### **FINAL**

## REMEDIAL INVESTIGATION REPORT

# PALI TRAINING CAMP OAHU, HAWAII

FUDS Project Number H09HI027701 Contract: W912DY-10-D-0053 Task Order: 0003



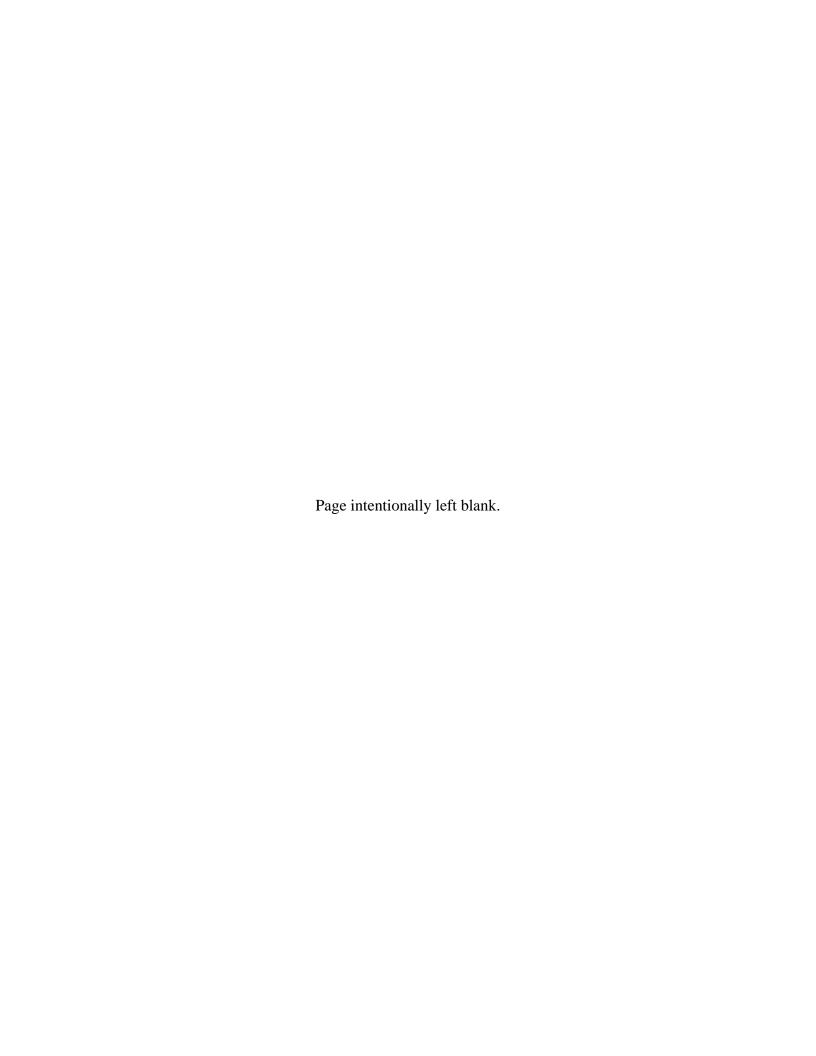
# Prepared for:

United States Army Corps of Engineering, Honolulu District and

**United States Army Engineering and Support Center, Huntsville** 

**by: Huikala, LLC**3375 Koapaka St., STE F200
Honolulu, HI 96819

November 2014
Revision 3



### **FINAL**

# REMEDIAL INVESTIGATION REPORT

# PALI TRAINING CAMP OAHU, HAWAII

FUDS Project Number H09HI027701 Contract: W912DY-10-D-0053 Task Order: 0003



Prepared for:

United States Army Corps of Engineering, Honolulu District and

**United States Army Engineering and Support Center, Huntsville** 

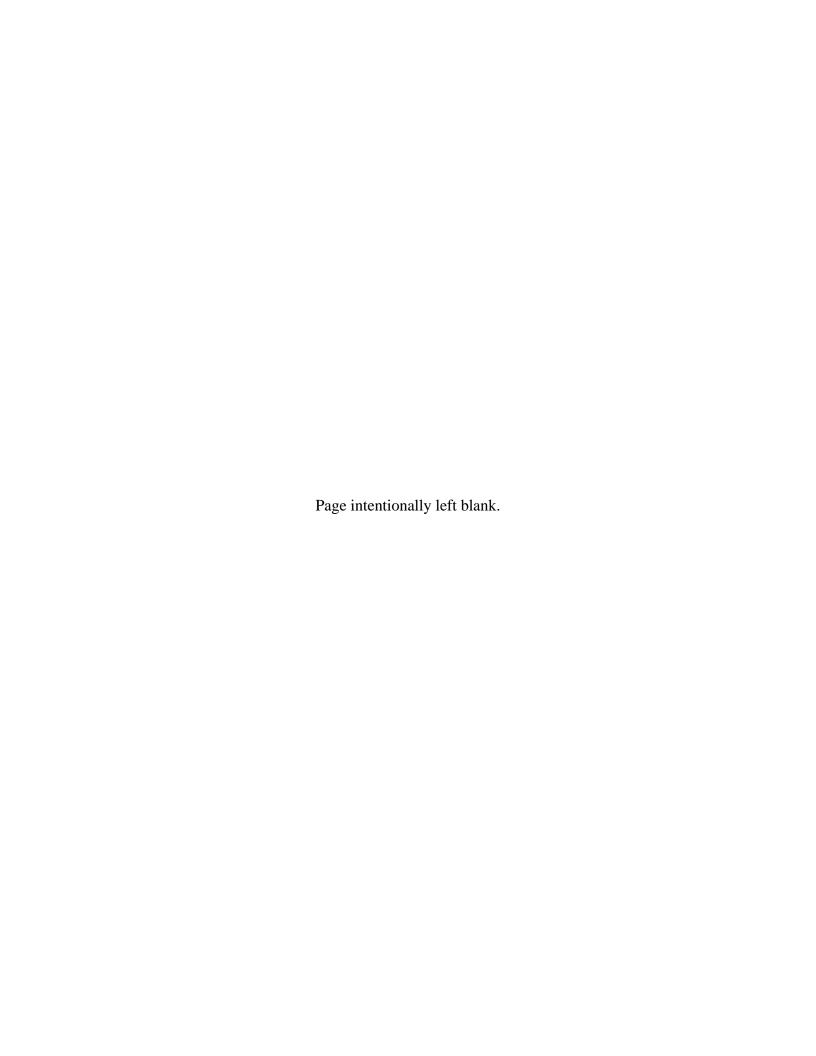
by:

Huikala, LLC

3375 Koapaka St., STE F200 Honolulu, HI 96819

> November 2014 Revision 3

> > **Reviewed by:**



# **Table of Contents**

1.0	Executiv	ve Summ	ary	1-1
	1.1	Maunav	wili Valley Impact Area MRS	1-1
		1.1.1	Technical Approach	1-1
		1.1.2	MEC Investigation and Data Analysis	1-2
		1.1.3	MC Investigation and Data Analysis	1-3
		1.1.4	Results	1-3
	1.2	Maunav	wili Training Course MRS	1-4
	1.3	Makalii	Valley Training Course MRS	1-5
	1.4	Ulumav	vao Training Course MRS	1-5
2.0	Introdu	ction		2-1
	2.1	Task O	rder Purpose and Scope	2-1
	2.2	RI Repo	ort Organization	2-2
	2.3	Property	y Description and Problem Identification	2-2
		2.3.1	Project Location	2-2
		2.3.2	Topography	2-3
		2.3.3	Geology	2-4
		2.3.4	Hydrology	2-4
		2.3.5	Climate	2-4
		2.3.6	Biological and Ecological Resources	2-5
		2.3.7	Cultural Resources	2-6
		2.3.8	Current and Future Land Use	2-6
		2.3.9	Problem Identification	2-7
	2.4	Historic	cal Information	2-7
		2.4.1	Historic Use	2-7
	2.5	Previou	s Investigations	2-8
		2.5.1	1994 Inventory Project Report	2-8
		2.5.2	2008 Engineering Evaluation/Cost Analysis	
		2.5.3	2009 Site Investigation	2-9
		2.5.4	2012 Removal Action at Maunawili Valley Impact Area	2-10
		2.5.5	Quality and Utility of Existing Data	2-10
3.0	Project 1	Remedial	l Response Objectives	3-1
	3.1	CSM ar	nd Project Approach	3-1
		3.1.1	Preliminary CSM	
		3.1.2	Project Approach	3-3
	3.2	Preliminary Remediation Goals		
		3.2.1	Assessment of Land Use and Institutional Analysis Aspects	
		3.2.2	PRG for MEC	
		3.2.3	PRG for MC	3-4

	3.3	Prelimin	ary Identification of Applicable or Relevant and	Appropriate
	Requ	irements a	and To Be Considered Information	3-5
		3.3.1	Chemical-Specific ARARs	3-7
		3.3.2	Location-Specific ARARs	3-8
		3.3.3	Action-Specific ARARs	3-8
	3.4	Institutio	onal Analysis	3-9
	3.5	Data Ne	eds and Data Quality Objectives	3-10
		3.5.1	Analysis of Existing Data	3-10
		3.5.2	Data Needs	
		3.5.3	MEC DQOs Resulting from TPP Process	3-12
		3.5.4	MC DQOs Resulting from TPP Process	3-16
		3.5.5	MRSPP DQO	3-24
		3.5.6	MEC Data Obtained During RI	3-24
		3.5.7	MC Data Obtained During RI	3-24
		3.5.8	Evaluation of MC Methodology	3-24
4.0	Charact	erization	of MEC and MC	4-1
	4.1	Data Ma	nnagement	4-1
		4.1.1	Hard Copy Data	4-1
		4.1.2	Electronic Data	4-1
		4.1.3	Geographic Information System Data	4-1
	4.2	MEC Ch	naracterization	4-1
		4.2.1	Technical Approach	4-2
		4.2.2	Field Change Requests	4-2
		4.2.3	Geophysical Prove Out	4-3
		4.2.4	Archaeological, Cultural, and Ecological Resource Avoidar	nce 4-4
		4.2.5	Limited Vegetation Removal	4-4
		4.2.6	MEC Investigation	4-4
		4.2.7	MEC Disposal	4-6
		4.2.8	Disposal/Disposition of MPPEH	4-6
		4.2.9	Quality Control	4-6
	4.3	MC Cha	racterization	4-7
		4.3.1	Technical Approach	4-8
		4.3.2	Field Change Requests	4-8
		4.3.3	Archaeological and Ecological Resource Avoidance	4-8
		4.3.4	MC Investigation	4-9
		4.3.5	Quality Control Procedures	4-10
5.0	RI Resu	lts and Re	evised CSM	5-1
	5.1	RI Resul	lts (MEC)	5-1
		5.1.1	Visual Sample Plan Analysis	5-1
		5.1.2	UXO Estimator	

		5.1.3	Results of RI Compared to Previous Studies	5-3
	5.2	5.2 Revised CSM (MEC)		
		5.2.1	MVIA – West	5-4
		5.2.2	MVIA – Central	5-5
		5.2.3	MVIA – East	5-6
	5.3	RI Resu	ults (MC)	5-7
		5.3.1	MC Presence, Nature, and Extent	5-7
	5.4	Revised	1 CSM (MC)	5-15
		5.4.1	Maunawili Valley Impact Training Area	5-15
		5.4.2	Maunawili Training Course	5-15
6.0	Contam	inant Fat	te and Transport for MEC and MC	6-1
	6.1	MEC		6-1
		6.1.1	Potential Sources of Contamination	6-1
		6.1.2	Contaminant Persistence	6-1
		6.1.3	Contaminant Migration	6-1
		6.1.4	Potential Human Receptors and Exposure Pathways	6-1
	6.2	MC		6-2
<b>7.0</b>	Hazard	Assessmo	ent for MEC and Baseline Risk Assessment for MC	7-1
	7.1	MEC H	[A	7-1
		7.1.1	Maunawili Valley Impact Area – West	7-2
		7.1.2	Maunawili Valley Impact Area – Central	7-4
		7.1.3	Maunawili Valley Impact Area – East	7-4
		7.1.4	Maunawili Training Course	7-5
		7.1.5	Makalii Valley Training Course	7-5
		7.1.6	Ulumawao Training Course	7-5
	7.2	Baseline	e Risk Assessment for MC	7-5
		7.2.1	Maunawili Valley Impact Area	7-5
		7.2.2	Maunawili Training Course	7-5
		7.2.3	Makalii Valley Training Course	7-5
		7.2.4	Ulumawao Training Course	7-6
8.0	Summa	ry and Co	onclusions	8-1
9.0	Referen	ces		9-1
Apı	pendices.	•••••		9-1

### **List of Tables**

- Table 3-1: Summary of Preliminary CSMs
- Table 3-2: Preliminary Remediation Goals for MCs
- Table 3-3: Preliminary Identification of ARARs
- Table 3-4: Final MEC DQOs
- Table 3-5: Final MC DQOs
- Table 4-1: IVS Construction
- Table 4-2: MEC and MD Items
- Table 5-1: Summary of RI Findings
- Table 5-2: MEC and MD in MVIA West
- Table 5-3: MD in MVIA Central
- Table 5-4: Summary of Soil Analytical Results Metals
- Table 5-5: Summary of Soil Analytical Results Explosives
- Table 5-6: Site-Specific Background Values for Metals
- Table 5-7: Summary Statistics for Background Soil Data
- Table 7-1: Summary of MEC HA Score for MVIA West Baseline

## **List of Figures**

- Figure A1-1 Site Location Map
- Figure A2-1 2008 EE/CA Reconnaissance Map and Impact Area
- Figure A2-2 2008 EE/CA Munitions Debris in Maunawili Valley Impact Area
- Figure A2-3 2008 EE/CA Findings in Maunawili Training Course and Makalii Valley Training Course
- Figure A2-4 2009 Site Investigation Sample Results
- Figure A2-5 2012 Maunawili Valley Impact Area Removal Action
- Figure A4-1 Instrumentation Verification Strip (2013)
- Figure A4-2 Instrumentation Verification Strip (2014)
- Figure A4-3 Final Transect and Grid Location Map
- Figure A4-4 Soil Sampling Unit Coverage Map
- Figure A5-1 MEC and MD Finds for the Maunawili Valley Impact Area
- Figure A5-2 Maunawili Valley Impact Area RI and Previous Investigation Finds
- Figure A5-3 Conceptual Site Model (MEC)
- Figure A5-4 Conceptual Site Model (MC) Maunawili Valley Impact Area
- Figure A5-5 Conceptual Site Model (MC) Maunawili Training Course

# **List of Appendices**

Appendix A – Figures

Appendix B – Biological Monitoring Report

Appendix C – Sampling and Laboratory Data

Appendix D – Daily Field Reports

Appendix E – Field Logbooks

Appendix F – Photographic Log

Appendix G – GIS Data

Appendix H – Field Change Requests

Appendix I – MPPEH Tracking Log and DD Form 1348-1A

Appendix J – Transect and Grid Logs

Appendix K – QC Documentation

Appendix L – QA Documentation

Appendix M – Visual Sample Plan Report

Appendix N – MEC HA Worksheets

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

# **Acronyms and Abbreviations**

ags above ground surface

AMP Archaeological Monitoring Plan

AP armor piercing

APCT armor piercing capped tracer

APT armor piercing tracer

ARAR applicable or relevant and appropriate requirements

bgs below ground surface

BTV background threshold value

CEPOH United States Army Corps of Engineers, Honolulu District

CERCLA Comprehensive Environmental Response, Compensation, and Liability

Act

CFR Code of Federal Regulations
COPC contaminant of potential concern

CSM conceptual site model

DA Department of Army
DD Decision Document

DDESB Department of Defense Explosives Safety Board
DERP Defense Environmental Restoration Program

DGM digital geophysical mapping

DID data item description

DLNR State of Hawaii Department of Land and Natural Resources

DMM discarded military munitions

DNB dinitrobenzene
DNT dinitrotoluene

DoD Department of Defense, United States

DQO data quality objective

DU decision units

EAL environmental action level edd electronic data deliverable

EE/CA engineering evaluation/cost analysis

EP Engineer Pamphlet

EPA Environmental Protection Agency, United States

ESP Explosives Siting Plan

ESQD explosive safety quantity distance

# **Acronyms and Abbreviations (continued)**

°F degrees Fahrenheit
FCR field change request
FS feasibility study

FUDS Formerly Used Defense Sites

FUDSMIS Formerly Used Defense Sites Management Information Systems

GIS geographic information system
GPS global positioning system

HA hazard assessment

HARC Hawaii Agricultural Research Center
HBMP Hawaii Biodiversity & Mapping Program
HDOH State of Hawaii Department of Health

HE high explosives

HEAT high explosive anti-tank

HEER Hazard Evaluation and Emergency Response

HMX cyclotetramethylenetetranitramine

IAW in accordance with IC institutional controls

ID identification

INPR Inventory Project Report

ISM incremental sample methodology

ISO industry standard objects
IVS instrument verification strip

jpg joint photographic experts group

kg kilogram

LCS laboratory control samples

MC munitions constituent
MD munitions debris

MDAS material documented as safe

mdb personal geodatabase

MDT Maunawili Demonstration Trail
MEC munitions and explosives of concern

MFT Maunawili Falls Trail

# **Acronyms and Abbreviations (continued)**

mg milligram millimeter

MPPEH material potentially presenting an explosive hazard

MRA munitions response area MRS munitions response site

MRSPP Munitions Response Site Prioritization Protocol

MS matrix spike

MSD matrix spike duplicate

MSL mean sea level

MTC Maunawili Training Course
MVIA Maunawili Valley Impact Area
MVTC Makalii Valley Training Course

NG nitroglycerin NT nitrotoluene

OESS Ordnance and Explosives Safety Specialist

pdf portable document format
PDSQ Point Detonating Super Quick

PDT project delivery team
PETN pentaerythritol tetranitrate

PP Proposed Plan

PRG preliminary remediation goal

PTC Pali Training Camp

QA quality assurance QC quality control

RCRA Resource Conservation and Recovery Act

RDX research development explosive (cyclotrimethylenetrinitramine)

RI remedial investigation

ROE right-of-entry

RPD relative percent difference RSD relative standard deviation

SDG sample delivery group

SEDD staged electronic data deliverable

# **Acronyms and Abbreviations (continued)**

shp shapefiles

SI site investigation
SU sampling unit
SW solid waste

T&E threatened and endangered

TBC to be considered

Tetryl 2,4,6-Trinitrophenylmethylnitramine

TGM Technical Guidance Manual

TNB trinitrobenzene

TNT 2,4,6-trinitrotoluene

TO task order

TPP Technical Project Planning

TSQ Time Super Quick

UFP-QAPP Uniform Federal Policy – Quality Assurance Project Plan

USACE United States Army Corps of Engineers

USAESCH United States Army Engineering and Support Center, Huntsville

USC United States Code

UTC Ulumawao Training Course

UTL upper tolerance limits UXO unexploded ordnance

UXOQCS UXO Quality Control Specialist

VSP Visual Sample Plan

WERS Worldwide Environmental Remediation Services

WP Work Plan

# 1.0 Executive Summary

- 1.0.1 This report describes the results of a Remedial Investigation (RI) conducted by Huikala, LLC (Huikala) between July and October 2013 and February and March 2014 at the Formerly Used Defense Sites (FUDS) Property Number H09HI0277, also known as the former Pali Training Camp (PTC), Oahu, Hawaii. The former PTC was included in the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) based on its use as regimental combat training center between 1943 and 1945, emphasizing the use of and familiarity with modern arms and field weapons, in addition to providing rugged terrain for jungle and ranger training.
- 1.0.2 The FUDS property consists of four non-contiguous parcels located in portions of the Maunawili and Makalii Valleys: Maunawili Valley Impact Area (MVIA), Maunawili Training Course (MTC), Makalii Valley Training Course (MVTC), and Ulumawao Training Course (UTC). Each parcel is considered a munitions response area (MRA). Each MRA contains one munition response site (MRS). The former PTC, as currently reported in the Formerly Used Defense Sites Management Information System (FUDSMIS), consists of the four MRSs totaling 4,378 acres<sup>1</sup>. Refer to Appendix A, Figure A1-1 for the site location map. Field investigation was performed in the MVIA MRS only.
- 1.0.3 The objective of this RI is to characterize the nature and extent of munitions and explosives of concern (MEC), munitions debris (MD), and munitions constituents (MC) within each MRS and to assess the associated risks to human health and the environment.
- 1.0.4 This RI Report is an independent document. A follow-on Feasibility Study (FS) will be prepared to evaluate potential future courses of action for each MRS.

## 1.1 Maunawili Valley Impact Area MRS

# 1.1.1 Technical Approach

1.1.1.1 The MEC investigation technical approach was designed to collect sufficient surface and subsurface anomaly data along pre-determined transects in accessible areas (defined as less than 18 degrees slope). Visual Sample Plan (VSP) software was used to determine the number of transects and transect spacing required to characterize the nature and extent of MEC contamination (areas where MEC was found). The transect design optimized the determination of MEC density and the limits of MEC contamination to ensure a 90% confidence level of traversing and detecting a potential impact area with a 500-foot radius by collecting data along transects spaced 350 feet apart (Appendix M).

-

<sup>&</sup>lt;sup>1</sup> Site acreage calculated with Geographical Information System (GIS) is 3,666 acres. The acreages reported in this document and on maps are based on GIS-calculated acreages, unless otherwise noted.

1.1.1.2 UXO Estimator software was used to determine the minimal acreage required for investigation, outside of an impact or MEC contamination, to demonstrate with at least a 90% confidence that the concentration of unexploded ordnance (UXO) did not exceed the applicable land-use threshold. For the MVIA, the entire MRS was determined to be "low use" based on the types of activities occurring in the MRS (recreational, agricultural, undeveloped forest). As a result, UXO Estimator determined that 4.59 acres outside of the potential impact or MEC-contaminated areas required investigation to ensure that the concentration of UXO did not exceed the low-use threshold of 0.5 UXO per acre. Refer to Appendix M for the UXO Estimator report.

### 1.1.2 MEC Investigation and Data Analysis

- 1.1.2.1 Approximately 36.11 miles (14.36 acres) of parallel and meandering 1-meter wide transects and an additional 10.30 miles (8.45 acres) of public trails transects were investigated using hand-held all-metals detectors and implementing a "mag and dig" approach. The final transect map is provided in Appendix A, Figure 4-3. All anomalies were investigated. Seven MEC items were found in the western portion of the MRS. A total of 1,346 MD items were found in the western and central portions of the MRS, with the majority in the west. Additionally, seven new munition types were identified. No MEC or MD items were found in the portion of the MRS east of the Aniani Nui/Olomana ridgeline. Appendix A, Figure 5-1 illustrates the location and types of MEC and MD findings.
- 1.1.2.2 Using the data collected from the transects, VSP software was applied to confirm that sufficient data had been collected to demonstrate that the simulated probability of traversing and detecting a 500-foot radius circular impact area with at least a 90% confidence level had been achieved in accessible areas. The seven new munition types identified during the field investigation were similar in nature to previously identified types or have a target radius of at least 500 feet. The original VSP transect design was valid. Refer to Appendix M for the VSP coverage analysis.
- 1.1.2.3 VSP also analyzed the transect data to estimate anomaly density in the accessible areas within the MRS. Anomaly density is characterized as either high density or elevated density. For this project, high density is defined as MEC/MD density greater than 100 anomalies per acre total density (which is at least 50 anomalies per acre greater than the selected background density of 50 anomalies per acre. Elevated density is defined as MEC/MD density above the background density of 50 anomalies per acre. VSP identified four areas of high density in the western portion of the MRS. Eight areas of elevated density were identified in the central and western regions. MEC-contamination was present in three of the VSP high density or elevated density areas. Approximately 4.57 acres of grids were then placed in or around elevated density, high density, or MEC-contaminated areas. Grids ranged in size from 0.1 acres to 0.4 acres. The grids were used to delineate the extent of possible contamination and to define the nature of

MEC-contamination potentially at the site. The grids were investigated using the same approach as the transect investigation. No additional MEC items were found in the grids.

- 1.1.2.4 Using the results of the VSP density analysis, the transect/grid data, and data from previous investigations, the section of the MVIA to the west and south of Pikoaka Spring (closest stream east of the spring is unnamed) is confirmed to be an impact area. The data also indicates that there may be a smaller target area, within the impact area and near Maunawili Falls, used for 81-millimeter (mm) mortars and 37-mm projectiles.
- 1.1.2.5 Additionally, the investigation demonstrated, with at least a 90% confidence level, that low-use areas outside of MEC-contamination had an UXO concentration below a threshold of 0.5 UXO per acre. This was achieved by investigating over 19.50 acres of transects and 1.04 acres of grids outside of MEC-contaminated and high density areas without locating any additional MEC items, satisfying the UXO Estimator software minimum requirement of 4.59 acres.

#### 1.1.3 MC Investigation and Data Analysis

- 1.1.3.1 Fourteen sample units (SU) were placed in areas with high concentrations of MEC or MD (Appendix A, Figure 4-4). Forty-two surface soil samples were collected and analyzed for MCs (metals [antimony, chromium, copper, lead, and zinc] and explosive compounds). The analytical results were compared to the State of Hawaii Department of Health (HDOH) Tier 1 environmental action levels (EALs). Four or more metals were detected in all samples though below their respective HDOH Tier 1 EALs. Explosives were also detected in surface soil but at concentrations below their respective HDOH Tier 1 EALs.
- 1.1.3.2 Eighteen background surface soil samples were also collected from areas in the MRS that appeared to have been minimally impacted by military use. Site-specific background threshold values (BTVs) for metals (antimony, chromium, copper, lead, and zinc) were developed. The surface soil analytical results were then compared to the BTVs. In general, the comparison indicates that the concentrations of metals do not exceed background values.
- 1.1.3.3 Risks to human health associated with MCs in surface soil do not exceed risk thresholds. Analytical results were below HDOH Tier 1 EALs and metals concentrations did not exceed background values.

#### 1.1.4 Results

Based on the results of the transect/grid data analysis, site usage, historical information, and topographic and natural features, the MVIA MRS was divided into multiple sections to develop revised conceptual site models (CSM) and MEC Hazard Assessments (HA) and to evaluate remedial alternatives in the FS. The MRS is divided, along mountain ridgelines, into three sections: MVIA – West, MVIA – Central, and MVIA – East.

#### 1.1.4.1 MVIA – West

- 1.1.4.1.1 Seven MEC items were found in MVIA West during the RI and 26 MEC items were found in the same area during the 2012 Removal Action (Appendix A, Figure 5-2). Four of the MEC items found during the RI were located on or in the immediate vicinity of popular public hiking trails. Given the primary uses of MVIA West are recreational and agricultural, there is a complete exposure pathway to human receptors through direct contact with surface and subsurface MEC. There is also a complete exposure pathway for occupational workers maintaining trails and utilities.
- 1.1.4.1.2 The potential explosive hazards from MEC were evaluated using the Environmental Protection Agency (EPA) MEC HA methodology (EPA, 2008c). The MEC HA performed for the MVIA West baseline condition yielded a score of 925 which corresponds to Hazard Level 1. Hazard Level 1 sites contain the highest potential explosive hazard and there may be instances of surface MEC or intrusive activities that would encounter MEC in the subsurface.

#### 1.1.4.2 MVIA – Central

- 1.1.4.2.1 Even though no MEC items were found in MVIA Central during the RI or reported historically, the types of MD found, such as the 60-mm high explosive (HE) Mortar, M49A2, indicate that munitions with HE were used in the area and could be present in the southern portion of this section.
- 1.1.4.2.2 MVIA Central is used primarily for recreational activities so there is a potentially complete exposure pathway to human receptors through direct contact with surface MEC. There is also a potentially complete exposure pathway to subsurface MEC for commercial/occupational workers maintaining recreational facilities, trails, and utilities.
- 1.1.4.2.3 A MEC HA was not completed for the MVIA Central since there were no MEC items found or reported.

#### 1.1.4.3 MVIA – East

No MEC or MD items were found in MVIA – East. There is no source of an explosive hazard and therefore, no complete exposure pathways to human receptors.

## 1.2 Maunawili Training Course MRS

Previous investigations resulted in identifying only small arms debris and evidence of troop maneuvering, such as foxholes and C-ration residue, in the MTC MRS. Additional field data collection was not possible during the RI because right-of-entry (ROE) privileges were not granted by the landowner. However, the southern boundary of this MRS is immediately adjacent to the northwestern boundary of the MVIA MRS (Appendix A, Figure A1-1). The northwestern

area of the MVIA MRS had a high density of MD and one MEC discovery during the RI. Further evaluation of the MTC MRS is recommended if ROE can be acquired.

### 1.3 Makalii Valley Training Course MRS

RI field activities were not conducted in this MRS as agreed to and documented during the Technical Project Planning (TPP) process. MVTC is a suspected observation point rather than a firing point since neither MEC nor MD has been found during previous investigations. The only significant finding in this MRS was two large holes along the mountain ridge. Their locations suggest that they were used as observation points and are not impact craters, given their vantage point of viewing the MVIA. The lack of MEC and MD indicates there is no source of an explosive hazard and no complete pathways to human and ecological receptors. Therefore no known MEC hazards or MC risks are suspected.

### 1.4 Ulumawao Training Course MRS

RI field activities were not conducted in this MRS as agreed to and documented during the TPP process. The area is documented as an encampment or cantonment and ordnance use is not suspected based on historical records and anecdotal evidence. No MEC or MD have been observed in the MRS during previous investigations or land development activities, indicating no complete pathways to human and ecological receptors. As a result, no known MEC hazards or MC risks are suspected.

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

### 2.0 Introduction

- 2.0.1 This RI report has been prepared by Huikala, LLC (herein referred to as "Huikala" or the "Contractor") for the United States Army Corps of Engineers (USACE), Honolulu District (CEPOH) and the United States Army Engineering and Support Center, Huntsville (USAESCH) under Contract No. W912DY-10-D-0053 Task Order (TO) 0003. This RI Report was developed in accordance with (IAW) Data Item Description (DID) Worldwide Environmental Remediation Services (WERS) 010.02 and Engineer Pamphlet (EP) 1110-1-18.
- 2.0.2 The activities outlined herein are in support of the Military Munitions Response Program at the former PTC. The activities described were conducted IAW: (1) the performance work statement entitled "Remedial Investigation/Feasibility Study, Pali Training Camp, Property No.: H09HI0277, Koolaupoko District, Oahu, Hawaii" dated 19 October 2010; (2) the Final RI Work Plan (WP) dated July 2013; and (3) the Technical Project Planning process.

### 2.1 Task Order Purpose and Scope

- 2.1.1 The overall purpose of this TO is to achieve acceptance of a Decision Document (DD) in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Department of Defense (DoD), Department of Army (DA), and USACE regulations and guidance at the former PTC, Oahu, Hawaii FUDS Property No. H09HI0277. Remedial investigation activities were conducted from July to October 2013 and February to March 2014 in order to achieve this goal.
- 2.1.2 The objective of the RI is to gather sufficient data from the former PTC to adequately characterize the nature and extent of military munitions and munitions-related contamination present at the site in order to assess potential risks at the site. The data will be used during the FS to develop and evaluate effective remedial alternatives to address these risks.
- 2.1.3 The purpose of this RI Report is to present the results from the RI and previous investigations and to assess the potential risks to human health, safety, and the environment. Additionally, this report summarizes the cumulative characterization efforts within the MVIA, MVTC, and UTC MRSs and provides an assessment of risks associated with these MRSs. Characterization of the MTC MRS is inconclusive because no additional data could be gathered during the RI.
- 2.1.4 A FS and Proposed Plan (PP) will be prepared and submitted in order to support the development, evaluation, and selection of the appropriate munitions response alternative(s) to achieve acceptance of a DD.

### 2.2 RI Report Organization

- 2.2.1 This RI Report contains the requirements as specified in EP 1110-1-18 and DID WERS 010.02 and is organized as follows:
  - Section 1.0 Executive Summary
  - Section 2.0 Introduction
  - Section 3.0 Project Remedial Response Objectives
  - Section 4.0 Characterization of MEC and MC
  - Section 5.0 RI Results and Revised CSM
  - Section 6.0 Contaminant Fate and Transport for MEC and MC
  - Section 7.0 Hazard Assessment for MEC and Baseline Risk Assessment for MC
  - Section 8.0 Summary and Conclusions
  - Section 9.0 References
- 2.2.2 The following appendices are also provided:
  - Appendix A Figures
  - Appendix B Biological Monitoring Report
  - Appendix C Sampling and Laboratory Data
  - Appendix D Daily Field Reports
  - Appendix E Field Logbooks
  - Appendix F Photographic Log
  - Appendix G GIS Data
  - Appendix H Field Change Requests
  - Appendix I MPPEH Tracking Log and DD Form 1348-1A
  - Appendix J Transect and Grid Logs
  - Appendix K QC Documentation
  - Appendix L QA Documentation
  - Appendix M Visual Sample Plan Report
  - Appendix N MEC HA Worksheets

# 2.3 Property Description and Problem Identification

### 2.3.1 Project Location

2.3.1.1 The former PTC (also herein referred to as "FUDS property" or "site") is located at the base of the Koolau mountain range, near Kailua on the southeast side of the island of Oahu (Appendix A, Figure A1-1). The former PTC, as currently reported in the FUDSMIS, consists of

four non-contiguous parcels, totaling 4,378 acres located in portions of the Maunawili and Makalii Valleys. Each parcel is considered a MRA containing one MRS<sup>2</sup>.

- 2.3.1.2 MVIA (H09HI027701R01-1) is the largest MRS and encompasses approximately 3,432 acres in FUDSMIS (2,795 acres GIS) of Maunawili Valley and includes the Royal Hawaiian Golf Club (formerly Luana Hills Country Club) and the Maunawili Estates Subdivision. The MRS can be accessed by foot, bicycle, or horse via the Golf Club road or the Maunawili neighborhood. Vehicular traffic is controlled by the Golf Club guardhouse and a locked gate at the end of Maunawili Road. There are numerous public hiking trails throughout the site.
- 2.3.1.3 The MTC MRS (H09H1027702R02-2) encompasses approximately 400 acres in FUDSMIS (333 acres GIS). MTC is located on the western edge of the Maunawili Valley and south of the Pali Highway. It can be accessed through the Maunawili neighborhood or the St. Stephens Seminary property. A public hiking trail crosses the southern portion of the MRS.
- 2.3.1.4 The MVTC (also previously referred to as the Maunawili Stream Area) MRS (H09H1027703R03-3) is the smallest, encompassing approximately 46 acres in FUDSMIS (29 acres GIS). MVTC is located on the northern ridge of Mount Olomana. It can be accessed via a public hiking trailhead off of the Golf Club road. The trail runs up to and along a ridge that defines the MRS's eastern boundary.
- 2.3.1.5 The UTC MRS (H0H1027704R04-4) encompasses approximately 500 acres in FUDSMIS (509 acres GIS). UTC is located outside the Maunawili Valley, north of the Pali Highway. It can be accessed via the municipal Pali Golf Course, Hawaii Pacific University property, and the Hawaii State Veterans Cemetery.

### 2.3.2 Topography

These four MRSs are mostly undeveloped, rugged, and densely forested land with mixed residential, agricultural, occupational, and recreational uses. Each parcel contains shallow to deep gulches and moderate to steep slopes. The MVIA ranges in elevation from approximately 200 feet mean sea level (MSL) near the Golf Club to over 2,000 feet MSL at the Koolau range ridge line. MTC ranges in elevation from approximately 400 to 1,200 feet MSL. MVTC ranges in elevation from approximately 50 to 200 feet MSL. UTC ranges in elevation from approximately 250 to 1,000 feet MSL at Ulumawao peak (Zapata, 2008)

-

<sup>&</sup>lt;sup>2</sup> Site acreage calculated with GIS is 3,666 acres. The acreages reported in the document and on maps are based on GIS-calculated acreages, unless otherwise noted.

### 2.3.3 Geology

2.3.3.1 The four non-contiguous MRSs include portions of Maunawili and Makalii Valleys. The rocks of the Koolau mountain range are comprised chiefly of thin basalt flows with small amounts of ash. The Koolau volcanic series is comprised of lavas and dikes lying outside Koolau caldera and are altered only rarely by hydrothermal action. These lavas were erupted from two main rift zones in Pliocene time and a third southwest rift zone passing through Diamond Head (Wil Chee, 2009).

2.3.3.2 Soil conditions within the former PTC vary from the steep terraced areas of the Koolau mountain range, to the uniform sloping areas at the base of the mountain range. Found on the steep sloping areas (45-55% slope) are soils of both the Waikane Silty Clay and Alaeloa Silty Clay series. Soils from the Waikane Silty Clay series are found on steep terraces and alluvial fans. The surface layer is dark brown silty clay approximately 8 inches thick. The subsoil is about 52 inches thick and is dark reddish brown silty clay. Runoff is medium to rapid, and the erosion hazard is moderate to severe. These soils are commonly found in pastures. Soils from the Alaeloa Silty Clay series are found in sloping areas of 45 to 55%. The surface layer is dark reddish brown silty clay approximately 10 inches thick. The subsoil, about 48 inches thick, is dark red and red silty clay. Runoff is rapid to very rapid and the erosion hazard is severe. These soils are commonly found in pastures and wildlife habitats (Wil Chee, 2009).

2.3.3.3 Soils found in the lower lying, uniformly sloping areas of the site are predominantly of the Kaneohe Silty Clay series. These soils are reddish and dark brown soils that formed in gravelly alluvium. Permeability is moderately rapid, runoff is slow to medium, and the erosion hazard is slight. These soils are commonly found in pastures and golf courses (Wil Chee, 2009).

## 2.3.4 Hydrology

The project site overlies the Waimanalo aquifer system (Windward Oahu Aquifer Sector), which extends from the ridgeline of the Koolau Mountains to the northeast facing shores of Oahu, and from Makapuu Point in the southeast to Kahuku Point in the northwest. An unconfined flank aquifer overlies a basal groundwater system. Water in the upper flank aquifer is currently used, ecologically important, has low salinity (between 250 and 1,000 milligram per liter chloride ion), is replaceable, and has a high vulnerability to contamination. The basal aquifer is currently used for drinking water, has very low salinity (less than 250 milligram per liter chloride ion), is replaceable, and has a low vulnerability to contamination (Mink and Lau, 1990).

#### 2.3.5 Climate

Due to the location of the Hawaiian Islands in the northern tropics, Oahu's climate is mild and pleasant, primarily due to the presence of cooling trade winds. Average temperatures in the lowlands are approximately 72.5 degrees Fahrenheit (°F), with decreasing temperatures in higher elevations. Temperatures are coolest in January (59°F) and warmest in August (89°F). Relative

humidity on Oahu ranges from 30 to 90% per month. The main mechanism for rainfall is warm, moist ocean air rising and cooling as it passes over the mountains causing precipitation. This results in higher rainfall in the windward and mountain areas, and little in the leeward and coastal zones. The climate at the site is warm with moderate rainfall. Approximate temperatures for the project area range from 60°F to 85°F year. Approximate median annual rainfall for the area is between 24 to 47 inches per year (Wil Chee, 2009).

#### 2.3.6 Biological and Ecological Resources

- 2.3.6.1 Prior to the RI, previous biological surveys in the Maunawili area were reviewed to identify any known or suspected biological resources. Most of the area is dominated by introduced plant species; however three native tree species, (ohia lehua [Metrosideros polymorpha var. glaberrima], hala [Pandanus tectorius], and papala kepau [Pisonia umbellifera], and four endemic species (koa [Acacia koa], ohia lehua [Metrosideros polymorpha var. incana], uki [Machaerina mariscoides ssp. Meyenii], and hapu`u [Cibotium chamissoi]) have been observed. Additionally, data results from the Hawaii Biodiversity & Mapping Program (HBMP) were reviewed for rare species observations in the general area of the FUDS property. All four MRSs were included in the HBMP data request, as well as a buffer around the MRSs. Rare elements were not located in either the UTC or MVTC MRSs. The greatest density of rare plants was located outside of the MVIA, in the mauka (upland) sections of the Koolau Mountain range (Huikala, 2013a). The steep slopes at the higher elevations of the MRSs were excluded from the field investigation due to accessibility and safety concerns
- 2.3.6.2 A portion of Designated Critical Habitat for Oahu, Unit 5 has boundaries within the MVIA and MTC MRSs. The portion of the critical habitat unit that falls within the project area is designated for the Oahu `Elepaio (*Chasiempis sandwichensis ibidis*). Field work was conducted outside of `Elepaio nesting period. However, vegetation was inspected for any remaining nests or adults prior to removal (Huikala, 2013a).
- 2.3.6.3 RI field activities were conducted only within the MVIA MRS. No threatened or endangered plant species were observed during the RI. Generally, the MRS is dominated by non-native or invasive species. The few native plant species observed were located in the higher elevations of the MRS. Native plant species observed included `ulei (Osteomeles anthyllidifolia), pala`a fern (Odontosoria chinesis), `ekaha or birds nest fern (Asplenium nidus), uluhe (Dicranopteris linearis), uluhe (Dicranopteris linearis), ohi`a lehua (Metrosideros polymorpha), hala, and tree ferns or hapu`u (Cibotium chamissoi), ama (Diospyros sandwicensis), papala kepau (Pisonia umbellifera), and koa (Acacia koa).
- 2.3.6.4 No threatened or endangered animal species were observed during the RI. One migratory shorebird, the Pacific Golden-Plover or Kolea (*Pluvialis fulva*) was observed in open lawns and agriculture fields. While the Kolea is not a threatened or endangered species, they are protected

by Federal law under the Migratory Bird Treaty Act and by State law under Hawaii Administrative Rules Title 13 Chapter 124.

2.3.6.5 Additional information is provided in Appendix B, Biological Monitoring Report.

#### 2.3.7 Cultural Resources

- 2.3.7.1 An Archaeological Monitoring Plan (AMP) was prepared prior to RI activities. The AMP identified multiple archaeological features and areas of cultural significance within the FUDS property. Field activities were planned and conducted to avoid impact to these features and areas. During the course of the RI, the CEPOH archaeologist identified an additional twenty-nine features that were not previously recorded. Activities were modified as necessary to avoid these features as well, IAW the AMP (Cultural Surveys Hawaii, 2013).
- 2.3.7.2 Additional information is provided in a separate report prepared by CEPOH.

#### 2.3.8 Current and Future Land Use

#### 2.3.8.1 Maunawili Valley Impact Area

- 2.3.8.1.1 The State of Hawaii owns and manages the majority of the land within the MRS boundary. The land is zoned as Preservation and is primarily undeveloped with rugged terrain. Portions of the State of Hawaii owned land are used for recreational activities such as hiking, biking, or horseback riding. There are approximately 10 miles of well-used public trails that pass through the MRS. State of Hawaii Department of Land and Natural Resources (DLNR) workers perform periodic maintenance on the various trails.
- 2.3.8.1.2 The Royal Hawaiian Golf Club operates on approximately 40 acres in the central portion of the MRS. Extensive agricultural activities are conducted in the western portion of the MRS by the Hawaii Agriculture Research Center (HARC) and Luluku Banana Farmers. The Golf Club, HARC, and the Luluku Banana Farmers properties all contain man-made structures.
- 2.3.8.1.3 Occasionally, occupational workers from public utilities require access to the MRS to perform maintenance on power line infrastructure that runs along mountain ridgelines or on irrigation water lines/ditches/tunnel that are found throughout the MRS.
- 2.3.8.1.4 There is currently a residential subdivision being developed near the northeastern boundary of the MRS (Appendix A, Figure A1-1). Thirteen subdivision parcels overlap or are located within the MRS boundary. Although development activities at the subdivision precluded inclusion in the RI, the private developer hired their own UXO consultants and reported finding no evidence of munitions.
- 2.3.8.1.5 The future use of this MRS is not expected to change.

#### 2.3.8.2 Maunawili Training Course

MTC is owned by private landowners with a small section in the south/southwest corner owned by the State of Hawaii. One end of the Maunawili Demonstration Trail (MDT) is located in this section. Most of the MRS is undeveloped. St. Stephan's Seminary partially overlaps the boundaries of the MRS. The future use of MTC is not expected to change.

#### 2.3.8.3 Makalii Valley Training Course

The MVTC MRS is privately owned and primarily undeveloped. The access road to the Royal Hawaiian Golf Club transects the MRS. Additionally, portions of the Olomana Trail are within the MRS boundary. The future use of this MRS is not expected to change.

#### 2.3.8.4 Ulumawao Training Course

The UTC MRS is primarily owned by private landowners. Hawaii Pacific University and Le Jardin Academy are educational facilities located within the UTC MRS. The Hawaiian Memorial Park, Hawaii State Veterans Cemetery, and Ameron Quarry are commercial enterprises that are partially located in the MRS. The City and County of Honolulu operates the municipal Pali Golf Course in the western portion of the MRS. The future use of UTC is not expected to change.

#### 2.3.9 Problem Identification

#### 2.3.9.1 MEC Hazards and MC Risk

2.3.9.1.1 The former PTC was used as a regimental combat training center in the 1940s, emphasizing the use of and familiarity with modern arms and field weapons. Previous investigations have resulted in the discovery of MEC (60-mm mortar, 37-mm projectile, 75-mm shrapnel projectile, fuzes, 57-mm projectile, 2.36-inch rocket motor, 81-mm mortar), MD (75-mm shrapnel, 37-mm projectiles), and small arms (20-mm ball cartridges, other). An explosive hazard exists at the site.

2.3.9.1.2 Due to the presence of MEC and MD, MC contamination may also exist.

#### 2.3.9.2 Potential Receptors

Based on the preliminary CSM, potential receptors that could be exposed to MEC and/or MC hazards include residents, construction/agricultural/commercial/industrial workers, visitors/recreational users, and ecological receptors (ground-dwelling animals, birds, and plants).

#### 2.4 Historical Information

#### 2.4.1 Historic Use

2.4.1.1 The former PTC was established in 1943 as a regimental combat training center emphasizing the use of and familiarity with modern arms and field weapons, in addition to

providing rugged terrain for jungle and ranger training. Troops were housed in a sprawling tent city at the base of Nuuanu Pali capable of supporting 3,000 to 5,000 individuals. In addition to barracks, the encampments also contained latrines, showers, mess halls, administration buildings, and motor pools. Additional barracks, an ice plant, a bakery, and gun pits were situated within MVTC. A field hospital was erected where Maunawili Park now resides. Although records indicate a list of these uses/structures, their specific locations are unknown. Camp training aids consisted of 200- and 300-yard rifle ranges, a 1,000-inch range, four obstacle courses, an infiltration course, a combat in cities course, a close combat course, and a 400-yard long jungle firing course. An artillery impact area was also established in the rear of Maunawili Valley (USACE, 1994).

- 2.4.1.2 On 8 October 1945, G-3 Headquarters ordered the release of the PTC. The encampment was abandoned by the end of 1945. By the end of 1946, military-erected structures at PTC were subsequently sold as surplus by bid sale. Although the PTC's impact area was reportedly cleared of ordnance by the 212<sup>th</sup> ordnance disposal squad and the 18<sup>th</sup> engineer search team prior to property disposal in 1945, a warning to the public was issued in June 1948 by the Commanding Officer of Army Ordnance Services. The impact area in Maunawili Valley was one of several sites in which the public was advised to exercise caution when entering the area due to the potential presence of dud ordnance rounds (USACE, 1994).
- 2.4.1.3 Valley residents report that artillery rounds were fired into Maunawili Valley from firing points at the mouth of the valley or from other locations within Kailua. A ranch manager reported a "155-mm round" in the Maunawili Valley and a few claims have been made by local residents about finding duds and .30-caliber blanks. It is also reported by local residents that mortar rounds and machine gun bullets were frequently turned over in plowed fields. As of 1994, no anecdotal reports of material potentially presenting an explosive hazard (MPPEH) in Maunawili or Makalii Valleys have been substantiated (USACE, 1994). In March 2002, a worker on a movie set within the MVIA reported that a 20-mm projectile was found (Zapata, 2008).

# 2.5 Previous Investigations

# 2.5.1 1994 Inventory Project Report

- 2.5.1.1 The 1994 Inventory Project Report (INPR) established the former PTC as an eligible property under the FUDS program. The INPR also established the acreage, preliminary site boundaries, and summarized the historic military usage and investigations at the former training area.
- 2.5.1.2 The INPR identified munitions historically detected that included: 75-mm HE projectile; 60-mm HE mortar, a 37-mm HE projectile, 2.36- and 3.5-inch high explosive anti-tank (HEAT) rockets.

