoln\projects\Federal\DOD\USACE\PROJECTS\6332104 Pueblo SWMU 4 CMSIZ - GIS\Iona Progress map

Report Date: 7/28/2020
Project No: 63029587
Report No: 3

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny with pm clouds	89	76	65	0.00

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	7.0	DGM-7,24,12,16,3,19	PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	10.0	DGM-7,24,12,16,3,19	SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	10.0	DGM-7,24,12,16,3,19	UXOSO/QCS Duties
Shawn Lucas	MRS-1	UXO TIII / EA	10.0	DGM-7,24,12,16,3,19	Intrusive investigation
Dane McCarthy	MRS-1	UXO TII / EA	10.0	DGM-7,24,12,16,3,19	Intrusive investigation
Ryan Martin	MRS-1	UXO TII / EA	10.0	DGM-7,24,12,16,3,19	Intrusive investigation
Matt Fortune	MRS-1	UXO TII / EA	10.0	DGM-7,24,12,16,3,19	Intrusive investigation
Mike Depriest	MRS-1	UXO TI / EA	10.0	DGM-7,24,12,16,3,19	Intrusive investigation
Conor O'Hara	MRS-1	GIS Field Tech / EA	10.0	DGM-13,28,17,5,1,27,8,21,20,15,18,25,2,10,Dump site	Pin flag DGM grid locations
Brian Pawley	MRS-1	GIS Field Tech / EA	10.0	DGM-13,28,17,5,1,27,8,21,20,15,18,25,2,10,Dump site	Pin flag DGM grid locations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 7/28/2020
Project No: 63029587
Report No: 3

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	M. Fortune	WHO168	9.0	Yes
Schonstedt	D. McCarthy	WHO547	9.0	Yes
Schonstedt	R. Martin	WHO546	9.0	Yes
Schonstedt	M. Depriest	WHO213	9.0	Yes
Tremble R10	C. O'Hara	WHO339	9.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Completed: DGM-7, DGM-24, DGM-12, DGM-16, DGM-3. Partially Completed: DGM-19

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS 01	DGM12	18	0	0	0	93.00	0	0	1
1	Intrusive	MRS 01	DGM14	1	0	0	0	3.00	0	0	0
1	Intrusive	MRS 01	DGM16	23	0	0	0	72.00	0	0	2
1	Intrusive	MRS 01	DGM19	1	0	0	0	12.00	0	0	0
1	Intrusive	MRS 01	DGM24	14	0	0	0	138.00	0	0	1
1	Intrusive	MRS 01	DGM3	19	0	0	0	181.70	0	0	1
1	Intrusive	MRS 01	DGM7	22	0	0	0	549.00	0	0	0

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations brief, UXO instruments functional check thru IVS.
- USACE OESS onsite.
- UXO team completed intrusive investigation of single point anomalies and pothole trenches (SRA's) in 5 DGM grids in MRS-1 (DGM-7,DGM-24,DGM-12,DGM-16,DGM-3 and partially DGM-19).
- GIS team completed flagging points in remaining DGM grids and Landfill area in MRS-1.
- UXOSO/QCS inspected and passed 5 DGM grids (DGM-7, DGM-24, DGM-12, DGM-16, DGM-3).
- SUXOS and UXOSO/QCS inspected 416 lbs. of NMRD and placed in recycle container.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

Report Date: 7/28/2020
Project No: 63029587
Report No: 3

DGM-7, DGM-24, DGM-12, DGM-16, DGM-3

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM12	QC	25
Intrusive	MRS 01	DGM16		
Intrusive	MRS 01	DGM16	QC	
Intrusive	MRS 01	DGM24	QC	18
Intrusive	MRS 01	DGM3		

Inspections

N/A

Summary of Deficiencies

None noted.

Corrective Actions

N/A

Reinspection Results

None

Additional Notes

Quality Control Inspections of completed grids are documented on a separate, Application.

Grid QC Inspected on 27 Jul, Grid 14. Grids QC Inspected today, Grids 7, 24, 12, 16, and 3.

Report Date: 7/28/2020
Project No: 63029587
Report No: 3

SAFETY INSPECTIONS AND RESULTS:

Inspections

Performed Safety Inspection of UXO Intrusive team. No deficiencies noted.

Summary of Deficiencies

None

Corrective Actions

N/A

Reinspection Results

N/A

Additional Notes

None

CONTRACTOR'S VERIFICATION:

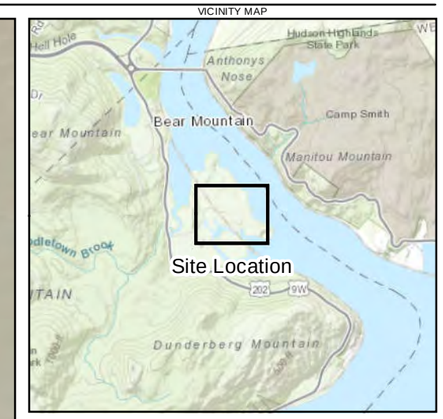
I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 7/28/2020 6:41:45 PM

SUXOS

Site Manager

VICINITY MAP



Legend

- Flagging Complete
- Intrusive Partially Complete
- Intrusive and QC Complete

Map Date: 7/29/2020

N

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Feet

1 inch = 250 feet

Progress Map
28 July 2020
IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

\\lincoln\projects\Federal\DOD\USACE\PROJECTS\6332104 Pueblo SWMU 4 CMSIZ - GIS\Iona Progress map

Report Date: 7/29/2020
Project No: 63029587
Report No: 4

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Sunny	93	67	61	0.00

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District. Drew Clemens, USACE, Baltimore District

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	10.0	Dump area/DGM-19,-10,-26.	PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	10.5	Dump area/DGM-19,-10,-26.	SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	10.5	Dump area/DGM-19,-10,-26.	UXOSO/QCS Duties
Shawn Lucas	MRS-1	UXO TIII / EA	10.0	Dump area/DGM-19,-10,-26.	Intrusive investigation
Dane McCarthy	MRS-1	UXO TII / EA	10.0	Dump area/DGM-19,-10,-26.	Intrusive investigation
Ryan Martin	MRS-1	UXO TII / EA	10.0	Dump area/DGM-19,-10,-26.	Intrusive investigation
Matt Fortune	MRS-1	UXO TII / EA	10.0	Dump area/DGM-19,-10,-26.	Intrusive investigation
Mike Depriest	MRS-1	UXO TI / EA	10.0	Dump area/DGM-19,-10,-26.	Intrusive investigation

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	M. Fortune	WHO168	9.0	Yes

Report Date: 7/29/2020
Project No: 63029587
Report No: 4

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	D. McCarthy	WHO547	9.0	Yes
Schonstedt	R. Martin	WHO546	9.0	Yes
Schonstedt	M. Depriest	WHO213	9.0	Yes
Tremble R10		WHO339	0.0	No
White	R. Martin	WHO194	9.0	Yes
White	D. McCarthy	WHO442	9.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Complete: DGM-19, DGM-10, Dump area. Partially Complete: DGM-26

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS 01	DGM10	20	0	0	0	279.20	0	0	1
1	Intrusive	MRS 01	DGM19	16	0	0	0	354.00	0	0	0
1	Intrusive	MRS 01	DGM26	5	0	0	0	23.00	0	0	0
1	Intrusive	MRS 02	Dump	15	0	0	0	16.00	0	0	0

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations brief, UXO instruments functional checks at IVS.
- USACE OESS onsite.
- UXO team completed intrusive investigation of single point anomalies and pothole trenches (SRA's) in 2 DGM grids in MRS-1 (DGM-10, DGM-19) and the Dump Area, and partially completed DGM-26.
- UXOSO/QCS inspected and passed DGM-19, DGM-10 and Dump area.
- SUXOS and UXOSO/QCS inspected 118 lbs. of NMRD and placed in a recycle container.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

DGM-19, DGM-10 and Dump area.

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

Report Date: 7/29/2020
Project No: 63029587
Report No: 4

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM10	QC	

Inspections

AM IVS checks. Follow Up Phase Inspection DFW 8.

Summary of Deficiencies

None noted.

Corrective Actions

N/A

Reinspection Results

N/A

Additional Notes

QC Inspection of Grids: 19, and 10. QC Inspection of Dump Area anomaly points D0002, D0004, D0015, D0026, D0027, D0043, D0047. QC Inspection of TP 1 through 8.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Safety Inspection of UXO Team 1 while they conducted Intrusive Operations at Grid 10.

Summary of Deficiencies

None noted

Corrective Actions

N/A

Reinspection Results

N/A

Additional Notes

None

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

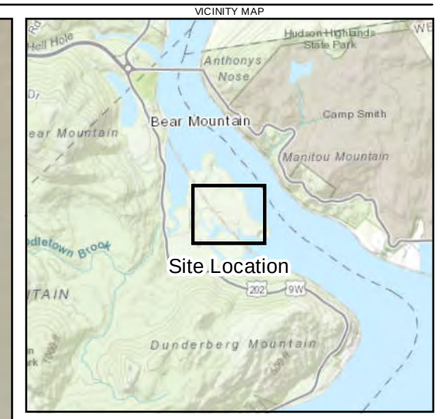
JD Marlowe 7/29/2020 6:10:05 PM

Report Date: 7/29/2020
Project No: 63029587
Report No: 4

SUXOS

Site Manager

VICINITY MAP



Legend

- Flagging Complete
- Intrusive Partially Complete
- Intrusive and QC Complete

Map Date: 7/30/2020

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Feet

1 inch = 250 feet

Progress Map
29 July 2020
IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

\\lincoln\projects\Federal\DOD\USACE\PROJECTS\6332104 Pueblo SWMU 4 CMS\Z - GIS\Iona Progress map

Report Date: 7/30/2020
Project No: 63029587
Report No: 5

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy with pm thunderstorms	90	72	79	0.03

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District; Drew Clements, USACE Geophysicist, Massachusetts District.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	UXOSO/QCS Duties
Shawn Lucas	MRS-1	UXO TIII / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	Intrusive investigation
Dane McCarthy	MRS-1	UXO TII / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	Intrusive investigation
Ryan Martin	MRS-1	UXO TII / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	Intrusive investigation
Matt Fortune	MRS-1	UXO TII / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	Intrusive investigation
Mike Depriest	MRS-1	UXO TI / EA	9.5	DGM Grid-26,-22,-4,-9,-25,-2.	Intrusive investigation

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	M Fortune	WHO168	9.0	Yes

Report Date: 7/30/2020
Project No: 63029587
Report No: 5

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	D McCarthy	WHO547	9.0	Yes
Schonstedt	R Martin	WHO546	9.0	Yes
Schonstedt	M Depriest	WHO213	9.0	Yes
Trimble R10		WHO339	0.0	No
White	R Martin	WHO194	9.0	Yes
White	D McCarthy	WHO442	9.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Completed: DGM-26, DGM-22, DGM-4, DGM-9, DGM-25 Partially Completed: DGM-2

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS 01	DGM22	17	0	0	0	5.70	0	0	1
1	Intrusive	MRS 01	DGM25	10	0	0	1.00	2.00	0	0	1
1	Intrusive	MRS 01	DGM26	8	0	0	0	981.00	0	0	0
1	Intrusive	MRS 01	DGM4	8	0	0	0	3.00	0	0	0
1	Intrusive	MRS 01	DGM9	13	0	0	0	4.00	0	0	0

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations briefing, UXO instruments functional checks at IVS.
- UXO team completed intrusive investigation of single point anomalies and pothole trenches (SRA's) in 5 DGM Grids in MRS-1 (DGM-26, DGM-22, DGM-4, DGM-9, DGM-25) and partially completed DGM-2 before lightning alert.
- UXOSO/QCS inspected and passed 5 Grids (DGM-26, DGM-22, DGM-4, DGM-9, DGM-25).
- SUXOS and UXOSO/QCS inspected 177 lbs. of NMRD and .5 lb. of MD which was placed in a secure container.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

DGM-26, DGM-22, DGM-4, DGM-9, DGM-25

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM22	QC	
Intrusive	MRS 01	DGM25		

Inspections

USACE OESS conducted USACE Project Inspection Checklist.

Summary of Deficiencies

None noted

Corrective Actions

N/A

Reinspection Results

N/A

Additional Notes

Conducted Follow Up Phase Inspection of UXO Intrusive Team performing DFW 8, Intrusive UXO Investigations in Grid 22. UXO QC Inspection of work performed in Grids: 26, 22, 4, and 9. All four grids QC Pass.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Conducted Safety Inspection of UXO Intrusive Team conducting UXO Intrusive Investigations at Grid 22.

Summary of Deficiencies

None noted.

Corrective Actions

None required.

Reinspection Results

N/A

Additional Notes

Continue providing COVID-19 briefings, training, and preventative resources for employees.

CONTRACTOR'S VERIFICATION:

Report Date: 7/30/2020
Project No: 63029587
Report No: 5

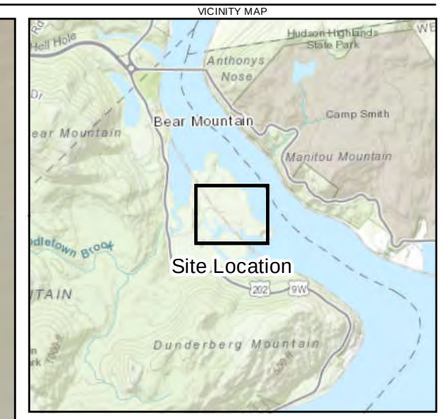
I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 7/30/2020 4:56:57 PM

SUXOS

Site Manager

VICINITY MAP



Legend

- Flagging Complete
- Intrusive Partially Complete
- Intrusive and QC Complete

Map Date: 7/30/2020

N

0 250 500
Feet

1 inch = 250 feet

Progress Map
30 July 2020
IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

\\lincoln\projects\Federal\DOD\USACE\PROJECTS\6332104 Pueblo SWMU 4 CMS\Z - GIS\Iona Progress map

Report Date: 7/31/2020
Project No: 63029587
Report No: 6

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Early am rain, remainder sunny	86	70	66	0.02

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District

SITE VISITORS (Name/Organization):

None

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	10.0	DGM-2,-18,-6,21,-8,-1	PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	10.0	DGM-2,-18,-6,21,-8,-1	SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	10.0	DGM-2,-18,-6,21,-8,-1	UXOSO/QCS Duties
Shawn Lucas	MRS-1	UXO TIII / EA	10.0	DGM-2,-18,-6,21,-8,-1	Intrusive investigation
Dane McCarthy	MRS-1	UXO TII / EA	10.0	DGM-2,-18,-6,21,-8,-1	Intrusive investigation
Ryan Martin	MRS-1	UXO TII / EA	10.0	DGM-2,-18,-6,21,-8,-1	Intrusive investigation
Matt Fortune	MRS-1	UXO TII / EA	10.0	DGM-2,-18,-6,21,-8,-1	Intrusive investigation
Mike Depriest	MRS-1	UXO TI / EA	10.0	DGM-2,-18,-6,21,-8,-1	Intrusive investigation

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt	M Fortune	WHO168	9.0	Yes
Schonstedt	D McCarthy	WHO547	9.0	Yes
Schonstedt	R Martin	WHO546	9.0	Yes
Schonstedt	M Depriest	WHO213	9.0	Yes
Tremble R10		WHO339	0.0	No
White	R Martin	WHO194	9.0	Yes

Report Date: 7/31/2020
Project No: 63029587
Report No: 6

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
White	D McCarthy	WHO442	9.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

See Additional Remarks for Grid Status

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS 01	DGM1	2	0	0	0	0	0	0	2
1	Intrusive	MRS 01	DGM16	3	0	0	0	4.00	0	0	0
1	Intrusive	MRS 01	DGM18	17	0	0	0	117.80	0	0	1
1	Intrusive	MRS 01	DGM2	24	0	0	2.00	82.90	0	0	0
1	Intrusive	MRS 01	DGM21	10	0	0	0	7.00	0	0	3
1	Intrusive	MRS 01	DGM6	36	0	0	0	45.80	0	0	1
1	Intrusive	MRS 01	DGM8	2	0	0	0	0	0	0	2
1	Intrusive	MRS 02	Dump	4	0	0	0	0	0	0	0

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations brief, UXO instruments functionally checked at IVS.
- UXO team completed intrusive investigation of single point anomalies and pothole trenches (SRA's) in 6 DGM Grids in MRS-1 (DGM-2, DGM-18, DGM-6, DGM-21, DGM-8, DGM-1).
- UXOSO/QCS conducted inspections in 6 DGM Grids (DGM-2, DGM-18, DGM-6, DGM-21, DGM-8, DGM-1) and found satisfactory.
- SUXOS and UXOSO/QCS inspected 128 lbs. of NMRD and .5 lb. of MD which was placed in a secure container.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

See Additional Notes

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

Report Date: 7/31/2020
Project No: 63029587
Report No: 6

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM1	QA	
Intrusive	MRS 01	DGM1	QC	
Intrusive	MRS 01	DGM18		
Intrusive	MRS 01	DGM21		
Intrusive	MRS 01	DGM21	QC	
Intrusive	MRS 01	DGM6		
Intrusive	MRS 01	DGM8	QA	
Intrusive	MRS 01	DGM8	QC	

Inspections

Follow Up Phase Inspection of UXO Intrusive Team 1 conducting UXO Intrusive Investigations at Grid 6. No deficiencies noted.

Summary of Deficiencies

None noted.

Corrective Actions

None required.

Reinspection Results

None required.

Additional Notes

QC of grids 25, 2, 18, 6, 21, 8, 1. Also conducted QC Inspection of four single point anomalies in Dump Area (33, 12, 41, and 48).

Report Date: 7/31/2020
Project No: 63029587
Report No: 6

SAFETY INSPECTIONS AND RESULTS:

Inspections

Safety Inspection conducted at Grid 6 of the UXO Intrusive team conducting their operations.

Summary of Deficiencies

None noted

Corrective Actions

None required.

Reinspection Results

N/A

Additional Notes

Ordnance refresher training conducted at Morning Safety Briefing, on the topic of the 6 pounder Navy projectile, due to MD remnants of this ordnance model being recovered on MRS by the UXO Intrusive Team. COVID 19 avoidance briefings continue to be addressed at morning meeting.

CONTRACTOR'S VERIFICATION:

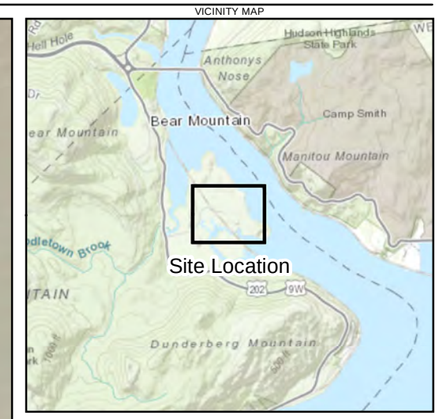
I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 7/31/2020 5:57:28 PM

SUXOS

Site Manager

VICINITY MAP



Legend

- Intrusive and QC Complete
- Flagging Complete

Map Date: 8/3/2020

N

0 250 500
Feet

1 inch = 250 feet

Progress Map
31 July 2020
IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

\\lincolnprojects\Federal\DOD\USACE\PROJECTS\6332104 Pueblo SWMU 4 CMSIZ - GIS\Iona Progress map

Report Date: 8/3/2020
Project No: 63029587
Report No: 7

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Partly cloudy.	89	74	55	0.00

GOVERNMENT PERSONNEL (Name/Organization):

None

SITE VISITORS (Name/Organization):

None

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire		PM / EA	10.0		PM Duties
J.D. Marlowe		SUXOS / EA	10.0		SUXOS Duties
Ward Stern		UXOSO/QCS / EA	10.0		UXOSO/QCS Duties
Shawn Lucas		UXO TIII / EA	10.0		Intrusive investigation
Dane McCarthy		UXO TII / EA	10.0		Intrusive investigation
Ryan Martin		UXO TII / EA	10.0		Intrusive investigation
Matt Fortune		UXO TII / EA	10.0		Intrusive investigation
Mike Depriest		UXO TI / EA	10.0		Intrusive investigation

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO168	9.0	No
Schonstedt		WHO547	9.0	No
Schonstedt		WHO546	9.0	No
Schonstedt		WHO213	9.0	No
Tremble R10		WHO339	0.0	No
White		WHO194	9.0	No

Report Date: 8/3/2020
Project No: 63029587
Report No: 7

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
White		WHO442	9.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS 01	DGM11	12	0	0	0	1.00	0	0	1
1	Intrusive	MRS 01	DGM13	7	0	0	0	8.00	0	0	2
1	Intrusive	MRS 01	DGM15	15	0	0	0	3.70	0	0	0
1	Intrusive	MRS 01	DGM17	2	0	0	0	0	0	0	2
1	Intrusive	MRS 01	DGM20	19	0	0	0	39.00	0	0	1
1	Intrusive	MRS 01	DGM27	10	0	0	0	11.00	0	0	3
1	Intrusive	MRS 01	DGM28	30	0	0	0	50.50	0	0	2
1	Intrusive	MRS 01	DGM5	1	0	0	0	0	0	0	1
1	Intrusive	MRS 02	Dump	2	0	0	0	0	0	0	0

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

None

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM11	QC	N\A

Report Date: 8/3/2020
Project No: 63029587
Report No: 7

SEED Results

Phase	MRS	Grid/Transect	Type	Serial Number
Intrusive	MRS 01	DGM13	QA	
Intrusive	MRS 01	DGM13	QC	16
Intrusive	MRS 01	DGM17	QA	
Intrusive	MRS 01	DGM17	QC	13
Intrusive	MRS 01	DGM20	QC	24
Intrusive	MRS 01	DGM27		
Intrusive	MRS 01	DGM27	QA	
Intrusive	MRS 01	DGM27	QC	08
Intrusive	MRS 01	DGM28	QC	14
Intrusive	MRS 01	DGM5	QC	06

Inspections

Follow Up Phase Inspection conducted of UXO Intrusive Team working Grid 28 today. No deficiencies noted.

Summary of Deficiencies

None noted.

Corrective Actions

None required.

Reinspection Results

N/A

Additional Notes

Performed QC Checks of Grids: 27, 5, 17, 28, 20, 15, 11, plus the following three remaining points in the “dump area” D0020, D0036, and D0028.

Report Date: 8/3/2020
Project No: 63029587
Report No: 7

SAFETY INSPECTIONS AND RESULTS:

Inspections

Safety Inspection of UXO Team performing restoration of grids within MRS. No deficiencies noted.

Summary of Deficiencies

None noted.

Corrective Actions

None required.

Reinspection Results

N/A

Additional Notes

Weatherbug notification that this location was under a hurricane warning, initially, which was later downgraded to a tropical storm warning (which remains in effect).

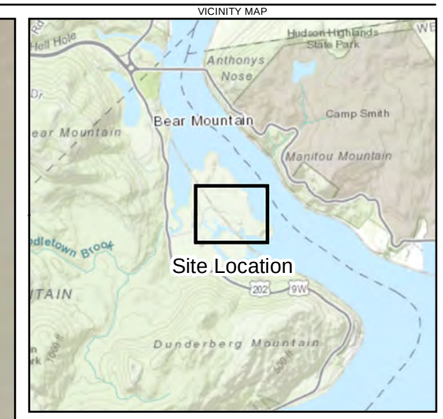
CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

SUXOS

Site Manager

VICINITY MAP



Legend

Intrusive and QC Complete

Map Date: 8/3/2020

N

0 250 500
Feet

1 inch = 250 feet

Progress Map
03 August 2020
IONA ISLAND NAVAL AMMUNITION DEPOT
FORMERLY USED DEFENSE SITE
ROCKLAND COUNTY, NY

\\lincoln\projects\Federal\DOD\USACE\PROJECTS\6332104 Pueblo SWMU 4 CMSIZ - GIS\Iona Progress map 0803

Report Date: 8/4/2020
Project No: 63029587
Report No: 44

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Severe weather with periods of rain and cloudy conditions from approaching tropical storm	77	67	100	1.05

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District.

SITE VISITORS (Name/Organization):

Rick Hanoski, National Service Line Program Manager - Munitions Responce

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	6.5		PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	6.5		SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	6.5		UXOSO/QCS Duties
Shawn Lucas	MRS-1	UXO TIII / EA	6.5	DGM-27,-15,-11	Single point QC inspection/Site restoration
Dane McCarthy	MRS-1	UXO TII / EA	6.5	DGM-27,-15,-11	Single point QC inspection/Site restoration
Ryan Martin	MRS-1	UXO TII / EA	6.5	DGM-27,-15,-11	Single point QC inspection/Site restoration
Matt Fortune	MRS-1	UXO TII / EA	6.5	DGM-27,-15,-11	Single point QC inspection/Site restoration
Mike Depriest	MRS-1	UXO TI / EA	6.5	DGM-27,-15,-11	Single point QC inspection/Site restoration
Marion Lorde		Dive Supervisor / AOR	8.0		Dive preparations
Ivan Stubblefield		Dive Team / AOR	8.0		Dive preparations
Ryan Salazer		Dive Team / AOR	8.0		Dive preparations
Dale Park		Dive Team / AOR	8.0		Dive preparations
Alex Glikman		Dive Team / AOR	8.0		Dive preparations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

Report Date: 8/4/2020
Project No: 63029587
Report No: 44

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO168	0.0	No
Schonstedt		WHO547	0.0	No
Schonstedt	M Fourtune	WHO546	5.0	Yes
Schonstedt	M Depriest	WHO213	5.0	Yes
Tremble R10	M Mcguire	WHO339	5.0	Yes
White	R Martin	WHO194	5.0	Yes
White	D McCarthy	WHO442	5.0	Yes

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

Grids rechecked included DGM15, DGM18, and DGM27.

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations brief, UXO instruments functional test at IVS.
- USACE OESS on site.
- MRS-01 under tropical storm advisory, SUXOS and UXOSO/QCS monitored weather activity, at mid afternoon, decision was made to shutdown operations due to heavy rain.
- UXO team continued to restore Grids in MRS to original condition, then conducted QC inspections of single point anomalies in 3 grids in MRS-1.
- AOR did not dive due to impending tropical storm, conducted training onshore.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

Inspections

Follow Up Phase Inspection conducted of Restoration Activities, DFW 13.

Summary of Deficiencies

None Noted

Corrective Actions

None required

Reinspection Results

N/A

Additional Notes

None

SAFETY INSPECTIONS AND RESULTS:

Inspections

Performed Safety Inspection Checklist of UXO Intrusive Team performing Site Restoration DFW.

Summary of Deficiencies

None noted

Corrective Actions

None required

Reinspection Results

N/A

Additional Notes

Area under Enhanced Severe Storm, and Tornado Warnings due to arriving Tropical Storm. Temporary Tornado Shelter identified within MRS.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 8/4/2020 6:49:06 PM

SUXOS

Site Manager

Report Date: 8/5/2020
Project No: 63029587
Report No: 9

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Mixture sun and clouds	86	67	58	0.00

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District

SITE VISITORS (Name/Organization):

Rick Hanoski, National Service Line Program Manager - Munitions Responce

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	8.0	DGM Grid-7,-16,-19	PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	8.0	DGM Grid-7,-16,-19	SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	3.5	DGM Grid-7,-16,-19	UXOSO/QCS Duties
Dane McCarthy	MRS-1	UXO TII / EA	3.5	DGM Grid-7,-16,-19	Single point QC inspection
Marion Lorde	MRS-1	Dive Supervisor / AOR	8.0		Dive preparations
Ivan Stubblefield	MRS-1	Dive Team / AOR	8.0		Dive preparations
Ryan Salazer	MRS-1	Dive Team / AOR	8.0		Dive preparations
Dale Park	MRS-1	Dive Team / AOR	8.0		Dive preparations
Alex Glikman	MRS-1	Dive Team / AOR	8.0		Dive preparations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO168	0.0	No
Schonstedt	D McCarthy	WHO547	3.0	Yes
Schonstedt		WHO546	0.0	No
Schonstedt		WHO213	0.0	No

Report Date: 8/5/2020
Project No: 63029587
Report No: 9

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Tremble R10		WHO339	3.0	Yes
White		WHO194	0.0	No
White		WHO442	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

Team #	Phase	MRS	Grid/ Transect	# of Anoms	MEC Total Wt (lbs)	MPPEH Total Wt (lbs)	MD Total Wt (lbs)	NMRD Total Wt (lbs)	RRD Total Wt(lbs)	Other Total Wt (lbs)	Seed Count
1	Intrusive	MRS-01	DGM16	2	0	0	0	6.00	0	0	0
1	Intrusive	MRS-01	DGM19	2	0	0	0	3.00	0	0	0
1	Intrusive	MRS-01	DGM7	1	0	0	0	2.00	0	0	0

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations brief, UXO instrument functional check with small ISO.
- USACE OESS on site.
- UXO personnel continued conducting Geophysical QC checks in 3 DGM Grids (DGM-7, DGM-16, DGM-19).
- AOR conducted EMP operations in Hudson River.
-SUXOS and UXOSO/QCS inspected 45 lbs. of NMRD and placed for recycle.
- United Rental was notified to pick up Mini-Ex.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

Inspections

Follow Up Phase Inspection, DFW12, Site Restoration

Summary of Deficiencies

None noted

Corrective Actions

None required

Reinspection Results

N/A

Additional Notes

Select Targets (5 each) chosen for supplemental investigations today. Recovered NMRD only.

Final Site Close-Out Inspection scheduled for tomorrow, plus documentation completion for recovered MDAS.

SAFETY INSPECTIONS AND RESULTS:

Inspections

Safety Inspection conducted - DFW 12 Site Restoration

Summary of Deficiencies

No deficiencies noted.

Corrective Actions

None required.

Reinspection Results

None required.

Additional Notes

None

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 8/5/2020 4:15:15 PM

SUXOS

Site Manager

Report Date: 8/6/2020
Project No: 63029587
Report No: 10

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Cloudy with pm sun	87	61	48	0.00

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District

SITE VISITORS (Name/Organization):

Rick Hanoski, National Service Line Program Manager - Munitions Responce; Ed McGowan, PITC.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
Mike McGuire	MRS-1	PM / EA	4.0		PM Duties
J.D. Marlowe	MRS-1	SUXOS / EA	8.0		SUXOS Duties
Ward Stern	MRS-1	UXOSO/QCS / EA	5.0		UXOSO/QCS Duties
Marion Lorde	MRS-1	Dive Supervisor / AOR	8.0		Dive operations
Ivan Stubblefield	MRS-1	Dive Team / AOR	8.0		Dive operations
Ryan Salazer	MRS-1	Dive Team / AOR	8.0		Dive operations
Dale Park	MRS-1	Dive Team / AOR	8.0		Dive operations
Alex Glikman	MRS-1	Dive Team / AOR	8.0		Dive operations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO168	0.0	No
Schonstedt		WHO547	0.0	No
Schonstedt		WHO546	0.0	No
Schonstedt		WHO213	0.0	No
Tremble R10		WHO339	0.0	No

Report Date: 8/6/2020
Project No: 63029587
Report No: 10

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
White		WHO194	0.0	No
White		WHO442	0.0	No

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted site safety and operations brief.
- USACE OESS on site.
- AOR continued to conduct dive operations in Hudson River covering the north, center and south pier areas.
- SUXOS and UXOSO/QCS completed ENG 1348-1A and EA Chain of Custody, secured container with seal number TBS083373 and TBS083374. MDAS will be delivered to recycle facility on 10th August 2020.
- UXOSO/QCS with Ed McGowan conducted MRS-1 QC final inspection, conformance.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

Inspections

Final Phase Site Close-Out Inspection conducted with Mr. Ed McGowan, of PITC.

Summary of Deficiencies

None noted.

Corrective Actions

None required.

Reinspection Results

N/A

Additional Notes

MDAS documentation completed. Shipment will be delivered to the reclamation facility Monday.

SAFETY INSPECTIONS AND RESULTS:

Inspections

N/A

Summary of Deficiencies

None noted

Corrective Actions

None required.

Reinspection Results

N/A

Additional Notes

UXOQCS/ UXOSO will demobe from site 07 Aug 2020.

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 8/6/2020 5:10:03 PM

SUXOS

Site Manager

Report Date: 8/7/2020
Project No: 63029587
Report No: 11

EA Engineering, Science, and Technology, Inc., PBC

Daily SUXOS Report
Iona Island UXO Clearance

Iona Island, New York

WORKDAY WEATHER:

Weather Description	High (°F)	Low (°F)	Humidity (%)	Rainfall (in)
Am rain, remainder sun and clouds	99	63	48	0.00

GOVERNMENT PERSONNEL (Name/Organization):

David Holland, USACE OESS, Baltimore District.

SITE VISITORS (Name/Organization):

None.

WORK PERFORMED BY CONTRACTOR/SUBCONTRACTORS:

Name	MRS	Title / Company	Hours	Grid/Transect Worked	Description of Work
J.D. Marlowe	MRS-1	SUXOS / EA	7.0		SUXOS Duties
Marion Lorde	MRS-1	Dive Supervisor / AOR	8.0		Dive operations
Ivan Stubblefield	MRS-1	Dive Team / AOR	8.0		Dive operations
Ryan Salazer	MRS-1	Dive Team / AOR	8.0		Dive operations
Dale Park	MRS-1	Dive Team / AOR	8.0		Dive operations
Alex Glikman	MRS-1	Dive Team / AOR	8.0		Dive operations

SUXOS = Senior Unexploded Ordnance Supervisor UXOSO = Unexploded Ordnance Safety Officer
UXOQCS = Unexploded Ordnance Quality Control Specialist MRS = Munitions Response Site

OPERATING EQUIPMENT DATA (Not Hand Tools):

Equipment	User	Equipment ID/TAG	Hours Used	Equipment Check
Schonstedt		WHO168	0.0	No
Schonstedt		WHO547	0.0	No
Schonstedt		WHO546	0.0	No
Schonstedt		WHO213	0.0	No
Trimble R10		WHO339	0.0	No
White		WHO194	0.0	No
White		WHO442	0.0	No

Report Date: 8/7/2020
Project No: 63029587
Report No: 11

SUMMARY OF WORK PERFORMED:

Grid/Transect Status

No Grids Completed

SS = Surface Sweep MG = Mag & Dig DGM = Digital Geophyscial Mapping Activities
DGI = Digitial Geophysical Instrusive Actvities

Grid/Transect Results

No Field Data Collected

NMRD = Non Munitions Related Debris NC = No Contact MEC = Munitions and Explosives of Concern MD = Munitions Debris
RRD = Range Related Debris MPPEH = Material Potentially Presenting an Explosive Hazard Wt = Weight lbs = Pounds

MEC/MPPEH Summary

No Munitions and Explosives of Concern (MEC) found

ADDITIONAL REMARKS:

- Conducted safety/operations brief.
- USACE OESS on site.
- AOR continued dive operations on south pier location and single point anomalies in the Hudson River.
- United Rentals removed Mini-excavator from MRS-1.
- AOR completed all dive requirements.
- UXOSO/QCS de-mobbed from IONA Island MEC activities.

QUALITY CONTROL INSPECTIONS AND RESULTS:

Quality Assurance and Quality Control Grid/Transect Status

No QA/QC Inspections Conducted

SS = Surface Sweep MG = Mag & Dig DG = DGM QC = Quality Control QA = Quality Assurance

SEED Results

No SEED Results Collected

Inspections

Summary of Deficiencies

Corrective Actions

Reinspection Results

Additional Notes

Report Date: 8/7/2020
Project No: 63029587
Report No: 11

SAFETY INSPECTIONS AND RESULTS:

Inspections

Summary of Deficiencies

Corrective Actions

Reinspection Results

Additional Notes

CONTRACTOR'S VERIFICATION:

I certify that to the best of my knowledge the above report is complete and correct. All material, equipment used, and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

JD Marlowe 8/8/2020 12:26:57 PM

SUXOS

Site Manager

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Quality Control Inspections

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EA Engineering, Science, and Technology, Inc., PBC

FINAL INSPECTION CHECKLIST (D-8)

(PART I)

PROJECT Iona Island, New York DATE: 8/6/2020

AREA OF INSPECTION :

Final walk through turn over inspection conducted of MRS 1, Iona Island, NY with Mr. Ed McGowan of PITC.

A. DEFINABLE FEATURE OF WORK: STATUS OF INSPECTION:

DFW 8, During walk through inspection, Mr. McGowan noted there was a small hummock of excavated spoils on a perimeter road at Grid 6. This hummock was leveled using a hand shovel. Several point flags were noted in Dump Area at point investigations. These flags were removed. All noted items corrected on the spot.

I HEREBY CERTIFY, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THAT THE WORK INSPECTED IS COMPLETE AND ALL MATERIALS AND EQUIPMENT USED AND WORK PERFORMED WERE COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS.

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 8/6/2020

SIGNATURE OF PROJECT QC SPECIALIST:

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 7/28/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Intrusive Anomaly Investigation/ Excavation, UXO Intrusive Team (Team Leader and 4 Team Member). Team at Grids 7, 24, and 12.

INSPECTION PERFORMED & WHO PERFORMED TEST

IVS, instrument checks - Assigned Operators.

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 7/28/2020

SIGNATURE OF PROJECT QC SPECIALIST: WR Stern

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 7/29/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DFW 8 - UXO Intrusive Investigation by UXO Team 1, working Grid 10.

INSPECTION PERFORMED & WHO PERFORMED TEST

IVS Instrument Checks by instrument operators.

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 7/29/2020

SIGNATURE OF PROJECT QC SPECIALIST: WR Stern

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 7/30/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DFW 8, UXO Intrusive Activities, Grid 22, UXO Team 1

INSPECTION PERFORMED & WHO PERFORMED TEST

Instrument Operators perform IVS Checks on magnetometers to ensure instrument accuracy.

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 7/30/2020

SIGNATURE OF PROJECT QC SPECIALIST: WR Stern

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 7/31/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DFW 8, Intrusive UXO Investigation, Grid 6, UXO Team 1.

INSPECTION PERFORMED & WHO PERFORMED TEST

IVS Checks of magnetometer instrumentation. QC Inspection of anomalies excavated, and recorded for Grid 6.

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 7/31/2020

SIGNATURE OF PROJECT QC SPECIALIST:

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 8/3/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DFW 8 Intrusive Investigation, Grid 28, Team 1

INSPECTION PERFORMED & WHO PERFORMED TEST

IVS Checks on instruments.

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 8/3/2020

SIGNATURE OF PROJECT QC SPECIALIST:

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 8/4/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

EA Project Number: 63029587, WP page 95, DFW 13 Site Restoration

INSPECTION PERFORMED & WHO PERFORMED TEST

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 8/4/2020

SIGNATURE OF PROJECT QC SPECIALIST: WR Stern

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 8/5/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

Remaining Crew completes DFW 14 activities.

INSPECTION PERFORMED & WHO PERFORMED TEST

IVS, performed by operators

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 8/5/2020

SIGNATURE OF PROJECT QC SPECIALIST:

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island NAD FUDS, Stony Point DATE: 7/27/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:

FINAL QAPP, page 89-91, Anomaly Excavation

DESCRIPTION AND LOCATION OF WORK INSPECTION

DFW 8 Intrusive Investigation Grid 14.

A. KEY PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.	JD Marlowe, SUXOS		
2.	Shawn Lucas, TL		
3.	Matt Fortune, UXO Tech II		
4.	Dane McCarthy, UXO Tech II		
5.	Ryan Martin, UXO Tech II		
6.	Mike DePriest, UXO Tech I		

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 7/28/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

EA Engineering, Science, and Technology, Inc., PBC

INITIAL PHASE INSPECTION CHECKLIST (PART I) (D-6)

PROJECT: Iona Island NAD DATE: 8/3/2020

TITLE AND NO. OF THE TECHNICIAL SECTION:

EA Project Number: 63029587, WP page 95, DFW 13 Site Restoration

DESCRIPTION AND LOCATION OF WORK INSPECTION

Inspect site restoration, flags recovered, and excavations back filled.

A. KEY PERSONNEL PRESENT:

NAME	POSITION	COMPANY
1. UXO Intrusive Team 1		
2.		
3.		
4.		
5.		
6.		

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

EA Engineering, Science, and Technology, Inc., PBC

C. PROCEDURES AND/OR WORK WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES ☒ NO ☐

IF NOT EXPLAIN BELOW:

_____

_____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE : YES ☒ NO ☐

STATE WHERE IMPROVEMENT IS NEEDED:

_____

_____

_____

_____

E. WORKMANSHIP IS FREE OF SAFETY VIOLATIONS : YES ☒ NO ☐

IF NO, CORRECTIVE ACTION TAKEN:

_____

_____

_____

_____

NAME OF PROJECT QC SPECIALIST: WR Stern

DATE: 8/3/2020

SIGNATURE OF PROJECT QC SPECIALIST: _____

EA Engineering, Science, and Technology, Inc., PBC

FOLLOW-UP PHASE INSPECTION CHECKLIST (D-7)

DATE: 4/3/2020

COMPANY/CONTRACTOR: EA Engineering, Science, and Technology Inc., PBC

PROJECT: Iona Island, New York

Y=YES; N=NO; SEE REMARKS BLANK=NOT APPLICABLE	
WORK COMPLIES WITH WORK PLAN AS APPROVED IN INITIAL PHASE	Yes

IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT

DGM Surveys, MRS-01 DGM Grid 04, N. Sibhat, NAEVA; N. Stevens, NAEVA; J. D. Marlowe, EA.

INSPECTION PERFORMED & WHO PERFORMED TEST

DGM of Grids in MRS-01; J.D. Marlowe, EA.

NAME OF PROJECT QC SPECIALIST: J.D. Marlowe, EA.

DATE: 4/3/2020

SIGNATURE OF PROJECT QC SPECIALIST:

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Appendix B

Photographic Log

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Photograph Log
Iona Island FUDS MMRP Remedial Investigation

Photo 1 RTK GPS Base Station

Photo 2 Vegetation Reduction

Photo 3 Track Mower

Photo 4 Flattening Cattails in Marsh

Photo 5 Seeding IVS

Photo 6 Seeding IVS

Photo 7 Blind Seeding

Photo 8 Blind Seeding

Photo 9 DGM at Grid 7

Photo 10 DGM at Grid 8

Photo 11 DGM at Grid 24

Photo 12 DGM at Grid 21

Photo 13 DGM at Grid 27

Photo 14 AGC at IVS

Photo 15 ARGO

Photo 16 Intrusive at Grid 7

Photo 17 Intrusive at Grid 16

Photo 18 Intrusive at Grid 27

Photo 19 Mini Excavator at Grid 26

Photo 20 Mini Excavator at Grid 26

Photo 21 Washing Mini Excavator Prior to Dump Area Excavations

Photo 22 Dump Area Excavations

Photo 23 Mini Excavator in Dump Area

Photo 24 Mini Excavator Path in Dump Area

Photo 25 Dump Area Test Pit 8

Photo 26 Documenting Test Pit at Dump Area

Photo 27 Intrusive at Dump Area

Photo 28 NMRD at Grid 2

Photo 29 6-pounder Projectile MD at Grid 2

Photo 30 NMRD at Grid 2 Test Pit 1

Photo 31 NMRD at Grid 2 Test Pit 2

Photo 32 NMRD at Grid 2 Test Pit 3

Photo 33 NMRD at Grid 2 Test Pit 4

Photo 34 NMRD at Grid 2 Test Pit 5 1

Photo 35 NMRD at Grid 3

Photo 36 NMRD at Grid 3 Test Pit 1

Photo 37 NMRD at Grid 3 Test Pit 2

Photo 38 NMRD at Grid 3 Test Pit 3

Photo 39 NMRD at Grid 3 Test Pit 4

Photo 40 NMRD at Grid 3 Test Pit 5

Photo 41 NMRD at Grid 3 Test Pit 6

Photo 42 NMRD at Grid 3 Test Pit 7

Photo 43 NMRD at Grid 3 Test Pit 8

Photo 44 NMRD at Grid 4

Photo 45 NMRD at Grid 4 Test Pit 1

Photo 46 NMRD at Grid 4 Test Pit 2

Photo 47 NMRD at Grid 4 Test Pit 3

Photo 48 NMRD at Grid 4 Test Pit 4

Photo 49 NMRD at Grid 4 Test Pit 5

Photo 50 NMRD at Grid 4 Test Pit 6

Photo 51 NMRD at Grid 5

Photo 52 NMRD at Grid 6

Photo 53 NMRD at Grid 6 Test Pit 1

Photo 54 NMRD at Grid 6 Test Pit 2

Photo 55 NMRD at Grid 6 Test Pit 3

Photo 56 NMRD at Grid 6 Test Pit 4

Photo 57 NMRD at Grid 7

Photo 58 NMRD at Grid 9 Test Pit 1

Photo 59 NMRD at Grid 9 Test Pit 2

Photo 60 NMRD at Grid 9 Test Pit 3

Photo 61 NMRD at Grid 9 Test Pit 4

Photo 62 NMRD at Grid 9 Test Pit 5

Photo 63 NMRD at Grid 9 Test Pit 6

Photo 64 NMRD at Grid 9 Pest Pit 7

Photo 65 NMRD at Grid 9 Test Pit 8

Photo 66 NMRD at Grid 9 Test Pit 9

Photo 67 NMRD at Grid 10

Photo 68 NMRD at Grid 10 Test Pit 1

Photo 69 NMRD at Grid 10 Test Pit 2

Photo 70 NMRD at Grid 10 Test Pit 3

Photo 71 NMRD at Grid 10 Test Pit 4

Photo 72 NMRD at Grid 10 Test Pit 5

Photo 73 NMRD at Grid 10 Test Pit 6

Photo 74 NMRD at Grid 10 Test Pit 7

Photo 75 NMRD at Grid 11 Test Pit 1

Photo 76 NMRD at Grid 11 Test Pit 2

Photo 77 NMRD at Grid 11 Test Pit 3

Photo 78 NMRD at Grid 11 Test Pit 4

Photo 79 NMRD at Grid 11 Test Pit 5

Photo 80 NMRD at Grid 11 Test Pit 6

Photo 81 NMRD at Grid 11 Test Pit 7

Photo 82 NMRD at Grid 11 Test Pit 8

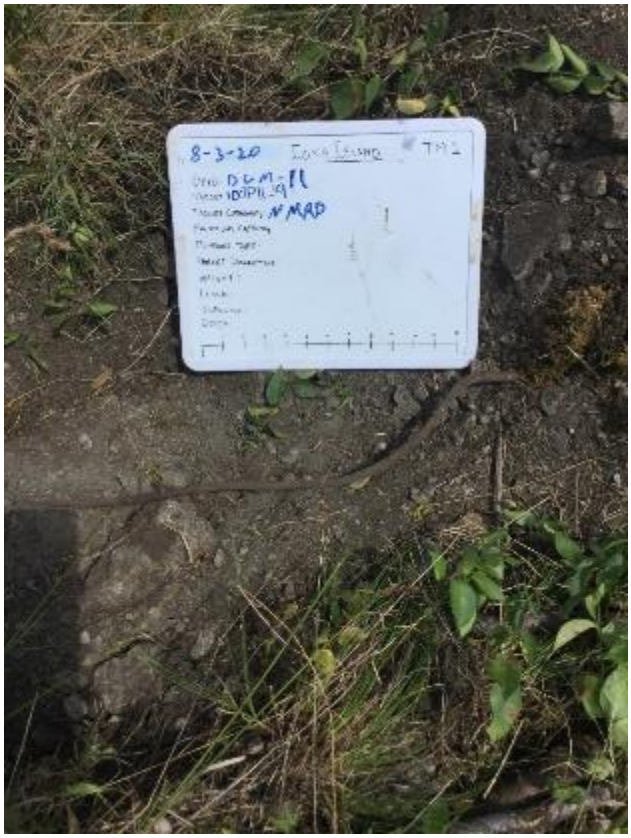

Photo 83 NMRD at Grid 11 Test Pit 9

Photo 84 NMRD at Grid 11 Test Pit 10

Photo 85 NMRD at Grid 12

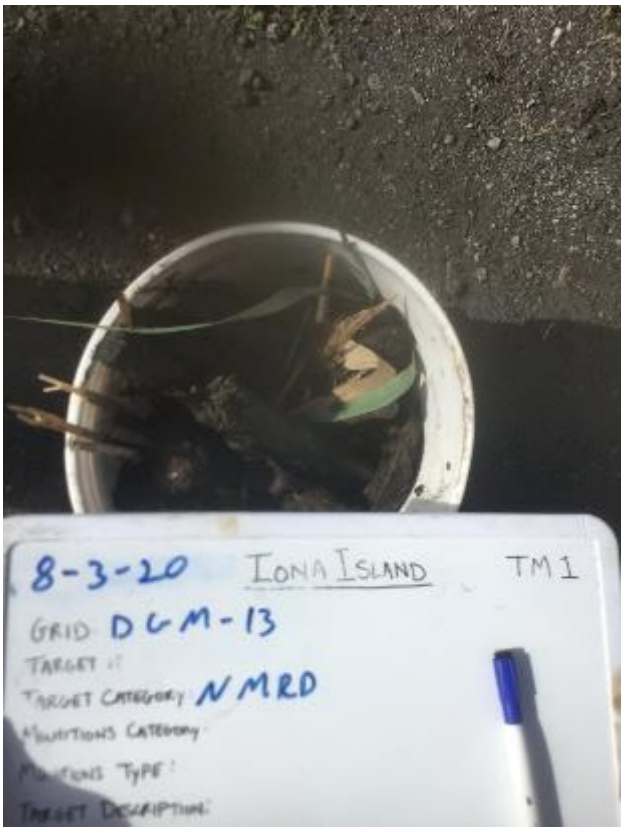

Photo 86 NMRD at Grid 13

Photo 87 NMRD at Grid 14

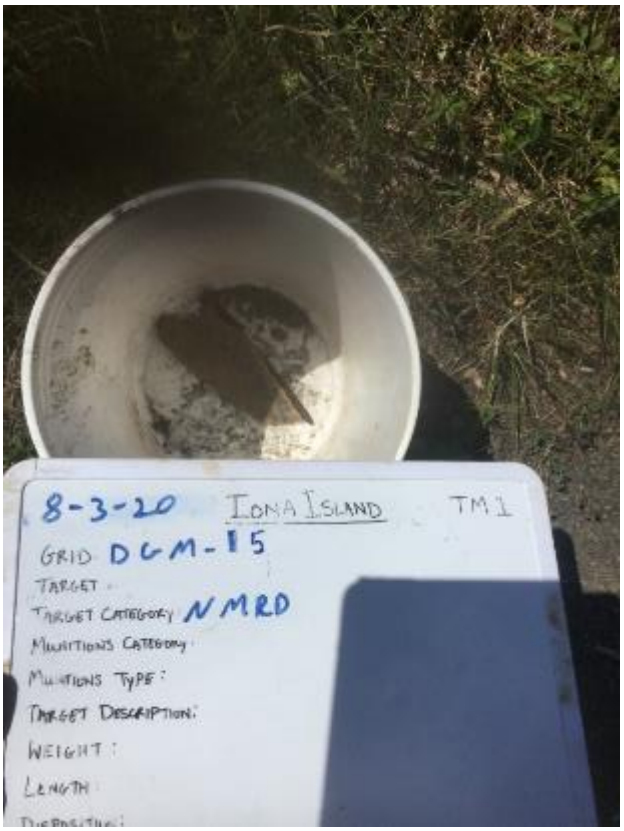

Photo 88 NMRD at Grid 15

Photo 89 NMRD at Grid 15 Test Pit 1

Photo 90 NMRD at Grid 15 Test Pit 2

Photo 91 NMRD at Grid 15 Test Pit 3

Photo 92 NMRD at Grid 15 Test Pit 4

Photo 93 NMRD at Grid 15 Test Pit 5

Photo 94 NMRD at Grid 15 Test Pit 6

Photo 95 NMRD at Grid 15 Test Pit 7

Photo 96 NMRD at Grid 15 Test Pit 8

Photo 97 NMRD at Grid 16

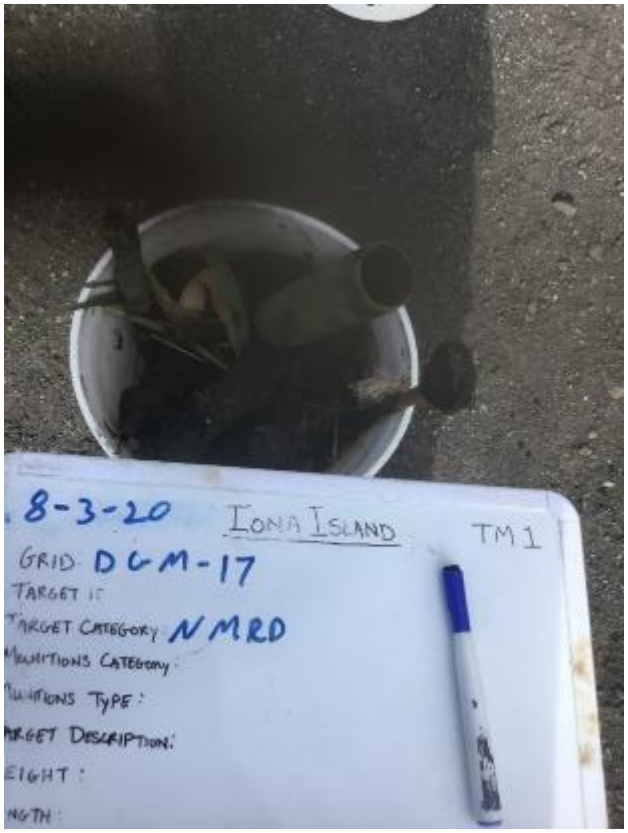

Photo 98 NMRD at Grid 17

Photo 99 NMRD at Grid 18

Photo 100 NMRD at Grid 18 Test Pit 1

Photo 101 NMRD at Grid 18 Test Pit 2

Photo 102 NMRD at Grid 18 Test Pit 3

Photo 103 NMRD at Grid 18 Test Pit 4

Photo 104 NMRD at Grid 18 Test Pit 5

Photo 105 NMRD at Grid 18 Test Pit 6

Photo 106 NMRD at Grid 18 Test Pit 7

Photo 107 NMRD at Grid 19

Photo 108 NMRD at Grid 19 Test Pit 1

Photo 109 NMRD at Grid 19 Test Pit 2

Photo 110 NMRD at Grid 19 Test Pit 3

Photo 111 NMRD at Grid 19 Test Pit 4

Photo 112 NMRD at Grid 20

Photo 113 NMRD at Grid 20 Test Pit 1

Photo 114 NMRD at Grid 20 Test Pit 2

Photo 115NMRD at Grid 20 Test Pit 3

Photo 116 NMRD at Grid 20 Test Pit 4

Photo 117 NMRD at Grid 20 Test Pit 5

Photo 118 NMRD at Grid 20 Test Pit 6

Photo 119 NMRD at Grid 20 Test Pit 7

Photo 120 NMRD at Grid 20 Test Pit 9

Photo 121 NMRD at Grid 20 Test Pit 10

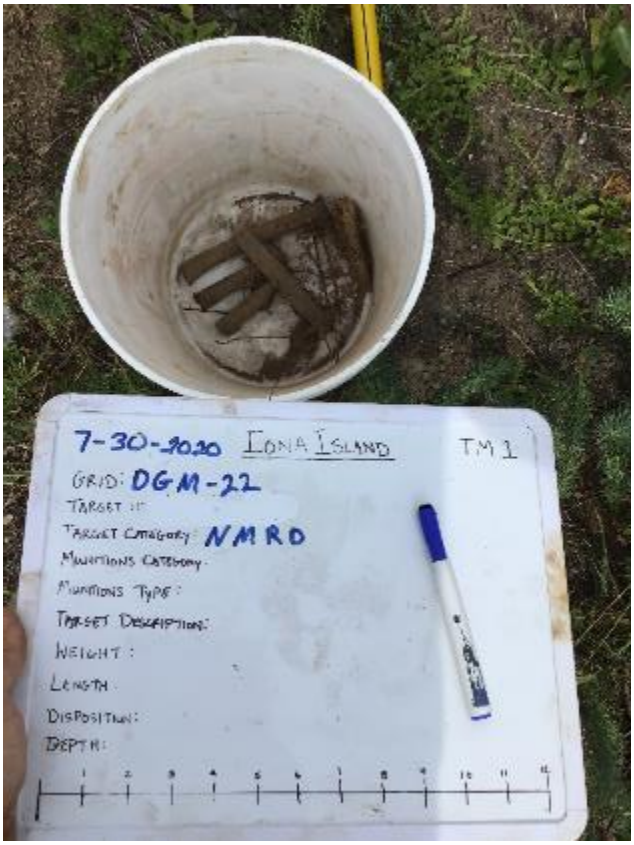

Photo 122 NMRD at Grid 22

Photo 123 NMRD at Grid 22 Test Pit 1

Photo 124 NMRD at Grid 22 Test Pit 2

Photo 125 NMRD at Grid 22 Test Pit 3

Photo 126 NMRD at Grid 22 Test Pit 4

Photo 127 NMRD at Grid 22 Test Pit 5

Photo 128 NMRD at Grid 22 Test Pit 6

Photo 129 NMRD at Grid 22 Test Pit 7

Photo 130 NMRD at Grid 22 Test Pit 8

Photo 131 NMRD at Grid 22 Test Pit 9

Photo 132 NMRD at Grid 22 Test Pit 10

Photo 133 NMRD at Grid 24

Photo 134 MD from 6-Pounder Projectile in Grid 25

Photo 135 NMRD from Grid 25 Test Pit 1

Photo 136 NMRD from Grid 25 Test Pit 2

Photo 137 NMRD from Grid 25 Test Pit 3

Photo 138 NMRD from Grid 25 Test Pit 4

Photo 139 NMRD from Grid 25 Test Pit 5

Photo 140 NMRD from Grid 25 Test Pit 6

Photo 141 NMRD from Grid 25 Test Pit 7

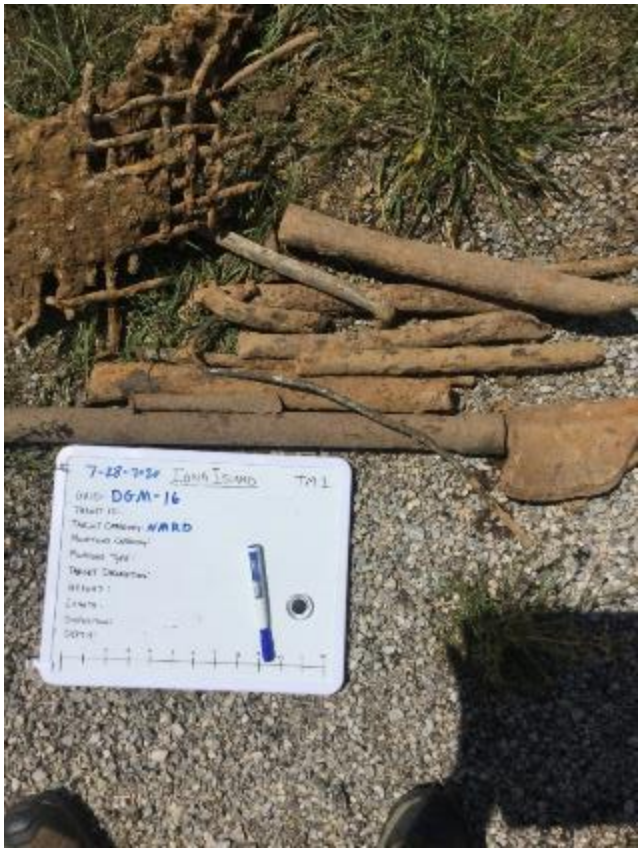

Photo 142 NMRD from Grid 26

Photo 143 NMRD from Grid 26 Test Pit 1

Photo 144 NMRD from Grid 26 Test Pit 2

Photo 145 NMRD from Grid 26 Test Pit 3

Photo 146 NMRD from Grid 26 Test Pit 4

Photo 147 NMRD from Grid 26 Test Pit 5

Photo 148 NMRD in Grid 26 Test Pit 6

Photo 149 NMRD in Grid 26 Test Pit 7

Photo 150 NMRD in Grid 26 Test Pit 8

Photo 151 NMRD in Grid 26 Test Pit 9

Photo 152 NMRD in Grid 26 Test Pit 10

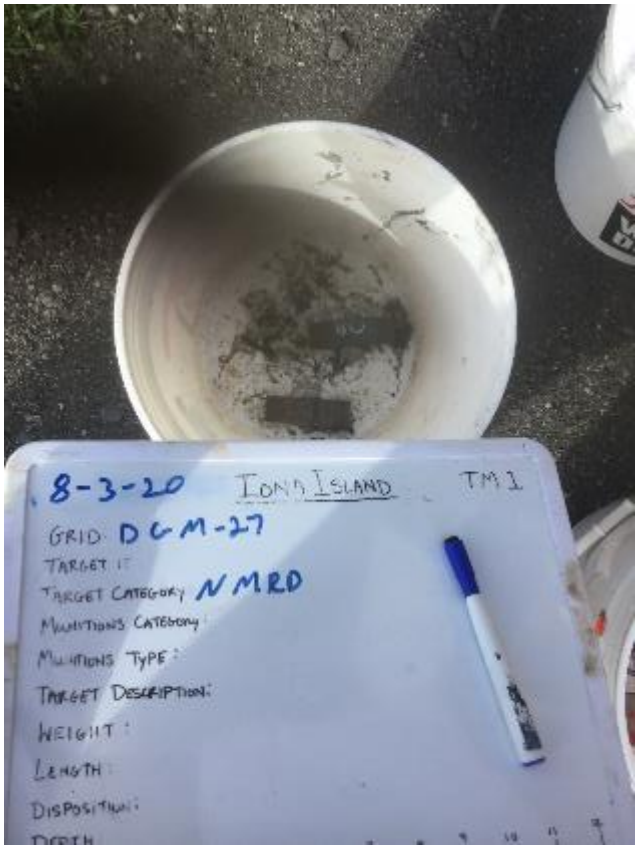

Photo 153 NMRD in Grid 27

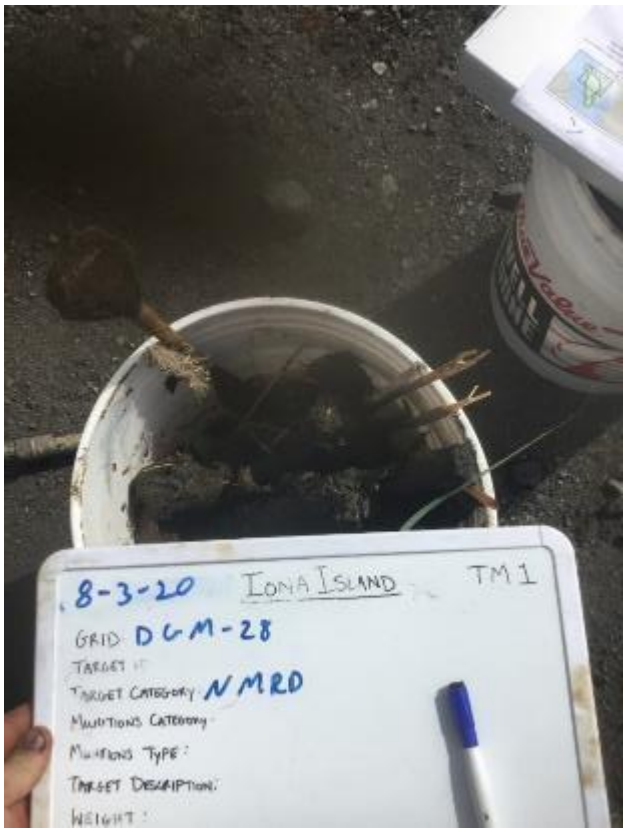

Photo 154 NMRD in Grid 28

Photo 155 Dump Area Test Pit 1

Photo 156 Dump Area Test Pit 1

Photo 157 Dump Area Test Pit 2

Photo 158 Dump Area Test Pit 2

Photo 159 Dump Area Test Pit 3

Photo 160 Dump Area Test Pit 4

Photo 161 Dump Area Test Pit 4

Photo 162 Dump Area Test Pit 4

Photo 163 Dump Area Test Pit 5

Photo 164 Dump Area Test Pit 7

Photo 165 Dump Area Test Pit 8

Photo 166 Dump Area Test Pit 8

Photo 167 Shoreline Target 1

Photo 168 Shoreline Target 2 and 3

Photo 169 Shoreline Target 4

Photo 170 Shoreline Target 8

Photo 171 Shoreline Target 10

Photo 172 Shoreline Target 17

Photo 173 Shoreline Target 44

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Appendix C

Geophysical Reports

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ANJV Daily and Data Processing Reports

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Collection, Processing and Data Quality Report

Dataset ID: 20200317_G01_DGM7_E01A **Grids Encountered:** DGM7

Collection Date: 3/17/2020 ☑ **Completed** **Start Time:** 3/17/2020 9:19:00 AM **End Time:** 3/17/2020 10:19:00 AM

Raw File Name(s): 20200317_G01_DGM7_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

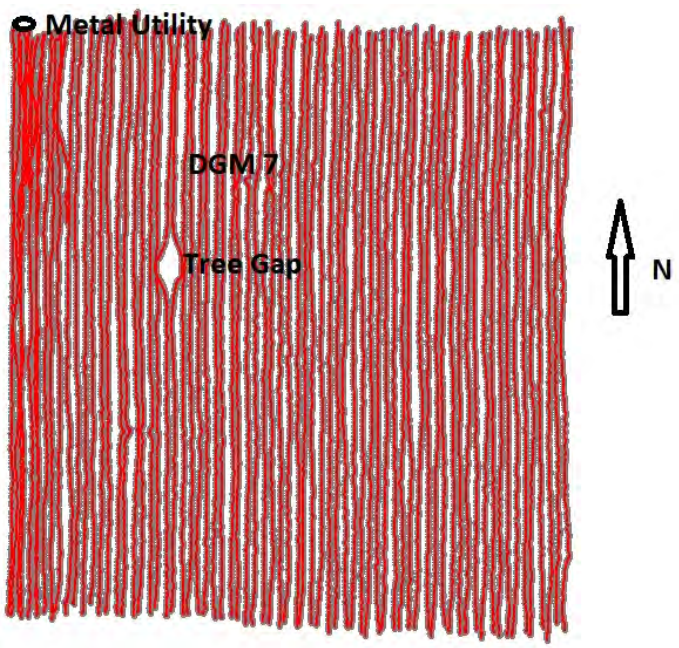
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold, light rain

Terrain: flat

Culture: metal at NW corner

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/17/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200317_G01_DGM7_E01A

Processing Information

Dataset ID: 20200317_G01_DGM7_E01A **Grids:** DGM7

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-500, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=5

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200317_G01_DGM7_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200317_G01_DGM7_E01A.gdb, 20200317_G01_DGM7_E01A.gdb.xml, 20200317_G01_DGM7_E01A.map, 20200317_G01_DGM7_E01A.map.xml, 20200317_G01_DGM7_E01A.pdf, 20200317_G01_DGM7_E01A.png, 20200317_G01_DGM7_E01A.png.gi, 20200317_G01_DGM7_E01A.png.xml, 20200317_G01_DGM7_E01A.tif, 20200317_G01_DGM7_E01A.tif.gi, 20200317_G01_DGM7_E01A.tif.xml, 20200317_G01_DGM7_E01A_AGC_BKG.gdb, 20200317_G01_DGM7_E01A_AGC_BKG.gdb.xml, 20200317_G01_DGM7_E01A_Along_Track_Separation.map, 20200317_G01_DGM7_E01A_Along_Track_Separation.map.xml, 20200317_G01_DGM7_E01A_Along_Track_Separation.png, 20200317_G01_DGM7_E01A_Along_Track_Separation.png.gi, 20200317_G01_DGM7_E01A_Along_Track_Separation.png.xml, 20200317_G01_DGM7_E01A_AlongTrackSampling.txt, 20200317_G01_DGM7_E01A_Background_Ch2_Stats.txt, 20200317_G01_DGM7_E01A_Ch2_level_lg.grd, 20200317_G01_DGM7_E01A_Ch2_level_lg.grd.gi, 20200317_G01_DGM7_E01A_Ch2_level_lg.grd.xml, 20200317_G01_DGM7_E01A_Culture.ply, 20200317_G01_DGM7_E01A_Culture_pg.dbf, 20200317_G01_DGM7_E01A_Culture_pg.prj, 20200317_G01_DGM7_E01A_Culture_pg.shp, 20200317_G01_DGM7_E01A_Culture_pg.shx, 20200317_G01_DGM7_E01A_GPS_HDOP.txt, 20200317_G01_DGM7_E01A_GPS_Quality.map, 20200317_G01_DGM7_E01A_GPS_Quality.map.xml, 20200317_G01_DGM7_E01A_GPS_Quality.png, 20200317_G01_DGM7_E01A_GPS_Quality.png.gi, 20200317_G01_DGM7_E01A_GPS_Quality.png.xml, 20200317_G01_DGM7_E01A_GPS_Quality.txt, 20200317_G01_DGM7_E01A_Processed.XYZ, 20200317_G01_DGM7_E01A_SRA.ply, 20200317_G01_DGM7_E01A_SRA_pg.dbf, 20200317_G01_DGM7_E01A_SRA_pg.prj, 20200317_G01_DGM7_E01A_SRA_pg.shp, 20200317_G01_DGM7_E01A_SRA_pg.shx, 20200317_G01_DGM7_E01A_Targets.gdb, 20200317_G01_DGM7_E01A_Targets.gdb.xml, 20200317_G01_DGM7_E01A_Targets.xls, 20200317_G01_DGM7_E01A_UceFootprintCov.map, 20200317_G01_DGM7_E01A_UceFootprintCov.map.xml, 20200317_G01_DGM7_E01A_UceFootprintCov.png, 20200317_G01_DGM7_E01A_UceFootprintCov.png.gi, 20200317_G01_DGM7_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Medium target density grid. One SRA and one culture polygon designated. Culture gap due to a tree.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.22 **Std Dev:** 0.03 **Mean:** 0.08 **Map ID:**20200317_G01_DGM7_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 114.99 **Requirement:** 100 % **Map ID:** 20200317_G01_DGM7_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1029.21

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -1.31 **Max:** 3.09 **Std Dev:** 0.47 **Mean:** 0.37 **Number of Points:** 3408

Comments:

GPS Quality and HDOP

MapID: 20200317_G01_DGM7_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 02.10 **DOP StDev:** 00.14 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.03; percent pass = 99.98%

Daily Tests

IVS

IVS Test ID: **20200317E01IVS1** **QC Status:** **Pass**

Date: 3/17/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200317E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	115.28	78.98	43.22	21.23	100.17	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	59.43	36.78	18.27	7.96	106.39	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.67	9.68	4.10	1.69	103.80	0.15	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: lag=6

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.79 **Max:** 81.78 **Std Dev:** 12.88 **Mean:** 5.23 **Number of Points:** 277

Comments:

IVS

IVS Test ID: **20200317E01IVS2** **QC Status:** **Pass**

Date: 3/17/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200317E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	113.49	78.17	42.86	20.97	99.14	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	57.13	35.13	17.89	7.61	101.61	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.06	8.30	3.71	1.56	89.01	0.15	Pass

Requirement: 75 % **Requirement:** 0.25

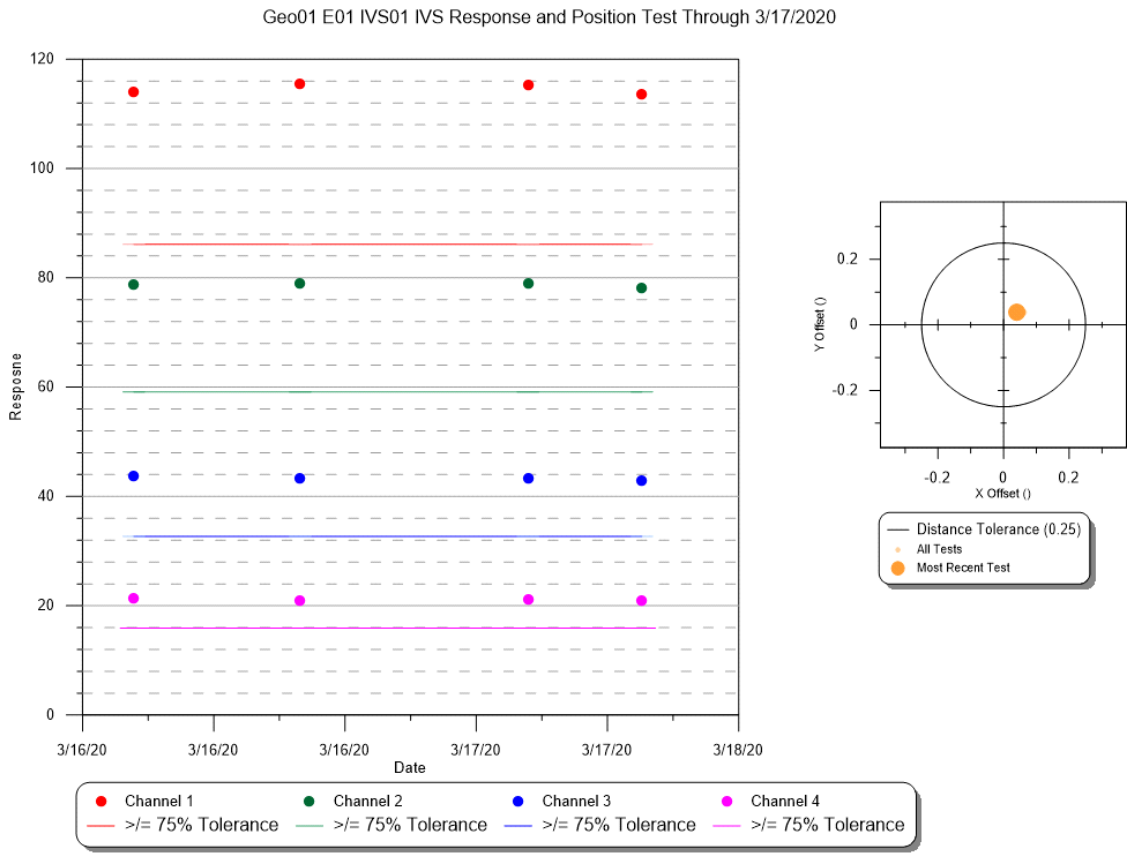
Field Comments:

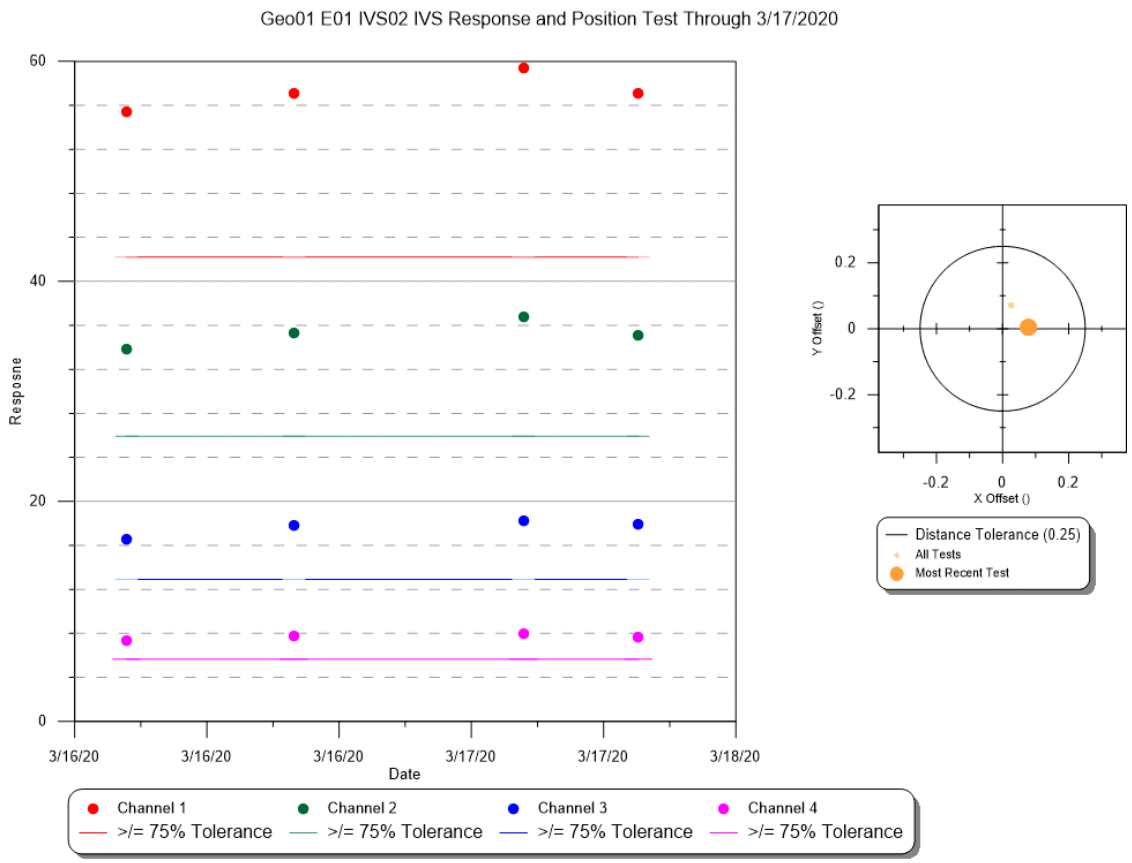
Processing Comments: lag=6

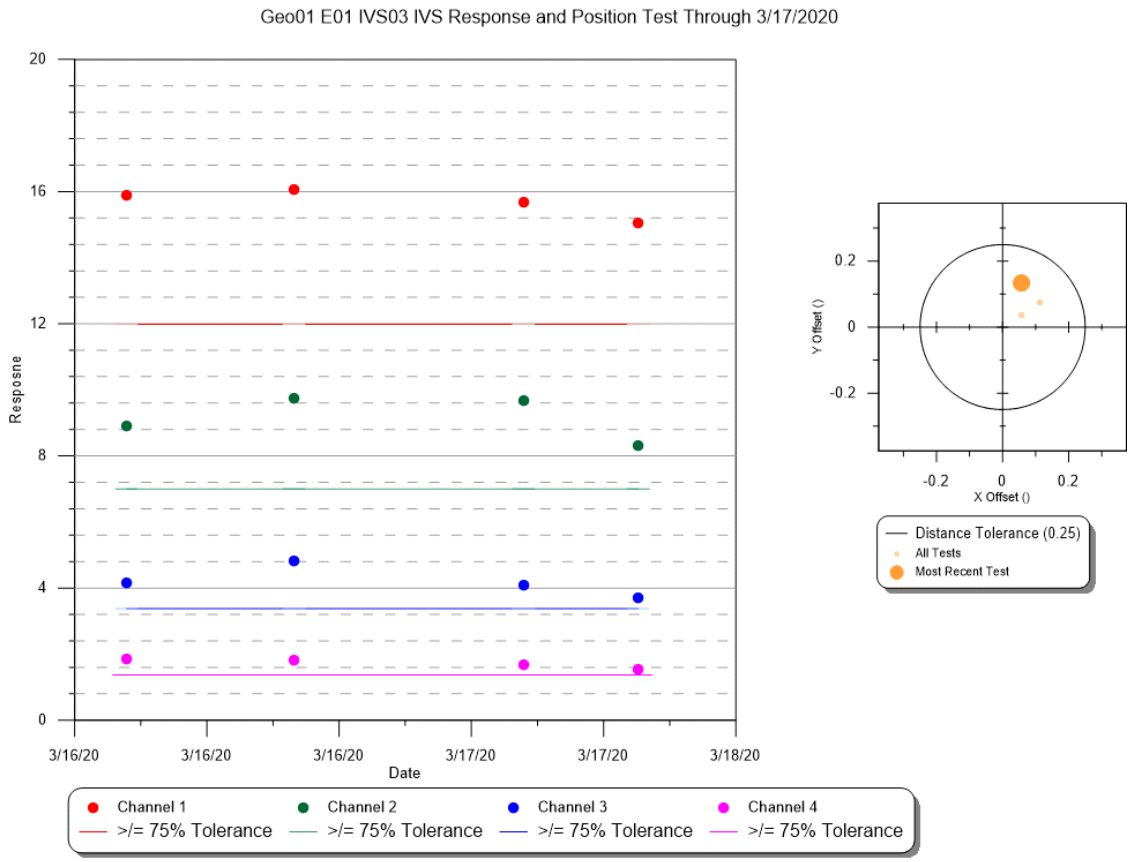
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/17/2020
Response
Date
3/16/20
3/17/20
3/18/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset ()
X Offset ()
Distance Tolerance (0.25)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200317E01QC1** **QC Status:** Pass

Date: 3/17/2020 8:20:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200317E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200317E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200317E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200317E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.23	-0.32	-0.46	-0.32
Pre-Background Std Dev:	0.32	0.19	0.14	0.11
Observed Spike (mV):	267	188	111	52
Spike Mean (mV):	266.23	188.18	111.27	52.78
Spike Std Dev:	0.28	0.17	0.13	0.09
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.39	0.46	-0.1	-0.16
Post-Background Std Dev:	0.28	0.23	0.12	0.09
Calculated Spike (mV):	**265.92**	**188.11**	**111.55**	**53.02**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.23	3.91	4.59	5.77

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200317E01QC2** **QC Status:** Pass

Date: 3/17/2020 4:55:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200317E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200317E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.68	-0.21	-0.24	-0.13
Pre-Background Std Dev:	0.25	0.19	0.14	0.09
Observed Spike (mV):	268	189	111	52
Spike Mean (mV):	266.81	188.94	111.62	52.58
Spike Std Dev:	0.29	0.17	0.12	0.09
Observed Post-Background (mV):	-2	0	0	0
Post-Background Mean (mV):	-2.17	-0.95	-0.53	-0.38
Post-Background Std Dev:	0.27	0.18	0.11	0.09
Calculated Spike (mV):	**267.55**	**189.52**	**112**	**52.83**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.86	4.68	5.02	5.39

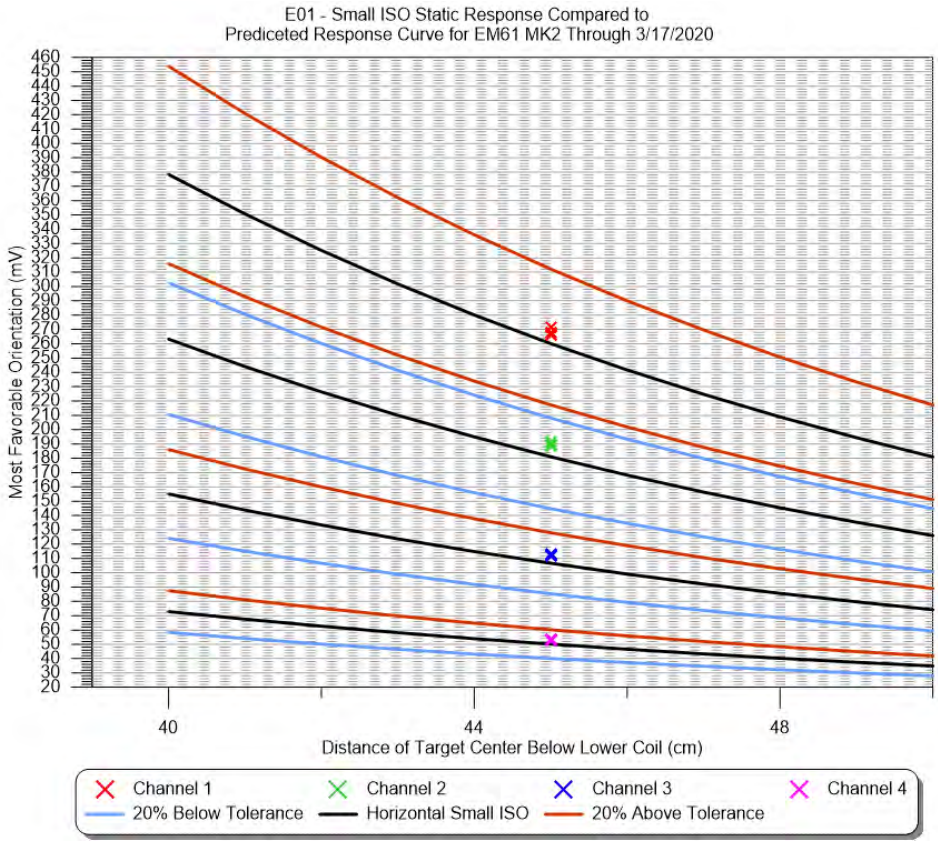
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200317E01GPS** **QC Status:** **Pass**

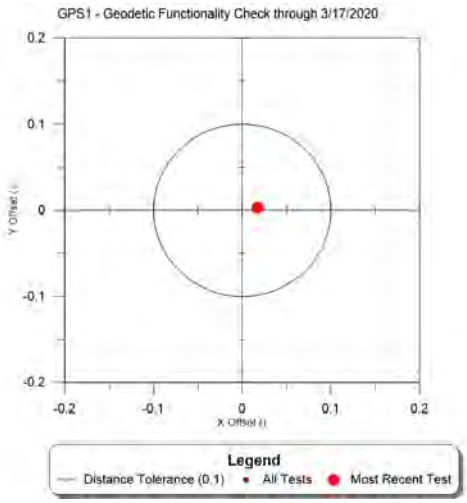
Date: 3/17/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.02	0.00

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/17/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200317_G01_DGM7_E01A, 20200317_G01_DGM14_E01A, 20200317_G01_DGM21_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 saftey meeting, 0800 AM QC/IVS, 0900 Data collection,0400 PM QC/IVS, 0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200317_G01_DGM14_E01A **Grids Encountered:** DGM14

Collection Date: 3/17/2020 ☑ **Completed** **Start Time:** 3/17/2020 11:31:00 AM **End Time:** 3/17/2020 1:34:00 PM

Raw File Name(s): 20200317_G01_DGM14_E01A,20200317_G01_DGM14_E01AA

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.3

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

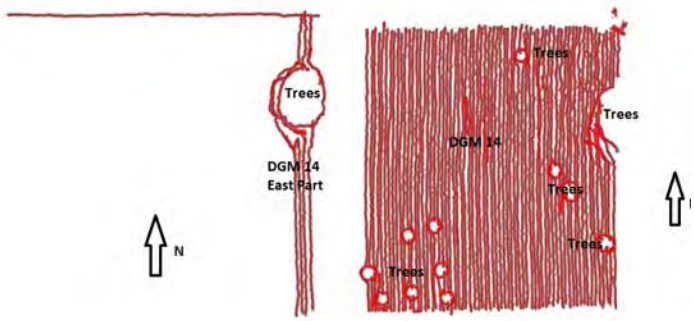
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: overcast slight rain

Terrain: flat, little rocky mound,

Culture: E-W gravel road to the north

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/17/2020 **Editor:** Nesibu Sibha ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200317_G01_DGM14_E01A,20200317_G01_DGM14_E01AA

Processing Information

Dataset ID: 20200317_G01_DGM14_E01A **Grids:** DGM14

Date Processed: 4/1/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200317_G01_DGM14_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200317_G01_DGM14_E01A.gdb, 20200317_G01_DGM14_E01A.gdb.xml, 20200317_G01_DGM14_E01A.map, 20200317_G01_DGM14_E01A.map.xml, 20200317_G01_DGM14_E01A.pdf, 20200317_G01_DGM14_E01A.tif, 20200317_G01_DGM14_E01A.tif.gi, 20200317_G01_DGM14_E01A.tif.xml, 20200317_G01_DGM14_E01A_AGC_BKG.gdb, 20200317_G01_DGM14_E01A_AGC_BKG.gdb.xml, 20200317_G01_DGM14_E01A_Along_Track_Separation.map, 20200317_G01_DGM14_E01A_Along_Track_Separation.map.xml, 20200317_G01_DGM14_E01A_Along_Track_Separation.png, 20200317_G01_DGM14_E01A_Along_Track_Separation.png.gi, 20200317_G01_DGM14_E01A_Along_Track_Separation.png.xml, 20200317_G01_DGM14_E01A_Background_Ch2_Stats.txt, 20200317_G01_DGM14_E01A_Ch2_level_lg.grd, 20200317_G01_DGM14_E01A_Ch2_level_lg.grd.gi, 20200317_G01_DGM14_E01A_Ch2_level_lg.grd.xml, 20200317_G01_DGM14_E01A_Channel_2.map, 20200317_G01_DGM14_E01A_Channel_2.map.xml, 20200317_G01_DGM14_E01A_Channel_2.png, 20200317_G01_DGM14_E01A_Channel_2.png.gi, 20200317_G01_DGM14_E01A_Channel_2.png.xml, 20200317_G01_DGM14_E01A_GPS_HDOP.txt, 20200317_G01_DGM14_E01A_GPS_Quality.map, 20200317_G01_DGM14_E01A_GPS_Quality.map.xml, 20200317_G01_DGM14_E01A_GPS_Quality.png, 20200317_G01_DGM14_E01A_GPS_Quality.png.gi, 20200317_G01_DGM14_E01A_GPS_Quality.png.xml, 20200317_G01_DGM14_E01A_GPS_Quality.txt, 20200317_G01_DGM14_E01A_Processed.XYZ, 20200317_G01_DGM14_E01A_SRA.ply, 20200317_G01_DGM14_E01A_SRA.xls, 20200317_G01_DGM14_E01A_SRA_pg.dbf, 20200317_G01_DGM14_E01A_SRA_pg.prj, 20200317_G01_DGM14_E01A_SRA_pg.shp, 20200317_G01_DGM14_E01A_SRA_pg.shx, 20200317_G01_DGM14_E01A_Targets.gdb, 20200317_G01_DGM14_E01A_Targets.gdb.xml, 20200317_G01_DGM14_E01A_Targets.xls, 20200317_G01_DGM14_E01A_uceFootprintCov.map, 20200317_G01_DGM14_E01A_uceFootprintCov.map.xml, 20200317_G01_DGM14_E01A_uceFootprintCov.png, 20200317_G01_DGM14_E01A_uceFootprintCov.png.gi, 20200317_G01_DGM14_E01A_uceFootprintCov.png.xml

Dataset Processing Comments:

Medium target density grid with two SRAs designated. Culture gaps due to trees and rocks.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.05 **Mean:** 0.08 **Map ID:**20200317_G01_DGM14_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 113.65 **Requirement:** 100 % **Map ID:** 20200317_G01_DGM14_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1056.22

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200317_G01_DGM14_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 03.70 **DOP StDev:** 00.19 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4) were deleted.
Original RTK values: min =2.00 ; max =5.00 ; standard deviation =0.27 ; percent pass = 97.47%

Daily Tests

IVS

IVS Test ID: **20200317E01IVS1** **QC Status:** **Pass**

Date: 3/17/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200317E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	115.28	78.98	43.22	21.23	100.17	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	59.43	36.78	18.27	7.96	106.39	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.67	9.68	4.10	1.69	103.80	0.15	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: lag=6

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.79 **Max:** 81.78 **Std Dev:** 12.88 **Mean:** 5.23 **Number of Points:** 277

Comments:

IVS

IVS Test ID: **20200317E01IVS2** **QC Status:** **Pass**

Date: 3/17/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200317E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	113.49	78.17	42.86	20.97	99.14	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	57.13	35.13	17.89	7.61	101.61	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.06	8.30	3.71	1.56	89.01	0.15	Pass

Requirement: 75 % **Requirement:** 0.25

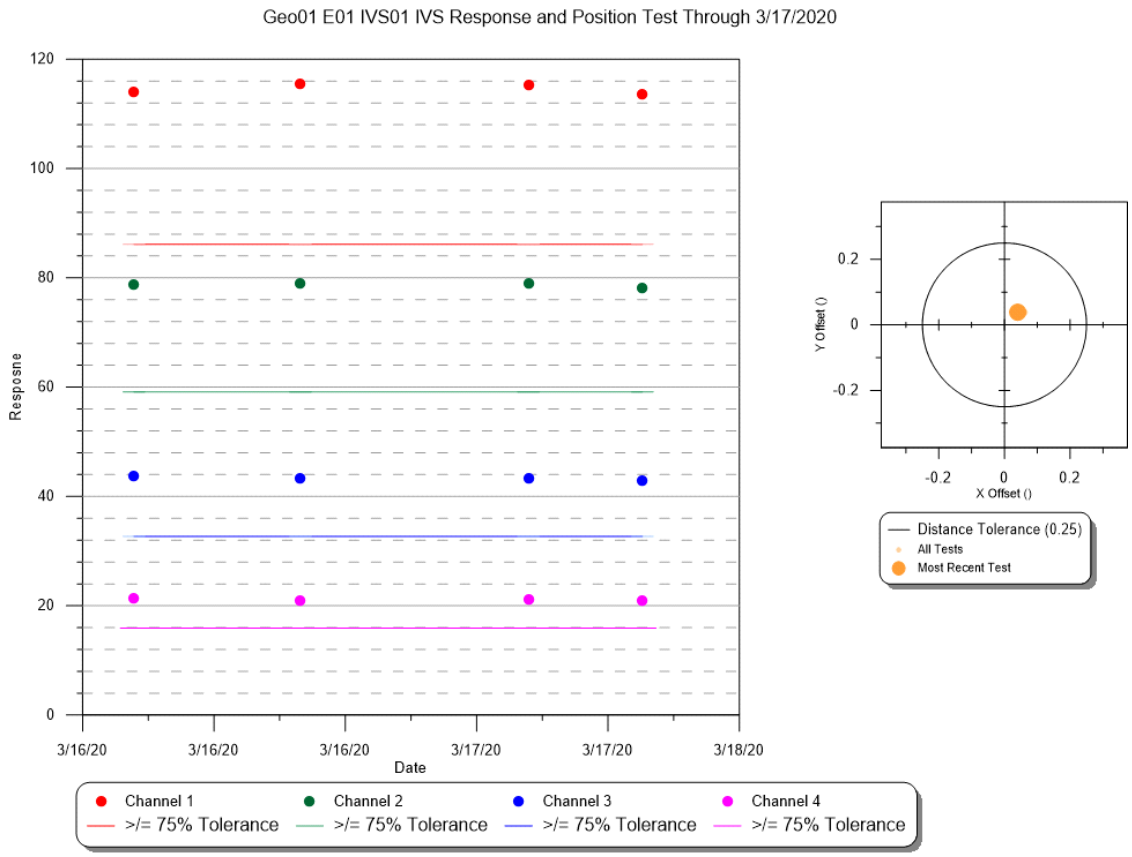
Field Comments:

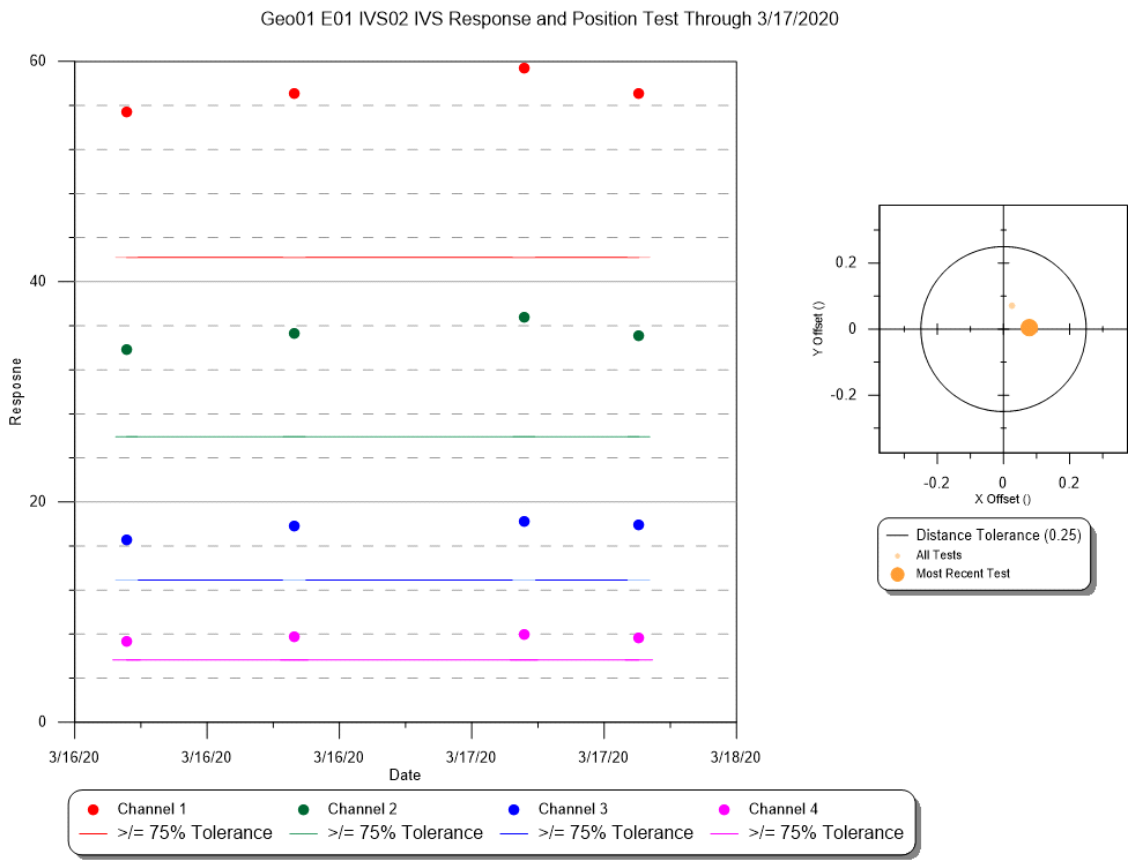
Processing Comments: lag=6

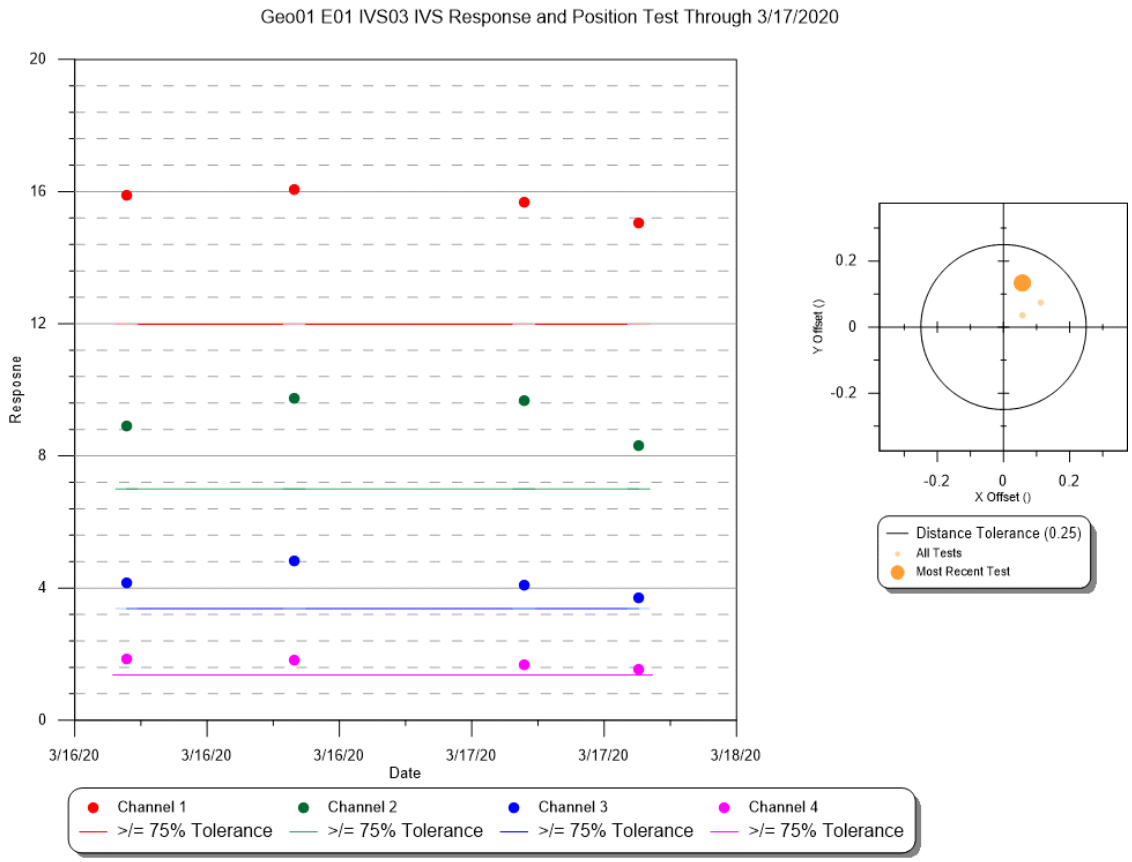
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/17/2020
Response
Date
3/16/20
3/17/20
3/18/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset ()
X Offset ()
Distance Tolerance (0.25)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200317E01QC1** **QC Status:** Pass

Date: 3/17/2020 8:20:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200317E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200317E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200317E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200317E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.23	-0.32	-0.46	-0.32
Pre-Background Std Dev:	0.32	0.19	0.14	0.11
Observed Spike (mV):	267	188	111	52
Spike Mean (mV):	266.23	188.18	111.27	52.78
Spike Std Dev:	0.28	0.17	0.13	0.09
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.39	0.46	-0.1	-0.16
Post-Background Std Dev:	0.28	0.23	0.12	0.09
Calculated Spike (mV):	**265.92**	**188.11**	**111.55**	**53.02**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.23	3.91	4.59	5.77

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200317E01QC2** **QC Status:** Pass

Date: 3/17/2020 4:55:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200317E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200317E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.68	-0.21	-0.24	-0.13
Pre-Background Std Dev:	0.25	0.19	0.14	0.09
Observed Spike (mV):	268	189	111	52
Spike Mean (mV):	266.81	188.94	111.62	52.58
Spike Std Dev:	0.29	0.17	0.12	0.09
Observed Post-Background (mV):	-2	0	0	0
Post-Background Mean (mV):	-2.17	-0.95	-0.53	-0.38
Post-Background Std Dev:	0.27	0.18	0.11	0.09
Calculated Spike (mV):	**267.55**	**189.52**	**112**	**52.83**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.86	4.68	5.02	5.39

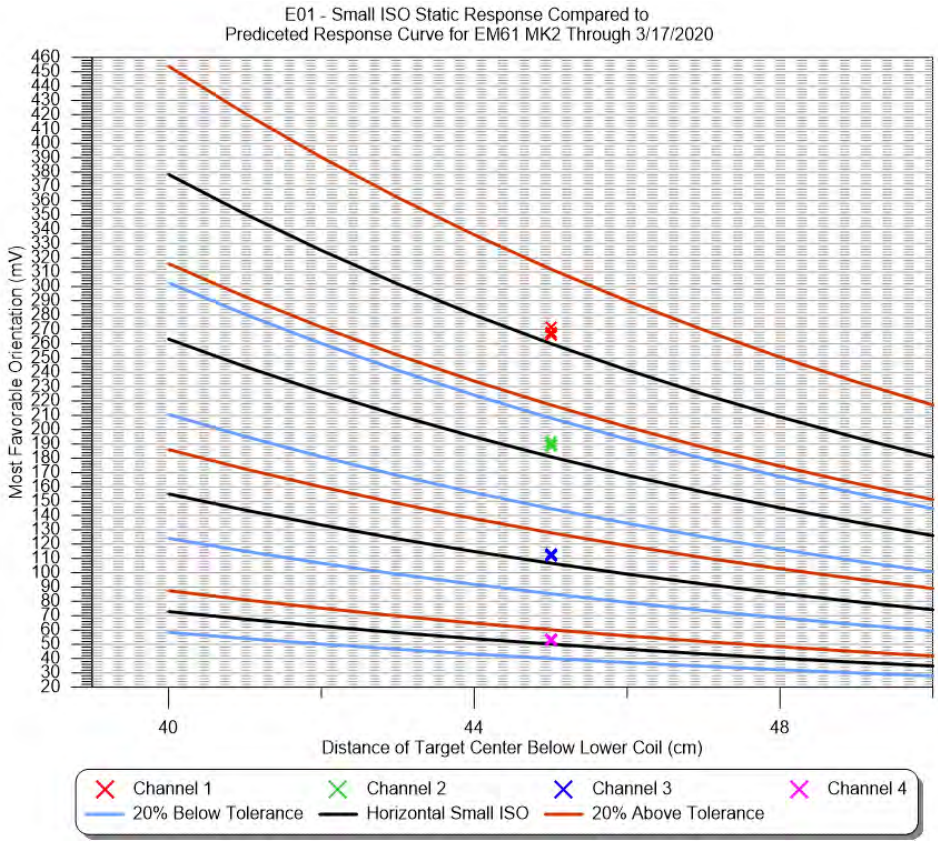
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200317E01GPS** **QC Status:** **Pass**

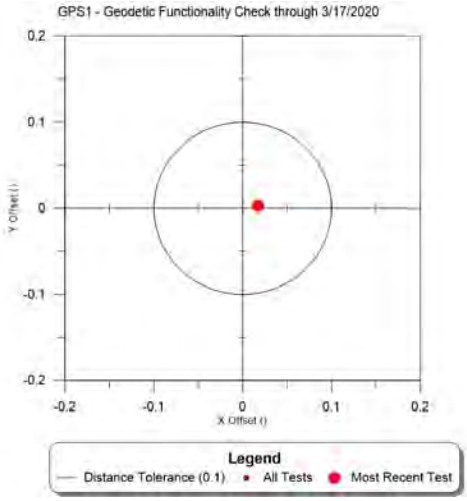
Date: 3/17/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.02	0.00

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/17/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200317_G01_DGM7_E01A, 20200317_G01_DGM14_E01A, 20200317_G01_DGM21_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 saftey meeting, 0800 AM QC/IVS, 0900 Data collection,0400 PM QC/IVS, 0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200317_G01_DGM21_E01A **Grids Encountered:** DGM21

Collection Date: 3/17/2020 ☑ **Completed** **Start Time:** 3/17/2020 2:22:00 PM **End Time:** 3/17/2020 4:19:00 PM

Raw File Name(s): 20200317_G01_DGM21_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.3

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

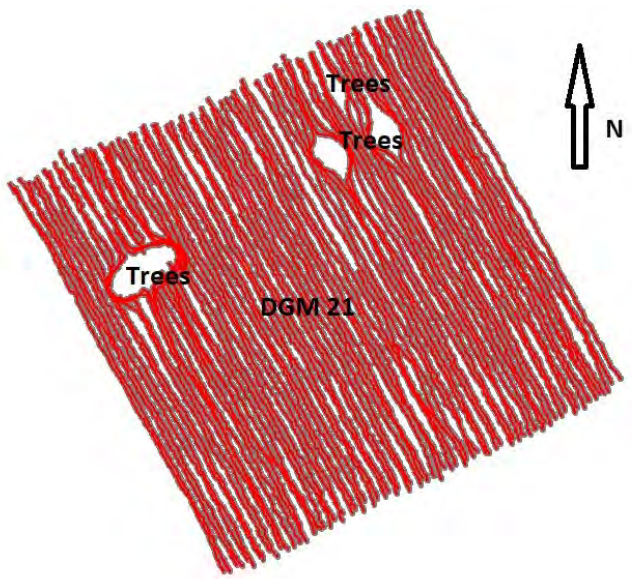
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: light rain

Terrain: flat, mudy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/17/2020 **Editor:** Nesibu Sibha ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200317_G01_DGM21_E01A

Processing Information

Dataset ID: 20200317_G01_DGM21_E01A **Grids:** DGM21

Date Processed: 4/1/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-200, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200317_G01_DGM21_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200317_G01_DGM21_E01A.gdb, 20200317_G01_DGM21_E01A.gdb.xml, 20200317_G01_DGM21_E01A.map, 20200317_G01_DGM21_E01A.map.xml, 20200317_G01_DGM21_E01A.pdf, 20200317_G01_DGM21_E01A.png, 20200317_G01_DGM21_E01A.png.gi, 20200317_G01_DGM21_E01A.png.xml, 20200317_G01_DGM21_E01A.tif, 20200317_G01_DGM21_E01A.tif.gi, 20200317_G01_DGM21_E01A.tif.xml, 20200317_G01_DGM21_E01A_AGC_BKG.gdb, 20200317_G01_DGM21_E01A_AGC_BKG.gdb.xml, 20200317_G01_DGM21_E01A_Along_Track_Separation.map, 20200317_G01_DGM21_E01A_Along_Track_Separation.map.xml, 20200317_G01_DGM21_E01A_Along_Track_Separation.png, 20200317_G01_DGM21_E01A_Along_Track_Separation.png.gi, 20200317_G01_DGM21_E01A_Along_Track_Separation.png.xml, 20200317_G01_DGM21_E01A_AlongTrackSampling.txt, 20200317_G01_DGM21_E01A_Background_Ch2_Stats.txt, 20200317_G01_DGM21_E01A_Ch2_level_lg.grd, 20200317_G01_DGM21_E01A_Ch2_level_lg.grd.gi, 20200317_G01_DGM21_E01A_Ch2_level_lg.grd.xml, 20200317_G01_DGM21_E01A_GPS_HDOP.txt, 20200317_G01_DGM21_E01A_GPS_Quality.map, 20200317_G01_DGM21_E01A_GPS_Quality.map.xml, 20200317_G01_DGM21_E01A_GPS_Quality.png, 20200317_G01_DGM21_E01A_GPS_Quality.png.gi, 20200317_G01_DGM21_E01A_GPS_Quality.png.xml, 20200317_G01_DGM21_E01A_GPS_Quality.txt, 20200317_G01_DGM21_E01A_Processed.XYZ, 20200317_G01_DGM21_E01A_Targeted.png, 20200317_G01_DGM21_E01A_Targets.gdb, 20200317_G01_DGM21_E01A_Targets.gdb.xml, 20200317_G01_DGM21_E01A_Targets.xls, 20200317_G01_DGM21_E01A_uceFootprintCov.map, 20200317_G01_DGM21_E01A_uceFootprintCov.map.xml, 20200317_G01_DGM21_E01A_uceFootprintCov.png, 20200317_G01_DGM21_E01A_uceFootprintCov.png.gi, 20200317_G01_DGM21_E01A_uceFootprintCov.png.xml

Dataset Processing Comments:

Low target density grid. Culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.03 **Mean:** 0.06 **Map ID:**20200317_G01_DGM21_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 109.84 **Requirement:** 100 % **Map ID:** 20200317_G01_DGM21_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1029.71

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200317_G01_DGM21_E01A_GPS_Quality.

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.30 **DOP StDev:** 00.13 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200317E01IVS1** **QC Status:** **Pass**

Date: 3/17/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200317E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	115.28	78.98	43.22	21.23	100.17	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	59.43	36.78	18.27	7.96	106.39	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.67	9.68	4.10	1.69	103.80	0.15	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: lag=6

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.79 **Max:** 81.78 **Std Dev:** 12.88 **Mean:** 5.23 **Number of Points:** 277

Comments:

IVS

IVS Test ID: **20200317E01IVS2** **QC Status:** **Pass**

Date: 3/17/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200317E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	113.49	78.17	42.86	20.97	99.14	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	57.13	35.13	17.89	7.61	101.61	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.06	8.30	3.71	1.56	89.01	0.15	Pass

Requirement: 75 % **Requirement:** 0.25

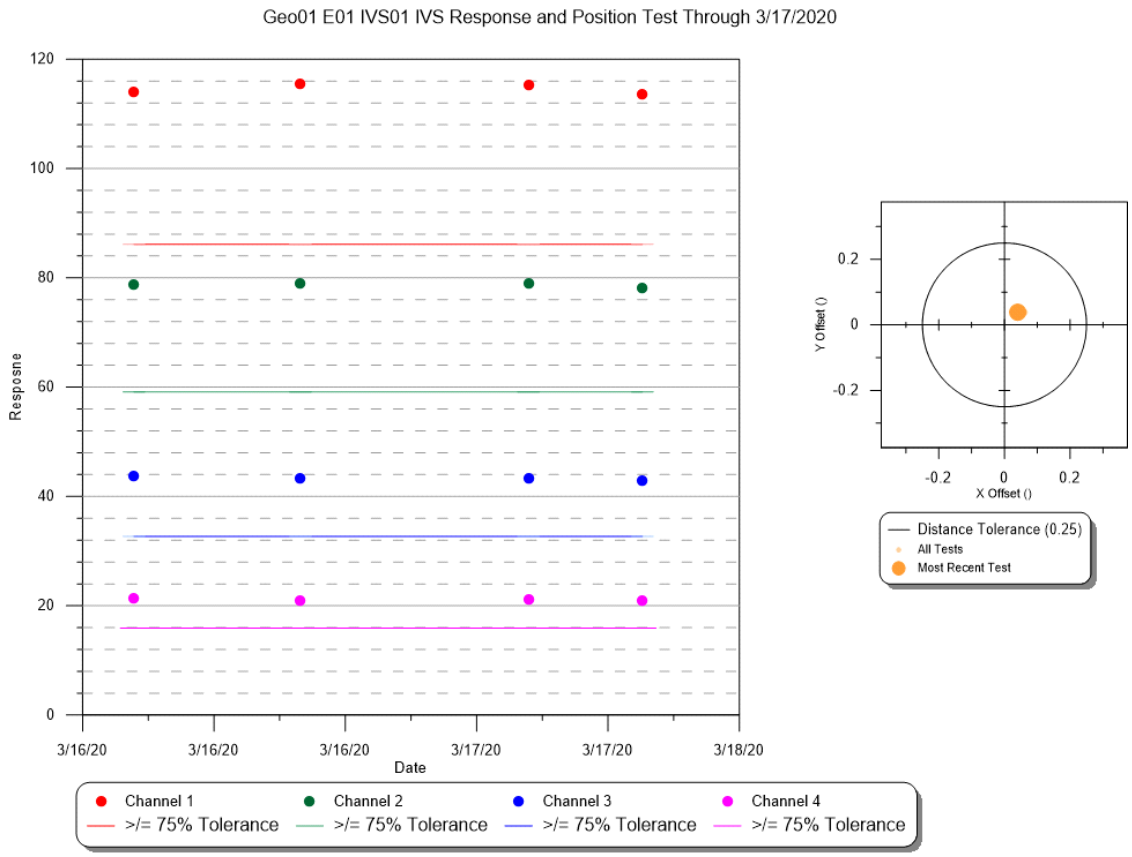
Field Comments:

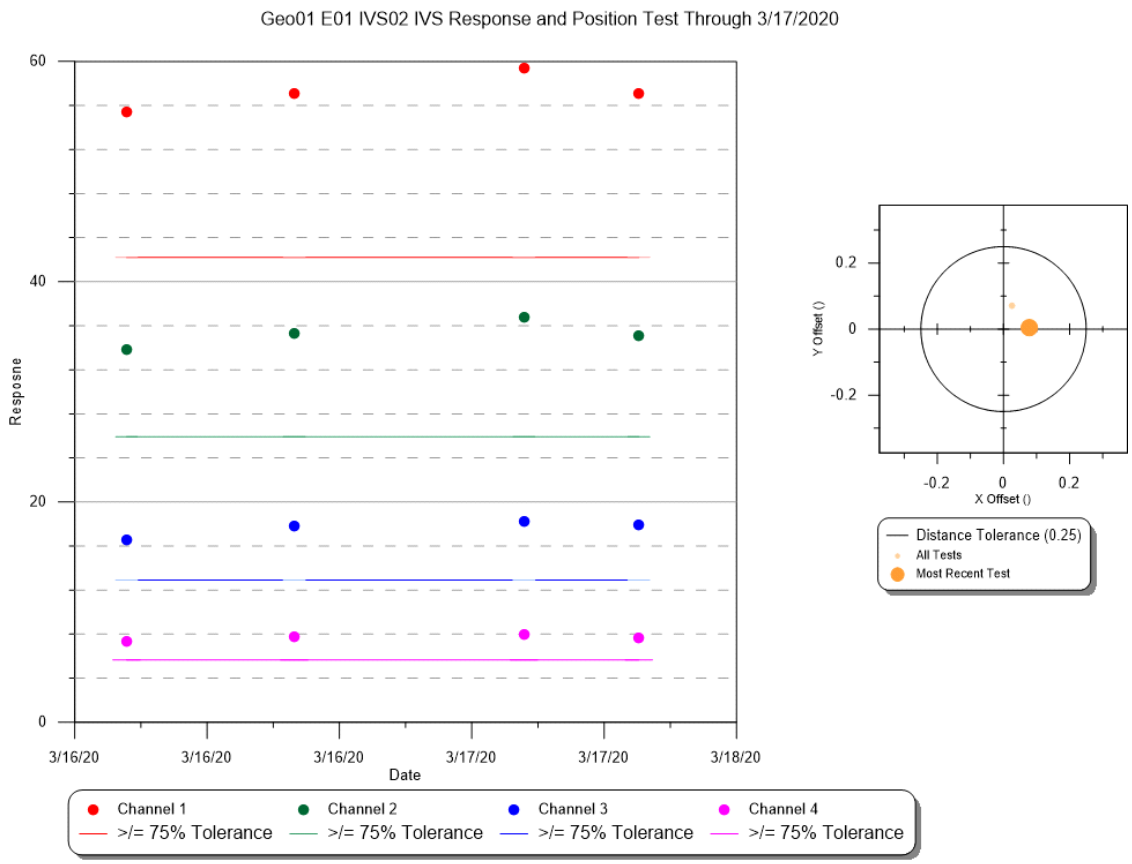
Processing Comments: lag=6

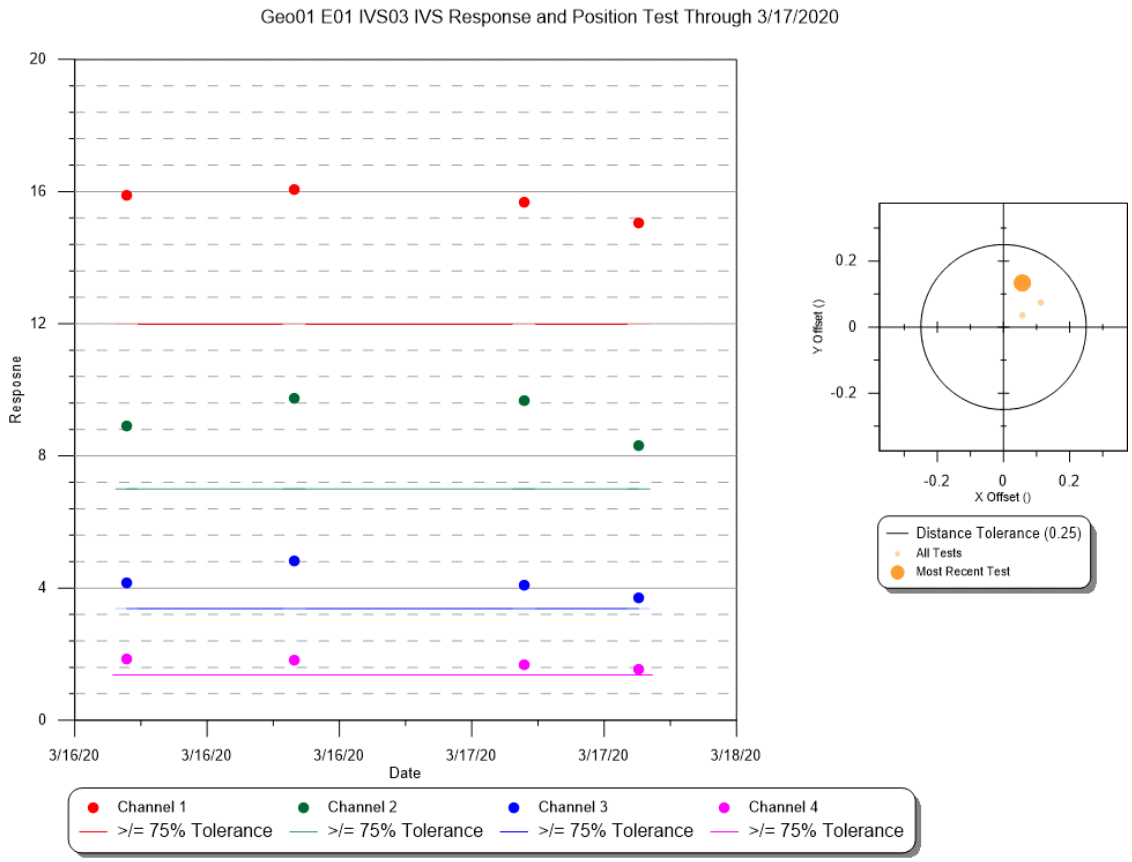
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/17/2020
Response
Date
3/16/20
3/16/20
3/16/20
3/17/20
3/17/20
3/18/20
Channel 1
>/= 75% Tolerance
Channel 2
>/= 75% Tolerance
Channel 3
>/= 75% Tolerance
Channel 4
>/= 75% Tolerance
Y Offset ()
X Offset ()
Distance Tolerance (0.25)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200317E01QC1** **QC Status:** Pass

Date: 3/17/2020 8:20:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200317E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200317E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200317E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200317E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.23	-0.32	-0.46	-0.32
Pre-Background Std Dev:	0.32	0.19	0.14	0.11
Observed Spike (mV):	267	188	111	52
Spike Mean (mV):	266.23	188.18	111.27	52.78
Spike Std Dev:	0.28	0.17	0.13	0.09
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.39	0.46	-0.1	-0.16
Post-Background Std Dev:	0.28	0.23	0.12	0.09
Calculated Spike (mV):	**265.92**	**188.11**	**111.55**	**53.02**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.23	3.91	4.59	5.77

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200317E01QC2** **QC Status:** Pass

Date: 3/17/2020 4:55:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200317E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200317E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.68	-0.21	-0.24	-0.13
Pre-Background Std Dev:	0.25	0.19	0.14	0.09
Observed Spike (mV):	268	189	111	52
Spike Mean (mV):	266.81	188.94	111.62	52.58
Spike Std Dev:	0.29	0.17	0.12	0.09
Observed Post-Background (mV):	-2	0	0	0
Post-Background Mean (mV):	-2.17	-0.95	-0.53	-0.38
Post-Background Std Dev:	0.27	0.18	0.11	0.09
Calculated Spike (mV):	**267.55**	**189.52**	**112**	**52.83**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.86	4.68	5.02	5.39

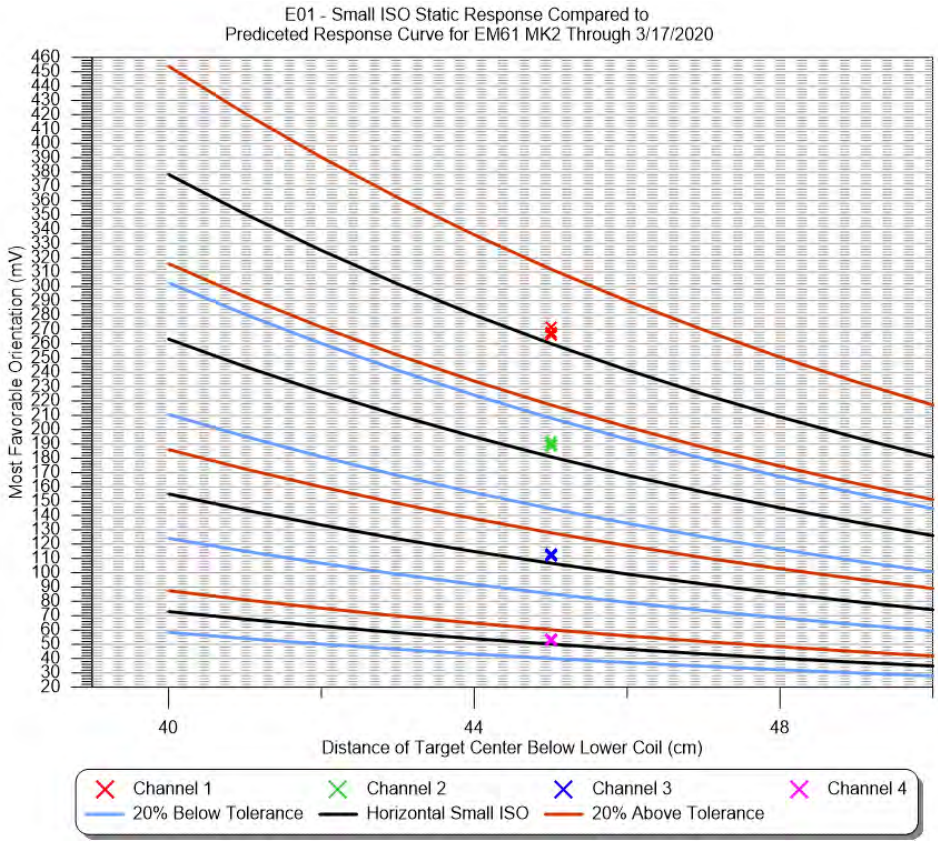
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200317E01GPS** **QC Status:** **Pass**

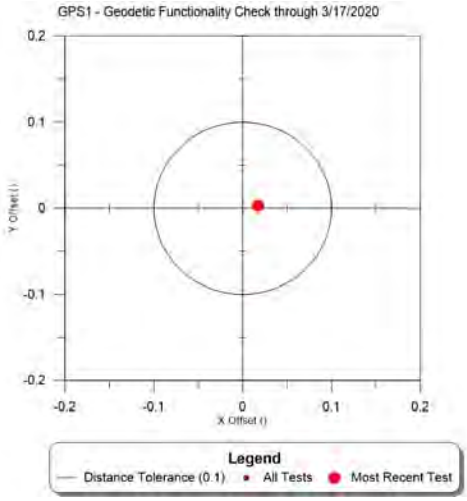
Date: 3/17/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.02	0.00

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/17/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200317_G01_DGM7_E01A, 20200317_G01_DGM14_E01A, 20200317_G01_DGM21_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 saftey meeting, 0800 AM QC/IVS, 0900 Data collection,0400 PM QC/IVS, 0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200318_G01_DGM16_E01A **Grids Encountered:** DGM16

Collection Date: 3/18/2020 ☑ **Completed** **Start Time:** 3/18/2020 9:45:00 AM **End Time:** 3/18/2020 10:49:00 AM

Raw File Name(s): 20200318_G01_DGM16_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

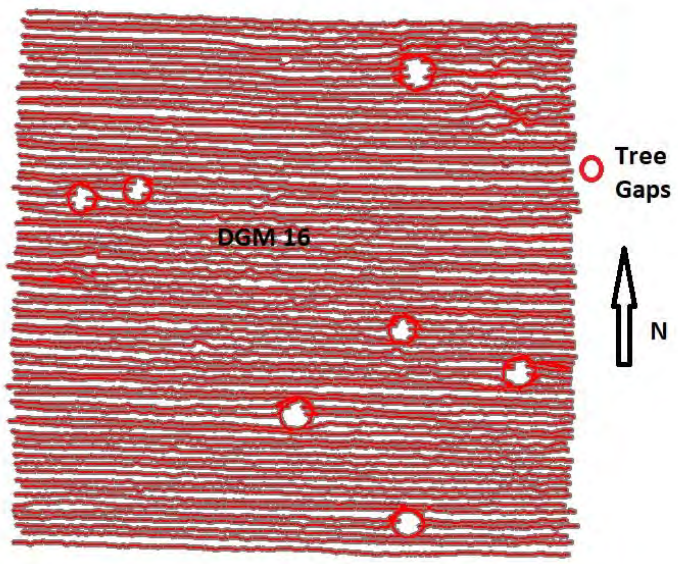
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: warm

Terrain: moderate slope

Culture: trees

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/18/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200318_G01_DGM16_E01A

Processing Information

Dataset ID: 20200318_G01_DGM16_E01A **Grids:** DGM16

Date Processed: 4/1/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200318_G01_DGM16_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200318_G01_DGM16_E01A.gdb, 20200318_G01_DGM16_E01A.gdb.xml, 20200318_G01_DGM16_E01A.map, 20200318_G01_DGM16_E01A.map.xml, 20200318_G01_DGM16_E01A.pdf, 20200318_G01_DGM16_E01A.png, 20200318_G01_DGM16_E01A.png.gi, 20200318_G01_DGM16_E01A.png.xml, 20200318_G01_DGM16_E01A.tif, 20200318_G01_DGM16_E01A.tif.gi, 20200318_G01_DGM16_E01A.tif.xml, 20200318_G01_DGM16_E01A_AGC_BKG.gdb, 20200318_G01_DGM16_E01A_AGC_BKG.gdb.xml, 20200318_G01_DGM16_E01A_Along_Track_Separation.map, 20200318_G01_DGM16_E01A_Along_Track_Separation.map.xml, 20200318_G01_DGM16_E01A_Along_Track_Separation.png, 20200318_G01_DGM16_E01A_Along_Track_Separation.png.gi, 20200318_G01_DGM16_E01A_Along_Track_Separation.png.xml, 20200318_G01_DGM16_E01A_AlongTrackSampling.txt, 20200318_G01_DGM16_E01A_Background_Ch2_Stats.txt, 20200318_G01_DGM16_E01A_Ch2_level_lg.grd, 20200318_G01_DGM16_E01A_Ch2_level_lg.grd.gi, 20200318_G01_DGM16_E01A_Ch2_level_lg.grd.xml, 20200318_G01_DGM16_E01A_GPS_HDOP.txt, 20200318_G01_DGM16_E01A_GPS_Quality.map, 20200318_G01_DGM16_E01A_GPS_Quality.map.xml, 20200318_G01_DGM16_E01A_GPS_Quality.png, 20200318_G01_DGM16_E01A_GPS_Quality.png.gi, 20200318_G01_DGM16_E01A_GPS_Quality.png.xml, 20200318_G01_DGM16_E01A_GPS_Quality.txt, 20200318_G01_DGM16_E01A_Processed.XYZ, 20200318_G01_DGM16_E01A_Targets.gdb, 20200318_G01_DGM16_E01A_Targets.gdb.xml, 20200318_G01_DGM16_E01A_Targets.xls, 20200318_G01_DGM16_E01A_uceFootprintCov.map, 20200318_G01_DGM16_E01A_uceFootprintCov.map.xml, 20200318_G01_DGM16_E01A_uceFootprintCov.png, 20200318_G01_DGM16_E01A_uceFootprintCov.png.gi, 20200318_G01_DGM16_E01A_uceFootprintCov.png.xml

Dataset Processing Comments:

Medium target density grid with culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.25 **Std Dev:** 0.04 **Mean:** 0.08 **Map ID:**20200318_G01_DGM16_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 111.84 **Requirement:** 100 % **Map ID:** 20200318_G01_DGM16_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1040.00

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -3 **Max:** 3.78 **Std Dev:** 0.6 **Mean:** 0.27 **Number of Points:** 1778

Comments:

GPS Quality and HDOP

MapID: 20200318_G01_DGM16_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.50 **DOP StDev:** 00.10 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4) were deleted.
Original RTK values: min =2.00 ; max = 4.00; standard deviation = 0.03; percent pass =99.98 %

Daily Tests

IVS

IVS Test ID: **20200318E01IVS1** **QC Status:** **Pass**

Date: 3/18/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200318E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	107.95	73.50	39.36	19.29	93.23	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.07	34.23	17.09	7.78	99.01	0.18	Pass
IVS03		15.98	9.33	4.50	1.82	15.39	9.11	4.49	1.87	97.64	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 4

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1.02 **Max:** 75.87 **Std Dev:** 11.81 **Mean:** 4.59 **Number of Points:** 204

Comments:

IVS

IVS Test ID: **20200318E01IVS2** **QC Status:** **Pass**

Date: 3/18/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200318E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	116.33	80.25	44.57	21.56	101.78	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	54.98	33.95	16.47	7.29	98.19	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.93	8.96	3.95	1.59	96.01	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

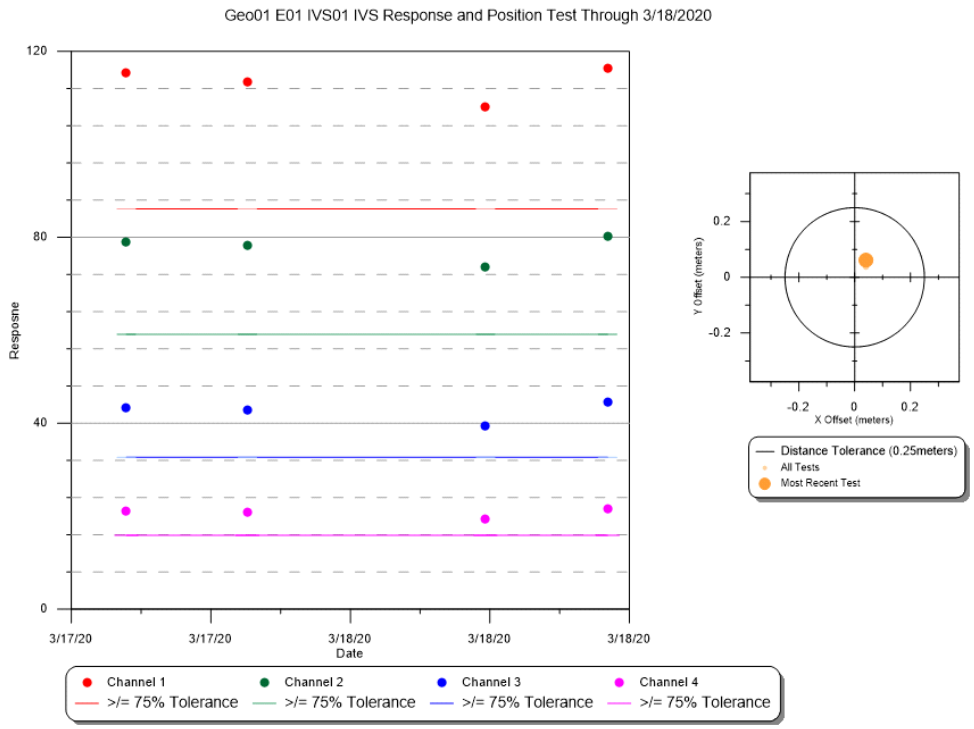
Field Comments:

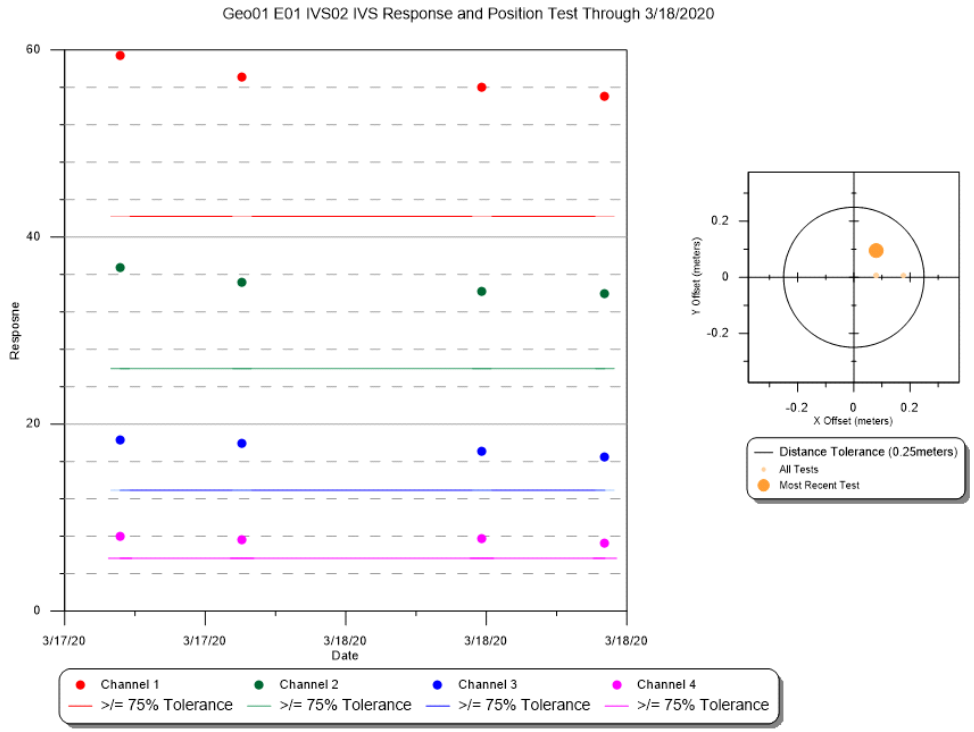
Processing Comments: Lag = 5

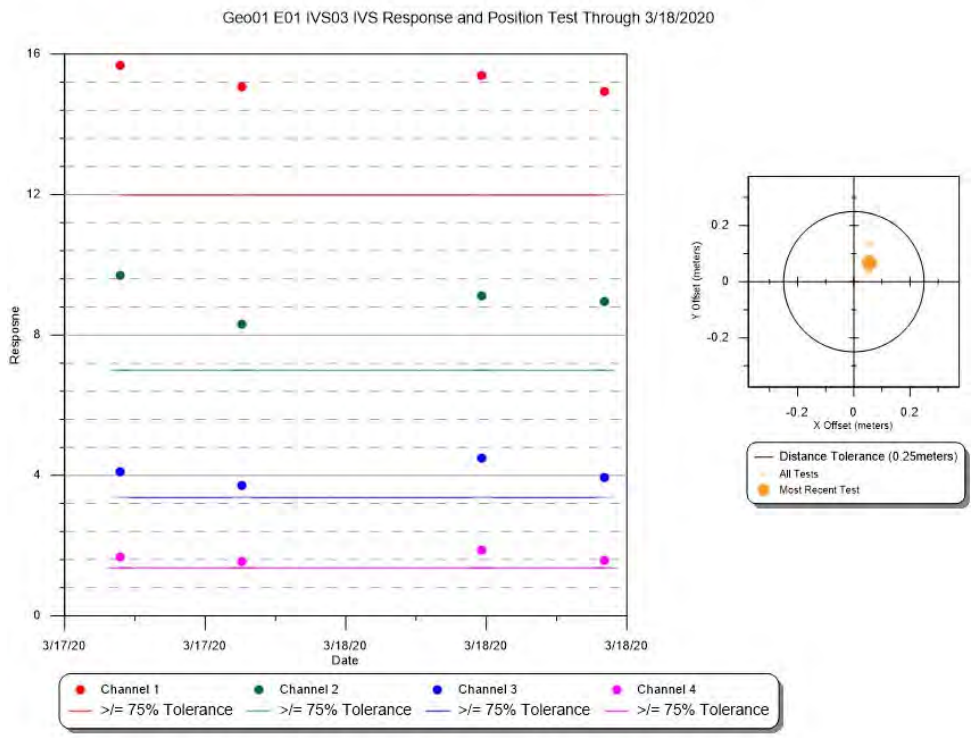
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/18/2020
Response
16
12
8
4
0
3/17/20
3/17/20
3/18/20
3/18/20
3/18/20
Date
Channel 1
>/= 75% Tolerance
Channel 2
>/= 75% Tolerance
Channel 3
>/= 75% Tolerance
Channel 4
>/= 75% Tolerance
Y Offset (meters)
0.2
0
-0.2
-0.2
0
0.2
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200318E01QC1** **QC Status:** Pass

Date: 3/18/2020 9:18:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200318E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200318E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200318E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200318E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.88	-0.06	-0.25	-0.24
Pre-Background Std Dev:	0.26	0.17	0.12	0.08
Observed Spike (mV):	268	188	111	52
Spike Mean (mV):	268.95	188.95	111.36	52.34
Spike Std Dev:	0.25	0.18	0.13	0.1
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.43	0.12	-0.43	-0.41
Post-Background Std Dev:	0.26	0.17	0.16	0.13
Calculated Spike (mV):	**267.29**	**188.92**	**111.7**	**52.66**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.76	4.35	4.74	5.05

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200318E01QC2** **QC Status:** Pass

Date: 3/18/2020 5:45:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200318E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200318E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.27	-0.13	-0.36	-0.33
Pre-Background Std Dev:	0.28	0.18	0.11	0.08
Observed Spike (mV):	0	0	0	0
Spike Mean (mV):	271.38	191.68	112.86	53.01
Spike Std Dev:	0.28	0.18	0.12	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.43	0.08	-0.22	-0.27
Post-Background Std Dev:	0.26	0.18	0.13	0.09
Calculated Spike (mV):	**271.03**	**191.7**	**113.15**	**53.31**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.19	5.89	6.09	6.34

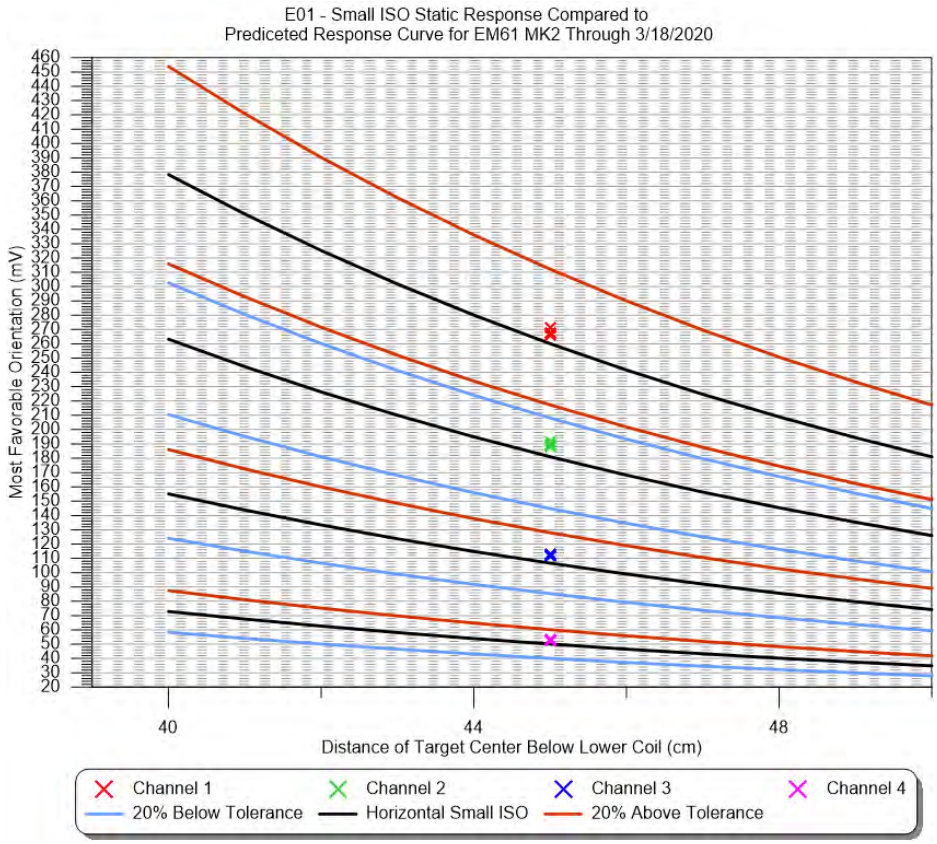
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200318GPSQC** **QC Status:** **Pass**

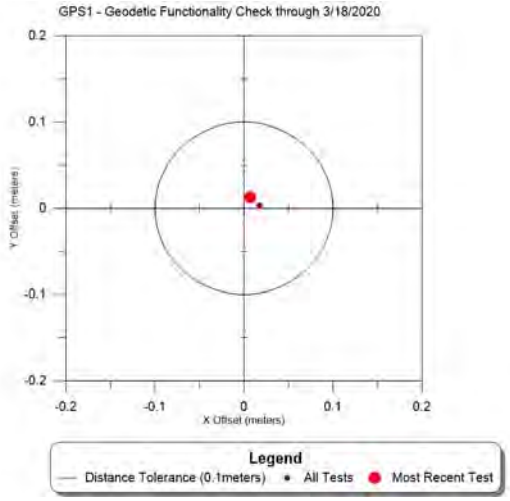
Date: 3/18/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.20	4572774.38
Actual:	585680.19	4572774.39
Offset:	0.01	0.01

Total Offset: 0.01 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/18/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200318_G01_DGM16_E01A,202018_G01_DGM24_E01A,202018_G01_DGM27_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200318_G01_DGM24_E01A **Grids Encountered:** DGM24

Collection Date: 3/18/2020 ☑ **Completed** **Start Time:** 3/18/2020 11:30:00 AM **End Time:** 3/18/2020 1:01:00 PM

Raw File Name(s): 20200318_G01_DGM24_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.15

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

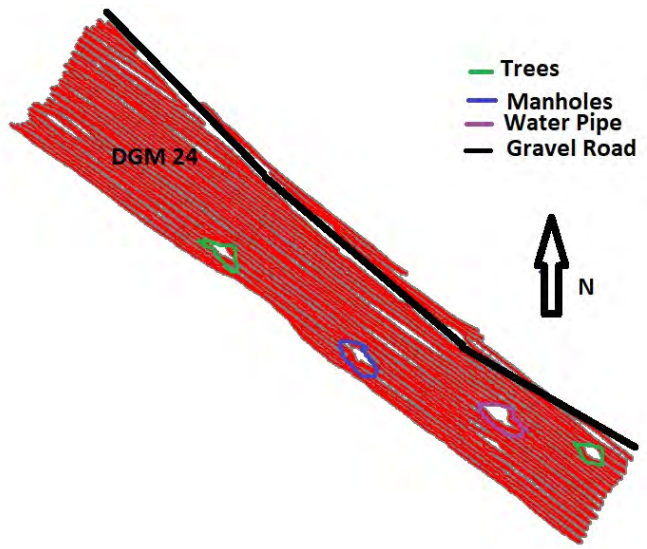
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: warm

Terrain: slight slope, flat

Culture: manholes,water pipe,N_S road pavement to E of grid

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/18/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200318_G01_DGM24_E01A

Processing Information

Dataset ID: 20200318_G01_DGM24_E01A **Grids:** DGM24

Date Processed: 4/2/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-8000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200318_G01_DGM24_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200318_G01_DGM24_E01A.gdb, 20200318_G01_DGM24_E01A.gdb.xml, 20200318_G01_DGM24_E01A.map, 20200318_G01_DGM24_E01A.map.xml, 20200318_G01_DGM24_E01A.pdf, 20200318_G01_DGM24_E01A.png, 20200318_G01_DGM24_E01A.png.gi, 20200318_G01_DGM24_E01A.png.xml, 20200318_G01_DGM24_E01A.tif, 20200318_G01_DGM24_E01A.tif.gi, 20200318_G01_DGM24_E01A.tif.xml, 20200318_G01_DGM24_E01A_AGC_BKG.gdb, 20200318_G01_DGM24_E01A_AGC_BKG.gdb.xml, 20200318_G01_DGM24_E01A_Along_Track_Separation.map, 20200318_G01_DGM24_E01A_Along_Track_Separation.map.xml, 20200318_G01_DGM24_E01A_Along_Track_Separation.png, 20200318_G01_DGM24_E01A_Along_Track_Separation.png.gi, 20200318_G01_DGM24_E01A_Along_Track_Separation.png.xml, 20200318_G01_DGM24_E01A_Background_Ch2_Stats.txt, 20200318_G01_DGM24_E01A_Ch2_level_lg.grd, 20200318_G01_DGM24_E01A_Ch2_level_lg.grd.gi, 20200318_G01_DGM24_E01A_Ch2_level_lg.grd.xml, 20200318_G01_DGM24_E01A_Culture.ply, 20200318_G01_DGM24_E01A_Culture.xls, 20200318_G01_DGM24_E01A_Culture_pg.dbf, 20200318_G01_DGM24_E01A_Culture_pg.prj, 20200318_G01_DGM24_E01A_Culture_pg.shp, 20200318_G01_DGM24_E01A_Culture_pg.shx, 20200318_G01_DGM24_E01A_GPS_HDOP.txt, 20200318_G01_DGM24_E01A_GPS_Quality.map, 20200318_G01_DGM24_E01A_GPS_Quality.map.xml, 20200318_G01_DGM24_E01A_GPS_Quality.png, 20200318_G01_DGM24_E01A_GPS_Quality.png.gi, 20200318_G01_DGM24_E01A_GPS_Quality.png.xml, 20200318_G01_DGM24_E01A_GPS_Quality.txt, 20200318_G01_DGM24_E01A_Processed.XYZ, 20200318_G01_DGM24_E01A_SRA.ply, 20200318_G01_DGM24_E01A_SRA.xls, 20200318_G01_DGM24_E01A_SRA_pg.dbf, 20200318_G01_DGM24_E01A_SRA_pg.prj, 20200318_G01_DGM24_E01A_SRA_pg.shp, 20200318_G01_DGM24_E01A_SRA_pg.shx, 20200318_G01_DGM24_E01A_Targets.gdb, 20200318_G01_DGM24_E01A_Targets.gdb.xml, 20200318_G01_DGM24_E01A_Targets.xls, 20200318_G01_DGM24_E01A_UceFootprintCov.map, 20200318_G01_DGM24_E01A_UceFootprintCov.map.xml, 20200318_G01_DGM24_E01A_UceFootprintCov.png, 20200318_G01_DGM24_E01A_UceFootprintCov.png.gi, 20200318_G01_DGM24_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Medium-high target density grid. Three culture polygons around nearby infrastructure. One SRA designated. Culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.25 **Std Dev:** 0.03 **Mean:** 0.09 **Map ID:**20200318_G01_DGM24_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 100.05 **Requirement:** 100 % **Map ID:** 20200318_G01_DGM24_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1019.73

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200318_G01_DGM24_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: **DOP Max:** **DOP StDev:** **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (RTK not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min =2.00 ; max =4.00 ; standard deviation =0.03 ; percent pass =99.98 %
Original HDOP values: min =0.70 ; max =4.20 ; standard deviation = 0.28; percent pass = 99.84%

Daily Tests

IVS

IVS Test ID: **20200318E01IVS1** **QC Status:** **Pass**

Date: 3/18/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200318E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	107.95	73.50	39.36	19.29	93.23	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.07	34.23	17.09	7.78	99.01	0.18	Pass
IVS03		15.98	9.33	4.50	1.82	15.39	9.11	4.49	1.87	97.64	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 4

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1.02 **Max:** 75.87 **Std Dev:** 11.81 **Mean:** 4.59 **Number of Points:** 204

Comments:

IVS

IVS Test ID: **20200318E01IVS2** **QC Status:** **Pass**

Date: 3/18/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200318E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	116.33	80.25	44.57	21.56	101.78	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	54.98	33.95	16.47	7.29	98.19	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.93	8.96	3.95	1.59	96.01	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

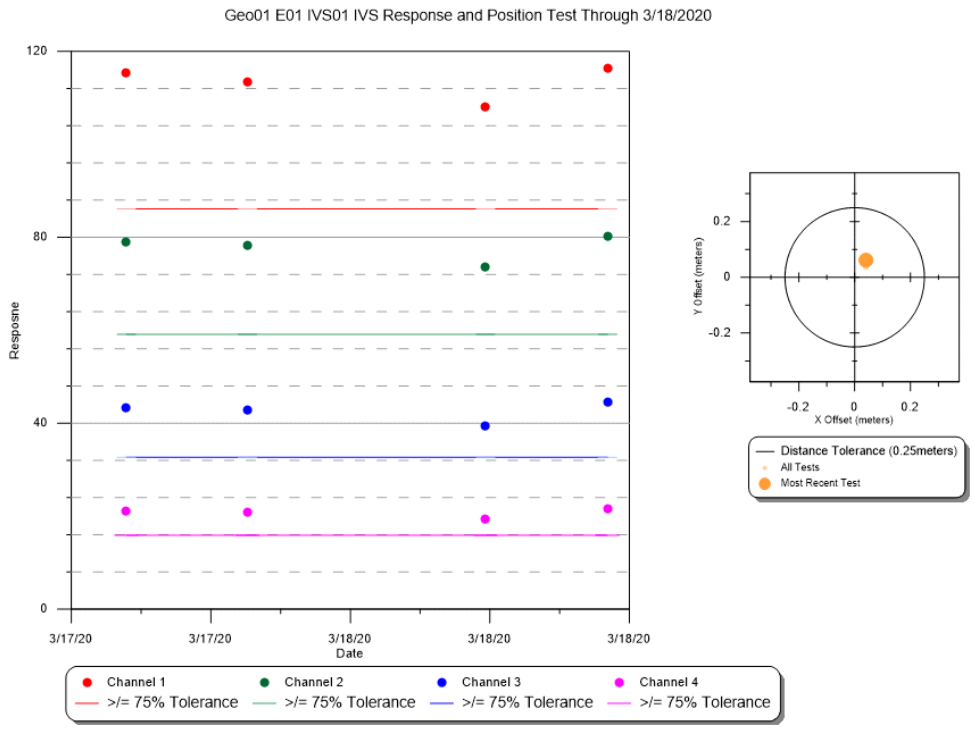
Field Comments:

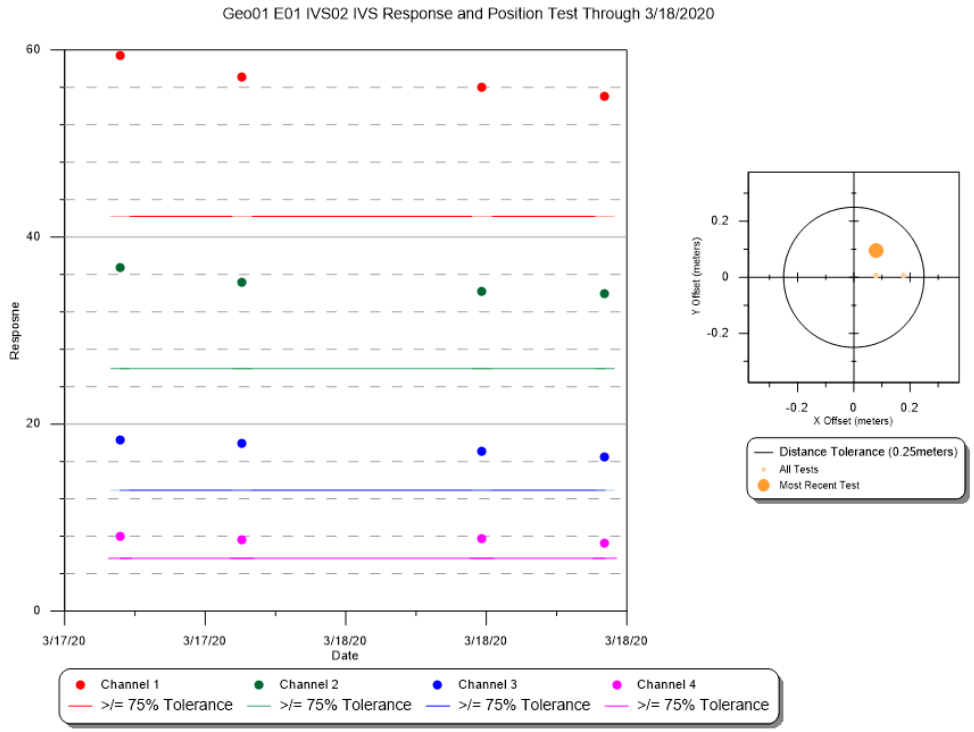
Processing Comments: Lag = 5

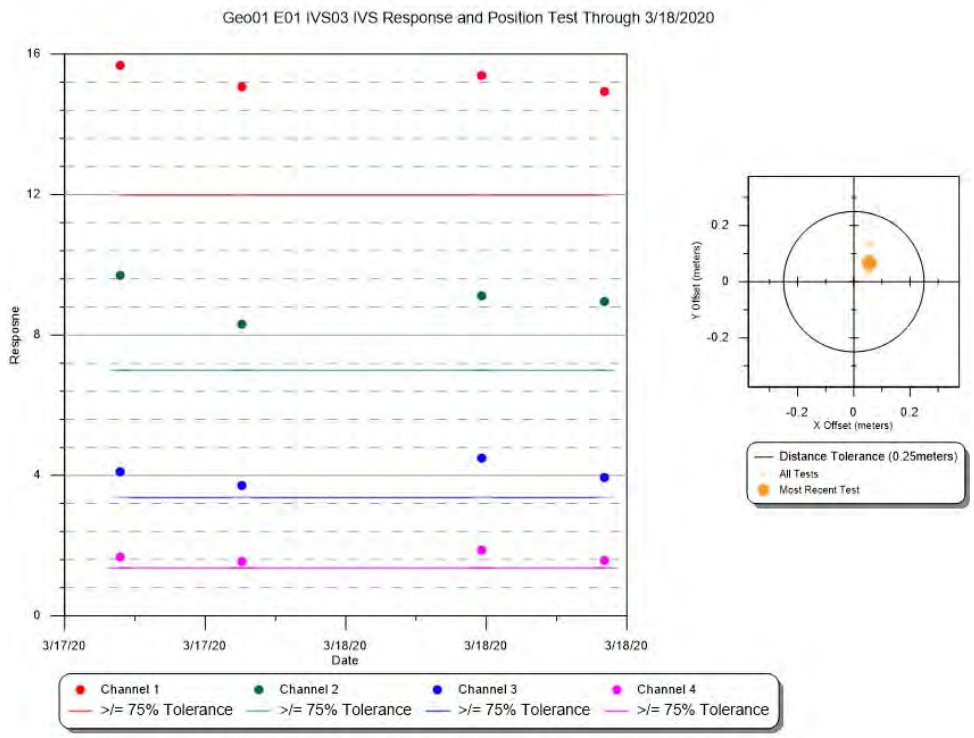
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/18/2020
Response
16
12
8
4
0
3/17/20
3/17/20
3/18/20
3/18/20
3/18/20
Date
Channel 1
>/= 75% Tolerance
Channel 2
>/= 75% Tolerance
Channel 3
>/= 75% Tolerance
Channel 4
>/= 75% Tolerance
Y Offset (meters)
0.2
0
-0.2
-0.2
0
0.2
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200318E01QC1** **QC Status:** Pass

Date: 3/18/2020 9:18:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200318E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200318E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200318E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200318E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.88	-0.06	-0.25	-0.24
Pre-Background Std Dev:	0.26	0.17	0.12	0.08
Observed Spike (mV):	268	188	111	52
Spike Mean (mV):	268.95	188.95	111.36	52.34
Spike Std Dev:	0.25	0.18	0.13	0.1
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.43	0.12	-0.43	-0.41
Post-Background Std Dev:	0.26	0.17	0.16	0.13
Calculated Spike (mV):	**267.29**	**188.92**	**111.7**	**52.66**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.76	4.35	4.74	5.05

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200318E01QC2** **QC Status:** Pass

Date: 3/18/2020 5:45:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200318E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200318E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.27	-0.13	-0.36	-0.33
Pre-Background Std Dev:	0.28	0.18	0.11	0.08
Observed Spike (mV):	0	0	0	0
Spike Mean (mV):	271.38	191.68	112.86	53.01
Spike Std Dev:	0.28	0.18	0.12	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.43	0.08	-0.22	-0.27
Post-Background Std Dev:	0.26	0.18	0.13	0.09
Calculated Spike (mV):	**271.03**	**191.7**	**113.15**	**53.31**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.19	5.89	6.09	6.34

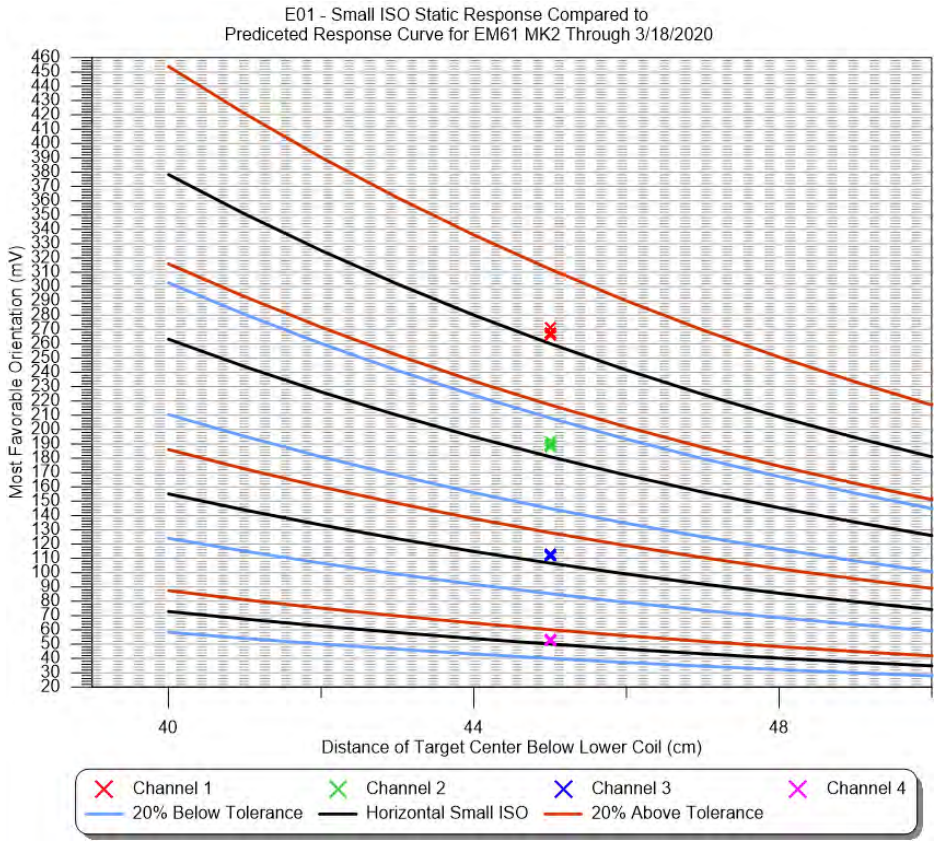
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200318GPSQC** **QC Status:** **Pass**

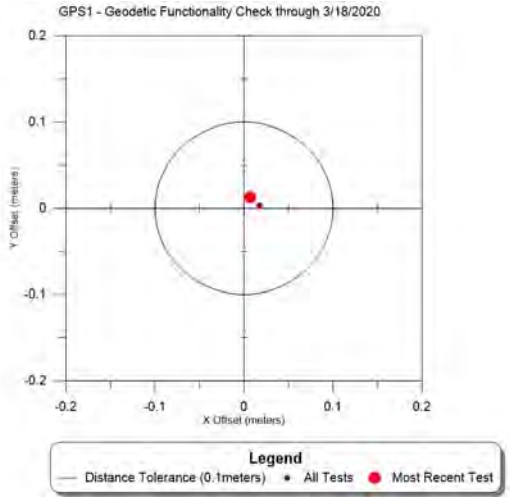
Date: 3/18/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.20	4572774.38
Actual:	585680.19	4572774.39
Offset:	0.01	0.01

Total Offset: 0.01 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/18/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200318_G01_DGM16_E01A,202018_G01_DGM24_E01A,202018_G01_DGM27_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200318_G01_DGM27_E01A **Grids Encountered:** DGM27

Collection Date: 3/18/2020 ☑ **Completed** **Start Time:** 3/18/2020 2:40:00 PM **End Time:** 3/18/2020 4:50:00 PM

Raw File Name(s): 20200318_G01_DGM27_E01A,20200318_G01_DGM27_E01AA

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

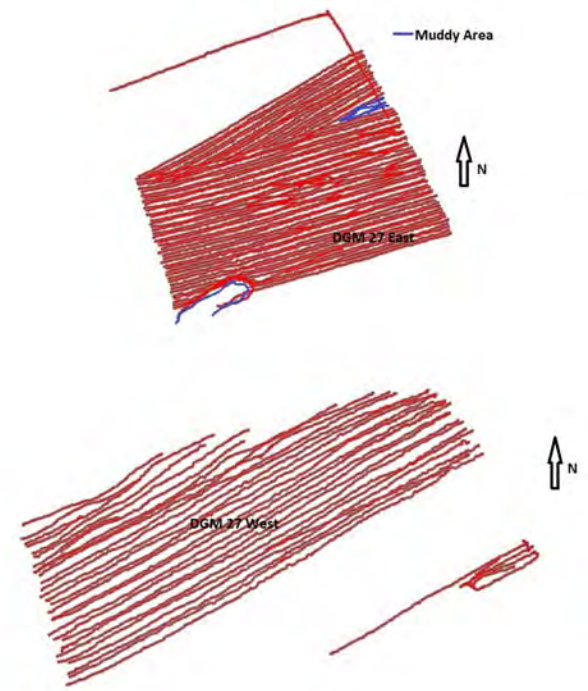
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: warm

Terrain: flat,muddy

Culture: N÷S power line near by

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/18/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200318_G01_DGM27_E01A,20200418_G01_DGM27_E01AA

Processing Information

Dataset ID: 20200318_G01_DGM27_E01A **Grids:** DGM27

Date Processed: 4/2/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-200, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200318_G01_DGM27_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200318_G01_DGM27_E01A.gdb, 20200318_G01_DGM27_E01A.gdb.xml, 20200318_G01_DGM27_E01A.map, 20200318_G01_DGM27_E01A.map.xml, 20200318_G01_DGM27_E01A.pdf, 20200318_G01_DGM27_E01A.png, 20200318_G01_DGM27_E01A.png.gi, 20200318_G01_DGM27_E01A.png.xml, 20200318_G01_DGM27_E01A.tif, 20200318_G01_DGM27_E01A.tif.gi, 20200318_G01_DGM27_E01A.tif.xml, 20200318_G01_DGM27_E01A_AGC_BKG.gdb, 20200318_G01_DGM27_E01A_AGC_BKG.gdb.xml, 20200318_G01_DGM27_E01A_Along_Track_Separation.map, 20200318_G01_DGM27_E01A_Along_Track_Separation.map.xml, 20200318_G01_DGM27_E01A_Along_Track_Separation.png, 20200318_G01_DGM27_E01A_Along_Track_Separation.png.gi, 20200318_G01_DGM27_E01A_Along_Track_Separation.png.xml, 20200318_G01_DGM27_E01A_AlongTrackSampling.txt, 20200318_G01_DGM27_E01A_Background_Ch2_Stats.txt, 20200318_G01_DGM27_E01A_Ch2_level_lg.grd, 20200318_G01_DGM27_E01A_Ch2_level_lg.grd.gi, 20200318_G01_DGM27_E01A_Ch2_level_lg.grd.xml, 20200318_G01_DGM27_E01A_Channel_2.png, 20200318_G01_DGM27_E01A_GPS_HDOP.txt, 20200318_G01_DGM27_E01A_GPS_Quality.map, 20200318_G01_DGM27_E01A_GPS_Quality.map.xml, 20200318_G01_DGM27_E01A_GPS_Quality.png, 20200318_G01_DGM27_E01A_GPS_Quality.png.gi, 20200318_G01_DGM27_E01A_GPS_Quality.png.xml, 20200318_G01_DGM27_E01A_GPS_Quality.txt, 20200318_G01_DGM27_E01A_Processed.XYZ, 20200318_G01_DGM27_E01A_Targets.gdb, 20200318_G01_DGM27_E01A_Targets.gdb.xml, 20200318_G01_DGM27_E01A_Targets.xls, 20200318_G01_DGM27_E01A_uceFootprintCov.map, 20200318_G01_DGM27_E01A_UceFootprintCov.map.xml, 20200318_G01_DGM27_E01A_uceFootprintCov.png, 20200318_G01_DGM27_E01A_UceFootprintCov.png.gi, 20200318_G01_DGM27_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Low target density grid. Culture gap due to mud.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.04 **Mean:** 0.06 **Map ID:**20200318_G01_DGM27_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 104.46 **Requirement:** 100 % **Map ID:** 20200318_G01_DGM27_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1156.64

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200318_G01_DGM27_E01A_GPS_Quality.

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.30 **DOP StDev:** 00.14 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200318E01IVS1** **QC Status:** **Pass**

Date: 3/18/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200318E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	107.95	73.50	39.36	19.29	93.23	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.07	34.23	17.09	7.78	99.01	0.18	Pass
IVS03		15.98	9.33	4.50	1.82	15.39	9.11	4.49	1.87	97.64	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 4

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1.02 **Max:** 75.87 **Std Dev:** 11.81 **Mean:** 4.59 **Number of Points:** 204

Comments:

IVS

IVS Test ID: **20200318E01IVS2** **QC Status:** **Pass**

Date: 3/18/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200318E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	116.33	80.25	44.57	21.56	101.78	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	54.98	33.95	16.47	7.29	98.19	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.93	8.96	3.95	1.59	96.01	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

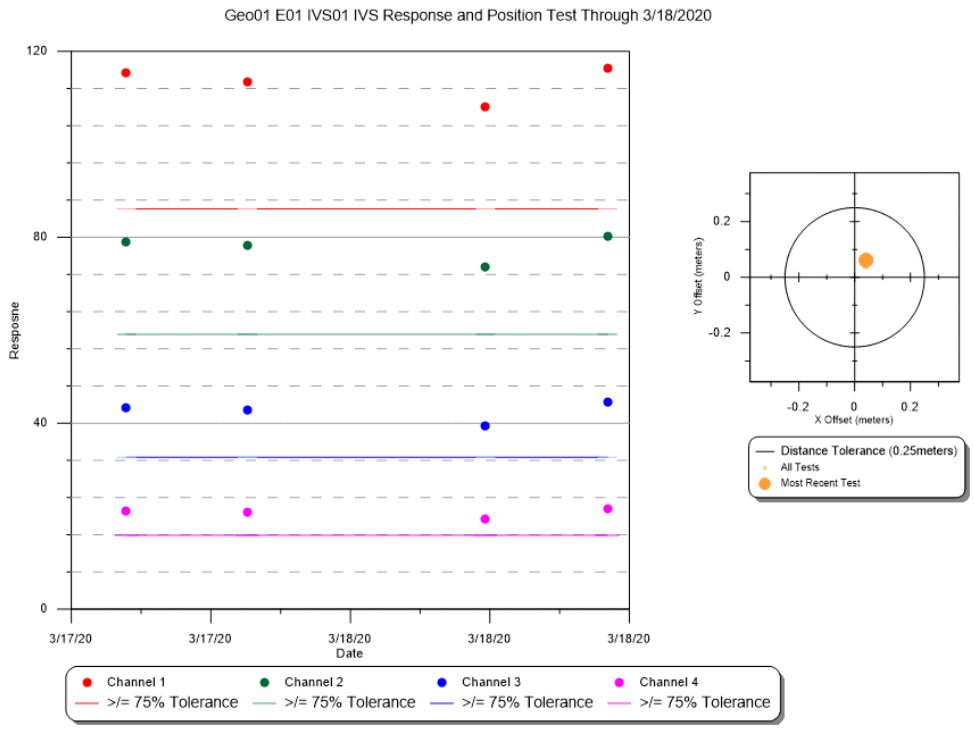
Field Comments:

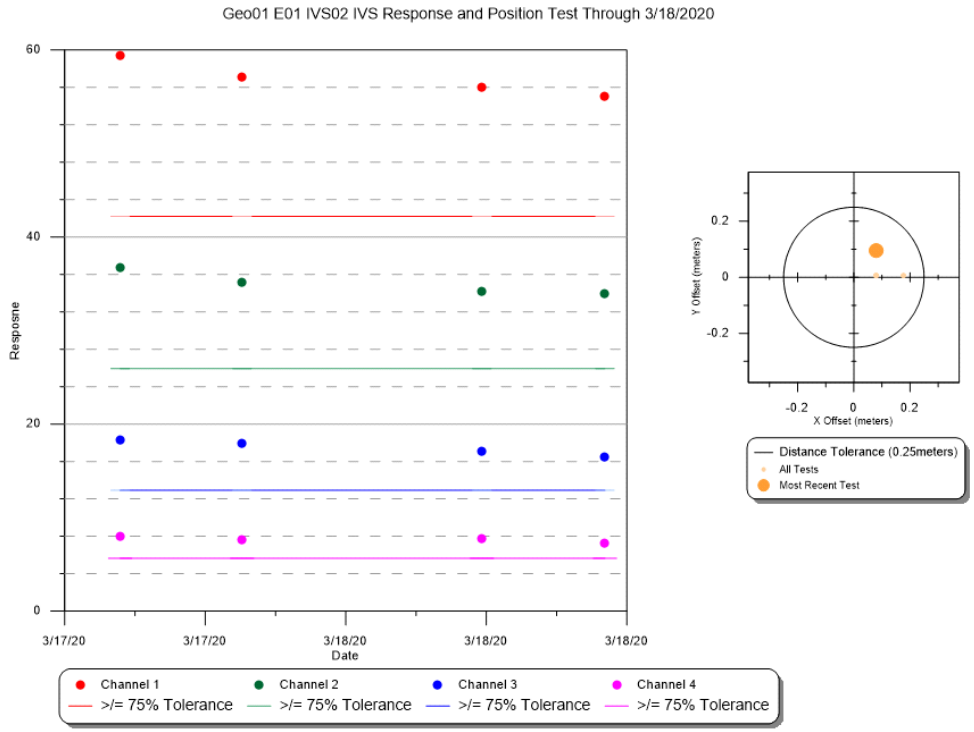
Processing Comments: Lag = 5

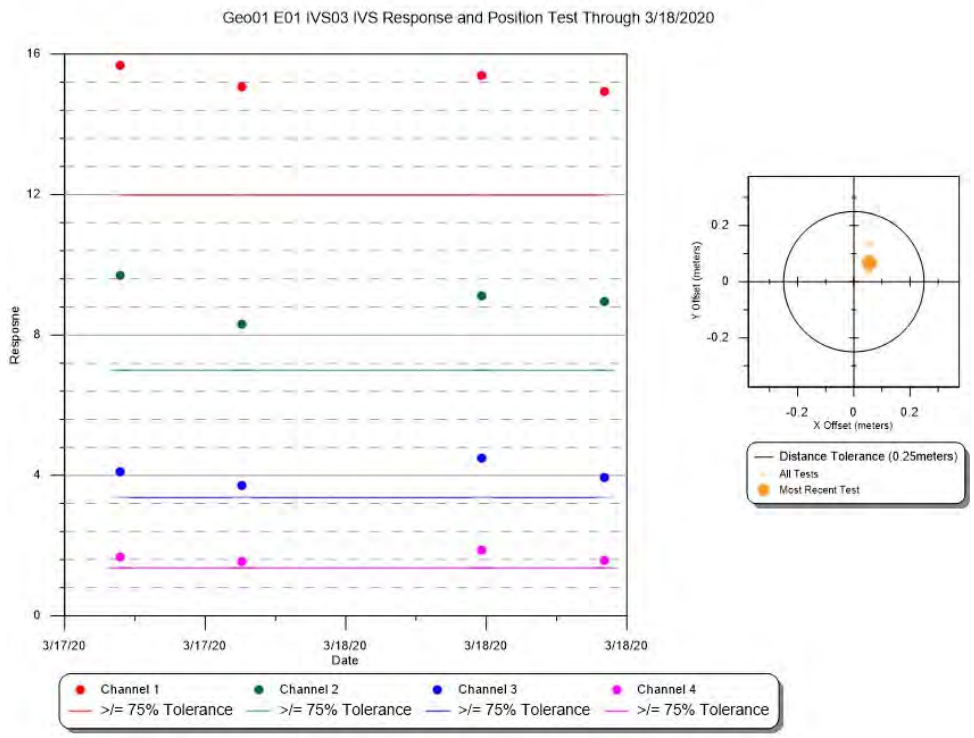
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/18/2020
Response
16
12
8
4
0
3/17/20
3/17/20
3/18/20
3/18/20
3/18/20
Date
Channel 1
>/= 75% Tolerance
Channel 2
>/= 75% Tolerance
Channel 3
>/= 75% Tolerance
Channel 4
>/= 75% Tolerance
Y Offset (meters)
0.2
0
-0.2
-0.2
0
0.2
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200318E01QC1** **QC Status:** Pass

Date: 3/18/2020 9:18:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200318E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200318E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200318E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200318E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.88	-0.06	-0.25	-0.24
Pre-Background Std Dev:	0.26	0.17	0.12	0.08
Observed Spike (mV):	268	188	111	52
Spike Mean (mV):	268.95	188.95	111.36	52.34
Spike Std Dev:	0.25	0.18	0.13	0.1
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.43	0.12	-0.43	-0.41
Post-Background Std Dev:	0.26	0.17	0.16	0.13
Calculated Spike (mV):	**267.29**	**188.92**	**111.7**	**52.66**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.76	4.35	4.74	5.05

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200318E01QC2** **QC Status:** Pass

Date: 3/18/2020 5:45:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200318E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200318E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.27	-0.13	-0.36	-0.33
Pre-Background Std Dev:	0.28	0.18	0.11	0.08
Observed Spike (mV):	0	0	0	0
Spike Mean (mV):	271.38	191.68	112.86	53.01
Spike Std Dev:	0.28	0.18	0.12	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.43	0.08	-0.22	-0.27
Post-Background Std Dev:	0.26	0.18	0.13	0.09
Calculated Spike (mV):	**271.03**	**191.7**	**113.15**	**53.31**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.19	5.89	6.09	6.34

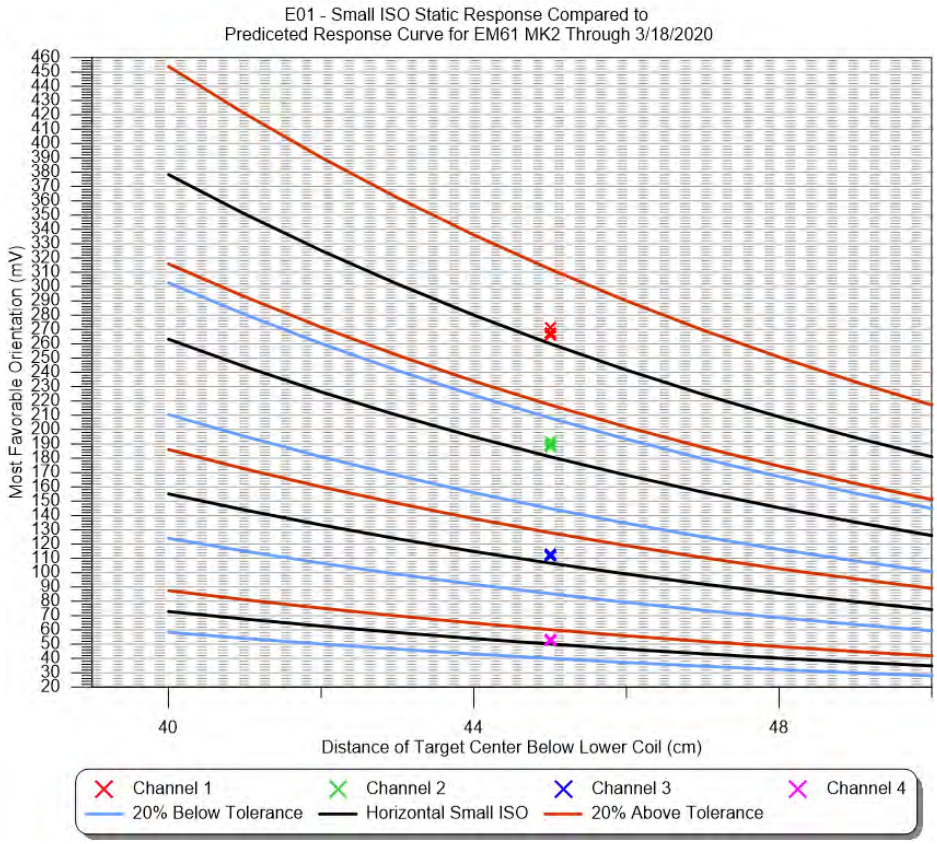
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200318GPSQC** **QC Status:** **Pass**

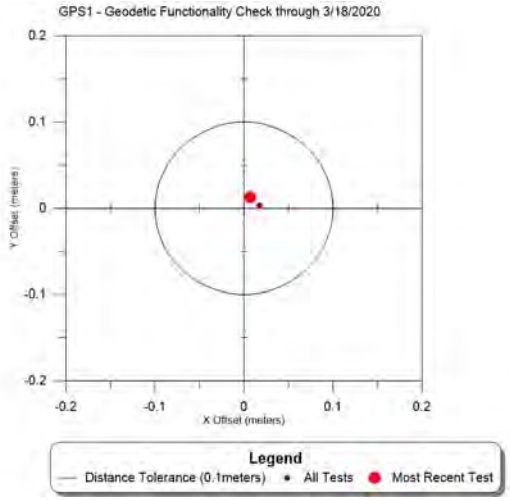
Date: 3/18/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.20	4572774.38
Actual:	585680.19	4572774.39
Offset:	0.01	0.01

Total Offset: 0.01 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/18/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200318_G01_DGM16_E01A,202018_G01_DGM24_E01A,202018_G01_DGM27_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200319_G01_DGM3_E01A **Grids Encountered:** DGM3

Collection Date: 3/19/2020 ☑ **Completed** **Start Time:** 3/19/2020 1:30:00 PM **End Time:** 3/19/2020 3:55:00 PM

Raw File Name(s): 20200319_G01_DGM3_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

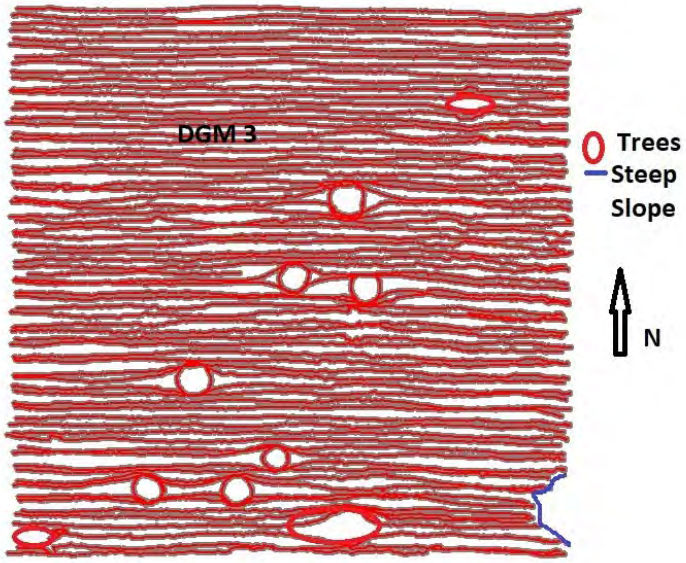
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat, rocky and steep slop at start

Culture: metal on surface on line 16

Survey Area Comments: radio off for 45min

Raw Data Editing Information

Editing Date: 3/19/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200319_G01_DGM3_E01A

Processing Information

Dataset ID: 20200319_G01_DGM3_E01A **Grids:** DGM3

Date Processed: 4/2/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-5000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200319_G01_DGM3_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200319_G01_DGM3_E01A.gdb, 20200319_G01_DGM3_E01A.gdb.xml, 20200319_G01_DGM3_E01A.map, 20200319_G01_DGM3_E01A.map.xml, 20200319_G01_DGM3_E01A.pdf, 20200319_G01_DGM3_E01A.png, 20200319_G01_DGM3_E01A.png.gi, 20200319_G01_DGM3_E01A.png.xml, 20200319_G01_DGM3_E01A.tif, 20200319_G01_DGM3_E01A.tif.gi, 20200319_G01_DGM3_E01A.tif.xml, 20200319_G01_DGM3_E01A_AGC_BKG.gdb, 20200319_G01_DGM3_E01A_AGC_BKG.gdb.xml, 20200319_G01_DGM3_E01A_Along_Track_Separation.map, 20200319_G01_DGM3_E01A_Along_Track_Separation.map.xml, 20200319_G01_DGM3_E01A_Along_Track_Separation.png, 20200319_G01_DGM3_E01A_Along_Track_Separation.png.gi, 20200319_G01_DGM3_E01A_Along_Track_Separation.png.xml, 20200319_G01_DGM3_E01A_AlongTrackSampling.txt, 20200319_G01_DGM3_E01A_Background_Ch2_Stats.txt, 20200319_G01_DGM3_E01A_Ch2_level_lg.grd, 20200319_G01_DGM3_E01A_Ch2_level_lg.grd.gi, 20200319_G01_DGM3_E01A_Ch2_level_lg.grd.xml, 20200319_G01_DGM3_E01A_GPS_HDOP.txt, 20200319_G01_DGM3_E01A_GPS_Quality.map, 20200319_G01_DGM3_E01A_GPS_Quality.map.xml, 20200319_G01_DGM3_E01A_GPS_Quality.png, 20200319_G01_DGM3_E01A_GPS_Quality.png.gi, 20200319_G01_DGM3_E01A_GPS_Quality.png.xml, 20200319_G01_DGM3_E01A_GPS_Quality.txt, 20200319_G01_DGM3_E01A_Processed.XYZ, 20200319_G01_DGM3_E01A_SRA.ply, 20200319_G01_DGM3_E01A_SRA.xls, 20200319_G01_DGM3_E01A_SRA_pg.dbf, 20200319_G01_DGM3_E01A_SRA_pg.prj, 20200319_G01_DGM3_E01A_SRA_pg.shp, 20200319_G01_DGM3_E01A_SRA_pg.shx, 20200319_G01_DGM3_E01A_Targets.gdb, 20200319_G01_DGM3_E01A_Targets.gdb.xml, 20200319_G01_DGM3_E01A_Targets.xls, 20200319_G01_DGM3_E01A_UceFootprintCov.map, 20200319_G01_DGM3_E01A_UceFootprintCov.map.xml, 20200319_G01_DGM3_E01A_UceFootprintCov.png, 20200319_G01_DGM3_E01A_UceFootprintCov.png.gi, 20200319_G01_DGM3_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Mostly saturated grid with one large SRA. Cuture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.08 **Map ID:**20200319_G01_DGM3_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 104.29 **Requirement:** 100 % **Map ID:** 20200319_G01_DGM3_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 965.23

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -2.05 **Max:** 5.43 **Std Dev:** 0.91 **Mean:** 0.12 **Number of Points:** 1350

Comments:

GPS Quality and HDOP

MapID: 20200319_G01_DGM3_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 02.60 **DOP StDev:** 00.13 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4) were deleted.
Original RTK values: min =1.00 ; max =4.00 ; standard deviation =0.20 ; percent pass =99.33 %

Daily Tests

IVS

IVS Test ID: **20200319E01IVS1** **QC Status:** **Pass**

Date: 3/19/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200319E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	116.39	80.33	45.17	21.30	101.88	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.57	34.59	16.97	7.19	100.06	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.79	8.43	3.88	1.42	90.37	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.71 **Max:** 82.3 **Std Dev:** 12.04 **Mean:** 4.52 **Number of Points:** 306

Comments:

IVS

IVS Test ID: **20200319E01IVS2** **QC Status:** **Pass**

Date: 3/19/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200319E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	108.95	74.33	39.71	19.22	94.27	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	55.89	33.50	16.61	7.12	96.90	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.98	8.13	3.56	1.23	87.14	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6

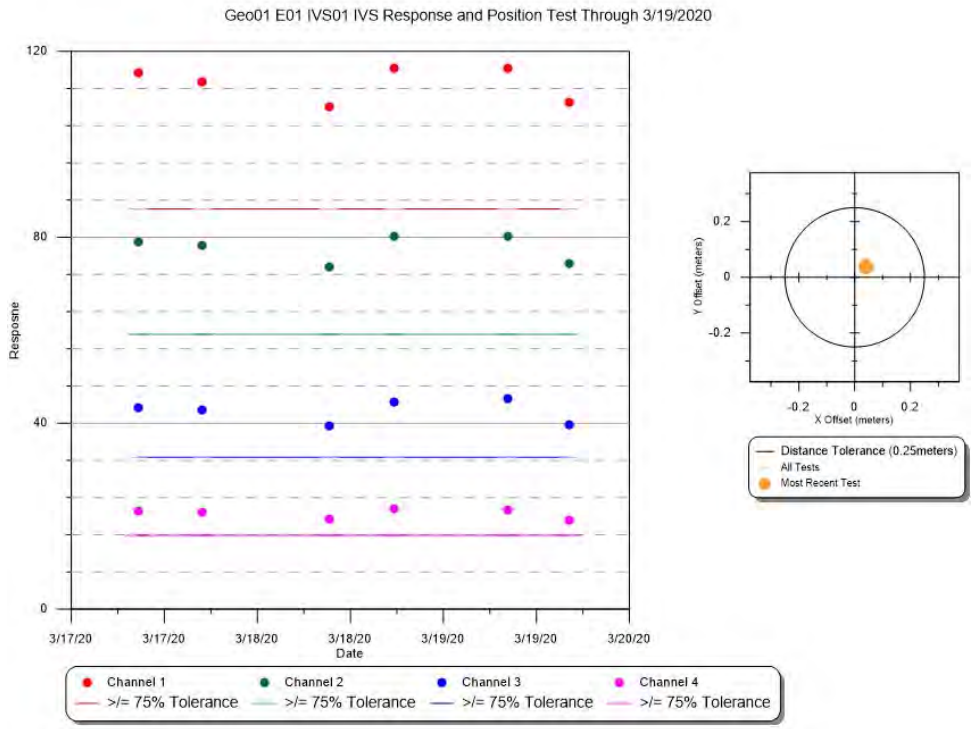
Exception Notes:

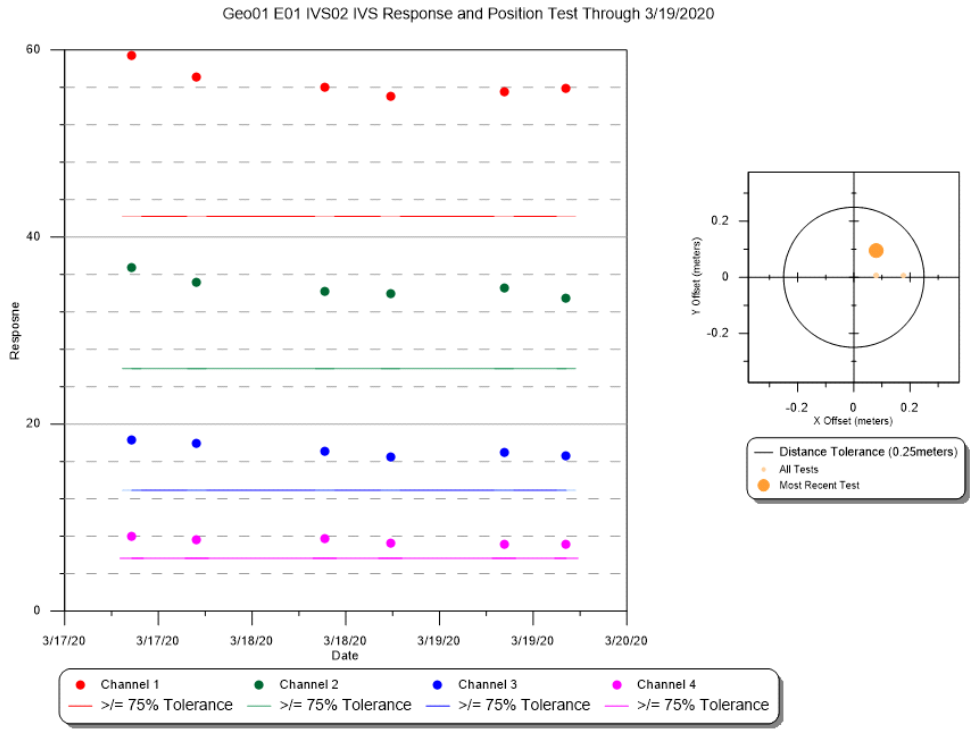
Background Noise Channel ID: Ch2_level_lg **Min:** -1.18 **Max:** 76.15 **Std Dev:** 12.19 **Mean:** 5.01 **Number of Points:** 217

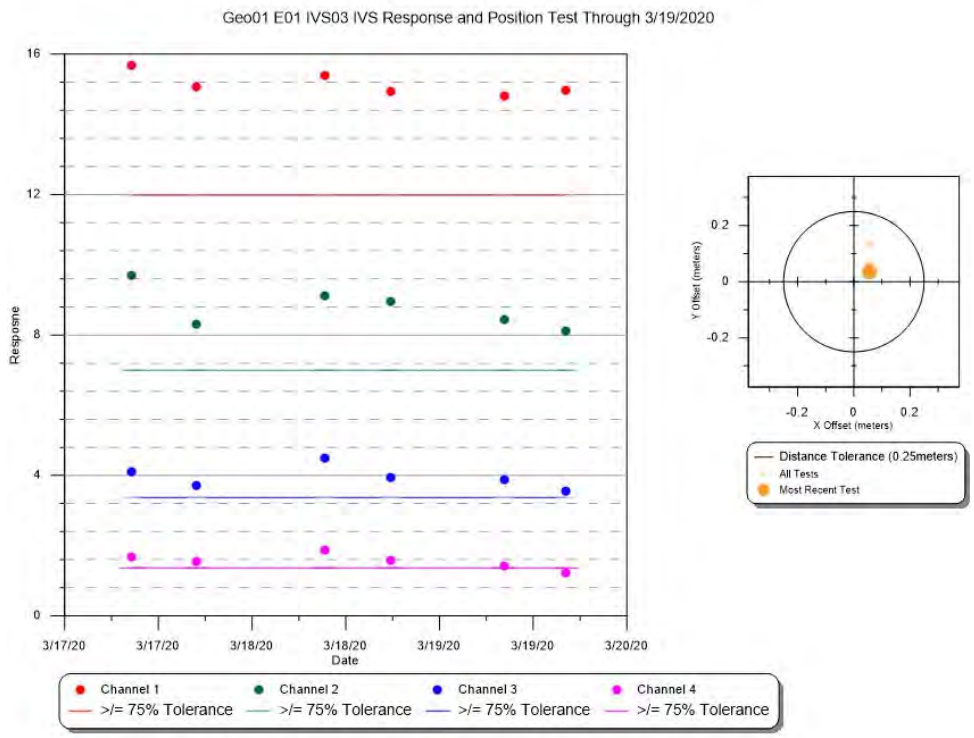
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/19/2020
Response
Date
3/17/20
3/18/20
3/19/20
3/20/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200319E01QC1** **QC Status:** Pass

Date: 3/19/2020 8:12:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200319E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200319E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	2	0	0	0
Pre-Background Mean (mV):	2.26	0.40	-0.14	-0.19
Pre-Background Std Dev:	0.37	0.19	0.13	0.09
Observed Spike (mV):	271	190	113	53
Spike Mean (mV):	271.43	191.44	113.25	53.6
Spike Std Dev:	0.35	0.39	0.32	0.16
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.65	-0.01	-0.33	-0.17
Post-Background Std Dev:	0.37	0.19	0.14	0.09
Calculated Spike (mV):	**269.475**	**191.245**	**113.485**	**53.78**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.60	5.64	6.41	7.28

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200319E01QC2** **QC Status:** Pass

Date: 3/19/2020 4:13:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200319E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200319E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	-0.01	-0.04	-0.14	-0.12
Pre-Background Std Dev:	0.28	0.19	0.14	0.11
Observed Spike (mV):	269	191	112	53
Spike Mean (mV):	270.28	191.3	112.92	53.24
Spike Std Dev:	0.27	0.17	0.14	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	-0.01	-0.11	-0.19	-0.16
Post-Background Std Dev:	0.24	0.17	0.11	0.1
Calculated Spike (mV):	**270.29**	**191.375**	**113.085**	**53.38**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.91	5.71	6.03	6.48

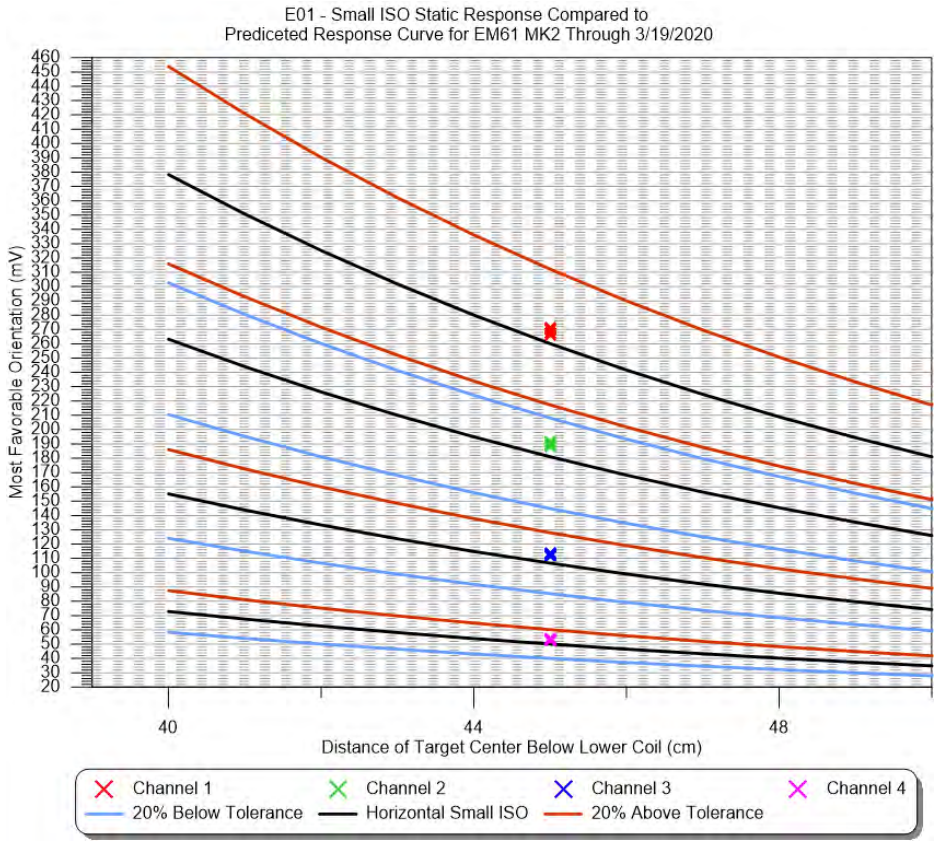
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200319GPSQC** **QC Status:** **Pass**

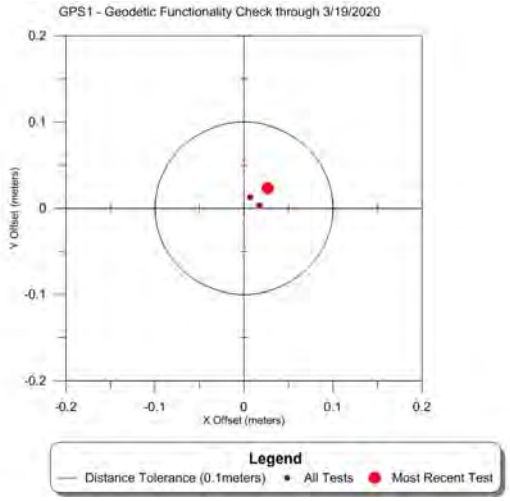
Date: 3/19/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.37
Actual:	585680.19	4572774.39
Offset:	0.03	0.02

Total Offset: 0.04 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/19/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200319_G01_DGM3_E01A,202019_G01_DGM12_E01A,202019_G01_DGM19_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

45 min Gps radio shut off

Collection, Processing and Data Quality Report

Dataset ID: 20200319_G01_DGM12_E01A **Grids Encountered:** DGM12

Collection Date: 3/19/2020 ☑ **Completed** **Start Time:** 3/19/2020 9:21:00 AM **End Time:** 3/19/2020 10:25:00 AM

Raw File Name(s): 20200319_G01_DGM12_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

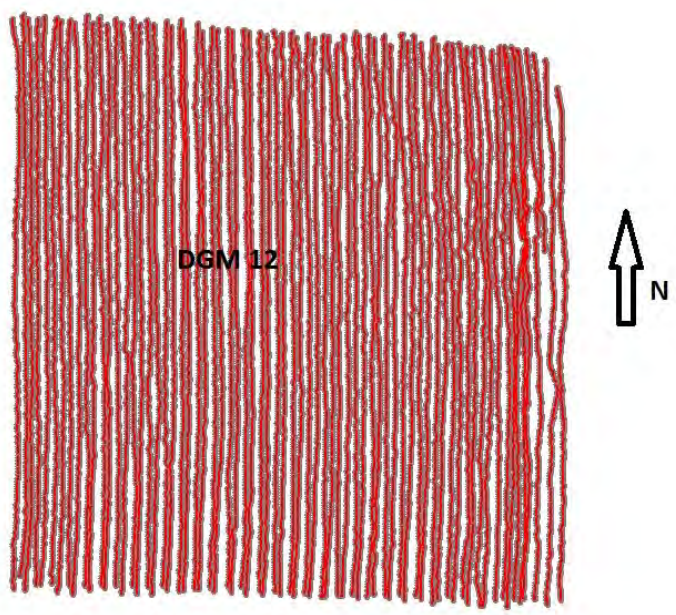
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat,slopy to NE

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/19/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200319_G01_DGM12_E01A

Processing Information

Dataset ID: 20200319_G01_DGM12_E01A **Grids:** DGM12

Date Processed: 4/3/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200319_G01_DGM12_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200319_G01_DGM12_E01A.gdb, 20200319_G01_DGM12_E01A.gdb.xml, 20200319_G01_DGM12_E01A.map, 20200319_G01_DGM12_E01A.map.xml, 20200319_G01_DGM12_E01A.pdf, 20200319_G01_DGM12_E01A.png, 20200319_G01_DGM12_E01A.png.gi, 20200319_G01_DGM12_E01A.png.xml, 20200319_G01_DGM12_E01A_AGC_BKG.gdb, 20200319_G01_DGM12_E01A_AGC_BKG.gdb.xml, 20200319_G01_DGM12_E01A_Along_Track_Separation.map, 20200319_G01_DGM12_E01A_Along_Track_Separation.map.xml, 20200319_G01_DGM12_E01A_Along_Track_Separation.png, 20200319_G01_DGM12_E01A_Along_Track_Separation.png.gi, 20200319_G01_DGM12_E01A_Along_Track_Separation.png.xml, 20200319_G01_DGM12_E01A_Background_Ch2_Stats.txt, 20200319_G01_DGM12_E01A_Ch2_level_lg.grd, 20200319_G01_DGM12_E01A_Ch2_level_lg.grd.gi, 20200319_G01_DGM12_E01A_Ch2_level_lg.grd.xml, 20200319_G01_DGM12_E01A_GPS_HDOP.txt, 20200319_G01_DGM12_E01A_GPS_Quality.map, 20200319_G01_DGM12_E01A_GPS_Quality.map.xml, 20200319_G01_DGM12_E01A_GPS_Quality.png, 20200319_G01_DGM12_E01A_GPS_Quality.png.gi, 20200319_G01_DGM12_E01A_GPS_Quality.png.xml, 20200319_G01_DGM12_E01A_GPS_Quality.txt, 20200319_G01_DGM12_E01A_Processed.XYZ, 20200319_G01_DGM12_E01A_Targets.gdb, 20200319_G01_DGM12_E01A_Targets.gdb.xml, 20200319_G01_DGM12_E01A_Targets.xls, 20200319_G01_DGM12_E01A_UceFootprintCov.map, 20200319_G01_DGM12_E01A_UceFootprintCov.map.xml, 20200319_G01_DGM12_E01A_UceFootprintCov.png, 20200319_G01_DGM12_E01A_UceFootprintCov.png.gi, 20200319_G01_DGM12_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Medium-high target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.09 **Map ID:**20200319_G01_DGM12_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 110.26 **Requirement:** 100 % **Map ID:** 20200319_G01_DGM12_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 994.48

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200319_G01_DGM12_E01A_GPS_Quality.