### 2.5.2 2008 Engineering Evaluation/Cost Analysis

- 2.5.2.1 During the 2008 Engineering Evaluation/Cost Analysis (EE/CA), digital geophysical mapping (DGM) was conducted within grids over six areas totaling 5.7 acres in the MVIA. A visual and surface sweep reconnaissance was conducted within the MVIA, the MTC, and the MVTC. Approximately 26.3 acres were covered during reconnaissance, which included hiking trails and meandering paths (Appendix A, Figure A2-1). Prior to conducting the DGM field work, a Geophysical Prove-out was conducted at the Luana Hills Country Club (currently known as the Royal Hawaiian Golf Club) in March 2002 to establish the methods, equipment, and procedures best suited to the site (Zapata, 2008).
- 2.5.2.2 No MEC items were found during the EE/CA investigation in the MVIA. However, 103 MD items were found including 75-mm HE, 75-mm shrapnel, and 37-mm projectiles. A new impact area was defined based on the results of the reconnaissance and the intrusive investigation. The majority of the MD was found in a bowl-shaped section of the Maunawili Valley that backs up to the Koolau Mountain Range on the west and is topographically exposed to the east. The northern and southern extents of the impact area are defined by finger ridges that extend eastward from the Koolau Range. Refer to Appendix A, Figure A2-2 (Zapata, 2008).
- 2.5.2.3 No MEC or MD items indicative of HE use were found within the MTC. However, evidence of troop maneuvering was found that included foxholes, small arms debris, and C-ration residue. Refer to Appendix A, Figure A2-3 (Zapata, 2008).
- 2.5.2.4 No MEC or MD items were found within the MVTC. Two large holes were discovered that may have been observation points to view impacts from firing into the MVIA. They are suspected to be observation points rather than impact craters given their location relative to the suspected firing point in the valley below and their vantage point of the MVIA. Refer to Appendix A, Figure A2-3 (Zapata, 2008).
- 2.5.2.5 The UTC MRS was not investigated based on historical information designating this area as an encampment or cantonment (Zapata, 2008).

### 2.5.3 2009 Site Investigation

2.5.3.1 The purpose of the 2009 Site Investigation (SI) was to collect and analyze sufficient soil, surface water, and sediment samples in order to complete Munitions Response Site Prioritization Protocol (MRSPP) worksheets. In November 2008, incremental soil samples were collected from six decision units (DU) within the MVIA MRS. In addition, two surface water samples and two stream bed sediment samples were collected from Maunawili Stream, the most prominent stream within the project sites. Soil, surface water, and sediment samples were analyzed for metals and explosive residues by EPA method 8330B, total metals by EPA method 6010B, and white phosphorus by EPA method 8270 (soil and sediment only). Analytical results were compared to project action levels selected for the SI.

- 2.5.3.2 Explosive compounds and white phosphorous were not detected at concentrations exceeding the project action level in any of the soil or sediment samples collected from the MRS.
- 2.5.3.3 Seven metals were detected at concentrations exceeding the respective project action levels in the multi-incremental soil samples. These compounds included aluminum, arsenic, chromium, cobalt, iron, nickel, and vanadium. A further analysis of these contaminants was conducted by screening the results against the 95th percentile estimated background concentration for major Oahu soil groups. Based on those results, five metals were identified as contaminants of potential concern (COPC) for the former PTC. These COPCs include aluminum (DU-6), arsenic (DU-2 and DU-6), chromium (DU-3), iron (DU-3), and vanadium (DU-3) (Wil Chee, 2009).
- 2.5.3.4 Two metals (cobalt and mercury) and one explosive compound (research development explosive [RDX]) were detected at concentrations exceeding their respective project action levels in the surface water samples collected from Maunawili Stream. Based on these results, cobalt, mercury, and RDX were identified as COPC for the Maunawili Stream. Six metals including aluminum, chromium, cobalt, iron, nickel, and vanadium were detected at concentrations exceeding their respective project action levels in both the upstream and downstream sediment samples collected from Maunawili Stream. A further analysis of these contaminants was conducted by screening the results against the 95<sup>th</sup> percentile estimated background concentrations for major Oahu soil groups. Based on those results, iron was identified as a COPC for sediment present in Maunawili Stream. Refer to Appendix A, Figure A2-4 for sample locations and results exceeding project action levels (Wil Chee, 2009).
- 2.5.3.5 No environmental samples were collected in the MTC, MVTC, or UTC MRSs.

#### 2.5.4 2012 Removal Action at Maunawili Valley Impact Area

- 2.5.4.1 The objective of the 2012 Removal Action at MVIA was to remove and dispose of all MEC and MD on 40 acres within the MVIA (Appendix A, Figure A2-5). Approximately 1,067 pounds of MD was removed and 26 MEC items were located during fieldwork. MEC items included: 60-mm HE mortar, M49A2; 37-mm HE projectile, M63; 75-mm shrapnel projectile, MK1; fuze of a projectile Time Super Quick (TSQ); fuze of a projectile Point Detonating Super Quick (PDSQ); 57-mm Armor Piercing Tracer (APT) projectile, M70; 37-mm Armor Piercing Capped Tracer (APCT) projectile, M59; 2.36-inch rocket motor; 81-mm HE mortar, M43A1; and fuze of a projectile, M1907M (Environet, 2012).
- 2.5.4.2 No environmental samples were collected.

### 2.5.5 Quality and Utility of Existing Data

2.5.5.1 The data collected along the visual and surface sweep reconnaissance transects investigated during the 2008 EE/CA was not sufficient to completely characterize the site

hazards. Data was collected at the surface only and with limited areal extent; thus, additional data was collected in the RI to determine nature and extent of MEC hazards in the reconnaissance transect area. The reconnaissance effort did identify an 81-mm HE mortar as a new munition not previously identified in the 1994 INPR.

- 2.5.5.2 Data collected in the 2008 EE/CA grid locations was sufficient for use in characterizing those locations because both surface and subsurface information was gathered. This data was subsequently used to determine the area to be cleared in the 2012 Removal Action.
- 2.5.5.3 Laboratory analytical data from the 2009 SI provided a preliminary COPC list for MCs. This list was reviewed and reduced to include only those COPCs that were directly related to munitions used at PTC, had known risk-based thresholds, and were not naturally occurring elements found in Hawaii's volcanic soil (i.e., explosives). Through this process, aluminum, arsenic, cobalt, iron, mercury, and vanadium were eliminated as potential MCs to be investigated in the RI.
- 2.5.5.4 The 2012 Removal Action identified new munition items including: 20-mm ball cartridge, MK1 (unfired); 20-mm ball cartridge, M55A1 (unfired); 37-mm APCT projectile, M59; fuze of a projectile TSQ; fuze of a projectile PDSQ; 57-mm APT projectile, M70; and fuze of a projectile, M1907M. This data is adequate for incorporation into the MEC HA and the MRSPP for the MVIA. The area within the 2012 Removal Action boundary was excluded from the RI MEC investigation since a removal action had been performed.

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

# 3.0 Project Remedial Response Objectives

- 3.0.1 The RI was conducted IAW the objectives and goals established during the TPP process and documented in the TPP Memorandum (Huikala, 2013b) and Final RI WP (Huikala, 2013a). The objective of the RI is to characterize the nature and extent of military munitions and munitions-related contamination for the purpose of assessing risks to human health, safety, and the environment.
- 3.0.2 Data needs specific to the RI were determined by reviewing data from previous investigations and historical documentation and through the TPP process. The TPP team (USAESCH, CEPOH, stakeholders, regulators, and Huikala) concluded that information gathered during previous investigations and historical records research indicated no evidence of HE munitions usage at either the MVTC or UTC MRSs. Therefore, no further investigation was required at the MVTC and UTC MRSs. The TPP team agreed that additional data was necessary in the MVIA and MTC MRSs to adequately characterize the nature and extent of MEC hazards and MC risk. Data would be collected by investigating parallel transects designed by VSP. Sweep teams, utilizing standard analog (mag and dig) clearing techniques, would traverse each MRS to detect MEC and MD. Areas traversed would be limited to those with less than 18 degree slopes due to worker safety and accessibility concerns. Once the transect data was analyzed, grids would be placed and investigated to further delineate the nature and extent of MEC contamination as well as estimate anomaly density.
- 3.0.3 Additionally, the TPP team agreed to change the environmental sampling approach from watershed-based sampling units (SUs) to smaller SUs, more specific to the location of possible MEC contamination. Surface soil samples would be collected, per the HDOH Hazard Evaluation and Emergency Response (HEER) Technical Guidance Manual (TGM), in areas with high concentrations of MEC/MD and analyzed for MCs. Subsurface soil, sediment, and/or surface water would only be sampled if the surface soil results exceeded HDOH Tier 1 EALs. A baseline risk assessment would be performed only if surface soil results exceeded HDOH Tier 1 EALs.
- 3.0.4 Subsequent to the second TPP Meeting and Memorandum, ROE was denied for the MTC MRS. No additional information was collected in the MRS.

# 3.1 CSM and Project Approach

## 3.1.1 Preliminary CSM

3.1.1.1 The preliminary CSMs were developed using historical documentation, previous investigations, and current/future land use assumptions. The preliminary CSMs for MEC and MC were refined during the TPP process and included in the Final RI WP. Table 3-1 summarizes the preliminary CSMs prior to the RI field activities.

**Table 3-1: Summary of Preliminary CSMs** 

Table 3-1: Summary of Preliminary CSNIS						
Criteria	Maunawili Valley Impact Area MRS	Maunawili Training Course MRS				
Acreage	3,432 acres (FUDMIS)	400 acres (FUDMIS)				
	2,795 acres (GIS)	333 acres (GIS)				
Past Department of Defense (DoD)	Regimental combat training center emp	hasizing the use of and familiarity				
Activities	with modern arms and field weapons, in	•				
	for jungle and ranger training.	1 6 66				
MEC and MD Found Since Closure:	75-mm HE projectile, M48	Small Arms, General .50-caliber				
	75-mm shrapnel projectile, Mk I					
	60-mm HE mortar, M49A2					
	37-mm HE projectile, M63					
	57-mm APT projectile, M70					
	37-mm APCT projectile, M59					
	81-mm HE Mortar, M43A1					
	2.36- and 3.5-inch HEAT rockets					
	2.36-inch rocket motor					
	20-mm ball cartridge, MK1 (unfired)					
	20-mm ball cartridge, M55A1 (unfired)					
	fuze of a projectile TSQ					
	fuze of a projectile PDSQ					
	fuze of a projectile, M1907M					
	Small Arms					
Munitions Constituents of Concern	Antimony, Chromium, Copper, Lead, Zin	nc, Tetryl,				
	cyclotetramethylenetetranitramine (HMX	X), RDX, trinitrobenzene (TNB),				
	dinitrobenzene (DNB), 2,4,6-trinitrotolue	ene (TNT), dinitrotoluene (DNT),				
	nitrotoluene (NT), nitroglycerin (NG), pe	entaerythritol tetranitrate (PETN)				
Current and Future Land Use	Residential, agricultural, recreational, un	developed forest				
Potential Receptors	Residents, construction/commercial/indu	strial workers, visitors/recreational				
	users, ecological receptors					
Pathways for Human Exposure to	Direct contact with MEC on the surface of	or subsurface (intrusive activities)				
MEC						
Pathways for Human Exposure to	_					
MC	sediment, and surface water, as well a	s inhalation of MC in surface and				
	subsurface soil. Ingestion of biota.					
Geological and Environmental	"Hot rocks" containing metallic content that trigger a magnetometer					
Features that Impact Proposed						
Activities	impassable vegetation also affect the tr	-				
	detecting MEC items. Public hiking tra					
	more potential for MEC and MC expo	sure. Sensitive archaeological and				
	biological features will be avoided.					

3.1.1.2 Revised CSMs based upon the RI findings and receptor pathway analyses are presented in Section 5.0 of this report.

### 3.1.2 Project Approach

The project approach identified during the TPP process and described in the Final RI WP included:

- Collecting and reviewing historical data and reports to help define the extent of contamination.
- Utilizing VSP to optimize a parallel transect design that determines MEC density and limits of contamination.
- Avoiding impacts to cultural, archaeological, and ecological resources.
- Minimizing vegetation removal.
- Performing geophysical investigations and mapping to identify lateral range boundaries and vertical extent of MEC.
- Identifying areas of high MEC/MD density (MEC/MD density of 100 anomalies per acre total density, which is equivalent to at least 50 anomalies per acre greater than the selected background density of 50 anomalies per acre).
- Managing, tracking, and disposing of MPPEH.
- Collecting and analyzing background surface soil samples for metals.
- Collecting and analyzing surface soil samples with the potential for MC as evidenced by the presence of MEC/MD.
- Comparing surface soil sample results to HDOH Tier 1 EALs and background concentrations.
- Collecting additional media samples if surface soil results exceeded HDOH Tier 1 EALs.
- Performing a screening-level risk assessment if surface soil results exceeded HDOH Tier 1 EALs.
- Compiling and analyzing data from historical documentation, previous investigations, and the RI to determine the nature and extent of MEC hazards and MC risk to human health and the environment.

# 3.2 Preliminary Remediation Goals

Preliminary remediation goals (PRGs) are both site- and contaminant-specific and provide the requirements necessary to be protective of human health and the environment. While PRGs are initially established within the RI, they are subject to review and refinement throughout the course of the CERCLA process, as more project-related information is obtained. The final goal of the project is to manage the MEC hazards and MC risk through a combination of institutional

controls, removal/remediation, and public education to render an MRS as safe as reasonably possible to humans and the environment under the current and anticipated future land uses.

#### 3.2.1 Assessment of Land Use and Institutional Analysis Aspects

- 3.2.1.1 The majority of land comprising the MVIA MRS is owned by the State of Hawaii and is primarily undeveloped forest with pockets of recreational, agricultural, and industrial use (including power lines, drainage features, and water lines). A private entity owns the Royal Hawaiian Golf Club and surrounding land parcels, currently undeveloped forest. A private landowner has initiated a residential development along the northeastern boundary of the MRS. The future use of this MRS is unlikely to change.
- 3.2.1.2 The MTC, MVTC, and UTC MRSs are largely owned by private landowners and are mostly undeveloped except for pockets of recreational and educational areas. The future land uses of these MRSs are not expected to change.
- 3.2.1.3 Institutional controls (IC) include administrative controls (permits), engineering controls (fencing, signage), public education programs, and legal mechanisms (deed notices). The overall effectiveness of ICs depends entirely on stakeholder (government agencies and private landowners) support, involvement, and willingness to enforce and maintain ICs implemented to reduce the potential for interaction with MEC/MC.

#### 3.2.2 PRG for MEC

The PRG for MEC is to demonstrate with at least 90 percent confidence that the UXO concentration is less than 0.5 UXO per acre for low-use areas. The MVIA MRS is determined to be "low use" based on the types of activities occurring in the MRS (recreational, agricultural, and undeveloped forest).

#### 3.2.3 PRG for MC

A PRG for MC is a concentration value for a specific COPC believed to be protective based on preliminary site information. The values established during the TPP process for the MVIA MRS were based on the HDOH Tier 1 EALs for Soil for Unrestricted Land Use at Sites where Surface Water is Located within 150 Meters of the Release Site and where the Site is Underlain by a Drinking Water Resource. Table 3-2 presents the PRGs for potential MCs.

Table 3-2: Preliminary Remediation Goals for MCs

HDOH Tier 1 EAL <sup>1</sup>		
Chemical of Potential Concern	Soil (milligram/kilogram [mg/kg])	
Antimony (Sb)	24	
Copper (Cu)	630	
Chromium (Cr)	1,100	
Lead (Pb)	200	
Zinc (Zn)	1,000	
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	29	
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	$0.009 / 5.5^2$	
1,3,5-Trinitrobenzene (1,3,5-TNB)	8.4	
1,3-Dinitrobenzene (1,3-DNB)	0.21	
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	49	
Nitrobenzene (NB)	$0.0046 / 4.8^{2}$	
2,4,6-Trinitrotoluene (2,4,6-TNT)	1.0	
4-Amino-2,6-dinitrotoluene (4-Am-DNT)	0.7	
2-Amino-4,6-dinitrotoluene (2-Am-DNT)	0.7	
2,4-Dinitrotoluene (2,4-DNT)	$0.021 / 1.6^2$	
2,6-Dinitrotoluene (2,6-DNT)		
2-Nitrotoluene (2-NT) 0.003		
3-Nitrotoluene (3-NT)		
4-Nitrotoluene (4-NT)		
Nitroglycerin (NG) 0.0		
Pentaerythritol tetranitrate (PETN)		

<sup>&</sup>lt;sup>1</sup> Tier 1 EALs for Sites where groundwater is a source of drinking water, less than 150 meters from the nearest surface water body (HDOH, 2012; Table A-2).

# 3.3 Preliminary Identification of Applicable or Relevant and Appropriate Requirements and To Be Considered Information

3.3.0.1 CERCLA Section 121 requires that site cleanups comply with federal Applicable or Relevant and Appropriate Requirements (ARARs), or state ARARs in cases where these requirements are more stringent than federal requirements. The preliminary ARARs presented herein are a compilation of the promulgated, substantive requirements of federal and state laws or regulations that are legally applicable or are relevant and appropriate based upon the circumstances present at the site as related to the release of MEC or MC contamination to the environment. Identification and evaluation of ARARs is an iterative process that occurs

<sup>&</sup>lt;sup>2</sup> For these analytes, the groundwater protection EAL is followed by a direct exposure EAL, since the most stringent (i.e., groundwater protection) EAL is lower than the Limit of Detection. To allow for risk-based screening, analytical results will be compared to the direct exposure EAL.

throughout the life of the project. The preliminary ARARs are presented in Table 3-3. The final ARARs are selected and become enforceable when the DD for the site is signed.

- 3.3.0.2 Under CERCLA Section 121(d)(2), the federal ARARs for remedial action could include requirements under any of the federal environmental laws (e.g., Clean Air Act, Clean Water Act, Safe Drinking Water Act). State ARARs include promulgated requirements under state environmental or facility siting laws that are more stringent than federal ARARs and that have been identified in a timely manner, according to 40 Code of Federal Regulations (CFR) Part 300.400(g)(4). A requirement may be either "applicable," or "relevant and appropriate."
- 3.3.0.3 Applicable requirements are defined as those cleanup or control standards, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state laws.
- 3.3.0.4 A requirement is applicable if the specific terms (or jurisdictional prerequisites) of the statute or regulation directly address the circumstances at the site.
- 3.3.0.5 If not applicable, a requirement may be relevant and appropriate if circumstances at the site are sufficiently similar to the problems or situations regulated by the requirement. "Relevant and appropriate" refers to those cleanup standards, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law, that, while not necessarily applicable, address problems or situations sufficiently similar to those encountered at the CERCLA site, and whose use is well-suited to the particular site.
- 3.3.0.6 Determining whether a requirement is both relevant and appropriate is a two-step process. First, to determine relevance, a comparison is made between the response action, location, or chemicals covered by the requirement and related conditions at the site, release, or potential remedy. A requirement is relevant if it generally pertains to these conditions. Second, to determine whether the requirement is appropriate, the comparison is further refined by focusing on the nature of the items, the characteristics of the site, the circumstances of the release, and the proposed response action. The requirement is appropriate if, based on such comparison, its use is well-suited to the particular site. USACE must comply with requirements that are determined to be both relevant and appropriate.
- 3.3.0.7 Federal or state agencies may develop criteria, advisories, guidance, and proposed standards that are not legally enforceable but may be helpful in carrying out, or in determining protectiveness of, selected remedies. These materials are "to be considered" (TBC) and are meant to complement the use of ARARs, not compete or replace them. TBC materials are not ARARs and their identification and use are not mandatory.
- 3.3.0.8 There are certain circumstances under which ARARs may be waived. CERCLA Section 121(d) allows the selection of alternatives that will not attain ARAR status if any of six conditions for a waiver of ARARs exists. However, the selected alternative must be

protective even if an ARAR is waived. Only five of the conditions for a waiver may apply to a DoD site. The conditions for a waiver are as follows:

- The clearance action selected is only part of a total response action that will attain such level or standard of control when completed.
- Compliance with such a requirement at a particular site will result in greater risk to human safety and the environment (e.g., worker safety) than alternative options.
- Compliance is technically impracticable from an engineering perspective.
- The clearance action selected will result in a standard of performance that is equivalent to an applicable requirement through the use of another method or approach.
- A state requirement has not been equitably applied in similar circumstances on other clearance actions within the state.
- A fund-financed clearance action does not provide a balance between available monies and the need for protection of public safety and the environment at sites where the need is more immediate (not applicable to DoD sites).
- 3.3.0.9 ARARs that govern actions at CERCLA sites fall into three broad categories based upon the chemical contaminants present, site characteristics, and alternatives proposed for cleanup. These three categories (chemical-specific, location-specific, and action-specific) are described in the following subsections.

#### 3.3.1 Chemical-Specific ARARs

- 3.3.1.1 Chemical-specific ARARs include those environmental laws and regulations that regulate the release to the environment of materials with certain chemical or physical characteristics or that contain specified chemical compounds. These requirements generally set health- or risk-based concentration limits or discharge limits for specific hazardous substances by media. Chemical-specific ARARs are triggered by the specific chemical contaminants found at a particular site.
- 3.3.1.2 MC sampling was only conducted within the MVIA MRS. Since no MCs were detected above the HDOH Tier 1 EALs for surface soil, the potential for adverse risks to human health or ecological receptors from exposure to MCs is negligible. Therefore, there are no chemical-specific ARARs for the MVIA MRS.
- 3.3.1.3 There are no current chemical-specific ARARs for the MTC MRS; however this should be re-evaluated if additional investigation is performed.
- 3.3.1.4 Based on previous investigations and historical documentation, risks associated with MCs at the MVTC and UTC MRSs are not suspected. Therefore, there are no chemical-specific ARARs for these MRSs.

## 3.3.2 Location-Specific ARARs

3.3.2.1 Location-specific requirements are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in special locations. Common examples of this type of ARAR include site proximity to wetland or floodplains, or the presence of natural or cultural resources.

3.3.2.2 The MVIA MRS and the MTC MRS are known to contain significant archaeological features and biological and ecological resources (rare, threatened, and endangered species and a critical habitat). Two location-specific ARARs have been identified, including one State of Hawaii Endangered Species requirement incorporated during the TPP process. Refer to Table 3-3.

## 3.3.3 Action-Specific ARARs

Action-specific ARARs are restrictions that define acceptable treatment and disposal procedures for hazardous substances. These ARARs generally set performance, design, or other similar action-specific controls or restrictions on particular kinds of activities. One action-specific ARAR has been identified. Refer to Table 3-3.

**Table 3-3: Preliminary Identification of ARARs** 

Type of ARAR	Requirement	Citation	Description	Comments
Action- Specific	Resource Conservation and Recovery Act (RCRA)	40 CFR 264.601 (RCRA, Subpart X)	Requires miscellaneous units for the management of hazardous waste, such as open burning/open detonation units, to be located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment.	Permits are not required for on-site response actions conducted under CERCLA and only the substantive requirements of Subpart X are considered potential ARARs.
Location- Specific	Endangered Species Act	16 United States Code (USC) 1538(a)(1)(B)	Prohibits the "taking" of any federally listed threatened or endangered species of fish or wildlife. In addition, federal agencies must ensure that their actions will not jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the designated critical habitat of a listed species.	Threatened and endangered (T&E) species are present on the site.  Refer to Appendix B for additional information.
Location- Specific	Endangered Species	Hawaii Revised Statutes Title 12, Chapter 195D- 4(e)(2) Hawaii Administrative Rules Title 13, Chapter 124- 3(b)(1)	Prohibits the take of any threatened or endangered species of aquatic life, wildlife, or land plant within the State of Hawaii. In addition to species listed under the federal Endangered Species Act, the prohibition on take under the state endangered species law applies to certain other indigenous species identified under state law as endangered or threatened.	T&E species are present on the site.  Refer to Appendix B for additional information.

# 3.4 Institutional Analysis

- 3.4.1 An institutional analysis is currently underway with the governmental agencies having jurisdiction over the properties within the MRS; the results of which will be presented in the FS. The institutional analysis process involves the collection of data from government agencies and landowners needed to design and support an institutional control program at the site. The objectives of the institutional analysis are to (1) illustrate the opportunities that exist to implement an institutional control program at the site, (2) identify government agencies and landowners having jurisdiction over the site, and (3) assess the appropriateness, capability, and willingness of these parties to assert their control over the site.
- 3.4.2 Data collection from government agencies, such as HDOH, DLNR, the State of Hawaii Land Use Commission, the City and County of Honolulu, Department of Planning and Permits, and private landowners is in progress. The types of data being gathered include:

- Jurisdiction of the Agency/Landowner
- Authority Exercised by the Agency/Landowner within its Jurisdiction
- Mission of the Agency/Landowner
- Capability of the Agency/Landowner
- Desire of the Agency/Landowner to Participate in the Institutional Control Program
- 3.4.3 Once this data is collected, it will be used to develop an institutional analysis as well as control strategies. Control strategies may consist of a single institutional control or a combination of strategies. The local community and stakeholders drive the development of the appropriate institutional control alternatives. The alternatives for the site will reflect the framework of the local institutions and the needs of the community. The information will be summarized and presented in a separate Institutional Analysis Report in accordance with EP 1110-1-24 and included in the FS.

# 3.5 Data Needs and Data Quality Objectives

- 3.5.0.1 Data quality objectives (DQOs) are statements defining the quality, quantity, and type of data required, and the acceptance criteria for those data, necessary to provide an adequate database to support project decisions. To generate data that will meet the project objectives, it is necessary to define the types of decisions that will be made and identify the intended use of the data in an effort to characterize the residual risk remaining at the FUDS property.
- 3.5.0.2 Data needs specific to this RI have been identified by evaluating existing data and through discussions of project requirements with stakeholders. The process by which data needs were developed is documented in the TPP Memorandum (Huikala, 2013b).

## 3.5.1 Analysis of Existing Data

- 3.5.1.1 Data collected from previous investigations was compiled and analyzed to determine data gaps and refine the additional data needs to meet the RI DQOs.
- 3.5.1.2 Previous investigations provide no evidence indicating MEC hazards or MC risks at either MVTC or UTC. MVTC was a suspected observation point and no MEC or MD items have been recovered from the MRS to date. The UTC MRS is documented as an encampment or cantonment area and no MEC were reported during development of the site, thus ordnance use is not suspected. The 2009 SI developed MRSPP ratings of "No Known or Suspected Hazards" for both of these MRSs. As a result, the TPP team concluded that additional investigation was not required in MVTC or UTC.
- 3.5.1.3 For the MTC and MVIA MRSs, a comprehensive list of anticipated MEC items was compiled from the 1994 INPR, 2008 EE/CA, and 2012 Removal Action. Since each progressive

investigation identified new munition items, there was not sufficient data to determine the nature of MEC at the project site. Additional information needed to be collected during the RI.

- 3.5.1.4 The 2008 EE/CA instrument-assisted visual reconnaissance transects collected surface-only data, not subsurface (Appendix A, Figure A2-1). This was not suitable to adequately characterize the extent of MEC in the surveyed areas. After discussions with the project delivery team (PDT [USAESCH and CEPOH]), it was determined that additional data was needed along the EE/CA transect areas.
- 3.5.1.5 Data collected during the 2012 Removal Action was useful in developing a comprehensive list of anticipated MEC items and completing the MEC HA and MRSPP (Environet, 2012). The 40 acres covered by this project were removed from the RI MEC investigation fieldwork, however, since a removal action was performed.
- 3.5.1.6 The 2009 SI provided the only MC data for MVIA. All samples were collected in the western portion of the MRS. The SI COPCs were identified as five metals (aluminum, arsenic, chromium, iron, and vanadium) in surface soil, two metals (cobalt and mercury) and one explosive compound (RDX) in surface water, and six metals (aluminum, chromium, cobalt, iron, nickel, and vanadium) in sediment. While the sample results for these constituents exceeded the SI project action levels, not all were related to munitions use or have known risk-based thresholds.
- 3.5.1.7 The comprehensive MEC list was also used to identify additional MCs not identified during the 2009 SI.

#### 3.5.2 Data Needs

- 3.5.2.1 The RI data needs for the MVIA and MTC MRSs were identified as follows:
  - Additional data to determine and delineate the nature, extent, and overall hazard potential for MEC suspected or used.
  - Additional data to determine the nature and extent of MC in surface soil.
  - Background concentrations of naturally occurring metals in surface soil.
  - Identification of sensitive habitats and/or cultural resources present within the MRSs (i.e., protected species and critical habitats, culturally significant sites, etc.)
  - Sufficient data to develop and evaluate effective response alternatives given the anticipated future land use.
- 3.5.2.2 No additional data was required for the MVTC and UTC MRSs.

# 3.5.3 MEC DQOs Resulting from TPP Process

- 3.5.3.1 Development of the DQOs is iterative and occurs through the TPP process. Notable changes from the preliminary MEC DQOs to the final MEC DQOs were:
  - Changing the definition of "accessible" from areas with less than 30 degrees to areas with less than 18 degrees slope. This change was made for worker safety. Working in areas with greater than 18 degrees slopes requires greater worker protection.
  - Removing the MVTC and UTC MRSs from further investigation. No evidence of military munitions has been found in these MRSs and no known MEC hazards or MC risks are suspected.

#### 3.5.3.2 The final MEC DQOs are:

- 1. Delineate the nature and extent of MEC contamination in accessible areas with at least a 90% confidence level of identifying impact areas within the MVIA and MTC.
- 2. For areas outside of the MEC-contaminated areas, determine with 90% confidence that the concentration of UXO in residential areas are less than or equal to 0.1 UXO per acre and low-use areas are less than or equal to 0.5 UXO per acre.
- 3.5.3.3 Table 3-4 summarizes the data needs, quantity of data, and data collection methods required to achieve the final MEC DQOs.

Table 3-4: Final MEC DOOs

Table 3-4. Final WEC DQOS			
DQO Step	Description		
Step 1:	The former PTC was used as a regimental combat training center in the 1940s,		
State the	emphasizing the use of and familiarity with modern arms and field weapons, in		
Problem	addition to providing rugged terrain for jungle and ranger training. MEC has been		
	identified or is suspected of being present at several areas within the Site including		
	MD from 81-mm mortars, 75-mm HE, 75-mm shrapnel, and 37-mm projectiles.		
	Additional investigation is required to assess whether MEC and/or MC are present at		
	the site, to evaluate risk, and to guide further management decisions. <i>Delineate the</i>		
	nature and extent of MEC contamination within the MVIA MRS and MTC MRS.		
Step 2:	Principal Study Questions		
Identify the Goal of the Study	Are MEC present at the site?		
	What types of MEC (i.e., energetic material category) are present?		
	Do known MEC items comprise the extent of MEC present within each MRS?		
	Do MEC items exist outside of the current boundaries of each MRS?		
	Do MEC items pose an unacceptable hazard to human receptors?		

**Table 3-4: Final MEC DQOs (continued)** 

DQO Step  Step 2: Identify the Goal of the Study (continued)  No further investigation is required and a No Further Action determine be sought for the site.  Investigate additional transects/grids if MEC items exist outside to the state of	the known
Identify the Goal of the Study (continued)  No further investigation is required and a No Further Action determine be sought for the site.  Investigate additional transects/grids if MEC items exist outside to	the known
of the Study (continued)  • No further investigation is required and a No Further Action determine be sought for the site.  • Investigate additional transects/grids if MEC items exist outside to	the known
<ul> <li>Investigate additional transects/grids if MEC items exist outside t</li> </ul>	
boundaries of the MRS in order to identify the lateral extents of MEC.	
Institute Institutional Controls or perform a removal action to reduce hazard to an acceptable level	e the MEC
Collect incremental surface soil samples in areas identified as havin MD contamination.	ig MEC or
Based on the principal study questions and the alternative actions that in response to these questions, the following decision statements I	-
generated:	
Determine the type and spatial extent of MEC and the exposure particle humans.	thways for
If MEC is present, does the risk posed to humans require additional invimplementation of institutional controls, and implementation of remedial of actions.	-
Step 3: Historical Data and Previous Investigations:	
Identify Information Inputs  Historical information, investigation results, and analytical data from reports, including:	1 previous
• INPR (CEPOH, 1994)	
• EE/CA (Zapata, 2008)	
SI Report (WCP, September 2009)	
Site Specific Final Report (Environet, 2012)	
Current RI:	
Analog geophysical data.	
Results of visual and instrument investigations along transects and in a	grids.
Results of intrusive investigation of identified anomalies.	-
Evaluation of the conceptual site model and site receptors.	

**Table 3-4: Final MEC DQOs (continued)** 

DQO Step	Description
Step 4:	Lateral and Vertical Boundaries
Define the	Only areas with less than 18 degrees slope will be investigated.
Boundaries of the Study	• Instrument investigation is bound by 1-meter wide transects.
	• Transects will be spaced approximately 350 feet apart for MVIA and 350 feet apart for MTC.
	• Transect spacing is designed to allow at least a 90% probability of traversing and detecting any 1,000-foot diameter (500-foot radius) circular target area.
	• Perpendicular transects will be used to refine potential target areas. Perpendicular transects are terminated at the intersection of the parallel transect bounding the target area.
	Analog grid investigation may be used to define and bound target areas.
	Grid locations will be determined based on results of transect investigations.
	• Vertical boundary will consist of the depth to which the metal detection device can detect metal in the subsurface.
	Constraints
	Rights-of-Entry, environmental setting, weather, current land use activities, e.g., agricultural, recreational.
Step 5:	IF MEC:
Develop the Analytical	a) are identified, THEN determine the lateral and vertical extents and distribution of the MEC.
Approach	b) are not identified, THEN collect sufficient data to assess potential hazards and develop and evaluate effective remedial alternatives.
	IF the MEC investigation:
	a) does indicate areas of high density, THEN investigate additional transects/grids to determine lateral and vertical extent of MEC to an accuracy of +/- 100 feet horizontal and +/- 0.5 feet vertical.
	b) does not indicate areas of high density, THEN collect sufficient data to assess risk and develop and evaluate effective remedial alternatives.
	IF the results of the MEC investigation:
	a) do not indicate the presence of MEC within the MRS, THEN the MRS (or portions of the MRS) will be considered for unrestricted use in the FS.
	b) do indicate the presence of MEC/MD at the MRS, THEN incremental sampling of surface soil will be conducted and the results analyzed for MC associated with MEC/MD item identified.

**Table 3-4: Final MEC DQOs (continued)** 

Table 3-4: Final MEC DQOs (continued)			
DQO Step	Description		
Step 6:	Repeatability (Instrument Functionality) - All items in test strip detected.		
Specify Performance or	• Dynamic Repeatability (transects) - Repeat a segment of transect and show extra flags/digs with not greater than the greater of 20% or 8 flags.		
Acceptance Criteria	• Coverage (grids) - Blind coverage seeds and blind detection seeds recovered 75% if MEC 90% if no MEC.		
	<ul> <li>Detection and Recovery (grids) - Blind detection seeds recovered 80% if MEC, 100% if no MEC.</li> </ul>		
	• Anomaly Resolution - QC checks open holes to determine if MEC: 70% confidence <10% anomalies unresolved, and a 90% confidence <5% unresolved if no MEC is found.		
	• Identification of MEC-contaminated areas (areas with elevated anomaly densities relative to background density of 50 anomalies per acre) with at least a 90% statistical confidence.		
	<ul> <li>Analog grids demonstrate that areas surrounding MEC-contaminated areas do not exceed 0.1 UXO per acre for residential areas and 0.5 UXO per acre for low use areas.</li> </ul>		
Step 7: Develop the Detailed Plan for	• Design transect plan to allow at least a 90% probability of identifying impact areas (areas with elevated anomaly densities relative to background density of 50 anomalies per acre).		
<b>Obtaining Data</b>	Conduct visual and instrument investigation on transects.		
	• Collect data 32.05 miles/11.6556 acres of transects in MVIA and 6.21 miles/2.2598 acres of transects in MTC.		
	• If impact areas are identified, investigate perpendicular transects to bound impact area.		
	• After the potential target areas are defined through VSP and intrusive investigation, apply UXO Estimator to the surrounding area. Through the use of GIS, the surrounding area will be divided into different land uses: residential and low use (such as, agricultural, golf course) areas. UXO Estimator will then be applied for the land uses that apply for both 0.1 and 0.5 UXO per acre.		
	<ul> <li>Conduct intrusive investigation of anomalies identified during transect and grid sweeps.</li> </ul>		
	Perform a MEC Hazard Assessment using investigation data to determine the overall hazard potential.		

## 3.5.4 MC DQOs Resulting from TPP Process

- 3.5.4.1 During the TPP process, stakeholders expressed concern about using a sampling approach based on watershed-size SUs. Collecting one incremental sample per watershed is not representative of the nature and extent of MC contamination due to the size of the watersheds surrounding the MRSs. The TPP team agreed that a better approach is to use a 5,000 square foot SU centered on potential impact areas or in areas with high MD concentrations. Background SUs would also be 5,000 square feet and located in upgradient areas with the least probability of military activity. The 5,000 square feet SU size is based on HDOH guidance for typical residential areas in Hawaii.
- 3.5.4.2 Additionally, the stakeholders requested that the number of sub-samples included in one (1) incremental soil sample be increased from 30 to 50.
- 3.5.4.3 The TPP team also reviewed the list of MCs that were developed using the 2009 SI data and the list of MEC potentially used at the site. The team eliminated several metals identified during the 2009 SI from further consideration since the metals were not associated with the munitions suspected at the site. Metals that have no risk-based threshold or were below the 2009 SI project action levels were also eliminated from consideration. The final MC list included antimony, chromium, copper, lead, zinc, Tetryl, HMX, TNB, DNB, TNT, DNT, NT, NG, PETN, and RDX.
- 3.5.4.4 The stakeholders also requested a phased sampling approach. Surface soil would be collected and analyzed first. If MC concentrations in surface soil exceeded the HDOH Tier 1 EALs, then subsurface soil, sediment, and surface water would be collected and analyzed.

#### 3.5.4.5 The final MC DQOs are:

- 1. Within MEC-contaminated areas or potential target areas, determine the nature and extent of MC concentrations in surface soil by collecting incremental surface soil samples IAW the HDOH HEER TGM (HDOH, 2009), analyzing samples using EPA approved methods and following general DoD guidelines (DoD, 2010).
- 2. Determine if MC concentrations in surface soil are above acceptable risk thresholds by comparing concentrations against HDOH Tier 1 EALs and, if necessary, performing a Tier 2 site-specific baseline risk assessment.
- 3. If MC concentrations are above acceptable risk thresholds in surface soil, delineate the nature and extent of MC contamination in subsurface soil as well as sediment and surface water. Incremental subsurface soil samples will be collected at the same locations as the surface soil samples but in the 6 to 12 inches below ground surface (bgs) interval. Discrete sediment and surface water samples will be collected downgradient from MC contamination in surface soil. Analysis will be conducted using EPA approved methods

- following general DoD guidelines (DoD, 2010). Surface water will only be sampled if sediment concentrations are above HDOH EALs.
- 4. Determine background concentrations of metals in surface soil through collection of eight incremental background soil samples from areas with the least probability of DoD activity and where no MEC was found; analyze samples using EPA approved methods following general DoD guidelines (DoD, 2010).
- 5. If sediment and surface water samples are collected, determine background concentrations of metals in sediment and surface water by collecting eight discrete sediment samples and one surface water sample upgradient of MC contamination and where no MEC was found; analyze samples using EPA approved methods following general DoD guidelines (DoD, 2010).
- 3.5.4.6 Table 3-5 summarizes the final MC DQOs developed during the TPP process.

**Table 3-5: Final MC DOOs** 

Table 3-3. Final MC DQOS		
DQO Step	Description	
Step 1 State the Problem	MEC has been identified or is suspected of being present at several areas within the Site including MD from 81-mm mortars, 75-mm high explosive, 75-mm shrapnel, and 37-mm projectiles. Additional investigation is required to assess whether MEC and/or MC are present at the site, to evaluate risk, and to guide further management decisions.	
Step 2 Identify the Goal of the Study	<ul> <li>The principal study questions for this project are:</li> <li>Are MEC present at the site?</li> <li>What types of MEC (i.e., energetic material category) are present?</li> <li>If MEC or MD is present at the site, is MC present in surface soil at concentrations exceeding the Tier 1 screening level risk assessment Environmental Action Levels (EALs) and/or Tier 2 site-specific screening levels?</li> <li>If MEC or MD is present at the site, are metals present in surface soil at concentrations exceeding background metal concentrations?</li> <li>What risk of injury or death is posed by MEC/MC identified at the site?</li> <li>The alternative actions for this project are:</li> <li>No further investigation is required and a No Further Action determination may be sought for the site.</li> </ul>	
	<ul> <li>Perform a MEC Hazard Assessment to assess whether on-site MEC present an unacceptable level of risk to human health and/or the environment and requires the performance of additional site work.</li> <li>If MEC or MD is found in surface soil, determine target area and conduct increment sampling of surface soil for MC associated with each specific type of MEC or MD item identified. Compare MC concentrations to human health and ecological screening values, as presented in the HDOH's Tier 1 EALs as presented in Worksheet #15.</li> </ul>	

**Table 3-5: Final MC DQOs (continued)** 

	Table 5-3. That We boos (continued)
DQO Step	Description
Step 2 Identify the Goal of the Study (continued)	<ul> <li>If MC concentrations exceed Tier 1 EALs, perform a Tier 2 Site-Specific Screening-Level Evaluation in accordance with the HDOH Technical Guidance Manual (TGM) (HDOH, 2009) to determine whether MC associated with MEC present an unacceptable level of risk to human health and/or the environment and requires the performance of additional site work.</li> <li>If the Tier 2 Site-Specific Screening-Level Evaluation indicates a risk to human health</li> </ul>
	and ecology, then collect subsurface soil, sediment and surface water samples as detailed in Worksheet #17; and perform a Baseline Risk Assessment as detailed in Worksheet #14, Section 14.4.
	Based on the principal study questions and the alternative actions that may result in response to these questions, the following decision statements have been generated:
	If MEC and/or MC are present, evaluate whether the risk posed to human health and/or the environment requires additional site investigation activities, implementation of land use controls (LUCs), and/or implementation of remedial or removal actions.
Step 3	The inputs to the project decision include information from the following:
Identify	Historical Data and Previous Investigations:
Information Inputs	Historical information, investigation results, and analytical data from previous reports, including:
	■ INPR (CEPOH, 1994)
	■ EE/CA (Zapata, 2008)
	■ SI Report (WCP, September 2009)
	Site Specific Final Report (Environet, 2012)
	Current RI:
	The MEC/MC investigation technical approach is comprised of the following:
	Cultural and biological monitoring to avoid sensitive resources
	<ul> <li>Identification of Sampling Units with potential MC in available media as evidenced by the presence of MEC or MD.</li> </ul>
	<ul> <li>Use of increment sampling (IS) and discrete sampling techniques to determine concentrations of MC</li> </ul>
	<ul> <li>Use of HDOH EALs to evaluate COPC metals (antimony, chromium, copper, lead, zinc) and explosives (Tetryl, HMX, RDX, TNB, DNB, TNT, DNT, NT, PETN, and NG).</li> </ul>
	<ul> <li>Use of background soil samples from areas with the least probability of military activity to evaluate background concentrations of COPC metals (antimony, chromium, copper, lead, and zinc).</li> </ul>
	Perform laboratory analysis of metals and explosives in soil using methods 3050A/6020A and 8330B, respectively.

**Table 3-5: Final MC DQOs (continued)** 

DQO Step	Description		
Step 4	The lateral boundaries of the study area are as follows:		
Define the Boundaries of the Study	The lateral boundaries are confined to accessible areas (areas of less than 18 degrees slope) within two non-contiguous parcels within the Maunawili Valley near Kailua, Oahu. These two parcels are:		
	Maunawili Valley Impact Area		
	Maunawili Site		
	For investigation of MEC the lateral boundaries will consist of the outer edges (3 feet width) of transects shown on Figure E4. For the investigation of MC, the lateral boundaries will consist of 5,000-square foot sampling units centered on locations where potential target areas were identified during the MEC investigation, or in locations biased where MD was found on soil. For the investigation of background metal concentrations, the lateral boundaries will be confined to locations where no MEC or MD is found and with the least probability of military activity.		
	The vertical boundaries of the study area are as follows:		
	• The vertical boundary for MEC investigation will consist of the depth to which the metal detection device can detect metal in the subsurface.		
	For MC, the initial sampling conducted in the Phase One of the MC investigation will be a vertical depth of 6 inches. If concentrations exceed Tier 2 Site-specific Screening Levels, additional samples will be collected below 6 inches.		
	• For background metal concentrations in surface soil, the vertical boundary will be a vertical depth of 6 inches. If surface soil sample concentrations exceed Tier 2 Site-Specific Screening Levels, the vertical boundary of background metal concentrations in subsurface soil will below 6 inches.		
	The temporal boundaries of the study area are as follows:		
	For all fieldwork, the temporal boundary is limited to the time required to complete these activities. The concentration and location of MC in subsurface soil, if any, are not anticipated to change over time.		
Step 5	1. IF the results of the initial MEC investigation:		
Define the Decision Rules	a. <b>do not indicate</b> the presence of MEC-contaminated/potential target areas at the Site, <b>THEN</b> the site or portions of the site will be considered for unrestricted use in the FS.		
	b. <b>do indicate</b> the presence of MEC-contaminated/potential target areas, <b>THEN</b> increment sampling of surface soil will be conducted and the results analyzed for MC associated with each specific MEC item identified. The MC COPCs are listed in Worksheet #15.		
	c. <b>do not indicate</b> the presence of MEC but MD indicating the presence of potential target areas was found at the site, <b>THEN</b> increment sampling of surface soil will be conducted and the results analyzed for MC associated with each specific item identified. The MC COPCs are listed in Worksheet #15.		

**Table 3-5: Final MC DQOs (continued)** 

Table 3-3. That We boos (continued)			
DQO Step	Description		
Step 5	2. IF MC concentrations in surface soil samples:		
Define the Decision Rules	a. <b>are less than</b> the Tier 1 EALs for that constituent, THEN no further sampling will be conducted.		
(continued)	b. <b>are greater than</b> the Tier 1 EAL for a specific COPC, THEN the MC results will be used to conduct a detailed Tier 2 Site-Specific Screening-Level Evaluation.		
	c. <b>are greater than</b> the Tier 1 EAL for a specific COPC, and are located within 100 feet upgradient from a surface water body; THEN sediment and surface water samples will be collected from the surface water body; and all the MC results will be used to conduct a detailed Tier 2 Site-Specific Screening-Level Evaluation.		
	<b>3. IF</b> the results of the Tier 2 Site-Specific Screening-Level Evaluation indicate a:		
	<ul> <li>a. minimal risk posed to human health and/or the environment by MC, THEN no further sampling will be conducted.</li> </ul>		
	b. unacceptable risk posed to human health and/or the environment by MC, THEN additional sampling of surface water, sediment, and subsurface soil will be conducted, and the results will be used to prepare a Tier 3 Baseline Risk Assessment. The Tier 3 Baseline Risk Assessment will provide a detailed exposure and toxicity assessment which will be used to evaluate whether remedial actions will be required to protect human health and/or the environment.		
Step 6	1. Presence of MD/MEC		
Specify Acceptance Criteria	The stated baseline condition (null hypothesis) is that the site does not contain MEC. This assumption will be maintained unless there is convincing evidence to the contrary. The alternative condition to the baseline condition is that the site contains MEC. The statistical hypotheses for this study are as follows:		
	$\blacksquare$ $H_0 = \text{Site does not contain MEC}$		
	■ H <sub>a</sub> = Site contains MEC		
	A decision error occurs when the decision-maker rejects the null hypothesis when it is true, or fails to reject the null hypothesis when it is false. For the purposes of this project, the possible decision errors are as follows:		
	• False Rejection Error (α): H <sub>0</sub> is correct. The true condition is that the site does not contain MEC, yet the data show that the site does contain MEC. The consequence of a false rejection error at this site may result in the implementation of unnecessary remedial alternatives and/or LUCs and the expenditure of associated and unnecessary funds.		
	To make the determination that MEC are not present and that the site can be made available for unrestricted use, an intrusive investigation of anomalies detected along transects spaced in parallel with sufficient density will be performed. The spacing of the transects will allow at least a 90% probability of identifying potential target areas given the munitions of concern with the smallest expected fragmentation dispersion pattern.		
	The false rejection decision error limit shall be 0.05, and the false acceptance decision error limit shall be 0.20.		

**Table 3-5: Final MC DQOs (continued)** 

Table 5-5: Final WC DQOs (continued)		
DQO Step	Description	
Step 6	2. Presence of MD/MEC	
Specify Acceptance Criteria (continued)	The stated baseline condition (null hypothesis) is that the site does not contain MEC. This assumption will be maintained unless there is convincing evidence to the contrary. The alternative condition to the baseline condition is that the site contains MEC. The statistical hypotheses for this study are as follows:	
	• $\mathbf{H}_0$ = Site does not contain MEC	
	• $\mathbf{H_a} = \text{Site contains MEC}$	
	A decision error occurs when the decision-maker rejects the null hypothesis when it is true, or fails to reject the null hypothesis when it is false. For the purposes of this project, the possible decision errors are as follows:	
	• False Rejection Error (α): H <sub>0</sub> is correct. The true condition is that the site does not contain MEC, yet the data show that the site does contain MEC. The consequence of a false rejection error at this site may result in the implementation of unnecessary remedial alternatives and/or LUCs and the expenditure of associated and unnecessary funds.	
	• False Acceptance Error (β): H <sub>0</sub> is false. The true condition is that the site contains MEC, yet the data show that the site does not contain MEC. The consequence of a false acceptance error at this site could result in injury or death due to an adverse human or ecological resources encounter with MEC.	
	To make the determination that MEC are not present and that the site can be made available for unrestricted use, an intrusive investigation of anomalies detected along transects spaced in parallel with sufficient density will be performed. The spacing of the transects will allow at least a 90% probability of identifying potential target areas given the munitions of concern with the smallest expected fragmentation dispersion pattern.	
	The false rejection decision error limit shall be 0.05, and the false acceptance decision error limit shall be 0.20.	
	3. Presence of MC above Tier 1 and Tier 2 Screening Levels	
	In the event that MEC or MD is identified as present at the site, the stated baseline condition (null hypothesis) is that the site does not contain MC at concentrations above the EALs. This assumption will be maintained unless there is convincing evidence to the contrary. The alternative condition to the baseline condition is that the site contains MC at concentrations above the EALs. The statistical hypotheses for this hypothesis are as follows:	
	• $\mathbf{H_0} = \text{Site does not contain MC at concentrations above the EALs}$	
	$\mathbf{H}_{\mathbf{a}}$ = Site contains MC at concentrations above the EALs	
	A decision error occurs when the decision-maker rejects the null hypothesis when it is true, or fails to reject the null hypothesis when it is false. For the purposes of this hypothesis, the possible decision errors are as follows:	
	False Rejection Error (α): H <sub>0</sub> is correct. The true condition is that the site does not contain MC at concentrations above the EALs, yet the data show that the site does contain MC at concentrations above the EALs. The consequence of a false rejection error at this site may result in the implementation of unnecessary remedial alternatives and/or LUCs and the expenditure of associated and unnecessary funds.	

**Table 3-5: Final MC DQOs (continued)** 

DQO Step	Description
DQO Step	Description
Step 6 Specify Acceptance Criteria (continued)	<ul> <li>False Acceptance Error (β): H<sub>0</sub> is false. The true condition is that the site contains MC at concentrations above the EALs, yet the data show that the site does not contain MC at concentrations above the EALs. The consequence of a false acceptance error at this site could result in illness due to an adverse human or ecological resources encounter with MC.</li> <li>To make the determination that MC are not present and that the Site can be made available</li> </ul>
	for unrestricted use, IS samples will be collected and analyzed for the constituent(s) of the munitions at each potential target area identified during the MEC investigation or in areas where higher concentrations of MD was found.
	4. Presence of MC above Background
	In the event that MEC or MD is identified as present at the site, the stated baseline condition (null hypothesis) is that the Site does not contain MC concentrations at concentrations above background metals concentrations; explosive compounds are not naturally occurring and will not be included in background sample analyses.
	The assumption that the Site does not contain MC concentrations at concentrations above background metals concentrations will be maintained unless there is convincing evidence to the contrary. The alternative condition to the baseline condition is that the site contains MC at concentrations above background concentrations. The statistical hypotheses for this hypothesis are as follows:
	$\mathbf{H}_0$ = Site does not contain MC at concentrations above the background concentrations
	$\mathbf{H}_{\mathbf{a}}$ = Site contains MC at concentrations above the background concentrations
	A decision error occurs when the decision-maker rejects the null hypothesis when it is true, or fails to reject the null hypothesis when it is false. For the purposes of this hypothesis, the possible decision errors are as follows:
	■ False Rejection Error (a): H <sub>0</sub> is correct. The true condition is that the site does not contain MC at concentrations above the background concentrations, yet the data show that the site does contain MC at concentrations above the background concentrations. The consequence of a false rejection error at this site may result in the implementation of unnecessary remedial alternatives and/or LUCs and the expenditure of associated and unnecessary funds.
	False Acceptance Error (β): H <sub>0</sub> is false. The true condition is that the site contains MC at concentrations above the background concentrations, yet the data show that the site does not contain MC at concentrations above the background concentrations. The consequence of a false acceptance error at this site could result in illness due to an adverse human or ecological resources encounter with MC.
	To make the determination that MC are not present and that the site can be made available for unrestricted use, increment soil samples (IS) will be collected and analyzed for the constituent(s) of the munitions at each potential target area identified during the MEC investigation or in areas where higher concentrations of MD was found.
	The false rejection decision error limit shall be 0.05, and the false acceptance decision error limit shall be 0.20.

**Table 3-5: Final MC DQOs (continued)** 

DQO Step	Description				
Step 6 Specify Acceptance	5. Risk Assessment  In the event that a Tier 2 Site-Specific Screening-Level Evaluation is prepared for the site, the stated baseline condition (null hypothesis) is that MC present at the site does not present				
Criteria (continued)	an unacceptable risk to human health. This assumption will be maintained unless there is convincing evidence to the contrary. The alternative condition to the baseline condition is that MC at the site does present a risk to human health and/or the environment. The statistical hypotheses for this hypothesis are as follows:				
	$\mathbf{H}_0$ = Site does not present an unacceptable risk to human health and/or the environment				
	■ H <sub>a</sub> = Site does present an unacceptable risk to human health and/or the environment				
	A decision error occurs when the decision-maker rejects the null hypothesis when it is true, or fails to reject the null hypothesis when it is false. For the purposes of this hypothesis, the possible decision errors are as follows:				
	• False Rejection Error (α): H <sub>0</sub> is correct. The true condition is that the site does not present an unacceptable risk to human health and/or the environment, yet the data show that the site does present an unacceptable risk to human health and/or the environment. The consequence of a false rejection error at this site may result in the implementation of unnecessary remedial alternatives and/or LUCs and the expenditure of associated and unnecessary funds.				
	• False Acceptance Error (β): H <sub>0</sub> is false. The true condition is that the site does present an unacceptable risk to human health and/or the environment, yet the data show that the site does not present an unacceptable risk to human health and/or the environment. The consequence of a false acceptance error at this site could result in preventable illness due to an adverse human or ecological resources encounter with MC.				
	For the purpose of determining that MC concentrations at the site do not present a risk to human health and/or the environment, and that the Site can be made available for unrestricted use, a Tier 2 Site-Specific Screening-Level Evaluation will be prepared using data collected during the increment surface soil sampling event.				
	The false rejection decision error limit shall be 0.05, and the false acceptance decision error limit shall be 0.20.				
Step 7 Describe the Plan for	The investigation design and rationale were developed using the Conceptual Site Model presented in Appendix B of the Work Plan, and are described in Worksheet #17. In general, the investigation design includes the following elements:				
Obtaining Data	A MEC survey designed to collect sufficient surface and subsurface anomaly data along predetermined transects using a MINELAB SE or equivalent all-metals detector will be performed to determine if MD/MEC are present at the site. MC sampling will be performed in a phased approach following identification of MEC-contaminated, potential target areas, or areas with higher concentrations of MD. MC increment sampling of surface soil will be conducted within these areas. If concentrations of MC in soil samples exceed the Tier I EALs for leaching to groundwater, a Tier 2 Site-Specific Screening-Level Tier 2 Site-Specific Screening-Level Evaluation will be conducted to evaluate the risk posed to human health and/or the environment by MC at the site. If the Tier 2 Site-Specific Screening-Level Evaluation concludes that an unacceptable level of risk due to MC is present at the site, additional sampling of surface water, sediment, and subsurface soil will be conducted, and the results used to prepare a Tier 3 Baseline Risk Assessment.				

#### 3.5.5 MRSPP DQO

The MRSPP DQO is to determine the MRS Priority score for each MRS by collecting MRS-specific data from historical documentation and the RI field work. The Explosive Hazard Evaluation, Chemical Warfare Materiel Hazard Evaluation, and Health Hazard Evaluation modules from the MRSPP Scoring Tables will be updated using all data. The MRSPP Scoring Tables will be submitted independently of this RI Report.

## 3.5.6 MEC Data Obtained During RI

3.5.6.1 Visual and analog investigation was conducted along 46.42 miles (22.81 acres) of transects within the MVIA MRS to evaluate the nature and extent of MEC. The transect data was analyzed to identify MEC-contaminated areas and potential impact areas. Using RI and historical data, 5.60 acres of grids were placed to either define the nature and extent of MEC-contamination or to demonstrate that areas outside of MEC-contaminated areas were below the respective land-use UXO threshold of 0.5 UXO per acre. The MEC data was sufficient for meeting the MEC DQOs, as detailed in Section 5.1.

3.5.6.2 No additional MEC data was obtained for the MTC MRS due to ROE refusal.

## 3.5.7 MC Data Obtained During RI

- 3.5.7.1 Forty-two surface soil samples (14 primary and 28 duplicates/triplicates) were collected in areas with the highest concentration of MEC/MD, including the 2012 Removal Action area, and in areas where MEC items were demolished. The MC data was sufficient for meeting the MC DQOs, as detailed in Section 5.3.
- 3.5.7.2 Eighteen background surface soil samples (6 primary and 12 duplicates/triplicates) were collected in areas that appeared to be un-impacted by military use. The background MC data was sufficient for meeting the MC DQOs.
- 3.5.7.3 No subsurface soil, sediment, or surface water samples were collected in the MVIA MRS.
- 3.5.7.4 No additional MC data was obtained for the MTC MRS, including collection of background surface soil samples (2 primary, 4 duplicates/triplicates), due to ROE refusal.

# 3.5.8 Evaluation of MC Methodology

#### 3.5.8.1 Evaluation of Chemical-Specific DQOs

3.5.8.1.1 One of the primary goals of the RI were to determine if MC were present in surface soil at concentrations exceeding the HDOH Tier 1 EALs and if so, to evaluate the potential risk the MC pose to humans and the environment. The following principal study questions were developed for the RI:

- If MEC or MD is present at the site, is MC present in surface soil at concentrations exceeding the HDOH Tier 1 EALs?
- If MEC or MD is present at the site, are metals present in surface soil at concentrations exceeding background concentrations?
- What is the risk of injury or death posed by MC at the site?
- 3.5.8.1.2 The DQOs listed in Section 3.5.4 were developed to address these questions.

#### 3.5.8.2 MC Data Collection Methods

- 3.5.8.2.1 Soil samples were collected IAW the HDOH HEER TGM (HDOH, 2009) guidance on incremental sampling methodology (ISM). Each ISM sample was comprised of 50 incremental subsamples. Within each SU a primary, duplicate, and triplicate ISM sample was collected. Transects were laid out across each SU at fixed intervals and increment locations were selected based on a systematic-random sampling scheme. Increments were collected at evenly spaced intervals along each transect line beginning at the randomly selected starting locations. Each increment consisted of an approximately 45-gram soil sample collected from the 0 to 6 inches bgs interval with a disposable hand trowel. The soil increments were then composited in a zip-top bag. The duplicate and triplicate ISM samples were collected in the same manner as the primary ISM sample, but from a different starting point that was offset to the left or right along each transect.
- 3.5.8.2.2 Based on the use of disposable sampling equipment, equipment decontamination was not required or performed. Waste generated during sampling included used personal protective equipment (i.e., nitrile gloves) and municipal debris (e.g., plastic bottles, food waste, etc.). Nitrile gloves contained minimal adherence of site soil and were therefore containerized along with municipal debris in trash bags and disposed of off-site in municipal trash bins.
- 3.5.8.2.3 Following compositing, each sample bag was re-bagged in a new, clean zip-top bag. Zip-top bags were labeled with identifying information, including the sample identification (ID), sample collection date and time, the initials of the sampler, the client's name, and the analyses to be performed. Sample IDs indicated the SU (i.e., MVIA-# or BKG-#) and whether the sample was the primary (i.e., -A), duplicate (i.e., -D1), or triplicate (-D2) ISM. Soil samples were stored in a sample cooler packed with ice while on-site. At the completion of each day's sampling activities, the samples were transported by motor vehicle under chain-of-custody protocols to TestAmerica in Honolulu, Hawaii for shipment to TestAmerica in West Sacramento, California. Sample records were maintained during field activities, and chain-of-custody forms were prepared and maintained with the samples at all times. Appendix C includes copies of the soil sample records and chain-of-custody forms.

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

# 4.0 Characterization of MEC and MC

The goal of the RI field work was to gather sufficient data on the former PTC to characterize the nature and extent of MEC and MC and assess the potential threat posed by MEC and MC to human health, safety, and the environment. This section describes the procedures used to collect the data necessary for characterization and assessment of the site. The detailed technical approach for the MEC field investigation is described in the Final RI WP (Huikala, 2013a). Deviations from the Final RI WP are described in the following sections.

# 4.1 Data Management

# 4.1.1 Hard Copy Data

During fieldwork, a written record of data, notes, and observations was maintained in a field logbook and on field forms and drawings. In addition, production reports, health and safety briefings, and contractor quality control (QC) reports were prepared for each day of fieldwork. Appendices D and E contains copies of these reports and forms.

#### 4.1.2 Electronic Data

Electronic data collected during the RI included digital photographs and laboratory analytical results. Appendix C contains the laboratory results. Digital photographs were captured in Joint Photographic Experts Group format (.jpg). Appendix F contains the representative digital photographs taken during this RI.

# 4.1.3 Geographic Information System Data

Global positioning system (GPS) data was collected in the field using Universal Transverse Mercator Zone 4 North, WGS84 format. Data was then projected into NAD 1983 HARN and converted to into ArcGIS shapefiles (.shp) or personal geodatabase (.mdb). The GIS coordinate system is in meters. Satellite imagery used in maps was acquired from United States Geological Survey high resolution orthoimages and Bing Maps aerial imagery GIS service. Final GIS data is provided in Appendix G.

#### 4.2 MEC Characterization

4.2.0.1 Primary MEC investigation activities were conducted from July 2013 thru October 2013 in the MVIA MRS. After a preliminary review of the data, the PDT and Huikala determined that additional investigation along public trails would be appropriate to address finding a 105-mm HE projectile on the Maunawili Demonstration Trail (MDT) and a 37-mm HE M63 on the Maunawili Falls Trail (MFT). Additional investigation activities along public trails were performed from February to March 2014.

4.2.0.2 No investigation activities were performed in the MTC MRS because the landowners did not provide ROE.

## 4.2.1 Technical Approach

- 4.2.1.1 The MEC investigation technical approach was designed to collect sufficient surface and subsurface anomaly data along pre-determined transects using a hand-held all-metals detector. The transect design optimized the determination of MEC density and the limits of MEC contamination, to ensure a 90% confidence level of identifying potential impact areas (e.g., areas with elevated anomaly densities relative to background) given the munitions of concern with the smallest expected fragmentation dispersion pattern. VSP software was used to calculate the probability of traversing and detecting a target area using 1-meter wide transects with a parallel transect pattern. A background anomaly density of 50 anomalies per acre was selected for the MVIA.
- 4.2.1.2 The target radius for MVIA was determined to be 500 feet based on discussions with the PDT. Once potential impact or high MEC/MD density areas were identified, the field team would subsequently collect additional anomaly data by placing and investigating grids to estimate the anomaly density and determine nature and extent of MEC. UXO Estimator would then be used to calculate the acreage requiring investigation to determine if areas outside of MEC-contaminated areas were below the low-use threshold of 0.5 UXO per acre.
- 4.2.1.3 The approach was comprised of the following steps:
  - Archaeological, Cultural, and Biological Resource Avoidance
  - Limited Vegetation Removal
  - MEC Investigation
  - MEC Disposal
  - Disposal/Disposition of MPPEH
  - Quality Control

## 4.2.2 Field Change Requests

- 4.2.2.1 Field change request (FCR) 001 was submitted and approved to incorporate the use of meandering transects in the investigation. Steep topography impaired and limited the application of the parallel transects in the central and western areas of the MRS.
- 4.2.2.2 FCR 0003 was submitted and approved to modify the transect width from the 1-meter wide standard to the actual width of the trail. This modification was specifically for the public trails investigation. FCR 002 was relevant to MC sampling and is described in Section 4.3.2.
- 4.2.2.3 FCRs are provided in Appendix H.

## 4.2.3 Geophysical Prove Out

4.2.3.1 An instrument verification strip (IVS) was installed at the laydown yard as described in the Final RI WP (Appendix A, Figure A4-1). Industry standard objects (ISOs) were used as the seed items and buried at varying depths and orientations. Initially, the three ISO sizes listed in Table 4-1 were used as seed items.

Table 4-1. TVS Construction									
Item	Nominal Pipe Size	Outside Diameter	Length	Depth	Orientation				
Small ISO	1-inch	1.315-inch (33-mm)	4.000-inch (102-mm)	3 inches	Vertical				
				7 inches	Horizontal				
Medium ISO	2-inch	2.375-inch (60-mm)	8.000-inch (204-mm)	6 inches	Horizontal				
				14 inches	Vertical				
Large ISO	4-inch	4.500-inch (115-mm)	12.000-inch (306-mm)	20 inches	Vertical				
				28 inches	Horizontal				

**Table 4-1: IVS Construction** 

4.2.3.2 The UXO Quality Control Specialist (UXOQCS) determined that there was an issue detecting the large ISOs in the IVS during the operator/equipment QC check. The all-metals detector could not detect the large ISOs when the instrument was held 6 inches above ground surface (ags). The large ISOs were installed at depths of 28 inches (in a horizontal orientation) and 20 inches (in a vertical orientation) bgs. The equipment was detecting the ISO at the 20-inch depth more often than the ISO at the 28-inch depth, but not with sufficient confidence. The PDT and the Huikala project team agreed that the largest munition expected was an 81-mm mortar which was closer in size to a medium ISO and would likely be found at a depth shallower than 28 inches bgs. As a result, the large ISOs were replaced by medium ISOs and buried deeper than 12 inches bgs in a horizontal orientation.

4.2.3.3 A new IVS was established for the public trails investigation in February 2014 (Appendix A, Figure A4-2). The new IVS was constructed as described in the Final RI WP using ISOs placed at the depths/orientations shown in Table 4-1, with the exception of the large ISO. During the July – October 2013 investigation, a 105-mm HE projectile was found along the MDT. The 105-mm projectile replaced the 81-mm mortar as the largest munition expected and the large ISO was appropriate to use in the IVS. However, as described in the previous paragraph, the all-metals detectors were not detecting the large ISO at a 28-inch depth (in a horizontal orientation) with sufficient confidence. The PDT and the Huikala project team agreed to install a large ISO at a 20-inch depth in both the vertical and horizontal orientation.

## 4.2.4 Archaeological, Cultural, and Ecological Resource Avoidance

Trained archaeological and ecological monitors accompanied the UXO teams to identify existing or new resources within the areas of investigation. If resources were identified, the UXO teams adjusted the path of the transect or location of the grid to avoid any impact to the resource.

## 4.2.5 Limited Vegetation Removal

Vegetation removal was conducted only to allow access for investigation or sampling activities. Grass, vines, shrubs, and small trees less than 4-inches in diameter were cleared to 6 inches ags using manual methods such as machetes, brush cutters, and chain saws. Vegetation cuttings were left on-site to naturally decay. No threatened or endangered species were impacted.

## 4.2.6 MEC Investigation

Investigation activities were performed by qualified UXO personnel meeting the standards of Department of Defense Explosives Safety Board Technical Paper 18 (DDESB, 2004) and the requirements outlined in the Final RI WP (Huikala, 2013a). Transects and grids were navigated and recorded by using a hand-held TRIMBLE GeoExplorer (XH) 6000 GPS unit with a polemounted external antenna.

#### 4.2.6.1 Transect and Grid Investigation

- 4.2.6.1.1 Refer to Appendix A, Figure A4-3 for final transect and grid locations and Appendix J for transect and grid logs.
- 4.2.6.1.2 UXO teams, using a MINELAB Explorer SE, swept 1-meter wide transects and identified surface and subsurface anomalies in accessible areas (less than 18 degrees slope) during the primary investigation activities in 2013. In the eastern portion of MVIA, transects were placed in a parallel pattern spaced approximately 350 feet apart, as designed. As the UXO team moved westward, the terrain became steeper and more rugged and evenly spaced parallel transects were not feasible. Meandering transects, following terrain and topography, were implemented IAW FCR 001 (Appendix H). A total of 86 transects of varying orientation and length were investigated.
- 4.2.6.1.3 Once the transect data was analyzed, 19 grids ranging in size from 0.1 acres to 0.4 acres were placed in areas of high density, elevated density, or where MEC was found to better define the nature of potential MEC contamination. Three grids were placed in areas with low MD density and without MEC to determine if areas outside of the MEC-contaminated areas were less than the low-use threshold of 0.5 UXO per acre, as referenced in Section 4.2.1.2. No grids were placed in the eastern portion of the MVIA due to the lack of MEC/MD finds during transect investigation.

- 4.2.6.1.4 During the additional investigation activities in 2014, 24 transects were placed and swept on the MDT and the MFT. The entire lengths of the MDT and MFT within the MVIA boundary were investigated. The width of the transects varied to match the actual width of the trail, as delineated by vegetation growth and professional judgment of the UXO sweep team IAW FCR 0003 (Appendix H). No additional grids were installed.
- 4.2.6.1.5 Each subsurface anomaly location was excavated until the anomaly was located and the excavation was confirmed to be clear. Excavations were then backfilled. Seven MEC items, including two discarded military munitions (DMM) items, and 1,346 MD items were found. Table 4-2 lists the types of items discovered. Seven items were found that had not been identified during previous investigations. The discovery of the 105-mm HE projectile resulted in an amendment to the Explosives Siting Plan (ESP). The 105-mm HE projectile replaced the 81-mm HE mortar, M43A1 as the munition with the greatest fragmentation distance. The minimum separation distance was increased from 1,579 feet to 2,111 feet for intentional detonations. Additionally, the seven new munition types identified during the field investigation were similar in nature to previously identified types or have a target radius of at least 500 feet. The original VSP transect design was valid.

Table 4-2: MEC and MD Items

Item Description	Quantity
MD, 2.36-in Rocket, M7A1 Practice*	3
MD, 37-mm armor piercing (AP) M74	4
MD, 37-mm, APCT, M51*	1
MD, 37-mm, APCT M59	8
MD, 57-mm Projectile, APT M70	1
MD, 60-mm Mortar, M49A2	4
MD, 60-mm Mortar, M50A2, Practice *	1
MD, 60-mm Mortar, Tail Boom	10
MD, 75-mm Projectile, Shrapnel MK1	2
MD, 81-mm Mortar	9
MD, 81-mm Mortar, White Phosphorus, M57 *	1
MD, 81-mm Mortar, Tail Boom	40
MD, Frag Unknown	1,070
MD, Fuze Component	88
MD, Fuze, PD M48 *	47
MD, Fuze, PTT M1907	2
MD, Fuze, PTT TSQ M54	6
MD, Large Frag Unknown*	4
MEC, 105-mm HE Projectile *	1
MEC, 37-mm, HE M63 with BD M58 Fuze	3
MEC, 75-mm Shrapnel, Mk1	1
MEC, 81-mm HE Mortar, M43A1 (DMM)	2
Small Arms	45
Total	1,353

<sup>\*</sup>New item (not identified during previous investigations)

- 4.2.6.1.6 Data (location, coordinates, depth, fuzing type, and condition) for each MEC/MD anomaly was recorded as described in the Final RI WP (Huikala, 2013a) and is available in Appendix I. Digital photographs were taken of each MEC item and MD item type and are provided in Appendix F.
- 4.2.6.1.7 Additional transect and grid information is provided in Appendix J. Results of the investigation are presented in Section 5.0.

## 4.2.7 MEC Disposal

Seven MEC items were found during the transect and trail investigation. No MEC items were found in grids. MEC disposal was performed IAW the procedures outlined in the Final RI WP (Huikala, 2013a) and ESP. Four items were determined to be acceptable-to-move and were relocated to a consolidated demolition area for disposal. Three items, the 37-mm HE projectiles, though deemed acceptable-to-move, were blown-in-place due to logistical challenges of moving them over rugged terrain to reach a consolidated demolition area. The project biologist and CEPOH archaeologist surveyed the demolition areas and verified they were void of sensitive resources prior to demolition.

## 4.2.8 Disposal/Disposition of MPPEH

All MD/MPPEH were stored on-site in a locked container IAW the Final RI WP (Huikala, 2013a). The items were inspected and determined to be material documented as safe (MDAS). The MDAS was packaged, sealed in a labeled container, and shipped off-island for destruction and final disposition. The signed DD Form 1348-1A and the MEC-MD-MPPEH Log are presented in Appendix I. Final destruction forms will be submitted upon receipt from the destruction facility.

# 4.2.9 Quality Control

- 4.2.9.1 QC inspection and/or surveillance points and sampling frequency for each selected definable feature of work were in accordance with the Final RI WP (Huikala, 2013a). Inspection frequencies were at a normal state but could have been tightened or relaxed based on a variety of factors such as team performance, project duration, geophysical, and intrusive investigative results, etc. Daily QC reports are provided in Appendix D. Additional QC documentation is provided in Appendix K.
- 4.2.9.2 During the transect investigation, the UXOQCS or QC assistant followed the sweep teams to perform 100% transect and 100% anomaly verification checks. The QC assistant was designated by the UXOQCS to verify that the appropriate QC measures were being followed during the data collection process. Specifically, the QC assistant was tasked with following the investigation team and sweeping 100% of the transects and 100% of the anomalies and ensuring that the QC process was correctly documented. The UXOQCS then conducted spot checks at

60-meter intervals with the QC assistant. Once a transect "lot" was verified by the UXOQCS, the dynamic repeatability and anomaly resolution results were recorded on QC inspection forms and submitted to the Ordnance and Explosives Safety Specialist (OESS). A transect "lot" is defined as either 4 transects or approximately 2,000 meters.

- 4.2.9.3 During grid investigation, team leaders conducted 100% verification of blind seed recovery. The UXOQCS conducted 20% verification along a meandering path. Recovered seeds were recorded on grid data sheets. Coverage seeds, placed and recovered, were reported on the QC inspection forms on a per lot basis. A grid "lot" is defined as less than one-acre.
- 4.2.9.4 The UXOQCS notified the OESS when a transect or grid lot was completed to allow the OESS to conduct their quality assurance (QA) check. QA documentation is provided in Appendix L.
- 4.2.9.5 Functional checks of the MINELAB Explorer SE were performed at the IVS. Instruments that did not function properly during the functional test, or at any time during the investigation, were replaced and not used during field activities until they were repaired and passed the function test.
- 4.2.9.6 GPS equipment was tested on a known control point prior to the start of each day of use. The tolerance for testing the GPS equipment functionality was established at 1-foot checked against a known benchmark. If the test failed, the equipment was re-tested, repaired, or replaced.
- 4.2.9.7 Additionally the UXOQCS conducted QC checks and surveillance of the procedures used for processing and certifying metal scrap throughout the duration of field operations. The UXOQCS performed visual inspections on every container of scrap or waste generated, to ensure no items of a dangerous or explosive nature were identified as MDAS. All certified-MDAS material was segregated to prevent co-mingling and to maintain an intact chain-of-custody, and secured in storage containers while awaiting final destruction and disposition.

#### 4.3 MC Characterization

- 4.3.0.1 Data were collected during the RI to determine if MC (i.e., metals [antimony, chromium, copper, lead, and zinc] and explosives), associated with identified MEC, are present at the site and to provide sufficient information to conduct a human health baseline risk assessment and a screening level ecological risk assessment if MC are identified at concentrations exceeding the HDOH Tier 1 EALs (i.e., potentially impacted groundwater is a current or potential drinking water resource; surface water body <u>is</u> located within 150 meters) (HDOH, 2012). Data were also collected to evaluate site-specific background metals concentrations in soil in order to verify the assumption that the site does not contain metals concentrations above background.
- 4.3.0.2 Soil sampling activities were conducted between October 16 and October 22, 2013. This section summarizes the soil sampling activities, the handling and shipping of samples, data

quality and usability, and describes the procedures for managing data. Appendix D contains copies of field notes and forms. Appendix F provides photographs of the field activities. Laboratory results and validation reports are discussed in Section 5.0 and provided in Appendix C.

## 4.3.1 Technical Approach

4.3.1.1 Sampling was to be performed in a phased approach following identification of MEC-contaminated areas. If MEC-contaminated areas were identified during the MEC investigation, MC incremental sampling of surface soil would be conducted within the MEC-contaminated area, as well as areas with high MD density. The results of the MC sampling would be compared against HDOH Tier 1 EALs and background soil concentrations. If MC concentrations exceeded either threshold, a more detailed risk assessment would then be performed. If the next tier risk assessment indicated that a risk exists above acceptable risks to human health and the environment, subsurface soil, sediment, and surface water bodies that may be impacted by the MC-contaminated soil would also be subsequently sampled and a baseline risk assessment conducted. The approach was comprised of the following steps:

- Archaeological, Cultural, and Biological Resource Avoidance
- Identification of SUs with potential MC in available media as evidenced by the presence of MEC or MD
- Identification of SUs in background locations where environmental impacts from military munitions is unlikely
- Collection of surface soil samples using increment sampling techniques (50 increments per sampling unit)
- Calculation of the 95<sup>th</sup> percentile upper tolerance limit background concentrations
- Comparison of soil sample results to HDOH Tier 1 EALs and background concentrations
- Collection of additional surface soil, subsurface soil, sediment, or surface water samples, if necessary

## 4.3.2 Field Change Requests

FCR 002 was submitted and approved to revise sampling protocols (disposable sampling equipment), reduce the number of background samples, and laboratory procedures and reporting limits (Limits of Detection and Limits of Quantitation). FCR 002 is provided in Appendix H.

# 4.3.3 Archaeological and Ecological Resource Avoidance

Trained archaeological and ecological monitors accompanied the sampling team to identify resources within the SUs. If resources were identified, the sampling team adjusted the location or orientation of the SU to avoid any impact to the resource.

## 4.3.4 MC Investigation

# 4.3.4.1 Identification and Location of Sampling Units

- 4.3.4.1.1 Surface soil samples were collected at twenty SUs at the MVIA MRS (Appendix A, Figure A4-4). Each SU was approximately 5,000 square feet in size, and was sampled using an ISM. Six SUs (BKG-01 through BKG-06) were located in areas identified during the MEC investigation as un-impacted by MEC and/or MD. Fourteen of the SUs were located in areas where MEC and/or MD was discovered as follows:
  - Ten SUs (MVIA-01, -02, -05 through -07, and -09 through -13) were located within characterization grids or along transects where all MEC and MD were removed during the RI. The 10 areas selected for sampling were those where the highest concentrations of MEC and MD were found.
  - Two SUs (MVIA-03 and MVIA-08) were located in portions of the 2012 Removal Action Area where high concentrations of MEC were previously identified.
  - One SU (MVIA-04) was centered on the consolidated demolition area where MEC identified during the RI, and deemed "acceptable-to-move" were relocated for demolition.
  - One SU (MVIA-14) was centered on the area where the 37-mm HE projectile was blown-in-place during the primary RI activities.
- 4.3.4.1.2 SU boundaries were recorded using a TRIMBLE GeoXH hand-held GPS device.

#### 4.3.4.2 Surface Soil Sampling

- 4.3.4.2.1 Soil samples were collected in accordance with the HDOH HEER TGM guidance on ISM (HDOH, 2009). Each ISM sample was comprised of 50 incremental subsamples. Within each SU a primary, duplicate, and triplicate ISM sample was collected. Transects were laid out across each SU at fixed intervals and increment locations were selected based on a systematic-random sampling scheme. Increments were collected at evenly spaced intervals along each transect line beginning at the randomly selected starting locations. Each increment consisted of an approximately 45-gram soil sample collected from the 0 to 6 inches bgs interval with a disposable hand trowel. The soil increments were then composited in a zip-top bag. The duplicate and triplicate ISM samples were collected in the same manner as the primary ISM sample, but from a different starting point that was offset to the left or right along each transect.
- 4.3.4.2.2 Equipment decontamination was not required or performed because disposable sampling equipment was used. Waste generated during sampling included used personal protective equipment (i.e., nitrile gloves) and municipal debris (e.g., plastic bottles, food waste,

etc.). Nitrile gloves contained minimal adherence of site soil and were therefore containerized along with municipal debris in trash bags and disposed of off-site in municipal trash bins.

#### 4.3.4.3 Analytical Services

- 4.3.4.3.1 A total of 60 soil samples were analyzed by TestAmerica in West Sacramento, California. The laboratory is accredited by the United States DoD Environmental Laboratory Accreditation Program. Samples were received between October 18, 2013 and October 24, 2013 and assigned in the following sample delivery groups (SDGs) for metals: 320-1614, 320-4621, 320-4644, 320-4654, 320-4686. All samples were analyzed for the following:
  - Selected Metals (i.e., antimony, chromium, copper, lead, and zinc) by the EPA Solid Waste (SW)-846 Method 6020 (EPA, 2008a)
  - Explosives (also known as Nitroaromatics, Nitramines, and Nitrate Esters) by EPA SW-846 Method 8330B (EPA, 2008a)
- 4.3.4.3.2 ISM preparation and subsampling was performed by the lab IAW the approved Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) (Huikala, 2013a). In accordance with HDOH guidance, a 10-gram unground aliquot was analyzed for metals.
- 4.3.4.3.3 Although not required, the background surface soil samples were analyzed for explosives. This was a deviation from the Final UFP-QAPP submitted as part of the Final RI WP (Huikala, 2013a). Additional information is provided in Section 5.3.

#### 4.3.4.4 Data Management

The laboratory provided analytical results as data files in Adobe portable document format (.pdf). The analytical data are provided in five analytical reports, organized by SDG. Appendix C contains the laboratory analytical reports. The third-party data validator provided a single data validation report that included all five SDGs in .pdf format, which is also presented in Appendix C. In addition, the third-party data validator provided the validated laboratory data in a staged electronic data deliverable (SEDD) format (.edd) compatible with EPA SEDD specifications. The SEDD files were provided to USACE on compact disc and are not included in this RI Report.

## 4.3.5 Quality Control Procedures

#### 4.3.5.1 Data Validation

A third-party validation was performed by Laboratory Data Consultants. Samples were validated at the frequency of 90% Level III (standard validation) and 10% Level IV (full validation). The following six samples underwent full validation: PTC-SOIL-1-MVIA-11-A, PTC-SOIL-1-MVIA-11-D1, PTC-SOIL-1-MVIA-11-D2, PTC-SOIL-1-MVIA-13-A, PTC-

SOIL-1-MVIA-13-D1, and PTC-SOIL-1-MVIA-13-D2. The analyses were validated using the following documents, as applicable to each method:

- Approved UFP-QAPP (Huikala, 2013a)
- DoD Quality Systems Manual for Environmental Laboratories (DoD, 2010)
- Test Methods for Evaluating Solid Waste, Physical/Chemical methods (EPA, 2008a).

## 4.3.5.2 Data Validation Summary and Conclusions

- 4.3.5.2.1 Review of the data shows that the data are usable and of acceptable quality. Qualifiers applied to the dataset are U (non-detected), J (estimated), UJ (non-detected and estimated), and NJ (presumptive evidence of presence of the compound at an estimated quality).
- 4.3.5.2.2 Non-detected Data: Two RDX results were qualified as not detected because the analyte was detected in laboratory blank.
- 4.3.5.2.3 Estimated Data: Portions of the metal, nitroaromatics and nitroamines were qualified as estimated because of matrix spike/matrix spike duplicate (MS/MSD) recoveries, relative standard deviations (RSD) and relative percent differences (RPD) of field triplicate, laboratory blanks, and laboratory control samples (LCS) not meeting laboratory QC limits.
- 4.3.5.2.4 Data Completeness Assessment: A total of 1,260 data records were reviewed during the data validation and data quality review. No data were rejected and 100% of the data are considered valid.

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

# 5.0 RI Results and Revised CSM

- 5.0.1 This section summarizes the RI results for MEC and MC at the MVIA MRS. RI field activities were not performed at the MTC, MVTC, and UTC MRSs.
- 5.0.2 Figures, daily field reports, field logbooks, photographic logs, transect and grid logs, the MEC/MD/MPPEH log, and VSP analysis are included in the Appendices.

# 5.1 RI Results (MEC)

- 5.1.0.1 A total of 86 1-meter wide parallel and meandering transects and 24 trail transects were investigated in the MVIA. A total length of 46.42 miles (22.81 acres) was swept for the presence of MEC and MD within the 2,795-acre (GIS) MRS. An additional 5.60 acres of grids were also investigated. Areas with a slope greater than 18 degrees were not investigated due to worker safety concerns. Refer to Appendix A, Figure A4-3 for final transect and grid locations.
- 5.1.0.2 Overall, the MEC and MD finds were concentrated in the western portion of MVIA. MD was well distributed in the south-central region. No MEC or MD items were found in the north-central or eastern portions of the MRS. Refer to Appendix A, Figure A5-1 for MEC and MD locations. In total, 7 MEC items and 1,346 MD items were found, as listed in Table 5-1.

**Table 5-1: Summary of RI Findings** 

Anomalies	MEC Items	N	Non-MD	
		Items	Weight (pounds)	(pounds)
5,649	7	1,346	476	646

5.1.0.3 Seven new types of munitions were identified during the RI (Table 4-2). The findings were generally consistent with previous investigations with respect to the type and locations of MEC/MD, with the exception of the 105-mm HE projectile, M1 and the large MD fragments. The munition type that generated the large fragments is unknown, though it is estimated to be larger than the 105-mm HE projectile, M1. Additionally, the seven new munition types did not impact the VSP transect design.

# 5.1.1 Visual Sample Plan Analysis

5.1.1.1 Following the completion of the transect investigation, transect data and the locations of MEC and MD were input into VSP. The data were then used to generate (1) a report demonstrating that the simulated probability of traversing and detecting a 500-foot radius circular target area with at least a 90% confidence had been achieved and (2) a density analysis identifying locations of elevated and high anomaly density (Appendix M). Areas of elevated density were defined as areas where MEC/MD density is greater than background density of 50 anomalies per acre. VSP identified eight small areas of elevated density, three in the western

half and five in the central section of the MRS. Additionally, VSP identified four areas of high density in the western portion of the MVIA. Areas of high density were defined as locations where MEC/MD density is greater than 100 anomalies per acre total density, which is at least 50 anomalies per acre greater than background density. Areas of elevated density and high density correspond to areas where higher concentrations of MD were located (Appendix A, Figure A5-1).

- 5.1.1.2 Seventeen grids (Grids 02, 03, 05 through 16, 18, 20, and 21) were placed in areas with high MD density or near locations where MEC items were found during the transect investigation in order to determine nature and extent. Two grids (Grid 04 and 17) were placed at MEC locations. Three grids (Grids 01, 19, and 22) were located outside of MEC-contaminated areas. Grid locations are depicted in Appendix A, Figure A4-4. No additional MEC items were found in the grids. One new MD item, an 81-mm Mortar, White Phosphorus, M57 was identified in Grid 02; however, there were no other instances of this item in surrounding grids or transects.
- 5.1.1.3 As shown on Appendix A, Figure A5-1, there were no MEC items found in the central region of the MRS and only limited MD findings during both the transect and grid investigation. This is consistent with previous investigations. Based on this data, the elevated density areas identified by VSP in the central region are not MEC-contaminated and do not appear to be target areas.
- 5.1.1.4 In the western region of the MRS, VSP identified four large areas of high MEC/MD density and three smaller areas of elevated MEC/MD density (Appendix M). The VSP density analysis is consistent with the 1994 INPR and 2008 EE/CA which outlined the area west and south of Pikoakea Spring (closest stream east of the spring is unnamed) as an impact area. A removal action was conducted in this area based on these previous findings. One small elevated density area was also identified in the western portion of MVIA and is MEC-contaminated because two 81-mm mortars were found during the investigation. However, the area is not a target since the items found were DMM and intentionally buried rather than fired at that location.
- 5.1.1.5 Two large high density and two small elevated density areas are located in the southwestern bowl-shaped valley surrounding the 40-acre area cleared during the 2012 Removal Action. These areas likely represent an extension of the impact area that was previously addressed during the 2012 Removal Action. No MEC items were found, although a substantial quantity of MD, categorized as munitions fragments of unknown type were found within these four areas during the RI. The RI data in conjunction with the previous investigations and removal action, confirm that this is an impact area. There were no areas in the "bowl" with a high concentration of any specific munition type. There was also no evidence of physical targets, such as bunkers or a tank. It is likely that the "bowl" was a "general use" impact area.

- 5.1.1.6 The large high density area near the Maunawili Falls is MEC-contaminated. Three MEC items, all 37-mm HE projectiles, were found on or adjacent to the MFT. There was also a concentration of 81-mm mortar MD in the same area. This may have been a target area for these munitions types.
- 5.1.1.7 . One MEC item, a 75-mm projectile, was found in the large high density area located in the northwest valley of the MRS, separated from the "bowl" by the MFT/O`mao Stream. This area is MEC-contaminated. Similar to the "bowl," there were no areas with high concentrations of specific munition types. The types of MD found during both the RI and previous investigation were also categorized as munitions fragments of unknown type or high explosives fragments. It is likely this valley was also a "general use" impact area.
- 5.1.1.8 Based on the combined data from the 2008 EE/CA, the 2012 Removal Action, and the RI, the impact areas in the MVIA MRS have been identified with at least a 90% confidence level. Appendix A, Figure A5-2 depicts the combined MEC and MD finds. The MEC DQO 1 was achieved (refer to Section 3.5.3).

#### 5.1.2 UXO Estimator

- 5.1.2.1 UXO Estimator software was utilized to determine the acreage required for investigation in order to demonstrate that areas outside of potential MEC contamination were less than a specific land use UXO density threshold. The MVIA MRS has a land use classification of "low-use" and the corresponding threshold is 0.5 UXO per acre. "Low-use" typically indicates that there is minimal intrusive activity occurring. UXO Estimator acreage can be achieved by either investigating transects, grids, or both.
- 5.1.2.2 UXO Estimator determined that a minimum of 4.59 acres, outside of MEC-contaminated areas, required investigation to achieve a 90% confidence that low-use areas were below the 0.5 UXO per acre threshold. Approximately 19.50 acres of transects and 1.04 acres of grids (Grids 01, 19, and 22), outside of MEC-contaminated areas, were investigated with no MEC items found. The MEC DQO 2 was achieved (refer to Section 3.5.3).

#### 5.1.3 Results of RI Compared to Previous Studies

- 5.1.3.1 The RI findings were relatively consistent with findings from previous investigations with regards to the nature of MEC potentially within the MVIA MRS. Seven new types of potential munitions were identified:
  - 2.36-inch rocket, M7A1, Practice
  - 37-mm APCT, projectile, M51
  - 60-mm mortar, M50A2, Practice
  - 81-mm mortar, white phosphorous, M57
  - 105-mm HE projectile, M1

- fuze of a projectile, PD, M48
- unknown large fragments
- 5.1.3.2 With the exception of the 105-mm HE projectile, M1 and the unknown large fragments, the other five types of munitions were variations of munition types previously identified.
- 5.1.3.3 The extent of MEC/MD found within the MVIA was also relatively consistent with previous investigations, particularly in the western portion of the MRS. The combined data supported the conclusion to define this area as an impact area.
- 5.1.3.4 The extent of MEC/MD found in the central portion of the MRS was not consistent with previous investigations. Ninety-four MD items were found in the central portion during the RI, whereas no MEC or MD were found during the 2008 EE/CA. This inconsistency may be attributed to less transect coverage during the EE/CA as well as performing visual/surface sweeps only.

### 5.2 Revised CSM (MEC)

- 5.2.0.1 The locations and densities of the MEC and MD were assessed in relation to the topography of the MRS, the suspected military activities that may have occurred within the MRS, current/future land use scenarios, and possible receptors. As a result, the MVIA MRS was divided into three sections: MVIA West, MVIA Central, and MVIA East. Refer to Appendix A, Figure A5-2. Dividing the MRS into sections will assist in analyzing different remedial alternatives during the FS.
- 5.2.0.2 The CSM for MEC was updated using the RI results and is included in Appendix A, Figure A5-3. A CSM was developed for each of the MVIA subdivisions. There were no changes to the MTC CSM for MEC.

#### 5.2.1 MVIA – West

- 5.2.1.1 MVIA West is naturally bound by the Koolau mountain range to the south and ridgelines to the east and west. It is approximately 1,000 acres. MVIA West is primarily undeveloped forest with steep, rugged terrain. However, there are public hiking trails, an agricultural research center, farmland, water tunnels, and power lines within the boundary (Appendix A, Figure A1-1). Receptors in the section include recreational users, agricultural workers, and occupational workers maintaining trails or utility infrastructure.
- 5.2.1.2 Seven MEC items and 1,252 MD items were found in the 22.40 miles (11.05 acres) of meandering transects and 4.86 acres of grids investigated. The density of the MEC and MD in MVIA West indicates that this section was used as an impact area. This is consistent with previous investigations. The types and quantities of MEC and MD items are provided in Table 5-2.

Table 5-2: MEC and MD in MVIA – West

Item Description	Quantity
MD, 2.36-in Rocket, M7A1 Practice*	3
MD, 37-mm AP, M74	1
MD, 37-mm, APCT, M51*	1
MD, 37-mm, APCT M59	8
MD, 57-mm Projectile, APT M70	1
MD, 60-mm Mortar, M49A2	3
MD, 60-mm Mortar, M50A2, Practice *	1
MD, 60-mm Mortar, Tail Boom	10
MD, 75-mm Projectile, Shrapnel MK1	2
MD, 81-mm Mortar	9
MD, 81-mm Mortar, Tail Boom	34
MD, Frag Unknown	999
MD, Fuze Component	83
MD, Fuze, PD M48 *	45
MD, Fuze, PTT M1907	2
MD, Fuze, PTT TSQ M54	5
MD, Large Frag Unknown*	4
MEC, 105-mm HE Projectile, M1 *	1
MEC, 37-mm, HE M63 with BD M58 Fuze	3
MEC, 75-mm Shrapnel, Mk1	1
MEC, 81-mm HE Mortar, M43A1 (DMM)	2
Small Arms	41
Total	1,259

\*New item (not identified during previous investigations)

5.2.1.3 MEC items have been found in MVIA – West, both on the surface and subsurface. Therefore the exposure pathway from MEC to human receptors is complete.

#### 5.2.2 MVIA – Central

5.2.2.1 MVIA – Central is naturally segregated to the east and west by topographical features and is approximately 867 acres. The Aniani Nui/Olomana ridgeline extends from the Koolau mountain range on the east and the `Ainoni ridgeline extends from the Koolau to the west. Portions of the Royal Hawaiian Golf Club and the MDT as well as power and water utilities are within the boundary. However, MVIA – Central is primarily undeveloped forest with steep, rugged terrain (Appendix A, Figure A1-1). Receptors in this section include recreational users, golf club employees, and occupational workers maintaining trails or utility infrastructure.

5.2.2.2 Ninety-four MD items were found in the 16.40 miles (8.09 acres) of parallel and meandering transects and 0.74 acres of grids investigated. No MEC items were found in

accessible areas (less than 18 degrees slope) The majority of the MD was located southern half of the MVIA – Central, with a small clustering of fragmentation and 81-mm mortar tail booms in the northwestern corner along the `Ainoni ridgeline. There were no MD findings in the Golf Club property.

5.2.2.3 The lack of large areas with high anomaly density suggests that this section was more likely used as a maneuver area rather than an impact/target area. The types and quantities of MD items are provided in Table 5-3.

**Table 5-3: MD in MVIA – Central** 

Item Description	Quantity
MD, 37-mm AP, M74	3
MD, 60-mm Mortar, M49A2	1
MD, 81-mm Mortar, Tail Boom	6
MD, 81-mm Mortar, White Phosphorus, M57 *	1
MD, Frag Unknown	71
MD, Fuze Component	5
MD, Fuze, PD M48 *	2
MD, Fuze, PTT TSQ M54	1
Small Arms	4
Total	94

<sup>\*</sup>New item (not identified during previous investigations)

5.2.2.4 Even though no MEC items were found in the MVIA – Central accessible areas (less than 18 degrees slope), the types of MD found during the RI suggest that a potential explosive hazard exists. The exposure pathway from MEC to human receptors potentially complete through direct exposure to MEC located on the surface and subsurface.

#### 5.2.3 MVIA – East

5.2.3.1 MVIA – East is approximately 612 acres, topographically segregated from the rest of the MRS. The Aniani Nui/Olomana ridgeline extends from the Koolau mountain range to the northeast MRS border. A new residential community being constructed overlaps with the eastern border (Appendix A, Figure A1-1). The developer is providing their own UXO response contractor to manage any items found during construction. To the south of the new development, is an area owned by the State of Hawaii and leased to a community organization. ROE was not granted for this area. Therefore, neither area was included in the investigation

5.2.3.2 No MEC or MD items were found in the 7.61 miles (3.67 acres) of parallel transects investigated. However, there were multiple areas littered with non-MD items.

5.2.3.3 No MEC or MD were found during the RI or during previous investigations. There is no evidence to suggest an explosive hazard at MVIA – East. Consequently, the exposure pathway between MEC and human receptors is incomplete.

## 5.3 RI Results (MC)

#### 5.3.1 MC Presence, Nature, and Extent

Soil results were compared to the HDOH Tier 1 EALs (i.e., potentially impacted groundwater is a current or potential drinking water resource; surface water body <u>is</u> located within 150 meters). Metals results were also compared to site-specific background values. Tables 5-4 and 5-5 summarize the soil sampling results and the HDOH Tier 1 EALs. Tables 5-6 and 5-7 present the site-specific background values for metals and summary statistics for the background soil data. Surface soil samples were collected in MVIA MRS only.

#### 5.3.1.1 Soil Sample Results

- 5.3.1.1.1 In total, 42 soil samples (i.e., 14 primary and 28 replicate) were collected in SUs associated with MEC and/or MD. Metals and explosive concentrations in all samples were below the HDOH Tier I EALs (HDOH, 2012) (Tables 5-4 and 5-5).
- 5.3.1.1.2 Four or more metals were detected in all samples at concentrations one to two orders of magnitude below their respective HDOH Tier 1 EALs. Additionally, the soil metals concentrations results were generally below, or within one standard deviation of, the maximum detected background concentration. One or more of the following explosives were detected in one or more of the samples at concentrations one to three orders of magnitude below their respective HDOH Tier 1 EALs: 2,4,6-Trinitrotoluene; 2,4-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-Nitrotoluene; HMX; Nitrobenzene; RDX; and Tetryl.