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.50 **DOP StDev:** 00.10 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200319E01IVS1** **QC Status:** **Pass**

Date: 3/19/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200319E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	116.39	80.33	45.17	21.30	101.88	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.57	34.59	16.97	7.19	100.06	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.79	8.43	3.88	1.42	90.37	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.71 **Max:** 82.3 **Std Dev:** 12.04 **Mean:** 4.52 **Number of Points:** 306

Comments:

IVS

IVS Test ID: **20200319E01IVS2** **QC Status:** **Pass**

Date: 3/19/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200319E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	108.95	74.33	39.71	19.22	94.27	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	55.89	33.50	16.61	7.12	96.90	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.98	8.13	3.56	1.23	87.14	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6

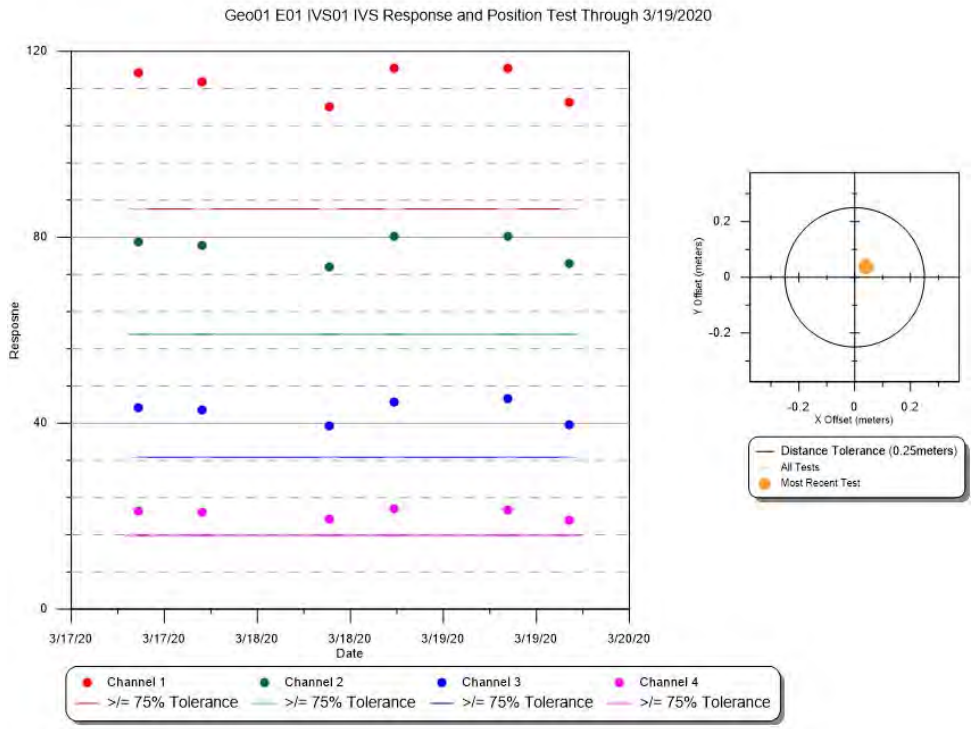
Exception Notes:

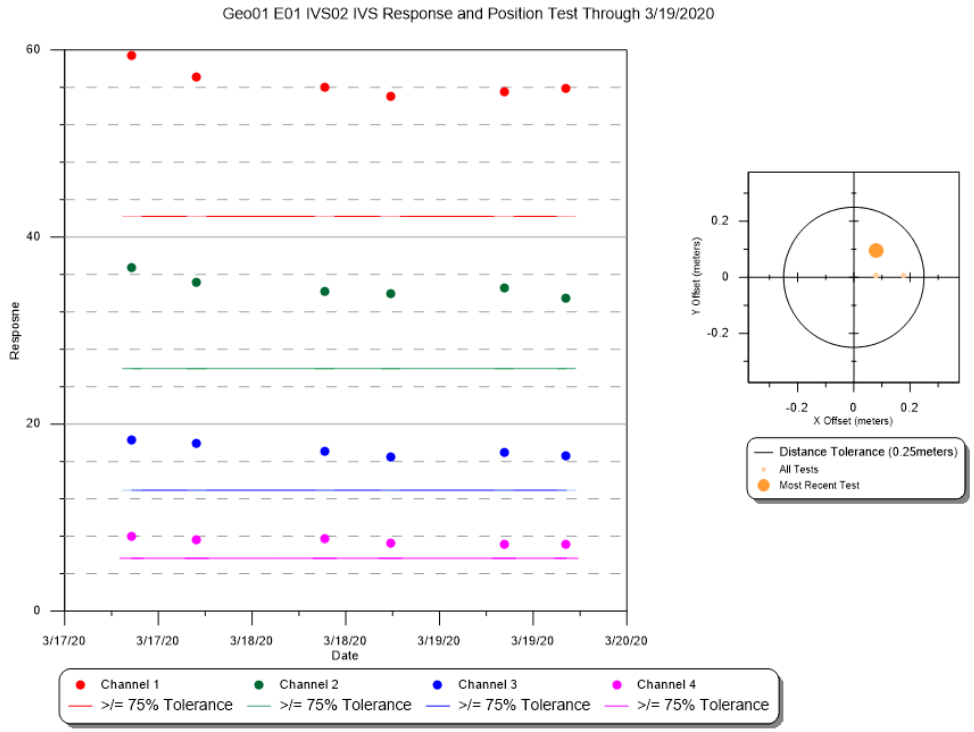
Background Noise Channel ID: Ch2_level_lg **Min:** -1.18 **Max:** 76.15 **Std Dev:** 12.19 **Mean:** 5.01 **Number of Points:** 217

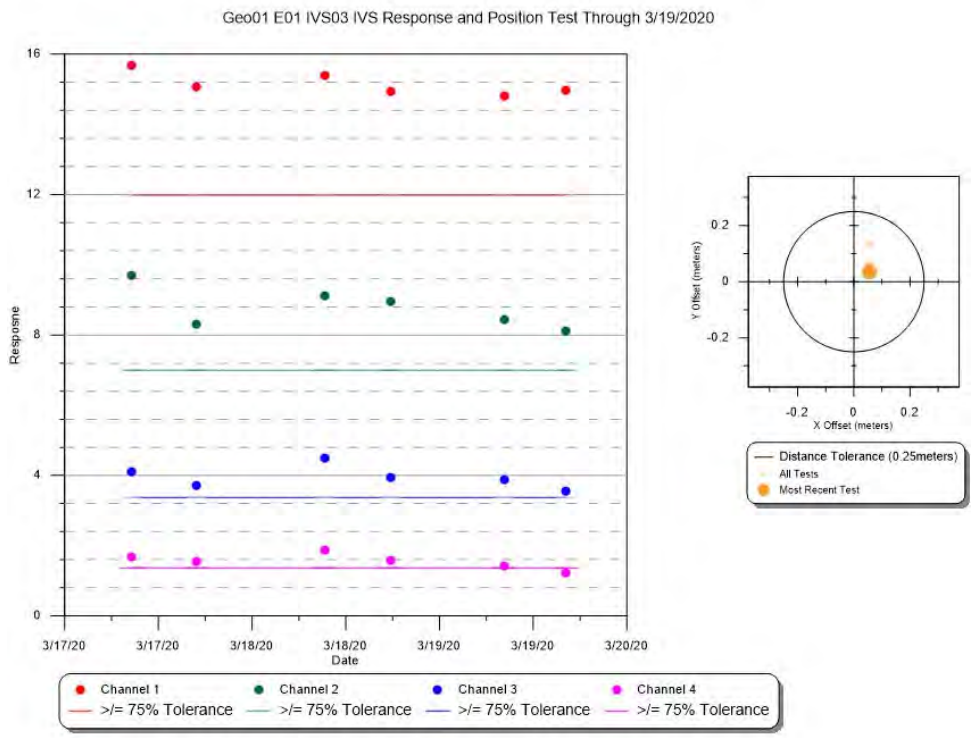
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/19/2020
Response
Date
3/17/20
3/18/20
3/19/20
3/20/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200319E01QC1** **QC Status:** Pass

Date: 3/19/2020 8:12:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200319E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200319E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	2	0	0	0
Pre-Background Mean (mV):	2.26	0.40	-0.14	-0.19
Pre-Background Std Dev:	0.37	0.19	0.13	0.09
Observed Spike (mV):	271	190	113	53
Spike Mean (mV):	271.43	191.44	113.25	53.6
Spike Std Dev:	0.35	0.39	0.32	0.16
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.65	-0.01	-0.33	-0.17
Post-Background Std Dev:	0.37	0.19	0.14	0.09
Calculated Spike (mV):	**269.475**	**191.245**	**113.485**	**53.78**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.60	5.64	6.41	7.28

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200319E01QC2** **QC Status:** Pass

Date: 3/19/2020 4:13:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200319E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200319E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	-0.01	-0.04	-0.14	-0.12
Pre-Background Std Dev:	0.28	0.19	0.14	0.11
Observed Spike (mV):	269	191	112	53
Spike Mean (mV):	270.28	191.3	112.92	53.24
Spike Std Dev:	0.27	0.17	0.14	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	-0.01	-0.11	-0.19	-0.16
Post-Background Std Dev:	0.24	0.17	0.11	0.1
Calculated Spike (mV):	**270.29**	**191.375**	**113.085**	**53.38**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.91	5.71	6.03	6.48

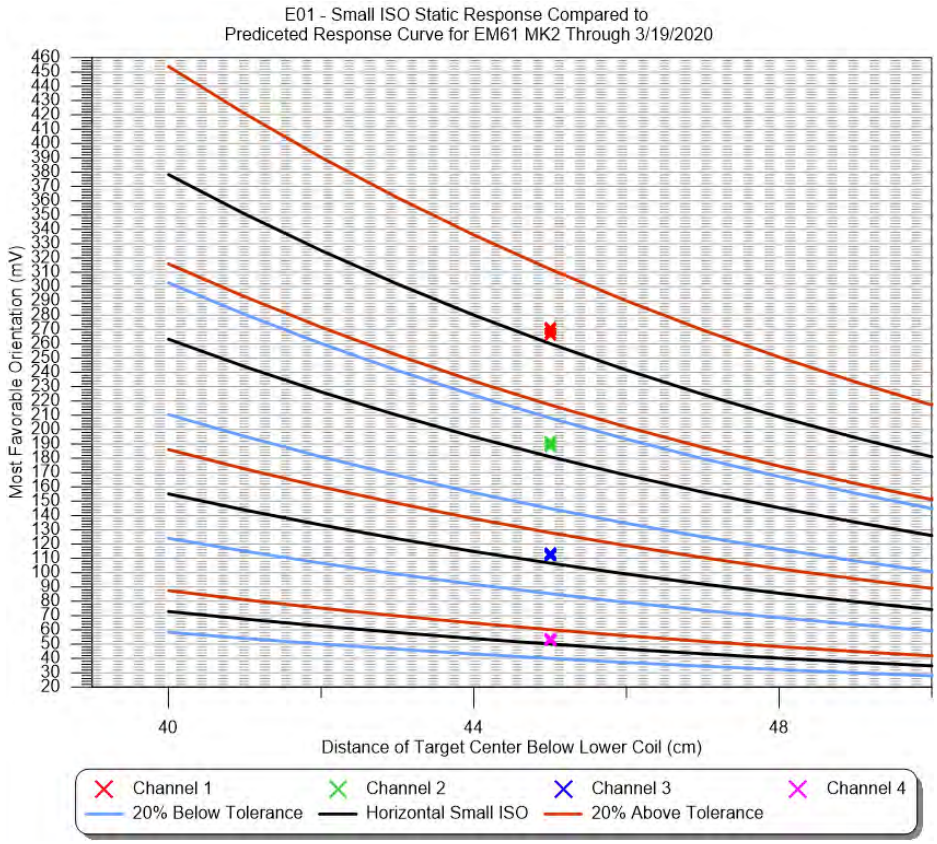
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200319GPSQC** **QC Status:** **Pass**

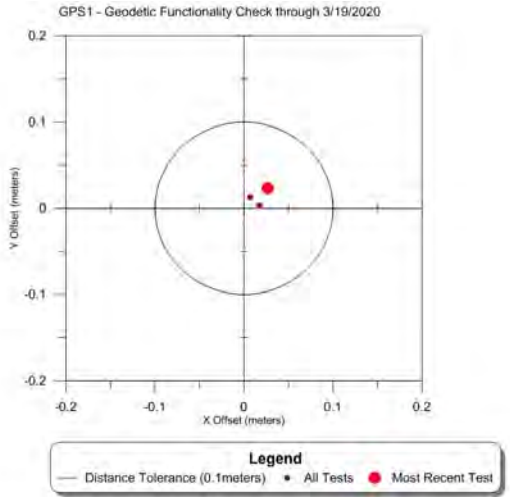
Date: 3/19/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.37
Actual:	585680.19	4572774.39
Offset:	0.03	0.02

Total Offset: 0.04 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/19/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200319_G01_DGM3_E01A,202019_G01_DGM12_E01A,202019_G01_DGM19_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

45 min Gps radio shut off

Collection, Processing and Data Quality Report

Dataset ID: 20200319_G01_DGM19_E01A **Grids Encountered:** DGM19

Collection Date: 3/19/2020 ☑ **Completed** **Start Time:** 3/19/2020 11:36:00 AM **End Time:** 3/19/2020 1:11:00 PM

Raw File Name(s): 20200319_G01_DGM19_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.15

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

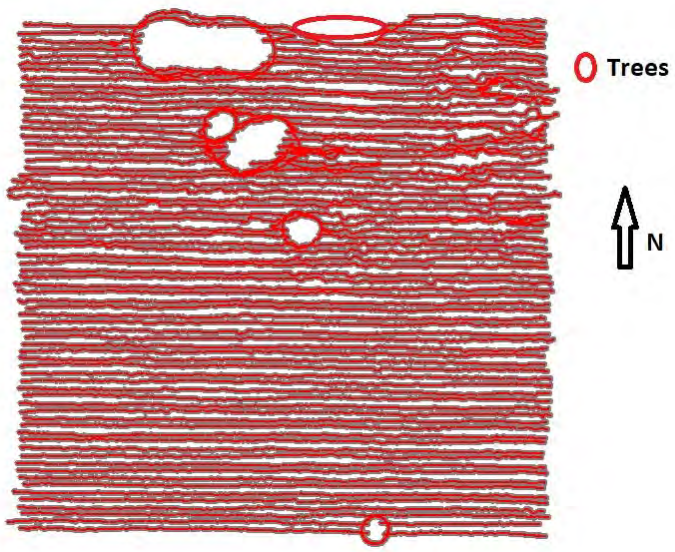
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat,rocky

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/19/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200319_G01_DGM19_E01A

Processing Information

Dataset ID: 20200319_G01_DGM19_E01A **Grids:** DGM19

Date Processed: 4/3/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-8000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200319_G01_DGM19_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200319_G01_DGM19_E01A.gdb, 20200319_G01_DGM19_E01A.gdb.xml, 20200319_G01_DGM19_E01A.map, 20200319_G01_DGM19_E01A.map.xml, 20200319_G01_DGM19_E01A.pdf, 20200319_G01_DGM19_E01A.png, 20200319_G01_DGM19_E01A.png.gi, 20200319_G01_DGM19_E01A.png.xml, 20200319_G01_DGM19_E01A.tif, 20200319_G01_DGM19_E01A.tif.gi, 20200319_G01_DGM19_E01A.tif.xml, 20200319_G01_DGM19_E01A_AGC_BKG.gdb, 20200319_G01_DGM19_E01A_AGC_BKG.gdb.xml, 20200319_G01_DGM19_E01A_Along_Track_Separation.map, 20200319_G01_DGM19_E01A_Along_Track_Separation.map.xml, 20200319_G01_DGM19_E01A_Along_Track_Separation.png, 20200319_G01_DGM19_E01A_Along_Track_Separation.png.gi, 20200319_G01_DGM19_E01A_Along_Track_Separation.png.xml, 20200319_G01_DGM19_E01A_Background_Ch2_Stats.txt, 20200319_G01_DGM19_E01A_Ch2_level_lg.grd, 20200319_G01_DGM19_E01A_Ch2_level_lg.grd.gi, 20200319_G01_DGM19_E01A_Ch2_level_lg.grd.xml, 20200319_G01_DGM19_E01A_GPS_HDOP.txt, 20200319_G01_DGM19_E01A_GPS_Quality.map, 20200319_G01_DGM19_E01A_GPS_Quality.map.xml, 20200319_G01_DGM19_E01A_GPS_Quality.png, 20200319_G01_DGM19_E01A_GPS_Quality.png.gi, 20200319_G01_DGM19_E01A_GPS_Quality.png.xml, 20200319_G01_DGM19_E01A_GPS_Quality.txt, 20200319_G01_DGM19_E01A_Processed.XYZ, 20200319_G01_DGM19_E01A_SRA.ply, 20200319_G01_DGM19_E01A_SRA.xls, 20200319_G01_DGM19_E01A_SRA_pg.dbf, 20200319_G01_DGM19_E01A_SRA_pg.prj, 20200319_G01_DGM19_E01A_SRA_pg.shp, 20200319_G01_DGM19_E01A_SRA_pg.shx, 20200319_G01_DGM19_E01A_Targets.gdb, 20200319_G01_DGM19_E01A_Targets.gdb.xml, 20200319_G01_DGM19_E01A_Targets.xls, 20200319_G01_DGM19_E01A_UceFootprintCov.map, 20200319_G01_DGM19_E01A_UceFootprintCov.map.xml, 20200319_G01_DGM19_E01A_UceFootprintCov.png, 20200319_G01_DGM19_E01A_UceFootprintCov.png.gi, 20200319_G01_DGM19_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

High density grid with three SRAs designated. Culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.04 **Mean:** 0.06 **Map ID:**20200319_G01_DGM19_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 107.68 **Requirement:** 100 % **Map ID:** 20200319_G01_DGM19_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1003.45

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -4.77 **Max:** 5.96 **Std Dev:** 1.43 **Mean:** 0.19 **Number of Points:** 1822

Comments:

GPS Quality and HDOP

MapID: 20200319_G01_DGM19_E01A_GPS_Quality.

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 03.20 **DOP StDev:** 00.18 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200319E01IVS1** **QC Status:** **Pass**

Date: 3/19/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200319E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	116.39	80.33	45.17	21.30	101.88	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.57	34.59	16.97	7.19	100.06	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.79	8.43	3.88	1.42	90.37	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.71 **Max:** 82.3 **Std Dev:** 12.04 **Mean:** 4.52 **Number of Points:** 306

Comments:

IVS

IVS Test ID: **20200319E01IVS2** **QC Status:** **Pass**

Date: 3/19/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200319E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	108.95	74.33	39.71	19.22	94.27	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	55.89	33.50	16.61	7.12	96.90	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.98	8.13	3.56	1.23	87.14	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6

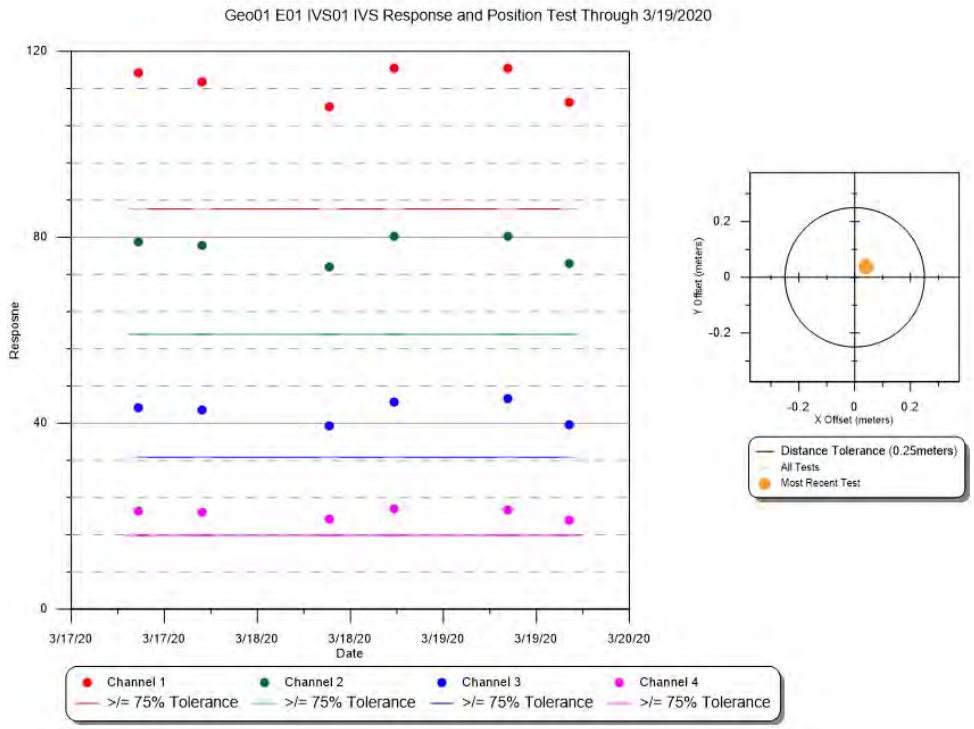
Exception Notes:

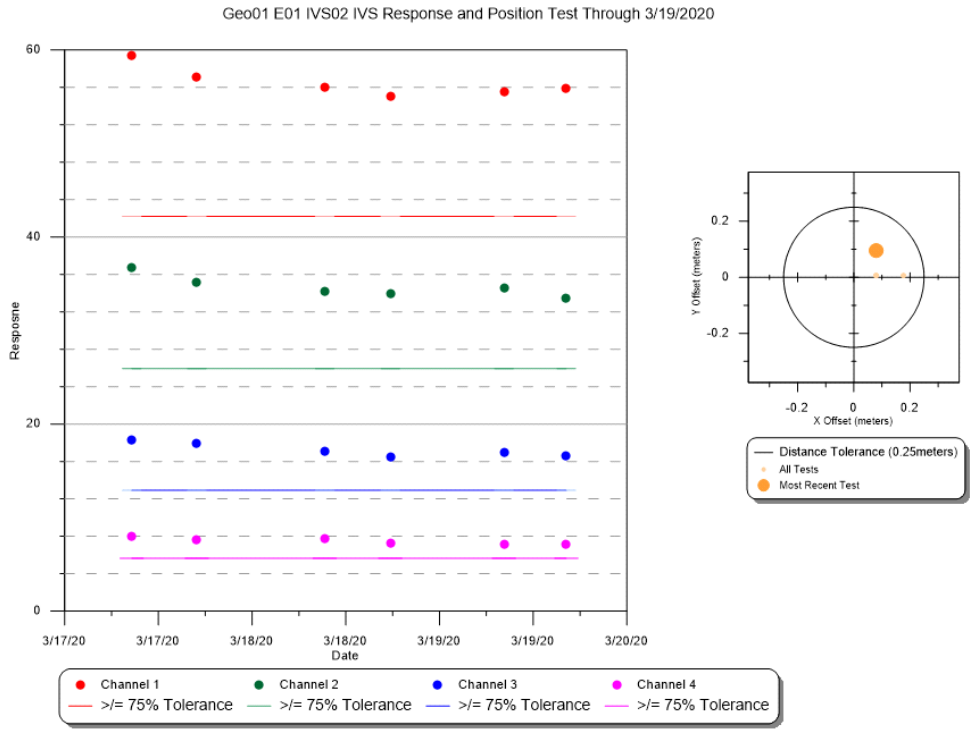
Background Noise Channel ID: Ch2_level_lg **Min:** -1.18 **Max:** 76.15 **Std Dev:** 12.19 **Mean:** 5.01 **Number of Points:** 217

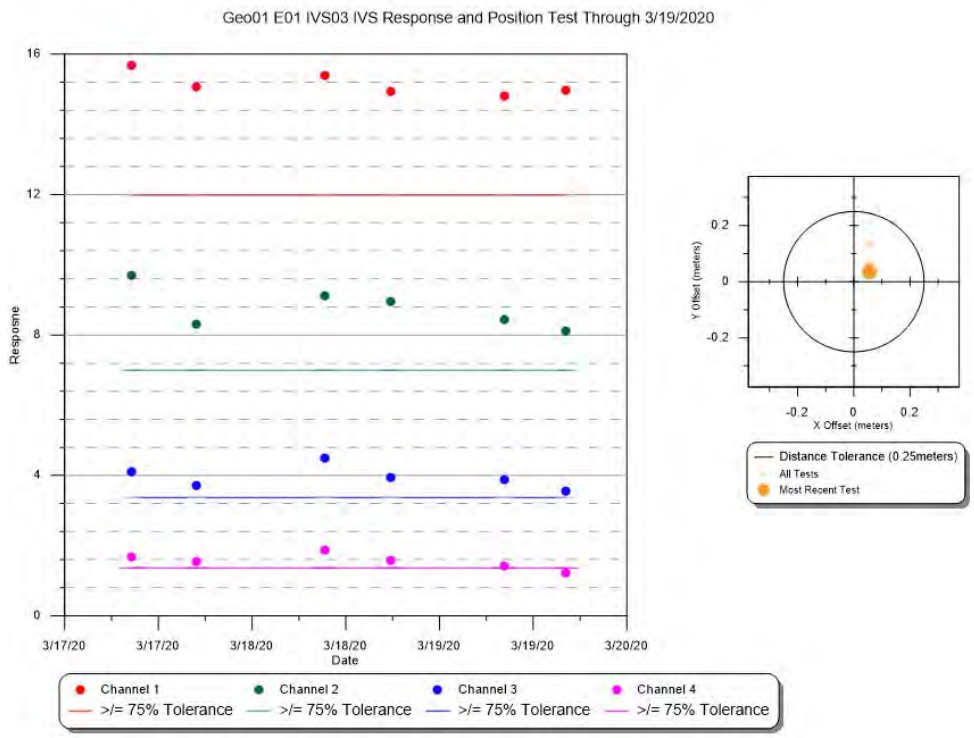
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/19/2020
Response
16
12
8
4
0
3/17/20
3/17/20
3/18/20
3/18/20
3/19/20
3/19/20
3/20/20
Date
Channel 1
>/= 75% Tolerance
Channel 2
>/= 75% Tolerance
Channel 3
>/= 75% Tolerance
Channel 4
>/= 75% Tolerance
Y Offset (meters)
0.2
0
-0.2
-0.2
0
0.2
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200319E01QC1** **QC Status:** Pass

Date: 3/19/2020 8:12:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200319E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200319E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	2	0	0	0
Pre-Background Mean (mV):	2.26	0.40	-0.14	-0.19
Pre-Background Std Dev:	0.37	0.19	0.13	0.09
Observed Spike (mV):	271	190	113	53
Spike Mean (mV):	271.43	191.44	113.25	53.6
Spike Std Dev:	0.35	0.39	0.32	0.16
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.65	-0.01	-0.33	-0.17
Post-Background Std Dev:	0.37	0.19	0.14	0.09
Calculated Spike (mV):	**269.475**	**191.245**	**113.485**	**53.78**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.60	5.64	6.41	7.28

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200319E01QC2** **QC Status:** Pass

Date: 3/19/2020 4:13:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200319E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200319E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	-0.01	-0.04	-0.14	-0.12
Pre-Background Std Dev:	0.28	0.19	0.14	0.11
Observed Spike (mV):	269	191	112	53
Spike Mean (mV):	270.28	191.3	112.92	53.24
Spike Std Dev:	0.27	0.17	0.14	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	-0.01	-0.11	-0.19	-0.16
Post-Background Std Dev:	0.24	0.17	0.11	0.1
Calculated Spike (mV):	**270.29**	**191.375**	**113.085**	**53.38**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.91	5.71	6.03	6.48

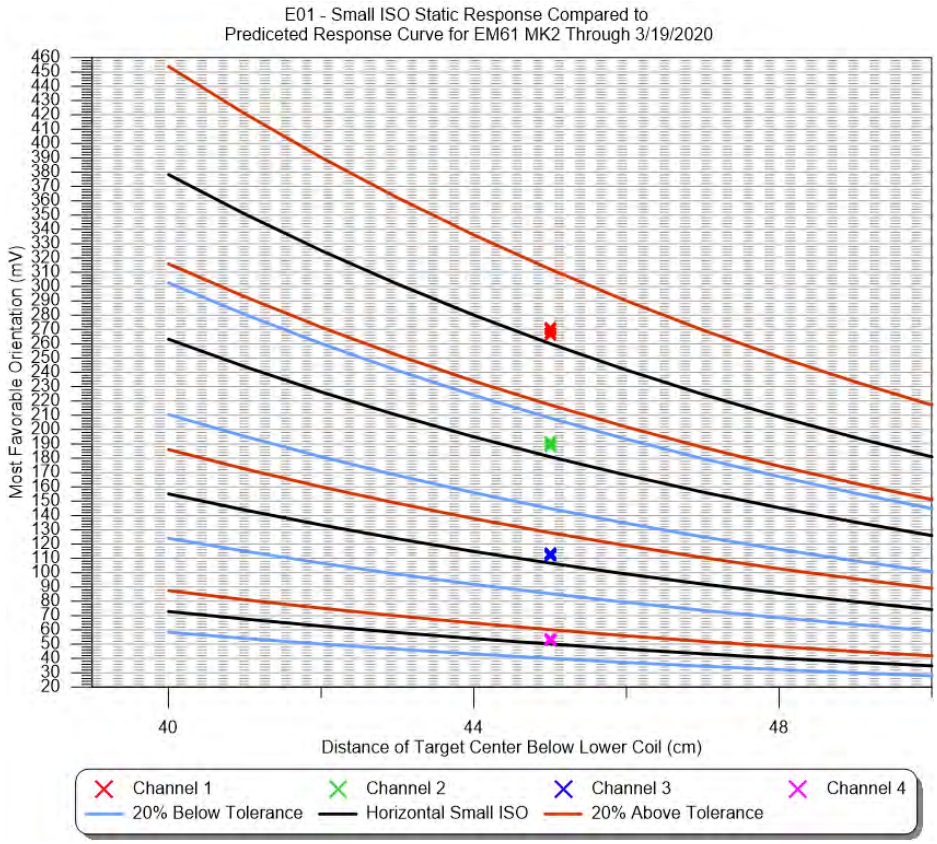
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200319GPSQC** **QC Status:** **Pass**

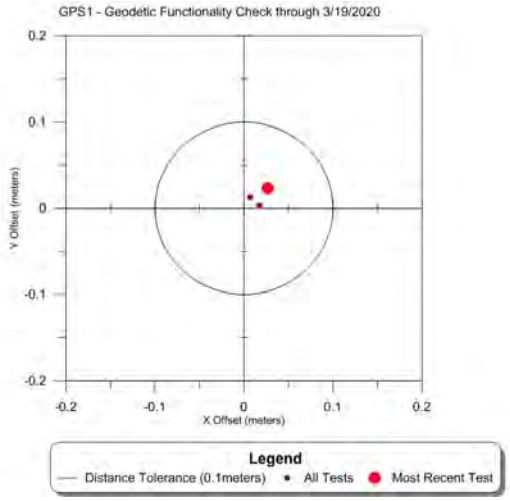
Date: 3/19/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.37
Actual:	585680.19	4572774.39
Offset:	0.03	0.02

Total Offset: 0.04 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/19/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200319_G01_DGM3_E01A,202019_G01_DGM12_E01A,202019_G01_DGM19_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

45 min Gps radio shut off

Collection, Processing and Data Quality Report

Dataset ID: 20200320_G01_DGM2_E01A **Grids Encountered:** DGM2

Collection Date: 3/20/2020 ☑ **Completed** **Start Time:** 3/20/2020 9:20:00 AM **End Time:** 3/20/2020 10:26:00 AM

Raw File Name(s): 20200320_G01_DGM2_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

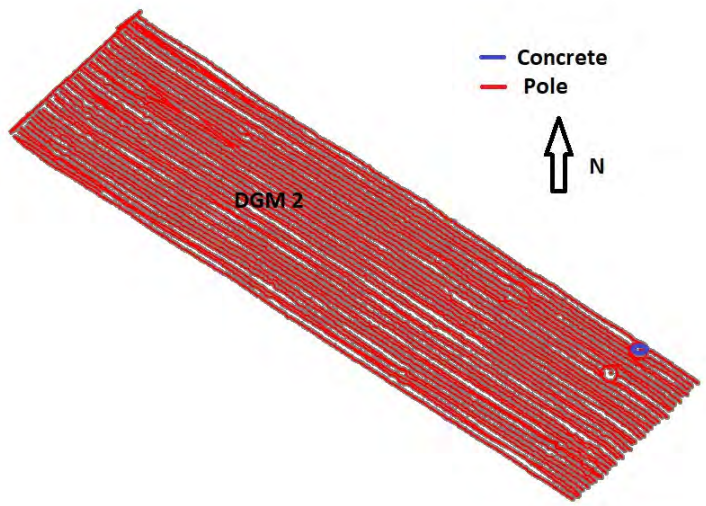
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat

Culture: metal pole

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/20/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200320_G01_DGM2_E01A

Processing Information

Dataset ID: 20200320_G01_DGM2_E01A **Grids:** DGM2

Date Processed: 4/6/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-6000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200320_G01_DGM2_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200320_G01_DGM2_E01A.gdb, 20200320_G01_DGM2_E01A.gdb.xml, 20200320_G01_DGM2_E01A.map, 20200320_G01_DGM2_E01A.map.xml, 20200320_G01_DGM2_E01A.pdf, 20200320_G01_DGM2_E01A.png, 20200320_G01_DGM2_E01A.png.gi, 20200320_G01_DGM2_E01A.png.xml, 20200320_G01_DGM2_E01A.tif, 20200320_G01_DGM2_E01A.tif.gi, 20200320_G01_DGM2_E01A.tif.xml, 20200320_G01_DGM2_E01A_AGC_BKG.gdb, 20200320_G01_DGM2_E01A_AGC_BKG.gdb.xml, 20200320_G01_DGM2_E01A_Along_Track_Separation.map, 20200320_G01_DGM2_E01A_Along_Track_Separation.map.xml, 20200320_G01_DGM2_E01A_Along_Track_Separation.png, 20200320_G01_DGM2_E01A_Along_Track_Separation.png.gi, 20200320_G01_DGM2_E01A_Along_Track_Separation.png.xml, 20200320_G01_DGM2_E01A_Background_Ch2_Stats.txt, 20200320_G01_DGM2_E01A_Ch2_level_lg.grd, 20200320_G01_DGM2_E01A_Ch2_level_lg.grd.gi, 20200320_G01_DGM2_E01A_Ch2_level_lg.grd.xml, 20200320_G01_DGM2_E01A_Culture.ply, 20200320_G01_DGM2_E01A_Culture.xls, 20200320_G01_DGM2_E01A_Culture_pg.dbf, 20200320_G01_DGM2_E01A_Culture_pg.prj, 20200320_G01_DGM2_E01A_Culture_pg.shp, 20200320_G01_DGM2_E01A_Culture_pg.shx, 20200320_G01_DGM2_E01A_GPS_HDOP.txt, 20200320_G01_DGM2_E01A_GPS_Quality.map, 20200320_G01_DGM2_E01A_GPS_Quality.map.xml, 20200320_G01_DGM2_E01A_GPS_Quality.png, 20200320_G01_DGM2_E01A_GPS_Quality.png.gi, 20200320_G01_DGM2_E01A_GPS_Quality.png.xml, 20200320_G01_DGM2_E01A_GPS_Quality.txt, 20200320_G01_DGM2_E01A_Processed.XYZ, 20200320_G01_DGM2_E01A_SRA.ply, 20200320_G01_DGM2_E01A_SRA.xls, 20200320_G01_DGM2_E01A_SRA_pg.dbf, 20200320_G01_DGM2_E01A_SRA_pg.prj, 20200320_G01_DGM2_E01A_SRA_pg.shp, 20200320_G01_DGM2_E01A_SRA_pg.shx, 20200320_G01_DGM2_E01A_Targets.gdb, 20200320_G01_DGM2_E01A_Targets.gdb.xml, 20200320_G01_DGM2_E01A_Targets.xls, 20200320_G01_DGM2_E01A_UceFootprintCov.map, 20200320_G01_DGM2_E01A_UceFootprintCov.map.xml, 20200320_G01_DGM2_E01A_UceFootprintCov.png, 20200320_G01_DGM2_E01A_UceFootprintCov.png.gi, 20200320_G01_DGM2_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Medium-high target density grid with two SRAs and three culture polygons designated. Culture included metal poles and reinforced concrete.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.04 **Mean:** 0.09 **Map ID:**20200320_G01_DGM2_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 112.44 **Requirement:** 100 % **Map ID:** 20200320_G01_DGM2_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1006.27

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200320_G01_DGM2_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.80 **DOP Max:** 01.10 **DOP StDev:** 00.08 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00 ; max = 4.00; standard deviation =0.03 ; percent pass = 99.98%

Daily Tests

IVS

IVS Test ID: **20200320E01IVS1** **QC Status:** **Pass**

Date: 3/20/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200320E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	109.82	74.99	38.55	19.16	95.11	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.29	33.76	16.72	7.31	97.64	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	16.07	8.51	4.16	1.17	91.25	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 4

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1.16 **Max:** 74.94 **Std Dev:** 11.87 **Mean:** 5.01 **Number of Points:** 196

Comments:

IVS

IVS Test ID: **20200320E01IVS2** **QC Status:** **Pass**

Date: 3/20/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200320E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	112.02	77.18	42.41	20.26	97.88	0.17	Pass
IVS02		56.27	34.57	17.21	7.54	55.69	34.24	16.34	6.95	99.03	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	15.65	8.78	3.80	1.66	94.09	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments: The raw data name is 202003IVS2

Processing Comments: Lag = 4

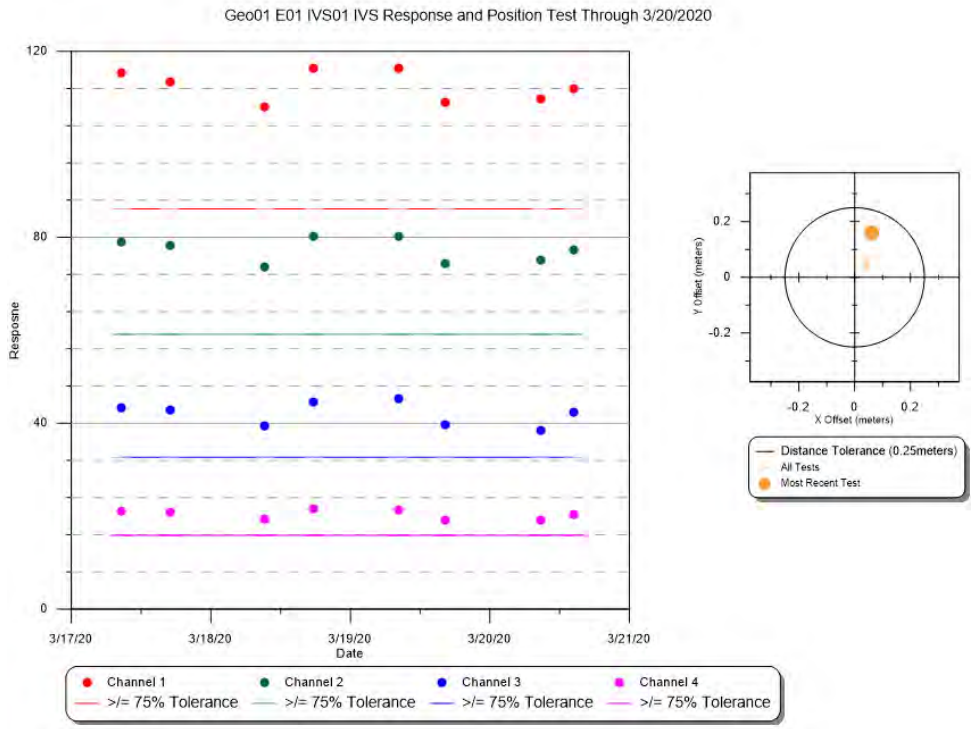
Exception Notes:

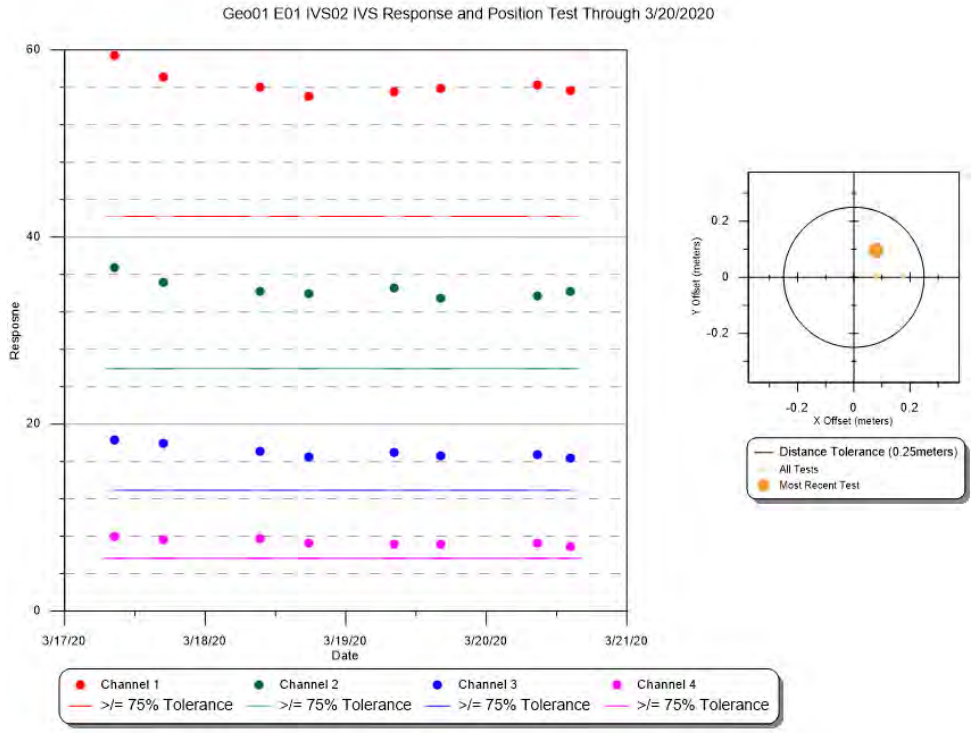
Background Noise Channel ID: Ch2_level_lg **Min:** -0.77 **Max:** 78.44 **Std Dev:** 12.44 **Mean:** 5.06 **Number of Points:** 222

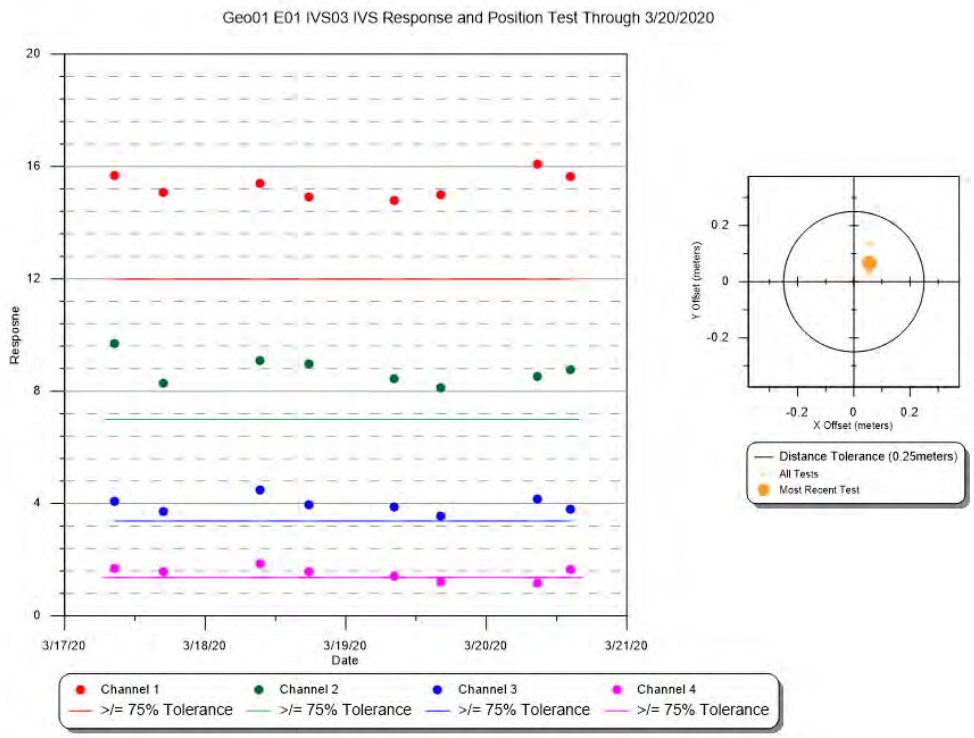
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/20/2020
Response
Date
3/17/20
3/18/20
3/19/20
3/20/20
3/21/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
>/= 75% Tolerance
>/= 75% Tolerance
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200320E01QC1** **QC Status:** Pass

Date: 3/20/2020 8:33:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200320E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200320E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200320E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200320E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.76	0.01	-0.08	0
Pre-Background Std Dev:	0.23	0.14	0.11	0.09
Observed Spike (mV):	273	191	113	53
Spike Mean (mV):	272.97	192.19	113.33	53.61
Spike Std Dev:	0.39	0.22	0.11	0.09
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.71	0.59	-0.15	-0.12
Post-Background Std Dev:	0.25	0.17	0.11	0.08
Calculated Spike (mV):	**271.235**	**191.89**	**113.445**	**53.67**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.27	5.99	6.37	7.06

Requirement: 20 %

Field Comments:

Processing Comments:

L1 object test in Ch1 and Ch2 showed an anomalous spike each, but did not have any failure points.

Static Repeatability

Static Test ID: **20200320E01QC2** **QC Status:** Pass

Date: 3/20/2020 4:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200320E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200320E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	-1	0	0	0
Pre-Background Mean (mV):	-1.11	-0.80	-0.36	-0.3
Pre-Background Std Dev:	0.32	0.2	0.12	0.08
Observed Spike (mV):	272	192	113	53
Spike Mean (mV):	272.82	192.26	113.12	52.9
Spike Std Dev:	0.51	0.28	0.14	0.11
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	-0.41	-0.43	-0.38	-0.42
Post-Background Std Dev:	0.43	0.25	0.14	0.1
Calculated Spike (mV):	**273.58**	**192.875**	**113.49**	**53.26**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	5.17	6.54	6.41	6.24

Requirement: 20 %

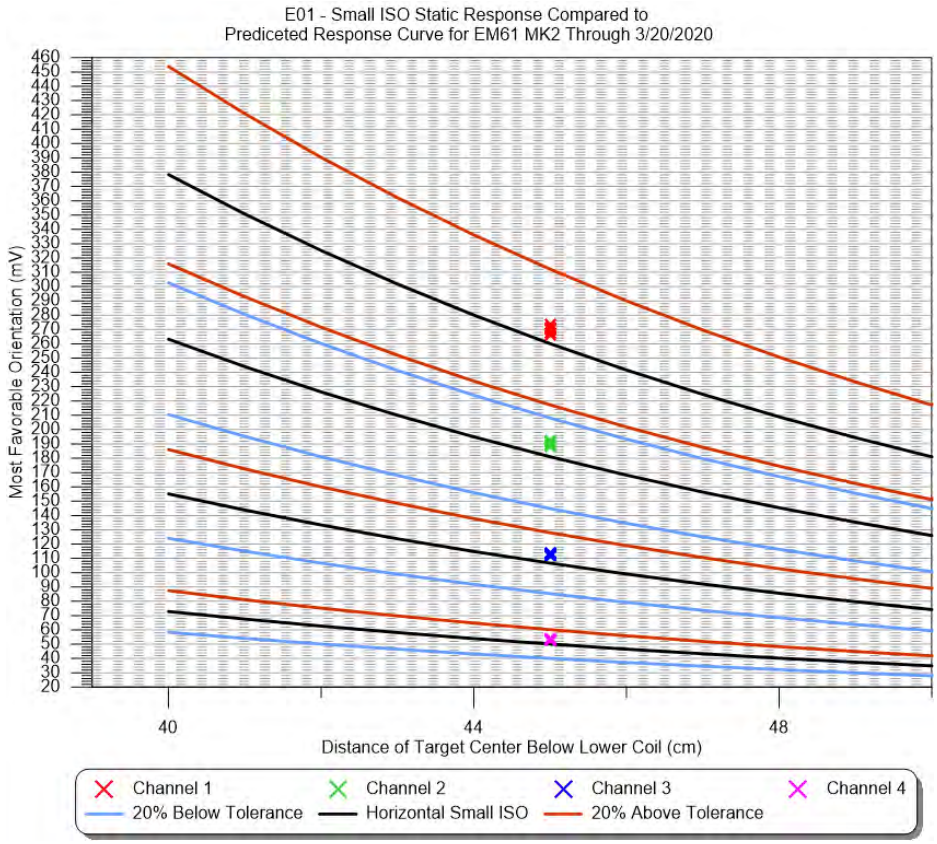
Field Comments:

The raw data name is 202003QC2

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200320GPSQC** **QC Status:** **Pass**

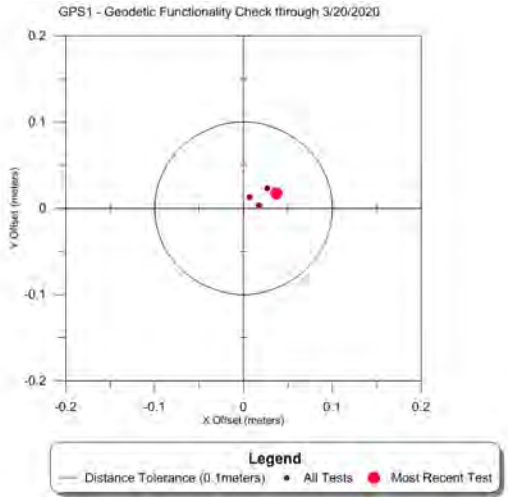
Date: 3/20/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.23	4572774.41
Actual:	585680.19	4572774.39
Offset:	0.04	0.02

Total Offset: 0.04 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/20/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200320_G01_DGM2_E01A,20200320_G01_DGM18_E01A,20200320_G01_DGM25_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200320_G01_DGM18_E01A **Grids Encountered:** DGM18

Collection Date: 3/20/2020 ☑ **Completed** **Start Time:** 3/20/2020 12:15:00 PM **End Time:** 3/20/2020 2:07:00 PM

Raw File Name(s): 20200320_G01_DGM18_E01A, 20200320_G01_DGM18_E01AA

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

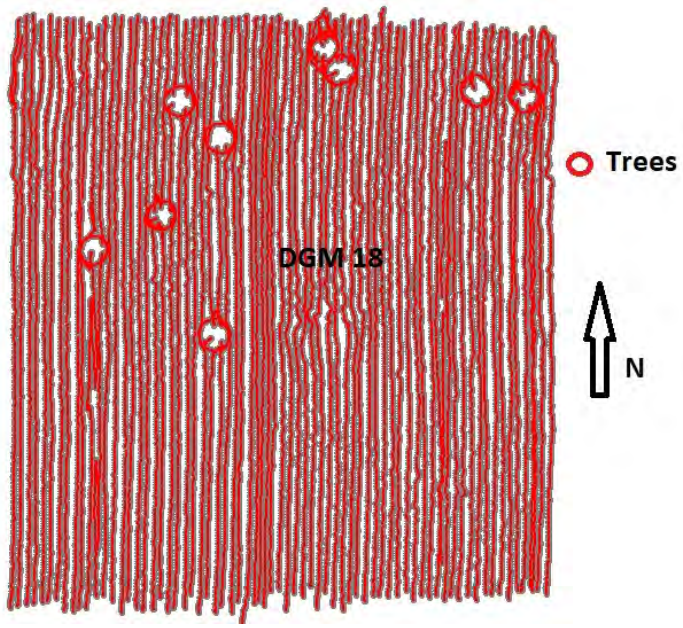
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/20/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200320_G01_DGM18_E01A,20200320_G01_DGM18_E01AA

Processing Information

Dataset ID: 20200320_G01_DGM18_E01A **Grids:** DGM18

Date Processed: 4/7/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-6000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200320_G01_DGM18_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200320_G01_DGM18_E01A.gdb, 20200320_G01_DGM18_E01A.gdb.xml, 20200320_G01_DGM18_E01A.map, 20200320_G01_DGM18_E01A.map.xml, 20200320_G01_DGM18_E01A.pdf, 20200320_G01_DGM18_E01A.png, 20200320_G01_DGM18_E01A.png.gi, 20200320_G01_DGM18_E01A.png.xml, 20200320_G01_DGM18_E01A.tif, 20200320_G01_DGM18_E01A.tif.gi, 20200320_G01_DGM18_E01A.tif.xml, 20200320_G01_DGM18_E01A_AGC_BKG.gdb, 20200320_G01_DGM18_E01A_AGC_BKG.gdb.xml, 20200320_G01_DGM18_E01A_Along_Track_Separation.map, 20200320_G01_DGM18_E01A_Along_Track_Separation.map.xml, 20200320_G01_DGM18_E01A_Along_Track_Separation.png, 20200320_G01_DGM18_E01A_Along_Track_Separation.png.gi, 20200320_G01_DGM18_E01A_Along_Track_Separation.png.xml, 20200320_G01_DGM18_E01A_Background_Ch2_Stats.txt, 20200320_G01_DGM18_E01A_Ch2_level_lg.grd, 20200320_G01_DGM18_E01A_Ch2_level_lg.grd.gi, 20200320_G01_DGM18_E01A_Ch2_level_lg.grd.xml, 20200320_G01_DGM18_E01A_GPS_HDOP.txt, 20200320_G01_DGM18_E01A_GPS_Quality.map, 20200320_G01_DGM18_E01A_GPS_Quality.map.xml, 20200320_G01_DGM18_E01A_GPS_Quality.png, 20200320_G01_DGM18_E01A_GPS_Quality.png.gi, 20200320_G01_DGM18_E01A_GPS_Quality.png.xml, 20200320_G01_DGM18_E01A_GPS_Quality.txt, 20200320_G01_DGM18_E01A_Processed.XYZ, 20200320_G01_DGM18_E01A_SRA.ply, 20200320_G01_DGM18_E01A_SRA.xls, 20200320_G01_DGM18_E01A_SRA_pg.dbf, 20200320_G01_DGM18_E01A_SRA_pg.prj, 20200320_G01_DGM18_E01A_SRA_pg.shp, 20200320_G01_DGM18_E01A_SRA_pg.shx, 20200320_G01_DGM18_E01A_Targets.gdb, 20200320_G01_DGM18_E01A_Targets.gdb.xml, 20200320_G01_DGM18_E01A_Targets.xls, 20200320_G01_DGM18_E01A_UceFootprintCov.map, 20200320_G01_DGM18_E01A_UceFootprintCov.map.xml, 20200320_G01_DGM18_E01A_UceFootprintCov.png, 20200320_G01_DGM18_E01A_UceFootprintCov.png.gi, 20200320_G01_DGM18_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Largely saturated grid with one SRA designated. Culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.04 **Mean:** 0.08 **Map ID:**20200320_G01_DGM18_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 110.87 **Requirement:** 100 % **Map ID:** 20200320_G01_DGM18_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1056.11

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200320_G01_DGM18_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 02.70 **DOP StDev:** 00.15 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 1.00; max = 4.00; standard deviation = 0.24; percent pass = 98.64%

Daily Tests

IVS

IVS Test ID: **20200320E01IVS1** **QC Status:** **Pass**

Date: 3/20/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200320E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	109.82	74.99	38.55	19.16	95.11	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.29	33.76	16.72	7.31	97.64	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	16.07	8.51	4.16	1.17	91.25	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 4

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1.16 **Max:** 74.94 **Std Dev:** 11.87 **Mean:** 5.01 **Number of Points:** 196

Comments:

IVS

IVS Test ID: **20200320E01IVS2** **QC Status:** **Pass**

Date: 3/20/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200320E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	112.02	77.18	42.41	20.26	97.88	0.17	Pass
IVS02		56.27	34.57	17.21	7.54	55.69	34.24	16.34	6.95	99.03	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	15.65	8.78	3.80	1.66	94.09	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments: The raw data name is 202003IVS2

Processing Comments: Lag = 4

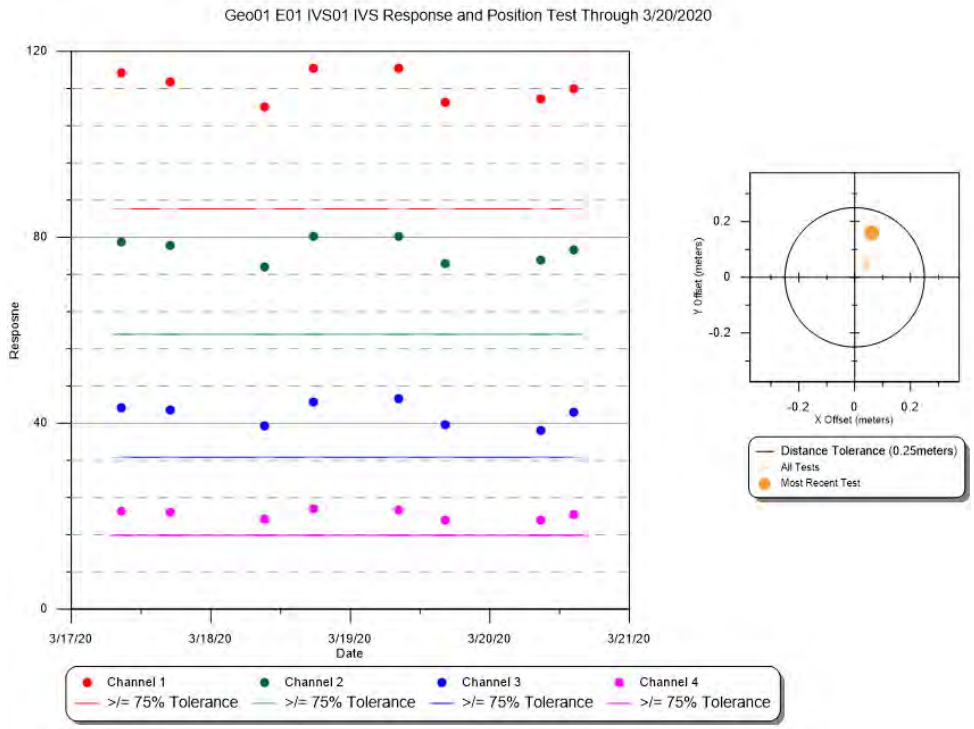
Exception Notes:

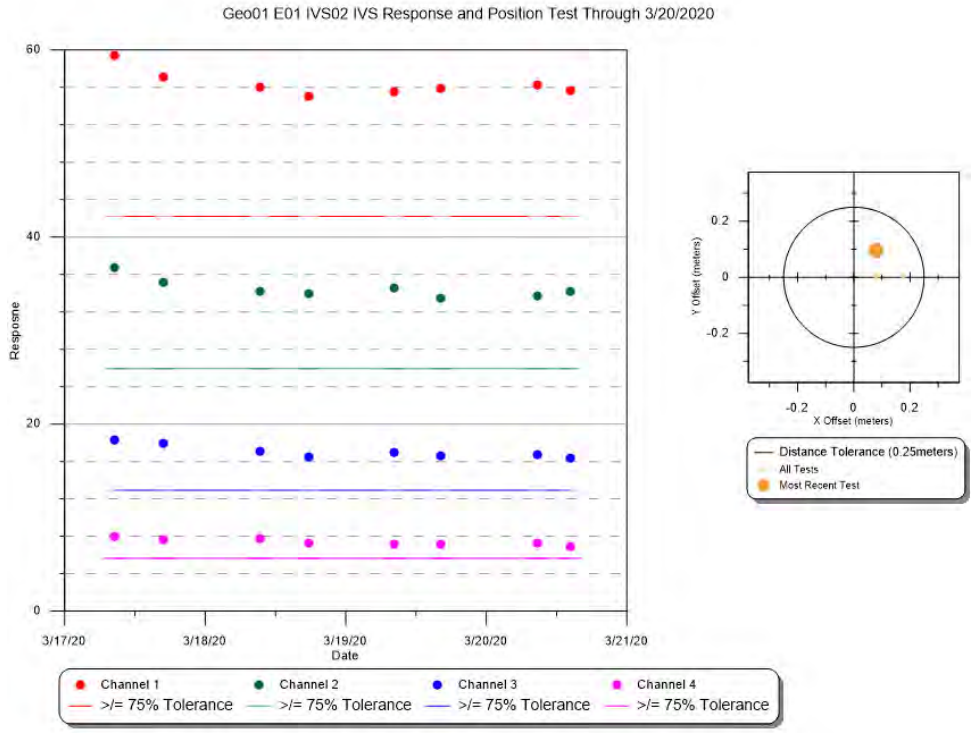
Background Noise Channel ID: Ch2_level_lg **Min:** -0.77 **Max:** 78.44 **Std Dev:** 12.44 **Mean:** 5.06 **Number of Points:** 222

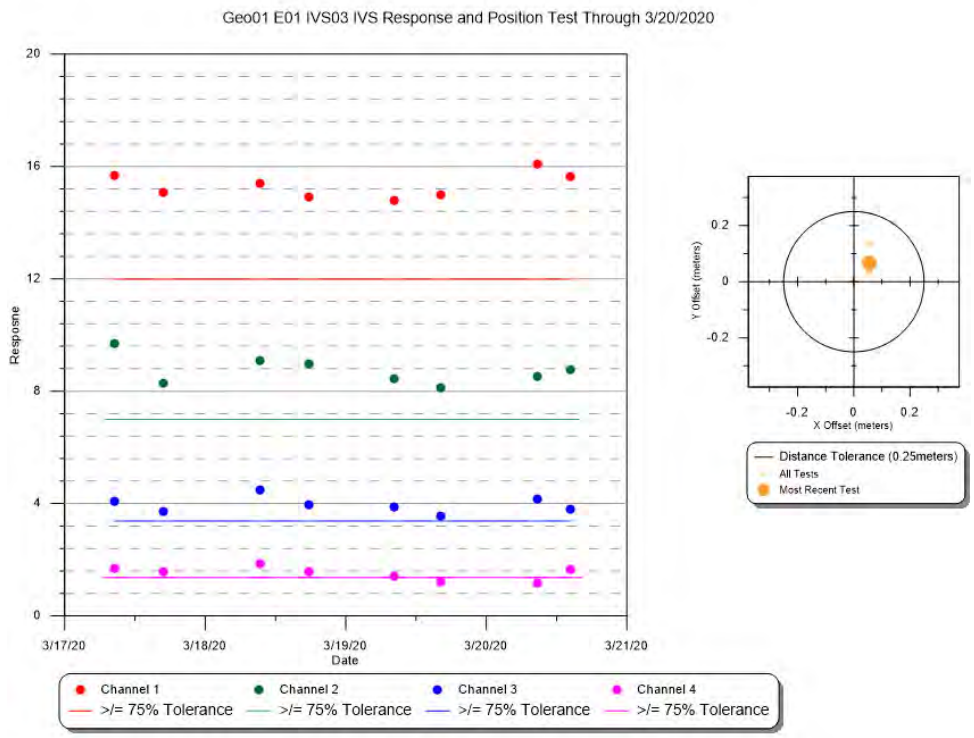
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/20/2020
Response
Date
3/17/20
3/18/20
3/19/20
3/20/20
3/21/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
>/= 75% Tolerance
>/= 75% Tolerance
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200320E01QC1** **QC Status:** Pass

Date: 3/20/2020 8:33:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200320E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200320E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200320E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200320E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.76	0.01	-0.08	0
Pre-Background Std Dev:	0.23	0.14	0.11	0.09
Observed Spike (mV):	273	191	113	53
Spike Mean (mV):	272.97	192.19	113.33	53.61
Spike Std Dev:	0.39	0.22	0.11	0.09
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.71	0.59	-0.15	-0.12
Post-Background Std Dev:	0.25	0.17	0.11	0.08
Calculated Spike (mV):	**271.235**	**191.89**	**113.445**	**53.67**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.27	5.99	6.37	7.06

Requirement: 20 %

Field Comments:

Processing Comments:

L1 object test in Ch1 and Ch2 showed an anomalous spike each, but did not have any failure points.

Static Repeatability

Static Test ID: **20200320E01QC2** **QC Status:** Pass

Date: 3/20/2020 4:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200320E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200320E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	-1	0	0	0
Pre-Background Mean (mV):	-1.11	-0.80	-0.36	-0.3
Pre-Background Std Dev:	0.32	0.2	0.12	0.08
Observed Spike (mV):	272	192	113	53
Spike Mean (mV):	272.82	192.26	113.12	52.9
Spike Std Dev:	0.51	0.28	0.14	0.11
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	-0.41	-0.43	-0.38	-0.42
Post-Background Std Dev:	0.43	0.25	0.14	0.1
Calculated Spike (mV):	**273.58**	**192.875**	**113.49**	**53.26**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	5.17	6.54	6.41	6.24

Requirement: 20 %

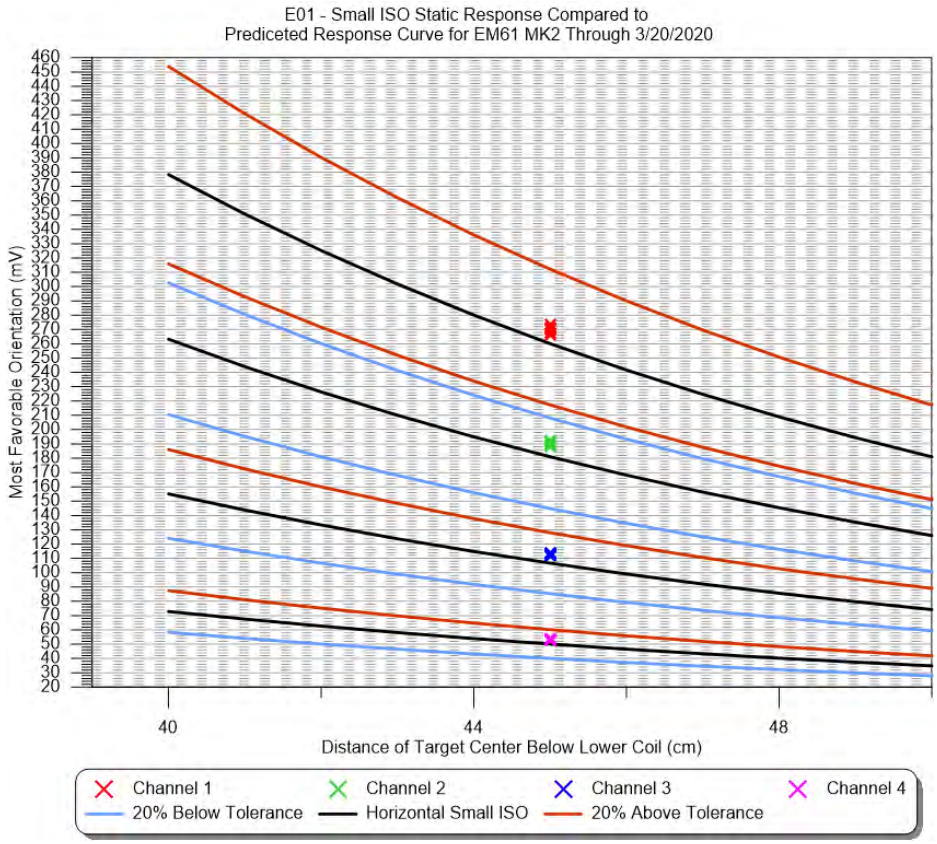
Field Comments:

The raw data name is 202003QC2

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200320GPSQC** **QC Status:** **Pass**

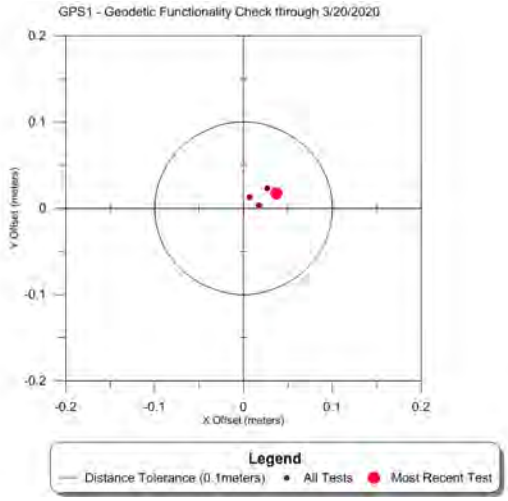
Date: 3/20/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.23	4572774.41
Actual:	585680.19	4572774.39
Offset:	0.04	0.02

Total Offset: 0.04 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/20/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200320_G01_DGM2_E01A,20200320_G01_DGM18_E01A,20200320_G01_DGM25_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200320_G01_DGM25_E01A **Grids Encountered:** DGM25

Collection Date: 3/20/2020 ☑ **Completed** **Start Time:** 3/20/2020 10:36:00 AM **End Time:** 3/20/2020 11:50:00 AM

Raw File Name(s): 20200320_G01_DGM25_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.30

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

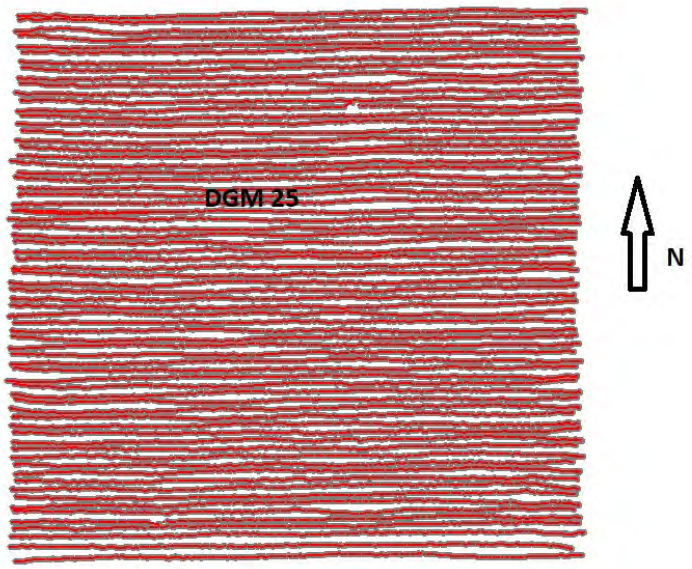
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/20/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200320_G01_DGM25_E01A

Processing Information

Dataset ID: 20200320_G01_DGM25_E01A **Grids:** DGM25

Date Processed: 4/7/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-8000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200320_G01_DGM25_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200320_G01_DGM25_E01A.gdb, 20200320_G01_DGM25_E01A.gdb.xml, 20200320_G01_DGM25_E01A.map, 20200320_G01_DGM25_E01A.map.xml, 20200320_G01_DGM25_E01A.pdf, 20200320_G01_DGM25_E01A.png, 20200320_G01_DGM25_E01A.png.gi, 20200320_G01_DGM25_E01A.png.xml, 20200320_G01_DGM25_E01A.tif, 20200320_G01_DGM25_E01A.tif.gi, 20200320_G01_DGM25_E01A.tif.xml, 20200320_G01_DGM25_E01A_AGC_BKG.gdb, 20200320_G01_DGM25_E01A_AGC_BKG.gdb.xml, 20200320_G01_DGM25_E01A_Along_Track_Separation.map, 20200320_G01_DGM25_E01A_Along_Track_Separation.map.xml, 20200320_G01_DGM25_E01A_Along_Track_Separation.png, 20200320_G01_DGM25_E01A_Along_Track_Separation.png.gi, 20200320_G01_DGM25_E01A_Along_Track_Separation.png.xml, 20200320_G01_DGM25_E01A_Background_Ch2_Stats.txt, 20200320_G01_DGM25_E01A_Ch2_level_lg.grd, 20200320_G01_DGM25_E01A_Ch2_level_lg.grd.gi, 20200320_G01_DGM25_E01A_Ch2_level_lg.grd.xml, 20200320_G01_DGM25_E01A_GPS_HDOP.txt, 20200320_G01_DGM25_E01A_GPS_Quality.map, 20200320_G01_DGM25_E01A_GPS_Quality.map.xml, 20200320_G01_DGM25_E01A_GPS_Quality.png, 20200320_G01_DGM25_E01A_GPS_Quality.png.gi, 20200320_G01_DGM25_E01A_GPS_Quality.png.xml, 20200320_G01_DGM25_E01A_GPS_Quality.txt, 20200320_G01_DGM25_E01A_Processed.XYZ, 20200320_G01_DGM25_E01A_SRA.ply, 20200320_G01_DGM25_E01A_SRA.xls, 20200320_G01_DGM25_E01A_SRA_pg.dbf, 20200320_G01_DGM25_E01A_SRA_pg.prj, 20200320_G01_DGM25_E01A_SRA_pg.shp, 20200320_G01_DGM25_E01A_SRA_pg.shx, 20200320_G01_DGM25_E01A_Targets.gdb, 20200320_G01_DGM25_E01A_Targets.gdb.xml, 20200320_G01_DGM25_E01A_Targets.xls, 20200320_G01_DGM25_E01A_UceFootprintCov.map, 20200320_G01_DGM25_E01A_UceFootprintCov.map.xml, 20200320_G01_DGM25_E01A_UceFootprintCov.png, 20200320_G01_DGM25_E01A_UceFootprintCov.png.gi, 20200320_G01_DGM25_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Mostly saturated grid with three SRAs designated.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.26 **Std Dev:** 0.03 **Mean:** 0.1 **Map ID:**20200320_G01_DGM25_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 109.48 **Requirement:** 100 % **Map ID:** 20200320_G01_DGM25_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1014.86

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200320_G01_DGM25_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.20 **DOP StDev:** 00.14 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.05; percent pass = 99.94%

Daily Tests

IVS

IVS Test ID: **20200320E01IVS1** **QC Status:** **Pass**

Date: 3/20/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200320E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	109.82	74.99	38.55	19.16	95.11	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.29	33.76	16.72	7.31	97.64	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	16.07	8.51	4.16	1.17	91.25	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 4

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1.16 **Max:** 74.94 **Std Dev:** 11.87 **Mean:** 5.01 **Number of Points:** 196

Comments:

IVS

IVS Test ID: **20200320E01IVS2** **QC Status:** **Pass**

Date: 3/20/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200320E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	112.02	77.18	42.41	20.26	97.88	0.17	Pass
IVS02		56.27	34.57	17.21	7.54	55.69	34.24	16.34	6.95	99.03	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	15.65	8.78	3.80	1.66	94.09	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments: The raw data name is 202003IVS2

Processing Comments: Lag = 4

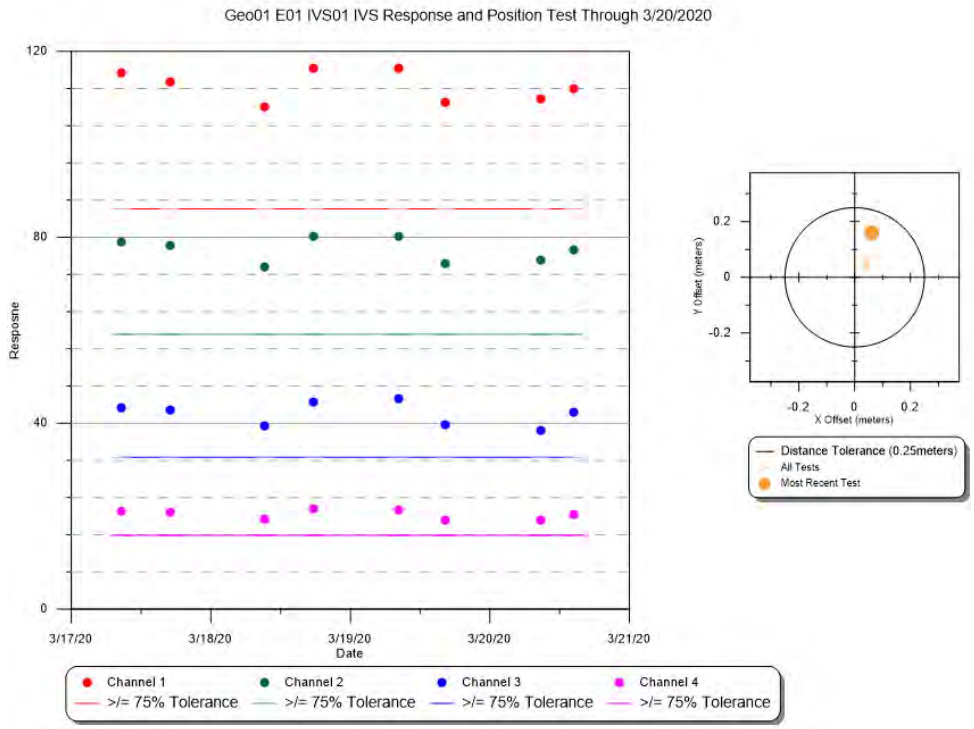
Exception Notes:

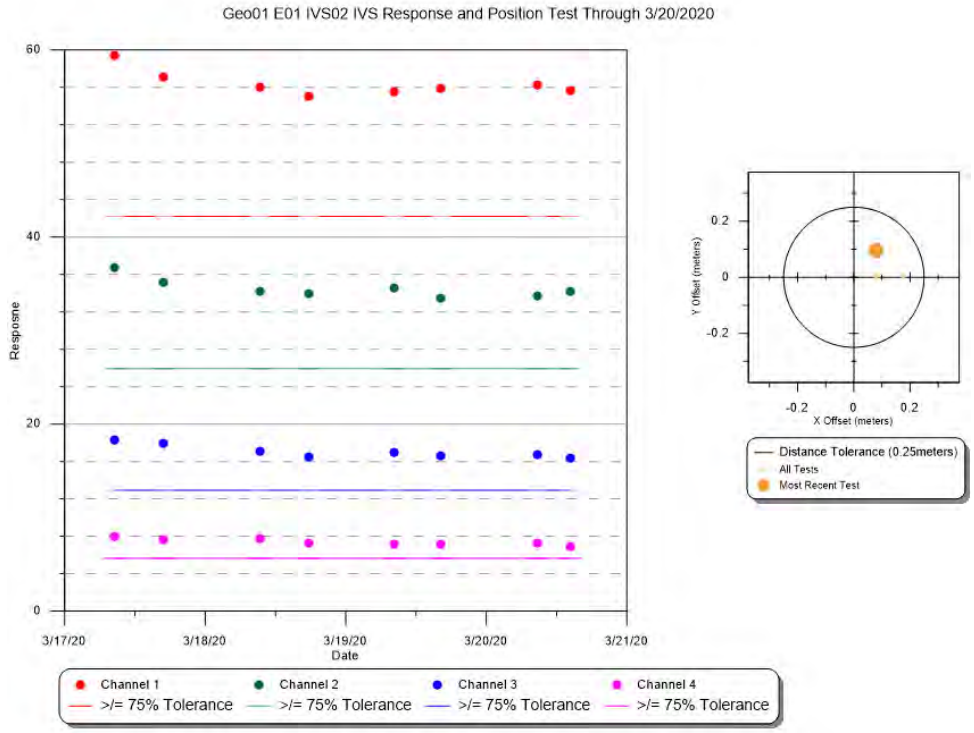
Background Noise Channel ID: Ch2_level_lg **Min:** -0.77 **Max:** 78.44 **Std Dev:** 12.44 **Mean:** 5.06 **Number of Points:** 222

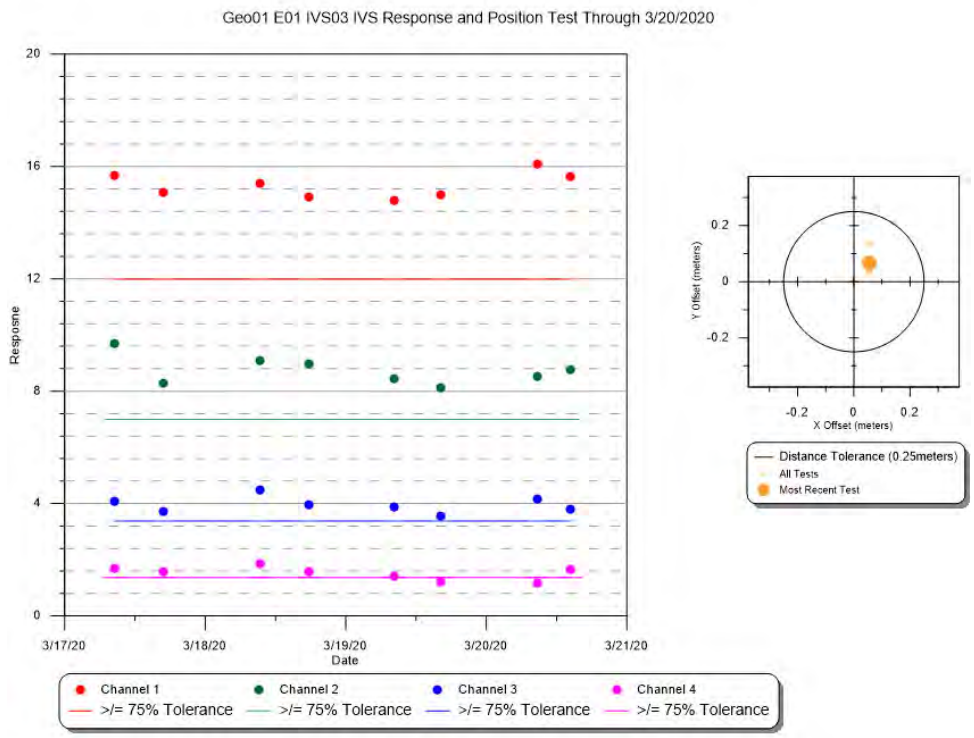
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/20/2020
Response
Date
3/17/20
3/18/20
3/19/20
3/20/20
3/21/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
>/= 75% Tolerance
>/= 75% Tolerance
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200320E01QC1** **QC Status:** Pass

Date: 3/20/2020 8:33:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200320E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200320E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200320E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200320E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.76	0.01	-0.08	0
Pre-Background Std Dev:	0.23	0.14	0.11	0.09
Observed Spike (mV):	273	191	113	53
Spike Mean (mV):	272.97	192.19	113.33	53.61
Spike Std Dev:	0.39	0.22	0.11	0.09
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.71	0.59	-0.15	-0.12
Post-Background Std Dev:	0.25	0.17	0.11	0.08
Calculated Spike (mV):	**271.235**	**191.89**	**113.445**	**53.67**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.27	5.99	6.37	7.06

Requirement: 20 %

Field Comments:

Processing Comments:

L1 object test in Ch1 and Ch2 showed an anomalous spike each, but did not have any failure points.

Static Repeatability

Static Test ID: **20200320E01QC2** **QC Status:** Pass

Date: 3/20/2020 4:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200320E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200320E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	-1	0	0	0
Pre-Background Mean (mV):	-1.11	-0.80	-0.36	-0.3
Pre-Background Std Dev:	0.32	0.2	0.12	0.08
Observed Spike (mV):	272	192	113	53
Spike Mean (mV):	272.82	192.26	113.12	52.9
Spike Std Dev:	0.51	0.28	0.14	0.11
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	-0.41	-0.43	-0.38	-0.42
Post-Background Std Dev:	0.43	0.25	0.14	0.1
Calculated Spike (mV):	**273.58**	**192.875**	**113.49**	**53.26**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	5.17	6.54	6.41	6.24

Requirement: 20 %

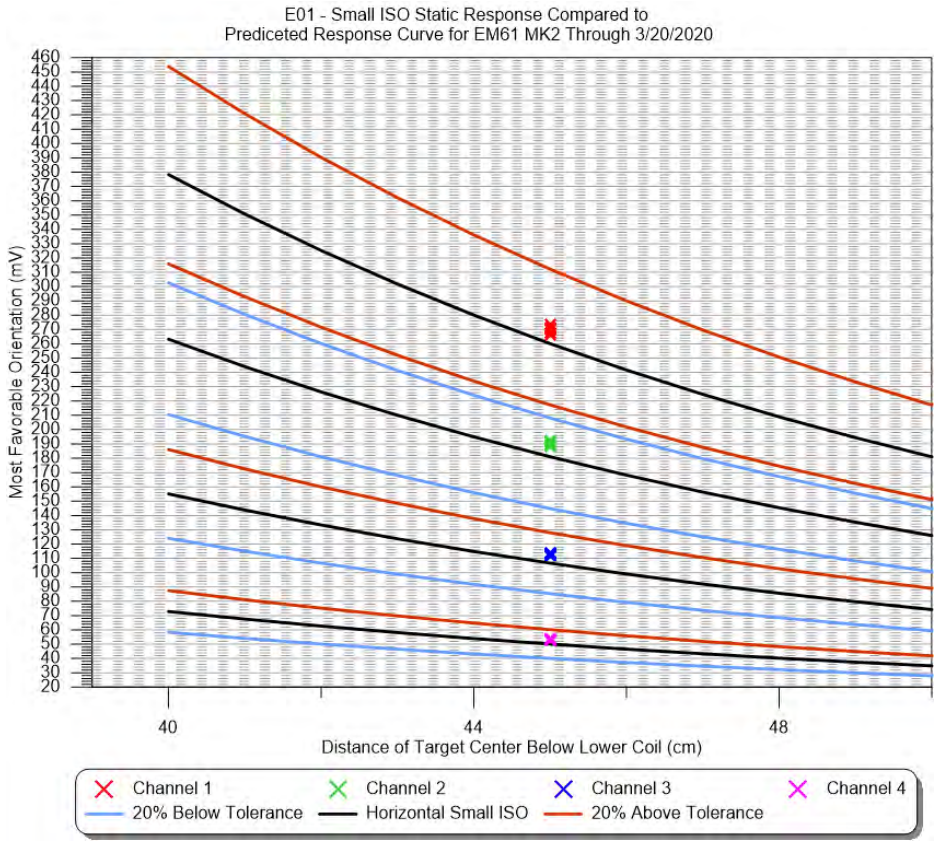
Field Comments:

The raw data name is 202003QC2

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200320GPSQC** **QC Status:** **Pass**

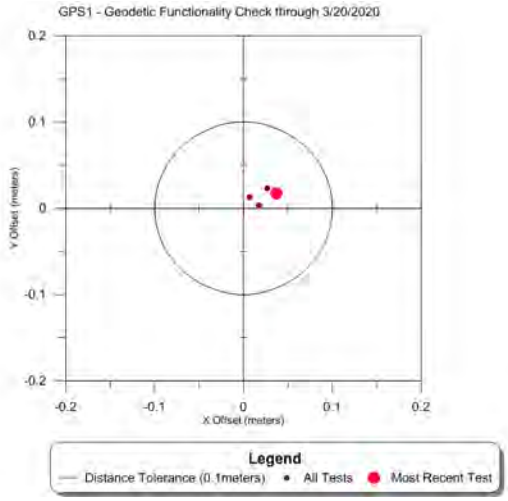
Date: 3/20/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.23	4572774.41
Actual:	585680.19	4572774.39
Offset:	0.04	0.02

Total Offset: 0.04 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/20/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200320_G01_DGM2_E01A,20200320_G01_DGM18_E01A,20200320_G01_DGM25_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200330_G01_DGM8_E01A **Grids Encountered:** DGM8

Collection Date: 3/30/2020 ☑ **Completed** **Start Time:** 3/30/2020 10:11:00 AM **End Time:** 3/30/2020 12:08:00 PM

Raw File Name(s): 20200330_G01_DGM8_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

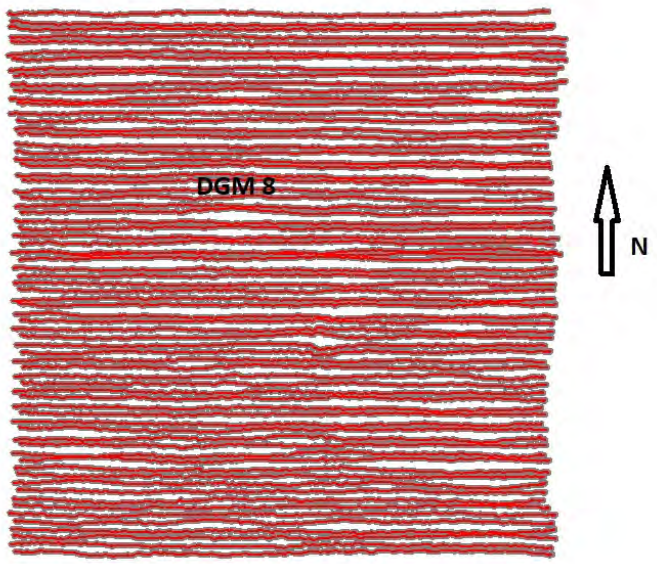
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat,swampy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/30/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200330_G01_DGM8_E01A

Processing Information

Dataset ID: 20200330_G01_DGM8_E01A **Grids:** DGM8

Date Processed: 4/6/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-200, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=5

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200330_G01_DGM8_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200330_G01_DGM8_E01A.gdb, 20200330_G01_DGM8_E01A.gdb.xml, 20200330_G01_DGM8_E01A.map, 20200330_G01_DGM8_E01A.map.xml, 20200330_G01_DGM8_E01A.pdf, 20200330_G01_DGM8_E01A.png, 20200330_G01_DGM8_E01A.png.gi, 20200330_G01_DGM8_E01A.png.xml, 20200330_G01_DGM8_E01A.tif, 20200330_G01_DGM8_E01A.tif.gi, 20200330_G01_DGM8_E01A.tif.xml, 20200330_G01_DGM8_E01A_AGC_BKG.gdb, 20200330_G01_DGM8_E01A_AGC_BKG.gdb.xml, 20200330_G01_DGM8_E01A_Along_Track_Separation.map, 20200330_G01_DGM8_E01A_Along_Track_Separation.map.xml, 20200330_G01_DGM8_E01A_Along_Track_Separation.png, 20200330_G01_DGM8_E01A_Along_Track_Separation.png.gi, 20200330_G01_DGM8_E01A_Along_Track_Separation.png.xml, 20200330_G01_DGM8_E01A_Background_Ch2_Stats.txt, 20200330_G01_DGM8_E01A_Ch2_level_lg.grd, 20200330_G01_DGM8_E01A_Ch2_level_lg.grd.gi, 20200330_G01_DGM8_E01A_Ch2_level_lg.grd.xml, 20200330_G01_DGM8_E01A_GPS_HDOP.txt, 20200330_G01_DGM8_E01A_GPS_Quality.map, 20200330_G01_DGM8_E01A_GPS_Quality.map.xml, 20200330_G01_DGM8_E01A_GPS_Quality.png, 20200330_G01_DGM8_E01A_GPS_Quality.png.gi, 20200330_G01_DGM8_E01A_GPS_Quality.png.xml, 20200330_G01_DGM8_E01A_GPS_Quality.txt, 20200330_G01_DGM8_E01A_Processed.XYZ, 20200330_G01_DGM8_E01A_Targets.gdb, 20200330_G01_DGM8_E01A_Targets.gdb.xml, 20200330_G01_DGM8_E01A_Targets.xls, 20200330_G01_DGM8_E01A_uceFootprintCov.map, 20200330_G01_DGM8_E01A_UceFootprintCov.map.xml, 20200330_G01_DGM8_E01A_uceFootprintCov.png, 20200330_G01_DGM8_E01A_UceFootprintCov.png.gi, 20200330_G01_DGM8_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Very low target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.21 **Std Dev:** 0.03 **Mean:** 0.07 **Map ID:**20200330_G01_DGM8_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 107.39 **Requirement:** 100 % **Map ID:** 20200330_G01_DGM8_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 997.94

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200330_G01_DGM8_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.20 **DOP StDev:** 00.13 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00 ; max = 4.00 ; standard deviation = 0.03 ; percent pass = 99.98 %

Daily Tests

IVS

IVS Test ID: **20200330E01IVS1** **QC Status:** **Pass**

Date: 3/30/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200330E01IVS1.map

Processor: **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	109.20	74.77	41.91	19.97	94.83	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	54.45	32.99	16.47	6.88	95.42	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	14.46	7.63	3.61	1.09	81.81	0.06	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch4 low response was noted and found to fall within the bounds of normal device function.

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1 **Max:** 78.08 **Std Dev:** 12.3 **Mean:** 4.84 **Number of Points:** 231

Comments:

IVS

IVS Test ID: **20200330E01IVS2** **QC Status:** **Pass**

Date: 3/30/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200330E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	114.73	78.67	41.72	20.91	99.78	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	57.34	34.53	17.33	7.42	99.88	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	15.06	7.89	3.95	1.50	84.55	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

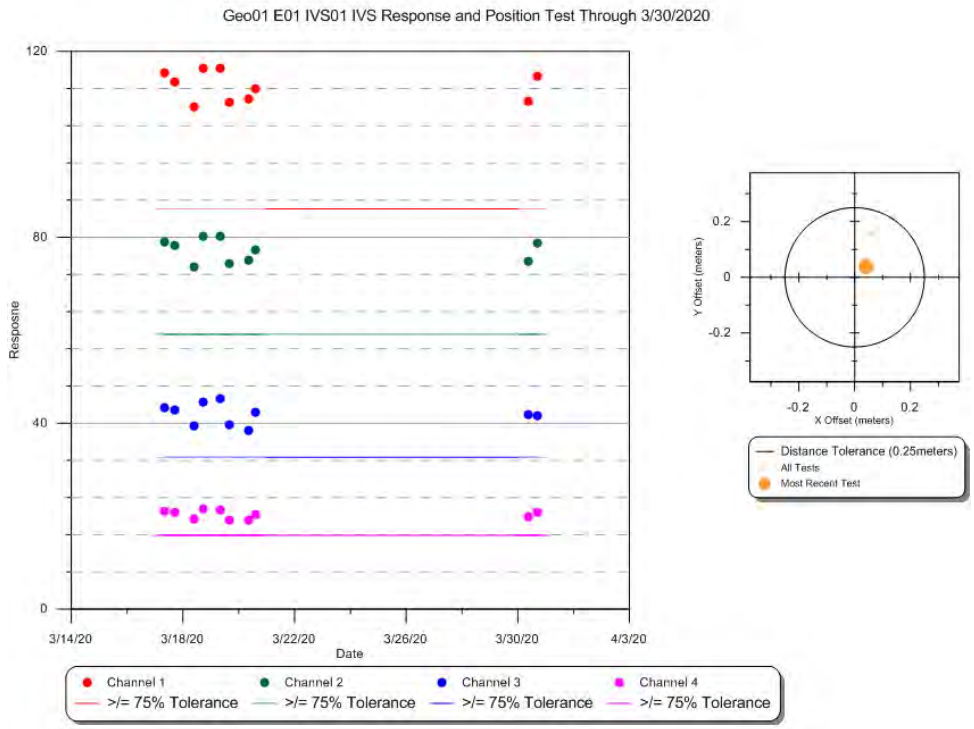
Exception Notes:

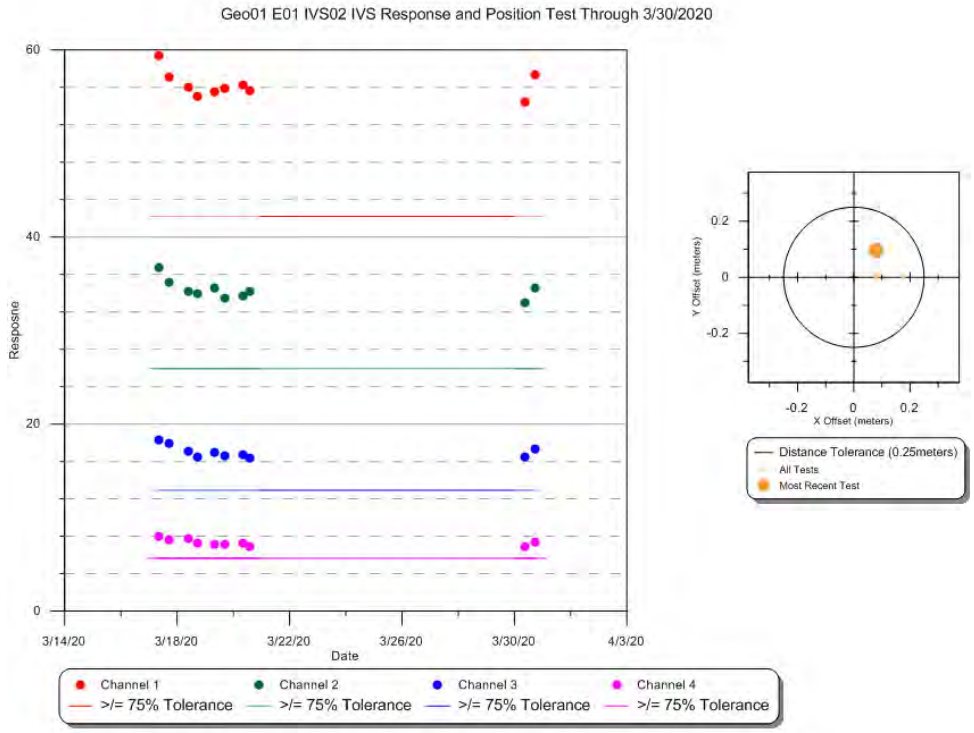
Background Noise Channel ID: Ch2_level_lg **Min:** -0.5 **Max:** 79.31 **Std Dev:** 12.72 **Mean:** 5.13 **Number of Points:** 213

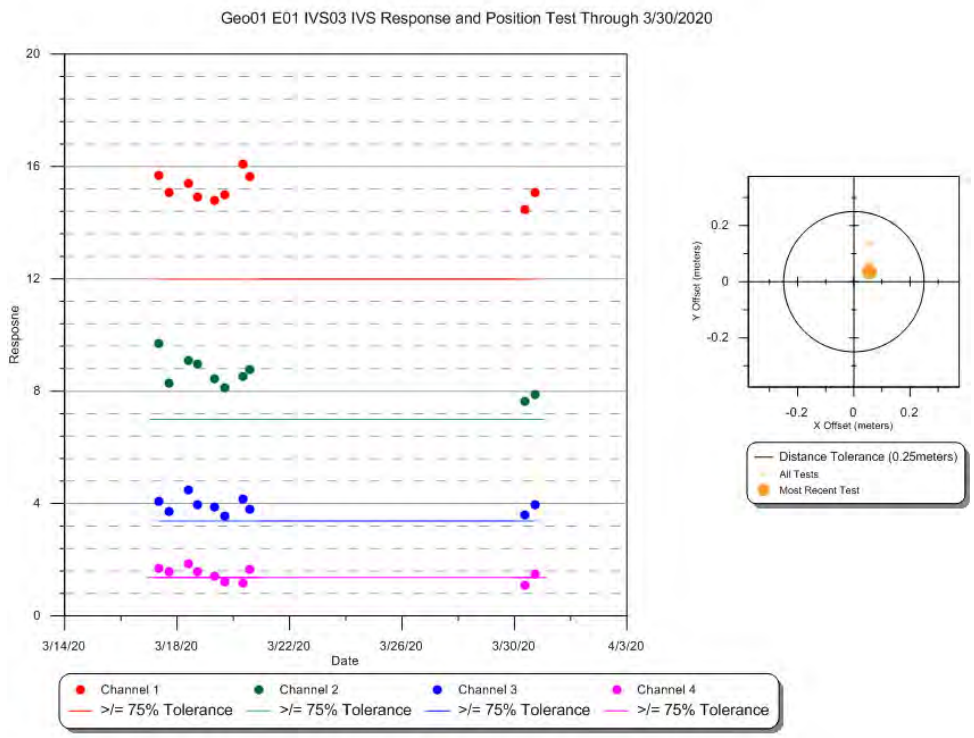
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/30/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200330E01QC1** **QC Status:** Pass

Date: 3/30/2020 8:33:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200330E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200330E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200330E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200330E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.67	0.07	-0.72	-0.39
Pre-Background Std Dev:	0.26	0.2	0.12	0.09
Observed Spike (mV):	272	191	112	53
Spike Mean (mV):	272.36	191.59	112.39	53.09
Spike Std Dev:	0.25	0.17	0.12	0.08
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.42	0.49	-0.75	-0.43
Post-Background Std Dev:	0.23	0.15	0.12	0.09
Calculated Spike (mV):	**270.315**	**191.31**	**113.125**	**53.5**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.92	5.67	6.07	6.72

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200330E01QC2** **QC Status:** Pass

Date: 3/30/2020 5:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200330E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200330E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.23	-0.36	-0.33	-0.28
Pre-Background Std Dev:	0.32	0.2	0.13	0.08
Observed Spike (mV):	270	190	112	53
Spike Mean (mV):	269.32	190.51	112.9	53.25
Spike Std Dev:	0.38	0.23	0.19	0.1
Observed Post-Background (mV):	-1	0	0	0
Post-Background Mean (mV):	-1.49	-1.05	-0.42	-0.32
Post-Background Std Dev:	0.36	0.21	0.13	0.09
Calculated Spike (mV):	**269.95**	**191.215**	**113.275**	**53.55**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.78	5.62	6.21	6.82

Requirement: 20 %

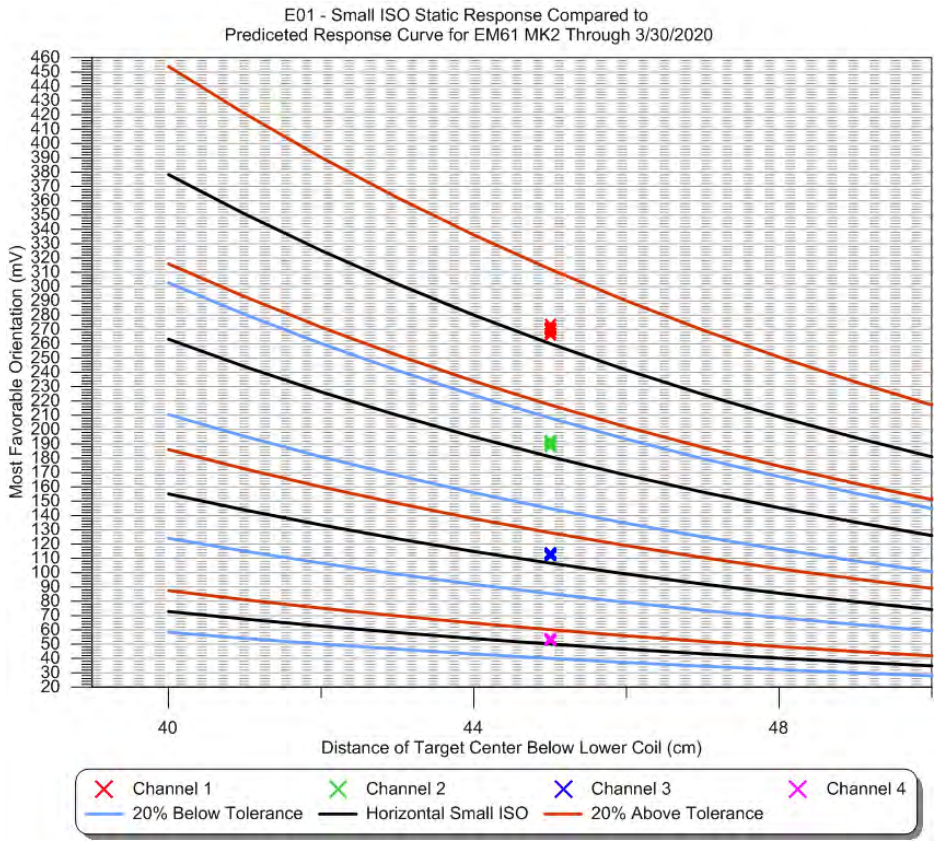
Field Comments:

Processing Comments:

Object test showed an anomalous spike in Ch1, but did not have any failure points.

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200330GPSQC** **QC Status:** **Pass**

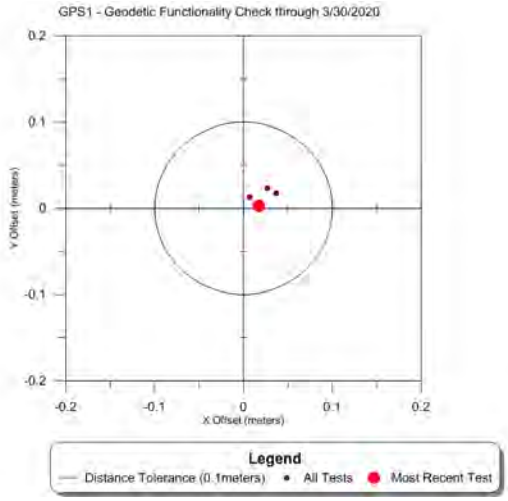
Date: 3/30/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.02	0.00

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/30/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200330_G01_DGM8_E01A,20200330_G01_DGM10_E01A,20200330_G01_DGM26_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200330_G01_DGM10_E01A **Grids Encountered:** DGM10

Collection Date: 3/30/2020 ☑ **Completed** **Start Time:** 3/30/2020 3:21:00 PM **End Time:** 3/30/2020 4:41:00 PM

Raw File Name(s): 20200320_G01_DGM10_E01A,20200330_G01_DGM10_E01AA

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.30

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

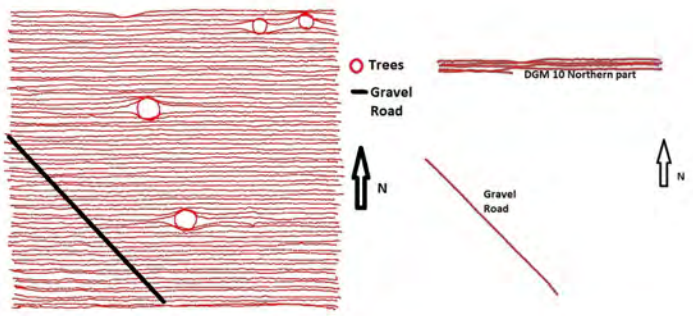
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/30/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200330_G01_DGM10_E01A,20200330_G01_DGM10_E01AA

Processing Information

Dataset ID: 20200330_G01_DGM10_E01A **Grids:** DGM10

Date Processed: 4/7/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200330_G01_DGM10_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200330_G01_DGM10_E01A.gdb, 20200330_G01_DGM10_E01A.gdb.xml, 20200330_G01_DGM10_E01A.map, 20200330_G01_DGM10_E01A.map.xml, 20200330_G01_DGM10_E01A.pdf, 20200330_G01_DGM10_E01A.png, 20200330_G01_DGM10_E01A.png.gi, 20200330_G01_DGM10_E01A.png.xml, 20200330_G01_DGM10_E01A.tif, 20200330_G01_DGM10_E01A.tif.gi, 20200330_G01_DGM10_E01A.tif.xml, 20200330_G01_DGM10_E01A_AGC_BKG.gdb, 20200330_G01_DGM10_E01A_AGC_BKG.gdb.xml, 20200330_G01_DGM10_E01A_Along_Track_Separation.map, 20200330_G01_DGM10_E01A_Along_Track_Separation.map.xml, 20200330_G01_DGM10_E01A_Along_Track_Separation.png, 20200330_G01_DGM10_E01A_Along_Track_Separation.png.gi, 20200330_G01_DGM10_E01A_Along_Track_Separation.png.xml, 20200330_G01_DGM10_E01A_Ch2_level_lg.grd, 20200330_G01_DGM10_E01A_Ch2_level_lg.grd.gi, 20200330_G01_DGM10_E01A_Ch2_level_lg.grd.xml, 20200330_G01_DGM10_E01A_GPS_HDOP.txt, 20200330_G01_DGM10_E01A_GPS_Quality.map, 20200330_G01_DGM10_E01A_GPS_Quality.map.xml, 20200330_G01_DGM10_E01A_GPS_Quality.png, 20200330_G01_DGM10_E01A_GPS_Quality.png.gi, 20200330_G01_DGM10_E01A_GPS_Quality.png.xml, 20200330_G01_DGM10_E01A_GPS_Quality.txt, 20200330_G01_DGM10_E01A_Processed.XYZ, 20200330_G01_DGM10_E01A_SRA.ply, 20200330_G01_DGM10_E01A_SRA.xls, 20200330_G01_DGM10_E01A_SRA_pg.dbf, 20200330_G01_DGM10_E01A_SRA_pg.prj, 20200330_G01_DGM10_E01A_SRA_pg.shp, 20200330_G01_DGM10_E01A_SRA_pg.shx, 20200330_G01_DGM10_E01A_Targets.gdb, 20200330_G01_DGM10_E01A_Targets.gdb.xml, 20200330_G01_DGM10_E01A_Targets.xls, 20200330_G01_DGM10_E01A_uceFootprintCov.map, 20200330_G01_DGM10_E01A_UceFootprintCov.map.xml, 20200330_G01_DGM10_E01A_uceFootprintCov.png, 20200330_G01_DGM10_E01A_UceFootprintCov.png.gi, 20200330_G01_DGM10_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Mostly saturated grid with two SRAs designated. Culture gaps due to trees. Field crew reported presence of a gravel road which corresponds to a large continuous anomaly in the southwestern SRA.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.03 **Mean:** 0.09 **Map ID:**20200330_G01_DGM10_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 109.99 **Requirement:** 100 % **Map ID:** 20200330_G01_DGM10_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1021.23

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200330_G01_DGM10_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.80 **DOP Max:** 01.20 **DOP StDev:** 00.12 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.04; percent pass = 99.95%

Daily Tests

IVS

IVS Test ID: **20200330E01IVS1** **QC Status:** **Pass**

Date: 3/30/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200330E01IVS1.map

Processor: **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	109.20	74.77	41.91	19.97	94.83	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	54.45	32.99	16.47	6.88	95.42	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	14.46	7.63	3.61	1.09	81.81	0.06	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch4 low response was noted and found to fall within the bounds of normal device function.

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1 **Max:** 78.08 **Std Dev:** 12.3 **Mean:** 4.84 **Number of Points:** 231

Comments:

IVS

IVS Test ID: **20200330E01IVS2** **QC Status:** **Pass**

Date: 3/30/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200330E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	114.73	78.67	41.72	20.91	99.78	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	57.34	34.53	17.33	7.42	99.88	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	15.06	7.89	3.95	1.50	84.55	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

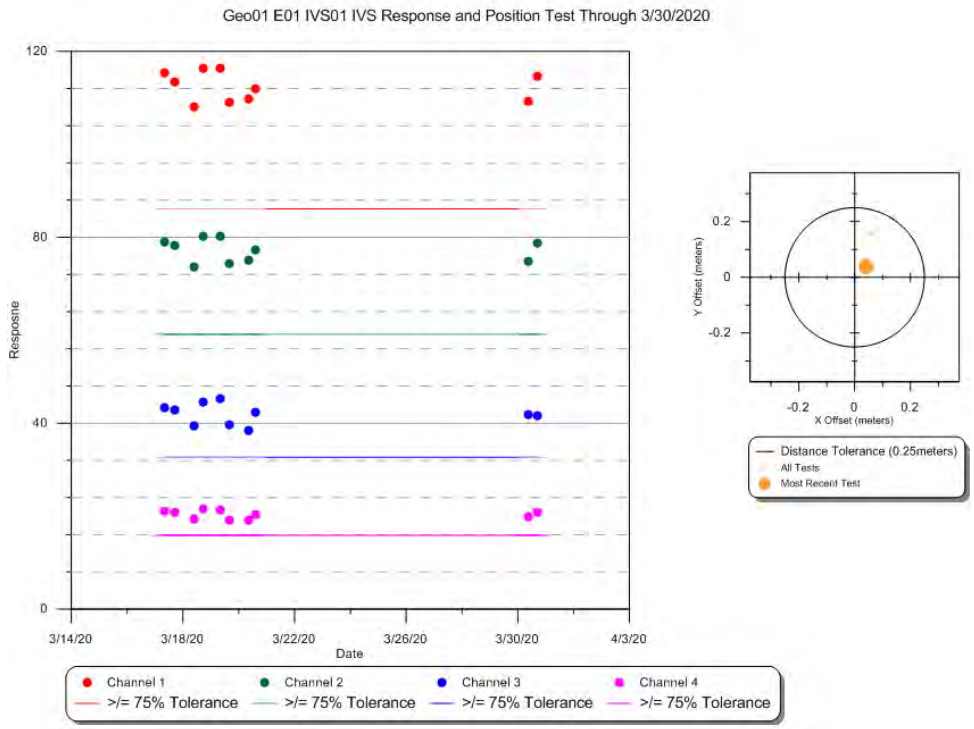
Exception Notes:

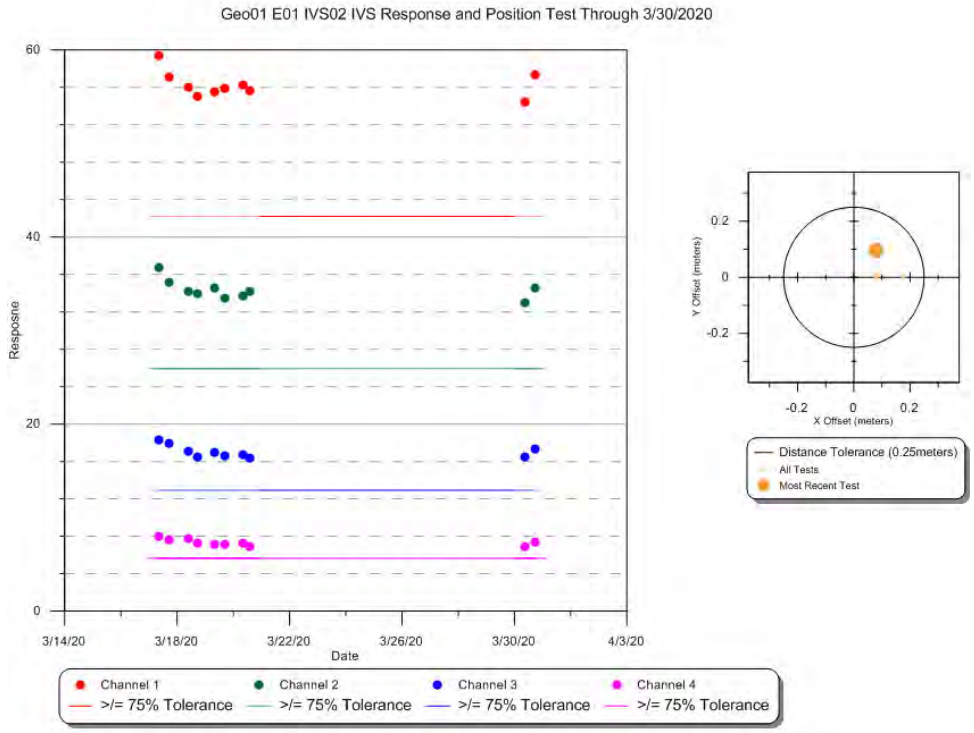
Background Noise Channel ID: Ch2_level_lg **Min:** -0.5 **Max:** 79.31 **Std Dev:** 12.72 **Mean:** 5.13 **Number of Points:** 213

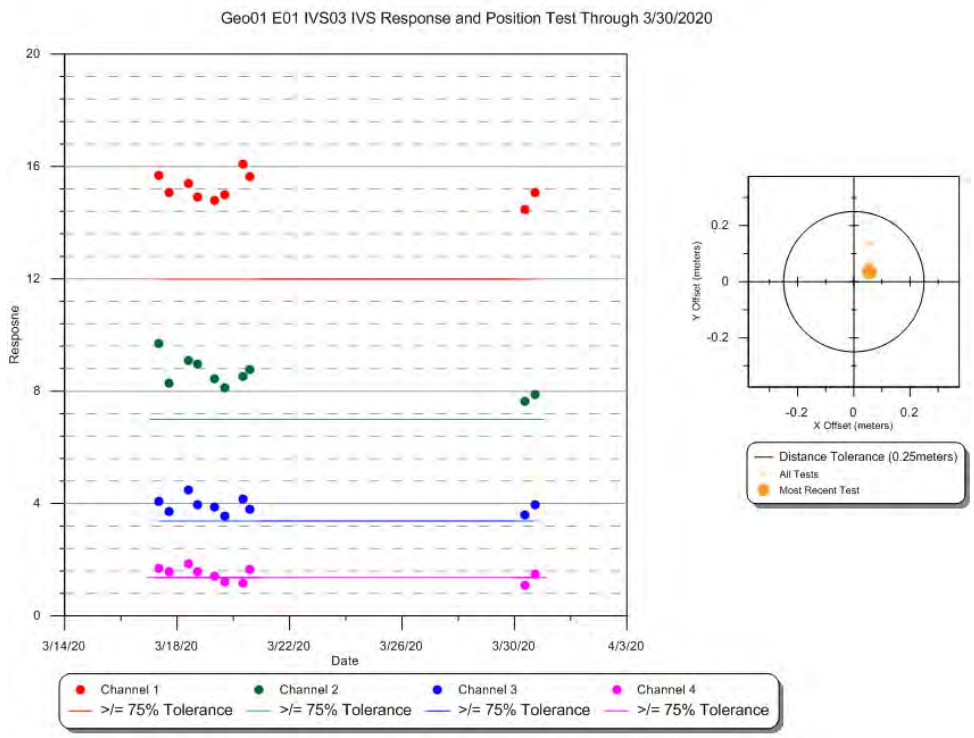
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/30/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200330E01QC1** **QC Status:** Pass

Date: 3/30/2020 8:33:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200330E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200330E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200330E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200330E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.67	0.07	-0.72	-0.39
Pre-Background Std Dev:	0.26	0.2	0.12	0.09
Observed Spike (mV):	272	191	112	53
Spike Mean (mV):	272.36	191.59	112.39	53.09
Spike Std Dev:	0.25	0.17	0.12	0.08
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.42	0.49	-0.75	-0.43
Post-Background Std Dev:	0.23	0.15	0.12	0.09
Calculated Spike (mV):	**270.315**	**191.31**	**113.125**	**53.5**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.92	5.67	6.07	6.72

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200330E01QC2** **QC Status:** Pass

Date: 3/30/2020 5:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200330E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200330E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.23	-0.36	-0.33	-0.28
Pre-Background Std Dev:	0.32	0.2	0.13	0.08
Observed Spike (mV):	270	190	112	53
Spike Mean (mV):	269.32	190.51	112.9	53.25
Spike Std Dev:	0.38	0.23	0.19	0.1
Observed Post-Background (mV):	-1	0	0	0
Post-Background Mean (mV):	-1.49	-1.05	-0.42	-0.32
Post-Background Std Dev:	0.36	0.21	0.13	0.09
Calculated Spike (mV):	**269.95**	**191.215**	**113.275**	**53.55**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.78	5.62	6.21	6.82

Requirement: 20 %

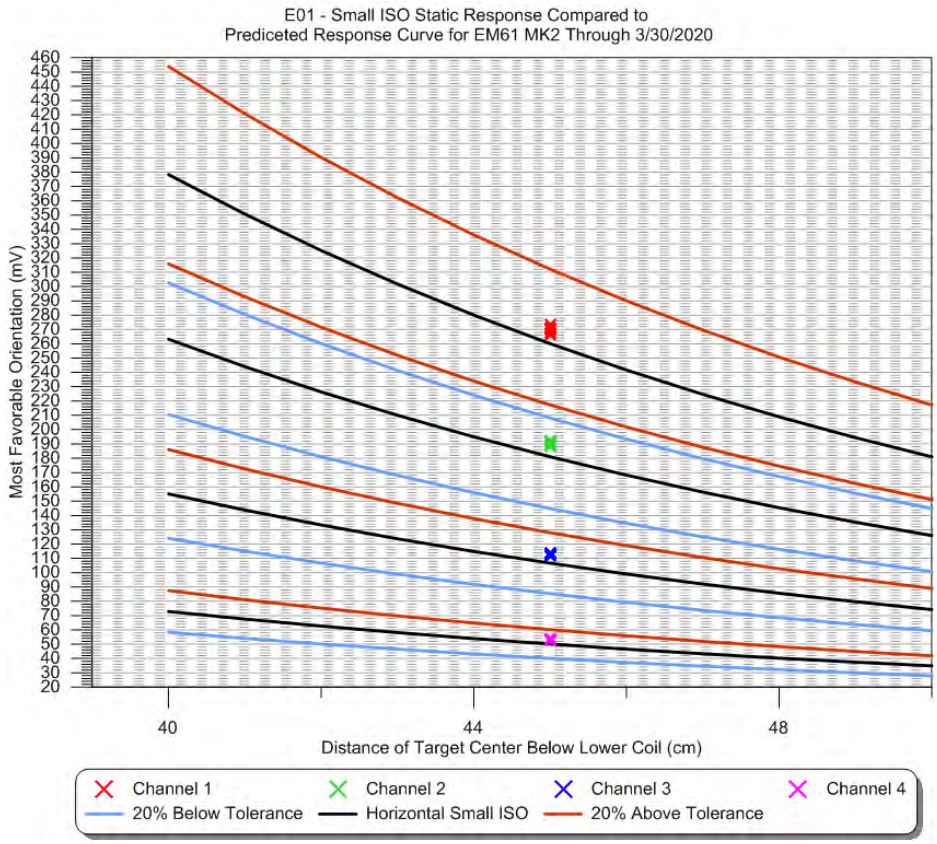
Field Comments:

Processing Comments:

Object test showed an anomalous spike in Ch1, but did not have any failure points.

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200330GPSQC** **QC Status:** **Pass**

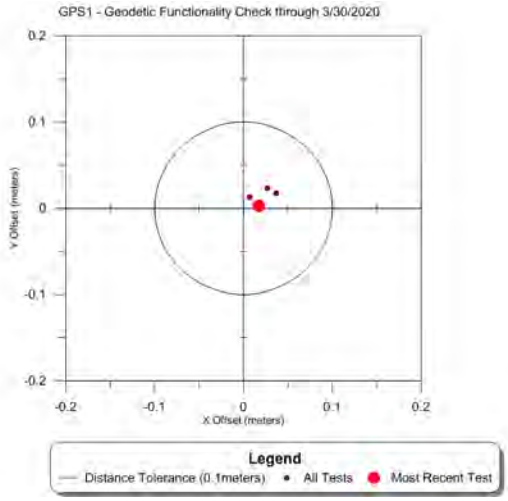
Date: 3/30/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.02	0.00

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/30/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200330_G01_DGM8_E01A,20200330_G01_DGM10_E01A,20200330_G01_DGM26_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200330_G01_DGM26_E01A **Grids Encountered:** DGM26

Collection Date: 3/30/2020 ☑ **Completed** **Start Time:** 3/30/2020 1:18:00 PM **End Time:** 3/30/2020 2:46:00 PM

Raw File Name(s): 20200320_G01_DGM18_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.30

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

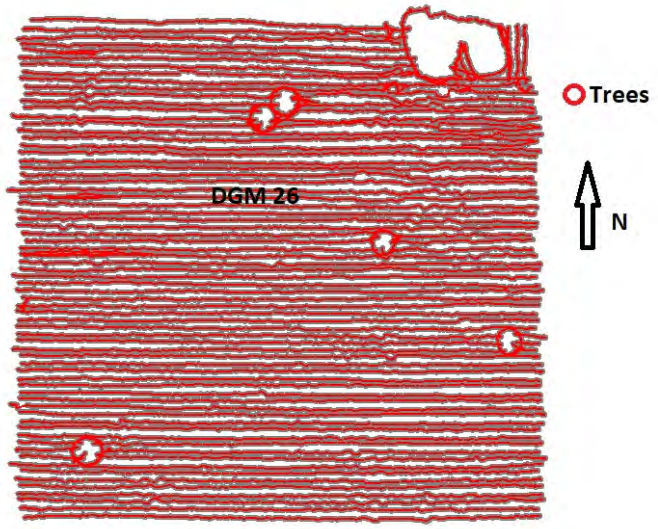
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/30/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200330_G01_DGM26_E01A

Processing Information

Dataset ID: 20200330_G01_DGM26_E01A **Grids:** DGM26

Date Processed: 4/8/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200330_G01_DGM26_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200330_G01_DGM26_E01A.gdb, 20200330_G01_DGM26_E01A.gdb.xml, 20200330_G01_DGM26_E01A.map, 20200330_G01_DGM26_E01A.map.xml, 20200330_G01_DGM26_E01A.pdf, 20200330_G01_DGM26_E01A.png, 20200330_G01_DGM26_E01A.png.gi, 20200330_G01_DGM26_E01A.png.xml, 20200330_G01_DGM26_E01A.tif, 20200330_G01_DGM26_E01A.tif.gi, 20200330_G01_DGM26_E01A.tif.xml, 20200330_G01_DGM26_E01A_AGC_BKG.gdb, 20200330_G01_DGM26_E01A_AGC_BKG.gdb.xml, 20200330_G01_DGM26_E01A_Along_Track_Separation.map, 20200330_G01_DGM26_E01A_Along_Track_Separation.map.xml, 20200330_G01_DGM26_E01A_Along_Track_Separation.png, 20200330_G01_DGM26_E01A_Along_Track_Separation.png.gi, 20200330_G01_DGM26_E01A_Along_Track_Separation.png.xml, 20200330_G01_DGM26_E01A_Ch2_level_lg.grd, 20200330_G01_DGM26_E01A_Ch2_level_lg.grd.gi, 20200330_G01_DGM26_E01A_Ch2_level_lg.grd.xml, 20200330_G01_DGM26_E01A_GPS_HDOP.txt, 20200330_G01_DGM26_E01A_GPS_Quality.map, 20200330_G01_DGM26_E01A_GPS_Quality.map.xml, 20200330_G01_DGM26_E01A_GPS_Quality.png, 20200330_G01_DGM26_E01A_GPS_Quality.png.gi, 20200330_G01_DGM26_E01A_GPS_Quality.png.xml, 20200330_G01_DGM26_E01A_GPS_Quality.txt, 20200330_G01_DGM26_E01A_Processed.XYZ, 20200330_G01_DGM26_E01A_SRA.ply, 20200330_G01_DGM26_E01A_SRA.xls, 20200330_G01_DGM26_E01A_SRA_pg.dbf, 20200330_G01_DGM26_E01A_SRA_pg.prj, 20200330_G01_DGM26_E01A_SRA_pg.shp, 20200330_G01_DGM26_E01A_SRA_pg.shx, 20200330_G01_DGM26_E01A_Targets.gdb, 20200330_G01_DGM26_E01A_Targets.gdb.xml, 20200330_G01_DGM26_E01A_Targets.xls, 20200330_G01_DGM26_E01A_uceFootprintCov.map, 20200330_G01_DGM26_E01A_UceFootprintCov.map.xml, 20200330_G01_DGM26_E01A_uceFootprintCov.png, 20200330_G01_DGM26_E01A_UceFootprintCov.png.gi, 20200330_G01_DGM26_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Mostly saturated grid with one SRA designated. Culture gaps due to trees and bushes.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.25 **Std Dev:** 0.04 **Mean:** 0.07 **Map ID:**20200330_G01_DGM26_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 109.12 **Requirement:** 100 % **Map ID:** 20200330_G01_DGM26_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1013.48

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200330_G01_DGM26_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 03.10 **DOP StDev:** 00.38 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.10; percent pass = 99.76%

Daily Tests

IVS

IVS Test ID: **20200330E01IVS1** **QC Status:** **Pass**

Date: 3/30/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200330E01IVS1.map

Processor: **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	109.20	74.77	41.91	19.97	94.83	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	54.45	32.99	16.47	6.88	95.42	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	14.46	7.63	3.61	1.09	81.81	0.06	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch4 low response was noted and found to fall within the bounds of normal device function.

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -1 **Max:** 78.08 **Std Dev:** 12.3 **Mean:** 4.84 **Number of Points:** 231

Comments:

IVS

IVS Test ID: **20200330E01IVS2** **QC Status:** **Pass**

Date: 3/30/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200330E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	114.73	78.67	41.72	20.91	99.78	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	57.34	34.53	17.33	7.42	99.88	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	15.06	7.89	3.95	1.50	84.55	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

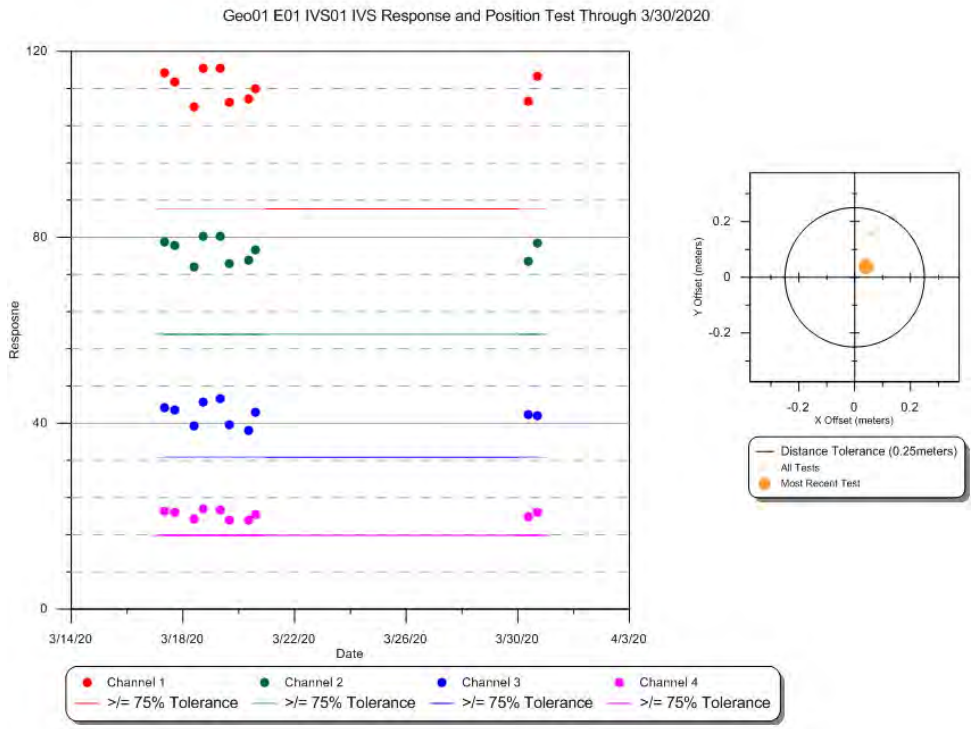
Exception Notes:

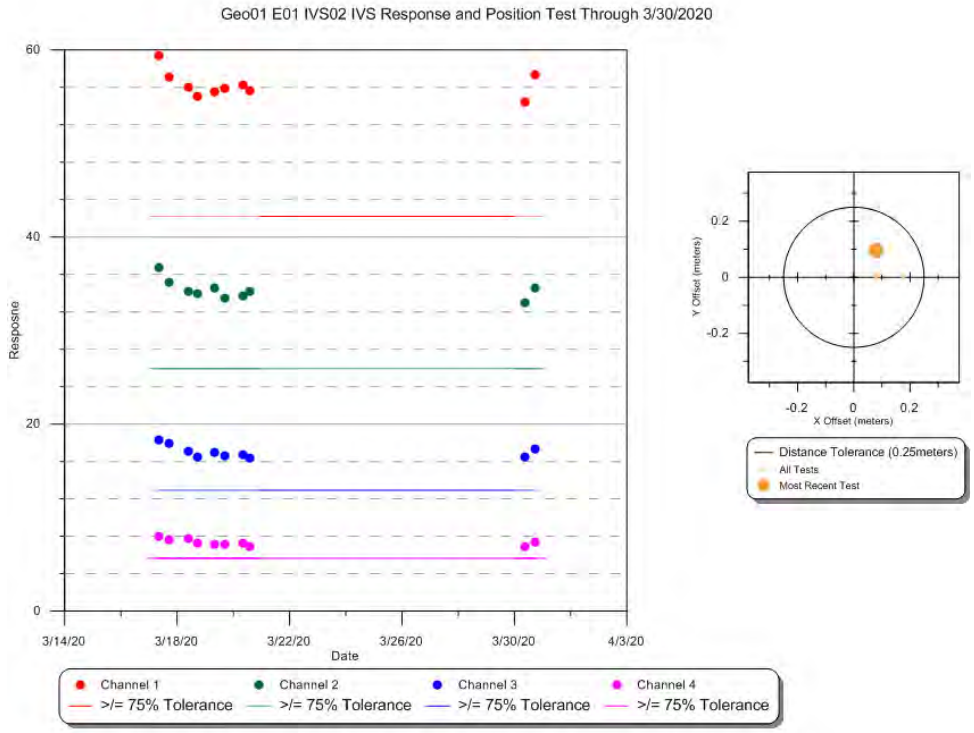
Background Noise Channel ID: Ch2_level_lg **Min:** -0.5 **Max:** 79.31 **Std Dev:** 12.72 **Mean:** 5.13 **Number of Points:** 213

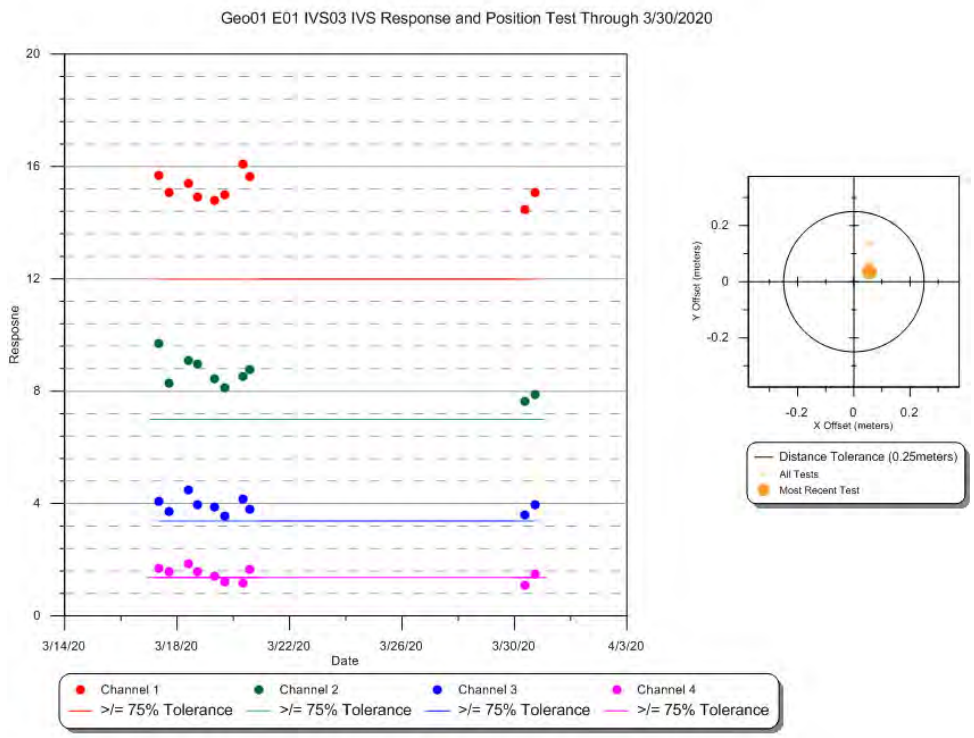
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/30/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200330E01QC1** **QC Status:** Pass

Date: 3/30/2020 8:33:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200330E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200330E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200330E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200330E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.67	0.07	-0.72	-0.39
Pre-Background Std Dev:	0.26	0.2	0.12	0.09
Observed Spike (mV):	272	191	112	53
Spike Mean (mV):	272.36	191.59	112.39	53.09
Spike Std Dev:	0.25	0.17	0.12	0.08
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.42	0.49	-0.75	-0.43
Post-Background Std Dev:	0.23	0.15	0.12	0.09
Calculated Spike (mV):	**270.315**	**191.31**	**113.125**	**53.5**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.92	5.67	6.07	6.72

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200330E01QC2** **QC Status:** Pass

Date: 3/30/2020 5:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200330E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200330E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.23	-0.36	-0.33	-0.28
Pre-Background Std Dev:	0.32	0.2	0.13	0.08
Observed Spike (mV):	270	190	112	53
Spike Mean (mV):	269.32	190.51	112.9	53.25
Spike Std Dev:	0.38	0.23	0.19	0.1
Observed Post-Background (mV):	-1	0	0	0
Post-Background Mean (mV):	-1.49	-1.05	-0.42	-0.32
Post-Background Std Dev:	0.36	0.21	0.13	0.09
Calculated Spike (mV):	**269.95**	**191.215**	**113.275**	**53.55**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.78	5.62	6.21	6.82

Requirement: 20 %

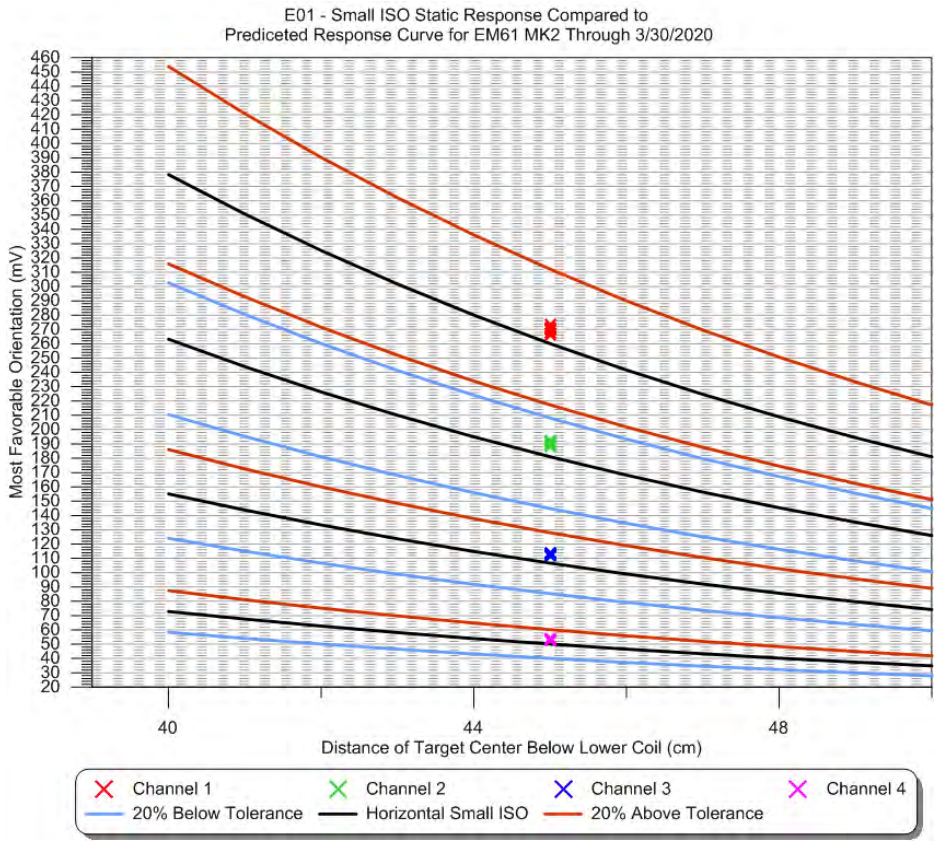
Field Comments:

Processing Comments:

Object test showed an anomalous spike in Ch1, but did not have any failure points.

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200330GPSQC** **QC Status:** **Pass**

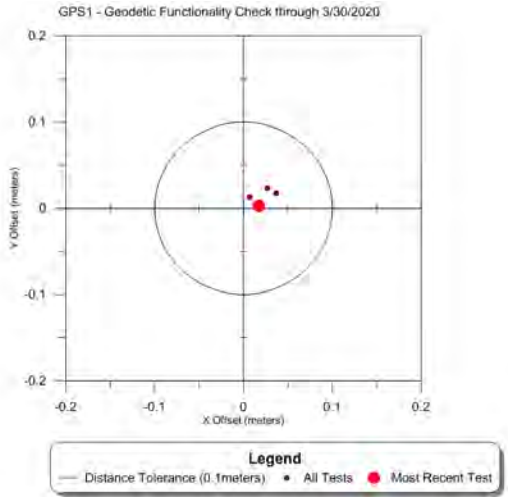
Date: 3/30/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.02	0.00

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/30/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200330_G01_DGM8_E01A,20200330_G01_DGM10_E01A,20200330_G01_DGM26_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200331_G01_DGM1_E01A **Grids Encountered:** DGM1

Collection Date: 3/31/2020 ☑ **Completed** **Start Time:** 3/31/2020 11:50:00 AM **End Time:** 3/31/2020 1:05:00 PM

Raw File Name(s): 20200331_G01_DGM1_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.30

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

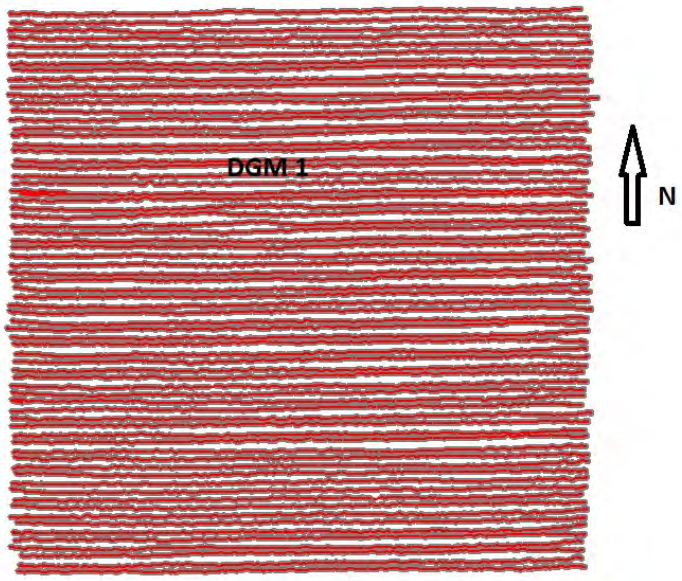
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: flat,swampy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/31/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200331_G01_DGM1_E01A

Processing Information

Dataset ID: 20200331_G01_DGM1_E01A **Grids:** DGM1

Date Processed: 4/8/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200331_G01_DGM1_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200331_G01_DGM1_E01A.gdb, 20200331_G01_DGM1_E01A.gdb.xml, 20200331_G01_DGM1_E01A.map, 20200331_G01_DGM1_E01A.map.xml, 20200331_G01_DGM1_E01A.pdf, 20200331_G01_DGM1_E01A.png, 20200331_G01_DGM1_E01A.png.gi, 20200331_G01_DGM1_E01A.png.xml, 20200331_G01_DGM1_E01A.tif, 20200331_G01_DGM1_E01A.tif.gi, 20200331_G01_DGM1_E01A.tif.xml, 20200331_G01_DGM1_E01A_AGC_BKG.gdb, 20200331_G01_DGM1_E01A_AGC_BKG.gdb.xml, 20200331_G01_DGM1_E01A_Along_Track_Separation.map, 20200331_G01_DGM1_E01A_Along_Track_Separation.map.xml, 20200331_G01_DGM1_E01A_Along_Track_Separation.png, 20200331_G01_DGM1_E01A_Along_Track_Separation.png.gi, 20200331_G01_DGM1_E01A_Along_Track_Separation.png.xml, 20200331_G01_DGM1_E01A_Ch2_level_lg.grd, 20200331_G01_DGM1_E01A_Ch2_level_lg.grd.gi, 20200331_G01_DGM1_E01A_Ch2_level_lg.grd.xml, 20200331_G01_DGM1_E01A_GPS_HDOP.txt, 20200331_G01_DGM1_E01A_GPS_Quality.map, 20200331_G01_DGM1_E01A_GPS_Quality.map.xml, 20200331_G01_DGM1_E01A_GPS_Quality.png, 20200331_G01_DGM1_E01A_GPS_Quality.png.gi, 20200331_G01_DGM1_E01A_GPS_Quality.png.xml, 20200331_G01_DGM1_E01A_GPS_Quality.txt, 20200331_G01_DGM1_E01A_Processed.XYZ, 20200331_G01_DGM1_E01A_Targets.gdb, 20200331_G01_DGM1_E01A_Targets.gdb.xml, 20200331_G01_DGM1_E01A_Targets.xls, 20200331_G01_DGM1_E01A_UceFootprintCov.map, 20200331_G01_DGM1_E01A_UceFootprintCov.map.xml, 20200331_G01_DGM1_E01A_UceFootprintCov.png, 20200331_G01_DGM1_E01A_UceFootprintCov.png.gi, 20200331_G01_DGM1_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Very low target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.03 **Mean:** 0.08 **Map ID:**20200331_G01_DGM1_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 110.02 **Requirement:** 100 % **Map ID:** 20200331_G01_DGM1_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1025.83

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200331_G01_DGM1_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.00 **DOP StDev:** 00.06 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.04; percent pass = 99.96%

Daily Tests

IVS

IVS Test ID: **20200331E01IVS1** **QC Status:** **Pass**

Date: 3/31/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200331E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	108.63	74.05	39.67	18.69	93.92	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	58.30	35.11	17.26	7.81	101.57	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.29	8.46	3.89	1.69	90.65	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.66 **Max:** 77.8 **Std Dev:** 12.48 **Mean:** 5.17 **Number of Points:** 215

Comments:

IVS

IVS Test ID: **20200331E01IVS2** **QC Status:** **Pass**

Date: 3/31/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200331E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	110.69	76.53	42.33	20.52	97.06	0.09	Pass
IVS02		56.27	34.57	17.21	7.54	55.99	34.87	17.10	7.37	100.88	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.19	7.79	3.45	1.22	83.51	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5. Ch4 low response was noted and found to fall within the bounds of normal device function.

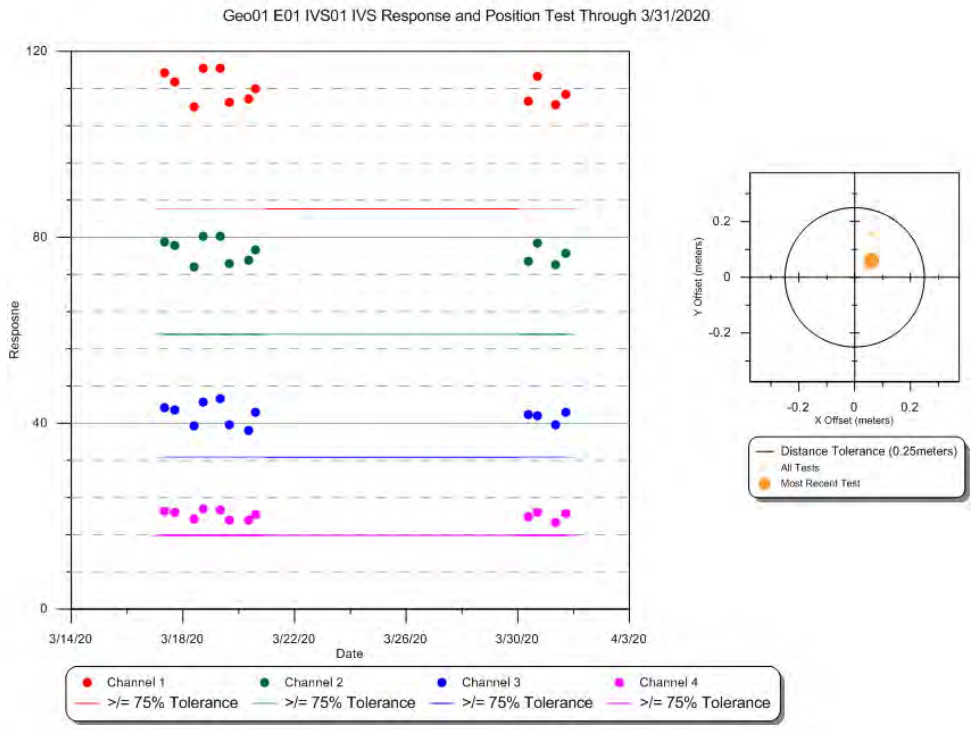
Exception Notes:

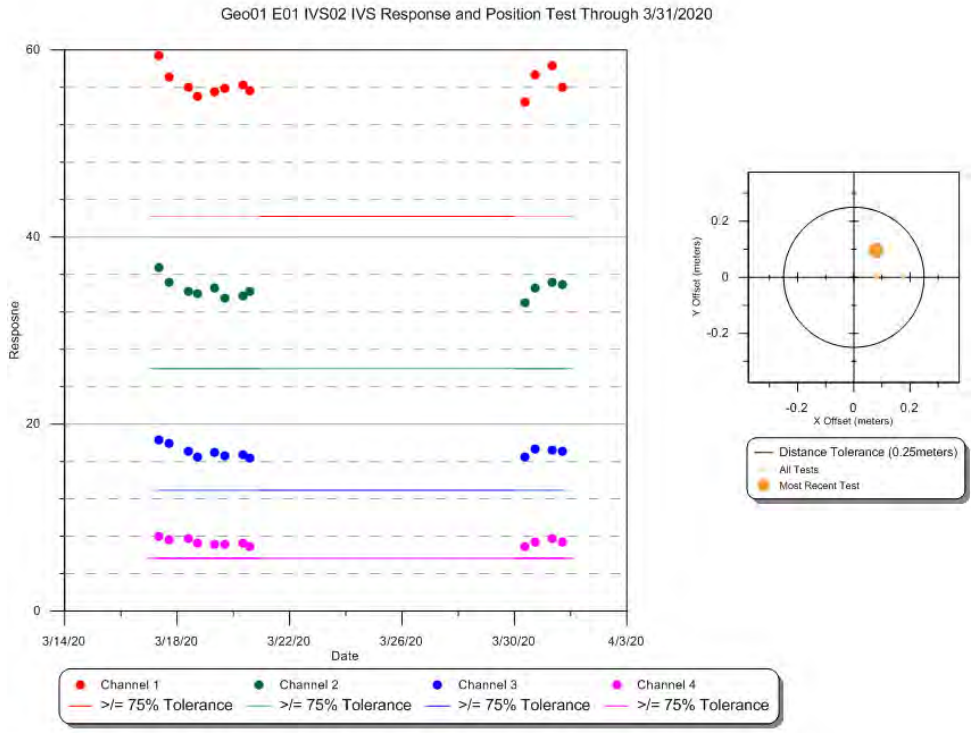
Background Noise Channel ID: Ch2_level_lg **Min:** -0.57 **Max:** 78.52 **Std Dev:** 12.23 **Mean:** 5.1 **Number of Points:** 242

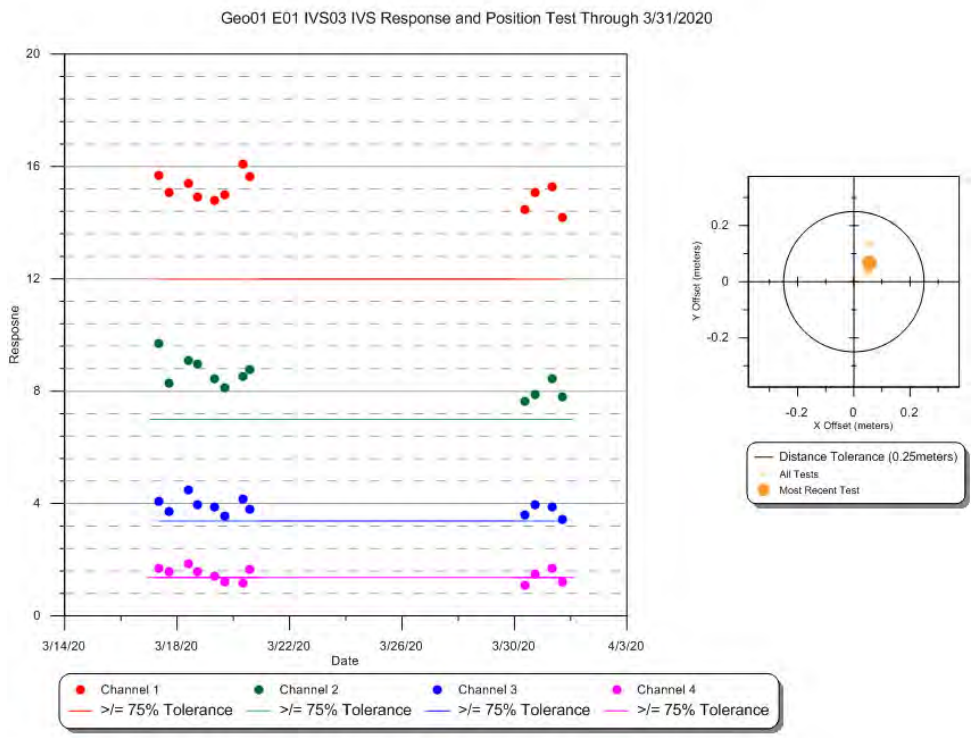
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/31/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200331E01QC1** **QC Status:** Pass

Date: 3/31/2020 8:10:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200331E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200331E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200331E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200331E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.75	0.46	-0.03	-0.15
Pre-Background Std Dev:	0.27	0.18	0.12	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	274.03	192.67	113.3	53.48
Spike Std Dev:	0.25	0.18	0.11	0.08
Observed Post-Background (mV):	3	1	0	0
Post-Background Mean (mV):	3.49	1.04	-0.03	-0.21
Post-Background Std Dev:	0.28	0.17	0.13	0.1
Calculated Spike (mV):	**271.41**	**191.92**	**113.33**	**53.66**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.34	6.01	6.26	7.04

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200331E01QC2** **QC Status:** Pass

Date: 3/31/2020 4:53:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200331E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200331E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.71	0.03	-0.08	-0.03
Pre-Background Std Dev:	0.28	0.17	0.14	0.1
Observed Spike (mV):	269	190	112	53
Spike Mean (mV):	268.73	189.79	112.36	53
Spike Std Dev:	0.3	0.21	0.15	0.09
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.11	0.08	-0.15	-0.16
Post-Background Std Dev:	0.28	0.21	0.12	0.1
Calculated Spike (mV):	**267.82**	**189.735**	**112.475**	**53.095**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.96	4.80	5.46	5.91

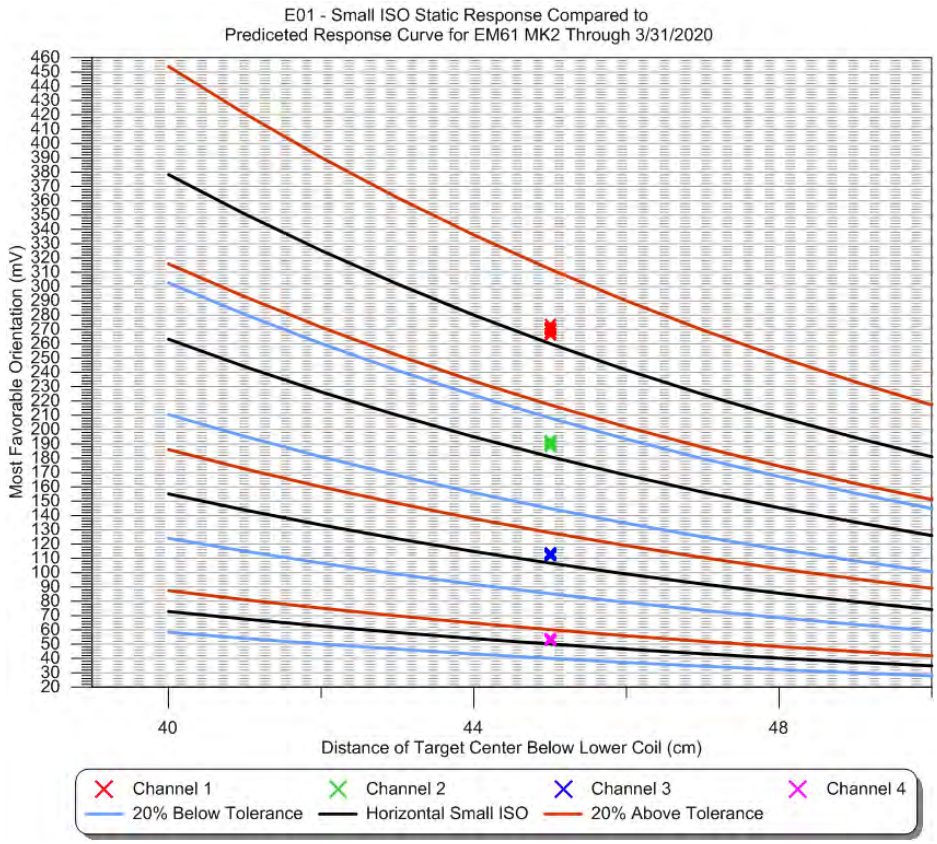
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200331GPSQC** **QC Status:** **Pass**

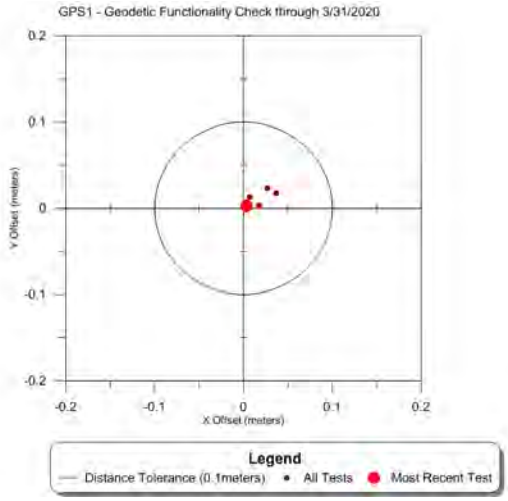
Date: 3/31/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.19	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.00	0.00

Total Offset: 0.00 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/31/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200331_G01_DGM1_E01A,20200331_G01_DGM15_E01A,20200331_G01_DGM20_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200331_G01_DGM15_E01A **Grids Encountered:** DGM15

Collection Date: 3/31/2020 ☑ **Completed** **Start Time:** 3/31/2020 8:45:00 AM **End Time:** 3/31/2020 10:43:00 AM

Raw File Name(s): 20200331_G01_DGM15_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.75

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

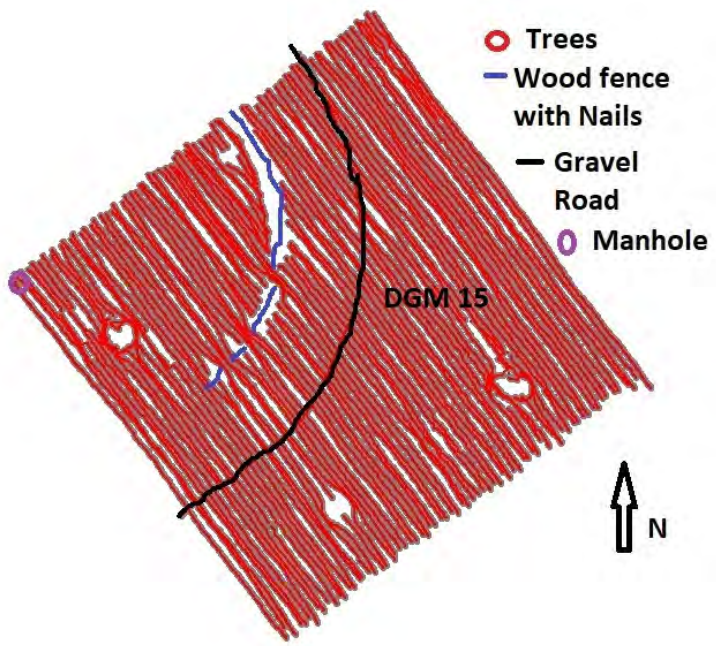
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: moderate slope

Culture: wood fence with nails,Manholes,metal swerage cover,gravel road

Survey Area Comments: line 36 collected along gravel roads

Raw Data Editing Information

Editing Date: 3/31/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200331_G01_DGM15_E01A

Processing Information

Dataset ID: 20200331_G01_DGM15_E01A **Grids:** DGM15

Date Processed: 4/8/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200331_G01_DGM15_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200331_G01_DGM15_E01A.gdb, 20200331_G01_DGM15_E01A.gdb.xml, 20200331_G01_DGM15_E01A.map, 20200331_G01_DGM15_E01A.map.xml, 20200331_G01_DGM15_E01A.pdf, 20200331_G01_DGM15_E01A.png, 20200331_G01_DGM15_E01A.png.gi, 20200331_G01_DGM15_E01A.png.xml, 20200331_G01_DGM15_E01A.tif, 20200331_G01_DGM15_E01A.tif.gi, 20200331_G01_DGM15_E01A.tif.xml, 20200331_G01_DGM15_E01A_AGC_BKG.gdb, 20200331_G01_DGM15_E01A_AGC_BKG.gdb.xml, 20200331_G01_DGM15_E01A_Along_Track_Separation.map, 20200331_G01_DGM15_E01A_Along_Track_Separation.map.xml, 20200331_G01_DGM15_E01A_Along_Track_Separation.png, 20200331_G01_DGM15_E01A_Along_Track_Separation.png.gi, 20200331_G01_DGM15_E01A_Along_Track_Separation.png.xml, 20200331_G01_DGM15_E01A_Ch2_level_lg.grd, 20200331_G01_DGM15_E01A_Ch2_level_lg.grd.gi, 20200331_G01_DGM15_E01A_Ch2_level_lg.grd.xml, 20200331_G01_DGM15_E01A_Culture.ply, 20200331_G01_DGM15_E01A_Culture.xls, 20200331_G01_DGM15_E01A_Culture_pg.dbf, 20200331_G01_DGM15_E01A_Culture_pg.prj, 20200331_G01_DGM15_E01A_Culture_pg.shp, 20200331_G01_DGM15_E01A_Culture_pg.shx, 20200331_G01_DGM15_E01A_GPS_HDOP.txt, 20200331_G01_DGM15_E01A_GPS_Quality.map, 20200331_G01_DGM15_E01A_GPS_Quality.map.xml, 20200331_G01_DGM15_E01A_GPS_Quality.png, 20200331_G01_DGM15_E01A_GPS_Quality.png.gi, 20200331_G01_DGM15_E01A_GPS_Quality.png.xml, 20200331_G01_DGM15_E01A_GPS_Quality.txt, 20200331_G01_DGM15_E01A_Processed.XYZ, 20200331_G01_DGM15_E01A_SRA.ply, 20200331_G01_DGM15_E01A_SRA.xls, 20200331_G01_DGM15_E01A_SRA_pg.dbf, 20200331_G01_DGM15_E01A_SRA_pg.prj, 20200331_G01_DGM15_E01A_SRA_pg.shp, 20200331_G01_DGM15_E01A_SRA_pg.shx, 20200331_G01_DGM15_E01A_Targets.gdb, 20200331_G01_DGM15_E01A_Targets.gdb.xml, 20200331_G01_DGM15_E01A_Targets.xls, 20200331_G01_DGM15_E01A_UceFootprintCov.map, 20200331_G01_DGM15_E01A_UceFootprintCov.map.xml, 20200331_G01_DGM15_E01A_UceFootprintCov.png, 20200331_G01_DGM15_E01A_UceFootprintCov.png.gi, 20200331_G01_DGM15_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Mostly saturated grid with cultural influence from man-hole covers. Culture gaps due to trees and a nearby fence

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.07 **Map ID:**20200331_G01_DGM15_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 106.16 **Requirement:** 100 % **Map ID:** 20200331_G01_DGM15_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 991.90

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200331_G01_DGM15_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: **DOP Max:** **DOP StDev:** **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 5.00; standard deviation = 0.24; percent pass = 98.47%
Original HDOP values: min = 0.70; max = 5.00; standard deviation = 0.39; percent pass = 99.71%

Daily Tests

IVS

IVS Test ID: **20200331E01IVS1** **QC Status:** **Pass**

Date: 3/31/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200331E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	108.63	74.05	39.67	18.69	93.92	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	58.30	35.11	17.26	7.81	101.57	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.29	8.46	3.89	1.69	90.65	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.66 **Max:** 77.8 **Std Dev:** 12.48 **Mean:** 5.17 **Number of Points:** 215

Comments:

IVS

IVS Test ID: **20200331E01IVS2** **QC Status:** **Pass**

Date: 3/31/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200331E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	110.69	76.53	42.33	20.52	97.06	0.09	Pass
IVS02		56.27	34.57	17.21	7.54	55.99	34.87	17.10	7.37	100.88	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.19	7.79	3.45	1.22	83.51	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5. Ch4 low response was noted and found to fall within the bounds of normal device function.

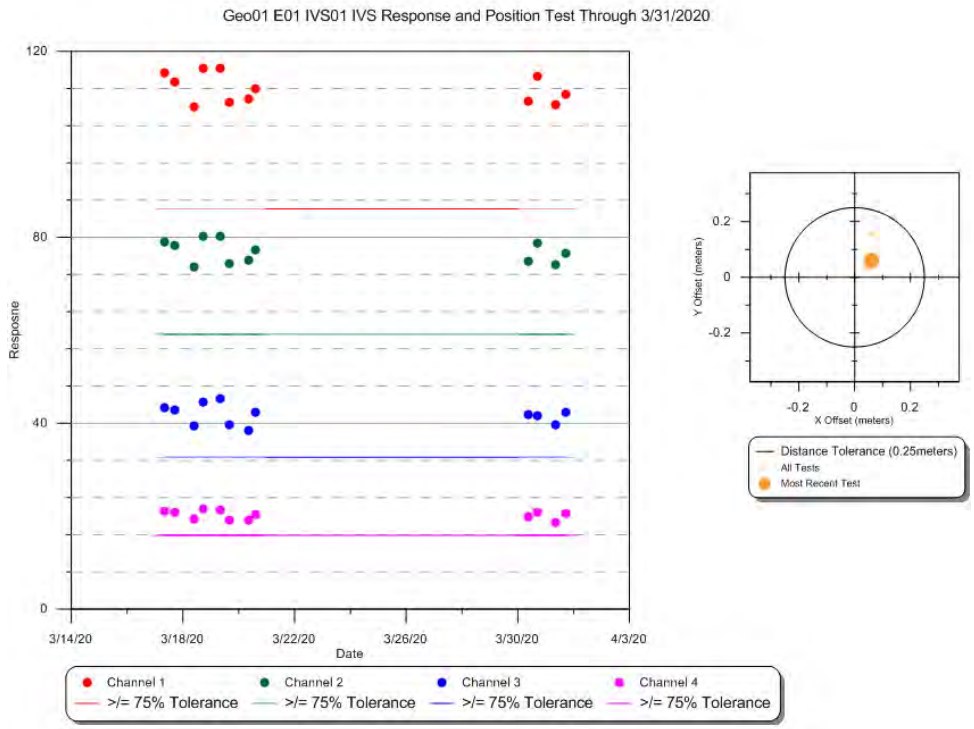
Exception Notes:

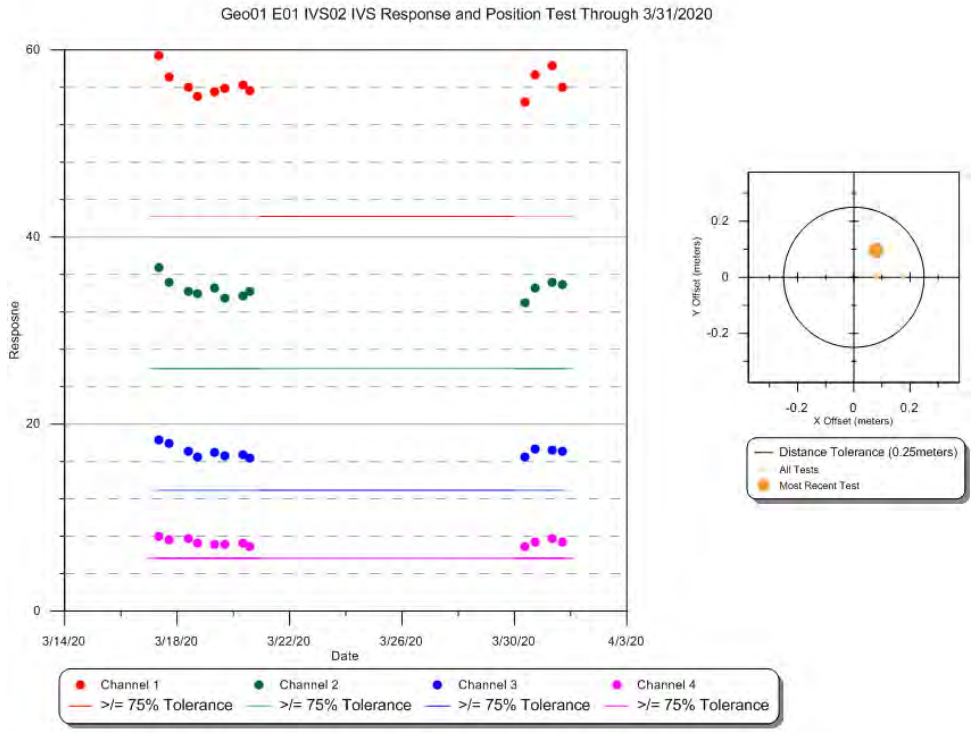
Background Noise Channel ID: Ch2_level_lg **Min:** -0.57 **Max:** 78.52 **Std Dev:** 12.23 **Mean:** 5.1 **Number of Points:** 242

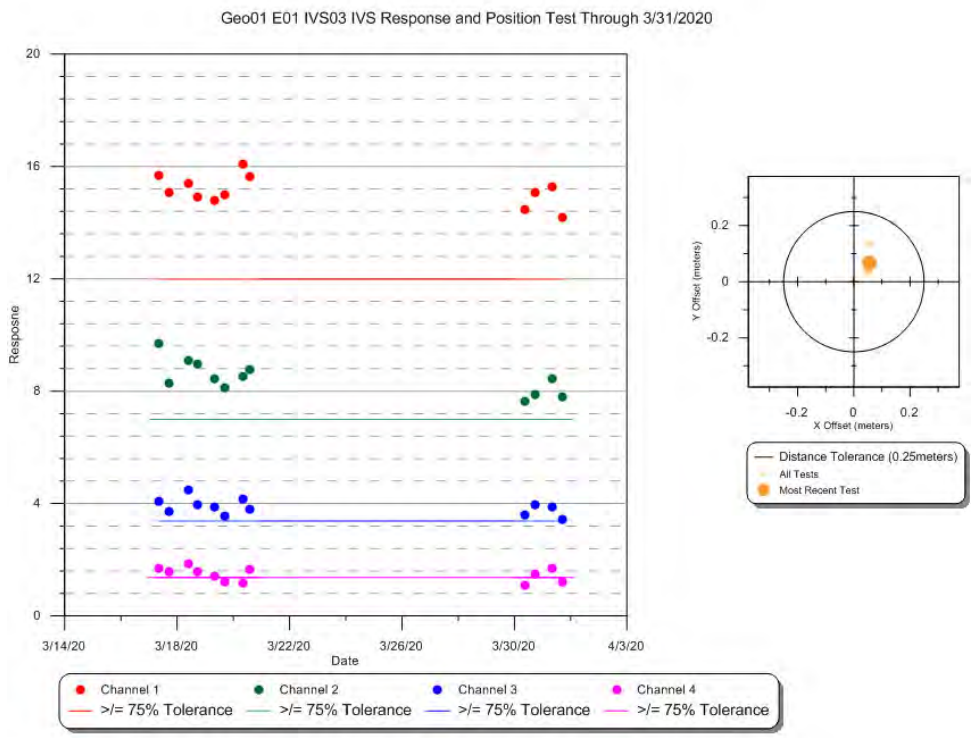
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/31/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200331E01QC1** **QC Status:** Pass

Date: 3/31/2020 8:10:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200331E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200331E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200331E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200331E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.75	0.46	-0.03	-0.15
Pre-Background Std Dev:	0.27	0.18	0.12	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	274.03	192.67	113.3	53.48
Spike Std Dev:	0.25	0.18	0.11	0.08
Observed Post-Background (mV):	3	1	0	0
Post-Background Mean (mV):	3.49	1.04	-0.03	-0.21
Post-Background Std Dev:	0.28	0.17	0.13	0.1
Calculated Spike (mV):	**271.41**	**191.92**	**113.33**	**53.66**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.34	6.01	6.26	7.04

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200331E01QC2** **QC Status:** Pass

Date: 3/31/2020 4:53:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200331E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200331E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.71	0.03	-0.08	-0.03
Pre-Background Std Dev:	0.28	0.17	0.14	0.1
Observed Spike (mV):	269	190	112	53
Spike Mean (mV):	268.73	189.79	112.36	53
Spike Std Dev:	0.3	0.21	0.15	0.09
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.11	0.08	-0.15	-0.16
Post-Background Std Dev:	0.28	0.21	0.12	0.1
Calculated Spike (mV):	**267.82**	**189.735**	**112.475**	**53.095**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.96	4.80	5.46	5.91

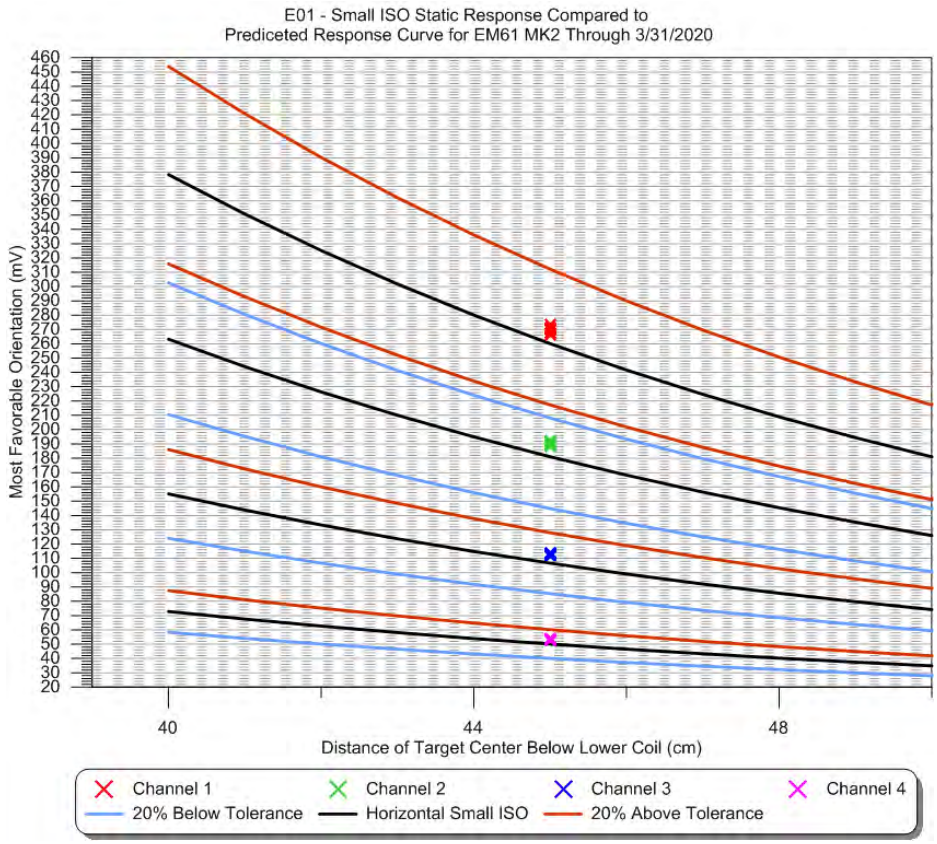
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200331GPSQC** **QC Status:** **Pass**

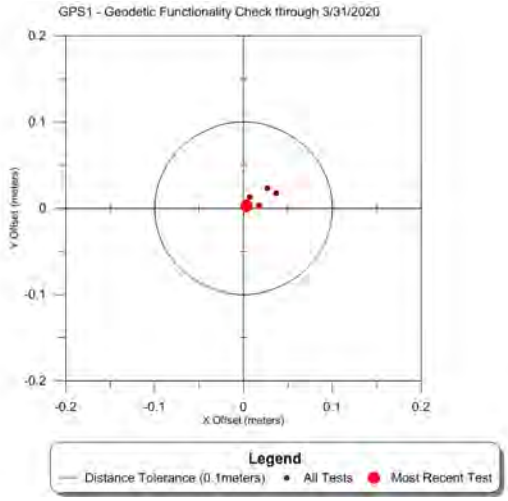
Date: 3/31/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.19	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.00	0.00

Total Offset: 0.00 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/31/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200331_G01_DGM1_E01A,20200331_G01_DGM15_E01A,20200331_G01_DGM20_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200331_G01_DGM20_E01A **Grids Encountered:** DGM20

Collection Date: 3/31/2020 ☑ **Completed** **Start Time:** 3/31/2020 2:50:00 PM **End Time:** 3/31/2020 4:43:00 PM

Raw File Name(s): 20200331_G01_DGM20_E01A,20200331_G01_DGM20_E01AA

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

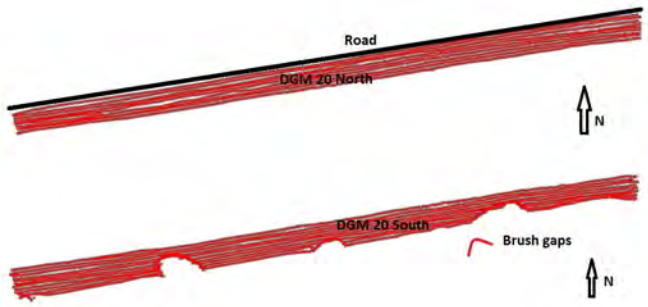
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cloudy

Terrain: moderate slope

Culture: E-W gravel road,rebar

Survey Area Comments:

Raw Data Editing Information

Editing Date: 3/31/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200331_G01_DGM20_E01A,20200331_G01_DGM20_E01AA

Processing Information

Dataset ID: 20200331_G01_DGM20_E01A **Grids:** DGM20

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-3000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200331_G01_DGM20_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200331_G01_DGM20_E01A.gdb, 20200331_G01_DGM20_E01A.gdb.xml, 20200331_G01_DGM20_E01A.map, 20200331_G01_DGM20_E01A.map.xml, 20200331_G01_DGM20_E01A.pdf, 20200331_G01_DGM20_E01A.png, 20200331_G01_DGM20_E01A.png.gi, 20200331_G01_DGM20_E01A.png.xml, 20200331_G01_DGM20_E01A.tif, 20200331_G01_DGM20_E01A.tif.gi, 20200331_G01_DGM20_E01A.tif.xml, 20200331_G01_DGM20_E01A_AGC_BKG.gdb, 20200331_G01_DGM20_E01A_AGC_BKG.gdb.xml, 20200331_G01_DGM20_E01A_Along_Track_Separation.map, 20200331_G01_DGM20_E01A_Along_Track_Separation.map.xml, 20200331_G01_DGM20_E01A_Along_Track_Separation.png, 20200331_G01_DGM20_E01A_Along_Track_Separation.png.gi, 20200331_G01_DGM20_E01A_Along_Track_Separation.png.xml, 20200331_G01_DGM20_E01A_AlongTrackSampling.txt, 20200331_G01_DGM20_E01A_Background_Ch2_Stats.txt, 20200331_G01_DGM20_E01A_Ch2_level_lg.grd, 20200331_G01_DGM20_E01A_Ch2_level_lg.grd.gi, 20200331_G01_DGM20_E01A_Ch2_level_lg.grd.xml, 20200331_G01_DGM20_E01A_GPS_HDOP.txt, 20200331_G01_DGM20_E01A_GPS_Quality.map, 20200331_G01_DGM20_E01A_GPS_Quality.map.xml, 20200331_G01_DGM20_E01A_GPS_Quality.png, 20200331_G01_DGM20_E01A_GPS_Quality.png.gi, 20200331_G01_DGM20_E01A_GPS_Quality.png.xml, 20200331_G01_DGM20_E01A_GPS_Quality.txt, 20200331_G01_DGM20_E01A_Processed.XYZ, 20200331_G01_DGM20_E01A_SRA.ply, 20200331_G01_DGM20_E01A_SRA.xls, 20200331_G01_DGM20_E01A_SRA_pg.dbf, 20200331_G01_DGM20_E01A_SRA_pg.prj, 20200331_G01_DGM20_E01A_SRA_pg.shp, 20200331_G01_DGM20_E01A_SRA_pg.shx, 20200331_G01_DGM20_E01A_Targets.gdb, 20200331_G01_DGM20_E01A_Targets.gdb.xml, 20200331_G01_DGM20_E01A_Targets.xls, 20200331_G01_DGM20_E01A_UceFootprintCov.map, 20200331_G01_DGM20_E01A_UceFootprintCov.map.xml, 20200331_G01_DGM20_E01A_UceFootprintCov.png, 20200331_G01_DGM20_E01A_UceFootprintCov.png.gi, 20200331_G01_DGM20_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Mostly saturated grid with two SRAs designated. Culture gaps due to brush.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.25 **Std Dev:** 0.03 **Mean:** 0.06 **Map ID:**20200331_G01_DGM20_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 107.90 **Requirement:** 100 % **Map ID:** 20200331_G01_DGM20_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 829.01

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -22.92 **Max:** 5.09 **Std Dev:** 5.92 **Mean:** -4.68 **Number of Points:** 672

Comments:

GPS Quality and HDOP

MapID: 20200331_G01_DGM20_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 02.00 **DOP StDev:** 00.09 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.22; percent pass = 98.81%

Daily Tests

IVS

IVS Test ID: **20200331E01IVS1** **QC Status:** **Pass**

Date: 3/31/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200331E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	108.63	74.05	39.67	18.69	93.92	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	58.30	35.11	17.26	7.81	101.57	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.29	8.46	3.89	1.69	90.65	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.66 **Max:** 77.8 **Std Dev:** 12.48 **Mean:** 5.17 **Number of Points:** 215

Comments:

IVS

IVS Test ID: **20200331E01IVS2** **QC Status:** **Pass**

Date: 3/31/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200331E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	110.69	76.53	42.33	20.52	97.06	0.09	Pass
IVS02		56.27	34.57	17.21	7.54	55.99	34.87	17.10	7.37	100.88	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.19	7.79	3.45	1.22	83.51	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5. Ch4 low response was noted and found to fall within the bounds of normal device function.