#### 5.3.1.2 Site-Specific Background Evaluation

- 5.3.1.2.1 Site data were compared to the site-specific background values in order to verify the assumption that the site does not contain metals concentrations above background values and, if this assumption proved incorrect, to enable the risk assessments to focus on MC related to site-specific activities and to eliminate metals that are present at natural or anthropogenic background concentrations. Background is defined as either naturally occurring (i.e., the concentration is not due to a release of chemicals from human activities) or anthropogenic (i.e., the concentration is due to human activities but is not the result of site-specific use or a chemical release).
- 5.3.1.2.2 Background concentrations were calculated using EPA's Statistical Software ProUCL Version 5.0 (EPA, 2013) and the analytical results from the 18 background soil samples collected during the RI (Table 5-6). Background concentrations were calculated in accordance with the following guidance:

- "Use of Statistics for Determining Soil/Groundwater Cleanup Levels under the Risk Reduction Rules" (EPA, 1998)
- Memorandum Regarding "Role of Background in the CERCLA Cleanup Program, OSWER 9285.6-07P" (EPA, 2002)
- USEPA Region 10 Superfund Regional, Sediment Evaluation Team, Dredged Material Management Program (DMMP) Dioxin Workgroup. "Statistical Experts' Workshop, Workshop Report" (EPA, 2008b)
- 5.3.1.2.3 The background threshold value (BTV) was defined in this assessment as the 95% upper tolerance limits (UTLs) for the background dataset. ProUCL 5.0 computes UTLs which adjust for data skewness. ProUCL 5.0 computes upper limits using estimates based on normal, lognormal, gamma, or nonparametric distributions. Table 5-6 presents the calculated BTVs for each metal by distribution and identifies the recommended BTV based on the most appropriate distribution for each dataset. The BTV selected was based on the ProUCL recommended distribution. When data appeared to follow more than one distribution, the BTV was selected assuming the dataset was normally distributed. Appendix C presents the complete ProUCL background statistics for each metal.
- 5.3.1.2.4 All five metals were detected in one or more background samples (Table 5-4). Table 5-7 presents the summary statistics for the background samples including minimum detection concentration, maximum detection concentration, average concentration, standard deviation, and the selected BTV. A comparison of the site data to the BTVs identified the following:
  - Antimony was not detected in any of the background soil samples; therefore, no BTV was calculated. Antimony was detected in four soil samples, from two locations, (i.e., PTC-SOIL-I-MVIA-9-A, PTC-SOIL-I-MVIA-9-D1, PTC-SOIL-I-MVIA-9-D2, and PTC-SOIL-I-MVIA-10-D2) at concentrations ranging from 1.3 mg/kg to 1.7 mg/kg.
  - Chromium was detected in three samples, all from a single location, (i.e., PTC-SOIL-I-MVIA-14-A, PTC-SOIL-I-MVIA-14-D1, PTC-SOIL-I-MVIA-14-D2) at concentrations greater than the BTV (i.e., 500 mg/kg, 510 mg/kg, 570 mg/kg versus 490 mg/kg).
  - Copper was detected in a single sample (i.e., PTC-SOIL-I-MVIA-04-D1) at a concentration greater than BTV (i.e., 130 mg/kg versus 104 mg/kg). Copper concentrations in the corresponding primary and triplicate sample were below the BTV.
  - Lead was detected in a single sample (i.e., PTC-SOIL-I-MVIA-14-D2) at a concentration slightly greater than BTV (i.e., 19 mg/kg versus 17 mg/kg). Lead concentrations in the corresponding primary and duplicate sample were below the BTV.
  - Zinc concentrations were below the BTV in all samples.

- 5.3.1.2.5 In general, results of the comparison of site data to the background data suggest that metals concentrations at the site do not exceed background values. A limited number of detections at concentrations slightly above the BTVs likely reflect uncertainty in the BTV values as a result of the limited sample size and variability in soil composition at the site.
- 5.3.1.2.6 Though not required in the UFP-QAPP, background samples were also analyzed for explosives to further confirm that selected background locations were not impacted by MEC and/or MD. There were insufficient detections for calculations of BTVs, as was done for metals; therefore, results are discussed solely by sample. Explosives concentrations were not detected in any soil samples except for RDX in PTC-SOIL-I-BKG-04, both of its replicates, and in the primary sample for PTC-SOIL-I-BKG-05-A. RDX was not detected in the replicate samples for PTC-SOIL-I-BKG-05-A. According to the requirements of EPA SW-846 Method 8330B (EPA, 2008a), detections of explosives must be confirmed by second column analysis to be considered a valid result. In all four cases, RDX was only detected by first column analysis and was not detected by the second column. Further, the four first column detections were between the laboratory limit of quantitation and the limit of detection and are considered estimated values. Based on the lack of second column detection, the estimated nature of the first column detections, and the fact that no other explosives were detected in the samples, the four RDX detections most likely represent interference and not actual presence of RDX in the samples.

**Table 5-4: Summary of Soil Analytical Results - Metals** 

Sample ID	Date Depth Collected (inches bgs)		Antimony	Chromium	Copper	Lead	Zinc
•	I	IDOH Tier I EAL <sup>1</sup>	2.4	1,100	630	200	1,000
	Background Threshold	Value (95% UTL)	NA	490	104	17	120
PTC-SOIL-I-BKG-01-A	10/16/2013	0—6	<1 J	140 J	74 J	3.4	80 J
PTC-SOIL-I-BKG-01-D1	10/16/2013	0—6	<0.97 J	160	73	2.6	75
PTC-SOIL-I-BKG-01-D2	10/16/2013	0—6	<1 J	150	74	2.5	73
PTC-SOIL-I-BKG-02-A	10/16/2013	0—6	<1	180	44	6.5	74
PTC-SOIL-I-BKG-02-D1	10/16/2013	0—6	<1	180	44	7	73
PTC-SOIL-I-BKG-02-D2	10/16/2013	0—6	< 0.99	190	47	7.1	75
PTC-SOIL-I-03-A	10/16/2013	0—6	< 0.96	210	62	4.6	110
PTC-SOIL-I-03-D1	10/16/2013	0—6	<1	210	63	4.6	110
PTC-SOIL-I-03-D2	10/16/2013	0—6	< 0.98	210	63	4.6	110
PTC-SOIL-I-BKG-04-A	10/17/2013	0—6	<1 J	220 J	98	6.9 J	92 J
PTC-SOIL-I-BKG-04-D1	10/17/2013	0—6	<1 J	230	78	6.6	76
PTC-SOIL-I-BKG-04-D2	10/17/2013	0—6	<1 J	230	77	6.2	76
PTC-SOIL-I-BKG-05-A	10/17/2013	0—6	<1	470	35	14	80
PTC-SOIL-I-BKG-05-D1	10/17/2013	0—6	< 0.99	480	37	15	82
PTC-SOIL-I-BKG-05-D2	10/17/2013	0—6	<1	490	37	15	85
PTC-SOIL-I-BKG-06-A	10/17/2013	0—6	<1	170	38	8.6	61
PTC-SOIL-I-BKG-06-D1	10/17/2013	0—6	< 0.97	160	39	9	63
PTC-SOIL-I-BKG-06-D2	10/17/2013	0—6	<1	150	35	7.8	57
PTC-SOIL-I-MVIA-01-A	10/17/2013	0—6	<1	180	59	6.5	100
PTC-SOIL-I-MVIA-01-D1	10/17/2013	0—6	< 0.97	170	55	6.6	95
PTC-SOIL-I-MVIA-01-D2	10/17/2013	0—6	< 0.99	160	53	6.2	91
PTC-SOIL-I-MVIA-02-A	10/18/2013	0—6	<1 J	170 J	78 J	2.8 J	87 J

Table 5-4: Summary of Soil Analytical Results – Metals (continued)

	Table 3-4. Su	illilliai y Ui S	on Analytica	i ixesuits – ivi	ictais (contin	ucu)	
Sample ID	Date Collected	Depth (inches bgs)	Antimony	Chromium	Copper	Lead	Zinc
		IDOH Tier I EAL <sup>1</sup>	2.4	1,100	630	200	1,000
	Background Threshold		NA	490	104	17	120
	Background Threshold	value (95% CTL)	IVA	450	104	17	120
PTC-SOIL-I-MVIA-02-D1	10/18/2013	0—6	<1 J	150	69	2.6	77
PTC-SOIL-I-MVIA-02-D2	10/18/2013	0—6	<0.99 J	160	71	2.7	80
PTC-SOIL-I-MVIA-03-A	10/18/2013	0—6	< 0.97	220	69	4	57
PTC-SOIL-I-MVIA-03-D1	10/18/2013	0—6	< 0.97	220	72	5.2	62
PTC-SOIL-I-MVIA-03-D2	10/18/2013	0—6	< 0.97	260	78	5.1	73
PTC-SOIL-I-MVIA-04-A	10/18/2013	0—6	<1.1	240	93	7.7 J	66
PTC-SOIL-I-MVIA-04-D1	10/18/2013	0—6	<1	290	130	14 J	69
PTC-SOIL-I-MVIA-04-D2	10/18/2013	0—6	<1	290	95	5.2 J	71
PTC-SOIL-I-MVIA-05-A	10/18/2013	0—6	<1	250	91	4.7	96
PTC-SOIL-I-MVIA-05-D1	10/18/2013	0—6	< 0.99	260	95	5	98
PTC-SOIL-I-MVIA-05-D2	10/18/2013	0—6	< 0.99	270	92	4.5	92
PTC-SOIL-I-MVIA-06-A	10/21/2013	0—6	< 0.98	180	73	2.8	79
PTC-SOIL-I-MVIA-06-D1	10/21/2013	0—6	< 0.98	170	70	3.1	78
PTC-SOIL-I-MVIA-06-D2	10/21/2013	0—6	<1	120	52	2	57
PTC-SOIL-I-MVIA-07-A	10/21/2013	0—6	< 0.99	150	58	2.9	71
PTC-SOIL-I-MVIA-07-D1	10/21/2013	0—6	<1	190	70	4	85
PTC-SOIL-I-MVIA-07-D2	10/21/2013	0—6	<1	180	67	3.5	85
PTC-SOIL-I-MVIA-08-A	10/21/2013	0—6	<1	360	42	10	48
PTC-SOIL-I-MVIA-08-D1	10/21/2013	0—6	< 0.98	330	35	11	45
PTC-SOIL-I-MVIA-08-D2	10/21/2013	0—6	< 0.96	350	36	11	45
PTC-SOIL-I-MVIA-09-A	10/21/2013	0—6	1.7	300	72	7	82
PTC-SOIL-I-MVIA-09-D1	10/21/2013	0—6	1.8	220	58	4.9	65
PTC-SOIL-I-MVIA-09-D2	10/21/2013	0—6	1.3 J	260	69	6	75
PTC-SOIL-I-MVIA-10-A	10/21/2013	0—6	<1 J	300	69	6.3	73
PTC-SOIL-I-MVIA-10-D1	10/21/2013	0—6	<1 J	290	67	6.1	72
PTC-SOIL-I-MVIA-10-D2	10/21/2013	0—6	1.4 J	310	72	6.9	73
PTC-SOIL-I-MVIA-11-A	10/22/2013	0—6	<1 J	210 J	89	5.3	110
PTC-SOIL-I-MVIA-11-D1	10/22/2013	0—6	<1 J	200	85	5.3	100
PTC-SOIL-I-MVIA-11-D2	10/22/2013	0—6	<1 J	190	80	5.1	99
PTC-SOIL-I-MVIA-12-A	10/22/2013	0—6	<1	250	72	7	82
PTC-SOIL-I-MVIA-12-D1	10/22/2013	0—6	<0.99	240	73	7	82
PTC-SOIL-I-MVIA-12-D2	10/22/2013	0—6	<1	250	71	7.4	80
PTC-SOIL-I-MVIA-13-A	10/22/2013	0—6	<1	270	75	7.1	77
PTC-SOIL-I-MVI-13-D1	10/22/2013	0—6	<1	250	72	6.8	74
PTC-SOIL-I-MVIA-13-D2	10/22/2013	0—6	<1	240	70	6.8	74
PTC-SOIL-I-MVIA-14-A	10/22/2013	0—6	<1	500	43	16	53
PTC-SOIL-I-MVIA-14-D1	10/22/2013	0—6	<1	510	43	15	54
PTC-SOIL-I-MVIA-14-D2	10/22/2013	0—6	< 0.96	570	50	19	58
Notes:		<u> </u>					

Notes:
All results are provided in milligrams per kilogram
All samples analyzed by EPA Method 6020
1 = HDOH, 2012. "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Appendix 1, Table A-2, Soil Action Levels (Potentially impacted groundwater IS a current or potential drinking water resource; surface water body IS located within 150m)." Office of Hazard Evaluation and Emergency Response. January.

Bold = analyte detected at concentration shown < Sample was not detected above the indicated laboratory limit of detection

< Sample was not detected above the indicated laboratory limit of detection bgs = below ground surface</p>
EAL = environmental action levels
EPA = U.S. Environmental Protection Agency
HDOH = Hawaii Department of Health
J = Estimated value. Analyte was detected at a concentration between the laboratory limit of detection and the limit of quantitation.
UTL = upper tolerance limit

**Table 5-5: Summary of Soil Analytical Results - Explosives** 

				Ta	ble 5-5:	Summary	y of Soil A	<b>Analytica</b>	Results -	- Explosiv	es					
Sample ID	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	НМХ	Nitrobenzene	Nitroglycerin	PETIN	RDX	Tetryl
HDOH Tier I EAL <sup>1</sup>	8.4	0.21	1.0	1.6 <sup>2</sup>	3.6	0.7	$1.9^{2}$	7.3	0.7	0.25	29	4.8 <sup>2</sup>	1.22	0.42	5.5 <sup>2</sup>	49
PTC-SOIL-I-MVIA-01-A	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.25	< 0.25	<0.051 J	< 0.051
PTC-SOIL-I-MVIA-01-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	<0.05 J	<0.05 J
PTC-SOIL-I-MVIA-01-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	<0.05 J	<0.05 J
PTC-SOIL-I-MVIA-02-A	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	<0.05 J	<0.05 J
PTC-SOIL-I-MVIA-02-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	<0.05 J	<0.05 J
PTC-SOIL-I-MVIA-02-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	<0.25	< 0.25	<0.05 J	<0.05 J
PTC-SOIL-I-MVIA-03-A	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	<0.05 J	< 0.05
PTC-SOIL-I-MVIA-03-D1	< 0.049	< 0.049	< 0.049	<0.049	< 0.049	< 0.049	< 0.049	<0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.25	< 0.25	<0.049 J	< 0.049
PTC-SOIL-I-MVIA-03-D2	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	< 0.049	<0.25	< 0.25	<0.049 J	<0.049
PTC-SOIL-I-MVIA-04-A	< 0.05	< 0.05	0.13 J	< 0.05	< 0.05	0.076 J	< 0.05	< 0.05	0.072 J	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	<0.05 J	<0.05 J
PTC-SOIL-I-MVIA-04-D1	<0.051 J	<0.051 J	0.25 J	<0.051 J	<0.051 J	0.093 J	<0.051 J	<0.051 J	0.089 J	<0.051 J	<0.051 J	<0.051 J	<0.25 J	<0.25 J	<0.051 J	<0.051 J
PTC-SOIL-I-MVIA-04-D2	<0.049 J	<0.049 J	0.054 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.25 J	<0.25 J	<0.049 J	<0.049 J
PTC-SOIL-I-MVIA-05-A	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.25 J	<0.25 J	<0.061 J	<0.049 J
PTC-SOIL-I-MVIA-05-D1	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.25 J	<0.25 J	<0.053 J	<0.05 J
PTC-SOIL-I-MVIA-05-D2	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.049 J	<0.25 J	<0.25 J	<0.049 J	<0.049 J
PTC-SOIL-I-MVIA-06-A	< 0.051	< 0.051	< 0.051	<0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	<0.25	<0.25	<0.051 J	<0.051
PTC-SOIL-I-MVIA-06-D1	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	<0.25	<0.25	0.066 NJ	<0.05
PTC-SOIL-I-MVIA-06-D2	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.25	<0.25	0.093 NJ	<0.05
PTC-SOIL-I-MVIA-07-A	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.25	<0.25	0.14 NJ	<0.05
PTC-SOIL-I-MVIA-07-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.25	<0.25	<0.05 J	<0.05
PTC-SOIL-I-MVIA-07-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.25	<0.25	< 0.05	<0.05
PTC-SOIL-I-MVIA-08-A	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.059 J	< 0.05	<0.25	<0.25	0.4 NJ	<0.05
PTC-SOIL-I-MVIA-08-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	< 0.05	< 0.05	< 0.05	<0.25	<0.25	0.27 NJ	<0.05
PTC-SOIL-I-MVIA-08-D2	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	< 0.05	< 0.05	<0.25	<0.25	0.33 NJ	<0.05
PTC-SOIL-I-MVIA-09-A	<0.05	<0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	<0.05	<0.05	0.11 J	< 0.05	<0.25	<0.25	0.094 NJ	<0.05
PTC-SOIL-I-MVIA-09-D1	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.25	<0.25	0.1 NJ	<0.05
PTC-SOIL-I-MVIA-09-D2	< 0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	0.065 J	<0.05	<0.25	<0.25	0.093 NJ	<0.05
PTC-SOIL-I-MVIA-10-A	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.25	<0.25	0.081 NJ	<0.05
PTC-SOIL-I-MVIA-10-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05 J	< 0.05	< 0.25	< 0.25	0.063 NJ	<0.05 J

5-11

Table 5-5: Summary of Soil Analytical Results – Explosives (continued)

				- *************************************		J 01 20	J		т. —	031763 (601							
Sample ID	1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-dinitrotoluene	4-Nitrotoluene	ХМН	Nitrobenzene	Nitroglycerin	PETIN		RDX	Tetryl
HDOH Tier I EAL <sup>1</sup>	8.4	0.21	1.0	$1.6^{2}$	3.6	0.7	$1.9^{2}$	7.3	0.7	0.25	29	$4.8^{2}$	1.2 <sup>2</sup>	0.42	5.5 <sup>2</sup>		49
PTC-SOIL-I-MVIA-10-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.055 J	< 0.05	< 0.25	< 0.25	0.077	NJ	<0.05 J
PTC-SOIL-I-MVIA-11-A	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.25	< 0.25	0.054	NJ	< 0.051
PTC-SOIL-I-MVIA-11-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	0.052	NJ	< 0.05
PTC-SOIL-I-MVIA-11-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	0.06	NJ	< 0.05
PTC-SOIL-I-MVIA-12-A	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	J	< 0.05
PTC-SOIL-I-MVIA-12-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	0.054	NJ	< 0.05
PTC-SOIL-I-MVIA-12-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	0.064	NJ	< 0.05
PTC-SOIL-I-MVIA-13-A	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.067 NJ	< 0.05	< 0.05	< 0.25	< 0.25	0.15	NJ	< 0.05
PTC-SOIL-I-MVI-13-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.053 J	< 0.05	< 0.25	< 0.25	0.86	NJ	< 0.05
PTC-SOIL-I-MVIA-13-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.077 NJ	0.052 J	< 0.05	< 0.25	< 0.25	0.29	NJ	< 0.05
PTC-SOIL-I-MVIA-14-A	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05 J	0.12 J	< 0.05	< 0.25	< 0.25	0.43	NJ	< 0.05
PTC-SOIL-I-MVIA-14-D1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.087 J	< 0.05	< 0.25	< 0.25	0.41	NJ	< 0.05
PTC-SOIL-I-MVIA-14-D2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.076 J	< 0.05	< 0.25	< 0.25	0.34	NJ	< 0.05

All results are provided in milligrams per kilogram

All samples analyzed by EPA Method 8330B

1 = HDOH, 2012. "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Appendix 1, Table A-2, Soil Action Levels (Potentially impacted groundwater IS a current or potential drinking water resource; surface water body IS located within 150m)." Office of Hazard Evaluation and Emergency Response. January.

Bold = analyte detected at concentration shown

bgs = below ground surface

EAL = environmental action levels HDOH = Hawaii Department of Health

J = Estimated value. Analyte was detected at a concentration between the laboratory limit of detection and the limit of quantitation.

NJ = Presumptive evident of presence of the compound at an estimated quantity. The compound was detected on the first column but not detected on the second column.

<sup>&</sup>lt; Sample was not detected above the laboratory limit of detection

Table 5-6: Site-Specific Background Values for Metals

			Background Threshold Values 95% UTL with 95% Coverage								
Metal	Frequency of Detection	Approximate Distribution	Assuming Normal Distribution	Assuming Gamma Distribution	Assuming Lognormal Distribution	Non- parametric Upper Limits					
Antimony	0/18	NA	NA	NA	NA	NA					
Chromium	18/18	Data do not follow a Discernible Distribution	520	547	572.6	490					
Copper	18/18	Data appear Approximate Normal at 5% Significance Level	103.9	114.2	123.3	98					
Lead	18/18	Data appear Approximate Normal at 5% Significance Level	16.8	19.7	23.6	15					
Zinc	18/18	Data appear Approximate Normal at 5% Significance Level	119.5	123.3	126.1	110					

Notes:
Background Threshold Values calculated by ProUCL version 5.0
Bold and shaded = ProUCL BTV based on recommended distribution. When data appeared to follow more than one distribution, the BTV based on an assumed normal distribution was selected.

NNA = Not applicable UTL = Upper Tolerance Limit

Table 5-7: Summary Statistics for Background Soil Data

	Table 3-	7. Summe	ary Statistics	or Dackgrou	na son Data		
Sample ID	Date Collected	Depth (inches bgs)	Antimony	Chromium	Copper	Lead	Zinc
PTC-SOIL-I-BKG-01-A	10/16/2013	0—6	<1 J	140 J	74 J	3.4	80 J
PTC-SOIL-I-BKG-01-D1	10/16/2013	0—6	<0.97 J	160	73	2.6	75
PTC-SOIL-I-BKG-01-D2	10/16/2013	0—6	<1 J	150	74	2.5	73
PTC-SOIL-I-BKG-02-A	10/16/2013	0—6	<1	180	44	6.5	74
PTC-SOIL-I-BKG-02-D1	10/16/2013	0—6	<1	180	44	7	73
PTC-SOIL-I-BKG-02-D2	10/16/2013	0—6	< 0.99	190	47	7.1	75
PTC-SOIL-I-03-A	10/16/2013	0—6	< 0.96	210	62	4.6	110
PTC-SOIL-I-03-D1	10/16/2013	0—6	<1	210	63	4.6	110
PTC-SOIL-I-03-D2	10/16/2013	0—6	< 0.98	210	63	4.6	110
PTC-SOIL-I-BKG-04-A	10/17/2013	0—6	<1 J	220 J	98	6.9 J	92 J
PTC-SOIL-I-BKG-04-D1	10/17/2013	0—6	<1 J	230	78	6.6	76
PTC-SOIL-I-BKG-04-D2	10/17/2013	0—6	<1 J	230	77	6.2	76
PTC-SOIL-I-BKG-05-A	10/17/2013	0—6	<1	470	35	14	80
PTC-SOIL-I-BKG-05-D1	10/17/2013	0—6	< 0.99	480	37	15	82
PTC-SOIL-I-BKG-05-D2	10/17/2013	0—6	<1	490	37	15	85
PTC-SOIL-I-BKG-06-A	10/17/2013	0—6	<1	170	38	8.6	61
PTC-SOIL-I-BKG-06-D1	10/17/2013	0—6	< 0.97	160	39	9	63
PTC-SOIL-I-BKG-06-D2	10/17/2013	0—6	<1	150	35	7.8	57
	Minin	um Detection	NA	140	35	2.5	57
	Maxin	um Detection	NA	490	98	15	110
		Average	NA	235	57	7	81
	Stand	ard Deviation	NA	116	19	4	16
Backgro	ound Threshold Vali	ue (95% UTL)	NA	490	104	17	120

Notes:

All results are provided in milligrams per kilogram All samples analyzed by EPA Method 6020

Bold = analyte detected at concentration shown
< Sample was not detected above the laboratory limit of detection
bgs = below ground surface
EAL = environmental action levels
EPA = U.S. Environmental Protection Agency
HDOH = Hawaii Department of Health
J = Estimated value. Analyte was detected at a concentration between the laboratory limit of detection and the limit of quantitation.
NA = not applicable, all results are non-detect
UTL = upper tolerance limit

# 5.4 Revised CSM (MC)

Separate CSMs were developed and updated for the MVIA and MTC MRSs and are presented in Appendix A, Figures A5-4 and A5-5.

#### 5.4.1 Maunawili Valley Impact Training Area

Risks above acceptable thresholds that are attributed to MC in soil is unlikely given the surface soil analytical results were below HDOH Tier 1 EALs and metals concentrations were generally below background values. As a result, the transport mechanisms and exposure routes to potential human and ecological receptors are considered incomplete.

# 5.4.2 Maunawili Training Course

No surface soil samples were collected during the RI. The pathways from MCs in surface soil to potential human and ecological receptors are incomplete or have not been quantitatively assessed.

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

# 6.0 Contaminant Fate and Transport for MEC and MC

#### 6.1 MEC

#### 6.1.1 Potential Sources of Contamination

- 6.1.1.1 The former PTC was used as a regimental combat training center in the 1940s emphasizing the use of and familiarity with modern arms and field weapons, in addition to providing rugged terrain for jungle and ranger training. The former PTC is divided into four MRSs: MVIA, MTC, MVTC, and UTC.
- 6.1.1.2 Data collected during the RI and previous investigations indicate that the MVIA MRS was used as an impact area and a maneuver area as evidenced by the type and density of MEC and MD found. Sections 5.1 and 5.2 describe the types and quantities of MEC and MD located throughout the MRS and Appendix A, Figure A5-2 shows the locations of these items. It is a source of contamination.
- 6.1.1.3 The MTC MRS may be a potential source of contamination; however, additional data needs to be obtained.
- 6.1.1.4 Historical documentation and previous investigations were used to determine that the MVTC and UTC MRSs are unlikely sources of contamination.

#### 6.1.2 Contaminant Persistence

MEC may remain intact for long periods of time. MEC was found during the 2012 Removal Action and the 2013 Remedial Investigation, more than 65 years after the abandonment of the former PTC.

### 6.1.3 Contaminant Migration

It is possible that MEC within the MVIA MRS will migrate from its original site of deposition (i.e., target areas) due to naturally occurring events (storm water runoff, landslides) and the steep terrain. It is also possible that MEC could be disturbed by human activity. Recreational users and occupational workers using paths and trails could possibly disturb MEC or collect MEC as a souvenir. Most of the munition items found are relatively lightweight and could be hand-carried without much difficulty. The heaviest item found, the 105-mm HE projectile, M1, weighs approximately 40 pounds and is less likely to be moved.

# 6.1.4 Potential Human Receptors and Exposure Pathways

Current and future human receptors at the MVIA MRS consist of recreational users (visitors, hikers, golfers), agricultural workers, and occupational workers (utility and trail maintenance). The potential exposure pathway to MEC is through direct contact with MEC present on the

surface. Contact with subsurface MEC is possible for agricultural workers while excavating plots and for occupational workers performing subsurface infrastructure maintenance.

#### 6.2 MC

MCs were not identified at concentrations exceeding the HDOH Tier 1 EALs. Per the HDOH, concentrations of chemicals below the HDOH Tier 1 EALs are not considered to pose a risk to human health or the environment and no response action is required to address these contaminants. Therefore, evaluation of the fate and transport of MC at the site are not discussed in this RI.

# 7.0 Hazard Assessment for MEC and Baseline Risk Assessment for MC

7.0.1 The purpose of the MEC HA and Baseline Risk Assessment is to assist in the evaluation and selection of removal and remedial alternatives, including the implementation of land use controls, during the RI/FS stage of remedial actions.

#### 7.1 MEC HA

7.1.0.1 The MEC HA addresses the National Contingency Plan direction to conduct site-specific risk assessments for threats to human health and the environment. For the purpose of this RI, the MEC HA methodology presented in the document titled, "Munitions and Explosives of Concern Methodology (Interim)" prepared by the Technical Working Group for HA was used to evaluate the hazards (EPA, 2008c). The MEC HA was designed to be used as the CERCLA HA methodology for a MRS where there is an explosive hazard from the known or suspected presence of MEC. An explosive hazard exists at a site if there is a potentially complete MEC exposure pathway. A potentially complete MEC exposure pathway is present any time a receptor can come into contact with MEC and interact with the item in a manner that might result in its detonation. There are three elements of a potentially complete MEC exposure pathway: (1) a source of MEC, (2) a receptor, and (3) the potential for interaction between the MEC source and the receptor. All three of these elements must be present for a potentially complete MEC exposure pathway to exist.

7.1.0.2 The MEC HA is structured around three components of a potential explosive hazard incident:

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

7.1.0.3 Each of these components is assessed in the MEC HA using nine numerically weighted input factors. The sum of the input factor scores falls within one of four defined ranges, called hazard levels. Each of the four levels reflects site attributes that describe groups of site and site conditions ranging from highest to lowest hazards. The MEC HA hazard levels are:

• Hazard Level 1 (Score 840-1000): Sites with the highest potential explosive hazard conditions. There may be instances where there is an imminent threat to human health from MEC.

- Hazard Level 2 (Score 725-835): Sites with high potential explosive hazard conditions. There may be instances of surface MEC or intrusive activities that would encounter MEC in the subsurface. Sites have moderate or greater accessibility by the public.
- Hazard Level 3 (Score 530-720): Sites with moderate potential explosive hazard conditions. Site may have gone through a surface cleanup or has moderate or limited accessibility and low number of contact hours.
- Hazard Level 4 (Score 125-525): Sites with low potential explosive hazard conditions. Site may have undergone a cleanup and MEC is only located subsurface, below the depth of receptor intrusive activities. Accessibility is limited or very limited.
- 7.1.0.4 The MEC HA may be conducted several times to analyze different remedial alternative scenarios as well as evaluate the current/future human activities or land use and types and densities of MEC items in the MRS. Each scenario will be assigned a Hazard Level.
- 7.1.0.5 The following sections describe the ratings assigned to the nine input factors for each MRS or MRS subdivision. The MEC HA worksheets are provided in Appendix N.

### 7.1.1 Maunawili Valley Impact Area – West

#### 7.1.1.1 Energetic Material Type

The MEC items known or suspected to be present at the MVIA – West include projectiles (105-mm HE; 75-mm shrapnel; 57-mm APT; 37-mm HE, AP, APCT), mortars (81-mm HE; 60-mm HE, practice), 2.36-inch rockets, and fuzes. MD, such as small arms and 20-mm ball cartridges, are also known and suspected. Based on these findings, the energetic material type selected for the site is determined to be "High Explosive and Low Explosive Filler in Fragmenting Rounds" which is the most potentially hazardous of the available selections.

#### 7.1.1.2 Location of Additional Human Receptors

Within the MVIA – West, there are multiple public hiking trails, access roadways, an agricultural research center, agricultural fields, an irrigation waterline, and utilities. Additionally, there is a residential area and a water tower outside of the MRS boundary but within the 2,111-foot Explosive Safety Quantity Distance (ESQD) arc. This input factor is rated "Inside the MRS or inside the ESQD arc."

#### 7.1.1.3 Site Accessibility

MVIA – West contains multiple public hiking trails that are easily accessible by receptors. Additionally, portions of the area are actively used as an agricultural research center and for farming. Occupational workers occasionally access the area to maintain hiking trails and public utilities. As a result, this input factor category is "Moderate Accessibility."

#### 7.1.1.4 Potential Contact Hours

The Potential Contact Hours factor is evaluated by estimating both the number of users per year and the number of hours that each user engages in activities that may result in encounters with MEC. The MVIA – West is accessed daily by residents and visitors using the Maunawili Demonstration Trail and the Maunawili Falls Trail, by workers at an agricultural research center and by farmers. Occupational workers maintaining trails or infrastructure also access the area on a less frequent basis. The Potential Contact Hours input factor was assessed as "100,000 to 999,999 receptor-hours/year."

#### 7.1.1.5 Amount of MEC

The potential MEC presence within MVIA – West is likely given the MEC items located during the RI, previous investigations, and the historic use of the site as an impact area. For this reason, a classification of "Target Area" is considered most appropriate for the site for purposes of the MEC HA.

#### 7.1.1.6 Minimum MEC Depth Relative To The Maximum Receptor Intrusive Depth

The MEC and MD found were located on the ground surface and subsurface. The maximum receptor intrusive depth at the site is anticipated to be two feet, in agricultural fields and infrastructure repair areas. Based on this information, the minimum MEC depth relative to the maximum receptor intrusive depth is assessed to be "Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC."

### 7.1.1.7 Migration Potential

Migration Potential has been rated as "Possible" because migration can occur via natural forces such as erosion caused by overland water flow or landslides along steep slopes.

#### 7.1.1.8 MEC Classification

The MVIA – West was used as an impact area, where MEC, including projectiles, mortars, and fuzes, have been detected. The MEC HA guidance suggests that assessment teams should assume UXO is present in former target areas (EPA, 2008c). The MEC Classification input factor for this site is assessed as "UXO Special Case."

#### 7.1.1.9 MEC Size

The items known or suspected to be present within the MVIA – West vary in size from fuzes up to 105-mm projectiles. A potential receptor is more likely to pick up or interact with a smaller item, such as fuzes than a heavy bomb. The MEC Size classification for this site is conservatively assessed as "Small" because of the detection of both fuzes and large MEC at the site.

#### 7.1.1.10 MEC Score

Table 7-1 contains the MEC HA scores calculated for the baseline analysis. The total MEC HA score is 925 and associated MEC HA Hazard Level of 1 for the baseline assessment. The MEC HA worksheets are provided in Appendix N.

Table 7-1: Summary of MEC HA Score for MVIA – West Baseline

Explosive Hazard Component	Input Factors	Category Selected for MRS/Area	Baseline Score
1			(Max. Score)
Severity	Explosive Material Type	High Explosive and Low Explosive	100
		Filler in Fragmenting Rounds	(100)
	Location of Additional Human	Inside the MRS or inside the ESQD arc	30
	Receptors	inside the MRS of hiside the ESQD arc	(30)
	Site Accessibility	Moderate Accessibility	55
	Site Accessionity	Wioderate Accessionity	(80)
	Total Contact Hours	100,000 to 999,999 receptor hours/year	70
	Total Contact Hours	100,000 to 999,999 receptor hours/year	(120)
	Amount of MEC	Target Area	180
Accessibility	Amount of MEC	Taiget Area	(180)
Accessionity		Baseline Condition: MEC located	
	Minimum MEC Depth vs.	surface and subsurface. After Cleanup:	240
	Maximum Intrusive Depth	Intrusive depth overlaps with subsurface	(240)
		MEC.	
	Migration Potential	Possible	30
	Wilgration Fotential	Fossible	(30)
	MEC Classification	LIVO Special Case	180
Sensitivity	WIEC Classification	UXO Special Case	(180)
Schsilivity	MEC Size	Small	40
	IVILE SIZE	Siliali	(40)
Total MEC HA Score			925
MEC HA Hazard Leve	el		1

# 7.1.2 Maunawili Valley Impact Area – Central

No MEC and only limited MD were found during the RI or previous investigations. There is no evidence to indicate that this portion of the MVIA MRS poses MEC hazards to human receptors. Laterally, the ESQD arc extends from the MVIA – West. However, there are a mountain ridges that physically separate the MVIA – Central from the rest of the MRS. It is unlikely that unintentional detonation in MVIA – West would impact human receptors in MVIA – Central. Therefore, a MEC HA was not performed.

# 7.1.3 Maunawili Valley Impact Area – East

Neither MEC nor MD were found during the RI or previous investigations. There is no evidence that this portion of the MVIA MRS poses MEC hazards to human receptors. Laterally, the

ESQD arc extends from the MVIA – Central. As discussed in the previous section, however, there is no MEC hazard in the MVIA – Central. Additionally, there is a mountain ridge that physically separates the MVIA – East from the rest of the MRS. It is unlikely that unintentional detonation in MVIA – Central or MVIA – West would impact human receptors in MVIA – East. Therefore, a MEC HA was not performed.

#### 7.1.4 Maunawili Training Course

There is insufficient data to prepare a MEC HA. RI field activities were not conducted in MTC. Although, no MEC or MD, indicative of HE use, were found in during the 2008 EE/CA, small arms casings were found. Given the close proximity of the southwestern border of the MRS to the northwestern portion of the MVIA – West, where a high density of MD and one MEC item (Mk1 75-mm) were found during the RI, additional data collection efforts is recommended.

### 7.1.5 Makalii Valley Training Course

RI field activities were not conducted in this MRS. MVTC was a suspected observation point, and no MEC or MD have been found to date. The lack of MEC and MD indicates an incomplete pathway to human and ecological receptors, and therefore no known MEC hazards are suspected.

#### 7.1.6 Ulumawao Training Course

The area is documented as an encampment or cantonment and ordnance use is not suspected based on historical records anecdotal evidence. No MEC or MD have been observed in the MRS during previous investigations or during land development, indicating no and incomplete pathway to human and ecological receptors. As a result, no known MEC hazards are suspected.

#### 7.2 Baseline Risk Assessment for MC

#### 7.2.1 Maunawili Valley Impact Area

MCs were not identified in surface soil at concentrations exceeding the HDOH risk-based EALs. Per the HDOH, concentrations of chemicals below the HDOH Tier 1 EALs are not considered to pose a risk to human health or the environment and no response action is required to address these contaminants. Therefore, no further evaluation of risk is necessary.

# 7.2.2 Maunawili Training Course

RI field activities were not conducted at MTC. There is not sufficient data to evaluate risk associated with MCs at this MRS.

# 7.2.3 Makalii Valley Training Course

No MEC or MD items have been found at this MRS. Therefore, there is no evidence of MC risk.

# 7.2.4 Ulumawao Training Course

UTC is documented as an encampment or cantonment and neither MEC nor MD have been found at this MRS. Therefore, there is no evidence of MC risk.

# 8.0 Summary and Conclusions

- 8.0.1 A RI was conducted at the former PTC between July and October 2013 and February and March 2014. The PTC consists of four non-contiguous parcels: MVIA, MTC, MVTC, and UTC. Each parcel is referred to as an MRS. The objective of the RI is to characterize the nature and extent of MEC, MD and MC within each MRS and to assess the associated risks to human health and the environment.
- 8.0.2 Previous investigations in the MVIA MRS have found numerous MEC and MD items including projectiles, mortars, fuzes, rockets, ball cartridges, and small arms. Additional data was gathered during the RI to further delineate and determine the nature and extent of MEC contamination in accessible areas and to demonstrate that areas outside of MEC-contamination were less than an appropriate UXO per acre threshold. A total of 46.42 miles (22.81 acres) of transects and 5.60 acres of grids were investigated in order to achieve (1) at least a 90% probability of traversing and detecting a 500-foot radius circular impact area and (2) a 90% confidence level that areas outside of MEC-contamination were below a low-use threshold of 0.5 UXO per acre. Both of these goals were achieved.
- 8.0.3 Seven MEC items and 1,346 MD items were found the in the MVIA. All MEC items were found in the western portion of the MRS. No MEC or MD items were found in the east of the Aniani Nui/Olomana ridgeline. Refer to Appendix A, Figure A5-1.
- 8.0.4 Seven new munition types identified during the field investigation were similar in nature to previously identified types or have a target radius of at least 500 feet. The original VSP transect design was valid. VSP identified eight areas of elevated density (MEC/MD density is above the selected background density of 50 anomalies per acre) and four areas of high density (MEC/MD density is at least 100 anomalies per acre total density) in the MVIA MRS based on the spatial distribution of MEC and MD found during the RI. Three elevated and four high density areas were located in the western portion of MVIA and five elevated density areas were located in the central portion. Refer to Appendix M. Three of the areas in the west contained MEC.
- 8.0.5 Grids were placed at or near elevated density, high density, or MEC-contaminated areas to gather additional data to determine nature and extent (Appendix A, Figure A4-3). No additional MEC items were found. One MD item found in Grid 02, an 81-mm mortar, white phosphorus, M57, was identified as a new munitions type. No other instances of this item were found in the surrounding transects or grids, however. Nature and extent of MEC contamination has been delineated.
- 8.0.6 The results of both the transect and grid findings during the RI were relatively consistent with previous investigations with respect to the type and locations of the MEC/MD. The collective data confirms that there is an impact area to the west and south of Pikoakea Spring.

The types of MEC and MD found are widely dispersed in the impact area, with the exception of the area near Maunawili Falls. There is a concentration of 37-mm projectiles (MEC) and 81-mm mortar tail booms (MD) in this area, suggesting that it may be a target area, within the impact area, for these particular munitions types.

- 8.0.7 The elevated density areas in the central region of the MRS are not impact areas and likely associated with maneuver activities.
- 8.0.8 In addition to identifying impact areas and delineating nature and extent of MEC contamination, the investigation also determined that the area outside of the MEC-contamination were below the low-use land threshold of 0.5 UXO per acre. Approximately 19.50 acres of transects and 1.04 acres of grids, outside of MEC-contamination and high-density areas, were investigated. No MEC items were found.
- 8.0.9 The RI findings and previous investigation data were evaluated with respect to the MVIA historical usage, topographical features, current/future land use scenarios, and potential receptors of MRS. As a result, the MVIA MRS was divided into three sections: MVIA West, MVIA Central, and MVIA East. Dividing the MRS into sections will assist in analyzing different remedial alternatives during the FS.
- 8.0.10 The cumulative types and quantity of MEC and MD found in MVIA West indicates that an explosive hazard exists in this section of the MRS. MVIA West is primarily used for recreational and agricultural purposes, with limited industrial-type use. There are complete exposure pathways to human receptors through direct contact with surface and subsurface MEC. The MEC HA performed for the MVIA West baseline condition yielded a score of 925 which corresponds to Hazard Level 1. Hazard Level 1 sites contain the highest potential explosive hazard and there may be instances of surface MEC or intrusive activities that would encounter MEC in the subsurface.
- 8.0.11 Although no MEC items have been found in MVIA Central during the RI or previous investigations, the types of MD found during the RI indicate that MEC with HE could be present in this section. There are recreational activities that occur in the MVIA Central so a potentially complete exposure pathway to human receptors through direct contact with surface MEC exists. Occupational workers maintaining recreational facilities or utilities may also have a complete exposure pathway through direct contact with subsurface MEC. A MEC HA was not conducted for MVIA Central since there have been no MEC finds.
- 8.0.12 There is no evidence that an explosive hazard exists in MVIA East. There are no complete exposure pathways to human receptors.
- 8.0.13 Surface soil samples were collected in the MVIA MRS in areas with high concentrations of MEC or MD and analyzed for MCs (metals [antimony, chromium, copper, lead, zinc] and explosive compounds). Background samples were also collected from non-impacted areas to

calculate the site-specific BTVs. The analytical results were compared to the HDOH Tier 1 EALs and the BTVs. Although metals and explosives were detected in surface soil samples, the concentrations were below their respective EALs and within the range of BTVs. Risks to human health associated with MCs in surface soil are less than acceptable risk thresholds.

8.0.14 Small arms have been found in the MTC MRS during previous investigations. However, the landowner did not provide ROE to conduct RI activities. As a result, the characterization of this MRS is inconclusive because no additional data could be gathered. Further evaluation is recommended given the close proximity of the southwestern border to the MVIA MRS, where a high density of MD and one MEC item were found during the RI.

8.0.15 Neither MEC nor MD have been found in MVTC or UTC; therefore, these MRSs have no explosive hazards. No further investigation was conducted in these MRSs.

8.0.16 A follow-on FS will evaluate the potential future courses of action for the former PTC FUDS property.

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

## 9.0 References

CFR. Title 40 Protection of Environment.

CFR. Title 43 Public Lands: Interior.

CFR. Title 50 Wildlife and Fisheries.

Cultural Surveys Hawaii, 2013. Final Archaeological Monitoring Plan for Cultural Resources Support for a Remedial Investigation/Feasibility Study at Pali Training Camp. July.

DDESB, 2004. Technical Paper 18 – Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel. December.

DID-WERS, http://www.hnc.usace.army.mil/Missions/Engineering.aspx 2010.

DoD, 2010. DOD Quality Systems Manual for Environmental Laboratories. Version 4.2. October. Available Online at: <a href="http://www.denix.osd.mil/edqw/upload/QSM-V4-2-Final-102510.pdf">http://www.denix.osd.mil/edqw/upload/QSM-V4-2-Final-102510.pdf</a>

Environet, 2012. Site Specific Final Report, Munitions and Explosives of Concern (MEC) Removal Action and Supporting Functions, Former Heeia Combat Training Area and Former Pali Training Camp, Island of Oahu, Hawaii. July.

EPA, 1998. Use of Statistics for Determining Soil/Groundwater Cleanup Levels under the Risk Reduction Rules. April.

EPA, 2002. *Role of Background in the CERCLA Cleanup Program, OSWER 9285.6-07P*. April. Available Online at: http://www.epa.gov/oswer/riskassessment/pdf/role.pdf

EPA, 2008a. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846. Final. Update IV.* January 3. Available Online at: http://www.epa.gov/osw/hazard/testmethods/sw846/online/index.htm.

EPA, 2008b. USEPA Region 10 Superfund Regional, Sediment Evaluation Team, Dredged Material Management Program (DMMP) Dioxin Workgroup. 'Statistical Experts' Workshop, Workshop Report.

EPA, 2008c. Munitions and Explosives of Concern Hazard Assessment Methodology (Interim). October.

Hawaii Administrative Rules. Title 13 DLNR, Subtitle Historic Preservation Division, Rules of Practice and Procedure Relating to Burial Site and Remains.

Hawaii Revised Statutes. Title 12 Conservation and Resources.

HDOH-HEER, 2009. *Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan (Interim Final Edition)*, November. Available Online at: <a href="http://www.hawaiidoh.org/tgm.aspx">http://www.hawaiidoh.org/tgm.aspx</a>.

HDOH-HEER, 2012. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater Pacific Basin Edition. January.

Huikala, 2013a, Final Remedial Investigation Work Plan, Pali Training Camp, Oahu, Hawaii. July.

Huikala, 2013b. Final Technical Planning Process Meeting Memorandum. February.

Mink, J.F. and L.S. Lau, 1990. Aquifer Identification and Classification for O'ahu: Groundwater Protection Strategy for Hawaii. University of Hawaii Water Resource Research Center, Technical Guidance Report #179.

USACE, 1994. DERP-FUDS Inventory Project Report, Pali Training Camp. May.

USACE, 2006. EP 1110-1-18, Military Munitions Response Process. April.

USAESCH, 2010. Performance Work Statement, Remedial Investigation/Feasibility Study Pali Training Camp, Property No. H09HI0277, Koolaupoko District, Oahu, Hawaii. October.

USC. Title 16, Conservation.

Wil Chee – Planning, Inc., 2009. Final Site Investigation Report, Pali Training Camp, Heeia Combat Training Area, and Waikane Training Area, Oahu, Hawaii. September.

Zapata Incorporated, 2008. Final Revision 1 Engineering Evaluation / Cost Analysis (EE/CA) Report, Former Heeia Combat Training and Pali Training Camp, Island of Oahu, Hawaii. June.