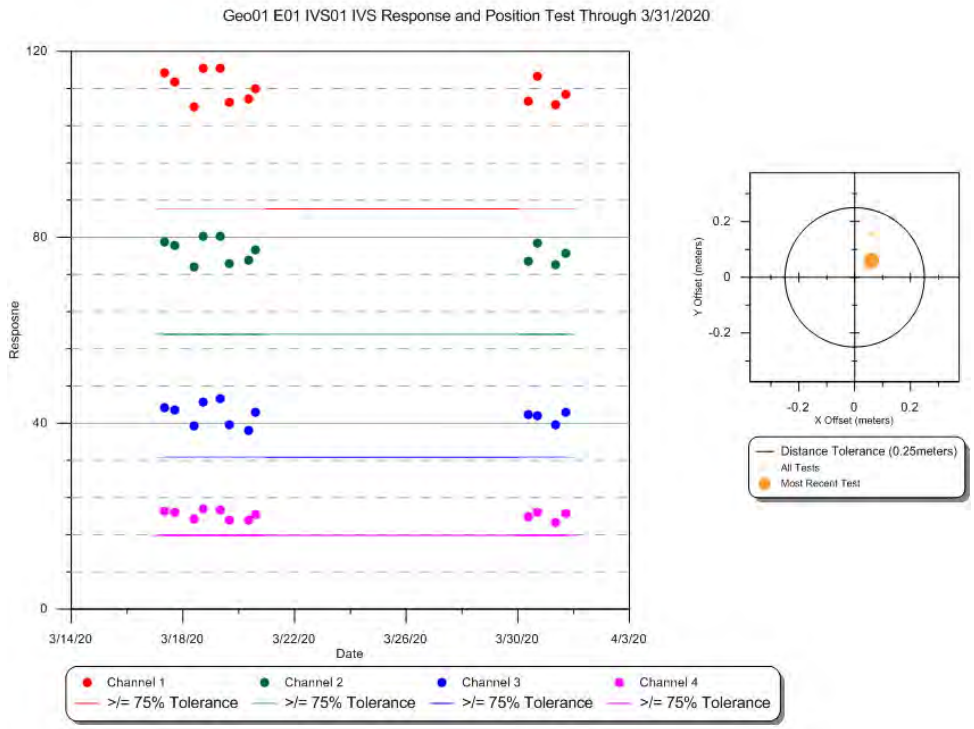
Exception Notes:

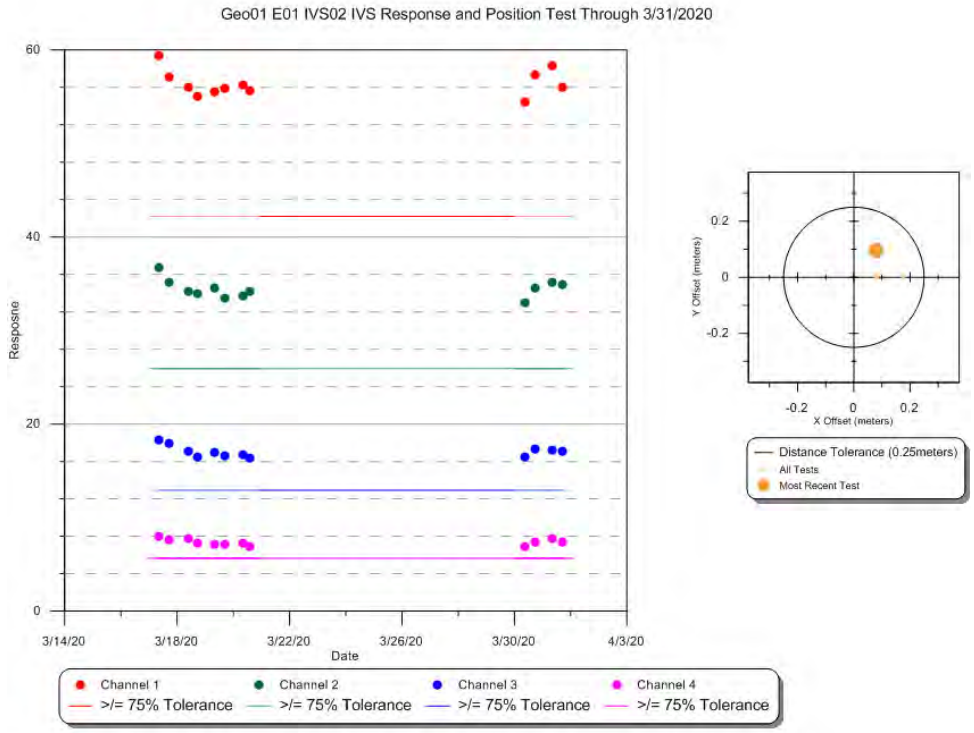
Background Noise Channel ID: Ch2_level_lg **Min:** -0.57 **Max:** 78.52 **Std Dev:** 12.23 **Mean:** 5.1 **Number of Points:** 242

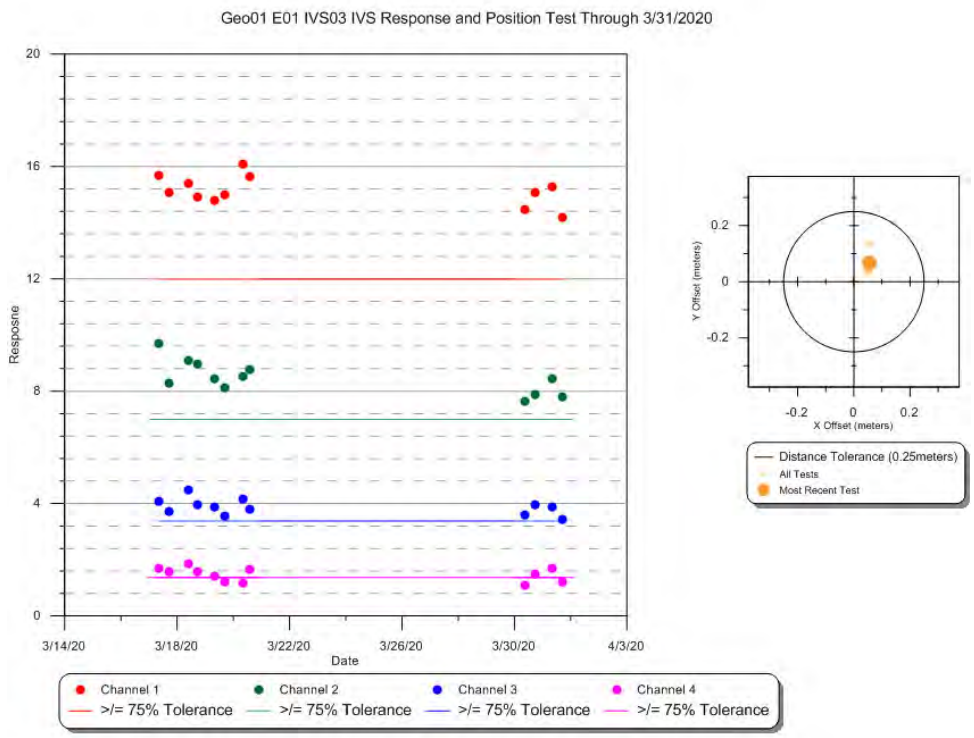
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 3/31/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200331E01QC1** **QC Status:** Pass

Date: 3/31/2020 8:10:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200331E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200331E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200331E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200331E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.75	0.46	-0.03	-0.15
Pre-Background Std Dev:	0.27	0.18	0.12	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	274.03	192.67	113.3	53.48
Spike Std Dev:	0.25	0.18	0.11	0.08
Observed Post-Background (mV):	3	1	0	0
Post-Background Mean (mV):	3.49	1.04	-0.03	-0.21
Post-Background Std Dev:	0.28	0.17	0.13	0.1
Calculated Spike (mV):	**271.41**	**191.92**	**113.33**	**53.66**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.34	6.01	6.26	7.04

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200331E01QC2** **QC Status:** Pass

Date: 3/31/2020 4:53:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200331E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200331E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.71	0.03	-0.08	-0.03
Pre-Background Std Dev:	0.28	0.17	0.14	0.1
Observed Spike (mV):	269	190	112	53
Spike Mean (mV):	268.73	189.79	112.36	53
Spike Std Dev:	0.3	0.21	0.15	0.09
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.11	0.08	-0.15	-0.16
Post-Background Std Dev:	0.28	0.21	0.12	0.1
Calculated Spike (mV):	**267.82**	**189.735**	**112.475**	**53.095**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.96	4.80	5.46	5.91

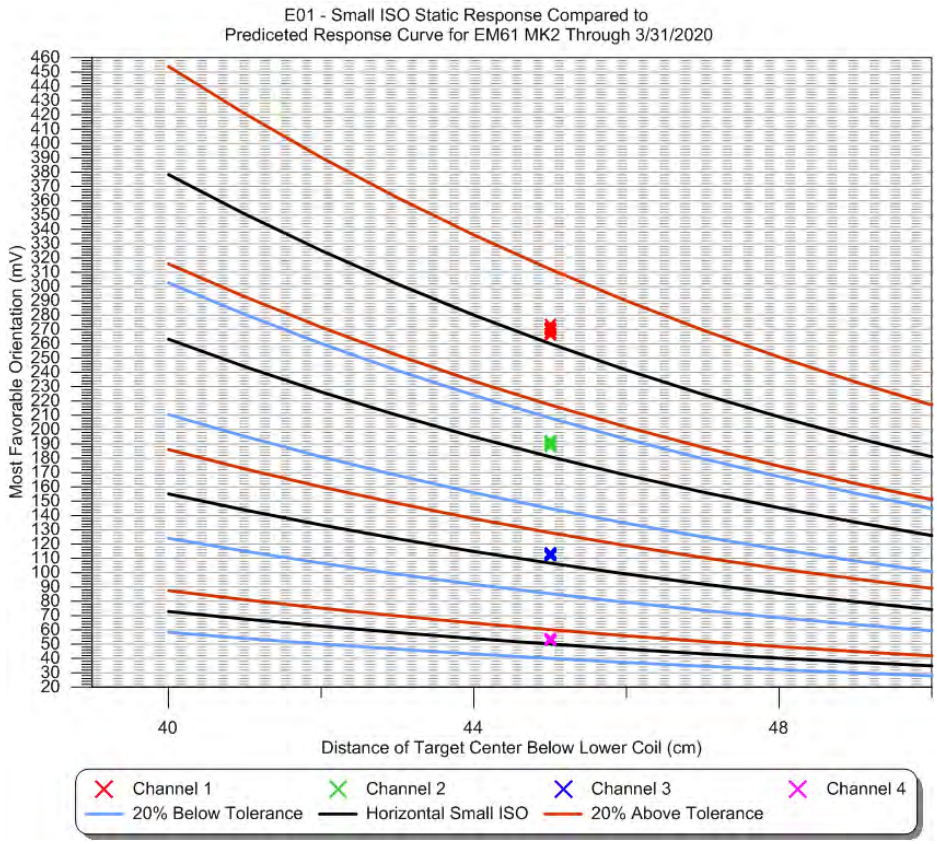
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200331GPSQC** **QC Status:** **Pass**

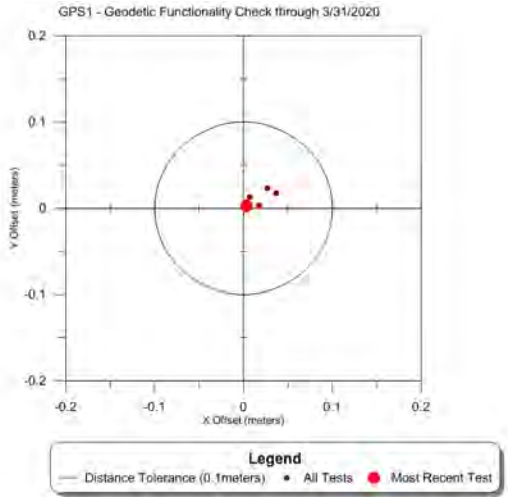
Date: 3/31/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.19	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.00	0.00

Total Offset: 0.00 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 3/31/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200331_G01_DGM1_E01A,20200331_G01_DGM15_E01A,20200331_G01_DGM20_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200401_G01_DGM5_E01A **Grids Encountered:** DGM5

Collection Date: 4/1/2020 ☑ **Completed** **Start Time:** 4/1/2020 2:34:00 PM **End Time:** 4/1/2020 3:28:00 PM

Raw File Name(s): 20200401_G01_DGM5_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.30

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

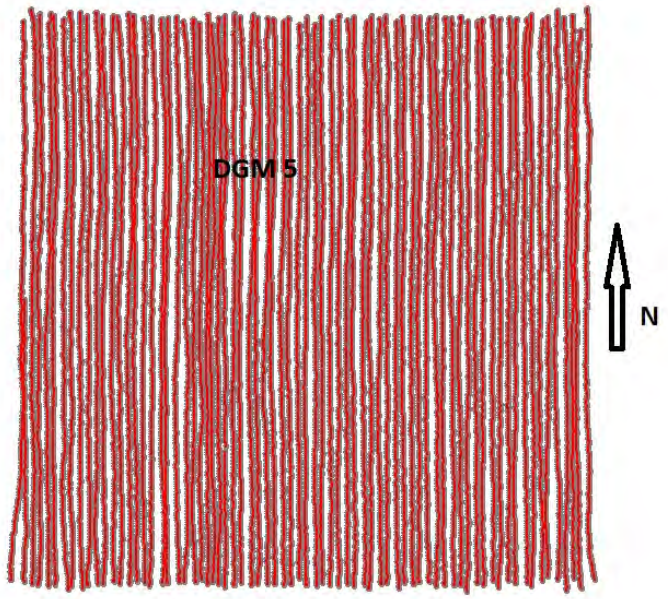
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: flat,swampy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/1/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200401_G01_DGM5_E01A

Processing Information

Dataset ID: 20200401_G01_DGM5_E01A **Grids:** DGM5

Date Processed: 4/8/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=5

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200401_G01_DGM5_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200401_G01_DGM5_E01A.gdb, 20200401_G01_DGM5_E01A.gdb.xml, 20200401_G01_DGM5_E01A.map, 20200401_G01_DGM5_E01A.map.xml, 20200401_G01_DGM5_E01A.pdf, 20200401_G01_DGM5_E01A.png, 20200401_G01_DGM5_E01A.png.gi, 20200401_G01_DGM5_E01A.png.xml, 20200401_G01_DGM5_E01A_AGC_BKG.gdb, 20200401_G01_DGM5_E01A_AGC_BKG.gdb.xml, 20200401_G01_DGM5_E01A_Along_Track_Separation.map, 20200401_G01_DGM5_E01A_Along_Track_Separation.map.xml, 20200401_G01_DGM5_E01A_Along_Track_Separation.png, 20200401_G01_DGM5_E01A_Along_Track_Separation.png.gi, 20200401_G01_DGM5_E01A_Along_Track_Separation.png.xml, 20200401_G01_DGM5_E01A_Ch2_level_lg.grd, 20200401_G01_DGM5_E01A_Ch2_level_lg.grd.gi, 20200401_G01_DGM5_E01A_Ch2_level_lg.grd.xml, 20200401_G01_DGM5_E01A_GPS_HDOP.txt, 20200401_G01_DGM5_E01A_GPS_Quality.map, 20200401_G01_DGM5_E01A_GPS_Quality.map.xml, 20200401_G01_DGM5_E01A_GPS_Quality.png, 20200401_G01_DGM5_E01A_GPS_Quality.png.gi, 20200401_G01_DGM5_E01A_GPS_Quality.png.xml, 20200401_G01_DGM5_E01A_GPS_Quality.txt, 20200401_G01_DGM5_E01A_Processed.XYZ, 20200401_G01_DGM5_E01A_Targets.gdb, 20200401_G01_DGM5_E01A_Targets.gdb.xml, 20200401_G01_DGM5_E01A_Targets.xls, 20200401_G01_DGM5_E01A_UceFootprintCov.map, 20200401_G01_DGM5_E01A_UceFootprintCov.map.xml, 20200401_G01_DGM5_E01A_UceFootprintCov.png, 20200401_G01_DGM5_E01A_UceFootprintCov.png.gi, 20200401_G01_DGM5_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Very low target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.08 **Map ID:**20200401_G01_DGM5_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 111.23 **Requirement:** 100 % **Map ID:** 20200401_G01_DGM5_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1033.13

Explanation of Gaps:

GPS Quality and HDOP

MapID:

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.20 **DOP StDev:** 00.12 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.03; percent pass = 99.98%

Daily Tests

IVS

IVS Test ID: **20200401E01IVS1** **QC Status:** **Pass**

Date: 4/1/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200401E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	113.11	77.53	42.71	20.19	98.33	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.08	33.74	16.68	7.12	97.60	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.75	7.43	2.98	1.01	79.60	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.55 **Max:** 77.85 **Std Dev:** 12.39 **Mean:** 4.89 **Number of Points:** 224

Comments:

IVS

IVS Test ID: **20200401E01IVS2** **QC Status:** **Pass**

Date: 4/1/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200401E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	110.15	75.39	41.56	20.54	95.62	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.52	34.18	16.83	7.05	98.87	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	14.37	7.65	3.28	1.29	82.03	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

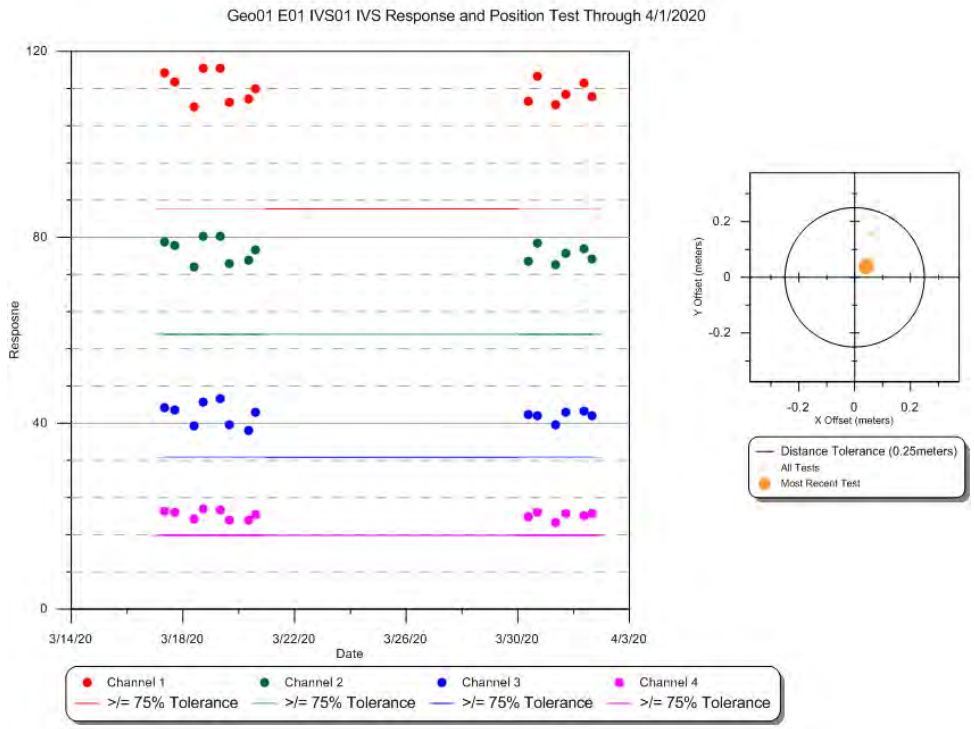
Exception Notes:

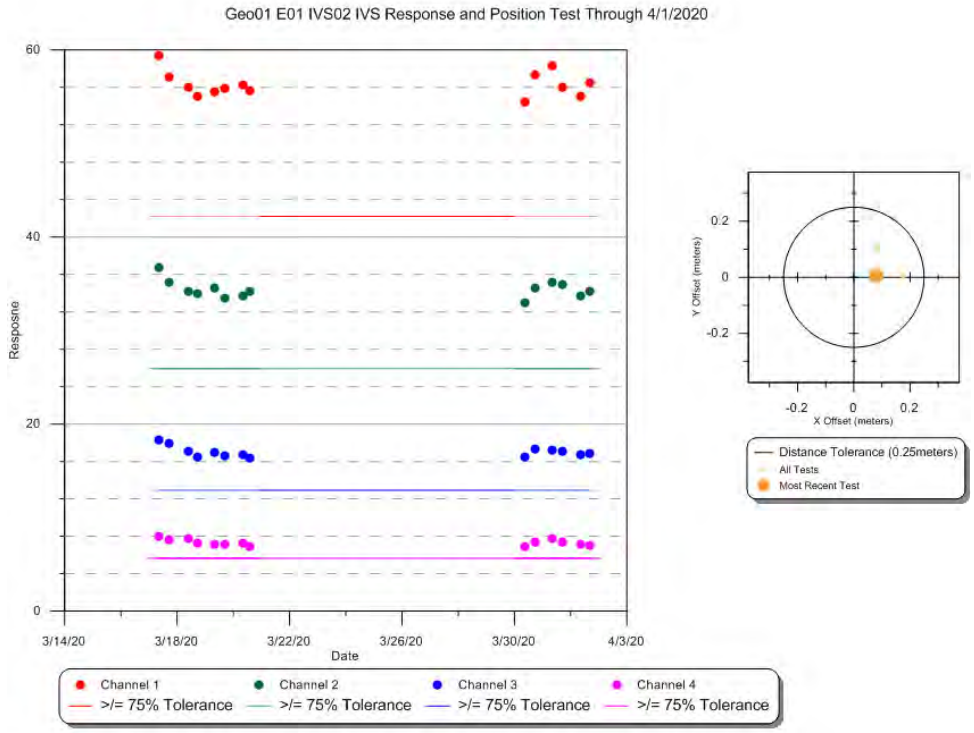
Background Noise Channel ID: Ch2_level_lg **Min:** -0.48 **Max:** 77.43 **Std Dev:** 12.71 **Mean:** 5.12 **Number of Points:** 217

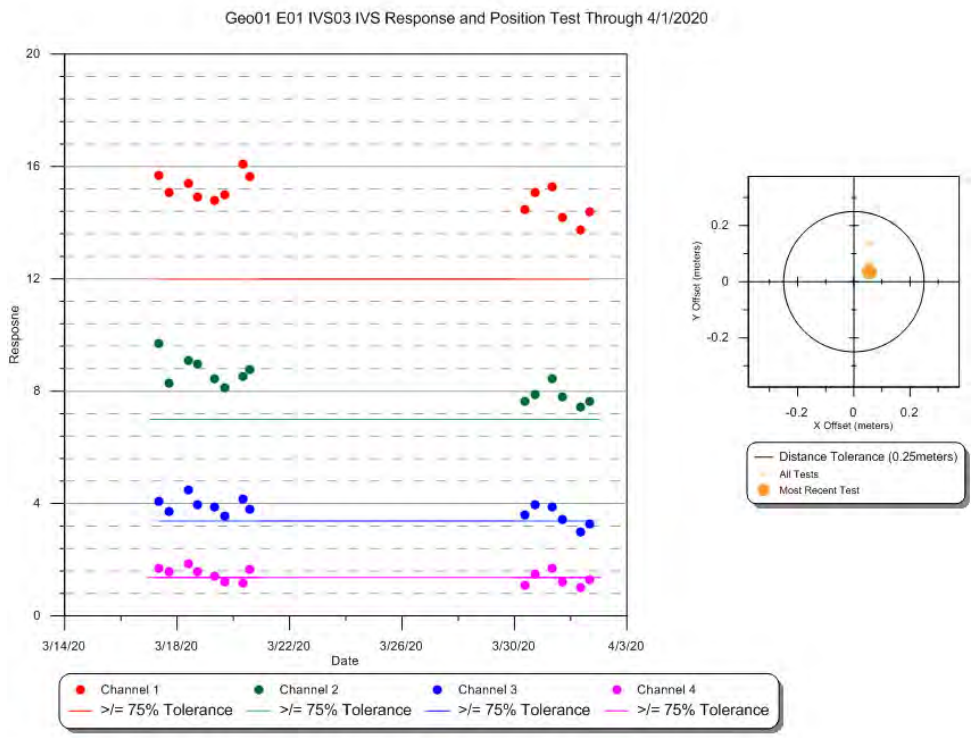
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/1/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200401E01QC1** **QC Status:** Pass

Date: 4/1/2020 8:21:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200401E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200401E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200401E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200401E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.84	-0.20	-0.38	-0.16
Pre-Background Std Dev:	0.25	0.18	0.12	0.09
Observed Spike (mV):	274	192	112	53
Spike Mean (mV):	274.78	192.26	112.77	53.15
Spike Std Dev:	0.26	0.18	0.12	0.09
Observed Post-Background (mV):	3	0	0	0
Post-Background Mean (mV):	3.42	0.2	-0.68	-0.36
Post-Background Std Dev:	0.24	0.15	0.1	0.09
Calculated Spike (mV):	**272.65**	**192.26**	**113.3**	**53.41**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.82	6.20	6.24	6.54

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200401E01QC2** **QC Status:** Pass

Date: 4/1/2020 4:18:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200401E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200401E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	-0.38	-0.33	-0.27	-0.16
Pre-Background Std Dev:	0.29	0.19	0.11	0.11
Observed Spike (mV):	270	190	112	52
Spike Mean (mV):	270.31	190.69	112.36	52.75
Spike Std Dev:	0.26	0.18	0.14	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.29	-0.41	-0.35	-0.22
Post-Background Std Dev:	0.3	0.18	0.12	0.09
Calculated Spike (mV):	**270.355**	**191.06**	**112.67**	**52.94**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.93	5.53	5.64	5.61

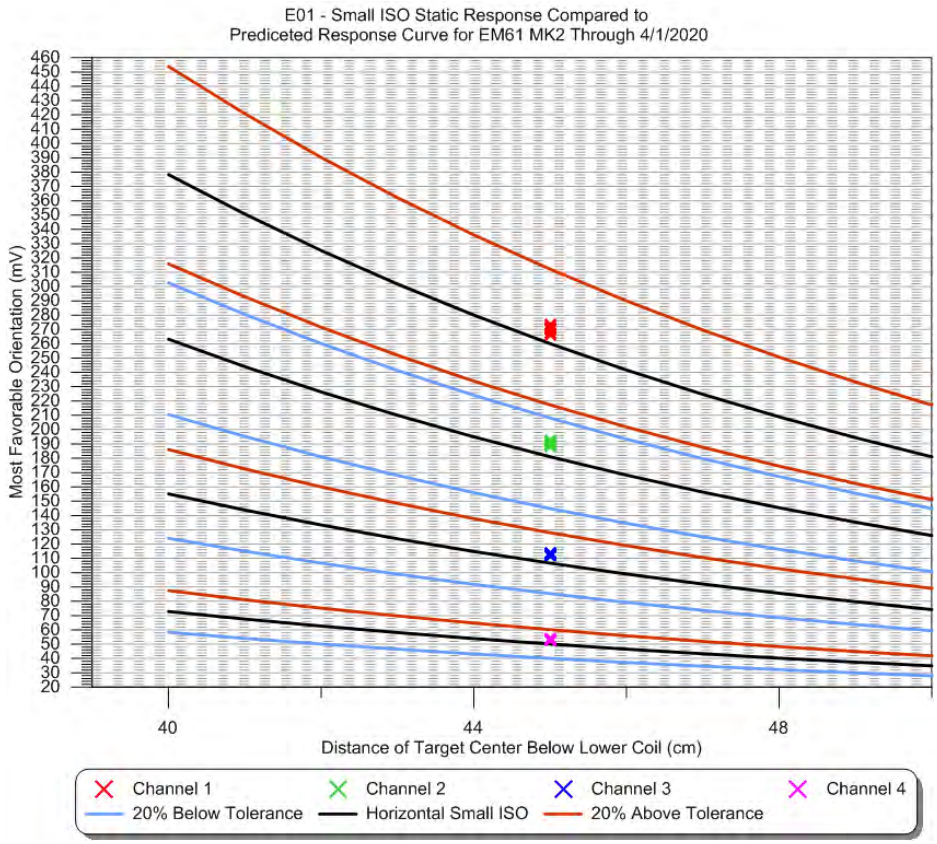
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200401GPSQC** **QC Status:** **Pass**

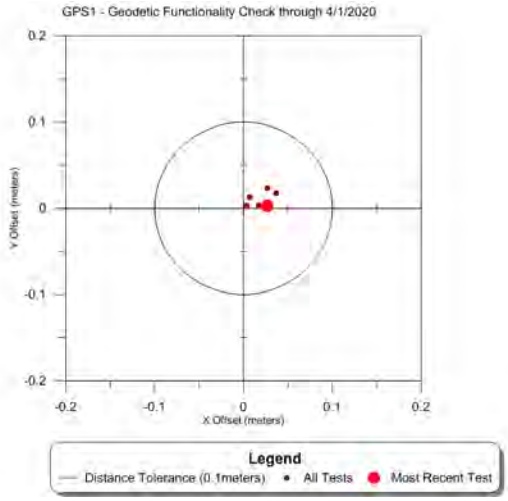
Date: 4/1/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.03	0.00

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/1/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200401_G01_DGM5_E01A,20200401_G01_DGM6_E01A,20200401_G01_DGM17_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200401_G01_DGM6_E01A **Grids Encountered:** DGM6

Collection Date: 4/1/2020 ☑ **Completed** **Start Time:** 4/1/2020 8:58:00 AM **End Time:** 4/1/2020 10:45:00 AM

Raw File Name(s): 20200401_G01_DGM6_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

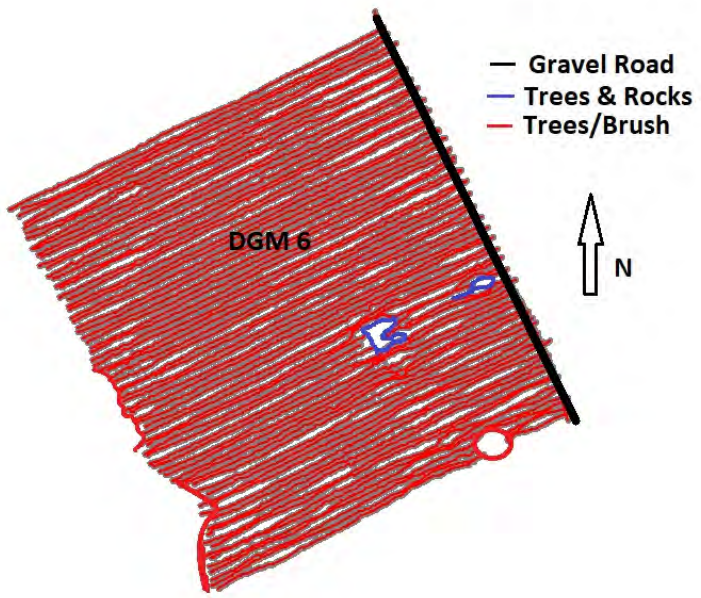
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: moderate slope,rocky

Culture: gravel road

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/1/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200401_G01_DGM6_E01A

Processing Information

Dataset ID: 20200401_G01_DGM6_E01A **Grids:** DGM6

Date Processed: 4/6/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-600, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200401_G01_DGM6_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200401_G01_DGM6_E01A.gdb, 20200401_G01_DGM6_E01A.gdb.xml, 20200401_G01_DGM6_E01A.map, 20200401_G01_DGM6_E01A.map.xml, 20200401_G01_DGM6_E01A.pdf, 20200401_G01_DGM6_E01A.png, 20200401_G01_DGM6_E01A.png.gi, 20200401_G01_DGM6_E01A.png.xml, 20200401_G01_DGM6_E01A.tif, 20200401_G01_DGM6_E01A.tif.gi, 20200401_G01_DGM6_E01A.tif.xml, 20200401_G01_DGM6_E01A_AGC_BKG.gdb, 20200401_G01_DGM6_E01A_AGC_BKG.gdb.xml, 20200401_G01_DGM6_E01A_Along_Track_Separation.map, 20200401_G01_DGM6_E01A_Along_Track_Separation.map.xml, 20200401_G01_DGM6_E01A_Along_Track_Separation.png, 20200401_G01_DGM6_E01A_Along_Track_Separation.png.gi, 20200401_G01_DGM6_E01A_Along_Track_Separation.png.xml, 20200401_G01_DGM6_E01A_Background_Ch2_Stats.txt, 20200401_G01_DGM6_E01A_Ch2_level_lg.grd, 20200401_G01_DGM6_E01A_Ch2_level_lg.grd.gi, 20200401_G01_DGM6_E01A_Ch2_level_lg.grd.xml, 20200401_G01_DGM6_E01A_GPS_HDOP.txt, 20200401_G01_DGM6_E01A_GPS_Quality.map, 20200401_G01_DGM6_E01A_GPS_Quality.map.xml, 20200401_G01_DGM6_E01A_GPS_Quality.png, 20200401_G01_DGM6_E01A_GPS_Quality.png.gi, 20200401_G01_DGM6_E01A_GPS_Quality.png.xml, 20200401_G01_DGM6_E01A_GPS_Quality.txt, 20200401_G01_DGM6_E01A_Processed.XYZ, 20200401_G01_DGM6_E01A_SRA.ply, 20200401_G01_DGM6_E01A_SRA.xls, 20200401_G01_DGM6_E01A_SRA_pg.dbf, 20200401_G01_DGM6_E01A_SRA_pg.prj, 20200401_G01_DGM6_E01A_SRA_pg.shp, 20200401_G01_DGM6_E01A_SRA_pg.shx, 20200401_G01_DGM6_E01A_Targets.gdb, 20200401_G01_DGM6_E01A_Targets.gdb.xml, 20200401_G01_DGM6_E01A_Targets.xls, 20200401_G01_DGM6_E01A_UceFootprintCov.map, 20200401_G01_DGM6_E01A_UceFootprintCov.map.xml, 20200401_G01_DGM6_E01A_UceFootprintCov.png, 20200401_G01_DGM6_E01A_UceFootprintCov.png.gi, 20200401_G01_DGM6_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Medium target density grid with one SRA designated. Culture gaps due to trees and rocks.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.19 **Std Dev:** 0.04 **Mean:** 0.07 **Map ID:**20200401_G01_DGM6_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 108.90 **Requirement:** 100 % **Map ID:** 20200401_G01_DGM6_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1000.09

Explanation of Gaps:

GPS Quality and HDOP

MapID: 20200401_G01_DGM6_E01A_GPS_Quality.m

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.80 **DOP Max:** 02.50 **DOP StDev:** 00.16 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200401E01IVS1** **QC Status:** **Pass**

Date: 4/1/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200401E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	113.11	77.53	42.71	20.19	98.33	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.08	33.74	16.68	7.12	97.60	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.75	7.43	2.98	1.01	79.60	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.55 **Max:** 77.85 **Std Dev:** 12.39 **Mean:** 4.89 **Number of Points:** 224

Comments:

IVS

IVS Test ID: **20200401E01IVS2** **QC Status:** **Pass**

Date: 4/1/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200401E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	110.15	75.39	41.56	20.54	95.62	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.52	34.18	16.83	7.05	98.87	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	14.37	7.65	3.28	1.29	82.03	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

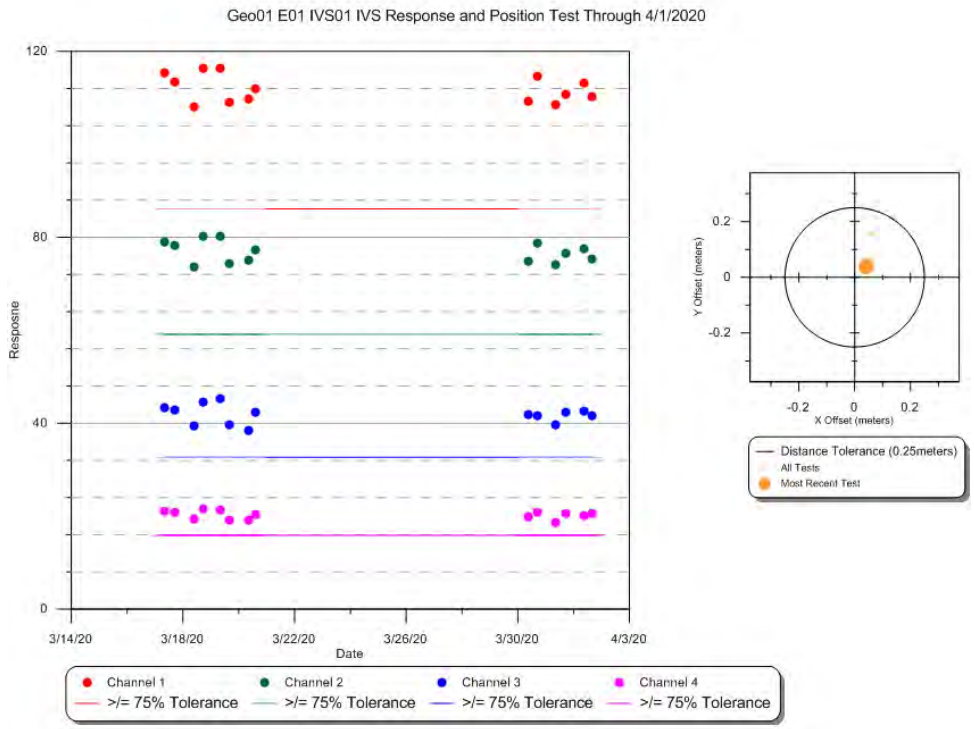
Exception Notes:

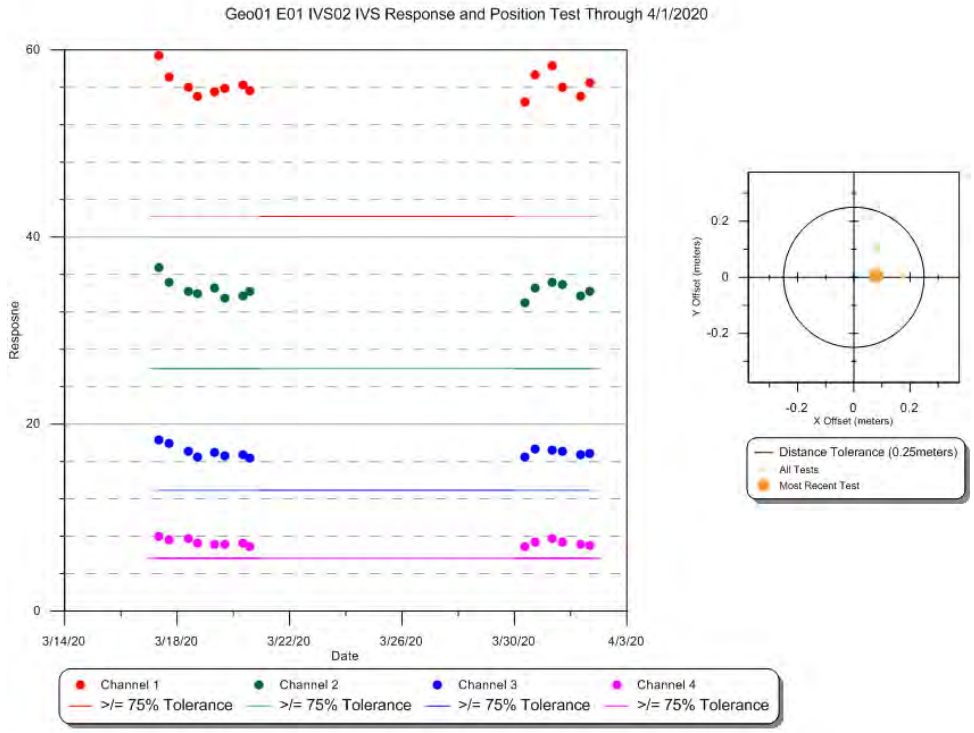
Background Noise Channel ID: Ch2_level_lg **Min:** -0.48 **Max:** 77.43 **Std Dev:** 12.71 **Mean:** 5.12 **Number of Points:** 217

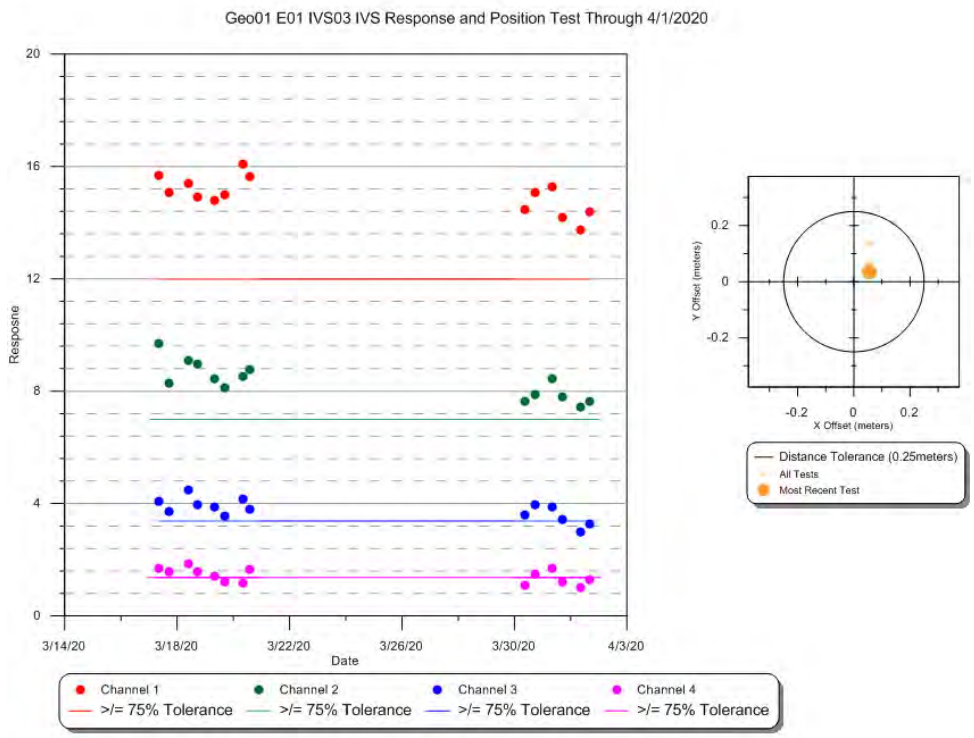
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/1/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200401E01QC1** **QC Status:** Pass

Date: 4/1/2020 8:21:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200401E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200401E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200401E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200401E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.84	-0.20	-0.38	-0.16
Pre-Background Std Dev:	0.25	0.18	0.12	0.09
Observed Spike (mV):	274	192	112	53
Spike Mean (mV):	274.78	192.26	112.77	53.15
Spike Std Dev:	0.26	0.18	0.12	0.09
Observed Post-Background (mV):	3	0	0	0
Post-Background Mean (mV):	3.42	0.2	-0.68	-0.36
Post-Background Std Dev:	0.24	0.15	0.1	0.09
Calculated Spike (mV):	**272.65**	**192.26**	**113.3**	**53.41**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.82	6.20	6.24	6.54

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200401E01QC2** **QC Status:** Pass

Date: 4/1/2020 4:18:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200401E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200401E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	-0.38	-0.33	-0.27	-0.16
Pre-Background Std Dev:	0.29	0.19	0.11	0.11
Observed Spike (mV):	270	190	112	52
Spike Mean (mV):	270.31	190.69	112.36	52.75
Spike Std Dev:	0.26	0.18	0.14	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.29	-0.41	-0.35	-0.22
Post-Background Std Dev:	0.3	0.18	0.12	0.09
Calculated Spike (mV):	**270.355**	**191.06**	**112.67**	**52.94**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.93	5.53	5.64	5.61

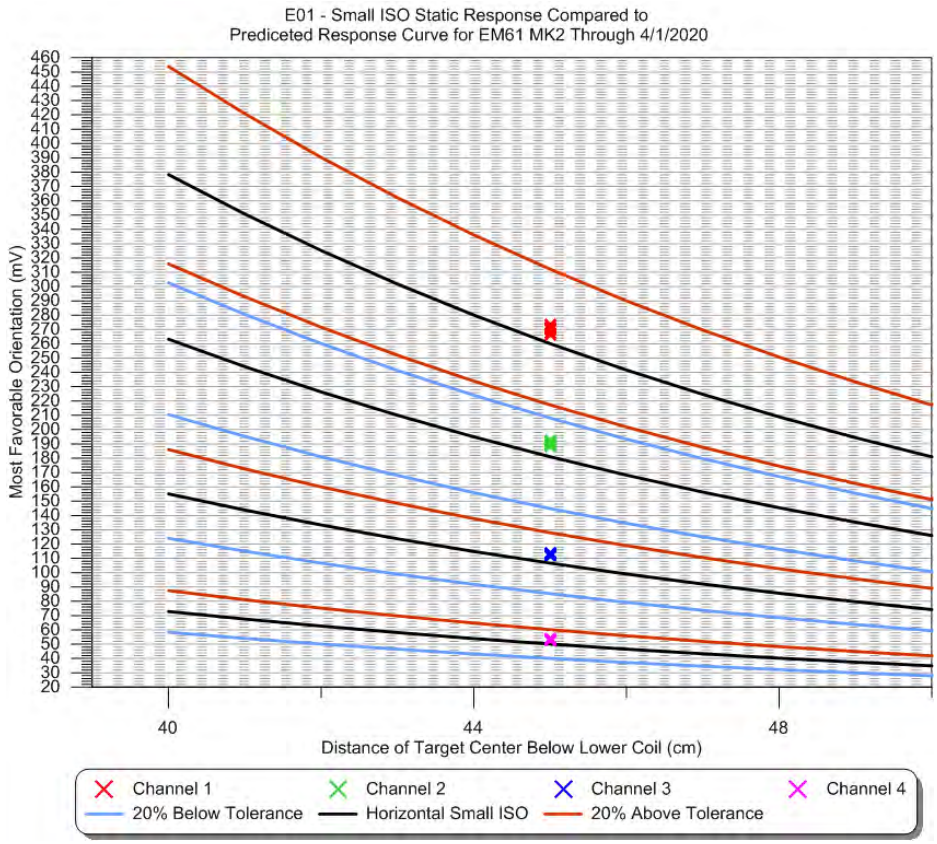
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200401GPSQC** **QC Status:** **Pass**

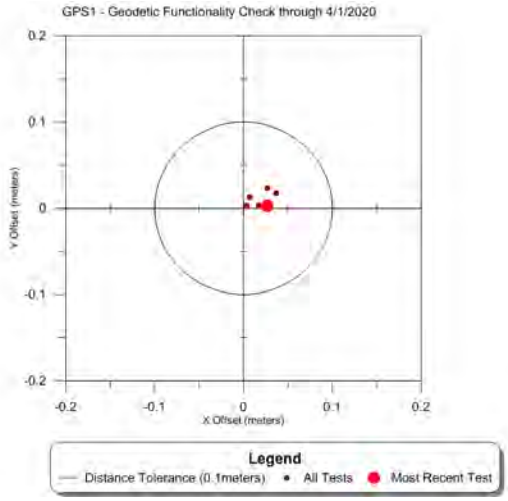
Date: 4/1/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.03	0.00

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/1/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200401_G01_DGM5_E01A,20200401_G01_DGM6_E01A,20200401_G01_DGM17_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200401_G01_DGM17_E01A **Grids Encountered:** DGM17

Collection Date: 4/1/2020 ☑ **Completed** **Start Time:** 4/1/2020 1:13:00 PM **End Time:** 4/1/2020 2:10:00 PM

Raw File Name(s): 20200401_G01_DGM17_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.75

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

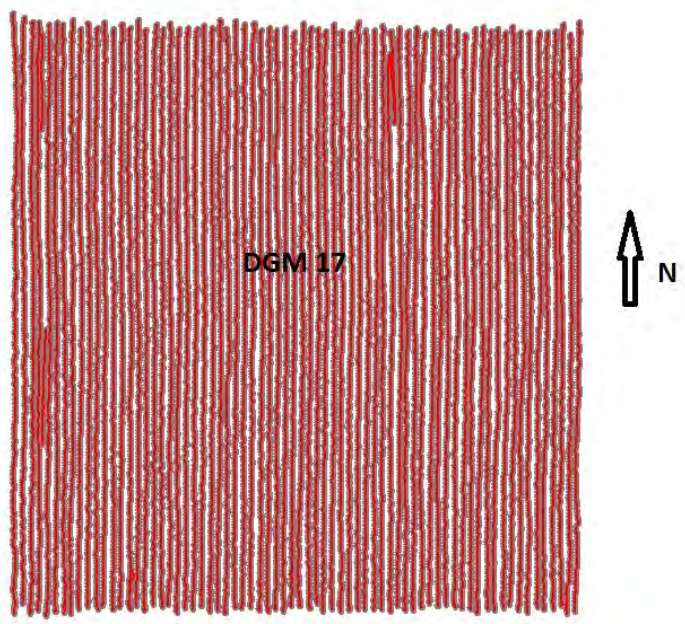
Raw Coordinate Units: Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: fkat,swampy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/1/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200401_G01_DGM17_E01A

Processing Information

Dataset ID: 20200401_G01_DGM17_E01A **Grids:** DGM17

Date Processed: 4/8/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200401_G01_DGM17_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200401_G01_DGM17_E01A.gdb, 20200401_G01_DGM17_E01A.gdb.xml, 20200401_G01_DGM17_E01A.map, 20200401_G01_DGM17_E01A.map.xml, 20200401_G01_DGM17_E01A.pdf, 20200401_G01_DGM17_E01A.png, 20200401_G01_DGM17_E01A.png.gi, 20200401_G01_DGM17_E01A.png.xml, 20200401_G01_DGM17_E01A.tif, 20200401_G01_DGM17_E01A.tif.gi, 20200401_G01_DGM17_E01A.tif.xml, 20200401_G01_DGM17_E01A_AGC_BKG.gdb, 20200401_G01_DGM17_E01A_AGC_BKG.gdb.xml, 20200401_G01_DGM17_E01A_Along_Track_Separation.map, 20200401_G01_DGM17_E01A_Along_Track_Separation.map.xml, 20200401_G01_DGM17_E01A_Along_Track_Separation.png, 20200401_G01_DGM17_E01A_Along_Track_Separation.png.gi, 20200401_G01_DGM17_E01A_Along_Track_Separation.png.xml, 20200401_G01_DGM17_E01A_Ch2_level_lg.grd, 20200401_G01_DGM17_E01A_Ch2_level_lg.grd.gi, 20200401_G01_DGM17_E01A_Ch2_level_lg.grd.xml, 20200401_G01_DGM17_E01A_GPS_HDOP.txt, 20200401_G01_DGM17_E01A_GPS_Quality.map, 20200401_G01_DGM17_E01A_GPS_Quality.map.xml, 20200401_G01_DGM17_E01A_GPS_Quality.png, 20200401_G01_DGM17_E01A_GPS_Quality.png.gi, 20200401_G01_DGM17_E01A_GPS_Quality.png.xml, 20200401_G01_DGM17_E01A_GPS_Quality.txt, 20200401_G01_DGM17_E01A_Processed.XYZ, 20200401_G01_DGM17_E01A_Targets.gdb, 20200401_G01_DGM17_E01A_Targets.gdb.xml, 20200401_G01_DGM17_E01A_Targets.xls, 20200401_G01_DGM17_E01A_UceFootprintCov.map, 20200401_G01_DGM17_E01A_UceFootprintCov.map.xml, 20200401_G01_DGM17_E01A_UceFootprintCov.png, 20200401_G01_DGM17_E01A_UceFootprintCov.png.gi, 20200401_G01_DGM17_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Very low target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.25 **Std Dev:** 0.03 **Mean:** 0.08 **Map ID:**20200401_G01_DGM17_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 115.16 **Requirement:** 100 % **Map ID:** 20200401_G01_DGM17_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1068.06

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -0.93 **Max:** 2.57 **Std Dev:** 0.34 **Mean:** 0.32 **Number of Points:** 19297

Comments:

GPS Quality and HDOP

MapID: 20200401_G01_DGM17_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.60 **DOP Max:** 00.90 **DOP StDev:** 00.06 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.03; percent pass = 99.98%

Daily Tests

IVS

IVS Test ID: **20200401E01IVS1** **QC Status:** **Pass**

Date: 4/1/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200401E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	113.11	77.53	42.71	20.19	98.33	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.08	33.74	16.68	7.12	97.60	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.75	7.43	2.98	1.01	79.60	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.55 **Max:** 77.85 **Std Dev:** 12.39 **Mean:** 4.89 **Number of Points:** 224

Comments:

IVS

IVS Test ID: **20200401E01IVS2** **QC Status:** **Pass**

Date: 4/1/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200401E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response* Ch 1	Ch 2	Ch 3	Ch 4	*Measured Response* Ch 1	Ch 2	Ch 3	Ch 4	*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
IVS01		114.84	78.85	43.60	21.18	110.15	75.39	41.56	20.54	95.62	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.52	34.18	16.83	7.05	98.87	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	14.37	7.65	3.28	1.29	82.03	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

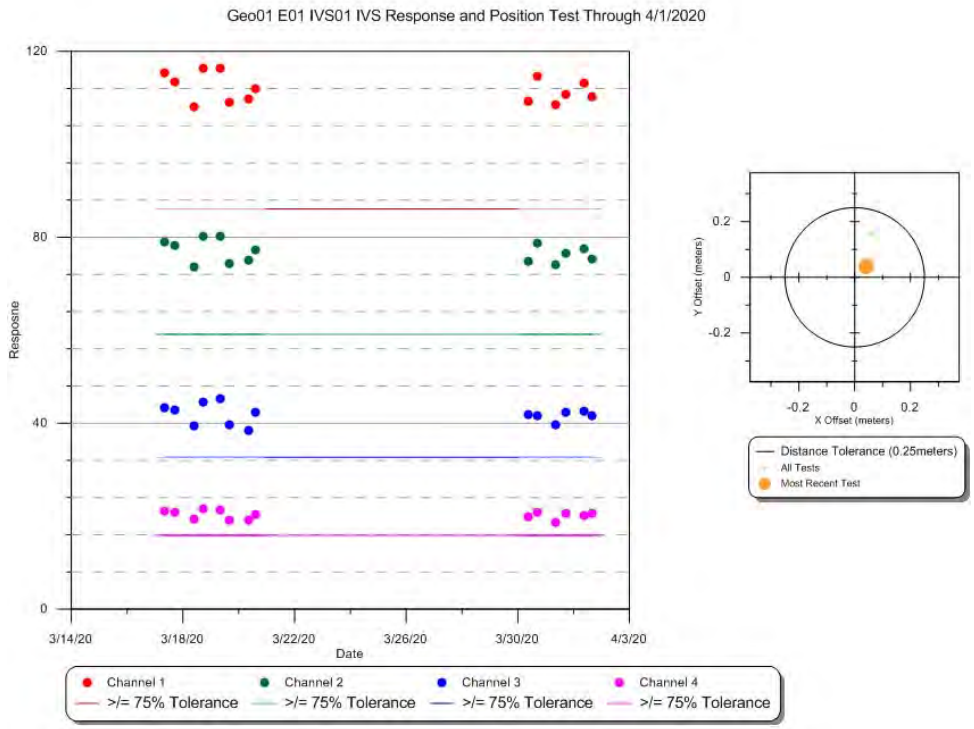
Exception Notes:

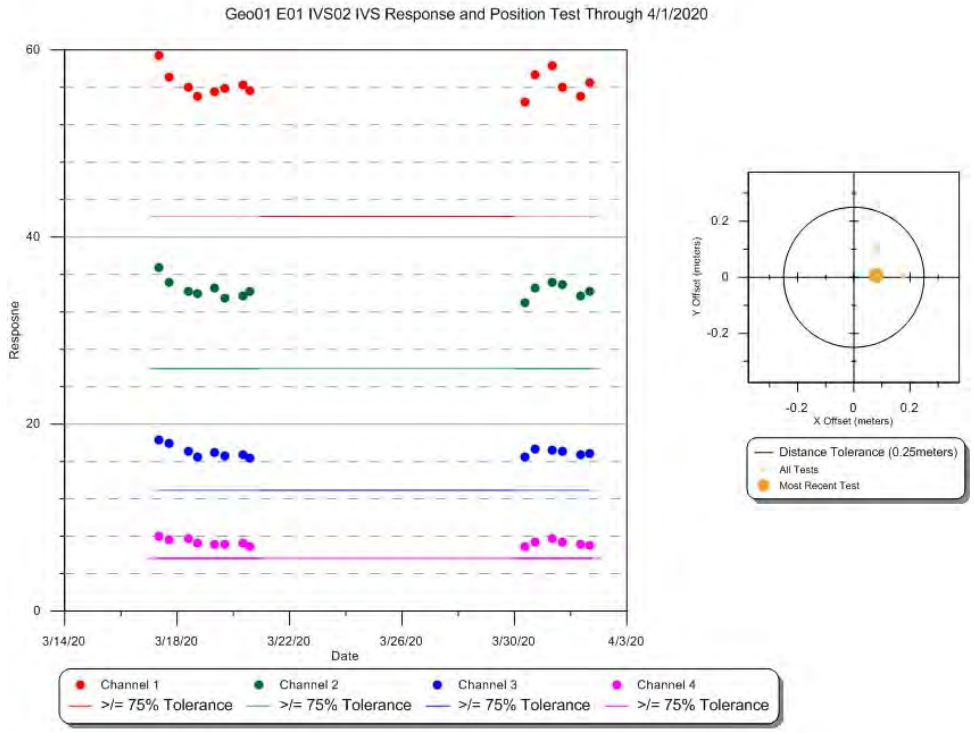
Background Noise Channel ID: Ch2_level_lg **Min:** -0.48 **Max:** 77.43 **Std Dev:** 12.71 **Mean:** 5.12 **Number of Points:** 217

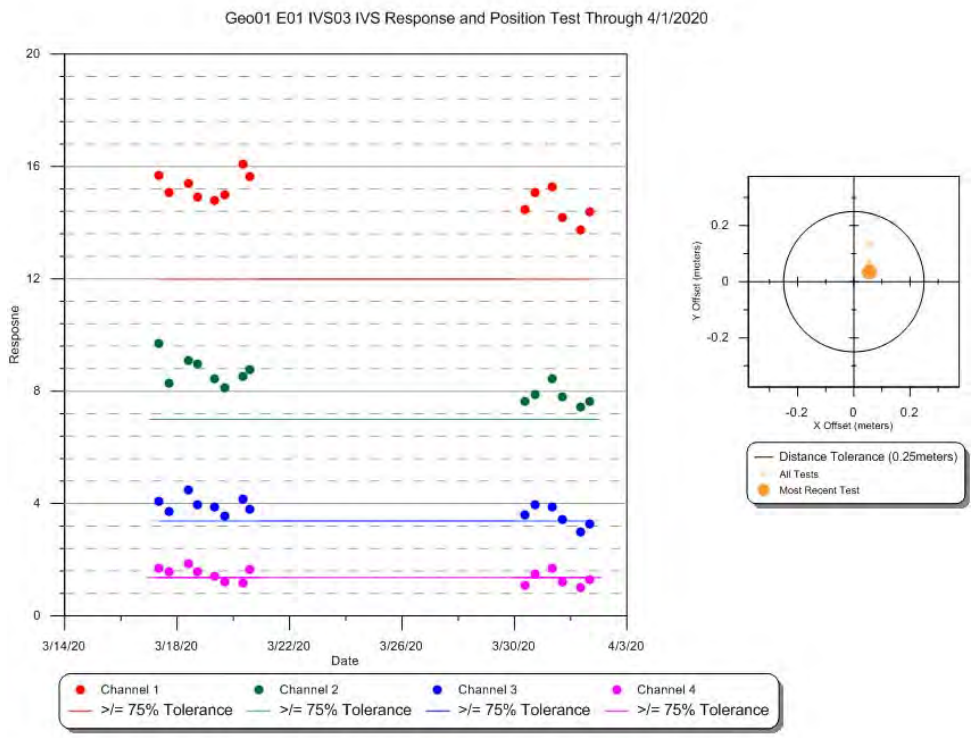
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/1/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200401E01QC1** **QC Status:** Pass

Date: 4/1/2020 8:21:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200401E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200401E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200401E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200401E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.84	-0.20	-0.38	-0.16
Pre-Background Std Dev:	0.25	0.18	0.12	0.09
Observed Spike (mV):	274	192	112	53
Spike Mean (mV):	274.78	192.26	112.77	53.15
Spike Std Dev:	0.26	0.18	0.12	0.09
Observed Post-Background (mV):	3	0	0	0
Post-Background Mean (mV):	3.42	0.2	-0.68	-0.36
Post-Background Std Dev:	0.24	0.15	0.1	0.09
Calculated Spike (mV):	**272.65**	**192.26**	**113.3**	**53.41**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.82	6.20	6.24	6.54

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200401E01QC2** **QC Status:** Pass

Date: 4/1/2020 4:18:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200401E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200401E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	-0.38	-0.33	-0.27	-0.16
Pre-Background Std Dev:	0.29	0.19	0.11	0.11
Observed Spike (mV):	270	190	112	52
Spike Mean (mV):	270.31	190.69	112.36	52.75
Spike Std Dev:	0.26	0.18	0.14	0.1
Observed Post-Background (mV):	0	0	0	0
Post-Background Mean (mV):	0.29	-0.41	-0.35	-0.22
Post-Background Std Dev:	0.3	0.18	0.12	0.09
Calculated Spike (mV):	**270.355**	**191.06**	**112.67**	**52.94**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.93	5.53	5.64	5.61

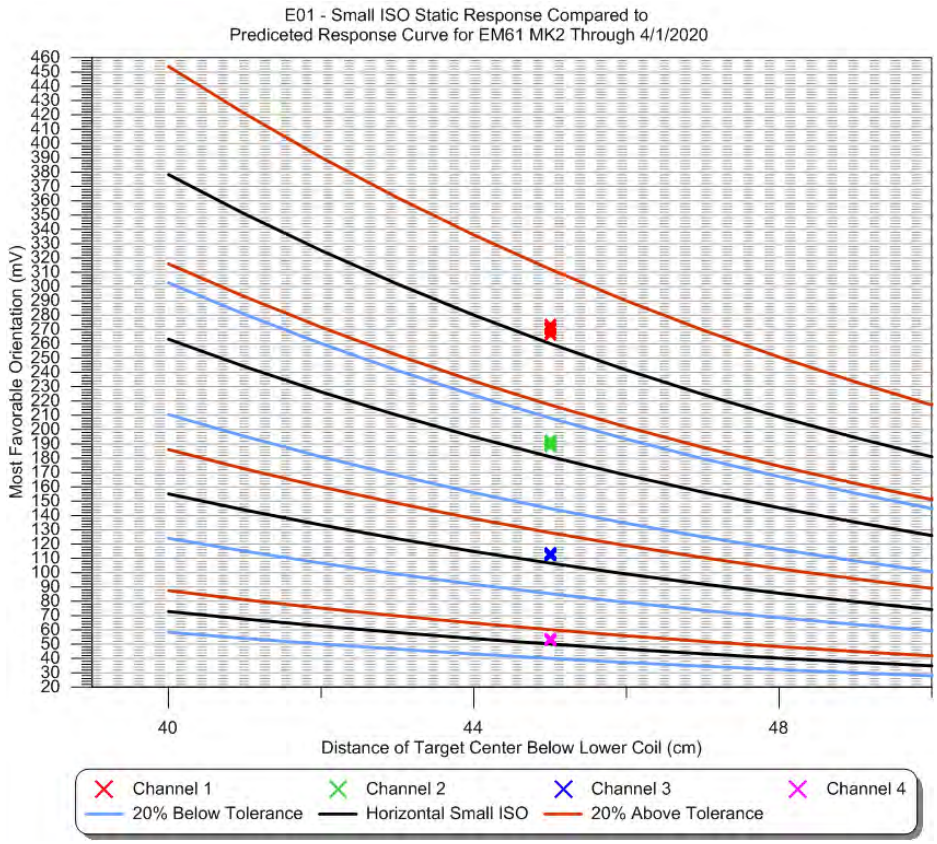
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200401GPSQC** **QC Status:** **Pass**

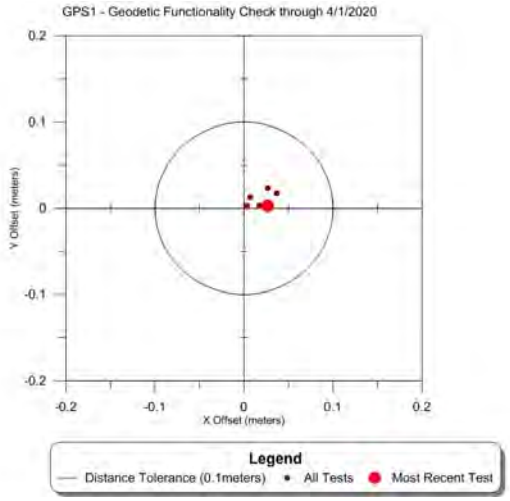
Date: 4/1/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.03	0.00

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/1/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200401_G01_DGM5_E01A,20200401_G01_DGM6_E01A,20200401_G01_DGM17_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200402_G01_DGM11_E01A **Grids Encountered:** DGM11

Collection Date: 4/2/2020 ☑ **Completed** **Start Time:** 4/2/2020 10:00:00 AM **End Time:** 4/2/2020 11:50:00 AM

Raw File Name(s): 20200402_G01_DGM11_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.75

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

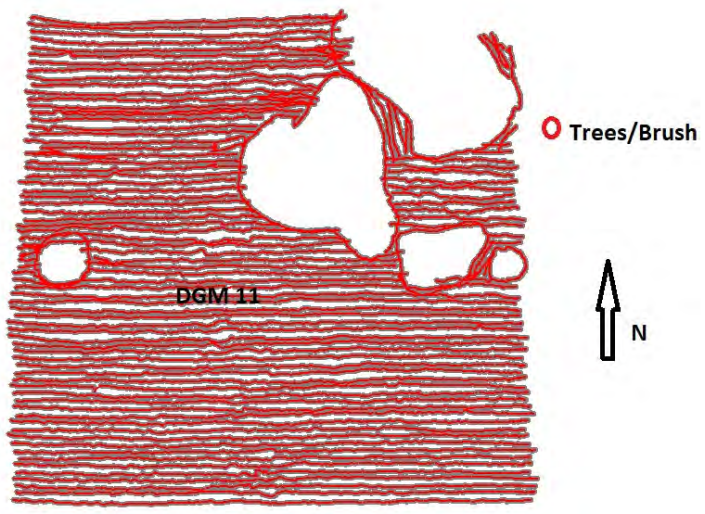
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: steep slope,rocky

Culture: barbwire,rebars and metals on surface

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/2/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200402_G01_DGM11_E01A

Processing Information

Dataset ID: 20200402_G01_DGM11_E01A **Grids:** DGM11

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1400, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200402_G01_DGM11_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200402_G01_DGM11_E01A.gdb, 20200402_G01_DGM11_E01A.gdb.xml, 20200402_G01_DGM11_E01A.map, 20200402_G01_DGM11_E01A.map.xml, 20200402_G01_DGM11_E01A.pdf, 20200402_G01_DGM11_E01A.png, 20200402_G01_DGM11_E01A.png.gi, 20200402_G01_DGM11_E01A.png.xml, 20200402_G01_DGM11_E01A.tif, 20200402_G01_DGM11_E01A.tif.gi, 20200402_G01_DGM11_E01A.tif.xml, 20200402_G01_DGM11_E01A_AGC_BKG.gdb, 20200402_G01_DGM11_E01A_AGC_BKG.gdb.xml, 20200402_G01_DGM11_E01A_Along_Track_Separation.map, 20200402_G01_DGM11_E01A_Along_Track_Separation.map.xml, 20200402_G01_DGM11_E01A_Along_Track_Separation.png, 20200402_G01_DGM11_E01A_Along_Track_Separation.png.gi, 20200402_G01_DGM11_E01A_Along_Track_Separation.png.xml, 20200402_G01_DGM11_E01A_AlongTrackSampling.txt, 20200402_G01_DGM11_E01A_Background_Ch2_Stats.txt, 20200402_G01_DGM11_E01A_Ch2_level_lg.grd, 20200402_G01_DGM11_E01A_Ch2_level_lg.grd.gi, 20200402_G01_DGM11_E01A_Ch2_level_lg.grd.xml, 20200402_G01_DGM11_E01A_GPS_HDOP.txt, 20200402_G01_DGM11_E01A_GPS_Quality.map, 20200402_G01_DGM11_E01A_GPS_Quality.map.xml, 20200402_G01_DGM11_E01A_GPS_Quality.png, 20200402_G01_DGM11_E01A_GPS_Quality.png.gi, 20200402_G01_DGM11_E01A_GPS_Quality.png.xml, 20200402_G01_DGM11_E01A_GPS_Quality.txt, 20200402_G01_DGM11_E01A_Processed.XYZ, 20200402_G01_DGM11_E01A_SRA.ply, 20200402_G01_DGM11_E01A_SRA.xls, 20200402_G01_DGM11_E01A_SRA_pg.dbf, 20200402_G01_DGM11_E01A_SRA_pg.prj, 20200402_G01_DGM11_E01A_SRA_pg.shp, 20200402_G01_DGM11_E01A_SRA_pg.shx, 20200402_G01_DGM11_E01A_Targets.gdb, 20200402_G01_DGM11_E01A_Targets.gdb.xml, 20200402_G01_DGM11_E01A_Targets.xls, 20200402_G01_DGM11_E01A_UceFootprintCov.map, 20200402_G01_DGM11_E01A_UceFootprintCov.map.xml, 20200402_G01_DGM11_E01A_UceFootprintCov.png, 20200402_G01_DGM11_E01A_UceFootprintCov.png.gi, 20200402_G01_DGM11_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Saturated grid with one SRA designated. Large culture gaps due to bushes.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.06 **Map ID:**20200402_G01_DGM11_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 100.00 **Requirement:** 100 % **Map ID:** 20200402_G01_DGM11_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 859.57

Explanation of Gaps: Large number of bushes prevented the field team from achieving full coverage of the grid. Original percent coverage = 93.35%.

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -42.61 **Max:** 4.29 **Std Dev:** 12.91 **Mean:** -14.46 **Number of Points:** 883

Comments:

GPS Quality and HDOP

MapID: 20200402_G01_DGM11_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.60 **DOP Max:** 01.10 **DOP StDev:** 00.15 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted. Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.05; percent pass = 99.93%

Daily Tests

IVS

IVS Test ID: **20200402E01IVS1** **QC Status:** **Pass**

Date: 4/2/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200402E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	113.02	77.36	41.30	20.60	98.12	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	59.04	36.45	17.91	7.81	105.43	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.92	9.36	4.25	2.01	100.30	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.69 **Max:** 78.44 **Std Dev:** 12.81 **Mean:** 5.22 **Number of Points:** 228

Comments:

IVS

IVS Test ID: **20200402E01IVS2** **QC Status:** **Pass**

Date: 4/2/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200402E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	115.52	79.80	42.97	21.08	101.21	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.21	34.44	16.81	7.41	99.63	0.18	Pass
IVS03		15.98	9.33	4.50	1.82	15.00	8.23	3.37	1.28	88.24	0.06	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 6. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

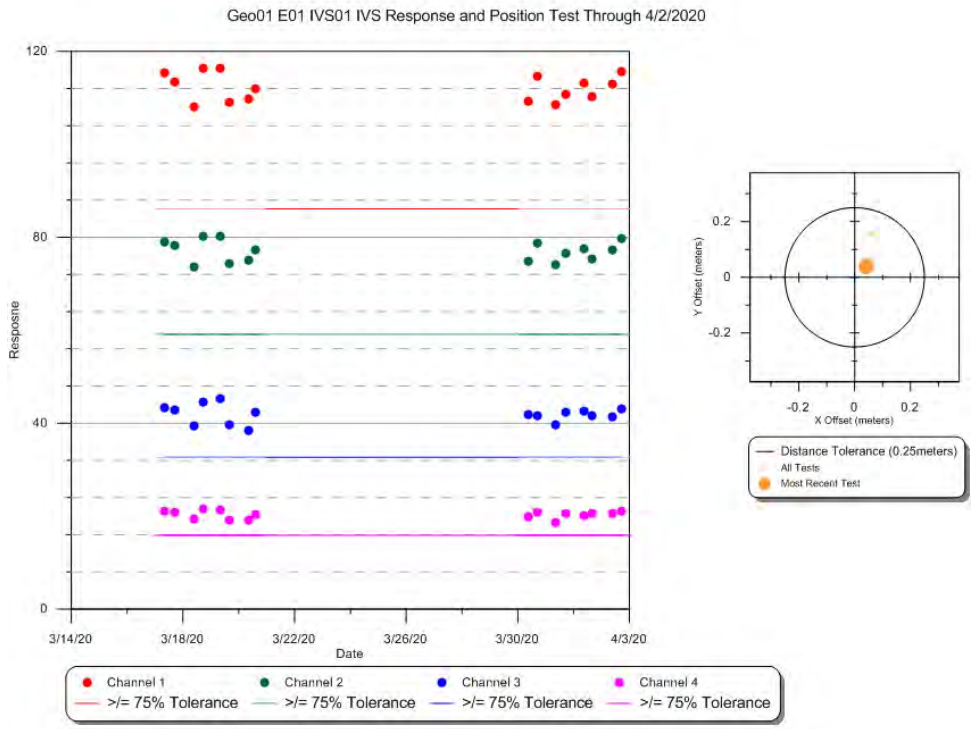
Exception Notes:

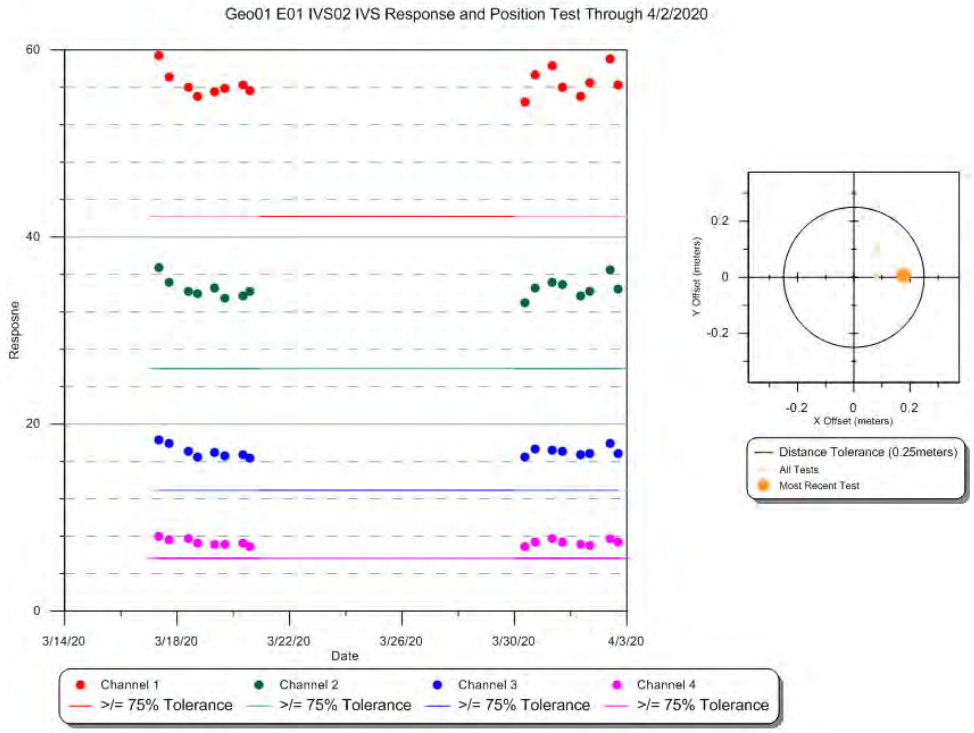
Background Noise Channel ID: Ch2_level_lg **Min:** -0.68 **Max:** 80.86 **Std Dev:** 12.73 **Mean:** 5 **Number of Points:** 255

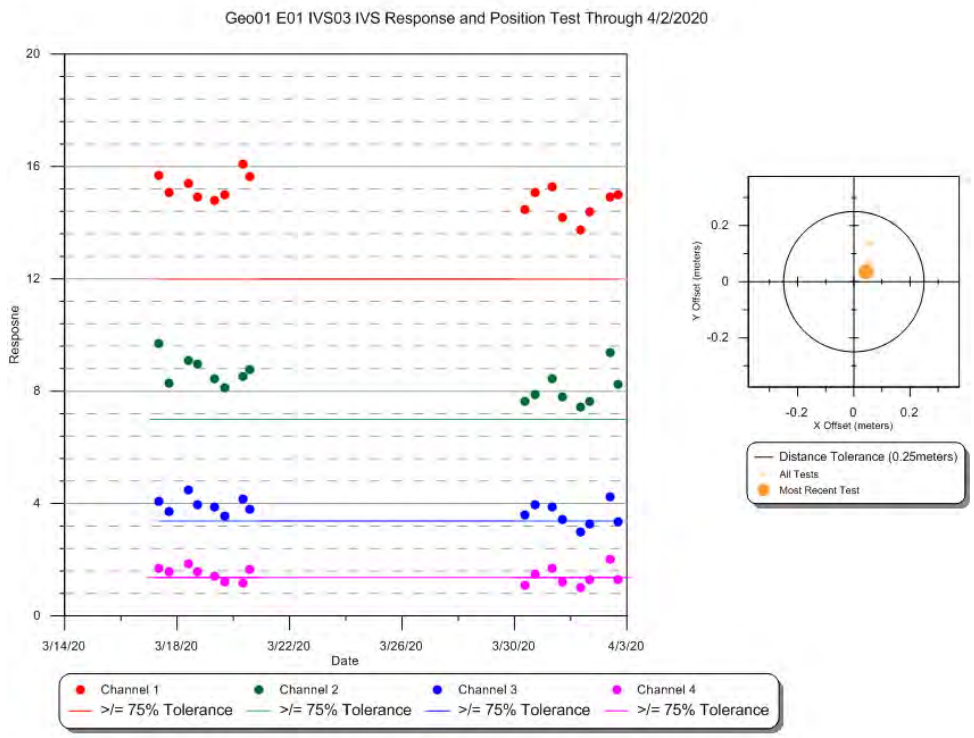
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/2/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200402E01QC1** **QC Status:** Pass

Date: 4/2/2020 9:13:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200402E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200402E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200402E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200402E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.83	0.08	-0.13	-0.08
Pre-Background Std Dev:	0.23	0.2	0.12	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	274.78	193.42	113.84	53.61
Spike Std Dev:	0.28	0.23	0.17	0.11
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.7	0.4	-0.26	-0.22
Post-Background Std Dev:	0.25	0.18	0.12	0.09
Calculated Spike (mV):	**273.515**	**193.18**	**114.035**	**53.76**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	5.15	6.71	6.92	7.24

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200402E01QC2** **QC Status:** Pass

Date: 4/2/2020 4:45:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200402E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200402E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.03	0.42	-0.03	0.1
Pre-Background Std Dev:	0.37	0.18	0.14	0.11
Observed Spike (mV):	271	191	112	53
Spike Mean (mV):	270.97	191.07	112.43	52.95
Spike Std Dev:	0.33	0.19	0.15	0.1
Observed Post-Background (mV):	2	1	0	0
Post-Background Mean (mV):	2.39	1.06	0.08	-0.02
Post-Background Std Dev:	0.33	0.18	0.13	0.09
Calculated Spike (mV):	**269.26**	**190.33**	**112.405**	**52.91**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.51	5.13	5.40	5.55

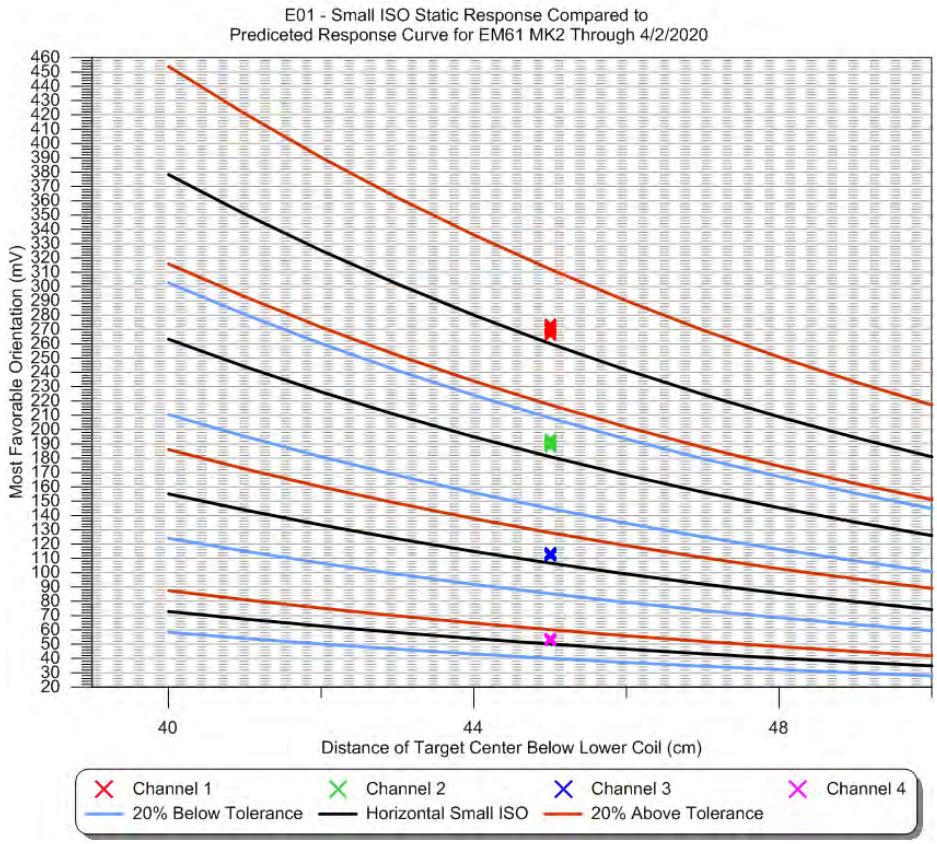
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200402GPSQC** **QC Status:** **Pass**

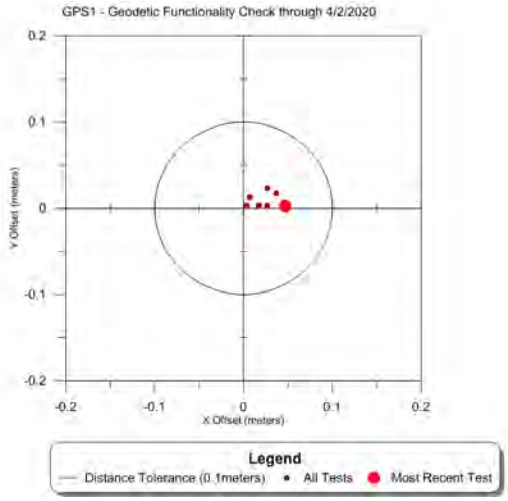
Date: 4/2/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.24	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.05	0.00

Total Offset: 0.05 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/2/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200402_G01_DGM11_E01A,0200402_G01_DGM28_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

1hr GPS hold

Collection, Processing and Data Quality Report

Dataset ID: 20200402_G01_DGM28_E01A **Grids Encountered:** DGM28

Collection Date: 4/2/2020 ☑ **Completed** **Start Time:** 4/2/2020 1:38:00 PM **End Time:** 4/2/2020 4:17:00 PM

Raw File Name(s): 20200402_G01_DGM28_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

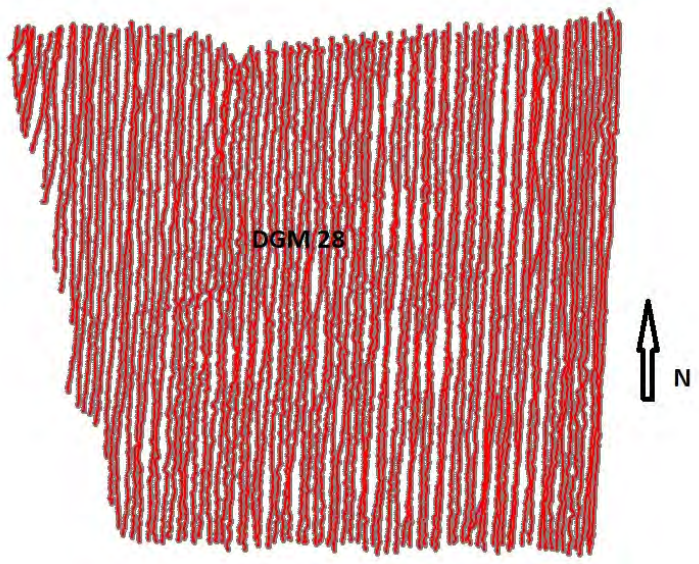
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: flat,muddy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/2/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200402_G01_DGM28_E01A

Processing Information

Dataset ID: 20200402_G01_DGM28_E01A **Grids:** DGM28

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-200, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=5

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200402_G01_DGM28_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200402_G01_DGM28_E01A.gdb, 20200402_G01_DGM28_E01A.gdb.xml, 20200402_G01_DGM28_E01A.map, 20200402_G01_DGM28_E01A.map.xml, 20200402_G01_DGM28_E01A.pdf, 20200402_G01_DGM28_E01A.png, 20200402_G01_DGM28_E01A.png.gi, 20200402_G01_DGM28_E01A.png.xml, 20200402_G01_DGM28_E01A.tif, 20200402_G01_DGM28_E01A.tif.gi, 20200402_G01_DGM28_E01A.tif.xml, 20200402_G01_DGM28_E01A_AGC_BKG.gdb, 20200402_G01_DGM28_E01A_AGC_BKG.gdb.xml, 20200402_G01_DGM28_E01A_Along_Track_Separation.map, 20200402_G01_DGM28_E01A_Along_Track_Separation.map.xml, 20200402_G01_DGM28_E01A_Along_Track_Separation.png, 20200402_G01_DGM28_E01A_Along_Track_Separation.png.gi, 20200402_G01_DGM28_E01A_Along_Track_Separation.png.xml, 20200402_G01_DGM28_E01A_Ch2_level_lg.grd, 20200402_G01_DGM28_E01A_Ch2_level_lg.grd.gi, 20200402_G01_DGM28_E01A_Ch2_level_lg.grd.xml, 20200402_G01_DGM28_E01A_GPS_HDOP.txt, 20200402_G01_DGM28_E01A_GPS_Quality.map, 20200402_G01_DGM28_E01A_GPS_Quality.map.xml, 20200402_G01_DGM28_E01A_GPS_Quality.png, 20200402_G01_DGM28_E01A_GPS_Quality.png.gi, 20200402_G01_DGM28_E01A_GPS_Quality.png.xml, 20200402_G01_DGM28_E01A_GPS_Quality.txt, 20200402_G01_DGM28_E01A_Processed.XYZ, 20200402_G01_DGM28_E01A_Targets.gdb, 20200402_G01_DGM28_E01A_Targets.gdb.xml, 20200402_G01_DGM28_E01A_Targets.xls, 20200402_G01_DGM28_E01A_UceFootprintCov.map, 20200402_G01_DGM28_E01A_UceFootprintCov.map.xml, 20200402_G01_DGM28_E01A_UceFootprintCov.png, 20200402_G01_DGM28_E01A_UceFootprintCov.png.gi, 20200402_G01_DGM28_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Low target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.03 **Mean:** 0.05 **Map ID:**20200402_G01_DGM28_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 111.03 **Requirement:** 100 % **Map ID:** 20200402_G01_DGM28_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1032.83

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -3.52 **Max:** 3.76 **Std Dev:** 0.5 **Mean:** 0.46 **Number of Points:** 10028

Comments:

GPS Quality and HDOP

MapID: 20200402_G01_DGM28_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.20 **DOP StDev:** 00.11 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.02; percent pass = 99.99%

Daily Tests

IVS

IVS Test ID: **20200402E01IVS1_** **QC Status:** **Pass**

Date: 4/2/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200402E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	113.02	77.36	41.30	20.60	98.12	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	59.04	36.45	17.91	7.81	105.43	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.92	9.36	4.25	2.01	100.30	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments:
Lag = 5

Exception Notes:

IVS

IVS Test ID: **20200402E01IVS2_** **QC Status:** **Pass**

Date: 4/2/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200402E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	115.52	79.80	42.97	21.08	101.21	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	56.21	34.44	16.81	7.41	99.63	0.18	Pass
IVS03		15.98	9.33	4.50	1.82	15.00	8.23	3.37	1.28	88.24	0.06	Pass

Requirement: 75 % **Requirement:** 0.25

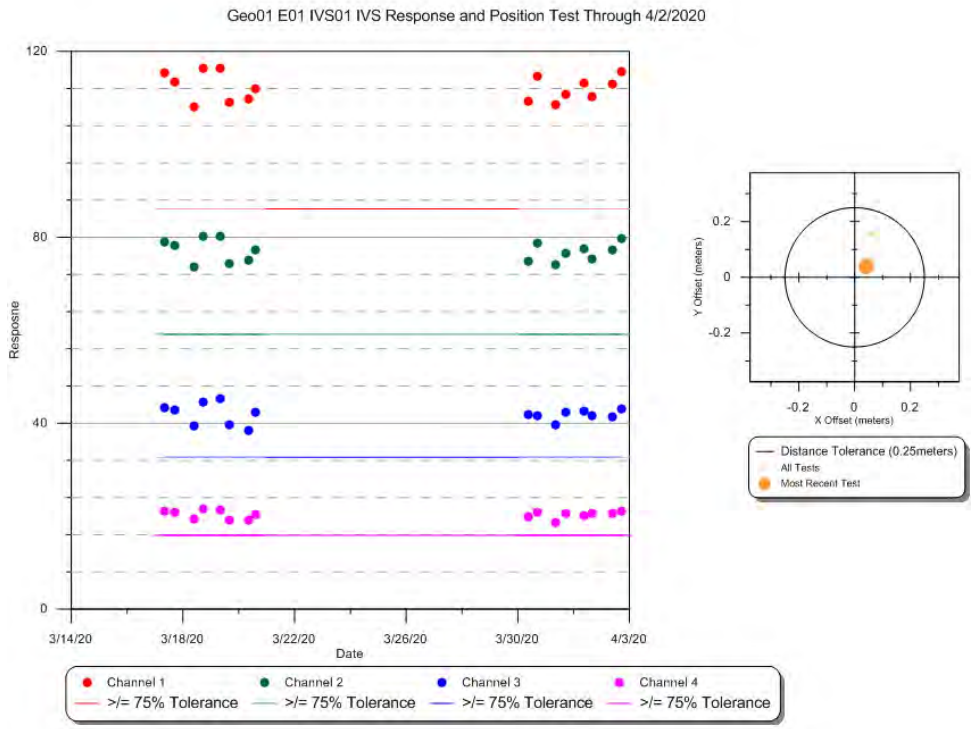
Field Comments:

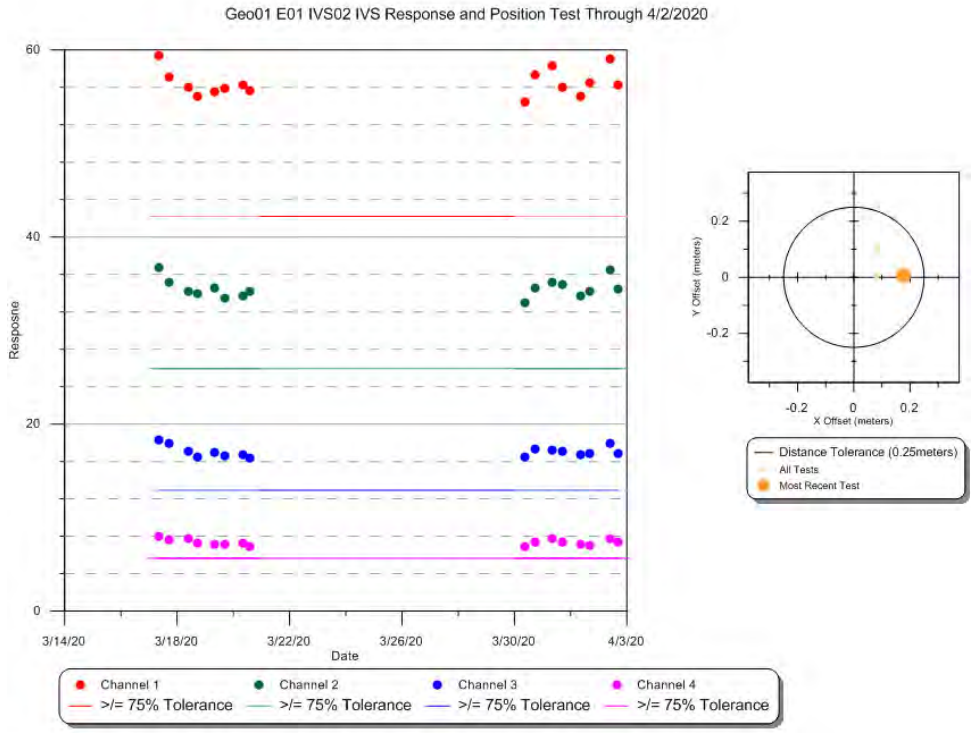
Processing Comments:
Lag = 6. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

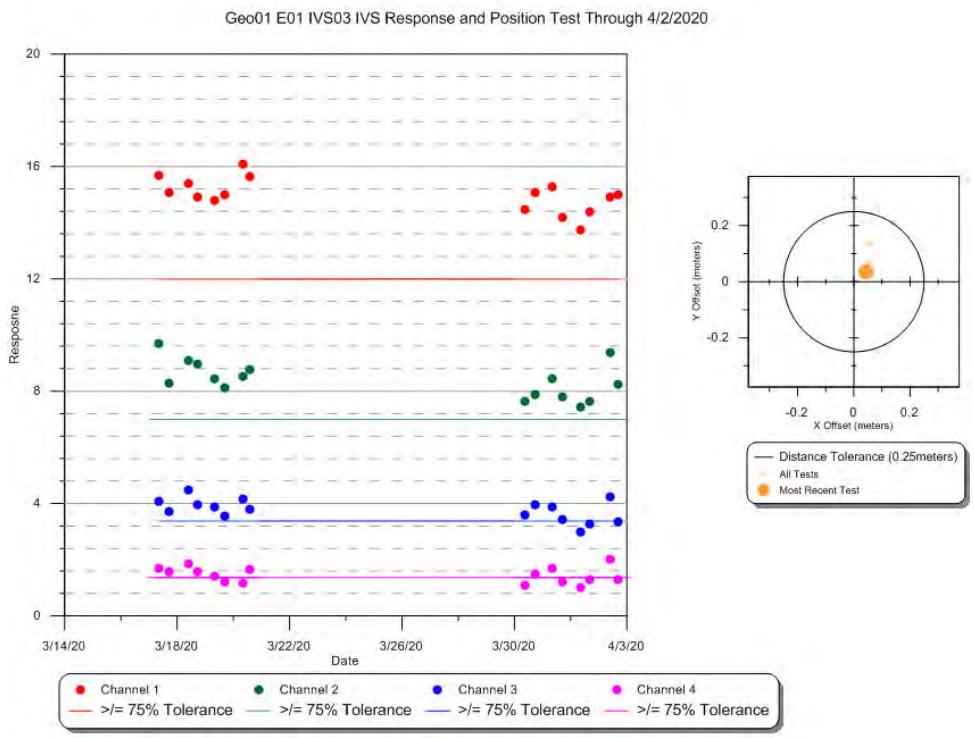
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/2/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200402E01QC1** **QC Status:** Pass

Date: 4/2/2020 9:13:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200402E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200402E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200402E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200402E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.83	0.08	-0.13	-0.08
Pre-Background Std Dev:	0.23	0.2	0.12	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	274.78	193.42	113.84	53.61
Spike Std Dev:	0.28	0.23	0.17	0.11
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.7	0.4	-0.26	-0.22
Post-Background Std Dev:	0.25	0.18	0.12	0.09
Calculated Spike (mV):	**273.515**	**193.18**	**114.035**	**53.76**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	5.15	6.71	6.92	7.24

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200402E01QC2** **QC Status:** Pass

Date: 4/2/2020 4:45:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200402E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200402E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	1.03	0.42	-0.03	0.1
Pre-Background Std Dev:	0.37	0.18	0.14	0.11
Observed Spike (mV):	271	191	112	53
Spike Mean (mV):	270.97	191.07	112.43	52.95
Spike Std Dev:	0.33	0.19	0.15	0.1
Observed Post-Background (mV):	2	1	0	0
Post-Background Mean (mV):	2.39	1.06	0.08	-0.02
Post-Background Std Dev:	0.33	0.18	0.13	0.09
Calculated Spike (mV):	**269.26**	**190.33**	**112.405**	**52.91**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.51	5.13	5.40	5.55

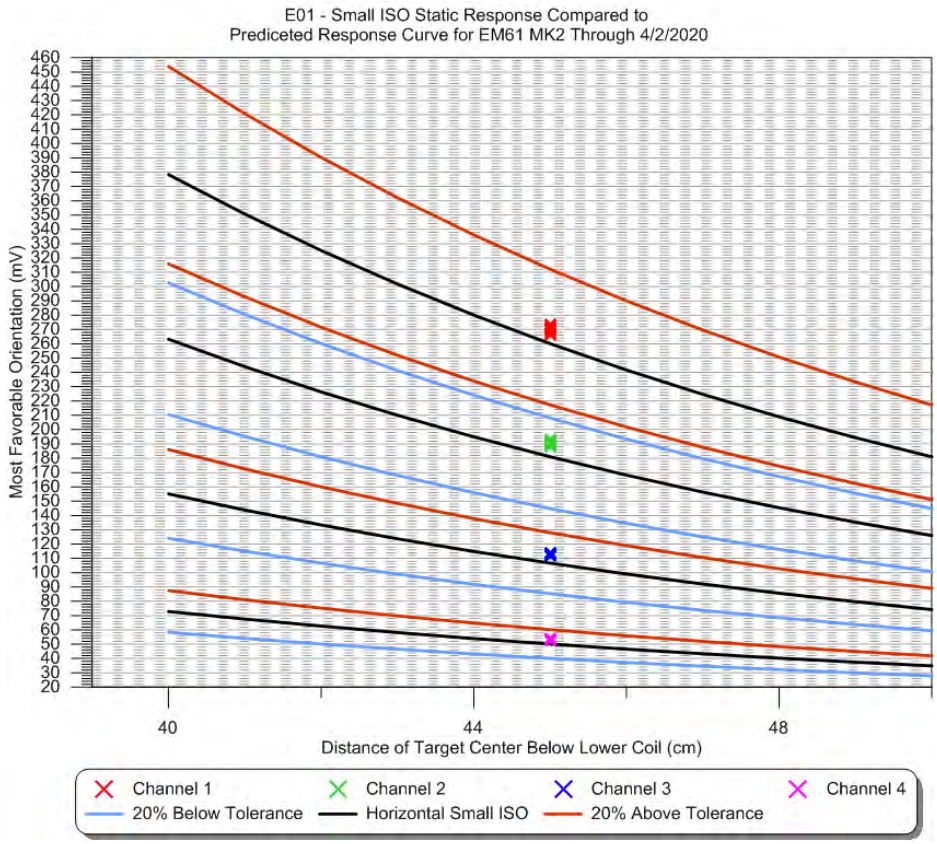
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200402GPSQC** **QC Status:** **Pass**

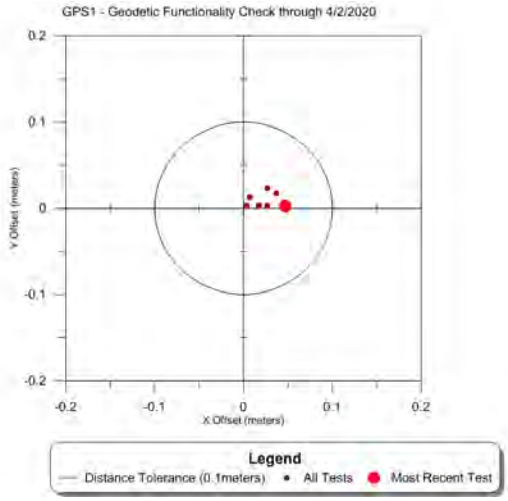
Date: 4/2/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.24	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.05	0.00

Total Offset: 0.05 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/2/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200402_G01_DGM11_E01A,0200402_G01_DGM28_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0430 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

1hr GPS hold

Collection, Processing and Data Quality Report

Dataset ID: 20200403_G01_DGM4_E01A **Grids Encountered:** DGM4

Collection Date: 4/3/2020 ☑ **Completed** **Start Time:** 4/3/2020 10:43:00 AM **End Time:** 4/3/2020 11:55:00 AM

Raw File Name(s): 20200403_G01_DGM4_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.45

Battery End Voltage: 12.30

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

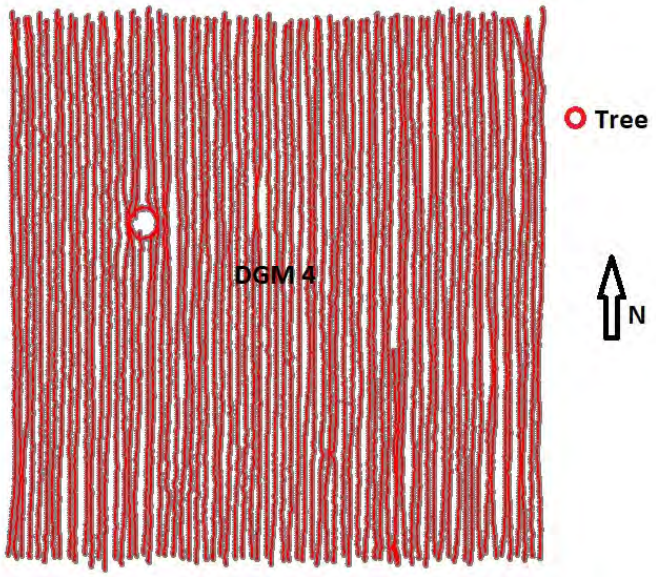
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold,windy,light rain

Terrain: moderate slope

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/3/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200403_G01_DGM4_E01A

Processing Information

Dataset ID: 20200403_G01_DGM4_E01A **Grids:** DGM4

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-200, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=5

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200403_G01_DGM4_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200403_G01_DGM4_E01A.gdb, 20200403_G01_DGM4_E01A.gdb.xml, 20200403_G01_DGM4_E01A.map, 20200403_G01_DGM4_E01A.map.xml, 20200403_G01_DGM4_E01A.pdf, 20200403_G01_DGM4_E01A.png, 20200403_G01_DGM4_E01A.png.gi, 20200403_G01_DGM4_E01A.png.xml, 20200403_G01_DGM4_E01A.tif, 20200403_G01_DGM4_E01A.tif.gi, 20200403_G01_DGM4_E01A.tif.xml, 20200403_G01_DGM4_E01A_AGC_BKG.gdb, 20200403_G01_DGM4_E01A_AGC_BKG.gdb.xml, 20200403_G01_DGM4_E01A_Along_Track_Separation.map, 20200403_G01_DGM4_E01A_Along_Track_Separation.map.xml, 20200403_G01_DGM4_E01A_Along_Track_Separation.png, 20200403_G01_DGM4_E01A_Along_Track_Separation.png.gi, 20200403_G01_DGM4_E01A_Along_Track_Separation.png.xml, 20200403_G01_DGM4_E01A_AlongTrackSampling.txt, 20200403_G01_DGM4_E01A_Background_Ch2_Stats.txt, 20200403_G01_DGM4_E01A_Ch2_level_lg.grd, 20200403_G01_DGM4_E01A_Ch2_level_lg.grd.gi, 20200403_G01_DGM4_E01A_Ch2_level_lg.grd.xml, 20200403_G01_DGM4_E01A_GPS_HDOP.txt, 20200403_G01_DGM4_E01A_GPS_Quality.map, 20200403_G01_DGM4_E01A_GPS_Quality.map.xml, 20200403_G01_DGM4_E01A_GPS_Quality.png, 20200403_G01_DGM4_E01A_GPS_Quality.png.gi, 20200403_G01_DGM4_E01A_GPS_Quality.png.xml, 20200403_G01_DGM4_E01A_GPS_Quality.txt, 20200403_G01_DGM4_E01A_Processed.XYZ, 20200403_G01_DGM4_E01A_SRA.ply, 20200403_G01_DGM4_E01A_SRA.xls, 20200403_G01_DGM4_E01A_SRA_pg.dbf, 20200403_G01_DGM4_E01A_SRA_pg.prj, 20200403_G01_DGM4_E01A_SRA_pg.shp, 20200403_G01_DGM4_E01A_SRA_pg.shx, 20200403_G01_DGM4_E01A_Targets.gdb, 20200403_G01_DGM4_E01A_Targets.gdb.xml, 20200403_G01_DGM4_E01A_Targets.xls, 20200403_G01_DGM4_E01A_UceFootprintCov.map, 20200403_G01_DGM4_E01A_UceFootprintCov.map.xml, 20200403_G01_DGM4_E01A_UceFootprintCov.png, 20200403_G01_DGM4_E01A_UceFootprintCov.png.gi, 20200403_G01_DGM4_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Saturated grid with one SRA designated. Culture gap due to a tree.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.1 **Map ID:**20200403_G01_DGM4_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 111.25 **Requirement:** 100 % **Map ID:** 20200403_G01_DGM4_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1031.17

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -1.31 **Max:** 5.45 **Std Dev:** 1.03 **Mean:** 0.79 **Number of Points:** 1748

Comments:

GPS Quality and HDOP

MapID: 20200403_G01_DGM4_E01A_GPS_Quality.m

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.60 **DOP Max:** 01.90 **DOP StDev:** 00.11 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200403E01IVS1** **QC Status:** **Pass**

Date: 4/3/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200403E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	112.20	77.20	42.60	20.93	97.92	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.44	34.00	17.06	7.47	98.34	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.53	7.80	3.61	1.52	83.64	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.7 **Max:** 78.05 **Std Dev:** 12.52 **Mean:** 4.96 **Number of Points:** 222

Comments:

IVS

IVS Test ID: **20200403E01IVS2** **QC Status:** **Pass**

Date: 4/3/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200403E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	110.61	76.03	42.72	20.21	96.42	0.09	Pass
IVS02		56.27	34.57	17.21	7.54	57.66	34.21	17.18	7.35	98.95	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.72	8.49	3.79	1.58	90.96	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

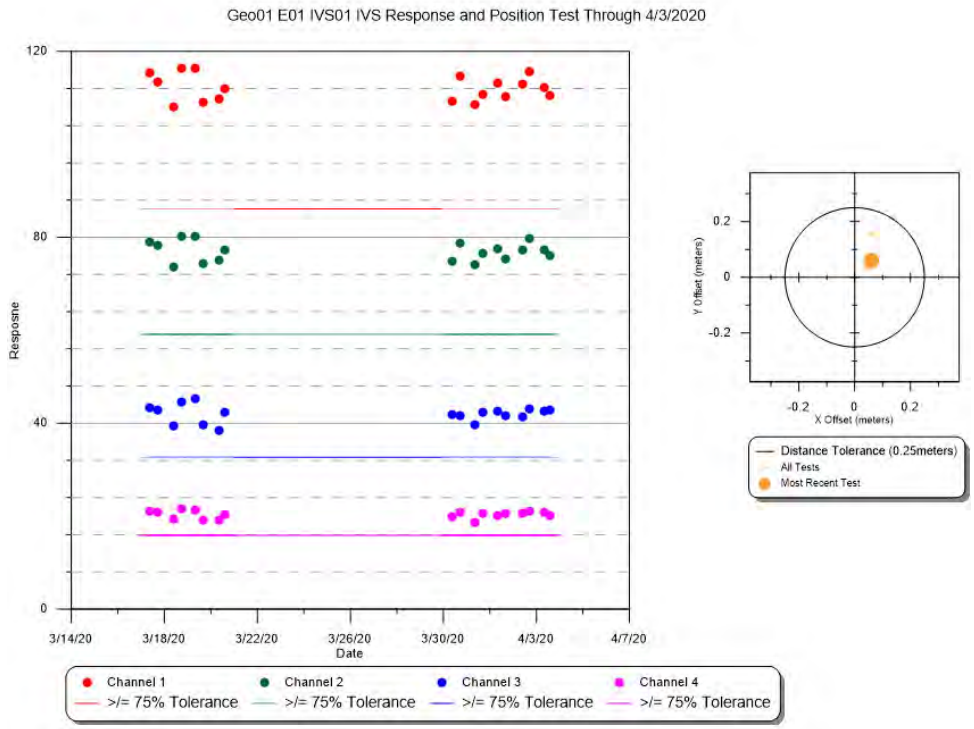
Exception Notes:

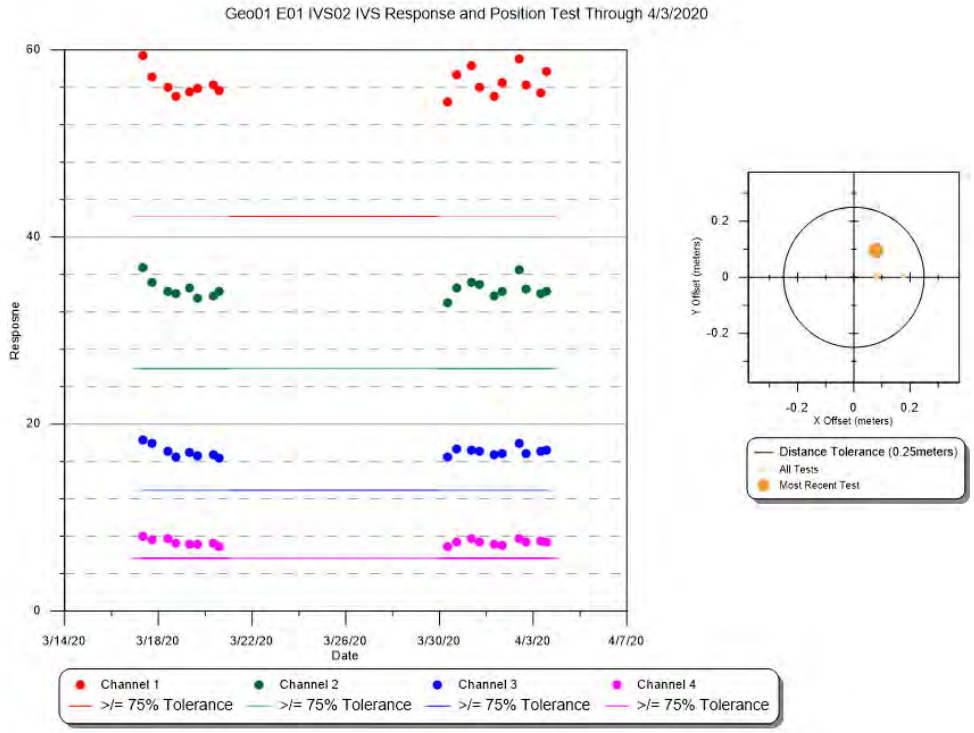
Background Noise Channel ID: Ch2_level_lg **Min:** -1 **Max:** 82.29 **Std Dev:** 13.18 **Mean:** 5.32 **Number of Points:** 233

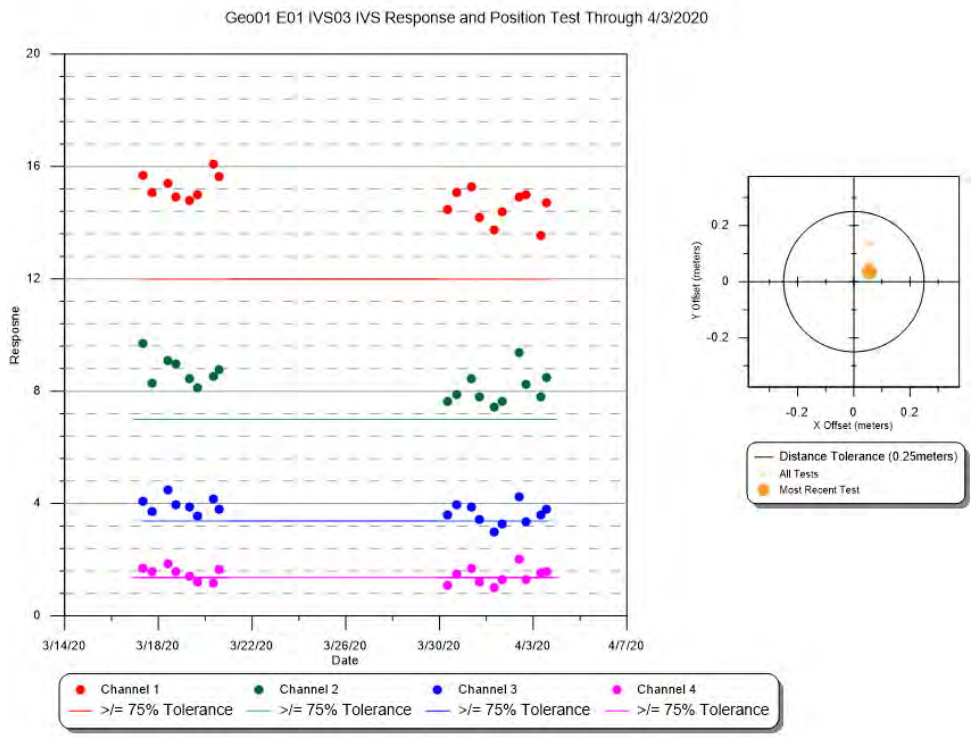
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/3/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
4/7/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200403E01QC1** **QC Status:** Pass

Date: 4/3/2020 8:00:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200403E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200403E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200403E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200403E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.14	-0.17	-0.31	0.03
Pre-Background Std Dev:	0.24	0.17	0.11	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	273.79	192.57	113.36	53.64
Spike Std Dev:	0.27	0.17	0.12	0.08
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	1.89	0.26	-0.4	-0.1
Post-Background Std Dev:	0.22	0.17	0.13	0.1
Calculated Spike (mV):	**272.775**	**192.525**	**113.715**	**53.675**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.87	6.34	6.62	7.07

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200403E01QC2** **QC Status:** Pass

Date: 4/3/2020 2:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200403E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200403E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.57	-0.48	-0.45	-0.24
Pre-Background Std Dev:	0.29	0.2	0.12	0.08
Observed Spike (mV):	269	189	111	52
Spike Mean (mV):	269.92	189.64	111.74	52.62
Spike Std Dev:	0.3	0.22	0.16	0.1
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.56	0.45	-0.28	-0.3
Post-Background Std Dev:	0.31	0.18	0.14	0.09
Calculated Spike (mV):	**268.355**	**189.655**	**112.105**	**52.89**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.17	4.76	5.11	5.51

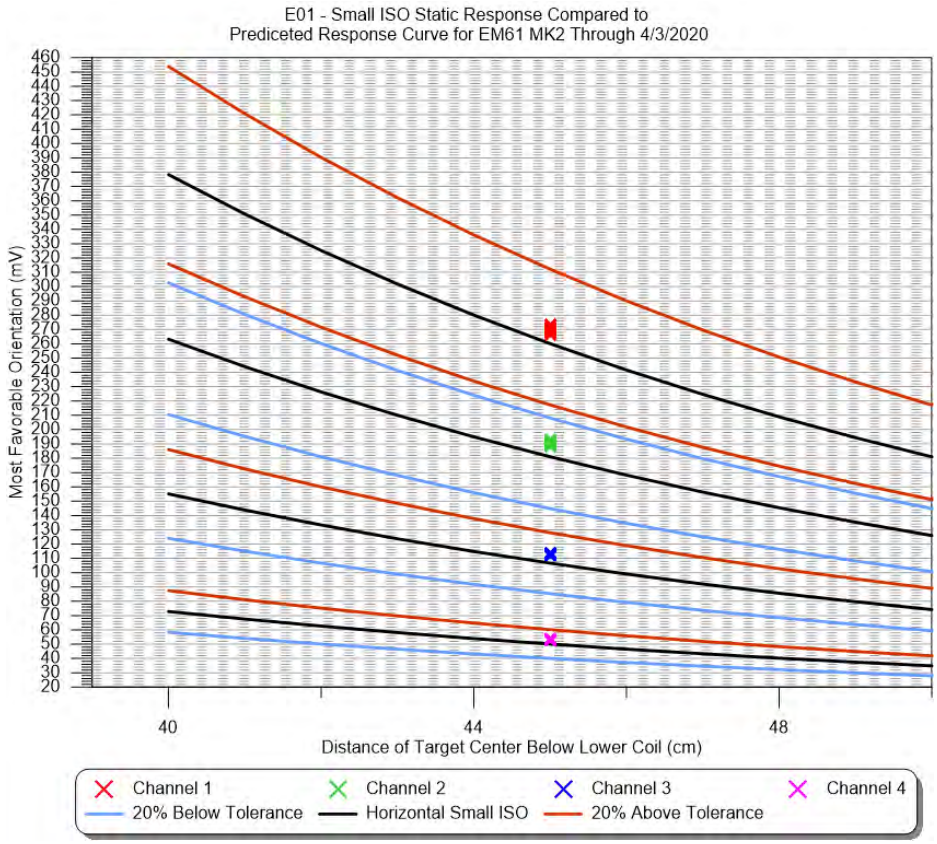
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200403GPSQC** **QC Status:** **Pass**

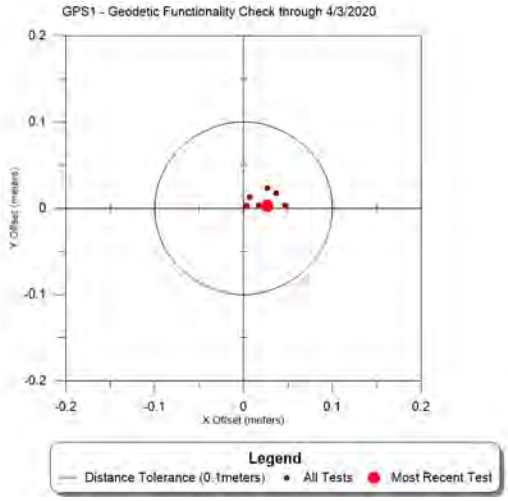
Date: 4/3/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.03	0.00

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/3/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200403_G01_DGM4_E01A,0200403_G01_DGM9_E01A,20200403_G01_DGM22_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0210 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200403_G01_DGM9_E01A **Grids Encountered:** DGM9

Collection Date: 4/3/2020 ☑ **Completed** **Start Time:** 4/3/2020 9:05:00 AM **End Time:** 4/3/2020 10:26:00 AM

Raw File Name(s): 20200403_G01_DGM9_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

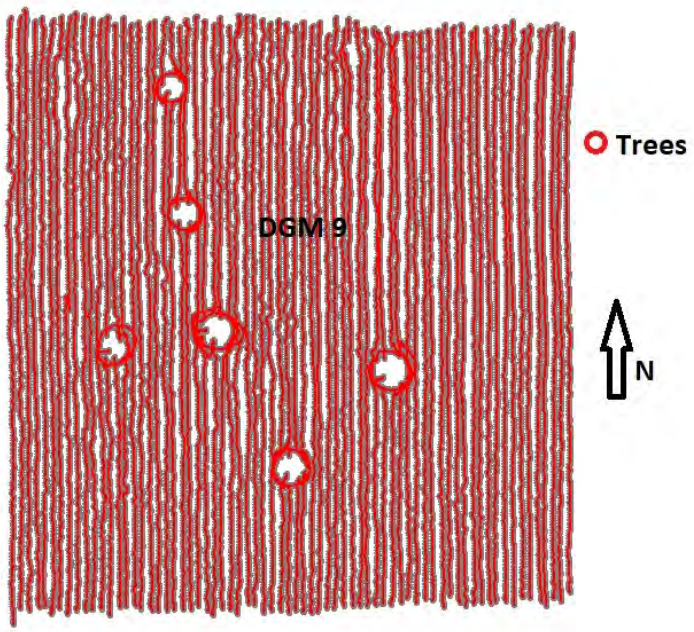
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold,light rain,wind

Terrain: moderate slope

Culture: manholes at NW corner

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/3/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200403_G01_DGM9_E01A

Processing Information

Dataset ID: 20200403_G01_DGM9_E01A **Grids:** DGM9

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-800, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200403_G01_DGM9_E01A_Ch2_level_

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200403_G01_DGM9_E01A.gdb, 20200403_G01_DGM9_E01A.gdb.xml, 20200403_G01_DGM9_E01A.map, 20200403_G01_DGM9_E01A.map.xml, 20200403_G01_DGM9_E01A.pdf, 20200403_G01_DGM9_E01A.png, 20200403_G01_DGM9_E01A.png.gi, 20200403_G01_DGM9_E01A.png.xml, 20200403_G01_DGM9_E01A.tif, 20200403_G01_DGM9_E01A.tif.gi, 20200403_G01_DGM9_E01A.tif.xml, 20200403_G01_DGM9_E01A_AGC_BKG.gdb, 20200403_G01_DGM9_E01A_AGC_BKG.gdb.xml, 20200403_G01_DGM9_E01A_Along_Track_Separation.map, 20200403_G01_DGM9_E01A_Along_Track_Separation.map.xml, 20200403_G01_DGM9_E01A_Along_Track_Separation.png, 20200403_G01_DGM9_E01A_Along_Track_Separation.png.gi, 20200403_G01_DGM9_E01A_Along_Track_Separation.png.xml, 20200403_G01_DGM9_E01A_AlongTrackSampling.txt, 20200403_G01_DGM9_E01A_Background_Ch2_Stats.txt, 20200403_G01_DGM9_E01A_Ch2_level_lg.grd, 20200403_G01_DGM9_E01A_Ch2_level_lg.grd.gi, 20200403_G01_DGM9_E01A_Ch2_level_lg.grd.xml, 20200403_G01_DGM9_E01A_GPS_HDOP.txt, 20200403_G01_DGM9_E01A_GPS_Quality.map, 20200403_G01_DGM9_E01A_GPS_Quality.map.xml, 20200403_G01_DGM9_E01A_GPS_Quality.png, 20200403_G01_DGM9_E01A_GPS_Quality.png.gi, 20200403_G01_DGM9_E01A_GPS_Quality.png.xml, 20200403_G01_DGM9_E01A_GPS_Quality.txt, 20200403_G01_DGM9_E01A_Processed.XYZ, 20200403_G01_DGM9_E01A_SRA.ply, 20200403_G01_DGM9_E01A_SRA.xls, 20200403_G01_DGM9_E01A_SRA_pg.dbf, 20200403_G01_DGM9_E01A_SRA_pg.prj, 20200403_G01_DGM9_E01A_SRA_pg.shp, 20200403_G01_DGM9_E01A_SRA_pg.shx, 20200403_G01_DGM9_E01A_Targets.gdb, 20200403_G01_DGM9_E01A_Targets.gdb.xml, 20200403_G01_DGM9_E01A_Targets.xls, 20200403_G01_DGM9_E01A_UceFootprintCov.map, 20200403_G01_DGM9_E01A_UceFootprintCov.map.xml, 20200403_G01_DGM9_E01A_UceFootprintCov.png, 20200403_G01_DGM9_E01A_UceFootprintCov.png.gi, 20200403_G01_DGM9_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Saturated grid with one SRA designated. Culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.23 **Std Dev:** 0.04 **Mean:** 0.08 **Map ID:**20200403_G01_DGM9_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 112.64 **Requirement:** 100 % **Map ID:** 20200403_G01_DGM9_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1044.92

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -9.86 **Max:** 5.6 **Std Dev:** 2.66 **Mean:** -0.47 **Number of Points:** 2311

Comments:

GPS Quality and HDOP

MapID: 20200403_G01_DGM9_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.10 **DOP StDev:** 00.16 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.03; percent pass = 99.98%

Daily Tests

IVS

IVS Test ID: **20200403E01IVS1** **QC Status:** **Pass**

Date: 4/3/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200403E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	112.20	77.20	42.60	20.93	97.92	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.44	34.00	17.06	7.47	98.34	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.53	7.80	3.61	1.52	83.64	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.7 **Max:** 78.05 **Std Dev:** 12.52 **Mean:** 4.96 **Number of Points:** 222

Comments:

IVS

IVS Test ID: **20200403E01IVS2** **QC Status:** **Pass**

Date: 4/3/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200403E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	110.61	76.03	42.72	20.21	96.42	0.09	Pass
IVS02		56.27	34.57	17.21	7.54	57.66	34.21	17.18	7.35	98.95	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.72	8.49	3.79	1.58	90.96	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

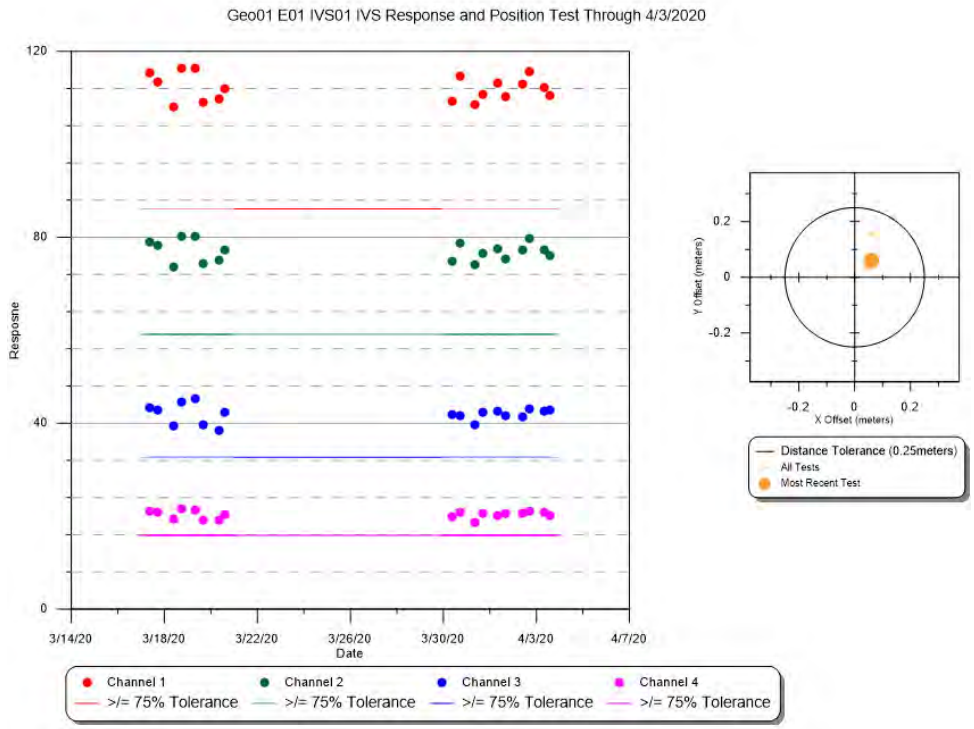
Exception Notes:

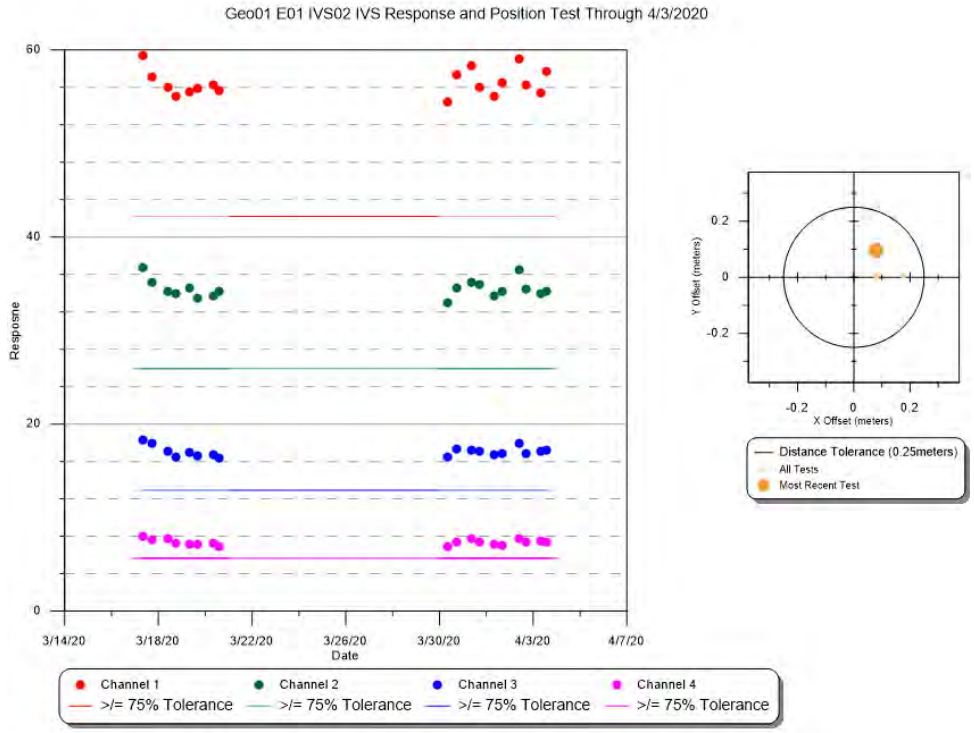
Background Noise Channel ID: Ch2_level_lg **Min:** -1 **Max:** 82.29 **Std Dev:** 13.18 **Mean:** 5.32 **Number of Points:** 233

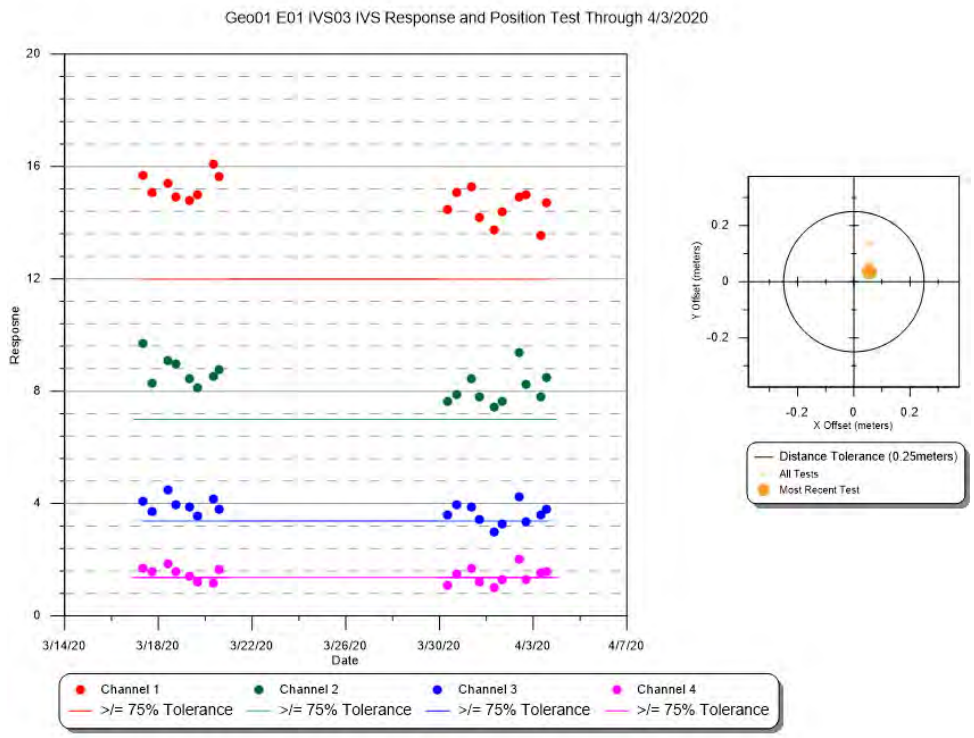
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/3/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
4/7/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200403E01QC1** **QC Status:** Pass

Date: 4/3/2020 8:00:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200403E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200403E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200403E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200403E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.14	-0.17	-0.31	0.03
Pre-Background Std Dev:	0.24	0.17	0.11	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	273.79	192.57	113.36	53.64
Spike Std Dev:	0.27	0.17	0.12	0.08
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	1.89	0.26	-0.4	-0.1
Post-Background Std Dev:	0.22	0.17	0.13	0.1
Calculated Spike (mV):	**272.775**	**192.525**	**113.715**	**53.675**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.87	6.34	6.62	7.07

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200403E01QC2** **QC Status:** Pass

Date: 4/3/2020 2:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200403E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200403E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.57	-0.48	-0.45	-0.24
Pre-Background Std Dev:	0.29	0.2	0.12	0.08
Observed Spike (mV):	269	189	111	52
Spike Mean (mV):	269.92	189.64	111.74	52.62
Spike Std Dev:	0.3	0.22	0.16	0.1
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.56	0.45	-0.28	-0.3
Post-Background Std Dev:	0.31	0.18	0.14	0.09
Calculated Spike (mV):	**268.355**	**189.655**	**112.105**	**52.89**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.17	4.76	5.11	5.51

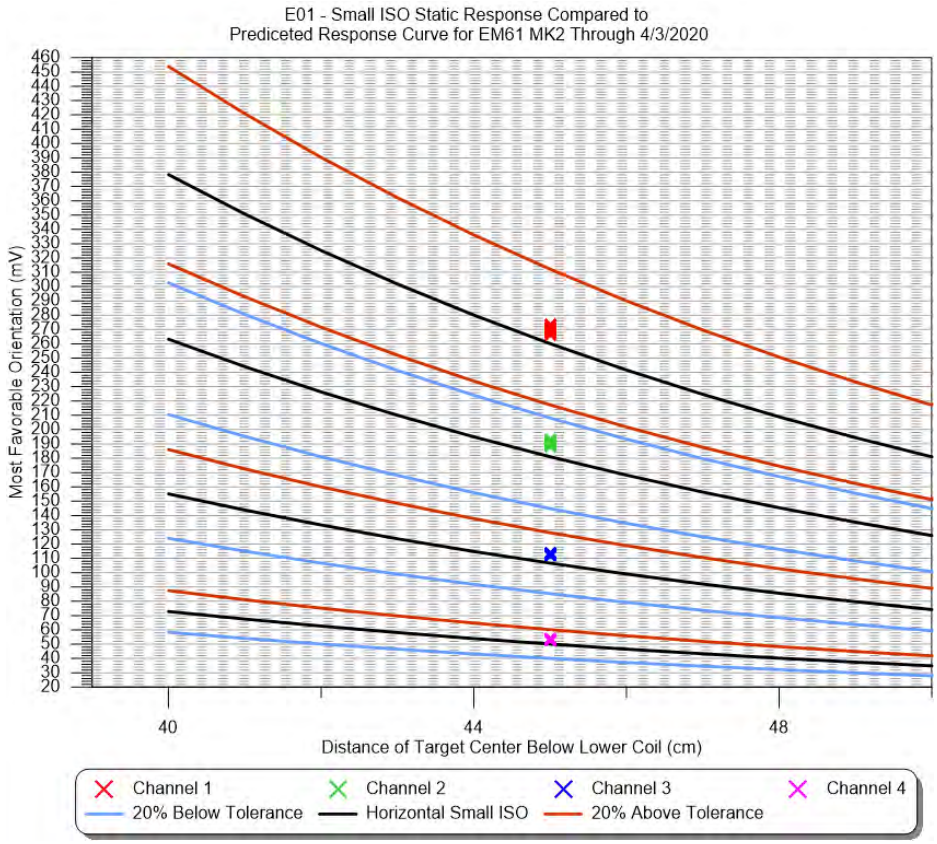
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200403GPSQC** **QC Status:** **Pass**

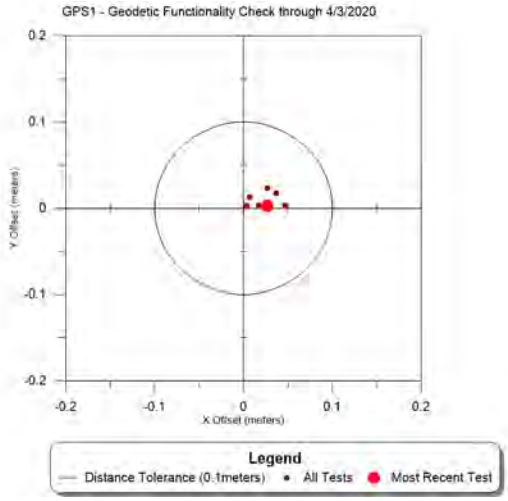
Date: 4/3/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.03	0.00

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/3/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200403_G01_DGM4_E01A,0200403_G01_DGM9_E01A,20200403_G01_DGM22_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0210 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200403_G01_DGM22_E01A **Grids Encountered:** DGM22

Collection Date: 4/3/2020 ☑ **Completed** **Start Time:** 4/3/2020 12:22:00 PM **End Time:** 4/3/2020 1:55:00 PM

Raw File Name(s): 20200403_G01_DGM22_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.75

Battery End Voltage: 12.6

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

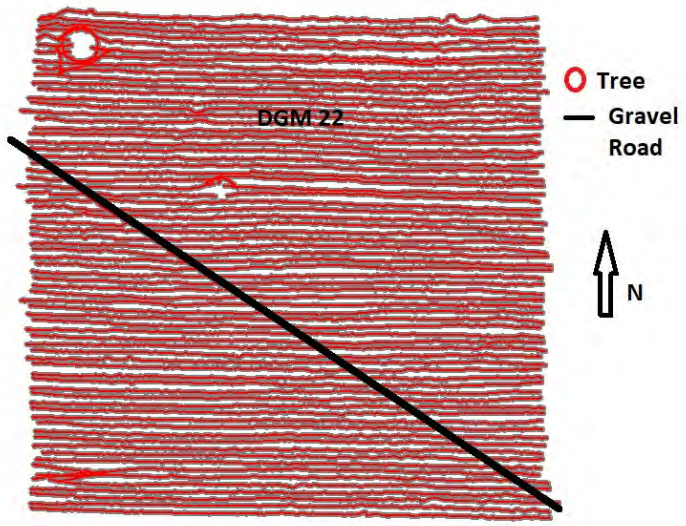
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold,light rain

Terrain: steep slope

Culture: gravel road

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/3/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200403_G01_DGM22_E01A

Processing Information

Dataset ID: 20200403_G01_DGM22_E01A **Grids:** DGM22

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-800, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=4

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200403_G01_DGM22_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200403_G01_DGM22_E01A.gdb, 20200403_G01_DGM22_E01A.gdb.xml, 20200403_G01_DGM22_E01A.map, 20200403_G01_DGM22_E01A.map.xml, 20200403_G01_DGM22_E01A.pdf, 20200403_G01_DGM22_E01A.png, 20200403_G01_DGM22_E01A.png.gi, 20200403_G01_DGM22_E01A.png.xml, 20200403_G01_DGM22_E01A.tif, 20200403_G01_DGM22_E01A.tif.gi, 20200403_G01_DGM22_E01A.tif.xml, 20200403_G01_DGM22_E01A_AGC_BKG.gdb, 20200403_G01_DGM22_E01A_AGC_BKG.gdb.xml, 20200403_G01_DGM22_E01A_Along_Track_Separation.map, 20200403_G01_DGM22_E01A_Along_Track_Separation.map.xml, 20200403_G01_DGM22_E01A_Along_Track_Separation.png, 20200403_G01_DGM22_E01A_Along_Track_Separation.png.gi, 20200403_G01_DGM22_E01A_Along_Track_Separation.png.xml, 20200403_G01_DGM22_E01A_AlongTrackSampling.txt, 20200403_G01_DGM22_E01A_Background_Ch2_Stats.txt, 20200403_G01_DGM22_E01A_Ch2_level_lg.grd, 20200403_G01_DGM22_E01A_Ch2_level_lg.grd.gi, 20200403_G01_DGM22_E01A_Ch2_level_lg.grd.xml, 20200403_G01_DGM22_E01A_GPS_HDOP.txt, 20200403_G01_DGM22_E01A_GPS_Quality.map, 20200403_G01_DGM22_E01A_GPS_Quality.map.xml, 20200403_G01_DGM22_E01A_GPS_Quality.png, 20200403_G01_DGM22_E01A_GPS_Quality.png.gi, 20200403_G01_DGM22_E01A_GPS_Quality.png.xml, 20200403_G01_DGM22_E01A_GPS_Quality.txt, 20200403_G01_DGM22_E01A_Processed.XYZ, 20200403_G01_DGM22_E01A_SRA.ply, 20200403_G01_DGM22_E01A_SRA.xls, 20200403_G01_DGM22_E01A_SRA_pg.dbf, 20200403_G01_DGM22_E01A_SRA_pg.prj, 20200403_G01_DGM22_E01A_SRA_pg.shp, 20200403_G01_DGM22_E01A_SRA_pg.shx, 20200403_G01_DGM22_E01A_Targets.gdb, 20200403_G01_DGM22_E01A_Targets.gdb.xml, 20200403_G01_DGM22_E01A_Targets.xls, 20200403_G01_DGM22_E01A_UceFootprintCov.map, 20200403_G01_DGM22_E01A_UceFootprintCov.map.xml, 20200403_G01_DGM22_E01A_UceFootprintCov.png, 20200403_G01_DGM22_E01A_UceFootprintCov.png.gi, 20200403_G01_DGM22_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Saturated grid with one SRA designated. Culture gaps due to trees.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.24 **Std Dev:** 0.03 **Mean:** 0.07 **Map ID:**20200403_G01_DGM22_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 111.27 **Requirement:** 100 % **Map ID:** 20200403_G01_DGM22_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1036.50

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -15.95 **Max:** 3.47 **Std Dev:** 3.9 **Mean:** -4.76 **Number of Points:** 607

Comments:

GPS Quality and HDOP

MapID: 20200403_G01_DGM22_E01A_GPS_Quality.

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.10 **DOP StDev:** 00.08 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.03; percent pass = 99.98%

Daily Tests

IVS

IVS Test ID: **20200403E01IVS1** **QC Status:** **Pass**

Date: 4/3/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200403E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	112.20	77.20	42.60	20.93	97.92	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	55.44	34.00	17.06	7.47	98.34	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.53	7.80	3.61	1.52	83.64	0.09	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.7 **Max:** 78.05 **Std Dev:** 12.52 **Mean:** 4.96 **Number of Points:** 222

Comments:

IVS

IVS Test ID: **20200403E01IVS2** **QC Status:** **Pass**

Date: 4/3/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200403E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	110.61	76.03	42.72	20.21	96.42	0.09	Pass
IVS02		56.27	34.57	17.21	7.54	57.66	34.21	17.18	7.35	98.95	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	14.72	8.49	3.79	1.58	90.96	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

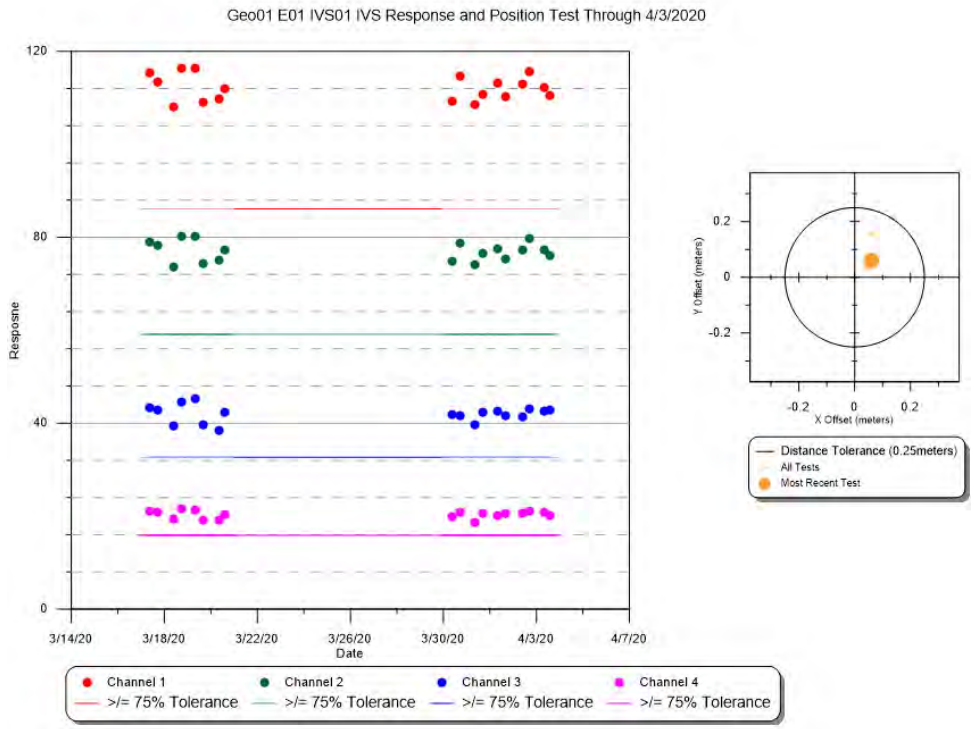
Exception Notes:

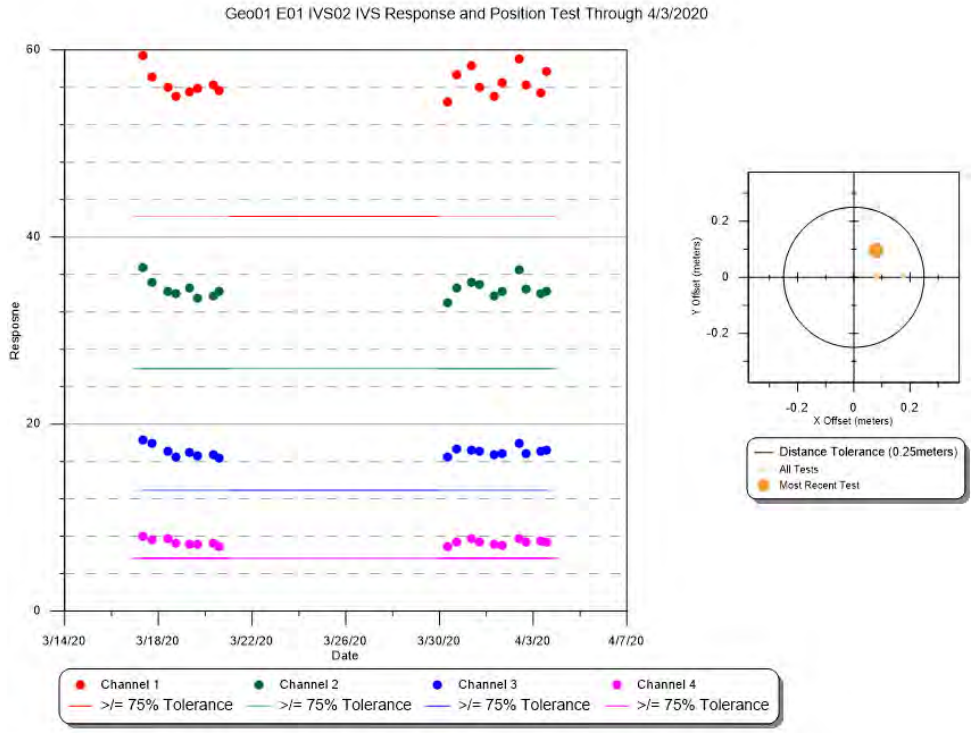
Background Noise Channel ID: Ch2_level_lg **Min:** -1 **Max:** 82.29 **Std Dev:** 13.18 **Mean:** 5.32 **Number of Points:** 233

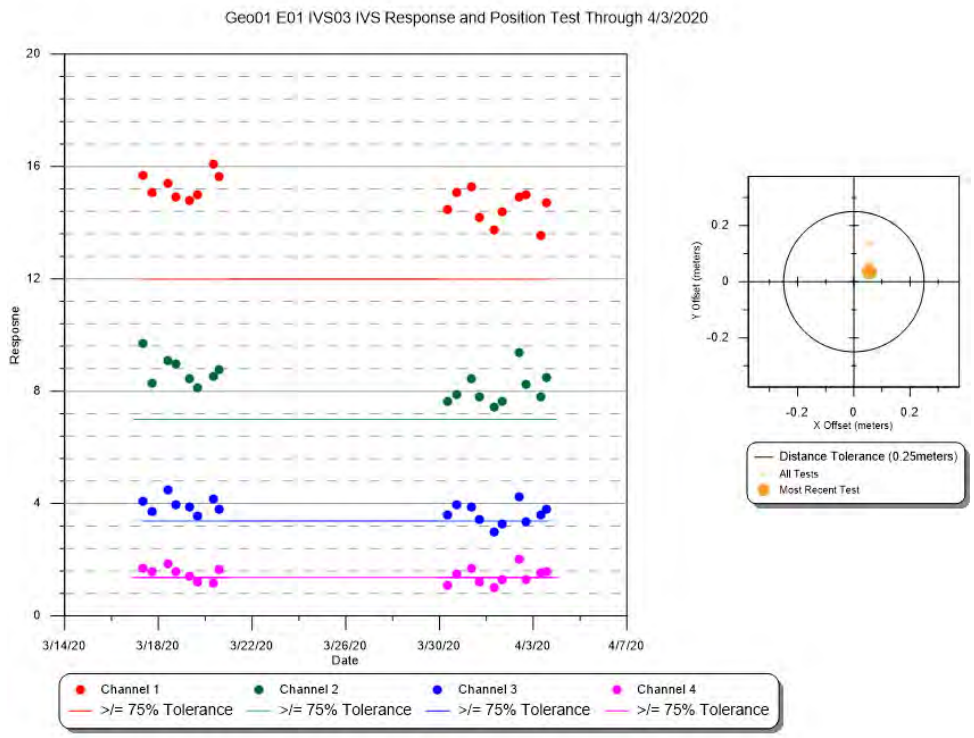
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/3/2020
Response
Date
3/14/20
3/18/20
3/22/20
3/26/20
3/30/20
4/3/20
4/7/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200403E01QC1** **QC Status:** Pass

Date: 4/3/2020 8:00:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200403E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200403E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200403E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200403E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.14	-0.17	-0.31	0.03
Pre-Background Std Dev:	0.24	0.17	0.11	0.09
Observed Spike (mV):	274	192	113	53
Spike Mean (mV):	273.79	192.57	113.36	53.64
Spike Std Dev:	0.27	0.17	0.12	0.08
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	1.89	0.26	-0.4	-0.1
Post-Background Std Dev:	0.22	0.17	0.13	0.1
Calculated Spike (mV):	**272.775**	**192.525**	**113.715**	**53.675**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.87	6.34	6.62	7.07

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200403E01QC2** **QC Status:** Pass

Date: 4/3/2020 2:14:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200403E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200403E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.57	-0.48	-0.45	-0.24
Pre-Background Std Dev:	0.29	0.2	0.12	0.08
Observed Spike (mV):	269	189	111	52
Spike Mean (mV):	269.92	189.64	111.74	52.62
Spike Std Dev:	0.3	0.22	0.16	0.1
Observed Post-Background (mV):	2	0	0	0
Post-Background Mean (mV):	2.56	0.45	-0.28	-0.3
Post-Background Std Dev:	0.31	0.18	0.14	0.09
Calculated Spike (mV):	**268.355**	**189.655**	**112.105**	**52.89**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.17	4.76	5.11	5.51

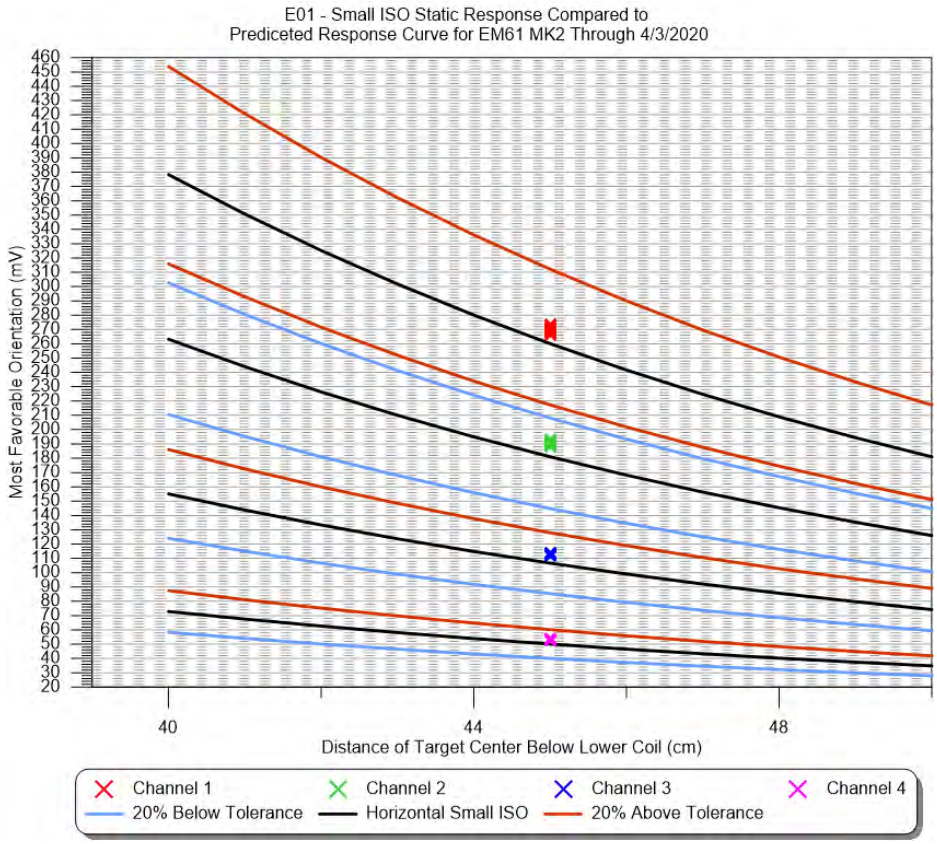
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200403GPSQC** **QC Status:** **Pass**

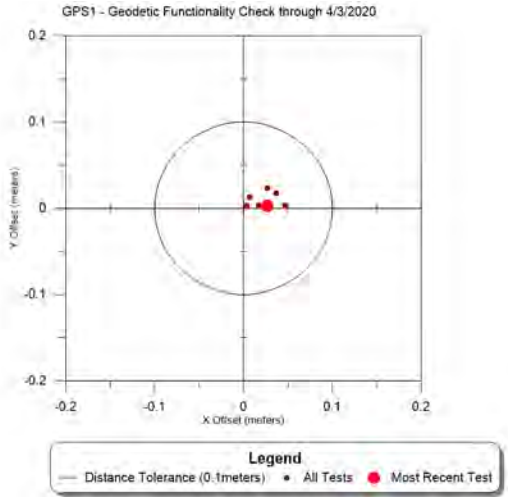
Date: 4/3/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.39
Actual:	585680.19	4572774.39
Offset:	0.03	0.00

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/3/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200403_G01_DGM4_E01A,0200403_G01_DGM9_E01A,20200403_G01_DGM22_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0900 Data collection,0210 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

Collection, Processing and Data Quality Report

Dataset ID: 20200406_G01_DGM13_E01A **Grids Encountered:** DGM13

Collection Date: 4/6/2020 ☑ **Completed** **Start Time:** 4/6/2020 3:15:00 PM **End Time:** 4/6/2020 5:00:00 PM

Raw File Name(s): 20200406_G01_DGM13_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

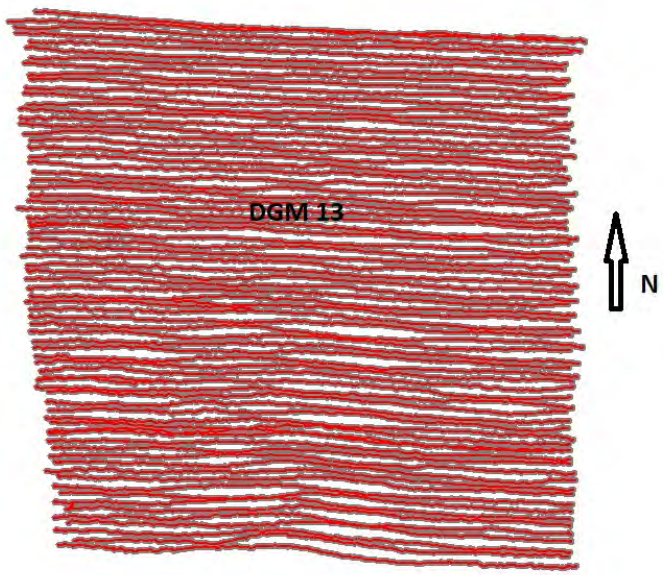
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: warm

Terrain: flat,swampy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/6/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200406_G01_DGM13_E01A

Processing Information

Dataset ID: 20200406_G01_DGM13_E01A **Grids:** DGM13

Date Processed: 4/10/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-200, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=5

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200406_G01_DGM13_E01A_Ch2_level

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200406_G01_DGM13_E01A.gdb, 20200406_G01_DGM13_E01A.gdb.xml, 20200406_G01_DGM13_E01A.map, 20200406_G01_DGM13_E01A.map.xml, 20200406_G01_DGM13_E01A.pdf, 20200406_G01_DGM13_E01A.png, 20200406_G01_DGM13_E01A.png.gi, 20200406_G01_DGM13_E01A.png.xml, 20200406_G01_DGM13_E01A.tif, 20200406_G01_DGM13_E01A.tif.gi, 20200406_G01_DGM13_E01A.tif.xml, 20200406_G01_DGM13_E01A_AGC_BKG.gdb, 20200406_G01_DGM13_E01A_AGC_BKG.gdb.xml, 20200406_G01_DGM13_E01A_Along_Track_Separation.map, 20200406_G01_DGM13_E01A_Along_Track_Separation.map.xml, 20200406_G01_DGM13_E01A_Along_Track_Separation.png, 20200406_G01_DGM13_E01A_Along_Track_Separation.png.gi, 20200406_G01_DGM13_E01A_Along_Track_Separation.png.xml, 20200406_G01_DGM13_E01A_AlongTrackSampling.txt, 20200406_G01_DGM13_E01A_Background_Ch2_Stats.txt, 20200406_G01_DGM13_E01A_Ch2_level_lg.grd, 20200406_G01_DGM13_E01A_Ch2_level_lg.grd.gi, 20200406_G01_DGM13_E01A_Ch2_level_lg.grd.xml, 20200406_G01_DGM13_E01A_GPS_HDOP.txt, 20200406_G01_DGM13_E01A_GPS_Quality.map, 20200406_G01_DGM13_E01A_GPS_Quality.map.xml, 20200406_G01_DGM13_E01A_GPS_Quality.png, 20200406_G01_DGM13_E01A_GPS_Quality.png.gi, 20200406_G01_DGM13_E01A_GPS_Quality.png.xml, 20200406_G01_DGM13_E01A_GPS_Quality.txt, 20200406_G01_DGM13_E01A_Processed.XYZ, 20200406_G01_DGM13_E01A_Targets.gdb, 20200406_G01_DGM13_E01A_Targets.gdb.xml, 20200406_G01_DGM13_E01A_Targets.xls, 20200406_G01_DGM13_E01A_UceFootprintCov.map, 20200406_G01_DGM13_E01A_UceFootprintCov.map.xml, 20200406_G01_DGM13_E01A_UceFootprintCov.png, 20200406_G01_DGM13_E01A_UceFootprintCov.png.gi, 20200406_G01_DGM13_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Very low target density grid.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.22 **Std Dev:** 0.03 **Mean:** 0.08 **Map ID:**20200406_G01_DGM13_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 118.40 **Requirement:** 100 % **Map ID:** 20200406_G01_DGM13_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 1010.94

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -0.9 **Max:** 1.89 **Std Dev:** 0.33 **Mean:** 0.36 **Number of Points:** 7803

Comments:

GPS Quality and HDOP

MapID: 20200406_G01_DGM13_E01A_GPS_Quality.

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.10 **DOP StDev:** 00.07 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200406E01IVS1_** **QC Status:** **Pass**

Date: 4/6/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200406E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	112.67	77.50	42.77	20.94	98.29	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	53.60	32.87	16.49	7.11	95.09	0.12	Pass
IVS03		15.98	9.33	4.50	1.82	13.60	7.79	3.23	1.06	83.45	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments:
Lag = 5. Ch3 and Ch4 low responses were noted and found to fall within the bounds of normal device function.

Exception Notes:

IVS

IVS Test ID: **20200406E01IVS2_** **QC Status:** **Pass**

Date: 4/6/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200406E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	111.07	75.68	41.33	20.32	95.99	0.06	Pass
IVS02		56.27	34.57	17.21	7.54	55.92	33.80	16.42	7.33	97.79	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.08	8.70	4.09	1.66	93.21	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

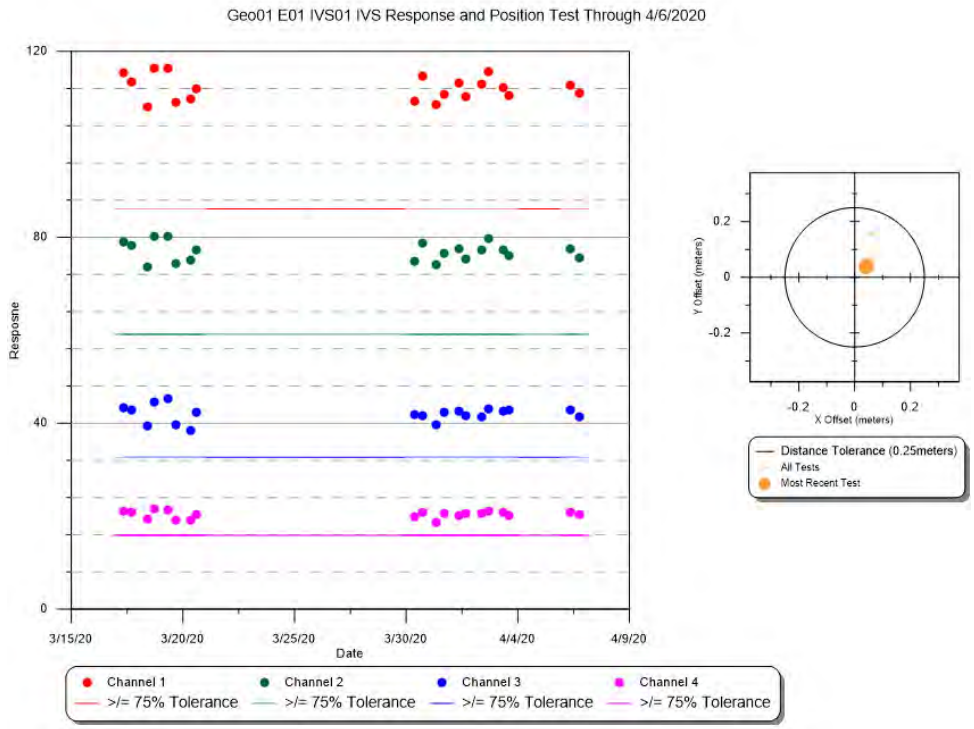
Field Comments:

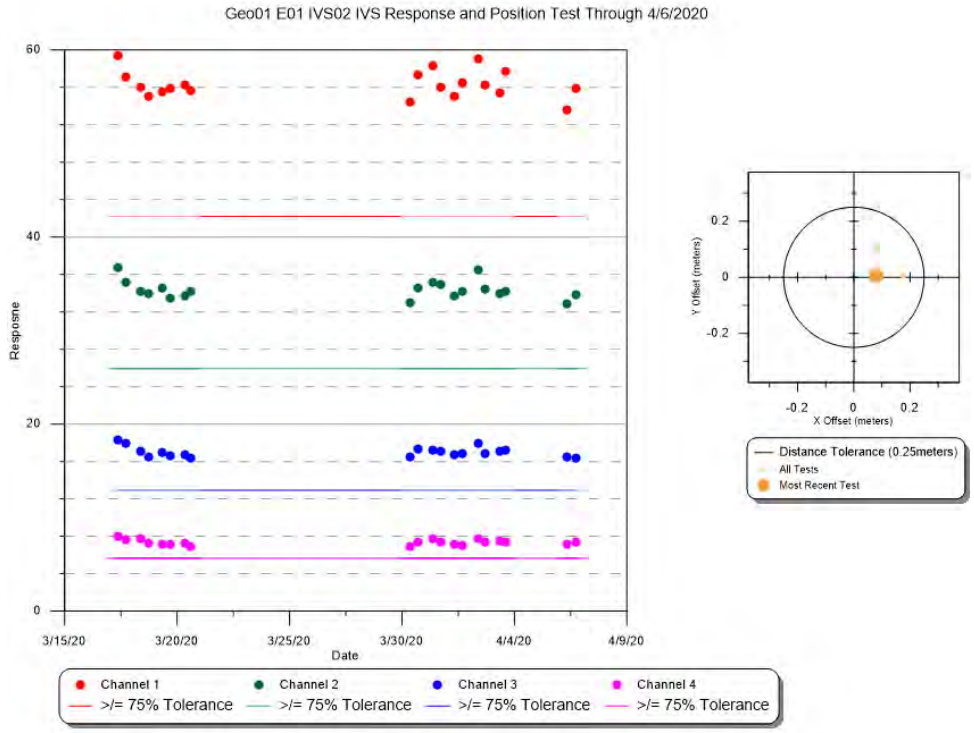
Processing Comments:
Lag = 5

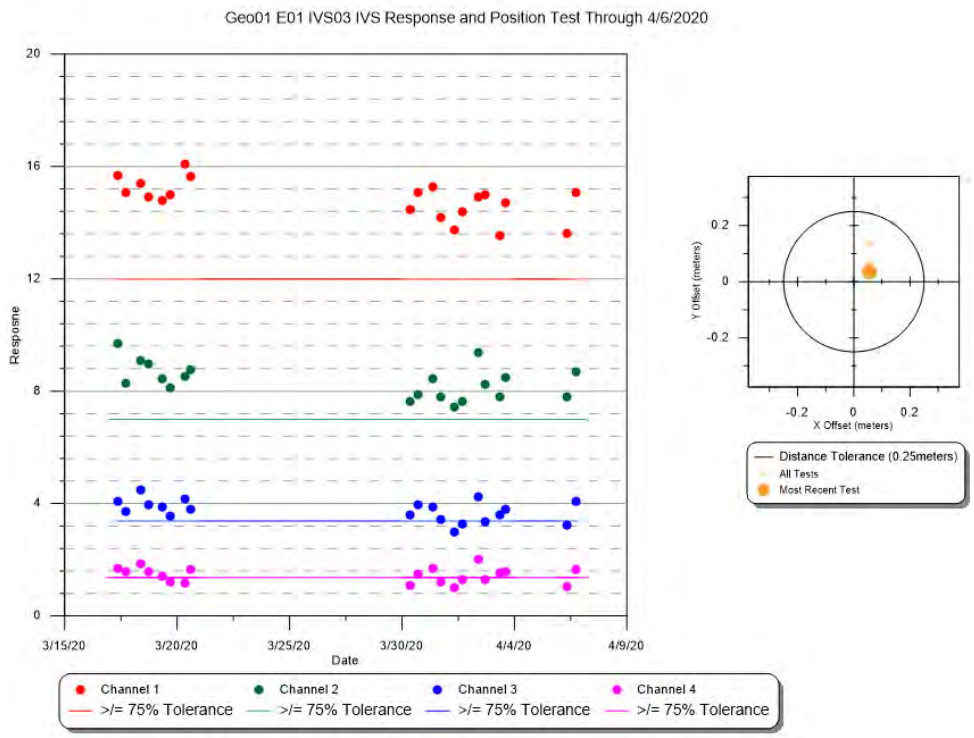
Exception Notes:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/6/2020
Response
Date
3/15/20
3/20/20
3/25/20
3/30/20
4/4/20
4/9/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200406E01QC1** **QC Status:** Pass

Date: 4/6/2020 7:50:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200406E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200406E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200406E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200406E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	2	0	0	0
Pre-Background Mean (mV):	2.41	-0.25	-0.28	-0.26
Pre-Background Std Dev:	0.3	0.13	0.12	0.08
Observed Spike (mV):	276	192	112	52
Spike Mean (mV):	277	192.15	112.57	52.57
Spike Std Dev:	0.27	0.21	0.13	0.1
Observed Post-Background (mV):	4	0	0	0
Post-Background Mean (mV):	4.94	-0.11	-0.47	-0.45
Post-Background Std Dev:	0.22	0.2	0.09	0.09
Calculated Spike (mV):	**273.325**	**192.33**	**112.945**	**52.925**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	5.08	6.24	5.90	5.58

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200406E01QC2** **QC Status:** Pass

Date: 4/6/2020 5:48:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200406E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200406E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	2	0	0	0
Pre-Background Mean (mV):	1.94	0.20	0.04	-0.07
Pre-Background Std Dev:	0.3	0.17	0.13	0.09
Observed Spike (mV):	274	191	112	52
Spike Mean (mV):	273.7	191.86	112.62	52.55
Spike Std Dev:	0.28	0.2	0.14	0.12
Observed Post-Background (mV):	3	0	0	0
Post-Background Mean (mV):	2.98	0.71	0.2	-0.11
Post-Background Std Dev:	0.27	0.17	0.11	0.1
Calculated Spike (mV):	**271.24**	**191.405**	**112.5**	**52.64**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.27	5.73	5.49	5.01

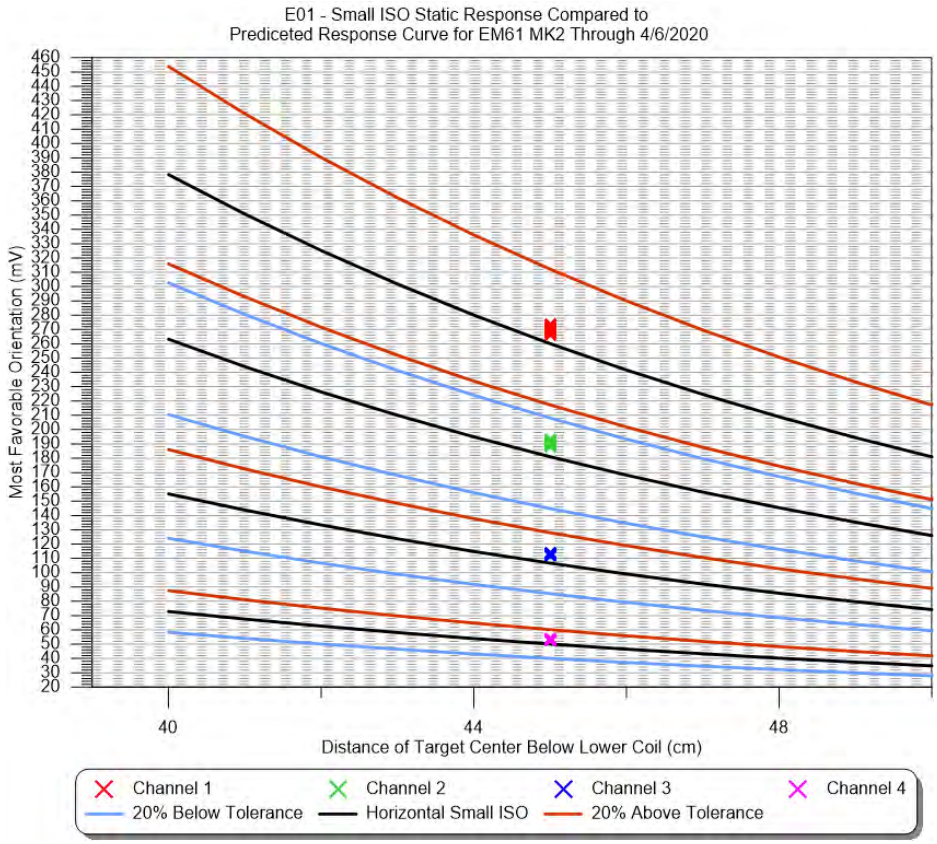
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200406GPSQC** **QC Status:** **Pass**

Date: 4/6/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.22	4572774.40
Actual:	585680.19	4572774.39
Offset:	0.03	0.01

Total Offset: 0.03 **Requirement:** 0.1

Field Comments:

Daily Logs

Date: 4/6/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200406_G01_DGM13_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 safety btief,0800 AM QC/IVS,0300pm Data collection,0545PM QC/IVS,0600 eod

Lessons Learned:

Standby Time:

5hrs high tide hold

Collection, Processing and Data Quality Report

Dataset ID: 20200408_G01_Water_E01A **Grids Encountered:** under water transect

Collection Date: 4/8/2020 ☑ **Completed** **Start Time:** 4/8/2020 10:15:00 AM **End Time:** 4/8/2020 11:51:00 AM

Raw File Name(s): 20200408_G01_DGM_E01A

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

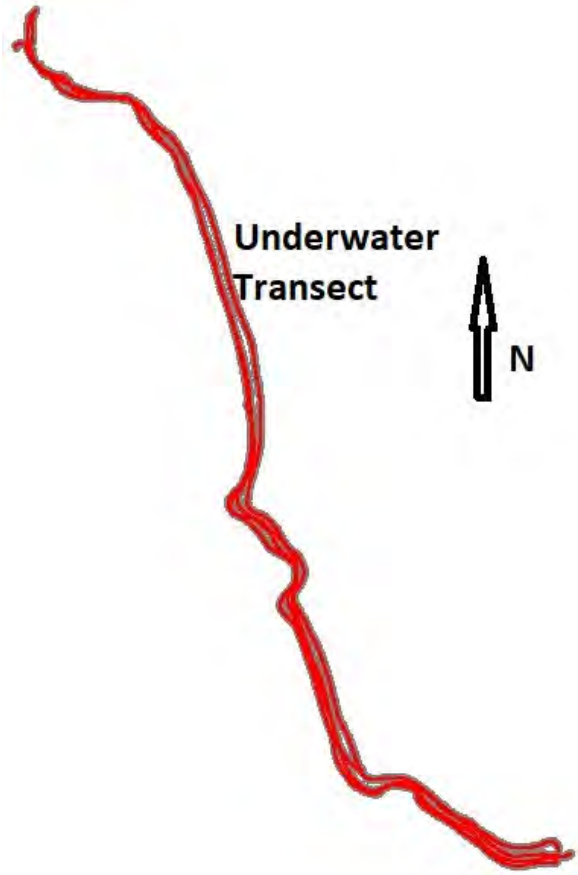
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: underwater transect survey

Culture: water

Survey Area Comments: underwater boat survey

Raw Data Editing Information

Editing Date: 4/8/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments: underwater boat 10ft separation transect data

Raw and Edited Files:

XYZ Files: 20200408_G01_Water_E01A

Processing Information

Dataset ID: 20200408_G01_Water_E01A **Grids:** under water transect

Date Processed: 4/13/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-6000, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200408_G01_Water_E01A_Ch2_level_l

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☐ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200408_G01_Water_E01A.gdb, 20200408_G01_Water_E01A.gdb.xml, 20200408_G01_Water_E01A.map, 20200408_G01_Water_E01A.map.xml, 20200408_G01_Water_E01A.pdf, 20200408_G01_Water_E01A.png, 20200408_G01_Water_E01A.png.gi, 20200408_G01_Water_E01A.png.xml, 20200408_G01_Water_E01A.tif, 20200408_G01_Water_E01A.tif.gi, 20200408_G01_Water_E01A.tif.xml, 20200408_G01_Water_E01A_AGC_BKG.gdb, 20200408_G01_Water_E01A_AGC_BKG.gdb.xml, 20200408_G01_Water_E01A_Along_Track_Separation.map, 20200408_G01_Water_E01A_Along_Track_Separation.map.xml, 20200408_G01_Water_E01A_Along_Track_Separation.png, 20200408_G01_Water_E01A_Along_Track_Separation.png.gi, 20200408_G01_Water_E01A_Along_Track_Separation.png.xml, 20200408_G01_Water_E01A_AlongTrackSampling.txt, 20200408_G01_Water_E01A_Background_Ch2_Stats.txt, 20200408_G01_Water_E01A_Ch2_level_lg.grd, 20200408_G01_Water_E01A_Ch2_level_lg.grd.gi, 20200408_G01_Water_E01A_Ch2_level_lg.grd.xml, 20200408_G01_Water_E01A_GPS_HDOP.txt, 20200408_G01_Water_E01A_GPS_Quality.map, 20200408_G01_Water_E01A_GPS_Quality.map.xml, 20200408_G01_Water_E01A_GPS_Quality.png, 20200408_G01_Water_E01A_GPS_Quality.png.gi, 20200408_G01_Water_E01A_GPS_Quality.png.xml, 20200408_G01_Water_E01A_GPS_Quality.txt, 20200408_G01_Water_E01A_Processed.XYZ, 20200408_G01_Water_E01A_SRA.ply, 20200408_G01_Water_E01A_SRA.xls, 20200408_G01_Water_E01A_SRA_pg.dbf, 20200408_G01_Water_E01A_SRA_pg.prj, 20200408_G01_Water_E01A_SRA_pg.shp, 20200408_G01_Water_E01A_SRA_pg.shx, 20200408_G01_Water_E01A_Targets.gdb, 20200408_G01_Water_E01A_Targets.gdb.xml, 20200408_G01_Water_E01A_Targets.xls, 20200408_G01_Water_E01A_UceFootprintCov.map, 20200408_G01_Water_E01A_UceFootprintCov.map.xml, 20200408_G01_Water_E01A_UceFootprintCov.png, 20200408_G01_Water_E01A_UceFootprintCov.png.gi, 20200408_G01_Water_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Dataset consisted of transects collected with a floating array towed behind a one-man kayak along the coast of the island. Three SRAs designated. Targets not picked beyond the ends of the planned transect lines. In places of IVS tests, an aquatic static test was performed by placing a sledgehammer under the floating array.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.18 **Std Dev:** 0.02 **Mean:** 0.07 **Map ID:**20200408_G01_Water_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 100.00 **Requirement:** 100 % **Map ID:** 20200408_G01_Water_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 827.71

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -0.91 **Max:** 5.89 **Std Dev:** 0.86 **Mean:** 0.68 **Number of Points:** 7490

Comments:

GPS Quality and HDOP

MapID: 20200408_G01_Water_E01A_GPS_Quality.m

Fix Min: **Fix Max:** **Fix StDev:** **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 02.90 **DOP StDev:** 00.38 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments: UTM positional data for locations with bad GPS readings (readings not equal to 4 or HDOP>=4) were deleted.
Original RTK values: min = 2.00; max = 4.00; standard deviation = 0.14; percent pass = 99.48%

Static Repeatability

Static Test ID: **20200408E01QC1** **QC Status:** Pass

Date: 4/8/2020 9:31:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** at survey area

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200408E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200408E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200408E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200408E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.9	-0.84	-0.77	-0.52
Pre-Background Std Dev:	0.27	0.2	0.14	0.11
Observed Spike (mV):	268	187	112	52
Spike Mean (mV):	268.63	188.59	111.88	52.94
Spike Std Dev:	0.36	0.29	0.15	0.11
Observed Post-Background (mV):	3	0	0	0
Post-Background Mean (mV):	3.8	0.05	-0.35	-0.31
Post-Background Std Dev:	0.37	0.19	0.14	0.1
Calculated Spike (mV):	**266.28**	**188.985**	**112.44**	**53.355**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	2.37	4.39	5.43	6.43

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200408E01QC2** **QC Status:** Pass

Date: 4/8/2020 2:09:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** at survey ares

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200408E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200408E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	-1	-1	-1	0
Pre-Background Mean (mV):	-1.25	-1.93	-1.44	-0.81
Pre-Background Std Dev:	0.37	0.23	0.14	0.11
Observed Spike (mV):	262	184	109	51
Spike Mean (mV):	261.47	184.61	109.37	51.72
Spike Std Dev:	0.52	0.27	0.17	0.12
Observed Post-Background (mV):	0	-1	-1	0
Post-Background Mean (mV):	-0.35	-1.95	-1.52	-0.8
Post-Background Std Dev:	0.54	0.25	0.18	0.11
Calculated Spike (mV):	**262.27**	**186.55**	**110.85**	**52.525**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	0.83	3.04	3.94	4.78

Requirement: 20 %

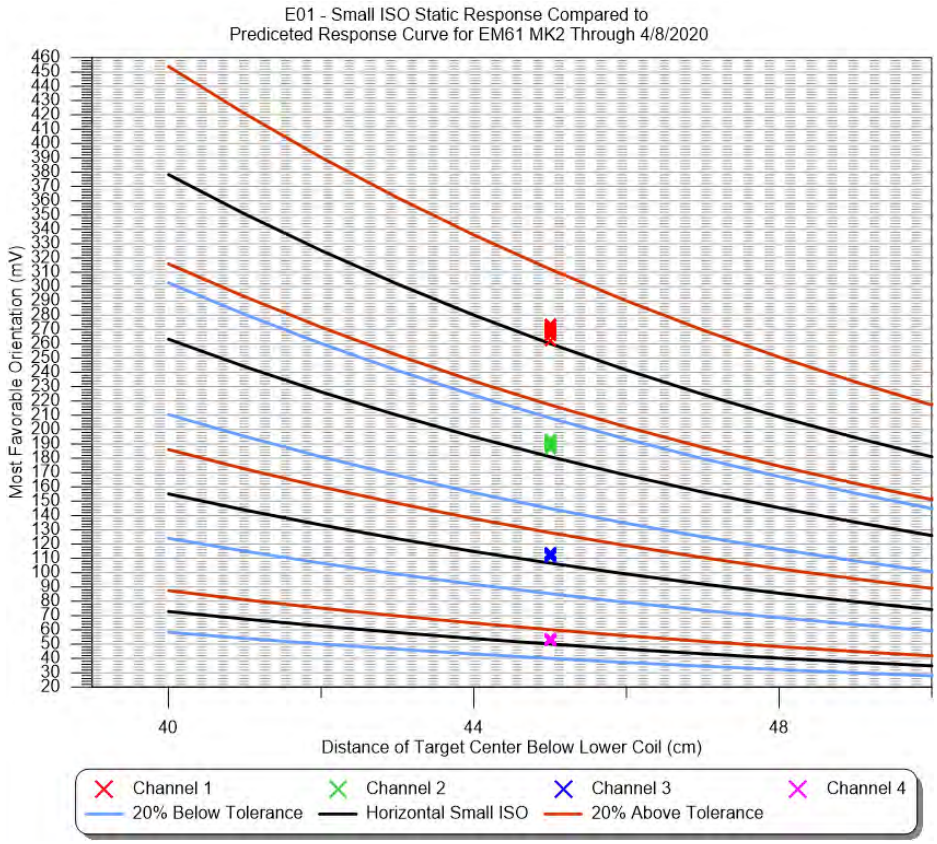
Field Comments:

Processing Comments:

Strong negative spikes were observed in the Ch1 L1 & L2 tests, causing failure points, but did not affect the overall passing of the test. Determined to be acceptable insofar as the primary data channel is Ch2.