# **Appendices**

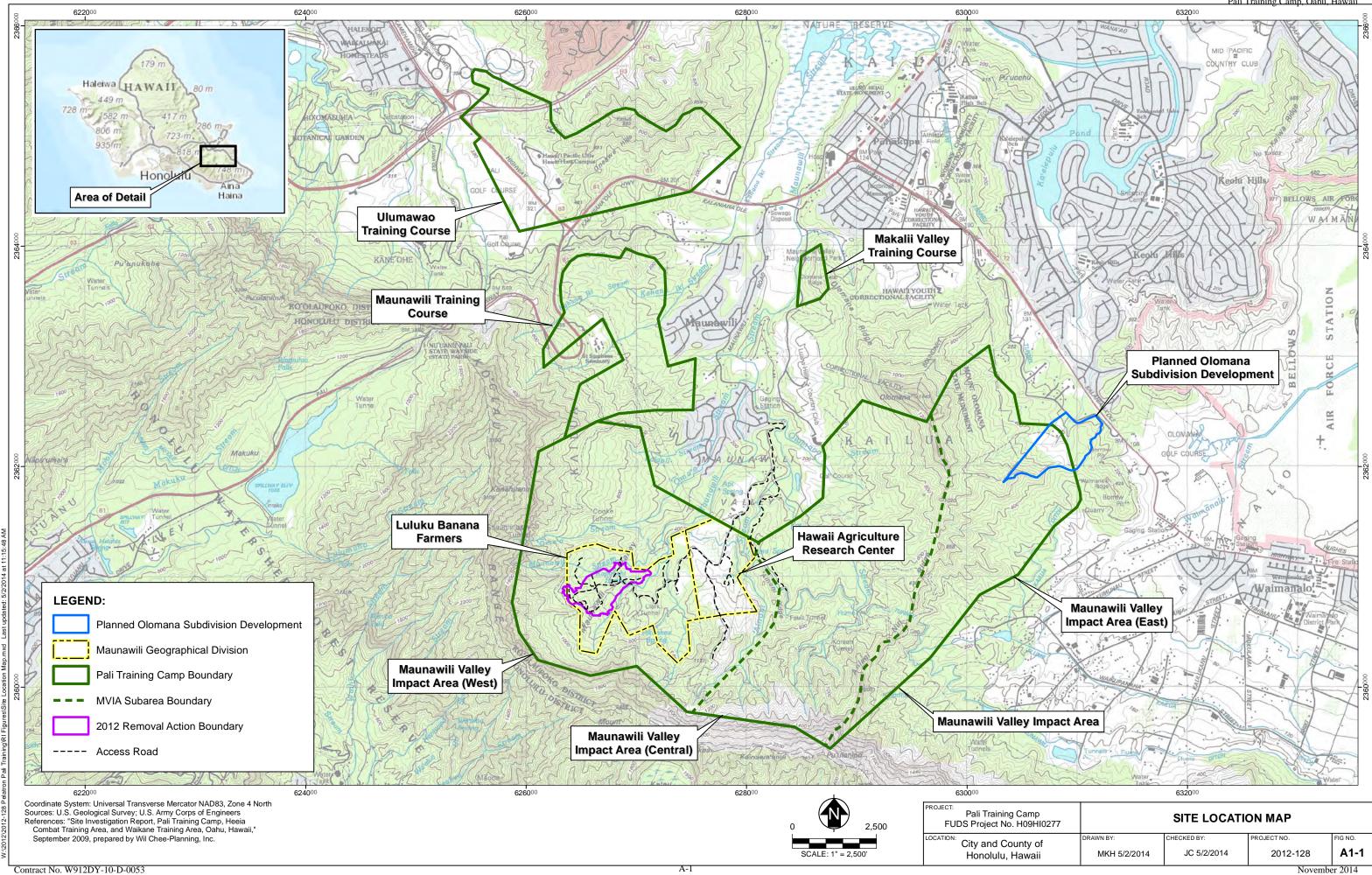
Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

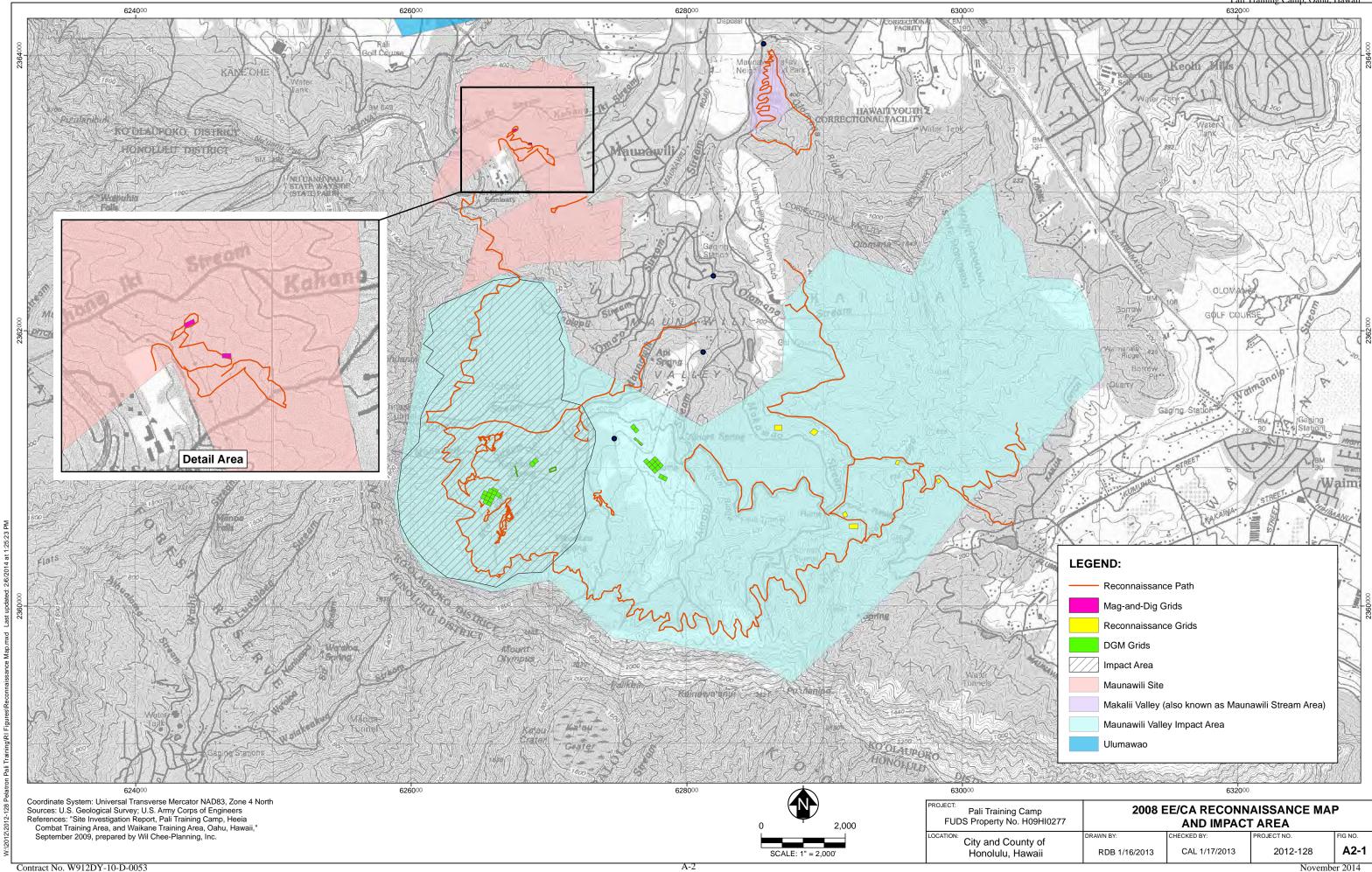
Page intentionally left blank.

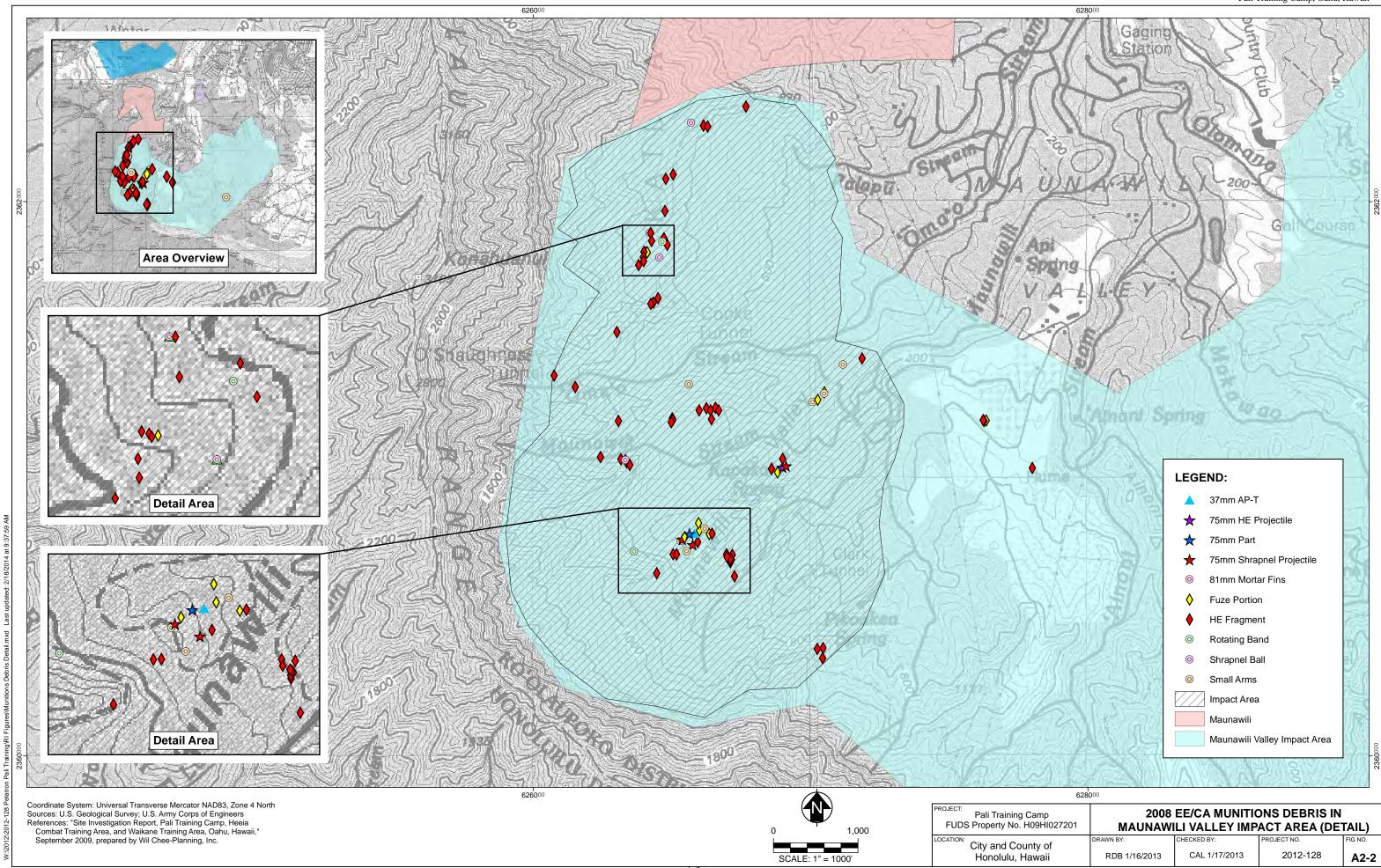
# Appendix A Figures

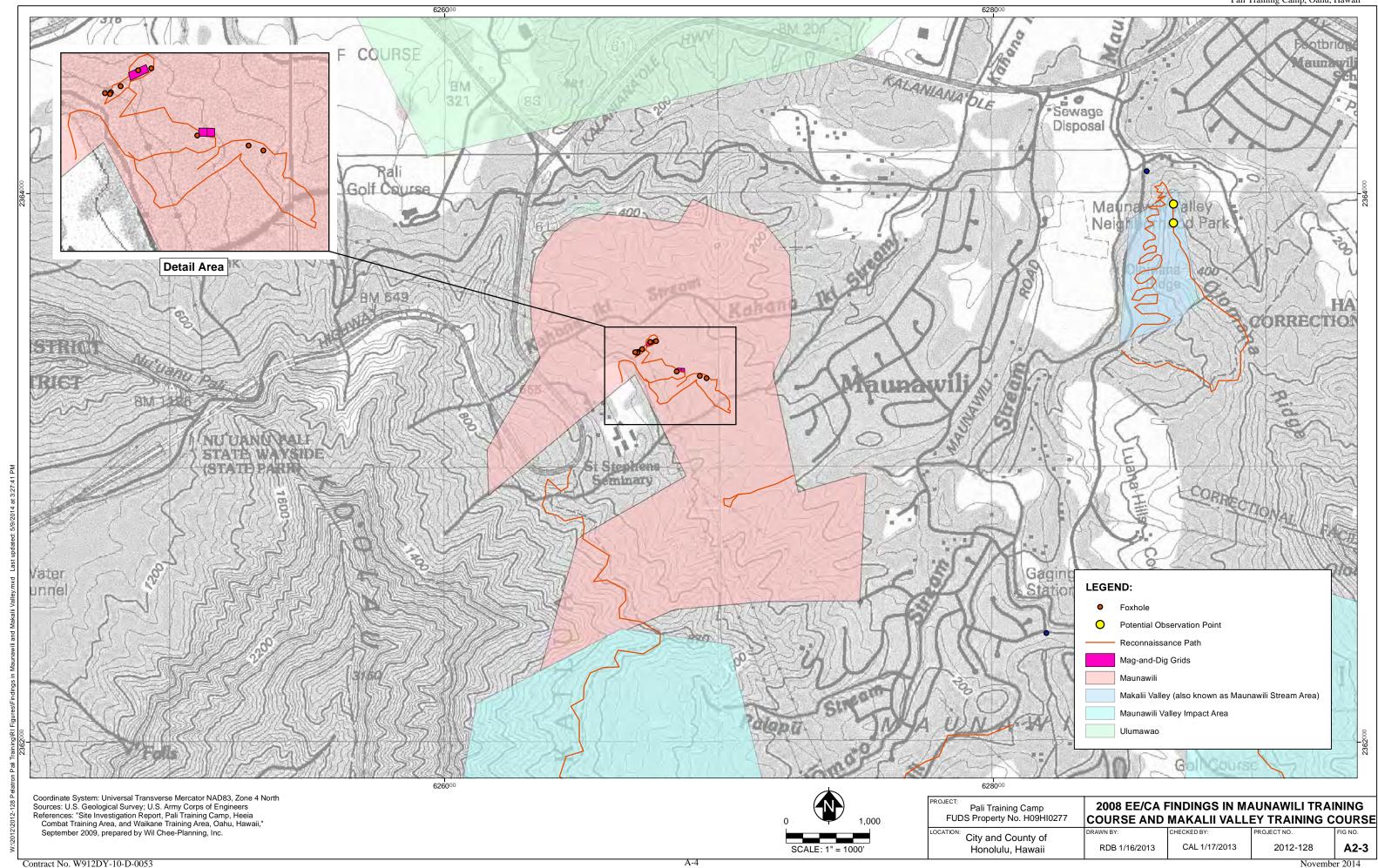
Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

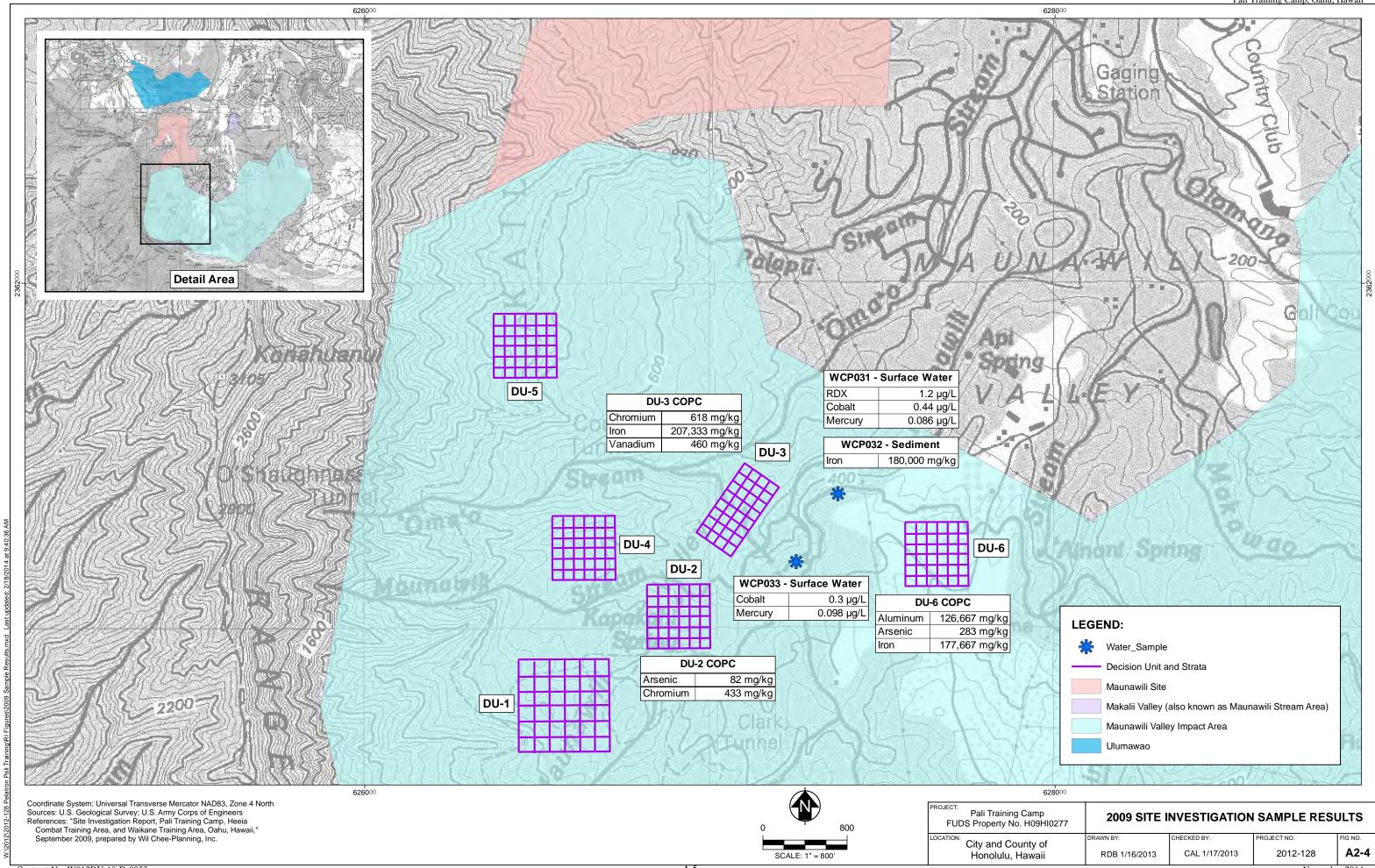
Page intentionally left blank.



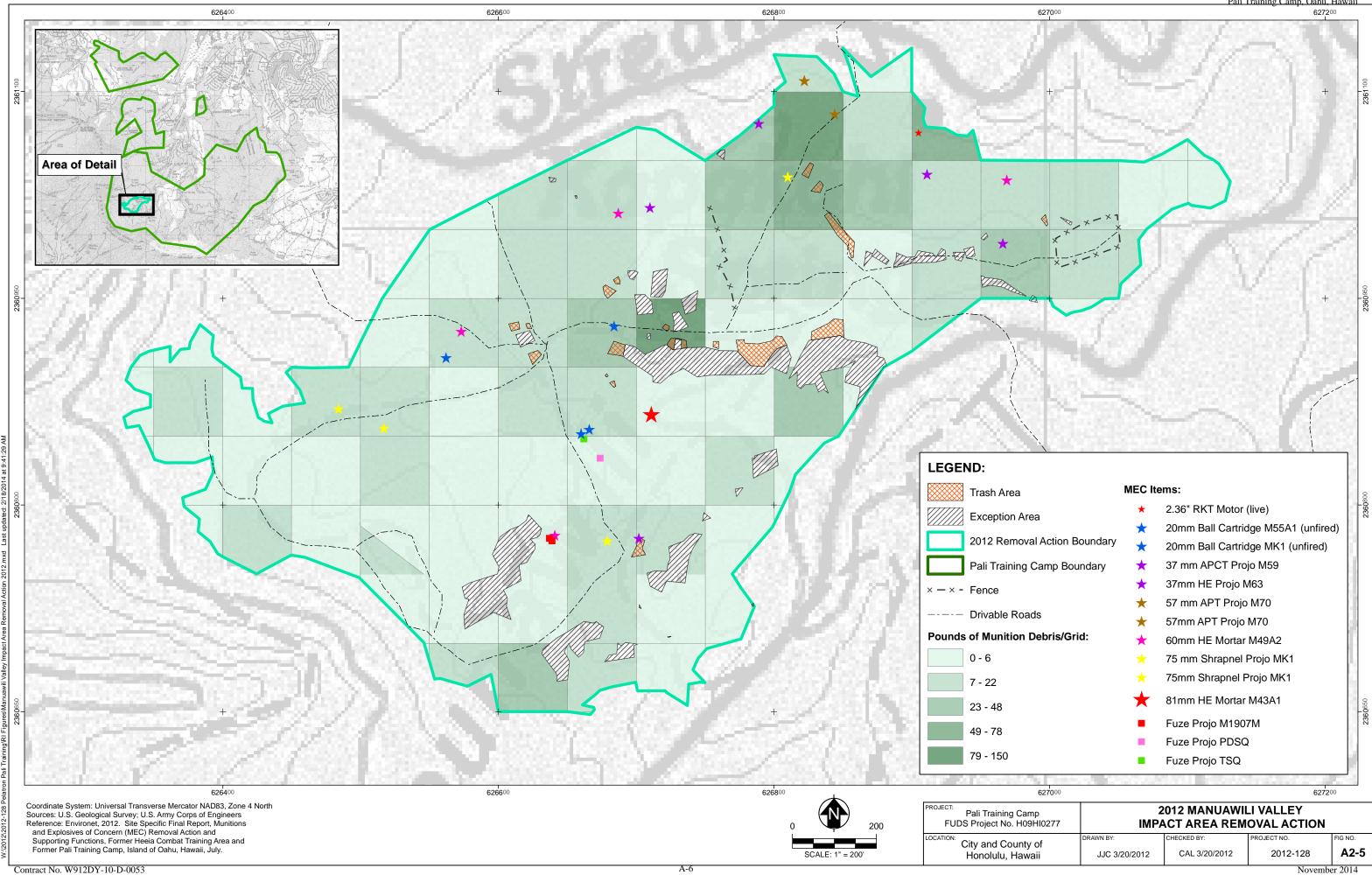




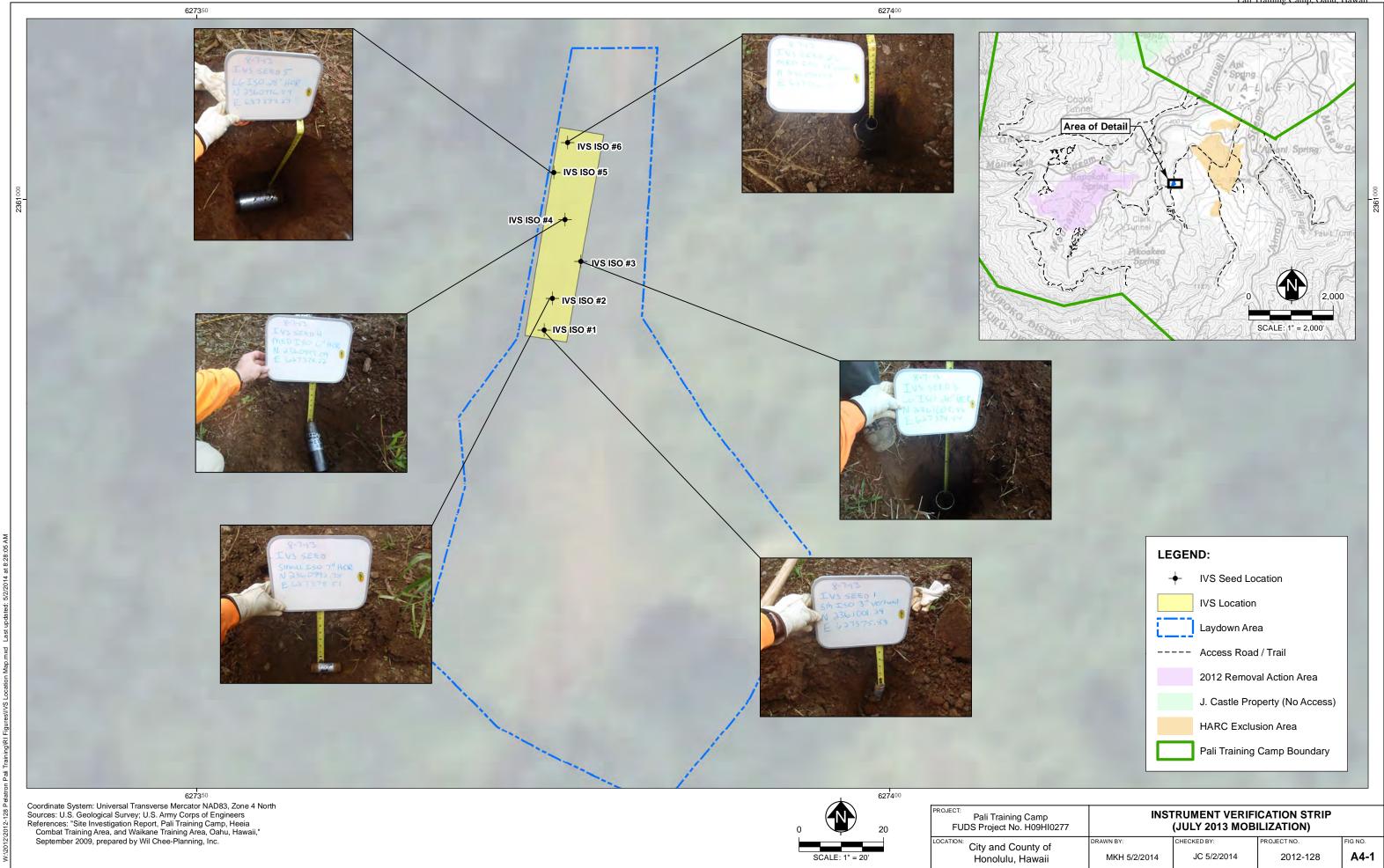


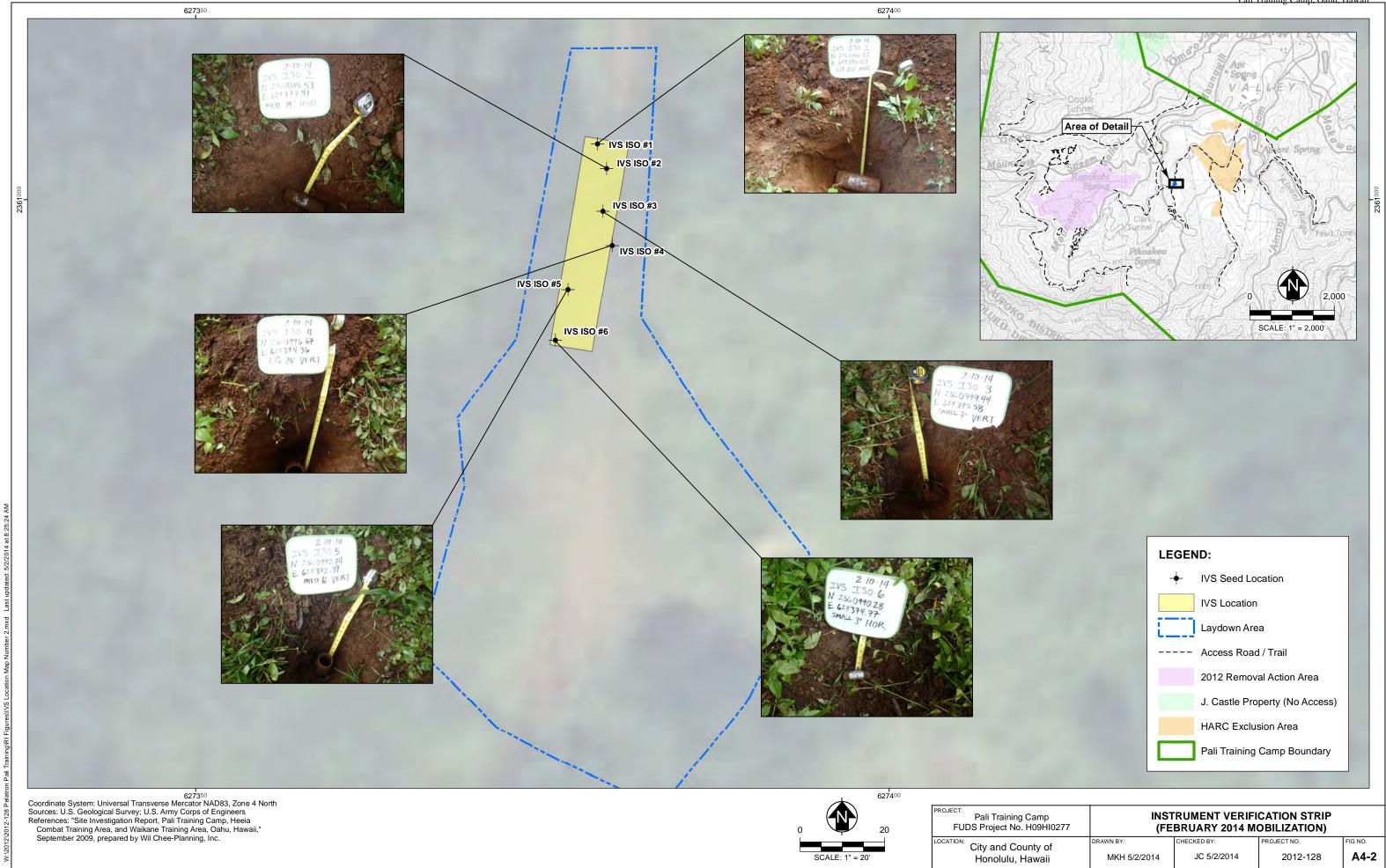


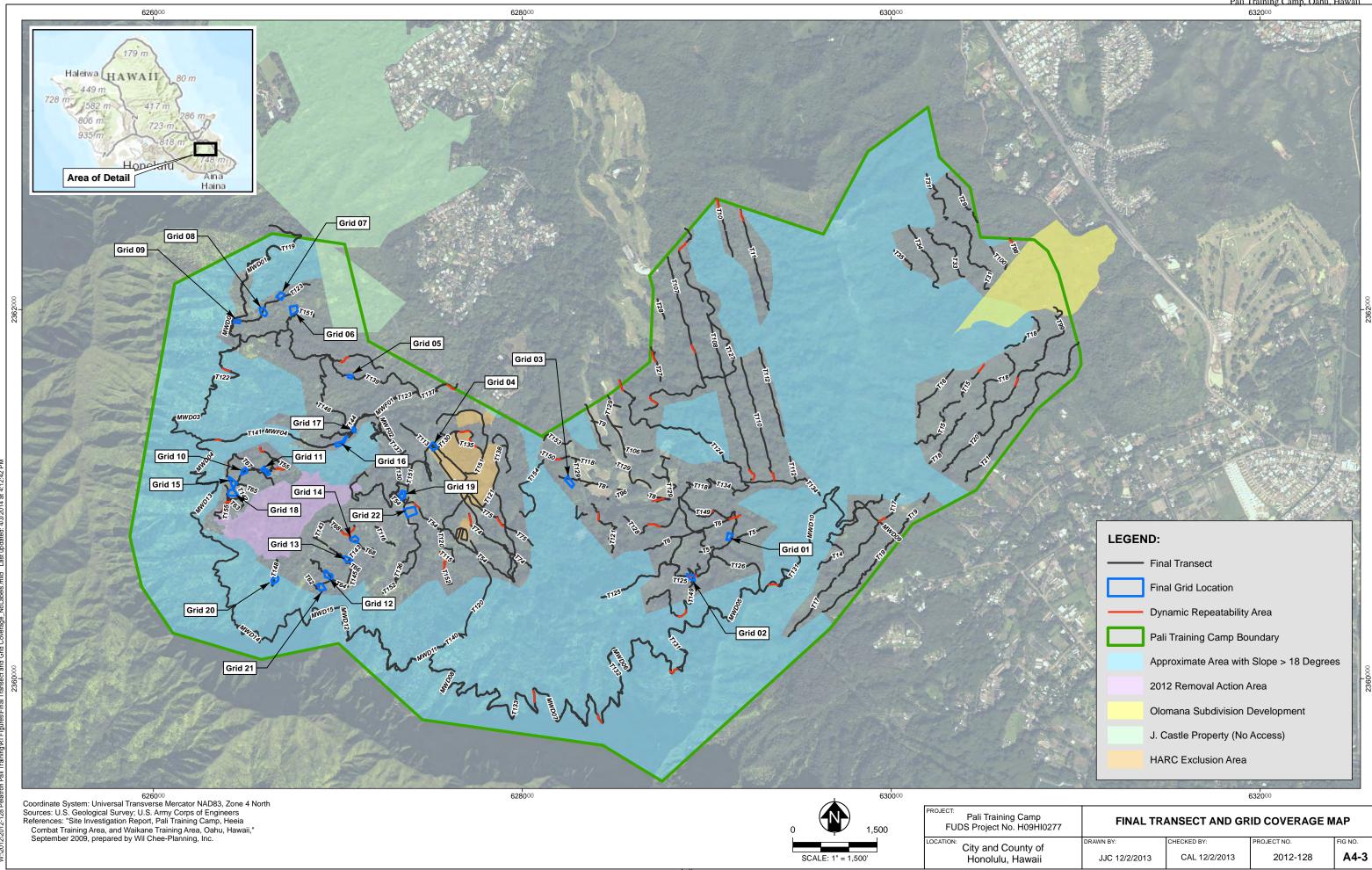
Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

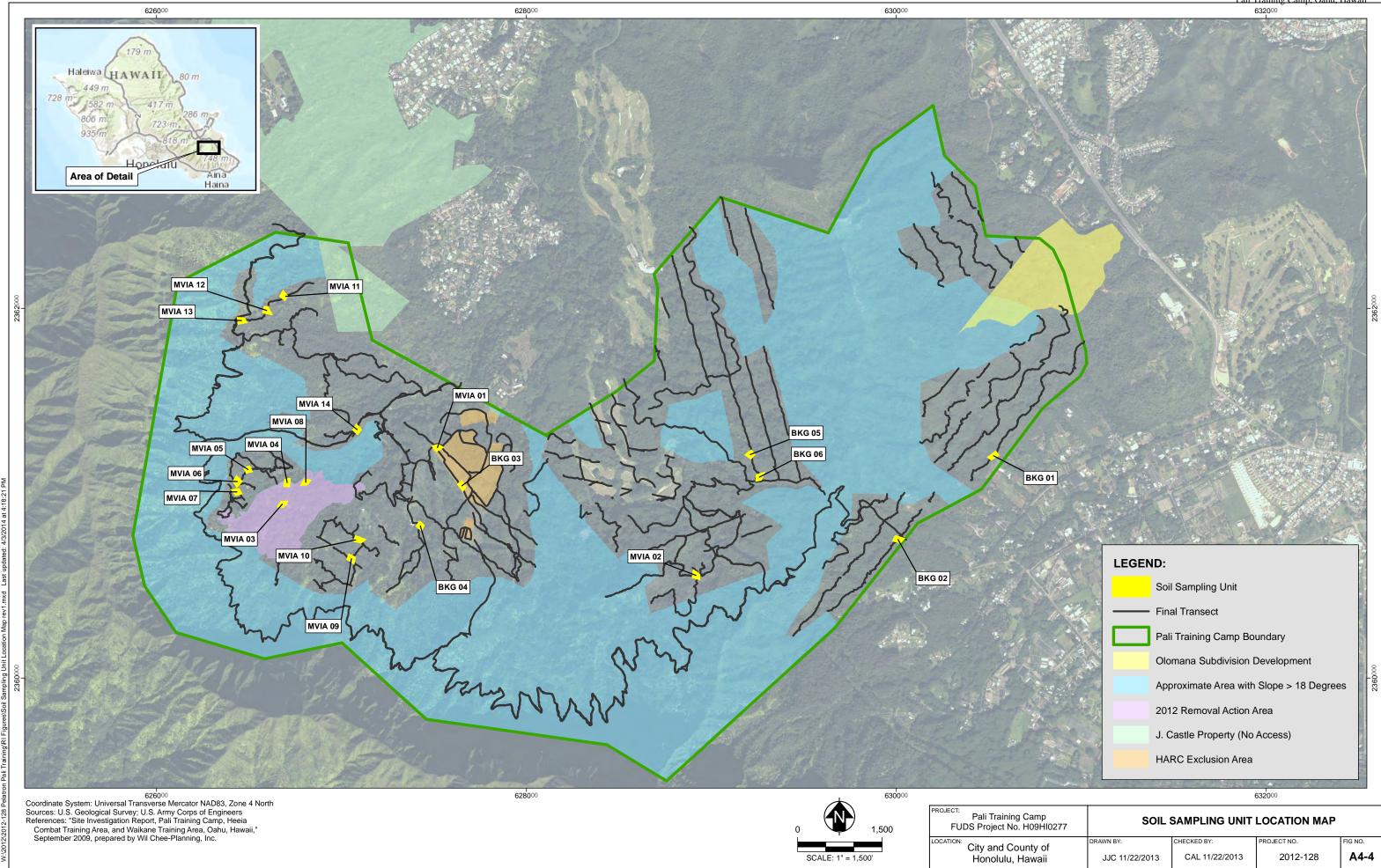


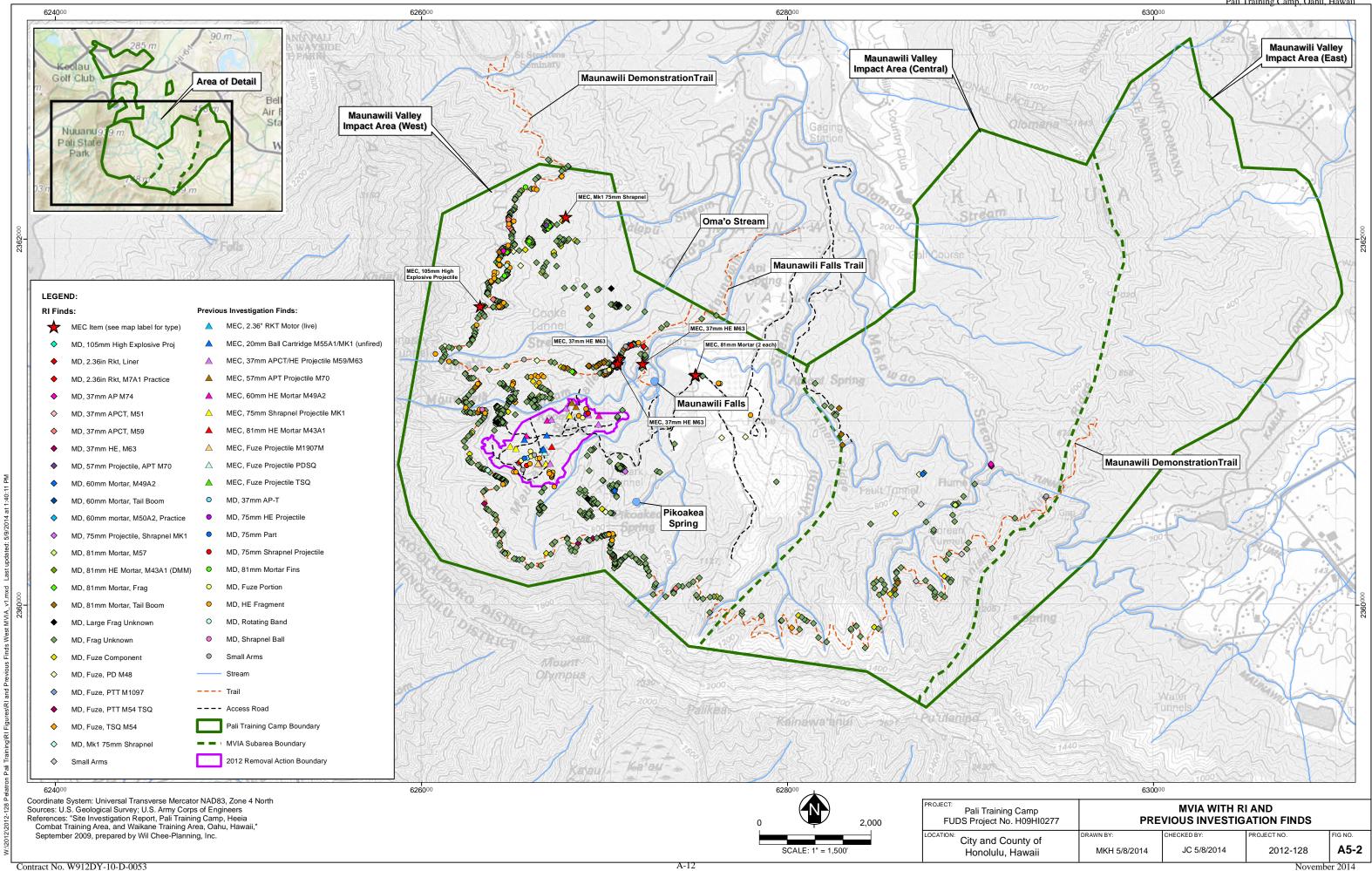
TO 0003











## FIGURE A5-3 REVISED CONCEPTUAL SITE MODEL

PALI TRAINING CAMP, OAHU, HAWAII FUDS PROJECT No. H09HI027701

MRS	Acreage	Suspected Past DoD Activities	Potential MEC/MD Presence	MEC/MD Found Since Closure	Previous Investigation/Clearanc e Actions	Post-DoD Land Use and Current Land Use	Potential Receptors	Potential Source and Receptor Interaction	Field Sampling/Qualitative Reconnaissance
Maunawili Valley Impact Area (WEST)	999.7	Regimental combat training center emphasizing the use of and familiarity with modern arms and field weapons, in addition to providing rugged terrain for jungle and ranger training.	37-mm AP projectile, M74 <sup>1,3</sup> 37-mm APCT projectile, M59 <sup>2,3</sup> 37-mm APCT projectile, M59 <sup>2,3</sup> 37-mm HE projectile, M63 <sup>2,3</sup> 57-mm APT projectile, M70 <sup>2,3</sup> 60-mm HE mortar, M49A2 <sup>2,3</sup> 60-mm mortar, M50A2, Practice <sup>3</sup> 60-mm mortar, Tail Boom <sup>3</sup> 75-mm HE projectile, M48 <sup>1</sup> 75-mm shrapnel projectile, MK1 <sup>1,2,3</sup> 81-mm HE mortar, M43A1 <sup>2,3</sup> 81-mm HE mortar, Tail Boom <sup>1,3</sup> 105-mm HE projectile <sup>3</sup> 2.36-inch rocket motor <sup>2</sup> 2.36-inch rocket, M7A1, Practice <sup>3</sup> 3.5-inch HEAT rockets Munition Fragments <sup>1,2,3</sup> Large Munition Fragments <sup>3</sup> Fuze components <sup>1,2,3</sup> Fuze head M521, M48A2, M52 <sup>1</sup> Fuze, M51A1 <sup>1</sup> Fuze, projectile, PD, M48 <sup>3</sup> Fuze, projectile, PD, M48 <sup>3</sup> Fuze, projectile, TSQ, M54 <sup>2,3</sup> Fuze, projectile, TSQ, M54 <sup>2,3</sup> Fuze, projectile, M1907M <sup>1,2,3</sup> 20-mm ball cartridge, MK1 <sup>2</sup> 20-mm ball cartridge, MS5A1 <sup>2</sup> Small Arms <sup>1,2,3</sup>	37-mm AP projectile, M74 <sup>1,3</sup> 37-mm APCT projectile, M51 <sup>3</sup> 37-mm APCT projectile, M59 <sup>2,3</sup> 37-mm HE projectile, M63 <sup>2,3</sup> 57-mm APT projectile, M70 <sup>2,3</sup> 60-mm HE mortar, M49A2 <sup>2,3</sup> 60-mm mortar, M50A2, Practice <sup>3</sup> 60-mm mortar, Tail Boom <sup>3</sup> 75-mm HE projectile, M48 <sup>1</sup> 75-mm shrapnel projectile, MK1 <sup>1,2,3</sup> 81-mm HE mortar, M43A1 <sup>2,3</sup> 81-mm mortar, Tail Boom <sup>1,3</sup> 105-mm HE projectile <sup>3</sup> 2.36-inch rocket motor <sup>2</sup> 2.36-inch rocket motor <sup>2</sup> 2.36-inch rocket, M7A1, Practice <sup>3</sup> Munition Fragments <sup>1,2,3</sup> Large Munition Fragments <sup>3</sup> Fuze components <sup>1,2,3</sup> Fuze head M521, M48A2, M52 <sup>1</sup> Fuze, projectile, PD, M48 <sup>3</sup> Fuze, projectile, PD, M48 <sup>3</sup> Fuze, projectile, TSQ, M54 <sup>2,3</sup> Fuze, projectile, TSQ, M54 <sup>2,3</sup> Fuze, projectile, TSQ, M54 <sup>2,3</sup> Fuze, projectile, M1907M <sup>1,2,3</sup> 20-mm ball cartridge, MK1 <sup>2</sup> 20-mm ball cartridge, M55A1 <sup>2</sup> Small Arms <sup>1,2,3</sup>	1994 INPR  2008 EE/CA – 103 MD items removed. No MEC found.  2012 Removal Action - Removed 1,067 pounds of MD and 26 MEC items.	Recreational (trails) Agricultural Utilities Easement Undeveloped forest	Visitors/Recreational Users Commercial/Industrial Workers (farmers, agricultural researchers) Occupational Workers (maintenance/constructi on of utilities, trail)	MEC is possibly at surface and subsurface.  Potential for receptors to interact during intrusive and non-intrusive activities.	2008 EE/CA – 8.49 miles/3.38 acres <sup>4</sup> surveyed with handheld analog and electromagnetic instruments. 5.7 acres (100ft x 100ft grids) investigated with DGM. 103 MD items found.  2012 Removal Action – Removed 1,067 pounds of MD and 26 MEC items from 40 acres (50m x 50m grids) to depth of 2 ft.  2013 RI/FS – Performed visual and instrument inspection on 22.40 miles/11.05 acres of transects and 4.86 acres of grids. 7 MEC items found. 1,252 MD items found.
Maunawili Valley Impact Area (CENTRAL)	867.15	Regimental combat training center emphasizing the use of and familiarity with modern arms and field weapons, in addition to providing rugged terrain for jungle and ranger training.	37-mm AP projectile, M74 <sup>3</sup> 60-mm HE mortar, M49A2 <sup>3</sup> 81-mm mortar, White Phosphorus, M57 <sup>3</sup> 81-mm mortar, Tail Boom <sup>3</sup> Munition Fragments <sup>3</sup> Fuze components <sup>3</sup> Fuze of a projectile, PD, M48 <sup>3</sup> Fuze of a projectile, PTT TSQ, M54 <sup>3</sup> Small Arms <sup>2,3</sup>	37-mm AP projectile, M74 <sup>3</sup> 60-mm HE mortar, M49A2 <sup>3</sup> 81-mm mortar, White Phosphorus, M57 <sup>3</sup> 81-mm mortar, Tail Boom <sup>3</sup> Munition Fragments <sup>3</sup> Fuze components <sup>3</sup> Fuze of a projectile, PD, M48 <sup>3</sup> Fuze of a projectile, PTT TSQ, M54 <sup>3</sup> Small Arms <sup>2,3</sup>	1994 INPR  2008 EE/CA – No MEC or MD found.	Recreational (golf course, trails) Utilities Easement Undeveloped forest	Visitors/Recreational Users Commercial/Industrial Workers (golf club employees) Occupational Workers (maintenance/constructi on of utilities, trail)	MEC is possibly at surface and subsurface.  Potential for receptors to interact during intrusive and non-intrusive activities.	2008 EE/CA – 6.40 miles/2.54 acres <sup>4</sup> surveyed with handheld analog and electromagnetic instruments. No MEC or MD found.  2013 RI/FS – Performed visual and instrument inspection on 16.40 miles/8.09 acres of transects and 0.74 acres of grids. 94 MD items were found. No MEC found.

## FIGURE A5-3 REVISED CONCEPTUAL SITE MODEL

PALI TRAINING CAMP, OAHU, HAWAII FUDS PROJECT No. H09HI027701

MRS	Acreage	Suspected Past DoD Activities	Potential MEC/MD Presence	MEC/MD Found Since Closure	Previous Investigation/Clearance Actions	Post-DoD Land Use and Current Land Use	Potential Receptors	Potential Source and Receptor Interaction	Field Sampling/Qualitative Reconnaissance
Maunawili Valley Impact Area (EAST)	611.6	Regimental combat training center emphasizing the use of and familiarity with modern arms and field weapons, in addition to providing rugged terrain for jungle and ranger training.	None.	None.	1994 INPR  2008 EE/CA – No MEC or MD found.	Residential Agricultural Recreational (trails) Undeveloped forest	Residents Construction Workers Commercial/Industrial Workers Visitors/Recreational Users	Not Applicable.	2008 EE/CA – 1.76 miles/0.70 acres <sup>4</sup> surveyed with handheld analog and electromagnetic instruments. No MEC or MD found.  2013 RI/FS – Performed visual and surface/subsurface instrument inspection on 7.61 miles/3.67acres of transects. No MEC or MD found.
Maunawili Training Course	400	Regimental combat training center emphasizing the use of and familiarity with modern arms and field weapons, in addition to providing rugged terrain for jungle and ranger training.	Small Arms, General .50-Caliber; M2 Ball, M1 Tracer, M10 Tracer, M17 Tracer, M21 Tracer, M2 AP Propellant Primer, Percussion B	Small Arms, General <sup>1</sup>	1994 INPR  2008 EE/CA – Small arms found near foxholes.	Commercial (religious facilities) Recreational (trails) Undeveloped forest	Construction Workers Commercial/Industrial Workers Visitors/Recreational Users	MEC is possibly at surface and subsurface.  Potential for receptors to interact during intrusive and non-intrusive activities.	2008 EE/CA – 2.0 acres surveyed with handheld analog and electromagnetic instruments. 0.2 acres (50ft x 50ft, 50ft x 100ft grids) investigated using mag and flag method. Small arms found.  2013 RI/FS – Right of Entry not received from landowners. RI field activities not performed.

<sup>&</sup>lt;sup>1</sup> Found during 2008 EE/CA

#### **ACRONYMS**

APCT armor piercing capped tracer

APT armor piercing tracer

AT anti-tank

HE high explosive

HEAT high-explosive anti-tank

millimeter mm

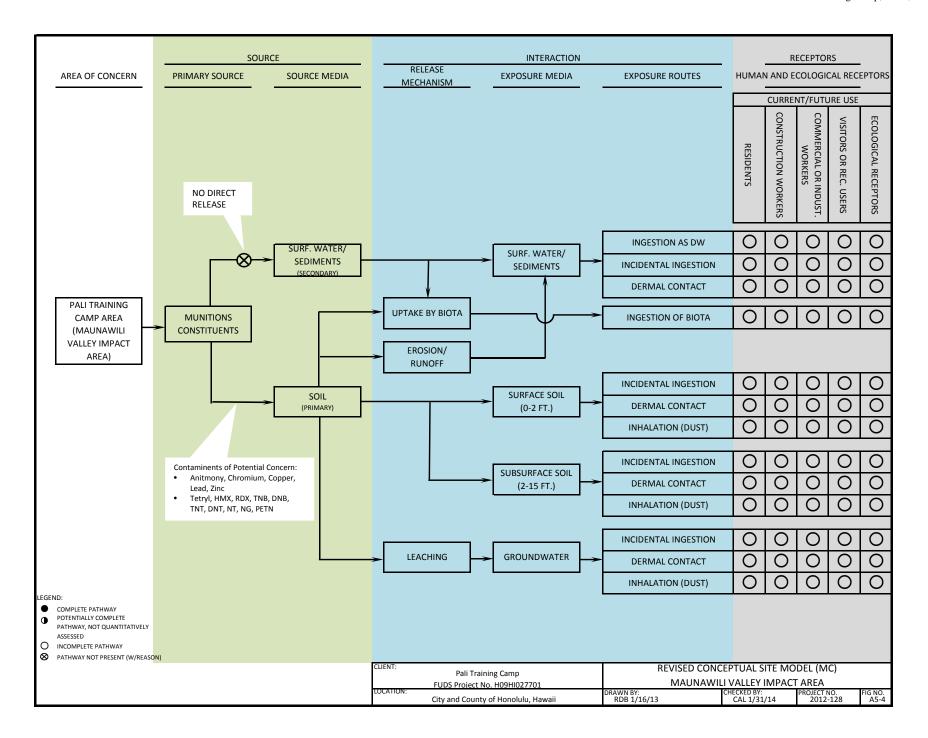
PDSQ point detonating super quick

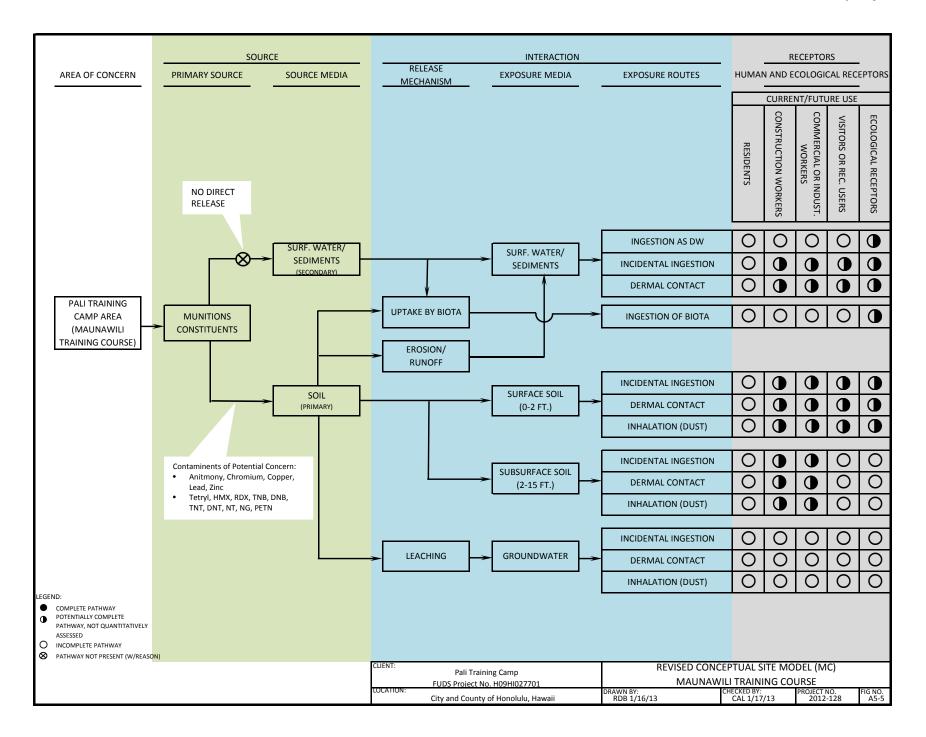
time super quick

<sup>&</sup>lt;sup>2</sup> Found during 2012 Removal Action

<sup>&</sup>lt;sup>3</sup> Found during 2013 Remedial Investigation

<sup>&</sup>lt;sup>4</sup>The 2008 EE/CA reconnaissance transect mileage/acreage for each segment was generated using GIS, assuming 1-meter wide transects.





## Appendix B Biological Monitoring Report

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

# BIOLOGICAL MONITORING REPORT PALI TRAINING CAMP OAHU, HAWAII

FUDS Project Number H09HI027701 Contract: W912DY-10-D-0053 Task Order: 0003



## Prepared for:

## **United States Army Corps of Engineering, Honolulu District**

and

**United States Army Engineering and Support Center, Huntsville** 

**by: Huikala, LLC**3375 Koapaka St., STE F200
Honolulu, HI 96819

November 2014



## **Table of Contents**

1.0 Intro	oducti	tion	B-1
1	.1 F	Results of Literature and Historical Research	B-1
2.0 Resu	ılts of	f Field Work	B-2
2	.1 V	Vegetation Observations	B-2
		Faunal Observations	
	2	2.2.1 Birds	B-4
	2	2.2.2 Mammals	B-5
3.0 Disc	ussion	n	B-5

## List of Tables

Table 2-1 Types of Birds Observed in the MVIA MRS

## List of Figures

Figure B1-1 Threatened or Endangered Species Hexagon Map

Figure B1-2 Critical Habitat Areas

## List of Attachments

Attachment 1 Figures

Attachment 2 Threatened and Endangered Species List

Attachment 3 Photographic Log Attachment 4 Field Data Forms

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii

## Acronyms and Abbreviations

BMP Biological Monitoring Plan
BMR Biological Monitoring Report

CFR Code of Federal Regulations

HBMP Hawaii Biodiversity& Mapping Program

MC munitions constituent

MEC munitions and explosives of concern

MRS munitions response site
MTC Maunawili Training Course
MVIA Maunawili Valley Impact Area
MVTC Makalii Valley Training Course

RI remedial investigation

T&E threatened and endangered

USC United States Code

UTC Ulumawao Training Course

VSP Visual Sample Plan

## 1.0 Introduction

- 1.0.1 A Remedial Investigation (RI) was conducted at the former Pali Training Camp located on the windward side of Oahu, Hawaii. The former Pali Training Camp consists of four non-contiguous parcels. Each parcel is considered a munitions response area containing one munition response site (MRS): Maunawili Valley Impact Area (MVIA), Maunawili Training Course (MTC), Makalii Valley Training Course (MVTC), and Ulumawao Training Course (UTC). Field activities were conducted in the MVIA MRS only.
- 1.0.2 As part of the RI, a munitions and explosives of concern (MEC) investigation was performed. Biological monitoring was required during these activities to avoid sensitive resources as well as identify potential ecological receptors.
- 1.0.3 This Biological Monitoring Report (BMR) summarizes the findings of the field observations. A Biological Monitoring Plan (BMP) was developed prior to field activities to ensure that any action taken during field activities would not likely jeopardize the continued existence of any threatened or endangered (T&E) species or result in the destruction or adverse modification of designated critical habitat, in accordance with 16 United States Code (USC) 1536(a)(2); 50 Code of Federal Regulations (CFR) 402.01(a), and the prohibition against any action that results in a "take" of a T&E species without a determination that any "take" is not likely to jeopardize the continued existence of any T&E species, in accordance with 16 USC 1538(a); 50 CFR 402.14(i).

#### 1.1 Results of Literature and Historical Research

- 1.1.1 Data results from the Hawaii Biodiversity & Mapping Program (HBMP) were reviewed for rare species observations in the general area of the project site. All four MRSs were included in the HBMP data request, as well as a buffer around the MRSs. Rare elements were not located in either the MVTC or UTC MRSs. The greatest density of rare plants is located outside of the MVIA, in the mauka (upland) sections of the Ko'olau Mountain range. Attachment 1, Figure B1-1 displays the general locations of T&E species identified by the HBMP. The hexagons are 500 meters and the precise point of the species is located somewhere within that area. The information is provided in hexagon format to protect the exact location of species. The identification number(s) located in the hexagons corresponds to the spreadsheet presented in Attachment 2. Only hexagons within the investigation areas and with documented T&E species are listed.
- 1.1.2 Research also determined that the Designated Critical Habitat for Oahu, Unit 5 has boundaries within the project area (Attachment 1, Figure B1-2). The portion of the critical habitat unit that falls within the MVIA boundary is designated for the Oahu `Elepaio (Chasiempis sandwichensis ibidis).

1.1.3 Additional reviews of previous biological surveys and literature research of the Maunawili area identified three native tree species (ohia lehua [Metrosideros polymorpha var. glaberrima], hala [Pandanus tectorius], and papala kepau [Pisonia umbellifera] (LeGrande & Bruner, 2011)) and four endemic species (koa [Acacia koa], ohia lehua [Metrosideros polymorpha var. incana], uki [Machaerina mariscoides ssp. Meyenii], and hapu`u [Cibotium chamissoi] (Imada, 2011)) as being previously observed.

#### 2.0 Results of Field Work

- 2.0.1 Biological monitoring was completed in conjunction with the field activities July 31, 2013 through October 10, 2013 and February 10, 2014 through March 6, 2014, in accordance with the approved BMP and Work Plan. Prior to field activities, a rare species review was presented to all individuals participating in field investigations. All known or predicted rare plant and animal species were reviewed using a MICROSOFT Power Point presentation. The presentation was updated as needed and reviewed by the field teams. Each field team included one biologist during MEC investigation or munitions constituent (MC) sampling activities requiring biological monitoring. Biologists did not accompany field teams during investigation of public trails or commonly used roadways.
- 2.0.2 Field observations utilized a walk-through and visual monitoring method. Due to the density of the vegetation at the site, a biologist accompanied the field team during vegetation clearance and transect stakeout to ensure that sensitive habitats were not disturbed. Transects were generally 1-meter wide and the distance between transects were determined by Visual Sample Plan (VSP) or actual terrain. Areas with slopes greater than 18 degrees were not included in the investigation due to accessibility and safety concerns.
- 2.0.3 Notes were collected regarding plant associations and distribution, disturbances, topography, substrate types, exposure, and drainage. Plant identifications were made in the field. Plants that were not positively identified were documented by photograph for later determination in the herbarium, and for comparison with the recent taxonomic literature.
- 2.0.4 Biologists also noted individuals of each bird and mammal species observed, as well as signs of their presence, such as footprints, droppings, or burrows. Birds were identified by sight using the naked eye and 10-power binoculars, and by calls.
- 2.0.5 No wetland areas were observed within the areas of investigation.

## 2.1 Vegetation Observations

2.1.1 Only the MVIA MRS was investigated. Vegetation for the entire MRS is dominated by non-native or invasive plant species. Very few native plant species were observed and predominately in the higher elevation areas of the investigation area. No new or previously identified T&E species were observed during this investigation. The following discussion

includes the most abundant non-native and most abundant native plant species observed during the investigation.

- 2.1.2 The MVIA MRS is divided into four main areas for the purpose of describing vegetation zones:
  - Waimanalo (the area to the East of the ridge dividing Maunawili and Waimanalo);
  - East Maunawili (the east side of Maunawili Valley including the Royal Hawaiian Golf Club and Olomana);
  - West Maunawili (the west side of the Maunawili Valley including the Maunawili Falls Trail and the Maunawili Demonstration Trail); and
  - Agricultural Fields (all areas with fallow or current cultivation at the center of the MRS).
- 2.1.3 The Waimanalo section was dominated by a forest composed of Octopus tree (*Schefflera actinophylla*), Shoebutton (*Ardisia ellipticum*), Moluccan albizia (*Falcataria moluccana*), Strawberry guava (*Psidium cattleianum*), and Java Plum (*Syzigium cumini*), with an open understory of basket grass (*Oplismenus hirtellus*) and various fern species including laua'e (*Phymatosorus grossus*), Christella (*Cyclosorus* sp.), and sword fern (*Nephrolepis* sp.). Sections of forest, especially near ridge tops were dominated by monotypic stands of ironwood (*Casuarina equisetifolia*). Along dirt roadways, Guinea grass (*Panicum maximum*) and Formosa koa (*Acacia confusa*) were dominant. Natives observed uncommonly in the area were `ulei (*Osteomeles anthyllidifolia*) and pala'a fern (*Odontosoria chinesis*).
- 2.1.4 East Maunawili included the Royal Hawaiian Golf Club, which is dominated by ornamental plant species and bordered by a naturalized alien forest dominated by octopus tree, fiddlewood (*Citharexylum caudatum*), and large albizia trees. Gulch bottoms and drainages were dominated by hau (*Hibiscus tiliaceus*) thickets. Sections of forest are covered with vining and climbing shrubs such as maile pilau (*Padaeria foetida*) and cat's claw (*Caesalpinia decapetala*). On the slopes of Olomana, sections of forest were dominated by kukui (*Aleurites moluccana*) and mountain apple (*Syzigium malaccense*) trees, in some cases the tree canopies were festooned with the native vine ke'e'e or sea bean (*Mucuna gigantea*). Large individuals of the native fern 'ekaha or birds nest fern (*Asplenium nidus*) were observed scattered throughout the forested area of the East Maunawili section of the MRS.
- 2.1.5 West Maunawili included the large section of the MRS on the west side of the valley. Along with the common invasive tree species observed in the other areas of the MRS, mango (Mangifera indica), hala (Pandanus tectorius), Gunpowder tree (Trema orientalis), Chinese banyan (Ficus microcarpa), and common guava (Psidium guajava) were observed frequently. Understory plants included christella ferns, awapuhi or shampoo ginger (Zingiber zerumbet), ti (Cordyline fruticosa), coffee (Coffea arabica), arthrostema (Arthrostemma ciliatum), and basket

grass. In the upper elevations near the Maunawili Demonstration Trail, the native fern uluhe (*Dicranopteris linearis*) dominated with scattered trees such as `ohi`a lehua (*Metrosideros polymorpha*), hala, and tree ferns or hapu`u (*Cibotium chamissoi*). Other native plants observed infrequently were lama (*Diospyros sandwicensis*), papala kepau (*Pisonia umbellifera*), and koa (*Acacia koa*).

2.1.6 Agricultural areas within the MRS were located near the center of Maunawili Valley near the project lay down yard. Some of the fields were fallow and either bare dirt or grown over with weedy plant species. Fields in cultivation had crops including, sugar cane, papaya, chili pepper, and banana. The edges of the fields were dominated by non-native species such as elephant grass (*Pennisetum purpureum*), Guinea Grass, coffee, Moluccana albizia, sleeping grass (*Mimosa pudica*), and fiddlewood.

#### 2.2 Faunal Observations

No new or previously identified T&E species were observed during this investigation.

#### 2.2.1 Birds

2.2.1.1 A total of 16 species of alien (introduced) birds were observed (see Table 2-1) within the MRS during the investigation period. None of these species are listed as endangered or threatened. One migratory shorebird species the Pacific Golden-Plover or Kolea (*Pluvialis fulva*) was observed in open lawns and agriculture fields infrequently. Kolea are the most abundant migrant shorebird in Hawaii. They arrive from their subarctic breeding grounds in southwestern Alaska in August – September and depart Hawaii in the spring around the 25<sup>th</sup> of April. While in Hawaii most individuals defend foraging territories on lawns and other open habitats. This species is not endangered or threatened. They are, however, protected by Federal law under the Migratory Bird Treaty Act and by State law under Hawaii Administrative Rules Title 13 Chapter 124.

Table 2-1: Types of Birds Observed in the MVIA MRS

COMMON NAME	SCIENTIFIC NAME	
Cattle Egret	Bubulcus ibis	
Spotted Dove	Streptopelia chinensis	
Zebra Dove	Geopelia striata	
Red-vented Bulbul	Pycnonotus cafer	
Red-whiskered Bulbul	Pycnonotus jocosus	
Japanese Bush-Warbler	Cettia diphone	
White-rumped Shama	Cpsychus malabaricus	
Red-billed Leiothrix	Leothrix lutea	
Japanese White eye	Zosterops japonicus	
Common Myna	Acridotheres tristis	
Red-crested Cardinal	Paroaria coronata	
Northern Cardinal	Cardinalis cardinalis	

COMMON NAME	SCIENTIFIC NAME
House Finch	Carpodacus mexicanus
House Sparrow	Passer domesticus
Common Waxbill	Estrilda astrild
Nutmeg Mannikin	Lonchura punctulata

2.2.1.2 Field activities had minimal impact to the critical habitat for the Oahu 'Elepaio. The Designated Critical Habitat Unit that overlaps the Pali Training Camp is based on 1975 data that historically located the Oahu 'Elepaio as being present in the Maunawili Valley. Two subsequent surveys, in 1990 and 2013, found no presence of 'Elepaio within the current Critical Habitat Unit in Maunawili Valley (VanderWerf, 2013). Measures were taken to minimize habitat alterations during the vegetation clearance within the MVIA. Larger shrubs and trees were not cleared during transect investigation. Prior to grid investigations, the project biologist extensively searched the area to be cleared of vegetation in order to determine if any native plant or animal species, including 'Elepaio, were present.

#### 2.2.2 Mammals

The only mammal visually observed during the field investigation was the Small Indian Mongoose (*Herpestes javanicus*). Tracks of cats, dogs and pigs were seen throughout the project area. Signs of the feral pig (*Sus scrofa*), rooting, hoof tracks, and wallows in muddy areas, were abundant throughout the MRS. Rats and mice likely also occur at this location.

#### 3.0 Discussion

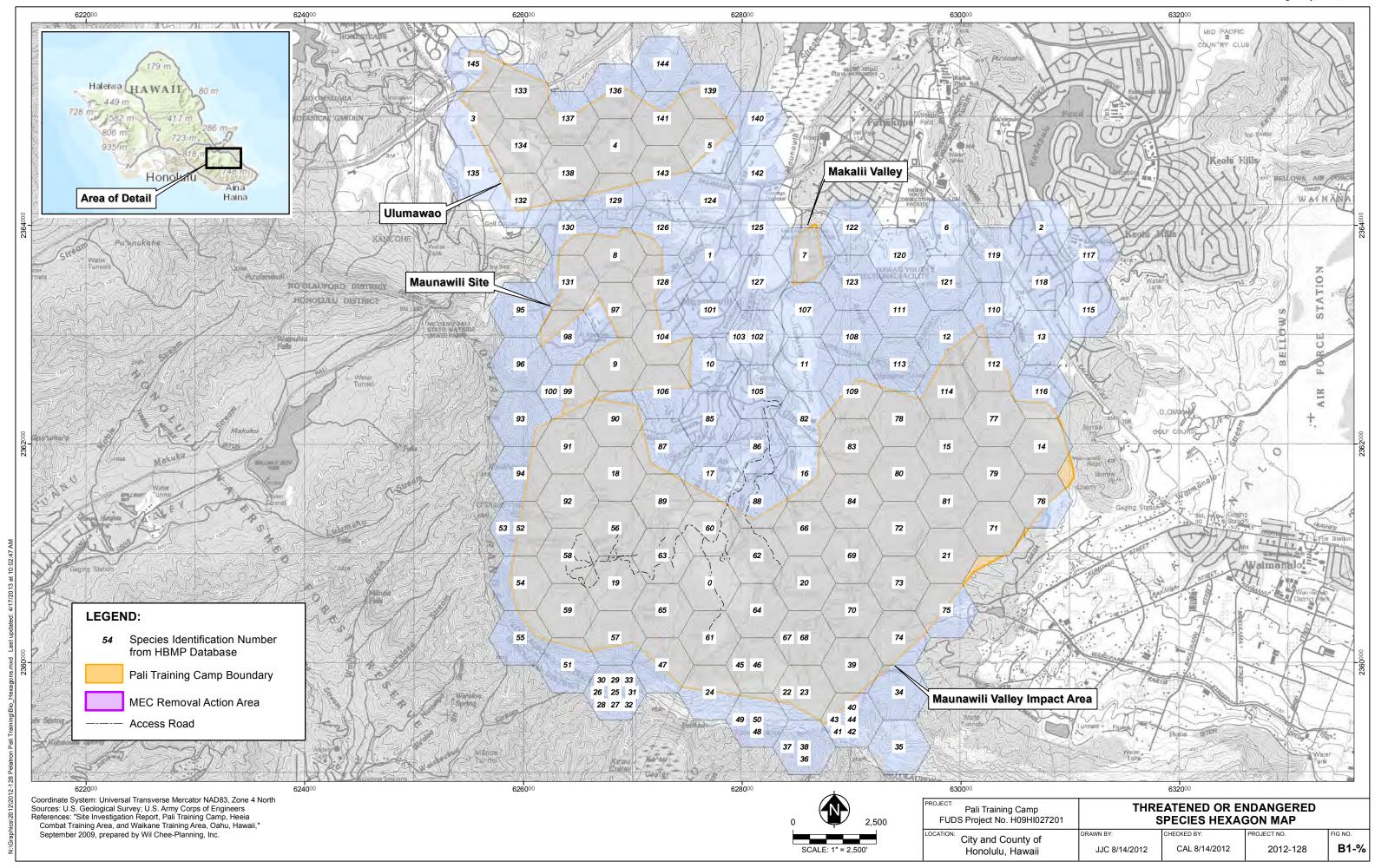
The investigation area has been impacted over time by human use and the biological resources have been altered from their native state. The majority of the plant and animal species observed during the survey of the MVIA MRS are introduced (non-native). The native plant and animal species observed during transect and grid investigations were infrequent and easily avoided during clearance for MEC detection. No rare, threatened, or endangered species were observed during the transect and grid investigations or in consolidation areas.

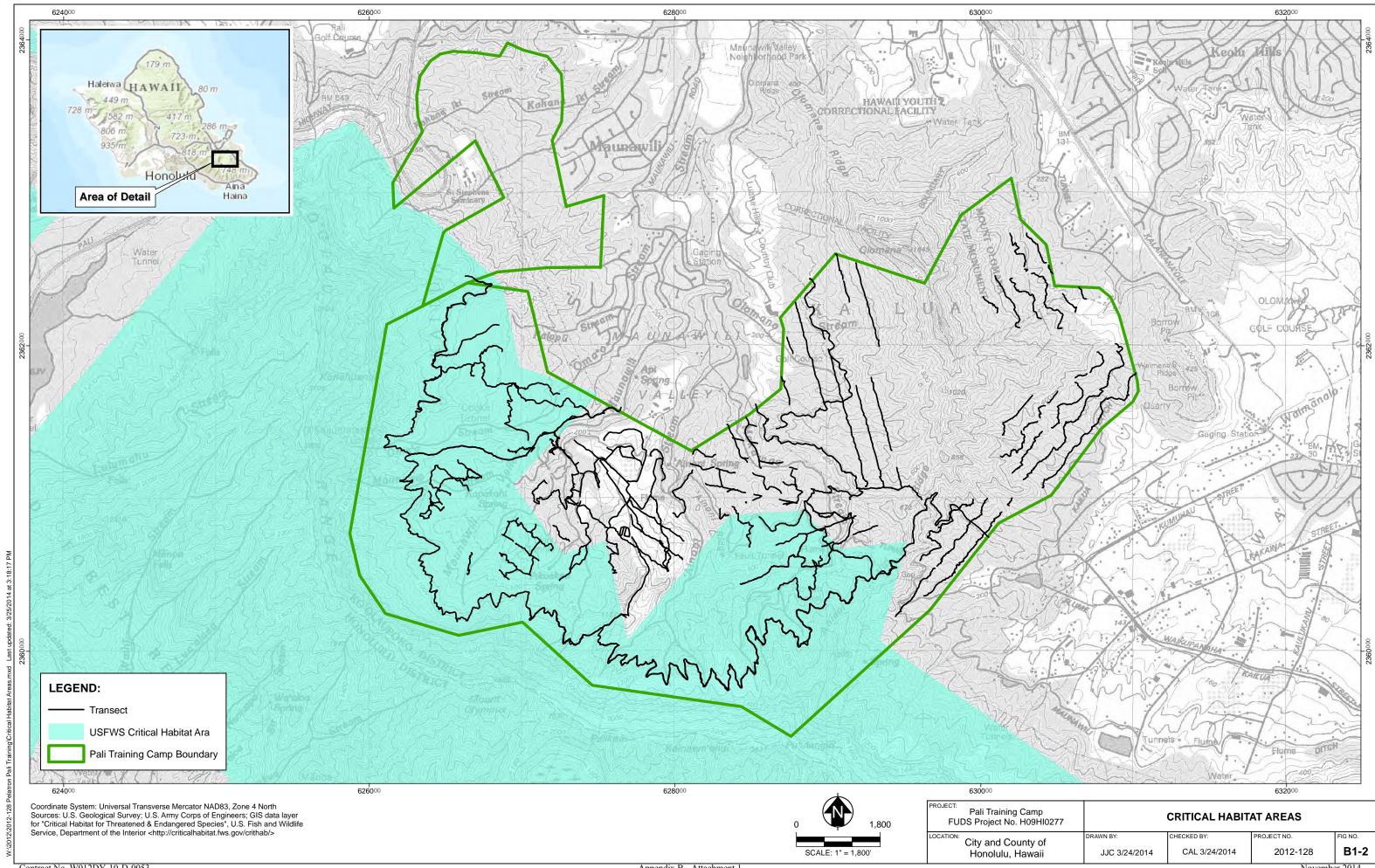
## **Attachments**

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii

# Attachment 1 – Figures

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii





# Attachment 2 – Threatened and Endangered Species List

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii

### **Threatened and Endangered Species List**

ID#	SCIENTIFIC NAME	COMMON NAME	LOCATION NOTES	ECO TYPE	USESA	GRANK	GENERAL NOTES
22	Achatinella fulgens	Oahu Treesnail, Pupu Kuahiwi	west of Aniani Nui Ridge	Animal-Invertebrate	LE	G1	
23	Achatinella taeniolata	Oahu Treesnail, Pupu Kuahiwi		Animal-Invertebrate	LE	GH	Achatinella fulgens (IMGASN7160.019) collected in same locality
40	Myrsine fosbergii	KOLEA		Plant	С		Associated with Perrottetia, Pelea [Melicope], Cheirodendron, Myrsine lessertiana (P87PER01).
41	Zanthoxylum oahuense	Hea`e, A`e	Waialae Nui Ridge and summit crest between Waialae Nui and Wiliwilinui Ridges	Plant	С	G1	
42	Achatinella fulgens	Oahu Treesnail, Pupu Kuahiwi	Near Puu Lanipo	Animal-Invertebrate	LE	G1	
43	Lobelia oahuensis	`OHA, HAHA, `OHA WAI	Waialaenui-Waimanalo and Kapakahi-Waimanalo portions of summit ridge, 2400-2800 ft	Plant	LE	G1	
44	Tetraplasandra gymnocarpa	`Ohe`ohe	Puu Lanipo and Wiliwilinui Ridge	Plant	LE	G1	
45	Achatinella fulgens	Oahu Treesnail, Pupu Kuahiwi	Ainoni Ridge	Animal-Invertebrate	LE	G1	
46	Achatinella taeniolata	Oahu Treesnail, Pupu Kuahiwi		Animal-Invertebrate	LE	GH	Achatinella fulgens (IMGASN7160.020) collected in same locality
48	Achatinella fuscobasis	Oahu Treesnail, Pupu Kuahiwi		Animal-Invertebrate	LE	G1	
49	Zanthoxylum oahuense	Hea`e, A`e	Mauumae Ridge and Kainawaaunui	Plant	С	G1	
50	Hesperomannia arborescens		Kainawaanui	Plant	LE	G1	
52	Lasiurus cinereus semotus	Hawaiian Hoary Bat, Ope`ape`a		Animal-Vertebrate	LE	G5T2	
53	Cyanea crispa	`Oha, Haha, `Oha wai	Maunawili, 980 ft.	Plant	LE	G1	
67	Achatinella fulgens	Oahu Treesnail, Pupu Kuahiwi	Gulch west of Aniani Ridge	Animal-Invertebrate	LE	G1	
68	Achatinella taeniolata	Oahu Treesnail, Pupu Kuahiwi		Animal-Invertebrate	LE	GH	Achatinella fulgens (IMGASN7160.021) collected in same locality

#### **Threatened and Endangered Species List**

ID#	SCIENTIFIC NAME	COMMON NAME	LOCATION NOTES	ЕСО ТҮРЕ	USESA	GRANK	GENERAL NOTES
70	Chasiempis sandwichensis ibidis	Oahu `Elepaio	Maunawili	Animal-Vertebrate	LE	G3T1	
89	Megalagrion nigrohamatum nigrolineatum	Blackline Megalagrion Damselfly		Animal-Invertebrate	С	G4T2	
98	Cyperus odoratus			Plant		G5	Soil constantly moist, but not seeping. Alien vegetation. Associates in order of abundance: Hedychium coronarium, Coix lachryma-jobi, Arthrostemma ciliatum, Rubus rosifolius, Citharexylum caudatum, Ipomoea indica, Oplismenus hirtellus, Paederia foetida
99	Lasiurus cinereus semotus	Hawaiian Hoary Bat, Ope`ape`a		Animal-Vertebrate	LE	G5T2	
100	Cyrtandra kaulantha	Ha`iwale, Kanawao Ke`oke`o		Plant	С	G1	Open brush of kukui [Aleurites moluccana], Dioscorea, guava [Psidium], Musa, and Touchardia (S56PEABM).
131	Puffinus auricularis newelli	Newell's Shearwater, `A`o		Animal-Vertebrate	LT	G2T2	

#### **ACROYMNS**

C Candidate

**GRANK Global Rank** 

LE Listed Endangered

LT Listed Threatened SOC Species of Concern

USESA Federal Status (United States Endangered Species Act)

#### Footnote:

Global rank (GRANK) is a reflection of the overall condition of an element throughout its global range. Subspecies are denoted by a T-Rank; multiple rankings indicate a range of values. An H-rank indicates that all sites are historical.

- G1 = Critically imperiled; Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals
- G2 = Imperiled; 6-20 EOs OR 1,000-3,000 individuals
- G3 = Rare, uncommon or threatened, but not immediately imperiled; 21-100 EOs OR 3,000-10,000 individuals
- G4 = Not rare and apparently secure, but with cause for long-term concern; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
- G5 = Demonstrably widespread, abundant, and secure

## Attachment 3 – Photographs

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.



 $Photograph\ 1-Typical\ Octopus\ tree\ forest\ and\ open\ understory\ of\ basket\ grass\ in\ the\ Waimanalo\ section\ of\ the\ MVIS\ MRS.$ 



Photograph 2 – Hau thicket commonly encountered in gulches and small drainages.



Photograph 3 – West Maunawili on the slopes of Olomana had large areas of kukui/mountain apple forest with sea bean vines festooning the tree top canopy.



Photograph 4 – Octopus tree/Java plum forest with `awapuhi understory and large native `ekaha fern growing amongst large boulders.



 $Photograph \ 5-View \ from \ Demonstration \ Trail \ looking \ to \ the \ back \ of \ Maunawili \ Valley. \ Large \ trees \ in \ foreground \ are mango \ and \ within \ the \ East \ Maunawili \ section \ of \ the \ MRS.$ 



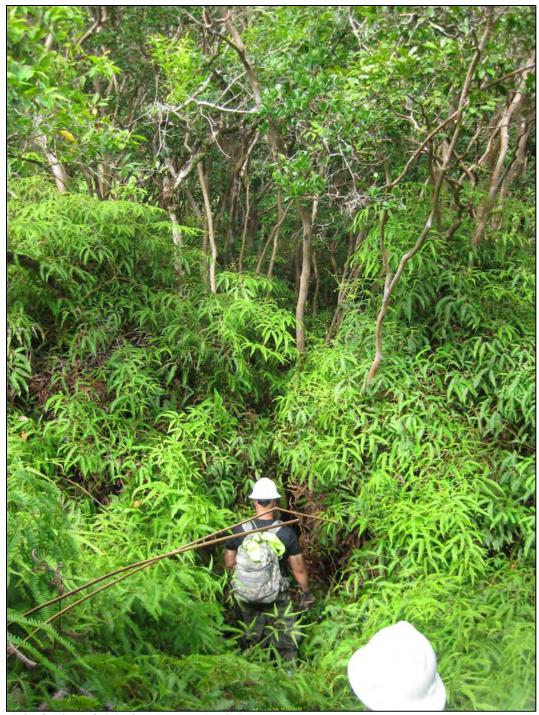
Photograph 6 – Typical dark forest understory of ferns and basket grass in areas within the East Maunawili section.



Photograph 7 – Large mango tree in foreground with basket grass understory fiddlewood and mountain apple in background.



Photograph 8 – Uluhe fern thicket in foreground, commonly found in the upper elevations in the East and West Maunawili areas. Olomana in background.



Photograph 9 – Sections of uluhe fern were overhead along transects.



Photograph 10 - Slope into small drainage in the Western Maunawili section with large strawberry guava trees.



Photograph 11 – Drainage with running water hapu'u fern and stands of strawberry guava growing on banks.



Photograph 12 – Kukui forest with coffee and Guinea Grass understory in the western Maunawili section.



Photograph 13 – Hala forest in the Western Maunawili section.



Photograph 14 – Upper slopes of Western Maunawili with uluhe fern and a native koa tree in foreground.



Photograph 15 – Fallow and sugar cane agricultural fields along transect with Ko'olau Mountains in the background.

### Attachment 4 - Field Data Forms

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

Project: PALI TRAINING AREA
Date: 8/2/2013 (FRIDAY)
OBSERVATIONS: M. LEGRANDE T19 0-400m: Schefflera, Nephiologis X, Cyclosonis X ferns, Ardisia crispa & A. ellipticum. Paperbark
SURVEY TEAM: Clyde Q. /W. TACOBOWCKI / Pablo

Project: PALI TRAINING
Date: 8/5/2013 MONDAY
Date.
OBSERVATIONS: M. LeGrande
Transect 19 -D Ended bransect before mapped End due to Sovereign Land boundaries. Abundant Mucuna gigante (Indigenous) (Seabean) festooning trees from T-19 600 to 800 meters.
Heneral Vegetation includes schooligera forest with basked glass understong. Java Dlum, Ardisia, clidemia, Macacanga, + gruyer-

Project: PALI TRAINING AREA
Date: 8/6/2013
OBSERVATIONS:  Transcol 17-D start @ 400 m - Scheffera forest w/basket  Grass / lawa'e fern open understony. Royal Palms  Past 600B @ small trail: grove of Terminalia cattapatrees
800 B @ MAIN TRAIL  990 B END OF TIT! Barren hill w/ lulei, Grevillea, Citnarexylum, palala fern, the Euglandina Shail Shells,
A) Nanga te to 714 Start @ 486 A: Follow bottom of drainage then turn uphill to right. Stope main trail. Marked W/ flassing
7/255

Project: PALI TRAINING AREA
Date: 8/7/2013 (WEDNESDAY)
M. LEGRANDE
OBSERVATIONS: TH: START below water pump house. in gulch - Kukui, Java plum, schefflera forest. Lauale fern undestong with ti. Followed existing footpath @ 163 m. Maugo, tropical almond, coconut, ti. Met up with previous TI4 @ Main trait.
T21: Walk up main trail to 1001 m 'Start'. Schefflera, Sapotaceae forest. Farmosa Koa, Guinea grass glong trail. @ 400 m Albizia trees. 500 m: ironwood. formosa Koa, Straw. guava, Schofflera. @ 000 A (End of Line) Albizia, java plum, Str. guava. uphill from trail.

Project: PALI TRAINING AMEA
Date: 8/8/13 (THURSDAY)
OBSERVATIONS: M. LeGrande  T20: Start 2t 8:45 @ 000 m coss main travil. Schefflere  Chrysophyllum, Ochna Spp. Guinea Grass and barbet wine  fenceline end @ 10:30. @ 1022 m
T99: 600 UP Steep Slope W/ Guinor Guass Formusa Kog, Koa haole, camphor, who thumbergis.
1101: 70m (extended) to 000
T18: Camphor, christmes beny, Gume, Gass. Schofflera Ul basket grass e 500 m. end transect e ado - Schofflerg, formosa, basket gras
Non-native   Weedy dominant

Project: PALI TRAINING AREA
Date: 8/13/13
OBSERVATIONS: 7:53 Ingress to T98 . Start @ 92m @ 8:00 am. Java Pum / Schefflera forest w/ Passiflora vines and
layale understong.  8:16 am done with 798.
Start T29 @ 8:28 am done @ T29 Java Plum, Schefflera, Ficus, tī, fern tree, Asparagus fern, Passiflora dominant.
Looked at T92/30/32 - 10 Delay Intil tomorrow due to Steep Stope
T31-000) Start @ 10:15 am : Java Plum w/ basket grass Schefflera, Parsifran
Linch 11:20-11:50
+21 - WILLIA (1:88 / 6 1212 0 / 27
T31 - Vestar+@ 11:50 done @ 12:15pm @ 627m
7700 - 000 ) Start @ 12:35pm
T100 - 000 ) Start @ 12:35pm Albizia, Formson Koa, 2 frags then hop auto Roedway. Follow to 157A -D ENDED transcot due to Steep Slope.
T33 - 474) Start @ 1:15 pm end @ 158m due to Steep Slape @ 2:04 pm Schofflere Forest w/ basket grass
Schoffiers forest w/ basket grass
· · · · · · · · · · · · · · · · · · ·
O Pare Bo seen. Very few native plants: Ulei
· · · · · · · · · · · · · · · · · · ·

Project: Pali Training Arec  Date: 8/14/2013
Date: 8/14/2013
OBSERVATIONS:
OBSERVATIONS.
<u> </u>
end C 7:15
Follow contour trail to find 734 tunn
downslope when you reach trail Curbing.
Veg: Schefflem Pres w/ bestet quess.
veg: saletyling (web w pester grass.
T34 - 075 @ 9:40cm
Va- Calafflera Lova Ninea Descifha
Vez: Schefftra, Java plum, Pessifkm mankupod, Kutcui.
134-455 END @ 10:29am
Golf Course -> manioured greens
<u> </u>
796
491
<b>T118</b>

Project: Vaining frea
Project: Pall Training free  Date: 8   15   2013
OBSERVATIONS: Golf Course Transects
(West) TIDLE (Greens) State 8:20 am finish @ 10 am
(WOST) T9 - Start @ 10:07 am (Greens Swept)
TIT- Sweep greans
east) T9 - Sweep greens
(ast) T106 - Sweep greens
Veg: all Manicured greens, mamental plantings @ Jedge's Of Surey Parres
Taxas.0

Project: PALITRAINING AREA
Date: 8/19/2013
OBSERVATIONS:  Sam @ Golf Course to find beginning of (T107)  Start Transect @ S:30 am.  VEGETATION: Ardisia elliptom forest w/ Schefflera, clidemia,  Cithorexylum, pala'a fem, Nephnolepis, Grevillea, Java Plun  Albizia.  X Small guld w/ Hom, Ficus, busketgrass,  royal palms, fern trees, lande.
Paused line -toosteep by Ulshe.
Crossed stream veg to cat's claw + awapuhi
C 500m - Albizia, Trimbleberny, clidenia,
Lunch 12-12:30
July Sapling observed
1:30 pm pau transect
(TII) Follows man trail - terminate @ Steep Slope above dirt road to Golf Corre. Albizia, java plum, Schefflerz
Designificant BIO observed.

Project: PAZI TRAINING AREA
Date: 20 AVG 2013
OBSERVATIONS:
Ingress to Tios from Golf Corrse @ 8:30 am  At fork in 1d take left trail.  Start upuill to N.
(T108) Veg - Albizia, jara plom, schofflera
Manyo, Ficus, @ indgety).
+ I , noni , royal palms, str. gueva,
Crosi gular al/ han + awaputi
12:30-100 Lond
Resume Tios end C dumpanes, Java, Kukmi, cats claux, Musuna, mut. apple
& Significant Blo Seen.

# Sovee Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii Jake's Team

Project: PALI TRAINING AREA
Date: 21 AUG 2013
OBSERVATIONS: 8:15 @ Olamana trail Head
8:30 Ingress to (TIO)
TTO-500 @ 9:45  Vegetation: Kukui/mointain apple forest w/ Mucuma  draped in trees. Understang mostly open w/ busket grass, Christella, Laua'e, bare dirt Kukui nuts, maile pilau, lilikari
Paused line due to Steep supe Resume - Vegetztion: Chidenica, Pluchea, maile pilae Cats claw, java prum, Ardisia Elliptica, Scheffe Arbitia, xmas berny, voyal pulms, laurie.
pala'a relephant grass.
11:45 - @ 309 meters FND too Steep
12-12:15 bonds 12:15 Walk marka to find TII
(2:50 pm Start (TII)
Veg: mourtain apple, Kukui, mucuna, Ficus.
& Significant Bio Noted

Final Biological Monitoring Report Pali Training Camp, Oahu, Hawaii

Metine for chamis		
21 Aug 2013 Bio-Chyde Imed.  25 Los 2013 Bio-Chyde Imed.  To No bio of increat.  Shampoo ginger: Culmorana   backalara.	Single press, momental (Piplover Blidge)  about road, motor race  Tuts Same as Tuts  Sections of has fored, otherwise  mixed won-racine forest of albra, Trema  they been buing and sector, hote  of Arthropteman, maile pilos  of Arthropteman, maile pilos	Modify Trema (albizing forest with Schuler standary grova.  Schuller, standary grova.  Christelle.  Christell
003	B4-12	Revision

Contrac TO 000

r 2014 ision 3

Project: PALI TRAINING MEET
Date: 22 AVG 2013
OBSERVATIONS:  Jugress At Olomana Trail Head @ 8-45apr  9:45am @ 10 (FII) Start @ Munt apple grove  Veg: Guava, basket grass, lamae, royal pa
Gulch area: Java Plum, Schefflera, Ficus, Ekaha, basket grass, maile pilau,
pig damage / vooting evident.  Ridgetop Veg: Albizia, citharexylum, Grevilleg, clidenia.
Ø Significant Blo Observed.

### BIOLOGICAL DAILY FIELD REPORT LeGrande Biological Surveys Inc / Clayle Inche, Bio w/ Kevin's term

P	roject: MAUNIAWILI PALI
D	Pate: 22 AUGUST 203
	Summary: No significant bio on tolay's transects.
0	BSERVATIONS:  Finished T 54 heading NW from HQ - No 5:0 of significance  Primary to non-native to-est of tellallizia, fiddlewood (Citha)
enc-en	Primarily non-native forest of tellalissia, tiddlewood (Citha. rexylum), Toona ciliata.
	Guiches with Eukis a mountain apple, unleston of sharpso ginger, besketgrass, Arthrostemma; maileplieu a common vine
	Sections of criss-crossing has branches, some large is likely Chinese bangan, single large Fiers elastice by Pandany's technics true
TOTAL COMMENT	Several stream crossing, much how along those, will Arthroster may booked grow; also a fourter of agreetlets, both dry and running
	Thick strantarry gueve forests w/scattered retree happy free ferros (Cibalium chartissoi)
	Section of rative where fern on sleep (over 30%) slopes
NOSACAAA	740 - No significant bio - mostly flat and associated with well substitle - section of edible from Opphisium esculation
	T113 - hedry found NW and steeling of man dowl roal
	lots of coffee, har, Anthroslemma, to matire vegetation
- Americano	THE heading SE - no bis of significance Koa planting adjacent to transcell to NE on HARC land
	Transect thelly non-retire except for Mucura giganley vives mixed w/ Mile pilaw, 5 vyar cane
	TOS - no bio of significance hots of fiddlewood, also alsize, sahellers, Toona
	Only getire sees was pales fern (Spherioreless schromsss) - common from
<del>,</del>	shortly a feet reaching flowing stream, translet 68 chopped due to

Project: PALI TRAINING ARE-A
Project: PALI TRAINING ARE-A  Date: 8/26/2013
OBSERVATIONS:
8:30 am - Ingress to [T112]
Start @ trail 934m
Veg: Paperbark, laua'e fern, java plum, Christmas berry, Citharexylum, basket grass, maile pilau, Albizia, Waiawi, Schefflera
@ Paused transect @ gulch - too Steep
Resume and Cross gulch bottom (veg: +Tileaf, java plum, royal palm.
& Five ants abundant all along transect.
11:10am END TIIZ & Northend fotal of 641 meters for 2 segments.
11:15am) Walk downslope to [710]
Start TIO @ north end Cout out Section to north = too.
11:30am - Veg olong TIIO: Java plum, Ardisis ellip.  Olidemia, Schefflera, Nephrolepis, Waiawi,  Citnorexylum, Ardisia crispa.
12:15 lunch 12:45 resume TIIO veg - Ochna, Pasgiflora foetida, maile pilan.
Han in gulches @ south end of transect.
END @ trail /transect to South impenitrable (Ham).
D Significant BIO observed.

Project: PALI TRAINING AREA
Date: 8 27 / 13
OBSERVATIONS: Ingress to (T12) from trail. Find area near Start.  Too Steep to get to Start.
Too Steep to get to Stevt.
TG H8) Junction: flagged junction with bue/Wht
Start travelling West en (Tb) Veg: Albizia, Bischoffia, Schefflera, Cituarexylum tamais fern, ochna, basket, Monkey pod, Cats claw.
basket, Monkey pod, Cats claw. x readway
X Foraway X Stream
Hay + Mucuna after Stream X.
* Stop at small hill in ath/ Guava forest
-linch -
Travel back to beginning of The to put in QC length.
Find (T5)—C. 12:10 frag begin w/ blve/wht.
travel west along transect to dirt roadway
Neg: Albizia Citurrexylm, basket grass Non: (2), Elaphantopis, Bischoffid, lantuna, guava.
D'Significant BIO Observed



Project: PALI TRAINING AREA
Date: 8/28/2013
OBSERVATIONS:
Resume (Tle) - Veg: uphill after flume -
Strawberny guava, Schofflera, palaia, akia.
Metrosidenos polymorpha (1 trea)
, ,
Mango, Eucalyptus Sp.,
10 am - Radio malfunctioning return to golf carts
to get new radio from QC.
Positione To many billion I laigh win Ken william
-> Resume To near hilltop w) large mango tree. Veg: stransbern guaval, royal palms,
Schefflera, Clidenia, java Dum,
Passiftora Suberusa,
(T5) Start near water pipeline @ 1:55 pm
13) Jett i visus obside produce le 1 vis pin
bare dirt (recent construction for water line)
Veri Maria (12) Cura Maria (12)
Citrarecytom, Schoffera, Royal Palms,
Vely: Abizia, mango, awaputi, basketgrass, Citharcoylum, Schoffiera, Royal palms, Bischoffia, Kukui, Passifina edulis,
Macaianga.
Significant Bio observed

### BIOLOGICAL DAILY FIELD REPORT LeGrande Biological Surveys Inc - Clyde Ineda on Team Kevin

Project: MAUNAWILI PALI
Date: 28 AUGUST 2013
OBSERVATIONS:
Hikedon Koolaugoko Trail from hairpin turn on Using "neundering transect" system
Lury sections of Inddewood canopy (Coth praylum cus strantery quare (Psidion cattleianom), some Kukri
shauter avance (Isidium cattleianum), some kuku

Interston of awaren (Linguer zeromsel), blenwood grass,
Christell L. Sern, Arthroslemma, mule's foot Gern (Angiopheris)
Native component: Metrosideros, Viche Gern, papa fern, hapor
Com (Cobalism chamistrai), Lepisorus ferm, Papila kepas (Pisonia
umbe (). Lora, birli- no el lera (Arglenium nidus), i e i e (Frey cinella arbrea

Koa	- CAc	ecia ko	j		, , , , , , , , , , , , , , , , , , ,	#000##################################	······································	S AND
No	rare	orend	anglied	plants	n Had	doring	4. Lays	Lucher Mary 3 60 Company
YELHAMAN CHU (ON A								

<del></del>
KASAMONEN MATARIAN MA
······································
<del></del>
mariintaraanaanaanaanaanaanaanaanaanaanaanaanaa
W2764W147777

Project: PARI TRAINING AREA
Project: PALI TRAINING AREA  Date: 8/29/2013
OBSERVATIONS:  Daire in margane - Produce as the Terre discreted to
Pain in morning - Roadways wet -> Team directed to Survey Isweep paths + roadways within HARC area /Ag Field
Upper Field W/ Sugar Cane - PATH I Veg: Albizia, clidemia, wedelia, Pterolyxia, CE, Mimosa, Crotzlana.
PATH 2: Walk up Roadway to Electric four.  Trema, Atbizia, Cecnopia, Gumea Grass, awapuhi, Schefflera, basket grass, maile pilan, Coffee.
PATH 3: Pala'a, Straw. Gnava, Christella, Setaria palmifolia, Desmodium, Elephantopis, (qual 2) Centella, Oxalis, maile pilau,
Oluhe, Koa haole, Polygala, Moa, Plantago, Chamaecrista, Spermacocce, Phillipme orchid.
Bird-Shama thrish, leaturix
Higher elevation: Uluhe, Metro sideros, Dymapha, Prochoe carolineusis, inonwood, Yelie
Oc strip - Indigofera, Wedelia, Citharexylum, Arbizia, Nephrolepis. X
Passpalum Scribiculatum, 'Ulu Trees, Kukui, Coffee, palmgmass (all dawashire of frais)
Significant Bio observed

# BIOLOGICAL DAILY FIELD REPORT

BIOLOGICAL DAILY FIELD REPORT LeGrande Biological Surveys Inc Clycle Imade W/ Kevin's group

Project: MAUNAWILI PALI
Date: 29 AUGUST 2013
OBSERVATIONS:
) Conducted "meandering transect on Queen's Road
Parket jeep at miduay point and hikel to upper end ca. 500 mele up the road, and surreged back toward jeep
Forest completely non-nective, only scattered happy for (Cisotium chamissi) and bird's-nective (Asplenium nidus) noted
Otherwise, main campy trace include lots of a bircie (Falcetaria matuccano), royal falis along aqueluct rowler (Roystonee regia), and other campy tree: Toola, mango, Schofflere, Macuraya mappa, white moho
Growndower mostly Optismenus hintellys (barketagnes), Christelle fern, wedelin (Sphagneticola tribable), some ape (Alocasia macropritos) tarovina
NO SIGNIFICANT RARE/ ENDANGERED PLANTS FOUND
2) Meandering franced adjacent to HARC koa planting by T74
Forested sections dominated by non-native trees: Albiria, Toora, kukui in wetter guiches with mountain apple, Spatkodeus some section of how foresty Cecropia
Underston doni when by non-rative plants! Op! smenus (baskelymas), Arthroptemas, a waputi, Christella fern, palagrass, lavae Sera
Only reduce plant roted was palala (Sphenomeris chiransis) fern on road banks
Some open seed one with tell Guirer grass (Panicum maximum), California grass, homohomo grass (Commeline differen)
NO RARE / ENDANGERED PLANTS SEEN



Project: YALI TRAINING AREA
Date: $9/3/2013$
OBSERVATIONS:  Ingress into T113 by Tail.  Start @ T113 Veg! Waiawi, Grevilleg, Kukui, basket grass,  awapuhi, Christella x, Gibotum gaud., clidemia Ptenslyxia, tī, tustralian tree fern, Schefflere.
Slow going - plenty of hit.  Pablo marked Arch. Wall.
Rocks W/ Moss, lichen, + Gonocomus fern.
Passifrom edulis unes in large mango trees. Psilotum Mudum. Ficus Chinensis.
level area w/ maintain apples and basket grass. Abundant pig hoting in area.
CNSS T91 -D Veg: Strawberry guava, lauae, Schofflera, Clidemia, Julyne, gragir.
Finished day Walking Maunawili fulls trail and Sweeping.