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200408GPSQC** **QC Status:** **Pass**

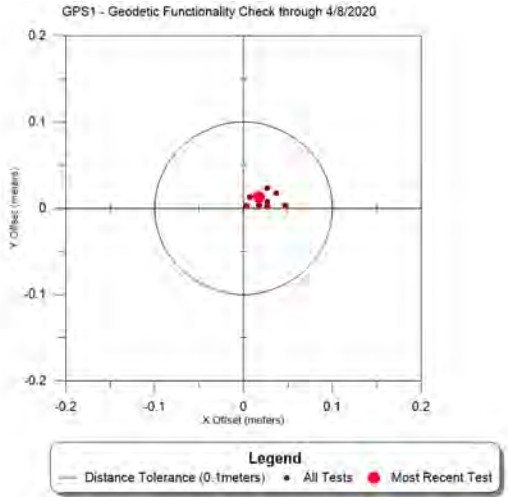
Date: 4/8/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.21	4572774.38
Actual:	585680.19	4572774.39
Offset:	0.02	0.01

Total Offset: 0.02 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/8/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200408_G01_Water_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700pm safety brief,0930 AM QC/IVS,1000 Data collection underwater transect with boat, 0230 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

1 and half hrs GPS hold

Collection, Processing and Data Quality Report

Dataset ID: 20200415_G01_Transect_E01A **Grids Encountered:** Transect

Collection Date: 4/15/2020 ☑ **Completed** **Start Time:** 4/15/2020 12:06:00 PM **End Time:** 4/15/2020 1:30:00 PM

Raw File Name(s): 20200415_G01_Transect_E01

Team ID: Geo01 **Team Members:** Nash Stevens; Nesibu Sibhat

Geophysical System: EM61-MK2 Bottom Coil

Geophysical Sensor: E01

Serial Numbers: EM61 Coil em6100032, EM61 Back Pack em6100003, Allegro 33662

Battery Start Voltage: 12.6

Battery End Voltage: 12.45

Positioning System: GPS GGA

Positioning Sensor: GPS1

Serial Numbers: R10 5836470416, Trimble R8 4943404711, Trimble TSC3 0329, Radio 12466303

Raw Coordinate System: UTM

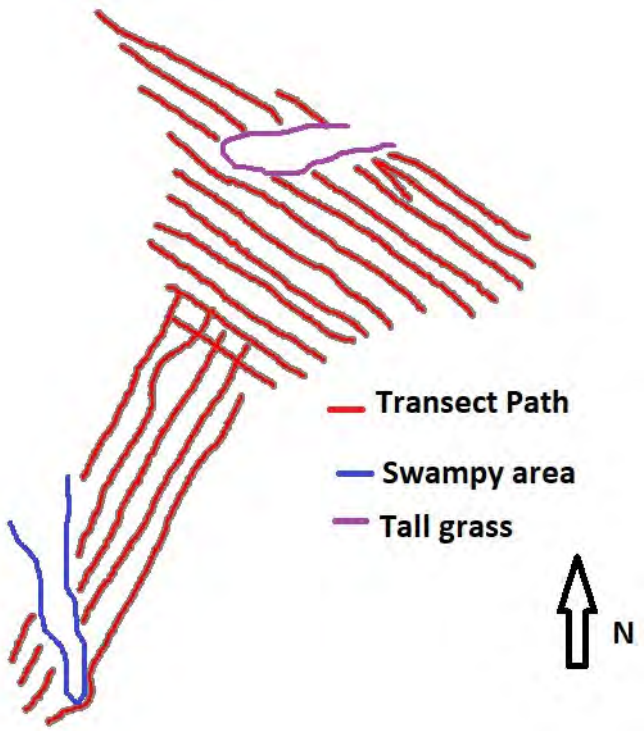
Raw Coordinate Units Meters

Line Direction: N-S ☐ **Positional Offset**

Offset X: **Offset Y:**

Grid Corners:

Survey Area Sketch Map:



Weather: cold

Terrain: flat,swampy

Culture:

Survey Area Comments:

Raw Data Editing Information

Editing Date: 4/15/2020 **Editor:** Nesibu Sibhat ☑ **Raw Data Submittal**

Editing Comments:

Raw and Edited Files:

XYZ Files: 20200415_G01_Transect_E01

Processing Information

Dataset ID: 20200415_G01_Transect_E01A **Grids:** Transect

Date Processed: 4/16/2020 **Instrument:** EM61-MK2 Bottom Coil **GPS:** GPS GGA **Processor:** Nicholas Pierson

Leveling **Parameters:** Low=0, High=80, Window=100-1800, median

Applied ☑

Method: stlevel4.gx

Lag/Latency **Parameters:**

Applied ☑

Method: lag=6

Filtering **Parameters:**

Applied ☐

Method:

Gridding **Other Parameters:**

Applied ☑

Gridding Method: Minimum Curvature

Input Channel: Ch2_level_lg

Output Grid: 20200415_G01_Transect_E01A_Ch2_leve

Grid Cell Size: 0.1

Blanking Distance: 0.4

Gaps/Culture Noted ☑ **Base Station Correction** ☐

Dataset Processed Submittal Package ☑

Processed Files:

20200415_G01_TRANSECT_E01A.gdb, 20200415_G01_TRANSECT_E01A.gdb.xml, 20200415_G01_TRANSECT_E01A.map, 20200415_G01_TRANSECT_E01A.map.xml, 20200415_G01_TRANSECT_E01A.pdf, 20200415_G01_TRANSECT_E01A.png, 20200415_G01_TRANSECT_E01A.png.gi, 20200415_G01_TRANSECT_E01A.png.xml, 20200415_G01_TRANSECT_E01A.tif, 20200415_G01_TRANSECT_E01A.tif.gi, 20200415_G01_TRANSECT_E01A.tif.xml, 20200415_G01_TRANSECT_E01A_AGC_BKG.gdb, 20200415_G01_TRANSECT_E01A_AGC_BKG.gdb.xml, 20200415_G01_TRANSECT_E01A_Along_Track_Separation.map, 20200415_G01_TRANSECT_E01A_Along_Track_Separation.map.xml, 20200415_G01_TRANSECT_E01A_Along_Track_Separation.png, 20200415_G01_TRANSECT_E01A_Along_Track_Separation.png.gi, 20200415_G01_TRANSECT_E01A_Along_Track_Separation.png.xml, 20200415_G01_TRANSECT_E01A_AlongTrackSampling.txt, 20200415_G01_TRANSECT_E01A_Background_Ch2_Stats.txt, 20200415_G01_TRANSECT_E01A_Ch2_level_lg.grd, 20200415_G01_TRANSECT_E01A_Ch2_level_lg.grd.gi, 20200415_G01_TRANSECT_E01A_Ch2_level_lg.grd.xml, 20200415_G01_TRANSECT_E01A_GPS_HDOP.txt, 20200415_G01_TRANSECT_E01A_GPS_Quality.map, 20200415_G01_TRANSECT_E01A_GPS_Quality.map.xml, 20200415_G01_TRANSECT_E01A_GPS_Quality.png, 20200415_G01_TRANSECT_E01A_GPS_Quality.png.gi, 20200415_G01_TRANSECT_E01A_GPS_Quality.png.xml, 20200415_G01_TRANSECT_E01A_GPS_Quality.txt, 20200415_G01_TRANSECT_E01A_Processed.XYZ, 20200415_G01_TRANSECT_E01A_SRA.ply, 20200415_G01_TRANSECT_E01A_SRA.xls, 20200415_G01_TRANSECT_E01A_SRA_pg.dbf, 20200415_G01_TRANSECT_E01A_SRA_pg.prj, 20200415_G01_TRANSECT_E01A_SRA_pg.shp, 20200415_G01_TRANSECT_E01A_SRA_pg.shx, 20200415_G01_TRANSECT_E01A_Targets.gdb, 20200415_G01_TRANSECT_E01A_Targets.gdb.xml, 20200415_G01_TRANSECT_E01A_Targets.xls, 20200415_G01_TRANSECT_E01A_UceFootprintCov.map, 20200415_G01_TRANSECT_E01A_UceFootprintCov.map.xml, 20200415_G01_TRANSECT_E01A_UceFootprintCov.png, 20200415_G01_TRANSECT_E01A_UceFootprintCov.png.gi, 20200415_G01_TRANSECT_E01A_UceFootprintCov.png.xml

Dataset Processing Comments:

Series of transects collected over the island dump site. Mostly saturated data with three SRAs designated. Culture gaps due to tall grass and swampy conditions. Some planned transects were made inaccessible by tides, despite the field crew collecting at low tide.

Dataset Performance Requirement Checks

Along Line Spacing Data Density

% Passing Points: 100 **Requirement:** 100% **% Pass Other:** 100 **Requirement:** 100 % 100 **QC Status:** Pass

Stats: Min: 0 **Max:** 0.18 **Std Dev:** 0.03 **Mean:** 0.04 **Map ID:** 20200415_G01_TRANSECT_E01A_Along_Track_Separation.map

Comments:

Coverage

% Coverage: 100.00 **Requirement:** 100 % **Map ID:** 20200415_G01_Transect_E01A_uceFootprintCov.map **QC Status:** Pass

Acreage: 365.07

Explanation of Gaps:

Background Noise

Channel ID: Ch2_level_lg **Stats: Min:** -115.58 **Max:** 4.33 **Std Dev:** 34.71 **Mean:** -38.07 **Number of Points:** 564

Comments:

GPS Quality and HDOP

MapID: 20200415_G01_Transect_E01A_GPS_Quality

Fix Min: 04.00 **Fix Max:** 04.00 **Fix StDev:** 00.00 **% RTK Fix:** 100.00 **RTK MQO:** Pass

DOP Min: 00.70 **DOP Max:** 01.30 **DOP StDev:** 00.16 **% DOP below Acceptance Criteria:** 100.00 **DOP MQO:** Pass

Comments:

Daily Tests

IVS

IVS Test ID: **20200415E01IVS1** **QC Status:** **Pass**

Date: 4/15/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200415E01IVS1.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	112.39	76.23	42.18	20.89	96.69	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	57.17	35.17	17.34	7.45	101.74	0.08	Pass
IVS03		15.98	9.33	4.50	1.82	15.38	8.02	3.49	1.43	85.96	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

Exception Notes:

Background Noise Channel ID: Ch2_level_lg **Min:** -0.76 **Max:** 76.9 **Std Dev:** 12.4 **Mean:** 5.21 **Number of Points:** 211

Comments:

IVS

IVS Test ID: **20200415E01IVS2** **QC Status:** **Pass**

Date: 4/15/2020 **Team ID:** Geo01 **Geophysical Sensor:** E01 **Location:** IVS **Map ID:** 20200415E01IVS2.map

Processor: Nicholas Pierson **Battery Start Voltage:** **Battery End Voltage:**

Test Item	*Sensor ID*	*Ideal Response*				*Measured Response*				*Amplitude Difference (%)*	*Positioning Offset*	*QC Status*
		Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4			
IVS01		114.84	78.85	43.60	21.18	120.39	82.24	45.57	21.89	104.30	0.07	Pass
IVS02		56.27	34.57	17.21	7.54	58.56	35.87	17.91	7.51	103.75	0.10	Pass
IVS03		15.98	9.33	4.50	1.82	14.89	8.59	4.03	1.52	92.12	0.07	Pass

Requirement: 75 % **Requirement:** 0.25

Field Comments:

Processing Comments: Lag = 5

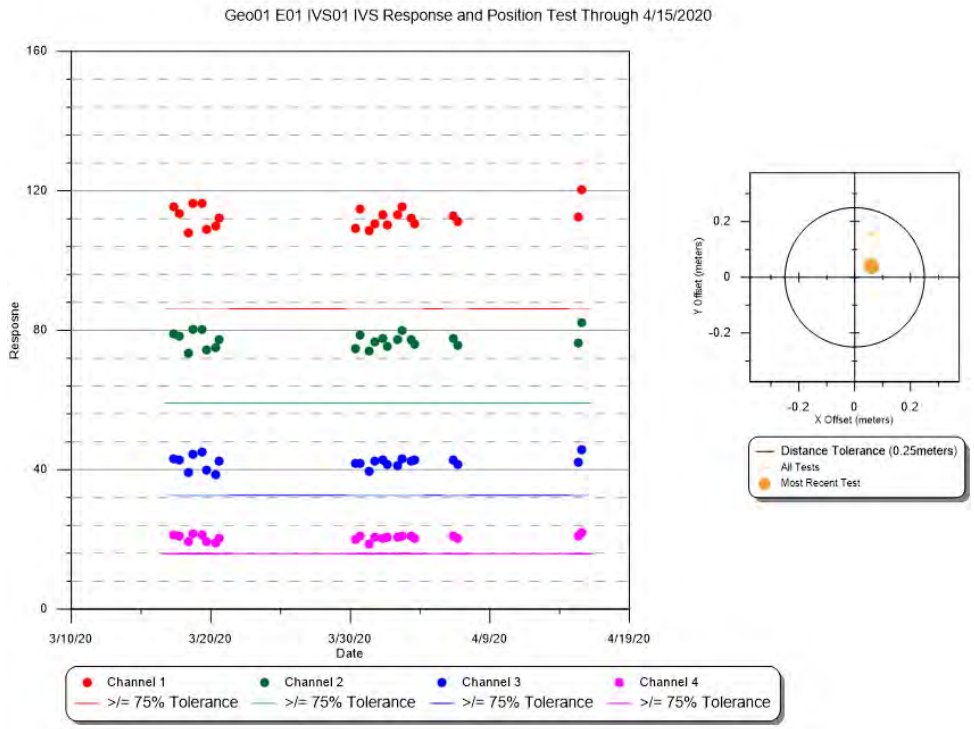
Exception Notes:

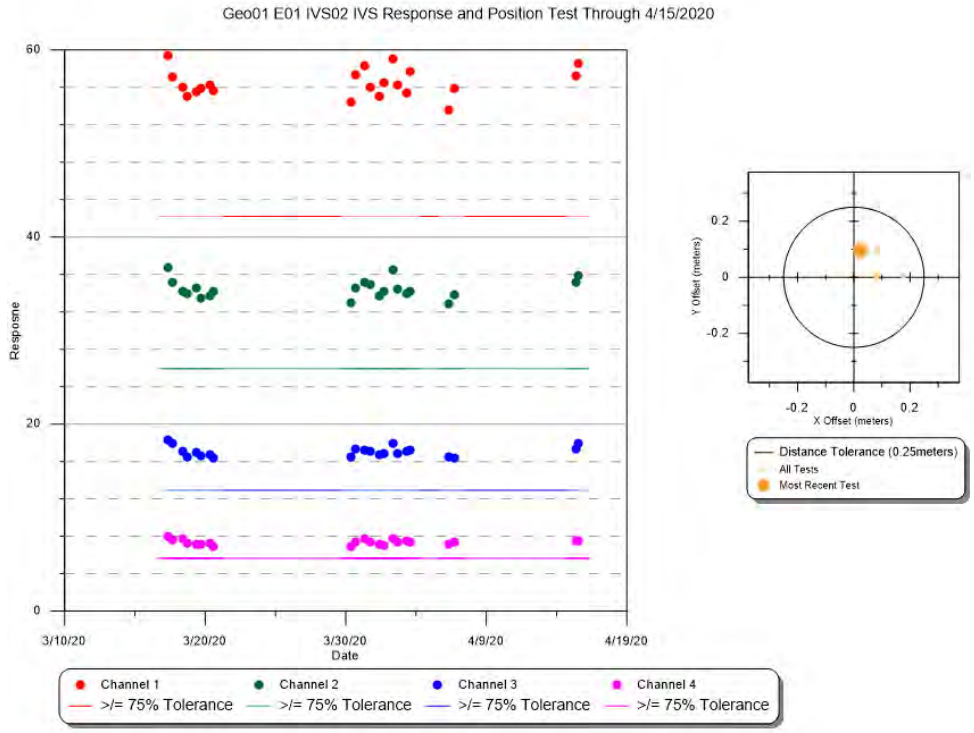
Background Noise Channel ID: Ch2_level_lg **Min:** -0.66 **Max:** 82.64 **Std Dev:** 13.21 **Mean:** 5.37 **Number of Points:** 247

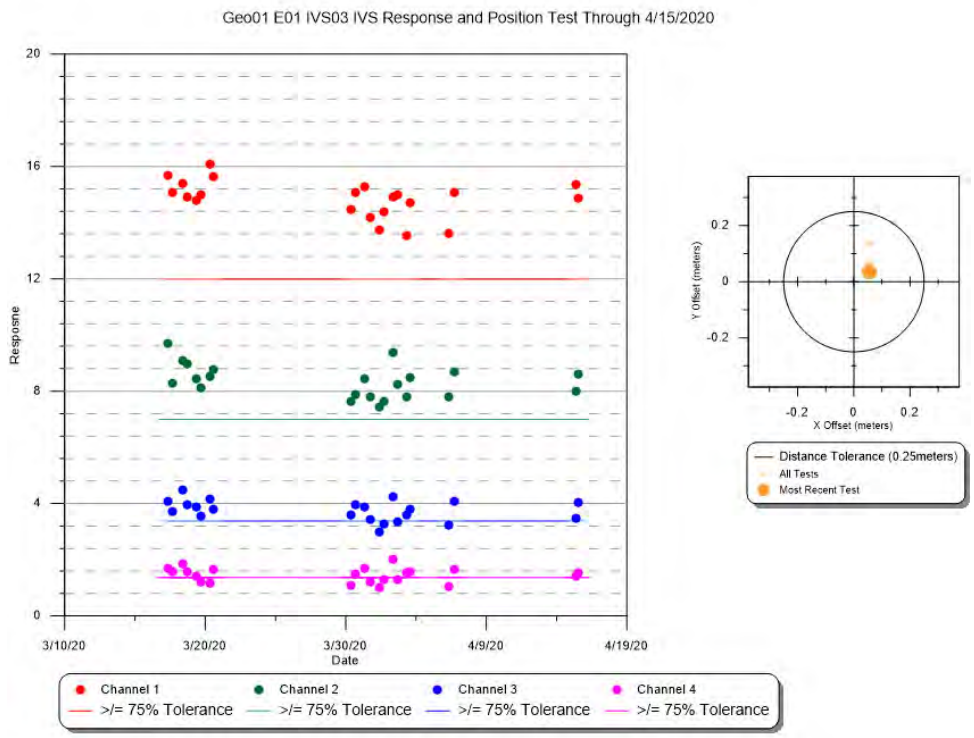
Comments:

IVS Test Results - Graphic

Response and position are plotted for each corresponding item in the IVS. A range of tests are displayed up through the most current for this dataset.






Geo01 E01 IVS03 IVS Response and Position Test Through 4/15/2020
Response
Date
3/10/20
3/20/20
3/30/20
4/9/20
4/19/20
Channel 1
Channel 2
Channel 3
Channel 4
>/= 75% Tolerance
Y Offset (meters)
X Offset (meters)
Distance Tolerance (0.25meters)
All Tests
Most Recent Test

Static Repeatability

Static Test ID: **20200415E01QC1** **QC Status:** Pass

Date: 4/15/2020 8:27:00 AM **AM/PM:** AM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** Ivs

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200415E01QC1_Ch1_Ch2.map,
StaticCalibrate_20200415E01QC1_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☑ **Test OK?** ☑

Personnel/Vehicle Test Performed ☑ **Test OK?** ☑

Cable Shake and Personnel Map ID:

CableShakePersonnel_20200415E01QC1_Ch1_Ch2.map,
CableShakePersonnel_20200415E01QC1_Ch3_Ch4.map

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	0	0	0	0
Pre-Background Mean (mV):	0.49	-0.36	-0.6	-0.23
Pre-Background Std Dev:	0.24	0.18	0.13	0.09
Observed Spike (mV):	273	192	113	53
Spike Mean (mV):	272.67	192.13	113.28	53.65
Spike Std Dev:	0.25	0.17	0.14	0.09
Observed Post-Background (mV):	1	0	0	0
Post-Background Mean (mV):	1.28	-0.14	-0.81	-0.4
Post-Background Std Dev:	0.28	0.17	0.12	0.1
Calculated Spike (mV):	**271.785**	**192.38**	**113.985**	**53.965**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	4.48	6.26	6.88	7.65

Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability

Static Test ID: **20200415E01QC2** **QC Status:** Pass

Date: 4/15/2020 2:02:00 PM **AM/PM:** PM

Team ID: Geo01 **Test Item ID:** Item1

Geophysical Sensor: E01

Sensor ID: **Location:** Ivs1

Processor: Nicholas Pierson

Static Rep Map ID:

StaticCalibrate_20200415E01QC2_Ch1_Ch2.map,
StaticCalibrate_20200415E01QC2_Ch3_Ch4.map

Voltage Start: **Voltage End:**

Cable Shake Test Performed ☐ **Test OK?** ☐

Personnel/Vehicle Test Performed ☐ **Test OK?** ☐

Cable Shake and Personnel Map ID:

Test Statistics

	Ch 1	Ch 2	Ch 3	Ch 4
Observed Pre-Background (mV):	1	0	0	0
Pre-Background Mean (mV):	0.85	-0.83	-0.92	-0.48
Pre-Background Std Dev:	0.33	0.21	0.13	0.1
Observed Spike (mV):	272	190	112	52
Spike Mean (mV):	271.13	189.98	111.7	52.34
Spike Std Dev:	0.25	0.19	0.14	0.1
Observed Post-Background (mV):	1	-1	-1	0
Post-Background Mean (mV):	1.92	-0.93	-1.14	-0.67
Post-Background Std Dev:	0.25	0.19	0.12	0.09
Calculated Spike (mV):	**269.745**	**190.86**	**112.73**	**52.915**
Expected Value (mV):	**260.12**	**181.04**	**106.65**	**50.13**
QC Status:	**Pass**	**Pass**	**Pass**	**Pass**
% Difference:	3.70	5.42	5.70	5.56

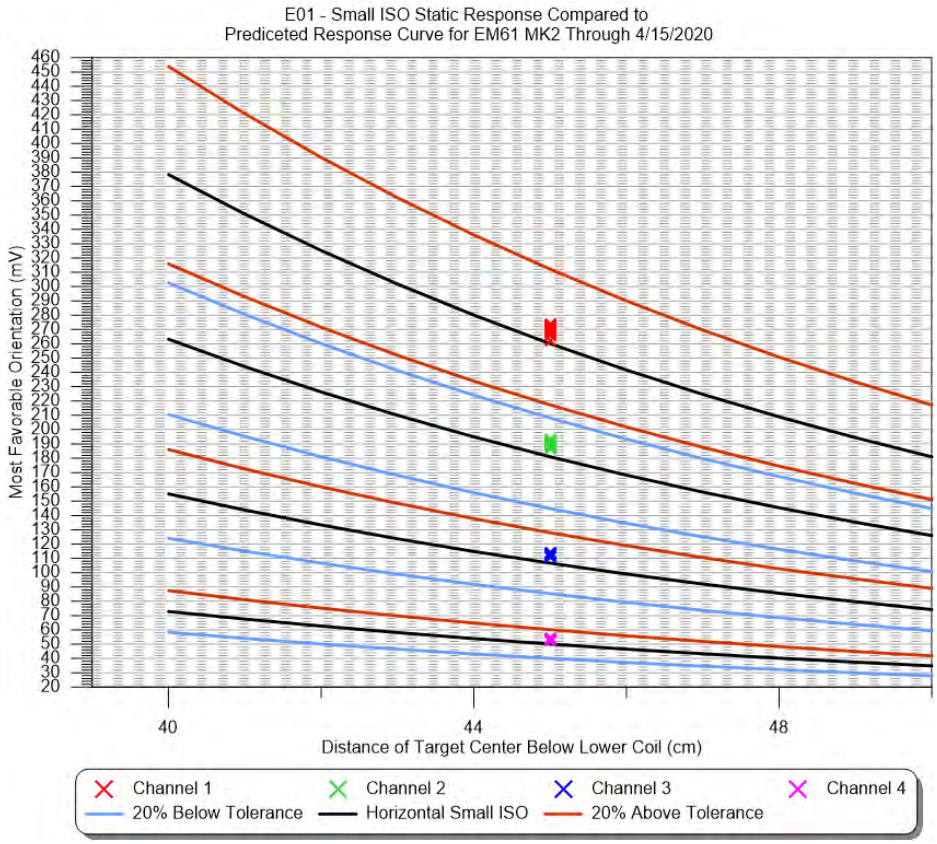
Requirement: 20 %

Field Comments:

Processing Comments:

Static Repeatability Test Results - Graphic

Response is plotted for a range of tests and is displayed up through the most current test for this dataset.



Geodetic Equipment Functionality (GPS Check)

GPS Check ID: **20200415GPSQC** **QC Status:** **Pass**

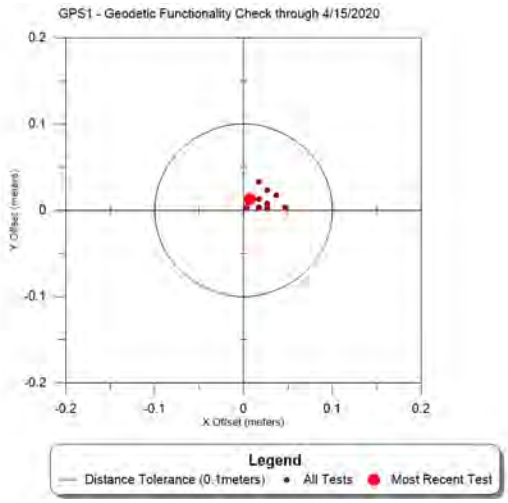
Date: 4/15/2020 **Team ID:** Geo01 **Geodetic Sensor:** GPS1

Point ID: ControlPoint1

	X	Y
Measured:	585680.20	4572774.38
Actual:	585680.19	4572774.39
Offset:	0.01	0.01

Total Offset: 0.01 **Requirement:** 0.1

Field Comments:



Daily Logs

Date: 4/15/2020 **Team ID:** Geo01 **Team Hours:** 20

Completed Datasets: 20200415_G01_Transect_E01A

Partial Datasets:

Grids Reacquired:

Total Targets Reacquired: 0

Comments:

0700 saftey brief,0730 AM QC/IVS,MMP QC/IVS,0900 MMP Cued,1200 EM collection,0300 MMP Cued,0400 PM QC/IVS,0500 eod

Lessons Learned:

Standby Time:

AOR

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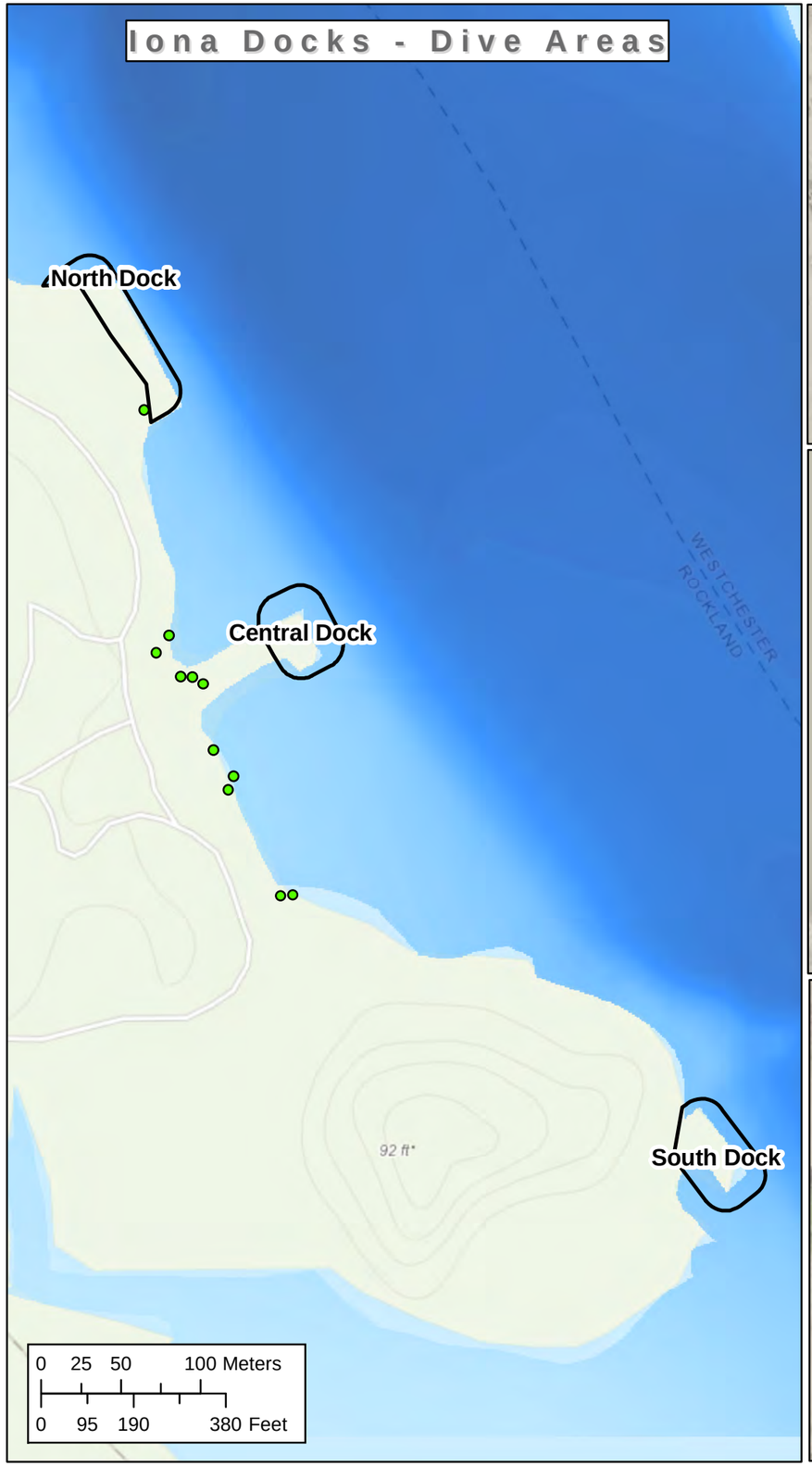

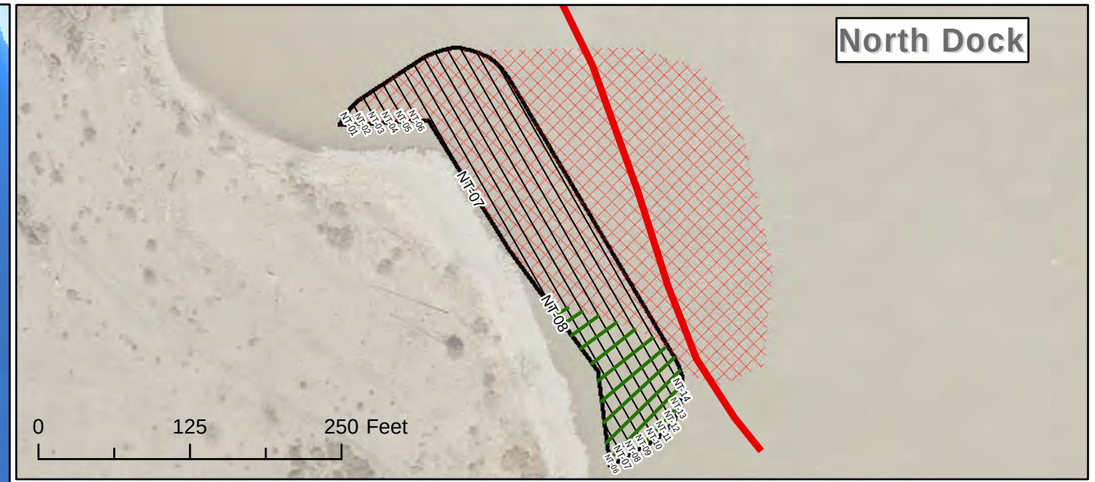

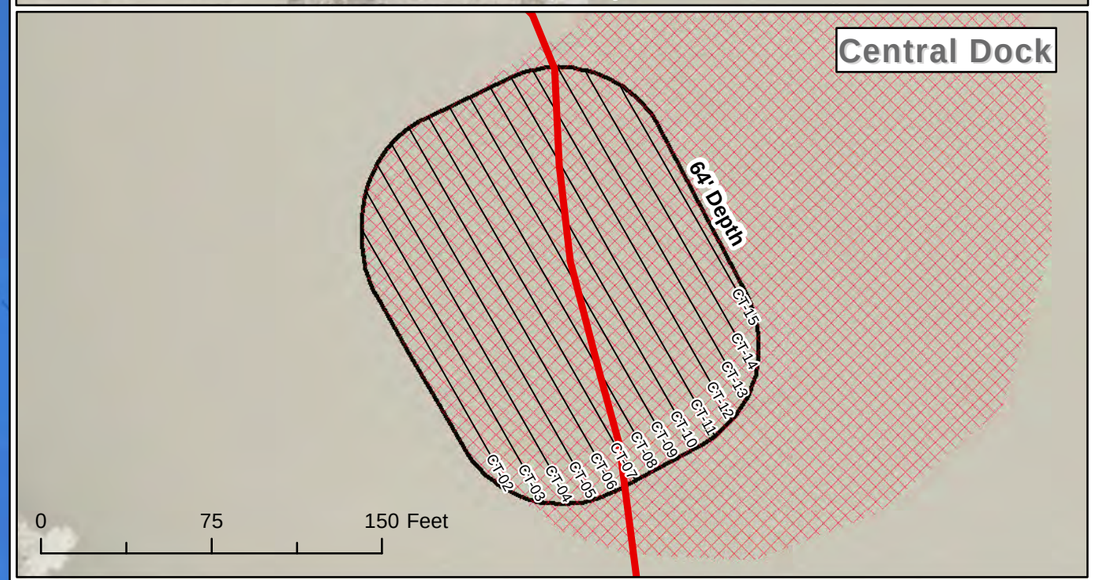

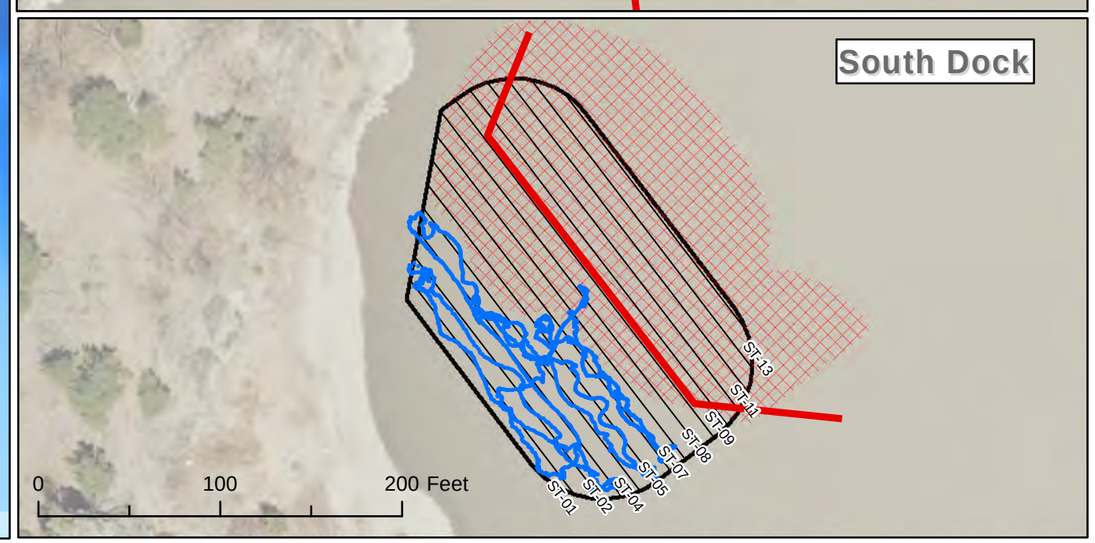

N

Scale Varies

Data is projected to the UTM Coordinate System: WGS 1984 UTM Zone 18N

Iona Field Map

Transects and Dive Targets

Iona Island Naval Ammunition Depot
Bear Mountain State Park

LEGEND

- Dive Areas
- Transects - 10ft
- Reacquisition Targets
- Walked Transects
- Diver Tracklogs
- Beginning of 65 Degree Slope
- Debris Field / Rubble

Bathymetry

High : 6.30104

Low : -51.8361

US Army Corps of Engineers

Drawn By: NBrautigam	Scale: Scale Varies	Rev:	
Checked By:	Date Drawn: 9/14/2020		
Submitted By: NBrautigam	Revision Date:		

Path: Y:\Iona\GIS\MXD\ProductionMap_09092020.mxd

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DGM Grid Maps

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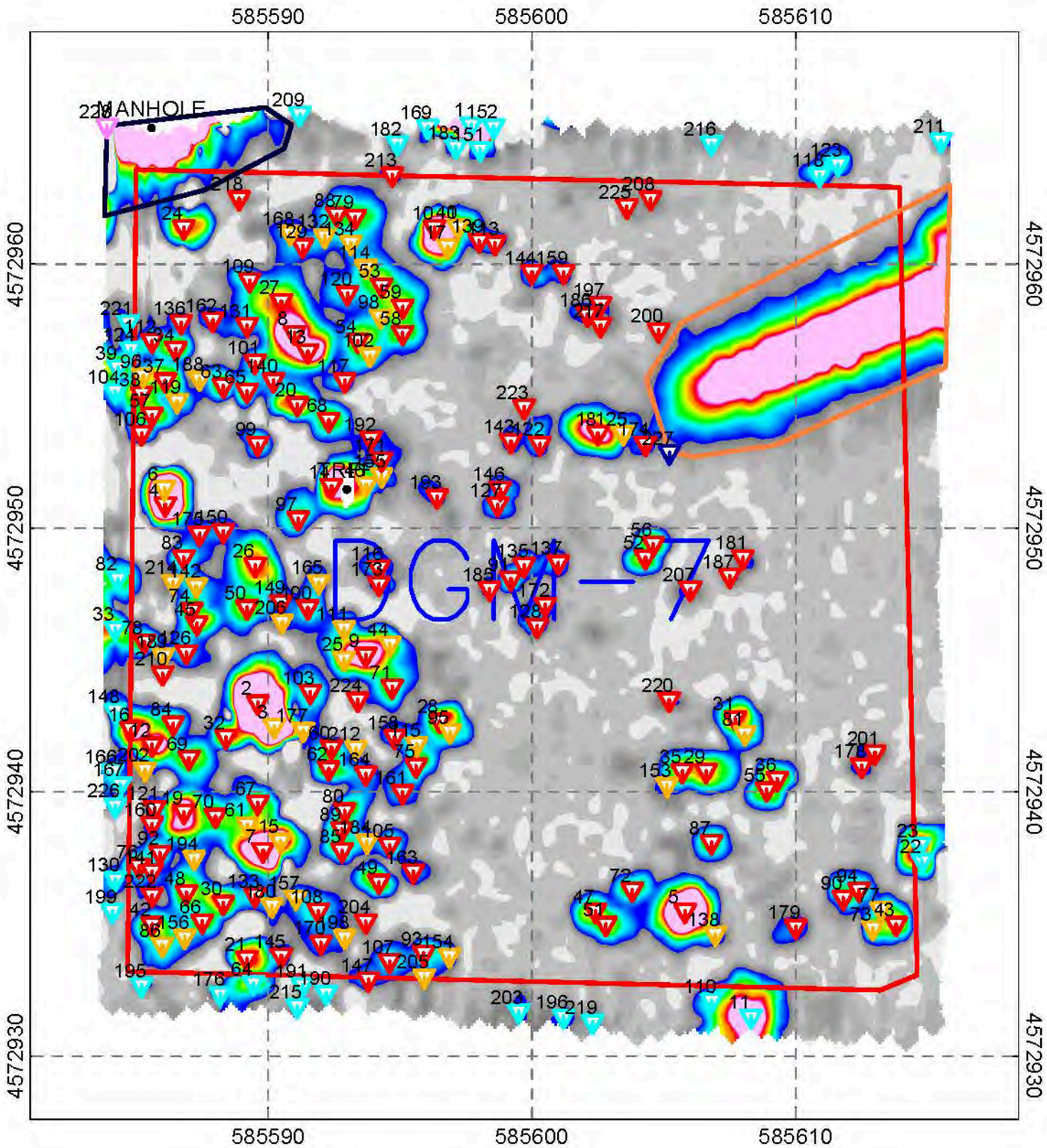
NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-7XXX, eg. DGM-7002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

99, 96, 93, 90, 87, 84, 81, 78, 75, 72, 69, 66, 63, 60, 57, 54, 51, 48, 45, 42, 39, 36, 33, 30, 27, 24, 21, 18, 15, 12, 9, 6, 3, 0

mV
Channel 2

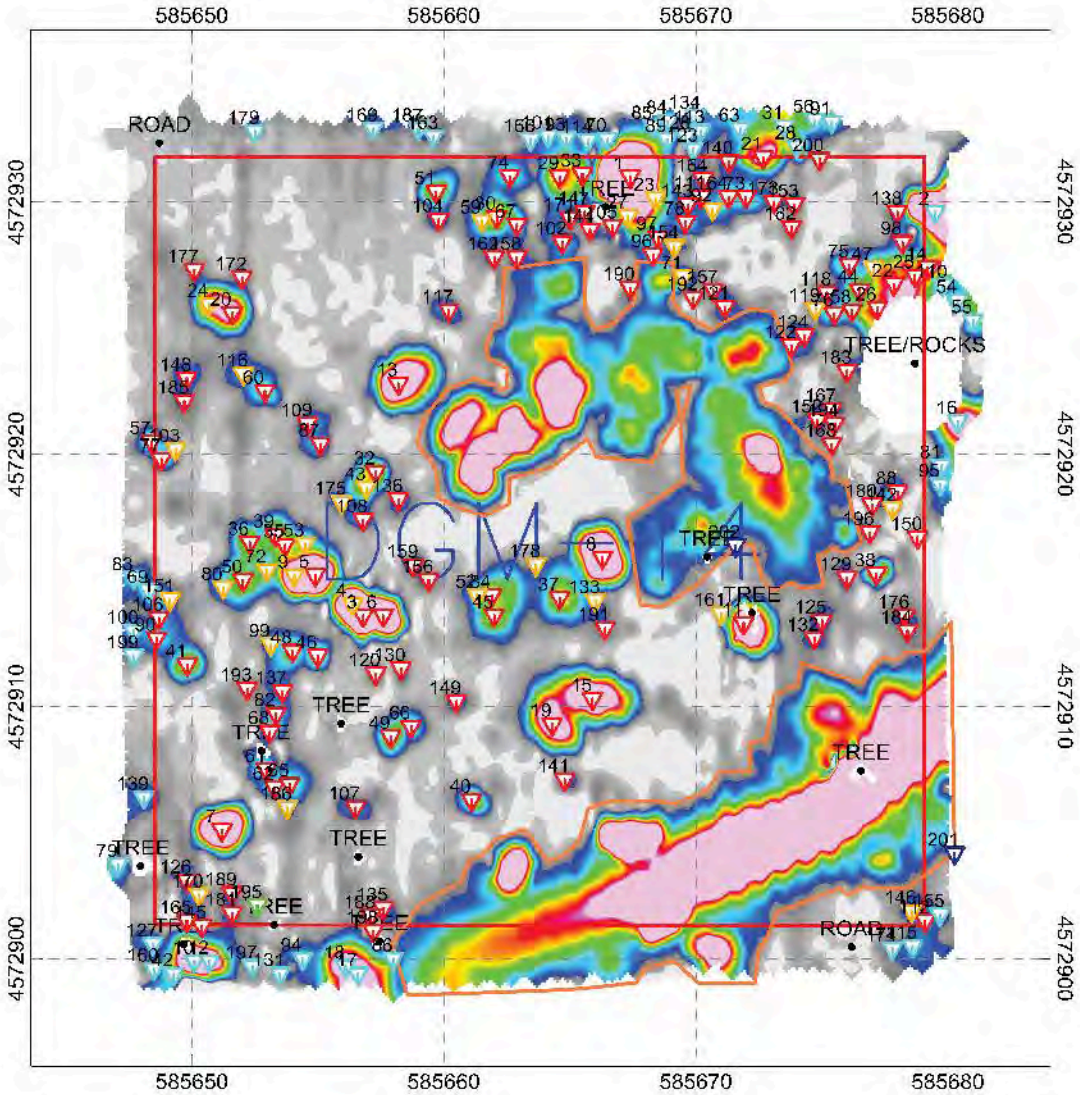
N

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200317_G01_DGM7_E01A
Grid DGM-7
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 03/17/2020



Legend

- Area of Investigation
- Saturated Response Area
- Noise Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGHM 14XXX, eg. DGHM 14002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

99, 96, 93, 90, 87, 84, 81, 78, 75, 72, 69, 66, 63, 60, 57, 54, 51, 48, 45, 42, 39, 36, 33, 30, 27, 24, 21, 18, 15, 12, 9, 6, 3, 0

mV
Channel 2

N

Scale 1:300

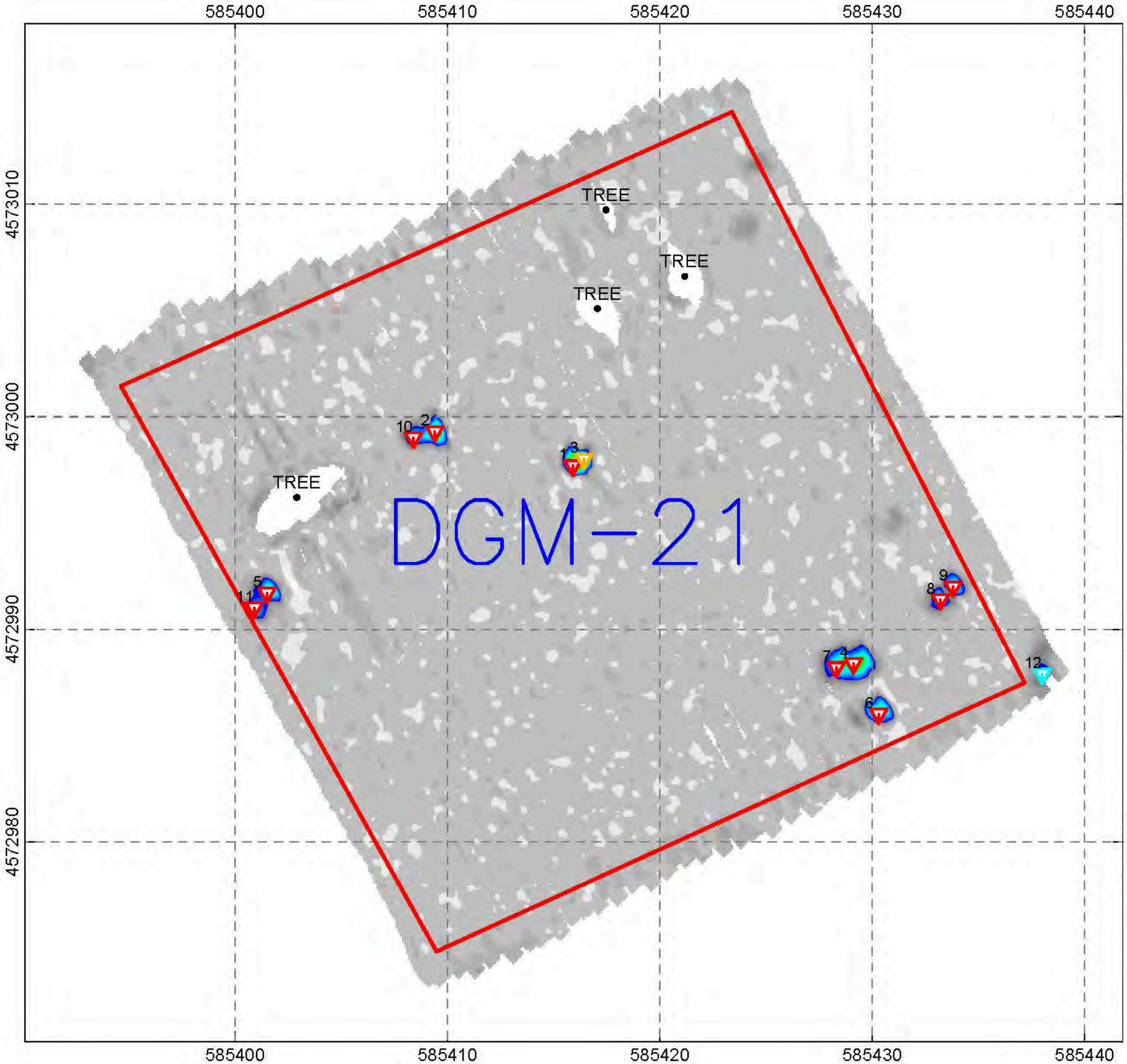
5 0 5
(meters)
WGS 84 / UTM zone 18N

AcornSI and NAEVA JV for EA Engineering

EM61MK2 Bottom Coil
Dataset 20200317_G01_DGM14_E01A
Grid DGM-14
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/01/2020
Date of Survey: 03/17/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Subsurface Geophysical Services



Legend

- Area of Investigation
- Saturated Response Area
- Noise Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGHM-14XXX, eg. DGHM-14002)

- 2 Type 1 - Point
- 2 Type 2 - Tiling
- 2 Type 3 - Culture
- 2 Type 4 - Poor Decay (Noise)
- 2 Type 5 - Suspected Culture
- 2 Type 6 - SRA
- 2 Type 7 - Utility/Known Culture Polygon
- 2 Type 8 - Outside Grid Boundary

99, 96, 93, 90, 87, 84, 81, 78, 75, 72, 69, 66, 63, 60, 57, 54, 51, 48, 45, 42, 39, 36, 33, 30, 27, 24, 21, 18, 15, 12, 9, 6, 3, 0

mV
Channel 2

N

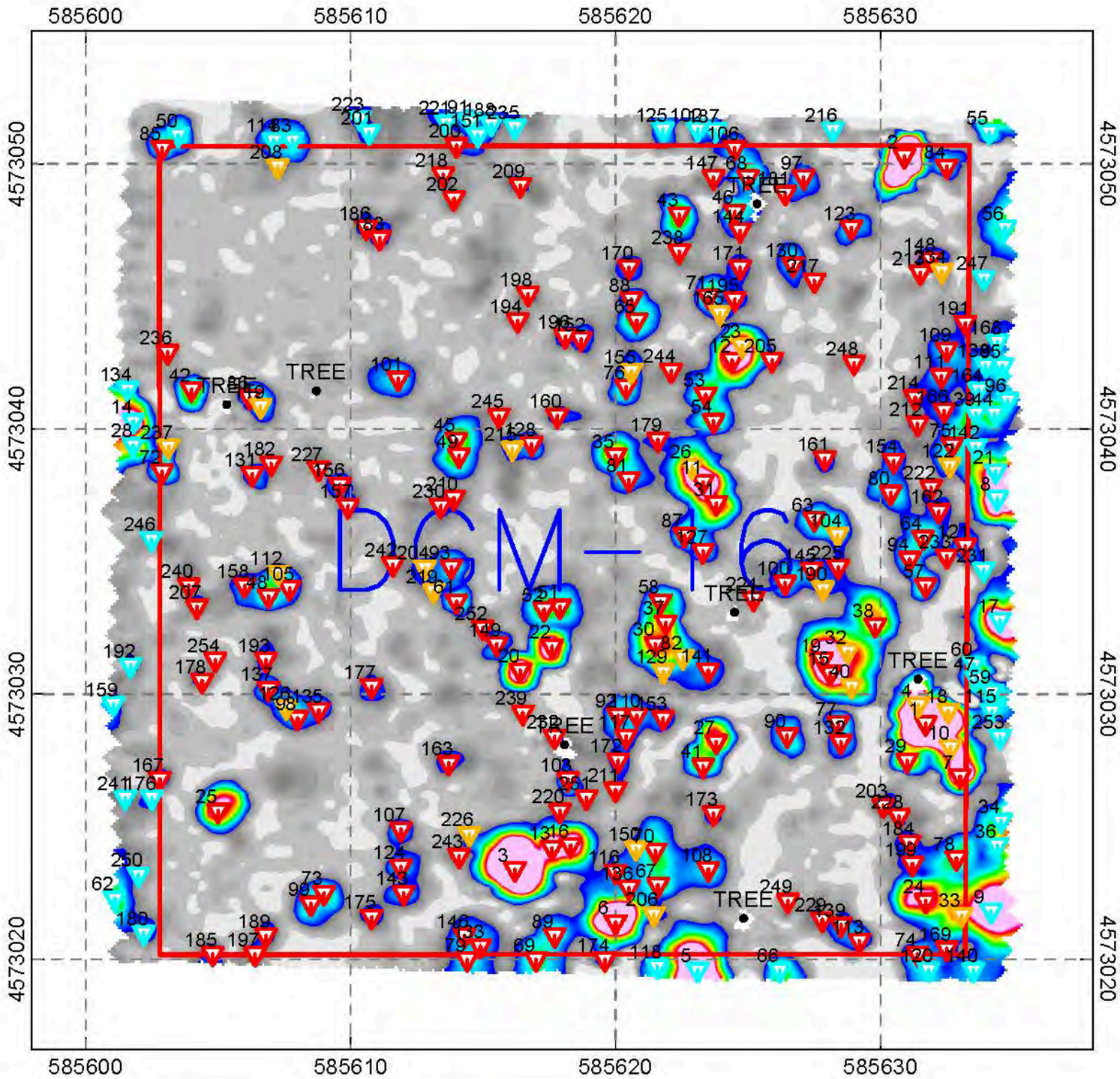
Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

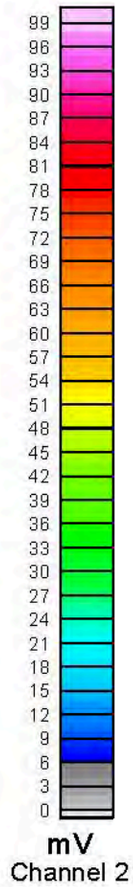
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200317_G01_DGM21_E01A
Grid DGM-21
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/01/2020
Date of Survey: 03/17/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Noise Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGHM-14XXX, eg. DGHM-14002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

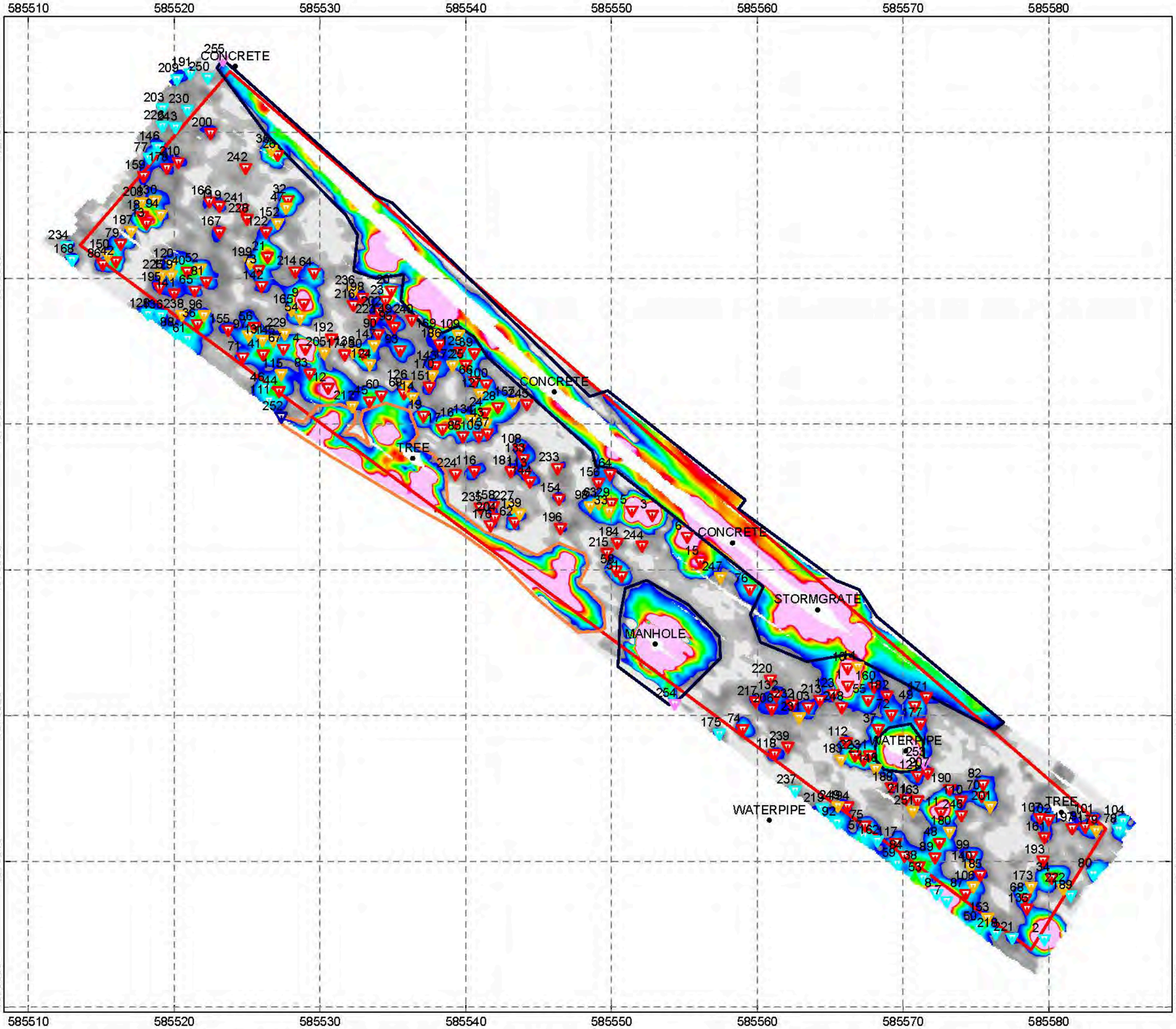
N

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200318_G01_DGM16_E01A
Grid DGM-16
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/01/2020
Date of Survey: 03/18/2020



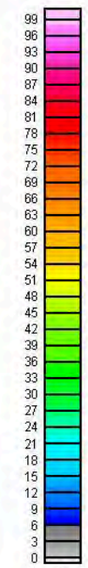
NAEVA GEOPHYSICS INC.

Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGHM-14XXX, eg. DGHM-14002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary



N

Scale 1:300

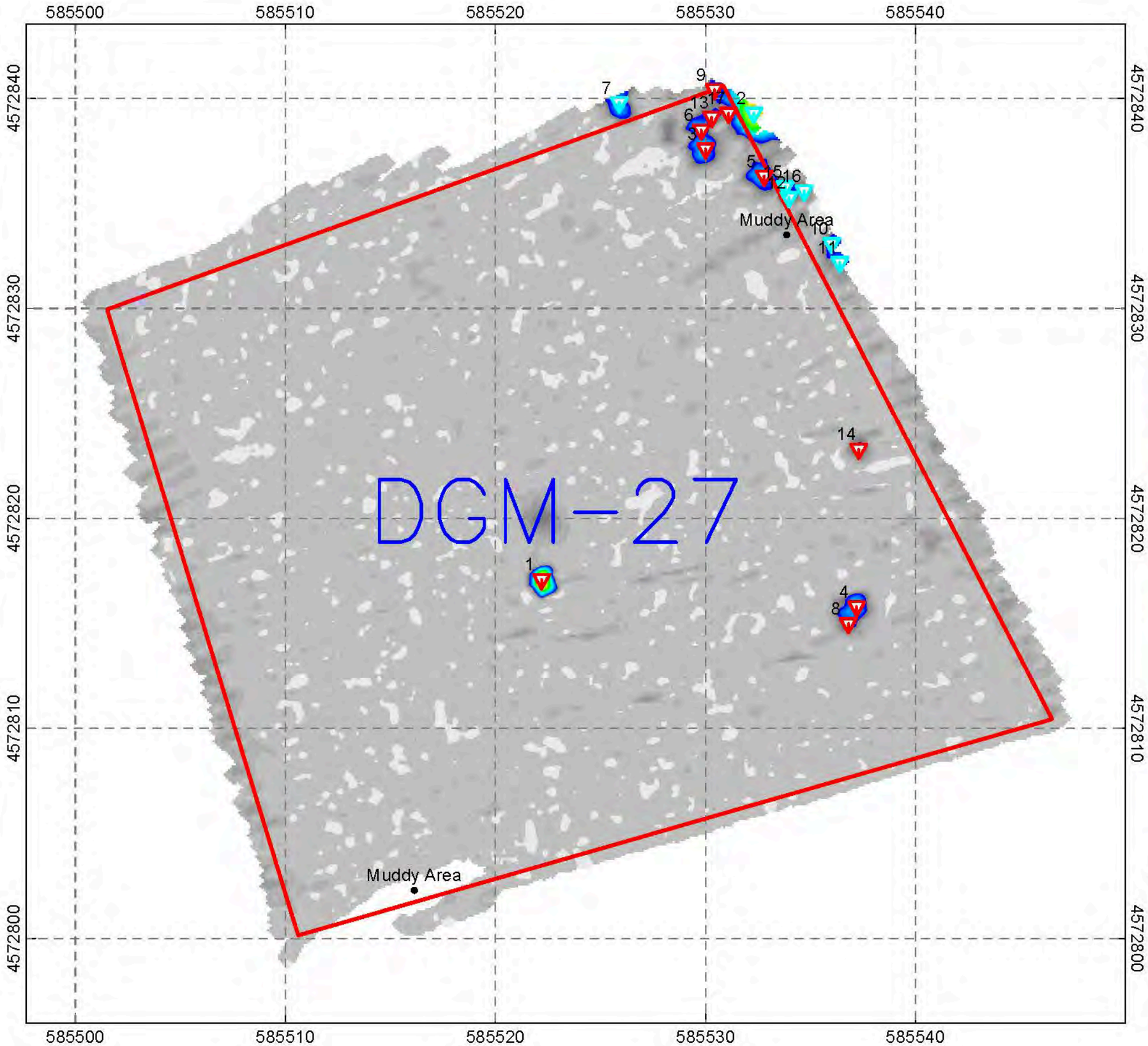
5 0 5
(meters)
WGS 84 / UTM zone 18N

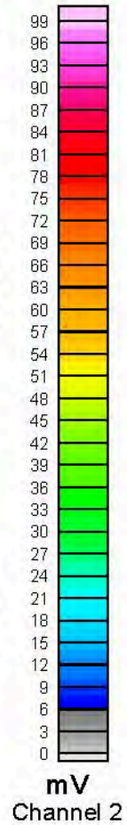
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200318_G01_DGM24_E01A
Grid DGM-24
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/02/2020
Date of Survey: 03/18/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Subsurface Geophysical Surveys





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-27XXX, eg. DGM-27002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

N

Scale 1:300

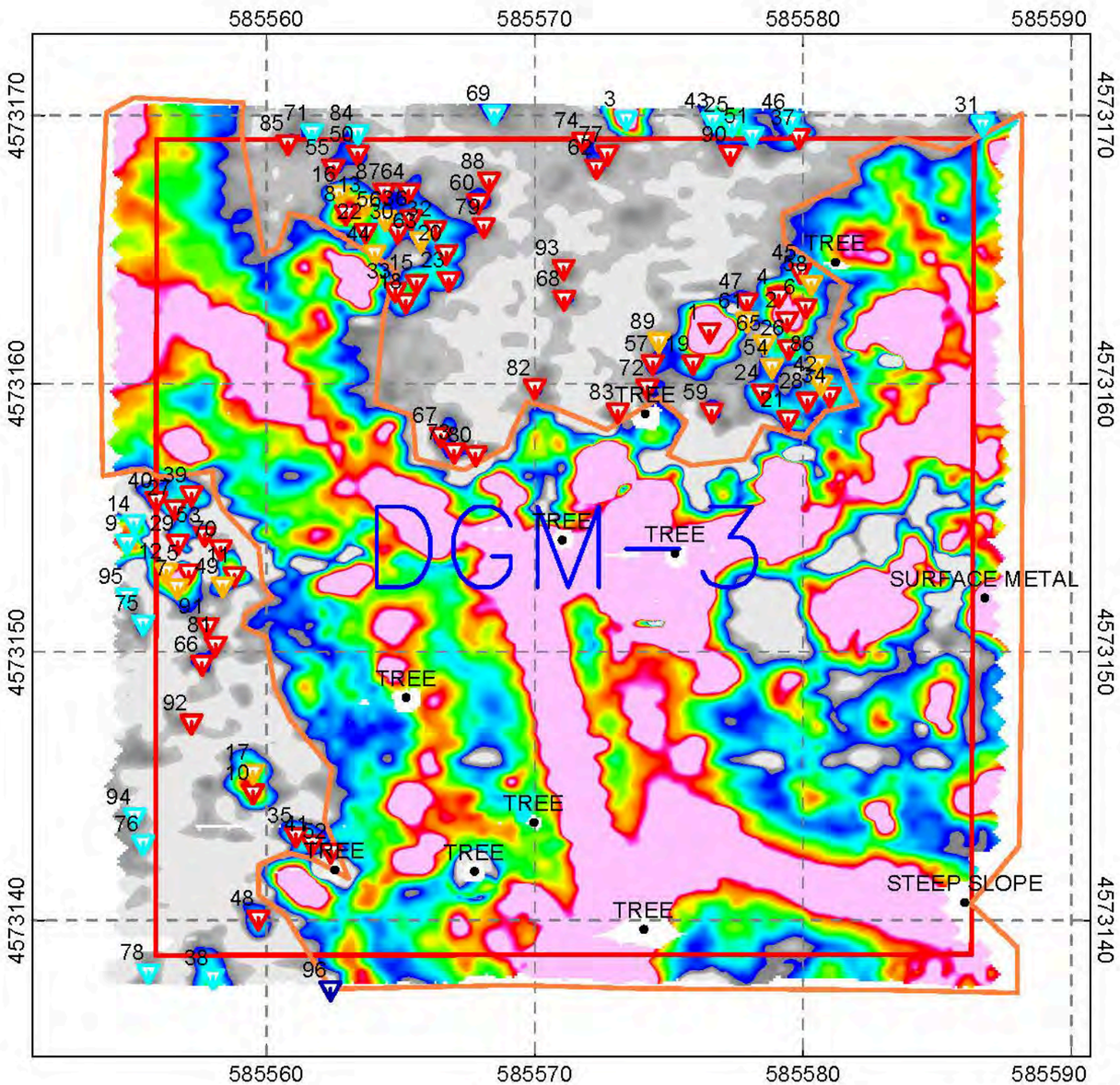
5 0 5
(meters)
WGS 84 / UTM zone 18N

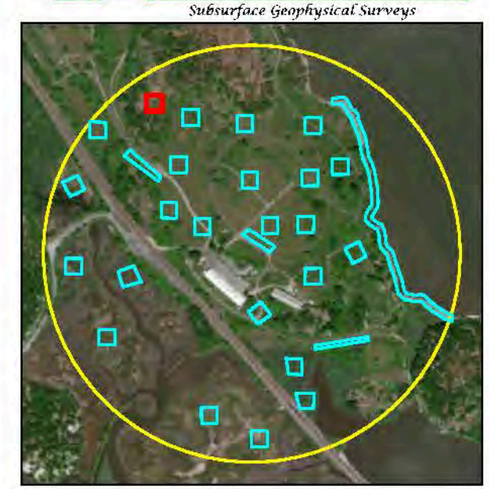
AcornSI and NAEVA JV for
EA Engineering

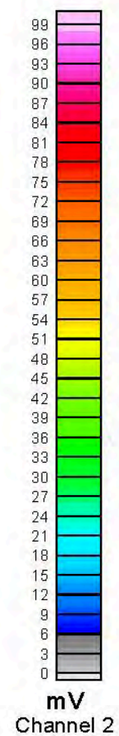
EM61MK2 Bottom Coil
Dataset 20200318_G01_DGM27_E01A
Grid DGM-27
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/02/2020
Date of Survey: 03/18/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Subsurface Geophysical Surveys







Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-3XXX, eg. DGM-3002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

N

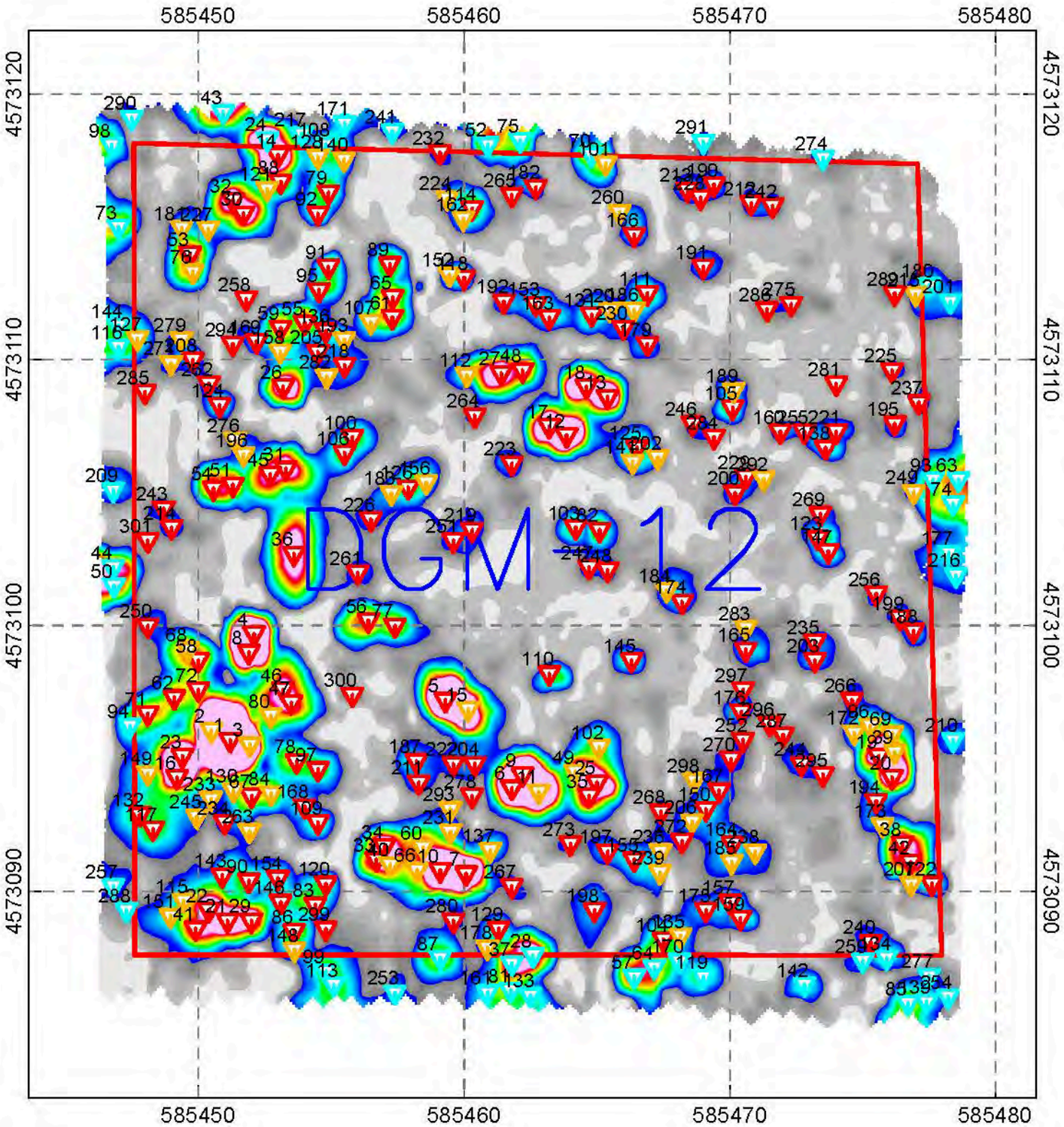
Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

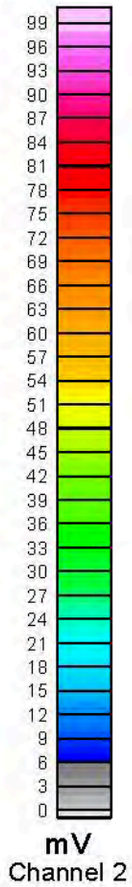
AcornSI and NAEVA JV for EA Engineering

EM61MK2 Bottom Coil
Dataset 20200319_G01_DGM3_E01A
Grid DGM-3
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/02/2020
Date of Survey: 03/19/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Underground Geophysical Surveys





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-12XXX, eg. DGM-12002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

N

Scale 1:300

5 0 5

(meters)

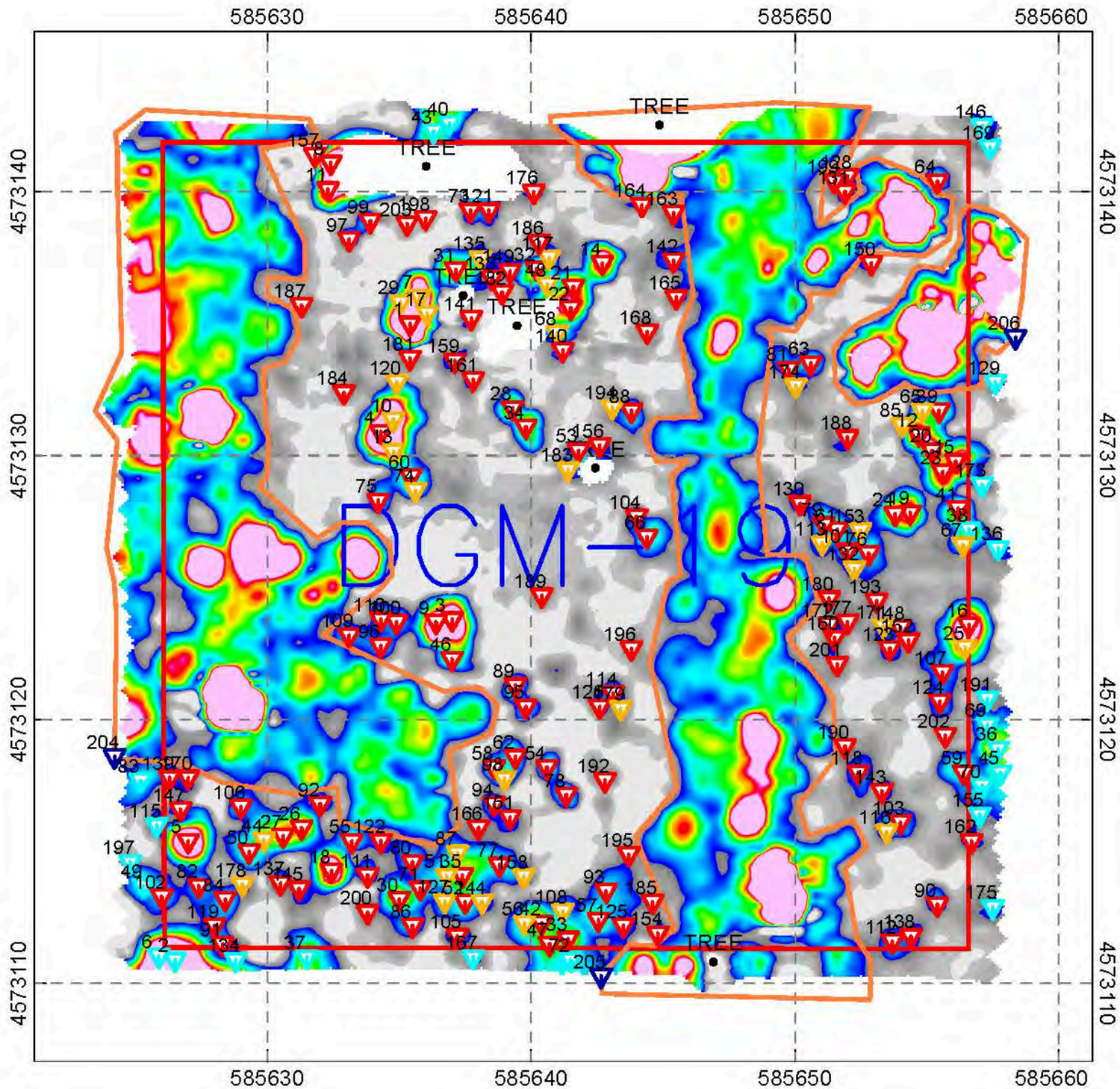
WGS 84 / UTM zone 18N

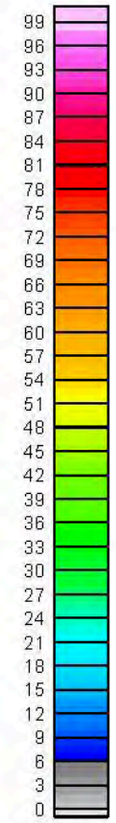
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200319_G01_DGM12_E01A
Grid DGM-12
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/03/2020
Date of Survey: 03/19/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-19XXX, eg. DGM-19002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

N

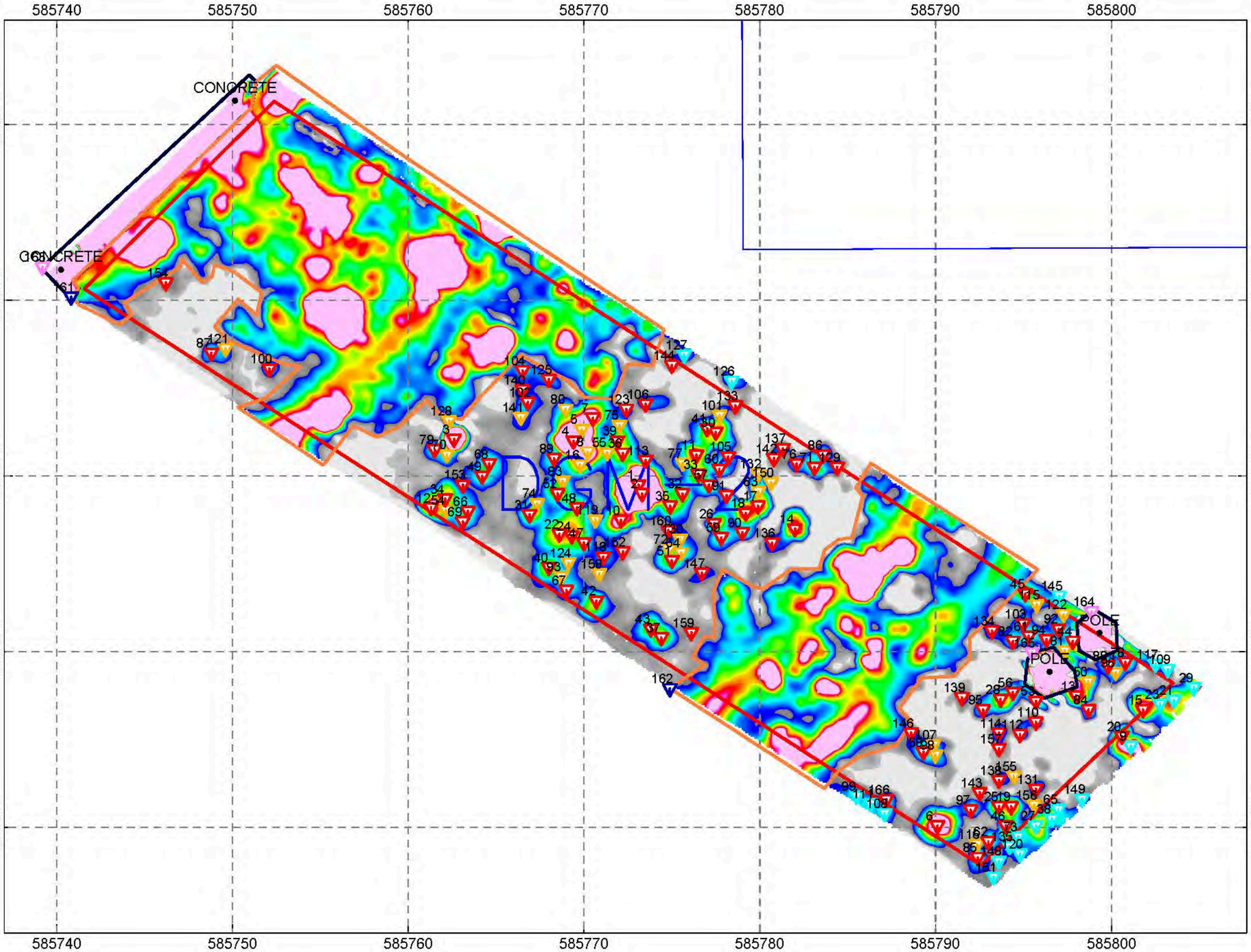
Scale 1:300

5 0 5
(meters)
WGS 84 / UTM zone 18N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200319_G01_DGM19_E01A
Grid DGM-19
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/03/2020
Date of Survey: 03/19/2020



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-2XXX, eg. DGM-2002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

99, 96, 93, 90, 87, 84, 81, 78, 75, 72, 69, 66, 63, 60, 57, 54, 51, 48, 45, 42, 39, 36, 33, 30, 27, 24, 21, 18, 15, 12, 9, 6, 3, 0

mV
Channel 2

Scale 1:300

5 0 5
(meters)
WGS 84 / UTM zone 18N

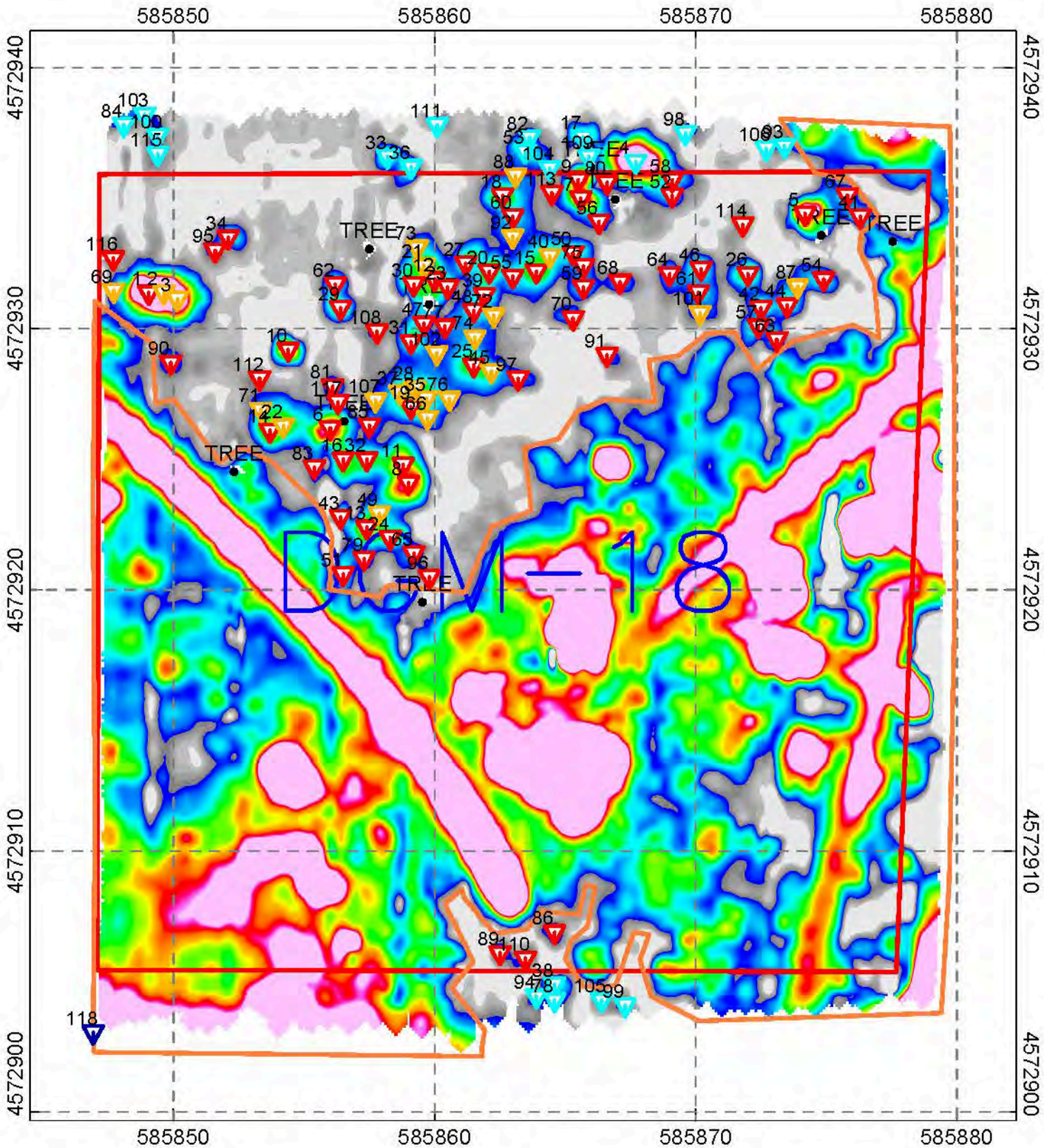
N

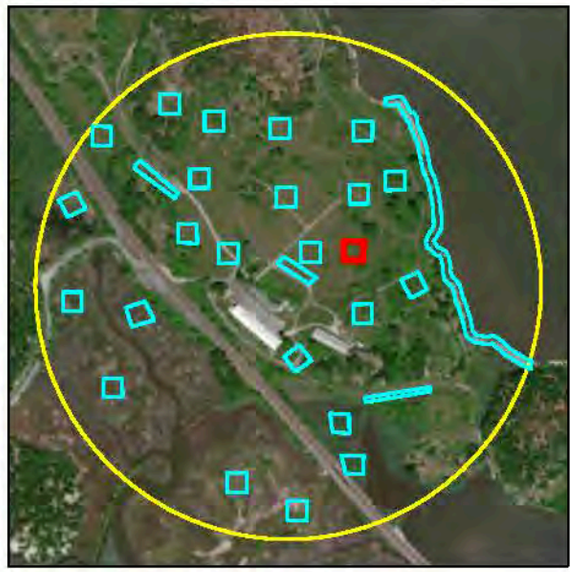
AcornSI and NAEVA JV for EA Engineering

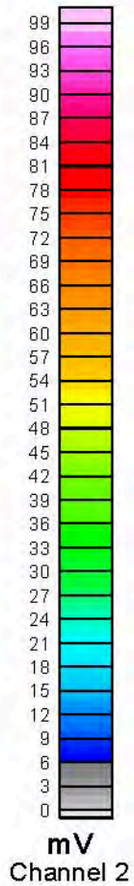
EM61MK2 Bottom Coil
Dataset 20200320_G01_DGM2_E01A
Grid DGM-2
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/06/2020
Date of Survey: 03/20/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Subsurface Geophysical Surveys







Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-18XXX, eg. DGM-18002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

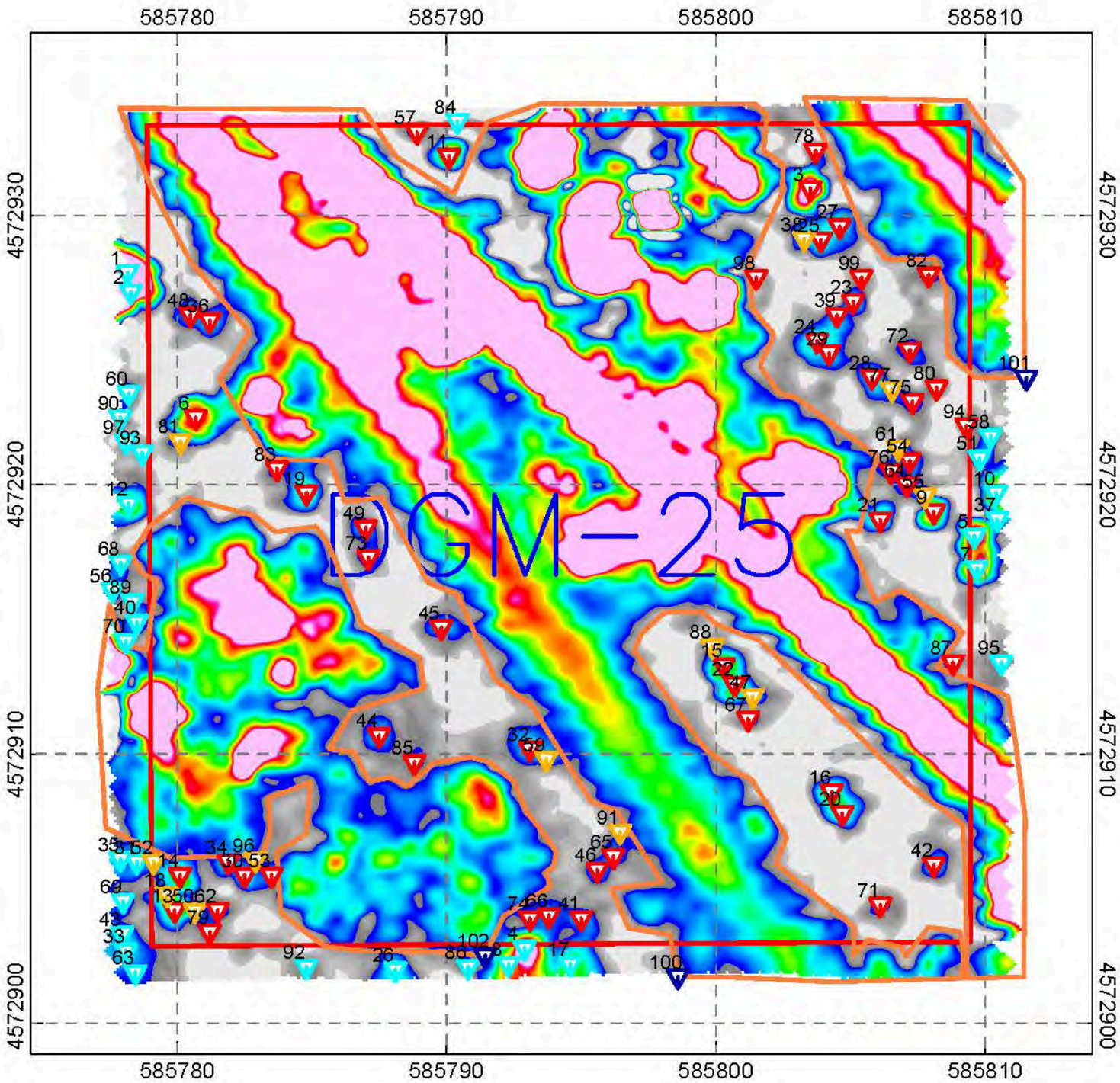
N

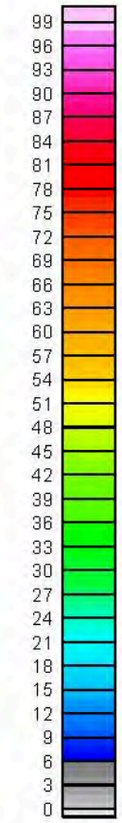
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200320_G01_DGM18_E01A
Grid DGM-18
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/07/2020
Date of Survey: 03/20/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-25XXX, eg. DGM-25002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

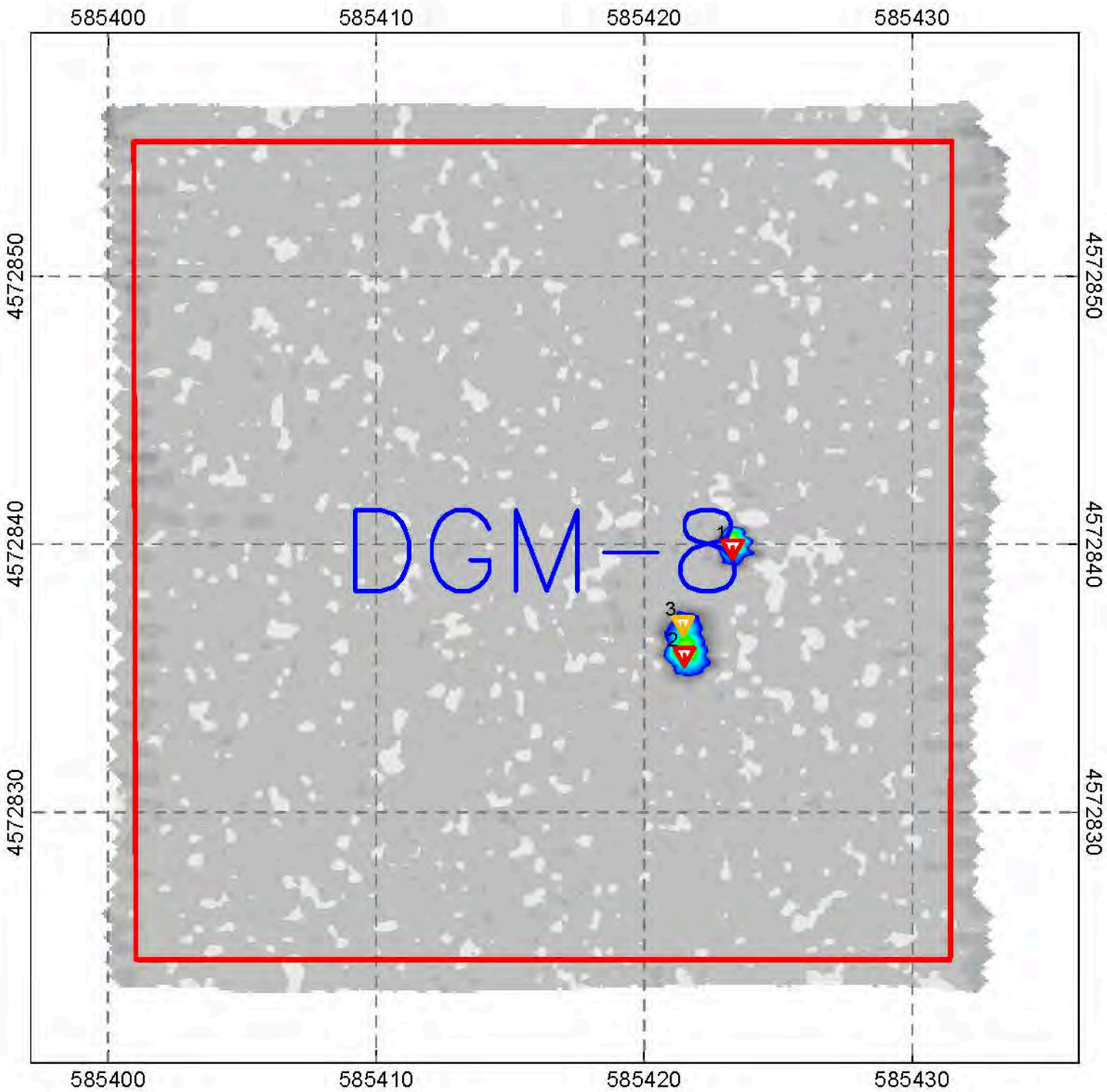
N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200320_G01_DGM25_E01A
Grid DGM-25
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/07/2020
Date of Survey: 03/20/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Subsurface Geophysical Surveys



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-8XXX, eg. DGM-8002)

- 2 Type 1 - Point
- 2 Type 2 - Tiling
- 2 Type 3 - Culture
- 2 Type 4 - Poor Decay (Noise)
- 2 Type 5 - Suspected Culture
- 2 Type 6 - SRA
- 2 Type 7 - Utility/Known Culture Polygon
- 2 Type 8 - Outside Grid Boundary

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

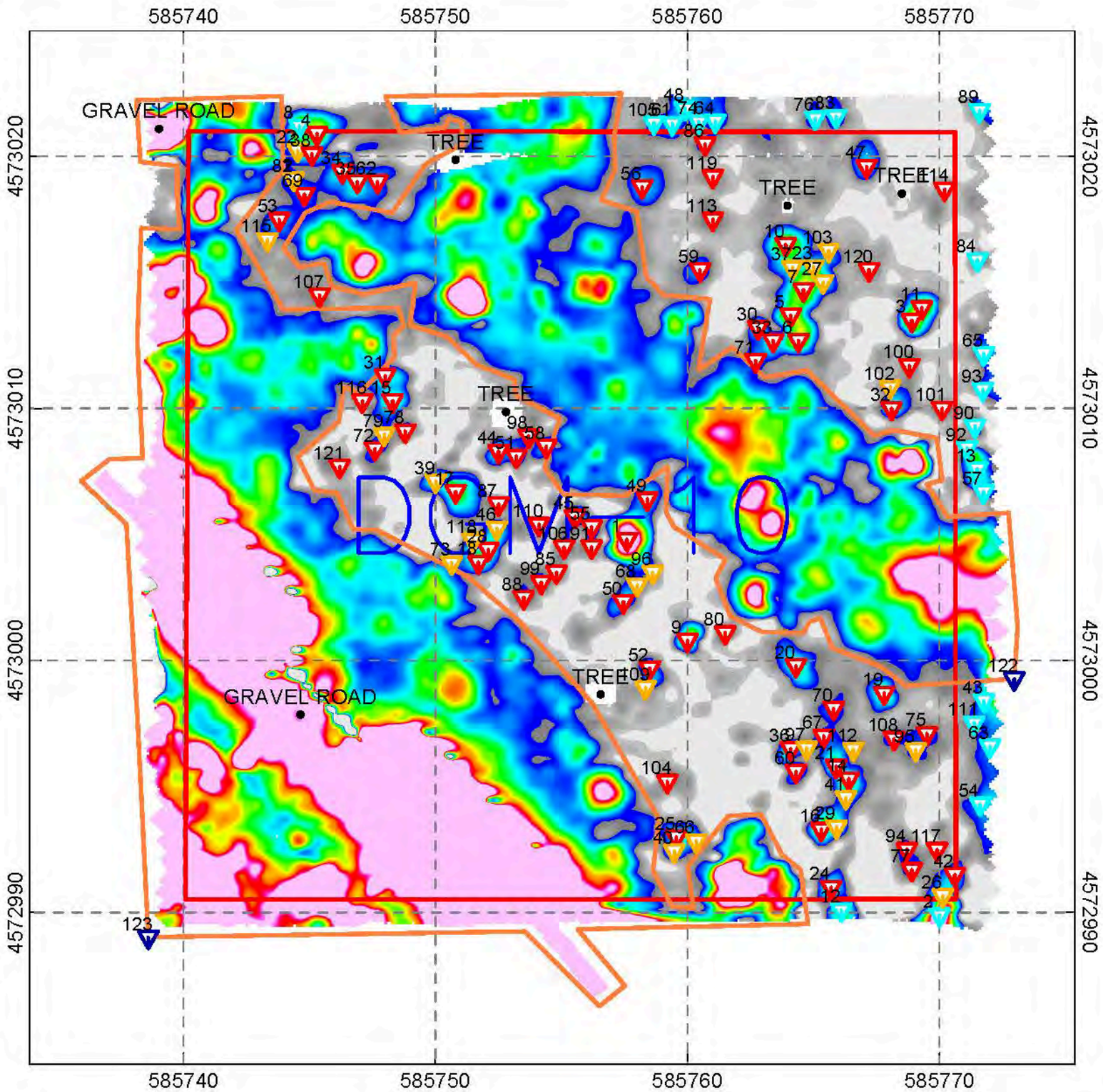
N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200330_G01_DGM8_E01A
Grid DGM-8
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/06/2020
Date of Survey: 03/30/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-10XXX, eg. DGM-10002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

mV
Channel 2

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200330_G01_DGM10_E01A
Grid DGM-10
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/07/2020
Date of Survey: 03/30/2020

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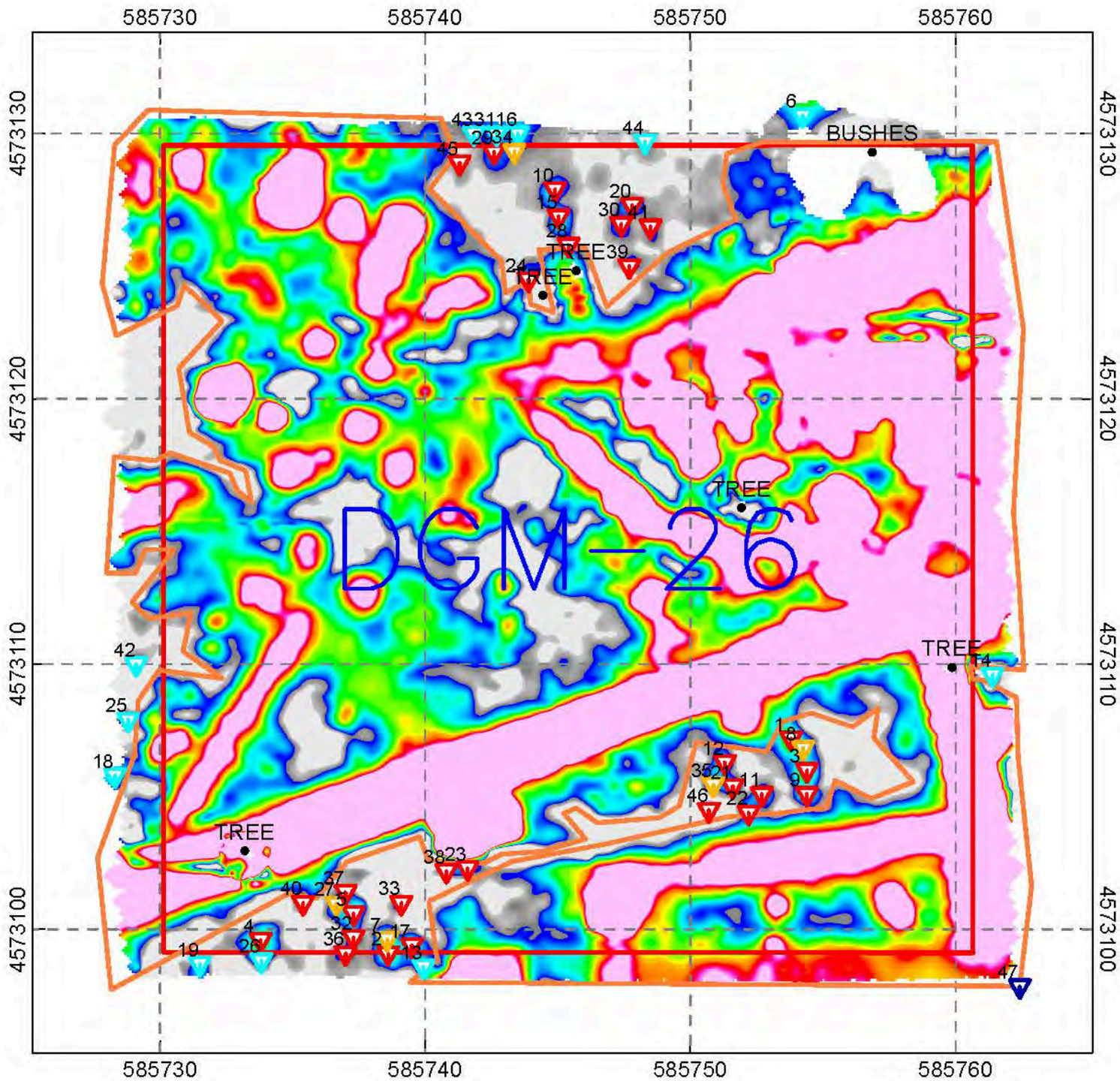
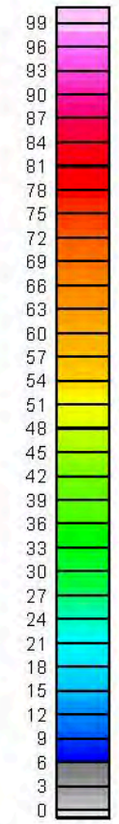




Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-26XXX, eg. DGM-26002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

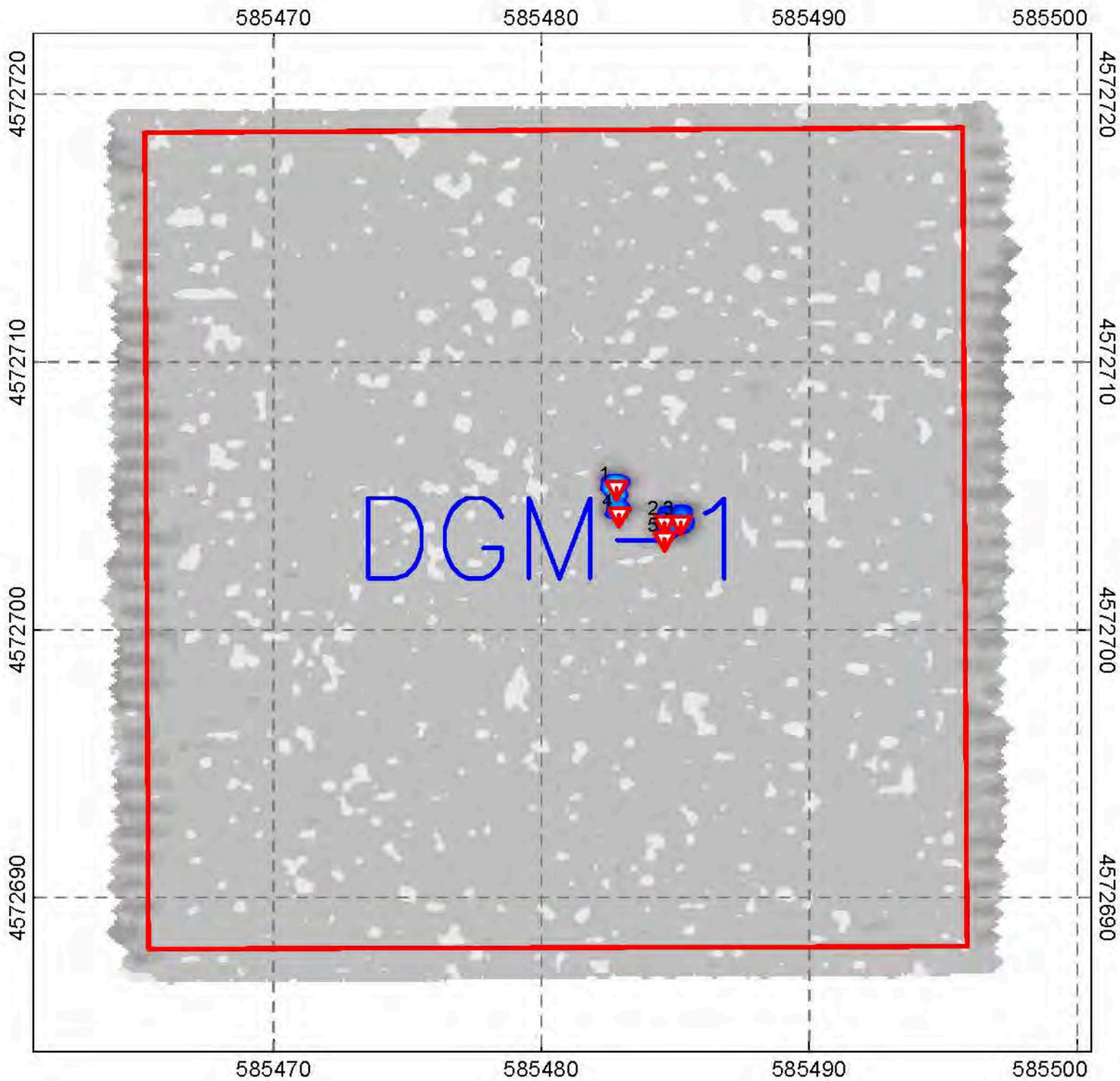
N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200330_G01_DGM26_E01A
Grid DGM-26
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/08/2020
Date of Survey: 03/30/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-1XXX, eg. DGM-1002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

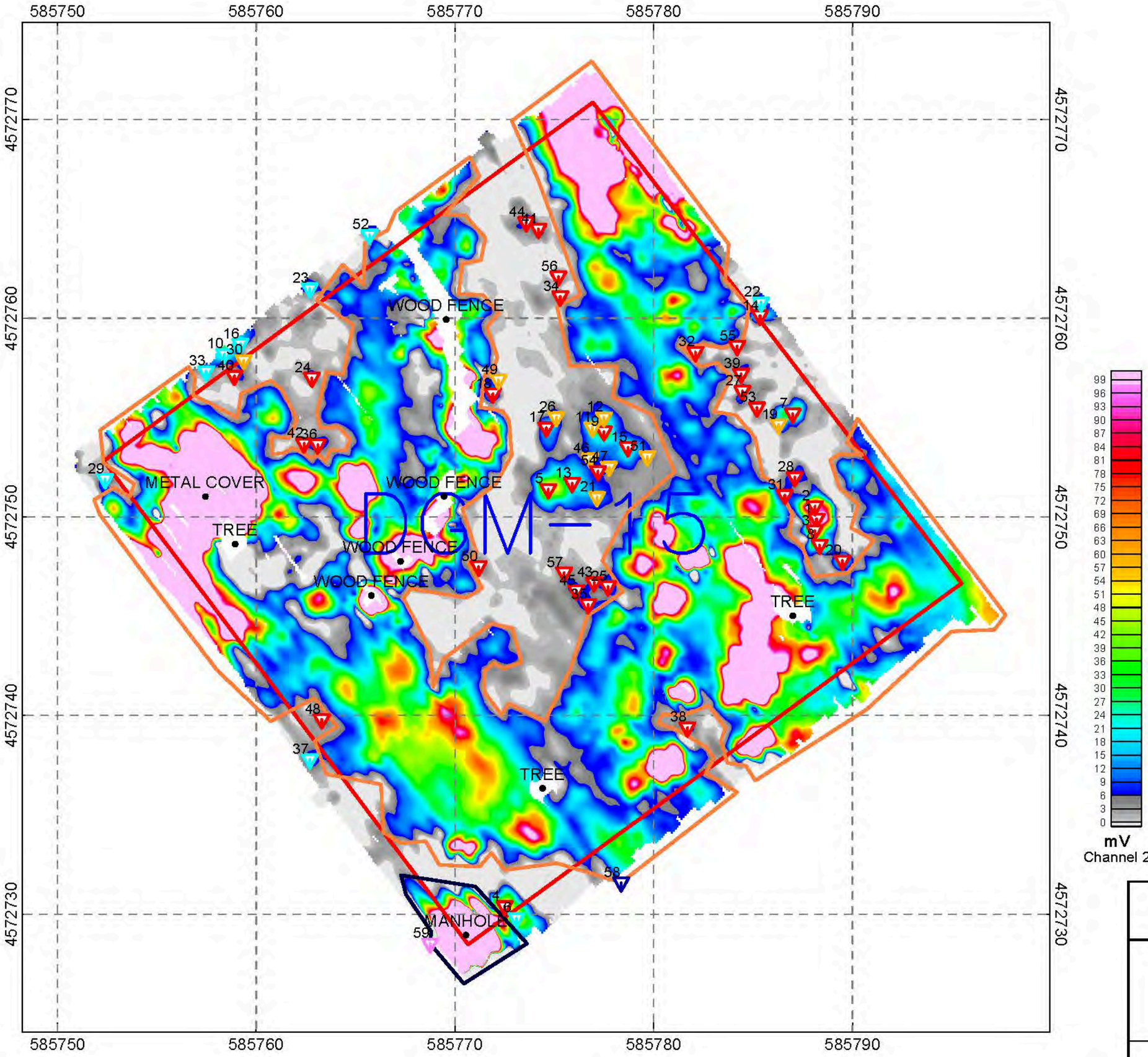
N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200331_G01_DGM1_E01A
Grid DGM-1
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/08/2020
Date of Survey: 03/31/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-15XXX, eg. DGM-15002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

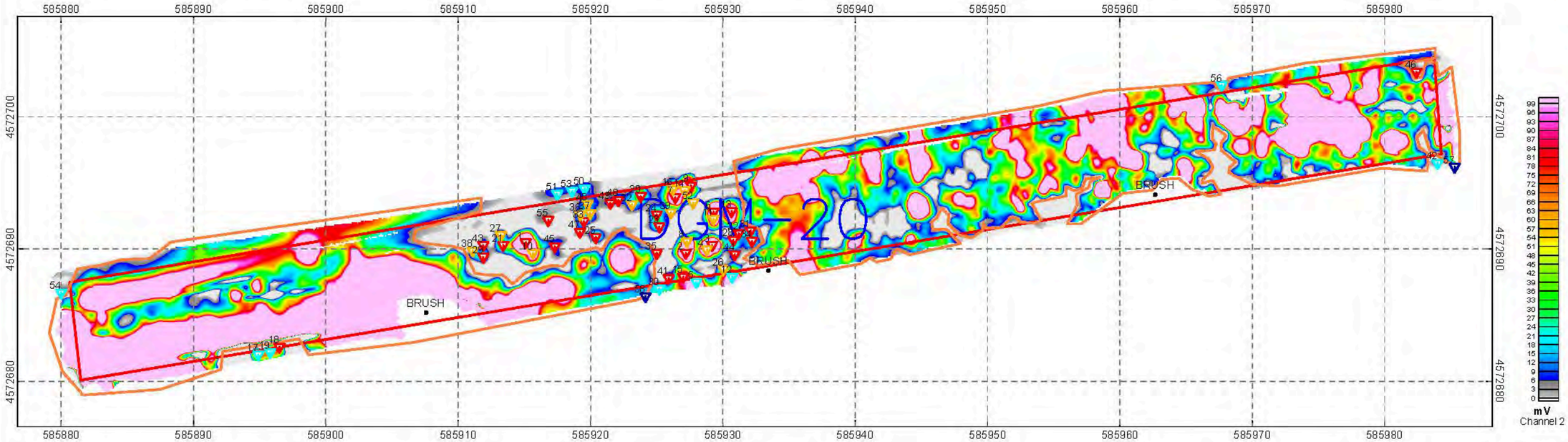
WGS 84 / UTM zone 18N

N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200331_G01_DGM15_E01A
Grid DGM-15
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/08/2020
Date of Survey: 03/31/2020



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-20XXX, eg. DGM-20002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

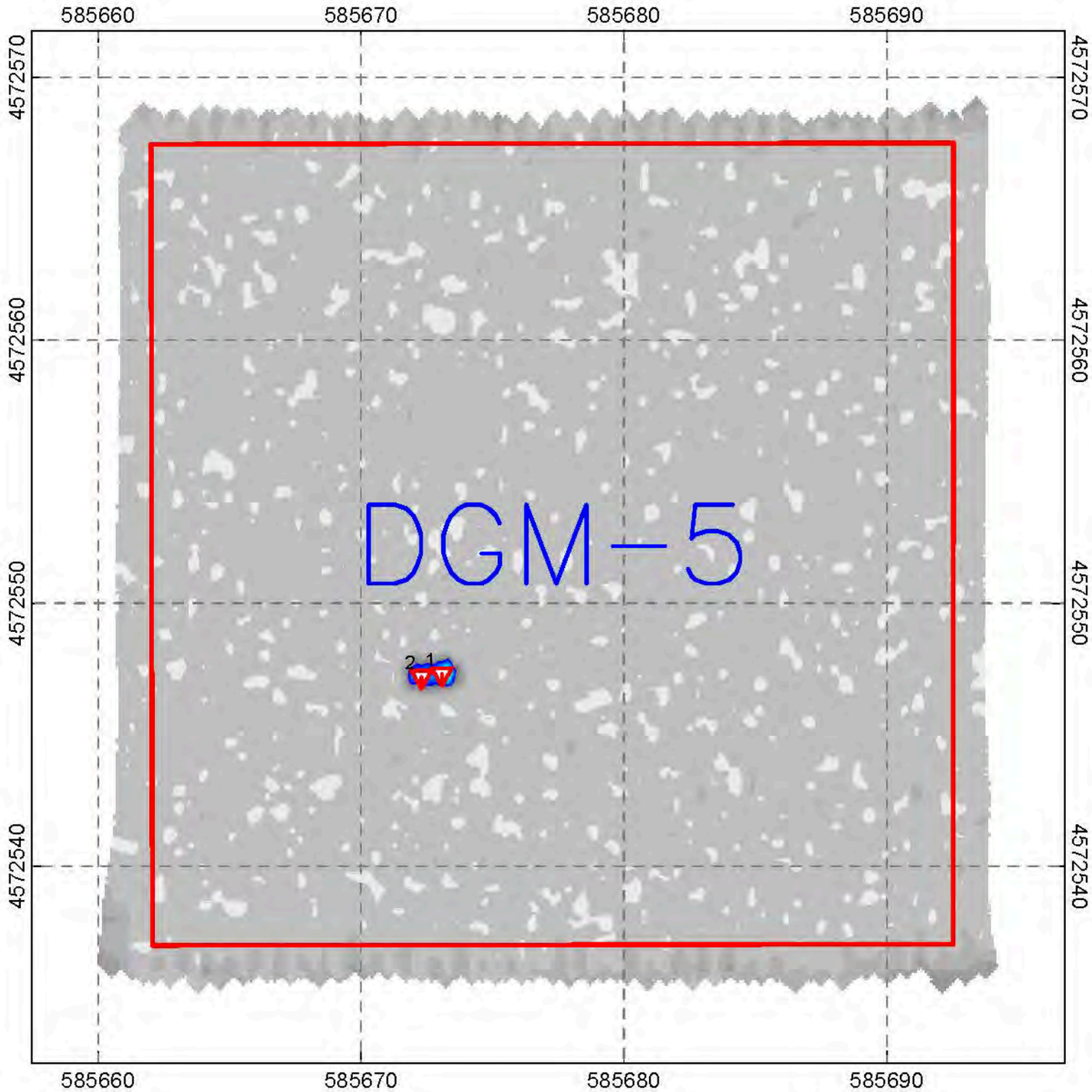
N

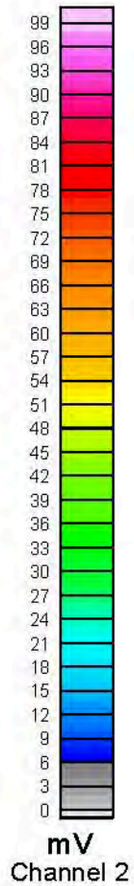
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200331_G01_DGM20_E01A
Grid DGM-20
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 03/31/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-5XXX, eg. DGM-5002)

- 2 Type 1 - Point
- 2 Type 2 - Tiling
- 2 Type 3 - Culture
- 2 Type 4 - Poor Decay (Noise)
- 2 Type 5 - Suspected Culture
- 2 Type 6 - SRA
- 2 Type 7 - Utility/Known Culture Polygon
- 2 Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

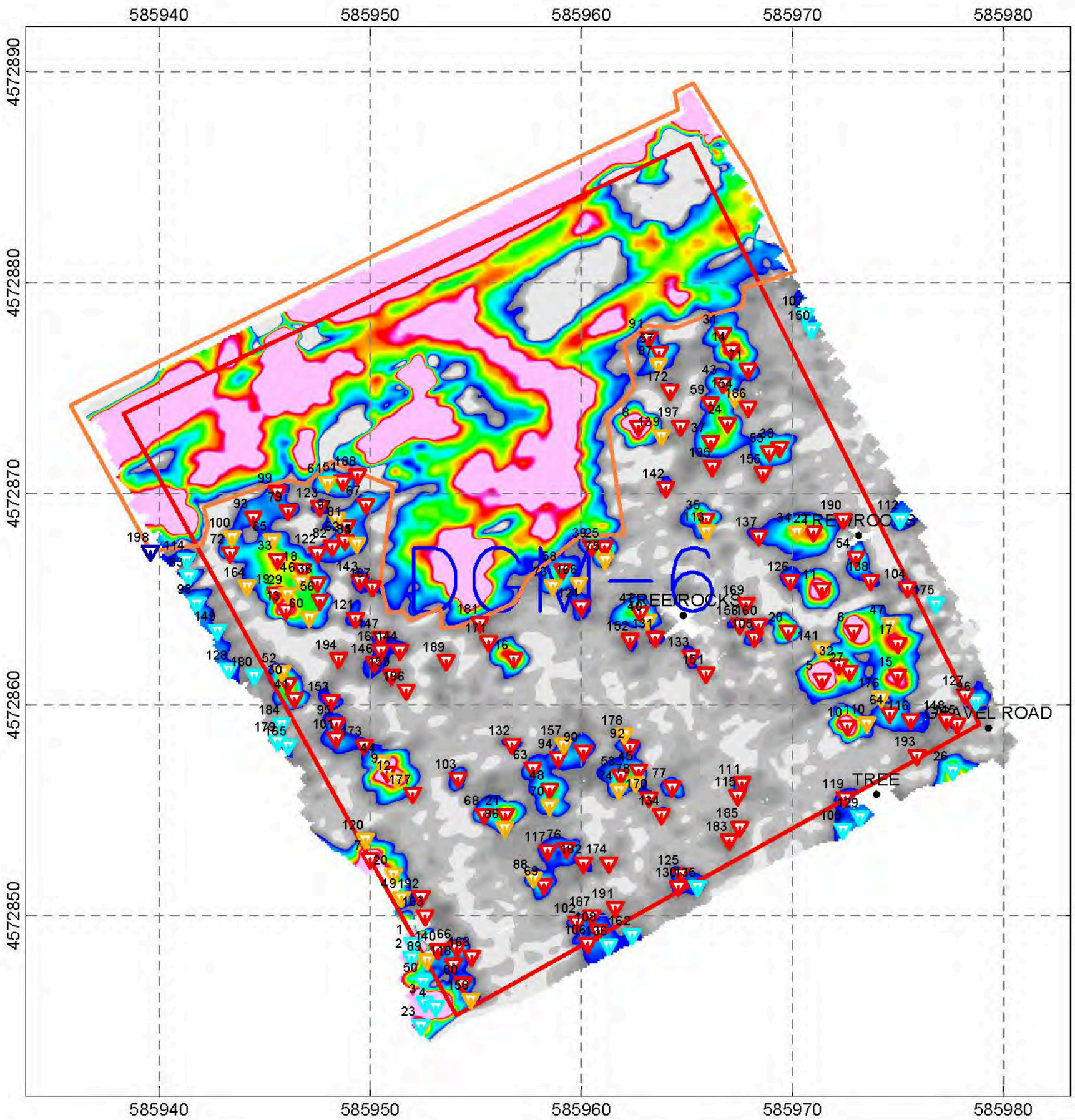
N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200401_G01_DGM5_E01A
Grid DGM-5
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/08/2020
Date of Survey: 04/01/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-6XXX, eg. DGM-6002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

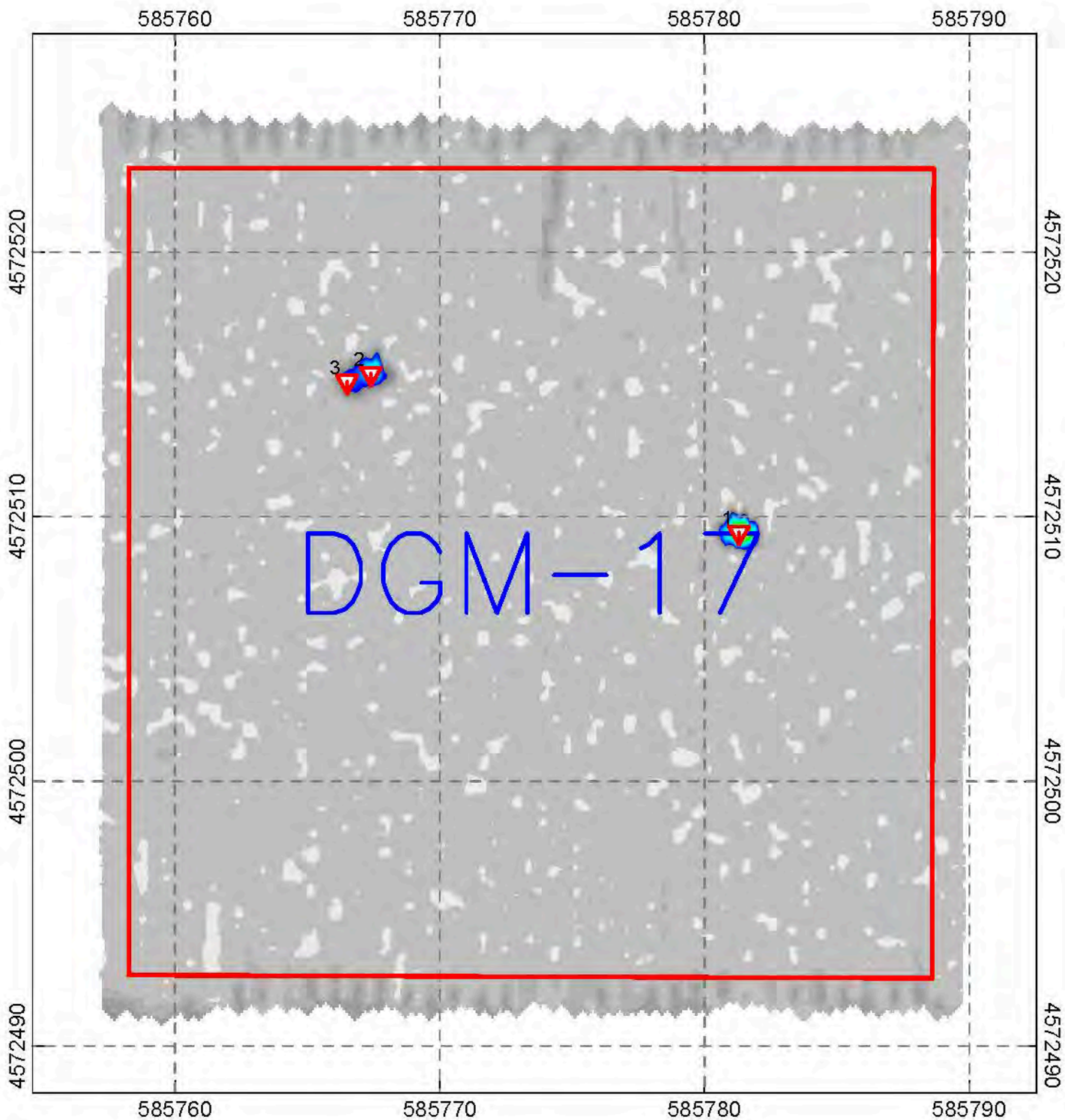
N

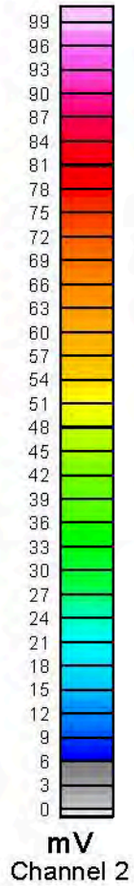
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200401_G01_DGM6_E01A
Grid DGM-6
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/06/2020
Date of Survey: 04/01/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-17XXX, eg. DGM-17002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

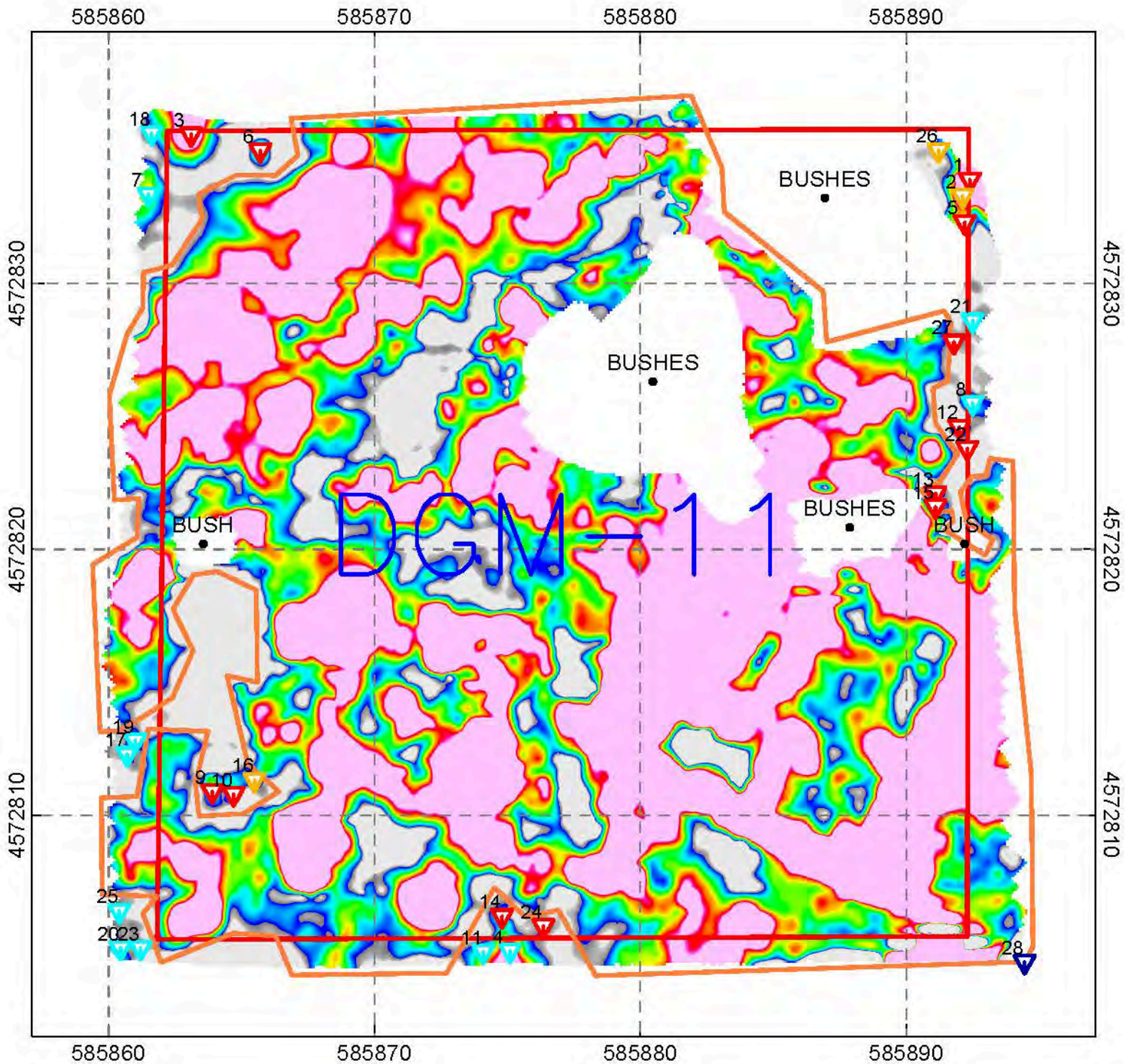
N

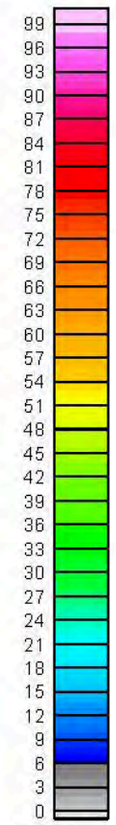
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200401_G01_DGM17_E01A
Grid DGM-17
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/08/2020
Date of Survey: 04/01/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types
(See Target List For Response and Location)
(Unique Target ID is DGM-11XXX, eg. DGM-11002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300
5 0 5
(meters)
WGS 84 / UTM zone 18N

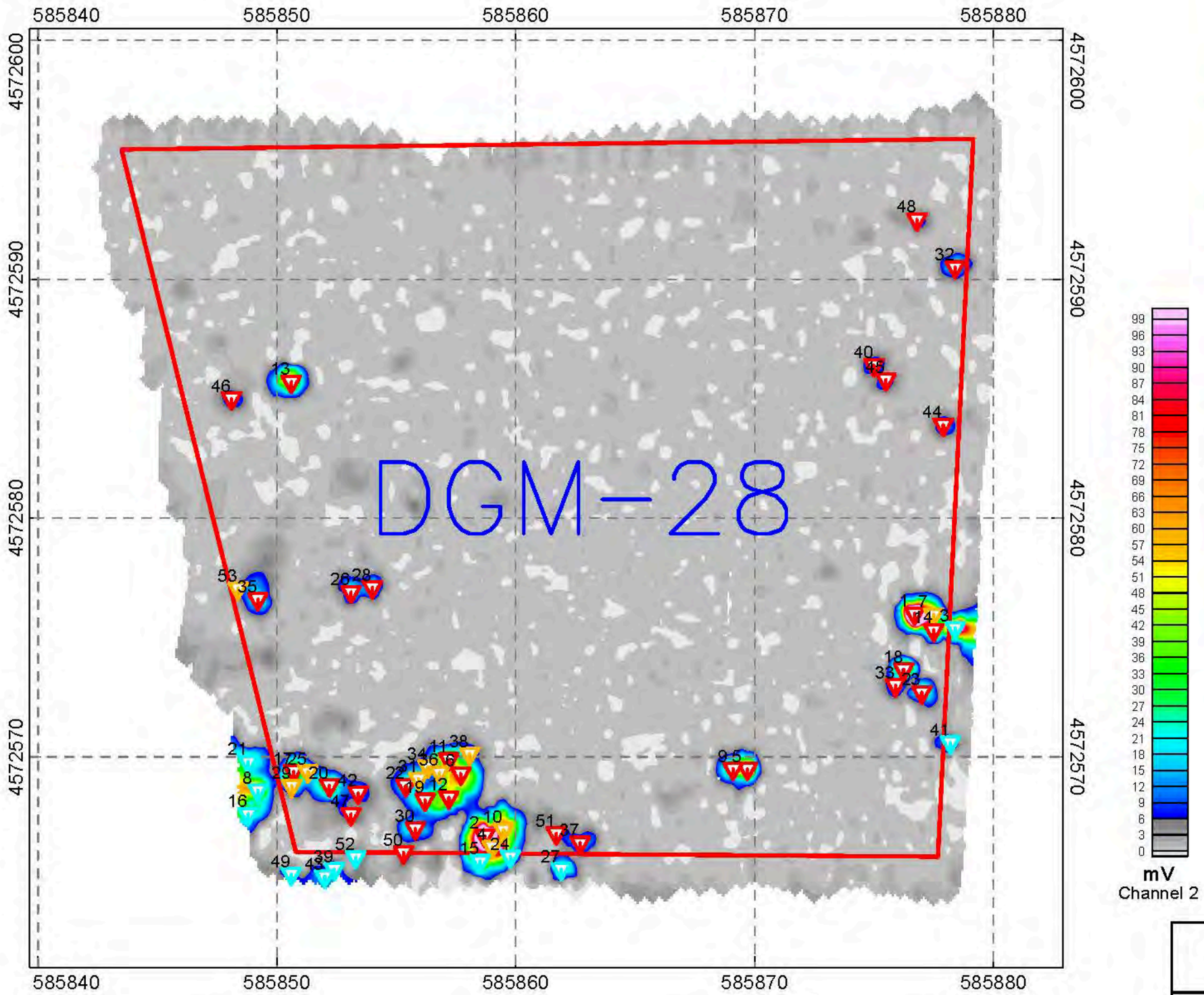
N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200402_G01_DGM11_E01A
Grid DGM-11
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 04/02/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION
Underground Geophysical Surveys



Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-28XXX, eg. DGM-28002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

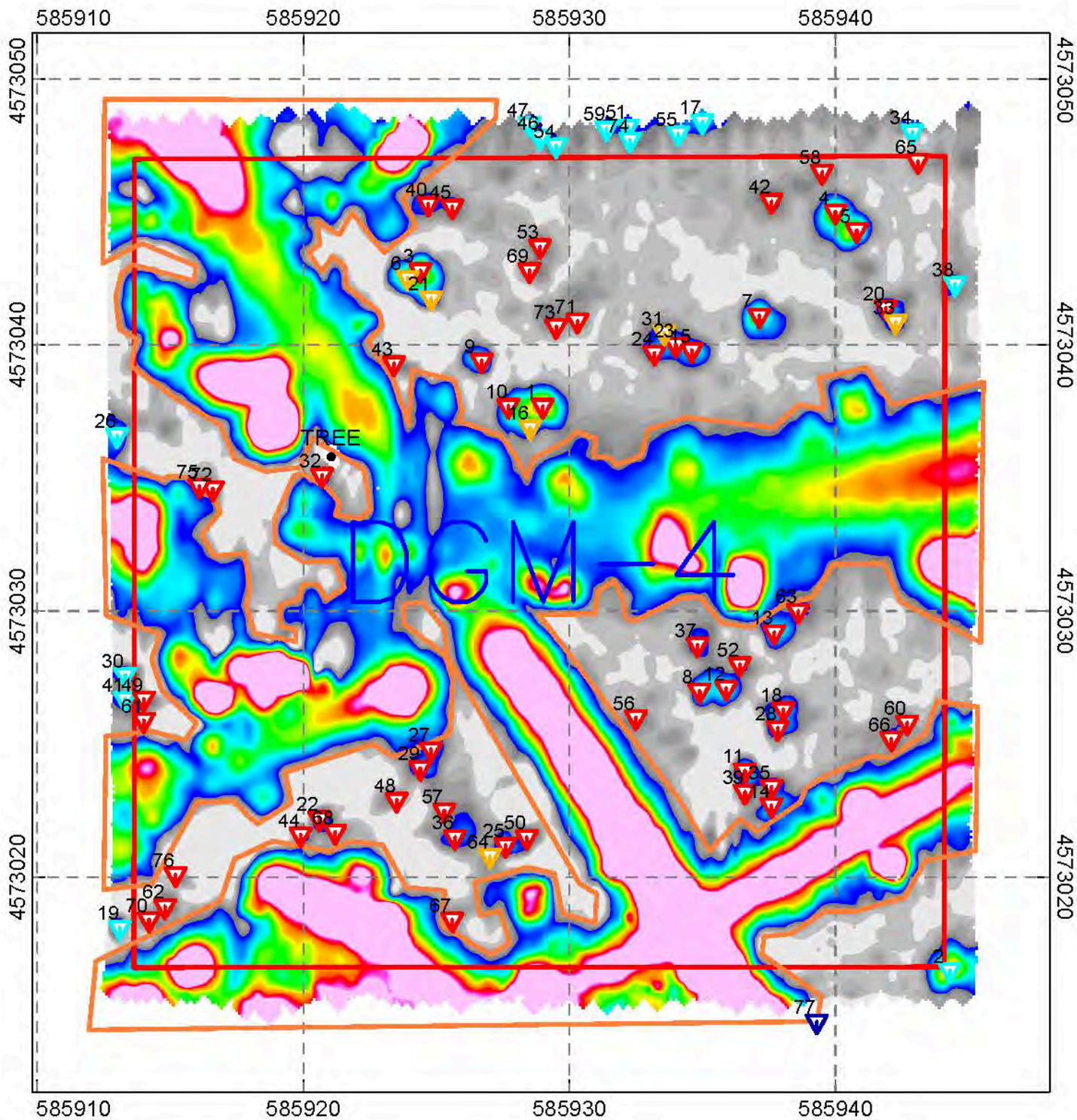
N

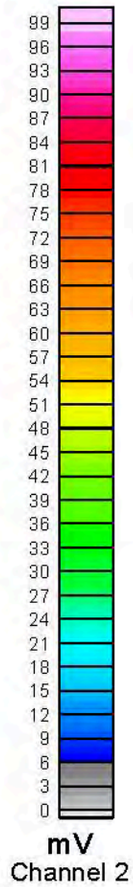
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200402_G01_DGM28_E01A
Grid DGM-28
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 04/02/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-4XXX, eg. DGM-4002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

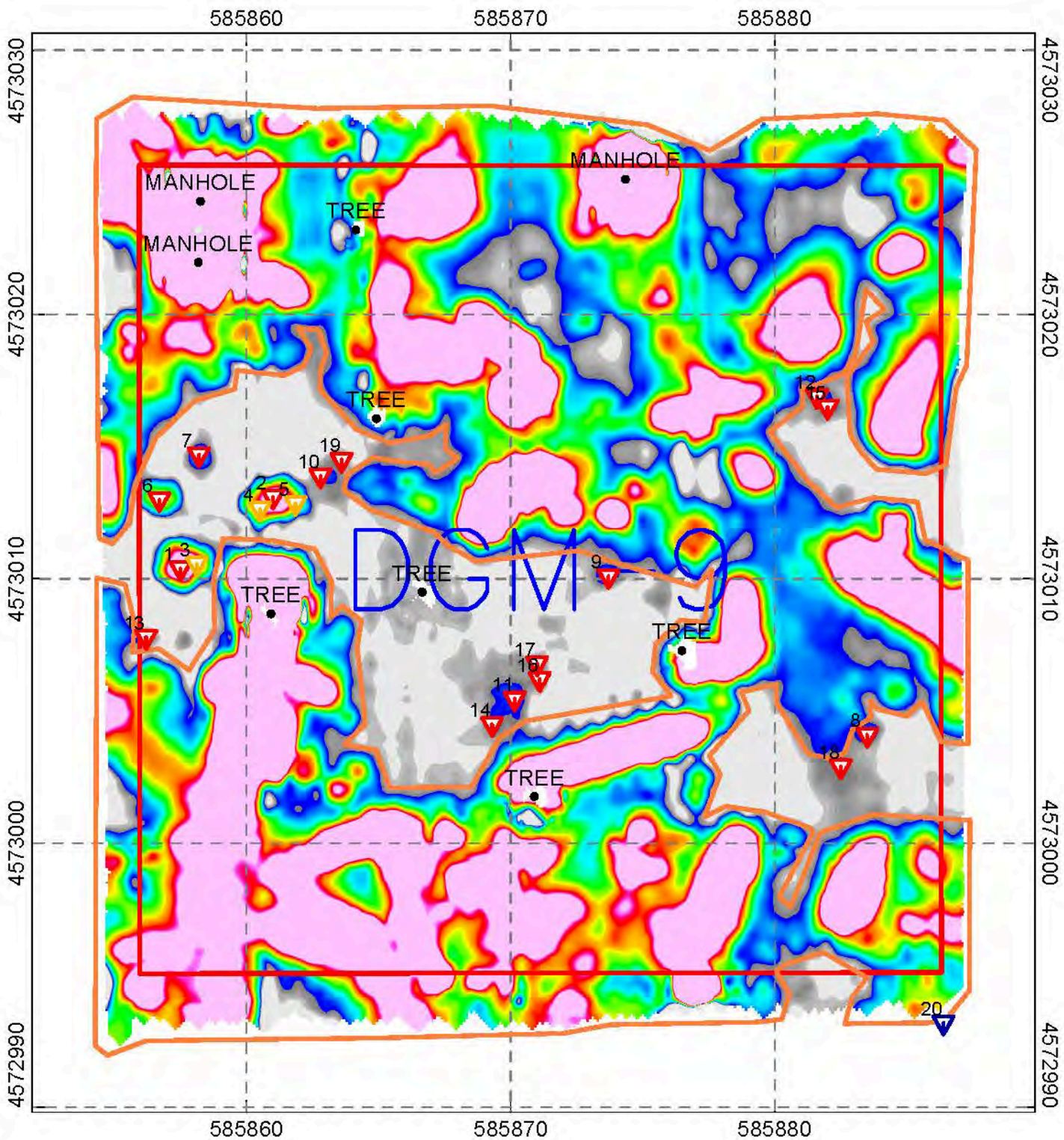
N

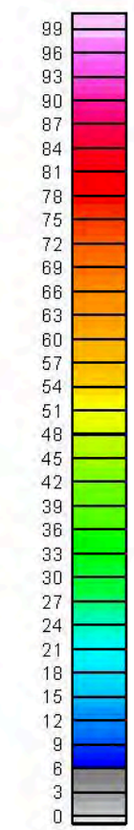
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200403_G01_DGM4_E01A
Grid DGM-4
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 04/03/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-9XXX, eg. DGM-9002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

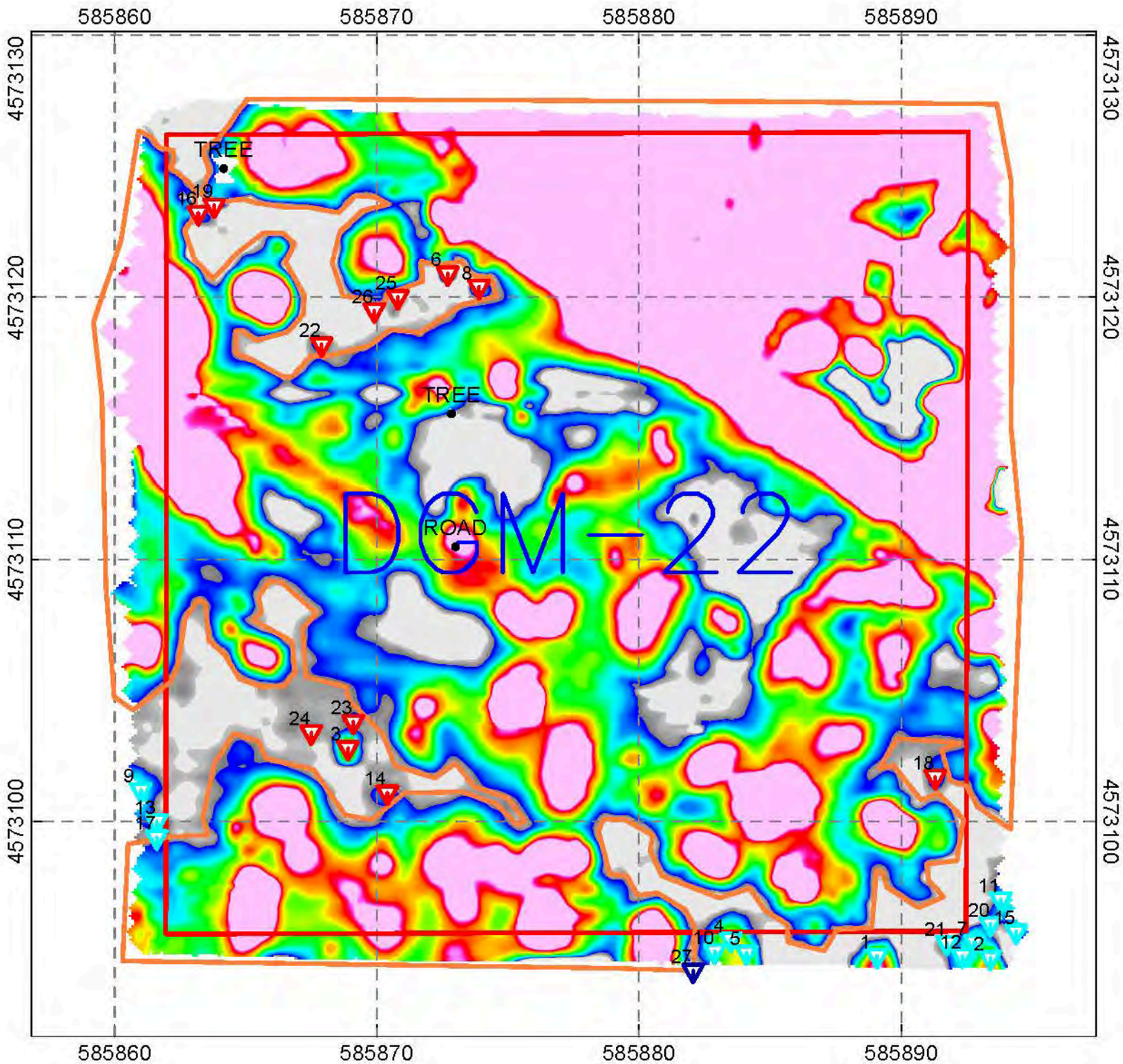
N

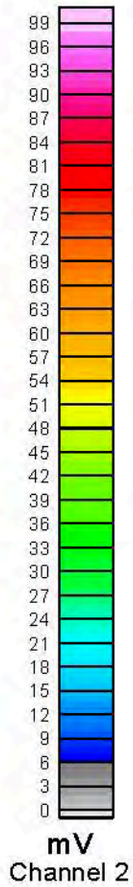
AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200403_G01_DGM9_E01A
Grid DGM-9
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 04/03/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-22XXX, eg. DGM-22002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

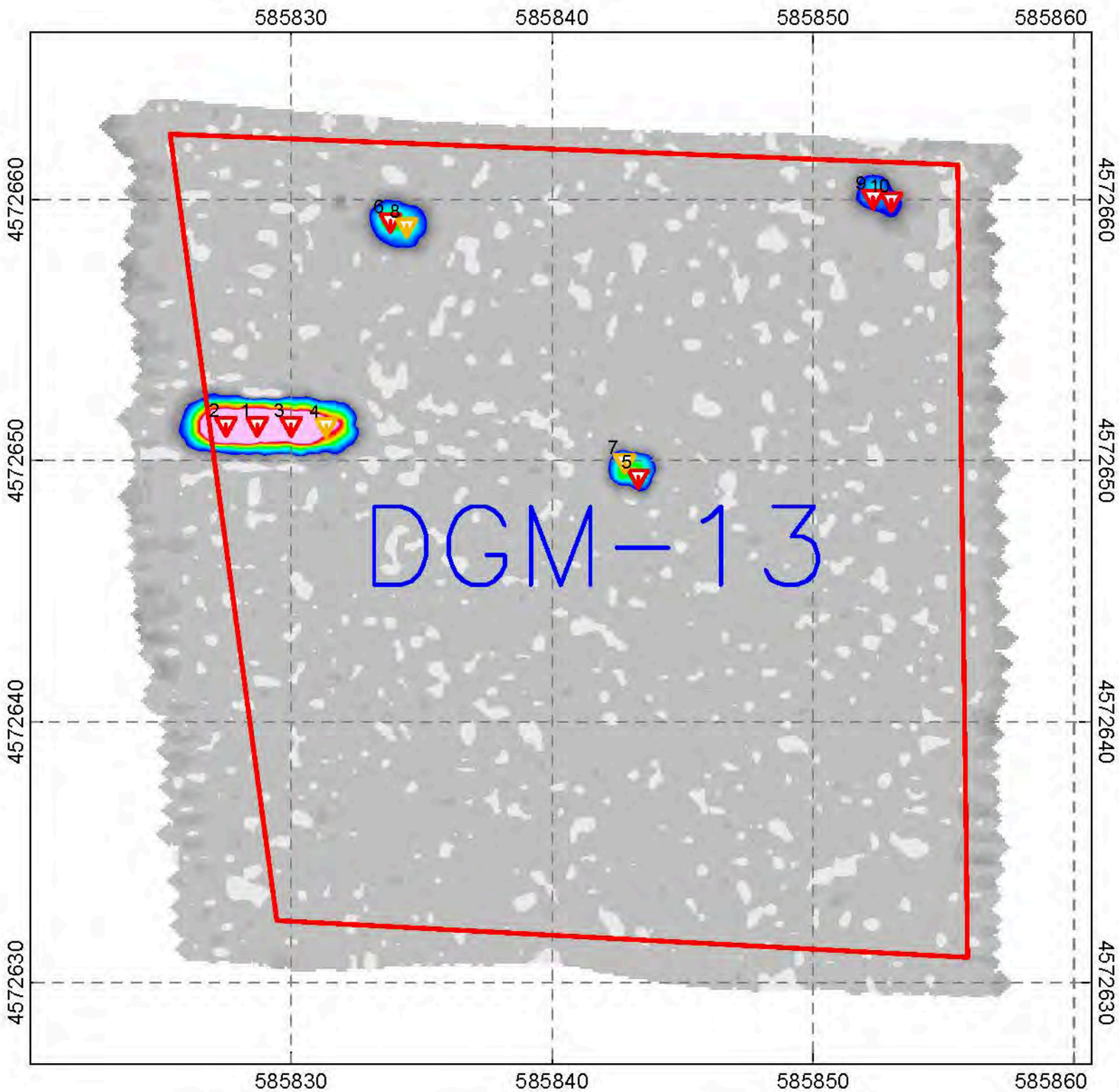
N

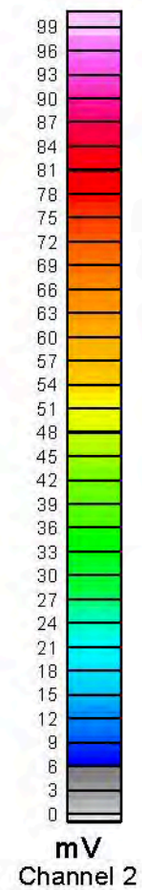
AcornSI and NAEVA JV for EA Engineering

EM61MK2 Bottom Coil
Dataset 20200403_G01_DGM22_E01A
Grid DGM-22
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 04/03/2020

NAEVA GEOPHYSICS INC.
THE LEADER IN SUBSURFACE DETECTION





Legend

- Area of Investigation
- Saturated Response Area
- Utility/Known Culture Polygon
- brush Culture (if noted)

Target Types

(See Target List For Response and Location)
(Unique Target ID is DGM-13XXX, eg. DGM-13002)

- Type 1 - Point
- Type 2 - Tiling
- Type 3 - Culture
- Type 4 - Poor Decay (Noise)
- Type 5 - Suspected Culture
- Type 6 - SRA
- Type 7 - Utility/Known Culture Polygon
- Type 8 - Outside Grid Boundary

Scale 1:300

5 0 5

(meters)

WGS 84 / UTM zone 18N

N

AcornSI and NAEVA JV for
EA Engineering

EM61MK2 Bottom Coil
Dataset 20200406_G01_DGM13_E01A
Grid DGM-13
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York

Date of Map Creation: 04/10/2020
Date of Survey: 04/06/2020

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DGM-AGC Reports

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AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Digital Geophysical Mapping
Remedial Investigation Report
Iona Island Naval Ammunition Depot Formerly Used Defense Site
Rockland County, New York

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Submitted by Tom Furuya; September 17, 2020
Reviewed by Dean Keiswetter; September 17, 2020

AcornSI and NAEVA JV
1487 Chain Bridge Road, Suite 200
McLean, VA 22101
703-995-9872

Submitted by Electronic Delivery to:
Michael McGuire, EA Engineering, P.C.; mmcguire@eaest.com
David King, USACE; David.V.King@usace.army.mil

Approval Signature& Date:

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1 INTRODUCTION

This Remedial Investigation (RI) report supplemental has been prepared on behalf of the EA Engineering (EA) team for the USACE under contract W912DR-15-D-0014 to summarize the results of the digital geophysical mapping (DGM) detection survey that AcornSI and NAEVA Joint Venture (ANJV) performed for the RI at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), Rockland County, New York.

The RI Report is a compilation of the individual reports submitted in compliance with the Uniform Federal Policy (UFP) – Quality Assurance Project Plan (QAPP) guidance. Taken together, the individual reports document the field methods used, the data analysis procedures, the target selection parameters including the final list of targets selected from the DGM data, and the suitability of the data to meet the project data quality objectives (DQOs).

The reports that comprise the RI Report include the following:

1. Instrument Verification Strip Memorandum (Dynamic Data)
2. EM61 Target Selection Technical Memorandum
3. Data Usability Assessment for Dynamic Data
4. Final DGM Target List

2 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) for Quality Assurance Project Plan (QAPP), Military Munitions Response Program Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York*.

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AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Instrument Verification Strip Memorandum
Remedial Investigation
Iona Island Naval Ammunition Depot
March 20, 2020
Report 1
Version 2

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Date: March 20, 2020
Submitted by Alexander Kostera
Reviewed by Dean Keiswetter, March 24, 2020

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1 INTRODUCTION

This IVS memorandum, which has been prepared on behalf of the EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014, presents results of the Instrument Verification Strip (IVS) that AcornSI and NAEVA JV (ANJV) performed at the start of the geophysical investigation for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY). The IVS was surveyed as part of a Geophysical System Verification program to document that the detection sensors and positioning systems are functioning properly and to demonstrate that the geophysical data collection teams are well-trained in system operation prior to the initiation of fieldwork. This memorandum addresses the initial IVS surveys conducted on March 16, 2020.

This process is discussed in greater detail in *Worksheet #22—Field Equipment Calibration, Maintenance, Testing and Inspection*, and *Appendix F - Field Standard Operating Procedures (SOP)*, contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).

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2 ASSEMBLY

The digital geophysical mapping (DGM) was completed by using industry-standard Geonics EM61 MK2 metal detectors and GPS-integrated positioning. The EM61 MK2 device is a four-channel time domain EM device that detects ferrous and non-ferrous metal objects. The man-portable EM61 MK2 uses an air-cored 1.0-meter by 0.5-meter copper transceiver coil mounted on wheels at 42 centimeters above the ground. Data are recorded at several intervals of time (time gates), which provides a measurement of the response decay. In the single pass transect and full coverage grid areas EM data was positioned with a Trimble RTK GPS (**Figure 1**).

Figure 1: EM61 MK2 with RTK GPS Positioning

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3 INSTRUMENT VERIFICATION STRIP CONSTRUCTION

The IVS was installed in the central area of the site (**Figure 2**). Pre-seeded and initial seeded surveys were conducted on March 16, 2020. A pre-seed background survey, conducted with 0.50m line spacing, was performed to demonstrate the planned seed locations were free of anomalous response prior to burial (**Figure 3**). A few small anomalies were identified in the background survey, but they did not affect placement of the seeds or the background line. The IVS and background survey lines are approximately 15 meters long and will be used for the EM61 MK2 DGM detection survey and MetalMapper 2x2 AGC survey. Three ISOs, two small ISO 80s and one medium ISO 40, were spaced three meters apart downline from each other. Seed item descriptions and orientations are in **Table 1**, photographs of the items in place are in **Figure 4**.

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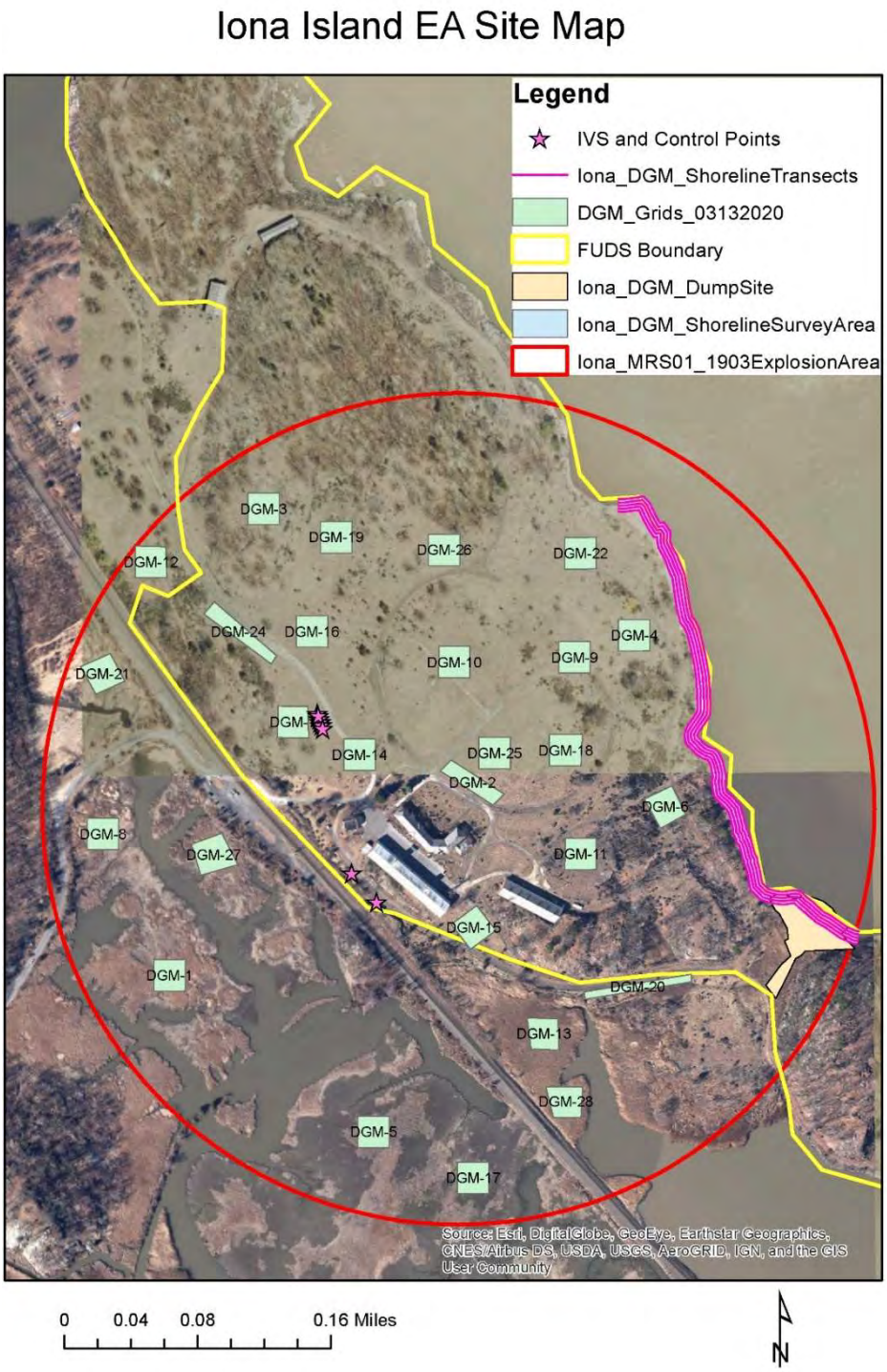

Figure 2: IVS1 location

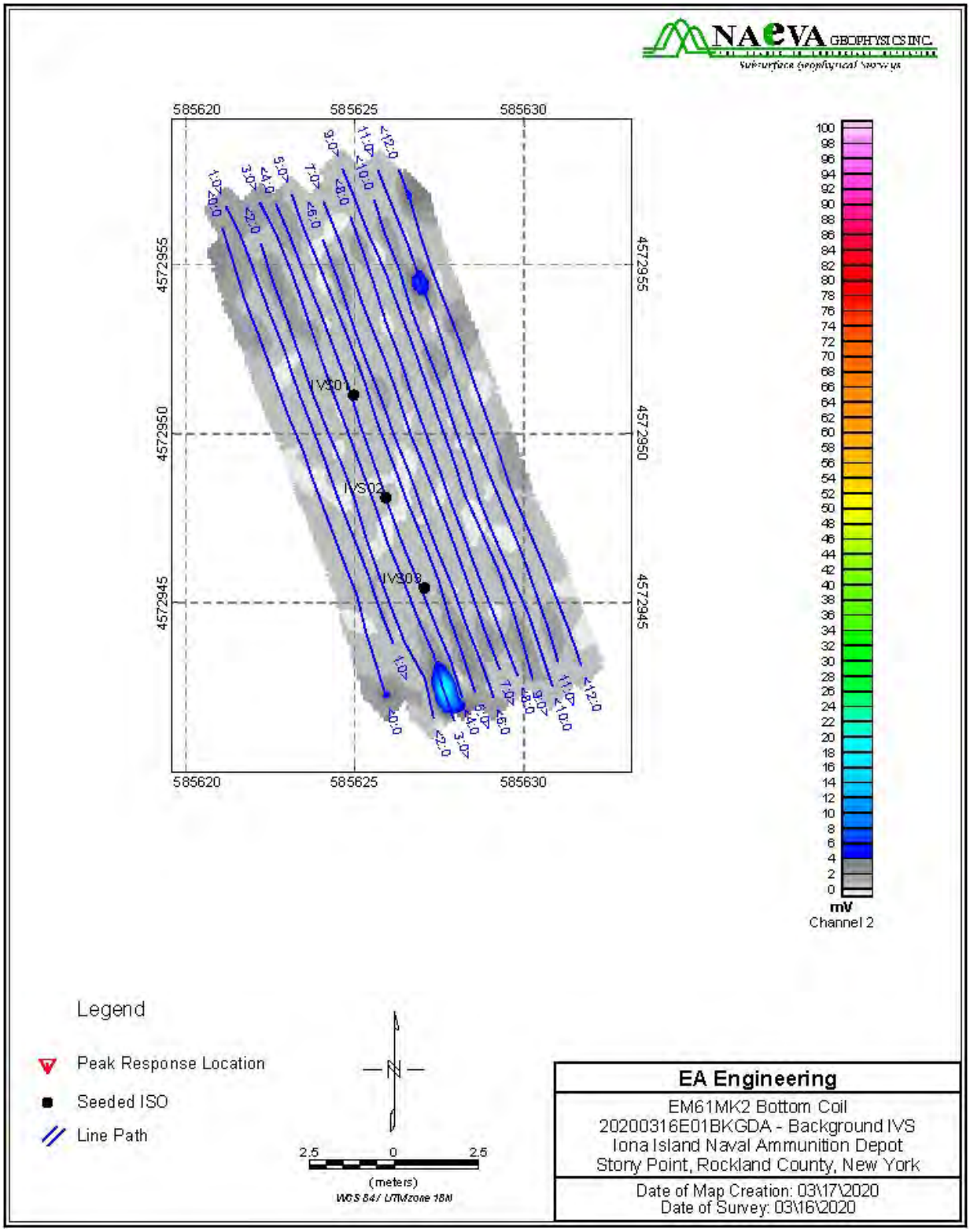

Figure 3: 20200316E01BKGDA Pre-Seed Background Survey

Table 1: IVS Seed Item Locations and Descriptions

Test Item ID	Easting*	Northing*	Depth to Center of Mass (feet)	Description
IVS01	585624.960	4572951.139	0.5	small ISO80 vertical
IVS02	585625.922	4572948.106	1.0	medium ISO, horizontal, perpendicular to IVS
IVS03	585627.056	4572945.435	0.5	small ISO80, horizontal, perpendicular to IVS
* WGS84 UTM Zone 18 North, meters collected with Trimble RTK GPS on 3/16/2019				

Figure 4: Seed items in place
(a) IVS01 (b) IVS02 (c) IVS03

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4 INITIAL IVS SURVEY RESULTS

The Trimble RTK GPS was set up on base1 (585680.193E,4572774.393N), which was established by EA prior to the start of the geophysical investigation. A GPS QC check point was established nearby to perform daily geodetic functionality checks. Control points for the ends of the seeded and background lines of the survey and the seed locations were surveyed in with the RTK GPS.

The background, latency test and 5-line initial IVS was collected on March 16, 2020 positioned with the RTK GPS. The EM61MK2 was deployed in as a wheel mounted cart at a standard sensor height of 42cm. The latency test consists of three sets of passes up and down the seeded IVS line. The 5-line survey consists of the following passes:

- offset from seeded line at 50 cm
- offset from seeded line at 25 cm
- seeded line
- offset from seeded line at 50 cm (opposite side)
- background line

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5 CONCLUSIONS

5.1 Results

The background noise levels at the IVS were calculated for the four bottom coil channels (**Table 2**) from the data collected on March 16, 2020. Areas free of anomalies from the 20200316E01BKGDA survey and the background line for the 20200316E01IVS1 and 20200316E015LINE surveys were used to compute background statistics. The statistics and RMS noise values were calculated.

Table 2: IVS Background Statistics

ChannelID	Ave Mean (mV)	Ave StDev (mV)	Ave RMS (mV)	7x StDev (mV)	7x RMS (mV)
Ch1_level_lg	1.48	1.97	2.47	13.81	17.29
Ch2_level_lg	0.94	1.18	1.50	8.24	10.53
Ch3_level_lg	0.49	0.59	0.76	4.11	5.34
Ch4_level_lg	0.24	0.29	0.38	2.03	2.65

The first three production area datasets, 20200317_G01_DGM7_E01A, 20200317_G01_DGM14_E01A, 20200317_G01_DGM21_E01A, were collected with RTK GPS on March 17, 2020 covering three approximately 100x100ft grids (Grids DGM7, DGM14, and DGM21). The background statistics for an anomaly free area within each dataset were calculated for comparison to the IVS background values and are shown in **Table 3**.

Table 3: Initial Datasets Background Statistics

ChannelID	Ave Mean (mV)	Ave StDev (mV)	Ave RMS (mV)	7x StDev (mV)	7x RMS (mV)
Ch1_level_lg	0.78	1.05	1.32	7.33	9.26
Ch2_level_lg	0.39	0.70	0.83	4.92	5.78
Ch3_level_lg	0.21	0.47	0.53	3.31	3.74
Ch4_level_lg	0.13	0.35	0.39	2.47	2.71

The responses from the initial passes of collection of the IVS seed items are detailed in **Table 4**. Average values for item response (**Table 5**) and positioning (**Table 6**) were calculated. The positional requirement for the initial surveys for the IVS seeds is 0.25m for RTK GPS positioning.

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Table 4: Results of the initial IVS collections

IVS Test ID	Item ID	IVS X (m)	IVS Y (m)	Ch1 (mV)	Ch2 (mV)	Ch3 (mV)	Ch4 (mV)
20200316E01IVS5LINE	IVS01	585624.900	4572951.100	115.569	78.888	43.379	20.935
20200316E01IVS5LINE	IVS02	585625.946	4572948.177	57.116	35.347	17.835	7.755
20200316E01IVS5LINE	IVS03	585626.944	4572945.362	16.055	9.755	4.825	1.803
20200316E01IVS1	IVS01	585625.000	4572951.100	114.108	78.802	43.810	21.422
20200316E01IVS1	IVS02	585626.000	4572948.100	55.433	33.794	16.576	7.317
20200316E01IVS1	IVS03	585627.000	4572945.400	15.903	8.904	4.175	1.836

Table 5: Average responses of the initial IVS collections

Item	Ch1Avg (mV)	Ch2Avg (mV)	Ch3Avg (mV)	Ch4Avg (mV)
IVS01	114.838	78.845	43.595	21.178
IVS02	56.274	34.570	17.206	7.536
IVS03	15.979	9.330	4.500	1.820

Table 6: Average position offset of IVS collections

Average position offset of initial local IVS collections					
Item	X Avg (m)	Y Avg (m)	X Ideal (m)	Y Ideal (m)	Offset (m)
IVS01	585624.950	4572951.100	585624.960	4572951.139	0.040
IVS02	585625.973	4572948.139	585625.922	4572948.106	0.060
IVS03	585626.972	4572945.381	585627.056	4572945.435	0.100

All seed items were detected within this criterion and the results are summarized in the Access database. The peak response along the profile directly over the IVS seeds was selected for the target location. For vertical ISOs this value is associated with the peak amplitude of the anomaly and for horizontal ISOs this value is associated with the trough of the double peaked anomaly. All seeds and the average locations of the peak responses are within the initial positioning precision MQO of 0.25m. **Figure 5** is the channel 2 response map of the three-pass latency test, the peak response values and locations repeat well after a correction of 6 readings (corresponding to approximately 0.6 seconds) was applied to the data. **Figures 6 and 7** are the channel 2 response maps of the initial seeded IVS surveys. The ongoing positioning precision MQO is the IVS targets are to be within 0.25m of the average locations. The average locations are calculated from the initial surveys conducted on March 16, 2020; the X Ave and Y Ave values in **Table 6** will be used to evaluate the ongoing dynamic detection survey positioning precision (IVS) MQO.

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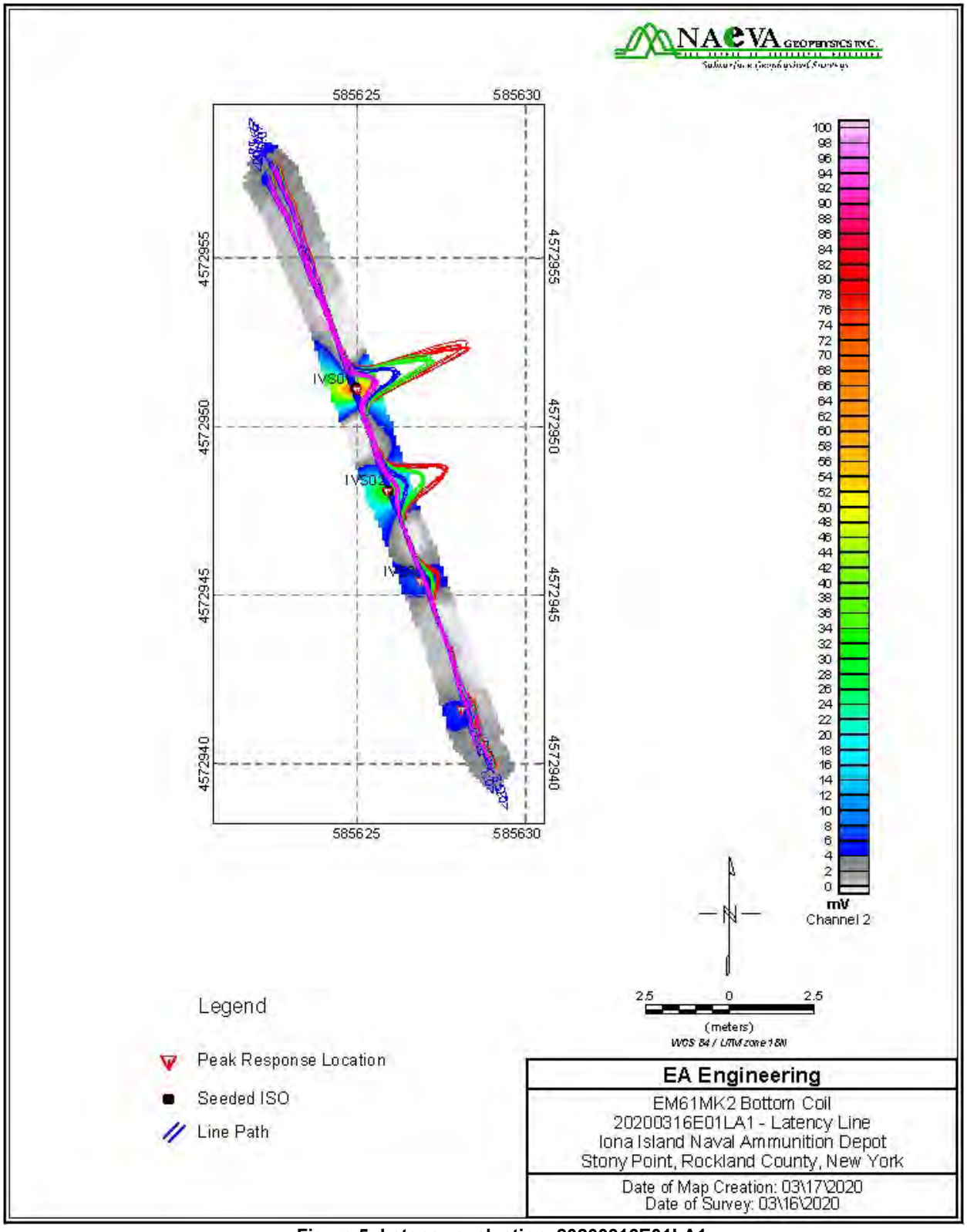

Figure 5: Latency evaluation, 20200316E01LA1

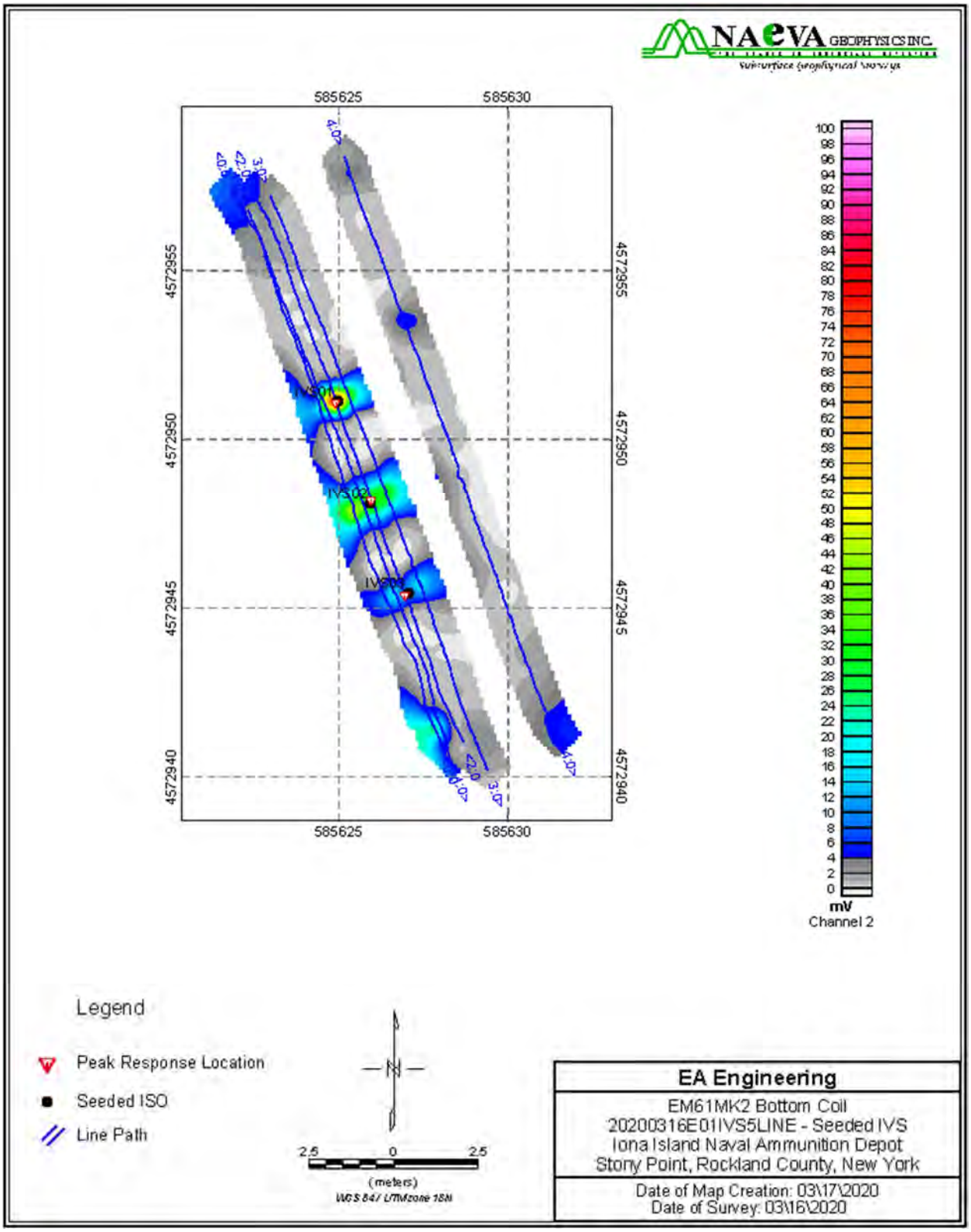

Figure 6: Initial 5-Line seeded IVS survey wheel deployment, 20200316E01IVS5LINE

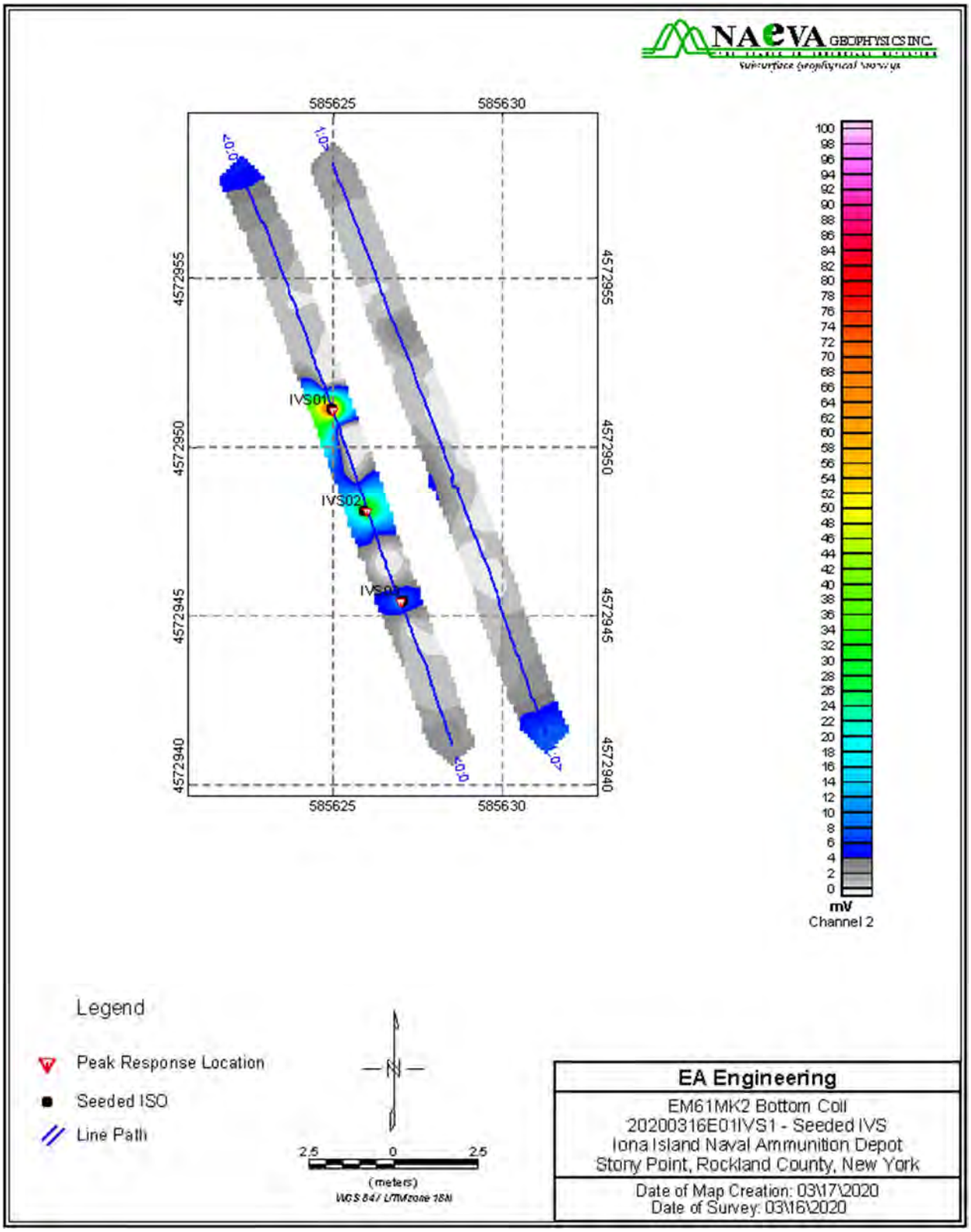

Figure 7: Initial seeded IVS survey wheel deployment, 20200316E01IVS1

The IVS ISO responses were compared against the NRL response curves (**Table 7**). For the small ISO, the response curves were generated using schedule 40 small ISOs (the IVS was seeded with schedule 80 small ISOs). For the response the difference is within 25% or ± 2 mV for all items and all time gates. The variation of response from the predicted response as the item is offset from center of the coil is abrupt, for a static test where item location can be very well controlled one would expect to measure responses closer to the predicted values. For IVS the location offset due to line path and sampling rate we do not expect to capture the actual peak or trough response of item.

Table 7: Response Variation from NRL Predicted Values

Item	Ch1 Difference		Ch2 Difference		Ch3 Difference		Ch4 Difference	
	Percent	mV	Percent	mV	Percent	mV	Percent	mV
IVS01	-9.90%	-12.63	-11.10%	-9.87	-16.60%	-8.67	-13.80%	-3.39
IVS02	-6.80%	-4.11	2.10%	0.72	12.30%	1.89	29.00%	1.70
IVS03	8.80%	1.29	14.60%	1.19	24.00%	0.87	42.20%	0.54

The response of the IVS items was compared to the average RMS (**Table 8 and 9**). The seed items in the IVS all had strong signals well above background noise. The channel with the highest SNR varies depending on the item, depth and orientation. Given the expected variation of potential TOI at the site, Channel 2 provides a good compromise between the earliest channel which is more sensitive to small shallow items and the late channels that show higher SNR for strong signal targets but less sensitivity to deeper items. Channel 2 is the recommended channel for target selection.

Table 8: IVS SNR (IVS RMS noise)

Item	Ch1 (mV)	Ch2 (mV)	Ch3 (mV)	Ch4 (mV)
IVS01	46.51	52.42	57.17	55.92
IVS02	22.79	22.98	22.56	19.90
IVS03	6.47	6.20	5.90	4.80

Table 9: IVS SNR (Initial Dataset RMS noise)

Item	Ch1 (mV)	Ch2 (mV)	Ch3 (mV)	Ch4 (mV)
IVS01	86.82	95.44	81.52	54.71
IVS02	42.54	41.85	32.17	19.47
IVS03	12.08	11.29	8.41	4.70

5.2 Measurement Quality Objectives

The IVS specific Measurement Quality Objectives (MQOs) are:

- Initial dynamic detection survey positioning accuracy (IVS) – derived positions of IVS target(s) are within 25cm of ground truth, **Figures 8, 9 and 10** show positioning results. This MQO was met.

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- Ongoing dynamic detection survey positioning precision (IVS) – derived positions of IVS target(s) within 25cm of the average locations. The average locations stated in **Table 6** will be used to evaluate ongoing IVS tests for the project.

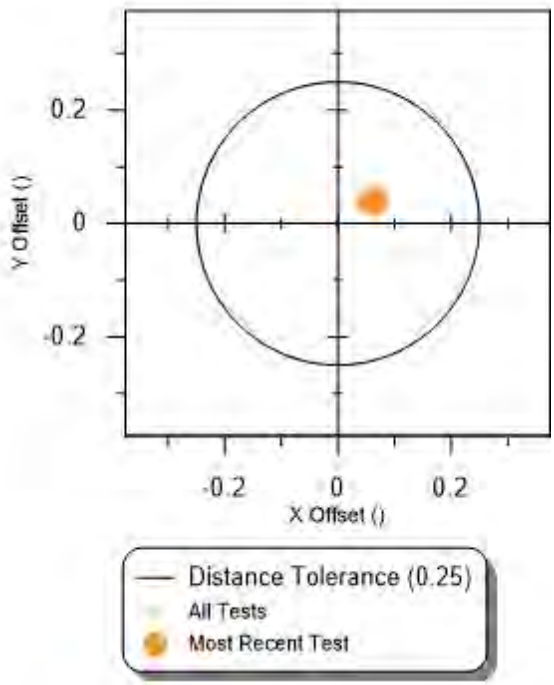

Figure 8: IVS01 (Small ISO Vertical) IVS positional results through March 16, 2020

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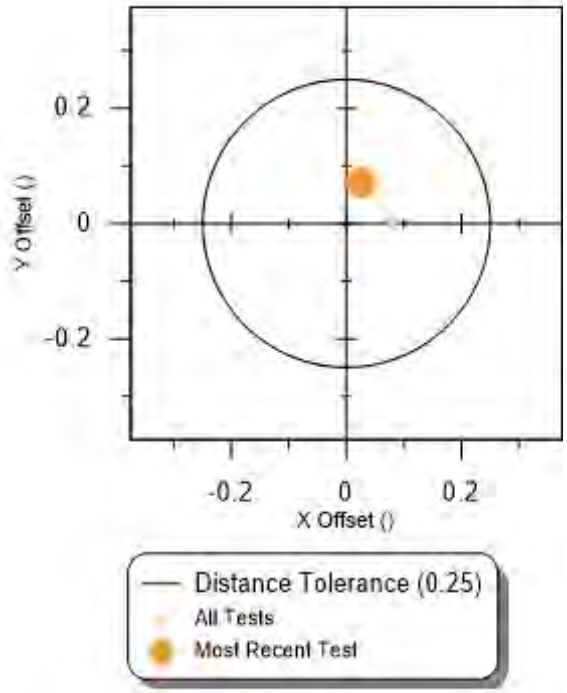

Figure 9: IVS02 (Medium ISO Horizontal) IVS positional results through March 16, 2020

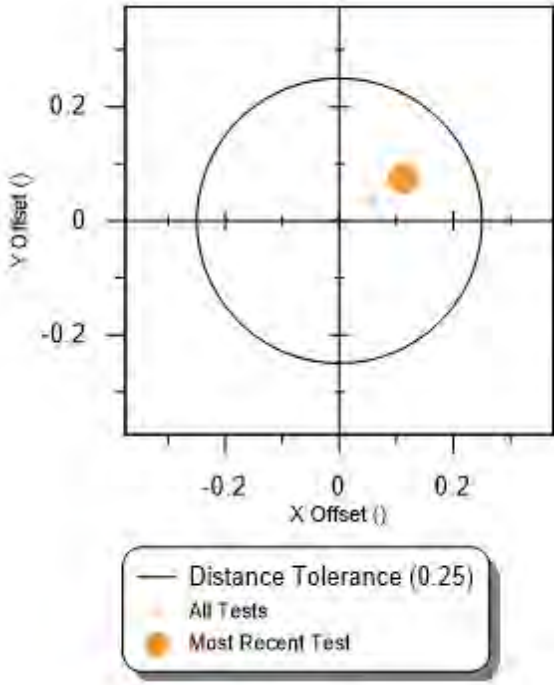

Figure 10: IVS03 (Small ISO Horizontal) IVS positional results through March 16, 2020

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Additional, MQOs that were met in the IVS were the following:

- Inline measurement spacing (EM61) - 100% ≤ 0.25m between successive measurements.

- Valid position data (EM61 data collected with RTK GPS) - GPS status flag indicates real-time kinematic (RTK) fix and dilution of precision (DOP) less than 4.0.

In addition to checking the MQOs in the IVS survey data, the following tests are evaluated to ensure the equipment was working correctly:

- Initial Instrument Function Test (EM61) - Response (mean static spike minus mean static background) within 20% of predicted response for all channels after background correction. This test is performed with a small schedule 40 ISO placed 45cm from the coil in a jig mounted on the coil. **Figure 11** display the static spike test results for the initial tests performed on March 16, 2020. This MQO was met.

- Ongoing Instrument Function Test (EM61) - Response (mean static spike minus mean static background) within 20% of predicted response for all channels. This MQO was met on March 17, 2020, the data of collection for the initial grid survey datasets.

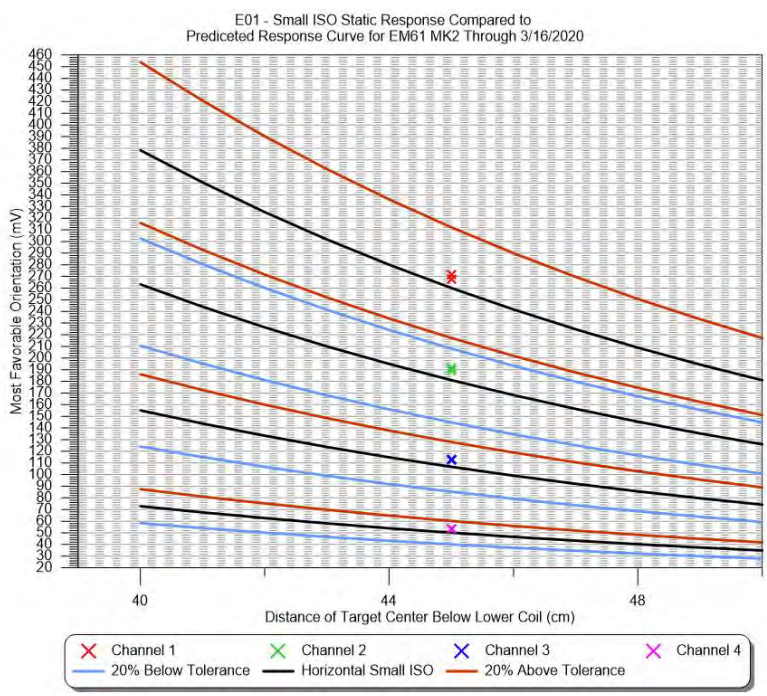

Figure 11: Static Response Chart wheel deployment

- RTK GPS QC Test (Geodetic Equipment Functionality) - Positional error of the RTK GPS at a known/temporary monument will not exceed ± 0.328 ft (10 centimeters [cm]). This MQO was met on March 16 and 17, 2020 (**Figure 12**)

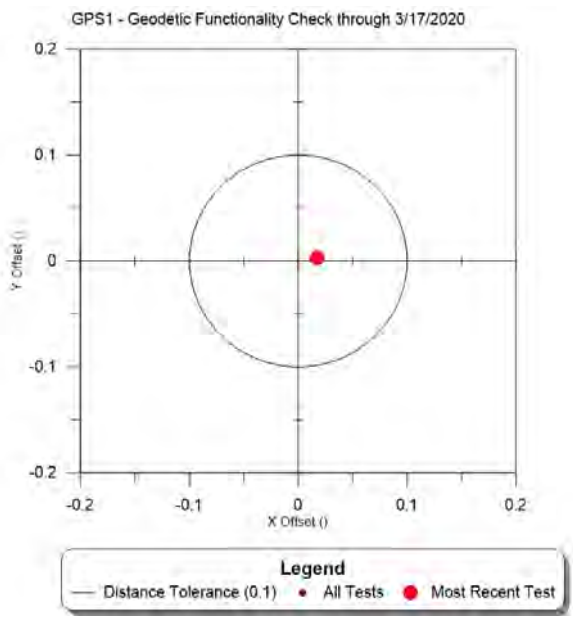

Figure 12: RTK GPS QC Check

Results for all MQOs are presented in the Access database that accompanies the IVS Report.

5.3 Recommended Target Selection Threshold

The intended EM61 detection threshold is to be between 5 and 7 times the nominal sensor noise levels based on initial IVS and the effective depth of reliable detection. Based on the results of the background statistics within the IVS and initial datasets, AN JV recommends targeting the second time gate (Channel 2) for the EM61 MK2. The recommended target selection threshold is 6 mV in the second time gate. This threshold is just above 7x RMS values for the initial background values within the first three datasets.

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6 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP),* Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

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ADVANCED GEOPHYSICAL CLASSIFICATION

EM61 Target Selection Technical Memorandum
March 31, 2020
Report 1
Version 2

For

Site: Iona Island Naval Ammunition Depot
Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Author: Alexander Kostera, March 31, 2020
Reviewed: Dean Keiswetter, April 3, 2020

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3.3 Saturated Response Areas (SRAs) 5

1 INTRODUCTION

In support of the Iona Island Naval Ammunition Depot investigation, a person portable EM61-MK2 detection survey of 27 sampling grids was conducted to identify geophysical anomaly locations that may indicate the presence of buried munitions. In total, approximately 6.2 acres were surveyed.

Results of this study will be used to direct excavations of source materials or guide an advanced EMI classification investigation. The advanced geophysical classification survey will determine whether the sources of EM61 anomalies are munitions and explosives of concern (MEC), seed items, or inert munitions resembling MEC that need to be excavated, or non-hazardous clutter that can be safely left in the ground.

The primary objective of this memorandum is to describe the methods to be used to identify and locate EM61 anomalies potentially indicative of subsurface MEC.

2 DGM METHODS

2.1 Survey Equipment

The Geonics EM61-MK2 is a time-domain electromagnetic instrument designed to detect shallow ferrous and non-ferrous metallic objects. The standard EM61-MK2 system consists of an air-cored coil, a digital data recorder, batteries and processing electronics. The EM61-MK2 transmitter generates a pulsed primary electromagnetic field that induces eddy currents in nearby metallic objects. The eddy currents produce a secondary electromagnetic field which then induces a secondary voltage inside the EM61-MK2 receiver coil that is measured at four distinct intervals (time gates) with measurements recorded in milliVolts (mV). The earlier time gates provide enhanced detection of smaller metallic objects while the later time gates provide for the identification of larger, more massive metal objects.

Positional data for the person-portable system was collected using RTK-GPS equipment. The Trimble Real-Time Kinematic (RTK) R8 GPS is a 440-channel Global Navigation Satellite System (GNSS) receiver capable of tracking all GNSS satellite frequencies and can maintain an accuracy of less than one cm horizontal in ideal conditions. This RTK system utilizes a GPS base station that sends positional corrections to the GPS rover via radio link. For configuration with the person-portable system, the rover was set to output a NMEA GGA data string at one Hz, which was captured asynchronously with the EM61-MK2 sensor data in real-time by the Geonics data collection software on an Allegro data recorder. Marked survey ropes were placed laterally across the survey area at 25-foot intervals. Alternating colored markers on the ropes facilitate straight-line profiling.

2.2 Data Processing

We used TrackMaker61MK2 to interpolate GPS readings for each EM measurement and project the coordinates into the project coordinate system. Once spatially registered, the data were imported into Geosoft's Oasis montaj processing environment for analysis by ANJV's processors. All coordinates included in this report use the project coordinate system, (WGS84, UTM Zone 18N, meters).

Once in Oasis montaj, the Dynamic Detection Survey MQOs were checked to meet the acceptance criteria for in-line spacing, coverage, GPS RTK fix, GPS HDOP and valid position data. The EM61-MK data were leveled using a windowed demedian filter and lag corrected. The MQO checks and data correction parameters are specified in the Data Processing table in the Microsoft Access database.

3 TARGET SELECTION

3.1 Determination of the Source Selection Threshold

Per the Final Quality Assurance Project Plan (QAPP), the target selection threshold for EM61-MK2 data was calculated using site-specific noise values, represented by the Root-Mean-Square (RMS) value of a sample of background data. The targeting threshold was determined during the initial collection of the IVS and documented in the *Iona Island Naval Ammunition Depot IVS Letter Report*. It was determined that Channel 2 at 6mV would be the most appropriate targeting threshold for detecting and collecting cued data over the largest number of potential munitions at the site, the smallest of which is expected to be the 1-pounder Projectile. Additional target picks could be selected by the processor depending on characteristics of the response (including shape and decay). This threshold is slightly below 5xRMS at the IVS location and slightly above 7xRMS in the first three production grids which by industry standards is considered the noise floor.

3.2 Target Selection and Location

Initial target selections were performed using the Blakely Method in Oasis montaj using the gridded Channel 2 data at 6mV. Targets within 40cm of each other were resolved by removing the target with the lower response. Targets will be resolved as follows, giving preference to targets auto picked on the gridded data.

- Anomalous features with responses greater than 6mV, located more than 40cm from a targeted grid peak, and that exhibit either irregular shapes or response decreases that are not linear from the targeted peak, will be added and classified as “tiling” targets.

- Profile peaks that were within the footprint of an anomaly that is associated with a grid peak and do not appear to clearly represent a separate peak in the data - i.e. the gridded profile data indicate a single peaked response that consistently drops off in all directions from the targeted peak response – will not be added as additional target selections.

3.3 Saturated Response Areas (SRAs)

SRAs are defined for this project as an anomaly that is larger in size than 100 square feet. The selection of individual point targets is not appropriate for anomalies of this size. All SRA boundaries will be reviewed and approved by the QC Geophysicist before targeting of the grid is complete. The boundaries of an SRA will be outlined on the geophysical contour map, but individual anomalies will not be identified within SRA’s.

3.4 Target Types

All targets selected as part of this investigation will be assigned one of the following numeric target types. The intent of assigned target types is to allow further classification of the selected targets and could be used to prioritize the targets during the cued survey. Note that all target types will be displayed in the legend of the contour maps.

Target Type	Description	Definition
1	Point	Point Target
2	Tiling	Target selected 40cm or more from a Point Target that may be associated with the Point Target
3	Culture	Target selected at a known cultural feature
4	Poor Decay (Noise)	Target location exhibits poor decay among response channels suggesting it may not have a metallic source
5	Suspected Culture	Target selected where response characteristics suggest presence of unknown cultural feature (e.g. subsurface utility)
6	SRA	Single point attached to boundary of an SRA (SRA ID)
7	Utility/Known Culture Polygon	Single point attached to boundary of response associated with known cultural feature (Polygon ID)

AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Data Usability Assessment for Dynamic Data
EM61MK2
Remedial Investigation
Iona Island Naval Ammunition Depot Formerly Used Defense Site
Rockland County, New York

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Date: May 26, 2020
Submitted by Tom Furuya
Reviewed by Dean Keiswetter, May 26, 2020

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1 INTRODUCTION

This Data Usability Assessment (DUA) has been prepared on behalf of the EA Engineering (EA) team for the USACE under contract W912DR-15-D-0014 to summarize the results of the digital geophysical mapping (DGM) detection survey that AcornSI and NAEVA Joint Venture (ANJV) performed for the Remedial Investigation at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), Rockland County, New York.

The DUA is an evaluation based on the results of data verification and validation in the context of the overall project decisions or objectives. The assessment determines whether the project execution and resulting data meet the project data quality objectives (DQOs) (see Worksheet #11 of the QAPP). The data are considered with the ultimate goal of assessing whether the final, qualified results support the decisions to be made with the data. In this case, the assessment is focused on whether the collected geophysical detection survey data were of sufficient quality to locate anomalies and delineate areas of high density from areas of low density and to identify anomalies for cued AGC data acquisition or intrusive investigation.

This process is discussed in greater detail in *Worksheet #37—Data Usability Assessment for MEC*, contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Remedial Investigation – Iona Island Naval Ammunition Depot (EA, 2019).

2 DATA USABILITY ASSESSMENT

As described on Worksheet #37 of the approved QAPP, the data usability assessment for dynamic geophysical data will follow a four-step process:

1. Review the project objectives and sampling design.
2. Review the data verification and validation outputs
3. Document data usability, update the CSM, and draw conclusions
4. Document lessons learned and make recommendations

These steps are explained in more detail in the QAPP. The results of the DUA is tabulated in Table 1. For each step of the DUA, answers are provided to relevant questions concerning the data and if required, comments are entered to explain the conclusion reached.

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Table 1 Data Usability Assessment for Dynamic EM61MK2 Data

STEP 1: PROJECT OBJECTIVES AND SAMPLING DESIGN			
Evaluation		**Yes/No**	**Comments (1)**
Are the relevant DQOs, MPCs, and MQOs for dynamic data still applicable?		Yes	
If relevant DQOs, MPCs, or MQOs for dynamic data have changed, are changes documented?		N/A	
Is the dynamic sampling design consistent with project objectives?		Yes	
STEP 2: REVIEW THE DATA VERIFICATION AND VALIDATION OUTPUTS			
Activity	**DFW 3 and 4: Establish IVS, Blind Seeding, DGM Equipment Set Up and Testing**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
IVS Technical Memorandum	Yes	Yes	Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist
Production Area QC Seed Report	Yes	Yes	Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist
Activity	**DFW 5: DGM Surveys**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
DGM Data Deliverable(s)	Yes	Yes	All data met MQOs as stated in the QAPP and have passed QC.
DGM QC Deliverable(s)	Yes	Yes	All QC deliverables have been submitted as described in the QAPP. Instead of a weekly QC report, a QC report was submitted per dataset/grid for all data collected.
RCA/NCR(s)			n/a – there were no RCA/NCR(s)
FCR(s)			n/a
Weekly Geophysical QC Reports			n/a – QC reports were submitted by dataset/grid.
Seed Tracking Log	Yes	Yes	Submitted by the QC Geophysicist to USACE Geophysicist, met MQOs as stated in the QAPP.
Target Selection Technical Memo	Yes		Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist

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STEP 3: DOCUMENT DATA USABILITY, UPDATE CSM AND DRAW CONCLUSIONS		
Evaluation	**Yes/No**	**Comments (1)**
Have the relevant DQOs/MPCs for dynamic data been met?	Yes	
Can the dynamic data be used as intended?	Yes	Significant areas of saturated response were encountered, which affected the number of point targets that could be selected for cued investigation.
Are there limitations on dynamic data use?	No	
Is there new information to be added to the CSM and, if so, does the CSM need to be updated?	No	
STEP 4: DOCUMENT LESSONS LEARNED AND MAKE RECOMMENDATIONS		
Evaluation	**Yes/No**	**Comments (1)**
Should the DQOs, MPCs, or sampling design be updated for future delivery units?	No	
Are there other recommendations for future delivery units?	No	

3 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) for Quality Assurance Project Plan (QAPP), Military Munitions Response Program Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York*.

ANJV, 2020. *EM61 Target Selection Technical Memorandum*, *Remedial Investigation, Iona Island Naval Ammunition Depot*

ANJV, 2020. *Instrument Verification Strip Memorandum (EM61)*, *Remedial Investigation, Iona Island Naval Ammunition Depot*

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Final DGM Target List

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Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-1	P-DGM-10001	585482.80	4572705.30	45.4	30.2	16.7	7.9	Point	FALSE
DGM-1	P-DGM-10002	585484.60	4572704.00	28.4	19.1	10.7	5.2	Point	FALSE
DGM-1	P-DGM-10003	585485.20	4572704.00	25.1	17.1	9.5	4.5	Point	FALSE
DGM-1	P-DGM-10004	585482.90	4572704.30	21.5	15.2	8.7	4.2	Point	FALSE
DGM-1	P-DGM-10005	585484.60	4572703.40	15.7	10.5	6.1	2.9	Point	FALSE
DGM-2	P-DGM-20001	585773.10	4572889.50	3092.3	2118.9	1256.0	674.8	Point	FALSE
DGM-2	P-DGM-20002	585773.30	4572889.00	3032.2	2090.0	1239.2	655.5	Point	FALSE
DGM-2	P-DGM-20003	585762.60	4572892.10	1013.7	813.5	523.0	254.6	Point	FALSE
DGM-2	P-DGM-20004	585769.40	4572892.00	790.2	574.0	360.8	203.7	Point	FALSE
DGM-2	P-DGM-20005	585769.87	4572892.66	655.2	473.3	283.0	165.2	Tiling	FALSE
DGM-2	P-DGM-20006	585790.10	4572870.10	314.3	211.4	114.4	48.0	Point	FALSE
DGM-2	P-DGM-20007	585770.50	4572893.30	293.7	205.0	120.1	66.5	Point	FALSE
DGM-2	P-DGM-20008	585770.21	4572891.38	276.8	198.8	122.8	71.0	Tiling	FALSE
DGM-2	P-DGM-20010	585772.10	4572887.50	229.1	142.6	68.0	21.9	Point	FALSE
DGM-2	P-DGM-20011	585776.40	4572891.20	196.7	142.6	89.3	53.4	Point	FALSE
DGM-2	P-DGM-20012	585761.30	4572888.20	183.8	138.9	89.7	54.0	Point	FALSE
DGM-2	P-DGM-20013	585798.00	4572877.50	177.1	129.1	80.8	47.6	Point	FALSE
DGM-2	P-DGM-20014	585782.00	4572887.00	185.7	119.5	63.1	30.4	Point	FALSE
DGM-2	P-DGM-20015	585801.80	4572876.70	179.2	115.5	60.6	26.4	Point	FALSE
DGM-2	P-DGM-20016	585769.77	4572890.64	145.4	104.8	65.2	38.0	Tiling	FALSE
DGM-2	P-DGM-20017	585779.90	4572888.30	137.7	98.2	61.2	36.0	Point	FALSE
DGM-2	P-DGM-20018	585779.20	4572887.90	140.3	98.0	59.2	34.5	Point	FALSE
DGM-2	P-DGM-20019	585794.30	4572871.20	131.6	94.4	58.9	34.2	Point	FALSE
DGM-2	P-DGM-20020	585800.60	4572875.20	126.8	91.5	56.3	32.7	Point	FALSE
DGM-2	P-DGM-20022	585768.60	4572886.70	107.1	73.9	45.2	27.5	Point	FALSE
DGM-2	P-DGM-20024	585769.30	4572886.60	103.9	72.5	42.6	21.7	Point	FALSE
DGM-2	P-DGM-20025	585793.60	4572871.20	99.0	72.2	46.6	26.8	Point	FALSE
DGM-2	P-DGM-20026	585777.40	4572887.30	101.5	69.5	40.3	22.2	Point	FALSE
DGM-2	P-DGM-20028	585793.70	4572877.30	93.6	66.9	41.2	23.6	Point	FALSE
DGM-2	P-DGM-20030	585777.50	4572892.50	94.3	64.4	36.2	16.2	Point	FALSE
DGM-2	P-DGM-20031	585766.90	4572887.80	104.2	64.4	32.2	14.1	Point	FALSE
DGM-2	P-DGM-20032	585775.60	4572889.00	86.5	61.0	34.2	14.7	Point	FALSE
DGM-2	P-DGM-20033	585776.50	4572890.10	85.6	60.6	36.3	20.8	Point	FALSE
DGM-2	P-DGM-20034	585762.10	4572888.70	81.7	59.9	36.7	20.7	Point	FALSE
DGM-2	P-DGM-20035	585774.90	4572888.30	83.9	59.2	34.1	14.8	Point	FALSE
DGM-2	P-DGM-20036	585772.20	4572891.30	90.6	58.6	30.5	13.5	Point	FALSE
DGM-2	P-DGM-20037	585774.40	4572880.80	85.3	57.9	34.1	17.8	Point	FALSE
DGM-2	P-DGM-20039	585771.90	4572892.00	91.2	57.1	28.9	12.8	Point	FALSE
DGM-2	P-DGM-20040	585768.00	4572884.80	81.3	57.0	32.2	14.3	Point	FALSE
DGM-2	P-DGM-20041	585777.00	4572892.70	85.4	56.2	29.8	13.3	Point	FALSE
DGM-2	P-DGM-20042	585770.70	4572882.90	76.9	53.9	31.0	14.3	Point	FALSE
DGM-2	P-DGM-20043	585773.80	4572881.30	80.3	53.1	30.6	15.8	Point	FALSE
DGM-2	P-DGM-20044	585797.80	4572880.60	51.5	48.8	28.0	5.0	Point	FALSE
DGM-2	P-DGM-20045	585795.10	4572883.30	67.2	46.8	27.8	14.8	Point	FALSE
DGM-2	P-DGM-20046	585794.00	4572870.10	63.6	45.3	27.2	15.1	Point	FALSE
DGM-2	P-DGM-20047	585770.00	4572886.20	63.8	43.9	24.8	11.3	Point	FALSE
DGM-2	P-DGM-20048	585769.60	4572888.20	61.4	41.3	24.3	14.3	Point	FALSE
DGM-2	P-DGM-20049	585764.20	4572890.00	62.5	41.0	21.7	9.3	Point	FALSE
DGM-2	P-DGM-20050	585798.68	4572878.32	57.1	40.4	24.6	14.3	Tiling	FALSE
DGM-2	P-DGM-20051	585775.00	4572885.20	56.1	40.1	22.5	9.6	Point	FALSE
DGM-2	P-DGM-20052	585768.50	4572889.00	62.8	39.8	22.1	11.4	Point	FALSE
DGM-2	P-DGM-20053	585795.70	4572877.20	74.7	39.2	11.7	2.7	Point	FALSE
DGM-2	P-DGM-20054	585762.14	4572888.06	54.1	37.9	22.5	11.7	Tiling	FALSE
DGM-2	P-DGM-20055	585771.32	4572891.33	56.2	37.5	21.3	9.4	Tiling	FALSE
DGM-2	P-DGM-20056	585794.40	4572877.70	53.3	36.9	22.0	13.0	Point	FALSE
DGM-2	P-DGM-20057	585777.10	4572889.50	53.3	36.0	20.8	11.6	Point	FALSE
DGM-2	P-DGM-20058	585789.30	4572874.30	59.8	35.6	15.7	4.9	Point	FALSE
DGM-2	P-DGM-20059	585777.80	4572886.50	56.6	35.1	18.0	8.5	Point	FALSE
DGM-2	P-DGM-20060	585777.70	4572890.40	47.8	33.9	20.6	10.8	Point	FALSE
DGM-2	P-DGM-20061	585795.30	4572880.90	49.3	33.8	19.5	10.0	Point	FALSE
DGM-2	P-DGM-20062	585793.00	4572869.20	46.9	33.7	21.2	11.6	Point	FALSE
DGM-2	P-DGM-20063	585779.91	4572889.12	45.7	33.5	20.4	10.4	Tiling	FALSE
DGM-2	P-DGM-20064	585775.52	4572885.64	46.7	33.0	18.2	8.4	Tiling	FALSE
DGM-2	P-DGM-20066	585763.40	4572888.00	45.1	32.1	19.0	9.5	Point	FALSE
DGM-2	P-DGM-20067	585769.00	4572883.50	46.0	31.9	18.3	9.7	Point	FALSE
DGM-2	P-DGM-20068	585764.60	4572890.70	49.0	31.8	17.2	7.1	Point	FALSE
DGM-2	P-DGM-20069	585763.10	4572887.40	45.0	31.6	18.5	9.0	Point	FALSE
DGM-2	P-DGM-20070	585762.20	4572891.22	48.5	31.2	17.5	9.3	Tiling	FALSE
DGM-2	P-DGM-20071	585783.11	4572890.49	49.3	31.1	15.8	7.0	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-2	P-DGM-20072	585774.81	4572885.84	45.1	31.0	17.2	7.3	Tiling	FALSE
DGM-2	P-DGM-20074	585767.33	4572888.45	52.4	30.6	14.5	6.1	Tiling	FALSE
DGM-2	P-DGM-20075	585772.01	4572892.90	46.4	30.5	15.1	6.9	Tiling	FALSE
DGM-2	P-DGM-20076	585782.10	4572890.70	58.3	30.1	9.2	1.3	Point	FALSE
DGM-2	P-DGM-20077	585775.62	4572890.74	45.2	29.8	14.4	6.8	Tiling	FALSE
DGM-2	P-DGM-20078	585800.80	4572879.40	65.4	29.6	10.6	3.7	Point	FALSE
DGM-2	P-DGM-20079	585761.50	4572891.50	41.4	28.0	16.3	8.7	Point	FALSE
DGM-2	P-DGM-20080	585768.95	4572893.80	43.6	27.7	13.6	5.7	Tiling	FALSE
DGM-2	P-DGM-20081	585797.36	4572880.09	45.4	27.5	12.5	5.0	Tiling	FALSE
DGM-2	P-DGM-20082	585794.40	4572880.60	43.4	27.5	15.1	7.7	Point	FALSE
DGM-2	P-DGM-20083	585768.79	4572889.73	45.0	27.3	14.4	7.6	Tiling	FALSE
DGM-2	P-DGM-20084	585798.70	4572876.70	38.7	27.1	16.0	8.6	Point	FALSE
DGM-2	P-DGM-20085	585792.40	4572868.30	40.1	27.1	15.0	7.4	Point	FALSE
DGM-2	P-DGM-20086	585783.60	4572891.20	39.2	26.7	14.9	8.8	Point	FALSE
DGM-2	P-DGM-20087	585748.80	4572897.00	39.5	25.9	14.1	6.7	Point	FALSE
DGM-2	P-DGM-20088	585799.80	4572879.20	39.3	25.7	13.5	6.7	Point	FALSE
DGM-2	P-DGM-20089	585768.30	4572891.00	41.4	24.9	12.2	5.0	Point	FALSE
DGM-2	P-DGM-20090	585779.00	4572886.80	36.3	24.8	14.9	7.5	Point	FALSE
DGM-2	P-DGM-20091	585778.10	4572888.90	36.1	23.7	12.2	5.1	Point	FALSE
DGM-2	P-DGM-20092	585797.00	4572881.30	34.7	23.5	12.9	6.5	Point	FALSE
DGM-2	P-DGM-20093	585768.71	4572884.30	34.8	23.0	13.2	6.0	Tiling	FALSE
DGM-2	P-DGM-20094	585796.30	4572880.70	40.4	23.0	10.5	4.8	Point	FALSE
DGM-2	P-DGM-20095	585792.70	4572876.70	52.6	21.4	4.4	0.1	Point	FALSE
DGM-2	P-DGM-20096	585800.25	4572878.84	32.6	21.3	12.1	6.0	Tiling	FALSE
DGM-2	P-DGM-20097	585792.00	4572871.00	30.2	20.7	12.4	6.3	Point	FALSE
DGM-2	P-DGM-20098	585789.98	4572874.13	32.3	20.7	11.2	4.4	Tiling	FALSE
DGM-2	P-DGM-20100	585787.20	4572871.60	28.0	20.1	12.8	7.5	Point	FALSE
DGM-2	P-DGM-20101	585752.10	4572896.10	29.0	20.1	12.9	7.8	Point	FALSE
DGM-2	P-DGM-20102	585777.71	4572893.46	32.3	20.0	10.2	4.6	Tiling	FALSE
DGM-2	P-DGM-20103	585766.80	4572894.20	26.0	19.2	11.5	5.9	Point	FALSE
DGM-2	P-DGM-20104	585795.00	4572881.60	28.3	19.2	11.4	5.7	Point	FALSE
DGM-2	P-DGM-20105	585766.50	4572896.00	35.0	18.9	6.6	1.2	Point	FALSE
DGM-2	P-DGM-20106	585778.20	4572891.10	28.4	18.3	10.5	5.1	Point	FALSE
DGM-2	P-DGM-20107	585773.50	4572894.10	28.0	17.7	9.1	4.5	Point	FALSE
DGM-2	P-DGM-20108	585789.89	4572874.74	28.1	17.1	7.2	2.0	Tiling	FALSE
DGM-2	P-DGM-20111	585795.70	4572876.00	23.1	17.0	10.0	5.5	Point	FALSE
DGM-2	P-DGM-20113	585794.80	4572875.30	23.6	16.1	9.5	5.8	Point	FALSE
DGM-2	P-DGM-20114	585773.50	4572890.90	26.3	16.0	8.0	3.4	Point	FALSE
DGM-2	P-DGM-20115	585793.60	4572875.40	26.8	15.8	6.1	1.3	Point	FALSE
DGM-2	P-DGM-20116	585795.75	4572882.69	24.7	15.5	8.7	3.7	Tiling	FALSE
DGM-2	P-DGM-20117	585792.35	4572869.05	21.5	14.7	8.4	4.3	Tiling	FALSE
DGM-2	P-DGM-20119	585771.10	4572885.40	28.0	14.3	6.2	2.2	Point	FALSE
DGM-2	P-DGM-20120	585770.64	4572887.51	23.2	14.3	8.1	3.9	Tiling	FALSE
DGM-2	P-DGM-20122	585749.61	4572897.25	21.3	14.1	7.5	3.7	Tiling	FALSE
DGM-2	P-DGM-20123	585797.28	4572882.13	19.2	13.8	8.1	3.1	Tiling	FALSE
DGM-2	P-DGM-20124	585772.40	4572893.80	20.6	13.2	6.2	2.9	Point	FALSE
DGM-2	P-DGM-20125	585769.12	4572885.07	21.1	13.1	7.3	3.1	Tiling	FALSE
DGM-2	P-DGM-20126	585768.00	4572895.50	22.6	13.1	5.3	2.0	Point	FALSE
DGM-2	P-DGM-20129	585762.32	4572893.15	18.7	12.6	8.2	4.2	Tiling	FALSE
DGM-2	P-DGM-20130	585784.40	4572890.50	17.7	12.5	7.3	4.5	Point	FALSE
DGM-2	P-DGM-20131	585775.47	4572886.41	19.8	12.4	6.8	3.0	Tiling	FALSE
DGM-2	P-DGM-20132	585795.70	4572872.20	19.0	12.2	6.9	3.4	Point	FALSE
DGM-2	P-DGM-20133	585779.91	4572890.14	21.2	12.1	5.7	2.6	Tiling	FALSE
DGM-2	P-DGM-20134	585778.60	4572894.00	17.5	11.6	5.8	2.4	Point	FALSE
DGM-2	P-DGM-20135	585793.20	4572881.20	23.9	11.6	4.5	1.3	Point	FALSE
DGM-2	P-DGM-20137	585780.70	4572886.20	19.6	11.4	5.8	2.8	Point	FALSE
DGM-2	P-DGM-20138	585781.31	4572891.57	18.9	11.2	4.4	0.6	Point	FALSE
DGM-2	P-DGM-20139	585793.60	4572872.70	26.5	11.0	2.6	0.2	Point	FALSE
DGM-2	P-DGM-20140	585791.50	4572877.40	32.7	10.7	0.2	-1.0	Point	FALSE
DGM-2	P-DGM-20141	585766.50	4572894.90	14.1	10.3	5.9	2.6	Point	FALSE
DGM-2	P-DGM-20142	585766.40	4572893.34	14.6	10.1	6.3	3.0	Tiling	FALSE
DGM-2	P-DGM-20143	585780.80	4572891.00	16.5	9.5	4.3	0.3	Point	FALSE
DGM-2	P-DGM-20144	585792.50	4572872.00	12.4	9.1	5.8	3.8	Point	FALSE
DGM-2	P-DGM-20145	585775.00	4572896.30	17.9	9.1	1.9	-0.7	Point	FALSE
DGM-2	P-DGM-20147	585788.60	4572875.40	14.7	8.5	3.7	1.1	Point	FALSE
DGM-2	P-DGM-20148	585776.70	4572884.50	15.4	8.0	2.8	0.4	Point	FALSE
DGM-2	P-DGM-20151	585780.63	4572889.64	13.4	7.3	4.3	2.0	Tiling	FALSE
DGM-2	P-DGM-20153	585772.20	4572885.70	19.4	7.2	2.0	0.5	Point	FALSE
DGM-2	P-DGM-20154	585763.10	4572889.50	12.1	7.2	4.5	2.0	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-2	P-DGM-20155	585746.20	4572901.00	11.9	7.0	3.0	1.3	Point	FALSE
DGM-2	P-DGM-20156	585794.45	4572872.93	14.3	6.8	2.7	0.8	Tiling	FALSE
DGM-2	P-DGM-20157	585795.61	4572871.30	11.0	6.7	3.1	1.3	Tiling	FALSE
DGM-2	P-DGM-20158	585793.60	4572874.50	10.6	6.6	3.9	2.0	Point	FALSE
DGM-2	P-DGM-20159	585770.87	4572884.46	9.5	6.5	4.1	1.4	Tiling	FALSE
DGM-2	P-DGM-20160	585776.10	4572881.10	11.2	6.3	2.6	0.7	Point	FALSE
DGM-2	P-DGM-20161	585774.80	4572886.90	11.5	6.0	3.7	1.6	Point	FALSE
DGM-2	P-DGM-20162	585740.82	4572900.20	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-2	P-DGM-20163	585774.88	4572877.91	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-2	P-DGM-20164	585739.20	4572901.89	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-2	P-DGM-20165	585798.87	4572882.29	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-2	P-DGM-20166	585795.49	4572879.96	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-3	P-DGM-30001	585576.51	4573161.98	743.7	478.8	243.1	92.4	Point	FALSE
DGM-3	P-DGM-30002	585579.40	4573162.40	312.7	232.0	147.2	87.6	Point	FALSE
DGM-3	P-DGM-30004	585579.10	4573163.30	226.2	167.5	104.8	63.5	Point	FALSE
DGM-3	P-DGM-30005	585557.10	4573153.00	198.3	145.3	91.1	56.2	Point	FALSE
DGM-3	P-DGM-30006	585580.10	4573162.90	189.0	140.1	89.9	55.1	Point	FALSE
DGM-3	P-DGM-30007	585556.68	4573152.44	147.2	106.4	68.1	41.0	Tiling	FALSE
DGM-3	P-DGM-30008	585562.96	4573166.37	152.1	93.9	45.4	16.1	Point	FALSE
DGM-3	P-DGM-30010	585559.50	4573144.80	121.2	85.7	50.6	27.6	Point	FALSE
DGM-3	P-DGM-30011	585558.80	4573152.90	111.9	72.7	38.3	18.3	Point	FALSE
DGM-3	P-DGM-30012	585556.27	4573153.04	95.2	70.8	47.6	27.9	Tiling	FALSE
DGM-3	P-DGM-30013	585563.69	4573166.72	108.1	67.5	32.4	12.1	Tiling	FALSE
DGM-3	P-DGM-30015	585565.60	4573163.80	70.9	53.6	34.7	21.5	Point	FALSE
DGM-3	P-DGM-30016	585562.72	4573167.12	78.8	49.3	23.2	8.4	Tiling	FALSE
DGM-3	P-DGM-30017	585559.50	4573145.55	78.7	48.5	23.8	10.6	Tiling	FALSE
DGM-3	P-DGM-30018	585565.20	4573163.10	63.8	46.7	28.7	17.6	Point	FALSE
DGM-3	P-DGM-30019	585575.90	4573160.80	67.2	46.5	25.3	13.1	Point	FALSE
DGM-3	P-DGM-30020	585566.70	4573164.90	63.6	40.5	21.2	9.2	Point	FALSE
DGM-3	P-DGM-30021	585579.45	4573158.71	55.8	39.8	23.4	13.3	Point	FALSE
DGM-3	P-DGM-30022	585563.70	4573165.70	61.7	38.9	19.3	7.2	Point	FALSE
DGM-3	P-DGM-30023	585566.80	4573163.90	60.4	38.5	19.7	8.8	Point	FALSE
DGM-3	P-DGM-30024	585578.50	4573159.70	58.9	37.3	19.5	8.6	Point	FALSE
DGM-3	P-DGM-30026	585579.47	4573161.36	51.7	36.1	20.1	8.5	Point	FALSE
DGM-3	P-DGM-30027	585556.60	4573155.40	55.8	35.4	18.6	8.5	Point	FALSE
DGM-3	P-DGM-30028	585580.16	4573159.40	48.0	33.6	19.8	10.9	Point	FALSE
DGM-3	P-DGM-30029	585556.70	4573154.10	45.7	33.0	20.9	13.2	Point	FALSE
DGM-3	P-DGM-30030	585564.90	4573165.70	52.0	32.2	15.4	6.4	Point	FALSE
DGM-3	P-DGM-30032	585566.30	4573165.80	52.2	31.7	14.8	5.8	Point	FALSE
DGM-3	P-DGM-30033	585564.80	4573163.50	43.3	31.5	19.4	11.4	Point	FALSE
DGM-3	P-DGM-30034	585581.00	4573159.60	48.5	31.0	16.6	7.7	Point	FALSE
DGM-3	P-DGM-30035	585561.10	4573143.20	39.8	29.9	17.0	9.7	Point	FALSE
DGM-3	P-DGM-30036	585565.40	4573166.20	47.7	29.5	13.7	5.5	Point	FALSE
DGM-3	P-DGM-30037	585579.84	4573169.22	44.4	29.3	15.9	7.8	Point	FALSE
DGM-3	P-DGM-30039	585557.20	4573155.90	47.8	28.0	13.4	4.6	Point	FALSE
DGM-3	P-DGM-30040	585555.90	4573155.70	43.9	27.3	13.9	5.9	Point	FALSE
DGM-3	P-DGM-30041	585561.70	4573142.90	40.0	26.1	14.5	7.4	Point	FALSE
DGM-3	P-DGM-30042	585580.67	4573160.03	37.8	24.9	13.7	6.2	Tiling	FALSE
DGM-3	P-DGM-30044	585564.03	4573164.89	37.0	23.3	12.3	5.2	Tiling	FALSE
DGM-3	P-DGM-30045	585579.90	4573164.20	39.0	22.7	10.6	3.7	Point	FALSE
DGM-3	P-DGM-30047	585577.90	4573163.10	32.8	20.7	10.0	4.1	Point	FALSE
DGM-3	P-DGM-30048	585559.70	4573140.10	33.9	20.5	7.9	1.0	Point	FALSE
DGM-3	P-DGM-30049	585558.37	4573152.51	34.7	19.9	10.3	4.8	Tiling	FALSE
DGM-3	P-DGM-30050	585563.40	4573168.60	28.4	19.7	10.1	4.5	Point	FALSE
DGM-3	P-DGM-30052	585562.40	4573142.60	28.7	17.8	8.2	3.2	Point	FALSE
DGM-3	P-DGM-30053	585557.70	4573154.40	32.1	17.2	8.7	3.1	Point	FALSE
DGM-3	P-DGM-30054	585578.85	4573160.66	24.0	17.1	8.8	3.8	Tiling	FALSE
DGM-3	P-DGM-30055	585562.50	4573168.10	23.5	16.3	9.3	4.0	Point	FALSE
DGM-3	P-DGM-30056	585564.43	4573166.17	25.1	15.7	8.5	3.0	Tiling	FALSE
DGM-3	P-DGM-30057	585574.40	4573160.80	20.9	14.7	7.5	2.5	Point	FALSE
DGM-3	P-DGM-30058	585580.31	4573163.77	24.8	14.6	6.9	3.3	Tiling	FALSE
DGM-3	P-DGM-30059	585576.60	4573159.00	27.6	14.6	4.9	0.7	Point	FALSE
DGM-3	P-DGM-30060	585567.90	4573166.80	19.9	14.5	8.3	3.4	Point	FALSE
DGM-3	P-DGM-30061	585577.91	4573162.39	25.5	14.3	6.7	1.7	Tiling	FALSE
DGM-3	P-DGM-30062	585572.30	4573168.10	19.9	13.9	8.1	4.4	Point	FALSE
DGM-3	P-DGM-30063	585565.76	4573165.38	23.0	13.8	6.7	2.5	Tiling	FALSE
DGM-3	P-DGM-30064	585565.30	4573167.20	21.2	13.8	7.0	3.2	Point	FALSE
DGM-3	P-DGM-30065	585578.58	4573161.55	21.1	13.5	7.6	3.1	Tiling	FALSE
DGM-3	P-DGM-30066	585557.60	4573149.60	19.1	12.6	6.8	3.1	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-3	P-DGM-30067	585566.50	4573158.10	22.5	12.0	4.8	1.5	Point	FALSE
DGM-3	P-DGM-30068	585571.10	4573163.20	17.4	11.4	5.9	2.3	Point	FALSE
DGM-3	P-DGM-30070	585558.30	4573153.90	21.2	10.9	4.2	2.0	Point	FALSE
DGM-3	P-DGM-30072	585574.20	4573159.90	14.2	9.9	5.2	2.0	Point	FALSE
DGM-3	P-DGM-30073	585567.00	4573157.50	19.6	9.5	3.0	-0.3	Point	FALSE
DGM-3	P-DGM-30074	585571.80	4573169.10	13.4	9.4	4.9	2.6	Point	FALSE
DGM-3	P-DGM-30077	585572.70	4573168.60	12.6	8.7	5.0	2.8	Point	FALSE
DGM-3	P-DGM-30079	585568.10	4573165.90	11.8	8.6	4.1	1.7	Point	FALSE
DGM-3	P-DGM-30080	585567.80	4573157.40	16.7	8.6	3.1	0.7	Point	FALSE
DGM-3	P-DGM-30081	585558.10	4573150.30	12.8	8.4	5.3	2.9	Point	FALSE
DGM-3	P-DGM-30082	585570.00	4573159.90	15.9	8.1	3.5	1.2	Point	FALSE
DGM-3	P-DGM-30083	585573.10	4573159.00	15.7	8.0	1.8	0.3	Point	FALSE
DGM-3	P-DGM-30085	585560.80	4573169.00	11.9	7.8	3.5	1.5	Point	FALSE
DGM-3	P-DGM-30086	585580.57	4573160.78	11.6	7.6	3.9	1.8	Tiling	FALSE
DGM-3	P-DGM-30087	585564.40	4573167.20	12.6	7.3	3.4	1.3	Point	FALSE
DGM-3	P-DGM-30088	585568.30	4573167.60	9.7	6.9	2.9	0.9	Point	FALSE
DGM-3	P-DGM-30089	585574.63	4573161.62	10.9	6.8	3.7	1.9	Tiling	FALSE
DGM-3	P-DGM-30090	585577.30	4573168.60	8.9	6.7	3.2	1.0	Point	FALSE
DGM-3	P-DGM-30091	585557.80	4573151.00	12.2	6.6	2.8	1.3	Point	FALSE
DGM-3	P-DGM-30092	585557.20	4573147.40	14.7	6.5	1.1	-0.5	Point (possible noise)	FALSE
DGM-3	P-DGM-30093	585571.07	4573164.35	10.1	6.5	3.3	0.8	Point	FALSE
DGM-3	P-DGM-30096	585562.39	4573137.46	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-4	P-DGM-40001	585929.00	4573037.70	116.1	77.7	39.4	14.3	Point	FALSE
DGM-4	P-DGM-40003	585924.40	4573042.80	90.5	59.0	32.0	15.9	Point	FALSE
DGM-4	P-DGM-40004	585940.00	4573045.00	75.0	54.6	33.4	20.0	Point	FALSE
DGM-4	P-DGM-40005	585940.80	4573044.30	61.5	45.5	28.5	16.6	Point	FALSE
DGM-4	P-DGM-40006	585923.93	4573042.51	66.5	43.5	23.0	11.7	Tiling	FALSE
DGM-4	P-DGM-40007	585937.14	4573041.09	49.1	36.7	22.5	13.6	Point	FALSE
DGM-4	P-DGM-40008	585934.90	4573027.00	43.1	26.6	12.3	4.2	Point	FALSE
DGM-4	P-DGM-40009	585926.70	4573039.40	83.8	24.9	2.8	0.3	Point	FALSE
DGM-4	P-DGM-40010	585927.70	4573037.70	38.3	24.7	12.6	4.4	Point	FALSE
DGM-4	P-DGM-40011	585936.60	4573024.00	32.6	23.6	14.8	9.1	Point	FALSE
DGM-4	P-DGM-40012	585935.90	4573027.10	37.0	22.7	10.2	3.4	Point	FALSE
DGM-4	P-DGM-40013	585937.70	4573029.20	38.3	19.4	6.1	1.2	Point	FALSE
DGM-4	P-DGM-40014	585937.60	4573022.70	28.0	18.8	9.6	3.1	Point	FALSE
DGM-4	P-DGM-40015	585934.60	4573039.80	28.4	17.3	8.9	4.3	Point	FALSE
DGM-4	P-DGM-40016	585928.53	4573036.90	25.9	16.7	8.1	3.4	Tiling	FALSE
DGM-4	P-DGM-40018	585938.04	4573026.30	25.4	16.1	8.3	2.8	Point	FALSE
DGM-4	P-DGM-40020	585941.90	4573041.40	24.2	15.5	8.2	3.7	Point	FALSE
DGM-4	P-DGM-40021	585924.81	4573041.76	47.0	15.5	1.9	0.1	Tiling	FALSE
DGM-4	P-DGM-40022	585920.60	4573022.20	25.0	15.3	7.2	3.6	Point	FALSE
DGM-4	P-DGM-40023	585934.00	4573040.00	24.5	15.2	7.6	3.6	Point	FALSE
DGM-4	P-DGM-40024	585933.20	4573039.70	31.1	14.3	3.8	0.8	Point	FALSE
DGM-4	P-DGM-40025	585927.60	4573021.20	19.3	14.0	7.6	3.9	Point	FALSE
DGM-4	P-DGM-40027	585924.80	4573024.80	20.3	13.8	7.6	3.9	Point	FALSE
DGM-4	P-DGM-40028	585937.83	4573025.60	22.7	13.7	6.3	2.2	Point	FALSE
DGM-4	P-DGM-40029	585924.40	4573024.10	30.2	13.6	4.2	1.0	Point	FALSE
DGM-4	P-DGM-40031	585933.57	4573040.46	24.4	11.5	3.9	1.2	Tiling	FALSE
DGM-4	P-DGM-40032	585920.70	4573035.10	132.5	11.1	1.4	0.6	Point	FALSE
DGM-4	P-DGM-40033	585942.27	4573040.87	17.1	11.1	5.8	2.5	Tiling	FALSE
DGM-4	P-DGM-40035	585937.60	4573023.40	16.2	11.0	6.1	1.9	Point	FALSE
DGM-4	P-DGM-40036	585925.70	4573021.50	17.0	10.7	5.5	2.6	Point	FALSE
DGM-4	P-DGM-40037	585934.82	4573028.74	20.2	10.2	3.2	0.5	Point	FALSE
DGM-4	P-DGM-40039	585936.60	4573023.20	13.2	10.0	6.3	3.9	Point	FALSE
DGM-4	P-DGM-40040	585924.70	4573045.30	14.7	9.7	4.5	1.7	Point	FALSE
DGM-4	P-DGM-40042	585937.60	4573045.40	14.3	9.1	4.1	1.4	Point	FALSE
DGM-4	P-DGM-40043	585923.40	4573039.30	26.6	8.9	-0.1	-0.7	Point	FALSE
DGM-4	P-DGM-40044	585919.90	4573021.60	13.0	8.8	3.7	2.0	Point	FALSE
DGM-4	P-DGM-40045	585925.60	4573045.20	12.2	8.7	4.2	1.6	Point	FALSE
DGM-4	P-DGM-40048	585923.50	4573022.90	14.6	8.1	3.3	0.5	Point	FALSE
DGM-4	P-DGM-40049	585914.00	4573026.70	13.4	8.1	4.1	1.5	Point	FALSE
DGM-4	P-DGM-40050	585928.40	4573021.50	13.5	7.9	2.8	1.1	Point	FALSE
DGM-4	P-DGM-40052	585936.40	4573028.00	12.4	7.7	3.3	0.9	Point	FALSE
DGM-4	P-DGM-40053	585928.90	4573043.70	12.5	7.5	3.2	1.3	Point	FALSE
DGM-4	P-DGM-40056	585932.50	4573026.00	10.2	7.2	3.4	1.5	Point	FALSE
DGM-4	P-DGM-40057	585925.30	4573022.50	10.5	7.1	3.3	1.0	Point	FALSE
DGM-4	P-DGM-40058	585939.50	4573046.50	10.2	7.1	3.5	1.3	Point	FALSE
DGM-4	P-DGM-40060	585942.70	4573025.80	9.7	6.9	4.3	2.7	Point	FALSE
DGM-4	P-DGM-40061	585914.00	4573025.90	12.0	6.9	3.6	1.5	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-4	P-DGM-40062	585914.80	4573018.90	9.4	6.9	4.1	1.1	Point	FALSE
DGM-4	P-DGM-40063	585938.60	4573030.00	10.6	6.8	4.5	2.6	Point	FALSE
DGM-4	P-DGM-40064	585927.02	4573020.80	11.2	6.8	3.1	0.9	Tiling	FALSE
DGM-4	P-DGM-40065	585943.10	4573046.90	10.1	6.8	3.6	1.0	Point	FALSE
DGM-4	P-DGM-40066	585942.10	4573025.20	10.3	6.6	3.5	2.0	Point	FALSE
DGM-4	P-DGM-40067	585925.60	4573018.40	8.9	6.4	3.3	2.2	Point	FALSE
DGM-4	P-DGM-40068	585921.20	4573021.70	9.8	6.3	2.1	0.5	Point	FALSE
DGM-4	P-DGM-40069	585928.50	4573042.80	9.3	6.3	3.2	1.1	Point	FALSE
DGM-4	P-DGM-40070	585914.20	4573018.40	9.0	6.3	3.0	1.1	Point	FALSE
DGM-4	P-DGM-40071	585930.30	4573040.90	9.5	6.2	2.8	1.0	Point	FALSE
DGM-4	P-DGM-40072	585916.60	4573034.60	8.9	6.2	4.2	2.3	Point	FALSE
DGM-4	P-DGM-40073	585929.50	4573040.70	13.8	6.1	1.6	-0.2	Point	FALSE
DGM-4	P-DGM-40075	585916.10	4573034.70	9.0	6.1	3.9	2.2	Point	FALSE
DGM-4	P-DGM-40076	585915.20	4573020.10	9.3	6.0	3.1	0.8	Point	FALSE
DGM-4	P-DGM-40077	585939.30	4573014.57	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-5	P-DGM-50001	585673.07	4572547.30	35.8	25.3	14.2	6.7	Point	FALSE
DGM-5	P-DGM-50002	585672.30	4572547.20	18.7	12.2	6.8	3.1	Point	FALSE
DGM-6	P-DGM-60005	585971.40	4572861.20	688.2	417.0	185.9	53.1	Point	FALSE
DGM-6	P-DGM-60006	585972.90	4572863.50	742.8	372.2	110.9	16.2	Point	FALSE
DGM-6	P-DGM-60007	585950.00	4572852.70	353.1	258.9	164.5	93.1	Point	FALSE
DGM-6	P-DGM-60008	585962.70	4572873.20	500.3	253.9	73.0	8.2	Point	FALSE
DGM-6	P-DGM-60009	585950.80	4572856.80	317.5	206.9	115.0	59.8	Point	FALSE
DGM-6	P-DGM-60010	585972.60	4572859.00	288.5	181.3	77.6	18.8	Point	FALSE
DGM-6	P-DGM-60011	585971.40	4572865.50	310.4	168.6	55.0	8.4	Point	FALSE
DGM-6	P-DGM-60012	585951.23	4572856.48	237.5	162.8	96.0	52.3	Tiling	FALSE
DGM-6	P-DGM-60013	585946.00	4572864.50	262.9	153.1	61.2	14.6	Point	FALSE
DGM-6	P-DGM-60014	585967.10	4572876.80	188.4	133.3	79.8	44.1	Point	FALSE
DGM-6	P-DGM-60015	585975.00	4572861.40	239.9	113.3	32.2	4.4	Point	FALSE
DGM-6	P-DGM-60016	585956.80	4572862.20	170.6	106.2	47.2	14.0	Point	FALSE
DGM-6	P-DGM-60017	585975.00	4572862.90	150.0	101.1	56.4	26.3	Point	FALSE
DGM-6	P-DGM-60018	585946.80	4572866.40	138.3	100.4	61.0	31.6	Point	FALSE
DGM-6	P-DGM-60019	585945.50	4572865.30	170.6	99.4	41.4	12.5	Point	FALSE
DGM-6	P-DGM-60020	585951.09	4572851.98	139.8	95.4	57.7	30.2	Tiling	FALSE
DGM-6	P-DGM-60021	585956.40	4572854.80	130.3	95.0	59.0	33.4	Point	FALSE
DGM-6	P-DGM-60022	585971.00	4572868.20	139.5	94.5	53.6	26.1	Point	FALSE
DGM-6	P-DGM-60024	585966.92	4572873.35	112.9	82.1	50.5	29.4	Point	FALSE
DGM-6	P-DGM-60025	585961.10	4572867.50	175.2	79.7	19.4	1.8	Point	FALSE
DGM-6	P-DGM-60027	585972.70	4572861.60	118.8	77.0	40.3	19.9	Point	FALSE
DGM-6	P-DGM-60028	585969.80	4572863.50	109.1	75.5	42.1	20.0	Point	FALSE
DGM-6	P-DGM-60029	585946.09	4572865.27	144.8	73.4	27.1	7.4	Tiling	FALSE
DGM-6	P-DGM-60030	585946.10	4572861.00	105.1	72.2	41.2	22.4	Point	FALSE
DGM-6	P-DGM-60031	585966.70	4572877.60	97.8	67.3	39.4	21.3	Point	FALSE
DGM-6	P-DGM-60032	585972.20	4572861.90	112.0	67.1	34.1	14.2	Point	FALSE
DGM-6	P-DGM-60033	585945.60	4572866.90	92.0	65.3	38.1	20.2	Point	FALSE
DGM-6	P-DGM-60034	585970.21	4572868.22	93.4	63.0	35.6	17.8	Tiling	FALSE
DGM-6	P-DGM-60035	585965.90	4572868.80	155.3	61.2	11.6	0.8	Point	FALSE
DGM-6	P-DGM-60036	585947.50	4572865.80	80.1	58.3	36.2	18.1	Point	FALSE
DGM-6	P-DGM-60037	585966.13	4572872.48	72.4	52.0	32.1	17.8	Point	FALSE
DGM-6	P-DGM-60038	585969.40	4572872.20	72.8	50.1	28.8	14.3	Point	FALSE
DGM-6	P-DGM-60039	585960.50	4572867.50	117.7	49.9	10.4	0.5	Point	FALSE
DGM-6	P-DGM-60040	585963.16	4572864.01	98.4	49.6	15.2	2.5	Tiling	FALSE
DGM-6	P-DGM-60041	585946.40	4572860.30	65.6	48.8	31.3	17.8	Point	FALSE
DGM-6	P-DGM-60042	585962.78	4572864.39	75.7	44.2	18.6	5.1	Point	FALSE
DGM-6	P-DGM-60043	585966.70	4572875.23	60.9	43.7	26.2	15.4	Point	FALSE
DGM-6	P-DGM-60044	585950.51	4572857.31	57.8	43.0	27.7	15.5	Tiling	FALSE
DGM-6	P-DGM-60045	585962.70	4572856.90	61.1	42.7	24.0	13.2	Point	FALSE
DGM-6	P-DGM-60046	585946.70	4572865.85	62.6	41.9	23.1	10.0	Tiling	FALSE
DGM-6	P-DGM-60047	585974.64	4572863.85	59.9	41.2	23.2	10.9	Tiling	FALSE
DGM-6	P-DGM-60048	585958.50	4572856.00	62.0	41.1	22.5	10.2	Point	FALSE
DGM-6	P-DGM-60049	585951.48	4572850.89	63.1	40.4	22.1	10.9	Tiling	FALSE
DGM-6	P-DGM-60051	585948.70	4572870.60	74.4	35.5	14.4	6.5	Point	FALSE
DGM-6	P-DGM-60052	585945.81	4572861.57	49.6	34.9	21.2	12.5	Tiling	FALSE
DGM-6	P-DGM-60053	585961.87	4572856.67	49.6	34.5	21.2	11.2	Point	FALSE
DGM-6	P-DGM-60054	585973.00	4572867.00	57.4	34.0	14.6	4.6	Point	FALSE
DGM-6	P-DGM-60055	585968.90	4572872.00	46.9	33.2	19.3	9.7	Point	FALSE
DGM-6	P-DGM-60056	585947.62	4572864.96	65.8	33.1	10.6	2.4	Point	FALSE
DGM-6	P-DGM-60057	585963.70	4572876.70	74.8	32.9	8.4	0.7	Point	FALSE
DGM-6	P-DGM-60058	585959.10	4572866.40	56.4	31.5	15.9	7.6	Point	FALSE
DGM-6	P-DGM-60059	585966.10	4572874.30	44.1	31.3	18.6	10.6	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-6	P-DGM-60060	585947.10	4572864.15	56.6	29.7	11.4	4.0	Tiling	FALSE
DGM-6	P-DGM-60061	585947.98	4572870.53	47.8	29.3	17.6	8.6	Tiling	FALSE
DGM-6	P-DGM-60062	585948.80	4572867.80	45.1	29.3	15.5	6.2	Point	FALSE
DGM-6	P-DGM-60063	585957.70	4572857.00	43.6	28.7	15.8	7.8	Point	FALSE
DGM-6	P-DGM-60064	585974.60	4572859.60	38.0	28.7	19.0	11.5	Point	FALSE
DGM-6	P-DGM-60065	585945.36	4572867.82	42.9	28.7	14.8	6.4	Tiling	FALSE
DGM-6	P-DGM-60066	585954.10	4572848.50	40.7	28.1	16.6	8.7	Point	FALSE
DGM-6	P-DGM-60067	585949.80	4572869.50	42.6	27.6	14.6	7.1	Point	FALSE
DGM-6	P-DGM-60068	585955.40	4572854.80	41.3	27.4	15.2	7.5	Point	FALSE
DGM-6	P-DGM-60069	585958.22	4572851.49	52.1	26.5	8.4	1.8	Point	FALSE
DGM-6	P-DGM-60070	585958.50	4572855.24	39.7	25.4	13.2	6.1	Tiling	FALSE
DGM-6	P-DGM-60071	585967.90	4572875.90	42.9	24.7	9.2	1.7	Point	FALSE
DGM-6	P-DGM-60072	585943.36	4572867.21	47.5	24.6	9.0	3.8	Point	FALSE
DGM-6	P-DGM-60073	585958.65	4572865.65	49.4	24.3	10.4	4.7	Tiling	FALSE
DGM-6	P-DGM-60074	585961.77	4572855.99	31.5	23.2	13.5	7.3	Tiling	FALSE
DGM-6	P-DGM-60075	585961.12	4572866.88	52.5	23.2	5.4	0.8	Tiling	FALSE
DGM-6	P-DGM-60076	585959.30	4572853.20	32.8	23.0	13.8	7.4	Point	FALSE
DGM-6	P-DGM-60077	585964.30	4572856.10	33.6	22.6	10.8	3.6	Point	FALSE
DGM-6	P-DGM-60078	585962.56	4572856.33	31.6	22.4	13.6	7.2	Tiling	FALSE
DGM-6	P-DGM-60079	585946.10	4572869.20	33.7	22.3	13.3	7.2	Point	FALSE
DGM-6	P-DGM-60080	585954.40	4572846.80	30.7	22.1	13.8	7.6	Point	FALSE
DGM-6	P-DGM-60081	585948.90	4572868.50	30.6	21.2	12.0	5.3	Point	FALSE
DGM-6	P-DGM-60082	585948.20	4572867.50	31.0	20.7	10.0	3.4	Point	FALSE
DGM-6	P-DGM-60084	585949.37	4572867.66	33.1	19.4	9.9	4.6	Tiling	FALSE
DGM-6	P-DGM-60085	585949.37	4572867.66	33.1	19.4	9.9	4.6	Tiling	FALSE
DGM-6	P-DGM-60086	585956.36	4572854.19	27.4	19.2	11.5	6.9	Tiling	FALSE
DGM-6	P-DGM-60087	585963.64	4572876.14	45.8	19.2	5.2	1.3	Tiling	FALSE
DGM-6	P-DGM-60088	585957.72	4572851.80	36.0	19.0	7.3	1.7	Tiling	FALSE
DGM-6	P-DGM-60089	585952.69	4572847.91	35.4	18.8	6.5	2.5	Tiling	FALSE
DGM-6	P-DGM-60090	585960.10	4572857.80	28.3	18.6	9.7	4.6	Point	FALSE
DGM-6	P-DGM-60091	585963.20	4572877.40	43.2	18.4	3.6	-0.3	Point	FALSE
DGM-6	P-DGM-60092	585962.30	4572858.00	25.2	18.3	11.5	6.4	Point	FALSE
DGM-6	P-DGM-60093	585944.46	4572868.89	25.0	17.9	12.1	6.9	Point	FALSE
DGM-6	P-DGM-60094	585958.90	4572857.50	27.0	17.7	9.5	4.0	Point	FALSE
DGM-6	P-DGM-60095	585948.40	4572859.10	29.0	17.6	7.1	2.2	Point	FALSE
DGM-6	P-DGM-60097	585948.42	4572868.82	27.0	16.6	8.3	3.7	Tiling	FALSE
DGM-6	P-DGM-60099	585945.60	4572870.10	24.2	16.6	10.7	7.0	Point	FALSE
DGM-6	P-DGM-60100	585943.46	4572867.96	29.9	16.1	6.4	1.7	Tiling	FALSE
DGM-6	P-DGM-60101	585948.38	4572858.42	25.7	16.0	8.4	4.1	Point	FALSE
DGM-6	P-DGM-60102	585959.80	4572849.70	21.9	15.9	10.3	5.8	Point	FALSE
DGM-6	P-DGM-60103	585954.16	4572856.53	23.0	15.9	8.3	4.5	Point	FALSE
DGM-6	P-DGM-60104	585975.44	4572865.56	23.0	15.9	9.8	6.0	Point	FALSE
DGM-6	P-DGM-60105	585968.20	4572863.20	22.7	15.6	10.8	6.3	Point	FALSE
DGM-6	P-DGM-60106	585960.30	4572848.70	20.6	15.4	10.3	5.1	Point	FALSE
DGM-6	P-DGM-60108	585960.80	4572849.30	22.0	15.0	8.2	3.7	Point	FALSE
DGM-6	P-DGM-60110	585973.52	4572859.14	23.6	14.7	7.9	3.9	Tiling	FALSE
DGM-6	P-DGM-60111	585967.60	4572856.30	20.0	14.6	9.0	5.5	Point	FALSE
DGM-6	P-DGM-60113	585965.92	4572868.25	31.2	14.5	4.5	0.7	Tiling	FALSE
DGM-6	P-DGM-60115	585967.40	4572855.70	18.9	13.9	9.2	5.4	Point	FALSE
DGM-6	P-DGM-60116	585975.60	4572859.30	18.9	13.8	8.8	5.6	Point	FALSE
DGM-6	P-DGM-60117	585958.40	4572853.10	20.8	13.8	8.2	4.2	Point	FALSE
DGM-6	P-DGM-60118	585953.94	4572847.71	18.8	13.6	7.2	4.1	Point	FALSE
DGM-6	P-DGM-60119	585972.50	4572855.60	26.2	13.6	5.8	2.2	Point	FALSE
DGM-6	P-DGM-60120	585949.77	4572853.64	20.6	13.6	8.0	4.3	Tiling	FALSE
DGM-6	P-DGM-60121	585949.30	4572864.10	21.7	13.4	6.6	2.4	Point	FALSE
DGM-6	P-DGM-60122	585947.50	4572867.20	18.5	13.3	6.1	1.3	Point	FALSE
DGM-6	P-DGM-60123	585947.60	4572869.40	37.0	13.3	3.9	1.3	Point	FALSE
DGM-6	P-DGM-60124	585959.99	4572864.67	20.6	12.7	6.4	2.3	Point	FALSE
DGM-6	P-DGM-60125	585964.70	4572852.00	22.2	12.6	6.3	2.7	Point	FALSE
DGM-6	P-DGM-60126	585969.90	4572865.90	29.9	12.4	3.0	0.6	Point	FALSE
DGM-6	P-DGM-60127	585978.18	4572860.48	22.7	12.3	4.1	0.3	Point	FALSE
DGM-6	P-DGM-60130	585964.60	4572851.40	24.7	11.8	4.9	1.7	Point	FALSE
DGM-6	P-DGM-60131	585963.50	4572863.20	18.9	11.7	6.5	3.4	Point	FALSE
DGM-6	P-DGM-60132	585956.71	4572858.13	16.1	11.6	7.1	3.3	Point	FALSE
DGM-6	P-DGM-60133	585965.19	4572862.33	15.9	11.5	7.0	3.3	Point	FALSE
DGM-6	P-DGM-60134	585963.80	4572854.80	17.5	11.5	5.3	1.5	Point	FALSE
DGM-6	P-DGM-60137	585968.40	4572868.00	21.3	11.0	4.2	1.3	Point	FALSE
DGM-6	P-DGM-60138	585973.70	4572865.90	26.4	11.0	2.4	0.3	Point	FALSE
DGM-6	P-DGM-60139	585963.79	4572872.76	16.8	10.9	6.0	3.9	Tiling	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-6	P-DGM-60140	585953.20	4572848.40	18.5	10.8	4.7	1.6	Point	FALSE
DGM-6	P-DGM-60141	585971.34	4572862.65	19.2	10.7	5.0	2.6	Tiling	FALSE
DGM-6	P-DGM-60142	585964.00	4572870.30	15.1	10.7	5.7	2.6	Point	FALSE
DGM-6	P-DGM-60143	585949.50	4572865.90	16.3	10.7	6.1	3.0	Point	FALSE
DGM-6	P-DGM-60144	585951.40	4572862.60	17.8	10.6	4.3	0.8	Point	FALSE
DGM-6	P-DGM-60145	585977.80	4572859.10	17.1	10.5	5.3	2.2	Point	FALSE
DGM-6	P-DGM-60146	585950.20	4572862.00	18.1	10.5	4.2	1.5	Point	FALSE
DGM-6	P-DGM-60147	585950.50	4572863.20	17.6	10.4	4.2	1.7	Point	FALSE
DGM-6	P-DGM-60148	585977.30	4572859.30	14.7	10.4	6.1	2.9	Point	FALSE
DGM-6	P-DGM-60151	585965.90	4572861.50	15.3	9.9	6.5	3.8	Point	FALSE
DGM-6	P-DGM-60152	585962.30	4572863.10	14.4	9.8	5.3	2.6	Point	FALSE
DGM-6	P-DGM-60153	585948.14	4572860.21	17.7	9.8	3.9	1.1	Point	FALSE
DGM-6	P-DGM-60154	585967.26	4572874.56	16.4	9.6	4.7	2.0	Tiling	FALSE
DGM-6	P-DGM-60155	585968.60	4572871.00	12.6	9.3	5.8	3.1	Point	FALSE
DGM-6	P-DGM-60156	585967.50	4572863.80	11.8	9.2	5.6	2.7	Point	FALSE
DGM-6	P-DGM-60157	585959.16	4572858.14	12.9	9.1	4.5	2.1	Tiling	FALSE
DGM-6	P-DGM-60158	585954.76	4572846.07	11.6	9.1	4.9	3.1	Tiling	FALSE
DGM-6	P-DGM-60159	585951.00	4572861.40	16.3	9.0	2.7	0.6	Point	FALSE
DGM-6	P-DGM-60160	585968.40	4572863.80	14.1	8.9	6.3	3.1	Point	FALSE
DGM-6	P-DGM-60161	585950.50	4572862.60	16.4	8.8	3.4	1.1	Point	FALSE
DGM-6	P-DGM-60163	585952.60	4572850.00	15.6	8.5	3.2	1.3	Point	FALSE
DGM-6	P-DGM-60164	585944.17	4572865.63	12.6	8.5	4.6	2.8	Tiling	FALSE
DGM-6	P-DGM-60166	585959.88	4572865.76	12.1	8.4	3.9	2.0	Tiling	FALSE
DGM-6	P-DGM-60167	585950.10	4572865.60	14.7	8.3	4.2	1.6	Point	FALSE
DGM-6	P-DGM-60168	585954.80	4572848.10	12.3	8.3	4.0	2.1	Point	FALSE
DGM-6	P-DGM-60169	585967.80	4572864.80	10.4	8.2	5.0	2.8	Point	FALSE
DGM-6	P-DGM-60170	585963.20	4572855.60	12.0	8.2	3.5	0.9	Point	FALSE
DGM-6	P-DGM-60171	585955.60	4572863.00	15.1	8.0	3.5	0.5	Point	FALSE
DGM-6	P-DGM-60172	585964.20	4572874.90	18.5	7.8	1.9	-0.1	Point	FALSE
DGM-6	P-DGM-60173	585949.70	4572858.10	12.6	7.8	4.0	1.8	Point	FALSE
DGM-6	P-DGM-60174	585961.30	4572852.50	17.7	7.7	1.8	0.0	Point	FALSE
DGM-6	P-DGM-60176	585974.20	4572860.37	30.8	7.5	1.8	0.6	Tiling	FALSE
DGM-6	P-DGM-60177	585952.00	4572855.80	11.3	7.3	4.1	1.6	Point	FALSE
DGM-6	P-DGM-60178	585962.04	4572858.61	9.8	7.2	3.8	2.4	Tiling	FALSE
DGM-6	P-DGM-60181	585955.20	4572863.90	10.1	7.1	4.2	2.5	Point	FALSE
DGM-6	P-DGM-60182	585960.10	4572852.50	10.6	7.1	4.2	2.2	Point	FALSE
DGM-6	P-DGM-60183	585967.00	4572853.60	11.8	7.1	2.6	0.8	Point	FALSE
DGM-6	P-DGM-60185	585967.50	4572854.20	11.0	7.0	3.0	0.8	Point	FALSE
DGM-6	P-DGM-60186	585967.90	4572874.10	10.6	6.8	3.8	1.6	Point	FALSE
DGM-6	P-DGM-60187	585960.50	4572850.00	10.0	6.8	3.9	1.8	Point	FALSE
DGM-6	P-DGM-60188	585949.40	4572870.90	31.4	6.7	-1.4	-1.4	Point	FALSE
DGM-6	P-DGM-60189	585953.60	4572862.10	9.8	6.6	3.9	1.5	Point	FALSE
DGM-6	P-DGM-60190	585972.40	4572868.80	9.0	6.5	3.5	1.6	Point	FALSE
DGM-6	P-DGM-60191	585961.60	4572850.40	9.6	6.5	3.7	1.7	Point	FALSE
DGM-6	P-DGM-60192	585952.40	4572850.90	8.8	6.4	3.1	1.8	Point	FALSE
DGM-6	P-DGM-60193	585975.90	4572857.60	10.2	6.4	3.2	0.8	Point (possible noise)	FALSE
DGM-6	P-DGM-60194	585948.50	4572862.20	11.6	6.4	2.7	1.0	Point	FALSE
DGM-6	P-DGM-60195	585966.20	4572871.30	9.3	6.2	2.8	1.0	Point	FALSE
DGM-6	P-DGM-60196	585951.70	4572860.70	10.5	6.2	2.0	0.1	Point	FALSE
DGM-6	P-DGM-60197	585964.70	4572873.20	12.9	6.1	2.7	1.7	Point	FALSE
DGM-6	P-DGM-60198	585939.59	4572867.28	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-7	P-DGM-70002	585589.60	4572943.40	1889.9	1289.2	741.4	377.0	Point	FALSE
DGM-7	P-DGM-70003	585590.23	4572942.51	801.8	570.4	312.3	154.9	Tiling	FALSE
DGM-7	P-DGM-70004	585586.10	4572950.90	759.2	462.8	204.5	65.4	Point	FALSE
DGM-7	P-DGM-70005	585605.80	4572935.50	674.9	452.5	254.5	122.8	Point	FALSE
DGM-7	P-DGM-70006	585586.07	4572951.52	613.8	361.5	172.1	50.8	Tiling	FALSE
DGM-7	P-DGM-70007	585589.80	4572937.80	437.3	321.8	200.7	114.3	Point	FALSE
DGM-7	P-DGM-70008	585591.00	4572957.40	357.7	251.5	151.3	75.9	Point	FALSE
DGM-7	P-DGM-70009	585593.70	4572945.20	334.1	227.1	127.1	58.0	Point	FALSE
DGM-7	P-DGM-70010	585596.30	4572961.40	340.1	222.2	120.8	55.6	Point	FALSE
DGM-7	P-DGM-70012	585585.60	4572941.80	264.7	198.9	129.6	77.9	Point	FALSE
DGM-7	P-DGM-70013	585591.50	4572956.70	278.4	195.8	115.3	57.7	Point	FALSE
DGM-7	P-DGM-70014	585592.40	4572951.60	289.9	184.0	94.7	40.6	Point	FALSE
DGM-7	P-DGM-70015	585590.46	4572938.16	243.9	180.6	115.7	70.6	Tiling	FALSE
DGM-7	P-DGM-70016	585584.80	4572942.40	236.5	176.4	113.6	69.1	Point	FALSE
DGM-7	P-DGM-70017	585596.81	4572960.68	228.8	151.4	79.4	38.0	Tiling	FALSE
DGM-7	P-DGM-70018	585602.50	4572953.60	213.7	143.4	80.0	41.0	Point	FALSE
DGM-7	P-DGM-70019	585586.81	4572939.25	213.7	142.7	79.8	39.8	Point	FALSE
DGM-7	P-DGM-70020	585591.10	4572954.70	169.3	106.7	54.1	22.1	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-7	P-DGM-70021	585589.20	4572933.70	159.4	102.2	53.3	25.1	Point	FALSE
DGM-7	P-DGM-70024	585586.80	4572961.40	150.3	90.5	42.1	14.4	Point	FALSE
DGM-7	P-DGM-70025	585592.87	4572945.06	133.6	89.3	48.8	22.2	Tiling	FALSE
DGM-7	P-DGM-70026	585589.50	4572948.60	124.9	87.8	53.4	29.9	Point	FALSE
DGM-7	P-DGM-70027	585590.50	4572958.60	126.5	86.8	50.2	26.1	Point	FALSE
DGM-7	P-DGM-70028	585596.50	4572942.70	120.9	86.8	52.0	29.2	Point	FALSE
DGM-7	P-DGM-70029	585606.60	4572940.80	162.5	84.4	29.0	5.7	Point	FALSE
DGM-7	P-DGM-70030	585588.30	4572935.80	191.1	83.9	20.6	3.3	Point	FALSE
DGM-7	P-DGM-70031	585607.70	4572942.80	140.5	83.8	40.5	15.1	Point	FALSE
DGM-7	P-DGM-70032	585588.40	4572942.10	112.7	82.5	52.8	32.4	Point	FALSE
DGM-7	P-DGM-70034	585586.50	4572956.80	128.0	78.7	33.4	9.6	Point	FALSE
DGM-7	P-DGM-70035	585605.70	4572940.80	151.5	74.4	24.5	5.0	Point	FALSE
DGM-7	P-DGM-70036	585609.30	4572940.50	100.8	71.3	42.2	22.8	Point	FALSE
DGM-7	P-DGM-70037	585586.10	4572955.60	105.6	70.2	38.3	17.1	Point	FALSE
DGM-7	P-DGM-70038	585585.20	4572955.10	98.8	69.9	41.9	25.0	Point	FALSE
DGM-7	P-DGM-70040	585597.20	4572961.42	107.7	69.3	35.1	15.0	Tiling	FALSE
DGM-7	P-DGM-70041	585597.20	4572961.42	107.7	69.3	35.1	15.0	Tiling	FALSE
DGM-7	P-DGM-70042	585585.60	4572935.00	95.6	69.1	41.8	24.1	Point	FALSE
DGM-7	P-DGM-70043	585613.80	4572935.00	94.9	68.9	43.2	25.3	Point	FALSE
DGM-7	P-DGM-70044	585594.61	4572945.62	112.9	68.7	28.6	7.9	Tiling	FALSE
DGM-7	P-DGM-70045	585587.30	4572946.40	96.8	66.4	37.7	20.0	Point	FALSE
DGM-7	P-DGM-70046	585593.72	4572951.67	119.5	64.8	25.5	7.9	Tiling	FALSE
DGM-7	P-DGM-70047	585602.40	4572935.50	98.1	63.5	33.6	15.2	Point	FALSE
DGM-7	P-DGM-70048	585586.90	4572936.20	99.3	62.4	28.3	8.5	Point	FALSE
DGM-7	P-DGM-70049	585594.20	4572936.60	85.7	62.1	38.3	21.8	Point	FALSE
DGM-7	P-DGM-70050	585589.20	4572947.00	95.0	61.6	31.0	13.9	Point	FALSE
DGM-7	P-DGM-70051	585602.80	4572935.00	94.1	60.6	32.6	14.4	Point	FALSE
DGM-7	P-DGM-70052	585604.30	4572948.90	82.7	60.5	36.7	20.8	Point	FALSE
DGM-7	P-DGM-70053	585594.30	4572959.20	88.8	59.8	34.0	15.6	Point	FALSE
DGM-7	P-DGM-70054	585593.40	4572957.10	94.3	58.9	30.6	14.0	Point	FALSE
DGM-7	P-DGM-70055	585608.90	4572940.10	86.3	58.6	33.5	17.4	Point	FALSE
DGM-7	P-DGM-70056	585604.60	4572949.40	80.3	58.3	36.4	20.5	Point	FALSE
DGM-7	P-DGM-70057	585585.60	4572954.30	82.2	57.5	33.8	18.0	Point	FALSE
DGM-7	P-DGM-70058	585595.10	4572957.40	84.8	57.1	31.0	12.7	Point	FALSE
DGM-7	P-DGM-70059	585595.10	4572958.40	82.4	55.8	31.4	13.7	Point	FALSE
DGM-7	P-DGM-70060	585592.40	4572941.70	83.4	55.0	28.9	13.7	Point	FALSE
DGM-7	P-DGM-70061	585589.21	4572938.77	74.9	53.7	34.1	18.5	Tiling	FALSE
DGM-7	P-DGM-70062	585592.30	4572940.90	79.0	52.5	29.0	13.7	Point	FALSE
DGM-7	P-DGM-70063	585588.30	4572955.40	73.7	51.8	31.2	17.5	Point	FALSE
DGM-7	P-DGM-70065	585589.20	4572955.20	71.2	49.6	29.7	17.5	Point	FALSE
DGM-7	P-DGM-70066	585587.50	4572935.10	66.1	49.4	32.8	20.3	Point	FALSE
DGM-7	P-DGM-70067	585589.60	4572939.60	65.4	47.8	28.9	17.9	Point	FALSE
DGM-7	P-DGM-70068	585592.30	4572954.10	70.0	46.5	25.9	12.1	Point	FALSE
DGM-7	P-DGM-70069	585587.00	4572941.30	63.8	45.8	27.0	15.1	Point	FALSE
DGM-7	P-DGM-70070	585588.00	4572939.10	62.8	43.9	25.7	14.2	Point	FALSE
DGM-7	P-DGM-70071	585594.70	4572944.00	68.2	43.6	21.9	9.4	Point	FALSE
DGM-7	P-DGM-70072	585603.80	4572936.30	68.5	43.2	21.9	9.7	Point	FALSE
DGM-7	P-DGM-70073	585612.92	4572934.85	59.7	42.8	27.9	17.3	Tiling	FALSE
DGM-7	P-DGM-70074	585587.10	4572946.90	59.8	40.5	23.5	11.5	Point	FALSE
DGM-7	P-DGM-70075	585595.60	4572941.00	56.7	40.3	25.0	14.8	Point	FALSE
DGM-7	P-DGM-70076	585585.10	4572937.20	57.9	40.3	21.7	8.2	Point	FALSE
DGM-7	P-DGM-70077	585613.23	4572935.57	56.2	40.1	24.8	15.0	Tiling	FALSE
DGM-7	P-DGM-70078	585585.30	4572945.70	68.0	39.7	15.9	4.4	Point	FALSE
DGM-7	P-DGM-70079	585593.30	4572961.80	60.9	38.6	19.8	8.7	Point	FALSE
DGM-7	P-DGM-70080	585592.90	4572939.30	57.7	38.5	22.2	10.8	Point	FALSE
DGM-7	P-DGM-70081	585608.08	4572942.22	59.7	38.3	21.5	9.1	Tiling	FALSE
DGM-7	P-DGM-70083	585586.80	4572948.90	72.6	37.8	13.4	2.9	Point	FALSE
DGM-7	P-DGM-70084	585586.40	4572942.60	76.6	37.7	11.0	1.7	Point	FALSE
DGM-7	P-DGM-70085	585592.80	4572937.80	75.4	36.9	13.2	5.7	Point	FALSE
DGM-7	P-DGM-70086	585585.99	4572934.23	51.8	36.8	23.2	13.5	Tiling	FALSE
DGM-7	P-DGM-70087	585606.80	4572938.10	77.1	36.2	9.9	1.1	Point	FALSE
DGM-7	P-DGM-70088	585592.60	4572961.90	55.3	36.2	20.2	9.5	Point	FALSE
DGM-7	P-DGM-70089	585592.80	4572938.60	53.4	35.3	20.4	10.9	Point	FALSE
DGM-7	P-DGM-70090	585611.80	4572936.00	86.9	34.7	8.1	1.5	Point	FALSE
DGM-7	P-DGM-70091	585599.20	4572948.10	46.4	33.9	21.4	12.3	Point	FALSE
DGM-7	P-DGM-70092	585585.90	4572937.70	46.2	33.2	18.3	7.6	Point	FALSE
DGM-7	P-DGM-70093	585595.90	4572933.90	54.3	33.0	16.0	6.0	Point	FALSE
DGM-7	P-DGM-70094	585612.40	4572936.30	83.6	32.6	6.6	0.5	Point	FALSE
DGM-7	P-DGM-70095	585596.90	4572942.30	47.3	32.5	20.3	9.6	Tiling	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-7	P-DGM-70096	585585.26	4572955.79	44.7	32.5	21.3	12.6	Tiling	FALSE
DGM-7	P-DGM-70097	585591.14	4572950.36	50.5	32.2	16.7	7.5	Point	FALSE
DGM-7	P-DGM-70098	585594.26	4572958.02	47.1	30.6	16.5	6.6	Tiling	FALSE
DGM-7	P-DGM-70099	585589.60	4572953.20	48.5	30.1	14.8	5.7	Point	FALSE
DGM-7	P-DGM-70100	585591.50	4572947.00	43.1	30.0	17.7	10.1	Point	FALSE
DGM-7	P-DGM-70101	585589.50	4572956.30	44.9	30.0	18.5	11.7	Point	FALSE
DGM-7	P-DGM-70102	585593.86	4572956.57	47.9	29.9	15.1	6.9	Tiling	FALSE
DGM-7	P-DGM-70103	585591.60	4572943.80	41.5	29.5	16.0	7.3	Point	FALSE
DGM-7	P-DGM-70105	585594.60	4572938.00	43.2	29.1	16.4	7.9	Point	FALSE
DGM-7	P-DGM-70106	585585.20	4572953.60	42.5	28.8	16.9	9.6	Point	FALSE
DGM-7	P-DGM-70107	585594.60	4572933.60	50.0	28.2	11.3	3.0	Point	FALSE
DGM-7	P-DGM-70108	585591.90	4572935.50	40.4	27.7	15.5	7.5	Point	FALSE
DGM-7	P-DGM-70109	585589.30	4572959.40	39.2	27.7	15.9	6.8	Point	FALSE
DGM-7	P-DGM-70111	585592.88	4572946.22	42.4	26.8	13.6	5.5	Tiling	FALSE
DGM-7	P-DGM-70112	585585.60	4572957.10	40.1	26.5	13.3	5.5	Point	FALSE
DGM-7	P-DGM-70113	585598.60	4572960.80	36.8	25.7	13.3	4.7	Point	FALSE
DGM-7	P-DGM-70114	585593.70	4572959.90	38.3	25.2	15.0	5.9	Tiling	FALSE
DGM-7	P-DGM-70115	585595.63	4572941.82	34.9	25.2	16.7	9.2	Tiling	FALSE
DGM-7	P-DGM-70116	585594.20	4572948.50	33.9	24.8	14.9	7.6	Point	FALSE
DGM-7	P-DGM-70117	585592.90	4572955.60	33.7	24.8	16.1	9.5	Point	FALSE
DGM-7	P-DGM-70119	585586.55	4572954.82	34.6	23.6	12.1	5.3	Tiling	FALSE
DGM-7	P-DGM-70120	585593.00	4572958.90	35.1	23.2	13.3	5.8	Point	FALSE
DGM-7	P-DGM-70121	585585.70	4572939.40	33.1	22.7	11.4	4.2	Point	FALSE
DGM-7	P-DGM-70122	585600.30	4572953.20	32.6	22.2	13.4	7.2	Point	FALSE
DGM-7	P-DGM-70125	585603.46	4572953.61	34.7	22.1	10.2	3.9	Tiling	FALSE
DGM-7	P-DGM-70126	585586.90	4572945.30	31.7	21.9	12.4	6.6	Point	FALSE
DGM-7	P-DGM-70127	585598.70	4572950.90	33.0	21.7	12.1	5.8	Point	FALSE
DGM-7	P-DGM-70128	585600.20	4572946.30	35.0	21.0	10.1	3.6	Point	FALSE
DGM-7	P-DGM-70129	585591.30	4572960.70	31.0	20.7	11.2	5.0	Point	FALSE
DGM-7	P-DGM-70131	585589.20	4572957.70	30.7	20.0	10.1	4.1	Point	FALSE
DGM-7	P-DGM-70132	585592.14	4572961.07	31.3	19.9	9.3	3.4	Tiling	FALSE
DGM-7	P-DGM-70133	585589.50	4572936.10	31.9	19.6	9.6	5.9	Point	FALSE
DGM-7	P-DGM-70134	585593.13	4572960.82	32.5	19.1	9.0	3.1	Tiling	FALSE
DGM-7	P-DGM-70135	585599.70	4572948.60	26.5	19.1	11.7	6.5	Point	FALSE
DGM-7	P-DGM-70136	585586.70	4572957.80	29.6	19.1	11.3	6.5	Point	FALSE
DGM-7	P-DGM-70137	585601.00	4572948.70	27.1	19.0	11.1	5.7	Point	FALSE
DGM-7	P-DGM-70138	585606.95	4572934.63	25.8	18.4	12.1	6.5	Tiling	FALSE
DGM-7	P-DGM-70139	585598.00	4572960.90	26.2	18.4	9.4	3.2	Point	FALSE
DGM-7	P-DGM-70140	585590.20	4572955.60	27.0	18.4	11.8	7.2	Point	FALSE
DGM-7	P-DGM-70141	585585.60	4572937.00	28.2	18.2	9.5	3.6	Point	FALSE
DGM-7	P-DGM-70142	585587.28	4572947.83	27.1	18.1	10.2	4.9	Tiling	FALSE
DGM-7	P-DGM-70143	585599.20	4572953.30	26.5	17.9	10.9	6.0	Point	FALSE
DGM-7	P-DGM-70144	585600.00	4572959.70	26.6	17.9	10.6	5.3	Point	FALSE
DGM-7	P-DGM-70145	585590.50	4572933.80	25.1	17.7	11.0	6.9	Point	FALSE
DGM-7	P-DGM-70146	585598.80	4572951.50	27.0	17.4	9.8	4.6	Point	FALSE
DGM-7	P-DGM-70147	585593.80	4572932.90	27.8	16.7	8.3	3.3	Point	FALSE
DGM-7	P-DGM-70149	585590.50	4572947.20	25.3	16.6	9.8	4.9	Point	FALSE
DGM-7	P-DGM-70150	585588.30	4572949.90	25.4	16.5	8.4	2.9	Point	FALSE
DGM-7	P-DGM-70153	585605.12	4572940.28	25.7	16.0	8.2	3.7	Tiling	FALSE
DGM-7	P-DGM-70154	585596.87	4572933.81	26.6	15.9	8.0	2.4	Tiling	FALSE
DGM-7	P-DGM-70155	585594.30	4572952.00	25.9	15.9	7.3	3.1	Tiling	FALSE
DGM-7	P-DGM-70156	585586.84	4572934.52	22.4	15.9	9.4	4.6	Tiling	FALSE
DGM-7	P-DGM-70157	585591.05	4572936.00	24.6	15.7	7.5	2.5	Tiling	FALSE
DGM-7	P-DGM-70158	585594.80	4572942.10	21.1	15.7	9.0	5.0	Point	FALSE
DGM-7	P-DGM-70159	585601.20	4572959.70	22.7	15.6	9.3	5.3	Point	FALSE
DGM-7	P-DGM-70160	585585.60	4572938.80	23.6	15.5	7.9	3.1	Point	FALSE
DGM-7	P-DGM-70161	585595.10	4572940.00	23.2	15.4	9.2	5.2	Point	FALSE
DGM-7	P-DGM-70162	585587.90	4572957.90	21.2	15.3	9.8	6.0	Point	FALSE
DGM-7	P-DGM-70163	585595.50	4572937.00	40.3	15.1	2.5	0.2	Point	FALSE
DGM-7	P-DGM-70164	585593.70	4572940.70	36.8	14.9	3.8	0.6	Point	FALSE
DGM-7	P-DGM-70165	585591.92	4572947.96	31.2	14.5	4.0	1.0	Tiling	FALSE
DGM-7	P-DGM-70168	585590.84	4572961.18	21.5	14.1	7.9	3.8	Tiling	FALSE
DGM-7	P-DGM-70170	585592.00	4572934.30	20.3	13.9	8.3	4.0	Point	FALSE
DGM-7	P-DGM-70171	585594.30	4572952.60	23.0	13.7	6.1	2.2	Point	FALSE
DGM-7	P-DGM-70172	585600.50	4572947.10	21.1	13.5	6.7	2.5	Point	FALSE
DGM-7	P-DGM-70173	585594.20	4572947.90	18.2	13.5	9.0	4.6	Point	FALSE
DGM-7	P-DGM-70174	585604.30	4572953.20	25.7	13.4	5.8	1.7	Point	FALSE
DGM-7	P-DGM-70175	585587.40	4572949.80	22.3	13.2	5.2	1.3	Point	FALSE
DGM-7	P-DGM-70177	585591.33	4572942.36	22.7	12.8	5.2	1.6	Tiling	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-7	P-DGM-70178	585612.50	4572941.00	19.1	12.7	5.3	1.2	Point	FALSE
DGM-7	P-DGM-70179	585610.00	4572934.90	20.1	12.2	6.1	2.6	Point	FALSE
DGM-7	P-DGM-70180	585590.15	4572935.70	19.8	12.0	5.9	2.4	Tiling	FALSE
DGM-7	P-DGM-70181	585608.00	4572948.90	17.7	12.0	7.3	4.2	Point	FALSE
DGM-7	P-DGM-70184	585593.75	4572938.13	16.9	11.6	7.4	4.0	Tiling	FALSE
DGM-7	P-DGM-70185	585598.40	4572947.70	15.5	11.4	6.7	3.9	Point	FALSE
DGM-7	P-DGM-70186	585602.10	4572958.10	16.3	11.0	6.8	3.7	Point	FALSE
DGM-7	P-DGM-70187	585607.50	4572948.20	15.5	10.6	6.3	3.6	Point	FALSE
DGM-7	P-DGM-70188	585587.40	4572955.67	17.3	10.5	4.5	1.4	Tiling	FALSE
DGM-7	P-DGM-70189	585586.03	4572945.18	17.8	10.5	4.3	1.5	Tiling	FALSE
DGM-7	P-DGM-70192	585593.90	4572953.40	17.0	10.3	4.4	1.1	Point	FALSE
DGM-7	P-DGM-70193	585596.40	4572951.20	17.1	10.2	4.4	2.0	Point	FALSE
DGM-7	P-DGM-70194	585587.20	4572937.50	13.2	10.1	4.2	1.5	Tiling	FALSE
DGM-7	P-DGM-70197	585602.60	4572958.50	13.0	9.6	5.9	3.4	Point	FALSE
DGM-7	P-DGM-70198	585592.90	4572934.51	17.2	9.4	4.3	1.5	Tiling	FALSE
DGM-7	P-DGM-70200	585604.80	4572957.50	15.6	9.3	3.6	0.9	Point	FALSE
DGM-7	P-DGM-70201	585613.00	4572941.50	13.7	9.2	3.5	1.0	Point	FALSE
DGM-7	P-DGM-70202	585585.33	4572940.85	15.3	9.1	4.5	1.9	Tiling	FALSE
DGM-7	P-DGM-70204	585593.70	4572935.10	16.0	9.0	4.2	1.7	Point	FALSE
DGM-7	P-DGM-70205	585595.92	4572933.02	14.3	8.8	5.3	2.5	Tiling	FALSE
DGM-7	P-DGM-70206	585590.53	4572946.47	12.3	8.7	5.2	2.7	Tiling	FALSE
DGM-7	P-DGM-70207	585606.00	4572947.70	13.3	8.7	3.7	1.3	Point	FALSE
DGM-7	P-DGM-70208	585604.50	4572962.50	16.4	8.5	2.7	0.6	Point	FALSE
DGM-7	P-DGM-70210	585586.00	4572944.50	11.5	8.1	5.4	3.3	Point	FALSE
DGM-7	P-DGM-70212	585593.33	4572941.67	15.4	7.8	2.4	0.5	Tiling	FALSE
DGM-7	P-DGM-70213	585594.70	4572963.40	11.2	7.7	4.3	2.1	Point	FALSE
DGM-7	P-DGM-70214	585586.39	4572947.97	14.3	7.6	2.8	0.7	Tiling	FALSE
DGM-7	P-DGM-70217	585602.60	4572957.70	10.2	7.5	4.1	2.3	Point	FALSE
DGM-7	P-DGM-70218	585588.90	4572962.50	10.5	7.4	3.7	1.5	Point	FALSE
DGM-7	P-DGM-70220	585605.20	4572943.50	20.5	7.2	1.2	0.2	Point	FALSE
DGM-7	P-DGM-70222	585585.60	4572936.10	13.2	6.8	3.2	1.3	Point	FALSE
DGM-7	P-DGM-70223	585599.70	4572954.60	9.9	6.8	4.2	2.2	Point	FALSE
DGM-7	P-DGM-70224	585593.40	4572943.50	8.6	6.5	3.8	2.3	Point	FALSE
DGM-7	P-DGM-70225	585603.60	4572962.20	12.5	6.5	2.6	0.3	Point	FALSE
DGM-7	P-DGM-70227	585605.21	4572952.87	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-7	P-DGM-70228	585583.89	4572965.24	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-8	P-DGM-80001	585423.30	4572839.90	122.1	85.3	47.7	23.2	Point	FALSE
DGM-8	P-DGM-80002	585421.50	4572835.90	102.7	72.5	43.0	22.1	Point	FALSE
DGM-8	P-DGM-80003	585421.45	4572837.05	16.2	11.4	6.7	3.8	Tiling	FALSE
DGM-9	P-DGM-90001	585857.50	4573010.40	290.7	174.0	78.3	27.5	Point	FALSE
DGM-9	P-DGM-90002	585861.00	4573013.10	226.3	142.8	71.6	29.9	Point	FALSE
DGM-9	P-DGM-90003	585858.12	4573010.57	208.0	122.8	57.0	22.1	Tiling	FALSE
DGM-9	P-DGM-90004	585860.50	4573012.65	153.7	93.6	45.4	18.3	Tiling	FALSE
DGM-9	P-DGM-90005	585861.85	4573012.86	120.6	76.3	40.9	18.0	Tiling	FALSE
DGM-9	P-DGM-90006	585856.70	4573013.00	83.4	51.5	24.1	10.1	Point	FALSE
DGM-9	P-DGM-90007	585858.20	4573014.70	27.3	18.2	8.8	4.4	Point	FALSE
DGM-9	P-DGM-90008	585883.50	4573004.10	23.3	15.2	7.7	4.5	Point	FALSE
DGM-9	P-DGM-90009	585873.70	4573010.10	20.8	11.6	5.7	2.0	Point	FALSE
DGM-9	P-DGM-90010	585862.80	4573013.90	17.1	11.2	5.4	3.0	Point	FALSE
DGM-9	P-DGM-90011	585870.15	4573005.46	15.7	10.1	3.9	1.1	Point	FALSE
DGM-9	P-DGM-90012	585881.60	4573016.90	14.3	9.6	6.0	2.9	Point	FALSE
DGM-9	P-DGM-90013	585856.20	4573007.80	25.6	8.6	0.2	-1.8	Point	FALSE
DGM-9	P-DGM-90014	585869.30	4573004.50	16.0	8.5	3.1	0.8	Point	FALSE
DGM-9	P-DGM-90015	585882.00	4573016.50	11.8	7.9	4.1	1.8	Point	FALSE
DGM-9	P-DGM-90016	585871.10	4573006.20	12.9	6.9	2.4	0.3	Point	FALSE
DGM-9	P-DGM-90017	585871.00	4573006.80	12.2	6.8	2.7	0.5	Point	FALSE
DGM-9	P-DGM-90018	585882.50	4573002.90	12.3	6.4	2.1	0.4	Point	FALSE
DGM-9	P-DGM-90019	585863.60	4573014.50	11.9	6.2	1.8	-0.2	Point	FALSE
DGM-9	P-DGM-90020	585886.39	4572993.21	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-10	P-DGM-100001	585757.60	4573004.80	292.8	190.9	99.1	48.1	Point	FALSE
DGM-10	P-DGM-100003	585768.90	4573013.50	110.3	61.2	21.6	3.9	Point	FALSE
DGM-10	P-DGM-100004	585745.30	4573020.90	83.5	60.2	37.7	21.5	Point	FALSE
DGM-10	P-DGM-100005	585764.10	4573013.70	81.8	59.2	36.8	21.8	Point	FALSE
DGM-10	P-DGM-100006	585764.40	4573012.70	76.6	56.3	35.9	21.4	Point	FALSE
DGM-10	P-DGM-100007	585764.60	4573014.70	106.4	51.9	16.4	3.4	Point	FALSE
DGM-10	P-DGM-100009	585760.00	4573000.80	70.8	51.3	32.6	19.6	Point	FALSE
DGM-10	P-DGM-100010	585763.90	4573016.50	67.0	49.5	32.0	17.6	Point	FALSE
DGM-10	P-DGM-100011	585769.30	4573014.00	92.2	47.4	13.9	1.9	Point	FALSE
DGM-10	P-DGM-100014	585766.40	4572995.30	60.2	38.5	20.8	10.8	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-10	P-DGM-100015	585748.30	4573010.30	47.3	35.2	22.5	13.3	Point	FALSE
DGM-10	P-DGM-100016	585765.30	4572993.30	58.5	34.5	13.9	4.4	Point	FALSE
DGM-10	P-DGM-100017	585750.80	4573006.70	46.8	34.1	20.6	11.1	Point	FALSE
DGM-10	P-DGM-100018	585751.70	4573003.90	50.0	33.7	17.5	8.7	Point	FALSE
DGM-10	P-DGM-100019	585767.80	4572998.70	78.1	33.1	6.9	0.7	Point	FALSE
DGM-10	P-DGM-100020	585764.30	4572999.80	44.8	31.0	17.6	8.5	Point	FALSE
DGM-10	P-DGM-100021	585765.89	4572995.80	49.3	30.9	17.2	9.0	Point	FALSE
DGM-10	P-DGM-100022	585744.53	4573020.23	42.3	28.7	15.4	4.9	Tiling	FALSE
DGM-10	P-DGM-100023	585765.00	4573015.62	43.5	28.2	15.0	6.9	Tiling	FALSE
DGM-10	P-DGM-100024	585765.70	4572991.00	45.7	27.7	11.2	2.9	Point	FALSE
DGM-10	P-DGM-100025	585759.56	4572993.00	41.6	26.6	12.8	5.7	Point	FALSE
DGM-10	P-DGM-100026	585770.13	4572990.67	41.0	26.5	13.9	5.8	Tiling	FALSE
DGM-10	P-DGM-100027	585765.38	4573015.03	43.2	26.3	12.4	4.6	Tiling	FALSE
DGM-10	P-DGM-100028	585752.10	4573004.40	42.0	26.1	12.1	6.2	Point	FALSE
DGM-10	P-DGM-100029	585765.91	4572993.39	39.2	25.8	12.8	5.6	Tiling	FALSE
DGM-10	P-DGM-100030	585762.80	4573013.20	35.4	25.4	16.1	10.3	Point	FALSE
DGM-10	P-DGM-100031	585748.00	4573011.30	32.9	24.4	14.6	7.9	Point	FALSE
DGM-10	P-DGM-100032	585768.10	4573010.00	34.3	23.7	13.5	6.2	Point	FALSE
DGM-10	P-DGM-100033	585763.40	4573012.70	34.4	23.2	14.6	8.9	Point	FALSE
DGM-10	P-DGM-100034	585746.30	4573019.40	32.9	22.5	11.5	4.0	Point	FALSE
DGM-10	P-DGM-100035	585746.90	4573019.00	33.6	22.3	11.1	3.6	Point	FALSE
DGM-10	P-DGM-100036	585764.10	4572996.50	30.3	21.8	12.3	6.7	Point	FALSE
DGM-10	P-DGM-100037	585764.17	4573015.59	35.6	21.6	10.4	4.0	Tiling	FALSE
DGM-10	P-DGM-100038	585745.10	4573020.10	35.0	21.5	10.9	3.5	Point	FALSE
DGM-10	P-DGM-100039	585750.01	4573007.12	27.9	21.2	13.4	6.4	Tiling	FALSE
DGM-10	P-DGM-100040	585759.47	4572992.44	32.0	20.6	10.9	5.4	Tiling	FALSE
DGM-10	P-DGM-100041	585766.28	4572994.56	33.3	20.2	10.4	5.1	Tiling	FALSE
DGM-10	P-DGM-100042	585770.60	4572991.50	31.2	19.7	10.0	3.4	Point	FALSE
DGM-10	P-DGM-100044	585752.50	4573008.30	32.3	18.9	7.7	1.8	Point	FALSE
DGM-10	P-DGM-100045	585755.54	4573005.70	26.9	18.7	10.3	6.0	Point	FALSE
DGM-10	P-DGM-100046	585752.44	4573005.25	26.7	18.7	9.6	5.2	Tiling	FALSE
DGM-10	P-DGM-100047	585767.10	4573019.60	31.6	18.5	8.7	3.3	Point	FALSE
DGM-10	P-DGM-100049	585758.40	4573006.40	27.4	18.0	8.9	3.4	Point	FALSE
DGM-10	P-DGM-100050	585757.46	4573002.34	26.4	17.4	9.4	4.3	Point	FALSE
DGM-10	P-DGM-100051	585753.20	4573008.10	29.9	17.0	6.9	1.7	Point	FALSE
DGM-10	P-DGM-100052	585758.50	4572999.70	25.4	17.0	9.2	3.8	Point	FALSE
DGM-10	P-DGM-100053	585743.80	4573017.50	24.6	16.8	9.2	4.3	Point	FALSE
DGM-10	P-DGM-100055	585756.20	4573005.30	24.3	16.4	8.8	5.1	Point	FALSE
DGM-10	P-DGM-100056	585758.20	4573018.80	23.0	15.8	8.3	3.5	Point	FALSE
DGM-10	P-DGM-100058	585754.40	4573008.50	22.2	14.3	6.9	2.2	Point	FALSE
DGM-10	P-DGM-100059	585760.50	4573015.50	22.5	13.9	6.4	2.6	Point	FALSE
DGM-10	P-DGM-100060	585764.30	4572995.60	23.1	13.6	7.3	4.2	Point	FALSE
DGM-10	P-DGM-100062	585747.70	4573019.00	19.7	13.2	6.4	2.1	Point	FALSE
DGM-10	P-DGM-100066	585760.34	4572992.84	18.7	11.5	5.4	1.8	Tiling	FALSE
DGM-10	P-DGM-100067	585765.40	4572997.00	17.0	11.3	5.0	1.6	Point	FALSE
DGM-10	P-DGM-100068	585758.00	4573003.00	15.9	11.3	6.2	3.1	Tiling	FALSE
DGM-10	P-DGM-100069	585744.80	4573018.50	18.1	11.3	5.5	2.5	Point	FALSE
DGM-10	P-DGM-100070	585765.80	4572998.10	18.5	11.3	4.9	1.4	Point	FALSE
DGM-10	P-DGM-100071	585762.70	4573011.90	24.1	11.1	3.9	1.0	Point	FALSE
DGM-10	P-DGM-100072	585747.60	4573008.40	18.6	10.9	4.5	1.5	Point	FALSE
DGM-10	P-DGM-100073	585750.64	4573003.87	16.6	10.9	4.8	1.3	Tiling	FALSE
DGM-10	P-DGM-100075	585769.50	4572997.10	14.1	9.9	5.2	2.6	Point	FALSE
DGM-10	P-DGM-100077	585768.90	4572991.70	17.2	9.8	4.5	2.3	Point	FALSE
DGM-10	P-DGM-100078	585748.80	4573009.10	13.6	9.7	4.6	1.9	Point	FALSE
DGM-10	P-DGM-100079	585747.97	4573008.97	14.3	9.6	5.4	2.2	Tiling	FALSE
DGM-10	P-DGM-100080	585761.50	4573001.10	14.9	9.6	4.4	1.8	Point	FALSE
DGM-10	P-DGM-100081	585744.38	4573019.10	13.6	9.6	4.8	2.1	Tiling	FALSE
DGM-10	P-DGM-100082	585744.38	4573019.10	13.6	9.6	4.8	2.1	Tiling	FALSE
DGM-10	P-DGM-100085	585754.80	4573003.50	15.3	9.2	2.5	0.5	Point	FALSE
DGM-10	P-DGM-100086	585760.70	4573020.50	16.6	9.2	5.1	2.2	Point	FALSE
DGM-10	P-DGM-100087	585752.50	4573006.20	13.1	9.1	6.0	4.3	Point (possible noise)	FALSE
DGM-10	P-DGM-100088	585753.50	4573002.50	12.0	8.9	5.6	3.1	Point	FALSE
DGM-10	P-DGM-100091	585756.20	4573004.50	12.3	8.4	3.4	2.3	Point	FALSE
DGM-10	P-DGM-100094	585768.70	4572992.50	14.9	8.3	3.7	1.3	Point	FALSE
DGM-10	P-DGM-100095	585769.06	4572996.46	13.5	8.2	3.8	1.5	Tiling	FALSE
DGM-10	P-DGM-100096	585758.62	4573003.50	12.0	8.2	3.2	2.1	Tiling	FALSE
DGM-10	P-DGM-100097	585764.73	4572996.52	11.8	8.2	4.3	1.6	Tiling	FALSE
DGM-10	P-DGM-100098	585753.70	4573008.90	13.2	8.2	3.3	0.9	Point	FALSE
DGM-10	P-DGM-100099	585754.20	4573003.10	12.4	8.1	3.1	1.0	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-10	P-DGM-100100	585768.80	4573011.70	13.4	8.1	3.8	1.2	Point	FALSE
DGM-10	P-DGM-100101	585770.10	4573010.00	12.3	8.0	4.9	2.1	Point	FALSE
DGM-10	P-DGM-100102	585768.04	4573010.84	13.7	8.0	3.8	1.3	Tiling	FALSE
DGM-10	P-DGM-100103	585765.60	4573016.27	12.8	7.9	4.4	2.2	Tiling	FALSE
DGM-10	P-DGM-100104	585759.20	4572995.20	13.1	7.8	4.0	1.3	Point	FALSE
DGM-10	P-DGM-100106	585755.10	4573004.50	13.7	7.7	1.3	0.0	Point	FALSE
DGM-10	P-DGM-100107	585745.40	4573014.50	12.2	7.6	3.6	1.5	Point (possible noise)	FALSE
DGM-10	P-DGM-100108	585768.20	4572996.90	10.6	7.3	3.2	0.7	Point	FALSE
DGM-10	P-DGM-100109	585758.33	4572998.93	12.8	6.9	3.1	1.4	Tiling	FALSE
DGM-10	P-DGM-100110	585754.10	4573005.40	12.1	6.9	2.3	0.8	Point	FALSE
DGM-10	P-DGM-100112	585766.58	4572996.48	10.0	6.7	3.0	1.2	Tiling	FALSE
DGM-10	P-DGM-100113	585761.00	4573017.50	11.7	6.6	3.0	0.7	Point	FALSE
DGM-10	P-DGM-100114	585770.20	4573018.70	9.3	6.6	3.6	1.2	Point	FALSE
DGM-10	P-DGM-100115	585743.34	4573016.69	10.8	6.5	2.7	0.5	Tiling	FALSE
DGM-10	P-DGM-100116	585747.10	4573010.30	9.0	6.4	3.2	0.6	Point	FALSE
DGM-10	P-DGM-100117	585769.90	4572992.50	27.8	6.4	-0.8	-1.2	Point	FALSE
DGM-10	P-DGM-100118	585751.49	4573004.77	10.6	6.3	2.8	1.0	Tiling	FALSE
DGM-10	P-DGM-100119	585761.00	4573019.20	9.5	6.3	3.2	1.1	Point (possible noise)	FALSE
DGM-10	P-DGM-100120	585767.20	4573015.50	9.9	6.1	2.4	0.3	Point (possible noise)	FALSE
DGM-10	P-DGM-100121	585746.20	4573007.70	14.1	6.0	3.9	1.3	Point (possible noise)	FALSE
DGM-10	P-DGM-100122	585772.96	4572999.27	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-10	P-DGM-100123	585738.61	4572989.02	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-11	P-DGM-110001	585892.40	4572833.90	798.6	560.5	343.0	187.2	Point	FALSE
DGM-11	P-DGM-110002	585892.12	4572833.29	410.7	307.0	199.3	118.3	Tiling	FALSE
DGM-11	P-DGM-110003	585863.10	4572835.60	442.3	270.5	141.7	69.2	Point	FALSE
DGM-11	P-DGM-110005	585892.20	4572832.30	99.8	72.6	44.8	21.0	Point	FALSE
DGM-11	P-DGM-110006	585865.70	4572835.00	84.3	56.1	27.3	12.6	Point	FALSE
DGM-11	P-DGM-110009	585863.90	4572810.90	55.5	39.1	24.3	12.7	Point	FALSE
DGM-11	P-DGM-110010	585864.70	4572810.80	49.5	34.1	22.4	11.8	Point	FALSE
DGM-11	P-DGM-110012	585892.00	4572824.60	42.9	26.9	14.5	7.6	Point	FALSE
DGM-11	P-DGM-110013	585891.10	4572822.10	35.3	26.3	15.0	6.9	Point	FALSE
DGM-11	P-DGM-110014	585874.80	4572806.20	30.9	22.7	14.7	9.0	Point	FALSE
DGM-11	P-DGM-110015	585891.10	4572821.60	31.3	18.3	8.9	3.7	Point	FALSE
DGM-11	P-DGM-110016	585865.49	4572811.33	27.0	16.5	9.1	4.7	Tiling	FALSE
DGM-11	P-DGM-110022	585892.30	4572823.80	26.8	10.1	5.5	1.9	Point	FALSE
DGM-11	P-DGM-110024	585876.35	4572805.82	13.1	7.9	3.2	1.4	Point	FALSE
DGM-11	P-DGM-110026	585891.21	4572835.01	21.3	7.8	1.0	-0.1	Tiling	FALSE
DGM-11	P-DGM-110027	585891.80	4572827.80	11.9	7.6	4.0	2.1	Point	FALSE
DGM-11	P-DGM-110028	585894.46	4572804.48	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-12	P-DGM-120001	585451.20	4573095.70	2936.4	1921.1	1040.8	433.7	Point	FALSE
DGM-12	P-DGM-120002	585450.50	4573096.06	1683.4	1143.1	627.3	255.5	Tiling	FALSE
DGM-12	P-DGM-120003	585451.94	4573095.53	958.5	626.4	321.0	122.0	Tiling	FALSE
DGM-12	P-DGM-120004	585452.10	4573099.70	869.5	605.1	318.9	115.3	Point	FALSE
DGM-12	P-DGM-120005	585459.30	4573097.20	784.0	531.1	290.9	127.1	Point	FALSE
DGM-12	P-DGM-120006	585461.80	4573093.90	750.2	525.5	307.7	157.9	Point	FALSE
DGM-12	P-DGM-120007	585460.08	4573090.68	652.2	473.4	284.8	146.2	Point	FALSE
DGM-12	P-DGM-120008	585451.90	4573099.00	695.0	472.5	245.8	91.3	Point	FALSE
DGM-12	P-DGM-120009	585462.20	4573094.40	649.7	434.7	245.2	119.6	Point	FALSE
DGM-12	P-DGM-120010	585459.10	4573090.80	551.1	384.3	223.9	112.5	Point	FALSE
DGM-12	P-DGM-120011	585462.81	4573093.76	489.0	335.1	193.2	95.1	Tiling	FALSE
DGM-12	P-DGM-120012	585463.86	4573107.16	429.9	276.0	143.5	68.3	Point	FALSE
DGM-12	P-DGM-120013	585465.40	4573108.60	405.6	267.5	132.8	46.5	Point	FALSE
DGM-12	P-DGM-120014	585453.00	4573117.70	382.1	259.4	138.0	55.9	Point	FALSE
DGM-12	P-DGM-120015	585460.15	4573096.87	376.8	258.1	143.6	60.8	Tiling	FALSE
DGM-12	P-DGM-120016	585449.20	4573094.30	372.3	254.4	144.7	73.4	Point	FALSE
DGM-12	P-DGM-120017	585463.20	4573107.50	392.6	253.9	134.3	64.5	Point	FALSE
DGM-12	P-DGM-120018	585464.60	4573109.00	382.9	248.9	122.5	43.2	Point	FALSE
DGM-12	P-DGM-120019	585475.60	4573095.10	337.3	226.7	119.0	44.6	Point	FALSE
DGM-12	P-DGM-120020	585476.10	4573094.30	332.9	221.7	113.6	44.1	Point	FALSE
DGM-12	P-DGM-120021	585451.10	4573088.90	302.7	202.2	112.2	52.0	Point	FALSE
DGM-12	P-DGM-120022	585450.40	4573089.30	275.2	190.6	112.9	61.0	Point	FALSE
DGM-12	P-DGM-120023	585449.40	4573095.10	284.5	188.6	105.0	49.5	Point	FALSE
DGM-12	P-DGM-120025	585465.00	4573094.10	303.1	180.4	86.2	36.4	Point	FALSE
DGM-12	P-DGM-120026	585453.20	4573109.00	371.6	175.1	46.4	6.8	Point	FALSE
DGM-12	P-DGM-120027	585461.40	4573109.50	257.1	167.5	84.1	33.4	Point	FALSE
DGM-12	P-DGM-120028	585462.60	4573087.60	245.2	160.5	83.9	41.6	Point	FALSE
DGM-12	P-DGM-120029	585452.00	4573088.90	236.9	158.6	88.5	41.0	Point	FALSE
DGM-12	P-DGM-120030	585451.70	4573115.50	239.1	154.4	81.6	34.6	Point	FALSE
DGM-12	P-DGM-120031	585453.30	4573105.90	229.4	153.9	81.0	33.2	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-12	P-DGM-120032	585451.30	4573116.00	230.6	150.1	82.0	36.0	Point	FALSE
DGM-12	P-DGM-120033	585456.70	4573091.20	223.0	148.9	79.1	31.6	Point	FALSE
DGM-12	P-DGM-120034	585457.00	4573091.70	219.0	146.0	77.5	30.3	Point	FALSE
DGM-12	P-DGM-120035	585464.70	4573093.60	223.1	139.2	70.1	27.9	Point	FALSE
DGM-12	P-DGM-120036	585453.60	4573102.70	198.8	138.0	83.3	46.6	Point	FALSE
DGM-12	P-DGM-120038	585476.50	4573091.80	215.2	134.9	68.8	29.6	Point	FALSE
DGM-12	P-DGM-120039	585476.20	4573095.26	205.0	134.0	67.6	24.5	Tiling	FALSE
DGM-12	P-DGM-120040	585457.22	4573091.02	198.5	132.7	69.7	29.2	Tiling	FALSE
DGM-12	P-DGM-120041	585449.90	4573088.60	188.9	130.8	75.8	40.4	Point	FALSE
DGM-12	P-DGM-120042	585476.80	4573091.10	199.6	127.2	63.2	25.6	Point	FALSE
DGM-12	P-DGM-120045	585452.70	4573105.70	178.5	118.4	60.7	22.3	Point	FALSE
DGM-12	P-DGM-120046	585453.20	4573097.60	169.5	116.3	70.9	39.7	Point	FALSE
DGM-12	P-DGM-120047	585453.50	4573097.10	168.7	115.9	69.4	38.9	Point	FALSE
DGM-12	P-DGM-120048	585462.20	4573109.60	178.3	115.0	56.0	18.4	Point	FALSE
DGM-12	P-DGM-120049	585464.19	4573094.50	240.8	114.8	34.9	6.8	Tiling	FALSE
DGM-12	P-DGM-120051	585451.30	4573105.30	159.9	100.2	47.7	15.6	Point	FALSE
DGM-12	P-DGM-120053	585449.70	4573114.00	148.2	99.5	53.6	22.9	Point	FALSE
DGM-12	P-DGM-120054	585450.58	4573105.16	153.1	95.0	44.7	14.8	Point	FALSE
DGM-12	P-DGM-120055	585454.00	4573111.40	136.6	92.1	52.0	24.8	Point	FALSE
DGM-12	P-DGM-120056	585456.40	4573100.20	125.8	91.8	58.5	32.4	Point	FALSE
DGM-12	P-DGM-120058	585450.00	4573098.70	148.6	90.9	41.7	13.6	Point	FALSE
DGM-12	P-DGM-120059	585453.10	4573111.20	135.1	86.9	45.2	21.1	Point	FALSE
DGM-12	P-DGM-120060	585458.45	4573091.66	121.8	86.6	53.0	29.7	Tiling	FALSE
DGM-12	P-DGM-120061	585457.30	4573111.60	128.3	81.5	41.9	19.5	Point	FALSE
DGM-12	P-DGM-120062	585449.10	4573097.30	127.3	80.1	38.5	13.9	Point	FALSE
DGM-12	P-DGM-120065	585457.31	4573112.36	117.4	77.9	43.9	20.2	Point	FALSE
DGM-12	P-DGM-120066	585458.23	4573090.81	104.2	75.8	46.3	24.5	Tiling	FALSE
DGM-12	P-DGM-120067	585452.00	4573093.60	122.7	73.8	32.8	10.7	Point	FALSE
DGM-12	P-DGM-120068	585449.62	4573099.11	122.0	72.6	31.8	9.8	Tiling	FALSE
DGM-12	P-DGM-120069	585476.11	4573095.95	110.1	70.8	35.3	9.6	Tiling	FALSE
DGM-12	P-DGM-120070	585464.80	4573117.70	125.4	70.2	25.9	6.4	Point	FALSE
DGM-12	P-DGM-120071	585448.10	4573096.70	99.3	67.9	38.6	19.5	Point	FALSE
DGM-12	P-DGM-120072	585450.00	4573097.60	108.5	65.6	30.9	10.3	Point	FALSE
DGM-12	P-DGM-120076	585449.80	4573113.32	92.5	59.9	32.2	14.4	Tiling	FALSE
DGM-12	P-DGM-120077	585457.40	4573100.00	77.6	57.8	37.8	22.5	Point	FALSE
DGM-12	P-DGM-120078	585453.70	4573094.90	85.0	57.8	30.8	13.2	Point	FALSE
DGM-12	P-DGM-120079	585454.90	4573116.30	88.9	57.5	30.6	12.4	Point	FALSE
DGM-12	P-DGM-120080	585452.73	4573096.62	82.0	56.4	31.9	16.5	Tiling	FALSE
DGM-12	P-DGM-120082	585465.10	4573103.60	81.2	53.9	28.8	13.3	Point	FALSE
DGM-12	P-DGM-120083	585454.40	4573089.50	79.9	53.4	27.4	10.9	Point	FALSE
DGM-12	P-DGM-120084	585452.74	4573093.69	79.5	52.7	26.1	9.3	Tiling	FALSE
DGM-12	P-DGM-120086	585453.60	4573088.50	83.4	52.2	25.6	9.4	Point	FALSE
DGM-12	P-DGM-120088	585453.10	4573116.70	75.5	50.6	28.0	11.0	Point	FALSE
DGM-12	P-DGM-120089	585457.20	4573113.60	101.1	49.7	14.5	1.7	Point	FALSE
DGM-12	P-DGM-120090	585451.90	4573090.40	72.2	48.6	28.1	13.0	Point	FALSE
DGM-12	P-DGM-120091	585454.90	4573113.50	66.1	47.9	29.5	17.5	Point	FALSE
DGM-12	P-DGM-120092	585454.50	4573115.50	75.6	47.6	23.1	9.2	Point	FALSE
DGM-12	P-DGM-120095	585454.55	4573112.62	63.5	45.1	27.4	16.2	Point	FALSE
DGM-12	P-DGM-120096	585475.29	4573096.24	72.1	44.6	21.3	7.1	Tiling	FALSE
DGM-12	P-DGM-120097	585454.50	4573094.60	64.7	44.5	24.8	10.8	Point	FALSE
DGM-12	P-DGM-120100	585455.80	4573107.10	66.2	43.0	24.2	12.9	Point	FALSE
DGM-12	P-DGM-120101	585465.33	4573117.39	80.0	42.1	15.7	4.3	Tiling	FALSE
DGM-12	P-DGM-120102	585465.07	4573095.44	77.8	42.0	14.9	3.5	Tiling	FALSE
DGM-12	P-DGM-120103	585464.20	4573103.70	63.9	41.9	22.5	10.5	Point	FALSE
DGM-12	P-DGM-120104	585467.50	4573088.20	63.5	41.5	22.7	11.0	Point	FALSE
DGM-12	P-DGM-120105	585470.10	4573108.20	59.5	41.0	23.0	11.9	Point	FALSE
DGM-12	P-DGM-120106	585455.50	4573106.50	64.9	40.5	21.1	10.2	Point	FALSE
DGM-12	P-DGM-120107	585456.50	4573111.42	67.7	40.3	16.2	5.5	Tiling	FALSE
DGM-12	P-DGM-120109	585454.50	4573092.60	54.5	40.0	23.1	10.5	Point	FALSE
DGM-12	P-DGM-120110	585463.20	4573098.20	57.0	39.6	20.8	8.1	Point	FALSE
DGM-12	P-DGM-120111	585466.90	4573112.50	62.1	39.2	15.9	3.4	Point	FALSE
DGM-12	P-DGM-120112	585460.11	4573109.43	53.9	39.0	24.4	14.8	Tiling	FALSE
DGM-12	P-DGM-120114	585460.30	4573115.70	60.9	37.9	18.9	8.5	Point	FALSE
DGM-12	P-DGM-120115	585449.45	4573089.65	58.2	37.4	19.7	10.2	Tiling	FALSE
DGM-12	P-DGM-120117	585448.30	4573092.35	51.4	35.6	21.4	11.8	Point	FALSE
DGM-12	P-DGM-120118	585460.00	4573113.10	58.4	35.1	14.2	3.3	Point	FALSE
DGM-12	P-DGM-120120	585454.80	4573090.30	50.3	33.9	17.2	6.3	Point	FALSE
DGM-12	P-DGM-120121	585452.59	4573116.43	52.9	33.5	17.0	6.5	Tiling	FALSE
DGM-12	P-DGM-120122	585477.60	4573090.30	50.9	33.2	16.0	5.1	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-12	P-DGM-120123	585473.30	4573103.30	47.3	33.1	19.9	10.8	Point	FALSE
DGM-12	P-DGM-120124	585450.80	4573108.30	50.5	32.2	16.6	6.6	Point	FALSE
DGM-12	P-DGM-120125	585466.50	4573106.70	57.4	32.1	13.2	5.1	Point	FALSE
DGM-12	P-DGM-120126	585457.90	4573105.20	52.6	31.8	14.6	5.0	Point	FALSE
DGM-12	P-DGM-120127	585447.71	4573110.80	44.8	31.8	20.1	11.2	Tiling	FALSE
DGM-12	P-DGM-120128	585454.51	4573117.64	52.2	31.5	14.7	4.7	Tiling	FALSE
DGM-12	P-DGM-120129	585461.30	4573088.60	59.7	31.0	10.2	1.8	Point	FALSE
DGM-12	P-DGM-120130	585451.33	4573093.81	47.2	30.9	17.7	5.9	Tiling	FALSE
DGM-12	P-DGM-120131	585464.80	4573111.70	54.2	30.3	11.5	2.4	Point	FALSE
DGM-12	P-DGM-120132	585447.80	4573092.90	42.4	30.3	18.3	10.1	Point	FALSE
DGM-12	P-DGM-120134	585475.90	4573087.50	46.8	29.4	14.2	5.4	Point	FALSE
DGM-12	P-DGM-120135	585468.14	4573088.34	43.6	29.3	16.7	8.2	Tiling	FALSE
DGM-12	P-DGM-120136	585454.80	4573111.10	41.8	28.5	16.2	9.5	Point	FALSE
DGM-12	P-DGM-120137	585460.99	4573091.57	61.1	28.4	8.2	2.0	Tiling	FALSE
DGM-12	P-DGM-120138	585473.60	4573106.70	41.1	28.0	16.2	8.4	Point	FALSE
DGM-12	P-DGM-120140	585455.49	4573117.54	49.0	27.7	11.8	3.8	Tiling	FALSE
DGM-12	P-DGM-120141	585466.34	4573106.17	52.1	27.7	9.7	3.1	Tiling	FALSE
DGM-12	P-DGM-120143	585450.90	4573090.60	41.4	27.4	17.2	8.6	Point	FALSE
DGM-12	P-DGM-120145	585466.30	4573098.70	37.6	26.7	14.4	6.2	Point	FALSE
DGM-12	P-DGM-120146	585453.10	4573089.60	37.8	26.6	16.7	8.3	Point	FALSE
DGM-12	P-DGM-120147	585473.70	4573102.80	38.3	26.5	15.4	7.7	Point	FALSE
DGM-12	P-DGM-120148	585453.62	4573087.81	43.6	26.4	11.5	3.9	Tiling	FALSE
DGM-12	P-DGM-120149	585448.11	4573094.45	39.7	26.2	14.5	6.8	Tiling	FALSE
DGM-12	P-DGM-120150	585469.10	4573093.10	37.9	26.1	15.8	8.0	Point	FALSE
DGM-12	P-DGM-120151	585448.96	4573089.08	41.6	25.8	12.6	5.2	Tiling	FALSE
DGM-12	P-DGM-120152	585459.45	4573113.21	44.3	25.5	9.7	2.1	Tiling	FALSE
DGM-12	P-DGM-120153	585462.70	4573112.10	42.8	25.4	10.8	2.6	Point	FALSE
DGM-12	P-DGM-120154	585453.00	4573090.50	37.4	25.2	15.4	7.9	Point	FALSE
DGM-12	P-DGM-120155	585466.40	4573091.20	35.7	24.9	14.3	7.7	Point	FALSE
DGM-12	P-DGM-120156	585458.58	4573105.39	42.5	24.9	10.2	2.4	Tiling	FALSE
DGM-12	P-DGM-120157	585470.00	4573089.60	36.5	24.7	14.5	7.7	Point	FALSE
DGM-12	P-DGM-120158	585453.08	4573110.33	35.9	24.4	14.2	8.0	Tiling	FALSE
DGM-12	P-DGM-120159	585470.40	4573089.00	33.7	23.7	14.0	7.5	Point	FALSE
DGM-12	P-DGM-120160	585471.90	4573107.30	114.1	23.4	2.3	0.5	Point	FALSE
DGM-12	P-DGM-120162	585459.97	4573115.32	36.5	22.9	12.1	5.6	Tiling	FALSE
DGM-12	P-DGM-120163	585463.20	4573111.60	36.9	22.2	9.6	2.8	Point	FALSE
DGM-12	P-DGM-120164	585470.10	4573091.80	34.0	22.1	12.6	6.2	Point	FALSE
DGM-12	P-DGM-120165	585470.60	4573099.10	30.5	21.9	12.8	6.5	Point	FALSE
DGM-12	P-DGM-120166	585466.40	4573114.70	34.0	21.7	10.5	3.5	Point	FALSE
DGM-12	P-DGM-120167	585469.60	4573093.80	31.9	21.5	12.6	6.3	Point	FALSE
DGM-12	P-DGM-120168	585454.00	4573093.20	31.7	21.3	11.2	4.6	Point	FALSE
DGM-12	P-DGM-120169	585452.20	4573110.70	31.1	21.2	11.9	6.5	Point	FALSE
DGM-12	P-DGM-120172	585474.68	4573095.97	31.3	20.4	9.1	2.6	Tiling	FALSE
DGM-12	P-DGM-120173	585475.74	4573092.49	27.9	20.0	11.7	6.3	Tiling	FALSE
DGM-12	P-DGM-120174	585468.20	4573100.90	28.5	20.0	10.8	4.6	Point	FALSE
DGM-12	P-DGM-120175	585469.10	4573089.30	32.6	19.9	9.8	4.3	Point	FALSE
DGM-12	P-DGM-120176	585470.43	4573096.77	27.6	19.8	11.7	5.8	Point	FALSE
DGM-12	P-DGM-120178	585460.88	4573087.89	36.5	19.3	6.2	1.6	Tiling	FALSE
DGM-12	P-DGM-120179	585466.90	4573110.60	26.2	19.0	11.3	6.5	Point	FALSE
DGM-12	P-DGM-120181	585449.38	4573114.97	25.6	18.6	10.1	4.3	Tiling	FALSE
DGM-12	P-DGM-120182	585462.70	4573116.50	30.0	18.5	8.2	3.2	Point	FALSE
DGM-12	P-DGM-120183	585457.27	4573104.99	30.6	18.5	9.3	4.1	Tiling	FALSE
DGM-12	P-DGM-120184	585467.62	4573101.34	26.2	18.4	10.3	5.1	Tiling	FALSE
DGM-12	P-DGM-120185	585470.07	4573091.11	28.9	18.0	9.4	4.8	Tiling	FALSE
DGM-12	P-DGM-120186	585466.40	4573111.89	31.1	17.9	6.7	1.6	Tiling	FALSE
DGM-12	P-DGM-120187	585458.21	4573094.90	27.0	17.7	9.4	4.1	Point	FALSE
DGM-12	P-DGM-120188	585476.90	4573099.80	28.9	17.5	9.2	4.4	Point	FALSE
DGM-12	P-DGM-120189	585470.14	4573108.85	25.3	17.4	10.3	5.0	Tiling	FALSE
DGM-12	P-DGM-120190	585469.40	4573116.60	23.5	17.4	10.4	4.4	Point	FALSE
DGM-12	P-DGM-120191	585469.00	4573113.50	29.6	17.4	8.0	2.4	Point	FALSE
DGM-12	P-DGM-120192	585461.50	4573112.20	28.5	17.2	8.1	2.2	Point	FALSE
DGM-12	P-DGM-120193	585455.49	4573110.77	27.2	17.2	9.6	5.5	Tiling	FALSE
DGM-12	P-DGM-120194	585475.50	4573093.40	23.3	17.1	10.6	5.4	Point	FALSE
DGM-12	P-DGM-120195	585476.20	4573107.60	26.2	17.0	10.3	6.1	Point	FALSE
DGM-12	P-DGM-120196	585451.71	4573106.44	24.6	16.8	10.2	5.1	Tiling	FALSE
DGM-12	P-DGM-120197	585465.40	4573091.50	23.0	16.5	9.5	4.9	Point	FALSE
DGM-12	P-DGM-120198	585464.90	4573089.30	24.7	16.4	8.5	3.5	Point	FALSE
DGM-12	P-DGM-120199	585476.40	4573100.30	43.1	16.3	6.5	3.5	Point	FALSE
DGM-12	P-DGM-120200	585470.20	4573105.00	27.6	16.2	5.8	1.3	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-12	P-DGM-120202	585467.28	4573106.34	26.4	15.8	8.1	4.6	Tiling	FALSE
DGM-12	P-DGM-120203	585473.20	4573098.70	25.5	15.8	7.5	1.9	Point	FALSE
DGM-12	P-DGM-120204	585460.40	4573094.80	23.1	15.7	7.9	3.4	Point	FALSE
DGM-12	P-DGM-120205	585454.50	4573110.30	23.8	15.6	8.8	4.5	Point	FALSE
DGM-12	P-DGM-120206	585468.57	4573092.64	21.7	14.9	9.0	4.4	Tiling	FALSE
DGM-12	P-DGM-120207	585476.82	4573090.29	25.0	14.8	6.7	2.2	Tiling	FALSE
DGM-12	P-DGM-120208	585449.80	4573110.00	24.4	14.7	6.9	2.6	Point	FALSE
DGM-12	P-DGM-120211	585458.30	4573094.10	22.4	14.5	7.4	3.2	Point	FALSE
DGM-12	P-DGM-120212	585470.80	4573115.90	21.1	14.4	7.9	4.3	Point	FALSE
DGM-12	P-DGM-120213	585468.40	4573116.40	19.7	14.4	8.4	3.8	Point	FALSE
DGM-12	P-DGM-120214	585449.00	4573103.70	20.8	14.4	7.8	4.3	Point	FALSE
DGM-12	P-DGM-120215	585476.99	4573112.48	23.7	14.3	8.6	4.4	Tiling	FALSE
DGM-12	P-DGM-120218	585455.50	4573109.80	23.2	14.1	7.7	4.1	Point	FALSE
DGM-12	P-DGM-120219	585460.30	4573103.60	23.9	14.0	7.1	3.3	Point	FALSE
DGM-12	P-DGM-120220	585465.49	4573111.89	22.7	13.9	5.8	2.0	Tiling	FALSE
DGM-12	P-DGM-120221	585474.00	4573107.30	19.3	13.9	8.4	4.3	Point	FALSE
DGM-12	P-DGM-120222	585459.60	4573094.80	22.0	13.8	7.3	3.3	Point	FALSE
DGM-12	P-DGM-120223	585461.80	4573106.10	22.1	13.7	7.0	2.8	Point	FALSE
DGM-12	P-DGM-120224	585459.37	4573116.08	19.7	13.7	7.1	3.4	Tiling	FALSE
DGM-12	P-DGM-120225	585476.10	4573109.60	18.5	13.4	7.7	4.5	Point	FALSE
DGM-12	P-DGM-120226	585456.50	4573104.00	19.9	13.3	8.0	4.8	Point	FALSE
DGM-12	P-DGM-120227	585450.38	4573114.94	21.3	13.3	6.9	2.4	Tiling	FALSE
DGM-12	P-DGM-120228	585468.90	4573116.10	17.8	13.2	8.1	3.6	Point	FALSE
DGM-12	P-DGM-120229	585470.60	4573105.60	22.8	13.0	5.2	1.2	Point	FALSE
DGM-12	P-DGM-120230	585466.00	4573111.20	20.2	12.9	7.0	3.6	Point	FALSE
DGM-12	P-DGM-120231	585459.49	4573092.25	19.3	12.8	6.9	3.2	Tiling	FALSE
DGM-12	P-DGM-120232	585459.10	4573117.80	22.7	12.7	5.1	1.8	Point	FALSE
DGM-12	P-DGM-120233	585450.48	4573093.49	17.9	12.6	7.3	3.1	Tiling	FALSE
DGM-12	P-DGM-120234	585451.00	4573092.60	22.2	12.5	6.4	2.8	Point	FALSE
DGM-12	P-DGM-120235	585473.20	4573099.40	20.1	12.4	5.5	1.7	Point	FALSE
DGM-12	P-DGM-120236	585467.39	4573091.51	18.3	12.3	7.2	3.8	Tiling	FALSE
DGM-12	P-DGM-120237	585477.10	4573108.40	24.9	12.3	4.8	1.5	Point	FALSE
DGM-12	P-DGM-120238	585470.95	4573091.50	17.9	12.1	7.3	4.3	Tiling	FALSE
DGM-12	P-DGM-120239	585467.37	4573090.72	19.6	11.9	5.7	2.5	Tiling	FALSE
DGM-12	P-DGM-120240	585475.30	4573088.10	19.7	11.9	5.8	2.1	Point	FALSE
DGM-12	P-DGM-120242	585471.60	4573115.80	18.4	11.8	6.5	2.9	Point	FALSE
DGM-12	P-DGM-120243	585448.70	4573104.40	19.0	11.6	6.8	3.6	Point	FALSE
DGM-12	P-DGM-120244	585472.70	4573094.80	21.4	11.6	5.6	2.6	Point	FALSE
DGM-12	P-DGM-120245	585449.95	4573092.82	14.5	11.6	7.0	3.1	Tiling	FALSE
DGM-12	P-DGM-120246	585468.60	4573107.60	20.7	11.5	4.2	1.2	Point	FALSE
DGM-12	P-DGM-120247	585464.70	4573102.20	21.8	11.2	3.5	0.3	Point	FALSE
DGM-12	P-DGM-120248	585465.40	4573102.10	19.1	11.1	4.0	0.9	Point	FALSE
DGM-12	P-DGM-120249	585476.92	4573105.03	15.3	10.8	6.6	3.8	Tiling	FALSE
DGM-12	P-DGM-120250	585448.10	4573100.00	20.1	10.8	3.8	1.1	Point	FALSE
DGM-12	P-DGM-120251	585459.60	4573103.20	17.7	10.8	5.6	2.3	Point	FALSE
DGM-12	P-DGM-120252	585470.50	4573095.70	13.8	10.7	6.0	2.8	Point	FALSE
DGM-12	P-DGM-120255	585472.80	4573107.30	19.2	10.3	3.9	1.2	Point	FALSE
DGM-12	P-DGM-120256	585475.50	4573101.20	14.0	10.0	6.4	4.2	Point	FALSE
DGM-12	P-DGM-120258	585451.80	4573112.30	14.1	10.0	6.0	3.5	Point	FALSE
DGM-12	P-DGM-120260	585465.85	4573115.57	16.9	9.9	4.4	1.7	Tiling	FALSE
DGM-12	P-DGM-120261	585456.00	4573102.00	20.6	9.7	2.9	0.5	Point	FALSE
DGM-12	P-DGM-120262	585450.40	4573109.10	14.8	9.5	4.5	1.7	Point	FALSE
DGM-12	P-DGM-120263	585451.93	4573092.28	19.3	9.4	2.5	0.4	Tiling	FALSE
DGM-12	P-DGM-120264	585460.40	4573107.90	15.3	9.4	4.9	2.0	Point	FALSE
DGM-12	P-DGM-120265	585461.80	4573116.20	16.3	9.1	3.5	0.7	Point	FALSE
DGM-12	P-DGM-120266	585474.60	4573097.20	11.2	9.0	5.2	2.3	Point	FALSE
DGM-12	P-DGM-120267	585461.80	4573090.20	14.1	8.9	4.6	2.3	Point	FALSE
DGM-12	P-DGM-120268	585467.40	4573093.00	15.2	8.9	4.0	1.8	Point	FALSE
DGM-12	P-DGM-120269	585473.40	4573104.20	13.1	8.8	5.0	2.9	Point	FALSE
DGM-12	P-DGM-120270	585470.05	4573095.00	13.7	8.7	4.3	1.6	Point	FALSE
DGM-12	P-DGM-120271	585448.98	4573109.88	13.5	8.5	4.1	1.7	Tiling	FALSE
DGM-12	P-DGM-120272	585468.20	4573091.90	13.9	8.1	4.1	2.3	Point	FALSE
DGM-12	P-DGM-120273	585464.00	4573091.80	13.3	8.1	3.8	1.6	Point	FALSE
DGM-12	P-DGM-120275	585472.30	4573112.10	11.7	8.0	4.0	1.4	Point	FALSE
DGM-12	P-DGM-120276	585451.38	4573107.00	15.5	7.9	3.5	1.4	Tiling	FALSE
DGM-12	P-DGM-120278	585460.30	4573093.60	16.0	7.8	4.0	2.0	Point	FALSE
DGM-12	P-DGM-120279	585449.37	4573110.77	12.8	7.8	3.4	1.1	Tiling	FALSE
DGM-12	P-DGM-120280	585459.60	4573088.90	9.7	7.8	4.2	1.7	Point	FALSE
DGM-12	P-DGM-120281	585474.00	4573109.10	37.5	7.8	0.7	0.0	Point (possible noise)	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-12	P-DGM-120282	585454.84	4573109.38	12.9	7.6	3.8	2.0	Tiling	FALSE
DGM-12	P-DGM-120283	585470.61	4573099.92	11.5	7.6	4.0	1.6	Tiling	FALSE
DGM-12	P-DGM-120284	585469.40	4573107.10	16.0	7.5	2.1	-0.5	Point	FALSE
DGM-12	P-DGM-120285	585448.00	4573108.80	10.3	7.4	4.3	2.5	Point	FALSE
DGM-12	P-DGM-120286	585471.40	4573111.90	11.0	7.4	4.0	1.8	Point	FALSE
DGM-12	P-DGM-120287	585472.00	4573095.90	15.3	7.4	2.6	0.9	Point	FALSE
DGM-12	P-DGM-120289	585476.20	4573112.50	12.0	7.1	3.2	0.5	Point	FALSE
DGM-12	P-DGM-120292	585471.27	4573105.54	12.7	6.7	2.3	0.8	Tiling (possible noise)	FALSE
DGM-12	P-DGM-120293	585459.49	4573093.10	11.4	6.7	2.8	0.9	Tiling	FALSE
DGM-12	P-DGM-120294	585451.30	4573110.60	10.4	6.5	3.7	2.1	Point	FALSE
DGM-12	P-DGM-120295	585473.50	4573094.40	9.1	6.3	3.5	2.0	Point	FALSE
DGM-12	P-DGM-120296	585471.50	4573096.30	15.1	6.3	1.7	0.5	Point	FALSE
DGM-12	P-DGM-120297	585470.50	4573097.60	9.4	6.2	3.0	0.9	Point	FALSE
DGM-12	P-DGM-120298	585468.68	4573094.18	9.0	6.2	3.9	1.9	Tiling	FALSE
DGM-12	P-DGM-120299	585454.80	4573088.60	9.1	6.2	3.2	1.3	Point	FALSE
DGM-12	P-DGM-120300	585455.80	4573097.40	9.8	6.1	3.4	1.4	Point	FALSE
DGM-12	P-DGM-120301	585448.10	4573103.20	8.7	6.0	3.4	1.7	Point	FALSE
DGM-13	P-DGM-130001	585828.70	4572651.40	704.1	522.2	340.2	197.8	Point	FALSE
DGM-13	P-DGM-130002	585827.50	4572651.40	666.6	493.8	321.2	186.2	Point	FALSE
DGM-13	P-DGM-130003	585830.00	4572651.40	488.4	361.6	234.2	136.0	Point	FALSE
DGM-13	P-DGM-130004	585831.34	4572651.37	170.9	124.9	78.3	45.9	Tiling	FALSE
DGM-13	P-DGM-130005	585843.30	4572649.40	62.8	43.3	24.7	11.6	Point	FALSE
DGM-13	P-DGM-130006	585833.80	4572659.20	62.1	42.7	24.6	12.6	Point	FALSE
DGM-13	P-DGM-130007	585842.78	4572649.98	53.7	36.7	20.1	10.0	Tiling	FALSE
DGM-13	P-DGM-130008	585834.43	4572659.02	46.8	31.4	16.9	8.4	Tiling	FALSE
DGM-13	P-DGM-130009	585852.30	4572660.10	27.6	19.1	10.8	5.6	Point	FALSE
DGM-13	P-DGM-130010	585853.00	4572660.00	17.2	11.5	6.1	2.9	Point	FALSE
DGM-14	P-DGM-140001	585667.40	4572931.00	6521.9	4217.7	2185.0	990.6	Point	FALSE
DGM-14	P-DGM-140003	585656.80	4572913.60	1085.5	747.6	417.5	200.2	Point	FALSE
DGM-14	P-DGM-140004	585656.39	4572914.06	840.4	578.0	316.7	146.6	Tiling	FALSE
DGM-14	P-DGM-140005	585654.90	4572915.20	687.2	486.6	285.8	161.7	Point	FALSE
DGM-14	P-DGM-140006	585657.60	4572913.60	666.1	463.2	263.3	129.5	Point	FALSE
DGM-14	P-DGM-140007	585651.20	4572905.10	671.3	448.0	228.7	94.2	Point	FALSE
DGM-14	P-DGM-140008	585666.30	4572915.90	618.0	430.9	254.1	145.6	Point	FALSE
DGM-14	P-DGM-140009	585654.07	4572915.19	489.4	350.7	215.7	123.6	Tiling	FALSE
DGM-14	P-DGM-140011	585671.90	4572913.30	451.5	307.7	180.6	94.0	Point	FALSE
DGM-14	P-DGM-140013	585658.20	4572922.80	384.2	257.1	149.8	78.9	Point	FALSE
DGM-14	P-DGM-140014	585679.20	4572927.40	424.7	232.5	105.5	35.9	Point	FALSE
DGM-14	P-DGM-140015	585665.90	4572910.30	333.6	226.2	132.3	73.9	Point	FALSE
DGM-14	P-DGM-140019	585664.30	4572909.30	242.1	169.7	103.2	59.8	Point	FALSE
DGM-14	P-DGM-140020	585651.60	4572925.60	230.8	168.0	103.7	62.3	Point	FALSE
DGM-14	P-DGM-140021	585672.67	4572931.77	196.4	141.1	83.7	45.8	Point	FALSE
DGM-14	P-DGM-140022	585677.86	4572926.73	199.4	136.6	77.6	38.4	Point	FALSE
DGM-14	P-DGM-140023	585668.40	4572930.15	174.7	126.2	78.8	43.2	Tiling	FALSE
DGM-14	P-DGM-140024	585650.68	4572925.94	172.1	125.5	81.5	49.4	Tiling	FALSE
DGM-14	P-DGM-140025	585678.69	4572927.08	217.5	124.9	59.5	20.2	Point	FALSE
DGM-14	P-DGM-140026	585677.20	4572925.80	167.0	108.1	53.6	20.2	Point	FALSE
DGM-14	P-DGM-140027	585667.31	4572929.43	124.3	86.7	58.1	26.2	Tiling	FALSE
DGM-14	P-DGM-140029	585664.60	4572931.00	111.6	77.1	44.2	24.1	Point	FALSE
DGM-14	P-DGM-140030	585662.10	4572929.40	104.7	72.2	42.2	22.1	Point	FALSE
DGM-14	P-DGM-140032	585657.30	4572919.30	100.4	65.9	35.7	17.6	Point	FALSE
DGM-14	P-DGM-140033	585665.50	4572931.10	93.7	64.9	38.2	21.1	Point	FALSE
DGM-14	P-DGM-140034	585661.90	4572914.40	89.7	59.2	32.0	13.7	Point	FALSE
DGM-14	P-DGM-140035	585653.70	4572916.40	118.6	59.0	20.3	6.5	Point	FALSE
DGM-14	P-DGM-140036	585652.30	4572916.50	80.2	58.4	36.0	22.0	Point	FALSE
DGM-14	P-DGM-140037	585664.60	4572914.30	81.3	57.6	34.6	20.4	Point	FALSE
DGM-14	P-DGM-140038	585677.16	4572915.26	161.9	56.9	8.5	0.7	Point	FALSE
DGM-14	P-DGM-140039	585653.30	4572916.80	83.7	54.7	31.1	18.4	Point	FALSE
DGM-14	P-DGM-140040	585661.10	4572906.30	87.3	53.9	21.1	4.7	Point	FALSE
DGM-14	P-DGM-140041	585649.82	4572911.65	84.9	50.7	23.7	9.4	Point	FALSE
DGM-14	P-DGM-140043	585656.93	4572918.66	74.9	47.9	24.4	10.7	Tiling	FALSE
DGM-14	P-DGM-140044	585676.50	4572926.50	71.7	47.6	25.0	9.5	Point	FALSE
DGM-14	P-DGM-140045	585662.00	4572913.60	72.4	46.7	27.7	15.3	Point	FALSE
DGM-14	P-DGM-140046	585655.00	4572912.00	63.6	46.5	28.7	14.8	Point	FALSE
DGM-14	P-DGM-140047	585677.05	4572927.39	71.0	45.6	24.1	10.9	Tiling	FALSE
DGM-14	P-DGM-140048	585654.00	4572912.20	63.5	45.3	25.9	12.3	Point	FALSE
DGM-14	P-DGM-140049	585657.90	4572908.80	65.7	45.3	26.2	13.9	Point	FALSE
DGM-14	P-DGM-140050	585652.04	4572915.00	96.5	44.4	10.3	1.3	Point	FALSE
DGM-14	P-DGM-140051	585659.70	4572930.40	63.2	41.4	22.2	9.6	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-14	P-DGM-140052	585661.33	4572914.42	57.9	41.0	23.3	9.7	Tiling	FALSE
DGM-14	P-DGM-140053	585654.50	4572916.45	77.8	36.9	10.1	1.6	Tiling	FALSE
DGM-14	P-DGM-140057	585648.40	4572920.50	47.3	33.5	19.6	11.5	Point	FALSE
DGM-14	P-DGM-140058	585676.20	4572925.70	53.9	33.4	16.0	4.9	Point	FALSE
DGM-14	P-DGM-140059	585661.52	4572929.25	48.8	33.1	18.2	9.5	Tiling	FALSE
DGM-14	P-DGM-140060	585652.90	4572922.50	43.2	30.0	17.6	9.7	Point	FALSE
DGM-14	P-DGM-140061	585652.97	4572907.50	41.5	29.5	16.8	8.4	Point	FALSE
DGM-14	P-DGM-140062	585653.29	4572906.79	43.1	29.3	16.8	8.3	Point	FALSE
DGM-14	P-DGM-140064	585671.30	4572930.20	46.7	29.0	13.1	4.6	Point	FALSE
DGM-14	P-DGM-140065	585653.89	4572906.92	46.7	28.9	14.8	7.2	Point	FALSE
DGM-14	P-DGM-140066	585658.70	4572909.20	44.3	28.6	15.7	8.1	Point	FALSE
DGM-14	P-DGM-140067	585662.90	4572929.10	40.8	28.2	16.2	8.8	Point	FALSE
DGM-14	P-DGM-140068	585653.10	4572909.00	42.1	27.5	16.1	7.2	Point	FALSE
DGM-14	P-DGM-140071	585669.49	4572927.04	42.8	26.4	13.2	5.2	Tiling	FALSE
DGM-14	P-DGM-140072	585652.98	4572915.39	55.9	25.9	10.1	3.8	Tiling	FALSE
DGM-14	P-DGM-140073	585672.00	4572930.20	41.6	25.8	12.5	4.5	Point	FALSE
DGM-14	P-DGM-140074	585662.62	4572931.01	39.7	25.4	14.2	7.3	Point	FALSE
DGM-14	P-DGM-140075	585676.10	4572927.50	39.0	25.1	13.6	5.8	Point	FALSE
DGM-14	P-DGM-140076	585675.50	4572925.58	40.4	24.9	11.6	3.2	Point	FALSE
DGM-14	P-DGM-140077	585648.80	4572919.80	35.2	24.7	14.9	8.6	Point	FALSE
DGM-14	P-DGM-140078	585669.60	4572929.20	39.1	24.1	10.3	2.9	Point	FALSE
DGM-14	P-DGM-140080	585651.25	4572914.71	50.3	23.0	5.6	0.3	Tiling	FALSE
DGM-14	P-DGM-140082	585653.35	4572909.71	42.0	22.3	13.8	6.6	Point	FALSE
DGM-14	P-DGM-140087	585655.10	4572920.40	28.3	20.4	11.8	6.8	Point	FALSE
DGM-14	P-DGM-140088	585678.00	4572918.50	29.9	20.1	10.8	4.6	Point	FALSE
DGM-14	P-DGM-140090	585648.60	4572912.70	44.9	19.6	4.0	0.0	Point	FALSE
DGM-14	P-DGM-140092	585670.67	4572929.71	25.8	17.5	9.4	4.3	Tiling	FALSE
DGM-14	P-DGM-140096	585668.30	4572927.90	24.9	16.3	7.2	2.2	Point	FALSE
DGM-14	P-DGM-140097	585668.50	4572928.60	25.8	16.2	7.5	2.2	Point	FALSE
DGM-14	P-DGM-140098	585678.20	4572928.40	26.3	16.1	7.5	2.3	Point	FALSE
DGM-14	P-DGM-140099	585653.14	4572912.46	28.5	15.8	8.0	2.4	Tiling	FALSE
DGM-14	P-DGM-140102	585664.70	4572928.40	21.2	15.4	7.6	3.1	Point	FALSE
DGM-14	P-DGM-140103	585649.35	4572920.19	22.3	15.2	8.2	5.2	Tiling	FALSE
DGM-14	P-DGM-140104	585659.80	4572929.30	20.2	15.1	9.7	5.1	Point	FALSE
DGM-14	P-DGM-140105	585666.70	4572929.05	22.6	14.9	8.1	4.7	Point	FALSE
DGM-14	P-DGM-140106	585648.70	4572913.50	33.6	14.9	3.4	0.1	Point	FALSE
DGM-14	P-DGM-140107	585656.50	4572906.00	24.1	14.5	7.4	2.6	Point	FALSE
DGM-14	P-DGM-140108	585656.80	4572917.40	43.6	14.5	2.0	0.1	Point	FALSE
DGM-14	P-DGM-140109	585654.60	4572921.20	21.1	14.4	8.6	4.5	Point	FALSE
DGM-14	P-DGM-140111	585670.20	4572930.20	22.5	14.0	5.6	1.9	Point	FALSE
DGM-14	P-DGM-140112	585679.10	4572901.50	21.4	14.0	8.8	4.8	Point	FALSE
DGM-14	P-DGM-140116	585652.05	4572923.17	19.0	13.6	7.2	3.9	Tiling	FALSE
DGM-14	P-DGM-140117	585660.20	4572925.70	22.7	13.6	6.4	2.4	Point	FALSE
DGM-14	P-DGM-140118	585675.20	4572926.40	20.6	13.5	6.1	1.8	Point	FALSE
DGM-14	P-DGM-140119	585674.75	4572925.75	20.9	13.5	6.8	2.2	Tiling	FALSE
DGM-14	P-DGM-140120	585657.30	4572911.30	18.4	13.2	8.3	4.8	Point	FALSE
DGM-14	P-DGM-140121	585671.15	4572925.84	21.5	12.8	4.9	1.7	Point	FALSE
DGM-14	P-DGM-140122	585673.80	4572924.30	21.4	12.7	5.5	1.8	Point	FALSE
DGM-14	P-DGM-140124	585674.30	4572924.70	20.1	12.4	5.7	1.5	Point	FALSE
DGM-14	P-DGM-140125	585675.00	4572913.40	19.2	12.3	5.4	1.5	Point	FALSE
DGM-14	P-DGM-140126	585649.80	4572903.10	20.4	12.2	5.5	2.5	Point	FALSE
DGM-14	P-DGM-140129	585676.00	4572915.10	16.9	11.8	6.9	4.0	Point	FALSE
DGM-14	P-DGM-140130	585658.30	4572911.50	15.9	11.8	7.2	4.5	Point	FALSE
DGM-14	P-DGM-140132	585674.70	4572912.70	19.0	11.7	5.7	1.7	Point	FALSE
DGM-14	P-DGM-140133	585666.01	4572914.20	17.7	11.7	5.3	1.9	Tiling	FALSE
DGM-14	P-DGM-140135	585657.60	4572902.00	19.2	11.6	5.2	2.4	Point	FALSE
DGM-14	P-DGM-140136	585658.20	4572918.20	36.2	11.5	2.1	0.8	Point	FALSE
DGM-14	P-DGM-140137	585653.60	4572910.60	23.6	11.5	4.1	1.1	Point	FALSE
DGM-14	P-DGM-140138	585678.00	4572929.60	17.3	11.2	5.7	1.7	Point	FALSE
DGM-14	P-DGM-140140	585671.30	4572931.60	19.2	11.1	4.1	1.3	Point	FALSE
DGM-14	P-DGM-140141	585664.80	4572907.10	21.6	11.1	2.7	0.1	Point	FALSE
DGM-14	P-DGM-140142	585677.81	4572917.86	16.6	10.8	5.8	2.7	Tiling	FALSE
DGM-14	P-DGM-140143	585669.70	4572929.90	16.0	10.8	5.7	2.3	Point	FALSE
DGM-14	P-DGM-140144	585665.80	4572928.90	15.6	10.5	5.0	1.6	Point	FALSE
DGM-14	P-DGM-140145	585650.40	4572901.30	15.1	10.4	5.5	3.5	Point	FALSE
DGM-14	P-DGM-140146	585678.56	4572901.89	23.9	10.4	4.9	3.0	Tiling (possible noise)	FALSE
DGM-14	P-DGM-140147	585665.60	4572929.60	13.9	10.1	5.5	2.0	Point	FALSE
DGM-14	P-DGM-140148	585649.80	4572923.00	14.7	10.0	6.9	3.9	Point	FALSE
DGM-14	P-DGM-140149	585660.50	4572910.20	13.5	10.0	5.3	1.8	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-14	P-DGM-140150	585678.80	4572916.70	15.8	9.7	5.1	2.0	Point	FALSE
DGM-14	P-DGM-140151	585649.14	4572914.24	24.0	9.6	2.0	0.2	Tiling	FALSE
DGM-14	P-DGM-140152	585674.84	4572921.36	16.0	9.6	4.5	1.9	Point	FALSE
DGM-14	P-DGM-140153	585673.90	4572929.90	16.1	9.5	4.0	1.0	Point	FALSE
DGM-14	P-DGM-140154	585669.15	4572928.24	13.1	9.4	5.0	1.4	Tiling	FALSE
DGM-14	P-DGM-140156	585659.40	4572915.00	14.0	9.1	5.8	2.3	Point	FALSE
DGM-14	P-DGM-140157	585670.70	4572926.50	27.6	9.1	0.8	-0.1	Point	FALSE
DGM-14	P-DGM-140158	585662.90	4572927.80	14.0	9.0	4.6	1.3	Point	FALSE
DGM-14	P-DGM-140159	585658.80	4572915.60	13.5	9.0	5.1	2.5	Point	FALSE
DGM-14	P-DGM-140161	585671.00	4572913.69	12.8	8.9	5.4	2.8	Tiling (possible noise)	FALSE
DGM-14	P-DGM-140162	585662.00	4572927.80	13.8	8.6	4.3	1.7	Point	FALSE
DGM-14	P-DGM-140164	585670.30	4572930.90	16.8	8.6	2.7	0.7	Point	FALSE
DGM-14	P-DGM-140165	585649.80	4572901.50	12.0	8.6	5.3	2.9	Point	FALSE
DGM-14	P-DGM-140167	585675.40	4572921.78	13.5	8.4	4.4	1.6	Point	FALSE
DGM-14	P-DGM-140168	585675.40	4572920.40	14.4	8.3	3.5	1.3	Point	FALSE
DGM-14	P-DGM-140170	585650.28	4572902.55	15.3	8.2	4.4	2.5	Tiling	FALSE
DGM-14	P-DGM-140171	585665.02	4572929.36	15.1	8.1	2.2	0.3	Point	FALSE
DGM-14	P-DGM-140172	585652.00	4572927.00	9.9	8.1	3.7	1.8	Point	FALSE
DGM-14	P-DGM-140173	585673.10	4572930.00	12.7	8.1	3.7	1.1	Point	FALSE
DGM-14	P-DGM-140175	585655.94	4572918.09	10.5	7.9	4.6	2.1	Tiling (possible noise)	FALSE
DGM-14	P-DGM-140176	585678.30	4572913.60	14.5	7.9	2.5	0.7	Point	FALSE
DGM-14	P-DGM-140177	585650.10	4572927.30	12.6	7.8	3.1	1.2	Point	FALSE
DGM-14	P-DGM-140178	585663.66	4572915.61	10.0	7.6	4.0	2.2	Tiling	FALSE
DGM-14	P-DGM-140180	585677.00	4572918.00	11.0	7.6	4.2	2.0	Point	FALSE
DGM-14	P-DGM-140181	585651.60	4572901.80	10.7	7.5	3.8	1.8	Point	FALSE
DGM-14	P-DGM-140182	585673.80	4572929.00	13.0	7.5	2.5	0.7	Point (possible noise)	FALSE
DGM-14	P-DGM-140183	585676.00	4572923.30	14.7	7.3	2.9	1.2	Point	FALSE
DGM-14	P-DGM-140184	585678.40	4572913.00	12.3	7.3	3.0	1.2	Point	FALSE
DGM-14	P-DGM-140185	585649.70	4572922.10	9.1	7.3	4.0	2.2	Point	FALSE
DGM-14	P-DGM-140186	585653.80	4572906.00	12.0	7.2	3.8	1.9	Tiling	FALSE
DGM-14	P-DGM-140188	585657.10	4572901.70	12.0	6.8	3.0	1.9	Point	FALSE
DGM-14	P-DGM-140189	585651.60	4572902.60	10.1	6.7	3.5	1.6	Point	FALSE
DGM-14	P-DGM-140190	585667.40	4572926.60	11.8	6.7	3.0	0.7	Point (possible noise)	FALSE
DGM-14	P-DGM-140191	585666.40	4572913.10	10.4	6.7	2.9	1.1	Point	FALSE
DGM-14	P-DGM-140192	585669.90	4572926.20	10.6	6.6	1.4	-0.1	Point (possible noise)	FALSE
DGM-14	P-DGM-140193	585652.20	4572910.70	10.7	6.6	2.7	1.2	Point (possible noise)	FALSE
DGM-14	P-DGM-140194	585675.50	4572921.20	10.2	6.6	3.0	1.4	Point (possible noise)	FALSE
DGM-14	P-DGM-140195	585652.60	4572902.10	6.1	6.6	1.6	1.5	Poor Decay (Noise)	FALSE
DGM-14	P-DGM-140196	585676.90	4572916.90	9.3	6.4	3.5	2.1	Point (possible noise)	FALSE
DGM-14	P-DGM-140198	585657.20	4572901.10	11.2	6.2	2.8	1.2	Point	FALSE
DGM-14	P-DGM-140200	585674.90	4572931.70	11.0	6.0	3.8	1.9	Point (possible noise)	FALSE
DGM-14	P-DGM-140201	585680.27	4572904.17	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-14	P-DGM-140202	585671.58	4572916.38	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-15	P-DGM-150001	585788.20	4572749.90	276.9	169.7	73.4	19.6	Point	FALSE
DGM-15	P-DGM-150002	585788.11	4572750.53	210.8	130.4	57.4	17.4	Point	FALSE
DGM-15	P-DGM-150003	585788.10	4572749.30	186.9	114.9	46.8	11.1	Point	FALSE
DGM-15	P-DGM-150004	585772.50	4572730.40	99.2	63.1	30.5	10.6	Point	FALSE
DGM-15	P-DGM-150005	585774.70	4572751.40	87.7	58.1	31.8	16.3	Point	FALSE
DGM-15	P-DGM-150007	585787.00	4572755.20	88.8	46.5	16.3	3.9	Point	FALSE
DGM-15	P-DGM-150008	585788.35	4572748.59	75.6	44.0	17.0	2.9	Point	FALSE
DGM-15	P-DGM-150009	585777.50	4572754.30	56.3	34.9	15.1	4.2	Point	FALSE
DGM-15	P-DGM-150011	585776.92	4572754.49	49.0	30.5	13.6	4.2	Tiling	FALSE
DGM-15	P-DGM-150012	585777.50	4572755.01	42.4	25.3	11.0	3.5	Tiling	FALSE
DGM-15	P-DGM-150013	585775.90	4572751.70	35.8	24.4	14.3	7.3	Point	FALSE
DGM-15	P-DGM-150014	585785.35	4572760.13	33.0	24.3	15.5	9.1	Point	FALSE
DGM-15	P-DGM-150015	585778.70	4572753.50	35.2	22.8	12.6	5.9	Point	FALSE
DGM-15	P-DGM-150017	585774.60	4572754.50	29.9	20.5	11.0	6.7	Point	FALSE
DGM-15	P-DGM-150018	585771.90	4572756.20	26.1	18.3	10.6	5.4	Point	FALSE
DGM-15	P-DGM-150019	585786.29	4572754.65	37.0	17.9	5.3	0.8	Tiling	FALSE
DGM-15	P-DGM-150020	585789.50	4572747.80	27.6	17.4	7.9	2.1	Point	FALSE
DGM-15	P-DGM-150021	585777.14	4572750.99	18.6	13.1	6.3	3.3	Tiling	FALSE
DGM-15	P-DGM-150024	585762.80	4572757.00	15.3	11.3	6.2	3.9	Point	FALSE
DGM-15	P-DGM-150025	585777.70	4572746.50	16.1	11.1	6.9	4.2	Point	FALSE
DGM-15	P-DGM-150026	585775.10	4572755.01	19.6	10.8	6.0	3.3	Tiling	FALSE
DGM-15	P-DGM-150027	585784.45	4572756.34	22.3	10.7	3.3	1.0	Point	FALSE
DGM-15	P-DGM-150028	585787.10	4572752.00	14.5	10.0	6.5	3.3	Point	FALSE
DGM-15	P-DGM-150030	585759.37	4572757.89	22.6	9.7	2.6	0.1	Tiling	FALSE
DGM-15	P-DGM-150031	585786.60	4572751.10	16.2	9.6	5.3	2.6	Point	FALSE
DGM-15	P-DGM-150032	585782.10	4572758.30	20.8	9.5	2.0	0.1	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-15	P-DGM-150034	585775.30	4572761.10	13.4	9.3	5.8	2.8	Point	FALSE
DGM-15	P-DGM-150035	585776.70	4572745.60	12.7	9.3	5.5	3.1	Point	FALSE
DGM-15	P-DGM-150036	585763.10	4572753.64	12.8	9.1	4.7	1.8	Point	FALSE
DGM-15	P-DGM-150038	585781.70	4572739.40	13.7	9.0	4.3	1.2	Point	FALSE
DGM-15	P-DGM-150039	585784.40	4572757.20	17.5	8.8	2.9	0.9	Point	FALSE
DGM-15	P-DGM-150040	585758.90	4572757.10	19.7	8.3	1.2	-0.3	Point	FALSE
DGM-15	P-DGM-150041	585774.20	4572764.50	16.2	8.3	3.1	1.0	Point	FALSE
DGM-15	P-DGM-150042	585762.40	4572753.70	18.8	8.2	3.5	0.9	Point	FALSE
DGM-15	P-DGM-150043	585777.00	4572746.70	11.7	8.2	5.4	3.1	Point	FALSE
DGM-15	P-DGM-150044	585773.58	4572764.83	13.3	8.2	4.3	2.2	Point	FALSE
DGM-15	P-DGM-150045	585776.10	4572746.30	11.4	8.0	4.7	2.4	Point	FALSE
DGM-15	P-DGM-150046	585776.81	4572752.93	12.5	7.7	4.0	1.6	Tiling	FALSE
DGM-15	P-DGM-150047	585777.76	4572752.52	10.9	7.4	4.0	2.2	Tiling	FALSE
DGM-15	P-DGM-150048	585763.30	4572739.80	10.6	7.2	3.7	1.6	Point	FALSE
DGM-15	P-DGM-150049	585772.19	4572756.89	10.9	7.1	4.2	2.3	Tiling	FALSE
DGM-15	P-DGM-150050	585771.20	4572747.50	10.8	7.0	3.8	1.8	Point	FALSE
DGM-15	P-DGM-150051	585779.68	4572753.04	8.4	6.8	3.0	1.3	Tiling	FALSE
DGM-15	P-DGM-150053	585785.20	4572755.50	10.1	6.3	4.1	2.5	Point	FALSE
DGM-15	P-DGM-150054	585777.20	4572752.30	9.9	6.1	3.4	1.5	Point	FALSE
DGM-15	P-DGM-150055	585784.20	4572758.60	15.2	6.1	0.5	-0.2	Point	FALSE
DGM-15	P-DGM-150056	585775.20	4572762.10	8.7	6.1	3.9	2.4	Point	FALSE
DGM-15	P-DGM-150057	585775.50	4572747.20	10.7	6.1	3.0	1.5	Point	FALSE
DGM-15	P-DGM-150058	585778.37	4572731.60	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-15	P-DGM-150059	585768.75	4572728.52	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-16	P-DGM-160001	585631.70	4573028.90	1862.5	1200.4	583.1	211.5	Point	FALSE
DGM-16	P-DGM-160002	585630.90	4573050.30	912.6	631.1	372.9	215.5	Point	FALSE
DGM-16	P-DGM-160003	585616.20	4573023.40	923.3	598.2	297.3	105.1	Point	FALSE
DGM-16	P-DGM-160004	585631.41	4573029.60	626.2	373.2	163.7	51.6	Tiling	FALSE
DGM-16	P-DGM-160006	585620.00	4573021.40	415.8	279.9	161.1	85.3	Point	FALSE
DGM-16	P-DGM-160007	585633.00	4573026.90	359.3	269.4	163.6	79.4	Point	FALSE
DGM-16	P-DGM-160010	585632.65	4573028.00	296.7	214.0	124.7	56.8	Tiling	FALSE
DGM-16	P-DGM-160011	585623.30	4573038.00	299.2	200.3	114.9	59.2	Point	FALSE
DGM-16	P-DGM-160012	585624.40	4573042.60	310.3	198.8	105.5	49.1	Point	FALSE
DGM-16	P-DGM-160013	585617.60	4573024.20	272.8	195.3	119.4	72.8	Point	FALSE
DGM-16	P-DGM-160015	585628.10	4573030.80	241.1	177.7	114.0	66.2	Point	FALSE
DGM-16	P-DGM-160016	585618.30	4573024.30	242.3	175.5	112.5	66.2	Point	FALSE
DGM-16	P-DGM-160018	585632.56	4573029.37	234.3	167.8	111.1	57.2	Tiling	FALSE
DGM-16	P-DGM-160019	585627.80	4573031.30	223.2	160.7	97.7	54.9	Point	FALSE
DGM-16	P-DGM-160020	585616.40	4573030.90	314.2	159.5	46.1	5.5	Point	FALSE
DGM-16	P-DGM-160022	585617.60	4573031.80	277.3	149.9	47.0	6.6	Point	FALSE
DGM-16	P-DGM-160023	585624.79	4573043.15	208.1	132.6	70.1	32.5	Tiling	FALSE
DGM-16	P-DGM-160024	585631.70	4573022.20	178.7	127.7	78.5	41.9	Point	FALSE
DGM-16	P-DGM-160025	585605.00	4573025.60	191.6	119.9	61.2	27.2	Point	FALSE
DGM-16	P-DGM-160026	585622.89	4573038.59	161.1	114.9	71.6	44.4	Tiling	FALSE
DGM-16	P-DGM-160027	585623.80	4573028.20	158.8	114.4	70.9	41.1	Point	FALSE
DGM-16	P-DGM-160029	585631.00	4573027.50	131.0	97.0	60.8	36.6	Point	FALSE
DGM-16	P-DGM-160030	585621.50	4573031.90	164.6	91.4	39.1	14.1	Point	FALSE
DGM-16	P-DGM-160031	585623.80	4573037.20	135.8	91.3	53.2	28.0	Point	FALSE
DGM-16	P-DGM-160032	585628.77	4573031.62	121.5	91.2	58.3	33.0	Tiling	FALSE
DGM-16	P-DGM-160033	585633.06	4573021.67	113.9	84.3	53.5	28.3	Tiling	FALSE
DGM-16	P-DGM-160035	585620.00	4573039.00	110.5	75.0	41.7	19.8	Point	FALSE
DGM-16	P-DGM-160037	585621.90	4573032.70	151.2	74.0	23.8	6.4	Point	FALSE
DGM-16	P-DGM-160038	585629.80	4573032.60	99.3	69.9	40.4	22.1	Point	FALSE
DGM-16	P-DGM-160040	585628.91	4573030.31	86.0	64.5	42.1	22.0	Tiling	FALSE
DGM-16	P-DGM-160041	585623.30	4573027.30	84.6	62.3	39.9	23.1	Point	FALSE
DGM-16	P-DGM-160042	585604.00	4573041.50	141.6	62.0	13.2	1.2	Point	FALSE
DGM-16	P-DGM-160043	585622.40	4573048.10	101.9	58.9	20.2	3.3	Point	FALSE
DGM-16	P-DGM-160045	585614.00	4573039.60	79.8	52.8	29.1	14.4	Point	FALSE
DGM-16	P-DGM-160046	585624.50	4573048.20	65.3	47.8	30.2	16.4	Point	FALSE
DGM-16	P-DGM-160048	585606.90	4573033.70	60.3	45.2	28.7	17.2	Point	FALSE
DGM-16	P-DGM-160049	585614.10	4573039.00	69.8	45.0	23.9	11.4	Point	FALSE
DGM-16	P-DGM-160051	585617.90	4573033.30	62.8	41.8	23.3	12.1	Point	FALSE
DGM-16	P-DGM-160052	585617.30	4573033.20	61.0	40.5	22.3	11.1	Point	FALSE
DGM-16	P-DGM-160053	585623.40	4573041.30	56.9	39.2	21.4	9.2	Point	FALSE
DGM-16	P-DGM-160054	585623.70	4573040.30	52.0	39.2	24.8	12.7	Point	FALSE
DGM-16	P-DGM-160057	585631.70	4573034.10	53.6	37.2	22.2	12.9	Point	FALSE
DGM-16	P-DGM-160058	585621.70	4573033.50	82.9	37.2	9.2	1.1	Point	FALSE
DGM-16	P-DGM-160061	585614.00	4573033.50	51.9	36.1	20.9	11.5	Point	FALSE
DGM-16	P-DGM-160063	585627.50	4573036.60	47.6	34.8	21.9	13.2	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-16	P-DGM-160064	585631.60	4573035.90	48.2	34.8	21.5	12.8	Point	FALSE
DGM-16	P-DGM-160065	585620.80	4573044.10	54.2	34.7	18.7	8.2	Point	FALSE
DGM-16	P-DGM-160067	585621.60	4573022.80	45.8	33.6	21.0	12.2	Point	FALSE
DGM-16	P-DGM-160068	585625.00	4573049.50	42.9	33.3	24.2	15.6	Point	FALSE
DGM-16	P-DGM-160069	585617.00	4573020.00	51.6	33.1	15.5	4.9	Point	FALSE
DGM-16	P-DGM-160070	585621.50	4573024.10	49.4	32.7	17.4	8.7	Point	FALSE
DGM-16	P-DGM-160071	585623.50	4573045.00	53.8	32.7	14.8	6.0	Point	FALSE
DGM-16	P-DGM-160072	585602.90	4573038.40	45.6	31.8	18.5	10.1	Point	FALSE
DGM-16	P-DGM-160073	585609.00	4573022.50	44.6	31.6	19.0	9.7	Point	FALSE
DGM-16	P-DGM-160074	585631.40	4573020.20	47.5	31.0	17.2	8.7	Point	FALSE
DGM-16	P-DGM-160075	585632.70	4573039.40	57.8	30.3	11.1	2.9	Point	FALSE
DGM-16	P-DGM-160076	585620.40	4573041.60	54.4	30.0	10.5	1.9	Point	FALSE
DGM-16	P-DGM-160077	585628.40	4573028.90	59.8	30.0	8.6	1.7	Point	FALSE
DGM-16	P-DGM-160078	585632.86	4573023.81	40.1	28.9	17.2	8.7	Point	FALSE
DGM-16	P-DGM-160079	585614.40	4573020.00	41.9	28.8	17.7	9.3	Point	FALSE
DGM-16	P-DGM-160080	585630.38	4573037.59	41.7	28.5	16.6	9.2	Point	FALSE
DGM-16	P-DGM-160081	585620.50	4573038.10	40.7	28.2	16.2	9.1	Point	FALSE
DGM-16	P-DGM-160082	585622.54	4573031.39	46.0	28.1	15.6	5.8	Tiling	FALSE
DGM-16	P-DGM-160084	585632.50	4573049.90	41.8	27.6	14.8	7.5	Point	FALSE
DGM-16	P-DGM-160085	585602.90	4573050.60	37.6	27.4	16.5	9.4	Point	FALSE
DGM-16	P-DGM-160086	585606.20	4573041.20	42.1	27.3	14.2	6.9	Point	FALSE
DGM-16	P-DGM-160087	585622.60	4573036.00	38.1	26.5	13.5	4.7	Point	FALSE
DGM-16	P-DGM-160088	585620.60	4573044.90	39.0	26.4	13.8	7.1	Point	FALSE
DGM-16	P-DGM-160089	585617.70	4573020.90	37.0	26.2	14.9	6.2	Point	FALSE
DGM-16	P-DGM-160090	585626.47	4573028.45	66.7	25.9	5.1	0.2	Point	FALSE
DGM-16	P-DGM-160092	585620.10	4573029.20	55.3	25.0	6.6	1.1	Point	FALSE
DGM-16	P-DGM-160093	585613.80	4573034.80	35.4	25.0	15.6	9.0	Point	FALSE
DGM-16	P-DGM-160094	585631.10	4573035.10	33.6	24.9	15.4	9.1	Point	FALSE
DGM-16	P-DGM-160097	585627.10	4573049.50	65.5	24.1	5.0	0.8	Point	FALSE
DGM-16	P-DGM-160098	585608.00	4573029.10	31.3	23.5	14.8	8.6	Point	FALSE
DGM-16	P-DGM-160099	585608.50	4573022.10	32.9	23.2	14.3	7.6	Point	FALSE
DGM-16	P-DGM-160100	585626.40	4573034.20	32.4	23.1	13.6	7.1	Point	FALSE
DGM-16	P-DGM-160101	585611.80	4573041.90	39.1	23.0	10.6	4.1	Point	FALSE
DGM-16	P-DGM-160103	585618.20	4573026.80	33.2	22.9	12.3	6.2	Point	FALSE
DGM-16	P-DGM-160104	585628.38	4573036.02	30.2	22.7	14.7	9.7	Tiling	FALSE
DGM-16	P-DGM-160105	585607.70	4573034.00	30.8	22.7	14.4	9.1	Point	FALSE
DGM-16	P-DGM-160106	585624.50	4573050.60	30.6	22.6	14.8	8.0	Point	FALSE
DGM-16	P-DGM-160107	585611.90	4573024.90	33.1	22.6	10.5	3.4	Point	FALSE
DGM-16	P-DGM-160108	585623.50	4573023.40	32.5	22.2	12.4	6.2	Point	FALSE
DGM-16	P-DGM-160109	585632.50	4573043.00	29.7	22.1	13.7	7.4	Point	FALSE
DGM-16	P-DGM-160110	585620.80	4573029.20	50.4	22.0	5.5	1.1	Point	FALSE
DGM-16	P-DGM-160111	585632.30	4573042.00	29.8	21.7	13.0	6.5	Point	FALSE
DGM-16	P-DGM-160112	585607.26	4573034.58	28.7	21.4	13.1	8.2	Tiling	FALSE
DGM-16	P-DGM-160113	585629.20	4573020.70	29.7	20.7	11.5	6.2	Point	FALSE
DGM-16	P-DGM-160116	585620.00	4573023.30	29.9	20.3	11.5	6.5	Point	FALSE
DGM-16	P-DGM-160117	585620.40	4573028.40	41.8	20.3	6.0	1.3	Point	FALSE
DGM-16	P-DGM-160119	585606.61	4573040.87	32.4	19.9	10.5	4.5	Tiling	FALSE
DGM-16	P-DGM-160121	585633.20	4573035.60	41.3	19.9	4.9	0.3	Point	FALSE
DGM-16	P-DGM-160122	585632.61	4573038.64	35.6	19.8	7.7	2.0	Tiling	FALSE
DGM-16	P-DGM-160123	585628.90	4573047.60	32.0	19.4	8.8	2.4	Point	FALSE
DGM-16	P-DGM-160124	585611.90	4573023.50	26.7	19.3	10.7	4.8	Point	FALSE
DGM-16	P-DGM-160126	585607.57	4573029.49	25.6	19.1	12.0	6.4	Tiling	FALSE
DGM-16	P-DGM-160127	585623.30	4573035.40	26.7	18.8	9.7	3.0	Point	FALSE
DGM-16	P-DGM-160128	585616.84	4573039.44	26.8	18.8	11.1	5.9	Point	FALSE
DGM-16	P-DGM-160129	585621.80	4573030.87	28.1	18.3	10.0	4.6	Tiling	FALSE
DGM-16	P-DGM-160130	585626.70	4573046.20	40.5	18.1	5.2	1.2	Point	FALSE
DGM-16	P-DGM-160131	585606.30	4573038.30	26.4	18.1	10.2	5.7	Point	FALSE
DGM-16	P-DGM-160132	585628.50	4573028.20	36.0	18.1	5.0	1.0	Point	FALSE
DGM-16	P-DGM-160133	585614.90	4573020.50	26.6	18.0	9.8	4.1	Point	FALSE
DGM-16	P-DGM-160135	585608.80	4573029.40	23.7	17.5	11.0	6.6	Point	FALSE
DGM-16	P-DGM-160136	585620.50	4573022.70	24.3	17.4	10.8	6.1	Point	FALSE
DGM-16	P-DGM-160137	585606.90	4573030.20	24.9	17.4	10.0	5.2	Point	FALSE
DGM-16	P-DGM-160139	585628.50	4573021.30	24.7	17.3	9.0	4.9	Point	FALSE
DGM-16	P-DGM-160141	585623.50	4573030.90	27.4	16.7	8.3	4.5	Point	FALSE
DGM-16	P-DGM-160143	585612.00	4573022.50	23.1	16.4	9.3	3.9	Point	FALSE
DGM-16	P-DGM-160144	585624.70	4573047.50	21.8	16.3	9.3	5.4	Point	FALSE
DGM-16	P-DGM-160145	585627.40	4573034.70	23.2	16.3	10.0	5.3	Point	FALSE
DGM-16	P-DGM-160146	585614.30	4573020.90	24.3	15.9	8.3	3.4	Point	FALSE
DGM-16	P-DGM-160147	585623.70	4573049.50	22.4	15.8	8.8	4.7	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-16	P-DGM-160148	585631.90	4573046.40	24.0	15.7	8.7	3.9	Point	FALSE
DGM-16	P-DGM-160149	585615.52	4573031.89	24.6	15.6	8.2	4.3	Point	FALSE
DGM-16	P-DGM-160150	585620.78	4573024.18	22.6	15.3	8.5	4.7	Tiling	FALSE
DGM-16	P-DGM-160152	585618.70	4573043.40	20.5	15.3	9.2	5.2	Point	FALSE
DGM-16	P-DGM-160153	585621.80	4573029.10	24.8	15.3	7.5	3.2	Point	FALSE
DGM-16	P-DGM-160154	585630.50	4573038.80	24.0	15.2	7.3	3.0	Point	FALSE
DGM-16	P-DGM-160155	585620.60	4573042.18	23.3	15.0	6.9	3.4	Tiling	FALSE
DGM-16	P-DGM-160156	585609.60	4573037.90	25.7	14.9	5.6	1.1	Point	FALSE
DGM-16	P-DGM-160157	585609.90	4573037.10	24.8	14.5	5.6	1.3	Point	FALSE
DGM-16	P-DGM-160158	585606.00	4573034.10	20.4	14.3	8.3	3.8	Point	FALSE
DGM-16	P-DGM-160160	585617.80	4573040.50	19.9	14.0	8.6	4.8	Point	FALSE
DGM-16	P-DGM-160161	585627.90	4573038.90	21.1	14.0	7.6	3.8	Point	FALSE
DGM-16	P-DGM-160162	585632.20	4573036.90	21.6	13.9	7.1	2.5	Point	FALSE
DGM-16	P-DGM-160163	585613.70	4573027.40	20.6	13.9	7.9	3.9	Point	FALSE
DGM-16	P-DGM-160165	585623.94	4573044.39	22.3	13.7	6.7	2.6	Tiling	FALSE
DGM-16	P-DGM-160166	585632.40	4573040.70	19.9	13.5	7.6	3.4	Point	FALSE
DGM-16	P-DGM-160167	585602.80	4573026.80	18.1	13.4	8.6	4.8	Point	FALSE
DGM-16	P-DGM-160169	585632.50	4573020.40	19.8	12.9	7.1	3.0	Point	FALSE
DGM-16	P-DGM-160170	585620.50	4573046.10	28.8	12.8	3.8	1.0	Point	FALSE
DGM-16	P-DGM-160171	585624.70	4573046.10	19.3	12.7	6.7	2.7	Point	FALSE
DGM-16	P-DGM-160172	585620.10	4573027.50	21.6	12.6	5.7	2.1	Point	FALSE
DGM-16	P-DGM-160173	585623.70	4573025.50	19.5	12.5	6.4	2.5	Point	FALSE
DGM-16	P-DGM-160174	585619.60	4573020.00	17.2	12.2	6.9	4.2	Point	FALSE
DGM-16	P-DGM-160175	585610.80	4573021.60	22.4	12.2	5.4	1.8	Point	FALSE
DGM-16	P-DGM-160177	585610.80	4573030.30	18.5	11.6	5.6	2.4	Point	FALSE
DGM-16	P-DGM-160178	585604.40	4573030.50	16.9	11.4	5.3	1.5	Point	FALSE
DGM-16	P-DGM-160179	585621.60	4573039.60	15.7	11.3	6.7	3.7	Point	FALSE
DGM-16	P-DGM-160181	585626.40	4573048.90	33.7	11.2	2.1	0.6	Point	FALSE
DGM-16	P-DGM-160182	585607.00	4573038.70	17.7	11.2	7.2	3.5	Point	FALSE
DGM-16	P-DGM-160183	585611.10	4573047.20	16.4	11.1	6.0	3.5	Point	FALSE
DGM-16	P-DGM-160184	585631.10	4573024.40	15.2	11.1	6.5	2.7	Point	FALSE
DGM-16	P-DGM-160185	585604.80	4573020.20	17.4	11.0	5.1	2.1	Point	FALSE
DGM-16	P-DGM-160186	585610.60	4573047.60	15.7	11.0	6.4	3.3	Point	FALSE
DGM-16	P-DGM-160189	585606.80	4573020.90	17.2	10.7	4.7	1.3	Point	FALSE
DGM-16	P-DGM-160190	585627.83	4573033.99	15.9	10.7	5.9	3.0	Tiling	FALSE
DGM-16	P-DGM-160191	585633.20	4573044.00	16.2	10.6	5.2	1.8	Point	FALSE
DGM-16	P-DGM-160193	585606.80	4573031.30	16.4	10.5	4.7	1.3	Point	FALSE
DGM-16	P-DGM-160194	585616.30	4573044.10	14.6	10.4	6.1	2.9	Point	FALSE
DGM-16	P-DGM-160195	585624.50	4573044.90	17.3	10.4	4.4	1.5	Point	FALSE
DGM-16	P-DGM-160196	585618.10	4573043.50	13.4	10.1	5.9	3.0	Point	FALSE
DGM-16	P-DGM-160197	585606.40	4573020.20	16.0	10.1	4.4	0.8	Point	FALSE
DGM-16	P-DGM-160198	585616.70	4573045.10	13.6	10.0	5.9	3.2	Point	FALSE
DGM-16	P-DGM-160199	585631.20	4573023.60	13.2	10.0	6.2	3.4	Point	FALSE
DGM-16	P-DGM-160200	585614.00	4573050.70	13.6	9.9	6.0	3.2	Point	FALSE
DGM-16	P-DGM-160202	585613.90	4573048.70	11.9	9.3	5.7	3.3	Point	FALSE
DGM-16	P-DGM-160203	585630.10	4573025.80	13.6	9.2	4.1	1.0	Point	FALSE
DGM-16	P-DGM-160204	585612.81	4573034.78	13.4	9.2	6.3	3.1	Tiling	FALSE
DGM-16	P-DGM-160205	585625.90	4573042.60	13.9	9.2	4.6	2.1	Point	FALSE
DGM-16	P-DGM-160206	585621.45	4573021.71	13.3	9.2	5.8	4.0	Tiling	FALSE
DGM-16	P-DGM-160207	585604.20	4573033.30	12.0	9.0	5.5	2.6	Point	FALSE
DGM-16	P-DGM-160208	585607.26	4573049.91	14.5	9.0	4.7	2.1	Tiling	FALSE
DGM-16	P-DGM-160209	585616.40	4573049.20	13.4	9.0	4.8	1.9	Point	FALSE
DGM-16	P-DGM-160210	585613.90	4573037.40	16.8	8.8	2.5	0.3	Point	FALSE
DGM-16	P-DGM-160211	585620.00	4573026.40	12.8	8.7	4.4	2.5	Point	FALSE
DGM-16	P-DGM-160212	585631.40	4573040.20	12.8	8.7	4.9	2.5	Point	FALSE
DGM-16	P-DGM-160213	585631.50	4573045.90	14.5	8.7	5.8	3.2	Point	FALSE
DGM-16	P-DGM-160214	585631.30	4573041.20	12.5	8.6	4.7	2.4	Point	FALSE
DGM-16	P-DGM-160215	585616.11	4573039.26	11.7	8.6	6.1	3.2	Tiling	FALSE
DGM-16	P-DGM-160217	585627.50	4573045.60	11.7	8.2	4.2	1.8	Point	FALSE
DGM-16	P-DGM-160218	585613.50	4573049.60	11.5	8.2	5.0	2.9	Point	FALSE
DGM-16	P-DGM-160219	585613.13	4573033.91	11.6	8.2	5.4	3.0	Tiling	FALSE
DGM-16	P-DGM-160220	585617.90	4573025.60	24.8	8.2	2.0	0.8	Point	FALSE
DGM-16	P-DGM-160222	585631.90	4573037.80	11.4	7.9	4.2	1.7	Point	FALSE
DGM-16	P-DGM-160224	585625.20	4573033.60	18.2	7.7	2.1	0.7	Point	FALSE
DGM-16	P-DGM-160225	585628.40	4573034.80	12.1	7.5	4.3	1.6	Point	FALSE
DGM-16	P-DGM-160226	585614.48	4573024.73	10.7	7.4	3.7	1.3	Tiling	FALSE
DGM-16	P-DGM-160227	585608.80	4573038.50	10.4	7.4	4.2	1.9	Point	FALSE
DGM-16	P-DGM-160228	585630.70	4573025.40	10.7	7.3	3.6	1.1	Point	FALSE
DGM-16	P-DGM-160229	585627.80	4573021.50	10.3	7.3	3.8	2.1	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-16	P-DGM-160230	585613.40	4573037.10	12.6	7.3	3.2	1.4	Point	FALSE
DGM-16	P-DGM-160232	585617.70	4573028.40	13.3	7.0	3.3	0.8	Point	FALSE
DGM-16	P-DGM-160233	585632.50	4573035.20	14.9	7.0	1.5	0.1	Point	FALSE
DGM-16	P-DGM-160234	585632.31	4573045.97	10.6	7.0	4.6	2.6	Tiling (possible noise)	FALSE
DGM-16	P-DGM-160236	585603.10	4573042.90	10.4	7.0	4.4	2.5	Point	FALSE
DGM-16	P-DGM-160237	585603.13	4573039.35	9.7	6.9	4.1	2.3	Tiling	FALSE
DGM-16	P-DGM-160238	585622.40	4573046.70	9.5	6.9	4.0	1.6	Point (possible noise)	FALSE
DGM-16	P-DGM-160239	585616.50	4573029.30	12.9	6.8	2.4	0.8	Point	FALSE
DGM-16	P-DGM-160240	585603.90	4573034.10	9.8	6.8	4.3	2.5	Point	FALSE
DGM-16	P-DGM-160242	585611.60	4573034.90	9.5	6.7	4.3	2.5	Point	FALSE
DGM-16	P-DGM-160243	585614.10	4573023.90	10.2	6.7	3.4	1.3	Point	FALSE
DGM-16	P-DGM-160244	585622.10	4573042.20	10.0	6.6	2.2	1.2	Point	FALSE
DGM-16	P-DGM-160245	585615.60	4573040.50	9.7	6.4	4.4	2.4	Point (possible noise)	FALSE
DGM-16	P-DGM-160248	585629.00	4573042.50	8.6	6.3	3.6	1.9	Point (possible noise)	FALSE
DGM-16	P-DGM-160249	585626.50	4573022.20	9.4	6.2	3.3	1.5	Point	FALSE
DGM-16	P-DGM-160251	585618.90	4573026.10	8.4	6.2	3.3	1.6	Point	FALSE
DGM-16	P-DGM-160252	585615.00	4573032.50	9.0	6.1	3.8	2.2	Point	FALSE
DGM-16	P-DGM-160254	585604.90	4573031.30	9.1	6.0	3.2	1.3	Point	FALSE
DGM-17	P-DGM-170001	585781.30	4572509.40	115.0	79.2	44.3	21.2	Point	FALSE
DGM-17	P-DGM-170002	585767.40	4572515.40	46.7	31.4	17.5	8.5	Point	FALSE
DGM-17	P-DGM-170003	585766.50	4572515.10	18.0	12.4	7.0	3.4	Point	FALSE
DGM-18	P-DGM-180001	585849.06	4572931.38	783.5	564.0	343.6	194.3	Point	FALSE
DGM-18	P-DGM-180002	585849.64	4572931.40	617.1	428.8	249.2	131.9	Tiling	FALSE
DGM-18	P-DGM-180003	585850.16	4572931.15	328.9	238.0	145.7	84.9	Tiling	FALSE
DGM-18	P-DGM-180005	585874.18	4572934.41	237.4	173.4	106.4	61.6	Point	FALSE
DGM-18	P-DGM-180006	585856.00	4572926.20	203.0	128.9	62.6	22.5	Point	FALSE
DGM-18	P-DGM-180007	585865.60	4572935.00	155.6	111.1	68.2	37.0	Point	FALSE
DGM-18	P-DGM-180008	585859.00	4572924.10	132.4	97.1	61.3	36.1	Point	FALSE
DGM-18	P-DGM-180009	585865.50	4572935.70	126.7	90.1	53.3	26.7	Point	FALSE
DGM-18	P-DGM-180010	585854.40	4572929.20	107.2	73.6	42.5	21.0	Point	FALSE
DGM-18	P-DGM-180011	585858.80	4572924.80	98.7	71.0	43.0	24.2	Point	FALSE
DGM-18	P-DGM-180012	585860.00	4572931.90	95.6	69.9	39.9	15.8	Point	FALSE
DGM-18	P-DGM-180013	585857.40	4572922.40	94.6	58.3	25.8	8.2	Point	FALSE
DGM-18	P-DGM-180014	585853.70	4572926.10	81.9	53.0	27.8	12.5	Point	FALSE
DGM-18	P-DGM-180015	585863.90	4572932.20	76.1	52.0	28.7	13.0	Point	FALSE
DGM-18	P-DGM-180016	585856.50	4572925.00	71.8	49.3	27.6	14.0	Point	FALSE
DGM-18	P-DGM-180018	585862.60	4572935.10	64.6	46.7	28.3	15.8	Point	FALSE
DGM-18	P-DGM-180019	585859.10	4572927.00	68.6	45.9	25.9	13.7	Point	FALSE
DGM-18	P-DGM-180020	585862.10	4572932.20	62.4	45.5	28.2	15.7	Point	FALSE
DGM-18	P-DGM-180021	585859.59	4572932.43	62.3	45.0	25.4	9.9	Tiling	FALSE
DGM-18	P-DGM-180022	585854.21	4572926.29	68.5	43.2	22.5	10.2	Tiling	FALSE
DGM-18	P-DGM-180023	585860.50	4572931.60	58.6	42.6	25.3	10.7	Point	FALSE
DGM-18	P-DGM-180024	585858.30	4572922.00	55.0	38.9	22.4	12.1	Point	FALSE
DGM-18	P-DGM-180025	585861.50	4572928.60	58.7	38.2	20.6	8.8	Point	FALSE
DGM-18	P-DGM-180026	585872.00	4572932.10	50.4	37.6	21.1	10.2	Point	FALSE
DGM-18	P-DGM-180027	585861.20	4572932.50	53.0	37.4	22.0	11.9	Point	FALSE
DGM-18	P-DGM-180028	585859.24	4572927.73	54.0	36.4	20.8	9.6	Tiling	FALSE
DGM-18	P-DGM-180029	585856.40	4572930.80	49.7	36.0	22.4	13.2	Point	FALSE
DGM-18	P-DGM-180030	585859.20	4572931.70	48.6	33.7	19.1	7.1	Point	FALSE
DGM-18	P-DGM-180031	585859.10	4572929.50	55.9	33.0	14.2	4.2	Point	FALSE
DGM-18	P-DGM-180032	585857.40	4572925.00	48.7	32.6	18.4	8.0	Point	FALSE
DGM-18	P-DGM-180034	585852.10	4572933.50	53.2	32.1	13.9	3.8	Point	FALSE
DGM-18	P-DGM-180035	585859.69	4572927.34	44.7	32.0	19.0	9.4	Tiling	FALSE
DGM-18	P-DGM-180037	585858.66	4572927.57	47.6	31.7	17.2	8.7	Tiling	FALSE
DGM-18	P-DGM-180039	585861.90	4572931.30	41.5	29.0	16.7	7.5	Point	FALSE
DGM-18	P-DGM-180040	585864.41	4572932.79	43.8	28.1	16.1	7.4	Tiling	FALSE
DGM-18	P-DGM-180041	585876.30	4572934.30	40.5	28.1	15.3	7.9	Point	FALSE
DGM-18	P-DGM-180042	585872.50	4572930.80	36.8	27.4	16.2	8.4	Point	FALSE
DGM-18	P-DGM-180043	585856.40	4572922.80	51.2	27.0	7.8	0.3	Point	FALSE
DGM-18	P-DGM-180044	585873.50	4572930.90	39.1	26.9	13.7	6.0	Point	FALSE
DGM-18	P-DGM-180045	585862.17	4572928.38	40.7	25.9	12.7	5.2	Tiling	FALSE
DGM-18	P-DGM-180046	585870.20	4572932.30	36.1	25.6	16.0	9.6	Point	FALSE
DGM-18	P-DGM-180047	585859.60	4572930.20	35.6	25.4	16.0	9.0	Point	FALSE
DGM-18	P-DGM-180048	585861.50	4572930.70	34.3	24.5	14.8	7.2	Point	FALSE
DGM-18	P-DGM-180049	585857.88	4572922.93	36.0	24.1	13.1	5.9	Tiling	FALSE
DGM-18	P-DGM-180050	585865.30	4572932.90	34.4	24.0	12.3	4.8	Point	FALSE
DGM-18	P-DGM-180051	585856.50	4572920.60	41.2	23.6	9.3	2.5	Point	FALSE
DGM-18	P-DGM-180052	585869.10	4572935.10	34.0	22.8	12.8	6.4	Point	FALSE
DGM-18	P-DGM-180054	585874.90	4572931.90	32.9	22.4	12.4	5.5	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-18	P-DGM-180055	585863.00	4572932.00	33.3	22.1	11.9	6.2	Point	FALSE
DGM-18	P-DGM-180056	585866.30	4572934.10	32.6	21.5	12.2	4.9	Point	FALSE
DGM-18	P-DGM-180057	585872.40	4572930.10	29.0	21.5	12.3	6.4	Point	FALSE
DGM-18	P-DGM-180058	585869.10	4572935.70	30.6	21.0	12.3	6.2	Point	FALSE
DGM-18	P-DGM-180059	585865.70	4572931.60	29.9	20.3	11.4	4.9	Point	FALSE
DGM-18	P-DGM-180060	585863.00	4572934.30	30.2	20.1	11.0	5.9	Point	FALSE
DGM-18	P-DGM-180061	585870.10	4572931.40	34.1	19.9	8.6	2.6	Point	FALSE
DGM-18	P-DGM-180062	585856.20	4572931.70	26.1	19.2	11.7	7.2	Point	FALSE
DGM-18	P-DGM-180063	585873.10	4572929.60	26.2	18.8	11.1	4.4	Point	FALSE
DGM-18	P-DGM-180064	585869.00	4572932.10	27.7	17.8	11.1	6.6	Point	FALSE
DGM-18	P-DGM-180065	585859.20	4572921.40	32.9	17.7	7.5	3.6	Point	FALSE
DGM-18	P-DGM-180066	585859.73	4572926.59	24.0	17.3	10.8	5.4	Tiling	FALSE
DGM-18	P-DGM-180067	585875.80	4572935.10	25.3	17.3	9.3	4.1	Point	FALSE
DGM-18	P-DGM-180068	585867.10	4572931.80	23.3	17.0	11.0	6.5	Point	FALSE
DGM-18	P-DGM-180069	585847.71	4572931.46	27.1	17.0	9.2	4.8	Tiling	FALSE
DGM-18	P-DGM-180070	585865.30	4572930.40	26.2	16.7	7.9	3.9	Point	FALSE
DGM-18	P-DGM-180071	585853.35	4572926.90	22.4	15.9	8.3	3.5	Tiling	FALSE
DGM-18	P-DGM-180072	585862.27	4572930.51	21.7	15.8	9.7	4.6	Tiling	FALSE
DGM-18	P-DGM-180073	585859.34	4572933.12	21.1	15.5	10.0	4.2	Tiling	FALSE
DGM-18	P-DGM-180074	585861.55	4572929.67	22.0	15.4	8.0	3.5	Tiling	FALSE
DGM-18	P-DGM-180075	585865.70	4572932.40	23.1	15.1	8.0	3.5	Point	FALSE
DGM-18	P-DGM-180076	585860.57	4572927.32	21.0	14.9	7.6	2.9	Tiling	FALSE
DGM-18	P-DGM-180077	585860.40	4572930.10	19.4	14.2	8.6	4.2	Point	FALSE
DGM-18	P-DGM-180079	585857.30	4572921.20	22.0	13.7	7.0	3.3	Point	FALSE
DGM-18	P-DGM-180080	585866.60	4572935.60	19.0	13.2	6.3	3.1	Point	FALSE
DGM-18	P-DGM-180081	585856.10	4572927.80	18.1	13.2	8.0	4.1	Point	FALSE
DGM-18	P-DGM-180083	585855.40	4572924.70	20.3	12.6	6.3	2.6	Point	FALSE
DGM-18	P-DGM-180085	585857.50	4572926.30	20.8	12.4	6.0	2.3	Point	FALSE
DGM-18	P-DGM-180086	585864.60	4572906.90	20.4	12.3	5.7	2.3	Point	FALSE
DGM-18	P-DGM-180087	585873.90	4572931.63	18.7	11.8	6.5	2.6	Tiling	FALSE
DGM-18	P-DGM-180088	585863.10	4572935.87	19.2	11.4	6.4	2.3	Tiling	FALSE
DGM-18	P-DGM-180089	585862.50	4572906.10	16.7	11.3	6.7	3.1	Point	FALSE
DGM-18	P-DGM-180090	585849.90	4572928.70	17.9	11.1	5.3	2.4	Point	FALSE
DGM-18	P-DGM-180091	585866.60	4572929.00	18.8	10.7	5.0	1.5	Point	FALSE
DGM-18	P-DGM-180092	585862.99	4572933.53	16.7	10.6	5.1	2.2	Tiling	FALSE
DGM-18	P-DGM-180095	585851.60	4572933.00	16.8	10.1	4.2	0.6	Point	FALSE
DGM-18	P-DGM-180096	585859.80	4572920.50	17.9	9.9	4.5	1.6	Point	FALSE
DGM-18	P-DGM-180097	585863.20	4572928.10	15.6	9.6	6.0	3.0	Point	FALSE
DGM-18	P-DGM-180101	585870.16	4572930.61	15.5	9.1	3.2	0.2	Tiling	FALSE
DGM-18	P-DGM-180102	585860.09	4572929.07	16.4	9.0	4.5	1.5	Tiling	FALSE
DGM-18	P-DGM-180107	585857.74	4572927.27	13.0	7.8	4.4	2.2	Tiling	FALSE
DGM-18	P-DGM-180108	585857.80	4572929.90	13.3	7.7	3.7	1.4	Point	FALSE
DGM-18	P-DGM-180110	585863.47	4572905.89	10.3	7.4	4.0	1.6	Point	FALSE
DGM-18	P-DGM-180112	585853.30	4572928.10	9.5	7.2	3.8	1.5	Point	FALSE
DGM-18	P-DGM-180113	585864.50	4572935.20	11.8	7.0	3.5	0.9	Point	FALSE
DGM-18	P-DGM-180114	585871.80	4572934.00	11.2	6.9	2.9	1.4	Point	FALSE
DGM-18	P-DGM-180116	585847.70	4572932.70	12.4	6.5	1.9	0.6	Point (possible noise)	FALSE
DGM-18	P-DGM-180117	585856.30	4572927.20	10.3	6.3	2.8	1.1	Point	FALSE
DGM-18	P-DGM-180118	585846.93	4572903.06	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-19	P-DGM-190001	585635.40	4573135.00	921.0	626.4	365.7	178.8	Point	FALSE
DGM-19	P-DGM-190003	585637.00	4573123.80	441.0	328.8	211.5	118.1	Point	FALSE
DGM-19	P-DGM-190004	585634.30	4573130.90	467.1	324.0	185.0	95.8	Point	FALSE
DGM-19	P-DGM-190005	585627.00	4573115.40	511.7	289.0	104.8	21.5	Point	FALSE
DGM-19	P-DGM-190007	585635.77	4573136.03	331.1	244.2	152.2	91.1	Tiling	FALSE
DGM-19	P-DGM-190008	585632.40	4573141.10	323.5	240.7	156.4	89.0	Point	FALSE
DGM-19	P-DGM-190009	585636.40	4573123.70	327.1	240.0	149.2	82.0	Point	FALSE
DGM-19	P-DGM-190010	585634.77	4573131.36	315.1	224.6	139.6	80.0	Tiling	FALSE
DGM-19	P-DGM-190011	585632.30	4573140.10	260.4	197.1	130.8	76.7	Point	FALSE
DGM-19	P-DGM-190012	585654.70	4573130.80	259.5	194.2	126.1	64.3	Point	FALSE
DGM-19	P-DGM-190013	585634.78	4573130.17	291.7	191.5	91.5	27.4	Tiling	FALSE
DGM-19	P-DGM-190014	585642.70	4573137.30	374.2	190.3	56.3	8.1	Point	FALSE
DGM-19	P-DGM-190015	585656.10	4573129.80	237.9	179.3	117.6	76.1	Point	FALSE
DGM-19	P-DGM-190016	585656.60	4573123.60	277.1	176.7	86.9	33.7	Point	FALSE
DGM-19	P-DGM-190017	585636.06	4573135.40	220.5	159.9	98.0	53.3	Tiling	FALSE
DGM-19	P-DGM-190018	585632.42	4573114.27	205.4	155.7	95.3	46.8	Point	FALSE
DGM-19	P-DGM-190019	585654.37	4573127.84	205.4	140.3	71.5	23.7	Point	FALSE
DGM-19	P-DGM-190020	585655.20	4573130.20	184.5	135.9	84.0	42.8	Point	FALSE
DGM-19	P-DGM-190021	585641.60	4573136.40	217.6	131.4	56.0	15.0	Point	FALSE
DGM-19	P-DGM-190022	585641.50	4573135.60	212.0	127.5	55.1	15.0	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-19	P-DGM-190023	585655.60	4573129.40	159.7	120.4	79.9	50.2	Point	FALSE
DGM-19	P-DGM-190024	585653.80	4573127.80	150.8	103.5	54.7	18.0	Point	FALSE
DGM-19	P-DGM-190025	585656.45	4573122.75	145.8	90.4	41.6	14.3	Tiling	FALSE
DGM-19	P-DGM-190026	585631.30	4573115.90	112.6	79.3	47.3	26.4	Point	FALSE
DGM-19	P-DGM-190027	585630.60	4573115.60	107.6	77.1	46.9	27.0	Point	FALSE
DGM-19	P-DGM-190028	585639.30	4573131.80	97.2	70.9	46.5	25.5	Point	FALSE
DGM-19	P-DGM-190029	585635.04	4573135.83	94.8	69.0	46.8	22.1	Tiling	FALSE
DGM-19	P-DGM-190030	585635.00	4573113.20	93.9	68.5	41.3	21.1	Point	FALSE
DGM-19	P-DGM-190031	585637.15	4573137.06	102.8	64.9	32.3	15.3	Point	FALSE
DGM-19	P-DGM-190032	585640.20	4573137.10	88.6	64.5	39.0	22.7	Point	FALSE
DGM-19	P-DGM-190033	585641.40	4573111.70	88.4	64.0	38.3	19.0	Point	FALSE
DGM-19	P-DGM-190034	585639.80	4573131.10	80.8	57.5	35.4	19.4	Point	FALSE
DGM-19	P-DGM-190035	585637.40	4573114.10	91.3	55.3	29.1	13.9	Point	FALSE
DGM-19	P-DGM-190039	585655.47	4573131.71	125.7	53.2	22.1	8.3	Point	FALSE
DGM-19	P-DGM-190041	585656.20	4573128.00	74.0	52.6	33.1	18.5	Point	FALSE
DGM-19	P-DGM-190042	585640.40	4573112.30	72.1	52.4	32.3	16.9	Point	FALSE
DGM-19	P-DGM-190044	585629.87	4573115.46	66.5	47.0	28.6	15.8	Tiling	FALSE
DGM-19	P-DGM-190046	585637.00	4573122.30	67.4	45.6	25.9	13.4	Point	FALSE
DGM-19	P-DGM-190047	585640.70	4573111.50	60.2	42.7	26.5	14.4	Point	FALSE
DGM-19	P-DGM-190048	585640.62	4573136.50	57.7	41.8	26.0	14.7	Tiling	FALSE
DGM-19	P-DGM-190050	585629.30	4573115.00	49.7	35.1	20.4	11.0	Point	FALSE
DGM-19	P-DGM-190051	585636.80	4573114.08	84.8	34.5	17.3	6.9	Tiling	FALSE
DGM-19	P-DGM-190052	585637.50	4573113.10	48.7	33.5	17.9	8.5	Point	FALSE
DGM-19	P-DGM-190053	585641.80	4573130.20	46.1	32.7	20.5	11.5	Point	FALSE
DGM-19	P-DGM-190054	585640.60	4573118.20	43.1	31.5	18.3	8.6	Point	FALSE
DGM-19	P-DGM-190055	585633.20	4573115.40	42.7	31.5	18.8	11.0	Point	FALSE
DGM-19	P-DGM-190056	585639.76	4573112.29	40.3	30.9	20.6	10.1	Tiling	FALSE
DGM-19	P-DGM-190057	585642.55	4573112.42	41.2	30.3	19.4	10.1	Point	FALSE
DGM-19	P-DGM-190058	585638.60	4573118.20	39.2	30.1	19.3	12.1	Point	FALSE
DGM-19	P-DGM-190059	585656.40	4573118.00	40.3	29.3	18.6	10.1	Point	FALSE
DGM-19	P-DGM-190060	585635.44	4573129.22	45.5	29.2	14.4	5.4	Point	FALSE
DGM-19	P-DGM-190061	585651.60	4573127.20	38.3	28.6	18.1	9.4	Point	FALSE
DGM-19	P-DGM-190062	585639.40	4573118.60	38.0	28.5	17.4	11.3	Point	FALSE
DGM-19	P-DGM-190063	585650.60	4573133.50	43.7	28.5	15.2	6.9	Point	FALSE
DGM-19	P-DGM-190064	585655.40	4573140.40	40.3	28.1	15.8	8.4	Point	FALSE
DGM-19	P-DGM-190065	585654.84	4573131.71	43.4	28.1	16.0	7.4	Tiling	FALSE
DGM-19	P-DGM-190066	585644.39	4573126.93	40.9	27.8	15.8	7.3	Point	FALSE
DGM-19	P-DGM-190067	585656.38	4573126.64	38.2	26.9	15.7	8.7	Tiling	FALSE
DGM-19	P-DGM-190068	585640.99	4573134.66	37.2	26.5	15.9	8.1	Tiling	FALSE
DGM-19	P-DGM-190071	585635.80	4573113.60	33.1	25.7	17.5	9.9	Point	FALSE
DGM-19	P-DGM-190073	585637.70	4573139.30	33.1	24.1	15.1	9.4	Point	FALSE
DGM-19	P-DGM-190074	585635.61	4573128.69	36.6	24.0	11.3	4.0	Tiling	FALSE
DGM-19	P-DGM-190075	585634.20	4573128.30	66.6	23.8	4.3	0.5	Point	FALSE
DGM-19	P-DGM-190076	585652.80	4573126.30	39.9	23.3	10.3	3.8	Point	FALSE
DGM-19	P-DGM-190077	585638.80	4573114.50	33.0	23.0	14.6	7.3	Point	FALSE
DGM-19	P-DGM-190078	585641.33	4573117.16	32.1	22.7	13.1	5.7	Point	FALSE
DGM-19	P-DGM-190079	585651.10	4573127.40	30.9	22.4	13.6	6.9	Point	FALSE
DGM-19	P-DGM-190080	585635.50	4573114.60	29.1	22.3	14.3	8.4	Point	FALSE
DGM-19	P-DGM-190081	585649.76	4573133.29	32.3	22.3	12.8	5.7	Point	FALSE
DGM-19	P-DGM-190082	585627.40	4573113.70	33.7	22.2	12.0	5.5	Point	FALSE
DGM-19	P-DGM-190084	585628.40	4573113.20	32.6	20.7	8.7	2.7	Point	FALSE
DGM-19	P-DGM-190085	585654.08	4573131.17	28.3	20.6	11.9	6.4	Tiling	FALSE
DGM-19	P-DGM-190086	585635.50	4573112.20	29.9	20.5	11.1	4.8	Point	FALSE
DGM-19	P-DGM-190087	585637.21	4573114.96	29.6	20.5	12.1	5.9	Tiling	FALSE
DGM-19	P-DGM-190088	585643.80	4573131.70	27.6	20.2	12.5	6.7	Point	FALSE
DGM-19	P-DGM-190089	585639.40	4573121.30	28.6	20.1	12.4	6.9	Point	FALSE
DGM-19	P-DGM-190090	585655.40	4573113.00	31.5	19.5	7.9	1.9	Point	FALSE
DGM-19	P-DGM-190091	585628.30	4573111.50	29.9	19.4	10.1	4.5	Point	FALSE
DGM-19	P-DGM-190092	585632.00	4573116.80	28.5	19.3	11.3	5.7	Point	FALSE
DGM-19	P-DGM-190093	585642.85	4573113.51	27.0	19.3	11.7	6.1	Point	FALSE
DGM-19	P-DGM-190094	585638.60	4573116.80	27.1	19.1	10.2	4.1	Point	FALSE
DGM-19	P-DGM-190095	585639.80	4573120.50	27.1	19.1	12.0	6.9	Point	FALSE
DGM-19	P-DGM-190096	585634.30	4573122.80	26.7	19.0	10.8	5.7	Point	FALSE
DGM-19	P-DGM-190097	585633.10	4573138.20	25.7	18.7	10.5	4.8	Point	FALSE
DGM-19	P-DGM-190098	585638.99	4573117.77	24.6	18.7	11.9	7.3	Tiling	FALSE
DGM-19	P-DGM-190099	585633.90	4573138.90	24.8	18.6	11.6	6.5	Point	FALSE
DGM-19	P-DGM-190100	585634.90	4573123.70	30.0	18.4	9.5	4.6	Point	FALSE
DGM-19	P-DGM-190101	585652.00	4573126.40	27.4	18.2	9.9	4.4	Point	FALSE
DGM-19	P-DGM-190102	585626.00	4573113.30	27.4	17.7	8.4	3.5	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-19	P-DGM-190103	585654.00	4573116.12	25.2	17.3	10.7	5.6	Point	FALSE
DGM-19	P-DGM-190104	585644.00	4573127.70	24.2	17.2	9.7	4.8	Point	FALSE
DGM-19	P-DGM-190105	585637.20	4573111.80	23.3	16.8	10.4	5.8	Point	FALSE
DGM-19	P-DGM-190106	585629.00	4573116.70	23.5	16.2	8.1	3.1	Point	FALSE
DGM-19	P-DGM-190107	585655.60	4573121.80	23.3	16.2	9.7	4.5	Point	FALSE
DGM-19	P-DGM-190108	585641.20	4573112.75	27.5	16.1	6.9	1.5	Tiling	FALSE
DGM-19	P-DGM-190109	585633.10	4573123.20	23.2	16.1	9.6	4.7	Point	FALSE
DGM-19	P-DGM-190110	585634.30	4573123.80	27.3	15.9	8.4	4.0	Point	FALSE
DGM-19	P-DGM-190111	585633.80	4573114.10	22.2	15.6	8.4	3.0	Point	FALSE
DGM-19	P-DGM-190112	585653.70	4573111.60	24.6	15.3	8.2	3.8	Point	FALSE
DGM-19	P-DGM-190113	585651.04	4573126.69	20.7	14.9	8.7	4.6	Tiling	FALSE
DGM-19	P-DGM-190114	585643.10	4573121.00	21.5	14.5	7.3	2.6	Point	FALSE
DGM-19	P-DGM-190116	585653.48	4573115.77	20.7	14.2	9.4	5.4	Tiling	FALSE
DGM-19	P-DGM-190117	585640.69	4573137.50	20.5	14.1	7.7	4.3	Tiling	FALSE
DGM-19	P-DGM-190118	585652.40	4573118.00	24.9	13.9	5.2	1.1	Point	FALSE
DGM-19	P-DGM-190119	585628.00	4573112.20	21.0	13.9	6.5	1.9	Point	FALSE
DGM-19	P-DGM-190120	585634.91	4573132.79	21.5	13.8	7.2	2.8	Tiling	FALSE
DGM-19	P-DGM-190121	585638.40	4573139.30	18.3	13.5	8.8	4.9	Point	FALSE
DGM-19	P-DGM-190122	585634.30	4573115.40	20.2	13.5	8.4	3.8	Point	FALSE
DGM-19	P-DGM-190123	585653.60	4573122.70	19.9	13.4	8.0	4.3	Point	FALSE
DGM-19	P-DGM-190124	585655.50	4573120.70	18.4	13.1	7.4	3.1	Point	FALSE
DGM-19	P-DGM-190125	585643.50	4573112.20	18.0	13.1	8.4	3.8	Point	FALSE
DGM-19	P-DGM-190126	585642.60	4573120.50	19.6	13.0	6.5	2.3	Point	FALSE
DGM-19	P-DGM-190127	585636.72	4573113.12	17.4	13.0	8.5	4.2	Tiling	FALSE
DGM-19	P-DGM-190128	585652.00	4573140.60	20.6	12.7	6.1	1.5	Point	FALSE
DGM-19	P-DGM-190130	585650.20	4573128.20	18.9	12.6	6.6	3.2	Point	FALSE
DGM-19	P-DGM-190131	585651.90	4573140.00	19.0	12.4	6.9	3.1	Point	FALSE
DGM-19	P-DGM-190132	585652.26	4573125.73	22.8	12.1	4.9	1.3	Tiling	FALSE
DGM-19	P-DGM-190133	585638.51	4573136.74	16.8	11.9	6.3	2.4	Point	FALSE
DGM-19	P-DGM-190135	585638.08	4573137.49	17.3	11.5	7.0	3.5	Tiling	FALSE
DGM-19	P-DGM-190137	585630.50	4573113.80	15.4	11.3	7.2	3.9	Point	FALSE
DGM-19	P-DGM-190138	585654.40	4573111.80	19.8	11.2	5.8	2.5	Point	FALSE
DGM-19	P-DGM-190139	585626.30	4573117.80	16.7	11.1	6.0	2.6	Point	FALSE
DGM-19	P-DGM-190140	585641.20	4573134.00	15.5	11.1	6.4	3.3	Point	FALSE
DGM-19	P-DGM-190141	585637.72	4573135.21	15.8	10.8	4.8	1.3	Point	FALSE
DGM-19	P-DGM-190142	585645.40	4573137.40	17.6	10.6	4.8	2.1	Point	FALSE
DGM-19	P-DGM-190143	585653.30	4573117.30	16.8	10.5	5.3	2.7	Point	FALSE
DGM-19	P-DGM-190144	585638.14	4573113.10	16.4	10.3	4.5	1.7	Tiling	FALSE
DGM-19	P-DGM-190145	585631.20	4573113.60	15.4	10.2	6.7	3.8	Point	FALSE
DGM-19	P-DGM-190147	585626.70	4573116.60	15.3	10.1	4.7	1.6	Point	FALSE
DGM-19	P-DGM-190148	585654.00	4573123.50	12.1	10.1	7.2	3.6	Point	FALSE
DGM-19	P-DGM-190149	585639.20	4573137.00	15.3	10.1	5.8	2.4	Point	FALSE
DGM-19	P-DGM-190150	585652.90	4573137.30	13.4	10.0	6.4	3.3	Point	FALSE
DGM-19	P-DGM-190151	585639.20	4573116.30	14.1	10.0	5.2	2.2	Point	FALSE
DGM-19	P-DGM-190152	585654.30	4573123.00	12.8	9.8	6.2	3.3	Point	FALSE
DGM-19	P-DGM-190153	585652.49	4573127.18	16.5	9.8	5.0	2.2	Tiling	FALSE
DGM-19	P-DGM-190154	585644.80	4573111.90	14.1	9.7	6.1	3.4	Point	FALSE
DGM-19	P-DGM-190156	585642.60	4573130.40	13.6	9.6	6.0	3.5	Point	FALSE
DGM-19	P-DGM-190157	585631.80	4573141.40	14.4	9.3	5.7	2.9	Point	FALSE
DGM-19	P-DGM-190158	585639.72	4573114.08	13.4	9.2	5.7	3.3	Tiling	FALSE
DGM-19	P-DGM-190159	585637.10	4573133.60	12.7	9.2	5.3	2.4	Point	FALSE
DGM-19	P-DGM-190160	585651.50	4573123.10	21.1	9.1	3.1	0.9	Point	FALSE
DGM-19	P-DGM-190161	585637.80	4573132.90	14.4	9.1	5.2	2.1	Point	FALSE
DGM-19	P-DGM-190162	585656.70	4573115.40	14.0	9.1	4.6	1.3	Point	FALSE
DGM-19	P-DGM-190163	585645.40	4573139.20	12.8	8.8	4.9	2.3	Point	FALSE
DGM-19	P-DGM-190164	585644.20	4573139.50	13.4	8.7	5.0	2.2	Point	FALSE
DGM-19	P-DGM-190165	585645.50	4573136.00	14.0	8.7	4.8	1.8	Point	FALSE
DGM-19	P-DGM-190166	585638.00	4573115.90	11.8	8.7	4.7	2.3	Point	FALSE
DGM-19	P-DGM-190168	585644.40	4573134.70	11.6	8.6	5.4	2.9	Point	FALSE
DGM-19	P-DGM-190170	585627.00	4573117.80	14.3	8.5	2.9	0.7	Point	FALSE
DGM-19	P-DGM-190171	585653.35	4573123.54	10.4	8.5	6.2	3.1	Tiling	FALSE
DGM-19	P-DGM-190172	585651.30	4573123.60	23.7	8.5	2.8	1.3	Point	FALSE
DGM-19	P-DGM-190174	585650.03	4573132.66	12.9	8.4	4.0	1.6	Tiling	FALSE
DGM-19	P-DGM-190176	585640.10	4573140.00	13.7	8.2	4.1	1.5	Point	FALSE
DGM-19	P-DGM-190177	585652.00	4573123.70	23.3	8.2	2.5	1.1	Point	FALSE
DGM-19	P-DGM-190178	585629.05	4573113.76	12.2	8.2	4.2	1.4	Tiling	FALSE
DGM-19	P-DGM-190179	585643.40	4573120.43	12.4	8.0	4.3	1.9	Tiling	FALSE
DGM-19	P-DGM-190180	585651.30	4573124.60	13.6	8.0	3.7	1.9	Point	FALSE
DGM-19	P-DGM-190181	585635.40	4573133.70	13.8	8.0	3.7	1.4	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-19	P-DGM-190182	585638.90	4573136.20	10.9	8.0	4.8	2.0	Point	FALSE
DGM-19	P-DGM-190183	585641.40	4573129.49	11.7	7.7	4.5	2.3	Tiling	FALSE
DGM-19	P-DGM-190184	585632.90	4573132.40	12.7	7.5	3.5	1.4	Point	FALSE
DGM-19	P-DGM-190185	585644.60	4573113.10	9.8	7.5	4.0	1.6	Point	FALSE
DGM-19	P-DGM-190186	585640.30	4573138.10	11.2	7.5	3.6	0.9	Point	FALSE
DGM-19	P-DGM-190187	585631.30	4573135.70	11.0	7.4	4.7	2.4	Point	FALSE
DGM-19	P-DGM-190188	585652.00	4573130.70	9.2	7.4	4.8	2.7	Point	FALSE
DGM-19	P-DGM-190189	585640.40	4573124.70	13.1	7.2	3.3	1.0	Point	FALSE
DGM-19	P-DGM-190190	585651.90	4573119.00	13.0	7.1	3.1	1.3	Point	FALSE
DGM-19	P-DGM-190192	585642.80	4573117.70	11.1	6.9	3.8	2.0	Point (possible noise)	FALSE
DGM-19	P-DGM-190193	585653.10	4573124.50	12.2	6.8	3.5	1.5	Point	FALSE
DGM-19	P-DGM-190194	585643.09	4573131.84	9.8	6.8	4.6	2.7	Tiling	FALSE
DGM-19	P-DGM-190195	585643.70	4573114.90	10.4	6.8	3.7	1.9	Point	FALSE
DGM-19	P-DGM-190196	585643.80	4573122.70	9.4	6.8	3.9	2.3	Point	FALSE
DGM-19	P-DGM-190198	585636.00	4573139.00	8.8	6.5	4.4	1.9	Point	FALSE
DGM-19	P-DGM-190199	585651.50	4573140.40	11.0	6.5	2.8	0.9	Point	FALSE
DGM-19	P-DGM-190200	585633.80	4573112.70	8.7	6.3	4.4	2.4	Point	FALSE
DGM-19	P-DGM-190201	585651.60	4573122.10	10.3	6.3	2.9	1.2	Point	FALSE
DGM-19	P-DGM-190202	585655.70	4573119.40	9.3	6.2	2.9	0.6	Point	FALSE
DGM-19	P-DGM-190203	585635.30	4573138.80	9.8	6.2	3.8	1.8	Point	FALSE
DGM-19	P-DGM-190204	585624.20	4573118.60	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-19	P-DGM-190205	585642.65	4573110.29	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-19	P-DGM-190206	585658.36	4573134.49	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-20	P-DGM-200001	585915.10	4572690.50	703.5	484.0	278.0	146.2	Point	FALSE
DGM-20	P-DGM-200002	585927.20	4572689.70	454.2	314.9	175.2	75.2	Point	FALSE
DGM-20	P-DGM-200003	585929.20	4572690.30	457.4	314.0	191.9	110.5	Point	FALSE
DGM-20	P-DGM-200004	585928.79	4572689.96	413.7	286.9	173.6	102.9	Tiling	FALSE
DGM-20	P-DGM-200006	585929.30	4572692.80	316.7	219.9	122.4	57.0	Point	FALSE
DGM-20	P-DGM-200007	585926.40	4572693.90	298.9	205.0	122.2	70.0	Point	FALSE
DGM-20	P-DGM-200008	585927.28	4572690.59	275.5	199.4	114.9	52.3	Tiling	FALSE
DGM-20	P-DGM-200009	585927.60	4572694.80	252.8	182.2	118.5	72.4	Point	FALSE
DGM-20	P-DGM-200010	585915.64	4572689.70	244.9	177.0	109.7	61.8	Tiling	FALSE
DGM-20	P-DGM-200011	585929.30	4572692.27	235.7	171.7	102.7	49.8	Tiling	FALSE
DGM-20	P-DGM-200013	585930.66	4572692.85	234.9	150.9	81.5	39.9	Point	FALSE
DGM-20	P-DGM-200014	585927.11	4572694.44	203.5	149.5	95.2	55.8	Tiling	FALSE
DGM-20	P-DGM-200015	585927.00	4572687.90	162.8	114.5	71.0	36.4	Point	FALSE
DGM-20	P-DGM-200016	585926.22	4572694.53	151.0	107.3	67.6	38.7	Tiling	FALSE
DGM-20	P-DGM-200018	585896.50	4572682.60	141.0	92.4	43.0	20.2	Point	FALSE
DGM-20	P-DGM-200020	585923.80	4572694.00	91.3	66.0	40.4	23.3	Point	FALSE
DGM-20	P-DGM-200021	585913.40	4572690.30	74.0	53.1	32.4	19.3	Point	FALSE
DGM-20	P-DGM-200022	585931.20	4572691.20	58.1	40.0	23.7	14.1	Point	FALSE
DGM-20	P-DGM-200023	585925.20	4572691.70	55.5	39.1	23.7	12.7	Point	FALSE
DGM-20	P-DGM-200024	585925.00	4572692.60	62.9	38.6	18.0	8.6	Point	FALSE
DGM-20	P-DGM-200025	585920.40	4572690.90	61.5	37.7	18.6	9.2	Point	FALSE
DGM-20	P-DGM-200026	585930.04	4572688.47	47.5	33.9	21.7	11.3	Tiling	FALSE
DGM-20	P-DGM-200027	585913.23	4572691.06	45.8	33.4	21.6	13.9	Tiling	FALSE
DGM-20	P-DGM-200028	585930.80	4572690.70	50.8	33.0	20.0	11.6	Point	FALSE
DGM-20	P-DGM-200029	585911.90	4572689.40	50.9	32.6	17.3	8.2	Point	FALSE
DGM-20	P-DGM-200031	585932.10	4572691.40	37.9	23.8	12.5	6.9	Point	FALSE
DGM-20	P-DGM-200032	585923.14	4572693.37	33.7	22.3	12.4	6.6	Tiling	FALSE
DGM-20	P-DGM-200033	585919.50	4572692.10	39.1	21.9	9.6	2.9	Point	FALSE
DGM-20	P-DGM-200034	585932.20	4572690.60	36.2	21.1	10.3	4.6	Point	FALSE
DGM-20	P-DGM-200035	585925.00	4572689.70	28.8	19.0	12.5	8.6	Point	FALSE
DGM-20	P-DGM-200036	585919.25	4572692.63	32.4	18.3	7.3	2.2	Tiling	FALSE
DGM-20	P-DGM-200037	585919.98	4572692.73	31.3	16.3	4.6	0.4	Tiling	FALSE
DGM-20	P-DGM-200038	585911.10	4572689.87	64.7	15.4	0.0	-1.0	Tiling	FALSE
DGM-20	P-DGM-200039	585926.08	4572692.76	28.3	14.9	5.5	2.1	Tiling	FALSE
DGM-20	P-DGM-200040	585919.78	4572693.40	21.9	14.4	7.5	3.5	Tiling	FALSE
DGM-20	P-DGM-200041	585925.90	4572687.80	43.2	14.1	-1.8	-3.8	Point	FALSE
DGM-20	P-DGM-200043	585911.90	4572690.30	23.8	12.5	3.9	1.5	Point	FALSE
DGM-20	P-DGM-200044	585930.90	4572689.60	20.7	11.5	3.1	0.4	Point	FALSE
DGM-20	P-DGM-200045	585917.30	4572690.20	21.2	11.1	3.6	0.3	Point	FALSE
DGM-20	P-DGM-200046	585982.40	4572703.40	25.4	11.0	6.3	4.2	Point	FALSE
DGM-20	P-DGM-200047	585919.20	4572691.30	19.1	10.4	4.5	1.6	Point	FALSE
DGM-20	P-DGM-200048	585922.10	4572693.70	13.6	10.4	6.1	2.4	Point	FALSE
DGM-20	P-DGM-200049	585921.50	4572693.50	13.0	9.7	5.1	2.1	Point	FALSE
DGM-20	P-DGM-200052	585927.76	4572693.50	14.4	8.4	4.6	2.6	Tiling	FALSE
DGM-20	P-DGM-200055	585916.80	4572692.20	16.1	7.1	1.0	-0.9	Point	FALSE
DGM-20	P-DGM-200057	585985.29	4572696.21	-666.0	-666.0	-666.0	-666.0	SRA	TRUE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-20	P-DGM-200058	585924.16	4572686.43	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-21	P-DGM-210001	585415.90	4572997.70	80.4	55.8	31.1	15.2	Point	FALSE
DGM-21	P-DGM-210002	585409.40	4572999.30	64.1	46.6	28.7	15.6	Point	FALSE
DGM-21	P-DGM-210003	585416.42	4572998.01	62.2	43.4	23.6	12.2	Tiling	FALSE
DGM-21	P-DGM-210004	585429.11	4572988.39	56.9	36.4	19.4	9.4	Point	FALSE
DGM-21	P-DGM-210005	585401.50	4572991.70	45.8	31.6	18.6	9.9	Point	FALSE
DGM-21	P-DGM-210006	585430.30	4572986.00	44.7	30.9	18.3	9.7	Point	FALSE
DGM-21	P-DGM-210007	585428.30	4572988.20	41.2	29.8	18.1	9.7	Point	FALSE
DGM-21	P-DGM-210008	585433.20	4572991.40	36.2	26.0	15.5	8.1	Point	FALSE
DGM-21	P-DGM-210009	585433.80	4572992.00	32.4	22.6	13.1	7.3	Point	FALSE
DGM-21	P-DGM-210010	585408.40	4572999.00	30.3	22.1	12.8	6.7	Point	FALSE
DGM-21	P-DGM-210011	585400.90	4572991.00	30.8	21.7	12.9	7.1	Point	FALSE
DGM-22	P-DGM-220003	585868.90	4573102.80	86.7	59.1	31.6	15.4	Point	FALSE
DGM-22	P-DGM-220006	585872.70	4573120.90	85.0	38.6	4.9	-5.6	Point	FALSE
DGM-22	P-DGM-220008	585873.90	4573120.40	51.4	31.8	13.7	4.5	Point	FALSE
DGM-22	P-DGM-220014	585870.40	4573101.10	33.8	15.6	4.3	0.2	Point	FALSE
DGM-22	P-DGM-220016	585863.19	4573123.22	24.1	14.3	6.6	1.3	Point	FALSE
DGM-22	P-DGM-220018	585891.30	4573101.70	21.7	13.5	7.2	2.5	Point	FALSE
DGM-22	P-DGM-220019	585863.80	4573123.50	21.1	12.1	5.5	0.7	Point	FALSE
DGM-22	P-DGM-220022	585867.90	4573118.20	21.5	9.0	1.7	-0.4	Point	FALSE
DGM-22	P-DGM-220023	585869.10	4573103.80	16.8	8.3	2.3	0.6	Point	FALSE
DGM-22	P-DGM-220024	585867.50	4573103.40	9.2	7.3	4.9	3.3	Point	FALSE
DGM-22	P-DGM-220025	585870.80	4573120.00	15.0	6.2	0.5	-0.4	Point	FALSE
DGM-22	P-DGM-220026	585869.90	4573119.50	17.6	6.1	-1.0	-3.7	Point	FALSE
DGM-22	P-DGM-220027	585882.06	4573094.31	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-24	P-DGM-240001	585566.20	4573022.10	1734.9	1275.4	802.4	469.4	Point	FALSE
DGM-24	P-DGM-240003	585552.80	4573033.80	991.9	603.3	289.4	123.3	Point	FALSE
DGM-24	P-DGM-240004	585529.00	4573045.20	851.8	547.8	246.1	67.8	Point	FALSE
DGM-24	P-DGM-240005	585551.40	4573034.10	708.9	464.0	250.4	121.8	Point	FALSE
DGM-24	P-DGM-240006	585555.20	4573032.30	419.8	293.0	150.5	51.7	Point	FALSE
DGM-24	P-DGM-240009	585528.90	4573048.30	445.3	228.2	71.5	11.3	Point	FALSE
DGM-24	P-DGM-240010	585566.20	4573023.30	312.7	219.2	130.5	69.0	Point	FALSE
DGM-24	P-DGM-240011	585572.60	4573013.40	367.9	213.2	94.1	34.5	Point	FALSE
DGM-24	P-DGM-240012	585530.56	4573042.51	251.6	175.2	104.5	57.3	Point	FALSE
DGM-24	P-DGM-240013	585518.10	4573053.80	196.8	140.0	81.8	41.4	Point	FALSE
DGM-24	P-DGM-240014	585566.90	4573023.39	196.1	132.6	76.2	37.2	Tiling	FALSE
DGM-24	P-DGM-240015	585556.10	4573030.60	191.5	118.5	51.3	15.8	Point	FALSE
DGM-24	P-DGM-240016	585539.30	4573040.10	145.7	111.4	74.1	41.7	Point	FALSE
DGM-24	P-DGM-240017	585538.40	4573039.70	140.8	109.2	70.2	39.0	Point	FALSE
DGM-24	P-DGM-240018	585517.80	4573054.30	135.8	96.0	56.7	28.4	Point	FALSE
DGM-24	P-DGM-240019	585537.10	4573040.60	121.9	90.7	58.9	35.8	Point	FALSE
DGM-24	P-DGM-240020	585534.90	4573049.20	124.4	89.6	51.3	27.0	Point	FALSE
DGM-24	P-DGM-240021	585526.40	4573051.50	167.0	87.0	30.8	8.1	Point	FALSE
DGM-24	P-DGM-240022	585566.70	4573017.30	108.4	80.4	50.5	25.1	Point	FALSE
DGM-24	P-DGM-240023	585534.50	4573048.50	100.6	68.1	36.8	19.3	Point	FALSE
DGM-24	P-DGM-240024	585541.30	4573040.80	92.5	67.1	40.3	19.2	Point	FALSE
DGM-24	P-DGM-240025	585540.00	4573044.10	93.3	66.5	40.0	21.6	Point	FALSE
DGM-24	P-DGM-240026	585527.10	4573058.50	93.2	63.6	35.8	18.3	Point	FALSE
DGM-24	P-DGM-240027	585567.29	4573017.00	84.8	63.3	39.5	19.9	Point	FALSE
DGM-24	P-DGM-240028	585542.20	4573041.20	83.4	61.7	37.8	18.9	Point	FALSE
DGM-24	P-DGM-240029	585550.00	4573034.60	89.3	59.3	31.6	12.6	Point	FALSE
DGM-24	P-DGM-240030	585533.00	4573044.80	83.4	58.1	33.1	18.3	Point	FALSE
DGM-24	P-DGM-240031	585567.69	4573017.30	77.0	56.8	36.4	19.0	Point	FALSE
DGM-24	P-DGM-240032	585527.80	4573055.40	96.4	56.2	22.0	5.5	Point	FALSE
DGM-24	P-DGM-240033	585549.85	4573034.03	79.1	52.9	27.6	10.9	Tiling	FALSE
DGM-24	P-DGM-240034	585580.20	4573008.90	93.1	50.5	24.0	10.2	Point	FALSE
DGM-24	P-DGM-240035	585526.67	4573058.85	72.7	49.1	27.8	13.1	Tiling	FALSE
DGM-24	P-DGM-240036	585521.60	4573046.90	67.1	49.0	30.0	17.9	Point	FALSE
DGM-24	P-DGM-240037	585568.30	4573019.10	65.5	48.8	30.7	18.6	Point	FALSE
DGM-24	P-DGM-240038	585571.10	4573009.70	76.4	48.5	23.7	8.7	Point	FALSE
DGM-24	P-DGM-240039	585540.60	4573044.90	66.1	47.3	26.8	14.4	Point	FALSE
DGM-24	P-DGM-240040	585520.90	4573050.50	65.0	45.7	27.9	16.1	Point	FALSE
DGM-24	P-DGM-240041	585526.10	4573044.80	67.9	44.8	22.7	9.0	Point	FALSE
DGM-24	P-DGM-240042	585516.00	4573051.20	60.1	44.2	27.0	14.7	Point	FALSE
DGM-24	P-DGM-240043	585541.39	4573040.07	63.9	44.0	23.5	8.5	Tiling	FALSE
DGM-24	P-DGM-240044	585527.20	4573042.30	64.1	43.9	25.7	14.7	Point	FALSE
DGM-24	P-DGM-240045	585533.40	4573041.60	59.8	43.1	26.3	15.5	Point	FALSE
DGM-24	P-DGM-240047	585527.68	4573054.87	67.0	42.0	20.4	8.7	Tiling	FALSE
DGM-24	P-DGM-240048	585572.50	4573011.30	64.2	41.4	21.7	9.6	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-24	P-DGM-240049	585570.80	4573020.70	65.3	41.3	19.6	6.9	Point	FALSE
DGM-24	P-DGM-240051	585550.70	4573029.60	57.4	38.7	21.8	11.4	Point	FALSE
DGM-24	P-DGM-240052	585521.78	4573050.70	50.1	37.1	23.1	14.1	Tiling	FALSE
DGM-24	P-DGM-240054	585528.64	4573047.31	56.1	34.8	15.9	5.3	Tiling	FALSE
DGM-24	P-DGM-240055	585567.60	4573021.10	57.8	34.3	13.4	2.8	Point	FALSE
DGM-24	P-DGM-240056	585525.50	4573046.70	48.8	34.1	20.1	11.2	Point	FALSE
DGM-24	P-DGM-240058	585550.30	4573030.00	52.4	33.6	18.5	9.3	Point	FALSE
DGM-24	P-DGM-240060	585534.20	4573042.00	46.9	32.4	19.9	11.2	Point	FALSE
DGM-24	P-DGM-240062	585543.36	4573033.30	44.3	31.4	18.7	8.9	Point	FALSE
DGM-24	P-DGM-240063	585549.12	4573034.59	49.4	31.3	16.4	5.9	Tiling	FALSE
DGM-24	P-DGM-240064	585529.60	4573050.40	42.2	30.8	19.1	10.5	Point	FALSE
DGM-24	P-DGM-240065	585521.40	4573049.20	40.3	29.5	18.6	11.0	Point	FALSE
DGM-24	P-DGM-240066	585540.60	4573043.00	39.9	29.3	17.6	10.2	Point	FALSE
DGM-24	P-DGM-240067	585527.50	4573045.20	52.5	28.7	13.5	5.9	Point	FALSE
DGM-24	P-DGM-240068	585578.40	4573007.50	46.5	28.2	14.1	5.4	Point	FALSE
DGM-24	P-DGM-240069	585535.76	4573042.14	41.8	28.2	14.7	5.9	Point	FALSE
DGM-24	P-DGM-240070	585575.40	4573014.50	42.8	27.5	14.4	5.7	Point	FALSE
DGM-24	P-DGM-240071	585524.70	4573044.60	40.0	27.3	16.0	8.7	Point	FALSE
DGM-24	P-DGM-240072	585569.20	4573020.10	37.2	27.2	16.4	9.1	Point	FALSE
DGM-24	P-DGM-240073	585525.80	4573050.60	38.6	26.9	15.6	8.2	Point	FALSE
DGM-24	P-DGM-240074	585559.00	4573019.10	38.3	26.4	14.8	7.9	Point	FALSE
DGM-24	P-DGM-240075	585567.40	4573012.50	52.3	25.8	7.0	0.5	Point	FALSE
DGM-24	P-DGM-240076	585559.50	4573028.70	37.5	25.3	14.3	6.6	Point	FALSE
DGM-24	P-DGM-240079	585516.33	4573052.40	35.6	24.7	14.2	6.8	Point	FALSE
DGM-24	P-DGM-240081	585522.20	4573049.80	33.5	24.6	15.5	9.3	Point	FALSE
DGM-24	P-DGM-240082	585575.50	4573015.30	37.0	24.5	12.6	5.0	Point	FALSE
DGM-24	P-DGM-240083	585529.30	4573043.50	54.4	24.1	8.1	3.0	Point	FALSE
DGM-24	P-DGM-240084	585570.10	4573010.40	38.2	23.9	12.8	6.5	Point	FALSE
DGM-24	P-DGM-240085	585539.80	4573039.20	32.8	23.9	14.9	8.0	Point	FALSE
DGM-24	P-DGM-240086	585515.10	4573051.00	34.7	22.9	12.0	5.5	Point	FALSE
DGM-24	P-DGM-240087	585574.30	4573007.80	32.4	22.6	13.6	7.4	Point	FALSE
DGM-24	P-DGM-240089	585572.20	4573010.30	35.3	22.4	11.2	5.3	Point	FALSE
DGM-24	P-DGM-240090	585534.00	4573046.20	32.9	21.9	12.3	6.5	Point	FALSE
DGM-24	P-DGM-240091	585582.50	4573012.40	30.3	21.9	12.9	6.1	Point	FALSE
DGM-24	P-DGM-240093	585535.50	4573045.10	30.7	21.7	13.2	7.1	Point	FALSE
DGM-24	P-DGM-240094	585519.09	4573054.41	33.6	21.6	11.9	5.1	Tiling	FALSE
DGM-24	P-DGM-240095	585535.10	4573046.70	31.1	21.6	11.8	6.3	Point	FALSE
DGM-24	P-DGM-240096	585522.06	4573047.50	29.2	21.5	13.0	7.5	Tiling	FALSE
DGM-24	P-DGM-240097	585525.09	4573046.13	30.5	21.4	12.7	6.8	Tiling	FALSE
DGM-24	P-DGM-240098	585548.54	4573034.40	42.2	21.3	7.0	2.0	Tiling	FALSE
DGM-24	P-DGM-240099	585574.70	4573010.40	49.8	21.0	7.6	2.6	Point	FALSE
DGM-24	P-DGM-240100	585541.40	4573042.76	29.3	21.0	11.3	5.7	Point	FALSE
DGM-24	P-DGM-240101	585583.00	4573012.90	29.6	20.8	12.1	6.1	Point	FALSE
DGM-24	P-DGM-240102	585580.00	4573012.90	33.4	20.5	8.7	1.9	Point	FALSE
DGM-24	P-DGM-240103	585563.50	4573020.60	28.6	20.5	12.0	5.9	Point	FALSE
DGM-24	P-DGM-240105	585540.90	4573039.20	28.2	19.9	11.8	6.3	Point	FALSE
DGM-24	P-DGM-240106	585574.82	4573008.32	28.6	19.8	10.5	5.2	Tiling	FALSE
DGM-24	P-DGM-240107	585579.40	4573013.00	33.3	19.7	8.4	1.7	Point	FALSE
DGM-24	P-DGM-240108	585543.70	4573038.30	26.5	19.5	11.6	7.1	Point	FALSE
DGM-24	P-DGM-240109	585539.49	4573046.16	29.5	19.4	11.6	5.3	Tiling	FALSE
DGM-24	P-DGM-240110	585574.00	4573014.20	26.9	19.4	11.9	6.3	Point	FALSE
DGM-24	P-DGM-240112	585566.10	4573018.20	76.4	19.0	2.2	0.3	Point	FALSE
DGM-24	P-DGM-240113	585544.10	4573036.60	27.8	18.6	10.0	4.9	Point	FALSE
DGM-24	P-DGM-240114	585536.36	4573041.87	46.1	18.2	7.3	2.9	Tiling	FALSE
DGM-24	P-DGM-240115	585527.34	4573043.46	33.6	18.2	9.0	4.7	Tiling	FALSE
DGM-24	P-DGM-240116	585540.60	4573036.80	25.0	18.1	10.7	6.3	Point	FALSE
DGM-24	P-DGM-240117	585569.50	4573011.30	27.0	18.1	9.9	3.9	Point	FALSE
DGM-24	P-DGM-240118	585561.20	4573017.40	31.3	18.0	9.0	4.6	Point	FALSE
DGM-24	P-DGM-240119	585523.10	4573055.00	25.4	18.0	10.5	6.0	Point	FALSE
DGM-24	P-DGM-240120	585519.84	4573051.00	28.3	17.8	9.7	3.9	Tiling	FALSE
DGM-24	P-DGM-240121	585571.00	4573015.90	27.3	17.7	11.3	5.4	Point	FALSE
DGM-24	P-DGM-240122	585526.30	4573053.20	25.5	17.6	9.9	5.3	Point	FALSE
DGM-24	P-DGM-240123	585565.20	4573021.50	24.2	17.5	11.3	5.0	Point	FALSE
DGM-24	P-DGM-240124	585533.42	4573044.14	24.9	17.5	11.8	5.7	Tiling	FALSE
DGM-24	P-DGM-240125	585539.60	4573045.00	24.8	17.4	10.1	4.5	Point	FALSE
DGM-24	P-DGM-240126	585535.87	4573042.70	25.4	17.1	8.5	3.3	Tiling	FALSE
DGM-24	P-DGM-240127	585540.98	4573042.12	25.0	17.1	9.7	4.2	Tiling	FALSE
DGM-24	P-DGM-240129	585519.81	4573050.25	29.9	16.7	7.3	2.5	Tiling	FALSE
DGM-24	P-DGM-240130	585518.70	4573055.36	29.4	16.6	8.2	3.2	Tiling	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-24	P-DGM-240131	585526.05	4573045.80	25.8	16.4	9.2	4.1	Tiling	FALSE
DGM-24	P-DGM-240132	585561.30	4573021.40	25.2	16.4	9.5	4.6	Point	FALSE
DGM-24	P-DGM-240133	585543.98	4573037.65	22.3	16.3	10.4	6.1	Point	FALSE
DGM-24	P-DGM-240134	585540.42	4573040.31	23.3	16.3	10.0	4.8	Tiling	FALSE
DGM-24	P-DGM-240135	585578.50	4573006.80	24.5	16.0	8.9	4.7	Point	FALSE
DGM-24	P-DGM-240137	585541.50	4573039.40	23.1	15.4	7.6	2.6	Point	FALSE
DGM-24	P-DGM-240138	585532.27	4573044.97	21.0	15.3	8.7	4.4	Tiling	FALSE
DGM-24	P-DGM-240139	585543.71	4573033.89	22.2	15.3	9.0	5.0	Tiling	FALSE
DGM-24	P-DGM-240140	585574.64	4573009.65	32.2	15.1	6.5	2.7	Tiling	FALSE
DGM-24	P-DGM-240141	585520.00	4573049.00	23.4	15.0	8.2	4.0	Point	FALSE
DGM-24	P-DGM-240142	585526.00	4573049.50	21.8	15.0	9.0	5.1	Point	FALSE
DGM-24	P-DGM-240143	585537.90	4573044.00	21.4	15.0	8.9	4.5	Point	FALSE
DGM-24	P-DGM-240144	585544.40	4573036.10	23.2	15.0	8.6	4.4	Point	FALSE
DGM-24	P-DGM-240145	585526.81	4573045.75	22.9	14.8	8.6	4.4	Tiling	FALSE
DGM-24	P-DGM-240147	585533.72	4573045.45	22.5	14.7	7.7	3.7	Tiling	FALSE
DGM-24	P-DGM-240148	585568.14	4573016.39	27.4	14.5	7.0	2.6	Tiling	FALSE
DGM-24	P-DGM-240149	585534.80	4573047.20	20.8	14.5	7.5	3.6	Point	FALSE
DGM-24	P-DGM-240150	585515.45	4573051.60	19.4	14.4	9.9	5.1	Tiling	FALSE
DGM-24	P-DGM-240151	585537.50	4573042.60	19.8	14.2	8.3	4.7	Point	FALSE
DGM-24	P-DGM-240152	585527.10	4573053.82	20.7	14.2	8.2	4.5	Tiling	FALSE
DGM-24	P-DGM-240153	585575.81	4573006.16	23.2	14.0	6.1	2.7	Tiling	FALSE
DGM-24	P-DGM-240154	585546.40	4573034.90	21.4	13.1	5.9	1.7	Point	FALSE
DGM-24	P-DGM-240155	585523.70	4573046.50	29.7	13.1	3.6	1.1	Point	FALSE
DGM-24	P-DGM-240156	585549.10	4573036.00	19.9	12.8	7.1	3.0	Point	FALSE
DGM-24	P-DGM-240157	585543.26	4573041.54	17.8	12.7	7.7	4.3	Tiling	FALSE
DGM-24	P-DGM-240158	585541.89	4573034.41	19.5	12.6	6.2	1.7	Point	FALSE
DGM-24	P-DGM-240159	585517.91	4573057.05	27.8	12.6	3.9	1.2	Point	FALSE
DGM-24	P-DGM-240160	585568.00	4573022.00	17.9	12.6	8.1	4.4	Point	FALSE
DGM-24	P-DGM-240161	585579.70	4573011.70	40.7	12.5	1.7	0.2	Point	FALSE
DGM-24	P-DGM-240163	585571.00	4573014.20	21.4	12.3	5.1	1.7	Point	FALSE
DGM-24	P-DGM-240164	585549.90	4573036.60	18.9	12.2	6.2	2.9	Point	FALSE
DGM-24	P-DGM-240165	585528.05	4573047.85	19.7	12.2	5.6	2.6	Tiling	FALSE
DGM-24	P-DGM-240166	585522.42	4573055.31	18.5	12.1	6.7	3.5	Point	FALSE
DGM-24	P-DGM-240167	585523.10	4573053.20	17.6	12.0	6.7	3.7	Point	FALSE
DGM-24	P-DGM-240169	585537.85	4573046.21	18.1	12.0	7.6	3.6	Tiling	FALSE
DGM-24	P-DGM-240170	585537.72	4573043.40	16.8	11.9	7.0	4.1	Tiling	FALSE
DGM-24	P-DGM-240171	585571.60	4573021.30	18.6	11.8	6.0	2.6	Point	FALSE
DGM-24	P-DGM-240172	585539.10	4573044.07	14.3	11.7	5.8	3.0	Tiling	FALSE
DGM-24	P-DGM-240173	585578.79	4573008.31	18.3	11.6	6.0	2.7	Tiling	FALSE
DGM-24	P-DGM-240174	585531.70	4573044.80	17.4	11.6	5.9	2.0	Point	FALSE
DGM-24	P-DGM-240176	585541.70	4573033.10	14.4	11.3	7.1	3.8	Point	FALSE
DGM-24	P-DGM-240177	585571.20	4573019.50	15.9	11.3	6.5	3.7	Point	FALSE
DGM-24	P-DGM-240178	585519.50	4573057.60	18.0	11.3	5.2	2.5	Point	FALSE
DGM-24	P-DGM-240179	585583.26	4573012.14	16.9	11.2	7.3	3.6	Tiling	FALSE
DGM-24	P-DGM-240180	585573.19	4573012.07	17.4	11.1	4.5	1.7	Tiling	FALSE
DGM-24	P-DGM-240181	585543.10	4573036.80	19.2	11.1	5.3	1.8	Point	FALSE
DGM-24	P-DGM-240182	585568.90	4573021.40	16.2	10.9	6.9	3.7	Point	FALSE
DGM-24	P-DGM-240183	585565.75	4573017.01	19.3	10.9	4.3	1.2	Tiling	FALSE
DGM-24	P-DGM-240184	585550.40	4573031.90	14.6	10.8	6.3	3.5	Point	FALSE
DGM-24	P-DGM-240185	585575.30	4573009.10	15.2	10.3	5.9	2.6	Point	FALSE
DGM-24	P-DGM-240186	585538.20	4573045.50	15.2	10.2	5.6	2.0	Point	FALSE
DGM-24	P-DGM-240187	585517.06	4573053.28	14.2	10.2	6.5	3.5	Tiling	FALSE
DGM-24	P-DGM-240188	585569.20	4573015.10	13.4	10.1	6.9	4.0	Point	FALSE
DGM-24	P-DGM-240190	585573.20	4573015.00	14.8	10.0	5.8	2.9	Point	FALSE
DGM-24	P-DGM-240192	585530.80	4573045.90	12.7	9.9	6.1	3.2	Point	FALSE
DGM-24	P-DGM-240193	585579.60	4573010.10	15.6	9.9	3.9	1.0	Point	FALSE
DGM-24	P-DGM-240194	585566.20	4573013.80	15.9	9.8	4.2	1.5	Point	FALSE
DGM-24	P-DGM-240195	585519.00	4573049.40	17.7	9.7	4.0	1.5	Point	FALSE
DGM-24	P-DGM-240196	585546.50	4573032.90	12.9	9.7	5.4	2.6	Point	FALSE
DGM-24	P-DGM-240197	585581.60	4573012.30	12.8	9.7	5.8	2.9	Point	FALSE
DGM-24	P-DGM-240198	585532.90	4573048.70	14.5	9.5	5.2	2.2	Point	FALSE
DGM-24	P-DGM-240199	585525.21	4573051.08	15.2	9.5	4.5	2.2	Tiling	FALSE
DGM-24	P-DGM-240200	585522.50	4573060.00	14.1	9.4	5.5	3.1	Point	FALSE
DGM-24	P-DGM-240201	585575.98	4573013.81	17.5	9.4	4.5	1.6	Tiling	FALSE
DGM-24	P-DGM-240202	585534.10	4573047.70	15.1	9.4	3.5	0.9	Point	FALSE
DGM-24	P-DGM-240204	585542.00	4573033.60	11.9	9.1	5.4	2.6	Point	FALSE
DGM-24	P-DGM-240205	585530.31	4573044.95	13.1	9.1	5.8	2.7	Tiling	FALSE
DGM-24	P-DGM-240206	585561.00	4573020.50	12.1	9.1	6.2	4.2	Point	FALSE
DGM-24	P-DGM-240207	585571.70	4573016.10	11.6	8.8	5.4	3.3	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-24	P-DGM-240208	585517.77	4573055.24	13.2	8.8	4.6	1.6	Tiling	FALSE
DGM-24	P-DGM-240210	585520.29	4573058.00	12.8	8.6	4.4	2.4	Point	FALSE
DGM-24	P-DGM-240211	585570.20	4573014.30	14.4	8.5	3.2	0.8	Point	FALSE
DGM-24	P-DGM-240212	585532.24	4573041.25	16.3	8.5	4.0	1.4	Tiling	FALSE
DGM-24	P-DGM-240213	585564.30	4573021.10	12.0	8.5	4.8	2.3	Point	FALSE
DGM-24	P-DGM-240214	585528.30	4573050.50	13.0	8.4	5.2	2.0	Point	FALSE
DGM-24	P-DGM-240215	585549.70	4573031.20	11.9	8.3	4.8	2.6	Point	FALSE
DGM-24	P-DGM-240216	585532.30	4573048.20	10.9	8.1	4.8	2.7	Point	FALSE
DGM-24	P-DGM-240217	585559.90	4573021.00	10.0	8.0	5.6	3.9	Point	FALSE
DGM-24	P-DGM-240220	585560.90	4573022.50	11.7	7.8	4.2	2.0	Point	FALSE
DGM-24	P-DGM-240222	585581.01	4573008.16	10.9	7.7	4.9	2.6	Tiling	FALSE
DGM-24	P-DGM-240223	585533.70	4573047.20	13.3	7.7	3.5	1.4	Point	FALSE
DGM-24	P-DGM-240224	585539.30	4573036.60	11.4	7.7	4.9	2.9	Point	FALSE
DGM-24	P-DGM-240225	585519.12	4573050.26	12.9	7.6	3.8	1.0	Tiling	FALSE
DGM-24	P-DGM-240227	585543.20	4573034.35	10.3	7.5	4.5	2.8	Tiling	FALSE
DGM-24	P-DGM-240228	585525.00	4573054.10	10.1	7.4	3.3	1.9	Point	FALSE
DGM-24	P-DGM-240229	585527.59	4573046.23	10.8	7.4	5.0	2.7	Tiling	FALSE
DGM-24	P-DGM-240231	585562.89	4573019.92	10.1	7.4	4.7	2.4	Tiling	FALSE
DGM-24	P-DGM-240232	585562.40	4573020.80	10.9	7.3	4.9	2.8	Point	FALSE
DGM-24	P-DGM-240233	585546.30	4573037.00	12.0	7.3	3.3	0.9	Point	FALSE
DGM-24	P-DGM-240235	585541.00	4573034.30	12.2	7.2	2.5	0.2	Point	FALSE
DGM-24	P-DGM-240236	585532.30	4573049.15	11.4	7.2	3.3	2.0	Tiling	FALSE
DGM-24	P-DGM-240238	585520.54	4573047.53	9.7	7.0	3.8	1.9	Tiling	FALSE
DGM-24	P-DGM-240239	585562.10	4573017.90	9.3	6.9	3.8	2.4	Point (possible noise)	FALSE
DGM-24	P-DGM-240240	585536.30	4573047.20	10.0	6.9	4.4	1.9	Point	FALSE
DGM-24	P-DGM-240241	585524.70	4573054.80	10.1	6.8	3.8	1.7	Point	FALSE
DGM-24	P-DGM-240242	585524.90	4573057.60	10.8	6.6	3.2	1.5	Point	FALSE
DGM-24	P-DGM-240244	585552.10	4573031.70	9.5	6.3	3.2	1.5	Point	FALSE
DGM-24	P-DGM-240245	585544.20	4573041.40	10.1	6.3	3.3	1.3	Point	FALSE
DGM-24	P-DGM-240246	585574.00	4573013.20	10.2	6.2	3.1	1.2	Point	FALSE
DGM-24	P-DGM-240247	585557.48	4573029.54	9.9	6.2	2.8	0.7	Tiling	FALSE
DGM-24	P-DGM-240248	585565.80	4573020.60	9.8	6.1	3.5	1.4	Point	FALSE
DGM-24	P-DGM-240249	585565.53	4573013.84	10.1	6.1	2.5	0.8	Tiling	FALSE
DGM-24	P-DGM-240251	585570.67	4573013.49	9.5	6.0	3.4	1.6	Tiling	FALSE
DGM-24	P-DGM-240252	585527.35	4573040.53	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-24	P-DGM-240253	585571.45	4573016.82	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-24	P-DGM-240254	585554.34	4573020.84	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-24	P-DGM-240255	585523.34	4573065.02	-777.0	-777.0	-777.0	-777.0	Utility/Known Culture Polygon	TRUE
DGM-25	P-DGM-250003	585803.50	4572931.00	446.3	179.2	34.5	1.2	Point	FALSE
DGM-25	P-DGM-250006	585780.70	4572922.50	181.1	115.0	61.5	30.1	Point	FALSE
DGM-25	P-DGM-250009	585808.10	4572919.00	94.9	69.8	43.2	26.2	Point	FALSE
DGM-25	P-DGM-250011	585790.10	4572932.20	92.9	62.6	36.1	19.1	Point	FALSE
DGM-25	P-DGM-250013	585779.90	4572904.20	67.8	48.9	28.4	14.4	Point	FALSE
DGM-25	P-DGM-250014	585780.10	4572905.50	62.2	43.5	25.4	13.8	Point	FALSE
DGM-25	P-DGM-250015	585800.30	4572913.30	62.6	43.4	23.9	12.3	Point	FALSE
DGM-25	P-DGM-250016	585804.30	4572908.60	63.8	43.1	24.5	13.3	Point	FALSE
DGM-25	P-DGM-250018	585779.63	4572904.77	52.9	34.9	19.4	10.2	Tiling	FALSE
DGM-25	P-DGM-250019	585784.80	4572919.70	53.3	32.9	14.7	4.7	Point	FALSE
DGM-25	P-DGM-250020	585804.70	4572907.80	49.6	32.1	18.1	8.9	Point	FALSE
DGM-25	P-DGM-250021	585806.10	4572918.70	45.2	31.6	16.2	7.4	Point	FALSE
DGM-25	P-DGM-250022	585800.70	4572912.60	45.1	31.1	17.8	9.3	Point	FALSE
DGM-25	P-DGM-250023	585805.10	4572926.80	36.1	26.2	14.3	8.6	Point	FALSE
DGM-25	P-DGM-250024	585803.75	4572925.34	36.5	24.4	13.9	7.9	Point	FALSE
DGM-25	P-DGM-250025	585803.90	4572929.10	38.3	24.1	12.6	6.2	Point	FALSE
DGM-25	P-DGM-250027	585804.60	4572929.60	33.3	23.1	12.9	6.3	Point	FALSE
DGM-25	P-DGM-250028	585805.80	4572924.00	35.1	22.4	12.1	5.5	Point	FALSE
DGM-25	P-DGM-250029	585804.20	4572924.90	32.4	22.3	13.2	7.7	Point	FALSE
DGM-25	P-DGM-250030	585782.50	4572905.50	33.0	22.2	13.4	7.5	Point	FALSE
DGM-25	P-DGM-250032	585793.10	4572910.20	33.5	21.8	10.6	3.6	Point	FALSE
DGM-25	P-DGM-250034	585781.90	4572906.00	29.8	20.4	12.8	7.1	Point	FALSE
DGM-25	P-DGM-250036	585781.20	4572926.10	27.3	19.3	10.7	5.4	Point	FALSE
DGM-25	P-DGM-250038	585803.28	4572929.13	30.5	19.0	9.6	5.5	Tiling	FALSE
DGM-25	P-DGM-250039	585804.50	4572926.30	24.8	18.2	11.4	6.9	Point	FALSE
DGM-25	P-DGM-250041	585795.00	4572903.90	25.2	17.3	10.2	5.8	Point	FALSE
DGM-25	P-DGM-250042	585808.10	4572905.90	27.6	17.1	8.0	3.3	Point	FALSE
DGM-25	P-DGM-250044	585787.50	4572910.70	26.7	16.4	9.0	4.1	Point	FALSE
DGM-25	P-DGM-250045	585789.80	4572914.70	28.3	16.0	6.5	2.1	Point	FALSE
DGM-25	P-DGM-250046	585795.60	4572905.70	24.9	15.8	8.2	3.2	Point	FALSE
DGM-25	P-DGM-250047	585801.37	4572912.15	22.4	15.8	8.7	4.5	Tiling	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-25	P-DGM-250048	585780.49	4572926.30	22.0	15.5	8.3	4.0	Point	FALSE
DGM-25	P-DGM-250049	585787.00	4572918.40	23.3	15.5	7.7	4.4	Point	FALSE
DGM-25	P-DGM-250050	585780.65	4572904.19	18.3	13.9	9.2	4.0	Tiling	FALSE
DGM-25	P-DGM-250052	585779.12	4572906.00	20.0	13.4	7.9	3.6	Tiling	FALSE
DGM-25	P-DGM-250053	585783.50	4572905.50	22.6	13.1	6.9	2.6	Point	FALSE
DGM-25	P-DGM-250054	585807.20	4572920.90	20.6	13.0	7.5	2.7	Point	FALSE
DGM-25	P-DGM-250055	585807.77	4572919.60	17.4	13.0	7.4	3.6	Tiling	FALSE
DGM-25	P-DGM-250057	585788.90	4572933.10	20.2	12.3	6.0	2.5	Point	FALSE
DGM-25	P-DGM-250059	585793.71	4572909.82	16.9	12.2	7.0	2.7	Tiling	FALSE
DGM-25	P-DGM-250061	585806.77	4572921.35	18.4	12.2	6.6	3.4	Tiling	FALSE
DGM-25	P-DGM-250062	585781.50	4572904.20	15.8	12.0	7.1	3.7	Point	FALSE
DGM-25	P-DGM-250064	585807.10	4572920.00	19.6	11.8	5.7	2.2	Point	FALSE
DGM-25	P-DGM-250065	585796.20	4572906.20	19.4	11.6	5.0	2.0	Point	FALSE
DGM-25	P-DGM-250066	585793.80	4572904.00	24.3	11.5	3.5	0.5	Point	FALSE
DGM-25	P-DGM-250067	585801.20	4572911.30	16.7	11.3	5.8	2.4	Point	FALSE
DGM-25	P-DGM-250071	585806.10	4572904.40	17.1	10.7	4.8	2.0	Point	FALSE
DGM-25	P-DGM-250072	585807.20	4572925.00	21.7	10.6	3.3	0.9	Point	FALSE
DGM-25	P-DGM-250073	585787.10	4572917.30	15.0	10.5	5.9	3.2	Point	FALSE
DGM-25	P-DGM-250074	585793.10	4572903.90	20.5	10.3	3.8	0.7	Point	FALSE
DGM-25	P-DGM-250075	585807.30	4572923.10	20.7	10.2	3.4	1.2	Point	FALSE
DGM-25	P-DGM-250076	585806.50	4572920.50	15.6	9.9	4.9	1.9	Point	FALSE
DGM-25	P-DGM-250077	585806.54	4572923.55	18.8	9.4	3.6	1.3	Tiling	FALSE
DGM-25	P-DGM-250078	585803.70	4572932.40	22.4	9.3	1.5	-0.6	Point	FALSE
DGM-25	P-DGM-250079	585781.20	4572903.40	13.9	9.3	6.3	3.3	Point	FALSE
DGM-25	P-DGM-250080	585808.20	4572923.60	28.4	9.2	0.9	-0.2	Point	FALSE
DGM-25	P-DGM-250081	585780.12	4572921.62	18.1	9.1	3.4	1.1	Tiling	FALSE
DGM-25	P-DGM-250082	585807.90	4572927.80	12.7	8.9	5.1	2.2	Point	FALSE
DGM-25	P-DGM-250083	585783.70	4572920.60	13.3	8.8	5.0	2.7	Point	FALSE
DGM-25	P-DGM-250085	585788.80	4572909.70	13.2	8.3	3.4	1.0	Point	FALSE
DGM-25	P-DGM-250087	585808.80	4572913.40	12.4	7.9	3.4	1.1	Point	FALSE
DGM-25	P-DGM-250088	585799.88	4572914.00	12.1	7.7	4.3	1.8	Tiling	FALSE
DGM-25	P-DGM-250091	585796.44	4572907.11	10.9	6.8	3.7	2.1	Tiling	FALSE
DGM-25	P-DGM-250094	585809.30	4572922.20	7.9	6.7	3.7	1.9	Point	FALSE
DGM-25	P-DGM-250096	585782.91	4572906.08	11.8	6.4	2.7	1.0	Tiling	FALSE
DGM-25	P-DGM-250098	585801.50	4572927.70	10.7	6.2	2.8	1.2	Point	FALSE
DGM-25	P-DGM-250099	585805.40	4572927.70	13.2	6.1	1.5	0.1	Point	FALSE
DGM-25	P-DGM-250100	585798.59	4572901.75	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-25	P-DGM-250101	585811.53	4572923.97	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-25	P-DGM-250102	585791.43	4572902.53	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-26	P-DGM-260001	585753.80	4573107.20	74.0	47.9	25.1	13.4	Point	FALSE
DGM-26	P-DGM-260002	585738.60	4573099.10	61.8	41.6	22.6	12.1	Point	FALSE
DGM-26	P-DGM-260003	585754.40	4573106.00	59.7	41.1	22.2	10.7	Point	FALSE
DGM-26	P-DGM-260004	585733.80	4573099.60	52.7	34.3	18.5	7.4	Point	FALSE
DGM-26	P-DGM-260005	585737.30	4573100.60	51.5	30.2	13.5	3.6	Point	FALSE
DGM-26	P-DGM-260007	585738.57	4573099.64	46.0	28.7	15.6	8.0	Tiling	FALSE
DGM-26	P-DGM-260008	585754.25	4573106.84	39.6	27.1	15.9	8.1	Tiling	FALSE
DGM-26	P-DGM-260009	585754.40	4573105.10	39.2	25.9	13.4	6.3	Point	FALSE
DGM-26	P-DGM-260010	585744.90	4573127.90	32.3	25.2	16.9	10.2	Point	FALSE
DGM-26	P-DGM-260011	585752.70	4573105.10	33.0	23.2	13.3	7.4	Point	FALSE
DGM-26	P-DGM-260012	585751.30	4573106.30	34.3	23.1	12.0	5.6	Point	FALSE
DGM-26	P-DGM-260015	585745.04	4573126.88	28.9	21.6	13.1	8.5	Point	FALSE
DGM-26	P-DGM-260017	585739.50	4573099.40	36.9	20.9	10.1	4.2	Point	FALSE
DGM-26	P-DGM-260020	585747.80	4573127.30	24.3	18.2	11.1	6.4	Point	FALSE
DGM-26	P-DGM-260021	585751.60	4573105.40	27.8	17.7	10.1	4.5	Point	FALSE
DGM-26	P-DGM-260022	585752.20	4573104.40	27.9	17.5	8.7	4.5	Point	FALSE
DGM-26	P-DGM-260023	585741.60	4573102.30	22.3	15.4	8.3	3.7	Point	FALSE
DGM-26	P-DGM-260024	585743.90	4573124.50	30.8	14.7	2.7	-0.2	Point	FALSE
DGM-26	P-DGM-260027	585736.65	4573100.97	27.5	13.2	4.4	1.5	Tiling	FALSE
DGM-26	P-DGM-260028	585745.40	4573125.80	18.4	13.1	7.5	2.9	Point	FALSE
DGM-26	P-DGM-260029	585742.60	4573129.30	20.9	13.0	6.5	2.4	Point	FALSE
DGM-26	P-DGM-260030	585747.40	4573126.60	19.5	12.8	5.9	3.0	Point	FALSE
DGM-26	P-DGM-260032	585737.30	4573099.70	23.4	11.7	3.5	0.9	Point	FALSE
DGM-26	P-DGM-260033	585739.10	4573101.00	21.1	11.5	4.5	0.8	Point	FALSE
DGM-26	P-DGM-260034	585743.36	4573129.34	16.4	11.0	4.7	1.2	Tiling	FALSE
DGM-26	P-DGM-260035	585750.87	4573105.46	18.2	10.8	6.1	2.0	Tiling	FALSE
DGM-26	P-DGM-260036	585737.00	4573099.10	17.2	10.6	4.6	2.2	Point	FALSE
DGM-26	P-DGM-260037	585737.00	4573101.40	22.5	10.0	1.1	-2.5	Point	FALSE
DGM-26	P-DGM-260038	585740.80	4573102.20	12.7	9.9	5.0	3.1	Point	FALSE
DGM-26	P-DGM-260039	585747.70	4573125.00	14.9	9.8	5.4	2.5	Point	FALSE