### BIOLOGICAL DAILY FIELD REPORT Cly de Imale, Bio LeGrande Biological Surveys Inc

Project: MAUNAWILI PALI
Date: Sept 4, 2013
OBSERVATIONS:
Accompanied demo prep team (6:1 be-+/Mark) to demo
Vegetation all non-native Overston of albizia with Trema, Spathodia, C. therexylon eardatum Wet thick underston of Commeline diffusa, Arthrostemma, Ludwigia octoralus, Bidens alba, some planted torch ginger, and Prederia footide forming vining canopy over trees
No rare l'endangered plants in vicinity



Project:	PAI	1 TRA	HININE	<u> 4728</u>	in f	<del></del>			
Date:		C Para	4, 2	2013		<del></del>			
OBSERVAT	rions **	5: Star	4 Sv	rvey	Sweep	along	"Quee.	1/5 Road	d C
			3.5					Cats ele	
<u> </u>	7 >	Calle	1 00	de do	base.				
							**************************************		
									***************************************
	***************************************		***************************************			The state of the s			
MALE VALUE OF THE PERSON NAMED OF THE PERSON N									

Clyde Imaka, Bio W/ Jake's Jean

Project: MANNAWILI PALI
Date: 5 September 2013
OBSERVATIONS: Queen's Road III transect
Continue with rood survey ( reaching transcel ad acent to
Rochsile vegetation all normative in morning Overstom of alkizia, Formason Loa, Schollera, mango, Trans
Underston mostly fiddlewood, gound cover of Optismenus historias, Christella, Arthrostemma, Wedelie, Pseudeiephaniapus
Section of sold seast mall on left side headen in road with sold forest as how and very little understory, was a will maden heir ferm
Catifician more previent by I mil break point
After lunch continued on distroad more toring. More casticalaw precent among vegetition after lunch some sections with grawburngy was replacing habor sleep rocky stopes; colonies of Chinese far polar also present.
At to lay's end point, mixed non-native forest of albizia, silk oak Java plum, fiddlewood, strauberry grave, Macaranga mappa, with best grass understory
No rative plants seen foly

Project: PALI TRAINING AREA
Date: 16 Sept 2013
OBSERVATIONS: M. LeGrando
Sweep team up to 76 by Maunawili trail -D
76 - Ulvhe, grava, paperbark, straw. grava,
Cross upto 13 - Whe dominated, lilikoi, Str. quava basket grass, chidemia,
Up hill w/ ironwood + Straw. Quava, Sphagnum mos
Frag abundant
Cibotilin gardidiaudii tree ferns Spirse.
Walk through use apple grove w didenia, palala, busket grassille grove w didenia,
Hit Demonstration trail, walk to Head of
Maun awili fall trail.
Metrosiders poly, Koa, Ulwa wl
Straw gwara, albizia, Silver oak
Squificant Blo Seen



Project: TRAINING AREA
Date: 17 September 2013,
OBSERVATIONS: M. Le Grande  Drive up to area near (63. Ingress Start Sweep
Vegetzman - D Kirkvi, albizia w basket grass understung- palm grass understong, Pteralyxia
Follow Meandoning Transects down through  + 63 / T65 / T67 / 755.
End @ TSS Follow and pull Flagsing
DARK GROVE of Albizia + Coffee. Understant of clinical palaia, cipotium gaud, Australain tree tem.
Oluhe, Straw. Guava, ion wood, litikoi , lauaé hable
9 grifficant 1310 Seen

Project: PALI TRAI NING AREA
Date: 9 18 2013
,
OBSERVATIONS:  Start w   Sweep head up Maunawili Trail - Start Sweep  after bench we camp last stop. Fund ordnance  t frag. Stopwork. Survey area for BIP
+ frag. Stopwork. Survey area for BIP
BIP VEGT - Strawbern, guava, Ironwood, Uluhe, biras lilikoi, Chidomia, basket grass, Leathurs & significant bio
- Pulled from sweep, sent to survey.
joined survey a Linch.
Started (+143) - O clidemia, Githarexylum,
Split @ (T66) Same firest w/ gold fem, Blechnum fern other weedy species.
OSignificant bio noted

LeGrande Biological Surveys Inc Clyde I made, B:0
w/Jike's group: Clyde/Keola/Mana (arch)
Project: MAUNAWILI PALI
Date: 18 5 EP 2013
OBSERVATIONS:
TIF3: Lots of Crthorexylm cardebus forest, with Clidemia, Nephrolepis brownii Neline plants: single wiketorenia o alvensis (akia), some Crbotium
chanisson, loke of whe
TIG: All non-matine regulation; norsen site reached w/ polled areca pulms, offer potted ornamentals, single 'awa ylant (P. per methysticum), bananas
Transl with brokertlers: C. Thereerylon endelin freel with Arthroteum, barketyrus, scuttered royd falms, has, it we fern, Greville volveta (Silkock), some standerry years
Some sections of rold vluke form over head high will senthered
After work, == T66: 30 kd when been with scattered  Java plum (Syzygium Comini)
No rare or entire enlargered plans seen. Netwes seen: white, alie, heav, moa hav. No retire birds, only shown thrush noted

Date: 19 SEP 2513  OBSERVATIONS:  1) Explosed E end of T66 first, in thick yield from grandender; because it was derived tragindo a dreambed, but deathed to go and busher.  2) But thacked and headed along T66 in W direction is 1. A Cocharagian cambridge force of will chidenia, Neghnologia brownia, Arthurstommen, Schefflere, Factoria spatial.  Ended français where it doe pped into a slage gully there again it is sold interestation forced with schildred To at aliefa charges of fi some streams on your pain greeness is skellfered, this of Clidenia, Neghrologia Brownia, bushers there is sold flavour, Nephrologia Brownia, brownia trages if fiche a tradition.  No restricted both allows fever stem, also exisping the Conomic common motion to proper sold from the health forms, pulmagrass, barrier grant, scattered bomana plander.  National scan whose position making, with availing open found of Arthursonia.  Best pafel of remaind notice forget sale, with lots of regard segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment (1) ones, along with the skip, single free of papels segment.	BIOLOGICAL DAILY FIELD REPORT LeGrande Biological Surveys Inc Chyde Imah, Bio W/Jake's group (Chyde's subgroup)
OBSERVATIONS:  1) Explored E ent of TEG birst, in thick while form a common content is because it was descenting into a strambed. In described to go no familian.  2) Consideration and headed along Tob in W direction. Rephologic branch, Arthordones, and there forest will children, Rephologic branch, Arthordones, and there is a clean familiant forest with school and the school of the same adjoint it is sold Cathordones, readered from the school of the same estimationing grant of the strange of the	
1) Explored E ent of T66 first, in thick vishe ferm accondition because it was descenting into a strembel, believely to go m further  2) Backtracked and headed along T66 in W direction  50! A Cotheren lum cardeban forest wil circle in Neghologic bernnii, Anthoretenna, Scheffen, laddina seatist  Ended times where it doepped into a steep only Here again it is solid Cotheren forest with schefulad  To it is simply of the some strandomy gueva, pala- grass, Scheffenz, lats of Clidenia, Nephrology drown is  vines of tradeica toolide  No restince but alwhafers steen, also epiptytic 60hor- cornus ministry, hepsorus thankers amus  3) T b2 survey brushwating Much Cotheren low, hepsorus thankers amus  Rus Dom lavy tolia, Christelle lenne, palagrass, baskel grass, Scattered bearance plants  Nature stem when, Psilotum nodum, hepur form  4) T 60 - Pretominately non-native, with maily open forest of Arthrelia ma  Best patch of remain reline forest seen, with lots of heavy stems, is a vine, single tall this, single tree of papele keypar (Pisonia), along with a known	
1) Explored E ent of T66 first, in thick vishe ferm accondition because it was descenting into a strembel, believely to go m further  2) Backtracked and headed along T66 in W direction  50! A Cotheren lum cardeban forest wil circle in Neghologic bernnii, Anthoretenna, Scheffen, laddina seatist  Ended times where it doepped into a steep only Here again it is solid Cotheren forest with schefulad  To it is simply of the some strandomy gueva, pala- grass, Scheffenz, lats of Clidenia, Nephrology drown is  vines of tradeica toolide  No restince but alwhafers steen, also epiptytic 60hor- cornus ministry, hepsorus thankers amus  3) T b2 survey brushwating Much Cotheren low, hepsorus thankers amus  Rus Dom lavy tolia, Christelle lenne, palagrass, baskel grass, Scattered bearance plants  Nature stem when, Psilotum nodum, hepur form  4) T 60 - Pretominately non-native, with maily open forest of Arthrelia ma  Best patch of remain reline forest seen, with lots of heavy stems, is a vine, single tall this, single tree of papele keypar (Pisonia), along with a known	
2) Barktraked and heiled along Tob in W direction  Solid Citharley (um caudalum forest w/ Chidenia, Nephroleps) brownii, Arthrottemma, Schaftlera, Paedicia Footide  Ended franced where it dispaed into a steep gully Here again it is solid Citharetalum forest with schaftled Toonk ciliagia, clumps of fi some structuring guara, pain- grass, Schaftlera, Irls of Clidenia, Nephrolepis Brownii, Vines of Ficher's footide  No natives but alway fern feem, also epiphytic Gono- cormus minotus, hepisorus thunkergianus  3) T62 survey Ibrushouthing Musik Citharetaylum again, with Arthrostomma, Cidenia Passition lauri folia, Chriselle Lerns, pulmarass, baskel- grass, Schaftered banane plants  Natives seen whe, Psilotum nodom, hepou fern  4) T60 - Pretominolog, non native, with mush open forest of Arthroleonia  Best palch of remain relive forest seen, with lots of hepus seen; is every single full ohia, single tree of gaple segan (lisonia), along with a kokus.	
Sold Cetharley lyn cardalum forest w/ Chidenia, Negholepis brownii, Arthortemma, Schefflere, Paederia footide  Ended francest where it dispped into a steep gully Here again it is sold Cetharekylum forest with schildred Toomk ciliadia, clumps of f1, some strowborm gueva, palm- grave, Schefflere, lots of Clidenia, Nephrolepis brownii, vines of Pickeria footida  No natives but uluhe fern feen, also epiphytic Goho- cormus minutus, Lepisorus thunkenjanus  3) T 62 survey brushoutling Mosely Cetharekylum again, with rethroslamma, Clidenia, Pas stora lauri folia, Chitelle ferns, pilmgrass, baskel- grave, Scattlered banana plants  Natives seen uluhe, Psilodum nudum, nepuu fern  4) T 60 - Predominila, non native, with welly open forest of Arthories me  Best patch of remains advise forest seen, with lots of Nepuu fern, i eve vine, single fall ohia, single free of graphe keyau (Pisonia), along w/ t i & kuku.	DEXPlored E end of T66 first, in thick vive fern grandwar; because it was descenting into a streambed, we decided to go no further
Here again it is sold (itherexylum-forest with schillred Tounk ciliaria, clumps of fi, some strowborny guara, palm- grans, schefflera, lots of Clidenia, Nephroleps Brownii, vines of Ficheria foetida  No natives but Muhe fern seen, also epiphytic Gono- cormus minster, Lepisorus thunkergianus  3) T62 survey Ibrushwetling Mostly Citherengium again, wil Arthrottomme, Cidenia, Passillora lauri folia, Chritelle ferns, pulmgraus, bastel- grass, Scattlered banana plants  Natives seen whe, Psilotom nodom, hepou fern  4) T60 - Predominately non-native, with westy open found of Arthrollenma  Best patch of remaind native societ seen, with lots of hapvy fern, i eve vine, single tall ohia, single tree of papele keyau (Pisonia), along w/t. 4 km ku.	501. 1 Citharlas los cardalis forest w/ Clidenia, Nephrolepis
cormus minutus, Lepisorus thunkergianus  3) T 62 survey Ibrushcutling Mo sly Citherenylum again, w/ Arthrotlemma, Cirdemia, Paus Dora lauri folia, Chritelle ferms, polingraus, baskel- grass, Scattlered banana plants  Natives seen uluhe, Psilotum nudum, hapuu ferm  4) T 60 - Predominikely non-native, with webly open forest of Arthrotemma  Best patch of remaind native forest seen, with lots of Nepus fern, ieie vine, single fall ohia, single tree of papele kepau (Pisonia), along w/ ti & kuku.	Here again it is sold Citherekylum-forest with schilled Tounk ciliata, champs of fi, some strawborry guera, palm-
Mostly Citherenglum again, w/ Arthrostemme, Cirdenia Passitiona lauri folia, Chattelle ferms, polingrass, baskel- gras, scattered banana plants  Natives seen whe, Psilotom nodom, hepov ferm  4) T60 - Predominately non-native, with mily open forest of Arthrollemme  Best patch of remaind rative logest seen, with lots of Napov fern, iere vine, single fall ohia, single free of papele kepar (Pisonia), along w/ ti & koko.	No rativez but viule fern seen, als epiphytic boho- cormus minutus, Lepisorus thunkenjanus
4) T60 - Predomindely now native with much open forest of Arthrodien me  Best patch of remaind native forest seen, with lots of report fern, i eve vine, single fall ohia, single tree of pupils keyas (Pisonia), along which to koko.	Mostly Citherexylum again, with Arthrostomma, Cirdenia, Passillora lauri folia, Christelle ferns, filmgrass, baskel- gazz, scattered banana plants
papele kepar (Pisonia), along w/ ti + kuku:	
No rare or indempered plants seen today	Best patch of remaind rative forest seen, with lots of report fern, iere vine, single fall ohia, single tree of papels kepai (Pisonia), along which to koko.
Shama thrush, mynal broken noted	No rare or endangered plants seen today Shama thrush, mynah birds noted



Project: PALI TRAINING AREA
Date: 9 19 2013
OBSERVATIONS: M. LeGrande T146 near T74
tike up Mannawili Trail to BIP area, then down to North Into Waiawi, ironwood forest with mango. Clear understong. Sweeping as we walk.
Heding downslope with olihe fern, Blechnum fern, Follow drainage up to steep area where we turn around and go back to Start.
· Find ditch - follow it Sweeping - Veg: Uluhe, palaig, Christella, ironwood, Clidemia, hala, Cibothum gaud. + Hau, gnava, one Metrosideros polymorpha, (Bhun T74+T75)
Drop down to Coma's Stream! veg: awapuli, Hau, Schofflera, Nephrolepis, Tana'e, transmitted, Pterolepis basketgrass, Phillipine ordid, palm grass, Blochnom, Christella, Mango, Citnarexylom, pakahakalla
, Uphill Section to North dominated by Haus on broket grass understary.
· [mont on vidge w/ Waiawi treos, clidemia, busketon
Walked NE to 175 then to 1113 Sweeping through Citnaresylum, clidemia, awapuhi, rose apple, Straw gram
Ø Significant BO observed
Native Species included: Metrosideros polymor pha Pandanus tectoros Cibotion Gravdichedii Lepisorus thunbergianus (pakahakaha)

Sweep Team/
Kevin

Project: MU RAINING AREA
Date: 9/24/2013
OBSERVATIONS: M. Le Grande
(T149) (near T4) -> strawbern chave of uneverylyn.
Blechnom fern, Ardisia elliptica, schefflera, busket- grass, clidemia, Gutella, Christella, fī, Java plum.
Wear Stream - Kukui, mango, schofflera
v ·
op Small Side drainage - awaputi, hala, Scheftlera, to.
On Dide Stope 11/51 11 trail
Up Drier Side Slope w/ Small trail. Hala, pala'a, phillipine orchid, pūkiawe, Metrosidus polymarphe, Bischoffia, 'akia,
Metrosidus polymorphe, Bischoffia, akia,
dava rum, menter, the melocus, elephantiques,
Nephroleps x, Phyncospora.
Droy down Stope - Poyal Patrus, chiclemia, busketgras ti, mutu. apple, x Stream.
typ to vidgeline w/ paperbank, Encalyptus, Schoffler, Cituaresylm, lanale.
schotfler, athanexylm, larate.
Down Supe, one large Kamani tree.
welk op Makawas Stream a bit.
FT 113) In Agriculture are. Elephant grass.
Mimosa prodica, Emelia, coffee, Pteraloria, han.
(TIT8) Cotnareaglum, Siche fflora, voyal palm, Oliderwa,
macaranga, Albizia, Courping to Golf corre.
(T8) From Gulf (aver up 8 lape: Schefflera, Citnavery un w basket grass. Arborde
hipple palm.
P 8

#### **BIOLOGICAL DAILY FIELD REPORT**

Project: MAVAIAWILI PALI

LeGrande Biological Surveys Inc Chyde I make, Bio
W/ Jekeiz group; Keoln's subgroup

Date: 24 SEPT 2013
OBSERVATIONS:
Worked on segment of TS4 NW of that brush out yesterday
Now designated as TSHY, this section was previously flyged on 21. Asy (Kevin's team), and biolarch wiveys were love of that time
Sioresurey - be overe of programe in querel vicinity (not alone transect robbe)
Sections of Albizia overstory with Cotharery un cautabon (Credle wood) & other berry goars Schefflers Unlesting i shampoo ginger, baskety 255, Christella, Anthose
End point of TSU's stopped where Kevin's group left end-point flugging on 21 Ava Vegetine is known overston wil now rose apple, mountain apple, Cithanexylum Vinleston of shampoo ginger, Oplismenus, Christelle, ti, Angingt Dies corea pentaphylla, Clidenia, Napov (maline ferm)
Did short segment of TS4 standing at gesterling's ent point w/Jule group fildlewood forest W/strawborn quava, Clidemia, Paederia foetide vines, Anthrostemms, Christella, open sider with wedels, Hilo
gase, Persottore workfile, Commeline, Elephanlopus, Whefern, milei-foot fern, Sporobshus pyramidenes, Dampia graza (invarint graza)  Accompanied team to brushert segments of TII8 and T8.
Total reely bio-surveyed previously Macarage,  The most of very tell Allinia forest w/ frog I silms, Trans  Spallades, Chines Fangeles, governouse of wedge in, bushed,  grass, onlygass, Christella, Anthrophymus

TROSES CERTE KATALO DE ESTADO.

TO A PERSONAL ESTADO.

14:51	hort down hill come I down it is a
	hard downhill segment of mein enly road at
Zink in the second	
	flen, Chamin jurkesty of wedden, side
Schall	Hen, Chalmin , understoy of wedelin, Silva
	wholing laden footbla
	ere plants seen on this segment excession
and the second of the second o	Lange and the first of the second
- Marketiganizing over the street, or	
terretalism faltas, eere eer teersameere faa.	
n constantium er som i Stein er e	
estano conseguidad personale conseguir atual conseguir atual conseguir atual conseguir atual conseguir atual c A seguir atual conseguir atual conseguir atual conseguir atual conseguir atual conseguir atual conseguir atual Conseguir atual conseguir atual conseguir atual conseguir atual conseguir atual conseguir atual conseguir atual	
terrepolity spectrum is true to the meaning	
All Andrews and the second	
seedhapelii Sterra ee ee ee ee ee ee ee ee	
	The state of the s
e sagangan ay ee ja ee	
monopolisado Visional e de la composición del composición de la composición de la composición del composición de la composición de la composición de la composición de la composición del composición de la composición de la composición del compos	
e e empleada estados en el entre este este estados estados estados estados en el estados estados estados estados en el estados estados en el estados estados en el estados	and the second of the second o
Constitute of the Constitution of the Constitu	
entre entre generalise en	
na sinte di periodi di disensi di periodi di di periodi Antigrafia	
er trapitant framer er met er	
ing grant Andrewson (1997) and a second and a	
sanga Palilanga sa	
e Adoptic de Mercia de Como de Caración de La como de l	
*	
engen er er gemeent weren van de versche ver	
Maria and a grant and are an area of the second	the control of the co
and the second of the second of the second	and the second s



Project: PALI TRAINING AREA
Date: 9/24/2013
M.LeGrande
OBSERVATIONS:  Ingess into Pali Demonstration trail. Dropin mean (above)  (T/13) Start Sweep @ (T/50) > veg: rose apple, clidenia,
Walawi, Schefflera, Ironwood, Citiorexylum, Uwhe,
Stop near Steep area w/ uwhe. Continue downstop to open area > Start heading down to 113/114 - D Headwater of Qma'o Stream - >
Veg - D Mango (large frees) Straw, guava, Clidenia, ironwood Pferolepis, awapuli, australian Tree Fern,
exaha (birds nest fern), mbuntain apple, pepperania sp.,
walk along drainage w/ Schefflera, awapely, fust. tree fem, Large Pisonia, Cibotism.
Lunch @ Laydown
(152) walk up ridge behind lay down
Up to 168-1102
Ulune, Citnarexalum, Metrisidens polymorpha,
braillea pobusta, Nephrolepis, Esa.
& Significant Bio Noted

PALITRAINING AREA
9/26/2013

M. LEGIZANDE - SWEEP TEAM

TOF > Start sweet at Laydenn Yerd. Follow For a bit then jump not Roxdoay Veqmonkeypod, Autralian Tree Fern, basketgrass, Ptendyoia, Rubus rosifaios. Cecropia, Ape, Kukai, cats claw.
Road Veg - Albizia, Citnarexylum, basketgrass,
Splagneticola.

Tun Up Stream - Veg: Han, Wht. Singer, Kukni, lilikoi, Maile pilan, Loyal palms, Begonie

Torn up Steep Slope out of Stream to frat ridge top - veg: Albizia, Cithareagum, Setaria palmiflia, Find 154 head back to Laydown.

Near Golf Corse (T153) - Guinea Gunss, Dolygala, Morriosa, Adisia, Spragnetizale,

(TISH) - Waiawi, Cats Claw, Maile pilau, han, lilikai, lande mango, Stachytarpheth, Grince Grass, and by power line

9 513 Bro Worled

Project: PALI TRAINING AREA
Date: 9/30/13
OBSERVATIONS: M. LeGrande
SURVEY GRID 01 - V (near T5+T6) before veg clearan
Royal palms, besket-grass, Wedelia, Maile Dilau, cats claw, Albizia, Pteralyzia, Schefflera, mango, Trema, Macaranga, awapuli near Stream.
Trema, Macavanga, anapuli near Stream.
GKID 02 -D 50×125
Schofflera, Albizia, Kutui, mango, Basket grass, cats claw, maile pilau, Christella, Bischoffa, Ardisia elliptica,
Christella, Bischoffea, Andisia Elliptica,
Cituarexylon, avapuni, lanae.
GRID 03 - D 100 X 50 + 100 X 50
Royal Palms, Maearanga, Ardisia elliptica, Christella albizia, Schofflera, Elephantopis, Chidenia, Wedelia Areca Palms, +I, awazartii:



Project: PALITRAINING AREA
Date: 10/1/2013
OBSERVATIONS: M. LeGrande
GRID 03 - Frish Eurey + Clear of Grid. No additional Species Observed @ grid.
GRID 04 -17 Near TII3 next to Food @ HARC Sugarcane field.+ powerline.
veg: Elephant grass. Wedelia. guinea grass fallow agriculture field.



Project: PALI TRAINING AFEA
Date: 10/2/2013
M. Lebrande
OBSERVATIONS:  GRID 10 T55
Albizia, banana, guava, Grevillea 106, Kukui, 10st. tree fern,
GRID 11 Otherexylun, St. guava, Clidemin, basket Grasc, Ptenelyxia, Stachytarpheta. coftee.
(GRID 12) Grava, Nephrolopis, Pterolopis, Clidenia CHarex, Christella, awapulu.
(Grid 13) Cituares, Schofflern, St. Suava, Clisternia, Blechnom, anate

LeGrande Biological Surveys Inc Cly Le Im.	alk, Bio
WITakes	group: Jeke/Chyde/Mana
Project: MAUNAWILI PALI	6 brush coffers
Date:	
OBSERVATIONS:	
Ascentaried group to comple 13 and 14 (both were biosurve	ete brushcutting of grids
Grid 13: Dominated by Cithare	rylum carlatum (fidliowood)
With scattered Schefflers Lect Passafle a Varifalia and Passe	opus free, common gurva;
Clidenia, and scattered not	wood with scrittered schefflera
in afternoon worked on new ar	
Grid S: Mostly fild leved, WH rough plus isomet: Africa	h scallered large Albizia and
royal plus isometis Advice	shirtellus (backetgrase), Authro-
Hemma plingers sharpe ging	ger, Christella ferd, white ginger
No rare/enlangered native pla	ichs urted to the
Only on notice speece seen.	PALA EXX

Project:	PACITRAINING AREA
Date:	10/3/2013 M. LeGrande
OBSERVAT	
	Fregress from Demonstration Trail.
	Relatively open unlerstry - Citrarex, Schafflere, maile billing, Clidering, Christella, basket of Grass, Kutrin, Large mango, ti, quare, Grass, Kutrin, Large mango, ti, quare, grave, one Mature Dapala Repart (Pisunia Sp)  One Mature Dapala Repart (Pisunia Sp)  Lander haole Peralyxia, chinese banyan,
	GROFF  2 take Manso theestass, open Onder Style of basket alass, dwapth Christella, Mnt. apple.  Awapth Christella, Mnt. apple.  Lama trees & Eastern permuster.  Neyte of Grid
	J significant Bio hoted.
	Al native desertation

BIOLOGICAL DAILY FIELD REPORT LeGrande Biological Surveys Inc Clyde Imake, Bio W/ Jake's group (Clyde, Mome (archaeologist), 6 broshcuthers
6 broshcuthers
Project: Mauranili Pali survey
Date: 7 October 2013
OBSERVATIONS:
Grid 16: flagging & brush wtt. ng
Marka portion it open ironwood forest with thick strawberry guara
Grid 16: flagging & brusharting  Marke portion if open ironwood forest with thick strawberry grave  understoon and very little grandcover except littler and moss  Cushions
Some petches of native vivle fern in open areas
Some petches of native vivie fern in open areas Some clodemia shows, a single fandances tree, Passiffore lavifolia vines; some retire pala fern, lavae hable fern on rotting logs
tower help of good 15 open iron wood forest with tominant whee fern unlessing up to 5-6' tall; scattered strantering guara, a couple fiddlewood plants, Clidinia, some pala fish
tern unlessing up to 5-6 tall; scattered strawberry gurva, a
50 Hid strawberry gurve forest 20-30' tall with mostly leaf littler
underston
Single paydentale tree (Melaleuca leucanlendon), as well as single native to a tree, straight & tall, 80' tall; in this eaction, open canopy W/Solid white understong over 6' tall
open canopy W/ solid while understong over 6 tall
Scallered rative palas for, Clidenia, Ardria crenafa (Hilo holly)
No care/enlargered plants seen
Natives & Brokel: koa (single true), who (common), palan (oca-
simily tarbanus (1)

Date: 10 /7 / 2013
OBSERVATIONS: M. Le Grande
Ingress in w/ Sweep team (kevin) to
GRID 7 -D veg documented on previous
Siwey.
Walked over to 😝 Maunawili, trail
through previous somey trail to
GRID 16. (Clyde Imada surveyed for
B10 @ 16).
O Significant BID Noted in grids

Project: PALITRAINING AREA
Date: 10/7/13
OBSERVATIONS: M. LeGrande / Survey / Jake / Clyde / BWsh / Pablo
GRID 18) - Dunderstong: awapuli, Christella, Pterolepis, Maile Pilau, Fi, Albizia, Cituarenylum, coffee, palm grass, basket grass, kukui, clidemia, Australian tree fern, grava,
GRID 21/off T62) - D'Citharesoylum, guava, Pferzyxic, maile pilan, basket grass, awayanti, palm grass, Schefflera, ti, Theme
Both girds dominated by weedly plant Species? Pig rooting/trails prevalent in both girds.

Project: PALITRAINING AREA
Date: 10/9/13
OBSERVATIONS: M. LeGrande
[GRID 21] - Ingress in to proposed grid area by
T148. Abundant archaeology in area So
placed grid to north.
Vegetation included large Albizia trees w/
African tolip, cats daw, Plewlep's, palm grass,
Stachytarpheta, Clidenia, Mimosa pudica
[Gird 22] - o Travel Up T148 to area for
Grid. Vegetetia — Trema, Kukni, Herolepis, Clidernia, Irau, FT, laugle hable.
large climbine plants of lietie (Freycinotia) in Kukui Free. Brush witers avoided plant.
& Significant Bio Observed.

Project: PALI TRAINING AREA
Date: 10 / 10 / 13
OBSERVATIONS: M. Le Grande
GRID 19 - D near laydown yard - large mango trees
GRID 19 - D Near laydown yard - large Mango trees w/ Grevilla, ironwood, coffee, cats claw, maile pilan, palm grass, Pteralyxia,
maile pilan, palm grass, Heralyxia,
GRID 5   Deiawi /Strawberry grava / Fronwood forest w/ little to not understory sphagmm moss. Ulbhe fem @ edges.
forest w/ little to not understong
sphagmm moss. Owke tem @ edges.

# Appendix F Photographic Log

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.



Photograph F-1: Team Training of the Remote Firing Device.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 1, 2013



Photograph F-2: Survey of Transect T-19.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 2, 2013



Photograph F-3: UXO Sweep Team Member Performing Instrument Check at Instrument Testing Strip.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala

Date: August 5, 2013

Photograph F-4: UXO Sweep Team Hiking to Transect 19.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii



Photograph F-5: Kahu Performing Site Blessing.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 6, 2013



Photograph F-6: UXO Sweep Team Conducting Survey and Sweep Operations. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 6, 2013

Date: August 8, 2013



Photograph F-7: Trash Pit Located near Transect T-14

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala



Photograph F-8: Performing an Anomaly Excavation on Transect 15.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala

Date: August 12, 2013



Photograph F-9: "Hot Rocks" Excavated from Transect 15.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 12, 2013



Photograph F-10: Survey Team on Transect 33.
Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 13, 2013



Photograph F-11: Anomaly Excavation on Royal Hawaiian Golf Course Property. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 14, 2013



Photograph F-12: Typical Excavation Repair in Royal Hawaiian Golf Course Fairway Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 15, 2013



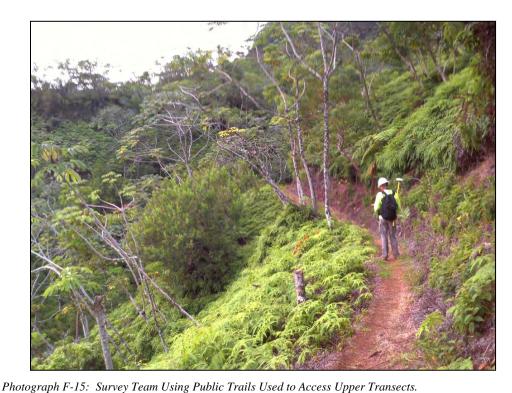
Photograph F-13: Detection and Exposure of Water Line on Transect 8 (on Golf Course Fairway). Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 15, 2013



Photograph F-14: Terrain and Vegetation in Areas West of the Former Removal Action Area Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 19, 2013



Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala

Date: August 20, 2013



Photograph F-16: Archaeologist Surveying Transect in Vegetation.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 21, 2013



Photograph F-17: Survey Team Marking Transects for Vegetation Removal.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 22, 2013



Photograph F-18: Steep Incline Leading to Transects
Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 26, 2013

Date: August 26, 2013



Photograph F-19: Deadfall Branch Blocking Transect Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii Photographed by: Huikala



Photograph F-20: Thick Vegetation Encountered During Transect Surveying.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala

Date: August 26, 2013



Photograph F-21: Pali Trail Access to Transects on Southwest Portion of the Site. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 27, 2013



Photograph F-22: 60-mm Mortar M-49A2 Munitions Debris on Transect T-6. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 28, 2013



Photograph F-23: Munitions Debris Located on Pali Trail.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 28, 2013



Photograph F-24: UXOSO Observing Sweep Team Excavation on the Pali Trail. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: August 29, 2013



Photograph F-25: MEC Item Found near Transect 91.
Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 3, 2013



Photograph F-26: 105-mm HE M1 Projectile Excavated from the Pali Trail. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii Photographed by: Huikala

Date: September 4, 2013



Photograph F-27: Demolition Area Post-Detonation.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 4, 2013



Photograph F-28: Sweep Team Conducting Operations Along Golf Course Irrigation Line. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 5, 2013



Photograph F-29: Sweep Team Investigating an Anomaly.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 9, 2013



Photograph F-30: Cache of Bullet Casings Excavated on Pali Trail Along Transect T-131. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 11, 2013



Photograph F-31: Steep Terrain Accessing Transect T-140.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 16, 2013



Photograph F-32: Sweep Team Operating in Wet Conditions.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 17, 2013



Photograph F-33: Pig Hunter's Blind Encountered Along Transect Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 17, 2013



Photograph F-34: Removing Vegetation and Accessing Transect through Heavy Brush. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 19, 2013



Photograph F-35: Excavating Anomaly after Heavy Downpour. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Date: September 24, 2013 Photographed by: Huikala



Photograph F-36: "Hot Rock" Registered as an Anomaly by the Minelab. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii Photographed by: Huikala

Date: September 24, 2013



Photograph F-37: MEC-004, 81-mm mortar, M43A1 Found on Transect T-113. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 26, 2013



Photograph F-38: MEC-004 and MEC-005 Located on the Shoulder of an Agricultural Road Under a Power Line Right-of-Way.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: September 26, 2013

Date: September 30, 2013



Photograph F-39: Brush Cleared and Sweeping in Progress at Grid 01. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii Photographed by: Huikala



Photograph F-40: Blind Seed Installed at Grid 01.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala

Date: September 30, 2013



Photograph F-41: Brush Cleared at Grid 03.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 1, 2013



Photograph F-42: Removing Vegetation at Grid 09.
Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii
Photographed by: Huikala

Date: October 2, 2013

Date: October 3, 2013



Photograph F-43: Documenting Archaeological Feature CSH-31.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala

Photograph F-44: Clearing Vegetation at Grid 15.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Hydrole



Photograph F-45: Clearing Vegetation at Grid 21.
Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 9, 2013



Photograph F-46: Incremental Soil Sampling at SU BKG-01, Collection of Single Increment.

Direction Facing: North

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 16, 2013



Photograph F-47: Measuring and Setting Boundaries for Soil Sampling at SU MVIA-02. Direction Facing: West-southwest

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 18, 2013



Photograph F-48: Recording GPS Coordinates for SU Boundaries at SU MVIA-02. Direction Facing: North-northeast

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 18, 2013



Photograph F-49: Measuring and Setting Boundaries for SU MVIA-03. Direction Facing: North Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 18, 2013



Photograph F-50: Incremental Soil Sampling at SU MVIA-03. Direction Facing: North

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 18, 2013



 $\label{local-photograph-formula} Photograph F-51: \ \textit{Incremental Soil Sampling at SU MVIA-04. Direction Facing: South} \ \textbf{Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii}$ 

Photographed by: Huikala Date: October 18, 2013



Photograph F-52: Incremental Soil Sampling at SU MVIA-12. Direction Facing: Northeast Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 22, 2013



 $Photograph \ F-53: \ Incremental \ Soil \ Sampling \ along \ Centerline \ of \ SU\ MVIA-14 \ (location \ of \ MEC\ blown-inplace).$   $Direction \ Facing: \ North$ 

## Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: October 22, 2013



Photograph F-54: UXOQCS conducting QC sweep of Maunawili Demonstration Trail. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: February 10, 2014



Photograph F-55: Sweeping Maunawili Demonstration Trail along transect MWD-09. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: February 21, 2014



Photograph F-56: Confirming excavation is clear of anomalies prior to backfill. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: February 26, 2014



Photograph F-57: Sweeping along Maunawili Demonstration Trail.

Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: March 4, 2014



Photograph F-58: Backfilling demo shot hole. Remedial Investigation Report, Pali Training Camp, Oahu, Hawaii

Photographed by: Huikala Date: March 6, 2014

# Appendix I MPPEH Tracking Log and Certificate of Destruction

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
T119	MD, Frag Unknown	MD0001	West	626598.67	2362274.61	264.50	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Frag Unknown	MD0002	West	626508.28	2362213.69	271.50	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Frag Unknown	MD0003	West	626508.67	2362175.60	269.21	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119 T119	MD, Fuze component MD, Fuze, PD M48	MD0004 MD0005	West West	626507.80 626475.60	2362164.37 2362117.02	277.50 270.22	8/28/2013 8/28/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T119	MD, 37mm, APCT M59	MD0005 MD0006	West	626475.59	2362117.02	273.86	8/28/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, 37mm, APCT M59	MD0007	West	626486.16	2362057.91	266.97	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Fuze, PD M48	MD0010	West	626455.80	2361955.97	283.95	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Frag Unknown	MD0011	West	626440.58	2361950.55	279.20	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, 81mm Mortar, Tail Boom	MD0013	West	626425.27	2361930.89	294.50	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119 T119	MD, Frag Unknown MD, 81mm Mortar	MD0014 MD0015	West West	626424.18 626418.75	2361896.67 2361865.92	280.84 288.60	8/28/2013 8/28/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Fuze component	MD0015 MD0016	West	626422.85	2361858.79	275.44	8/28/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T119	MD, Frag Unknown	MD0017	West	626451.96	2361795.26	286.87	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Fuze component	MD0018	West	626407.92	2361776.54	290.82	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Fuze component	MD0019	West	626373.07	2361767.77	294.62	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, Frag Unknown	MD0020	West	626360.70	2361716.05	291.69	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T119 T119	MD, Frag Unknown MD, Frag Unknown	MD0021 MD0022	West West	626357.37 626357.93	2361705.54 2361702.39	294.27 292.70	8/28/2013 8/28/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T119	MD, Fuze component	MD0022 MD0023	West	626364.24	2361696.62	301.89	8/28/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T119	MD, 37mm, APCT M59	MD0024	West	626391.04	2361671.64	295.77	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T6	MD, Frag Unknown	MD0008	Central	628745.59	2360723.00	198.57	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T6	MD, 60mm Mortar, M49A2	MD0009	Central	628739.30	2360717.32	170.90	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T6	MD, Fuze, PD M48	MD0012	Central	628719.47	2360715.72	170.04	8/28/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T120 T122	MD, Fuze, PD M48 MD, Frag Unknown	MD0025 MD0042	West West	627639.29 626416.74	2360915.68 2361660.64	197.55 295.54	8/29/2013 9/3/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0043	West	626426.68	2361657.44	292.01	9/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0044	West	626433.23	2361655.58	289.05	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0045	West	626452.70	2361647.80	290.78	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0046	West	626448.83	2361637.61	292.55	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0047	West	626442.17	2361634.26	291.98	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T122 T122	MD, Frag Unknown MD, Frag Unknown	MD0048 MD0049	West West	626431.41	2361630.51 2361629.77	292.41 292.96	9/3/2013 9/3/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0050	West	626390.45	2361629.45	295.23	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T122	MD, Frag Unknown	MD0051	West	626329.85	2361631.99	306.41	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0026	West	626445.24	2361932.20	273.45	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0027	West	626450.25	2361933.34	267.26	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123 T123	MD, Fuze, PD M48 MD, Frag Unknown	MD0028 MD0029	West West	626449.12 626462.73	2361933.36 2361938.84	270.57 258.47	9/3/2013 9/3/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0029 MD0030	West	626458.53	2361938.84	274.52	9/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0031	West	626477.63	2361938.42	263.94	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0032	West	626478.76	2361937.68	265.03	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Fuze, PD M48	MD0033	West	626501.12	2361933.09	261.35	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0034 MD0035	West	626534.02	2361938.09 2361942.87	261.87	9/3/2013 9/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T123 T123	MD, Fuze component MD, Frag Unknown	MD0036	West West	626566.35 626675.51	2362049.23	233.88	9/3/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0037	West	626678.35	2362052.50	231.13	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, 81mm Mortar	MD0038	West	626691.57	2362059.04	230.22	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123	MD, Frag Unknown	MD0039	West	626700.62	2362069.32	229.55	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T123 T123	MD, Frag Unknown	MD0040 MD0041	West	626739.39 626768.02	2362080.53 2362099.76	225.59 230.03	9/3/2013 9/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
1123	MD, Fuze component	MD0041	West	626768.02	2302099.76	230.03	9/3/2013	<1 ft bgs 8-inches bgs horizontal, facing	<110	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting intal disposal
T123	MEC, 75mm Shrapnel, Mk1	MEC0001	West	626787.92	2362123.31	229.36 <sup>a</sup>	9/3/2013	west	2-lbs	None	Fired	MVIA	NA	Detonation
T137	Small Arms	MD0052	West	627134.96	2361416.38	160.47	9/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T122	MEC, 105mm High Explosive Projectile	MEC0002	West	626319.53	2361634.10	305.41 <sup>a</sup>	9/4/2013	1 ft bgs, nose up	39-lbs	PD	Fired	MVIA	NA	Detonation
T125	MD, Frag Unknown	MD0053	Central	628453.81	2360444.16	229.05	9/5/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T125	MD, Fuze component	MD0054 MD0055	Central	628589.17 628729.28	2360502.51 2360552.91	210.71 184.37	9/5/2013 9/5/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T125 T126	Small Arms MD, Frag Unknown	MD0055 MD0057	Central Central	628729.28	2360552.91	184.37	9/5/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T149	MD, 81mm Mortar, Tail Boom	MD0056	Central	628919.27	2360552.79	139.14	9/5/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T128	MD, 81mm Mortar, Tail Boom	MD0058	Central	628294.48	2360934.32	139.76	9/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T128	MD, 81mm Mortar, Tail Boom	MD0059	Central	628300.10	2360875.63	155.40	9/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T131	Small Arms	MD0060	Central	629409.96	2360590.33	184.55	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T131 T131	MD, Frag Unknown MD, Frag Unknown	MD0061 MD0062	Central Central	628988.24 628979.08	2360342.78 2360307.90	205.82 206.72	9/11/2013 9/11/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T131	MD, Frag Unknown MD, Frag Unknown	MD0062 MD0063	Central	628979.08	2360307.90	250.94	9/11/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T131	MD, Frag Unknown	MD0064	Central	628839.91	2360059.15	115.52	9/11/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T131	MD, Frag Unknown	MD0065	Central	628805.68	2360045.37	238.84	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T131	MD, Frag Unknown	MD0066	Central	628802.57	2360061.15	244.26	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T131	Small Arms	MD0067	Central	628701.77	2360131.61	235.33	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
T131	MD, Frag Unknown	MD0068	Central	628593.76	2360146.01	242.45	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0069	Central	628581.39	2360081.86	252.36	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0070	Central	628512.42	2360138.74	421.94	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0071	Central	628522.37	2360071.25	250.69	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132 T132	MD, Frag Unknown	MD0072 MD0073	Central	628496.27 628473.60	2359873.66 2359880.85	302.27 307.04	9/11/2013 9/11/2013	<1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T132	MD, Fuze component MD, Frag Unknown	MD0073 MD0074	Central Central	628423.21	2359880.83	307.04	9/11/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0074 MD0075	Central	628374.22	2359888.25	318.18	9/11/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0076	Central	628345,93	2359871.21	323.27	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Fuze, PD M48	MD0077	Central	628346.57	2359864.04	324.92	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0078	Central	628212.30	2359800.28	332.47	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0079	Central	628140.76	2359902.39	306.18	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0080	Central	628105.46	2359916.38	300.55	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T132	MD, Frag Unknown	MD0081 MD0082	Central	628091.86 628059.01	2359922.86	302.71 295.14	9/11/2013 9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Fuze component MD, Frag Unknown	MD0082 MD0083	Central Central	628059.01	2359944.58	295.14	9/11/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown MD, Fuze, PTT TSQ M54	MD0083 MD0084	Central	628023.00	2359808.02	297.09	9/11/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown	MD0084 MD0085	Central	627964.88	2359916.28	294.18	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown	MD0086	Central	627855.95	2359943.40	313.42	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown	MD0087	Central	627749.43	2359950.18	310.13	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown	MD0088	West	627575.13	2359962.12	300.82	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown	MD0089	West	627597.80	2360047.98	303.26	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T133	MD, Frag Unknown	MD0090	West	627509.63	2360043.05	311.63	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T133 T137	MD, Frag Unknown	MD0091 MD0092	West	627500.75	2360055.90	307.02	9/11/2013	<1 ft bgs	<1 lb	None	NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T137	MD, Frag Unknown Small Arms	MD0092 MD0093	West West	627144.13 627127.37	2361421.64 2361411.07	155.33 157.70	9/12/2013 9/12/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T137	MD, 37mm, APCT M59	MD0093 MD0094	West	627124.61	2361411.07	188.85	9/12/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T137	MD, 60mm Mortar, M49A2	MD0094 MD0095	West	627117.05	2361411.64	168.19	9/12/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T137	MD, 81mm Mortar, Tail Boom	MD0096	West	627107.63	2361403.84	163.26	9/12/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0103	West	627218.73	2361603.73	110.02	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0113	West	627128.30	2361627.92	137.22	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0114	West	627065.61	2361644.91	154.07	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0115	West	627042.57	2361643.64	155.15	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0116 MD0117	West	627035.15 626969.85	2361644.14	179.08	9/16/2013 9/16/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown MD, Frag Unknown	MD0117 MD0119	West West	626889.85	2361727.38 2361743.87	213.21 194.77	9/16/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0119	West	626830.52	2361733.70	198.22	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0125	West	626779.67	2361734.62	210.20	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0128	West	626738.14	2361852.65	203.41	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0129	West	626683.32	2361871.97	238.15	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Frag Unknown	MD0130	West	626628.41	2361872.98	241.90	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T139	MD, Fuze, PD M48	MD0131	West	626540.88	2361855.28	266.15	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0097	West	627517.93	2360150.71	321.90	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140 T140	MD, Frag Unknown MD, 37mm, APCT M59	MD0098 MD0099	West West	627424.33 627389.07	2360103.71	315.23 312.25	9/16/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0100	West	627378.16	2360077.12	308.80	9/16/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0100	West	627378.14	2360077.12	307.54	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0102	West	627377.49	2360067.27	307.13	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0104	West	627264.61	2360059.19	300.63	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0105	West	627272.11	2360100.73	305.21	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0106	West	627238.84	2360185.39	294.39	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140 T140	MD, Frag Unknown	MD0107 MD0108	West	627238.82 627228.73	2360188.33	294.29 288.55	9/16/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T140 T140	MD, Frag Unknown MD, Frag Unknown	MD0108 MD0109	West West	627228.73	2360210.48 2360225.22	288.55	9/16/2013 9/16/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown MD, Frag Unknown	MD0109 MD0110	West	627223.65	2360228.81	286.90	9/16/2013	<1 it bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0110	West	627220.54	2360256.34	280.66	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0112	West	627212.43	2360265.17	280.82	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0118	West	627195.75	2360232.69	285.42	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0120	West	627087.43	2360247.62	281.11	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0121	West	627078.64	2360232.56	281.34	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140	MD, Frag Unknown	MD0122	West	627075.42	2360226.32	278.58	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T140 T140	MD, Frag Unknown MD, Fuze component	MD0123 MD0126	West West	627055.70 627050.55	2360218.86	294.32 288.11	9/16/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T140	MD, Fuze component  MD, Frag Unknown	MD0126 MD0127	West	627036.56	2360281.34	279.90	9/16/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Frag Unknown	MD0127 MD0132	West	626294.18	2361293.22	274.17	9/16/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Frag Unknown	MD0132	West	626369.73	2361288.13	261.49	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Frag Unknown	MD0134	West	626464.50	2361307.15	247.47	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Fuze, PD M48	MD0135	West	626631.54	2361338.24	232.09	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Frag Unknown	MD0136	West	626707.29	2361330.17	218.53	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Frag Unknown	MD0137	West	626727.01	2361325.81	220.83	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Fuze component MD, Frag Unknown	MD0138 MD0139	West	626762.68	2361303.02	215.06	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141			West	626783.84	2361295.35	210.74	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
T141	MD, 81mm Mortar, Tail Boom	MD0140	West	626797.19	2361295.46	207.74	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, 81mm Mortar	MD0140	West	626822.86	2361276.25	196.22	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Frag Unknown	MD0143	West	627020.87	2361280.51	171.07	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, Fuze component	MD0144	West	627026.56	2361280.21	170.73	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T141	MD, 60mm Mortar, M50A2, Practice	MD0147	West	627026.62	2361284.48	169.30	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T68	MD, Frag Unknown	MD0142	West	627027.98 627072.97	2360785.47 2360745.91	182.06 190.85	9/16/2013 9/16/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T68 T68	MD, Frag Unknown MD, Frag Unknown	MD0145 MD0146	West West	627084.71	2360743.73	190.85	9/16/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T68	MD, 75mm Projectile, Shrapnel MK1	MD0148	West	627111.91	2360730.66	190.05	9/16/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0149	West	626464.13	2361086.40	208.38	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0150	West	626475.69	2361101.11	220.43	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0151	West	626621.27	2361124.71	204.91	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0152	West	626629.66	2361124.99	205.41	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown MD, Frag Unknown	MD0153 MD0154	West West	626638.01 626647.64	2361124.52	180.74 185.83	9/17/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T142	MD, Fuze component	MD0155	West	626645.20	2361143.93	174.63	9/17/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0156	West	626688.21	2361172.01	208.21	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0157	West	626700.28	2361161.67	185.32	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0158	West	626702.82	2361156.55	180.36	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Fuze component	MD0162	West	626708.99	2361132.11	191.28	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0163 MD0164	West	626702.42 626697.85	2361134.61	187.38 196.75	9/17/2013 9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown MD, Frag Unknown	MD0164 MD0165	West	626673.47	2361133.17	202.79	9/17/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T142	MD, Frag Unknown	MD0166	West	626659.61	2361140.08	187.85	9/17/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T68	MD, Frag Unknown	MD0159	West	626941.89	2360855.37	189.85	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T68	MD, Frag Unknown	MD0160	West	626934.64	2360849.72	154.89	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T68	MD, Frag Unknown	MD0161	West	626932.64	2360849.02	164.28	9/17/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T144	Small Arms	MD0167	West	627101.22	2361392.05	161.59	9/18/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T144	MD, Frag Unknown	MD0168 MD0169	West	627091.62	2361374.28	161.55	9/18/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T144 T144	MD, Frag Unknown Small Arms	MD0169 MD0170	West West	627087.28 627087.47	2361359.75	159.47 161.33	9/18/2013 9/18/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T144	MD, 37mm, APCT M59	MD0170	West	627073.59	2361340.66	156.74	9/18/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T144	MD, 81mm Mortar, Tail Boom	MD0172	West	627072.93	2361340.34	159.89	9/18/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T144	MD, Frag Unknown	MD0173	West	627070.97	2361334.84	164.33	9/18/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T144	Small Arms	MD0174	West	627061.64	2361325.71	165.04	9/18/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T144 T144	MD, 60mm Mortar, M49A2 MD, Frag Unknown	MD0175 MD0176	West West	627045.27 627029.46	2361310.81 2361292.03	157.73 169.24	9/18/2013 9/18/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
1144	MD, Frag Unknown	MD0176	west	02/029.40	2301292.03	109.24	9/18/2013	<1 ft bgs 2-inches bgs,	<1 ID	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
								horizontal,						
T144	MEC, 37mm, HE M63 with BD M58 Fuze	MEC0003	West	627077.04	2361348.01	161.90	9/18/2013	facing west	1-lb	BD	Fired	MVIA	NA	Detonation
T146	MD, Frag Unknown	MD0177	West	627025.51	2361325.82	158.75	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Fuze, PD M48	MD0178	West	627026.67	2361320.12	178.20	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0179	West	627013.48	2361323.59	165.71	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146 T146	MD, 81mm Mortar, Tail Boom MD, 81mm Mortar, Tail Boom	MD0180 MD0181	West West	627001.57 626995.15	2361335.18 2361326.13	173.16 181.27	9/19/2013 9/19/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0181 MD0182	West	626984.75	2361326.15	188.16	9/19/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, 81mm Mortar, Tail Boom	MD0183	West	626973.56	2361317.94	187.08	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, 81mm Mortar, Tail Boom	MD0184	West	626964.74	2361310.84	162.44	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0185	West	626969.73	2361315.62	178.73	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0186	West	626966.45	2361311.64	171.91	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0187	West	626969.40	2361320.09	194.87	9/19/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T146 T146	MD, 81mm Mortar, Tail Boom MD, Frag Unknown	MD0188 MD0189	West West	626953.84 626954.93	2361304.19 2361309.30	161.05 183.60	9/19/2013 9/19/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0189 MD0190	West	626938.79	2361309.30	160.53	9/19/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0190	West	626917.16	2361307.27	170.35	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, 81mm Mortar, Tail Boom	MD0192	West	626913.06	2361308.73	173.98	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0193	West	626911.35	2361307.78	172.70	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0194	West	626917.51	2361532.47	167.14	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0195 MD0196	West West	626931.02 626908.58	2361580.24 2361622.89	165.94 158.84	9/19/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T146 T146	MD, 81mm Mortar, Tail Boom MD, Frag Unknown	MD0196 MD0197	West	626908.58	2361622.89	158.84	9/19/2013 9/19/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T146	MD, Frag Unknown	MD0197 MD0198	West	626962.01	2361723.51	156.68	9/19/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T146	MD, Large Frag Unknown	MD0198 MD0199	West	627036.14	2361723.31	159.20	9/19/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T143	MD, Frag Unknown	MD0200	West	627085.74	2360812.56	175.11	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T143	MD, Frag Unknown	MD0201	West	627073.83	2360667.15	196.07	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T143	MD, Frag Unknown	MD0202	West	627064.76	2360660.99	195.58	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T145	MD, Frag Unknown	MD0210	West	627063.24	2360599.77	203.10	9/23/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T145 T145	MD, Frag Unknown MD, Frag Unknown	MD0211 MD0226	West West	627066.03 626921.92	2360592.85 2360516.15	204.79 221.43	9/23/2013 9/23/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
T145	MD, Frag Unknown MD, Frag Unknown	MD0226 MD0227	West	626921.92	2360516.15	221.43	9/23/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
		1112 0221		0-007			,,_e,_e,_							
T148	MD, Frag Unknown	MD0232	West	626669.91	2360640.91	241.85 222.88	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