Location	Target_ID	Easting	Northing	CH1_final	CH2_final	CH3_final	CH4_final	Comments	Polygon Target
DGM-26	P-DGM-260040	585735.40	4573101.00	19.0	9.2	3.8	2.1	Point	FALSE
DGM-26	P-DGM-260041	585748.50	4573126.50	14.5	8.8	4.6	2.2	Point	FALSE
DGM-26	P-DGM-260045	585741.30	4573128.90	8.8	6.3	2.9	0.8	Point	FALSE
DGM-26	P-DGM-260046	585750.70	4573104.50	10.2	6.0	2.4	1.5	Point	FALSE
DGM-26	P-DGM-260047	585762.42	4573097.85	-666.0	-666.0	-666.0	-666.0	SRA	TRUE
DGM-27	P-DGM-270001	585522.20	4572817.10	115.5	79.9	44.6	21.5	Point	FALSE
DGM-27	P-DGM-270003	585530.00	4572837.60	26.4	19.7	12.8	7.0	Point	FALSE
DGM-27	P-DGM-270004	585537.20	4572815.80	28.5	19.4	10.7	5.4	Point	FALSE
DGM-27	P-DGM-270005	585532.80	4572836.30	24.6	18.2	12.0	7.1	Point	FALSE
DGM-27	P-DGM-270006	585529.80	4572838.50	27.0	18.2	10.7	4.6	Point	FALSE
DGM-27	P-DGM-270008	585536.80	4572815.00	16.6	11.2	6.3	2.9	Point	FALSE
DGM-27	P-DGM-270009	585530.42	4572840.42	17.5	10.9	5.4	2.3	Point	FALSE
DGM-27	P-DGM-270013	585530.30	4572839.10	14.6	8.8	3.5	0.9	Point	FALSE
DGM-27	P-DGM-270014	585537.30	4572823.30	10.7	8.2	4.7	1.5	Point	FALSE
DGM-27	P-DGM-270017	585531.10	4572839.30	9.8	6.6	4.0	1.3	Point	FALSE
DGM-28	P-DGM-280001	585876.70	4572576.00	511.6	327.8	159.6	61.6	Point	FALSE
DGM-28	P-DGM-280002	585858.70	4572566.70	255.9	175.7	104.0	55.8	Point	FALSE
DGM-28	P-DGM-280004	585859.02	4572566.23	196.2	133.0	79.6	41.7	Tiling	FALSE
DGM-28	P-DGM-280005	585869.70	4572569.50	188.1	94.7	25.9	2.7	Point	FALSE
DGM-28	P-DGM-280006	585857.70	4572569.30	136.5	91.0	53.4	27.9	Point	FALSE
DGM-28	P-DGM-280007	585877.50	4572575.97	139.2	88.2	42.0	15.2	Tiling	FALSE
DGM-28	P-DGM-280009	585869.10	4572569.50	148.1	75.6	21.7	2.2	Point	FALSE
DGM-28	P-DGM-280010	585859.49	4572566.95	104.0	70.2	41.6	21.5	Tiling	FALSE
DGM-28	P-DGM-280011	585857.20	4572569.90	97.0	65.4	38.5	20.8	Point	FALSE
DGM-28	P-DGM-280012	585857.20	4572568.30	97.0	63.3	36.2	18.1	Point	FALSE
DGM-28	P-DGM-280013	585850.60	4572585.70	78.8	58.0	36.7	20.9	Point	FALSE
DGM-28	P-DGM-280014	585877.50	4572575.30	161.5	56.3	13.9	2.8	Point	FALSE
DGM-28	P-DGM-280017	585850.70	4572569.40	73.8	48.3	24.6	10.7	Point	FALSE
DGM-28	P-DGM-280018	585876.24	4572573.66	64.3	45.8	27.5	15.0	Point	FALSE
DGM-28	P-DGM-280019	585856.20	4572568.20	66.8	44.3	25.6	13.2	Point	FALSE
DGM-28	P-DGM-280020	585852.20	4572568.80	61.8	42.3	24.6	11.7	Point	FALSE
DGM-28	P-DGM-280022	585855.40	4572568.80	47.5	31.5	18.2	9.3	Point	FALSE
DGM-28	P-DGM-280023	585877.00	4572572.70	42.9	30.8	19.6	11.0	Point	FALSE
DGM-28	P-DGM-280025	585851.30	4572569.38	41.6	28.3	16.0	7.2	Tiling	FALSE
DGM-28	P-DGM-280026	585853.10	4572576.90	40.7	27.8	16.0	7.5	Point	FALSE
DGM-28	P-DGM-280028	585854.00	4572577.10	39.1	26.9	15.2	7.1	Point	FALSE
DGM-28	P-DGM-280029	585850.62	4572568.78	35.1	24.3	14.5	6.8	Tiling	FALSE
DGM-28	P-DGM-280030	585855.80	4572567.00	34.2	23.2	11.8	4.6	Point	FALSE
DGM-28	P-DGM-280031	585855.93	4572569.09	33.3	23.1	13.9	7.0	Tiling	FALSE
DGM-28	P-DGM-280032	585878.40	4572590.50	39.0	19.9	5.7	1.0	Point	FALSE
DGM-28	P-DGM-280033	585875.90	4572573.00	26.5	19.1	12.3	7.0	Point	FALSE
DGM-28	P-DGM-280034	585856.33	4572569.59	27.2	18.6	11.6	6.2	Tiling	FALSE
DGM-28	P-DGM-280035	585849.20	4572576.60	25.8	18.0	10.6	5.6	Point	FALSE
DGM-28	P-DGM-280036	585856.81	4572569.34	26.1	17.6	9.4	4.6	Tiling	FALSE
DGM-28	P-DGM-280037	585862.70	4572566.40	23.7	16.8	10.2	5.2	Point	FALSE
DGM-28	P-DGM-280038	585858.07	4572570.13	24.6	16.4	9.9	4.5	Tiling	FALSE
DGM-28	P-DGM-280040	585875.00	4572586.40	22.2	15.1	8.8	4.5	Point	FALSE
DGM-28	P-DGM-280042	585853.40	4572568.50	19.5	13.2	8.3	4.2	Point	FALSE
DGM-28	P-DGM-280044	585877.90	4572583.90	17.9	12.7	7.2	3.8	Point	FALSE
DGM-28	P-DGM-280045	585875.50	4572585.80	16.0	11.4	6.5	3.1	Point	FALSE
DGM-28	P-DGM-280046	585848.10	4572585.00	16.6	11.2	6.5	3.4	Point	FALSE
DGM-28	P-DGM-280047	585853.10	4572567.60	14.9	10.5	5.8	3.2	Point	FALSE
DGM-28	P-DGM-280048	585876.80	4572592.50	15.0	9.8	5.5	2.6	Point	FALSE
DGM-28	P-DGM-280050	585855.30	4572566.00	11.4	8.6	5.6	3.5	Point	FALSE
DGM-28	P-DGM-280051	585861.70	4572566.80	10.7	8.0	5.0	2.8	Point	FALSE
DGM-28	P-DGM-280053	585848.37	4572577.05	9.2	6.1	3.6	1.8	Tiling	FALSE

AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Background Location Report
Static MetalMapper 2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Author: Tom Furuya, May 21, 2020
Reviewed: Dean Keiswetter, May 21, 2020

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1 INTRODUCTION

This memo has been prepared on behalf of the EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014 to document the process and results for selecting background locations as part of the cued advanced geophysical classification (AGC) surveys that AcornSI and NAEVA Joint Venture (ANJV) performed at the start of the geophysical investigation for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY). Cued AGC surveys involve collection of data in static mode with an AGC sensor over each anomaly location. Periodic background measurements are made over non-anomalous locations to measure the local soil response as well as the instrument's self-signature and zero level drift. These measurements are subtracted from the anomaly measurements to isolate the response from the anomaly source. The assumption that the background measurements do not have a localized metal source must hold true if the background corrections are to be valid.

The background locations selection process included the initial selection of non-anomalous locations based upon the EM61 dynamic detection survey results conducted earlier at the site. To verify that these locations were devoid of localized metal sources, a series of measurements were conducted with the MetalMapper2x2 (MM2x2) sensor to verify that the response was effectively uniform in the immediate vicinity of the location. The results of these measurements were analyzed, and a validation metric was derived to indicate the validity of the background locations. The details of the measurements, analysis and results are provided in this technical memorandum and are consistent with the guidance provided in *Worksheet #22—Field Equipment Calibration, Maintenance, Testing and Inspection*, and *Appendix F - Field Standard Operating Procedures (SOP)*, contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).

2 BACKGROUND LOCATION SELECTION AND VALIDATION

The MM2x2 system was used to perform cued surveys over anomalies selected within grids which were spread out over the project site. Background locations were initially selected from the same DGM data as were used for the anomaly detection process. These locations were selected where the responses appeared to be non-anomalous, and an attempt was made to have multiple locations distributed across each grid. The data acquisition software for the MM2x2 does not contain an infield background validation tool. Under normal operating procedures, background validation data would be collected and analyzed prior to the collection of cued data. Due to the separation of the grids and the accessibility issues it was decided that it would be more efficient to collect background validation data at the same time as the cued collection. In order to minimize the possibility of rejecting the cued data because the background validation failed, two background locations were validated within each grid. If more than one location passed validation, the analyst chose the location with the best validation results to correct the cued data. The validation was accomplished by comparing a set of 5 measurements taken at the intended location: one measurement at the location and one more with the sensor offset by ½ sensor spacing in four orthogonal directions. Next, the forward model of a small ISO80 was added to the center background measurement and the background was validated by separately subtracting each of the 4 offset backgrounds and performing a library match to the

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target of interest. If the background location was truly devoid of metal, the localized response should be homogenous and the residual signal in these leveled data sets should be very low, leaving only the response from the embedded synthetic TOI. The background location was considered valid if the surrounding background measurements are collected within ½ sensor offset (±50%) of the center background and the library match from all 4 offsets exceeds 0.9. The "Background Location Validation Test" in UX-Analyze performs these operations and creates an image and spreadsheet of the results. An example of the background validation image for a typical passed test is shown in Figure 1.

A total of 44 MM2x2 static background locations were selected for validation in the 22 grids and one location was tested in the IVS. 27 of the grid background locations and the IVS location passed the MQOs identified in the QAPP. 17 of the 22 grids contained a passed background validation location and in grids with multiple passed locations typically only one was selected for use to apply to the cued production data (Appendix A). Three (DGM11, DGM22, DGM26) of the five grids without a validated background were characterized by high responses throughout most of the surveyed area which prevented the placement of a suitable background location. For these grids, a validated background location from a nearby grid was used. As Figure 2 shows, the grids were all in relatively close proximity to each other and the consistent geology across the site allowed backgrounds from different grids to be used to reliably level the data.

The remaining two grids without a validated background were in grids DGM2 and DGM10. Figure 3 shows the failed background validation test for DGM2 (left) and DGM10 (right). The probable root cause that led to the background validation failures was metal sources in the vicinity of the failed surrounding measurements (ID 4 – shown in red). Normally, a failed background location validation test would necessitate locating another background location and recollecting both the background and production cued data that was affected by the failure. But in this case, it was observed that the location of the ongoing backgrounds that were used to level the production data were in the vicinity of the initial background measurements (ID 1) and not near measurement ID 4 and should be valid to level the production cued data. If the area in the immediate vicinity of the initial background location were not devoid of metal sources the background location validation test would have resulted in additional failures of the surrounding measurements. An NC-CAR was submitted and USACE agreed that there was no impact to the objectives of the RI and approved the use of the background data. Additional details of the DGM2 and DGM10 background location validation test can be found in the NC-CAR.

3 CONCLUSIONS

A total of 44 TEM2x2 static background locations were selected for validation in the 22 grids and one location was tested in the IVS. 27 of the background locations and the IVS location passed the MQOs identified in the QAPP. Based upon the analysis performed, it is concluded that background locations that passed validation were suitable to level all the MM2x2 cued survey data.

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4 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP),* Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

ANJV, 2020. *Non-Conformance / Corrective Actions Report, Background Validation Failure, April 14 and 17, 2020, Static MetalMapper2x2,* Remedial Investigation, Iona Island Naval Ammunition Depot.

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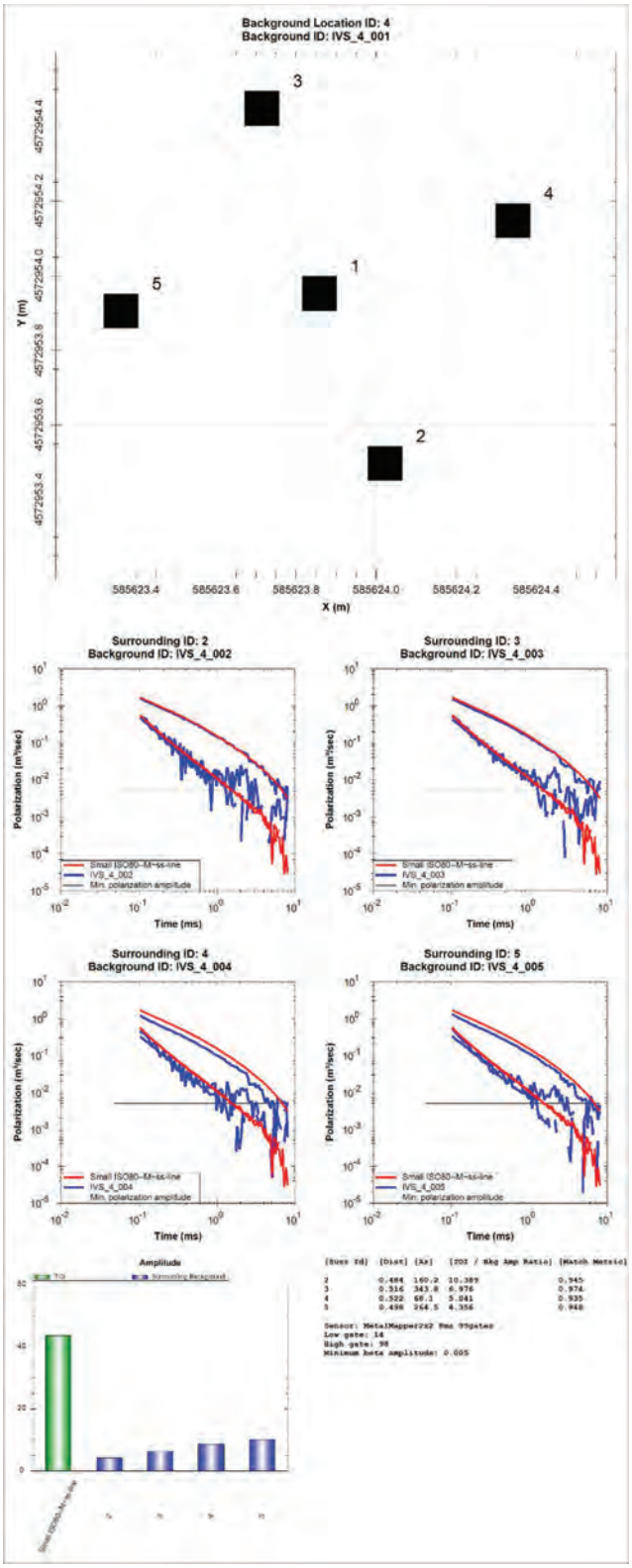

Figure 1 Background location validation test results for the validated background location at the IVS.

Figure 2 Iona Island site map showing the location of the 27 DGM grids.

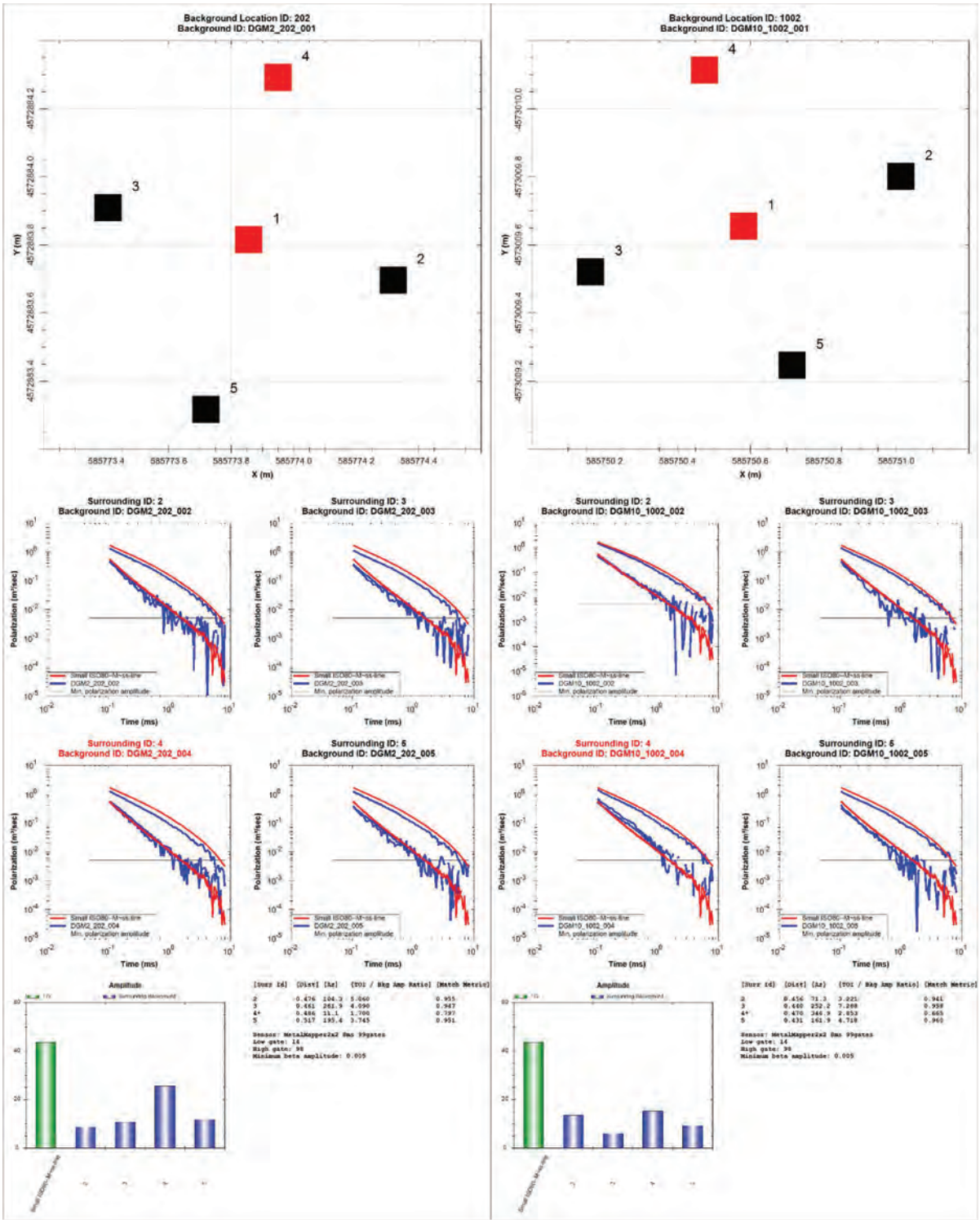

Figure 3 Background location validation test results for two failed tests at grid DGM2_202 (left) and grid DGM10_1002 (right).

Appendix A

Background Validation Metrics for MM2x2

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MM2x2 – Background validation metrics

Location ID	Pass/Fail	Background ID	Surrounding ID				Distance				Azimuth				Metric Match				TOI / Bkg Amp Ratio			
4	Passed	IVS_4_001	4	2	5	3	0.52	0.48	0.50	0.52	68	160	265	344	0.935	0.945	0.948	0.974	5.0	10.4	4.4	7.0
101	Passed	DGM1_101_001	2	5	3	4	0.50	0.51	0.48	0.49	85	184	262	353	0.977	0.971	0.98	0.984	14.3	9.3	12.2	11.8
202	Failed - Approved for use	DGM2_202_001	4	2	5	3	0.49	0.48	0.52	0.46	11	104	195	282	0.797	0.955	0.951	0.947	1.7	5.1	3.7	4.1
302	Passed	DGM3_302_001	3	4	2	5	0.28	0.28	0.28	0.28	34	129	215	308	0.967	0.964	0.982	0.976	11.1	9.3	17.2	12.7
401	Passed	DGM4_401_001	4	2	5	3	0.48	0.47	0.52	0.50	71	161	250	339	0.983	0.96	0.974	0.968	10.4	10.6	8.4	11.1
501	Passed	DGM5_501_001	4	2	5	3	0.38	0.38	0.38	0.37	2	88	186	272	0.941	0.982	0.946	0.977	7.0	10.4	6.2	9.3
602	Passed	DGM6_602_006	7	10	8	9	0.50	0.43	0.50	0.50	46	146	230	321	0.966	0.962	0.952	0.974	7.8	6.6	8.7	6.8
702	Passed	DGM7_702_001	3	4	2	5	0.49	0.50	0.50	0.50	21	108	203	295	0.967	0.961	0.965	0.957	9.1	5.9	9.7	5.4
901	Passed	DGM9_901_001	4	2	5	3	0.42	0.42	0.43	0.42	76	169	263	348	0.985	0.981	0.948	0.962	6.0	10.2	5.1	8.3
902	Passed	DGM9_902_001	2	5	3	4	0.39	0.39	0.39	0.38	88	183	268	358	0.97	0.946	0.956	0.948	11.3	5.1	6.7	5.6
1002	Failed - Approved for use	DGM10_1002_006	9	7	10	8	0.50	0.48	0.49	0.49	2	95	183	273	0.517	0.98	0.974	0.969	2.4	4.2	7.3	7.0
1201	Passed	DGM12_1201_001	5	3	4	2	0.45	0.45	0.47	0.46	6	92	182	270	0.952	0.977	0.958	0.963	7.2	8.8	7.2	8.8
1402	Passed	DGM14_1402_001	4	2	5	3	0.47	0.48	0.44	0.45	51	135	227	317	0.968	0.987	0.986	0.973	13.4	11.0	13.7	14.7
1501	Passed	DGM15_1501_001	3	4	2	5	0.45	0.49	0.50	0.43	91	176	259	351	0.974	0.949	0.971	0.942	6.4	5.0	7.3	4.2
1601	Passed	DGM16_1601_001	2	5	3	4	0.52	0.48	0.47	0.52	6	102	191	281	0.967	0.947	0.946	0.958	7.2	4.7	4.8	5.4
1701	Passed	DGM17_1701_001	4	2	5	3	0.50	0.50	0.49	0.47	69	155	247	334	0.98	0.98	0.982	0.985	16.7	16.6	14.1	15.2
1802	Passed	DGM18_1802_001	4	2	5	3	0.36	0.34	0.37	0.38	13	108	202	290	0.972	0.961	0.961	0.971	9.7	11.6	5.9	9.2
1902	Passed	DGM19_1902_001	5	3	4	2	0.49	0.45	0.47	0.45	10	95	178	276	0.926	0.959	0.915	0.96	4.8	6.2	5.4	10.0
2001	Passed	DGM20_2001_001	5	3	4	2	0.44	0.45	0.47	0.46	8	90	181	268	0.966	0.948	0.944	0.942	5.5	4.9	4.1	4.5
2402	Passed	DGM24_2402_007	10	8	11	9	0.36	0.43	0.41	0.41	76	189	257	354	0.971	0.96	0.955	0.979	5.0	8.0	4.5	8.0
2502	Passed	DGM25_2502_001	2	5	3	4	0.48	0.48	0.45	0.45	77	188	260	344	0.983	0.976	0.973	0.975	10.1	5.9	6.4	6.8

AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Classification Report
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 1

For

Contract: W912DR-15-D-0014
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1 INTRODUCTION

This target classification report has been prepared on behalf of EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014 to document the classification process used for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY). The general approach was to place grids throughout the MRS using a semi-biased placement to characterize the subsurface. The grids were surveyed using an EM61-MK2 sensor and anomalies were selected to identify appropriate locations for advanced geophysical classification (AGC) cued follow-up work and intrusive investigation. Cued MM2x2 data were collected on a portion of the DGM anomalies and analyzed to determine whether the source of an anomaly was a target of interest (TOI) or clutter item that could be safely left in the ground. The process used to select which anomalies to perform AGC is described in greater detail in the memorandum "Iona Island MEC Characterization Memo for MRS-01" (EA 2020). All targets classified as potential TOI were intrusively investigated as well as 49 targets classified as non-TOI. The intrusive results from the grids were used to determine the effectiveness of the AGC sensors to correctly classify sources at this site.

The MMM2x2 survey operations began with the sensor setup and initial IVS survey on April 10, 2020. The AcornSI and NAEVA Joint Venture (ANJV) MM2x2 survey team consisted of a Field Geophysicist and Field Geophysicist Assistant. The MM2x2 cued grid survey data collection began on April 10 and was completed on April 22, 2020.

2 MM2x2 ASSEMBLY

The MM2x2 is an advanced electromagnetic induction sensor designed for the detection and classification of buried metal objects. The sensor consists of four sensor elements arranged on 40-centimeter (cm) centers in a 2x2 array. Each sensor element consists of a 35-cm square transmit coil for target illumination with a 10-cm three-axis receive cube centered in the transmitter coil. The transmitters are energized in sequence and the decay curve is recorded up to 8 milliseconds after the transmitters are turned off for each of the 12 (4 cubes with 3 axes each) receive channels.

The MM2x2 sensor (Figure 1) was assembled in accordance with SOP01 MM2 Assembly referenced on worksheet #22 of the QAPP. Positioning of the MM2x2 was accomplished using an RTK GPS. A Trimble R8 Real-Time Kinematic (RTK) Global Position System (GPS) base station, Trimble TDL 450 series radio, and Trimble R8/R7/5700 receiver rovers were used for the real-time acquisition of positional data during geophysical data collection with the MM2x2. The GPS base station was used in conjunction with a GPS rover antenna mounted on the MM2x2 during surveying. Real-time corrections were broadcast to the roving GPS units via a radio link using a Trimble TDL 450 radio modem transmitting at 2 watts. This system provides positional corrections at a rate of 1 hertz (Hz), with an expected accuracy of 2 cm horizontal and 3 cm vertical when the required minimum of 5 satellites is available. Data quality derived from a satellite is potentially influenced by overhead canopy, local topography, the elevation of the satellite in the sky, weather, and other factors creating signal distortion. The GPS positions were streamed into the collection software using GGA National Marine Electronics Association (NMEA) message for the MM2x2 and were recorded simultaneously with the EM data in their respective collection programs. A GPS QC check was performed at the beginning of each day

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to demonstrate the accuracy of data positioning. The MM2x2 orientation is measured using a six-degree-of-freedom IMU.

Figure 1. Assembled MM2x2 sensor with RTK-GPS at the IVS.

3 INSTRUMENT VERIFICATION STRIP (IVS)

The IVS was installed in the central area of the site. On March 16, 2020 ANJV performed the background and initial seeded surveys at the IVS using an EM61 MK2 sensor at a line spacing of 0.5 m. The IVS and background survey lines were approximately 15 meters long and were used for the EM61 MK2 and MM2x2 systems. Three ISOs consisting of two small ISO 80s and one medium ISO 40, were spaced approximately three meters apart and a blank space was also marked.

The cued MM2x2 IVS survey for the Remedial Investigation at the Iona Island Naval Ammunition Depot was performed on April 10, 2020 by ANJV personnel, processed by an ANJV data processor and reviewed by the ANJV QC Geophysicist. The cued IVS data was processed and analyzed using the DOD validated software package UX-Analyze V9.6.0. The specific details of the data collection and processing are described in ANJV SOP-02. A sensor function test, background validation test and the initial IVS static test over each item were conducted. The data from the sensor function and background validation tests met all the MQOs. The XY location, depth accuracy, library match and fit coherence also passed the MQOs for all IVS

items. Based upon these results, it was concluded that MM2x2 collection and analysis procedures documented in the IVS report show that the project data quality objectives identified in the QAPP were achievable.

For additional details on the Initial MM2x2 IVS survey see the report "*Instrument Verification Strip Memorandum, Static MetalMapper2x2*, Remedial Investigation, Iona Island Naval Ammunition Depot".

4 MM2X2 CUED ACQUISITION

The MM2x2 cued survey data collection over 22 quarter acre grids began on April 10 and was completed on April 22, 2020. The same field crew that conducted the initial IVS survey performed the MM2x2 grid surveys. ANJV performed daily data calibration activities to document that the MM2x2 system was operating correctly prior to data collection within the production area. The data calibration activities included: ongoing static IVS survey and sensor function tests. Static IVS measurements were made over each of the IVS seed items as well as the validated background location. The background measurement was used to level the IVS data and after modeling, the results were compared to the initial reference polarizations and location. A GPS QC check was also performed at the beginning of each day to validate the spatial position accuracy.

Because the grids were situated at various locations across the MRS with variable difficulty of access, it was more efficient to validate and collect background location data concurrently with the measurements over the flagged anomalies. There was some risk using this methodology because all static anomaly measurements require a background measurement to remove the self-signature of the sensor system as well as any response from the ambient environment in which the source is buried. The background measurements must be over locations validated to be devoid of metallic sources and within one hour of the static anomaly measurement. Any static anomaly measurements without a background measurement meeting these criteria cannot be used for classification. Additionally, the MM2x2 data acquisition system did not contain an infield background validation tool so the field crew would not know a background location passed the MQO until the data processor analyzed the data.

The background location validation was accomplished by comparing a set of 5 measurements taken at the intended location: one measurement at the location and one more with the sensor offset by ½ sensor spacing in four orthogonal directions. These measured data and the synthetic response of a TOI buried at the project detection depth were used to calculate a metric which determined if the background location was suitable and a validated location. Background locations were initially selected from the same DGM data as were used for the anomaly detection process. Locations were selected where the responses appeared to be non-anomalous, and an attempt was made to have multiple locations distributed across each grid. To minimize the possibility of rejecting the cued data because the background validation failed, two background locations were validated within each grid. If more than one location passed validation, the analyst chose the location with the best validation results to correct the cued data. Most of grids contained a background location that passed the MQOs identified in the QAPP. Three grids (DGM11, DGM22 and DGM26) contained elevated EM61 responses over most of the grid such that a suitable background location within the individual grids could not be

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found. In these cases, a background location from a nearby grid was used. Two other grids (DGM2 and DGM10) were without a validated background location due to one of the surrounding measurements used to validate a background location failing the MQO. For these two grids all ongoing backgrounds were in the immediate vicinity of initial center background measurement and not near the failed measurement. For this reason, it was recommended and accepted by the USACE that the background data collected over the background locations at DGM2 and DGM10 are valid and could be used to level the production cued data. Additional details of the process and results can be found in the ANJV SOP-06, "*Non-Conformance / Corrective Actions Report, Background Validation Failure, April 14 and 17, 2020, Static MM2x2*, Remedial Investigation, Iona Island Naval Ammunition Depot" and "*Background Location Report, Static MetalMapper2x2*, Remedial Investigation, Iona Island Naval Ammunition Depot".

Cued MM2x2 data collection over the grid anomalies were performed as described in ANJV SOP-07 (collect cued target measurements). Generally, the data were collected with the MM2x2 sensor directly over the flag. After data were collected, the field team confirmed the validity of the data by checking the measured EMI response, IMU and GPS.

The daily field schedule was as follows, unless otherwise noted in daily work logs:

- Morning safety brief and planning.
- Equipment setup and warmup.
- Start of day sensor function and IVS test.
- Cued MM2x2 survey and background validation measurements.
- End of day sensor function and IVS test.
- Equipment storage.
- Data download and review for completeness.
- Upload to the FTP site.

Table 1 Number of cued anomalies by grid

Grid ID	# of Anomalies to Cue
DGM1	5
DGM2	61
DGM3	62
DGM4	5
DGM5	2
DGM6	133
DGM7	82
DGM9	16
DGM10	74
DGM11	6
DGM12	89
DGM14	123
DGM15	38
DGM16	57
DGM17	3

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Grid ID	# of Anomalies to Cue
DGM18	73
DGM19	46
DGM20	30
DGM22	12
DGM24	55
DGM25	12
DGM26	5
Total	989

5 MM2X2 CUED DATA PROCESSING

The cued MM2x2 data were processed daily as described in ANJV SOP-08 (process cued geophysical data). The first step was to import the HDF5 files output from the MM2x2 data acquisition system into Geosoft *Oasis montaj* using the purpose-built processing environment UX-Analyze (V9.6). Default settings for the different tools run during the initial QC of the data were used except where noted in this section. Separate Geosoft databases were created for background validation, ongoing background, sensor function, IVS and daily grid anomaly data. Once imported the data were inspected and assessed against the MQOs provided in QAPP worksheet #22 for transmit current, valid RTK-GPS, valid IMU data and EMI response. All data that did not pass these initial MQOs were flagged for recollection and a “redo” list was created and sent to the field crew. The redo list contained either the initial flag location or a revised location based on the modeled source location and a note indicating the reason the location was designated to be recollected. Daily QC notes from the field crews were also merged into their respective databases.

The background validation data were processed using the purpose-built tool in UX-Analyze to ensure the background location meets the requirements specified in worksheet #22. Backgrounds locations that failed the MQO were rejected and were not added to the final background database used to level the cued anomaly measurements. Ongoing background readings were evaluated to ensure consistent response and only valid backgrounds were used to correct the cued data prior to inversion and parameter extraction. The backgrounds were applied automatically choosing the closest one spatially within one hour of the cued measurement. The data analyst also checked that the function test data met the requirements of the ongoing instrument function test MQO using the purpose-built tool in UX-Analyze. Finally, the IVS data were background corrected, modeled and compared to the initial IVS measurements using the Process IVS data bundle in UX-Analyze. QC results of the background validation, ongoing background points, sensor function and IVS data are detailed in the QC RESULTS section of this report.

After the cued anomaly data were leveled using the validated backgrounds, the data (0.104 - 8.116ms) were modeled using a 1, 2 and 3 source solver creating a total of six sources for each target. Both intrinsic (size, shape, materials properties) and extrinsic (location, depth,

orientation) parameters were estimated in these analyses and a list of the relevant target parameters for each source was compiled. Sources that failed QC were not used during classification and tagged for recollection unless there was a reasonable explanation for the failure. The sources were failed for the following reasons:

- fit coherence (measure of how well the modeled data matched the observed data) less than 0.8
- Inverted XY location was > 0.4m from center of the sensor array
- Flag XY location was > 0.4m from center of the sensor array (initial collection only)
- Inversion produced negative polarizations

After the daily QC of the cued data was complete, the daily QC databases were merged into a master classification database.

6 MM2X2 CLASSIFICATION PROCEDURES

Classification of targets was based upon objective, numeric criteria. Using these criteria, a prioritized list was created with high likelihood TOIs placed at the top of the dig list (just after digs classified as “can’t analyze”) and high likelihood non-TOI placed at the bottom of the list. The primary method for classification was library matching, supplemented by cluster analysis and feature space analysis. The Classify and Rank bundle in UX-Analyze was used to perform the classification. Default settings for the different tools run in the Classify and Rank bundle were used except where noted in this section.

Classification was based primarily on the goodness of fit metric (values from 0.0 to 1.0) generated by UX-Analyze during a comparison of the polarization (β) values estimated for each surveyed target and the β values in the munitions library developed for the project. This comparison was performed via the library match utility in UX-Analyze and used a minimum polarization amplitude of 0.005. The goodness of fit metric is a measure of the amplitude and shape mismatch between a target and the library entry that best fits that target, with higher values indicating a better match between the target and the corresponding item in the library. The library fit analysis matches the following four combinations of βs to those of the candidate library TOIs:

- $\beta 1$, $\beta 1/\beta 2$, $\beta 1/\beta 3$
- $\beta 1$, $\beta 1/\beta 2$
- $\beta 1/\beta 2$, $\beta 1/\beta 3$
- $\beta 1$

A key factor in the success of the library matching classification process is the munitions library used for the comparisons. Based on the QAPP (and ASR), the items that may be encountered due to the 1903 explosion include the following projectiles:

1-pounders (~37mm equivalent),
6 pounders (~57mm equivalent),
6-inch (~152mm or ~155mm equivalent),
13-inch (no equivalent).

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The DOD library does not contain any of these specific items because they are all pre- WWI but items that best represented the suspected items (shown above) at Iona Island were used in the library matching process. The site specific library was created from the DOD Library HDF5 files dated July 8/17 and consisted of the items listed in *Table 2*.

The confidence metrics for each fit combination were averaged to derive a 'decision statistic'. This library matching process was performed on each source output from the N-dipole solver. For each flag position, the best decision statistic was used from all the sources to rank and classify the target list. If multiple sources at a flag position produced a decision statistic above the analyst's threshold, they were all kept if they were at unique locations. Values below the analyst's threshold were considered non-TOI. Normally, the analyst's stop dig threshold is refined and verified using training digs, but it was decided not to perform training digs because the anticipated level of munition contamination was very low. The low probability of munitions in conjunction with the expected high levels of construction debris (pipes, rebar, etc.) would likely produce training digs that were inconclusive and may lead to an inaccurate stop dig threshold. Therefore, the stop dig threshold was determined visually by inspecting the polarizations and library match statistics in ranked order and conservatively selecting a stop dig threshold using the experience of the AGC team. A stop dig threshold of 0.89 was selected to generate the final ranked dig list.

Cluster analyses was also performed whereby the clusters of sources with similar β signatures were identified using the self-match utility in UX-Analyze and a self-match cluster threshold of 0.925. Each identified cluster with at least four matches was examined for potential TOI-like properties. There were four unique clusters that showed TOI-like polarizations and all were well sampled above the stop dig line and therefore did not require additional cluster digs.

The analyst also explored the feature space for individual items that do not match any library items but have βs that indicate an axially symmetric object. The axial symmetry metric, defined as β2/β3, was calculated in UX-Analyze. All Items with an axial symmetry metric between 1 (perfect symmetry) and 1.3 with a decision statistic below the stop dig threshold were individually analyzed. Those sources that contained a good match between the modeled/measured data and a good recovery of the betas were moved up on the ranked list and classified as a "dig". The discontinuity on the decision metric plot (Figure 2) between the targets classified as TOI and those classified as non-TOI was due to declaring a target as a potential TOI based on their axial symmetry.

The analyst also added a code to the database channel "UXA_COMMENTS" and a note in the channel "UXA_COMMENTS_2" to document anything of interest during the QC inspection of the final classification. The following is a description of the codes used:

- "x" – Cannot analyze override with reason in UXA_COMMENTS_2
- "s" - Flags that fit to or are same as another flag with a description in UXA_COMMENTS_2
- "uc" - Possible TOI and note in UXA_COMMENTS_2
- "c" – Assign as Non-TOI and note in UXA_COMMENTS_2

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Based on the decision statistics, cluster analysis and feature analysis, each target was placed into one of the following categories with category 0,1 and 2 targets being placed on the dig list:

- Category 0: Can't Analyze
- Category 1: TOI (higher confidence TOI);
- Category 2: Unsure whether the TOI is TOI or non-TOI; and
- Category 3: Non-TOI (Highly unlikely to be TOI).

The ranked dig list was visually inspected a final time and submitted to the QC geophysicist. The QC Geophysicist verified that all QC blind seeds were detected within the project's MQO performance criteria and the dig list was submitted to USACE for final validation. The USACE geophysicist confirmed the correct classification of all validation seeds and selected 18 non-TOI targets to validate the classification process. The remaining validation targets were selected in ranked order beginning immediately after the stop dig threshold.

Table 2 Munitions in Site-Specific Library

Munition type	**Reason for inclusion**
152mmP-Concrete-Piercing-USSR	Similar to suspected item
152mmP-HE-USSR-Europe	Similar to suspected item
155mmP-M107	Similar to suspected item
155mmP-WP-Smoke-M110A2	Similar to suspected item
16-inP-Mk13Mod2	Similar to suspected item
37mmP-HE-Mk2-wFuze	Similar to suspected item
37mmP-HE-Mk2-woFuze	Similar to suspected item
37mmP-Hotchkiss-French	Similar to suspected item
37mmP-ERST-German	Similar to suspected item
37mmP-M59	Similar to suspected item
37mmP-AP-T-M74	Similar to suspected item
37mmP-LE-Mk1	Similar to suspected item
37mmP-HE-Mk2	Similar to suspected item
57mmP-AP-T-M70	Similar to suspected item
6-inP-READ-Short-Shell	Similar to suspected item
Small ISO	Potential seed item
Medium ISO	Potential seed item

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7 MM2X2 CLASSIFICATION RESULTS

Figure 2 shows the decision metric plotted against dig order with the intrusive results overlaid for the MM2x2 classification. The category 0 (can't analyze) targets are plotted as black circles at the beginning of the plot, followed by category 1 and 2 targets (red circles) and lastly the category 3 targets (green circles). Along the top of the plot are the ground truth information for all intrusively investigated targets. Red triangles represent TOI and green triangles are non-TOI items. The jumps in the decision metric plot are due to "same as" targets. "Same as" flags that were in "cannot analyze" were moved to the rank of the other flag and the decision statistic was not changed. *Table 3* shows the categorization of the cued targets analyzed. Of the 989 targets, 11 were classified as can't analyze; 54 were classified as high confidence digs; 162 were classified as low confidence digs and the remaining 773 were classified as no dig. The 11 extra digs on the final ranked list were due to multiple sources meeting the dig criteria at a single cued location. The 11 targets classified as can't analyze consisted of targets where the measured data collected did not meet the initial QC MQO or the sensor array to inverted location distance exceeding tolerance. If only category 1,2 and 3 anomalies are included, there were 205 targets classified as digs which equates to 20.5% of the cued targets.

The intrusive survey over the AGC targets did not recover any intact ordnance items. There were two locations (target 20011 and 250011) that produced a fragment of a 6lb projectile, but the rest of intrusive survey recovered either the QA/QC seeds (19 items) or non-munitions related debris (NMRD). All the seeds were recovered in the first 55 digs on the ranked dig list which equates to approximately 6% of the cued targets. The source of many of the other targets classified as "to dig" were construction debris such as rebar, pipes, railroad spikes and scrap steel. The size and shape of many of the items recovered matched well to the predicted results and the classification approach to conservatively add sources to the dig list based on their axial symmetry attributed to the increased number of false positives.

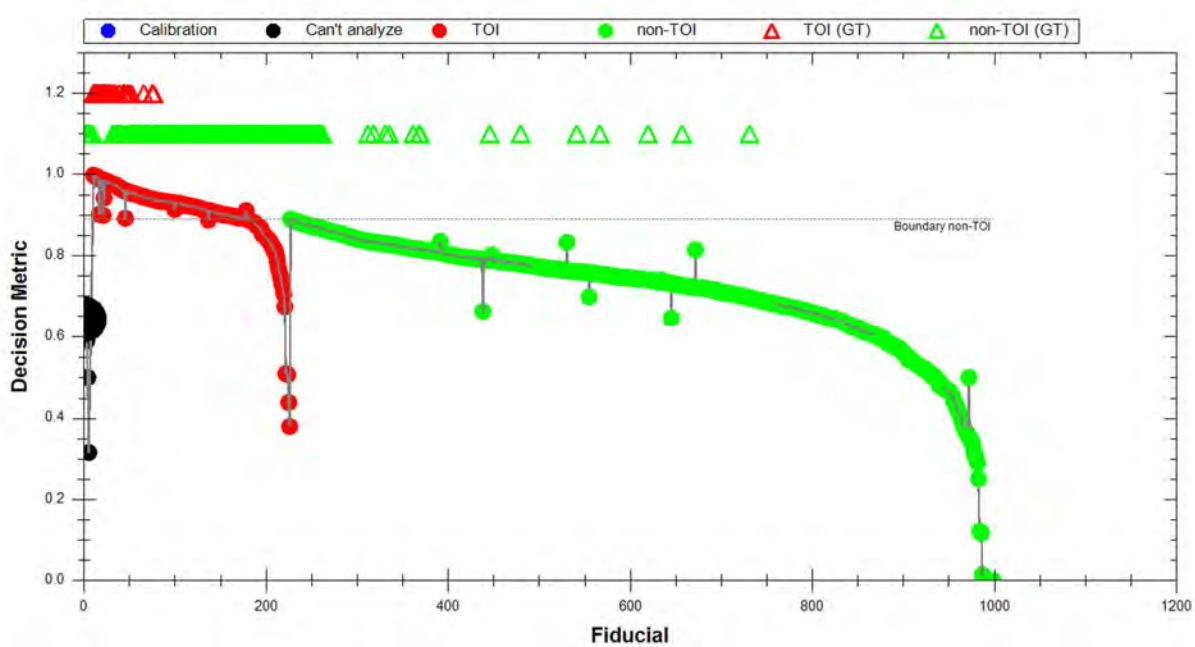

Figure 2 Final decision metric versus dig ranking with intrusive results.

Table 3 Classification categories by grid.

Grid ID	# Cued	Category 0	Category 1	Category 2	Category 3	Flags with 2+ sources	# "same as" sources	Percent to dig*
DGM1	5	0	5	0	0	0	5	100.0
DGM2	61	0	2	14	45	0	8	26.2
DGM3	62	0	2	5	55	0	8	11.3
DGM4	5	0	0	2	3	0	0	40.0
DGM5	2	0	2	0	0	0	2	100.0
DGM6	133	0	6	22	107	2	22	19.5
DGM7	82	0	4	16	63	1	5	23.2
DGM9	16	0	0	4	12	0	3	25.0
DGM10	74	0	2	10	62	0	12	16.2
DGM11	6	0	1	0	5	0	0	16.7
DGM12	89	0	3	16	71	1	28	20.2
DGM14	123	2	3	23	98	3	11	19.0
DGM15	38	0	2	3	34	1	4	10.5
DGM16	57	4	7	13	36	3	6	32.1
DGM17	3	0	3	0	0	0	2	100.0
DGM18	73	0	1	8	64	0	9	12.3
DGM19	46	4	1	6	35	0	1	16.7
DGM20	30	0	3	6	21	0	4	30.0
DGM22	12	1	1	3	7	0	0	36.4
DGM24	55	0	3	7	45	0	5	18.2
DGM25	12	0	2	2	8	0	4	33.3
DGM26	5	0	1	2	2	0	0	60.0
Total	989	11	54	162	773	11	139	21.0

* percent to dig does not include category 0 targets

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8 QC RESULTS

QA and QC of the MM2x2 cued data were primarily guided by the MQOs in *Worksheet #22—Field Equipment Calibration, Maintenance, Testing and Inspection, and Appendix F - Field Standard Operating Procedures (SOP), contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).* The purpose of the MQOs were to ensure that the quality of the measurement being tested was sufficient to meet the DQOs and MPCs described in Worksheets 11 and 12, respectively. Table 4 and *Table 5* summarizes the MM2X2 cued and intrusive survey MQO results. For most of the MQOs, there is not much detail to document beside the acceptance criteria, the passing result and possibly a brief comment. Any MQO that failed or for which additional explanations are needed are described below. All MQO failures were addressed through NC/CARs and any changes to the MQOs resulting from the Field Work Variance process are included in the tables.

8.1 Ongoing derived polarizabilities precision and Ongoing derived target position precision (IVS)

The end of day IVS test on April 22nd failed these MQOs for all three IVS items. The investigative process showed the transient data displayed different character for the morning and afternoon measurements even though the sensor was placed at the same location and in the same orientation. A background measurement and a sensor function test, performed at the IVS immediately prior to the data collection over the IVS items, passed the sensor function test. Unlike the measured data over the IVS items, the background transient data displayed the same character for the morning and afternoon tests and is further evidence that the sensor was functioning at this time. The exact cause of the failed IVS test was unknown but based on the repeatability of the background measurements and the sensor function test results just prior to the failed IVS measurements, we believe the sensor was functional up to the last three IVS measurements. Therefore, this non-conformance did not affect the usability or validity of the data acquired on April 22nd and with USACE concurrence the data collected on April 22nd was accepted. The three measurements in question were also the last three cued measurements for the project so there wasn't concern about future measurements. Further details can be found in the NC/CAR2.

8.2 Initial measurement of production area background locations and background verification

The MM2x2 system was used to perform cued surveys over anomalies selected within grids which were spread out over the project site. Two potential background locations were selected for validation in each of the grids selected for cued surveys. Most of grids contained a background location that passed the MQOs identified in the QAPP. Three grids (DGM11, DGM22 and DGM26) contained elevated EM61 responses over most of the grid such that a suitable background location within the individual grids could not be found. In these cases, a background location from a nearby grid was used. Two other grids (DGM2 and DGM10) were without a validated background location due to one of the surrounding measurements used to validate a background location failing the MQO. For these two grids all ongoing background were in the immediate vicinity of initial center background measurement and not near the failed

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measurement. For this reason, it was recommended and accepted by the USACE that the background data collected over the background locations at DGM2 and DGM10 are valid and could be used to level the production cued data. Further details can be found in the NC/CAR1.

8.3 Confirm derived features match ground truth (1 and 2 of 2)

Detailed intrusive results, which include recovered item locations offsets, depths, dimensions, weight, text descriptions, and photos, were compared to the final classification decision plots by the QC Geophysicist. Predicted location, size and shape were evaluated against the characteristics of the recovered items, and justification provided for targets with one or more mismatches.

Overall, the size and location of the recovered items matched well with predicted results with most discrepancies explained by the following situations.

1. There were four targets that were placed in the “cannot analyze” category because the measured data did not meet the MQOs and therefore could not be inverted to produce accurate predictions of the item’s physical dimensions.
2. One target was not excavated because the excavator was not able to move a large boulder that covered a pipe sticking out of the ground.
3. In several cases, reinforced concrete was found and left in place but accurate information on the metal composition could not be gathered to compare to the predicted size.

Additional details can be found in the Cued Verification report.

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Table 4 Cued Survey MQOs (instrument: MM2x2; classification tool: UX-Analyze)

MQO	DFW/SOP Reference	Frequency	Responsible Person/ Report Method/ Verified By	Acceptance Criteria	Results
Verify correct assembly	DFW 6/ AN JV SOP 1MM2	Once following assembly	Field team leader/ instrument assembly checklist/ Project Geophysicist	As specified in instrument assembly checklist	Pass. See checklists
Initial Instrument Function Test (MM2x2)	DFW 6/ AN JV SOP 1MM2	Once following assembly	Field team leader/ instrument assembly checklist/ Project Geophysicist	Response (mean static spike minus mean static background) with 20% of predicted response for all monostatic Tx/Rx combinations	Pass. See sensor function test plot
Initial IVS background measurement and background verification	DFW 6/ AN JV SOP 2/8	Once during initial system IVS test	Field team leader/ Initial IVS Memorandum / Project Geophysicist	All decay amplitudes within the noise level of each other and library match from all four offset measurements >0.9	Pass. See background validation test results
Initial derived polarizabilities accuracy (IVS)	DFW 6/ AN JV SOP 2	Once during initial system IVS test	Project Geophysicist / Initial IVS memorandum / QC Geophysicist	Library match metric ≥ 0.9 for each set of inverted polarizabilities	Pass. See Initial IVS plots
Derived target position accuracy (IVS)	DFW 6/ AN JV SOP 2/8	Once during initial system IVS test	Project Geophysicist/ Initial IVS Memorandum/QC Geophysicist	All IVS item fit locations within 0.25-meter of ground-truth locations	Pass. See Initial IVS plots
Ongoing derived polarizabilities precision (IVS)	DFW 7/ AN JV SOP 8	Beginning and end of each day as part of IVS testing	Project Geophysicist/ tracking summary/QC Geophysicist	Library match to initial polarizabilities metric ≥ 0.9 for each set of three inverted polarizabilities	IVS failure on 4/22/2020. See "NC/CAR PM IVS Failure, April 22, 2020" Report 2 Version 2. All other pass, see IVS plots
Ongoing derived target position precision (IVS)	DFW 7/ AN JV SOP 8	Beginning and end of each day as part of IVS testing	Project Geophysicist/ tracking summary/QC Geophysicist	All IVS items fit locations within 0.25-meter of average of derived fit locations	IVS failure on 4/22/2020. See "NC/CAR PM IVS Failure, April 22, 2020" Report 2 Version 2. All other pass, see IVS plots

MQO	DFW/SOP Reference	Frequency	Responsible Person/ Report Method/ Verified By	Acceptance Criteria	Results
Initial measurement of production area background locations and background verification	DFW 7/ AN JV SOP 6/8	Once per background location	Field team leader/ background location report/Project Geophysicist	All five measurements (decay amplitude) within the noise level of each other and library match from all four offset measurements >0.9	Background locations in 2 grids did not pass the background validation test. See "NC/CAR Background Validation Failure, April 14 and 17, 2020" Report 1 Version 2. See background validation plots & processing log
Ongoing production area background measurements	DFW 7/ AN JV SOP 6/8	Background data collected a minimum of every 2 hours during production	Field team leader/failures noted in field and tracking summary/Project Geophysicist	Original and ongoing measurements at each location differs by a factor of five or less	Pass. Failures noted in processing log. Background locations in other grids were used if the surveyed grid's location did not pass
Ongoing instrument function test (MM2x2)	DFW 7/ AN JV SOP 1MM2	Each time instrument is turned on or before and after changing batteries	Field team leader/ tracking summary/Project Geophysicist	Response within 20% of predicted response	Pass. See sensor function test plot
Transmit current levels (MM2x2)	DFW 7/ AN JV SOP 7/8	Evaluated for each sensor measurement	Field team leader/ tracking summary/Project Geophysicist	Current must be ≥ 8 amperes	Pass. Measurements that did not meet the MQO were identified during the data validation stage and were not used for classification. See processing log.
Confirm all background measurements are valid	DFW 7/ AN JV SOP 8	Evaluated for each background measurement	Project Geophysicist/ background summary/ QC Geophysicist	Ensure background variation does not impact ability to classify correctly	Backgrounds that did not meet this MQO were not used to correct the survey data. See processing log.
Confirm adequate spacing between units (MM2x2)	DFW 7/ AN JV SOP 6/7	Evaluated at start of each day (or grid)	Field team leader/ field logbook/Project Geophysicist	Minimum separation of 25m	Pass. Only one MetalMapper 2x2 was deployed.

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MQO	DFW/SOP Reference	Frequency	Responsible Person/ Report Method/ Verified By	Acceptance Criteria	Results
Confirm inversion model supports classification (1 of 3)	DFW 7/ AN JV SOP 8	Evaluated for all models derived from a measurement (i.e., single item and multi-item models)	Project Geophysicist / measurement QC summary/QC Geophysicist	Derived model response must fit the observed data with a fit coherence ≥ 0.8	Pass. See final UX-Analyze source database.
Confirm inversion model supports classification (2 of 3)	DFW 7/ AN JV SOP 8	Evaluated for derived target	Project Geophysicist / measurement QC summary/QC Geophysicist	Fit location estimate of item ≤ 0.4-meter from center of sensor	Pass. See final UX-Analyze source database.
Confirm inversion model supports classification (3 of 3)	DFW 7/ AN JV SOP 8	Evaluated for all seeds	QC Geophysicist / measurement inversion model QC summary/lead organization QA Geophysicist	100 percent of predicted seed positions ≤ 0.25- meter radially from known position (x, y); Z ≤ 0.15-meter)	Pass. See QC seed tracking spreadsheet
Confirm reacquisition GPS precision	DFW 7/ AN JV SOP 11	Daily	UXO Tech or field tech/Daily QC Report/Project Geophysicist	Control point positions repeatable to within 10 centimeters	Pass. See Access Geodetic_Functionality_Table
Classification performance	DFW 7/ AN JV SOP 10	Evaluated for all seeds	QC Geophysicist /Ranked Dig List/USACE QA Geophysicist	100 percent of QC and validation seeds placed on dig list	Pass. See QC seed tracking & intrusive results spreadsheets. Seeds that were not cued are noted in the former.

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Table 5 Intrusive Survey MQOs

MQO	DFW/SOP Reference	Frequency	Responsible Person/ Report Method/ Verified By	Acceptance Criteria	Results
Confirm derived features match ground truth (1 of 2)	DFW 11/ AN JV SOP 10	Evaluated for all recovered items	Project Geophysicist/Measurement QC Summary or intrusive database/QC Geophysicist	100% of recovered (excluding inconclusive category) item positions ≤ 0.25m from predicted position (x, y)	All passed or explained See Cued verification report for details
Confirm derived features match ground truth (2 of 2)	DFW 11/ AN JV SOP 10	Evaluated for all recovered items	Project Geophysicist/Dig List and intrusive database/QC Geophysicist	100% of recovered object size estimates (excluding inconclusive category) qualitatively match predicted size	All passed or explained See Cued verification report for details
Verification of TOI / non-TOI threshold	DFW 11/ AN JV SOP 10	Dig 50 anomalies beyond last TOI on Dig List	Project Geophysicist/Verification and Validation Report/QC Geophysisict	100% of predicted non-TOI intrusively investigated are non-TOI	Pass. See comments in final intrusive spreadsheet
Classification validation	DFW 11/ AN JV SOP 10	Random selection of non-TOIs	QA Geophysicist/Verification and Validation Report/QC Geophysicist	100% of predicted non-TOI qualitatively matches predicted size/shape	All passed or explained See Cued validation report for details

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9 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP),* Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

EA, 2020, *Iona Island MEC Characterization Memo for MRS-01*

ANJV, 2020, Background Location Report – *Static MM2x2 - Remedial Investigation Iona Island Naval Ammunition Depot*

ANJV, 2020, *IVS Memorandum – Static MM2x2 - Remedial Investigation Iona Island Naval Ammunition Depot*

ANJV, 2020, AGC Validation Report - *Static MM2x2 - Remedial Investigation Iona Island Naval Ammunition Depot*

ANJV, 2020, AGC Verification Report - *Static MM2x2 - Remedial Investigation Iona Island Naval Ammunition Depot*

ANJV, 2020. *Non-Conformance / Corrective Actions Report, Background Validation Failure, April 14 and 17, 2020, Static MetalMapper2x2,* Remedial Investigation, Iona Island Naval Ammunition Depot.

ANJV, 2020. *Non-Conformance / Corrective Actions Report, PM IV failure, April 22, 2020, Static MetalMapper2x2,* Remedial Investigation, Iona Island Naval Ammunition Depot.

DUAs

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AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Data Usability Assessment for Cued Data
Static MetalMapper 2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Author: Tom Furuya, June 23, 2020
Reviewed: Dean Keiswetter, June 24, 2020

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Approval Signature& Date:

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1 INTRODUCTION

This Data Usability Assessment (DUA) has been prepared on behalf of EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014 to summarize the results of the Advanced Geophysical Classification (AGC) cued survey that AcornSI and NAEVA Joint Venture (ANJV) performed for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY).

The data usability assessment is an evaluation based on the results of data verification and validation in the context of the overall project decisions or objectives. The assessment determines whether the project execution and resulting data meet the project data quality objectives (DQOs) (see Worksheet #11 of the QAPP). The data are considered with the ultimate goal of assessing whether the final, qualified results support the decisions to be made with the data. In this case, the assessment is focused on whether the collected AGC cued survey data were of sufficient quality to classify anomalies as TOI or non-TOI and to identify anomalies for intrusive investigation.

This process is discussed in greater detail in *Worksheet #37— Data Usability Assessment*, contained within contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).

2 DATA USABILITY ASSESSMENT

As described on Worksheet #37 of the approved QAPP, the data usability assessment for cued geophysical data will follow a four-step process:

1. Review the project objectives and sampling design.
2. Review the data verification and validation outputs
3. Document data usability, update the CSM, and draw conclusions
4. Document lessons learned and make recommendations

These steps are explained in more detail in the QAPP. The results of the DUA are tabulated in Table 1. For each step of the DUA, answers are provided to relevant questions concerning the data and if required, comments are entered to explain the conclusion reached.

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Table 1 Data Usability Assessment for Cued MM2x2 Data

STEP 1: PROJECT OBJECTIVES AND SAMPLING DESIGN			
Evaluation	**Yes/No**		**Comments (1)**
Are the relevant DQOs, MPCs, and MQOs for cued data still applicable?	Yes		
If relevant DQOs, MPCs, or MQOs for cued data have changed, are changes documented?	N/A		No changes.
Is the cued sampling design consistent with project objectives?	Yes		
STEP 2: REVIEW THE DATA VERIFICATION AND VALIDATION OUTPUTS			
Activity	**DFW 3: Establish IVS, Blind Seeding; DFW 4: DGM Equipment Set Up and Testing; and DFW 5: DGM Surveys**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
DUA for Dynamic Data	Y	Y	Approved by USACE Geophysicist
Activity	**DFW 6: Advanced Geophysical Sensor (AGC) Equipment Set up and Testing**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
IVS Technical Memorandum: AGC	Y	Y	Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist
AGC Sensor Assembly Checklist	Y		AGC sensor assembly checklists were delivered to USACE.
Activity	**DFW 7: Cued Surveys – Cued Survey Data Acquisition**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
Background Location Report	Y	Y	All used backgrounds were validated and documented in the Background Location Report. Grids DGM2 and DGM10 produced a background validation failure and a NC/CAR was generated. The NC/CAR documented the validity of the background location and USACE agreed that there was no impact to the objectives of the RI and approved the use of the background data. See NC/CAR 1 for details on the failure.
AGC Data Deliverable(s)	Y	Y	Submitted and Approved by USACE Geophysicist. All data has undergone QC and only data that has met DQOs/MPCs as stated in the QAPP were passed to the classification decision process. Any data that did not pass QC were documented in the final overall QC report.
AGC QC Deliverable(s)	Y	Y	All QC deliverables have been submitted as described in the QAPP and approved by USACE Geophysicist.
RCA/NCR(s)	Y		NC/CAR 01 – Grids DGM2 and DGM10 produced a background validation failure. One of the four surrounding background measurements failed the library match MQO. Because the ongoing background measurements were located in the vicinity of the passed measurements, it was recommended and approved to allow the use of the backgrounds. NC/CAR 02 – IVS failure for all items collected during the April 22 PM test. This was the last IVS test and AGC data collection event for the project and the exact cause is unknown. The sensor function test immediately prior to the IVS data collection passed and the associated background showed the same general response as previous background measurements. Based on these factors, the sensor was believed to be functional up to the IVS measurement. The USACE agreed with this conclusion and approved the use of the April 22 cued data.
FCR(s)	N/A		
Weekly Geophysical QC Reports	Y		Instead of a weekly QC report, an overall QC report was submitted.
Seed Tracking Log	Y		Log was submitted by the QC Geophysicist to USACE Geophysicist, met MQOs/MPC's as stated in the QAPP.

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STEP 2: REVIEW THE DATA VERIFICATION AND VALIDATION OUTPUTS (cont'd.)			
Activity	**DFW 7: Cued Surveys - Cued Data Processing**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
Site-specific TOI Library	Y		Site specific TOI library was submitted.
AGC Data Deliverable(s)	Y	Y	Submitted and Approved by USACE Geophysicist. All data has undergone QC and only data that has met DQOs/MPCs as stated in the QAPP were passed to the classification decision process. Any data that did not pass QC were documented in the final overall QC report..
AGC QC Deliverable(s)	Y	Y	All QC deliverables have been submitted as described in the QAPP and approved by USACE Geophysicist.
Supporting Classification Images	Y		Classification images for each TOI / nonTOI decision have been delivered.
RCA/NCR(s)	N/A		
FCR(s)	N/A		
Weekly Geophysical QC Reports	N/A		Instead of a weekly QC report, the delivered final classification database and accompanying spreadsheet contains the QC information for all processed data.
Seed Tracking Log	Y	Y	Log was submitted by the QC Geophysicist to USACE Geophysicist, met MQOs/MPC's as stated in the QAPP
Final Ranked Dig List	Y	Y	Submitted and Approved by USACE Geophysicist.

STEP 3: DOCUMENT DATA USABILITY, UPDATE CSM AND DRAW CONCLUSIONS		
Evaluation	**Yes/No**	**Comments (1)**
Have the relevant DQOs/MPCs for cued data been met?	Yes	
Can the cued data be used as intended?	Yes	
Are there limitations on cued data use?	No	
Is there new information to be added to the CSM and, if so, does the CSM need to be updated?	No	

STEP 4: DOCUMENT LESSONS LEARNED AND MAKE RECOMMENDATIONS		
Evaluation	**Yes/No**	**Comments (1)**
Should the DQOs, MPCs, or sampling design be updated for future delivery units?	No	
Are there other recommendations for future delivery units?	No	

(1) Comments should be added as required to clarify the conclusions of the evaluation steps. References should be included to records, if appropriate.
(2) References should be included to records, if appropriate.

3 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP),* Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

ANJV, 2020. *Non-Conformance / Corrective Actions Report, Background Validation Failure, April 14 and 17, 2020, Static MetalMapper2x2,* Remedial Investigation, Iona Island Naval Ammunition Depot.

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ANJV, 2020. *Non-Conformance / Corrective Actions Report, PM IV failure, April 22, 2020, Static MetalMapper2x2,* Remedial Investigation, Iona Island Naval Ammunition Depot.

ANJV, 2020, *IVS Memorandum – Static MM2x2 - Remedial Investigation Iona Island Naval Ammunition Depot*

ANJV, 2020. *Data Usability Assessment for Dynamic Data, EM61MK2*, *- Remedial Investigation Iona Island Naval Ammunition Depot*

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AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Data Usability Assessment for Dynamic Data
EM61MK2
Remedial Investigation
Iona Island Naval Ammunition Depot Formerly Used Defense Site
Rockland County, New York

Report 1
Version 1

For

Contract: W912DR-15-D-0014
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1 INTRODUCTION

This Data Usability Assessment (DUA) has been prepared on behalf of the EA Engineering (EA) team for the USACE under contract W912DR-15-D-0014 to summarize the results of the digital geophysical mapping (DGM) detection survey that AcornSI and NAEVA Joint Venture (ANJV) performed for the Remedial Investigation at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), Rockland County, New York.

The DUA is an evaluation based on the results of data verification and validation in the context of the overall project decisions or objectives. The assessment determines whether the project execution and resulting data meet the project data quality objectives (DQOs) (see Worksheet #11 of the QAPP). The data are considered with the ultimate goal of assessing whether the final, qualified results support the decisions to be made with the data. In this case, the assessment is focused on whether the collected geophysical detection survey data were of sufficient quality to locate anomalies and delineate areas of high density from areas of low density and to identify anomalies for cued AGC data acquisition or intrusive investigation.

This process is discussed in greater detail in *Worksheet #37—Data Usability Assessment for MEC*, contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Remedial Investigation – Iona Island Naval Ammunition Depot (EA, 2019).

2 DATA USABILITY ASSESSMENT

As described on Worksheet #37 of the approved QAPP, the data usability assessment for dynamic geophysical data will follow a four-step process:

1. Review the project objectives and sampling design.
2. Review the data verification and validation outputs
3. Document data usability, update the CSM, and draw conclusions
4. Document lessons learned and make recommendations

These steps are explained in more detail in the QAPP. The results of the DUA is tabulated in Table 1. For each step of the DUA, answers are provided to relevant questions concerning the data and if required, comments are entered to explain the conclusion reached.

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Table 1 Data Usability Assessment for Dynamic EM61MK2 Data

STEP 1: PROJECT OBJECTIVES AND SAMPLING DESIGN			
Evaluation	**Yes/No**	**Comments (1)**	
Are the relevant DQOs, MPCs, and MQOs for dynamic data still applicable?	Yes		
If relevant DQOs, MPCs, or MQOs for dynamic data have changed, are changes documented?	N/A		
Is the dynamic sampling design consistent with project objectives?	Yes		
STEP 2: REVIEW THE DATA VERIFICATION AND VALIDATION OUTPUTS			
Activity	**DFW 3 and 4: Establish IVS, Blind Seeding, DGM Equipment Set Up and Testing**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
IVS Technical Memorandum	Yes	Yes	Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist
Production Area QC Seed Report	Yes	Yes	Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist
Activity	**DFW 5: DGM Surveys**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
DGM Data Deliverable(s)	Yes	Yes	All data met MQOs as stated in the QAPP and have passed QC.
DGM QC Deliverable(s)	Yes	Yes	All QC deliverables have been submitted as described in the QAPP. Instead of a weekly QC report, a QC report was submitted per dataset/grid for all data collected.
RCA/NCR(s)			n/a – there were no RCA/NCR(s)
FCR(s)			n/a
Weekly Geophysical QC Reports			n/a – QC reports were submitted by dataset/grid.
Seed Tracking Log	Yes	Yes	Submitted by the QC Geophysicist to USACE Geophysicist, met MQOs as stated in the QAPP.
Target Selection Technical Memo	Yes		Prepared in accordance with QAPP and SOPs. Approved by USACE Geophysicist

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STEP 3: DOCUMENT DATA USABILITY, UPDATE CSM AND DRAW CONCLUSIONS		
Evaluation	**Yes/No**	**Comments (1)**
Have the relevant DQOs/MPCs for dynamic data been met?	Yes	
Can the dynamic data be used as intended?	Yes	Significant areas of saturated response were encountered, which affected the number of point targets that could be selected for cued investigation.
Are there limitations on dynamic data use?	No	
Is there new information to be added to the CSM and, if so, does the CSM need to be updated?	No	
STEP 4: DOCUMENT LESSONS LEARNED AND MAKE RECOMMENDATIONS		
Evaluation	**Yes/No**	**Comments (1)**
Should the DQOs, MPCs, or sampling design be updated for future delivery units?	No	
Are there other recommendations for future delivery units?	No	

3 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) for Quality Assurance Project Plan (QAPP), Military Munitions Response Program Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York*.

ANJV, 2020. *EM61 Target Selection Technical Memorandum*, *Remedial Investigation, Iona Island Naval Ammunition Depot*

ANJV, 2020. *Instrument Verification Strip Memorandum (EM61)*, *Remedial Investigation, Iona Island Naval Ammunition Depot*

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20 September 2020

TECHNICAL MEMORANDUM

TO: Erin Kirby, USACE NAE
David King, USACE NAB
Todd Beckwith, USACE NAB

FROM: Mike McGuire, EA

CC: Amanda Kohn, EA

SUBJECT: Munitions and Explosives of Concern Intrusive Investigation Data Usability Assessment – Iona Island FUDS

The following is a Technical Memorandum presenting the Data Usability Assessment (DUA) for the Intrusive Investigation of anomalies identified during the digital geophysical mapping (DGM) and advanced geophysical classification (AGC) surveys for the Remedial Investigation (RI) at the Iona Island FUDS and was prepared in accordance with Worksheet #37 of the Iona Island MMRP UFP-QAPP. This DUA will be included as an appendix in the RI Report.

Intrusive Investigation Data Usability Assessment

1. INTRODUCTION

This Data Usability Assessment (DUA) has been prepared to summarize the results of the intrusive investigation performed for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY).

The data usability assessment is an evaluation based on the results of data verification and validation in the context of the overall project decisions or objectives. The assessment determines whether the project execution and resulting data meet the project data quality objectives (DQOs) (see Worksheet #11 of the QAPP). The data are considered with the ultimate goal of assessing whether the final, qualified results support the decisions to be made with the data. In this case, the assessment is focused on whether the collected intrusive data were of sufficient quality to resolve digital geophysical mapping (DGM) and advanced geophysical classification (AGC) anomalies.

This process is discussed in greater detail in Worksheet #37— Data Usability Assessment, contained within contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).

2. DATA USABILITY ASSESSMENT

As described on Worksheet #37 of the approved QAPP, the data usability assessment for intrusive investigation data will follow a four-step process:

1. Review the project objectives and sampling design.
2. Review the data verification and validation outputs
3. Document data usability, update the CSM, and draw conclusions
4. Document lessons learned and make recommendations

These steps are explained in more detail in the QAPP. The results of the DUA are tabulated in Table 1. For each step of the DUA, answers are provided to relevant questions concerning the data and if required, comments are entered to explain the conclusion reached.

Table 1 Data Usability Assessment for Intrusive Data

STEP 1: PROJECT OBJECTIVES AND SAMPLING DESIGN		
Evaluation	**Yes/No**	**Comments (1)**
Are the relevant DQOs, MPCs, and MQOs for intrusive data still applicable?	Yes	
If relevant DQOs, MPCs, or MQOs for intrusive data have changed, are changes documented?	N/A	No changes.
Is the intrusive sampling design consistent with project objectives?	Yes	Intrusive investigation was completed in accordance with the sampling design presented in the approved Iona Island MEC Characterization Memorandum dated 23 July 2020.

STEP 2: REVIEW THE DATA VERIFICATION AND VALIDATION OUTPUTS			
Activity	**DFW 8: Intrusive Investigations**		
Data Output/ Record	**Verified? (Y/N)**	**Validated? (Y/N)**	**Briefly Describe How the Data Output Supports Verification and/or Validation of the Activity (2)**
Intrusive Data/AGC Data Verification Report	Y	Y	Approved by USACE Geophysicist. Intrusive database was used to verify AGC data.
Intrusive Data/AGC Data Validation Report	Y	Y	Approved by USACE Geophysicist. Intrusive database was used to validate AGC data. Verified that all "Digs" were investigated, and the dig sheets were complete and contained information to adequately describe the dig results.
Digital Photographs	Y		Photographs of munitions debris (MD) items and representative non-munition related debris (NMRD) items were used to validate DGM and AGC results. Photographs also documented intrusive procedures and activities.
Digital Logbook	Y		Digital logbooks and dive logs documented intrusive results for each TOI, trench, and former dock.
Intrusive database	Y		Verified by GIS database manager and Geophysical Program Manager. Database contained information on all intrusive items that included description, weight, size, depth, location, and offsets. Data was used for anomaly resolution and to verify and validate DGM and AGC data.
CAR(s)	N/A		No CARs were issued for this DFW
FCR(s)	N/A		No FCRs were issued for this DFW
DoD DD Form 1348-1	Y		Signed by SUXOS and verified by UXOQCS. Documented MD was explosive free.
Certificate of Destruction	Y		Signed by recycler and verified by SUXOS. Documented MD was disposed of properly.
3 Phase Inspection Checklists	Y	Y	Documented that the intrusive activities were performed in accordance with MR-QAPP.

STEP 3: DOCUMENT DATA USABILITY, UPDATE CSM AND DRAW CONCLUSIONS		
Evaluation	**Yes/No**	**Comments (1)**
Have the relevant DQOs/MPCs for intrusive data been met?	Yes	
Can the intrusive data be used as intended?	Yes	
Are there limitations on intrusive data use?	No	
Is there new information to be added to the CSM and, if so, does the CSM need to be updated?	Yes	The CSM will be updated in the MMRP Remedial Investigation Report to incorporate the intrusive results. No MEC or MD was found in the Dump Area, the Former Docks, or the Shoreline Area, and per the MR-QAPP DQO Step 5, these areas will be presumed not impacted by MEC.

STEP 4: DOCUMENT LESSONS LEARNED AND MAKE RECOMMENDATIONS		
Evaluation	**Yes/No**	**Comments (1)**
Should the DQOs, MPCs, or sampling design be updated for future delivery units?	Yes	MR-QAPP Worksheet #17 DFW 8 requires photographs of MEC/MPPEH and representative MD only. Photographs of all items should be photographed to help facilitate the AGC Data Verification and Validation process.
Are there other recommendations for future delivery units?	No	

(1) Comments should be added as required to clarify the conclusions of the evaluation steps. References should be included to records, if appropriate.
(2) References should be included to records, if appropriate.

3. REFERENCES

EA, 2019. Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP), Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

ANJV, 2020. AGC Validation Report, Static MetalMapper 2x2, Remedial Investigation, Iona Island Naval Ammunition Depot.

ANJV, 2020. AGC Verification Report, Static MetalMapper 2x2, Remedial Investigation, Iona Island Naval Ammunition Depot.

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IVS Memo

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AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Instrument Verification Strip Memorandum
Remedial Investigation
Iona Island Naval Ammunition Depot
March 20, 2020
Report 1
Version 2

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Date: March 20, 2020
Submitted by Alexander Kostera
Reviewed by Dean Keiswetter, March 24, 2020

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1 INTRODUCTION

This IVS memorandum, which has been prepared on behalf of the EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014, presents results of the Instrument Verification Strip (IVS) that AcornSI and NAEVA JV (ANJV) performed at the start of the geophysical investigation for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY). The IVS was surveyed as part of a Geophysical System Verification program to document that the detection sensors and positioning systems are functioning properly and to demonstrate that the geophysical data collection teams are well-trained in system operation prior to the initiation of fieldwork. This memorandum addresses the initial IVS surveys conducted on March 16, 2020.

This process is discussed in greater detail in *Worksheet #22—Field Equipment Calibration, Maintenance, Testing and Inspection*, and *Appendix F - Field Standard Operating Procedures (SOP)*, contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).

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2 ASSEMBLY

The digital geophysical mapping (DGM) was completed by using industry-standard Geonics EM61 MK2 metal detectors and GPS-integrated positioning. The EM61 MK2 device is a four-channel time domain EM device that detects ferrous and non-ferrous metal objects. The man-portable EM61 MK2 uses an air-cored 1.0-meter by 0.5-meter copper transceiver coil mounted on wheels at 42 centimeters above the ground. Data are recorded at several intervals of time (time gates), which provides a measurement of the response decay. In the single pass transect and full coverage grid areas EM data was positioned with a Trimble RTK GPS (**Figure 1**).

Figure 1: EM61 MK2 with RTK GPS Positioning

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3 INSTRUMENT VERIFICATION STRIP CONSTRUCTION

The IVS was installed in the central area of the site (**Figure 2**). Pre-seeded and initial seeded surveys were conducted on March 16, 2020. A pre-seed background survey, conducted with 0.50m line spacing, was performed to demonstrate the planned seed locations were free of anomalous response prior to burial (**Figure 3**). A few small anomalies were identified in the background survey, but they did not affect placement of the seeds or the background line. The IVS and background survey lines are approximately 15 meters long and will be used for the EM61 MK2 DGM detection survey and MetalMapper 2x2 AGC survey. Three ISOs, two small ISO 80s and one medium ISO 40, were spaced three meters apart downline from each other. Seed item descriptions and orientations are in **Table 1**, photographs of the items in place are in **Figure 4**.

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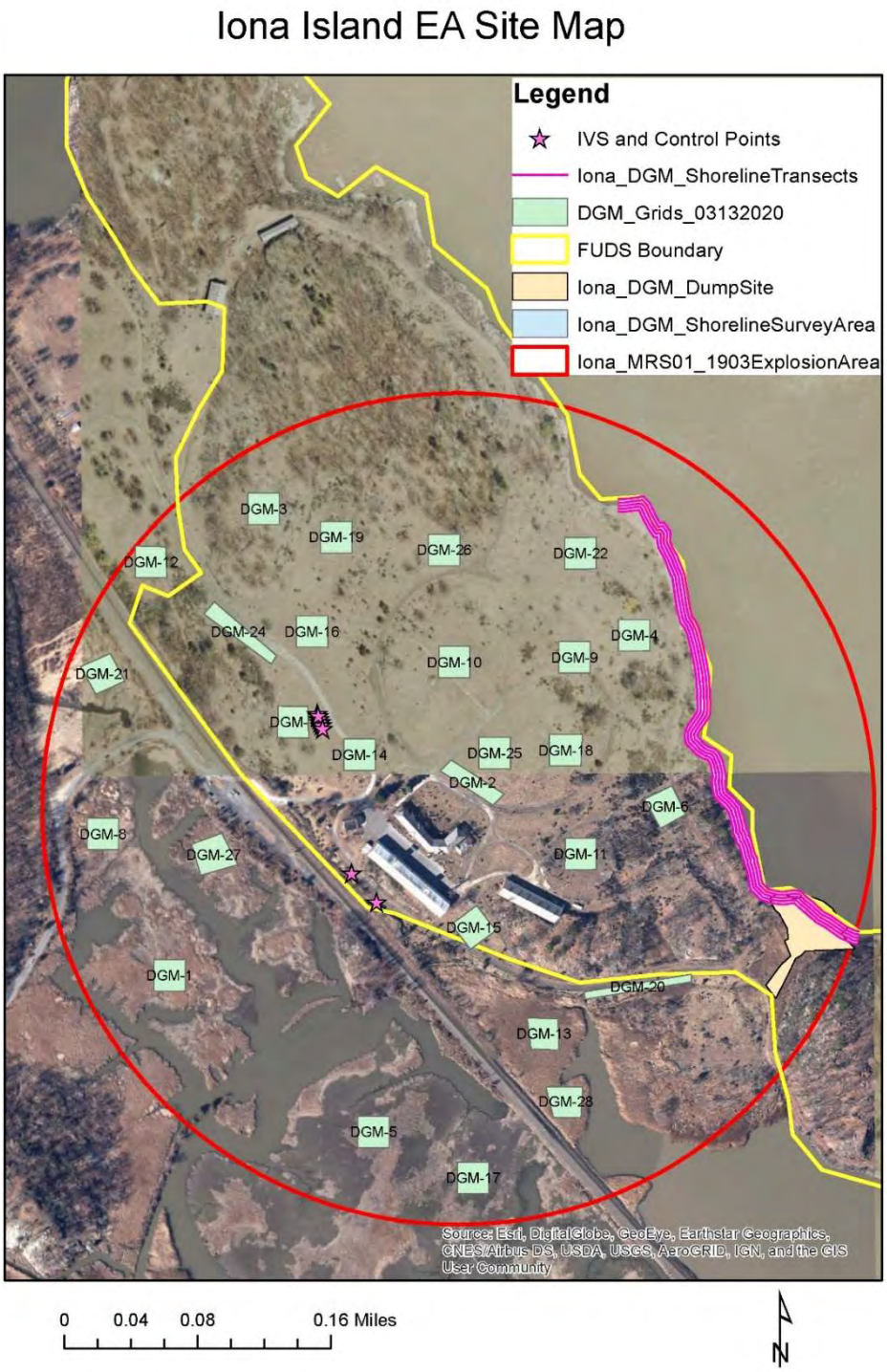

Figure 2: IVS1 location

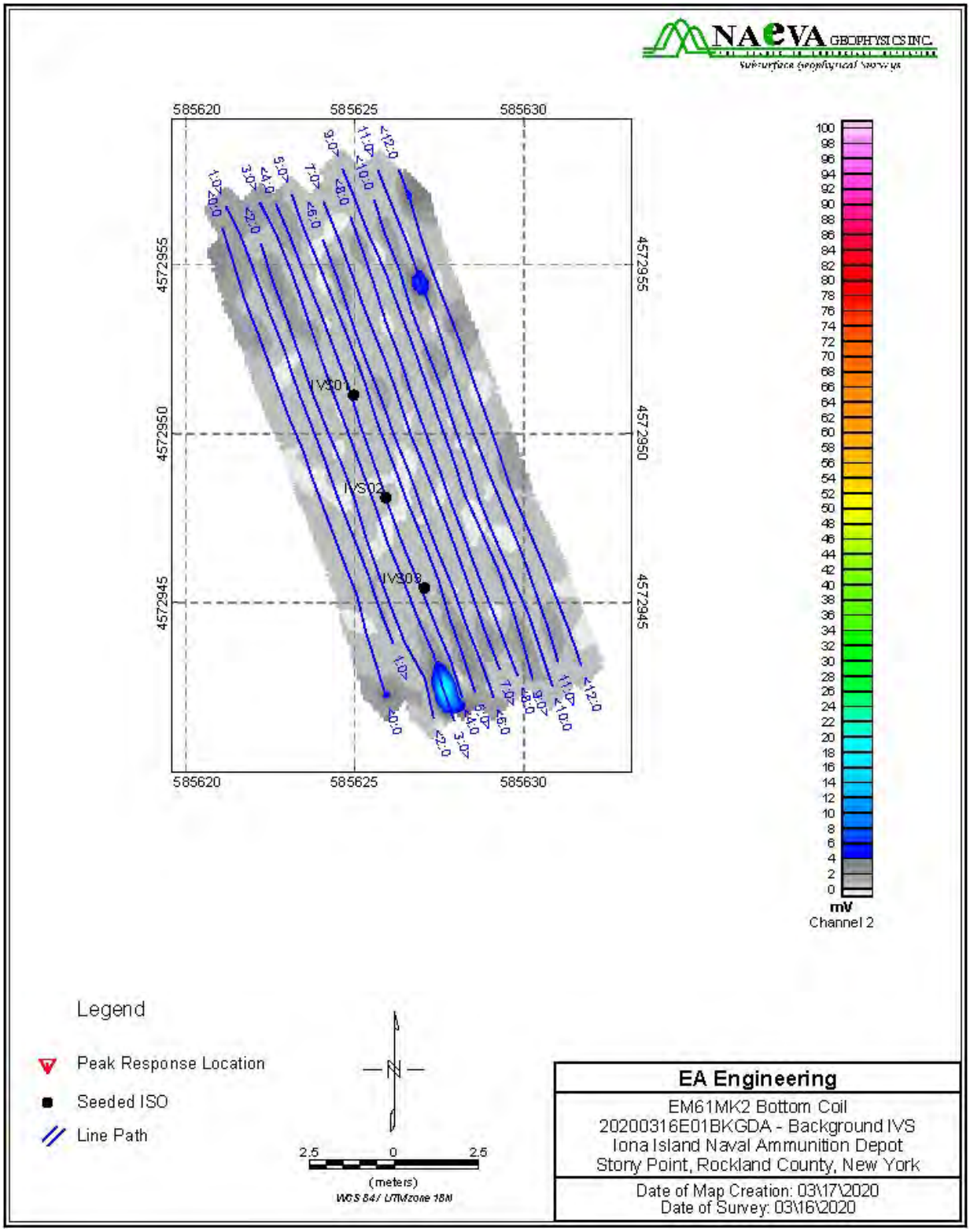

Figure 3: 20200316E01BKGDA Pre-Seed Background Survey

Table 1: IVS Seed Item Locations and Descriptions

Test Item ID	Easting*	Northing*	Depth to Center of Mass (feet)	Description
IVS01	585624.960	4572951.139	0.5	small ISO80 vertical
IVS02	585625.922	4572948.106	1.0	medium ISO, horizontal, perpendicular to IVS
IVS03	585627.056	4572945.435	0.5	small ISO80, horizontal, perpendicular to IVS
* WGS84 UTM Zone 18 North, meters collected with Trimble RTK GPS on 3/16/2019				

Figure 4: Seed items in place
(a) IVS01 (b) IVS02 (c) IVS03

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4 INITIAL IVS SURVEY RESULTS

The Trimble RTK GPS was set up on base1 (585680.193E,4572774.393N), which was established by EA prior to the start of the geophysical investigation. A GPS QC check point was established nearby to perform daily geodetic functionality checks. Control points for the ends of the seeded and background lines of the survey and the seed locations were surveyed in with the RTK GPS.

The background, latency test and 5-line initial IVS was collected on March 16, 2020 positioned with the RTK GPS. The EM61MK2 was deployed in as a wheel mounted cart at a standard sensor height of 42cm. The latency test consists of three sets of passes up and down the seeded IVS line. The 5-line survey consists of the following passes:

- offset from seeded line at 50 cm
- offset from seeded line at 25 cm
- seeded line
- offset from seeded line at 50 cm (opposite side)
- background line

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5 CONCLUSIONS

5.1 Results

The background noise levels at the IVS were calculated for the four bottom coil channels (**Table 2**) from the data collected on March 16, 2020. Areas free of anomalies from the 20200316E01BKGDA survey and the background line for the 20200316E01IVS1 and 20200316E015LINE surveys were used to compute background statistics. The statistics and RMS noise values were calculated.

Table 2: IVS Background Statistics

ChannelID	Ave Mean (mV)	Ave StDev (mV)	Ave RMS (mV)	7x StDev (mV)	7x RMS (mV)
Ch1_level_lg	1.48	1.97	2.47	13.81	17.29
Ch2_level_lg	0.94	1.18	1.50	8.24	10.53
Ch3_level_lg	0.49	0.59	0.76	4.11	5.34
Ch4_level_lg	0.24	0.29	0.38	2.03	2.65

The first three production area datasets, 20200317_G01_DGM7_E01A, 20200317_G01_DGM14_E01A, 20200317_G01_DGM21_E01A, were collected with RTK GPS on March 17, 2020 covering three approximately 100x100ft grids (Grids DGM7, DGM14, and DGM21). The background statistics for an anomaly free area within each dataset were calculated for comparison to the IVS background values and are shown in **Table 3**.

Table 3: Initial Datasets Background Statistics

ChannelID	Ave Mean (mV)	Ave StDev (mV)	Ave RMS (mV)	7x StDev (mV)	7x RMS (mV)
Ch1_level_lg	0.78	1.05	1.32	7.33	9.26
Ch2_level_lg	0.39	0.70	0.83	4.92	5.78
Ch3_level_lg	0.21	0.47	0.53	3.31	3.74
Ch4_level_lg	0.13	0.35	0.39	2.47	2.71

The responses from the initial passes of collection of the IVS seed items are detailed in **Table 4**. Average values for item response (**Table 5**) and positioning (**Table 6**) were calculated. The positional requirement for the initial surveys for the IVS seeds is 0.25m for RTK GPS positioning.

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Table 4: Results of the initial IVS collections

IVS Test ID	Item ID	IVS X (m)	IVS Y (m)	Ch1 (mV)	Ch2 (mV)	Ch3 (mV)	Ch4 (mV)
20200316E01IVS5LINE	IVS01	585624.900	4572951.100	115.569	78.888	43.379	20.935
20200316E01IVS5LINE	IVS02	585625.946	4572948.177	57.116	35.347	17.835	7.755
20200316E01IVS5LINE	IVS03	585626.944	4572945.362	16.055	9.755	4.825	1.803
20200316E01IVS1	IVS01	585625.000	4572951.100	114.108	78.802	43.810	21.422
20200316E01IVS1	IVS02	585626.000	4572948.100	55.433	33.794	16.576	7.317
20200316E01IVS1	IVS03	585627.000	4572945.400	15.903	8.904	4.175	1.836

Table 5: Average responses of the initial IVS collections

Item	Ch1Avg (mV)	Ch2Avg (mV)	Ch3Avg (mV)	Ch4Avg (mV)
IVS01	114.838	78.845	43.595	21.178
IVS02	56.274	34.570	17.206	7.536
IVS03	15.979	9.330	4.500	1.820

Table 6: Average position offset of IVS collections

Average position offset of initial local IVS collections					
Item	X Avg (m)	Y Avg (m)	X Ideal (m)	Y Ideal (m)	Offset (m)
IVS01	585624.950	4572951.100	585624.960	4572951.139	0.040
IVS02	585625.973	4572948.139	585625.922	4572948.106	0.060
IVS03	585626.972	4572945.381	585627.056	4572945.435	0.100

All seed items were detected within this criterion and the results are summarized in the Access database. The peak response along the profile directly over the IVS seeds was selected for the target location. For vertical ISOs this value is associated with the peak amplitude of the anomaly and for horizontal ISOs this value is associated with the trough of the double peaked anomaly. All seeds and the average locations of the peak responses are within the initial positioning precision MQO of 0.25m. **Figure 5** is the channel 2 response map of the three-pass latency test, the peak response values and locations repeat well after a correction of 6 readings (corresponding to approximately 0.6 seconds) was applied to the data. **Figures 6 and 7** are the channel 2 response maps of the initial seeded IVS surveys. The ongoing positioning precision MQO is the IVS targets are to be within 0.25m of the average locations. The average locations are calculated from the initial surveys conducted on March 16, 2020; the X Ave and Y Ave values in **Table 6** will be used to evaluate the ongoing dynamic detection survey positioning precision (IVS) MQO.

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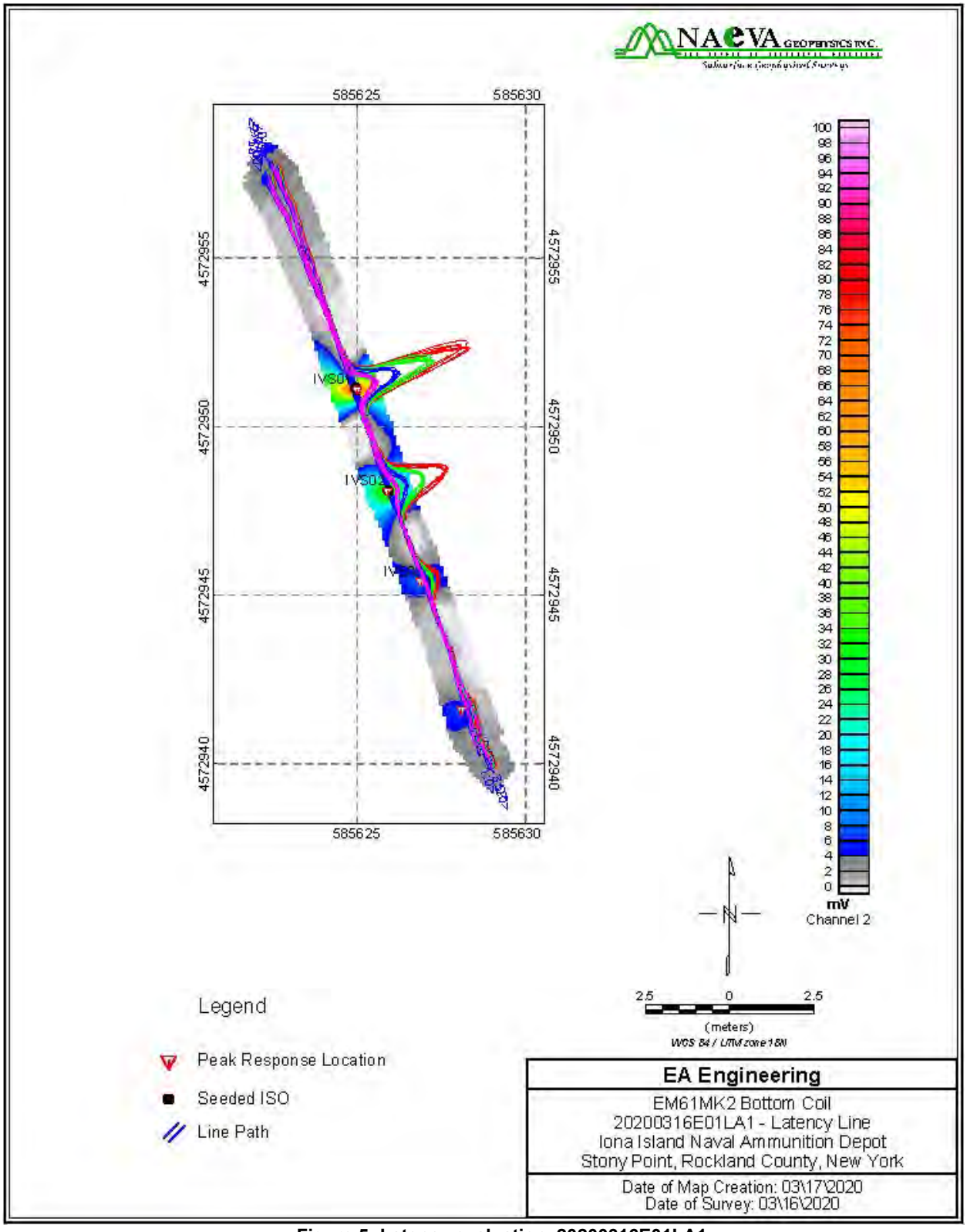

Figure 5: Latency evaluation, 20200316E01LA1

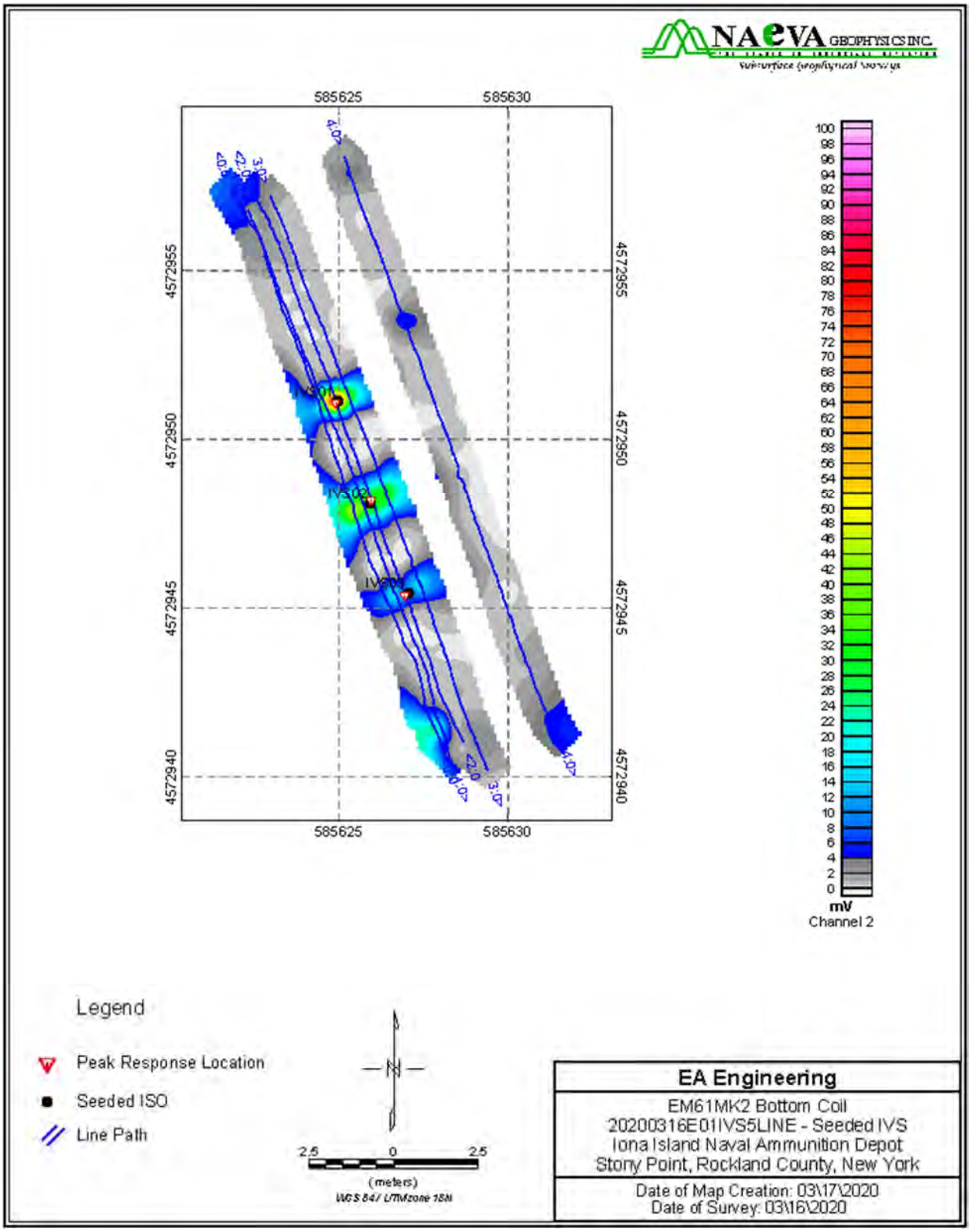

Figure 6: Initial 5-Line seeded IVS survey wheel deployment, 20200316E01IVS5LINE

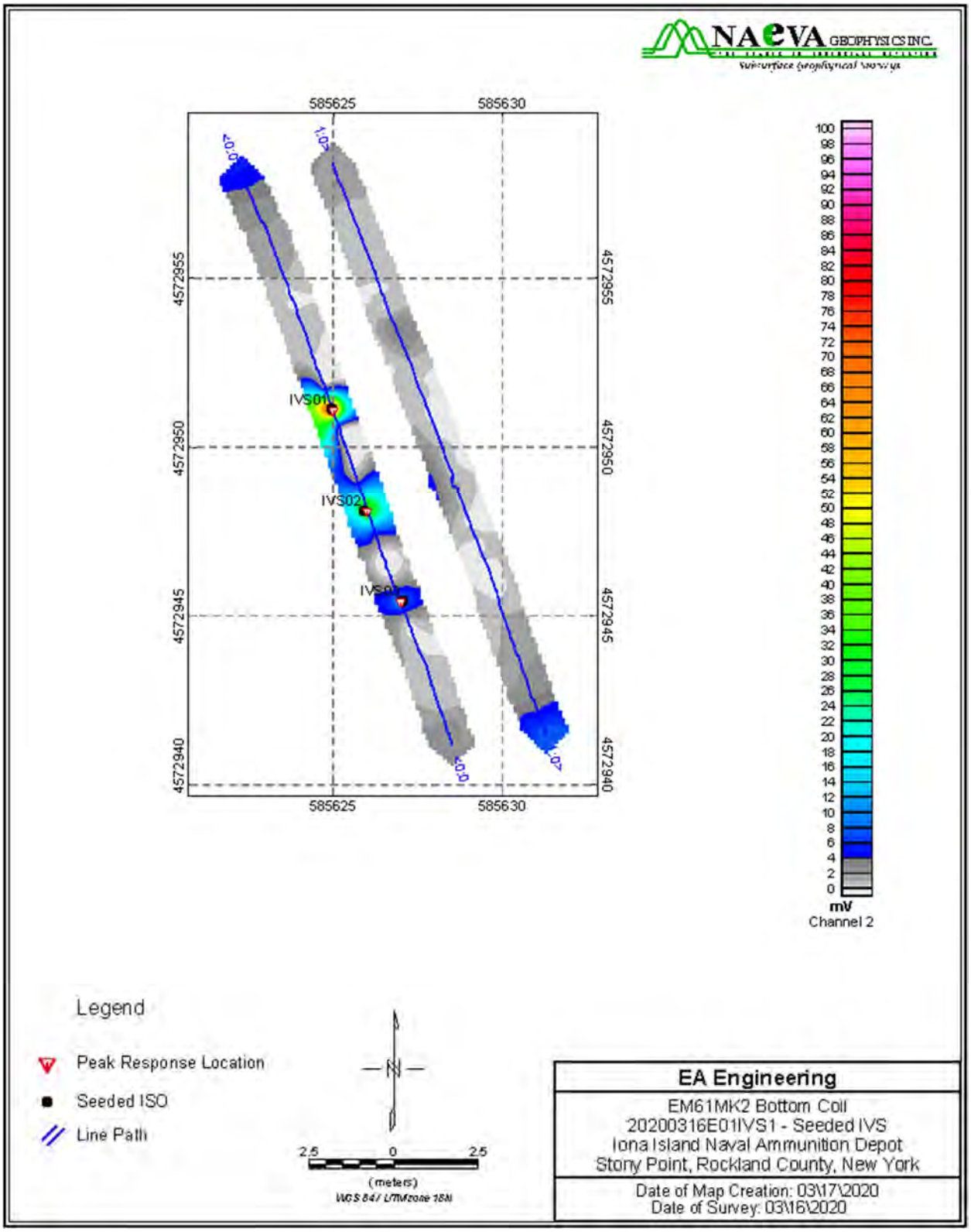

Figure 7: Initial seeded IVS survey wheel deployment, 20200316E01IVS1

The IVS ISO responses were compared against the NRL response curves (**Table 7**). For the small ISO, the response curves were generated using schedule 40 small ISOs (the IVS was seeded with schedule 80 small ISOs). For the response the difference is within 25% or ± 2 mV for all items and all time gates. The variation of response from the predicted response as the item is offset from center of the coil is abrupt, for a static test where item location can be very well controlled one would expect to measure responses closer to the predicted values. For IVS the location offset due to line path and sampling rate we do not expect to capture the actual peak or trough response of item.

Table 7: Response Variation from NRL Predicted Values

Item	Ch1 Difference		Ch2 Difference		Ch3 Difference		Ch4 Difference	
	Percent	mV	Percent	mV	Percent	mV	Percent	mV
IVS01	-9.90%	-12.63	-11.10%	-9.87	-16.60%	-8.67	-13.80%	-3.39
IVS02	-6.80%	-4.11	2.10%	0.72	12.30%	1.89	29.00%	1.70
IVS03	8.80%	1.29	14.60%	1.19	24.00%	0.87	42.20%	0.54

The response of the IVS items was compared to the average RMS (**Table 8 and 9**). The seed items in the IVS all had strong signals well above background noise. The channel with the highest SNR varies depending on the item, depth and orientation. Given the expected variation of potential TOI at the site, Channel 2 provides a good compromise between the earliest channel which is more sensitive to small shallow items and the late channels that show higher SNR for strong signal targets but less sensitivity to deeper items. Channel 2 is the recommended channel for target selection.

Table 8: IVS SNR (IVS RMS noise)

Item	Ch1 (mV)	Ch2 (mV)	Ch3 (mV)	Ch4 (mV)
IVS01	46.51	52.42	57.17	55.92
IVS02	22.79	22.98	22.56	19.90
IVS03	6.47	6.20	5.90	4.80

Table 9: IVS SNR (Initial Dataset RMS noise)

Item	Ch1 (mV)	Ch2 (mV)	Ch3 (mV)	Ch4 (mV)
IVS01	86.82	95.44	81.52	54.71
IVS02	42.54	41.85	32.17	19.47
IVS03	12.08	11.29	8.41	4.70

5.2 Measurement Quality Objectives

The IVS specific Measurement Quality Objectives (MQOs) are:

- Initial dynamic detection survey positioning accuracy (IVS) – derived positions of IVS target(s) are within 25cm of ground truth, **Figures 8, 9 and 10** show positioning results. This MQO was met.

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- Ongoing dynamic detection survey positioning precision (IVS) – derived positions of IVS target(s) within 25cm of the average locations. The average locations stated in **Table 6** will be used to evaluate ongoing IVS tests for the project.

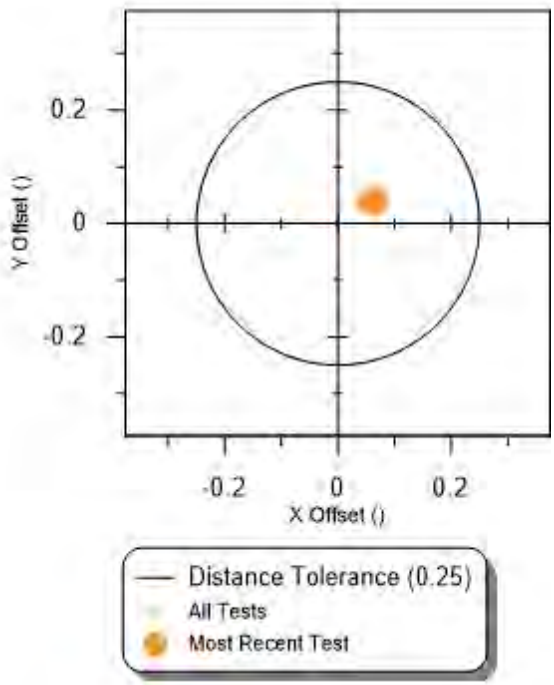

Figure 8: IVS01 (Small ISO Vertical) IVS positional results through March 16, 2020

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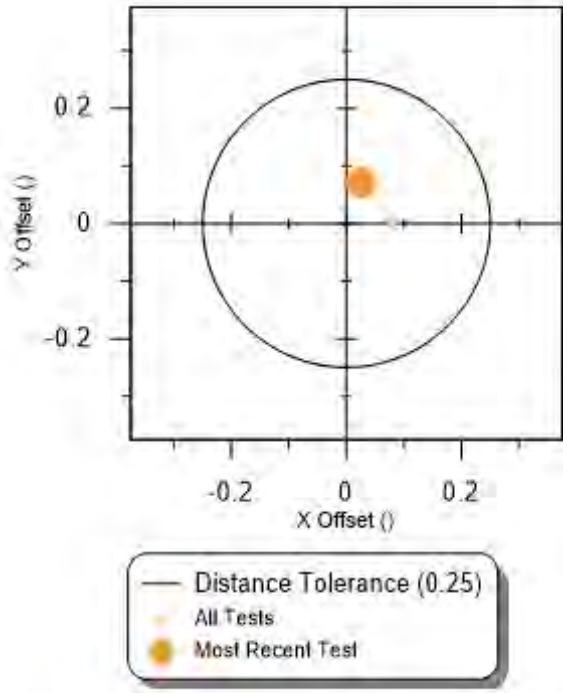

Figure 9: IVS02 (Medium ISO Horizontal) IVS positional results through March 16, 2020

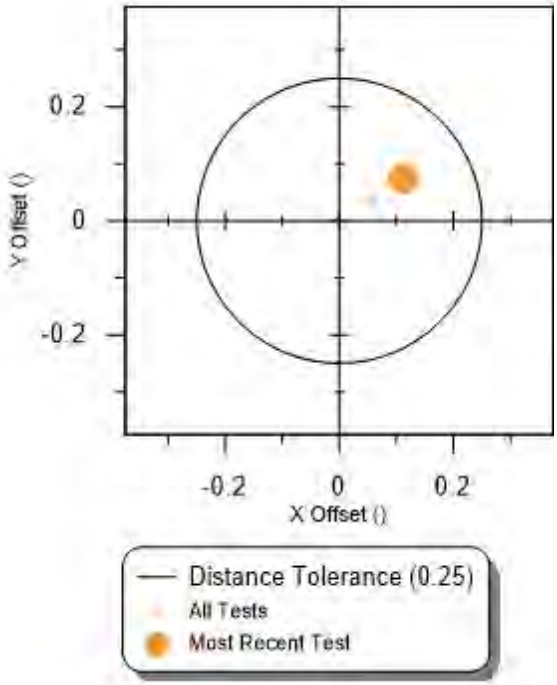

Figure 10: IVS03 (Small ISO Horizontal) IVS positional results through March 16, 2020

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Additional, MQOs that were met in the IVS were the following:

- Inline measurement spacing (EM61) - 100% ≤ 0.25m between successive measurements.

- Valid position data (EM61 data collected with RTK GPS) - GPS status flag indicates real-time kinematic (RTK) fix and dilution of precision (DOP) less than 4.0.

In addition to checking the MQOs in the IVS survey data, the following tests are evaluated to ensure the equipment was working correctly:

- Initial Instrument Function Test (EM61) - Response (mean static spike minus mean static background) within 20% of predicted response for all channels after background correction. This test is performed with a small schedule 40 ISO placed 45cm from the coil in a jig mounted on the coil. **Figure 11** display the static spike test results for the initial tests performed on March 16, 2020. This MQO was met.

- Ongoing Instrument Function Test (EM61) - Response (mean static spike minus mean static background) within 20% of predicted response for all channels. This MQO was met on March 17, 2020, the data of collection for the initial grid survey datasets.

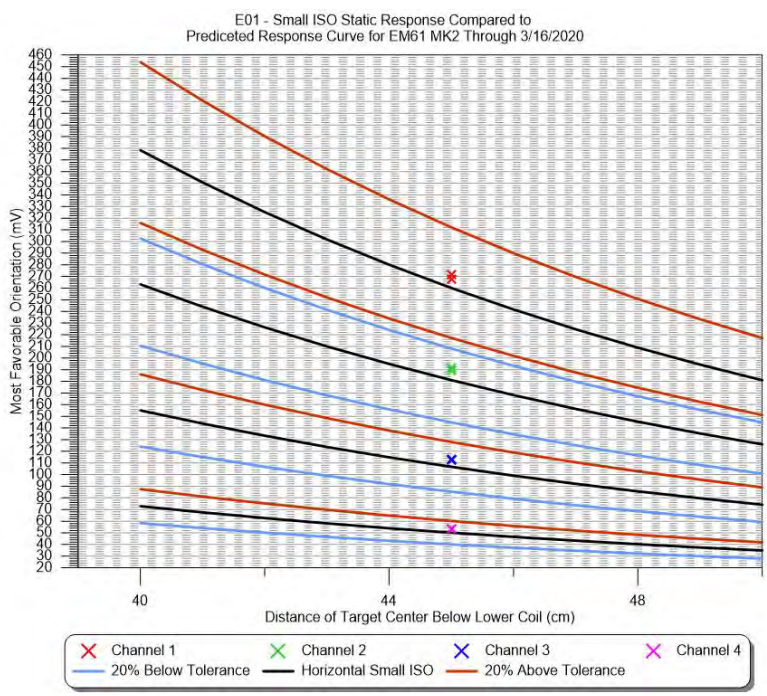

Figure 11: Static Response Chart wheel deployment

- RTK GPS QC Test (Geodetic Equipment Functionality) - Positional error of the RTK GPS at a known/temporary monument will not exceed ± 0.328 ft (10 centimeters [cm]). This MQO was met on March 16 and 17, 2020 (**Figure 12**)

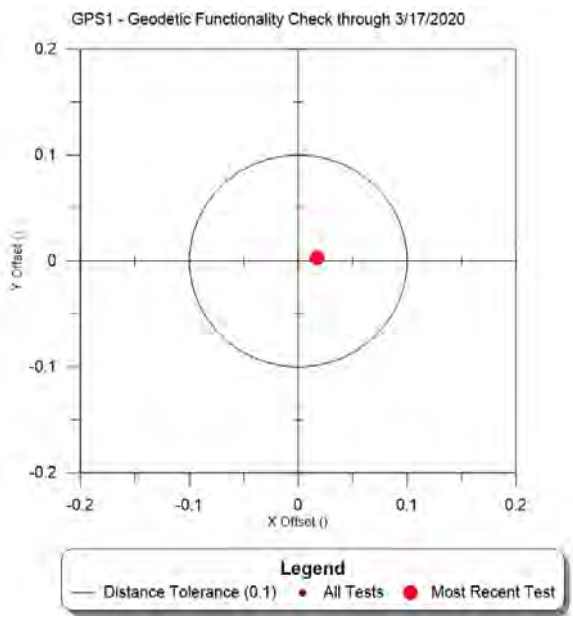

Figure 12: RTK GPS QC Check

Results for all MQOs are presented in the Access database that accompanies the IVS Report.

5.3 Recommended Target Selection Threshold

The intended EM61 detection threshold is to be between 5 and 7 times the nominal sensor noise levels based on initial IVS and the effective depth of reliable detection. Based on the results of the background statistics within the IVS and initial datasets, AN JV recommends targeting the second time gate (Channel 2) for the EM61 MK2. The recommended target selection threshold is 6 mV in the second time gate. This threshold is just above 7x RMS values for the initial background values within the first three datasets.

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6 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP),* Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

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ADVANCED GEOPHYSICAL CLASSIFICATION

Instrument Verification Strip Memorandum
Static MetalMapper 2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Date: April 19, 2020
Submitted by Tom Furuya
Reviewed by Dean Keiswetter, April 20, 2020

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1 INTRODUCTION

This IVS memorandum, which has been prepared on behalf of the EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014, presents results of the Instrument Verification Strip (IVS) that AcornSI and NAEVA JV (ANJV) performed at the start of the geophysical investigation for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY). The IVS was surveyed as part of a Geophysical System Verification program to document that the detection sensors and positioning systems are functioning properly and to demonstrate that the geophysical data collection teams are well-trained in system operation prior to the initiation of fieldwork. This memorandum addresses the initial MetalMapper 2x2 (MM2x2) IVS surveys conducted on April 10, 2020.

This process is discussed in greater detail in *Worksheet #22—Field Equipment Calibration, Maintenance, Testing and Inspection*, and *Appendix F - Field Standard Operating Procedures (SOP)*, contained within the Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) – Military Munitions Response Program Remedial Investigation, Iona Naval Ammunition Depot, Formerly Used Defense Site (EA, 2019).

2 ASSEMBLY

The MM2x2 sensor (Figure **1**) was assembled in accordance with ANJV SOP01 MM2 Assembly referenced on worksheet #22 of the QAPP. The MM2x2 sensor height above ground measured 26 centimeters (cm). Positioning of the static data was maintained using a Real-Time Kinematic (RTK) Global Positioning System (GPS). Sensor orientation was measured with an Inertial Measurement Unit (IMU), which recorded pitch, roll, and yaw for each data point.

The MM2x2 is an advanced electromagnetic induction sensor designed for the detection and classification of buried metal objects. The sensor consists of four sensor elements arranged on 40-centimeter (cm) centers in a 2x2 array. Each sensor element consists of a 35-cm square transmit coil for target illumination with a 10-cm three-axis receive cube centered in the transmitter coil. The transmitters are energized in sequence and the decay curve is recorded up to 8 milliseconds after the transmitters are turned off for each of the 12 (4 cubes with 3 axes each) receive channels. A schematic of the sensor coil configuration is shown in **Figure 2**.

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Figure 1 Assembled MM2x2 sensor. The circular grey receptacle centered on top of the sensor housing is used to hold the serialized ISO.

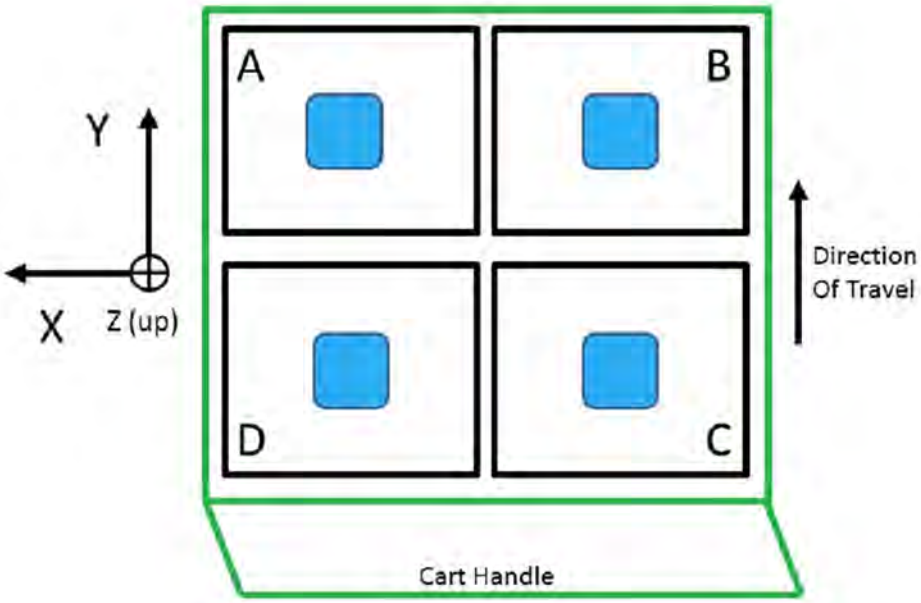

Figure 2 Orientation of the four MM2x2 sensor elements (top view).

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3 INSTRUMENT VERIFICATION STRIP CONSTRUCTION

The IVS was installed in the central area of the site. On March 16, 2020 ANJV performed the background and initial seeded surveys at the IVS using an EM61 MK2 sensor at a line spacing of 0.5 m. The IVS and background survey lines were approximately 15 meters long and were used for the EM61 MK2 and MM2x2 systems. Three ISOs consisting of two small ISO 80s and one medium ISO 40, were spaced approximately three meters apart and a blank space was also marked. Seed item descriptions and orientations are listed in **Table 1**. **Figure 3** shows the MM2x2 surveying the IVS line. The IVS EM61 MK2 background survey is discussed in more detail in the report "*IVS Memorandum – Remedial Investigation Iona Island Naval Ammunition Depot*".

Table 1: IVS Seed Item Locations and Descriptions

Test Item ID	Easting*	Northing*	Depth to Center of Mass (feet)	Description
IVS01	585624.960	4572951.139	0.5	small ISO80 vertical
IVS02	585625.922	4572948.106	1.0	medium ISO, horizontal, perpendicular to IVS
IVS03	585627.056	4572945.435	0.5	small ISO80, horizontal, perpendicular to IVS
Blank	585623.87	4572953.983	n/a	background location
* WGS84 UTM Zone 18 North, meters collected with Trimble RTK GPS on 3/16/2020				

Figure 3 The MM2x2 collecting data along the IVS line

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4 INITIAL IVS SURVEY RESULTS

4.1 Static

The cued MM2x2 IVS survey for the Remedial Investigation at the Iona Island Naval Ammunition Depot was performed on April 10, 2020 by ANJV personnel, processed by an ANJV data processor and reviewed by the ANJV QC Geophysicist. The MM2x2 system will be used to perform cued surveys over survey anomaly locations selected using DGM methods.

The cued IVS data was processed and analyzed using the DOD validated software package UX-Analyze V9.6.0.

4.1.1 Sensor Function Test

The objective of the sensor function test is to confirm that all transmitters (TX) and receivers (RX) are operating as expected. This is achieved by recording the instrument response to a known calibration item and then comparing the data to a reference measurement. The calibration item and actual position of the item with respect to the sensor can vary as long as the response of all receivers is above noise levels for some combination of transmitters. Once the calibration item and position are selected, they must remain the same whenever the test is performed. For this project the calibration item was a serialized ISO that was delivered with the MM2x2 system. The MM2x2 has a built-in receptacle for the serialized ISO at the center of the system (Figure **1**). Data were collected over a background location at the IVS and a second measurement was made at the same location but with the serialized ISO mounted in the receptacle. The initial measurement was used to background correct the second measurement resulting in the sensor response to the serialized ISO. The data were processed using the purpose-built tool in Geosoft's UX-Analyze. The tool compares the responses from each of the receiver cubes to reference values and flags measurements that exceed the +/-20% measurement quality objective (MQO). The results of the initial sensor function test as well as other tests recorded that day are presented in Figure **4** and show that all the TX-RX combinations pass the MQO.

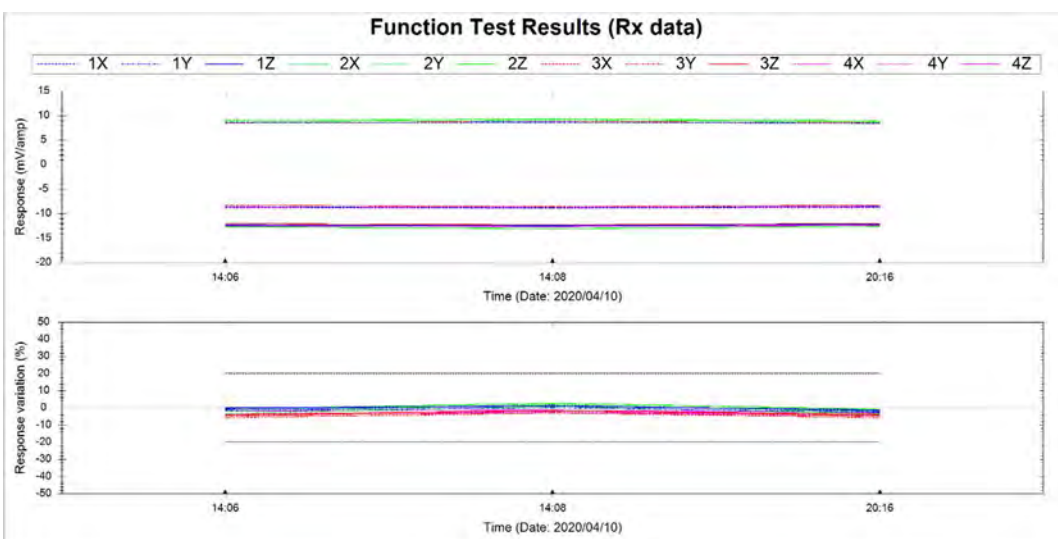

Figure 4 Static sensor function test results from the UX-Analyze Sensor Function Test routine with the serialized ISO.

4.1.2 Background Validation Test

Based on the initial IVS EM61 data, a potential background location was identified at the north end of the IVS line. Prior to use, the location was checked for potential interference from buried metal objects by taking measurements with the MM2x2. This was accomplished by comparing a set of 5 measurements taken at the intended location: one measurement at the location and one more with the sensor offset by ½ sensor spacing in four orthogonal directions. Next, the forward model of the most challenging target of interest / depth scenario is added to the center background measurement and the background is verified by separately subtracting each of the 4 offset backgrounds and performing a library match to the target of interest. The background location is considered valid if the surrounding background measurements are collected within ½ sensor offset (±50%) of the center background and the library match from all 4 offsets exceeds 0.90. The "Background Location Validation Test" in UX-Analyze performs these operations and creates an image and spreadsheet of the results.

The smallest QC seed target of interest at the site was a small ISO schedule 80. Polarizations from the small ISO corresponding to the DoD ordnance library h5 file - "ISO-SISO80-8ms-LibraryDataAddedTo-MM_BP_SLB_00107_2014281_04.h5" were used to calculate the small ISO's response in the horizontal orientation at a depth of 25cm.

The successful result of the background validation test at the northern end of the IVS line is shown in Figure **5**. The 4 plots beneath the spatial map show the inverted polarizabilities (blue lines) from the synthetic seeding of a small ISO80 at each surrounding background location compared to the library polarizations (red lines) of the small ISO80. The tool is designed to show failed backgrounds with red titles and passed backgrounds in black. The table in the bottom right corner of the image shows the library match metrics. The column chart at the bottom left shows the amplitude of the seeded TOI in comparison to the amplitude difference between the surrounding backgrounds and the center background. It essentially compares the signal (small ISO80) to the noise (backgrounds) at each location. The figure shows the amplitude of the TOI is much larger than the background variation and the library match for each measurement passed the MQO.

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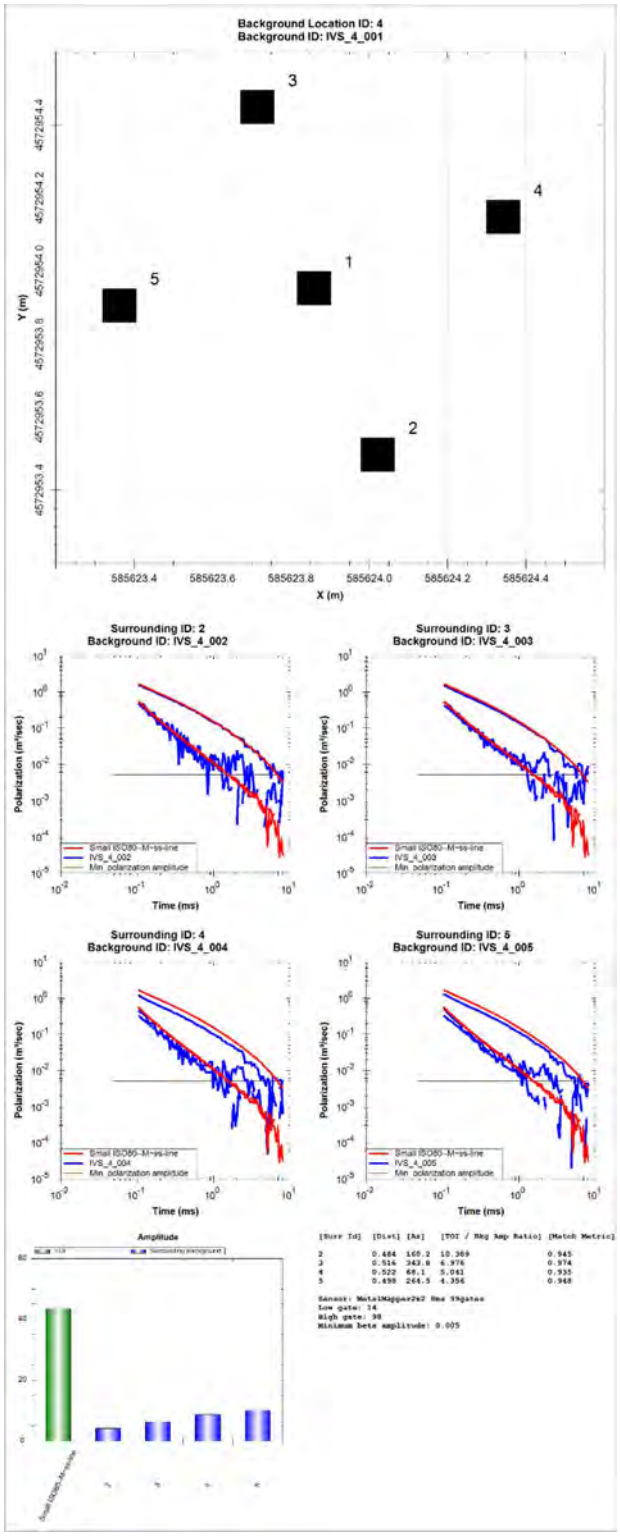

Figure 5 Background location validation test results for the background location at the northern end of the IVS line.

4.1.3 Initial Derived Polarizability Accuracy

Cued data were collected over each IVS item and the validated background location. The data were imported into UX-Analyze and the data were checked for validity with regards to transmitter current, IMU data quality, GPS data quality and EMI response range. The data were then leveled using the background measurement. The background corrected data were submitted to the inversion process which used a single source solver to derive target features. These features include extrinsic parameters (location and orientation) as well as intrinsic parameters (principal axis polarizabilities) that are used for classification. The polarizabilities were compared to a library consisting of ISOs from the DoD library and a fit metric (values from 0 to 1) was generated with higher values indicating a better match.

All recorded data passed the data validity checks. Table 2 and Table 3 present the relevant inversion results, comparison to the ground truth position and library match to DoD library for the seed items in the IVS. The XY location, depth accuracy, library match and fit coherence passed the MQOs for all IVS items. Figure **6** presents the results of the library match of all IVS items to the ISOs in the DoD library. The polarizations for the IVS items are shown in full color and those of the library are shown in reduced intensity. The top two images show the results for IVS 1 and 2 and the bottom image show the results for IVS 3.

Table 2 Cued IVS model and library match results using Single Source Solver

IVS ID	Seed Description	Fit coherence	Library match metric	Library match item
IVS-1	Small ISO	0.999	0.9933	Small ISO80--METALMAPPER-BP_107_003_11
IVS-2	Medium ISO	0.9985	0.9528	Medium ISO 40--TEM2X2X3-BP_71_002_11
IVS-3	Small ISO	0.9972	0.9919	Small ISO80--METALMAPPER-BP_107_003_11

Table 3 Cued IVS positioning results using Single Source Solver

IVS ID	Seed Description	UTM Easting (m)	UTM Northing (m)	Depth (m)	Location offset (m)	Depth offset (m)
IVS-1	Small ISO	585625.003	4572951.112	0.104	0.051	-0.046
IVS-2	Medium ISO	585625.987	4572948.066	0.282	0.076	-0.018
IVS-3	Small ISO	585627.107	4572945.379	0.140	0.075	-0.01

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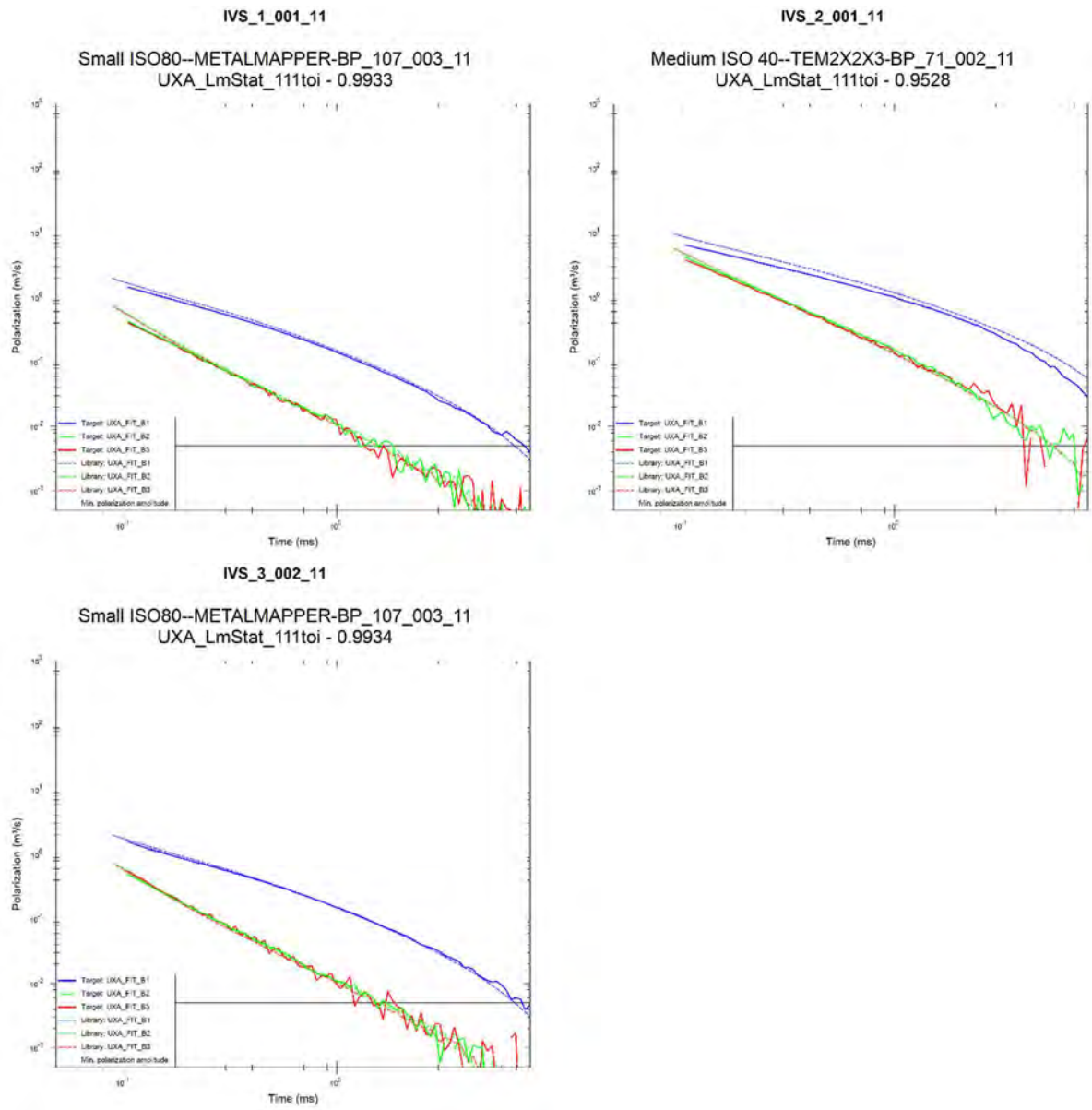

Figure 6 Library match for IVS1-3 using polarizations from the single solver (top left, top right, bottom left)

5 CONCLUSIONS

The ANJV MM2x2 data collection team performed an initial IVS survey in cued mode to validate the MM2x2 equipment prior to the start of the cued survey for the Remediation investigation at the Iona Island Naval Ammunition Depot. The data from the cued MM2x2 survey met all the MQOs defined in worksheet #22 of the QAPP. Based upon these results, it is concluded that MM2x2 collection and analysis procedures documented in this report indicate that the project data quality objectives identified in the QAPP are achievable.

6 REFERENCES

EA, 2019. *Final Uniform Federal Policy (UFP) - Quality Assurance Project Plans (QAPP),* Military Munitions Response Program, Remedial Investigation, Iona Island Naval Ammunition Depot, Formerly Used Defense Site, Stony Point, Rockland County, New York.

ANJV, 2020, *IVS Memorandum – Remedial Investigation Iona Island Naval Ammunition Depot*

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AcornSI and NAEVA JV
ADVANCED GEOPHYSICAL CLASSIFICATION

Non-Conformance / Corrective Actions Report
Background Validation Failure, April 14 and 17, 2020
Static MetalMapper2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 2

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Author: Tom Furuya, April 29, 2020
Reviewed: Dean Keiswetter, April 30, 2020

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Approval Signature & Date: KING.DAVID.VICTOR.1362517466 Digitally signed by KING.DAVID.VICTOR.1362517466 Date: 2020.05.20 14:43:33 -04'00'

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1 NON-CONFORMANCE

On April 14 and 17, 2020, ANJV collected background validation data over grids DGM2 and DGM10 that failed the initial measurement of production area background locations and background verification Measurement Quality Objective (MQO). Per the project QAPP, the acceptance criteria is that all five measurements (decay amplitudes) within the noise level of each other and library match from all four offset measurements greater than 0.9.

Problem statement	Failure to pass the UX-Analyze background location validation test for initial measurements of production area background locations.

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2 INVESTIGATION / ROOT CAUSE DETERMINATION

2.1 Investigative Process

The MetalMapper2x2 (MM2x2) system was used to perform cued surveys over anomalies selected within grids which were spread out over the project site. Background locations were initially selected from the same DGM data as were used for the anomaly detection process. These locations were selected where the responses appeared to be non-anomalous, and two locations were chosen in each of the grids (DGM2 and DGM10).

The two background locations in both DGM2 and DGM10 failed the UX-Analyze background location validation test. The validation test compares a set of 5 measurements taken at the intended location: one measurement at the location and one more with the sensor offset by ½ sensor spacing in four orthogonal directions. Next, the forward model of the most challenging target of interest / depth scenario is added to the center background measurement and the background is validated by separately subtracting each of the 4 offset backgrounds and performing a library match to the target of interest. If the background location is truly devoid of metal, the localized response should be homogenous and the residual signal in these leveled data sets should be very low, leaving only the response from the embedded synthetic TOI. The background location is considered valid if the surrounding background measurements are collected within ½ sensor offset (±50%) of the center background, and the library match from all 4 offsets exceeds 0.90.

The failed results of the background validation test for one of the two locations in each grid are shown in Figure 1. The 4 plots beneath the spatial map show the inverted polarizabilities (blue lines) from the synthetic seeding of a small ISO80 at each surrounding background location compared to the library polarizations (red lines) of the small ISO80. The tool is designed to show failed backgrounds with red titles and passed backgrounds in black. The table in the bottom right corner of the image shows the library match metrics. The column chart at the bottom left shows the amplitude of the seeded TOI in comparison to the amplitude difference between the surrounding backgrounds and the center background. It essentially compares the signal (small ISO80) to the noise (backgrounds) at each location.

Upon inspection, we discovered that the all four background locations in DGM2 and DGM10 failed the test but one background in each grid had only a single surrounding measurement that caused the test to fail. In both cases, the library match metric for the measurement failed the 0.9 MQO.

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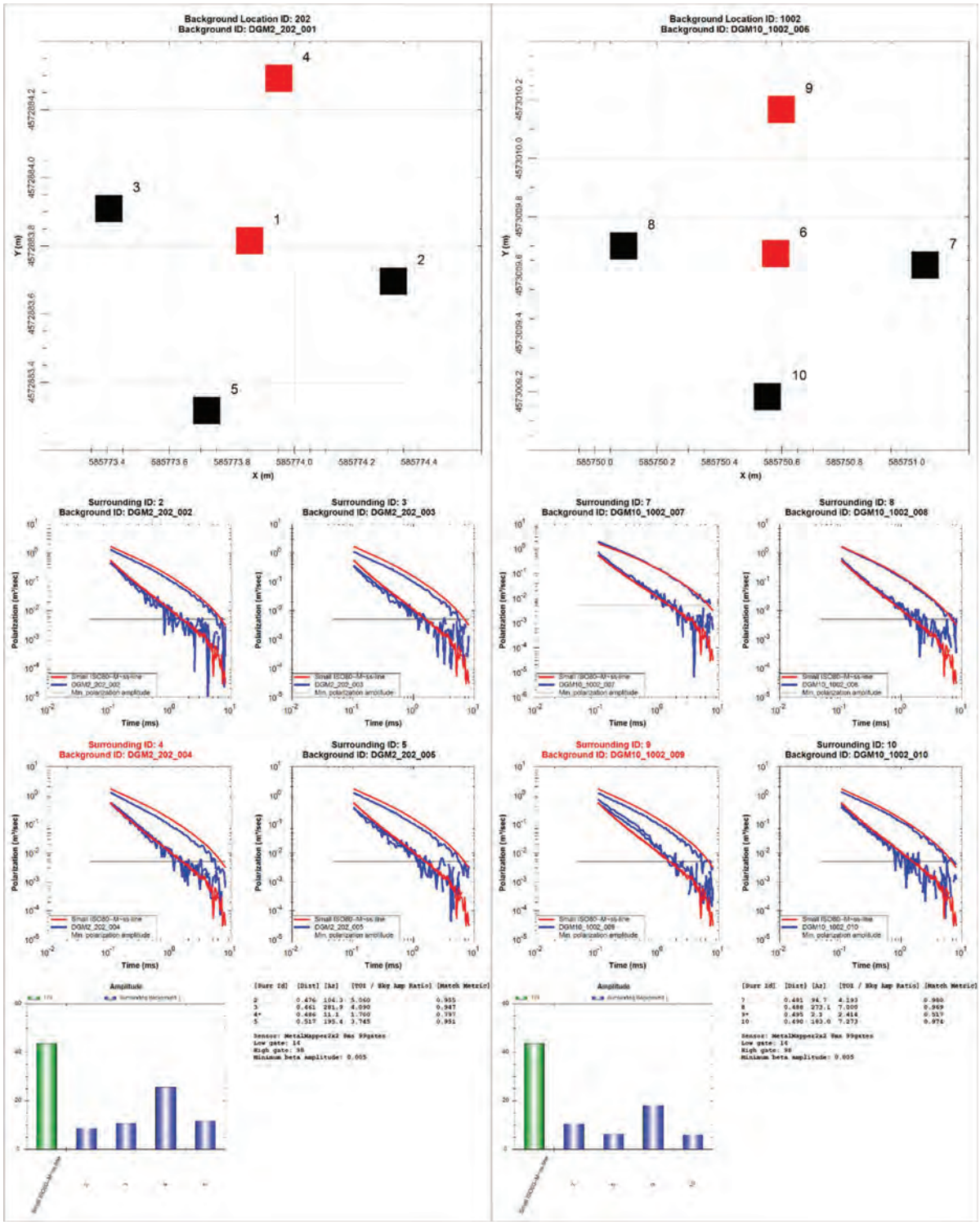

Figure 1 Background location validation test results for the two background locations in DGM2 (left) and DGM10 (right).

2.2 Probable Root and Contributing Cause(s)

The probable root cause that led to the background validation failure was metal sources in the vicinity of measurement ID 4 for DGM2 and ID 9 for DGM10. The data acquisition software for the MM2x2 does not contain an infield background validation tool so under normal operating procedures background validation data would be collected and analyzed prior to the collection of cued data. Due to the separation of the grids it was decided that it would be more efficient to collect background validation data at the same time as the cued collection. In order to minimize the possibility of rejecting the cued data by reason of a failed background validation test, two background locations were selected for validation within each grid.

2.3 Implications for Usability of Data

Normally, a failed background location validation test would necessitate locating another background location and recollecting both the background and production cued data that was affected by the failure. But in this case, it was observed that the location of the ongoing backgrounds at grids DGM2 and DGM10 that were used to level the production data were in the vicinity of the passed measurements. Figure 2 shows the background locations (red circles), passed individual background validation measurements (green pluses), failed individual background validation measurements (red crosses) and ongoing background measurements (black pluses). The ongoing background measurements in DGM2 and DGM10 are all within a few cm of the initial background location and should be valid to level the production cued data. If the area in the immediate vicinity of the initial background location were not devoid of metal sources or other interference, the background location validation test would have resulted in additional failures of the surrounding measurements. Additionally, the ANJV QC geophysicist applied the ongoing backgrounds to the QC seed cued measurements, modeled the data and compared the extracted polarizations to the TOI library. The one QC seed surveyed had a high library match (>0.95) to the respective item in the library and would be classified as high confidence TOI. Therefore, it is recommended that the background data collected over the background locations at DGM2 and DGM10 are valid and can be used to level the production cued data. If this recommendation is accepted, this non-conformance does not affect the usability or validity of data acquired at grids DGM2 and DGM10.

2.4 Potential Effect on Project

If the recommendation to use the ongoing production backgrounds is accepted, there is no effect on the project data.

If the recommendation is not accepted, the data collected over DGM2 (61 targets) and DGM10 (74 targets) will be rejected. All the targets affected will be added to the dig list. This will have minimal effect on the RI but will increase the intrusive survey costs. The actual increase in costs will depend on the final classification of the cued data which has not been completed. The main effect will be having slightly less information on the feasibility of using AGC at the site.

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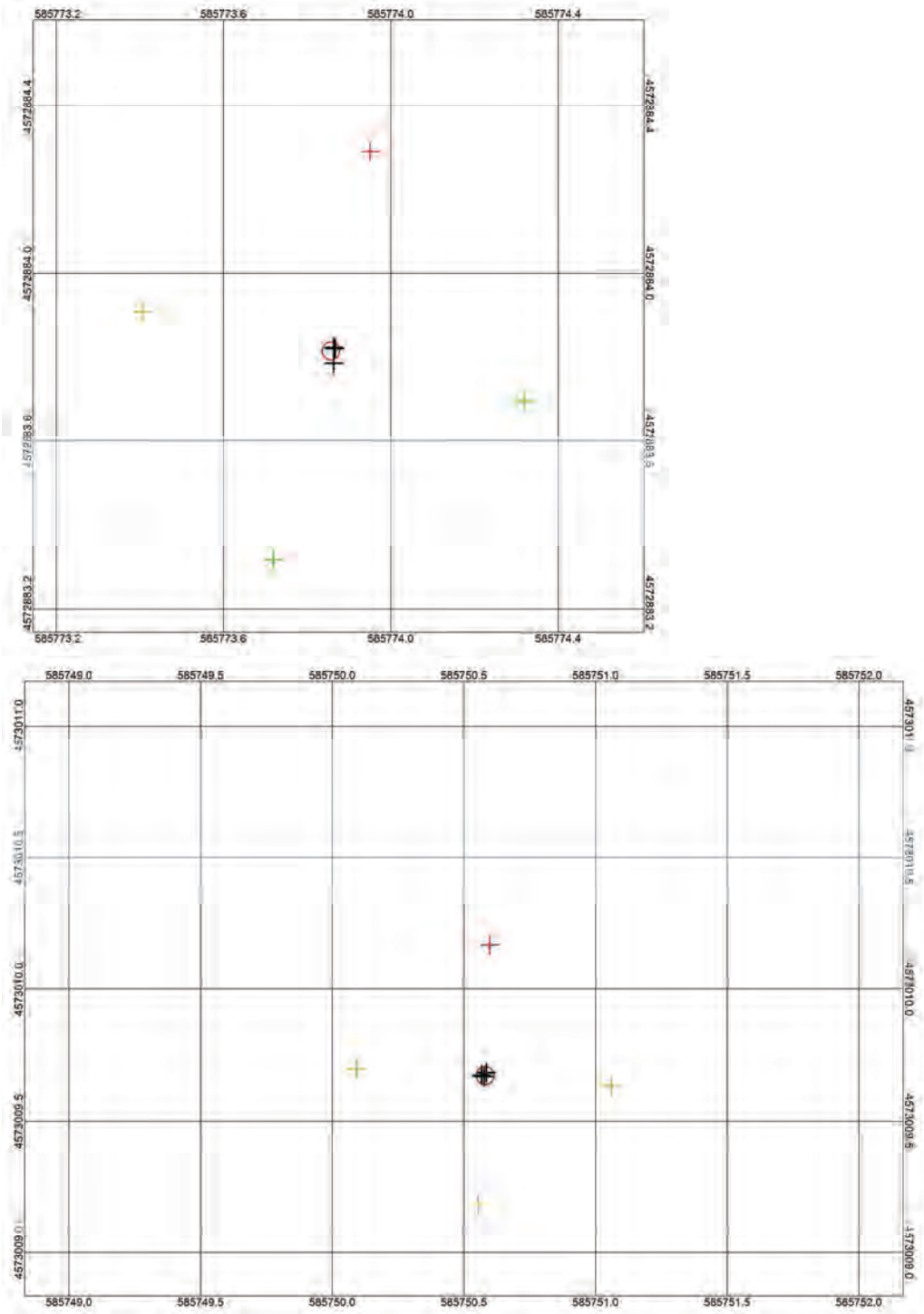

Figure 2 Grids DGM2 (top) and DGM10 (bottom) background locations (red circles), passed individual background validation measurements (green pluses), failed individual background validation measurements (red crosses) and ongoing background measurements (black pluses).

3 CORRECTIVE ACTION(S)

It is not very efficient to validate all the background locations prior to cued target measurements for an RI because of the separation and accessibility issues of the grids. Because the data acquisition software for the MM2x2 does not have an infield background validation test, the data would need to be collected and analyzed prior to the collection of cued data. Depending on the number of targets in the grid, it is more efficient to collect the cued data during the same sortie as the background validation data with the expectation that it may result in the recollection of all the data if the background validation failed. Multiple background validation locations were selected from the DGM data to increase the probability of a passed test at a grid.

There is no corrective action needed. The background location validation was conducted as planned with the knowledge that it may result in the occasional failure. The daily QC on the data was conducted and flagged the failed background validation. The data in question was discussed with the USACE Geophysicist prior to demobilization from the site and verbal agreement was given to allow the use of the background data.

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ADVANCED GEOPHYSICAL CLASSIFICATION

Non-Conformance / Corrective Actions Report
PM IVS Failure, April 22, 2020
Static MetalMapper2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 2
Version 2

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Author: Tom Furuya, May 7, 2020
Reviewed: Dean Keiswetter, May 11, 2020

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1 NON-CONFORMANCE

On April 22, 2020, ANJV failed the Measurement Performance Criteria (MPC) for Classification Survey (AGC) accuracy / precision / completeness. Per the project QAPP, the MPC requires the IVS to be surveyed twice a day; at the start of the day prior to production surveying and at the end of the day after production surveying is completed. The collected IVS data must also pass the pertinent Measurement Quality Objectives (MQO).

Problem statement	Failure to pass the end of day IVS MPC and MQO for AGC Cued surveys.

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2 INVESTIGATION / ROOT CAUSE DETERMINATION

2.1 Investigative Process

The MetalMapper2x2 (MM2x2) system was used to perform an end of day IVS cued survey. Daily QC of the IVS data showed the sensor malfunctioned during the data collection over the three IVS items. Figure 1 shows the measured MM2x2 transients over the three IVS items for the morning (light blue) and afternoon (purple) IVS survey. The transient data display different character for the morning and afternoon measurements even though the sensor was placed at the same location and in the same orientation.

A background measurement and a sensor function test, performed at the IVS immediately prior to the data collection over the IVS items, show normal sensor functions. Figure 2 shows the sensor function test results for the duration of the cued survey with the last two points on the chart representing the AM and PM results for April 22. As the chart shows, the sensor function tests on April 22 are consistent with the rest of the days and fall within the ranges supplied by the manufacturer indicating the sensor was operational. Figure 3 shows the measured MM2x2 transients over the IVS background location for the morning (light blue) and afternoon (purple) IVS survey. Juxtaposed to the IVS item transients, the background transient data display the same character for the two measurements and is further evidence that the sensor was functioning at this time.

The three measurements in question were collected the last day that ANJV was allowed on site.

2.2 Probable Root and Contributing Cause(s)

The exact cause of the change in response to the IVS items is unknown. The QC checks taken moments earlier, were normal.

2.3 Implications for Usability of Data

Based on the repeatability of the background measurements and the sensor function test results just prior to the failed IVS measurements, we believe the sensor was functional up to the last three IVS measurements. The last background measurement was taken minutes prior to the measurements over the three IVS items and no production cued measurements were collected after the last background.

ANJV has a lot of experience with the MM2x2 sensor and has put additional QC measures in place to identify potential sensor problems. The data analyst performs QC on the transient data for each measurement and requests reshots for any measurement that exhibits an unusual character.

If USACE agrees with this conclusion we request that the cued data is approved for use. If this recommendation is accepted, this non-conformance does not affect the usability or validity of data acquired on April 22.

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Figure 1 These plots show the measured MM2x2 transients over IVS items 1 (left), 2 (center) and 3 (right) for the morning (light blue) and afternoon (purple) IVS survey.

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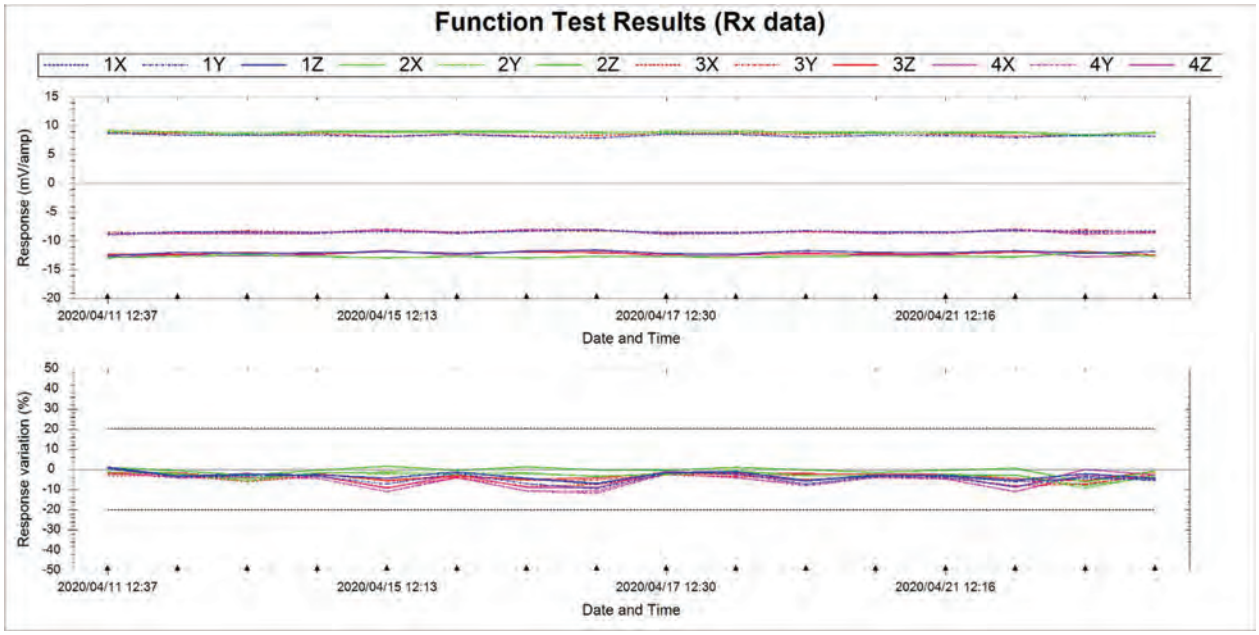

Figure 2 Sensor function test results for the duration of the cued survey. The last two points on the chart show the AM and PM results for April 22.

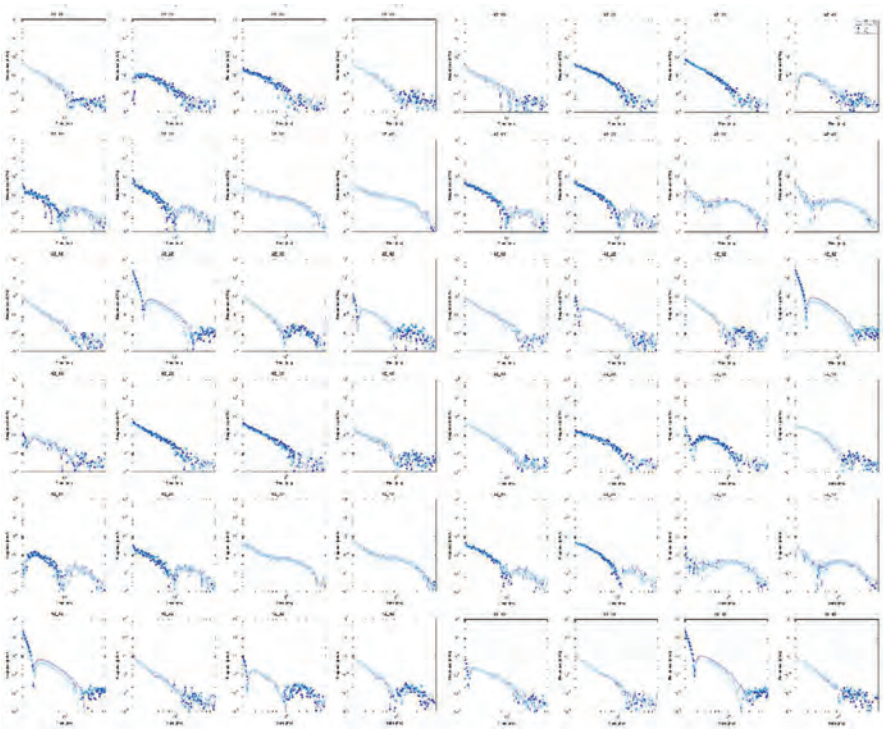

Figure 3 These plots show the measured MM2x2 transients over the IVS background location for the morning (light blue) and afternoon (purple) IVS survey. The transient data display the same character for the two measurements.

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2.4 Potential Effect on Project

If the recommendation to use the cued data is accepted, there is no effect on the project data.

If the recommendation is not accepted, the data collected on April 22 will be rejected and all the targets affected (~30) will be added to the dig list. This will have minimal effect on the RI but will increase the intrusive survey costs. The actual increase in costs will depend on the final classification of the cued data because some of those 30 would likely have been placed on the dig list as part of the classification process. The main effect will be having slightly less information on the feasibility of using AGC at the site.

3 CORRECTIVE ACTION(S)

No corrective action is required for this project. ANJV QC practices enabled the data analyst to detect the change in response over the IVS items.

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Phase I, II, Characterization Reports

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23 July 2020

TECHNICAL MEMORANDUM

TO: Erin Kirby, USACE NAE
David King, USACE NAB

FROM: Mike McGuire, EA
Tim Reese, EA

CC: Todd Beckwith, USACE NAB
Amanda Kohn, EA
Alex Kostera, ANJV
Tom Furuya, ANJV

SUBJECT: Phase I and II MEC Characterization Memorandum – Iona Island FUDS

The following is a synopsis of the findings from the digital geophysical mapping (DGM) and Advanced Geophysical Classification (AGC) of grids at Iona Island that will be used to guide the intrusive investigation of the 1903 Explosion Area (MRS-01), Dump Area, and Shoreline. This summary presents the selection process used to identify areas for AGC and intrusive investigation and to establish dig lists for the intrusive portion of the Remedial Investigation (RI).

DGM Data Collection and Coverage

Figure 1 shows MRS-01, the Dump Area, and the Shoreline and includes an aerial view of the MRS-01 DGM grids and transects in the Dump Area and along the Shoreline. The individual maps showing the DGM data and anomaly locations that met the selection criteria presented in the Target Selection Memorandum, and the saturated response areas (SRAs), are presented at the end of the memorandum.

DGM data were collected in accordance with the Iona Island Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) and met all Measurement Quality Objectives (MQOs) for DGM. The DGM data were positioned using a Real-Time Kinematic (RTK) Global Positioning System (GPS), and the MQO positioning accuracy was achieved throughout the site. All quality control (QC) blind seeds were accurately detected and met project MQOs. Some QC blind seeds fell within SRAs and as such were not selected as Targets of Interest (TOIs). The Data Quality Objectives for data collection quantities identified in Step 5 of Worksheet #11 of the Iona Island UFP-QAPP (i.e., 6 acres of planned DGM) were met or exceeded (i.e., 6.8 acres actual DGM).

DGM Analysis

Targets were identified using the automatic profile picker within Geosoft Oasis Montaj with 6 millivolts (mV) on Channel 2 for the selection criteria (1 Pounder projectile). Anomalies that were obviously the result of above ground objects/cultural items, suspected utilities, or possessed target attributes not indicative of TOIs (i.e., poor decay curve) were categorized as such on the target list. Additionally, SRAs where the selection of individual targets is not appropriate due to the extremely high target density are outlined on each DGM grid map presented in Attachment A.

All targets selected as part of this investigation are assigned one of the numeric target types in Table 1. The intent of assigned target types is to allow further classification of the selected targets and the classification is used to prioritize the targets during the AGC cued survey or intrusive investigation. The Target Type 1 targets will be considered TOIs for the purpose of follow-on investigations.

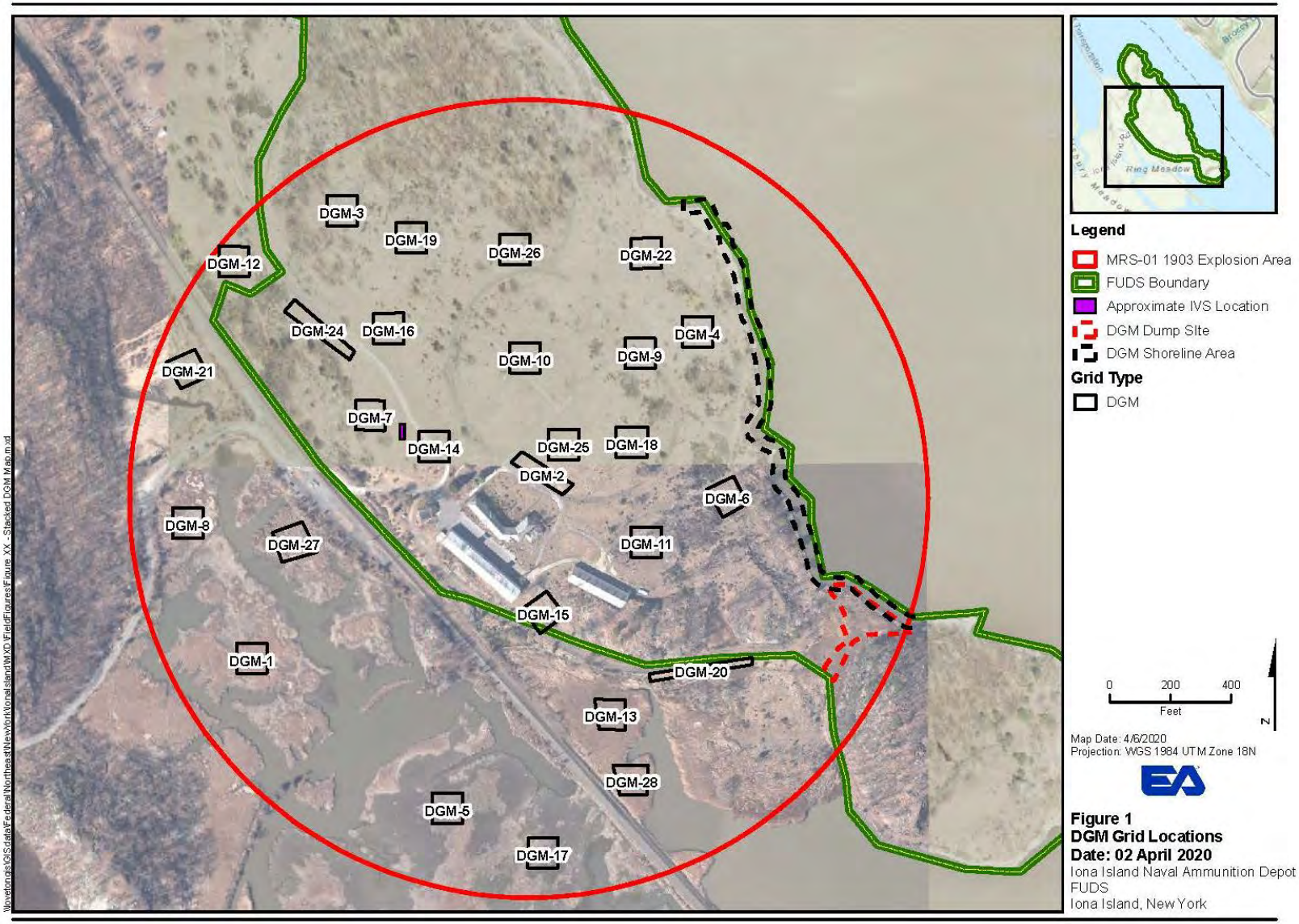
Cued AGC and Intrusive Sampling Recommendations

Visual Sampling Plan was utilized to create an anomaly density map using the DGM data and is presented in Figure 2. EA Engineering, Science, and Technology, Inc., PBC (EA), in coordination with Acorn-NAEVA Joint Venture (ANJV), categorized each grid in relation to anomaly density and location as follows:

- Low-TOI-Density (e.g., wetlands grids, <100 anomalies/acre)
- Medium-TOI-Density (e.g., wetlands grid near railroad tracks but away from former building locations, >100 and <500 anomalies/acre)

High-TOI-Density/SRA (e.g., upland grids with significant SRAs, >500 anomalies/acre).

Low and Medium-TOI-Density Grids: These grids (7 low density and 1 medium density) are in the wetlands in the western portion of the munitions response site (MRS) and are outside of the historically developed area of the depot. Therefore, the Low and Medium-TOI-Density grids are not influenced by the construction debris associated with the former buildings. These grids may be more representative of potential munitions and explosives of concern (MEC) that may have been distributed throughout the MRS from the 1903 Explosion. The wetlands make up roughly 30 percent (%) of the MRS, and 30% of the investigation grids are located within the wetlands. All of the DGM TOIs in the Low and Medium-TOI-Density grids in the wetlands will be intrusively investigated. AGC was used on three Low-TOI-Density grids to assess the effectiveness of AGC in the saturated soil conditions.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DGM-26
DGM-22
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DGM-7
DGM-14
DGM-25
DGM-18
DGM-2
DGM-6
DGM-8
DGM-27
DGM-11
DGM-15
DGM-1
DGM-20
DGM-13
DGM-28
DGM-5
DGM-17
Legend
MRS-01 1903 Explosion Area
FUDS Boundary
Approximate IVS Location
DGM Dump Site
DGM Shoreline Area
Grid Type
DGM
0 200 400
Feet
N
Map Date: 4/6/2020
Projection: WGS 1984 UTM Zone 18N
Figure 1
DGM Grid Locations
Date: 02 April 2020
Iona Island Naval Ammunition Depot
FUDS
Iona Island, New York

Figure 2 Density Map

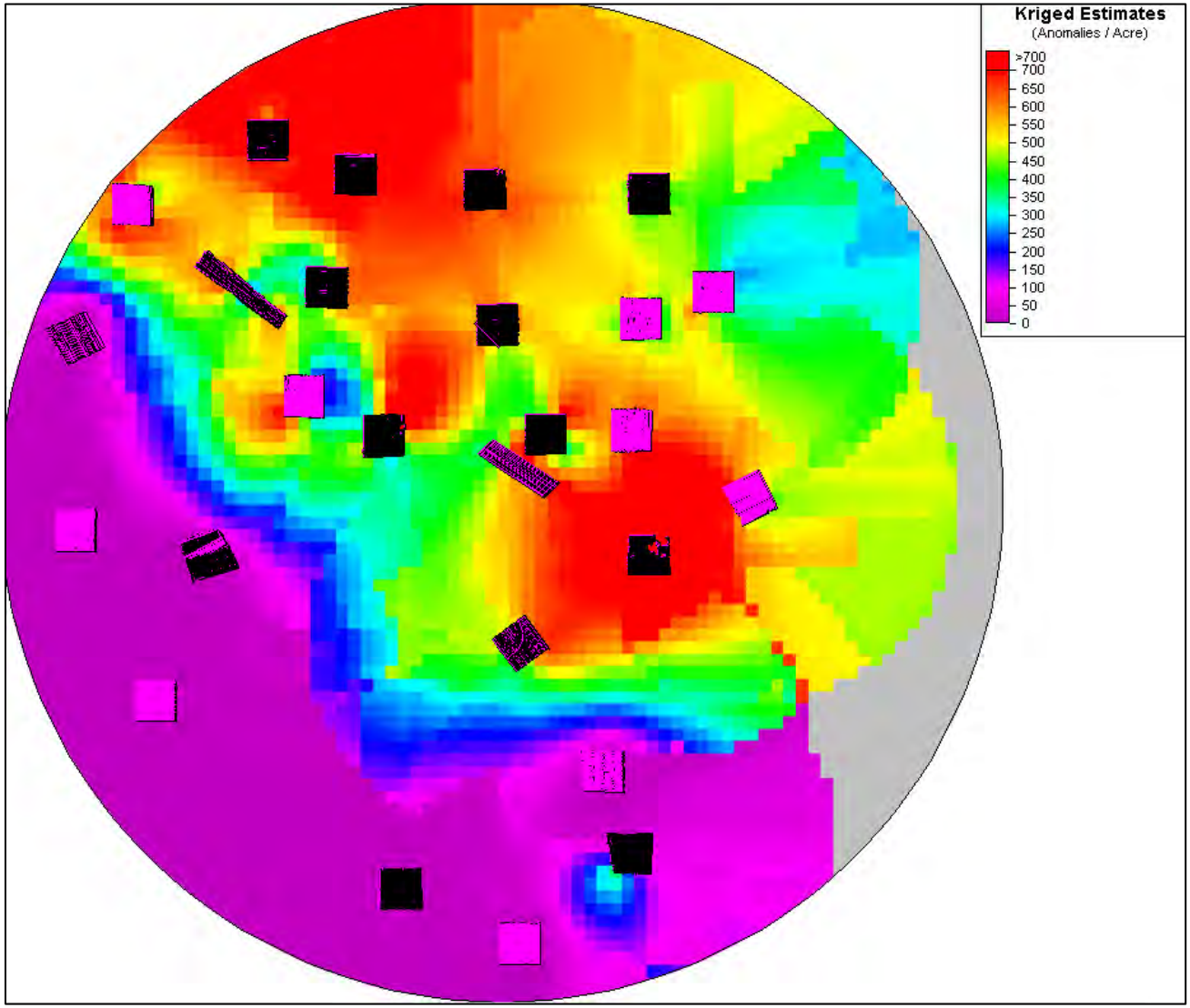

Table 1. DGM Target Types

Target Type	Description	Definition
1	Point	Point Target
2	Tiling	Target selected 40 centimeters or more from a Point Target that may be associated with the Point Target
3	Culture	Target selected at a known cultural feature
4	Poor Decay (Noise)	Target location exhibits poor decay among response channels suggesting it may not have a metallic source
5	Suspected Culture	Target selected where response characteristics suggest presence of unknown cultural feature (e.g., subsurface utility)
6	SRA	Single point attached to boundary of an SRA (SRA ID)
7	Utility/Known Culture Polygon	Single point attached to boundary of response associated with known cultural feature (Polygon ID)
8	Outside of Grid	Target selected outside DGM grid boundary

High-TOI-Density Grids: These 19 grids are located in the upland portion of the MRS and are near the footprints of the former buildings. The High-TOI-Density grids are likely to contain a large number of anomalies that are related to demolished building debris. The average density for these grids is approximately 1,000 anomalies/acre. Cued AGC was initially used in 9 High-TOI-Density grids. Most of the munition items that are related to the 1903 Explosion (6-pound projectiles, 6-inch projectiles, and 13-inch projectiles) are significantly larger than typical construction debris that is present throughout the formerly developed portion of the site (i.e., rebar and nails). In an effort to focus the intrusive investigation towards those anomalies that are less likely to be construction debris and more likely to be MEC, the TOI selection criteria were modified to identify 6-pound projectiles and larger in the 10 remaining high density grids that had not already been investigated with AGC methods. The TOI revised selection criteria is 27 mV on Channel 2 based on the Naval Research Laboratory minimum response estimate for a 6-pound projectile (57 millimeter [mm] mortar equivalent) buried at a depth of 1 foot (ft). The grids are distributed throughout the MRS with two grids biased towards the location of the 1903 explosion origin. Intrusive investigations of AGC TOIs will follow the Iona Island UFP-QAPP requirements (e.g., all Priority 1 and 2 TOIs, all Priority 0 targets [cannot analyze], plus 50 validation targets).

SRAs: These are the areas within the High-TOI-Density grids where the anomaly density is so high that it is not feasible to identify individual targets. AGC was not performed in SRAs. Within the SRAs, a pothole trenching approach will be used to determine the nature of these saturated areas. The number of pothole trenches will be based on the percentage of the grid's area contained in the SRA, with one pothole trench for each 10% (rounded) of the grid's area. For example, if a 100 ft x 100 ft grid (10,000 square feet [ft^2]) contains SRAs totaling 4,000 ft^2 (40%), then four pothole trenches will be semi-randomly placed within the SRAs. The pothole trenches about 2 ft wide x 4 ft long will be intrusively investigated with a mini-excavator to depth of undisturbed soil or bedrock, or if construction debris is encountered (e.g., concrete foundations), in addition to all of the individual targets for said grid that will be intrusively investigated.

Dump Area: This is the wetlands area located between Iona Island and Round Island (red area outlined in Figure 1). Approximately 2,360 linear feet of DGM data were collected in the Dump Area. The area is almost entirely characterized as an SRA and no AGC surveys were performed. There were 15 Priority 1 targets identified that will be intrusively investigated. The SRAs will be investigated using a mini-excavator to excavate pothole trenches if it is possible to get one close enough to the SRAs without getting stuck in the marsh. In SRAs where the mini-excavator cannot travel, an attempt to hand dig the potholes will be made using hand-tools and engineering controls (e.g., coffer dam and dewatering pump). Information recorded from the pothole trench excavations will include the type of material encountered, depth of fill material, odors, and water or soil staining.

In an effort to provide additional subsurface soil sampling data for the potential follow-on Phase II HTRW Dump Area characterization, soil samples will be collected from a side wall and the bottom of each pothole trench and stored at EAs Annex laboratory in Hunt Valley, MD for a maximum of 180 days (maximum RCRA metals holding time). If the HTRW Phase I data analysis determines that the pothole trench soil sampling data will be useful, samples will be sent to a lab for appropriate metals analysis.

Shoreline: EM61-MK2 data were collected in the Hudson River between the northern former dock and south of the Dump Area, along transects spaced approximately 10 ft to a distance of approximately 20 ft out from the shoreline. In general, the transects indicate the area adjacent to the Dump Area is characterized as an SRA. The areas at the northern former dock and middle dock are also characterized as SRAs. The remainder of the transects are generally characterized as low density. Nineteen DGM targets identified in the low-density areas outside of the former dock footprints will be investigated at the same time as the dive operations of the former docks.

Table 2 presents the grid by grid and transect DGM summary and investigation approach. The target locations for intrusive investigation and test pit locations are presented in Attachment B.

Attachments

A	Grid Maps
B	Dig Sheet

Table 2. Grid by Grid Investigation Approach Summary

Grid ID	Grid Density Type	Area Mapped (Acres)	Area of SRAs (Acres)	Area of Culture Polygon (Acres)	Total Point Targets	Number of Type 1 TOIs	Total Type 1 Targets/Acre	TOIs to AGC	TOIs Intrusive	% SRA	# SRA Test Pits (10%)
1	Low	0.253	0.000	0.000	5	5	20	5	2	0%	0
2	High	0.249	0.129	0.009	161	61	552	61	19	52%	5
3	High	0.238	0.187	0.000	95	62	1214	62	11	79%	8
4	High	0.255	0.159	0.000	76	5	52	5	2	62%	6
5	Low	0.255	0.000	0.000	2	2	8	2	1	0%	0
6	High	0.247	0.096	0.000	197	133	880	133	32	39%	4
7	High	0.254	0.017	0.005	226	82	352	82	24	7%	0
8	Low	0.247	0.000	0.000	3	2	8	0	2	0%	0
9	High	0.258	0.229	0.000	19	16	554	16	4	89%	9
10	High	0.252	0.167	0.000	121	74	869	74	13	66%	7
11	High	0.235	0.232	0.000	27	6	1714	6	2	99%	10
12	High	0.246	0.000	0.000	301	89	362	89	18	0%	0
13	Low	0.250	0.000	0.000	10	7	28	0	7	0%	0
14	High	0.261	0.069	0.000	200	123	643	123	30	27%	3
15	High	0.245	0.195	0.004	57	38	837	38	7	80%	8
16	High	0.257	0.000	0.000	254	57	222	57	23	0%	0
17	Low	0.264	0.000	0.000	3	3	11	3	2	0%	0
18	High	0.261	0.191	0.000	117	73	1037	73	13	73%	7
19	High	0.248	0.114	0.000	203	46	344	46	12	46%	5
20	High	0.205	0.200	0.000	56	30	5660	30	9	97%	10
21	Low	0.254	0.000	0.000	12	10	39	0	10	0%	0
22	High	0.256	0.246	0.000	26	12	1165	12	7	96%	10
24	High	0.252	0.018	0.067	251	55	330	55	13	7%	1
25	High	0.251	0.180	0.000	99	12	171	12	3	72%	7
26	High	0.250	0.241	0.000	46	5	538	5	3	96%	10
27	Low	0.286	0.000	0.000	17	10	35	0	10	0%	0
28	Medium	0.255	0.000	0.000	53	31	122	0	31	0%	0
Totals	27	6.783	2.669	0.085	2637	1049	260	989	310	39%	110
Low Density	7	1.809	0.000	0.000	52	39	22	10	34	0%	0
Medium Density	1	0.255	0.000	0.000	53	31	122	0	31	0%	0
High Density	19	4.719	2.669	0.085	2532	979	606	979	245	57%	110
Dump Area		0.090	0.068	0.000	49	15	674	0	14	75%	8
Shoreline		0.420	0.130	0.000	45	33	114	0	19	31%	0

Note: Intrusive targets include all Category 0, 1 and 2 AGC anomalies plus 50 Category 3 validation anomalies.
Note: Yellow highlights grids in which DGM selection criteria was raised to identify 6-lb projectile or larger.
Note: Only the DGM targets outside the former dock footprint/underwater survey area will be investigated along the shoreline.

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ATTACHMENT A
GRID MAPS

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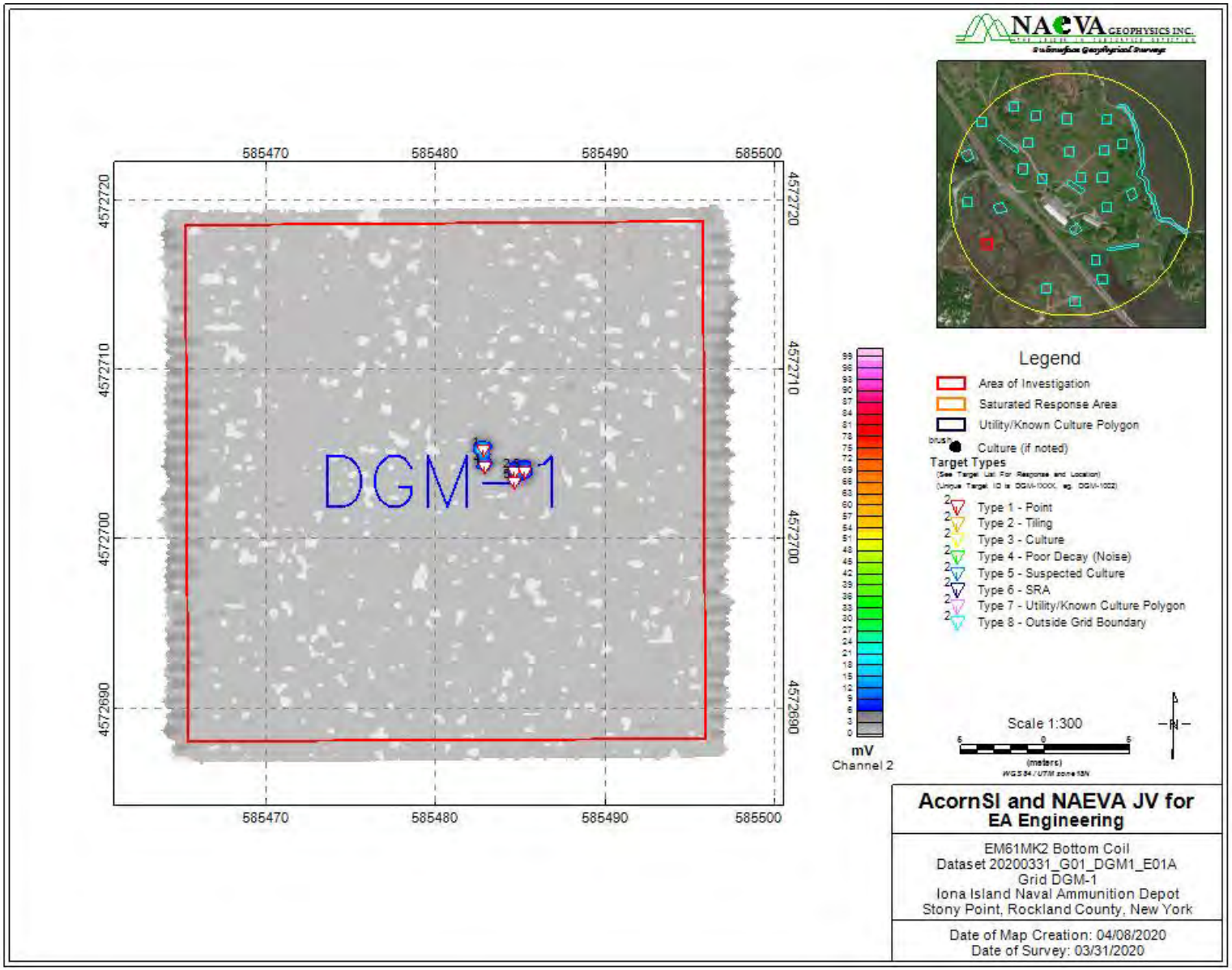
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585500
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4572700
4572690
DGM-1
mV
Channel 2
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Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
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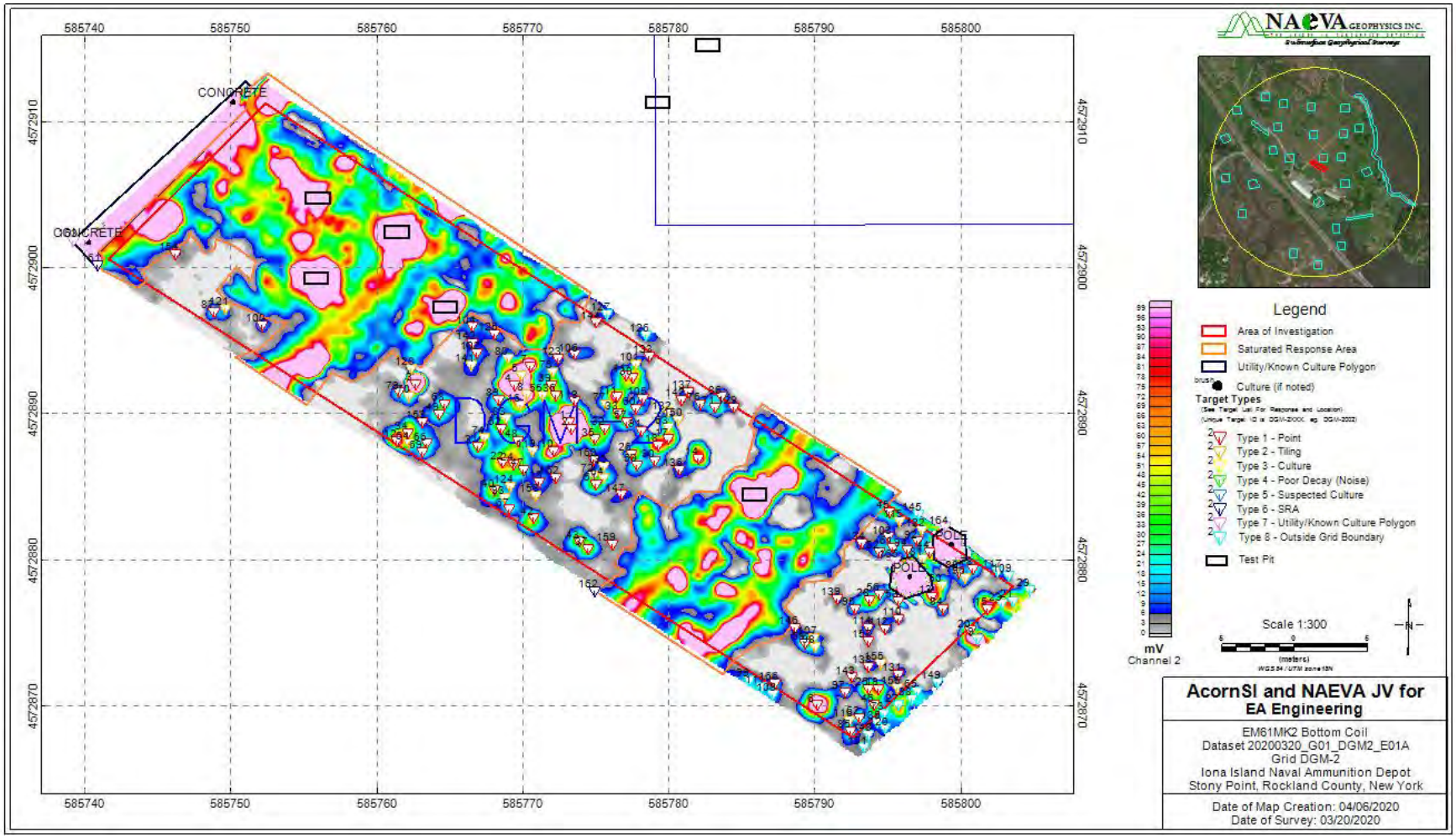
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CONCRETE
CONCRETE
POLE
POLE
NAEVA GEOPHYSICS INC.
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
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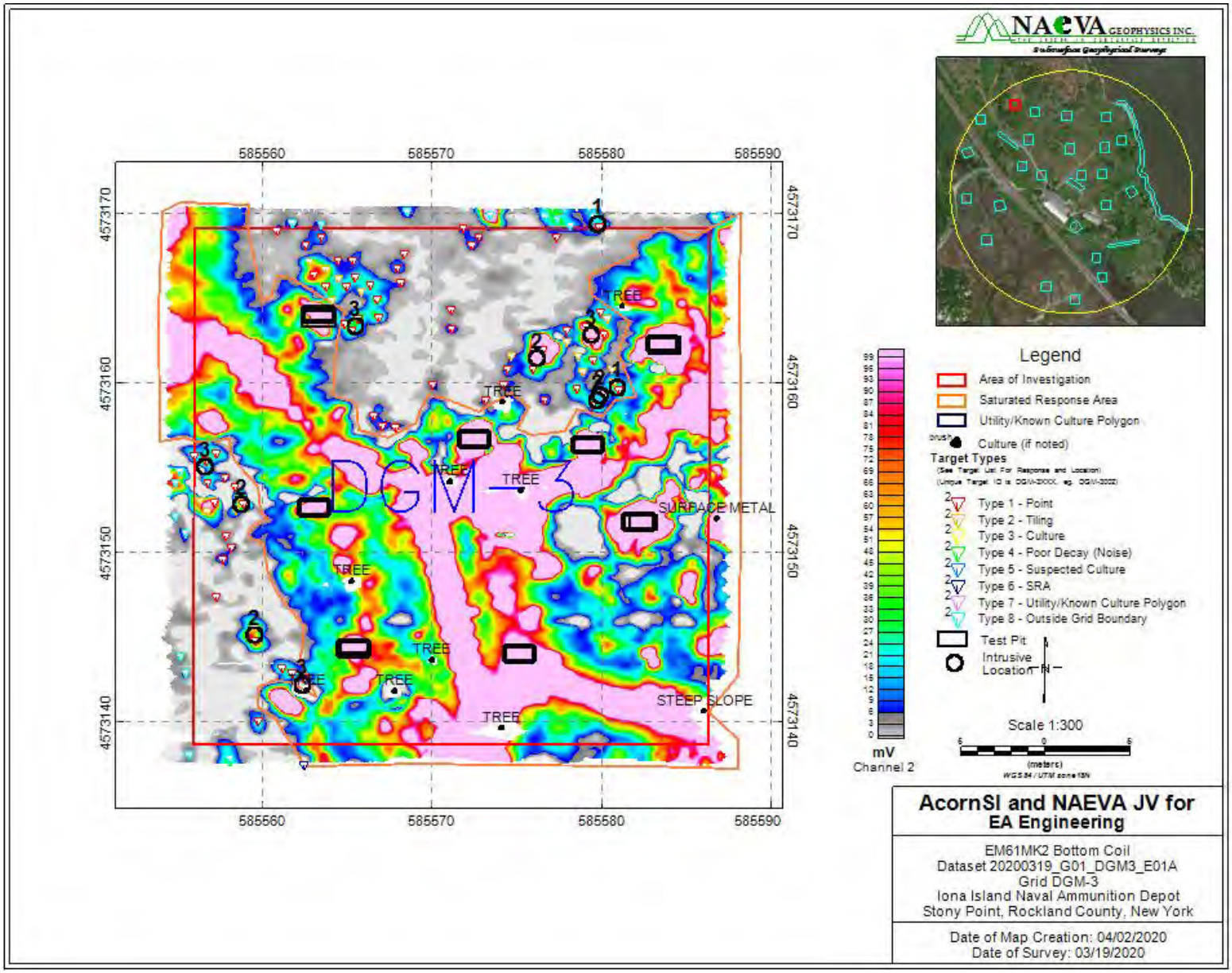
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TREE
SURFACE METAL
STEEP SLOPE
DGM-3
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
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Test Pit
Intrusive Location
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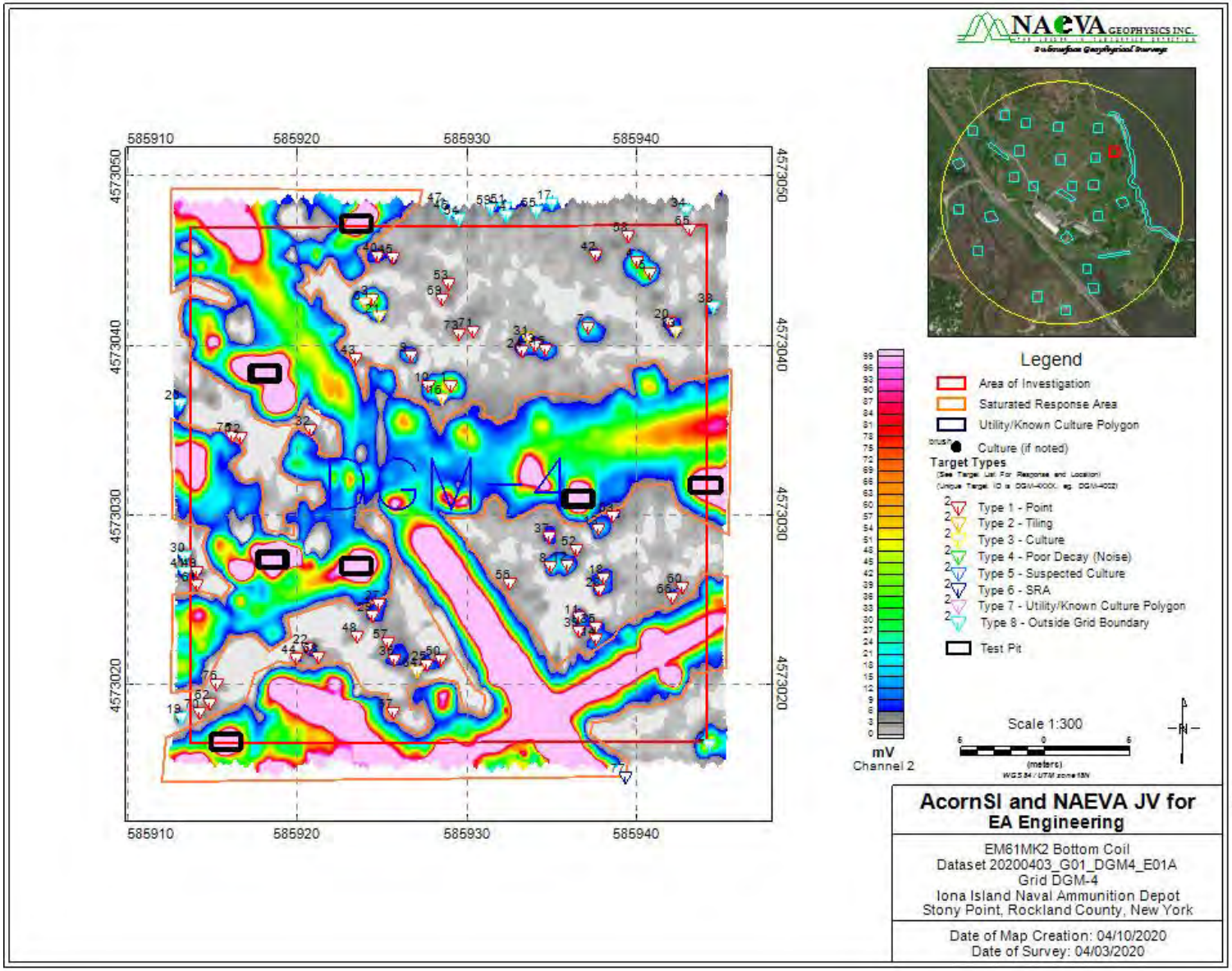
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Saturated Response Area
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Culture (if noted)
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Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
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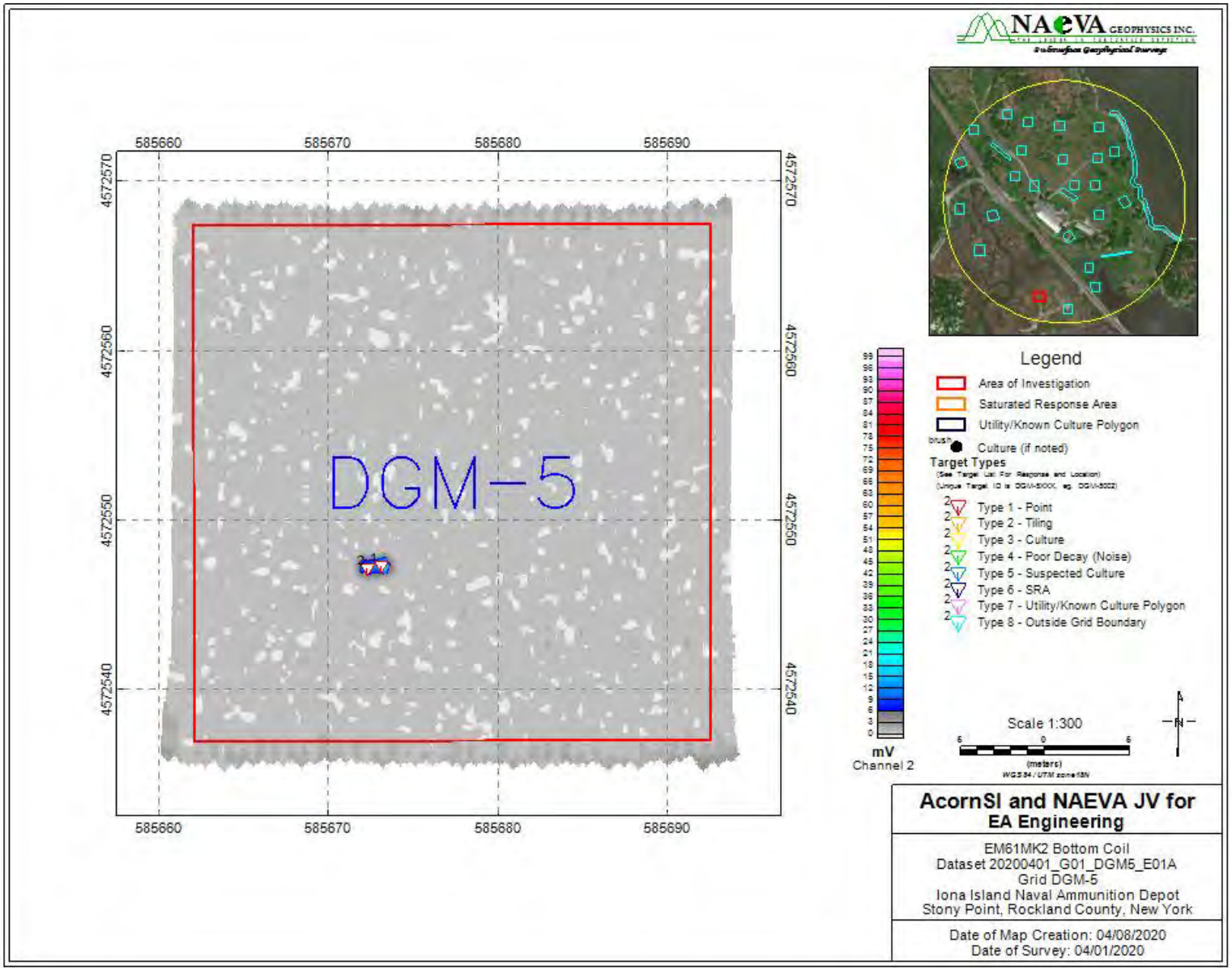
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Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
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Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
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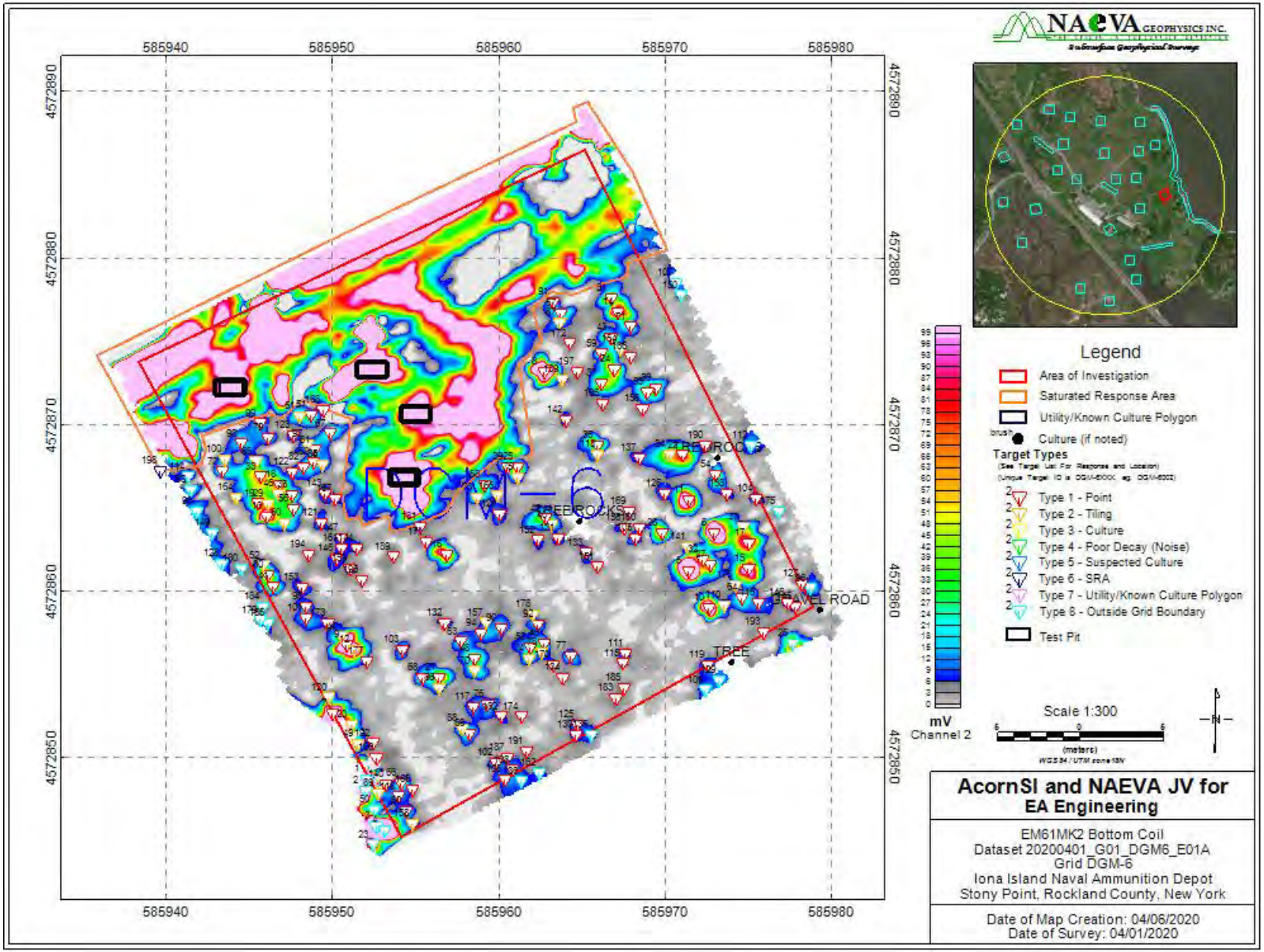
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TREE ROCKS
GRAVEL ROAD
TREE
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Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
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(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
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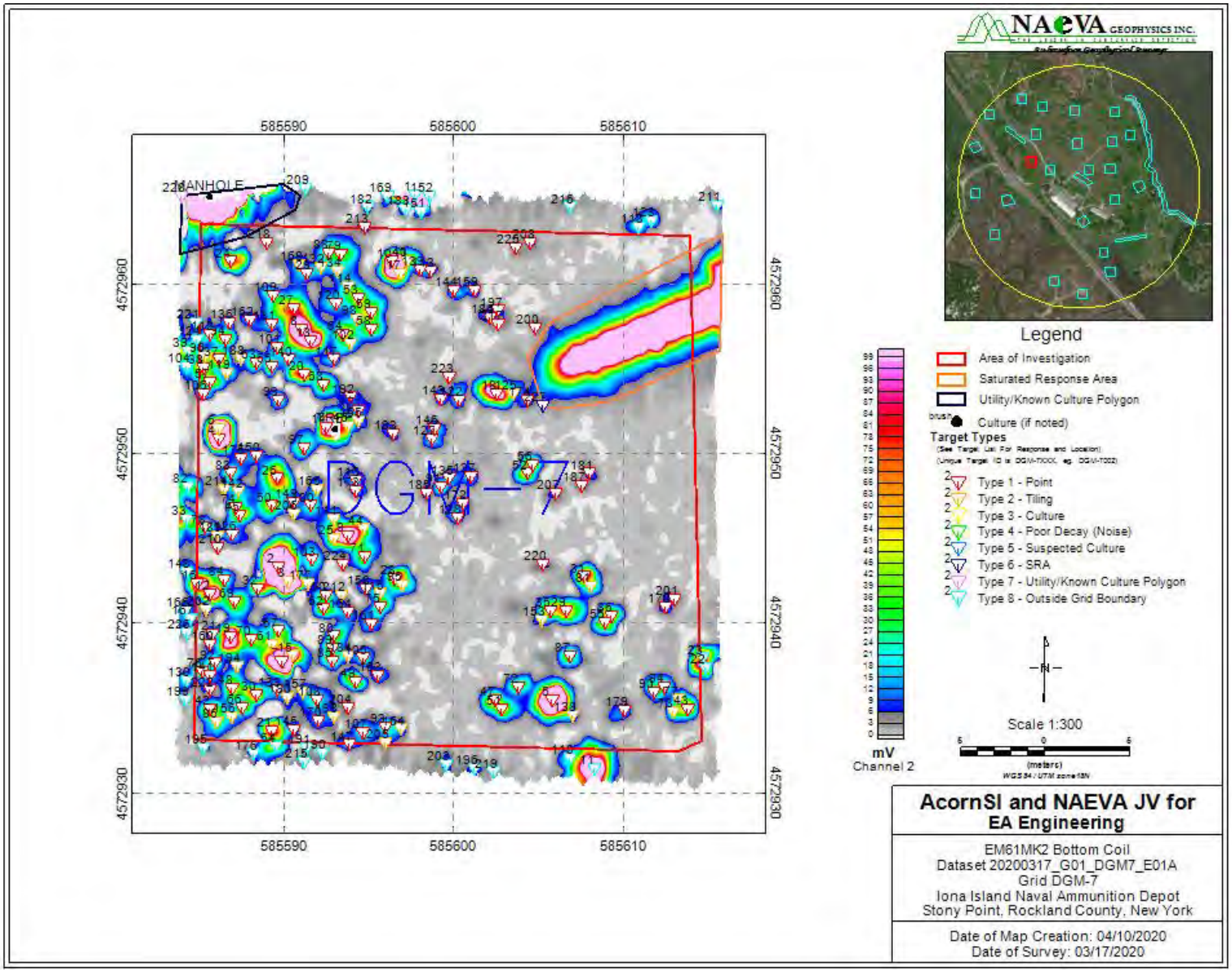
Date of Map Creation: 04/06/2020
Date of Survey: 04/01/2020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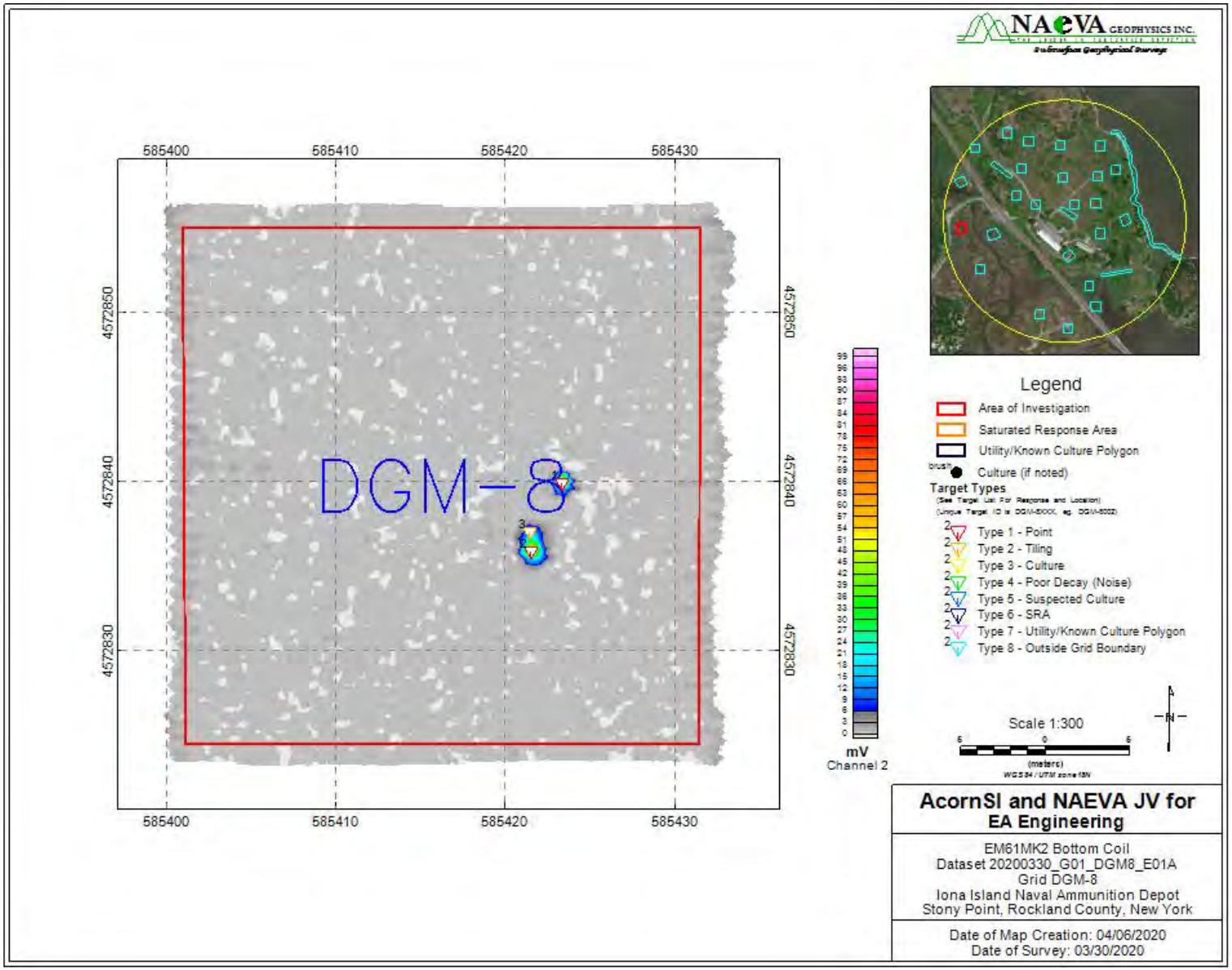
4572960
4572950
4572940
4572930
MANHOLE
DGM-7
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
mV
Channel 2
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200317_G01_DGM7_E01A
Grid DGM-7
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 03/17/2020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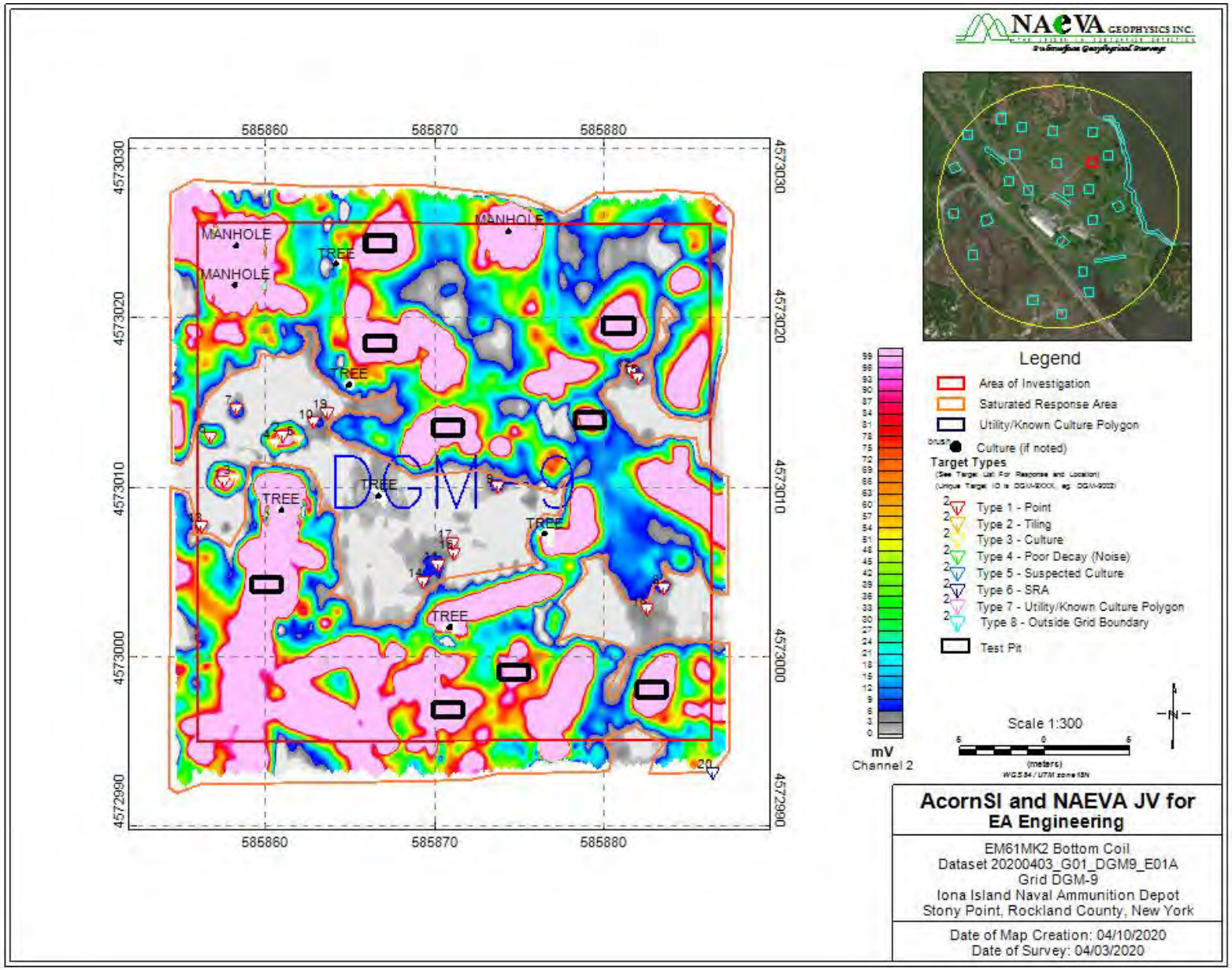
DGM-8
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200330_G01_DGM8_E01A
Grid DGM-8
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/06/2020
Date of Survey: 03/30/2020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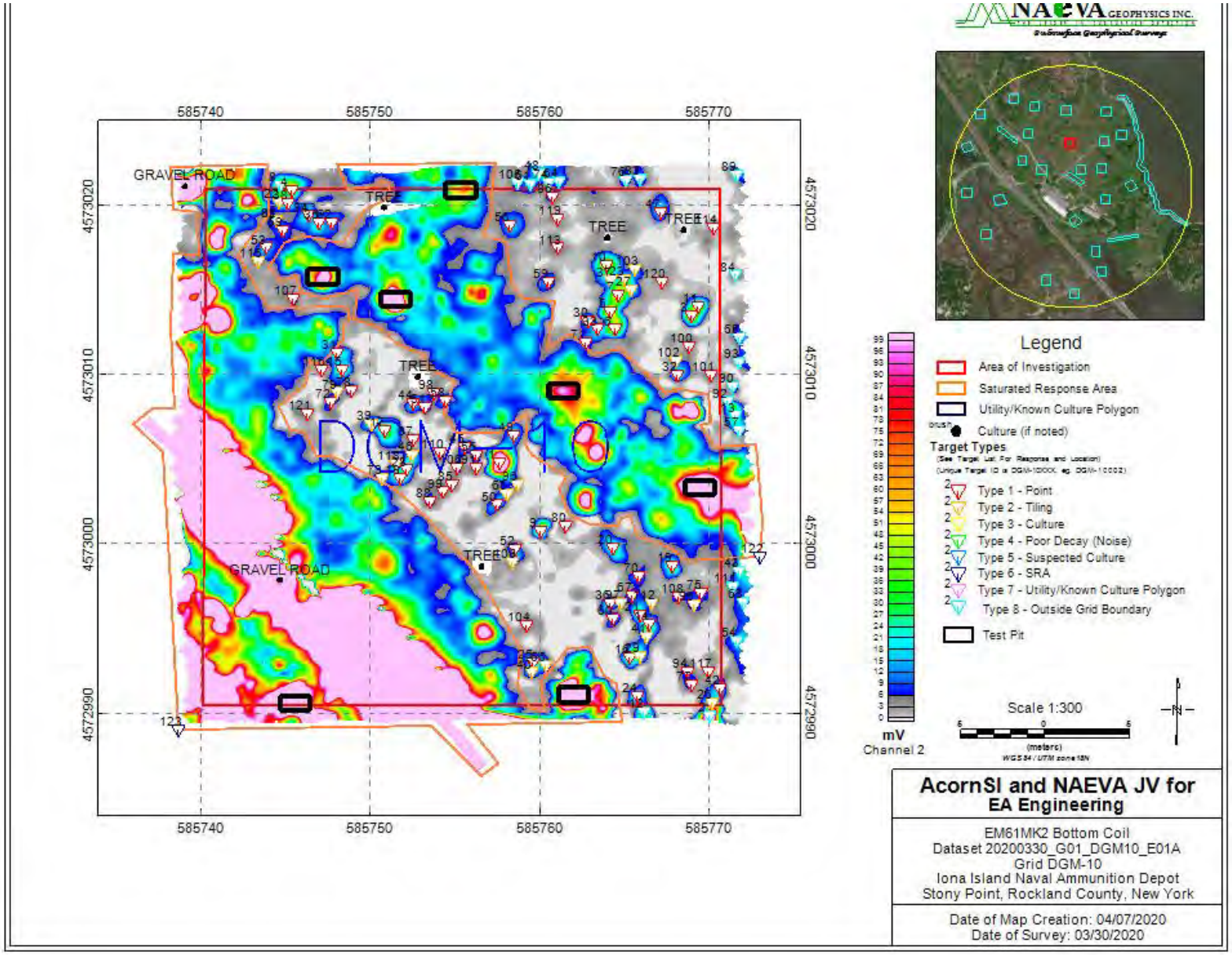
MANHOLE
MANHOLE
MANHOLE
TREE
TREE
TREE
TREE
TREE
TREE
DGM9
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
Scale 1:300
(meters)
N
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200403_G01_DGM9_E01A
Grid DGM-9
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 04/03/2020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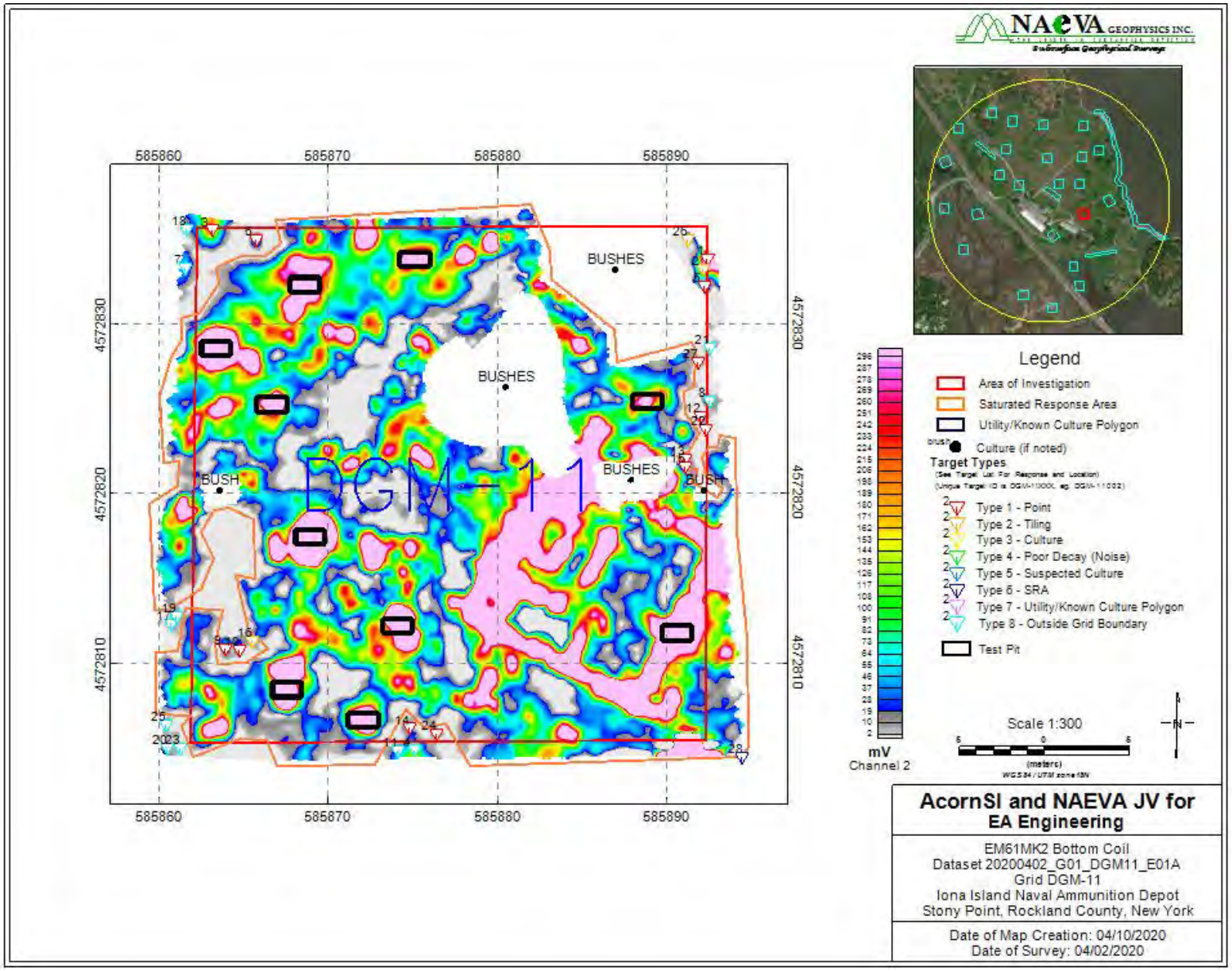
4572990
GRAVEL ROAD
TREE
DGM10
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
Scale 1:300
(meters)
N
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200330_G01_DGM10_E01A
Grid DGM-10
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/07/2020
Date of Survey: 03/30/2020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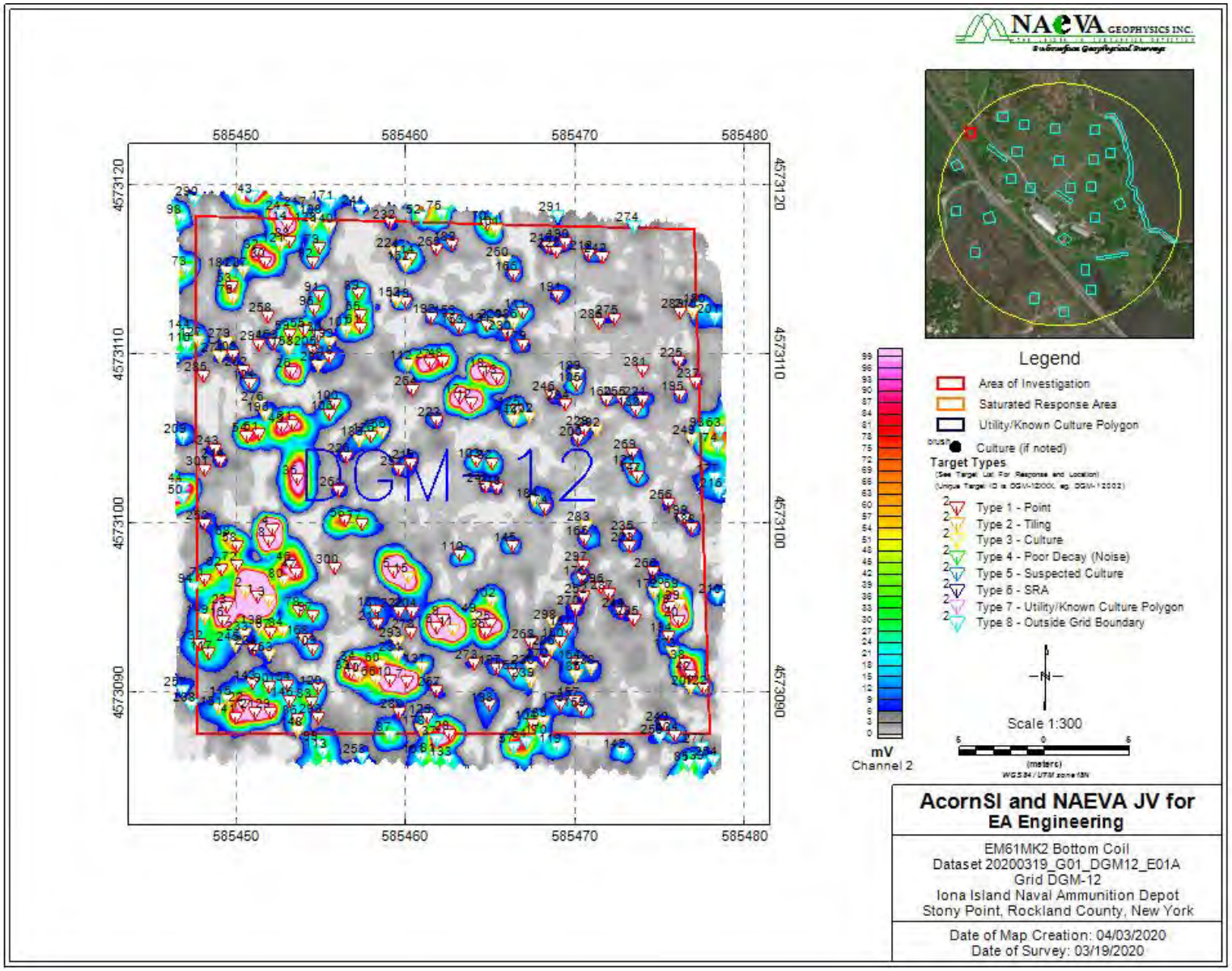
4572820
4572810
BUSHES
BUSHES
BUSHES
BUSH
BUSH
DGM-11
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200402_G01_DGM11_E01A
Grid DGM-11
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 04/02/2020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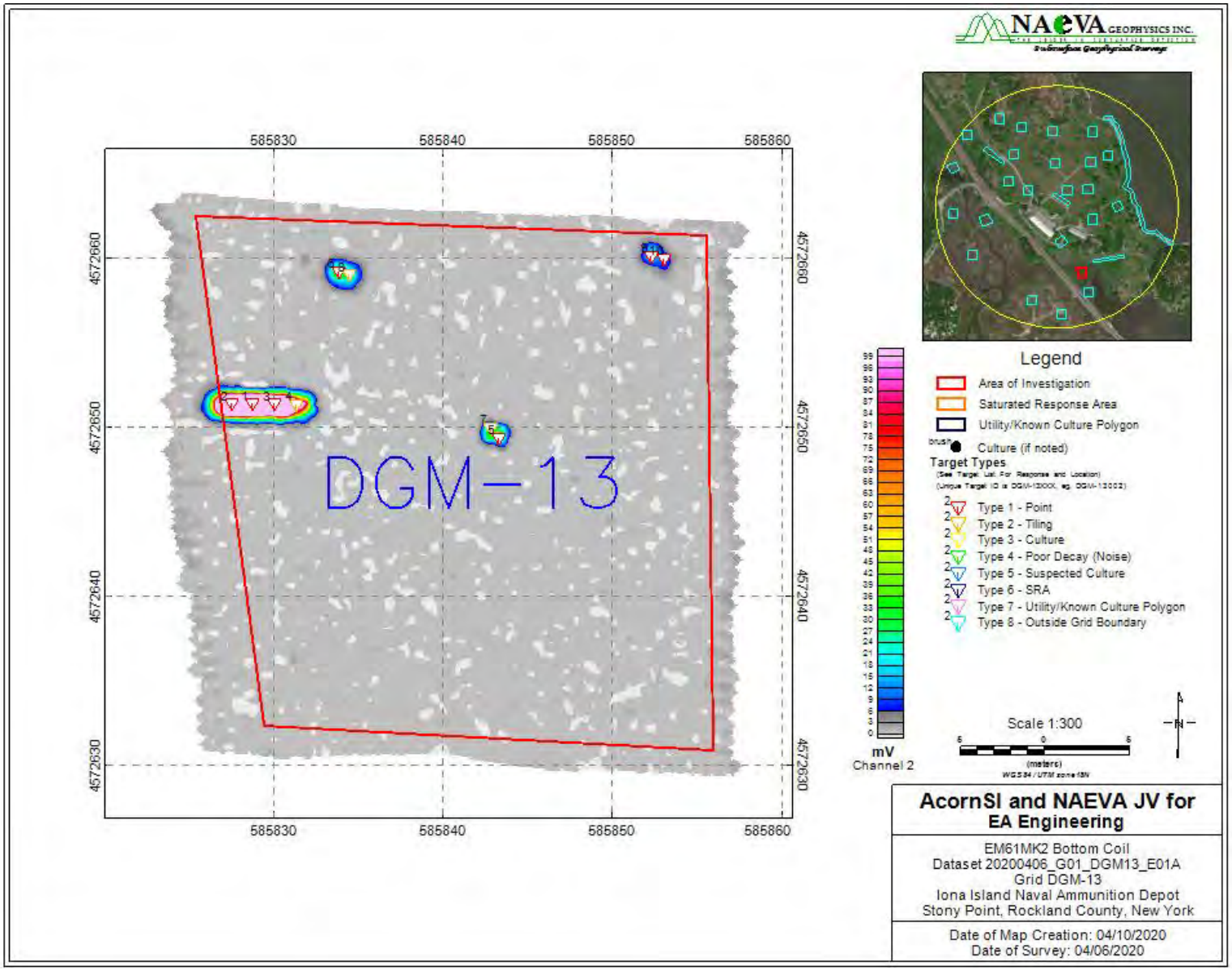
585480
4573120
4573110
4573100
4573090
DGM 12
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
mV
Channel 2
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200319_G01_DGM12_E01A
Grid DGM-12
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/03/2020
Date of Survey: 03/19/2020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585860
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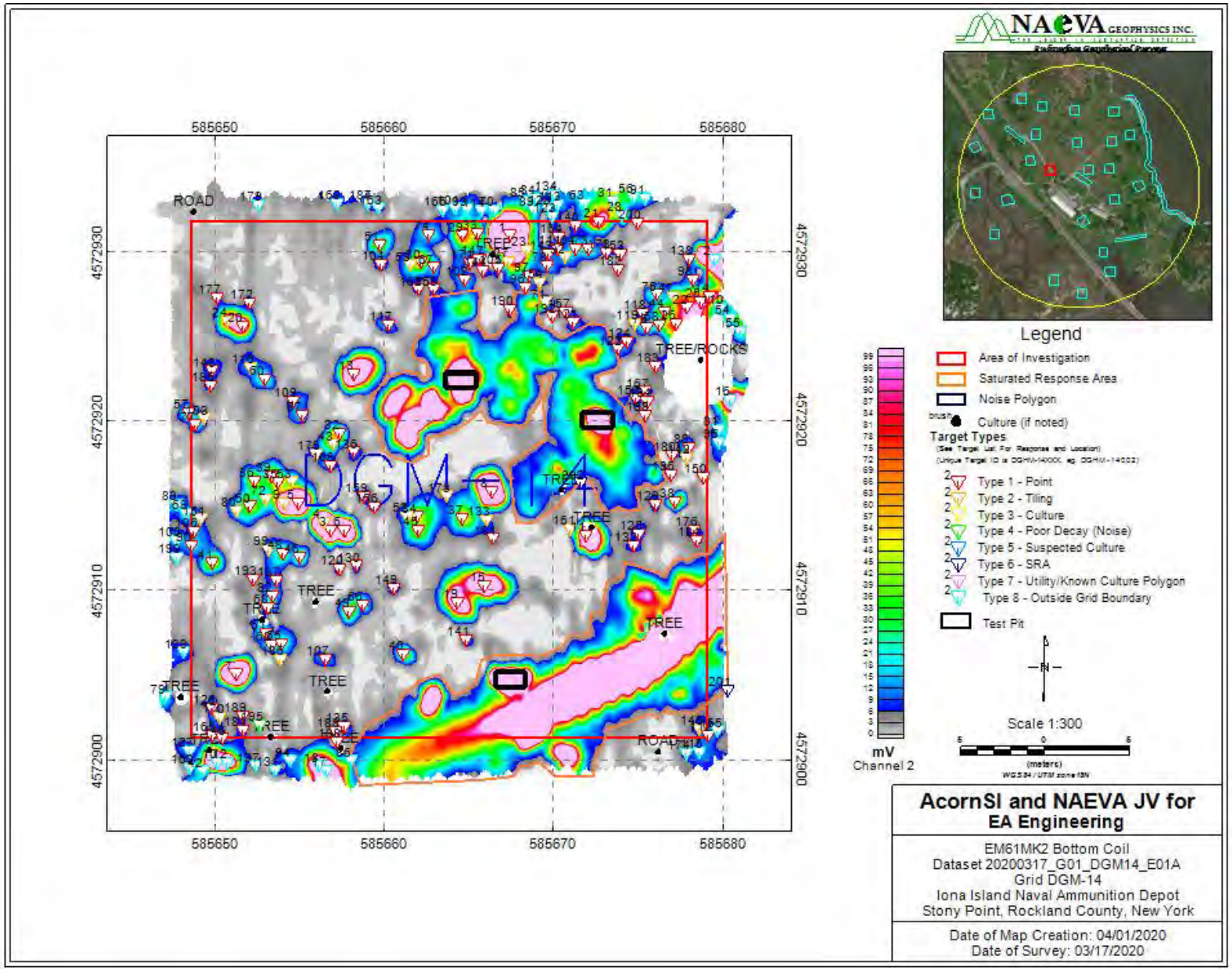
4572650
4572640
4572630
DGM-13
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200406_G01_DGM13_E01A
Grid DGM-13
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 04/06/2020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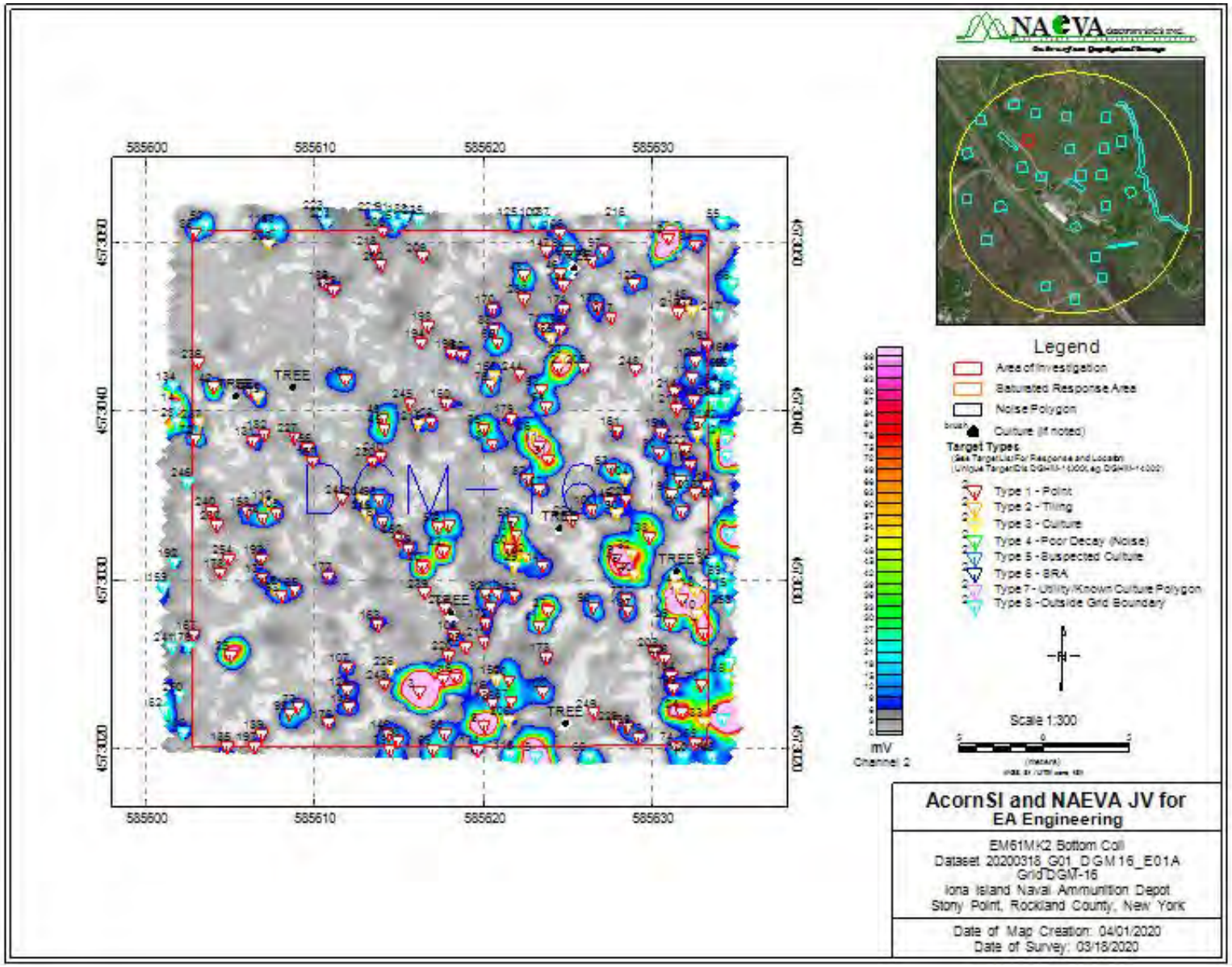
4572900
ROAD
TREE
TREE/ROCKS
DGM-14
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Noise Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
N
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200317_G01_DGM14_E01A
Grid DGM-14
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/01/2020
Date of Survey: 03/17/2020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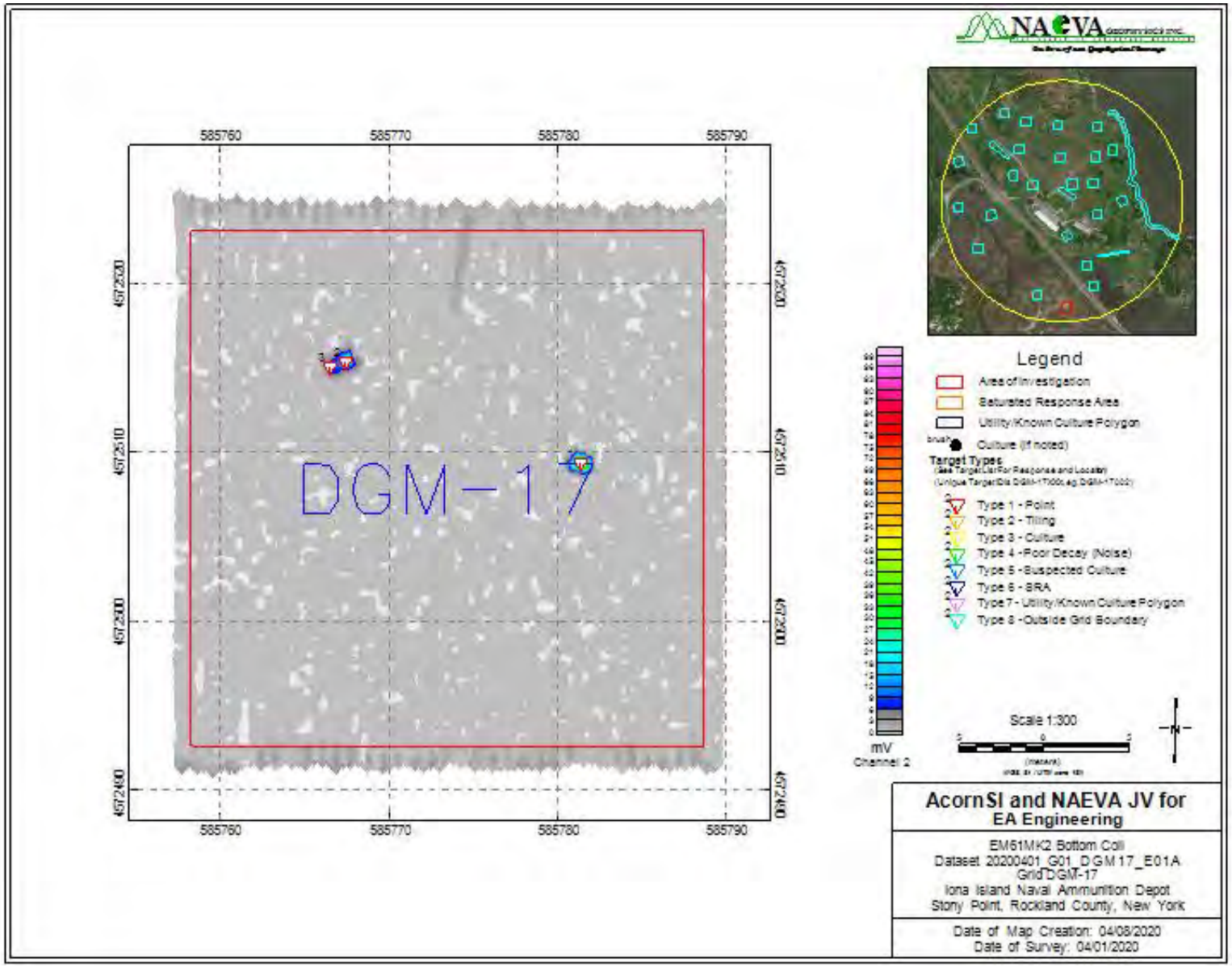
457050
TREE
DGM-16
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Noise Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200318_G01_DGM16_E01A
Grid DGM-16
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/01/2020
Date of Survey: 03/16/2020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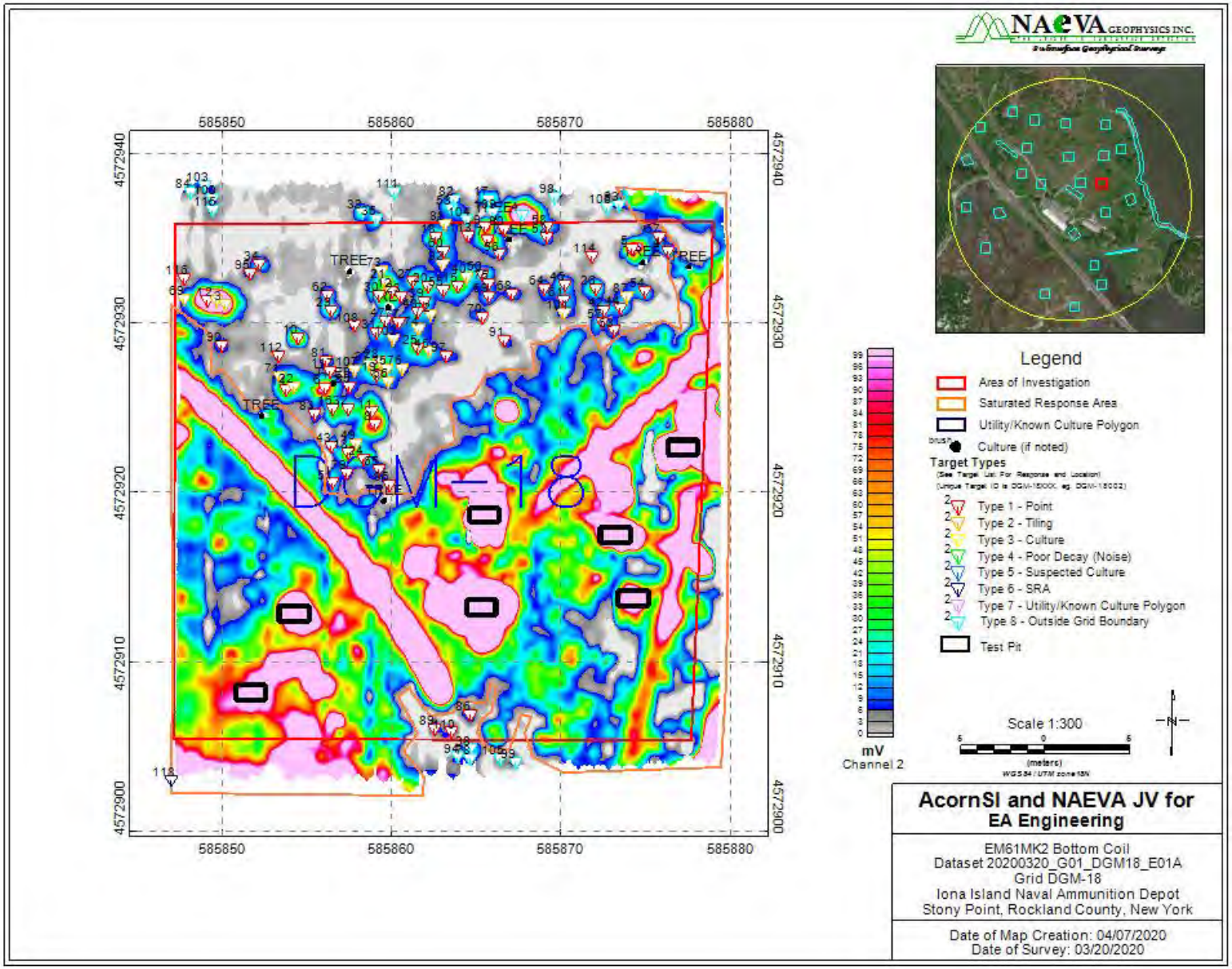
457240
DGM-17
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
mV
Channel 2
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200401_G01_DGM17_E01A
Grid DGM-17
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/08/2020
Date of Survey: 04/01/2020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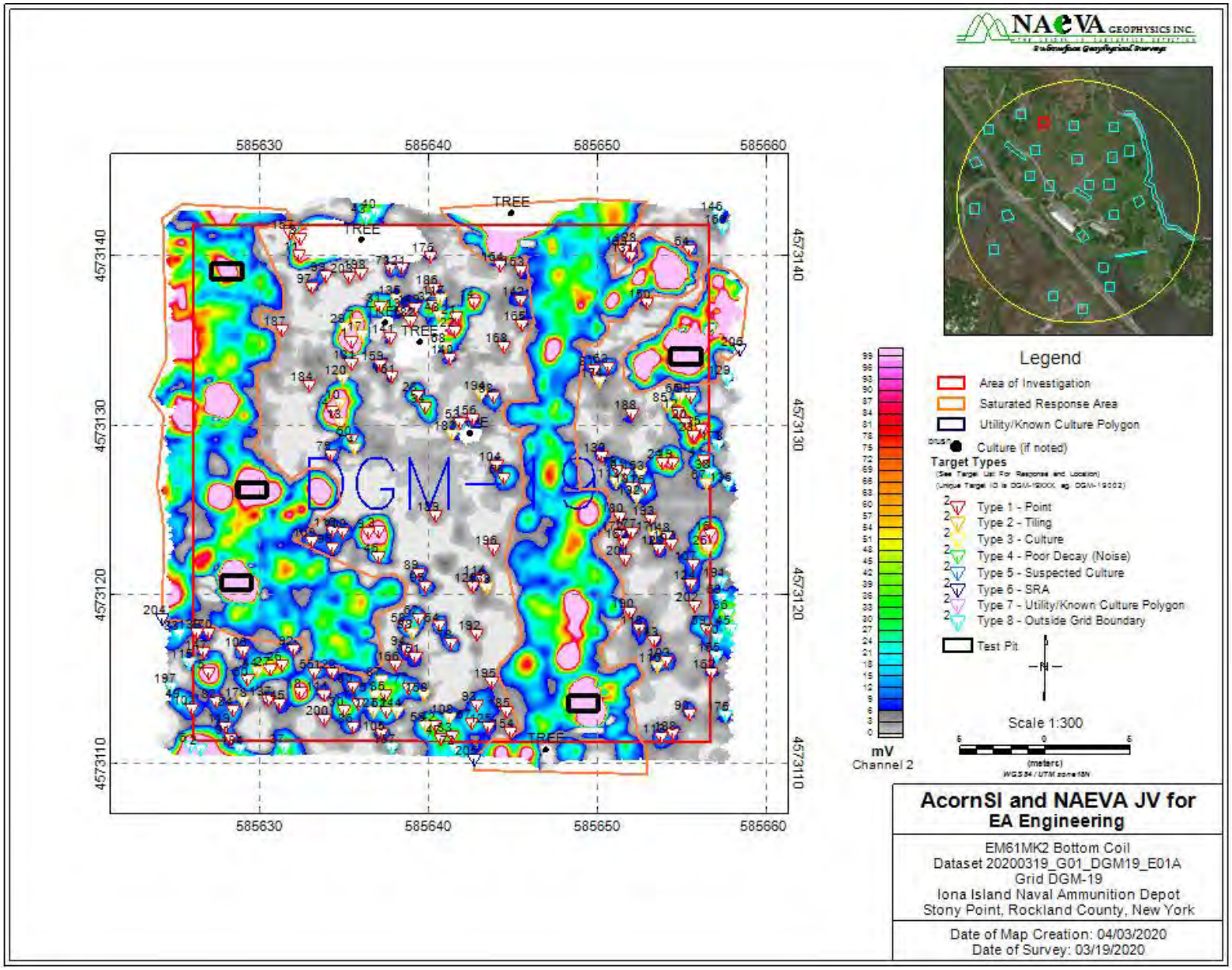
4572930
4572920
4572910
4572900
DGM-18
TREE
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
Scale 1:300
(meters)
N
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200320_G01_DGM18_E01A
Grid DGM-18
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/07/2020
Date of Survey: 03/20/2020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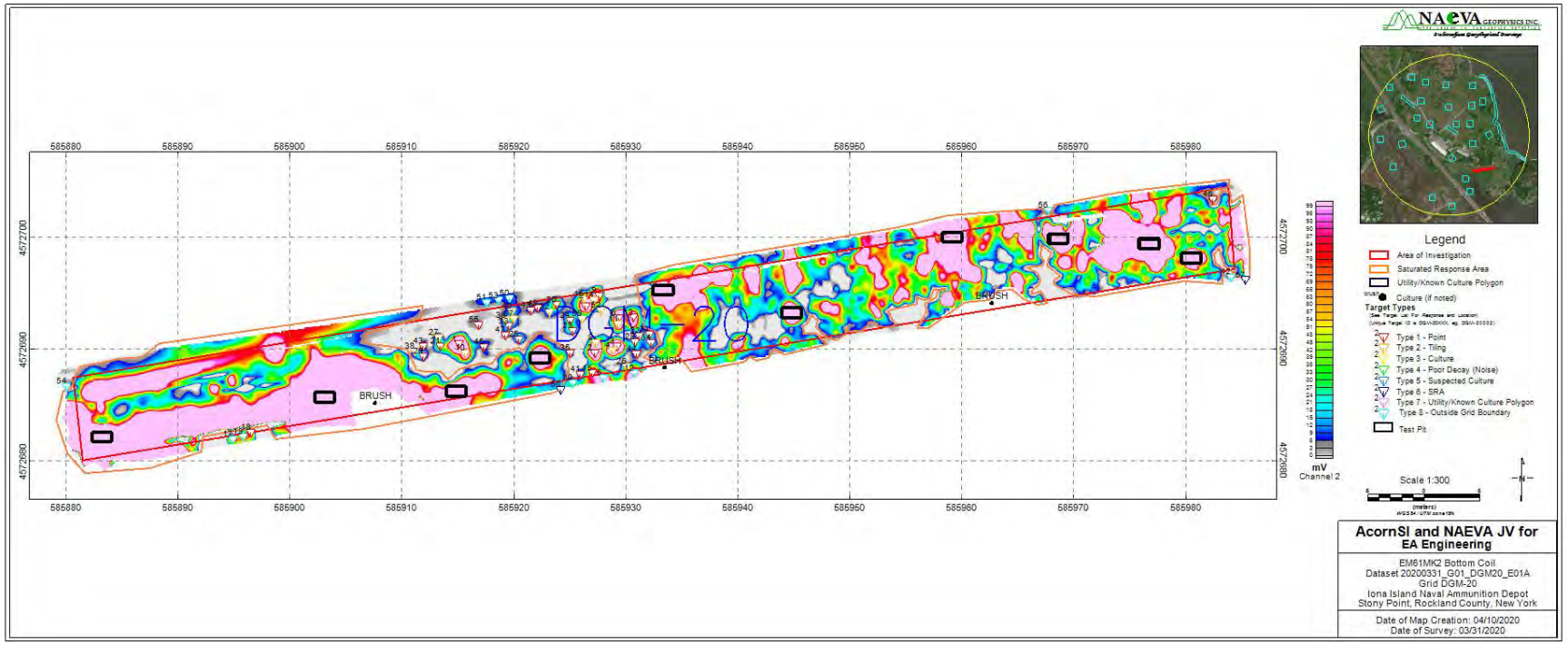
4573130
4573120
4573110
TREE
DGM-19
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
Scale 1:300
(meters)
mV
Channel 2
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200319_G01_DGM19_E01A
Grid DGM-19
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/03/2020
Date of Survey: 03/19/2020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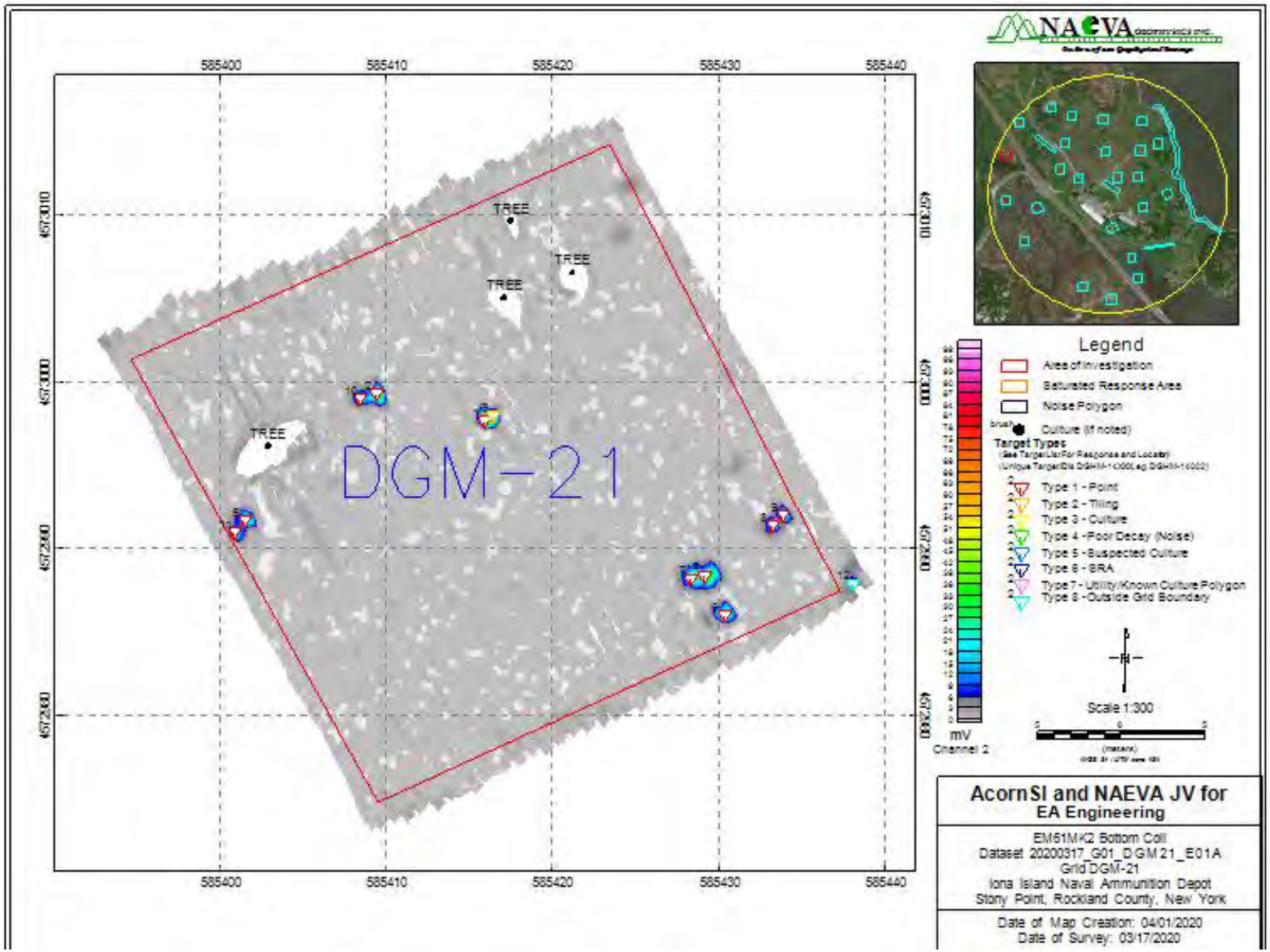
4572680
BRUSH
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200331_G01_DGM20_E01A
Grid DGM-20
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 03/31/2020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457300
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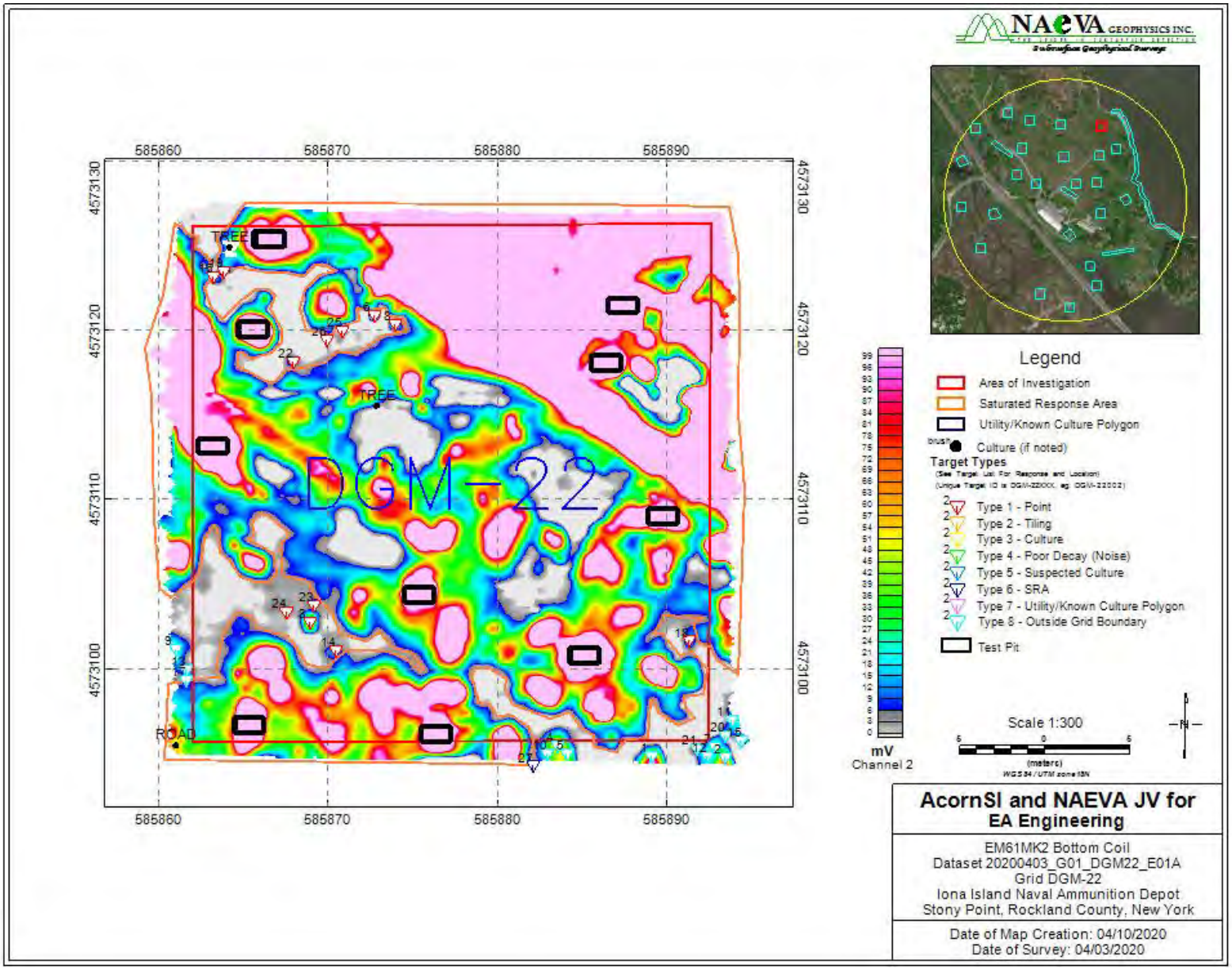
TREE
TREE
TREE
TREE
DGM-21
Legend
Area of Investigation
Saturated Response Area
Noise Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - BRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
mV
Channel 2
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200317_G01_DGM21_E01A
Grid DGM-21
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/01/2020
Date of Survey: 03/17/2020


NAEVA GEOPHYSICS INC.
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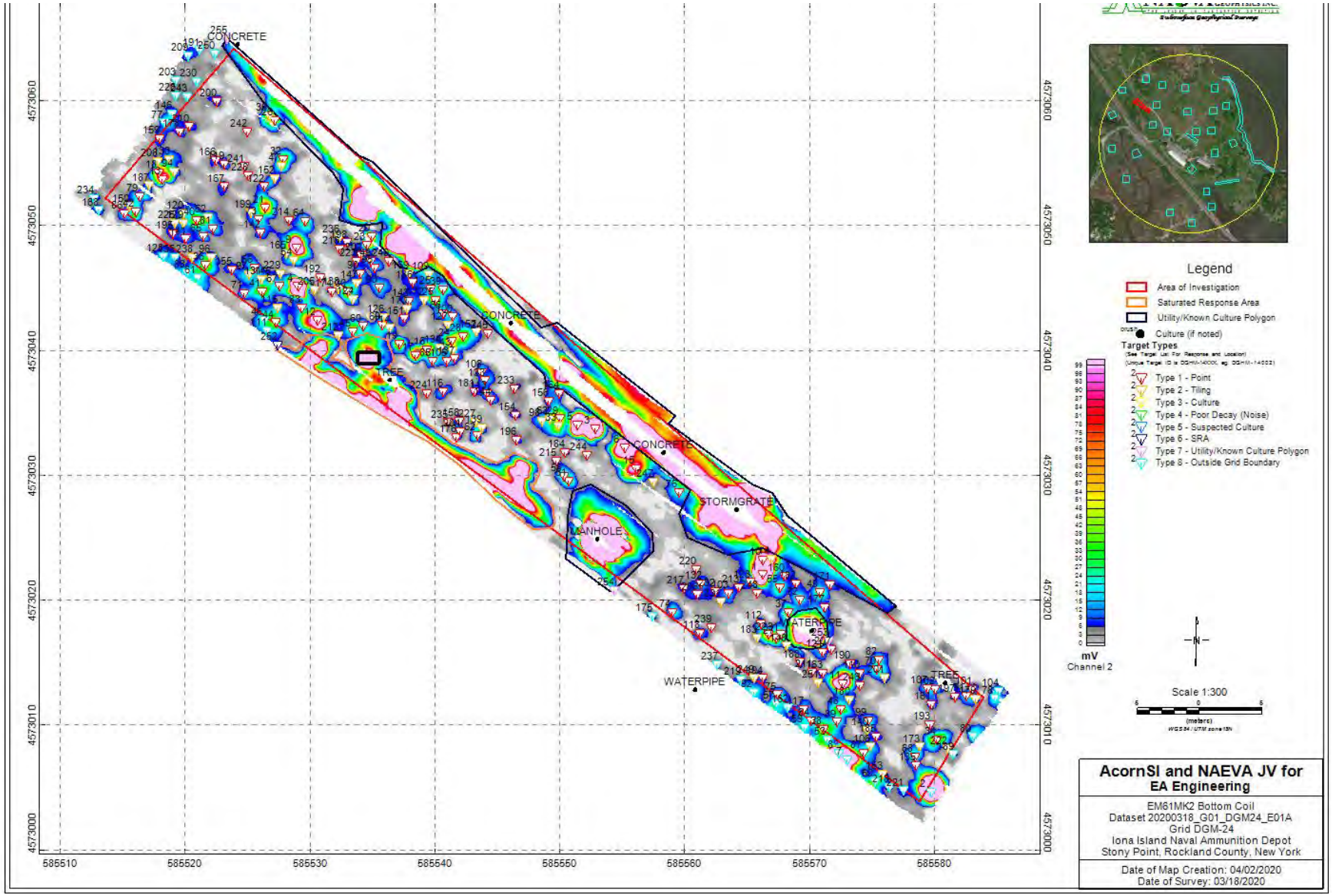
TREE
TREE
ROAD
DGM-22
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200403_G01_DGM22_E01A
Grid DGM-22
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 04/03/2020


Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
mV
Channel 2
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200318_G01_DGM24_E01A
Grid DGM-24
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/02/2020
Date of Survey: 03/18/2020
CONCRETE
TREE
STORMGRATE
MANHOLE
WATERPIPE
585510
585520
585530
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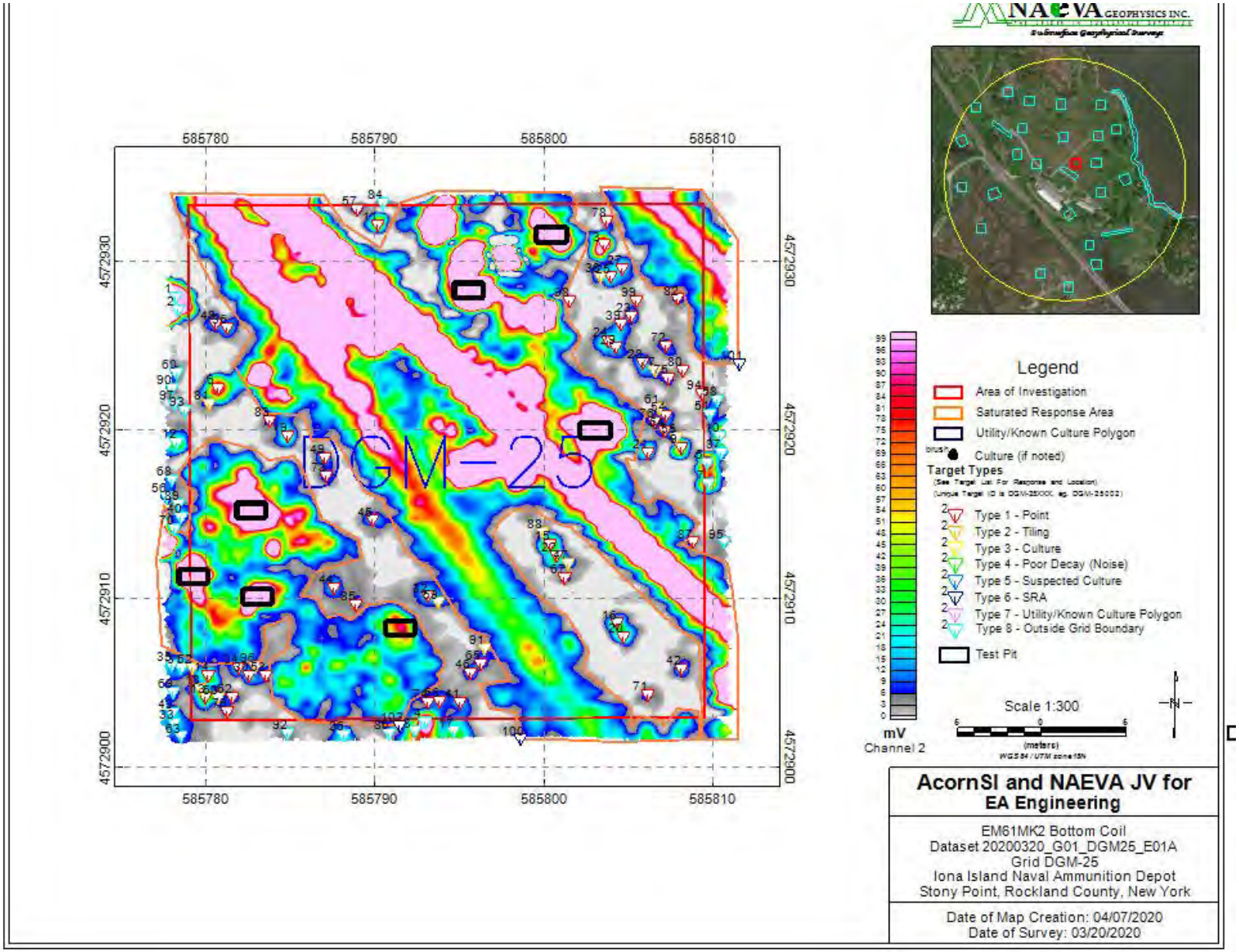
4573060


NAEVA GEOPHYSICS INC.
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585810
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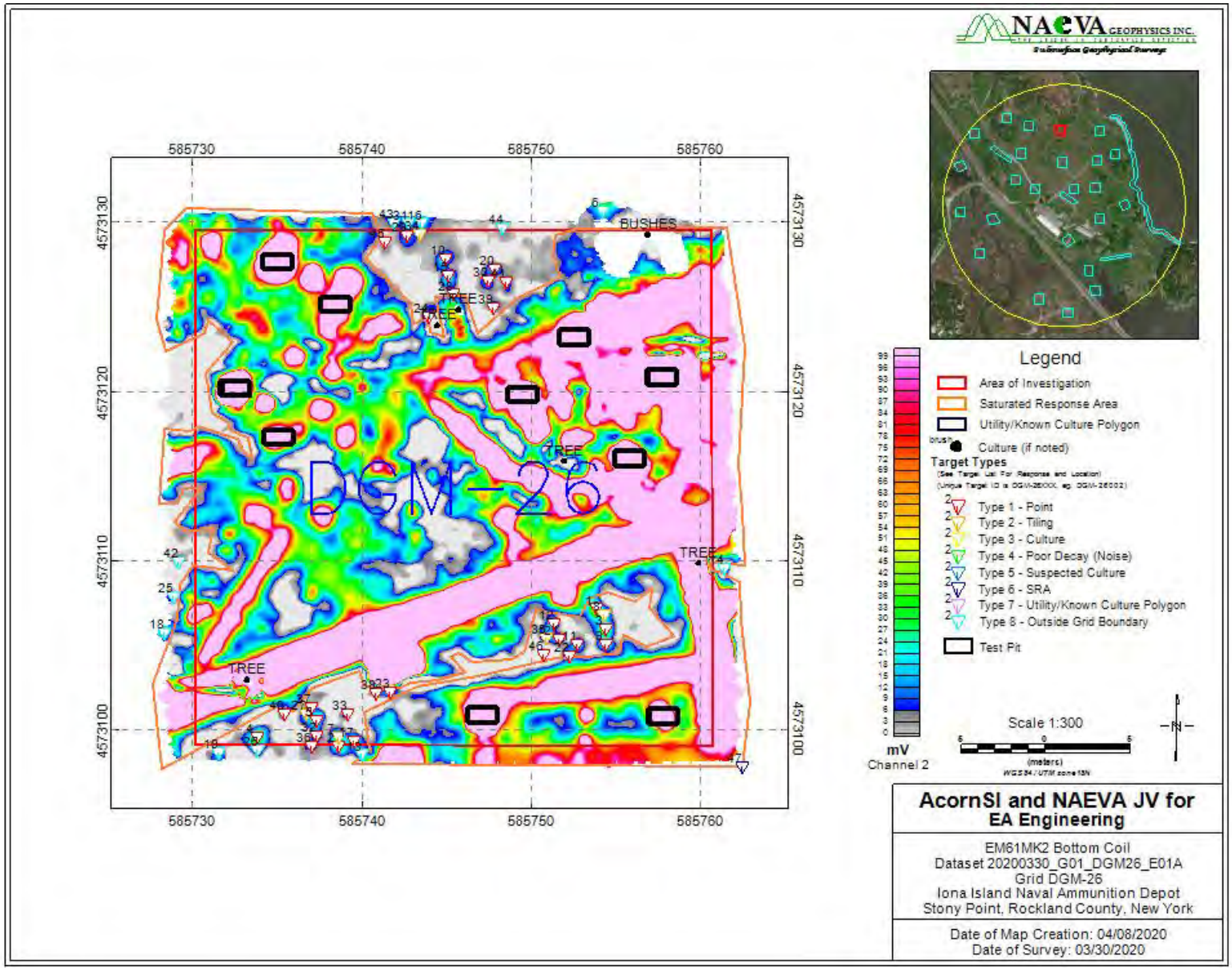
4572910
4572900
DGM-25
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200320_G01_DGM25_E01A
Grid DGM-25
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/07/2020
Date of Survey: 03/20/2020


NAEVA GEOPHYSICS INC.
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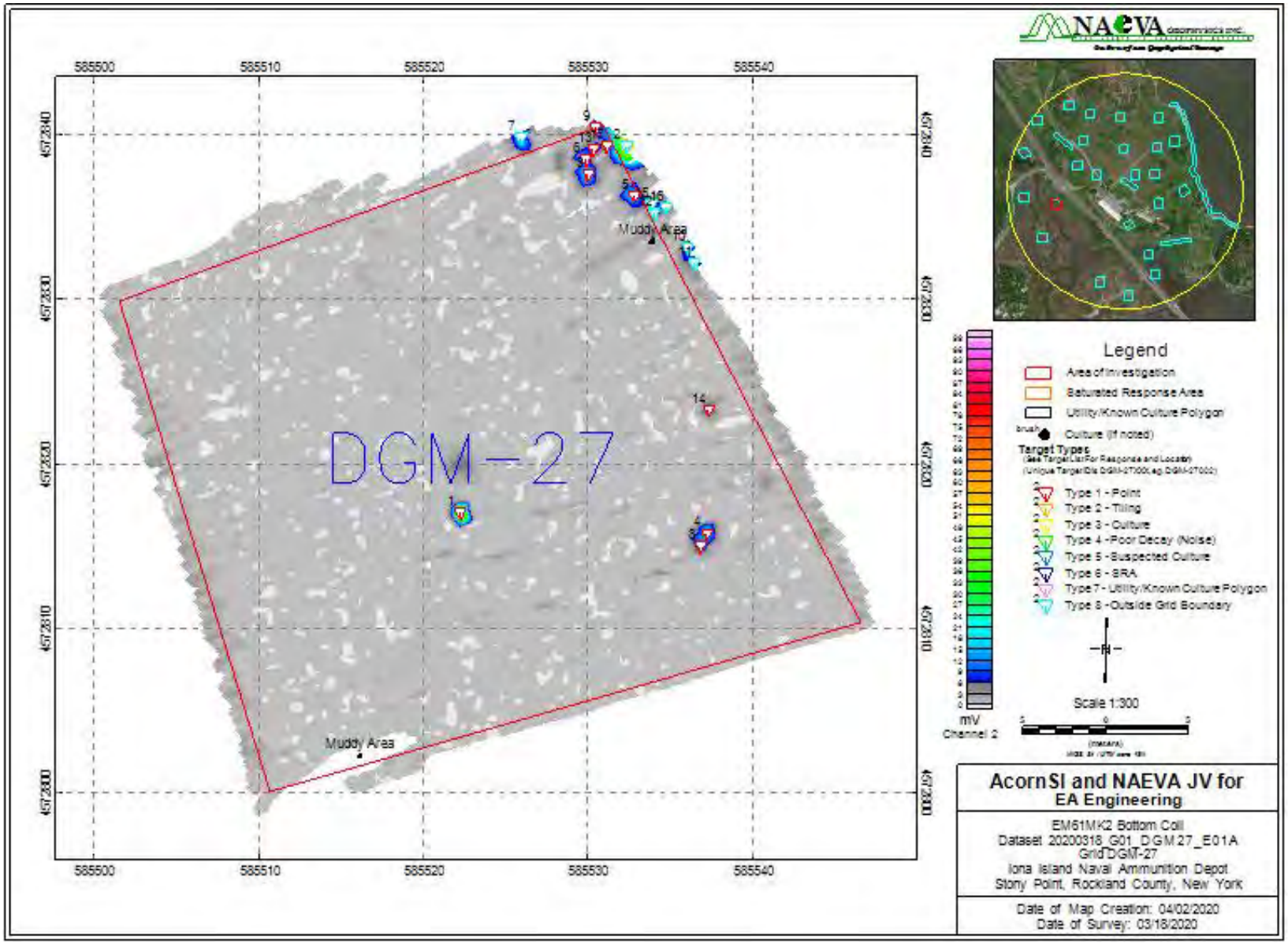
585760
4573130
4573120
4573110
4573100
BUSHES
TREE
DGM-26
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Test Pit
mV
Channel 2
Scale 1:300
(meters)
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200330_G01_DGM26_E01A
Grid DGM-26
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/08/2020
Date of Survey: 03/30/2020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457320
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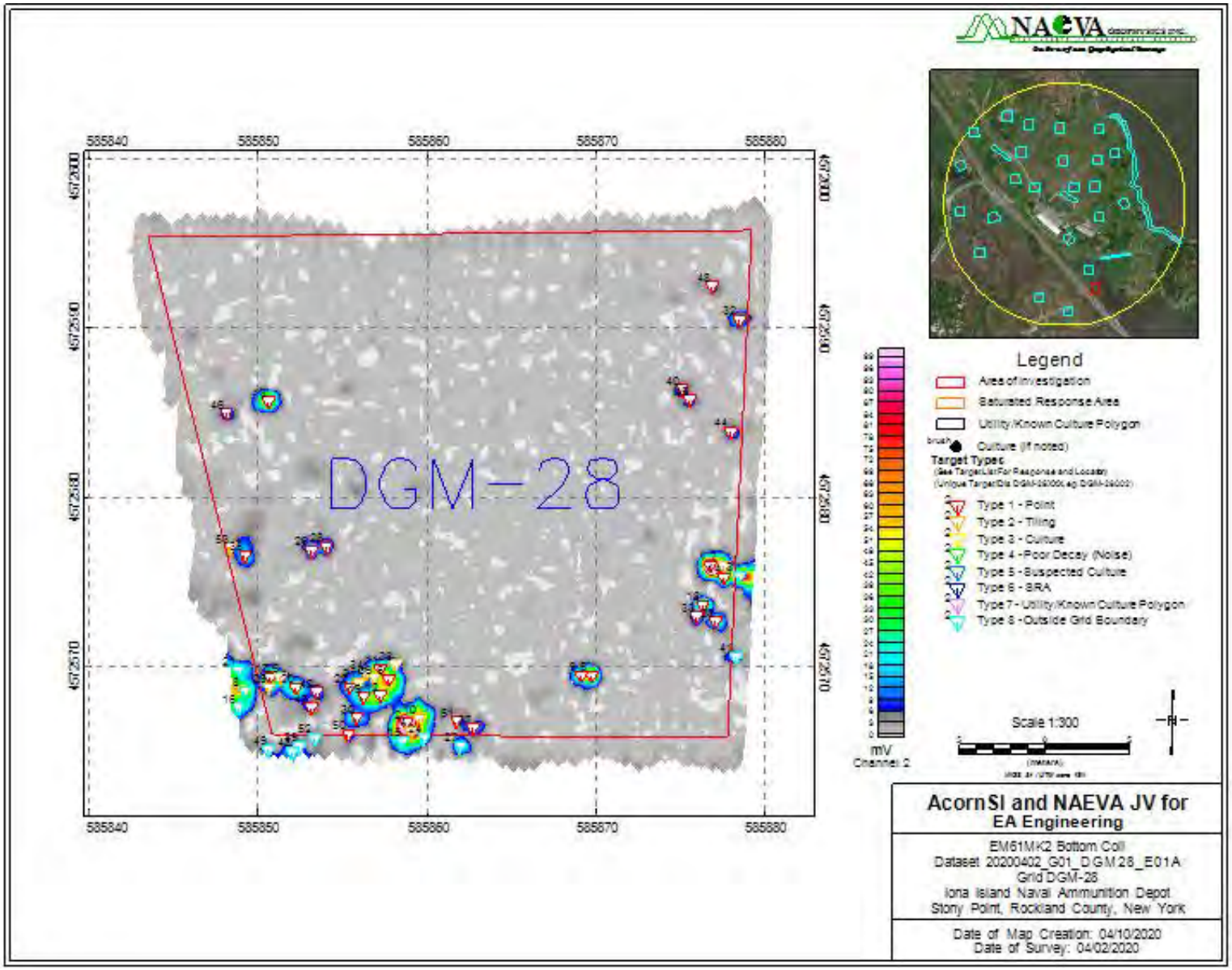
457300
DGM-27
Muddy Area
Muddy Area
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
mV
Channel 2
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200318_G01_DGM27_E01A
Grid DGM-27
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/02/2020
Date of Survey: 03/18/2020


585840
585850
585860
585870
585880
457300
457290
457280
457270
DGM-28
mV
Channel 2
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - BRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200402_G01_DGM28_E01A
Grid DGM-28
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/10/2020
Date of Survey: 04/02/2020

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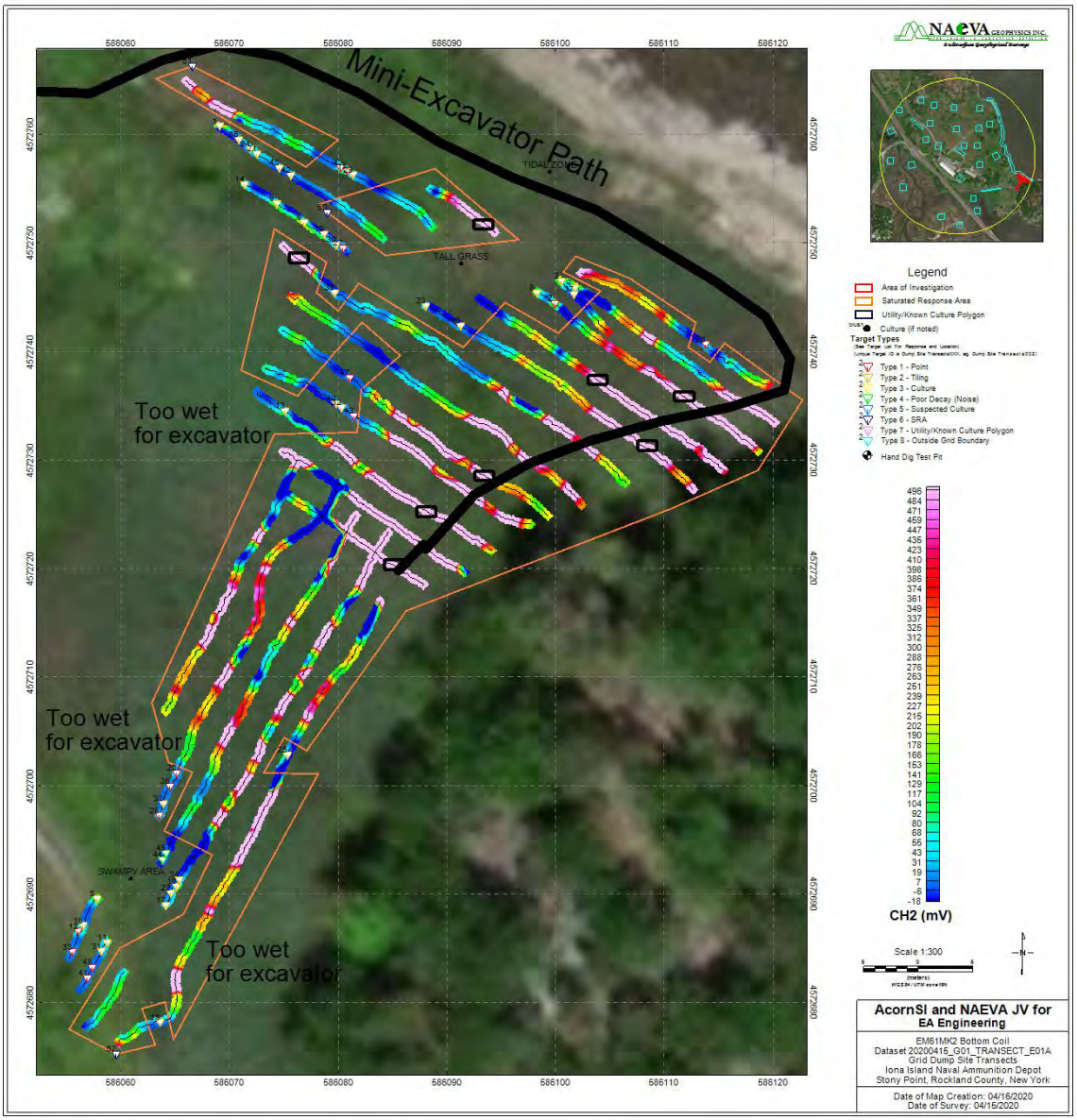
Mini-Excavator Path
TIDAL ZONE
TALL GRASS
SWAMPY AREA
Too wet
for excavator
Too wet
for excavator
Too wet
for excavator
586060
586070
586080
586090
586100
586110
586120
4572760
4572750
4572740
4572730
4572720
4572710
4572700
4572690
4572680
NAEVA GEOPHYSICS INC.
Legend
Area of Investigation
Saturated Response Area
Utility/Known Culture Polygon
Culture (if noted)
Target Types
Type 1 - Point
Type 2 - Tiling
Type 3 - Culture
Type 4 - Poor Decay (Noise)
Type 5 - Suspected Culture
Type 6 - SRA
Type 7 - Utility/Known Culture Polygon
Type 8 - Outside Grid Boundary
Hand Dig Test Pit
496
484
471
459
447
435
423
410
398
386
374
361
349
337
325
312
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276
263
251
239
227
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202
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178
166
153
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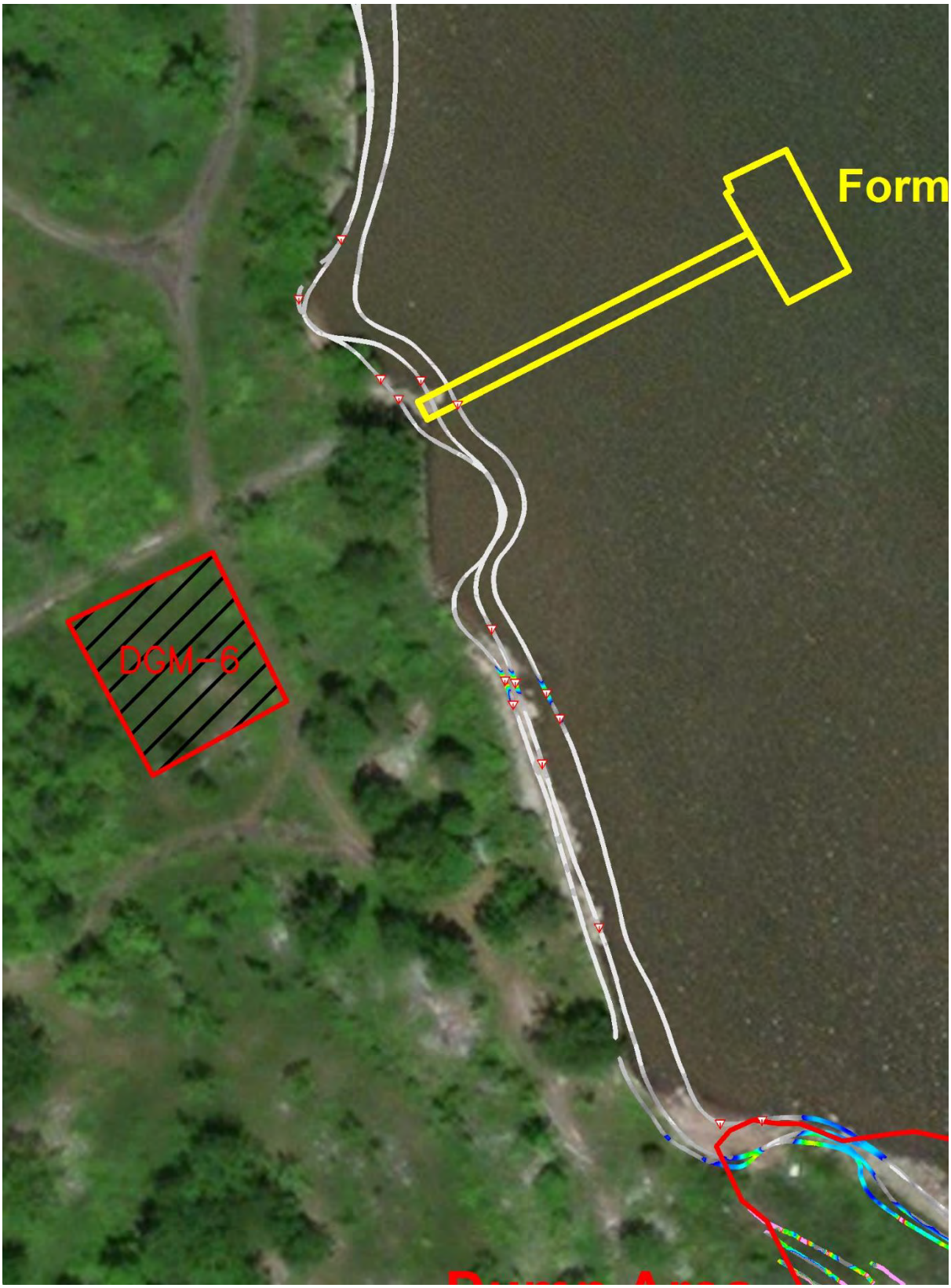
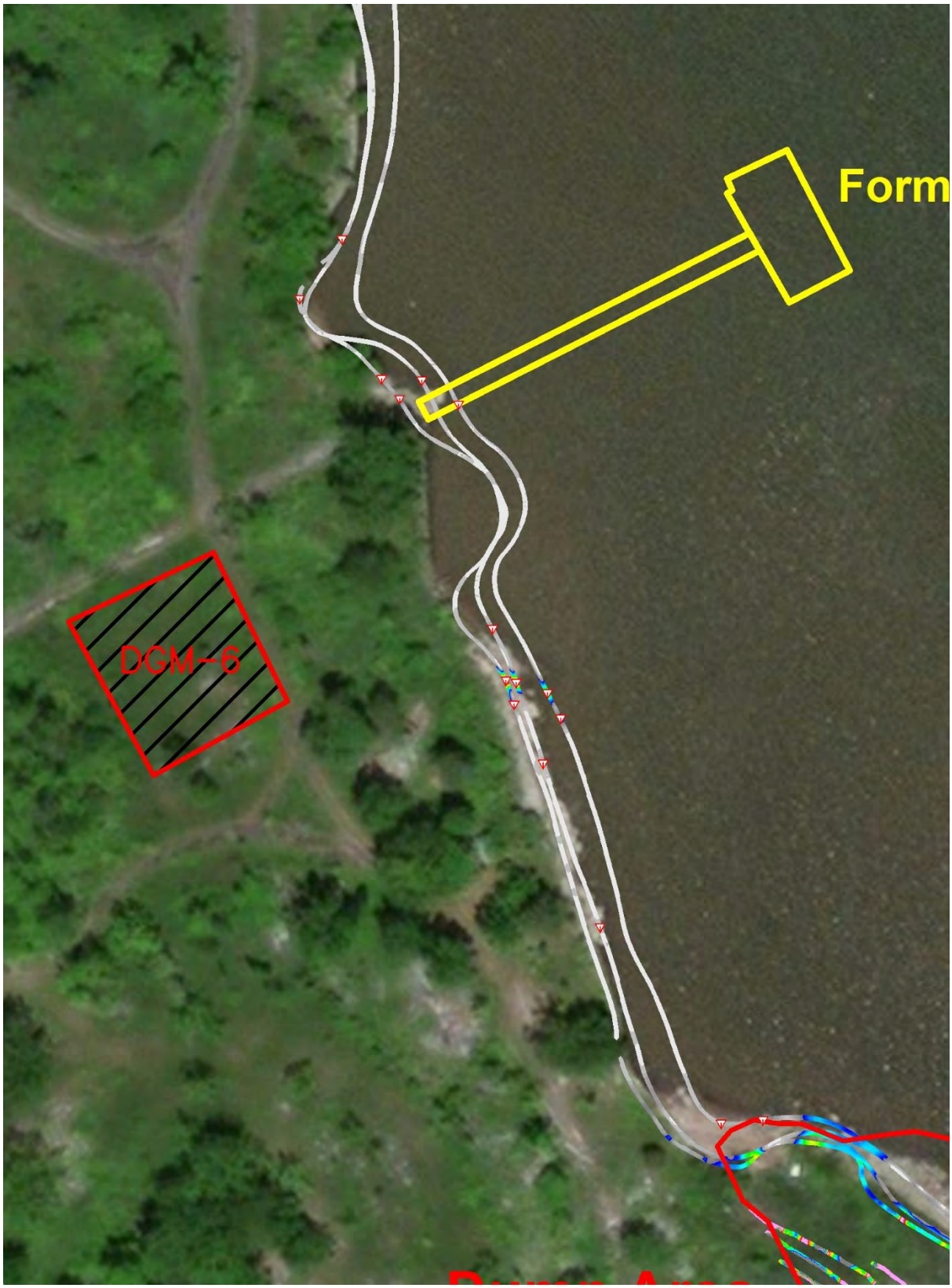
117
104
92
80
68
55
43
31
19
7
-6
-18
CH2 (mV)
Scale 1:300
AcornSI and NAEVA JV for
EA Engineering
EM61MK2 Bottom Coil
Dataset 20200415_G01_TRANSECT_E01A
Grid Dump Site Transects
Iona Island Naval Ammunition Depot
Stony Point, Rockland County, New York
Date of Map Creation: 04/16/2020
Date of Survey: 04/15/2020

Former Dock
DGM-22
DGM-4
DGM-9
Former Dock
DGM-6
DGM-11
Dump Area


Form
DGM-6


Form
DGM-6

ATTACHMENT B
DIG SHEET

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Intrusive Target and Test Pit List

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM1	10001	585482.722	4572704.926	10	1
DGM1	10003	585484.952	4572703.931	5	1
DGM2	20004	585769.289	4572892.178	156	2
DGM2	20007	585770.249	4572893.210	140	2
DGM2	20011	585776.401	4572891.269	43	1
DGM2	20019	585794.108	4572870.976	188	2
DGM2	20020	585800.622	4572874.879	191	2
DGM2	20022	585768.592	4572886.931	227	3
DGM2	20026	585777.661	4572886.989	208	2
DGM2	20032	585775.708	4572889.246	239	3
DGM2	20034	585762.299	4572888.551	149	2
DGM2	20039	585772.041	4572891.613	153	2
DGM2	20040	585768.029	4572884.833	160	2
DGM2	20043	585774.209	4572881.315	193	2
DGM2	20045	585794.992	4572883.597	65	2
DGM2	20052	585768.432	4572889.162	51	2
DGM2	20059	585777.783	4572886.756	136	2
DGM2	20061	585795.128	4572881.178	222	3
DGM2	20067	585769.079	4572884.184	23	1
DGM2	20071	585783.319	4572890.670	142	2
DGM2	20079	585761.799	4572891.375	181	2
DGM3	30002	585579.356	4573162.853	233	3
DGM3	30010	585559.463	4573145.164	95	2
DGM3	30011	585558.680	4573152.867	60	2
DGM3	30018	585565.425	4573163.369	214	3
DGM3	30019	585576.140	4573161.480	165	2
DGM3	30021	585579.692	4573158.992	145	2
DGM3	30027	585556.548	4573155.074	598	3
DGM3	30028	585579.865	4573159.292	139	2
DGM3	30034	585580.898	4573159.737	31	1
DGM3	30037	585579.736	4573169.377	19	1
DGM3	30052	585562.298	4573142.220	706	3
DGM4	40003	585924.134	4573042.770	178	2
DGM4	40007	585937.242	4573041.099	197	2
DGM5	50002	585672.650	4572547.246	4	1
DGM6	60007	585949.836	4572852.609	26	1
DGM6	60011	585971.060	4572865.476	545	3
DGM6	60014	585967.038	4572877.062	42	1

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM6	60017	585974.540	4572862.964	37	1
DGM6	60018	585946.829	4572866.128	302	3
DGM6	60021	585956.327	4572854.784	192	2
DGM6	60028	585969.602	4572863.448	8	1
DGM6	60030	585945.983	4572860.856	107	2
DGM6	60031	585967.020	4572877.117	236	3
DGM6	60032	585972.213	4572861.674	28	1
DGM6	60038	585969.056	4572872.051	141	2
DGM6	60043	585966.505	4572874.599	196	2
DGM6	60045	585962.335	4572856.610	114	2
DGM6	60048	585958.406	4572855.581	92	2
DGM6	60051	585948.481	4572870.333	143	2
DGM6	60053	585961.997	4572856.309	148	2
DGM6	60059	585966.398	4572874.373	93	2
DGM6	60063	585958.120	4572856.594	199	2
DGM6	60064	585974.810	4572859.680	220	3
DGM6	60066	585954.189	4572847.940	243	3
DGM6	60067	585949.887	4572869.740	235	3
DGM6	60068	585955.442	4572854.782	76	2
DGM6	60079	585946.273	4572869.254	69	2
DGM6	60081	585948.785	4572868.239	103	2
DGM6	60093	585944.383	4572869.011	85	2
DGM6	60099	585945.819	4572870.310	130	2
DGM6	60105	585967.989	4572862.940	232	3
DGM6	60133	585965.831	4572861.985	162	2
DGM6	60145	585977.652	4572859.087	110	2
DGM6	60167	585950.033	4572865.861	427	3
DGM6	60177	585951.702	4572855.824	113	2
DGM6	60189	585953.447	4572861.966	144	2
DGM7	70002	585589.642	4572943.213	94	2
DGM7	70005	585605.850	4572935.535	59	2
DGM7	70018	585602.301	4572953.682	24	1
DGM7	70019	585586.723	4572939.148	36	1
DGM7	70021	585589.008	4572933.414	229	3
DGM7	70026	585589.646	4572948.517	90	2
DGM7	70027	585590.523	4572958.470	41	1
DGM7	70027	585590.279	4572958.365	155	2
DGM7	70031	585607.892	4572942.517	104	2
DGM7	70036	585609.082	4572940.281	87	2

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM7	70045	585586.975	4572946.292	146	2
DGM7	70049	585594.112	4572936.502	209	3
DGM7	70050	585589.398	4572947.278	138	2
DGM7	70051	585602.635	4572935.220	177	2
DGM7	70059	585594.975	4572958.532	213	3
DGM7	70066	585587.425	4572934.863	221	3
DGM7	70067	585589.790	4572939.419	238	3
DGM7	70070	585588.260	4572938.894	125	2
DGM7	70074	585587.357	4572946.711	187	2
DGM7	70089	585592.833	4572938.260	96	2
DGM7	70100	585591.352	4572946.930	175	2
DGM7	70101	585590.109	4572956.668	25	1
DGM7	70105	585594.394	4572938.156	212	3
DGM7	70106	585585.475	4572953.801	200	2
DGM9	90007	585858.323	4573014.942	158	2
DGM9	90008	585883.328	4573004.423	207	2
DGM9	90009	585873.992	4573010.087	161	2
DGM9	90010	585862.989	4573013.588	151	2
DGM10	100001	585757.608	4573004.710	189	2
DGM10	100010	585763.747	4573016.305	122	2
DGM10	100014	585766.107	4572995.465	206	2
DGM10	100016	585765.464	4572993.307	46	1
DGM10	100017	585751.102	4573006.441	119	2
DGM10	100018	585751.918	4573004.261	64	2
DGM10	100028	585751.944	4573004.295	166	2
DGM10	100047	585767.059	4573019.776	168	2
DGM10	100050	585757.288	4573002.283	7	1
DGM10	100060	585764.138	4572995.905	97	2
DGM10	100070	585765.637	4572998.196	633	3
DGM10	100098	585753.664	4573008.916	353	3
DGM10	100121	585745.925	4573007.634	174	2
DGM11	110006	585865.568	4572835.210	18	1
DGM11	110009	585863.914	4572811.112	245	3
DGM12	120001	585451.125	4573095.933	228	3
DGM12	120025	585465.019	4573093.759	183	2
DGM12	120031	585453.039	4573105.774	194	2
DGM12	120036	585453.665	4573102.399	70	2
DGM12	120036	585453.670	4573103.054	126	2
DGM12	120041	585450.318	4573089.049	40	1

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM12	120046	585453.308	4573097.558	88	2
DGM12	120047	585453.387	4573097.284	123	2
DGM12	120078	585453.989	4573094.809	167	2
DGM12	120090	585451.605	4573090.596	84	2
DGM12	120097	585454.200	4573094.761	172	2
DGM12	120106	585455.746	4573106.770	12	1
DGM12	120109	585454.320	4573092.843	190	2
DGM12	120123	585473.725	4573103.251	159	2
DGM12	120125	585466.551	4573106.576	77	2
DGM12	120132	585447.791	4573092.703	108	2
DGM12	120136	585454.934	4573110.992	201	2
DGM12	120143	585451.618	4573090.845	84	2
DGM14	140001	585667.528	4572930.864	91	2
DGM14	140001	585667.507	4572931.095	101	2
DGM14	140005	585654.879	4572915.273	152	2
DGM14	140006	585657.516	4572913.656	137	2
DGM14	140008	585666.353	4572915.887	61	2
DGM14	140008	585666.208	4572916.073	154	2
DGM14	140013	585658.256	4572922.816	157	2
DGM14	140015	585665.764	4572910.448	218	3
DGM14	140019	585664.540	4572909.180	68	2
DGM14	140020	585651.327	4572925.843	81	2
DGM14	140022	585677.645	4572926.927	47	1
DGM14	140022	585678.132	4572926.537	58	2
DGM14	140029	585664.950	4572930.930	164	2
DGM14	140030	585662.242	4572929.126	89	2
DGM14	140032	585657.085	4572919.085	71	2
DGM14	140034	585662.128	4572914.151	460	3
DGM14	140044	585676.501	4572926.120	121	2
DGM14	140048	585653.412	4572912.204	215	3
DGM14	140049	585658.250	4572908.998	52	2
DGM14	140051	585659.771	4572930.441	217	3
DGM14	140062	585653.128	4572907.161	120	2
DGM14	140066	585658.449	4572909.117	63	2
DGM14	140074	585662.363	4572930.896	100	2
DGM14	140082	585653.218	4572909.427	11	1
DGM14	140087	585654.998	4572920.806	73	2
DGM14	140104	585659.836	4572929.688	115	2
DGM14	140117	585660.060	4572925.610	198	2

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM14	140120	585657.727	4572911.283	0	0
DGM14	140130	585658.391	4572911.562	0	0
DGM14	140149	585660.520	4572910.197	231	3
DGM15	150005	585774.937	4572751.697	39	1
DGM15	150009	585777.546	4572754.368	352	3
DGM15	150015	585778.780	4572753.551	520	3
DGM15	150017	585774.915	4572754.634	173	2
DGM15	150028	585787.025	4572751.961	53	2
DGM15	150028	585787.532	4572752.143	129	2
DGM15	150036	585763.293	4572753.547	50	1
DGM16	160002	585630.971	4573050.146	30	1
DGM16	160006	585619.863	4573021.472	21	1
DGM16	160006	585620.093	4573021.470	34	1
DGM16	160011	585623.009	4573038.158	45	1
DGM16	160011	585623.166	4573037.988	128	2
DGM16	160012	585624.613	4573042.871	79	2
DGM16	160013	585617.737	4573024.123	225	3
DGM16	160015	585628.021	4573030.975	116	2
DGM16	160016	585618.162	4573024.146	241	3
DGM16	160019	585627.940	4573031.234	345	3
DGM16	160024	585631.477	4573022.109	176	2
DGM16	160027	585623.390	4573027.905	0	0
DGM16	160041	585623.369	4573027.755	0	0
DGM16	160045	585614.020	4573039.249	14	1
DGM16	160052	585617.558	4573032.988	3	1
DGM16	160053	585623.453	4573041.090	163	2
DGM16	160063	585627.867	4573036.510	170	2
DGM16	160067	585621.581	4573023.078	117	2
DGM16	160067	585621.631	4573023.364	133	2
DGM16	160069	585617.082	4573020.231	147	2
DGM16	160072	585602.974	4573038.636	203	2
DGM16	160074	585631.524	4573020.063	105	2
DGM16	160085	585603.233	4573050.908	184	2
DGM17	170001	585781.242	4572509.328	1	1
DGM17	170002	585767.060	4572515.256	32	1
DGM18	180001	585849.252	4572931.588	57	2
DGM18	180010	585854.308	4572929.138	2	1
DGM18	180018	585862.701	4572935.079	210	3
DGM18	180019	585858.994	4572927.211	66	2

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM18	180026	585871.874	4572931.912	244	3
DGM18	180039	585861.865	4572931.059	111	2
DGM18	180041	585876.098	4572934.804	124	2
DGM18	180044	585873.634	4572931.443	240	3
DGM18	180058	585868.990	4572935.388	242	3
DGM18	180064	585869.474	4572932.305	56	2
DGM18	180068	585866.873	4572931.803	80	2
DGM18	180075	585865.570	4572932.407	223	3
DGM18	180077	585860.282	4572930.052	118	2
DGM19	190008	585632.491	4573140.708	0	0
DGM19	190009	585636.640	4573123.664	75	2
DGM19	190011	585632.214	4573140.007	0	0
DGM19	190012	585654.958	4573130.766	98	2
DGM19	190026	585630.999	4573115.888	237	3
DGM19	190031	585637.430	4573137.219	54	2
DGM19	190034	585640.109	4573130.810	135	2
DGM19	190046	585637.205	4573122.810	179	2
DGM19	190047	585640.652	4573111.601	234	3
DGM19	190059	585656.318	4573118.150	314	3
DGM19	190063	585650.822	4573133.434	33	1
DGM19	190064	585655.383	4573140.112	195	2
DGM20	200001	585915.043	4572690.508	67	2
DGM20	200003	585929.190	4572690.436	72	2
DGM20	200006	585929.250	4572692.659	180	2
DGM20	200022	585931.065	4572691.230	219	3
DGM20	200024	585925.040	4572692.369	9	1
DGM20	200025	585920.373	4572690.825	44	1
DGM20	200029	585912.030	4572689.771	171	2
DGM20	200031	585932.012	4572691.351	83	2
DGM20	200043	585911.884	4572689.934	99	2
DGM22	220003	585868.797	4573102.814	17	1
DGM22	220006	585872.811	4573120.519	295	3
DGM22	220008	585873.680	4573120.435	319	3
DGM22	220014	585869.300	4573101.814	0	0
DGM22	220016	585863.103	4573123.003	134	2
DGM22	220022	585867.542	4573118.408	55	2
DGM22	220025	585870.361	4573119.930	86	2
DGM24	240012	585530.643	4573042.400	49	1
DGM24	240013	585517.976	4573054.039	109	2

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM24	240016	585539.092	4573040.196	226	3
DGM24	240023	585534.843	4573048.884	169	2
DGM24	240025	585540.450	4573044.810	205	2
DGM24	240026	585526.790	4573058.481	224	3
DGM24	240027	585567.312	4573017.267	216	3
DGM24	240030	585533.074	4573044.497	202	2
DGM24	240039	585540.385	4573044.604	204	2
DGM24	240044	585526.680	4573042.577	78	2
DGM24	240056	585525.170	4573046.619	211	3
DGM24	240058	585550.500	4573030.036	16	1
DGM24	240071	585525.029	4573044.554	74	2
DGM25	250011	585789.972	4572932.115	132	2
DGM25	250015	585800.196	4572912.953	150	2
DGM25	250020	585804.519	4572908.107	15	1
DGM26	260001	585754.033	4573106.915	82	2
DGM26	260002	585738.716	4573098.756	106	2
DGM26	260003	585754.222	4573106.023	48	1
DGM Only Grids					
DGM8	80001	585423.30	4572839.90	NA	NA
DGM8	80002	585421.50	4572835.90	NA	NA
DGM13	130001	585828.70	4572651.40	NA	NA
DGM13	130002	585827.50	4572651.40	NA	NA
DGM13	130003	585830.00	4572651.40	NA	NA
DGM13	130005	585843.30	4572649.40	NA	NA
DGM13	130006	585833.80	4572659.20	NA	NA
DGM13	130009	585852.30	4572660.10	NA	NA
DGM13	130010	585853.00	4572660.00	NA	NA
DGM21	210001	585415.90	4572997.70	NA	NA
DGM21	210002	585409.40	4572999.30	NA	NA
DGM21	210004	585429.11	4572988.39	NA	NA
DGM21	210005	585401.50	4572991.70	NA	NA
DGM21	210006	585430.30	4572986.00	NA	NA
DGM21	210007	585428.30	4572988.20	NA	NA
DGM21	210008	585433.20	4572991.40	NA	NA
DGM21	210009	585433.80	4572992.00	NA	NA
DGM21	210010	585408.40	4572999.00	NA	NA
DGM21	210011	585400.90	4572991.00	NA	NA
DGM27	270001	585522.20	4572817.10	NA	NA
DGM27	270003	585530.00	4572837.60	NA	NA

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM27	270004	585537.20	4572815.80	NA	NA
DGM27	270005	585532.80	4572836.30	NA	NA
DGM27	270006	585529.80	4572838.50	NA	NA
DGM27	270008	585536.80	4572815.00	NA	NA
DGM27	270009	585530.42	4572840.42	NA	NA
DGM27	270013	585530.30	4572839.10	NA	NA
DGM27	270014	585537.30	4572823.30	NA	NA
DGM27	270017	585531.10	4572839.30	NA	NA
DGM28	280001	585876.70	4572576.00	NA	NA
DGM28	280002	585858.70	4572566.70	NA	NA
DGM28	280005	585869.70	4572569.50	NA	NA
DGM28	280006	585857.70	4572569.30	NA	NA
DGM28	280009	585869.10	4572569.50	NA	NA
DGM28	280011	585857.20	4572569.90	NA	NA
DGM28	280012	585857.20	4572568.30	NA	NA
DGM28	280013	585850.60	4572585.70	NA	NA
DGM28	280014	585877.50	4572575.30	NA	NA
DGM28	280017	585850.70	4572569.40	NA	NA
DGM28	280018	585876.24	4572573.66	NA	NA
DGM28	280019	585856.20	4572568.20	NA	NA
DGM28	280020	585852.20	4572568.80	NA	NA
DGM28	280022	585855.40	4572568.80	NA	NA
DGM28	280023	585877.00	4572572.70	NA	NA
DGM28	280026	585853.10	4572576.90	NA	NA
DGM28	280028	585854.00	4572577.10	NA	NA
DGM28	280030	585855.80	4572567.00	NA	NA
DGM28	280032	585878.40	4572590.50	NA	NA
DGM28	280033	585875.90	4572573.00	NA	NA
DGM28	280035	585849.20	4572576.60	NA	NA
DGM28	280037	585862.70	4572566.40	NA	NA
DGM28	280040	585875.00	4572586.40	NA	NA
DGM28	280042	585853.40	4572568.50	NA	NA
DGM28	280044	585877.90	4572583.90	NA	NA
DGM28	280045	585875.50	4572585.80	NA	NA
DGM28	280046	585848.10	4572585.00	NA	NA
DGM28	280047	585853.10	4572567.60	NA	NA
DGM28	280048	585876.80	4572592.50	NA	NA
DGM28	280050	585855.30	4572566.00	NA	NA
DGM28	280051	585861.70	4572566.80	NA	NA

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
Dump	D0002	586099.90	4572744.50	NA	NA
Dump	D0004	586080.20	4572757.00	NA	NA
Dump	D0012	586056.00	4572686.60	NA	NA
Dump	D0015	586080.80	4572756.70	NA	NA
Dump	D0020	586065.10	4572701.20	NA	NA
Dump	D0026	586113.80	4572740.70	NA	NA
Dump	D0027	586080.40	4572749.60	NA	NA
Dump	D0028	586063.50	4572697.27	NA	NA
Dump	D0033	586055.50	4572684.70	NA	NA
Dump	D0036	586064.50	4572700.00	NA	NA
Dump	D0041	586056.90	4572682.30	NA	NA
Dump	D0043	586081.40	4572734.10	NA	NA
Dump	D0047	586081.00	4572737.60	NA	NA
Dump	D0048	586057.30	4572683.30	NA	NA
Test Pits					
DGM10	TP10_1	585745.50	4572990.60	NA	NA
DGM10	TP10_2	585747.20	4573015.80	NA	NA
DGM10	TP10_3	585751.50	4573014.50	NA	NA
DGM10	TP10_4	585755.30	4573020.90	NA	NA
DGM10	TP10_5	585761.30	4573009.00	NA	NA
DGM10	TP10_6	585762.00	4572991.10	NA	NA
DGM10	TP10_7	585769.40	4573003.30	NA	NA
DGM11	TP11_1	585863.30	4572828.60	NA	NA
DGM11	TP11_10	585890.60	4572811.80	NA	NA
DGM11	TP11_2	585866.60	4572825.30	NA	NA
DGM11	TP11_3	585867.50	4572808.40	NA	NA
DGM11	TP11_4	585868.60	4572832.40	NA	NA
DGM11	TP11_5	585868.90	4572817.50	NA	NA
DGM11	TP11_6	585872.00	4572806.60	NA	NA
DGM11	TP11_7	585874.10	4572812.20	NA	NA
DGM11	TP11_8	585875.10	4572833.80	NA	NA
DGM11	TP11_9	585888.80	4572825.50	NA	NA
DGM14	TP14_1	585664.50	4572922.40	NA	NA
DGM14	TP14_2	585667.40	4572904.80	NA	NA
DGM14	TP14_3	585672.60	4572920.10	NA	NA
DGM15	TP15_1	585765.00	4572751.50	NA	NA
DGM15	TP15_2	585769.40	4572740.00	NA	NA
DGM15	TP15_3	585773.70	4572734.20	NA	NA
DGM15	TP15_4	585776.70	4572767.80	NA	NA

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM15	TP15_5	585780.50	4572737.60	NA	NA
DGM15	TP15_6	585780.70	4572745.80	NA	NA
DGM15	TP15_7	585784.60	4572747.40	NA	NA
DGM15	TP15_8	585784.90	4572742.20	NA	NA
DGM16	TP16_1	585851.60	4572908.20	NA	NA
DGM16	TP16_2	585865.40	4572918.70	NA	NA
DGM16	TP16_3	585874.20	4572913.80	NA	NA
DGM18	TP18_1	585854.20	4572912.80	NA	NA
DGM18	TP18_2	585865.30	4572913.20	NA	NA
DGM18	TP18_3	585873.20	4572917.50	NA	NA
DGM18	TP18_4	585877.20	4572922.70	NA	NA
DGM19	TP19_1	585628.00	4573139.10	NA	NA
DGM19	TP19_2	585628.60	4573120.70	NA	NA
DGM19	TP19_3	585629.50	4573126.20	NA	NA
DGM19	TP19_4	585649.10	4573113.60	NA	NA
DGM19	TP19_5	585655.20	4573134.10	NA	NA
DGM20	TP20_1	585883.20	4572682.20	NA	NA
DGM20	TP20_10	585980.50	4572698.20	NA	NA
DGM20	TP20_2	585903.10	4572685.70	NA	NA
DGM20	TP20_3	585914.80	4572686.30	NA	NA
DGM20	TP20_4	585922.30	4572689.20	NA	NA
DGM20	TP20_5	585933.30	4572695.30	NA	NA
DGM20	TP20_6	585944.80	4572693.30	NA	NA
DGM20	TP20_7	585959.10	4572700.00	NA	NA
DGM20	TP20_8	585968.60	4572699.90	NA	NA
DGM20	TP20_9	585976.70	4572699.40	NA	NA
DGM22	TP22_1	585863.20	4573113.20	NA	NA
DGM22	TP22_10	585889.70	4573109.00	NA	NA
DGM22	TP22_2	585865.30	4573096.70	NA	NA
DGM22	TP22_3	585865.50	4573120.10	NA	NA
DGM22	TP22_4	585866.50	4573125.40	NA	NA
DGM22	TP22_5	585875.30	4573104.40	NA	NA
DGM22	TP22_6	585876.30	4573096.20	NA	NA
DGM22	TP22_7	585885.10	4573100.80	NA	NA
DGM22	TP22_8	585886.40	4573118.10	NA	NA
DGM22	TP22_9	585887.40	4573121.50	NA	NA
DGM24	TP24_1	585534.60	4573039.40	NA	NA
DGM25	TP25_1	585779.20	4572911.30	NA	NA
DGM25	TP25_2	585782.60	4572915.30	NA	NA

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM25	TP25_3	585783.00	4572910.20	NA	NA
DGM25	TP25_4	585791.50	4572908.30	NA	NA
DGM25	TP25_5	585795.50	4572928.30	NA	NA
DGM25	TP25_6	585800.40	4572931.60	NA	NA
DGM25	TP25_7	585803.00	4572920.00	NA	NA
DGM26	TP26_1	585732.40	4573120.30	NA	NA
DGM26	TP26_10	585757.80	4573100.80	NA	NA
DGM26	TP26_2	585734.90	4573127.70	NA	NA
DGM26	TP26_3	585735.00	4573117.40	NA	NA
DGM26	TP26_4	585738.40	4573125.20	NA	NA
DGM26	TP26_5	585747.10	4573100.90	NA	NA
DGM26	TP26_6	585749.40	4573119.90	NA	NA
DGM26	TP26_7	585752.50	4573123.20	NA	NA
DGM26	TP26_8	585755.80	4573116.10	NA	NA
DGM26	TP26_9	585757.70	4573120.90	NA	NA
DGM2	TP2_1	585755.80	4572899.30	NA	NA
DGM2	TP2_2	585755.90	4572904.80	NA	NA
DGM2	TP2_3	585761.30	4572902.50	NA	NA
DGM2	TP2_4	585764.60	4572897.30	NA	NA
DGM2	TP2_5	585785.80	4572884.50	NA	NA
DGM3	TP3_1	585563.00	4573152.70	NA	NA
DGM3	TP3_2	585563.30	4573164.10	NA	NA
DGM3	TP3_3	585565.30	4573144.40	NA	NA
DGM3	TP3_4	585572.40	4573156.70	NA	NA
DGM3	TP3_5	585575.10	4573144.00	NA	NA
DGM3	TP3_6	585579.20	4573156.40	NA	NA
DGM3	TP3_7	585582.20	4573151.80	NA	NA
DGM3	TP3_8	585583.60	4573162.30	NA	NA
DGM4	TP4_1	585915.80	4573016.60	NA	NA
DGM4	TP4_2	585918.00	4573038.40	NA	NA
DGM4	TP4_3	585918.50	4573027.40	NA	NA
DGM4	TP4_4	585923.40	4573047.20	NA	NA
DGM4	TP4_5	585936.60	4573031.00	NA	NA
DGM4	TP4_6	585944.10	4573031.80	NA	NA
DGM6	TP6_1	585943.80	4572872.30	NA	NA
DGM6	TP6_2	585952.30	4572873.40	NA	NA
DGM6	TP6_3	585954.30	4572866.90	NA	NA
DGM6	TP6_4	585954.90	4572870.70	NA	NA
DGM9	TP9_1	585860.00	4573004.30	NA	NA

Grid	Target ID	Easting	Northing	AGC Rank	AGC Category
DGM9	TP9_2	585866.70	4573024.40	NA	NA
DGM9	TP9_3	585866.70	4573018.60	NA	NA
DGM9	TP9_4	585870.70	4573013.50	NA	NA
DGM9	TP9_5	585870.70	4572996.90	NA	NA
DGM9	TP9_6	585874.70	4572999.10	NA	NA
DGM9	TP9_7	585879.10	4573014.00	NA	NA
DGM9	TP9_8	585880.90	4573019.60	NA	NA
DGM9	TP9_9	585882.80	4572998.10	NA	NA
Dump Area Test Pits					
Dump	TPDump-1	586085.10	4572720.40	NA	NA
Dump	TPDump-2	586093.40	4572728.60	NA	NA
Dump	TPDump-3	586111.80	4572735.90	NA	NA
Dump	TPDump-4	586093.30	4572751.80	NA	NA
Dump	TPDump-5	586103.80	4572737.40	NA	NA
Dump	TPDump-6	586076.30	4572748.60	NA	NA
Dump	TPDump-7	586108.40	4572731.30	NA	NA
Dump	TPDump-8	586088.10	4572725.30	NA	NA

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QA Forms

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200317_G01_DGM7, 20200320_G01_DGM14, 20200320_G01_DGM21 Iona Island RI, Iona Island, NY, RI, EA

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 15-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200317_G01_DGM21 and 20200317_G01_DGM14 Iona Island RI, Iona Island, NY, RI, EA Engineering

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 12-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200318_G01_DGM16 and 20200318_G01_DGM24 Iona Island RI, Iona Island, NY, RI, EA Engineering

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 12-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200319_G01_DGM3 and 20200318_G01_DGM27 Iona Island
RI, Iona Island, NY, RI, EA Engineering

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 5-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200320_G01_DGM18, 20200320_G01_DGM25, 20200320_G01_DGM02 Iona Island RI, Iona Island, NY, RI, EA

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 15-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200330_G10_DGM8, 20200330_G01_DGM10, 20200330_G01_DGM26 Iona Island RI, Iona Island, NY, RI, EA

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 15-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200331_G01_DGM1, 2020031_G01_DGM15, and 2020031_G01_DGM20 Iona Island RI, Iona Island, NY, RI, EA

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 16-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200401_G10_DGM5, 20200401_G01_DGM6, 20200401_G01_DGM17 Iona Island RI, Iona Island, NY, RI, EA

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 15-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200402_G10_DGM11 and 20200402_G10_DGM28 Iona Island
RI, Iona Island, NY, RI, EA Engineering

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 16-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200403_G01_DGM4, 20200403_G01_DGM9, 20200403_G01_DGM13, and 20200403_G01_DGM22 Iona Island RI, Iona

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 16-Apr-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) Validation and QC seeds checked and pass MQOs.

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200408_G01_Water_E01A Iona Island RI, Iona Island, NY, RI, EA Engineering

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 18-May-20

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) No Comments

Draft DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE FORM *(DATA SUBMITTAL)*

U.S. Army Engineering & Support Center, Baltimore
[Project Name, Location, Phase, Contractor]
Lot ID: 20200415_G01_TRANSECT_E01A Iona Island RI, Iona Island, NY, RI, EA Engineering

Recommend Payment: Yes ☑ No ☐
QA Reviewer: D. King
Date: 18-May-20

	Pass	Fail	See Comments	Field Observation	N/A
1) Submittal Ontime	☑	☐	☐	☐	☐
2) Submittal Complete (raw/processed data files (mapping & QC), maps, field data sheets, updated Access DB (includes QC results, target selection tables, etc.)	☑	☐	☐	☐	☐
3) Performance Requirements Results (all results documented & failures have RCAs: Static Repeatability, Along line measurement spacing, Speed, Coverage, Dynamic Detection & Positioning Repeatability, Geodetic Equipment Functionality/internal consistency/accuracy)	☑	☐	☐	☐	☐
4) Periodic Recalculation of Performance Requirements (include details in comments section)					
(a) Static Repeatability	☑	☐	☐	☐	☐
(b) Along Line Measurement Spacing	☑	☐	☐	☐	☐
(c) Speed	☑	☐	☐	☐	☐
(d) Coverage	☑	☐	☐	☐	☐
(e) Dynamic Detection Repeatability	☑	☐	☐	☐	☐
(f) Dynamic Positioning Repeatability	☑	☐	☐	☐	☐
(g) Geodetic Functionality	☑	☐	☐	☐	☐
(h) Geodetic Internal Consistency	☑	☐	☐	☐	☐
5) Review of Maps/Gridded data (Assess Potential Field) (visual check: background levelling, striping, latency, noise, in particular view seed items for dynamic detection repeatability)	☑	☐	☐	☐	☐
6) Target Selection (following selection criteria for anomaly & dig lists, each single anomaly has one unique ID, cultural features noted/not selected to dig, no gridding artifacts, reporting of anomaly characteristics accurate)	☑	☐	☐	☐	☐
7) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
8) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) No Comments

AGC CUED DATA QUALITY ASSURANCE FORM

U.S. Army Corps of Engineers, Baltimore

QA Acceptance: Yes ☑ No ☐

[Project Name, Location, Phase, Contractor] Lot ID: Cued Data 2020101
Iona Island RI, Iona Island, NY, RI, EA Engineering

QA Reviewer: **David King**
Date: **22-Jun-20**

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime (per QAPP & SOPs)	☑	☐	☐	☐	☐
2) Submittal Complete (per QAPP SOPs) (Weekly QC reports, processed data, plots, field notes, MQO results spreadsheet; ranked dig list)	☑	☐	☐	☐	☐
3) Measurement Performance Criteria Results (QAPP WS #12 & 22) (All results documented & failures have RCAs)					
(a) Instrument Function Test repeatable	☑	☐		☐	☐
(b) IVS library match repeatable (0.9)	☑	☐	4	☐	☐
(c) IVS position offset (<=.25m)	☑	☐	4	☐	☐
(e) Backgrounds acceptable	☑	☐		☐	☐
(f) Cued measurement w/in 0.4m of all dynamic targets	☑	☐		☐	☐
(g) All seeds classified as dig (<=25cm radially, <-.15m Z)	☑	☐	2	☐	☐
(h) Transmit Current acceptable	☑	☐		☐	☐
(i) Inversion model supports classification (fitCoh >0.8 or CA dig)	☑	☐	1,2	☐	☐
(j) Inversion model supports classification (fitXY<0.4 from sensor)	☑	☐	1,2	☐	☐
4) Dig List (following selection criteria, Verification/Validation targets selected)	☑	☐	1,2,3,	☐	☐
5) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
6) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) All targets with low fit coherence or high collect or fit offset have adequate explanations (e.g. due to known surface features pulling/obstructing or same as another target) or are added to dig list as can't analyze.

2) All QA validation and QC seeds meet metrics.

3) The following validation digs are selected and expected dig results will be provided prior to digging:

Target ID
DGM6_60167
DGM6_60018

4) All IVS test passed.

AGC CUED DATA QUALITY ASSURANCE FORM

U.S. Army Corps of Engineers, Baltimore

QA Acceptance: Yes ☑ No ☐

[Project Name, Location, Phase, Contractor] Lot ID: Cued Data 2020102
Iona Island RI, Iona Island, NY, RI, EA Engineering

QA Reviewer: **David King**
Date: **22-Jun-20**

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime (per QAPP & SOPs)	☑	☐	☐	☐	☐
2) Submittal Complete (per QAPP SOPs) (Weekly QC reports, processed data, plots, field notes, MQO results spreadsheet; ranked dig list)	☑	☐	☐	☐	☐
3) Measurement Performance Criteria Results (QAPP WS #12 & 22) (All results documented & failures have RCAs)					
(a) Instrument Function Test repeatable	☑	☐		☐	☐
(b) IVS library match repeatable (0.9)	☑	☐	4	☐	☐
(c) IVS position offset (<=.25m)	☑	☐	4	☐	☐
(e) Backgrounds acceptable	☑	☐		☐	☐
(f) Cued measurement w/in 0.4m of all dynamic targets	☑	☐		☐	☐
(g) All seeds classified as dig (<=25cm radially, <-.15m Z)	☑	☐	2	☐	☐
(h) Transmit Current acceptable	☑	☐		☐	☐
(i) Inversion model supports classification (fitCoh >0.8 or CA dig)	☑	☐	1,2	☐	☐
(j) Inversion model supports classification (fitXY<0.4 from sensor)	☑	☐	1,2	☐	☐
4) Dig List (following selection criteria, Verification/Validation targets selected)	☑	☐	1,2,3,	☐	☐
5) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
6) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) All targets with low fit coherence or high collect or fit offset have adequate explanations (e.g. due to known surface features pulling/obstructing or same as another target) or are added to dig list as can't analyze.

2) All QA validation and QC seeds meet metrics.

3) The following validation digs are selected and expected dig results will be provided prior to digging:

Target ID
DGM6_60011
DGM14_140034

4) All IVS test passed.

AGC CUED DATA QUALITY ASSURANCE FORM

U.S. Army Corps of Engineers, Baltimore

QA Acceptance: Yes ☑ No ☐

[Project Name, Location, Phase, Contractor] Lot ID: Cued Data 2020105
Iona Island RI, Iona Island, NY, RI, EA Engineering

QA Reviewer: **David King**
Date: **22-Jun-20**

	Pass	*Fail*	*See Comments*	*Field Observation*	*N/A*
1) Submittal Ontime (per QAPP & SOPs)	☑	☐	☐	☐	☐
2) Submittal Complete (per QAPP SOPs) (Weekly QC reports, processed data, plots, field notes, MQO results spreadsheet; ranked dig list)	☑	☐	☐	☐	☐
3) Measurement Performance Criteria Results (QAPP WS #12 & 22) (All results documented & failures have RCAs)					
(a) Instrument Function Test repeatable	☑	☐		☐	☐
(b) IVS library match repeatable (0.9)	☑	☐	4	☐	☐
(c) IVS position offset (<=.25m)	☑	☐	4	☐	☐
(e) Backgrounds acceptable	☑	☐	5	☐	☐
(f) Cued measurement w/in 0.4m of all dynamic targets	☑	☐		☐	☐
(g) All seeds classified as dig (<=25cm radially, <-.15m Z)	☑	☐	2	☐	☐
(h) Transmit Current acceptable	☑	☐		☐	☐
(i) Inversion model supports classification (fitCoh >0.8 or CA dig)	☑	☐	1,2	☐	☐
(j) Inversion model supports classification (fitXY<0.4 from sensor)	☑	☐	1,2	☐	☐
4) Dig List (following selection criteria, Verification/Validation targets selected)	☑	☐	1,2,3,	☐	☐
5) Root Cause Analyses/Non-conformances Reported & Accepted	☐	☐	☐	☐	☑
6) Any additional field observations/QA (add notes below)	☐	☐	☐	☐	☑

Quality Assurance Comments:

1) All targets with low fit coherence or high collect or fit offset have adequate explanations (e.g. due to known surface features pulling/obstructing or same as another target) or are added to dig list as can't analyze.

2) All QA validation and QC seeds meet metrics.

3) The following validation digs are selected and expected dig results will be provided prior to digging:

Target ID
DGM10_100070
DGM10_100098

4) All IVS test passed.
5)Backgrounds DGM10_1001, DGM10_1002 and DGM18_1801 failed however data was still usable.

Validation Reports

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AcornSI and NAEVA JV

ADVANCED GEOPHYSICAL CLASSIFICATION

AGC Validation Report
Static MetalMapper 2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Date: August 26, 2020
Submitted by Tom Furuya
Reviewed by Dean Keiswetter, August 28, 2020

AcornSI and NAEVA JV
1487 Chain Bridge Road, Suite 200
McLean, VA 22101
703-995-9872

Submitted by Electronic Delivery to:
Michael McGuire, EA Engineering, P.C.; mmcguire@eaest.com
David King, USACE; David.V.King@usace.army.mil

Approval Signature& Date: KING.DAVID.VICTOR.1362517466 Digitally signed by KING.DAVID.VICTOR.1362517466 Date: 2020.09.10 07:53:41 -04'00'

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1 INTRODUCTION

This advanced classification validation report has been prepared on behalf of the EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014 to document the procedures for validating the classification results of the MetalMapper2x2 (MM2x2) cued survey for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY). The intent was to provide assurance that no native targets of interest (TOI) were classified as non-TOI. The validation process involves the selection and intrusive investigation of validation digs from the list of anomalies classified as non-TOI to test the assumptions inherent in the classification approach.

2 BACKGROUND

Classification was based primarily on the goodness of fit metric (values from 0.0 to 1.0) generated by UX-Analyze during a comparison of the β values estimated for each surveyed target and the β values in the munitions library developed for the project. This comparison was performed via the library match utility in UX-Analyze. The goodness of fit metric is a measure of the amplitude and shape mismatch between a target and the library entry that best fits that target, with higher values indicating a better match between the target and the corresponding item in the library.

This library matching process was performed for each single-solver model and every target model in each of the multi-solver candidate realizations. For each flag position, the highest value decision metric (i.e. most likely TOI) from the combined set of single-solver and multi-solver models was used as the decision statistic for that position. The stop-dig decision statistic threshold of 0.89 was established as described in ANJV SOP-08. Values below the analyst's threshold were considered non-TOI.

3 PROCEDURES

The goal of the validation process is to demonstrate that no TOI were classified as non-TOI. As part of this process, non-TOI should be classified as:

1. Not matching any TOI in the site-specific library
2. Not belonging to an identified cluster of anomalies that are subsequently found to be TOI
3. Not having polarizabilities that indicate the item is large, axially symmetric, and thick walled

49 validation targets were selected by the USACE and the PDT. For each selected validation target, the data analyst provided a short rationale for why that target was classified as a non-TOI. The intrusive results were blind to the analysis team until the comments and rationale were submitted. The procedures for validation were conducted in accordance with the ANJV SOP-10 "Validate Classification Process" and are subject to the Measurement Quality Objective (MQO) as defined in the UFP-QAPP Worksheet 22, that 100% of predicted non-TOI qualitatively match the predicted size/shape.

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Detailed intrusive results for the 49 validation targets, which include recovered item location offsets, depths, dimensions, weight, text descriptions, and photos, were compared by the QC Geophysicist with the analyst descriptions and final classification decision plots for each target. Common justifications for non-TOI classification included “decision statistic below threshold”, “separation and decay of betas is non-toi like” and “Axial symmetry outside range”.

4 RESULTS

All validation targets qualitatively agree with the rationale for classification as non-TOI. No TOI were found during the investigation of the validation targets. Most recovered objects were metal scrap (rebar, wire, pipe), which were either too asymmetric or the wrong size to place higher on the dig list. Intrusive photos, item weight and length were the primary tools used to assess the size of the object. UX-Analyze generates an approximate size estimate based on the early time gate, where Small is less than 37mm in diameter, Medium is between 37mm and 105mm, and Large is larger than 105mm. This information aids in the qualitative evaluation of the results, though extreme shapes can affect the reliability of the estimate.

Truncated tables summarizing relevant information are included in this report. Complete Excel spreadsheets accompany the Word document.

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Grid ID	Target ID	Dig Type	Nomenclature	Notes	Weight (lb)	Length (m)	Depth (m)	UXA decision statistic	Signal Amp (mV/A)	UXA Fit Depth (m)	UXA Size	Horizontal Offset (m)	Data Analyst Comments	QC Status
DGM2	20022	NMRD	Wire		0.2	0.61	0.25	0.875	4.79	0.59	Large	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, drop off of b3 non-toi like	Pass
DGM2	20032	NMRD	Wire		0.5	1.22	0.15	0.8685	6.79	0.19	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range	Pass
DGM2	20061	NMRD	Railroad spike	Hot rocks and bricks LIP	1	0.13	0.76	0.8791	4.88	0.17	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, separation of b2b3 non-toi like	Pass
DGM3	30002	NMRD	Rebar		3	0.91	0.05	0.8715	49.93	0	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, same as flag 4 which classifys as clutter as well	Pass
DGM3	30018	NMRD	Rebar		1	0.30	0.03	0.8846	6.66	0	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, alt solvers also classify as clutter	Pass
DGM3	30027	NMRD	Rebar		5	1.22	0.03	0.7389	8.66	0.13	Medium	< 0.15	separation and decay of betas is non-toi like	Pass
DGM3	30052	NMRD	Rebar		4	0.86	0.13	0.6962	0.46	0.66	Medium	< 0.15	separation and decay of betas is non-toi like	Pass
DGM6	60011	NMRD	Reinforced concrete/ hot rock	LIP		0.00	0.91	0.7538	18.81	0.4	Large	< 0.15	shape and separation of betas is non-toi like location on size decay plot is offset from toi	Pass
DGM6	60018	NMRD	1"x12" steel pipe	Hot bricks and reinforced concrete LIP	2	0.30	0.23	0.8325	20.53	0.14	Medium	< 0.15	separation of b2b3 and shape of b1 non-toi like	Pass
DGM6	60031	NMRD	Steel machine pin	Shared with 60014	7	0.25	0.20	0.8699	34.15	0.12	Medium	< 0.15	alt source models to flag 14 (toi) this source is non-toi like	Pass
DGM6	60064	NMRD	Steel rod/ reinforced concrete	Reinforced concrete LIP	2	0.71	0.36	0.8795	3.95	0.24	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, alt solvers also classify as clutter	Pass
DGM6	60066	NMRD	Railroad spike		1	0.13	0.20	0.8667	4.77	0.1	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, location on size decay plot offset from toi	Pass
DGM6	60067	NMRD	Reinforced concrete with rebar stick straight up out of the hole LIP	LIP		0.00	0.94	0.8705	3.89	0.62	Large	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range	Pass
DGM6	60105	NMRD	Reinforced concrete	LIP		0.00	0.05	0.8715	1.43	0.19	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, offset from TOI on size decay plot	Pass
DGM6	60167	NMRD	Reinforced concrete/LIP	LIP		0.00	0.76	0.7881	1.67	0.95	Large	< 0.15	b1b2-b3 separation more plate-like location on size decay plot offset from toi modeling close to 1m depth	Pass
DGM7	70021	NMRD	Flat steel		1	0.10	0.30	0.8737	11.23	0.45	Large	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, alt solvers also classfiy as clutter	Pass
DGM7	70049	NMRD	Spike		1	0.23	0.10	0.8886	13.05	0.15	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, and alt solvers also classify as clutter	Pass
DGM7	70059	NMRD	2" Steel pipe		11	0.61	0.69	0.8851	5.93	0.58	Large	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range	Pass
DGM7	70066	NMRD	1/2" Steel pipe		1	0.20	0.15	0.8794	4.08	0.24	Medium	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, separation of b2b3 non-toi like	Pass
DGM7	70105	NMRD	Angle iron		1	0.18	0.61	0.8858	3.86	0.41	Medium	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, location on size decay plot offset from TOI	Pass
DGM10	100070	NMRD	18" wire		0.2	0.46	0.36	0.7249	2.04	0.17	Medium	< 0.15	shape and separation of betas is non-toi like location on size decay plot offset from toi	Pass
DGM10	100098	NMRD	Hot bricks	Checked hole with schondstat and white only found hot bricks.....LIP	6	0.38	0.30	0.8141	1.74	0.25	Medium	< 0.15	offset from toi on size decay plot alt solvers also classify as clutter	Pass
DGM11	110009	NMRD	Scrap		1	0.20	0.15	0.865	23.67	0.09	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, alt solvers also classify as clutter	Pass
DGM12	120001	NMRD	6" steel pipe		10	0.91	0.36	0.8745	378.6	0.13	Large	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, late time drop off of b1b2b3 is non-toi like	Pass
DGM14	140015	NMRD	Steel Pipe		27	2.90	0.91	0.882	20.17	0.34	Large	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, separation fo b2b3 over time and location on size decay plot	Pass
DGM14	140034	NMRD	Steel Pipe		20	1.22	0.76	0.7789	4.57	0.46	Large	< 0.15	b1 shape is non-toi like	Pass

Grid ID	Target ID	Dig Type	Nomenclature	Notes	Weight (lb)	Length (m)	Depth (m)	UXA decision statistic	Signal Amp (mV/A)	UXA Fit Depth (m)	UXA Size	Horizontal Offset (m)	Data Analyst Comments	QC Status
DGM14	140048	NMRD	Scrap Steel		5	0.23	0.61	0.8831	2.49	0.27	Medium	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, for inital and reshot	Pass
DGM14	140051	NMRD	Rebar		1	0.15	0.61	0.883	7.28	0.09	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, cluster size less than 4	Pass
DGM14	140149	NMRD	Scrap Steel		1	0.10	0.18	0.872	0.35	0.39	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, offset from TOI on size decay plot	Pass
DGM15	150009	NMRD	Banding		0.3	0.15	0.03	0.8142	1.74	0.84	Large	< 0.15	decay and separation of betas is non-toi like	Pass
DGM15	150015	NMRD	Rebar		1	0.61	0.61	0.7603	1.59	0.59	Large	< 0.15	separation of betas is non-toi like	Pass
DGM16	160013	NMRD	2" steel pipe	Shared with 160016	3	0.61	0.08	0.8769	26.17	0.01	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, separation of b2b3 non-toi like	Pass
DGM16	160016	NMRD	2" steel pipe	Shared with 160013	3	0.61	0.08	0.867	36.28	0.08	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range	Pass
DGM16	160019	NMRD	Steel mesh	Shared with 160015	7	0.30	0.61	0.8166	14.37	0.38	Large	< 0.15	separation of b2b3 and b1-b2b2 is non-toi like	Pass
DGM18	180018	NMRD	Survey nail	Hot bricks LIP	0.2	0.15	0.05	0.8882	4.14	0.16	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, and alt solvers also classify as clutter	Pass
DGM18	180026	NMRD	Wire		0.2	0.30	0.15	0.8651	6.27	0.03	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, models smaller than TOI	Pass
DGM18	180044	NMRD	Bracket	Hot bricks LIP/ found a steel pipe roughly 3ft away from the hole	2	0.13	0.28	0.8679	5.79	0.1	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, separation of b2b3 is non-toi like	Pass
DGM18	180058	NMRD	Steel bracket	Hot Bricks LIP	2	0.13	0.13	0.867	2.09	0.15	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, same as flag 52 all solvers classifly as clutter as well	Pass
DGM18	180075	NMRD	Rebar	Hot bricks LIP	1	0.05	0.20	0.8777	2.42	0.24	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range	Pass
DGM19	190026	NMRD	Spike		3	0.30	0.08	0.8691	17.94	0.06	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, location on size decay plot offset from TOI	Pass
DGM19	190047	NMRD	Reinforced concrete	Left in place	220	0.61	0.51	0.8708	26.62	0.32	Medium	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, shape and separation of b2b3 non-toi like	Pass
DGM19	190059	NMRD	Wire		1	0.25	0.10	0.8288	3.69	0.26	Medium	< 0.15	separation of b2b3 and shapea of b1 (later in time) non-toi like	Pass
DGM20	200022	NMRD	Rebar		4	0.71	0.76	0.8817	6.97	0.2	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, and alt solvers also classify as clutter	Pass
DGM22	220006	NMRD	1" steel pipe		1	0.15	0.10	0.835	24.8	0.89	Large	< 0.15	separation of b1b2b3 non-toi like modeling deep (near 1m)	Pass. Recovered source likely single solver
DGM22	220008	NMRD	Flat steel 1" x 4"		1	0.10	0.18	0.8273	9.73	0.65	Large	< 0.15	separation of b1b2b3 non-toi like	Pass
DGM22	220016	NMRD	Nail	Target has a bleed off signature from tp22_4 LIP	0.2	0.10	0.43	0.9009	1.66	0.72	Large	< 0.15	UXA_Decision_Statistic below threshold b1 decays faster than expected late time compared to toi	Pass
DGM24	240026	NMRD	Flat steel bracket		2	0.15	0.23	0.8771	17.05	0.11	Medium	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, separation of b2b3 non-toi like	Pass
DGM24	240027	NMRD	Wire cable		1	0.61	0.18	0.8831	14.86	0.02	Small	< 0.15	UXA_Decision_Statistic below threshold, Axial symmetry outside range, alt solvers also classify as clutter	Pass
DGM24	240056	NMRD	Railroad spike		1	0.13	0.10	0.887	7.67	0.41	Medium	0.178	UXA_Decision_Statistic below threshold, Axial symmetry outside range, and alt solvers also classify as clutter	Pass. Recovered source likely single solver

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AcornSI and NAEVA JV

ADVANCED GEOPHYSICAL CLASSIFICATION

AGC Verification Report
Static MetalMapper 2x2
Remedial Investigation
Iona Island Naval Ammunition Depot

Report 1
Version 1

For

Contract: W912DR-15-D-0014
Delivery Order: W912DR17F0180

Date: August 26, 2020
Submitted by Tom Furuya
Reviewed by Dean Keiswetter, August 28, 2020

AcornSI and NAEVA JV
1487 Chain Bridge Road, Suite 200
McLean, VA 22101
703-995-9872

Submitted by Electronic Delivery to:
Michael McGuire, EA Engineering, P.C.; mmcguire@eaest.com
David King, USACE; David.V.King@usace.army.mil

Approval Signature& Date:

KING.DAVID.VICTOR.1362517466

Digitally signed by KING.DAVID.VICTOR.1362517466
Date: 2020.09.10 07:55:52 -04'00'

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1 INTRODUCTION

This advanced classification verification report has been prepared on behalf of the EA Engineering, P.C. and Its Affiliate EA Science and Technology (EA) team for the USACE under contract W912DR-15-D-0014 to document the procedures for verifying the classification results of the MetalMapper2x2 (MM2x2) cued survey for the Remedial Investigation (RI) at the Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS), located in Stony Point, Rockland County, New York (NY).. The intent was to confirm the derived features generated from the Advance Geophysical Classification (AGC) process qualitatively matched the intrusive results.

2 BACKGROUND

Classification was based primarily on the goodness of fit metric (values from 0.0 to 1.0) generated by UX-Analyze during a comparison of the β values estimated for each surveyed target and the β values in the munitions library developed for the project. This comparison was performed via the library match utility in UX-Analyze. The goodness of fit metric is a measure of the amplitude and shape mismatch between a target and the library entry that best fits that target, with higher values indicating a better match between the target and the corresponding item in the library.

This library matching process was performed for each single-solver model and every target model in each of the multi-solver candidate realizations. For each flag position, the highest value decision metric (i.e. most likely TOI) from the combined set of single-solver and multi-solver models was used as the decision statistic for that position. The stop-dig decision statistic threshold of 0.89 was established as described in ANJV SOP-08. Values below the analyst's threshold were considered non-TOI.

3 PROCEDURES

All targets classified as TOIs and intrusively investigated underwent a recovered item verification in which the recovered item was compared to the predictions as described in AN JV SOP 9 "Recovered Item Verification". The comparisons are subject to the Measurement Quality Objectives (MQOs) as defined in the UFP-QAPP Worksheet 22, that at least one recovered item position be within 0.25m of the predicted position, and that the size of at least one recovered object qualitatively match the predicted size for each target.

Detailed intrusive results for verification targets, which include recovered item location offsets, depths, dimensions, weight, text descriptions, and photos, were compared to the final classification decision plots by the QC Geophysicist. Intrusive photos, item weight and length were the primary tools used to assess the size of the object. UX-Analyze generates an approximate size estimate based on the early time gate, where Small is less than 37mm in diameter, Medium is between 37mm and 105mm, and Large is larger than 105mm. This information aids in the qualitative evaluation of the results, though extreme shapes or many items under the sensor can affect the reliability of the estimate. Shape was evaluated by comparing the polarizability curves to the shape of recovered items. The relationship of the three βs shows whether an item is cylindrical, plate-like, spherical, or asymmetric, and how fast they decay over time is an indicator of wall thickness. Any discrepancies were investigated by the QC Geophysicist and if warranted a re-examination of the intrusive location was conducted to search for additional items.

4 RESULTS

All verification targets passed the intrusive survey MQOs as defined in Worksheet 22 of the UFP-QAPP or a justification was given. There were four targets that were placed in the “cannot analyze” category because the measured data did not meet the MQOs and therefore could not be inverted to produce accurate predictions of the item’s physical dimensions. One target was not excavated because the excavator was not able to move a large boulder that covered a pipe sticking out of the ground. In several cases, reinforced concrete was found and left in place but accurate information on the metal composition could not be gathered to compare to the predicted size.

Complete Excel spreadsheets documenting the intrusive results, predicted results, MQO results and QC geophysicist comments accompany the Word document.

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Appendix D

Digital Geophysical Mapping Data

Per USACE Guidance, the Digital Geophysical Mapping Data is not included in the MMRP RI Report. The data can be accessed through the FUDSChem Site at http://fudschem.com.

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Appendix E

MDAS Disposal Documentation

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Material Documented as Safe Certification Chain of Custody

General

1. Generator's Name and Mailing Address EA Eng Science & Technology, Inc. PBC, 225 Schilling Circle, Ste 400, Hunt Valley, MD 21031	1.a Generator's Ph # (410)584-7000
2. Project Location Bear Mt State Park, Iona Island, NY	2.a Project Ph # (443)752-1775
3. MPPEH Contractor Name and Mailing Address Same as 1	3.a MPPEH Contractor Ph# ( )
4. Government Assigned Verification Name and Mailing Address (if used)	4.a Verifier Ph # ( )
5. Transporter Name and Mailing Address See Block 1	5.a Transporter Ph # ( ) See block 2a
6. Recycler Name and Mailing Address JFR Salvage, 6500 Sullivan Trail, Wind Gap, PA 18091	6.a Recycler Ph # (610) 863-6071

7. Container ID # 001	8. Security Seal #TBS 083373 and TBS 083374	9. Manifest # N/A	10. Date 08/06/2020

Explosives Safety Status / Certification and Verification

11. Description	12. Material	13. QTY	14. Unit (i.e., drum)
MDAS	MDAS	1	Can 8 lbs.

15. MATERIAL DOCUMENTED AS SAFE CERTIFICATION: This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, is inert and/or free of explosives or related materials.

16. SUXOS Certification

Signature	Address SAME AS #1	Date 8/06/2020
Printed/Typed Name JD Marlowe SUXOS		Phone Same as 2a

17. OESS Verification

Signature	Address SAME AS #1	Date 08/06/2020
Printed/Typed Name WR Stem, UXOQCS	Phone (256) 731-9151	

Transporter

18. Transporter Acknowledgement of Receipt of Materials (Receiving Signature Verifies that Container was Received with Seal Intact)

Signature	Address	Date 08/06/2020
Printed/Typed Name JD Marlowe	Same as 1	Phone

19. EA Acknowledgement of Transfer of Materials (Signature verifies that Container was Transferred to Transporter with Seal Intact.)

Signature	Address	Date 08/06/2020
Printed/Typed Name JD Marlowe		Phone Same as 2a

20. Discrepancy Indication Space

Signature	Address	Date
Printed/Typed Name		Phone

21. Recycler Acknowledgement of Receipt of Materials (Receiving Signature Verifies that Drums were Received with Seal Intact)

Signature Joseph A Polise	Address	Date 8-10-20
Printed/Typed Name Joseph A Polise	6500 Sullivan Trail	Phone 610-863-6071

Demil. and/or Recycle Facility

22. DEMILITARIZATION/RECYCLING CONFIRMATION: This certifies and verifies that each item or items contained have been demilitarized to the minimum requirements of DOD Instruction 4160.21-M-1, *Defense Demilitarization Manual*. **(To be signed by person performing the demilitarization – Recycler or UXO Technician)**

23. Recycler

Signature Joseph A Polise	Address	Date
Printed/Typed Name Joseph A Polise		Phone

24. Senior UXO Supervisor Verification

Signature	Address	Date 10 AUG 2020
Printed/Typed Name JD MARLOWE		Phone

25. Final Disposition (If other than recycling)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

DOC IDENT	RI FROM	M&S	UNIT	ISS	QUANTITY	SER	SUPPLEMENTARY ADDRESS	SIG	FUND	DISTRIBUTION	PROJECT	PRI	REQD	DELL	DATE	ADV	RI	O/P	COND	MGT

UNIT PRICE DOLLARS	UNIT PRICE CTS	DOLLARS	CTS

1. TOTAL PRICE

2. SHIP FROM: Bear Mt State Park, Iona Island, NY

3. SHIP TO: Block 27 see additional data

4. MARK FOR

5. DOC DATE: 20200806

6. NMFC

7. FRT RATE

8. TYPE CARGO: Cont. (Ammo Can)

9. PS

10. QTY. REC'D: N/A

11. UP

12. UNIT WEIGHT: 8 LBS

13. UNIT CUBE: BOX

14. UFC

15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE: Munitions Documented As Safe (MDAS) - Mixed Metal

18. TY CONT: Can

19. NO CONT: See Block 24

20. TOTAL WEIGHT: See Block 24

21. TOTAL CUBE

22. RECEIVED BY: Joseph A Polise

23. DATE RECEIVED: 10 AUG 2020

PREVIOUS EDITION MAY BE USED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Mixed Metal- Material Documented as Safe (MDAS) Project # 63029587

Container#	Seal#s	Weight
001	TBS083373 and TBS083374	8 Lbs.

25. NATIONAL STOCK NO. & ADD (8-22)

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

Certified by: John Marlowe
SUXOS
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, MD 2103
Signature _____

Verified by: Ward Stern
UXOQCS/UXOSO
EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, MD 21031
Signature _____

27. ADDITIONAL DATA

"Material has been 100% inspected and 100% re-inspected and is determined to be free of an explosive hazard."
Block 3 Ship to : JFR Salvage Inc.
6500 Sullivan Trail
Wind Gap, PA 18091
P: (610) 863-6071

Adobe Designer 8.0

JFR SALVAGE, LLC.

Buyers of Scrap Iron, Steel, Cars, and Metals
6500 Sullivan Trail · Wind Gap, PA 18091
Phone: (610)863-6071 · Fax: (610)863-7323

August 10, 2020

EA Engineering, Science, and Technology, Inc.
225 Schilling Circle, Suite 400
Hunt Valley, MD 21031

Dear Mr. John Marlowe:

I certify that the contents of sealed container #001, Seal Serial #TBS083373 and #TBS003374 from EA Engineering, Science, and Technology, Inc. from Project Bear Mt State Park, Iona Island, NY were demilitarized in accordance with guidelines in DoD 4160.21-1VI-1 and have been smelted and are only identifiable by their basic content.

Anthony Graziani

Vice President
JFR Salvage, LLC.

6500 Sullivan Trail
Wind Gap, PA 18091
Phone: 610-863-6071
Fax: 610-863-7323

JFR SALVAGE, LLC.

Buyers of Scrap Iron, Steel, Cars, and Metals
6500 Sullivan Trail · Wind Gap, PA 18091
Phone: (610)863-6071 · Fax: (610)863-7323

August 10, 2020

EA Engineering, Science, and Technology, Inc.
225 Schilling Circle, Suite 400
Hunt Valley, MD 21031

Dear Mr. John Marlowe:

On August 10, 2020, the contents of sealed Container #001, Custody Seal # TBS083373 and TBS083374 were received from EA Engineering, Science, and Technology, Inc. from Project Bear Mountain State Park, Iona Island NY.

JFR Salvage, LLC. has received and inspected the sealed container and agree that the material received is MD and contains no explosive hazards.

The contents of the sealed container are to be processed in accordance with DoD 4160-21 M-1, and will not be sold, traded or otherwise given to another party until the contents are only identifiable by their basic content.

Enclosed is the signed Chain of Custody that was received along with the containers.

Anthony Graziani

Vice President
JFR Salvage, LLC.

6500 Sullivan Trail
Wind Gap, PA 18091
Phone: 610-863-6071
Fax: 610-863-7323

Appendix F

Dig Sheets

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Grid ID	Target ID	AGC_ID	Date	Target Category	Munition Category	Munition Type	Target Description	Count	Munition Weight	Munition Length	Munition Depth	Non Munition Description	Seed Type	Note	Offset Distance	Offset Direction	Quality Control Check	Quality Control Comment
DGM1	10001	DGM1_10001_001_11	7/31/2020 18:42	SEED			Seed#15	1	0.5	4	12	Other	QC	Small				
DGM1	10003	DGM1_10003_001_11	7/31/2020 18:43	SEED			Seed	1	0.5	4	12	Other	QA	No I.d. Small				
DGM2	20004	DGM2_20004_001_22	7/31/2020 10:47	NMRD			Rebar	12	10	60	5	Metal Scrap						
DGM2	20007	DGM2_20007_001_32	7/31/2020 10:42	NMRD			Rebar	8	5	48	4	Metal Scrap						
DGM2	20011	DGM2_20011_001_11	7/31/2020 11:06	MD	Frag	6lb Proj	6lb projectile frag	1	2	3	3			Has a portion of the brass fuse in the base				
DGM2	20019	DGM2_20019_001_32	7/31/2020 11:24	NMRD			Rebar	1	4	36	2	Metal Scrap						
DGM2	20020	DGM2_20020_001_32	7/31/2020 11:35	NMRD			Rebar	1	4	24	2	Metal Scrap						
DGM2	20022	DGM2_20022_001_11	7/31/2020 11:26	NMRD			Wire	3	0.2	24	10	Wire						
DGM2	20026	DGM2_20026_001_11	7/31/2020 10:50	NMRD			Rebar	2	3	12	4	Metal Scrap						
DGM2	20032	DGM2_20032_001_31	7/31/2020 10:49	NMRD			Wire	7	0.5	48	6	Wire						
DGM2	20034	DGM2_20034_001_21	7/31/2020 11:58	NMRD			Reinforced concrete	10			48	Metal Scrap		LIP				
DGM2	20039	DGM2_20039_001_32	7/31/2020 10:43	NMRD			Rebar	7	4	24	6	Metal Scrap						
DGM2	20040	DGM2_20040_001_22	7/31/2020 11:51	NMRD			Flat steel 2”x24”	1	5	24	48	Metal Scrap						
DGM2	20043	DGM2_20043_001_31	7/31/2020 11:40	NMRD			3” steel pipe	1	6	30	24	Metal Scrap						
DGM2	20045	DGM2_20045_001_33	7/31/2020 11:20	NMRD			Railroad spike	1	1	5	30	Spike		Hot rocks LIP				
DGM2	20052	DGM2_20052_001_22	7/31/2020 10:53	NMRD			Wire	3	0.2	24	9	Wire						
DGM2	20059	DGM2_20059_001_11	7/31/2020 10:51	NMRD			Rebar	3	4	24	7	Metal Scrap						
DGM2	20061	DGM2_20061_001_22	7/31/2020 11:32	NMRD			Railroad spike	1	1	5	30	Spike		Hot rocks and bricks LIP				
DGM2	20067	DGM2_20067_002_11	7/31/2020 10:58	NMRD			Railroad spike	1	1	5	7	Spike						
DGM2	20071	DGM2_20071_001_11	7/31/2020 11:15	NMRD			Railroad spike	2	2	10	8	Spike						
DGM2	20079	DGM2_20079_001_11	7/31/2020 11:27	NMRD			Rebar	1	2	12	5	Metal Scrap						
DGM3	30002	DGM3_30002_002_33	7/28/2020 18:11	NMRD			Rebar	1	3	36	2	Metal Scrap						
DGM3	30010	DGM3_30010_001_11	7/28/2020 18:19	NMRD			Flat steel	1	3	6	8	Metal Scrap						
DGM3	30011	DGM3_30011_001_22	7/28/2020 18:16	NMRD			Bolt	1	0.5	4	4	Metal Scrap						
DGM3	30018	DGM3_30018_001_21	7/28/2020 18:07	NMRD			Rebar	1	1	12	1	Metal Scrap						
DGM3	30019	DGM3_30019_002_11	7/28/2020 17:53	NMRD			Broken piece of 6” pipe	1	7	7	2	Metal Scrap						
DGM3	30021	DGM3_30021_002_32	7/28/2020 17:43	NMRD			Flat steel	1	1	4	4	Metal Scrap						
DGM3	30027	DGM3_30027_001_11	7/28/2020 18:18	NMRD			Rebar	1	5	48	1	Metal Scrap						
DGM3	30028	DGM3_30028_001_11	7/28/2020 17:44	NMRD			Rebar	1	2	14	3	Metal Scrap						
DGM3	30034	DGM3_30034_001_11	7/28/2020 17:48	SEED			Seed # 05	1	0.5	4	12	Other		Small				
DGM3	30037	DGM3_30037_001_11	7/28/2020 18:12	NMRD			Wire	1	0.2	12	1	Wire		Broke off LIP				
DGM3	30052	DGM3_30052_001_22	7/28/2020 18:20	NMRD			Rebar	1	4	34	5	Metal Scrap						
DGM4	40003	DGM4_40003_001_11	7/30/2020 15:38	NMRD			Chain	1	2	12	4	Metal Scrap						
DGM4	40007	DGM4_40007_001_33	7/30/2020 15:39	NMRD			Scrap steel	1	1	11	3	Metal Scrap						
DGM5	50002	DGM5_50002_001_11	8/3/2020 11:40	SEED			Seed#06	1	0.5	4	12		QC	Small				
DGM6	60007	DGM6_60007_001_22	7/31/2020 15:54	NMRD			3” pipe				10	Other		Pipe is sticking straight from underneath a boulder that the excavator could not move LIP				
DGM6	60011	DGM6_60011_001_11	7/31/2020 16:11	NMRD			Reinforced concrete/ hot rock				36	Other		LIP				
DGM6	60014	DGM6_60014_001_32	7/31/2020 14:59	NMRD			Steel machine pin	1	7	10	8	Metal Scrap		Shared with 60031				
DGM6	60017	DGM6_60017_001_21	7/31/2020 16:14	NMRD			Reinforced concrete				30	Other		LIP				
DGM6	60018	DGM6_60018_001_21	7/31/2020 15:21	NMRD			1”x12” steel pipe	1	2	12	9	Metal Scrap		Hot bricks and reinforced concrete LIP				
DGM6	60021	DGM6_60021_001_31	7/31/2020 15:44	NMRD			Nails/reinforced concrete	3	0.3	4	5	Nail		Reinforced concrete LIP				
DGM6	60028	DGM6_60028_002_11	7/31/2020 16:18	SEED			Seed #04	1	0.5	4	12	Other						
DGM6	60030	DGM6_60030_001_11	7/31/2020 15:39	NMRD			Hammer	1	3	12	10	Metal Scrap						
DGM6	60031	DGM6_60031_002_11	7/31/2020 15:01	NMRD			Steel machine pin	1	7	10	8	Metal Scrap		Shared with 60014				
DGM6	60032	DGM6_60032_002_11	7/31/2020 16:10	NMRD			2”x8” steel pipe	1	3	8	12	Metal Scrap						

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DGM6	60038	DGM6_60038_001_32	7/31/2020 15:06	NMRD			Flat steel 2”x10”	1	4	10	14	Metal Scrap						
DGM6	60043	DGM6_60043_002_11	7/31/2020 15:02	NMRD			Angle iron 2”x12”	1	3	12	23	Metal Scrap		Shared with 60059				
DGM6	60045	DGM6_60045_002_21	7/31/2020 15:51	NMRD			Railroad spike	1	1	5	6	Spike		Shared with 60053	7	W		
DGM6	60048	DGM6_60048_002_21	7/31/2020 15:49	NMRD			Flat steel 2”x8”	1	2	8	8	Metal Scrap						
DGM6	60051	DGM6_60051_001_22	7/31/2020 15:31	NMRD			Reinforced concrete LIP				30	Other		LIP				
DGM6	60053	DGM6_60053_001_22	7/31/2020 15:52	NMRD			Railroad spike	1	1	5	6	Spike		Shared with 60045	7	N		
DGM6	60059	DGM6_60059_001_22	7/31/2020 15:05	NMRD			Angle iron 2”x12”	1	3	12	23	Metal Scrap		Shared with 60043				
DGM6	60063	DGM6_60063_002_11	7/31/2020 15:49	NMRD			Wire	3	0.5	36	2	Wire		Flakes of wire ringing around the hole				
DGM6	60064	DGM6_60064_002_21	7/31/2020 16:16	NMRD			Steel rod/ reinforced concrete	1	2	28	14	Metal Scrap		Reinforced concrete LIP				
DGM6	60066	DGM6_60066_002_22	7/31/2020 15:47	NMRD			Railroad spike	1	1	5	8	Spike						
DGM6	60067	DGM6_60067_001_21	7/31/2020 15:26	NMRD			Reinforced concrete with rebar stick straight up out of the hole LIP				37	Other		LIP				
DGM6	60068	DGM6_60068_001_22	7/31/2020 15:45	NMRD			Reinforced concrete LIP				24	Other		LIP				
DGM6	60079	DGM6_60079_001_31	7/31/2020 15:37	NMRD			Rebar/ reinforced concrete	1	2	7	18	Metal Scrap		LIP				
DGM6	60081	DGM6_60081_001_11	7/31/2020 15:19	NMRD			Broken pieces of 6” pipe/ reinforced concrete/ hot bricks	2	2	4	37	Other		Reinforced concrete and hot bricks LIP				
DGM6	60093	DGM6_60093_001_11	7/31/2020 15:41	NMRD			Reinforced concrete				32	Other		LIP				
DGM6	60099	DGM6_60099_001_11	7/31/2020 15:34	NMRD			Reinforced concrete LIP				22	Other		LIP				
DGM6	60105	DGM6_60105_002_33	7/31/2020 16:22	NMRD			Reinforced concrete				2	Other		LIP				
DGM6	60133	DGM6_60133_002_21	7/31/2020 15:56	NMRD			6” bolt	1	1	6	9	Metal Scrap						
DGM6	60145	DGM6_60145_002_11	7/31/2020 16:20	NMRD			Hot rocks/concrete				14	Other		LIP				
DGM6	60167	DGM6_60167_001_22	7/31/2020 15:10	NMRD			Reinforced concrete/LIP				30	Other		LIP				
DGM6	60177	DGM6_60177_001_22	7/31/2020 15:58	NMRD			Reinforced concrete				10	Other		LIP				
DGM6	60189	DGM6_60189_001_32	7/31/2020 15:42	NMRD			Angle iron 2”x3”	1	1	3	12	Metal Scrap						
DGM7	70002	DGM7_70002_001_21	7/28/2020 12:00	NMRD			4” Steel pipe	1	35	60	2	Metal Scrap						
DGM7	70005	DGM7_70005_001_33	7/28/2020 11:42	NMRD			Excavator bucket tooth	1	39	12	36	Metal Scrap						
DGM7	70018	DGM7_70018_001_11	7/28/2020 12:45	NMRD			Machine drill bit	1	16	12	8	Metal Scrap						
DGM7	70019	DGM7_70019_001_11	7/28/2020 11:58	NMRD			2” Steel pipe	1	4	14	7	Metal Scrap						
DGM7	70021	DGM7_70021_001_22	7/28/2020 11:52	NMRD			Flat steel	1	1	4	12	Metal Scrap						
DGM7	70026	DGM7_70026_001_31	7/28/2020 12:41	NMRD			2” steel pipe	2	8	36	24	Metal Scrap						
DGM7	70027	DGM7_70027_001_11	7/28/2020 12:33	NMRD			Scrap steel	1	1	4	24	Metal Scrap						
DGM7	70031	DGM7_70031_001_31	7/28/2020 11:46	NMRD			Flat steel	2	2	10	12	Metal Scrap						
DGM7	70036	DGM7_70036_001_11	7/28/2020 11:47	NMRD			Machine pin	1	3	12	5	Metal Scrap						
DGM7	70045	DGM7_70045_001_32	7/28/2020 12:09	NMRD			Scrap steel	1	1	5	5	Metal Scrap						
DGM7	70049	DGM7_70049_001_21	7/28/2020 11:39	NMRD			Spike	1	1	9	4	Spike						
DGM7	70050	DGM7_70050_001_21	7/28/2020 12:11	NMRD			Machine part	1	2	4	10	Metal Scrap						
DGM7	70051	DGM7_70051_001_11	7/28/2020 11:41	NMRD			1/2” Steel pipe	1	3	10	18	Metal Scrap						
DGM7	70059	DGM7_70059_001_11	7/28/2020 12:43	NMRD			2” Steel pipe	1	11	24	27	Metal Scrap						
DGM7	70066	DGM7_70066_001_11	7/28/2020 11:56	NMRD			1/2” Steel pipe	1	1	8	6	Metal Scrap						
DGM7	70067	DGM7_70067_001_11	7/28/2020 11:49	NMRD			Reinforced concrete	1	200	24	16	Other		Left in place				
DGM7	70070	DGM7_70070_001_31	7/28/2020 11:59	NMRD			Metal bracket	1	2	5	18	Brackets						
DGM7	70074	DGM7_70074_001_31	7/28/2020 12:08	NMRD			Flat steel	1	1	6	6	Metal Scrap						
DGM7	70089	DGM7_70089_001_22	7/28/2020 4:00	NMRD			1/2” Steel pipe	2	2	6	26	Metal Scrap						
DGM7	70100	DGM7_70100_001_32	7/28/2020 12:02	NMRD			Reinforced concrete	1	215	28	18	Other		Left in place				
DGM7	70101	DGM7_70101_002_21	7/28/2020 12:35	NMRD			Flat steel	1	1	5	6	Metal Scrap						
DGM7	70105	DGM7_70105_002_11	7/28/2020 11:35	NMRD			Angle iron	1	1	7	24	Metal Scrap						
DGM7	70106	DGM7_70106_001_11	7/28/2020 12:38	NMRD			Railroad spike	1	1	6	5	Spike						

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DGM8	80001		7/31/2020 18:31	SEED			Seed#09	1	0.5	4	12	Other	QC	Medium	10	N		
DGM8	80002		7/31/2020 18:33	SEED			Seed#091 medium						QA	Medium				
DGM9	90007	DGM9_90007_001_21	7/30/2020 17:02	NMRD			Plate steel 3"x4"	1	2	4	14	Metal Scrap		Hot bricks LIP				
DGM9	90008	DGM9_90008_001_22	7/30/2020 17:09	NMRD			Railroad spike	1	1	5	4	Spike						
DGM9	90009	DGM9_90009_002_11	7/30/2020 16:54	NMRD			Railroad spike	1	1	5	25	Spike						
DGM9	90010	DGM9_90010_001_11	7/30/2020 16:57	NMRD			Railroad spike				18			Hot bricks LIP				
DGM10	100001	DGM10_100001_002_32	7/29/2020 12:32	NMRD			Steel bracket	1	5	9	7	Brackets						
DGM10	100010	DGM10_100010_001_22	7/29/2020 13:59	NMRD			Reinforced concrete left in place	1		48	12	Other		LIP				
DGM10	100014	DGM10_100014_002_11	7/29/2020 13:28	NMRD			Spike	1	1	6	12	Spike						
DGM10	100016	DGM10_100016_001_22	7/29/2020 13:31	NMRD			Metal cable	1	3	20	2	Wire						
DGM10	100017	DGM10_100017_001_21	7/29/2020 13:17	NMRD			Metal bracket	1	1	10	12	Brackets						
DGM10	100018	DGM10_100018_001_11	7/29/2020 12:07	NMRD			Metal bracket	1	4	5	8	Brackets		Shared with 100028				
DGM10	100028	DGM10_100028_001_32	7/29/2020 12:10	NMRD			Metal bracket	1	4	5	8	Brackets		Shared with 100018				
DGM10	100047	DGM10_100047_001_33	7/29/2020 12:41	NMRD			2" pipe fitting	1	2	3	7	Metal Scrap						
DGM10	100050	DGM10_100050_001_32	7/29/2020 12:36	SEED			Seed #17	1	0.5	3	12	Other	QC	Small				
DGM10	100060	DGM10_100060_001_11	7/29/2020 13:29	NMRD			Metal bracket	1	1	6	6	Brackets						
DGM10	100070	DGM10_100070_001_32	7/29/2020 13:01	NMRD			18" wire	1	0.2	18	14	Wire						
DGM10	100098	DGM10_100098_001_31	7/29/2020 12:33	NMRD			Hot bricks	4	6	15	12	Other		Checked hole with schondstat and white only found hot bricks.....LIP				
DGM10	100121	DGM10_100121_002_11	7/29/2020 14:14	NMRD			4" metal bracket	1	1	4	8	Brackets		Hot bricks left in place				
DGM11	110006	DGM11_110006_001_22	8/3/2020 17:30	SEED			QC Seed	1	1	4	12	Other	QC					
DGM11	110009	DGM11_110009_001_33	8/3/2020 17:32	NMRD			Scrap	2	1	8	6	Metal Scrap						
DGM12	120001	DGM12_120001_001_33	7/28/2020 13:54	NMRD			6" steel pipe	3	10	36	14	Other						
DGM12	120025	DGM12_120025_001_32	7/28/2020 14:30	NMRD			Flat steel	3	8	16	4	Metal Scrap						
DGM12	120031	DGM12_120031_001_32	7/28/2020 14:32	NMRD			Steel cable	2	5	25	36	Other		Cable broke off still going straight down left LIP				
DGM12	120041	DGM12_120041_002_32	7/28/2020 14:16	NMRD			Metal scrap	1	15	16	12							
DGM12	120046	DGM12_120046_001_11	7/28/2020 14:49	NMRD			3"steel pipe	1	5	36	36	Metal Scrap						
DGM12	120047	DGM12_120047_001_22	7/28/2020 14:50	NMRD			3" steel pipe	1	2	8	36	Metal Scrap						
DGM12	120078	DGM12_120078_001_31	7/28/2020 14:51	NMRD			3" steel pipe	1	12	29	27	Metal Scrap						
DGM12	120090	DGM12_120090_001_11	7/28/2020 14:18	NMRD			Pipe	1	1	6	6			1 inch diameter				
DGM12	120097	DGM12_120097_001_11	7/28/2020 14:52	NMRD			3"steel pipe	1	5	12	27	Metal Scrap						
DGM12	120106	DGM12_120106_001_11	7/28/2020 14:22	SEED			Seed	1	2	8	12		QC	Medium				
DGM12	120109	DGM12_120109_001_11	7/28/2020 14:20	NMRD			Scrap metal	1	1	12	16							
DGM12	120123	DGM12_120123_002_33	7/28/2020 14:27	NMRD			Railroad spike	1	1	5	24	Spike						
DGM12	120125	DGM12_120125_001_11	7/28/2020 14:26	NMRD			Rail road spike	1	1	5	7	Spike						
DGM12	120132	DGM12_120132_002_11	7/28/2020 14:53	NMRD			3" steel pipe	1	3	9	24	Metal Scrap						
DGM12	120136	DGM12_120136_002_11	7/28/2020 14:24	NMRD			Spike	1	1	6	8							
DGM12	120143	DGM12_120143_002_22	7/28/2020 14:19	NMRD			Pipe	1	1	5	8			1				
DGM13	130001		8/3/2020 13:16	NMRD			2" steel pipe	1			12	Metal Scrap		Shared with 130003/130002 LIP				
DGM13	130002		8/3/2020 13:17	NMRD			2"steel pipe	1			12	Metal Scrap		Shared with 130001/130003 LIP				
DGM13	130003		8/3/2020 13:14	NMRD			2" steel pipe	1			12	Metal Scrap		Pipe runs to all 3 flags shared with 130002/130001 LIP				
DGM13	130005		8/3/2020 13:03	SEED			Seed #16	1	0.5	4	12	Other	QC	Small	10	W		
DGM13	130006		8/3/2020 13:09	SEED			Seed	1	2	8	12	Other	QA					
DGM13	130009		8/3/2020 13:06	NMRD			2"x15" steel pipe	1	4	15	24	Metal Scrap		Shared with 130010				
DGM13	130010		8/3/2020 13:07	NMRD			2"x15" steel pipe	1	4	15	24			Shared with 130009	12	W		
DGM14	140005	DGM14_140005_001_21	7/27/2020 18:30	NMRD			Steel Pipe	1	8	36	3	Other						

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DGM14	140006	DGM14_140006_001_31	7/27/2020 15:42	NMRD			Steel Pipe	1	10	48	2							
DGM14	140013	DGM14_140013_001_22	7/27/2020 18:12	NMRD			Car Parts	1	28	24	24	Brackets						
DGM14	140015	DGM14_140015_001_22	7/27/2020 16:23	NMRD			Steel Pipe	3	27	114	36	Other						
DGM14	140019	DGM14_140019_001_31	7/27/2020 16:38	NMRD			Steel Pipe	1	14	36	24	Other						
DGM14	140020	DGM14_140020_001_22	7/27/2020 14:36	NMRD			Steel Pipe	1	6	15	9	Other						
DGM14	140022	DGM14_140022_001_31	7/27/2020 18:16	NMRD			Flat Steel	4	8	6	12	Metal Scrap						
DGM14	140029	DGM14_140029_001_31	7/27/2020 16:09	NMRD			Steel Pipe	5	24	10		Other						
DGM14	140030	DGM14_140030_001_31	7/28/2020 3:31	NMRD			Car part	1	3	8	7	Metal Scrap						
DGM14	140032	DGM14_140032_002_21	7/27/2020 14:56	NMRD			Car Part	1	2	6	6	Brackets						
DGM14	140034	DGM14_140034_002_21	7/27/2020 17:04	NMRD			Steel Pipe	1	20	48	30	Other						
DGM14	140044	DGM14_140044_001_32	7/27/2020 18:22	NMRD			Nail	2	0.2	3	5	Nail						
DGM14	140048	DGM14_140048_002_22	7/27/2020 16:44	NMRD			Scrap Steel	3	5	9	24	Metal Scrap						
DGM14	140049	DGM14_140049_001_11	7/27/2020 15:09	SEED				1	2	9	12	Spike						
DGM14	140051	DGM14_140051_001_32	7/27/2020 18:25	NMRD			Rebar	1	1	6	24	Metal Scrap						
DGM14	140062	DGM14_140062_001_22	7/27/2020 15:59	NMRD			Flat Steel	1	1	6	8	Metal Scrap						
DGM14	140066	DGM14_140066_001_32	7/27/2020 15:17	SEED			Seed	1	2	9	12							
DGM14	140074	DGM14_140074_001_22	7/27/2020 4:47	NMRD			Rebar	1	1	5	6	Metal Scrap						
DGM14	140082	DGM14_140082_001_32	7/27/2020 15:55	SEED			Seed	1	0.5	4	6		Unspecified					
DGM14	140087	DGM14_140087_001_33	7/27/2020 14:41	NMRD			Railroad Spike	1	0.2	5	6	Spike						
DGM14	140104	DGM14_140104_002_31	7/27/2020 18:25	NMRD			Rebar	1	1	6	24							
DGM14	140117	DGM14_140117_001_11	7/27/2020 16:02	NMRD			Bolt	1	0.2	3	4	Other						
DGM14	140120	DGM14_140120_001_11	7/27/2020 15:48	NMRD			Nail	1	0.5	6	1	Nail						
DGM14	140130	DGM14_140130_001_31	7/27/2020 16:31	NMRD			Scrap Steel	1	2	9	5	Metal Scrap						
DGM14	140149	DGM14_140149_001_11	7/27/2020 4:00	NMRD			Scrap Steel	1	1	4	7	Metal Scrap						
DGM15	150005	DGM15_150005_001_11	8/3/2020 15:59	NMRD			Machine part	2	9	8	30	Other						
DGM15	150009	DGM15_150009_001_11	8/3/2020 15:57	NMRD			Banding	1	0.3	6	1	Metal Scrap						
DGM15	150015	DGM15_150015_001_21	8/3/2020 15:58	NMRD			Rebar	1	1	24	24	Other						
DGM15	150017	DGM15_150017_001_31	8/3/2020 16:00	NMRD			Machine part	2	12	10	36	Other						
DGM15	150036	DGM15_150036_001_21	8/3/2020 16:02	NMRD			Broken piece of 6” pipe	1	3	6	15	Metal Scrap						
DGM16	160002	DGM16_160002_001_21	7/28/2020 16:14	NMRD			2” steel pipe	1	4	24	1	Metal Scrap						
DGM16	160012	DGM16_160012_001_21	7/28/2020 16:12	NMRD			Flat steel	1	5	12	4	Metal Scrap						
DGM16	160013	DGM16_160013_001_32	7/28/2020 16:01	NMRD			2” steel pipe	1	3	24	3	Metal Scrap		Shared with 160016				
DGM16	160015	DGM16_160015_001_11	7/28/2020 16:27	NMRD			Steel mesh	2	7	12	24	Metal Scrap		Shared with 160019				
DGM16	160016	DGM16_160016_001_31	7/28/2020 16:02	NMRD			2” steel pipe	1	3	24	3	Metal Scrap		Shared with 160013				
DGM16	160019	DGM16_160019_001_11	7/28/2020 16:30	NMRD			Steel mesh	2	7	12	24	Metal Scrap		Shared with 160015				
DGM16	160024	DGM16_160024_001_21	7/28/2020 4:35	NMRD			2” steel pipe	1	4	24	3	Metal Scrap						
DGM16	160027	DGM16_160027_001_11	7/28/2020 15:48	NMRD			2” steel pipe	1	3	18	9	Metal Scrap		Shared with 160041				
DGM16	160031		8/5/2020 12:14	NMRD			Pipe piece 4” wide	1	5	13	12							
DGM16	160041	DGM16_160041_001_11	7/28/2020 15:55	NMRD			2” steel pipe	1	3	18	9	Metal Scrap		Shared with 160027				
DGM16	160045	DGM16_160045_001_11	7/28/2020 16:06	SEED			Seed unmarked	1	2	8	12	Other		Medium				
DGM16	160052	DGM16_160052_001_31	7/28/2020 16:04	SEED			Seed #22	1	2	8	12	Other	QC	Medium				
DGM16	160053	DGM16_160053_001_31	7/28/2020 16:34	NMRD			1” steel pipe	1	1	6	8	Metal Scrap						
DGM16	160063	DGM16_160063_001_11	7/28/2020 16:32	NMRD			1” steel pipe	1	2	18	2	Metal Scrap						
DGM16	160069	DGM16_160069_001_22	7/28/2020 15:58	NMRD			Flat steel	1	1	6	12	Metal Scrap						
DGM16	160072	DGM16_160072_001_11	7/28/2020 4:10	NMRD			Railroad spike	1	1	5	6	Spike						

Grid ID	Target ID	AGC_ID	Date	Target Category	Munition Category	Munition Type	Target Description	Count	Munition Weight	Munition Length	Munition Depth	Non Munition Description	Seed Type	Note	Offset Distance	Offset Direction	Quality Control Check	Quality Control Comment
DGM16	160074	DGM16_160074_001_21	7/28/2020 16:36	NMRD			Railroad spike	1	1	5	6	Spike						
DGM16	160076		8/5/2020 12:30	NMRD			Scrap metal 3" wide	1	1	6	12							
DGM16	160085	DGM16_160085_001_11	7/28/2020 16:11	NMRD			Railroad spike	1	1	5	2	Spike						
DGM17	170001	DGM17_170001_001_11	8/3/2020 11:32	SEED			Seed#13	1	0.5	4	12	Other	QC	Small				
DGM17	170002	DGM17_170002_001_11	8/3/2020 11:36	SEED			Seed	1	0.5	4	12	Other	QA	Small				
DGM18	180001	DGM18_180001_001_11	7/31/2020 13:27	NMRD			Rail road track	1	38	36	30	Metal Scrap		Reinforced concrete LIP				
DGM18	180010	DGM18_180010_001_11	7/31/2020 13:21	SEED			Seed #02	1	0.5	4	12	Other						
DGM18	180018	DGM18_180018_001_21	7/31/2020 13:25	NMRD			Survey nail	1	0.2	6	2	Nail		Hot bricks LIP				
DGM18	180019	DGM18_180019_001_22	7/31/2020 13:20	NMRD			Bolt	1	0.3	4	7	Metal Scrap		Hot bricks LIP				
DGM18	180026	DGM18_180026_001_11	7/31/2020 12:55	NMRD			Wire	1	0.2	12	6	Wire						
DGM18	180039	DGM18_180039_001_11	7/31/2020 13:18	NMRD			Rebar	1	4	25	7	Metal Scrap		Hot bricks LIP				
DGM18	180041	DGM18_180041_002_21	7/31/2020 12:32	NMRD			Steel bracket	1	2	12	7	Brackets						
DGM18	180044	DGM18_180044_002_11	7/31/2020 12:56	NMRD			Bracket	2	2	5	11	Brackets		Hot bricks LIP/ found a steel pipe roughly 3ft away from the hole				
DGM18	180058	DGM18_180058_001_22	7/31/2020 13:11	NMRD			Steel bracket	1	2	5	5	Brackets		Hot Bricks LIP				
DGM18	180064	DGM18_180064_002_11	7/31/2020 12:53	NMRD			Nails	2	0.1	3	7	Nail		Hot bricks LIP				
DGM18	180068	DGM18_180068_001_11	7/31/2020 12:58	NMRD			Bracket	1	2	5	6	Brackets		Hot bricks LIP				
DGM18	180075	DGM18_180075_001_21	7/31/2020 13:05	NMRD			Rebar	1	1	2	8	Other		Hot bricks LIP				
DGM18	180077	DGM18_180077_001_22	7/31/2020 13:36	NMRD			Rebar	1	3	27	30	Metal Scrap		No bricks LIP				
DGM19	190001		8/5/2020 12:51	NMRD			Hose clamp, 3/4" rod	2	3	30	6							
DGM19	190008	DGM19_190008_001_33	7/29/2020 11:14	NMRD			Rebar	1	4	36	1	Metal Scrap		Shared with 190011				
DGM19	190009	DGM19_190009_001_21	7/29/2020 11:21	NMRD			Angle iron	1	3	12	1	Metal Scrap						
DGM19	190011	DGM19_190011_001_32	7/29/2020 11:12	NMRD			Rebar	1	4	36	1	Metal Scrap		Shared with 190008				
DGM19	190012	DGM19_190012_001_22	7/29/2020 11:39	NMRD			Strap	1	1	13	2	Metal Scrap						
DGM19	190026	DGM19_190026_001_32	7/29/2020 11:01	NMRD			Spike	1	3	12	3	Spike						
DGM19	190031	DGM19_190031_002_31	7/29/2020 11:16	NMRD			Spike	1	1	6	2	Metal Scrap						
DGM19	190034	DGM19_190034_002_33	7/29/2020 11:19	NMRD			Spike	1	1	4	6	Metal Scrap						
DGM19	190041		8/5/2020 12:56	NMRD			Concrete slab; hot point inside	1			3							
DGM19	190046	DGM19_190046_001_21	7/29/2020 10:47	NMRD			Steel bracket	1	2	6	4	Brackets						
DGM19	190047	DGM19_190047_001_22	7/29/2020 11:26	NMRD			Reinforced concrete	1	220	24	20	Other		Left in place				
DGM19	190059	DGM19_190059_001_11	7/29/2020 11:31	NMRD			Wire	2	1	10	4	Wire						
DGM19	190063	DGM19_190063_001_11	7/29/2020 11:41	NMRD			Reinforced glass	1	1	2	4	Other						
DGM19	190064	DGM19_190064_001_11	7/29/2020 11:33	NMRD			Spike	1	1	6	4	Metal Scrap						
DGM20	200001	DGM20_200001_001_11	8/3/2020 15:08	NMRD			6" steel pipe pieces	3	14	24	36	Metal Scrap						
DGM20	200003	DGM20_200003_001_21	8/3/2020 15:05	NMRD			2"x30" steel pipe	1	7	30	25	Metal Scrap						
DGM20	200006	DGM20_200006_001_32	8/3/2020 15:02	NMRD			Flat steel 2"x18"	1	6	18	3	Metal Scrap						
DGM20	200022	DGM20_200022_001_21	8/3/2020 15:04	NMRD			Rebar	1	4	28	30	Metal Scrap						
DGM20	200024	DGM20_200024_001_11	8/3/2020 15:06	SEED			Seed#24	1	2	8	12	Other	QC	Medium				
DGM20	200025	DGM20_200025_001_11	8/3/2020 15:01	NMRD			Railroad spike	1	1	5	8	Spike						
DGM20	200029	DGM20_200029_001_31	8/3/2020 15:09	NMRD			Railroad spike	1	1	5	14	Spike						
DGM20	200031	DGM20_200031_001_11	8/3/2020 15:03	NMRD			Bracket	1	5	18	35	Metal Scrap						
DGM20	200043	DGM20_200043_001_22	8/3/2020 15:09	NMRD			Railroad spike	1	1	5	6	Spike						
DGM21	210001		7/31/2020 17:50	SEED			Seed#03	1	0.5	4	12	Other	QC		10	E		
DGM21	210002		7/31/2020 17:55	NMRD			Railroad spike	1	1	5	10	Spike						
DGM21	210004		7/31/2020 18:04	SEED			Seed	1	2	8	12	Other		Shared with 210007 medium				
DGM21	210005		7/31/2020 17:58	NMRD			Railroad spike	1	1	5	7	Spike						

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DGM21	210006		7/31/2020 18:07	NMRD			Railroad spike	1	1	5	5	Spike						
DGM21	210007		7/31/2020 18:06	SEED			Seed	1	2	8	12	Other		Shared with 210004 medium	16	E		
DGM21	210008		7/31/2020 18:10	NMRD			Railroad spike	1	1	5	9	Spike						
DGM21	210009		7/31/2020 18:11	NMRD			Railroad spike	1	1	5	3	Spike						
DGM21	210010		7/31/2020 17:56	NMRD			Railroad spike	1	1	5	7	Spike						
DGM21	210011		7/31/2020 17:59	NMRD			Railroad spike	1	1	5	10	Spike						
DGM22	220003	DGM22_220003_002_11	7/30/2020 14:25	SEED			Seed #12	1	0.5	3	12	Other	QC					
DGM22	220006	DGM22_220006_001_31	7/30/2020 14:37	NMRD			1” steel pipe	1	1	6	4	Metal Scrap						
DGM22	220008	DGM22_220008_001_31	7/30/2020 14:38	NMRD			Flat steel 1” x 4”	1	1	4	7	Metal Scrap						
DGM22	220014	DGM22_220014_002_33	7/30/2020 14:27	NMRD			Wire	6	0.5	19	6	Wire						
DGM22	220016	DGM22_220016_002_11	7/30/2020 15:03	NMRD			Nail	2	0.2	4	17	Nail		Target has a bleed off signature from tp22_4 LIP				
DGM22	220022	DGM22_220022_002_11	7/30/2020 14:49	NMRD			Broken piece of 6” pipe	1	1	4	12	Metal Scrap						
DGM22	220025	DGM22_220025_001_22	7/30/2020 14:34	NMRD			1” steel pipe	1	2	8	8	Metal Scrap						
DGM24	240012	DGM24_240012_001_21	7/28/2020 13:27	NMRD			Flat steel	1	3	10	3	Metal Scrap						
DGM24	240013	DGM24_240013_001_33	7/28/2020 13:35	NMRD			Flat steel	1	2	6	4	Metal Scrap						
DGM24	240016	DGM24_240016_001_33	7/28/2020 13:19	NMRD			Flat steel	1	3	16	3	Metal Scrap						
DGM24	240023	DGM24_240023_001_11	7/28/2020 13:33	NMRD			Steel spike drove into boulder	1	1	10	24	Spike		Left in place				
DGM24	240025	DGM24_240025_002_11	7/28/2020 13:20	NMRD			Railroad spike	1	1	5	6	Spike		Shared with 240039				
DGM24	240026	DGM24_240026_001_22	7/28/2020 13:10	NMRD			Flat steel bracket	1	2	6	9	Brackets						
DGM24	240027	DGM24_240027_001_33	7/28/2020 13:11	NMRD			Wire cable	1	1	24	7	Wire						
DGM24	240030	DGM24_240030_001_11	7/28/2020 13:26	NMRD			1/2” rebar	1	2	24	3	Metal Scrap						
DGM24	240039	DGM24_240039_001_11	7/28/2020 13:22	NMRD			Railroad spike	1	1	5	6	Spike		Shared with 240025	7	N		
DGM24	240044	DGM24_240044_002_11	7/28/2020 13:37	NMRD			Angle iron	1	5	14	36	Metal Scrap						
DGM24	240056	DGM24_240056_001_33	7/28/2020 13:29	NMRD			Railroad spike	1	1	5	4	Spike			7	N		
DGM24	240058	DGM24_240058_001_31	7/28/2020 13:13	SEED			Medium Seed #18	1	2	8	12		QC					
DGM24	240071	DGM24_240071_001_21	7/28/2020 13:31	NMRD			Railroad spike	1	1	5	7	Spike						
DGM25	250011	DGM25_250011_001_22	7/30/2020 18:17	MD	Frag	6lb Proj	6lb projectile frag	1	1	6	5							
DGM25	250015	DGM25_250015_002_32	7/30/2020 18:30	NMRD			Horseshoe	1	2	5	10	Metal Scrap						
DGM25	250020	DGM25_250020_001_11	7/30/2020 18:46	SEED			Seed#23	1	2	8	12	Other						
DGM26	260001	DGM26_260001_001_21	7/29/2020 15:44	NMRD			Railroad spike	1	1	5	5	Spike						
DGM26	260002	DGM26_260002_001_32	7/29/2020 15:46	NMRD			Railroad spike	1	1	5	6	Spike						
DGM26	260003	DGM26_260003_001_11	7/29/2020 15:44	NMRD			Railroad spike	1	1	5	8	Spike						
DGM27	270001		8/3/2020 10:56	SEED			Seed #08	1	0.5	4	12	Other	QC	Small				
DGM27	270003		8/3/2020 11:03	OTHER			No find					Other		No find 08/4/20 Re-reaquired and rechecked with QA and verified no finds				
DGM27	270004		8/3/2020 11:06	SEED			Seed	1	0.5	4	12	Other		Shared with 270008	12	S		
DGM27	270005		8/3/2020 10:36	NMRD			Railroad spike	1	1	5	14	Spike		Target was 3ft north of flag	36	n		
DGM27	270006		8/3/2020 11:03	OTHER			No find					Other		No find 08/4/20 Re-reaquired and rechecked with QA and verified no finds				
DGM27	270008		8/3/2020 11:04	SEED			Seed	1	0.5	4	12	Other	QA	Small shared with 270004	12	N		
DGM27	270009		8/3/2020 11:00	OTHER			No find					Other		No find 08/4/20 Re-reaquired and rechecked with QA and verified no finds				
DGM27	270013		8/3/2020 11:02	OTHER			No find					Other		No find 08/4/20 Re-reaquired and rechecked with QA and verified no finds				
DGM27	270014		8/3/2020 11:12	OTHER			No find					Other		Swept a 4ft radius with the schondstat and whites.....1 hot rock is all that was found				
DGM27	270017		8/3/2020 10:50	NMRD			Coil spring	2	10	10	18	Metal Scrap		Target was 3ft south east of flag				
DGM28	280001		8/3/2020 12:45	NMRD			6” pipe fitting	1	5	6	10	Metal Scrap						
DGM28	280002		8/3/2020 12:34	NMRD			2” steel pipe	1	5	18	24	Metal Scrap						
DGM28	280005		8/3/2020 12:40	NMRD			Steel can	1	0.5	4	1	Can		Shared with 280009				

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DGM28	280006		8/3/2020 12:30	NMRD			Wire	1	5	18	13	Wire						
DGM28	280009		8/3/2020 12:41	NMRD			Steel can	1	0.5	4	1	Can		Shared with 280005				
DGM28	280011		8/3/2020 12:27	NMRD			Steel pipe 1”x12”	1	4	12	12	Metal Scrap						
DGM28	280012		8/3/2020 12:31	NMRD			Flat steel 2”x13”	1	4	13	15	Metal Scrap						
DGM28	280013		8/3/2020 12:16	NMRD			Railroad spike	1	1	5	2	Spike						
DGM28	280017		8/3/2020 12:19	NMRD			Flat steel	1	3	6	6	Metal Scrap						
DGM28	280018		8/3/2020 12:46	NMRD			Railroad spike still in railroad tie	1				Spike		Spike was still in railroad tie LIP				
DGM28	280019		8/3/2020 12:28	NMRD			Flat steel 2”x10”	1	2	10	16	Metal Scrap						
DGM28	280020		8/3/2020 12:20	NMRD			Flat steel 3”x6”	1	4	6	12	Metal Scrap						
DGM28	280022		8/3/2020 12:32	NMRD			Railroad spike	1	1	5	6	Spike						
DGM28	280023		8/3/2020 12:43	NMRD			Steel pipe 1”x8”	1	3	8	4	Metal Scrap						
DGM28	280026		8/3/2020 12:09	SEED			Seed#14	1	0.5	4	12	Other	QC	Small shared with 280028	12	E		
DGM28	280028		8/3/2020 12:07	SEED			Seed#14	1	0.5	4	12	Other	QC	Small shared with 280026	12	W		
DGM28	280030		8/3/2020 12:27	NMRD			Railroad spike	1	1	5	12	Spike						
DGM28	280032		8/3/2020 12:54	NMRD			Fishing pole handle	1	0.5	6	5	Metal Scrap						
DGM28	280033		8/3/2020 12:44	NMRD			Railroad spike	1				Spike		Spike was still inside railroad tie LIP				
DGM28	280035		8/3/2020 12:11	NMRD			Bracket	1	2	6	24	Brackets						
DGM28	280037		8/3/2020 12:38	NMRD			Railroad spike	1	1	5	8	Spike						
DGM28	280040		8/3/2020 12:48	NMRD			Spike in railroad tie	1				Spike		Spike in railroad tie LIP				
DGM28	280042		8/3/2020 12:22	NMRD			Railroad spike	1	1	5	18	Spike						
DGM28	280044		8/3/2020 12:51	NMRD			Railroad spike in railroad tie					Spike		Spike still in railroad tie LIP				
DGM28	280045		8/3/2020 12:50	NMRD			Spike in railroad tie					Spike		Spike in railroad tie LIP				
DGM28	280046		8/3/2020 12:13	NMRD			Railroad spike	1	1	5	7	Spike						
DGM28	280047		8/3/2020 12:24	NMRD			Railroad spike	1	1	5	9	Spike						
DGM28	280048		8/3/2020 12:54	NMRD			Railroad spike	1	1	5	11	Spike						
DGM28	280050		8/3/2020 12:26	NMRD			Steel rod 1/2”x24”	1	3	24	22	Metal Scrap						
DGM28	280051		8/3/2020 12:38	NMRD			Railroad spike	1	1	5	11	Spike						
DGM12	120036_1	DGM12_120036_001_22	7/28/2020 14:34	NMRD			3” steel pipe	1	11	36	24	Metal Scrap		Shared with 120035_2. Pipe broke off LIP				
DGM12	120036_2	DGM12_120036_001_33	7/28/2020 14:35	Same As			3” steel pipe	1	11	36	24			Shared with 120036_1. Pipe broke off LIP				
DGM14	140001_1	DGM14_140001_001_21	7/27/2020 18:29	NMRD			Steel Box (empty)	1	22	12	15	Other		Shared with 140001_2				
DGM14	140001_2	DGM14_140001_001_33	7/27/2020 18:29	Same As			Steel Box (empty)	1	22	12	15	Other		Shared with 140001_1				
DGM14	140008_1	DGM14_140008_001_21	7/27/2020 17:30	NMRD			Steel Pipe	2	22	48	12	Metal Scrap						
DGM14	140008_2	DGM14_140008_001_33	7/27/2020 17:31	Same As			Steel Pipe	2	22	48	12	Other						
DGM14	140022_2	DGM14_140022_001_32	7/27/2020 18:18	NMRD			Flat Steel	4	8	6	12	Metal Scrap						
DGM15	150028-1	DGM15_150028_001_21	8/3/2020 15:39	NMRD			Survey nail	1	0.2	8	8	Nail		Shared with 150028-2	7	W		
DGM15	150028-2	DGM15_150028_001_32	8/3/2020 15:40	NMRD			Survey nail	1	0.2	8	8	Nail		Shared with 150028-1				
DGM16	160006_1	DGM16_160006_001_32	7/28/2020 16:38	NMRD			2” steel pipe	1	7	24	14	Metal Scrap		Shared with 160006_2				
DGM16	160006_2	DGM16_160006_001_31	7/28/2020 16:39	Same As			2” Steel pipe	1	7	24	14	Metal Scrap		Shared with 160006_1				
DGM16	160011_1	DGM16_160011_001_33	7/28/2020 16:15	NMRD			2” steel pipe	1	4	24	18	Metal Scrap		Shared with 160011_2				
DGM16	160011_2	DGM16_160011_001_32	7/28/2020 16:19	Same As			2” steel pipe	1	4	24	18	Metal Scrap		Shared with 160011_1				
DGM16	160067_1	DGM16_160067_001_11	7/28/2020 16:22	NMRD			Rebar	1	2	16	24	Metal Scrap		Shared with 160067_2				
DGM16	160067_2	DGM16_160067_002_11	7/28/2020 16:25	Same As			Rebar	1	2	16	24	Metal Scrap		Shared with 160067_1				
DGM7	70101a		8/5/2020 12:00	NMRD			Pipe 1 1/2 in diameter	1	2	8	16	Metal Scrap		Rechecked hole DGM7-101	7	S		
Dump	D0002		7/29/2020 18:31	NMRD			60” steel rod	1	6	60	24	Metal Scrap		Burn pit at at about 48” LaiP			7/29/2020 20:11	QC Pass wrs
Dump	D0004		7/29/2020 19:31	NMRD			Survey nail	1	1	6	1	Nail					7/29/2020 20:12	QC Pass wrs

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Dump	D0012		7/31/2020 17:15	NMRD			Reinforced concrete				6	Other		LIP			7/31/2020 19:08	QC Pass wrs
Dump	D0015		7/29/2020 19:29	NMRD			Iron nodules LIP				24	Other		Plethora of Iron nodules Lip			7/29/2020 20:13	QC Pass wrs
Dump	D0026		7/29/2020 18:57	NMRD			Banding 1"x3"	2	1	3	28	Metal Scrap					7/29/2020 20:14	QC Pass wrs
Dump	D0027		7/29/2020 18:27	NMRD			Burn pit 40" down full of trash LIP				40	Other		Burn pit full of trash LIP			7/29/2020 20:15	QC Pass wrs
Dump	D0028		8/3/2020 14:08	OTHER			Target was over 48" under water							Unable to reach Target was over 48" under water/ hole still hot			8/3/2020 14:21	Process QC Pass
Dump	D0033		7/31/2020 17:17	NMRD			Reinforced concrete and hot bricks				18	Other		LIP			7/31/2020 19:09	QC Pass wrs
Dump	D0036		8/3/2020 14:15	OTHER			Target under 48" of water							Unable to reach Target was over 48" under water/ hole still hot			8/3/2020 14:20	Process QC Pass
Dump	D0041		7/31/2020 17:22	NMRD			Reinforced concrete and bricks				16	Other		LIP			7/31/2020 19:31	QC Pass wrs
Dump	D0043		7/29/2020 19:10	NMRD			Flat steel 4"x8"	1	7	10	22	Metal Scrap					7/29/2020 20:16	QC Pass wrs
Dump	D0047		7/29/2020 18:34	NMRD			1" steel pipe	1	1	3	18	Metal Scrap					7/29/2020 20:17	QC Pass wrs
Dump	D0048		7/31/2020 17:22	NMRD			Reinforced concrete and hot bricks				18			LIP			7/31/2020 19:33	QC Pass wrs
DGM10	TP10_1		7/29/2020 12:56	NMRD			4-10" railroad spikes/1-2" pipe fitting	5	9	48	24	Other		Length is all items combined/ Hot bricks and rocks LIP				
DGM10	TP10_2		7/29/2020 14:11	NMRD			4" C channel	1	7	6	24	Metal Scrap		Hot bricks LIP				
DGM10	TP10_3		7/29/2020 14:04	NMRD			Wood wrapped in sheet metal	3	11	36	24	Metal Scrap		Hot bricks LIP				
DGM10	TP10_4		7/29/2020 13:49	NMRD			Metal scrap LIP	2	4	26	47	Metal Scrap		LIP				
DGM10	TP10_5		7/29/2020 13:39	NMRD			C channel & bricks LIP	1	100	100	38	Metal Scrap		C channel and hot bricks LIP				
DGM10	TP10_6		7/29/2020 13:42	NMRD			Scrap metal	6	20	18	12	Metal Scrap		Hot bricks LIP				
DGM10	TP10_7		7/29/2020 13:36	NMRD			C channel and rebar LIP	2	100	100	44	Other		C channel and rebar and hot bricks LIP				
DGM11	TP11_1		8/3/2020 17:36	NMRD			Scrap LIP				28	Metal Scrap		LIP				
DGM11	TP11_10		8/3/2020 18:54	NMRD			Metal				24	Metal Scrap		LIP				
DGM11	TP11_2		8/3/2020 17:40	NMRD			Rebar in concrete LIP				36	Other		Concrete LIP				
DGM11	TP11_3		8/3/2020 18:48	NMRD			Concrete LIP				28	Other		LIP				
DGM11	TP11_4		8/3/2020 17:38	NMRD			Pipe LIP				30	Other		Pipe LIP				
DGM11	TP11_5		8/3/2020 18:47	NMRD			Concrete rebar LIP				30			LIP				
DGM11	TP11_6		8/3/2020 18:50	NMRD			Sheet metal				24			LIP				
DGM11	TP11_7		8/3/2020 18:51	NMRD			Angle iron				42	Other		LIP				
DGM11	TP11_8		8/3/2020 17:41	NMRD			Excavator tooth				24	Other		Excavator tooth LIP				
DGM11	TP11_9		8/3/2020 18:53	NMRD			Rebar in concrete LIP				24			LIP				
DGM14	TP14_1		7/27/2020 18:07	NMRD			Small Pipe	7	12	192	48	Metal Scrap						
DGM14	TP14_2		7/27/2020 17:35	NMRD			Steel Spike	1	30			Spike						
DGM14	TP14_3		7/27/2020 4:00	NMRD			Steel pipe	3	22	192	36	Metal Scrap						
DGM15	TP15_1		8/3/2020 16:01	NMRD			6" steel pipe				30	Other		LIP				
DGM15	TP15_2		8/3/2020 15:37	OTHER			Hot rocks				24	Other		LIP				
DGM15	TP15_3		8/3/2020 15:28	NMRD			Fence post				30	Fence Posts		LIP				
DGM15	TP15_4		8/3/2020 15:53	NMRD			Water pump running to hydrant 6ft away				36	Other		LIP				
DGM15	TP15_5		8/3/2020 15:26	NMRD			Crumbled sheet metal				12	Other		LIP				
DGM15	TP15_6		8/3/2020 15:50	NMRD			Flat steel				24	Other		LIP				
DGM15	TP15_7		8/3/2020 15:49	NMRD			3" steel pipe				36	Other		LIP				
DGM15	TP15_8		8/3/2020 15:43	NMRD			3" steel pipe				4	Other		LIP				
DGM18	TP18_1		7/31/2020 12:41	NMRD			Plate steel				26	Metal Scrap		LIP				
DGM18	TP18_2		7/31/2020 12:40	NMRD			Steel plate				18	Other		LIP				
DGM18	TP18_3		7/31/2020 12:35	NMRD			Flat steel 4"x36"	1	18	36	25	Metal Scrap		LIP				
DGM18	TP18_4		7/31/2020 12:33	NMRD			Plate steel 24"x24"	1	45	24	3	Metal Scrap		LIP				
DGM16	TP18_5		7/31/2020 12:51	NMRD			6"steel pipe				60	Other		LIP				
DGM16	TP18_6		7/31/2020 12:38	NMRD			6" water pipe cap stick above the ground	1			0	Other		LIP				

Grid ID	Target ID	AGC_ID	Date	Target Category	Munition Category	Munition Type	Target Description	Count	Munition Weight	Munition Length	Munition Depth	Non Munition Description	Seed Type	Note	Offset Distance	Offset Direction	Quality Control Check	Quality Control Comment
DGM16	TP18_7		7/31/2020 12:29	NMRD			Plate steel 5"x12"	1	4	12	23	Metal Scrap		LIP				
DGM19	TP19_1		7/29/2020 11:07	NMRD			Angle iron	1	6	30	24	Metal Scrap						
DGM19	TP19_2		7/28/2020 19:27	NMRD			Sheet metal	9	12	36	36	Metal Scrap						
DGM19	TP19_3		7/29/2020 11:03	NMRD			2" steel pipe	2	6	24	24	Metal Scrap						
DGM19	TP19_4		7/29/2020 11:28	NMRD			Reinforced concrete	1	100	18	28	Metal Scrap		Left in place				
DGM19	TP19_5		7/29/2020 11:35	NMRD			Reinforced concrete	1		240	1	Other		10'x20' concrete slab				
DGM2	TP2_1		7/31/2020 11:00	NMRD			Rebar/bracket/bolt	7	8	36	27	Metal Scrap		LIP				
DGM2	TP2_2		7/31/2020 10:54	NMRD			Rebar				25	Metal Scrap		LIP				
DGM2	TP2_3		7/31/2020 10:56	NMRD			Rebar				24	Metal Scrap		LIP				
DGM2	TP2_4		7/31/2020 11:28	NMRD			Rebar	9	8	38	30	Metal Scrap		LIP				
DGM2	TP2_5		7/31/2020 11:18	NMRD			Rebar	14	14	144	29	Metal Scrap		LIP				
DGM20	TP20_1		8/3/2020 14:33	NMRD			Reinforced concrete/2"steel pip/braided cable				25	Other		LIP				
DGM20	TP20_10		8/3/2020 14:54	NMRD			Reinforced concrete				24	Other		LIP				
DGM20	TP20_2		8/3/2020 14:35	NMRD			2"steel pipe/reinforced concrete/hot bricks				30	Other		LIP				
DGM20	TP20_3		8/3/2020 14:37	NMRD			2" steel pipe/reinforced concrete				24	Other		LIP				
DGM20	TP20_4		8/3/2020 14:40	NMRD			Rebar/ reinforced concrete				35	Other		LIP				
DGM20	TP20_5		8/3/2020 14:58	NMRD			Hinge/hot bricks				24	Other		LIP				
DGM20	TP20_6		8/3/2020 14:44	NMRD			Bracket/reinforced concrete				32	Other		LIP				
DGM20	TP20_7		8/3/2020 14:46	NMRD			6"steel pipe/ reinforced concrete				29	Other		LIP				
DGM20	TP20_8		8/3/2020 14:49	NMRD			Broken pieces of 6" pipe				26	Other		LIP				
DGM20	TP20_9		8/3/2020 14:52	NMRD			2" steel pipe				31	Other		LIP				
DGM22	TP22_1		7/30/2020 14:44	NMRD			Reinforced concrete/LIP							LIP				
DGM22	TP22_10		7/30/2020 15:19	NMRD			Steel bracket 4"x12"				32	Metal Scrap		LIP				
DGM22	TP22_2		7/30/2020 15:10	NMRD			Flat steel				24	Metal Scrap		LIP				
DGM22	TP22_3		7/30/2020 14:21	NMRD			Flat steel 6"x36"				24	Metal Scrap		LIP				
DGM22	TP22_4		7/30/2020 14:36	NMRD			Broken pieces of 6" steel pipe				32	Metal Scrap		LIP				
DGM22	TP22_5		7/30/2020 14:55	NMRD			Metal grill grate/reinforced concrete				38	Metal Scrap		LIP				
DGM22	TP22_6		7/30/2020 15:06	NMRD			Reinforced concrete				30	Other		LIP				
DGM22	TP22_7		7/30/2020 15:00	NMRD			Broken piece of 6" pipe				24	Metal Scrap		LIP				
DGM22	TP22_8		7/30/2020 15:15	NMRD			Flat steel 4"x20"				28	Metal Scrap		LIP				
DGM22	TP22_9		7/30/2020 15:13	NMRD			Reinforced concrete				2	Other		LIP				
DGM24	TP24_1		7/28/2020 13:17	NMRD			Sheet metal/ reinforced concrete	3	115	18	24	Other		Removed the sheet metal. Left the reinforced concrete in place				
DGM25	TP25_1		7/30/2020 18:48	NMRD			Wire/reinforced concrete				24	Other		LIP				
DGM25	TP25_2		7/30/2020 18:27	NMRD			Angle iron				25	Metal Scrap		LIP				
DGM25	TP25_3		7/30/2020 18:49	NMRD			Angle iron				28	Metal Scrap		LIP				
DGM25	TP25_4		7/30/2020 18:29	NMRD			Flat steel				26	Metal Scrap		LIP				
DGM25	TP25_5		7/30/2020 18:34	NMRD			Railroad track				27	Metal Scrap		LIP				
DGM25	TP25_6		7/30/2020 18:39	NMRD			Excavator teeth/flat steel/machine roller	5			27	Metal Scrap		LIP				
DGM25	TP25_7		7/30/2020 18:32	NMRD			Angle iron/rebar broken pice of 6" pipe				24	Metal Scrap		LIP				
DGM26	TP26_1		7/30/2020 11:35	NMRD			Reinforced concrete (removed and set to the side of the tren	1	500	48	24	Other		LIP				
DGM26	TP26_10		7/29/2020 15:54	NMRD			Braided cable/hot rock, left in place.	1	2	36	33	Other		Braided cable broke off in hole, big hot rock in bottom of hole. LIP				
DGM26	TP26_2		7/30/2020 12:06	NMRD			Railroad spike/ steel plate/angle iron	7	90	48	30	Other		Hot bricks and hot rocks LIP				
DGM26	TP26_3		7/30/2020 11:37	NMRD			Railroad spike/ broken pieces of 6" pipe	8	11	14	28	Spike		Hot rocks and bricks LIP				
DGM26	TP26_4		7/30/2020 13:02	NMRD			Railroad spike/reinforced concrete	6	6	5	35	Spike		Reinforced concrete LIP				
DGM26	TP26_5		7/30/2020 11:49	NMRD			6"steel water pipe/braided cable	2	88	36	48	Other		The pipe is still going straight down at 48" and the cable as well LIP				

Grid ID	Target ID	AGC_ID	Date	Target Category	Munition Category	Munition Type	Target Description	Count	Munition Weight	Munition Length	Munition Depth	Non Munition Description	Seed Type	Note	Offset Distance	Offset Direction	Quality Control Check	Quality Control Comment
DGM26	TP26_6		7/30/2020 12:12	NMRD			Railroad spike/broken 6” pipe	9	9	14	26	Other		Hot rocks and bricks LIP				
DGM26	TP26_7		7/30/2020 12:17	NMRD			6”x28” flat steel/reinforced concrete/hot bricks	1	27	28	39	Other		Removed the flat steel left all the reinforced concrete and hot bricks in place LIP				
DGM26	TP26_8		7/29/2020 16:18	NMRD			Scrap metal	5	18	48	29	Metal Scrap		Hot bricks, left in place.				
DGM26	TP26_9		7/30/2020 12:35	NMRD			Rail road track/ reinforced concrete	1	250	84	38	Other		Reinforced concrete and hot bricks LIP				
DGM3	TP3_1		7/28/2020 18:15	NMRD			Rebar	1	3	36	24	Metal Scrap						
DGM3	TP3_2		7/28/2020 18:09	NMRD			2” steel pipe	1	4	27	24	Metal Scrap						
DGM3	TP3_3		7/28/2020 18:21	NMRD			Car part	1	17	8	24	Metal Scrap						
DGM3	TP3_4		7/28/2020 18:05	NMRD			6” pipe	1	22	11	24	Metal Scrap						
DGM3	TP3_5		7/28/2020 18:25	NMRD			6” pipe	1	20	17	48	Metal Scrap		6” pipe left in place				
DGM3	TP3_6		7/28/2020 17:52	NMRD			6” Pipe fitting	1	45	12	24	Metal Scrap						
DGM3	TP3_7		7/28/2020 17:40	NMRD			Rebar/flat steel/can lid	3	4	36	24	Metal Scrap						
DGM3	TP3_8		7/28/2020 17:46	NMRD			C channel steel	1	40	36	24	Metal Scrap						
DGM4	TP4_1		7/30/2020 15:46	NMRD			Reinforced concrete				38	Other		LIP				
DGM4	TP4_2		7/30/2020 15:53	NMRD			6” steel pipe				24	Other		LIP				
DGM4	TP4_3		7/30/2020 15:48	NMRD			Flat steel				10	Metal Scrap		LIP				
DGM4	TP4_4		7/30/2020 15:55	NMRD			Reinforced concrete				27	Other		LIP				
DGM4	TP4_5		7/30/2020 15:40	NMRD			2” steel pipe	1			24	Metal Scrap		LIP				
DGM4	TP4_6		7/30/2020 15:36	NMRD			Steel plate				27	Metal Scrap		LIP				
DGM6	TP6_1		7/31/2020 14:35	NMRD			Rebar				27	Metal Scrap		LIP				
DGM6	TP6_2		7/31/2020 14:56	NMRD			Steel c channel				35	Metal Scrap		LIP				
DGM6	TP6_3		7/31/2020 14:37	NMRD			Rebar				24	Metal Scrap		LIP				
DGM6	TP6_4		7/31/2020 14:44	NMRD			Reinforced concrete				32	Other		LIP				
DGM9	TP9_1		7/30/2020 17:37	NMRD			Reinforced concrete				9	Other		LIP				
DGM9	TP9_2		7/30/2020 17:08	NMRD			Reinforced concrete				28	Other		LIP				
DGM9	TP9_3		7/30/2020 17:00	NMRD			Reinforced concrete				1	Other		Concrete was impenetrable from the surface LIP				
DGM9	TP9_4		7/30/2020 16:59	NMRD			6” steel pipe				4			LIP				
DGM9	TP9_5		7/30/2020 16:55	NMRD			Reinforced concrete				30	Other		LIP				
DGM9	TP9_6		7/30/2020 16:50	NMRD			Wire/reinforced concrete/hot bricks				26			LIP				
DGM9	TP9_7		7/30/2020 17:33	NMRD			3” steel pipe				18	Other		LIP				
DGM9	TP9_8		7/30/2020 17:25	NMRD			6” steel pipe				40	Other		LIP				
DGM9	TP9_9		7/30/2020 16:46	NMRD			6” pipe				12	Other		LIP				
Dump	TPDump-1		7/29/2020 19:24	NMRD			Angle iron at 6” could not penetrate past with the excavator LIP				6	Other		LIP			7/29/2020 19:45	QC Pass wrs
Dump	TPDump-2		7/29/2020 19:05	NMRD			Burn pit reached at 16” went down to 44” did not reach the bottom of the pit LIP				44	Other		LIP			7/29/2020 19:47	QC Pass wrs
Dump	TPDump-3		7/29/2020 18:51	NMRD			Burn pit reached at 12” went down to 36” still super contaminated LIP			8	36	Other		LIP			7/29/2020 19:48	QC Pass wrs
Dump	TPDump-4		7/29/2020 17:52	NMRD			Burn pit down 18” on top of concrete slab LIP				18	Other		burn pit on top of slab about 20ftx20ft LIP,soil samples acquired by mike McGuire			7/29/2020 19:50	QC Pass wrs
Dump	TPDump-5		7/29/2020 18:24	NMRD			Burn pit starting at 20” went down to 45” deep LIP			72	45	Other		LIP			7/29/2020 19:51	QC Pass wrs
Dump	TPDump-6		7/29/2020 17:32	NMRD			Reinforced concrete 30 ft x 20 ft LIP				12	Other		20ft x 30ft reinforced concrete slab LIP. Soil sample acquired by mike McGuire			7/29/2020 19:52	QC Pass wrs
Dump	TPDump-7		7/29/2020 18:41	NMRD			Burn pit starting at 12” total depth to the bottom of the burn pit was not reached.LIP							LIP			7/29/2020 19:54	QC Pass wrs
Dump	TPDump-8		7/29/2020 19:17	NMRD			Reached burn pit at 12” went down 36” still contaminated LIP				36	Other		LIP			7/29/2020 19:56	QC Pass wrs

Appendix G

Risk Management Methodology Tables

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New Risk Management Methodology

Site Property/Project Number: Iona Island Naval Ammunition Depot/1903 Explosion Munitions Response Site (MRS) 01

Property Name: Iona Island Naval Ammunition Depot, Stoney Point, Rockland County, New York

Project Name: Military Munitions Response Program **(**MMRP) Remedial Investigation (RI) for Iona Island Naval Ammunition Depot Formerly Used Defense Site (FUDS)

Munitions Response Site Prioritization Protocol (MRSPP) Overall Score: ACCEPTABLE

1. List historically known or suspected munitions and specify what evidence of Munitions and Explosives of Concern (MEC) was found during characterization. As documented in the RI Report, in 1903 at least one 13-inch (in.) shell exploded between Shell Houses 3 and 4 (former Buildings 210 and 209, respectively) on Iona Island. The explosion destroyed Shell Houses 3 and 4 and their contents, and damaged Shell Houses 1 and 2 (former Buildings 115 and 116, respectively) (U.S. Army Corps of Engineers 1998).1 Some of the contents of the explosion thought to be included were 13-in. shells. Other munitions stored in the area during the time of the explosion included 1-pounders, 6-pounders, and 6-in. ammunition. During the RI, two pieces of fragmentation from a 6-pounder projectile were located at a depth of 3 and 5 in. below ground surface within the MRS near the 1903 explosion point of detonation (Shell Houses 3 and 4). The park police and park rangers had no past incidents on record of any live munitions containing explosives being found on the FUDS. However, in an interview prior to the Archive Search Report site inspection, a Bear Mountain State Park Ranger recounted a story of kids finding a grenade near Buildings 311 and 314 and that the EOD team from Fort Smith took care of the grenade. It is not known if the grenade was live or expended. Additional items found in various locations of the island include small arms cartridge cases, 6-pound projectile cartridge case, signal flare, 20-millimeter practice casing, and a fragment from a 3.5-in. rocket warhead. All items were expended and had no visible explosive residue.

Amount of MEC Justification (refer to Matrix 1): Visual Sampling Plan (VSP) was used to determine the upper limit of MEC density at the 1903 Explosion MRS 01. Approximately 6 acres were investigated and no MEC were identified. Based on the VSP parameters and RI investigation results, the upper limit of MEC at the site is no greater than 0.5 MEC/acre at 95 percent confidence. Additionally, potential MEC presence is based on a one-time event (1903 explosion) rather than continuous use such as a firing range, and as such, the potential amount of MEC is likely much lower than the upper limit of the VSP calculation. Combined with the low percentage of munitions debris encountered during the RI investigation (0.4 percent), the number of residual MEC present is probably closer to zero.

[1] U S. Army Corps of Engineers (USACE). 1998. *Defense Environmental Restoration Program for Formerly Used Defense Sites, Ordnance and Explosives, Chemical Warfare Materials, Archives Search Report, Iona Island Naval Ammunition Depo, Rockland County, New York, Project No. C02NY074403.* March.

Severity Justification (refer to Matrix 2): MD indicative of MEC (i.e., fragmentation from 6-pounder high explosion [HE] projectiles) have been discovered at the 1903 Explosion MRS 01 in the shallow subsurface (3 to 5-in.) soil. Other potential munitions items present during the 1903 explosion include 1-pounders, 6-in., and 13-in. HE ammunition.

Sensitivity Justification (refer to Matrix 3): The potential munitions items may contain HE but are not classified as sensitive.

2. Specify Land Use and Site Receptors. If multiple land use/receptors exist at different areas, these areas may be identified separately. Human receptors include Park Service employees, researchers, recreational users (permit only), contractors, and trespassers. The future use of Iona Island is anticipated to remain consistent with current use and will continue to be maintained by park employees and will continue to be an important area for research. Communication with the Director of Development and Special Projects at Palisades Interstate Park Commission indicates that there are no plans for construction or redevelopment at the site for the foreseeable future; however, it is possible that existing structures could be renovated or improved. Potential future work could involve repair to existing foundations. Construction workers in this limited future scenario could be potential receptors. Though not currently planned, hypothetical future plans for the Island may include recreational use and construction of a nature or retreat center.

Access Conditions Justification (refer to Matrix 1): Site access is limited to authorized employees of Bear Mountain State Park who use a few of the remaining buildings for storage, to researchers who work in the marsh areas, and to guided tour groups six to eight times a year between May and October. The Island is partially fenced, and the main gate is unmanned, which allows for unrestricted access to Iona Island from Bear Mountain State Park. Boating along the Hudson River is open to the public, and because the shoreline of Iona Island is not fenced, there is potential for recreational users of the Hudson River to access the island via the shoreline.

Likelihood to Impart Energy Justification (refer to Matrix 3): The site is a State Park and considered relatively undeveloped with no current plans for further development. “Moderate” areas include parks or areas where digging is manual or limited.

3. For each area having separate conditions above, indicate the Risk Management Results for the following:

Matrix 1: Unlikely
Matrix 2: D
Matrix 3: 2
Matrix 4: ACCEPTABLE.

Risk Determination: ACCEPTABLE.

Matrix 1. Likelihood of Encounter

Likelihood of Encounter, Matrix 1: Amount of MEC vs. Access Conditions		Access Conditions (Frequency of Use) [c]			
		Regular (e.g., daily use, open access)	**Often** (e.g., less regular or periodic use, some access)	**Intermittent** (e.g., some irregular use, or access limited)	**Rare** (e.g., very limited use, access prevented)
Amount of MEC [a][b]	• MEC is visible on the surface and detected in the subsurface.	Frequent	Frequent	Likely	Occasional
	• The area is identified as a Concentrated Munitions Use Area (CMUA) where MEC is known or suspected (e.g., MD indicative of MEC is identified) to be present in the surface and subsurface.	Frequent	Likely	Occasional	Seldom
	• MEC presence based on physical evidence (e.g., munitions debris [MD] indicative of MEC), although the area is not a CMUA, or • The MEC concentration is below a project-specific threshold to support this selection (e.g., less than 1.0/acre at 95 percent confidence).	Likely	Occasional	Seldom	Unlikely
	• MEC presence is based on isolated historical discoveries (e.g., Explosive Ordnance Disposal report) prior to investigation, or • A Defense Environmental Restoration Program (DERP) response action has been conducted to physically remove MEC and known or suspected hazard remains to support this selection, (e.g., surface removal where subsurface was not addressed), or • The MEC concentration is below a project-specific threshold to support this selection (e.g., less than 0.5/acre at 95 percent confidence).	Occasional	Seldom	Unlikely	Unlikely
	• MEC presence is suspected based on historical evidence of munitions use only, or • A DERP response action has been conducted to physically remove surface and subsurface MEC (evidence that some residual hazard remains to support this selection), or • The MEC concentration is below a project-specific threshold to support this selection (e.g., less than 0.25/acre at 95 percent confidence).	Seldom	Seldom	Unlikely	Unlikely
	• Investigation of the MRS did not identify evidence of MEC presence, or • A DERP response action has been conducted that will achieve unlimited use/unrestricted exposure (UU/UE).	Unlikely	Unlikely	**Unlikely**	Unlikely

Comments: No MEC has been documented in the MRS in the 117 years following the 1903 explosion. MD have been identified in the subsurface soil at the 1903 Explosion MRS 01 during the RI; however no MEC was identified. Grids were investigated using VSP parameters to demonstrate that MEC is less than 0.5 MEC/acre at 95 percent confidence. Potential MEC presence is based on a one-time event (1903 explosion) rather than continuous use such as a firing range, and as such the potential amount of MEC is likely much lower than the upper limit of the VSP calculation. Combined with the low percentage of munitions debris encountered during the RI investigation (0.4 percent), the number of residual MEC present is probably closer to zero.

Public use at the Island is limited to occasional educational outings and history tours. Site access is limited to authorized employees of Bear Mountain State Park who use a few of the remaining buildings for storage, to researchers who work in the marsh areas, and to guided tour groups six to eight times a year between May and October. The Island is partially fenced, and the main gate is unmanned, which allows for unrestricted access to Iona Island from Bear Mountain State Park. Boating along the Hudson River is open to the public, and because the shoreline of Iona Island is not fenced, there is potential for recreational users of the Hudson River to access the island via the shoreline. Although the Island was historically used for camping, camping is no longer conducted because the island is not regularly patrolled by the Park Service and there are physical hazards (not related to previous military use of the site). The frequency of use at Iona Island is considered Intermittent based on current and future use. The future use of Iona Island is anticipated to remain consistent with current use and will continue to be maintained by park employees and will continue to be an important area for research. Communication with the Director of Development and Special Projects at Palisades Interstate Park Commission indicates that there are no plans for construction or redevelopment at the site for the foreseeable future; however, it is possible that existing structures could be renovated or improved. Potential future work could involve repair to existing foundations. Construction workers in this limited future scenario could be potential receptors.

Matrix 1. Likelihood of Encounter

(a) The "Amount of MEC" selection in Matrix 1 differs from the MEC Hazard Assessment's input factor for "Amount of MEC," which is based solely on the MRS "type" historically identified. Instead, the "Amount of MEC" in Matrix 1 is initially dependent on the results of characterization data regarding MEC and MD distribution. The Matrix is then used to assess anticipated or completed results of a remedial action (physical removal of MEC) to a "reduced" amount.

(b) For example, historical information indicating an area has been extensively developed and used for years with no MEC encounters; and therefore, support a lower "Likelihood of Encounter."

(c) A site may be accessible but may have a relatively low frequency of use due to difficult terrain, which results in lower possible contact hours or "access" for the MRS. This scale of "access conditions" may include several factors including number of visitors or receptor hours per year, nearby population, or residential versus industrial use. Each of these factors may have different justifications depending on the facts at the site. The concept of calculation of "receptor hours per year" is provided in the MEC Hazard Assessment document.

Matrix 2. Severity of Incident

Severity of Explosive Incident, Matrix 2: Severity vs. Likelihood of Encounter		**Likelihood of Encounter** [(b)]				
		Frequent: Regular, or inevitable occurrences	**Likely:** Several or numerous occurrences	**Occasional:** Sporadic or intermittent occurrences	**Seldom:** Infrequent; rare occurrences	**Unlikely:** Not probable
Severity Associated with Specific Munitions Items [(a)]	**Catastrophic/Critical:** May result in one or more deaths, permanent total or partial disability, or hospitalization	A	A	B	B	**D**
	Modest: May result in one (or more) injury resulting in emergency medical treatment, without hospitalization	B	B	B	C	D
	Minor: May result in one or more injuries requiring first aid or medical treatment	B	C	C	C	D
	Improbable: No injury is anticipated	D	D	D	D	D

Comments: MD have been discovered at 1903 Explosion MRS 01 (i.e., fragments from 6-pounder projectile). For this reason, the severity associated with these items is catastrophic/critical; however, since no MEC has been found the likelihood of encounter is unlikely.

(a) There is currently no scale for ranking the explosive nature of munitions, and it; therefore, requires coordination with qualified Unexploded ordnance (UXO) professionals on the project team. Initiatives are underway to evaluate these considerations of scale. There must be a defined munitions item having an explosive nature and a defined exposure scenario. Additionally, the degrees of hazards differentiate between intact UXO and munitions components such as rocket motors, fuzes, discarded military munitions, and explosive soils. Decision logic to support the selection on this scale must be supported by the Conceptual Site Model and documented in the project reports. Additional research in this subject area in the future may allow for additional refinement within these categories so that site-specific conditions will be the primary factor for project team determination once MEC types onsite have been determined.

(b) Note that with data collected from physical remediation, it is possible to support an unlikely determination for Matrix 1 and Matrix 2.
"A" indicates conditions most likely to result in determination of an unacceptable risk.
"D" indicates conditions most likely to result in determination of an acceptable risk.

Matrix 3. Likelihood of Detonation

Likelihood of Detonation, Matrix 3: Munitions Sensitivity vs. Likelihood of Energy to be Imparted		Likelihood to Impart Energy on an Item [b]		
		High: (e.g., areas planned for development, or seasonally tilled)	**Modest:** (e.g., undeveloped, wildlife refuge, parks)	**Inconsequential:** (e.g., not anticipated, prevented, mitigated)
Sensitivity: [a] Susceptibility to Detonation	**High:** (e.g., classified as sensitive)	1	1	3
	Moderate: (e.g., high explosive or pyrotechnics)	1	**2**	3
	Low: (e.g., propellant or bulk secondary explosives)	1	3	3
	Not Sensitive	2	3	3

Comments: MD have been discovered at 1903 Explosion MRS 01 indicative of HE munitions (i.e., 6-pounder projectile fragmentation). The types of munitions stored at the FUDS are considered standard HE munitions and are not classified as "sensitive". The site is a State Park and considered relatively undeveloped with no plans for further development.

(a) The Sensitivity categories are scaled highest to lowest, similar to the MRSPP Table 1: Munitions Type Data Elements Table (Appendix I of this RI Report). While the scale of sensitivity in Matrix 3 is similar to MRSPP Table 1, the matrix must have the flexibility to consider the inclusion of unlisted or undefined items, such as fuzes having small amounts of primary charge and not attached to a booster charge, which may be less sensitive than fuzes with large amounts of primary charge or any fuze connected to a booster charge. Selections must be supported by identifying the specific munitions on the MRS (listed with correct nomenclature).

(b) The likelihood to impart energy on an item can be high for farmed land that is regularly tilled or areas where development is planned. Moderate areas may include parks or areas where digging is manual or limited. Areas that are inconsequential will include areas where digging is not anticipated, or otherwise mitigated to prevent imparting energy on an item. The project team will consider land use, specifically types and amount of energy imparted at the site that will result in an interaction with a munitions item. The project team will document the justification for selection on the scale.

Matrix 4. Acceptable and Unacceptable Site Conditions

Acceptable and Unacceptable Site Conditions		Result from Matrix 2			
		A	**B**	**C**	**D**
Result from Matrix 3	**1**	Unacceptable	Unacceptable	Unacceptable	Acceptable
	2	Unacceptable	Unacceptable	Acceptable	**Acceptable**
	3	Unacceptable	Acceptable	Acceptable	Acceptable

Comments: Based on the results from Matrix 2 (D) and the results from Matrix 3 (2) current conditions at 1903 Explosion MRS 01 are acceptable.
Multiple conditions may exist within an MRS such that unique baseline risks can be established for the multiple explosive hazards that are present within the same property. Acceptable conditions indicate input factors are collectively determined to support a negligible risk.

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Appendix H

Munitions Technical Data Sheets

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1-pounder Cartridge Case

CARTRIDGE CASE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
DESIGNATION: 1 Pdr. Cartridge Case Mk. II	GUN: 1 Pdr. / 20, 40, 42.5, 50 cal.

Mk. 2

CARTRIDGE CASE DATA

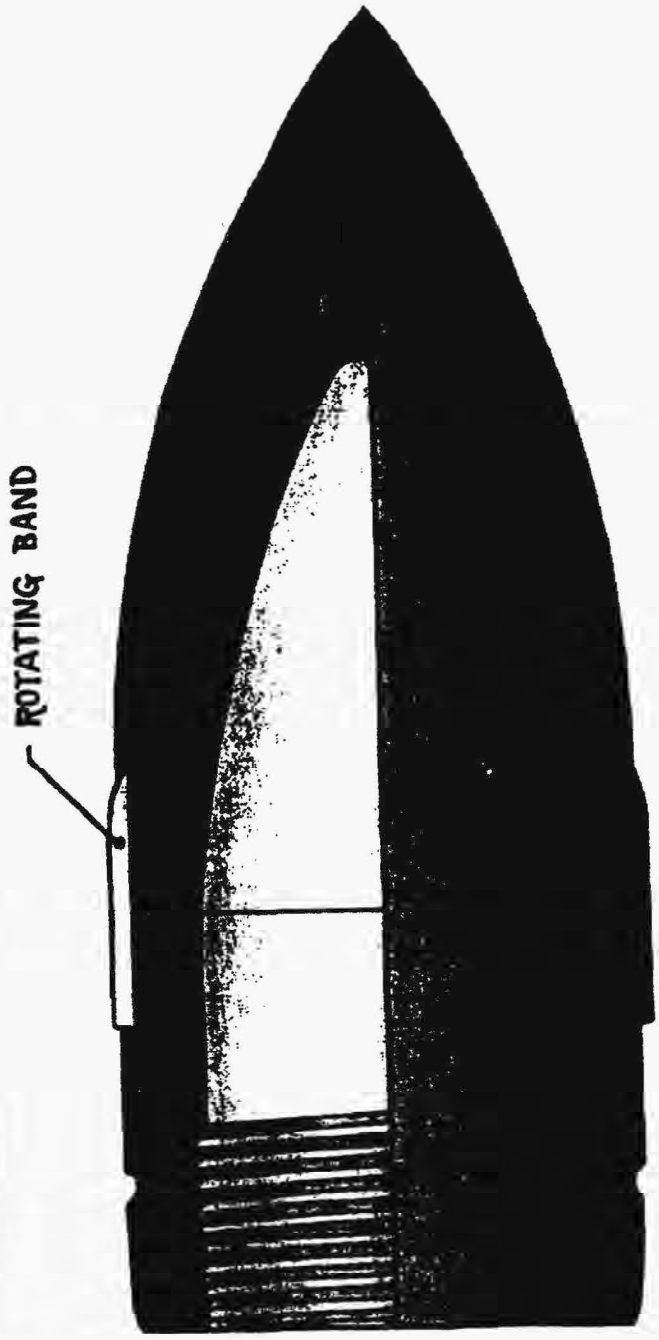
NATIONALITY:	U.S. NAVY	INFORMATION DATE:	April, 1943
DESIGNATION:	1 Pdr Cartridge Case Mk. II	GUN:	1 Pdr / 20, 40, 42.5, 50 cal.

1.	OVERALL LENGTH	5.389"
2.	MAXIMUM DIAMETER	1.600"
3.	INSIDE DIAMETER AT NECK	1.433"
4.	CASE THICKNESS AT NECK	.02"
5.	BEGINNING OF TAPER FROM BASE	4.248"
6.	DIAMETER OF CAP CONTAINER	.473"
7.	EXTRACTING LIP	.087"
8.	MATERIAL	Brass
9.	MARKING	Mfg's symbol, date, "Mk II - 1 pdr"
10.	WEIGHT EMPTY	6.502 oz.
11.	PROPELLANT	Black Powder
12.	EXPLOSIVE IN CAP	Mercury Fulminate, Antimony Sulfide, Potassium Chlorate.

1-pounder Projectile

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 1 Pdr.	CLASSIFICATION: Common
TARGET: Used in coast guard guns, landing forces, etc.	



1 PDR. PROJECTILE

PROJECTILE DATA

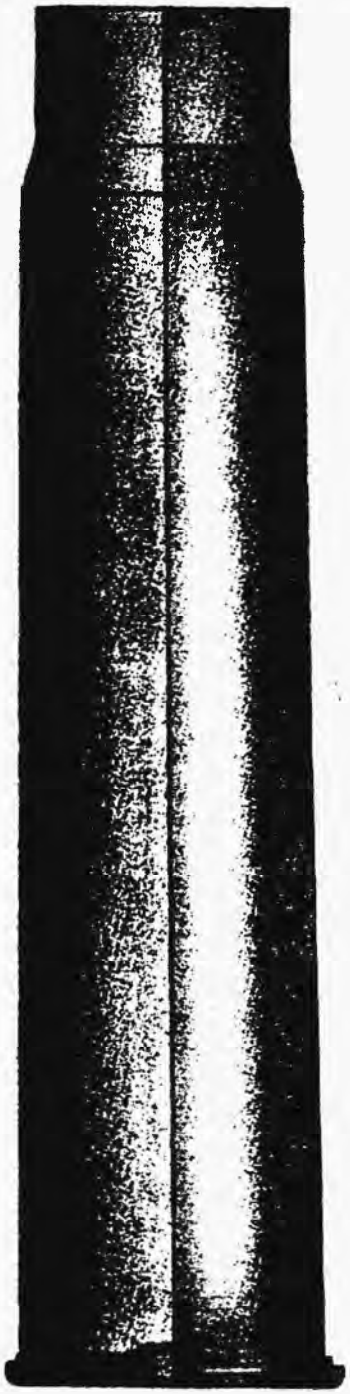
NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 1 Pdr.	CLASSIFICATION: Common
TARGET: Used in coast guard guns, landing forces, etc.	

1.	OVERALL LENGTH	3.56"
2.	DIAMETER OF BASE	1.441"
3.	DISTANCE FROM BASE TO BAND	.829"
4.	WIDTH OF BAND	.731"
5.	DIAMETER OF BOURRELET	1.445"
6.	TYPE OF FILLER	Black Powder
7.	WEIGHT OF FILLER	180 grains
8.	WEIGHT OF LOADED PROJECTILE	8670 grains
9.	CHARGE-WEIGHT RATIO	2.07%
10.	TYPE OF GUN USED IN	1 Pdr.
11.	FUZES WHICH MAY BE USED IN PROJECTILE	Base: Mk. 8; Mk. 8 Mods 1, 2, 3, 4 & 5; Mk. 2 Mods 8 & 9.
12.	TRACER	In Fuze
13.	CARTRIDGE CASE	Mk. 1 & Mk. 2
14.	PRIMER	Mk. 10 Mod 8; Mk. 10 Mod 9
15.	REMARKS: This ammunition is used in coast guard guns. Their bursting charge is Black Powder and T.N.T. or Black Powder alone. Black Powder is very sensitive and this should be kept in mind when unscrewing the fuze as some of the powder may have fallen down into the threads and the friction would cause detonation.	

6-pounder Cartridge Case

CARTRIDGE CASE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
DESIGNATION: 6 Pdr. Mk I	GUN: 6 Pdr. - 40, 45 and 50 cal.



Mk. I

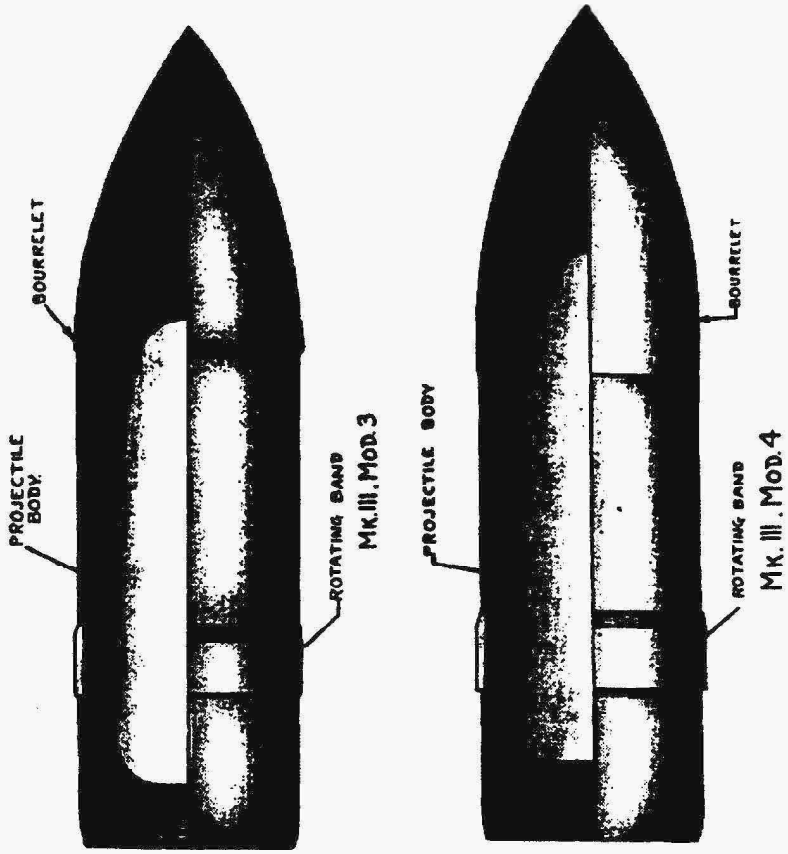
CARTRIDGE CASE DATA

NATIONALITY: U.S. NAVY		INFORMATION DATE: April, 1943
DESIGNATION: 6 Pdr. Mk I		GUN: 6 Pdr. - 40, 45 and 50 cal.
1.	OVERALL LENGTH	12.09"
2.	MAXIMUM DIAMETER	2.705"
3.	INSIDE DIAMETER AT NECK	2.209"
4.	CASE THICKNESS AT NECK	.045"
5.	BEGINNING OF TAPER AT BASE	10.04"
6.	DIAMETER OF CAP CONTAINER	.473"
7.	EXTRACTING LIP	.15"
8.	MATERIAL	Brass
9.	MARKING	Mfg's symbol, date, "6 Pdr. Mk I"
10.	WEIGHT EMPTY	2.125 lbs
11.	PROPELLANT	Black Powder
12.	EXPLOSIVE IN CAP	Mixture of Mercury Fulminate, Antimony Sulfide and Potassium Chlorate.

6-pounder Projectile

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6 Pounder	CLASSIFICATION: Common
TARGET: Used in Coast Guard guns, landing forces, etc.	



PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6 Pounder	CLASSIFICATION: Common
TARGET: Used in Coast Guard guns, landing forces, etc.	

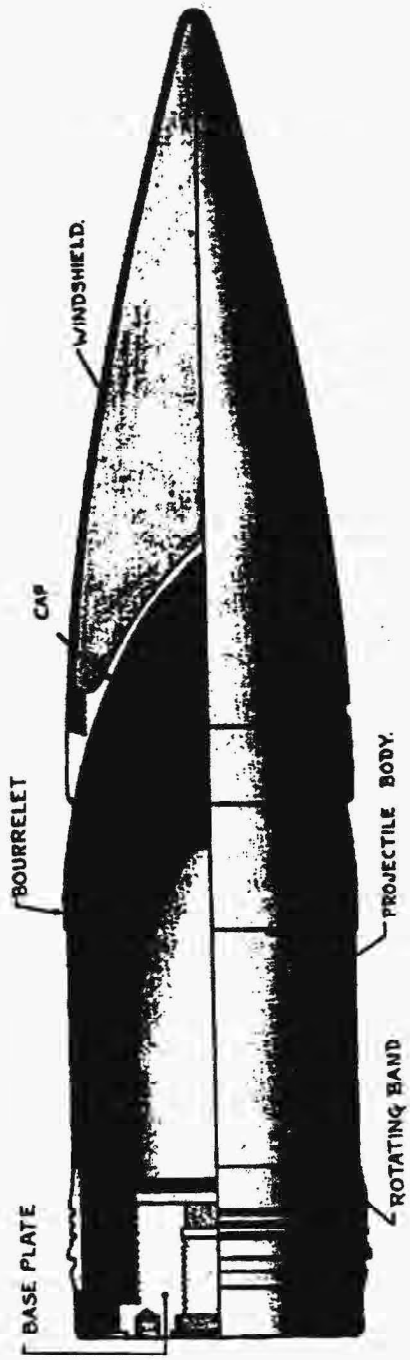
1.	OVERALL LENGTH -	8.45"
2.	DIAMETER OF BASE	2.224"
3.	DISTANCE FROM BASE TO BAND	1.493"
4.	WIDTH OF BAND	.787"
5.	DIAMETER OF BOURRELET	2.239"
6.	TYPE OF FILLER	Black Powder
7.	WEIGHT OF FILLER	.24 lbs
8.	WEIGHT OF LOADED PROJECTILE	6.00 lbs
9.	CHARGE-WEIGHT RATIO	4.00 %
10.	TYPE OF GUN USED IN	6 Pdr.
11.	FUZES WHICH MAY BE USED IN PROJECTILE	Base: Mk. 8; Mk. 8 Mods 1, 2, 3, 4 & 5; Mk. 2 Mods 8 & 9.
12.	TRACER	In fuze
13.	CARTRIDGE CASE	Mk. 1
14.	PRIMER	Mk. 10 Mods 8 & 9
15.	REMARKS:	

This ammunition is used in Coast Guard guns. The burstfng charge is Black Powder and T.N.T. or Black Powder alone. Black Powder is very sensitive and this should be kept in mind when unscrewing the fuze as some of the powder may have fallen down into the threads and the friction would cause detonation.

6-inch Projectile

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6"/47 - Mk. 27	CLASSIFICATION: Special Common
TARGET: Used against lightly armored surface craft such as cruisers, destroyers and also submarines.	



Mk. 27

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6"/47 - Mk. 27	CLASSIFICATION: Special Common

TARGET: Used against lightly armored surface craft such as cruisers, destroyers and also submarines.

1.	OVERALL LENGTH -	
	With Cap & Windshield	27.0"
	Without Cap & Windshield	15.95"
2.	DIAMETER OF BASE	5.99"
3.	DISTANCE FROM BASE TO BAND	1.0"
4.	WIDTH OF BAND	2.50"
5.	DIAMETER OF BOURRELET	5.99"
6.	TYPE OF FILLING	Explosive D
7.	WEIGHT OF FILLING	2.20 lbs
8.	WEIGHT OF LOADED PROJECTILE	105 lbs
9.	[illegible] RATIO	2.1 %
10.	TYPE OF GUN USED IN	6"/47
11.	TRACER	Mk. 5
12.	FUZES WHICH MAY BE USED IN PROJECTILE	Base: Mk. 19

13. CAP & WINDSHIELD:
The Cap is soldered to the nose of the projectile. Also it is held secure by five crimp caps equally spaced around the periphery of the nose.

The Windshield is fastened to the cap by means of five notches which are equally spaced on the periphery and staked.

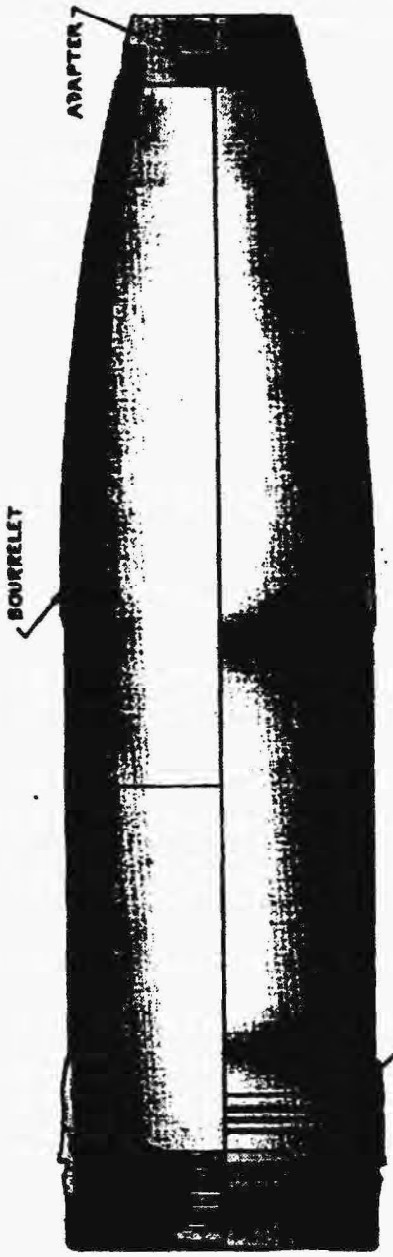
14.	CARTRIDGE CASE	Mk. 4
15.	PRIMER	Mk. 13

16. REMARKS:

For method of marking and painting projectile, see INTRODUCTION.

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6"/47 and 6"/53 Mk. 34	CLASSIFICATION: High Capacity (H.C.)
TARGET: Used effectively in bombarding shore installations because of the high loading factor. Also, used against lightly armored vessels such as cruisers, aircraft carriers, etc.	



Mk. 34

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6"/47 and 6"/53 Mk. 34	CLASSIFICATION: High Capacity (H.C.)

TARGET: Used effectively in bombarding shore installations because of high loading factor. Also, used against lightly armored vessels such as cruisers, aircraft carriers, etc.

1.	OVERALL LENGTH -	
	With Fuze	27.05"
	Without Fuze	22.625"
2.	DIAMETER OF BASE	5.99"
3.	DISTANCE FROM BASE TO BAND	1.00"
4.	WIDTH OF BAND	2.50"
5.	DIAMETER OF BOURRELET	5.99"
6.	TYPE OF FILLING	Explosive D
7.	WEIGHT OF FILLING	13.22 lbs
8.	WEIGHT OF LOADED PROJECTILE	105 lbs
9.	CHARGE-WEIGHT RATIO	12.60 %
10.	TYPE OF GUN USED IN	6"/47 and 6"/53
11.	FUZES WHICH MAY BE USED IN PROJECTILE	Base: Mk. 28 Nose: Mk. 29; Mk. 18 Mods 2, 3 & 4; A.P. Nose Plug; Auxiliary Detonator Fuze Mk. 17 and Mods.
12.	TRACER	Mk. 5; Mk. 5 Mod 1
13.	PRIMER	Mk. 13

14. REMARKS:

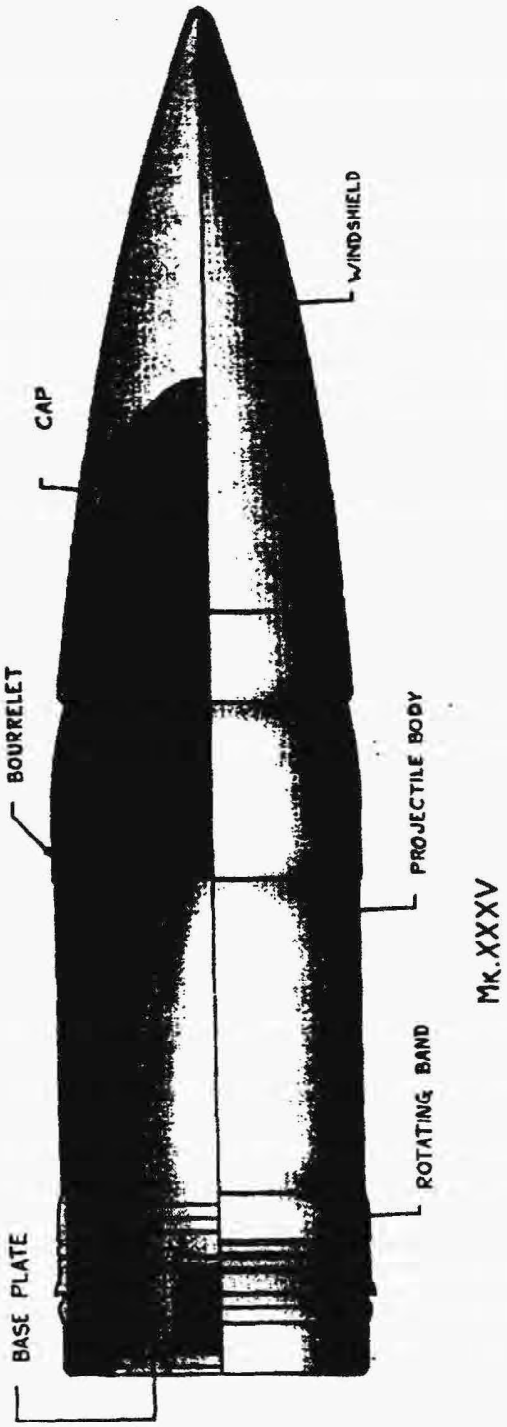
A waterproof cap may be placed over the nose fuze for protection from moisture.

For method of marking and painting projectile, see INTRODUCTION.

Note: - The nose of this projectile may be fitted with a steel armor piercing plug instead of a nose fuze. The steel plug has two notches 180° apart which may be staked to hold the plug in position and prevent turning. When the A.P. plug is used, the detonation depends entirely on the base fuze alone.

PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6"/47 - Mk. 35	CLASSIFICATION: A.P.
TARGET: Used against heavily armored targets.	



PROJECTILE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
CALIBER: 6"/47 - Mk. 35	CLASSIFICATION: A.F.
TARGET: Used against heavily armored targets.	

1.	OVERALL LENGTH -	
	With Cap & Windshield	27.0"
	Without Cap & Windshield	17.19"
2.	DIAMETER OF BASE.	5.99"
3.	DISTANCE FROM BASE TO BAND	1.00"
4.	WIDTH OF BAND	2.50"
5.	DIAMETER OF BOURRELET	5.99"
6.	TYPE OF FILLING	Explosive D
7.	WEIGHT OF FILLING	1.95 lbs
8.	WEIGHT OF LOADED PROJECTILE	130 lbs
9.	CHARGE-WEIGHT RATIO	1.5 %
10.	TYPE OF GUN USED IN	6"/47
11.	TRACER	Mk. 5
12.	FUZES WHICH MAY BE USED IN PROJECTILE	Base: Mk. 21; Mk. 19.
13.	CAP & WINDSHIELD: The Cap weighs 15.82 lbs and is soldered on to the nose of the projectile. In addition to the solder, it is secured by five crimp caps equally spaced around the periphery of the nose. The Windshield, 3/32" thick, is fastened to the cap by means of three equi-distanced notches which are staked.	
14.	CARTRIDGE CASE	Mk. 4
15.	PRIMER	Mk. 13
16.	REMARKS: For method of marking and painting projectile, see INTRODUCTION.	

8-inch Projectile, APHE

PROJECTILE, 8-INCH, AP, MK 21 MOD 1-5

8-inch AP, MK 21 Mods 1 - 5

Armor-Piercing (AP): These projectiles ar designed to penetrate an equal caliber of Class A armor plate. The windshield is made of either forged mild steel, steel stamping, or aluminum. It has no special strength other than to prevent destruction during handling and set back on firing. The cap is a soft steel designed t increase the power of penetration to the projectile. The body is of high quality alloy steel. The base plug closes off the explosive cavity and holds the base fuze or base fuze adapter. The base fuze is inserted through the base plug or base fuze adapter and is designed to detonate the projectile after penetration.

Length
- **with cap and windshield:** ..... 36.0 inch
- **without cap and windshield:** ..... 24.5 inch

Diameter of bourrelet: ..... 7.97 inch
Width of band: ..... 3.30 inch
Weight: ..... 335 pound
Filler: ..... Explosive D
Weight of filler: ..... 5.03 pounds
Fuze: ..... Base Fuze, Mk 21 Mods 0 and 1
Base Fuze, Mk 23 Mod 0

Reference: NAVSEA OP 1664, Vol 1, U.S. Explosive Ordnance, 28 May 1947
West Point Text Book, "Ordnance and Gunnery" copyright 1907

12-inch Projectile, APHE

PROJECTILE, 12-INCH, AP, MK 15 MOD 6

12-inch A.P. Mk 15 Mod 6

Armor-Piercing (AP) These projectiles are designed to penetrate an equal caliber of Class A armor plate. This is an old type projectile without a windshield. The cap is a soft steel designed t increase the power of penetration to the projectile. The body is of high quality alloy steel. The base plug closes off the explosive cavity and holds the base fuze or base fuze adapter. The base fuze is inserted through the base plug or base fuze adapter and is designed to detonate the projectile after penetration.

Length ..... 42.10 inches
Diameter of Base ..... 11.94 inches
Diameter of bourrelet ..... 12.97 inches
Width of band ..... 4.0 inches
Weight ..... 870 pounds
Filler ..... Explosive D
Weight of filler ..... 22.50 pounds
Fuze ..... Base Fuze, Mk 2 Mod 2;Mk 11

Reference: U.S.N. Bomb Disposal School., Projectiles and Fuzes, April 1943
West Point Text Book, "Ordnance and Gunnery" copyright 1907

13-inch Projectile, SHOT

PROJECTILE, 13-INCH, AP & TARGET

No Illustrations Available

Characteristics of Projectiles

Model	Length (in)	Diameter (in)	Explosive Weight (lb)	Complete Weight (lb)	Band Weight (in)
A.P., Mk III	43.58	13.163	22.11	1,130	1.74
A.P., Mk V	46.05	13.15	36.12	1,130.04	2.44
A.P., Mk IX-1	46.05	13.12	27.75	1,130	4.33
A.P., Mk IX-2	46.477	13.12	27.75	1,130	4.33
Target, Mk VI	45.36	13.15	0	1,130	2.44
Target, Mk VIII-1	45.80	13.12	0	1,130	2.33
Target, Mk VIII-2	45.80	13.12	0	1,130	2.33
Target, Mk VIII-3	45.80	13.12	0	1,130	2.33

Reference: Ordnance Pamphlet No. 4, Ammunition, September 1923

16-inch Projectile, APHE

PROJECTILE, 16-INCH, AP, MK 5 MOD 1-5

16-inch A.P. Mk 5 Mods 1-5

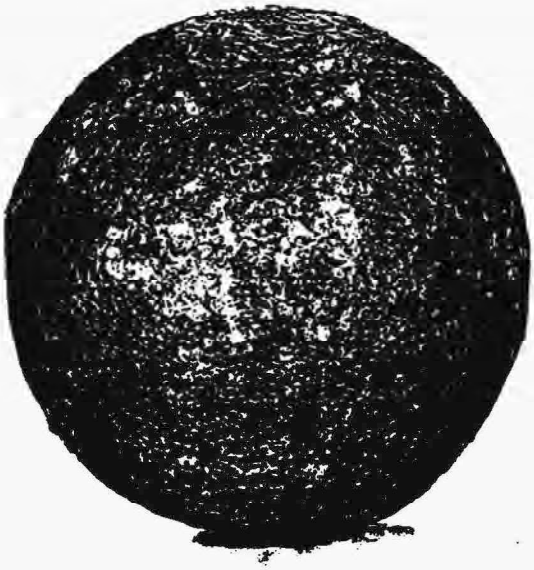
Armor-Piercing (AP): These projectiles ar designed to penetrate an equal caliber of Class A armor plate. The windshield is made of either forged mild steel, steel stamping, or aluminum. It has no special strength other than to prevent destruction during handling and set back on firing. The cap is a soft steel designed t increase the power of penetration to the projectile. The body is of high quality alloy steel. The base plug closes off the explosive cavity and holds the base fuze or base fuze adapter. The base fuze is inserted through the base plug or base fuze adapter and is designed to detonate the projectile after penetration.

Length
with cap and windshield: ..... 64.0 inches
without cap and windshield: ..... 43.387 inches
Diameter of bourrelet: ..... 15.97 inches
Width of band: ..... 5.32 inches
Weight: ..... 2,240 pounds
Filler: ..... Explosive D
Weight of filler: ..... 34 pounds
Fuze: ..... Base Fuze, Mk 21 Mods 0 and 1

Reference: TM 9-1904, Ammunition Inspection Guide, March 1944
West Point Text Book, "Ordnance and Gunnery" copyright 1907

10-inch Cannon Ball, Shot

SMOOTHBORE SHOT (CANNONBALL)
10-INCH



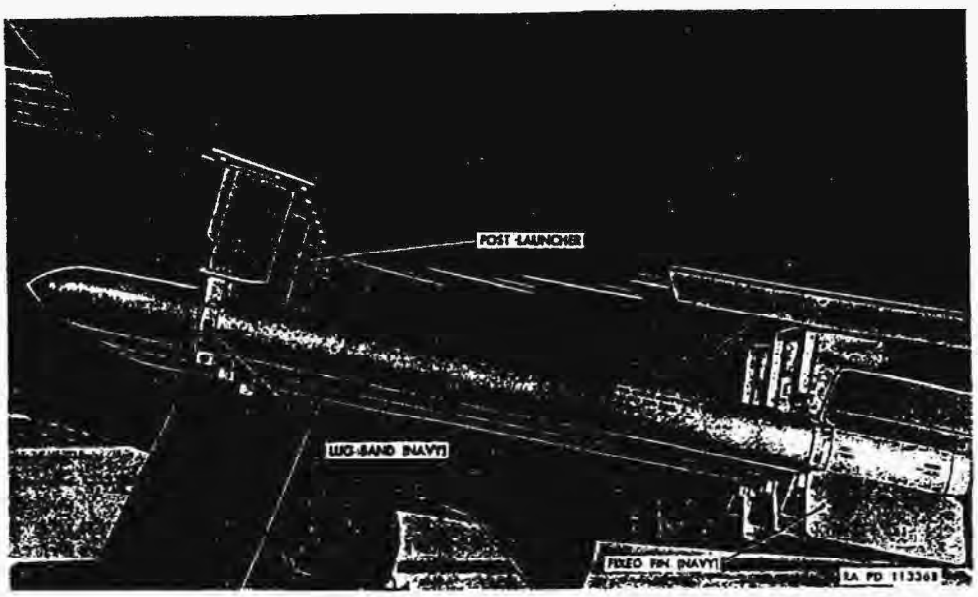
The Smoothbore Shot is frequently referred to as a "cannonball", a term somewhat archaic, even in 1861, but one that lingers on. These projectiles were used very extensively for both anti-material and anti-personnel purposes. Because of the inherent nature the projectile was very prone to ricochet - skipping over ground or water in the fashion of a flat rock over water. This peculiarity was utilized by skillful gunners against both ground troops and warships. They were extensively used to batter and breach fortifications on land and against warships in coastal batteries.

Diameter: ..... 10 inches (approximately)
Weight: ..... 128 pounds (approximately)
Fuze: ..... None

Reference: Heavy Artillery Projectiles of the Civil War 1861-1865, copyright 1972

3.5-inch Rocket Head

AIRCRAFT ROCKET, 3.5 INCH, Mk 4
SEMI-ARMOR PIERCING



3.5-inch aircraft rocket (3.5-inch head MK 8 Mod 1 and 3.25-inch motor MK 7

NO PICTURE AVAILABLE FOR THE 3.5-INCH Mk 4

Use: The 3.5-inch rockets were designed to be used against smaller targets, such as submarines and tanks. Due to the small amount of explosives the HE and AP head were not issued.

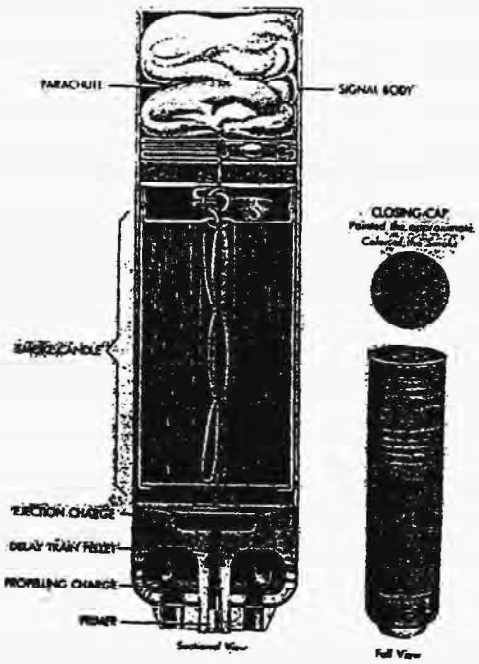
Description: The head has a semi-armor-piercing nose and is filled with 1-pound of high explosives. The High Explosive and Semi-Armor Piercing Heads were discontinued due to the small amount of explosives carried, and replaced with the 5.0-inch heads.

Head Length: ..... 13.4 inches
Head Weight: ..... 20.2 pounds
Filler: ..... TNT
Filler Weight: ..... 1.0 pounds
Total Weight: ..... 53.9 pounds
Total Length: ..... 54.7 inches
Fuzing: ..... Base fuze, Mk 146
Motor: ..... 3.25-inch Mk 7

Reference: NAVSEA OP 1664, U.S. Explosive Ordnance Disposal, May 1947
TM 9-1950, Rockets, July 1950

Ship's Emergency Identification Signal,
Mk3, Smoke (expended)

SHIP'S EMERGENCY IDENTIFICATION SIGNAL, MK 3, SMOKE



Description: The signal consists of a pressure-retaining disc and disc-locking nut, a primer, a four gram smokeless powder propelling charge, a copper obturating cup, a delay train, an ejection charge of approximately 1.1 grams of black powder.

Operation: The signal is placed in a projector where the primer rests against the retaining pin. A pull on the lanyard removes the firing pin. and allows the signal to descend against the firing pin with sufficient force to close the valve and fire the primer. The primer ignites the delay train and propelling charge simultaneously. Increased pressure ruptures the pressure retaining disc, and the gases then escape through the openings in the retaining disc locking nut into the projector bore. The gases propel the signal approximately 600 feet. The ejection charge ejects and ignites the signal pyrotechnics through a quick match and fire composition. The signal is designed to give two distinct bursts, one with a short delay and one with a long delay.

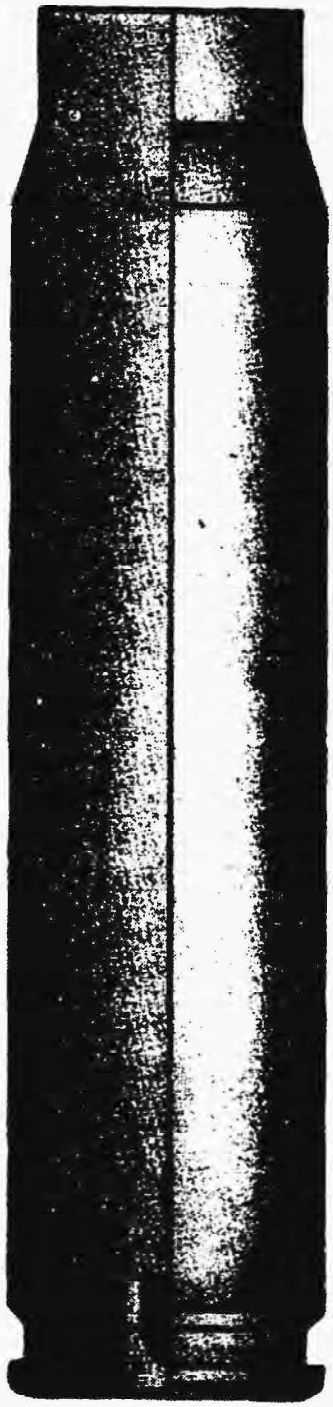
Length: ..... 9.124 inches
Diameter: ..... 2.49 inches
Color: ..... Red, black, green, yellow
Burning Time: ..... 5 seconds

Reference: NAVSEA OP 1664, Volume 1, 28 May 1947

Cartridge Case, 20mm
(Inert, inerting holes present in case)

CARTRIDGE CASE DATA

NATIONALITY: U.S. NAVY	INFORMATION DATE: April, 1943
DESIGNATION: 20 mm. Mk I	GUN: Hispano Suiza Type



MK. I

CARTRIDGE CASE DATA

NATIONALITY: U.S. NAVY		INFORMATION DATE: April, 1943
DESIGNATION: 20 mm. Mk I		GUN: Hispano Suiza Type
1.	OVERALL LENGTH	4.342"
2.	MAXIMUM OUTSIDE DIAMETER (Base)	.976"
3.	INSIDE DIAMETER AT NECK (Proj. end)	.766"
4.	THICKNESS CASE AT PROJECTILE END	.023"
5.	BEGINNING OF TAPER FROM BASE	.610"
6.	DIAMETER OF CAP CONTAINER	.388"
7.	DEPTH OF EXTRACTING GROOVE	.055"
8.	MATERIAL	Brass
9.	VOLUME OF CASE	2.4 cu.in.
10.	MARKINGS	Stamped with letters and figures 1/16" high and .01" deep the initials or symbols of mfg, year of mfg. and caliber and mark of case.
11.	WEIGHT EMPTY	.205 lbs
12.	PROPELLANT	Smokeless Powder
13.	PROPELLANT WEIGHT	30 grams
14.	EXPLOSIVE IN CAP	37½% Fulminate of Mercury 37½% Potassium Chloride 25% Antimony Sulfide
15.	EXPLOSIVE WEIGHT IN CAP	2¼ to 2½ grams
16.	REMARKS: The anvil is .3102 in. diameter. The primer cap chamber contains two fire holes which lead directly to the smokeless powder propellant.	

Cartridge Case Specifications

CARTRIDGE CASE SPECIFICATIONS

Type	Gun	Over-all Length	Base Dia	Case	Weight Empty	Weight of Propellant	Primer
3" Mk 2	3"/23	9.20"	3.46"	Brass	2.25 lb.	580 gram	Mk 10 Mod 9
3" Mk 3	3"/50	23.44"	4.30"	Brass	Mod 0 & 3 7.00 lb.		
					Mod 2: 7.88 lb	4.00 lb.	Mk 14, Mk 14 Mod 1
3" Mk 7 & 9	3"/50	22.99"	4.30"	Mk 7: Brass	Mk 7: 7.0 lb.		
				Mk 9: Steel	Mk 9: 6.54 lb.	4.00 lb.	Mk 14, Mk 14 Mod 1
4" Mk 2 Mod 0	4"/50	34.84"	5.90"	Brass	17.25 lb.	14.50 lb.	Mk 13 & all Mods
4" Mk 2 Mod 1	4"/50	33.74"	5.90"	Brass	17.00 lb.	14.50 lb.	Mk 13 & all Mods
4" Mk 2 Mod 3	4"50	34.84"	5.90"	Brass	15.10 lb.	14.50 lb.	Mk 13 & all Mods
4" Mk 2 Mod 4	4"/50	33.74"	5.90"	Brass	14.90 lb.	14.50 lb.	Mk 13 & all Mods
5" Mk 3	5"/51	33.05"	7.40"	Brass	27.38 lb.	24.50 lb.	Mk 13 & all Mods
5" Mk 5	5"/38	26.75"	6.22"	Brass	12.31 lb.	15.20 lb.	Mk 13 & all Mods
5" Mk 4 Mod 0	5"/25	24.65"	5.90"	Brass	14.44 lb.	9.60 lb.	Mk 13 & all Mods
5" Mk 4 Mod 2	5"/25	24.65"	5.90"	Brass	11.40 lb.	9.60 lb.	Mk 13 & all Mods
5" Mk 6	5"/54	32.93"	6.22"	Brass	13.04 lb.	18.00 lb.	Mk 13 & all Mods
6" Mk 4	6"/47	38.20"	7.85"	Brass	28.20 lb.	32.00 lb.	Mk 13 & all Mods
8" Mk 1	8"/55	50.27"	10.55"	Brass	57.00 lb.	90.00 lb.	Mk 35
20-mm Mk 2	20.mm A.A.	4.343"	0.87"	Brass	0.190 lb.	27.7 grams	Mk 30, Mk 31
20-mm Mk 3&4	20-mm A.A.	4.343"	0.87"	Mk 3: Steel	0.190 lb.	27.7 grams	Mk 31
				Mk 4: Brass			
40-mm Mk 1	40-mm A.A.	12.24"	2.44"	Brass	1.93 lb.	300 grams	Mk 21
40-mm Mk 2&3	40-mm A.A.	12.24"	2.44"	Mk2: Brass	Mk2: 1.89 lb.	300 grams	Mk 22
				Mk 3: Steel	Mk 3: 1.53 lb.		
1.1" Mk 1	1.1"A.A.	7.830"	1.71"	Brass	0.688 lb.	120 grams	Mk 19 Mod 3
1-pdr. Mk 2	1-pounder	5.389"	1.77"	Brass	0.406 lb.	70 grams	Mk 10 Mod 9
3-pdr. Mk 1	3-pounder	14.84"	02.5"	Brass	1.65 lb.	300 grams	Mk 10 Mod 9
6-pdr. Mk 1	6-pounder	12.09"	2.99"	Brass	2.13 lb.	500 grams	Mk 10 Mod 9

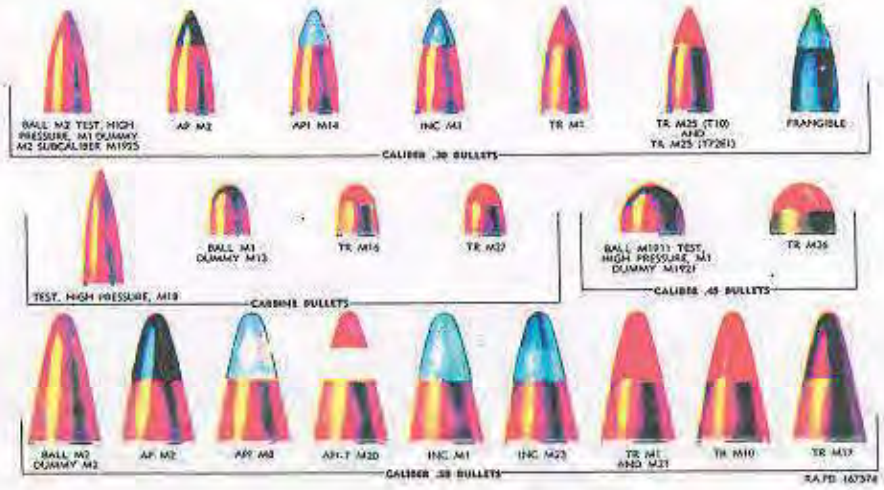
SHORT CASES

Type	Gun	Length	Propellant Weight	Primer
Mk 1 (Modified)	1.1"	5.25"	85 grams	Mk 19 Mods 1, 2, & 3
Mk 2 (Modified)	3"/23	4.9"	385 grams	Mk 10 Mod 9
Mk 3 & Mods 2 & 3 (Modified)	3"/50	18"	3.8 lb.	Mk 14
Mk 2 & Mod 3 (Modified)	4"/50	29"	14.0 lb.	Mk 13 & all Mods
Mk 4 (Modified)	5"/25	21"	9.0 lb.	Mk 13 & all Mods
Mk 5 (Modified)	5"/38	16.25"	9.0 lb.	Mk 13 & all Mods
Mk 3 (Modified)	5"/51	20"	10.0 lb.	Mk 13 & all Mods
Mk 6 (Modified)	5"/34	20"	10.0 lb.	Mk 13 & all Mods
Mk 4 (Modified)	6"/47	25.0"	23.0 lb.	Mk 13 & all Mods
Mk 2 (Not Modified)	8"/55	31.08"	44.0 lb.	Mk 35 Mod 1

Reference: NAVSEA OP 1664, VOL 1, 28 May 1947

Small Arms, General

SMALL ARMS, GENERAL



Identification of bullets of small arm cartridges

Use: Cal, .50 machine guns, Cal, .30, carbines, rifles, semiautomatic rifles, automatic rifles, and machine guns, Cal, .22 pistols, rifles, and machine guns (for gallery practice), Shotguns, 12-gage, Cal, .45 automatic pistols, revolvers, and submachine guns, Subcaliber tubes and adapters for artillery weapons which use ammunition of similar size and type.

Description: A complete round of small-arms ammunition is known as a cartridge, and is made up of the following components:

Bullet: The bullet in general is cylindrical. The nose may be round, as in the cal, .50 bullet, or ogival as in all service rifles and machine gun bullets. The base may be square or boat-tailed. Types are identified by the color of the tip and include the following:

- Armor-piercing bullets contain a core of hardened steel.
- Ball usually contain a slug of antimony hardened lead except in the case of the cal, .50, wherein the outer core is of soft steel.
- Tracer contains a lead slug, and a chemical composition in the rear.
- Incendiary bullets contain an incendiary composition.

Cartridge case: The cartridge case is the means whereby the other components are assembled into the unit. It also provides a waterproof container for the propelling charge.

Primer: Percussion

Propelling charge: The propelling charge consists of a quantity of smokeless powder. The weight of the charge is not constant. It is adjusted for each powder lot to give the required velocity with pressure within the limits prescribed for the weapon in which it is fired.

Reference: TM 9-1904, Ammunition Inspection Guide, dated 2 March 1944
TM 9-1900, Ammunition General, dated June 1956

9.0 EVALUATION OF OTHER SITE INFORMATION

Other than the items stated in the INPR, the archive search did not reveal any additional areas of potential environmental concern associated with DoD use.

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Appendix I

Munitions Response Site Prioritization Protocol Tables

Per USACE Guidance, the MRSPP is not included in the MMRP RI Report. The MRSPP can be accessed through the Formerly Used Defense Sites Management Information System (FUDSMIS) at https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=57481

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