Transect /		Item						Depth below	Estimated	Type of			External	
Grid Number	Description	Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/ orientation	Weight (lbs)	Fuzing	Condition	Location	Markings	Disposition
T148	MD, Frag Unknown	MD0234	West	626649.09	2360561.95	229.12	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T148	MD, Fuze component	MD0235	West	626648.88	2360561.67	228.02	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T148	MD, Frag Unknown	MD0236	West	626646.12	2360529.41	236.96	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T148	MD, Frag Unknown	MD0237	West	626644.07	2360526.65	232.97	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T148 T148	MD, Frag Unknown MD, Frag Unknown	MD0238 MD0239	West West	626649.28 626642.99	2360506.95 2360500.79	234.68 223.23	9/23/2013 9/23/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T62	MD, Frag Unknown	MD0239 MD0228	West	626902.39	2360477.65	225.23	9/23/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T62	MD, Frag Unknown	MD0229	West	626881.00	2360495.01	223.84	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T62	MD, Fuze component	MD0230	West	626867.44	2360509.16	219.78	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T62	MD, Frag Unknown	MD0231	West	626866.57	2360515.26	220.10	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0212	West	627046.05	2360502.08	220.90	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0213 MD0214	West	627036.70 627031.70	2360503.48 2360505.28	216.66	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64 T64	MD, Frag Unknown MD, Fuze, PD M48	MD0214 MD0215	West West	627006.33	2360505.28	217.25 223.73	9/23/2013 9/23/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T64	MD, Fuze component	MD0215	West	626985.53	2360527.51	225.69	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0217	West	626960.78	2360553.49	221.76	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0218	West	626950.78	2360557.65	213.16	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0219	West	626909.96	2360578.65	196.81	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Large Frag Unknown	MD0220	West	626908.04	2360582.53	196.28	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64 T64	MD, Frag Unknown	MD0221 MD0222	West	626892.56	2360595.34	163.06	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown MD, Frag Unknown	MD0222 MD0223	West	626895.78 626893.30	2360613.42	206.47 174.79	9/23/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0223	West	626861.47	2360615.59	176.06	9/23/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T64	MD, Frag Unknown	MD0225	West	626865.73	2360635.72	199.49	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T66	MD, Frag Unknown	MD0203	West	627045.33	2360623.79	208.31	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T66	MD, Fuze, PD M48	MD0204	West	627043.09	2360636.69	197.79	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T66	MD, Frag Unknown	MD0205	West	627028.63	2360652.65	191.84	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T66 T66	MD, Frag Unknown	MD0206 MD0207	West West	626992.29 626988.98	2360681.28 2360683.96	199.56 202.46	9/23/2013 9/23/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T66	MD, Frag Unknown MD, Frag Unknown	MD0207 MD0208	West	627053.55	2360625.59	194.02	9/23/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T66	MD, 60mm Mortar, M49A2	MD0209	West	627054.25	2360625.69	193.54	9/23/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T149	MD, Frag Unknown	MD0240	Central	628961.66	2360595.32	148.07	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T149	MD, Frag Unknown	MD0241	Central	628932.22	2360556.75	145.04	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T149	MD, Frag Unknown	MD0242	Central	628902.31	2360493.92	174.35	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T149	MD, Frag Unknown	MD0243	Central	628913.05	2360458.50	146.33	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T149 T149	MD, Frag Unknown	MD0244 MD0245	Central	628796.12 628798.12	2360401.78 2360412.18	178.77 175.36	9/24/2013 9/24/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T149	MD, Frag Unknown MD, Frag Unknown	MD0245 MD0246	Central Central	628757.10	2360412.18	1/5.36	9/24/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T150	MD, Frag Unknown	MD0247	Central	628149.82	2361213.12	129.88	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T150	MD, 81mm Mortar, Tail Boom	MD0248	Central	628281.35	2361076.87	113.13	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T150	MD, Frag Unknown	MD0249	Central	628202.26	2361090.55	127.95	9/24/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0250	West	626669.92	2361852.01	234.96	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0251	West	626664.85	2361841.91	241.92	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0252	West	626662.02	2361825.68	234.76	9/25/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T151 T151	MD, Fuze component MD, Frag Unknown	MD0253 MD0254	West West	626655.73 626677.51	2361817.93 2361800.79	194.24 245.17	9/25/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0254	West	626725.28	2361912.35	221.66	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze component	MD0257	West	626722.60	2361919.42	234.64	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze component	MD0258	West	626722.08	2361930.85	206.25	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0259	West	626754.24	2361973.68	204.20	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze component	MD0260	West	626754.42	2361974.01	202.92	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze component	MD0261	West	626759.98	2361961.93	195.94	9/25/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T151 T151	MD, Fuze, PD M48 MD, Fuze component	MD0262 MD0263	West West	626775.52 626783.12	2361986.99 2361993.83	206.54 213.26	9/25/2013 9/25/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze component MD, Fuze, PD M48	MD0263 MD0264	West	626795.70	2361993.83	198.70	9/25/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze, PD M48	MD0265	West	626799.92	2361994.11	193.14	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0266	West	626805.25	2362000.45	170.59	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Fuze component	MD0267	West	626840.28	2361992.63	187.49	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, Frag Unknown	MD0268	West	626849.98	2361986.51	194.94	9/25/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T74	MD, Frag Unknown	MD0255	West	627938.84	2360674.35	198.33	9/25/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T75 T116	MD, Fuze, PD M48 MD, Frag Unknown	MD0269 MD0271	West West	627768.87 627285.65	2360920.52 2360732.63	185.83 186.80	9/25/2013 9/26/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T116	MD, Frag Unknown MD, Frag Unknown	MD0271 MD0272	West	627302.21	2360732.63	186.80	9/26/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T143	MD, Frag Unknown	MD0272	West	626905.21	2360817.63	198.60	9/26/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T143	MD, Frag Unknown	MD0278	West	626924.08	2360849.10	187.73	9/26/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T151	MD, 81mm Mortar	MD0270	West	627498.80	2361261.52	159.36	9/26/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
								11-inches bgs,		1				
m	MEG 01 HEM 1 MIGHT TO THE	MEGaaa.	***	607.407.77	2251277.2	15005	0.000.000	horizontal,	2 "	pro	TT C .			B
T151	MEC, 81mm HE Mortar, M43A1 (DMM)	MEC0004	West	627495.75	2361257.34	158.85	9/26/2013	facing southeast 11-inches bgs,	3-lbs	PD	Unfired	MVIA	NA	Detonation
								horizontal,						
T151	MEC, 81mm HE Mortar, M43A1 (DMM)	MEC0005	West	627498.80	2361261.52	159.36	9/26/2013	facing southeast	3-lbs	PD	Unfired	MVIA	NA	Detonation
			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, 52, 1, 5.50		107.00	7,20,2013	cm, southetist	2 100		, cmmed	174 7 44 4		Detoimion

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
T54	MD, Frag Unknown	MD0273	West	627070.19	2361023.81	168.91	9/26/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T54	MD, Frag Unknown	MD0274	West	627071.46	2361031.51	167.88	9/26/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T54 T66	MD, Frag Unknown MD, Frag Unknown	MD0275 MD0277	West West	627096.67 626916.23	2361066.03 2360736.38	163.45 192.19	9/26/2013 9/26/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 01	MD, 37mm AP M74	MD0303	Central	629113.62	2360760.64	118.83	9/30/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 01	MD, 37mm AP M74	MD0304	Central	629112.66	2360764.81	115.67	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 01	MD, 37mm AP M74	MD0306	Central	629111.13	2360772.42	125.69	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T155	MD, Frag Unknown	MD0279	West	626397.31	2360954.81	232.33	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T155	MD, Frag Unknown	MD0305	West	626427.65	2361212.70	239.54	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T65 T65	MD, Fuze component	MD0280 MD0281	West West	626473.03 626511.49	2361057.81 2361042.19	218.12 200.04	9/30/2013 9/30/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown MD, Frag Unknown	MD0281 MD0282	West	626617.55	2361092.95	207.97	9/30/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0283	West	626640.07	2361083.88	187.10	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0284	West	626625.58	2361080.02	201.61	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0285	West	626627.96	2361093.29	191.48	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0286	West	626618.15	2361086.75	195.87	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67 T67	MD, Frag Unknown MD, Frag Unknown	MD0287 MD0288	West	626614.39	2361085.38	199.12 198.15	9/30/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown MD, Fuze, PD M48	MD0288 MD0289	West	626591.48	2361103.98	205.43	9/30/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0289	West	626575.02	2361111.55	205.72	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0291	West	626514.30	2361159.16	214.27	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0292	West	626495.36	2361183.16	220.14	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0293	West	626488.51	2361189.27	220.97	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0294	West	626473.07	2361181.02	245.50	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0295 MD0296	West	626462.02 626450.14	2361189.77 2361197.74	238.42 241.13	9/30/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T67 T67	MD, Frag Unknown MD, Frag Unknown	MD0296 MD0297	West West	626448.70	2361201.29	241.13	9/30/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T67	MD, Fuze component	MD0297 MD0298	West	626446.75	2361203.38	235.24	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Fuze, PTT TSQ M54	MD0299	West	626443.75	2361205.25	243.81	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0300	West	626447.72	2361208.57	240.84	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0301	West	626444.76	2361213.42	238.08	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T67	MD, Frag Unknown	MD0302	West	626443.83	2361213.41	240.21	9/30/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 02 Grid 02	MD, Frag Unknown MD, 81mm WP Mortar, M57	MD0307 MD0308	Central Central	628917.12 628916.38	2360547.45 2360548.21	110.59 131.77	10/1/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 02	MD, Frag Unknown	MD0308	Central	628919.34	2360551.36	149.36	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 02	MD, Frag Unknown	MD0310	Central	628925.08	2360548.92	178.93	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 02	MD, Frag Unknown	MD0311	Central	628907.23	2360552.44	137.51	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 03	MD, Frag Unknown	MD0320	Central	628254.61	2361047.07	120.83	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 03	MD, Frag Unknown	MD0321	Central	628265.87	2361046.29	120.74	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 03 Grid 03	MD, Frag Unknown MD, Frag Unknown	MD0322 MD0323	Central Central	628262.13	2361037.99	121.85 124.07	10/1/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T55	MD, Frag Unknown	MD0323	West	626579.07	2361247.47	213.85	10/1/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
T55	MD, Fuze component	MD0313	West	626610.32	2361223.45	215.21	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T55	MD, Fuze component	MD0314	West	626631.44	2361199.85	209.74	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T55	MD, Frag Unknown	MD0315	West	626647.16	2361191.09	207.33	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T55	MD, Frag Unknown	MD0316	West	626651.03	2361191.77	209.26	10/1/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
T55 T55	MD, Frag Unknown MD, Frag Unknown	MD0317 MD0318	West West	626661.75 626672.09	2361188.54	206.34 204.47	10/1/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
T55	MD, Frag Unknown MD, Frag Unknown	MD0318	West	626705.67	2361150.13	194.01	10/1/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, 37mm AP M74	MD0319	West	626447.49	2361936.70	264.45	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0325	West	626441.20	2361943.38	249.21	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0326	West	626444.39	2361945.76	254.56	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0327	West	626448.60	2361942.52	268.89	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0328	West	626448.09	2361935.71	285.05	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0329 MD0330	West West	626452.39 626452.31	2361944.86 2361942.15	285.56 274.70	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0330 MD0331	West	626456.94	2361942.13	274.70	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0331 MD0332	West	626460.50	2361939.00	265.34	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0333	West	626457.71	2361941.72	267.39	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0334	West	626469.85	2361941.63	267.71	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0335	West	626468.92	2361940.04	270.99	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0336	West	626469.84	2361936.68	272.43	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0337 MD0338	West	626470.00 626464.14	2361942.42	270.22 273.39	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0338 MD0339	West	626464.14	2361940.36	275.04	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0339	West	626468.52	2361945.01	277.65	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0341	West	626461.57	2361940.75	267.68	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
	MD, Frag Unknown	MD0342	West	626459.23	2361940.44	269.31	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	mb, rug emmonn													
Grid 09	MD, Frag Unknown	MD0343	West	626453.92	2361939.17	264.66	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
		MD0343 MD0344 MD0345	West West West	626453.92 626455.97 626453.74	2361939.17 2361940.30 2361939.81	264.66 273.62 274.26	10/2/2013 10/2/2013 10/2/2013	<1 ft bgs <1 ft bgs <1 ft bgs	<1 lb <1 lb <1 lb	None None None	NA NA NA	MVIA MVIA MVIA	NA NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea		Y-Coordinate		Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
Grid 09	MD, Frag Unknown	MD0347	West	626457.55	2361942.74	278.68	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Fuze, PD M48	MD0348	West	626452.20	2361937.82	262.24	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0349 MD0350	West West	626452.29 626450.58	2361937.36 2361936.66	264.24 273.56	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Fuze component	MD0350	West	626446.37	2361941.54	278.28	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Fuze component	MD0351	West	626442.17	2361939.75	275.93	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0353	West	626443.92	2361941.42	274.16	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0354	West	626459.87	2361948.43	294.00	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0355	West	626456.20	2361942.07	284.42	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0356 MD0357	West	626458.85	2361941.57	285.79	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0357 MD0358	West West	626456.55 626459.90	2361940.94 2361936.89	276.70 268.22	10/2/2013 10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, 81mm Mortar, Tail Boom	MD0358	West	626456.59	2361925.54	274.97	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0360	West	626440.00	2361936.03	274.75	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0361	West	626441.71	2361934.62	273.71	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Fuze component	MD0362	West	626443.40	2361934.77	275.68	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0363	West	626443.20	2361941.20	273.30	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Fuze component	MD0364 MD0365	West West	626457.60 626445.51	2361931.08 2361938.31	271.72 278.23	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0365 MD0366	West	626445.51	2361938.31	278.23	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0367	West	626443.83	2361939.40	282.17	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0368	West	626449.27	2361929.64	274.54	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0369	West	626453.13	2361933.89	280.90	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Fuze component	MD0370	West	626454.48	2361935.76	283.95	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0371	West	626455.73	2361933.22	279.03	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0372	West	626457.58	2361936.57	277.13	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0373 MD0374	West West	626457.88 626459.80	2361939.18 2361935.63	270.73 273.64	10/2/2013 10/2/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0374 MD0375	West	626461.45	2361935.05	280.35	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0376	West	626458.89	2361944.49	255.32	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0377	West	626469.09	2361937.79	275.81	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0378	West	626471.66	2361935.42	270.09	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, 81mm Mortar, Tail Boom	MD0379	West	626471.74	2361932.20	267.44	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, 81mm Mortar MD, Frag Unknown	MD0380 MD0381	West West	626466.98 626463.14	2361929.23	276.50 268.71	10/2/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0381 MD0382	West	626463.14	2361933.48	270.88	10/2/2013	<1 It bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0382	West	626463.40	2361945.89	284.39	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0384	West	626456.23	2361933.87	285.82	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0385	West	626451.04	2361927.29	276.46	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0386	West	626448.97	2361928.15	276.36	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0387 MD0388	West	626451.36	2361926.91	273.26	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Fuze component MD, Frag Unknown	MD0388 MD0389	West West	626445.36 626448.00	2361930.51	272.36 277.78	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0389 MD0390	West	626448.13	2361922.78	272.49	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0390	West	626451.55	2361935.75	286.20	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0392	West	626455.76	2361928.63	269.48	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0393	West	626447.31	2361926.81	280.22	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0394	West	626448.15	2361930.60	283.64	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0395	West	626439.91	2361928.81	279.24	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Frag Unknown	MD0396 MD0397	West West	626443.52 626445.22	2361938.77 2361932.91	285.30 278.54	10/2/2013 10/2/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 09	MD, Frag Unknown MD, Fuze component	MD0397 MD0398	West	626445.22	2361932.91	2/8.54 284.18	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0398 MD0399	West	626444.04	2361935.37	278.18	10/2/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0400	West	626463.48	2361930.74	276.49	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, 81mm Mortar, Tail Boom	MD0401	West	626468.62	2361930.89	271.35	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0402	West	626467.56	2361930.77	273.32	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09	MD, Frag Unknown	MD0403	West	626468.78	2361926.68	257.36	10/2/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 09 Grid 08	MD, Frag Unknown MD, Frag Unknown	MD0404 MD0405	West West	626469.44 626602.43	2361929.00 2361976.03	263.75	10/2/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown MD, Frag Unknown	MD0405 MD0406	West	626602.43	2361976.03	217.20	10/3/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0407	West	626600.50	2361968.52	238.61	10/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0408	West	626585.61	2361980.01	248.08	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0409	West	626601.02	2361975.66	245.83	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0410	West	626602.98	2361974.13	229.33	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0411	West	626598.50	2361982.59	238.26	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0412	West	626588.87	2361979.66	248.80	10/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08 Grid 08	MD, Frag Unknown MD, Frag Unknown	MD0413 MD0414	West West	626592.71 626599.00	2361980.03 2361976.91	246.89 227.68	10/3/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown MD, 81mm Mortar, Tail Boom	MD0414 MD0415	West	626579.32	2361976.91	227.68	10/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 08	MD. Frag Unknown	MD0413	West	626604.76	2361967.76	230.43	10/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0417	West	626607.61	2361972.11	237.26	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

		Item						Depth below	Estimated					
Transect / Grid Number	Description	Identification	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/	Weight	Type of Fuzing	Condition	Location	External Markings	Disposition
		Number						orientation	(lbs)					
Grid 08 Grid 08	MD, Frag Unknown	MD0419 MD0420	West West	626603.05 626599.11	2361974.13	235.53 230.73	10/3/2013 10/3/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown MD, Frag Unknown	MD0420 MD0421	West	626593.74	2361977.95	225.04	10/3/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, 81mm Mortar	MD0422	West	626588.67	2361987.77	229.57	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0423	West	626586.87	2361981.06	235.61	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0424 MD0425	West	626589.95	2361983.87	241.18	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08 Grid 08	MD, Frag Unknown MD, Fuze, PD M48	MD0425 MD0426	West West	626599.91 626606.29	2361965.40 2361975.72	232.95 238.15	10/3/2013 10/3/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0427	West	626584.43	2361995.57	237.16	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0428	West	626602.56	2361984.15	233.97	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0429	West	626590.33	2361989.33	237.30	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08 Grid 08	MD, Frag Unknown MD, Frag Unknown	MD0430 MD0431	West West	626606.35 626602.36	2361984.61	236.14 231.65	10/3/2013 10/3/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0431	West	626600.51	2361998.37	239.15	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0433	West	626596.76	2361990.04	243.92	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08	MD, Frag Unknown	MD0434	West	626590.16	2362002.31	248.47	10/3/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 08 Grid 07	MD, Fuze component MD, Frag Unknown	MD0435 MD0436	West West	626586.39 626690.70	2362005.21 2362059.05	240.05 226.30	10/3/2013 10/7/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0430	West	626695.03	2362065.18	225.93	10/7/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0438	West	626698.92	2362066.08	226.97	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0439	West	626699.57	2362067.57	231.42	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0440	West	626703.68	2362069.52	230.44	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Fuze, PD M48 MD, Frag Unknown	MD0441 MD0442	West West	626701.08 626701.28	2362078.32	232.49	10/7/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Fuze, PD M48	MD0442	West	626704.53	2362071.26	221.39	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, 81mm Mortar	MD0444	West	626699.67	2362072.72	218.38	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0445	West	626696.72	2362074.99	230.26	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Fuze component MD, Frag Unknown	MD0446 MD0447	West West	626694.64 626690.70	2362070.95 2362068.49	230.42 223.05	10/7/2013 10/7/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown MD, Fuze, PD M48	MD0447 MD0448	West	626687.79	2362065.29	225.05	10/7/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Fuze component	MD0449	West	626689.44	2362066.59	225.87	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0450	West	626687.92	2362062.05	227.79	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0451	West	626684.04	2362061.77	231.57	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Frag Unknown MD, Frag Unknown	MD0452 MD0453	West West	626679.95 626680.63	2362060.39 2362063.51	229.40 233.73	10/7/2013 10/7/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0453	West	626683.75	2362069.24	228.00	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Fuze component	MD0455	West	626684.01	2362075.99	227.39	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0456	West	626687.97	2362074.56	228.82	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Fuze component MD, Frag Unknown	MD0457 MD0458	West West	626693.61 626701.98	2362076.57 2362084.18	226.16 226.29	10/7/2013 10/7/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0458	West	626701.53	2362084.18	227.81	10/7/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0460	West	626707.24	2362083.70	227.03	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0461	West	626710.39	2362078.70	240.67	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Fuze, PD M48	MD0462	West	626699.38	2362088.68	233.35	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Frag Unknown MD, Frag Unknown	MD0463 MD0464	West West	626691.61 626688.00	2362088.26 2362083.84	230.12 235.00	10/7/2013 10/7/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0465	West	626690.92	2362077.26	231.06	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0466	West	626689.86	2362085.28	229.54	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Fuze component	MD0467	West	626687.66	2362081.28	226.33	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0468 MD0469	West	626680.26 626680.67	2362080.56 2362077.75	242.48 217.93	10/7/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Frag Unknown MD, 57mm Projectile, APT M70	MD0469 MD0470	West West	626680.67	2362077.75	233.27	10/7/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0470	West	626682.17	2362070.28	231.66	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0472	West	626667.01	2362071.53	234.73	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0473	West	626676.72	2362062.83	231.21	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Frag Unknown MD, Frag Unknown	MD0474 MD0475	West West	626672.74 626669.55	2362074.32 2362069.95	231.75 233.05	10/7/2013 10/7/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown MD, Frag Unknown	MD0475 MD0476	West	626676.37	2362069.95	233.05	10/7/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0477	West	626680.08	2362082.01	229.93	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0478	West	626676.05	2362083.47	236.69	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Frag Unknown	MD0479 MD0480	West West	626674.74 626675.09	2362075.33 2362078.54	226.79 229.42	10/7/2013 10/7/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Frag Unknown MD, Frag Unknown	MD0480 MD0481	West	626675.09 626677.35	2362078.54 2362080.91	229.42	10/7/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0481	West	626689.89	2362093.69	231.33	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0483	West	626684.38	2362098.18	235.59	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07	MD, Frag Unknown	MD0484	West	626686.13	2362089.76	245.58	10/7/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 07	MD, Fuze component MD, Frag Unknown	MD0485 MD0486	West	626683.62 626686.12	2362092.41	229.57 232.56	10/7/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 07 Grid 04	MD, Frag Unknown MD, Frag Unknown	MD0486 MD0487	West	626686.12	2361252.97	161.13	10/7/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 04	MD, Frag Unknown	MD0487	West	627536.32	2361252.36	161.24	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0504	West	626477.23	2361111.52	227.58	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0505	West	626476.62	2361114.22	230.92	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

_		Item						Depth below	Estimated					
Transect / Grid Number	Description	Identification	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/	Weight	Type of Fuzing	Condition	Location	External Markings	Disposition
		Number						orientation	(lbs)					
Grid 10 Grid 10	MD, Frag Unknown MD, Frag Unknown	MD0506 MD0507	West West	626482.99 626499.66	2361112.84 2361123.34	226.51 221.90	10/8/2013 10/8/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0508	West	626506.84	2361125.00	220.92	10/8/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0509	West	626498.94	2361117.70	225.79	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0510	West	626489.29	2361118.45	218.30	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Fuze component	MD0511	West	626482.03	2361117.52	221.22	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10 Grid 10	MD, Frag Unknown MD, Frag Unknown	MD0512 MD0513	West West	626479.54 626482.77	2361118.38 2361124.51	217.77 223.74	10/8/2013 10/8/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0514	West	626483.17	2361113.96	224.02	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Fuze component	MD0515	West	626481.63	2361127.63	231.58	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0516	West	626492.19	2361134.52	225.91	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10 Grid 10	MD, Frag Unknown MD, Frag Unknown	MD0517 MD0518	West West	626499.84 626507.49	2361134.03	222.36 219.49	10/8/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0519	West	626482.16	2361127.80	238.70	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0520	West	626478.56	2361127.52	227.19	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0521	West	626486.48	2361127.30	212.31	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10 Grid 10	MD, Frag Unknown MD, Fuze, PTT TSO M54	MD0522 MD0523	West West	626491.51 626510.58	2361134.57 2361109.21	222.85 190.98	10/8/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Fuze, PT 15Q M34 MD, Fuze, PD M48	MD0523 MD0524	West	626502.10	2361109.21	216.80	10/8/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0525	West	626484.61	2361133.95	218.51	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0526	West	626489.13	2361132.30	221.78	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0527	West	626491.72	2361124.52	210.60	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10 Grid 10	MD, Frag Unknown MD, Frag Unknown	MD0528 MD0529	West West	626503.71 626483.53	2361143.27 2361134.48	216.28 218.08	10/8/2013 10/8/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0530	West	626505.20	2361134.48	216.23	10/8/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Fuze component	MD0531	West	626478.41	2361131.14	219.91	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0532	West	626492.65	2361128.20	217.58	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10	MD, Frag Unknown	MD0533	West	626491.27	2361128.18	218.52 219.94	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 10 Grid 11	MD, Fuze component MD, Fuze, PD M48	MD0534 MD0489	West West	626484.40 626597.27	2361137.06 2361125.16	219.94	10/8/2013 10/8/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0490	West	626594.34	2361123.10	211.60	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0491	West	626615.66	2361118.97	208.27	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0492	West	626604.25	2361128.18	209.35	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11 Grid 11	MD, Frag Unknown MD, Frag Unknown	MD0493 MD0494	West West	626600.98 626613.45	2361136.58 2361117.33	209.86 212.60	10/8/2013 10/8/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0494	West	626619.84	2361121.59	190.75	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0496	West	626604.08	2361130.88	210.78	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0497	West	626596.63	2361141.02	200.61	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11 Grid 11	MD, Frag Unknown MD, Fuze, PD M48	MD0498 MD0499	West West	626597.78 626620.00	2361140.13 2361118.83	206.48 208.39	10/8/2013 10/8/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Fuze, PD M48 MD, Frag Unknown	MD0499 MD0500	West	626598.08	2361118.83	210.35	10/8/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0501	West	626603.58	2361148.58	216.06	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0502	West	626615.25	2361120.42	199.16	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 11	MD, Frag Unknown	MD0503	West	626615.35	2361119.73	204.50	10/8/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14 Grid 14	MD, Frag Unknown MD, Frag Unknown	MD0689 MD0690	West West	627097.35 627081.38	2360740.32	179.36 185.80	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0691	West	627104.40	2360752.92	180.88	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Fuze component	MD0692	West	627098.97	2360754.51	184.17	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0693	West	627099.06	2360757.49	185.55	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14 Grid 14	MD, Frag Unknown	MD0694 MD0695	West West	627086.12 627094.72	2360747.89 2360746.81	182.29 183.46	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 14 Grid 14	MD, Frag Unknown MD, Frag Unknown	MD0695 MD0696	West	627075.17	2360746.81	183.46	10/9/2013	<1 It bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0697	West	627076.22	2360750.31	183.02	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0698	West	627092.66	2360751.63	182.89	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0699	West	627090.54	2360758.56	183.72	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14 Grid 14	MD, Frag Unknown	MD0700 MD0701	West West	627090.61 627087.42	2360761.90 2360762.14	184.18 183.23	10/9/2013 10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown MD, Frag Unknown	MD0701 MD0702	West	627080.80	2360758.12	183.17	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0703	West	627078.72	2360752.77	183.59	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0704	West	627077.98	2360752.95	183.38	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0705	West	627082.67	2360757.90	182.99	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14 Grid 14	MD, Frag Unknown	MD0706 MD0707	West West	627083.62 627083.49	2360753.84 2360757.59	182.86 183.52	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 14 Grid 14	MD, Fuze component MD, Frag Unknown	MD0707 MD0708	West	627083.49	2360757.59	183.52	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0709	West	627072.84	2360763.52	183.92	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0710	West	627075.04	2360766.36	182.14	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 14	MD, Frag Unknown	MD0711	West	627085.48	2360750.35	183.87	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0535 MD0536	West West	626412.99 626413.28	2361086.74 2361087.59	228.40 223.36	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0536 MD0537	West	626413.28	2361087.59	223.36	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
0110	MD. Frag Unknown	MD0538	West	626409.60	2361086.26	224.63	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	WID0556	West	020409.00	2301080.20	224.03	10/9/2013	<1 It bgs	<1 10	None	1421	1V1 V 17 L		

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
Grid 15	MD, Frag Unknown	MD0540	West	626413.22	2361088.20	228.08	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0541	West	626413.28	2361087.05	225.64	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0542 MD0543	West	626414.52 626417.81	2361087.66 2361086.74	224.74 222.81	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Fuze component	MD0544	West	626411.88	2361078.61	219.66	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0545	West	626413.57	2361079.19	225.55	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0546	West	626411.08	2361078.86	226.35	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0547	West	626416.06	2361069.36	215.59	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0548	West	626414.21	2361070.01	224.30	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown	MD0549 MD0550	West	626419.27 626424.47	2361076.72 2361076.52	225.86 221.34	10/9/2013 10/9/2013	<1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0551	West	626418.25	2361076.32	225.37	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0551	West	626418.10	2361070.63	223.97	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0553	West	626417.42	2361084.55	226.76	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0554	West	626416.53	2361074.55	222.99	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0555	West	626418.17	2361082.58	219.63	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0556 MD0557	West	626416.43	2361079.04	227.37 224.89	10/9/2013	<1 ft bgs	<1 lb <1 lb	None	NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0557 MD0558	West	626416.67	2361076.22	224.89	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0559	West	626417.75	2361079.19	235.51	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0560	West	626418.25	2361077.35	219.45	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0561	West	626418.26	2361078.09	218.11	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0562	West	626422.13	2361079.74	220.48	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0563	West	626414.38	2361073.86	224.36	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0564	West	626413.77	2361079.75	220.01	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0565 MD0566	West	626412.02 626418.14	2361076.83	225.79 223.90	10/9/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0567	West	626424.00	2361074.52	216.06	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0568	West	626420.97	2361069.78	200.89	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0569	West	626422.16	2361071.05	222.04	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0570	West	626423.26	2361068.96	217.42	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0571	West	626424.34	2361053.08	217.89	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0572	West	626422.35 626433.40	2361054.37	216.98 219.64	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0573 MD0574	West West	626433.21	2361069.05 2361068.73	224.48	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0574	West	626431.74	2361067.76	199.32	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0576	West	626427.11	2361073.21	201.80	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0577	West	626431.76	2361075.81	228.81	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0578	West	626425.74	2361061.99	223.58	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0579 MD0580	West	626423.35	2361064.48	221.52	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0580 MD0581	West West	626422.95 626422.36	2361060.61	230.40	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0581 MD0582	West	626422.35	2361064.36	212.18	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0583	West	626424.75	2361063.77	223.49	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Fuze component	MD0584	West	626435.52	2361063.03	238.48	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0585	West	626431.76	2361073.07	228.04	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0586	West	626425.79	2361071.04	234.26	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0587	West	626426.74	2361068.07	225.47	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0588 MD0589	West West	626433.26 626435.67	2361065.44	237.60	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0590	West	626426.85	2361075.08	219.36	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0590	West	626419.16	2361055.50	219.64	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0592	West	626430.70	2361042.38	219.75	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0593	West	626431.52	2361059.94	211.88	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0594	West	626438.11	2361056.42	216.34	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0595	West	626436.71	2361059.71	213.25	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15 Grid 15	MD, Frag Unknown MD, Frag Unknown	MD0596 MD0597	West West	626449.27 626445.22	2361051.43 2361057.14	220.54 224.71	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0598	West	626442.75	2361064.86	230.04	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0599	West	626435.18	2361045.94	221.54	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0600	West	626428.80	2361039.69	219.14	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0601	West	626430.82	2361039.79	213.98	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0602	West	626432.22	2361038.53	221.24	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 15	MD, Frag Unknown	MD0603 MD0604	West	626433.86	2361044.77	218.31	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Fuze component MD, Frag Unknown	MD0604 MD0605	West	626407.03	2360992.47	222.19	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown MD, Fuze, PD M48	MD0605 MD0606	West	626406.26	2360997.58	223.98	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Fuze, FD M48 MD, Frag Unknown	MD0607	West	626420.10	2360999.54	226.01	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0608	West	626421.21	2360997.53	213.15	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0609	West	626419.51	2361001.04	215.55	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD. Frag Unknown	MD0610	West	626420.56	2360999.17	218.68	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0611	West	626417.61	2361006.52	214 58	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate		Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
Grid 18	MD, Frag Unknown	MD0612	West	626418.37	2361010.03	221.64	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Fuze, PD M48	MD0613 MD0614	West West	626413.53 626406.04	2360998.79 2361012.10	231.37 218.92	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0614 MD0615	West	626408.93	2361012.10	216.23	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0615	West	626409.22	2361015.44	224.70	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0617	West	626412.04	2361020.40	219.60	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0618	West	626413.17	2361007.88	223.22	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0619	West	626407.94	2361008.66	216.37	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0620	West	626409.30	2361006.85	223.05	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0621 MD0622	West West	626410.69 626410.34	2361007.17 2360991.27	227.87 224.48	10/9/2013 10/9/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0622 MD0623	West	626406.21	2360991.27	224.48	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0624	West	626409.03	2360988.24	230.18	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0625	West	626417.88	2360993.30	219.21	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0626	West	626418.40	2360998.15	224.68	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0627	West	626419.54	2361013.21	216.58	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown	MD0628 MD0629	West	626418.14	2361018.95	218.11	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0629 MD0630	West West	626409.00	2361000.58	228.22	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0631	West	626415.31	2360998.75	225.13	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD. Frag Unknown	MD0632	West	626416.98	2360996.82	224.54	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0633	West	626415.27	2360997.95	224.83	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0634	West	626415.21	2361000.43	225.67	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Large Frag Unknown	MD0635	West	626415.30	2361001.28	224.07	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0636	West	626413.73	2361009.73	222.96	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Fuze component	MD0637	West	626412.97	2361009.61	221.53	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0638 MD0639	West West	626410.73 626413.78	2361013.93 2361012.35	220.40 230.22	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0639	West	626415.59	2361012.33	222.88	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0641	West	626415.94	2361000.43	224.81	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0642	West	626416.14	2360998.71	224.75	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0643	West	626416.30	2361001.86	233.96	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0644	West	626422.30	2360995.63	218.48	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0645 MD0646	West	626421.05 626425.98	2360998.35	217.59 211.51	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0647	West	626425.36	2360997.01 2360996.43	214.19	10/9/2013	<1 It bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0647 MD0648	West	626425.20	2360997.10	215.37	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0649	West	626424.73	2360999.05	220.37	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0650	West	626427.12	2360996.81	228.96	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0651	West	626428.08	2361002.79	222.58	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0652 MD0653	West	626420.77	2361003.92	212.84	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0653 MD0654	West West	626440.78	2361007.64	225.67 214.27	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0655	West	626435.86	2361011.02	214.27	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0656	West	626435.19	2361005.19	213.54	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0657	West	626435.01	2361004.02	215.39	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0658	West	626438.38	2361002.28	210.84	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0659	West	626434.55	2360999.36	212.99	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0660	West	626433.65	2361000.47	221.31	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Fuze component	MD0661	West	626426.57	2360994.31 2360999.42	216.65	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0662 MD0663	West West	626433.68 626429.88	2360999.42	213.38 220.25	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0664	West	626432.48	2360997.11	217.12	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0665	West	626427.25	2361003.43	213.54	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0666	West	626428.63	2361007.12	215.77	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0667	West	626427.92	2361017.14	214.11	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0668	West	626430.62	2360997.47	215.03	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0669 MD0670	West West	626429.19 626428.57	2360992.28 2361003.89	217.98 220.25	10/9/2013 10/9/2013	<1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0670 MD0671	West	626428.57	2361003.89	220.25	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0672	West	626442.11	2360996.14	195.31	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0673	West	626439.50	2361001.61	218.75	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0674	West	626438.45	2361004.58	218.09	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0675	West	626437.74	2361009.15	222.06	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0676	West	626436.45	2361012.87	223.47	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0677	West	626437.62	2361015.11	224.73	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0678	West	626436.53	2361011.51	225.76	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0679 MD0680	West West	626448.96 626451.38	2360995.26 2360994.18	222.15 215.73	10/9/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0680 MD0681	West	626454.36	2360994.18	218.69	10/9/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
0110 10	, ,	111111111111	11 050		2300777.17	219.79	10/9/2013	<1 ft bgs	<1 lb		NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0682	West	626439.37	2361010.26	219.79	10/9/2013	<1 II bgs	<1 lb	None	NA	MVIA	INA	Locked Container (55 G drum), awaiting final disposal

		Item						Depth below	Estimated					
Transect / Grid Number	Description	Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/ orientation	Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
0:110	MD F U I		***	626450.02	2250002 20	222.02	10/0/2012			N.	N/A	2074	N/A	T 1 10 (1 (55 C 1 ) 27 C 1 F 1
Grid 18 Grid 18	MD, Frag Unknown MD, Frag Unknown	MD0684 MD0685	West West	626450.83 626439.24	2360993.39 2361006.22	223.82 222.56	10/9/2013 10/9/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0686	West	626438.96	2361007.81	224.16	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0687	West	626441.75	2360994.93	213.81	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 18	MD, Frag Unknown	MD0688	West	626442.10	2361000.16	220.89	10/9/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0730	West	627079.68	2361641.54	148.70	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05 Grid 05	MD, Large Frag Unknown MD, Frag Unknown	MD0731 MD0732	West West	627074.98 627067.82	2361638.50 2361639.94	152.01 163.19	10/10/2013 10/10/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0732 MD0733	West	627067.82	2361639.94	156.39	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0733	West	627067.38	2361638.14	153.15	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0735	West	627066.53	2361638.87	160.85	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0736	West	627066.25	2361638.11	159.70	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0737	West	627061.43	2361637.17	156.98	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0738	West	627059.43	2361640.99	152.22	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0739	West	627063.07	2361639.88	154.56	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 05 Grid 05	MD, Frag Unknown MD, Frag Unknown	MD0740 MD0741	West West	627073.87 627076.34	2361639.20 2361638.84	154.45 154.23	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0741 MD0742	West	627077.82	2361633.43	154.77	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0743	West	627072.09	2361633.50	157.08	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0744	West	627057.05	2361631.53	157.77	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0745	West	627070.02	2361633.11	152.77	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0746	West	627067.85	2361632.08	147.24	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0747 MD0748	West	627065.71	2361630.04	149.23	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 05 Grid 05	MD, Frag Unknown MD, Frag Unknown	MD0748 MD0749	West West	627065.52 627080.00	2361631.41 2361638.55	151.85 157.91	10/10/2013 10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 05	MD, Frag Unknown	MD0749 MD0750	West	627080.00	2361634.22	160.55	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0779	West	626941.67	2360558.81	208.02	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0780	West	626951.31	2360563.88	209.87	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0781	West	626963.51	2360556.73	210.39	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0782	West	626945.20	2360558.12	221.12	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 12 Grid 12	MD, Frag Unknown MD, Frag Unknown	MD0783 MD0784	West West	626933.84 626931.00	2360553.26 2360559.39	202.36	10/10/2013 10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown MD, Fuze, PD M48	MD0784 MD0785	West	626928.92	2360559.39	209.69	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0785	West	626928.98	2360565.47	207.97	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0787	West	626930.15	2360579.56	209.94	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 12	MD, Frag Unknown	MD0788	West	626940.59	2360580.22	211.13	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 13	MD, Frag Unknown	MD0751	West	627055.84	2360634.78	196.45	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 13	MD, Frag Unknown	MD0752 MD0753	West	627051.37	2360632.45	196.26	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 13 Grid 13	MD, Frag Unknown MD, Frag Unknown	MD0753 MD0754	West West	627049.91 627036.50	2360632.48	196.02 201.68	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 13	MD, Frag Unknown	MD0755	West	627030.30	2360644.93	199.93	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 13	MD, Frag Unknown	MD0756	West	627042.36	2360650.01	202.35	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 13	MD, Frag Unknown	MD0757	West	627045.42	2360659.29	201.72	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 13	MD, Frag Unknown	MD0758	West	627064.64	2360653.92	204.30	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0759	West	627029.03	2361286.81	169.23	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	Small Arms Small Arms	MD0760 MD0761	West West	627030.26 627032.46	2361286.55 2361287.03	172.36 171.46	10/10/2013 10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0761 MD0762	West	627034.31	2361287.03	169.42	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0762	West	627032.33	2361289.74	166.76	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0764	West	627029.74	2361289.82	166.49	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0765	West	627031.76	2361290.85	166.85	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0766	West	627033.83	2361290.81	166.11	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, 81mm Mortar, Tail Boom	MD0767	West	627035.56	2361293.11	167.03	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	MD, Frag Unknown MD, Frag Unknown	MD0768 MD0769	West West	627033.95 627036.39	2361295.19 2361296.95	169.48 168.72	10/10/2013 10/10/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0770	West	627039.55	2361296.93	165.70	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0770 MD0771	West	627036.85	2361300.95	166.75	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0772	West	627037.65	2361302.73	169.10	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze component	MD0773	West	627041.69	2361302.12	165.55	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0774	West	627043.04	2361302.71	164.80	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0775	West	627040.34	2361307.96	167.24	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	MD, 81mm Mortar, Tail Boom	MD0776 MD0777	West	627043.69 627043.74	2361310.09	161.33	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown Small Arms	MD0777 MD0778	West West	627045.48	2361312.21	166.14 165.86	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, Frag Unknown	MD0778 MD0789	West	627096.97	2361309.16	155.41	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, Frag Unknown	MD0790	West	627083.56	2361351.32	159.45	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, Frag Unknown	MD0791	West	627085.83	2361354.11	159.28	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, 81mm Mortar	MD0792	West	627085.62	2361349.40	153.67	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, Frag Unknown	MD0793	West	627082.87	2361349.79	158.80	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, Frag Unknown	MD0794	West	627081.86	2361348.97	155.81	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 17 Grid 17	MD, Frag Unknown MD, Fuze component	MD0795 MD0796	West West	627081.76 627084.20	2361345.55	157.51 157.43	10/10/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
GHG 17	MD, ruze component	MD0/90	west	02/084.20	2301342.33	157.45	10/10/2013	<1 II Dgs	<1 10	None	NA	WIVIA	NA	Locked Container (55 G drum), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea		Y-Coordinate		Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
Grid 17	MD, Frag Unknown	MD0797	West	627087.63	2361342.54	157.65	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 17	MD, Frag Unknown	MD0798	West	627088.54	2361349.48	155.01	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 17 Grid 17	Small Arms MD, Frag Unknown	MD0799 MD0800	West West	627091.79 627093.82	2361349.87 2361349.99	157.58 161.66	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0800 MD0712	West	626646.22	2360519.51	247.15	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0712	West	626647.73	2360524.39	235.05	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Fuze, PD M48	MD0714	West	626654.78	2360529.89	229.01	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0715	West	626656.38	2360528.74	237.01	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0716	West	626655.53	2360537.14	235.58	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0717	West	626653.27	2360538.93	225.91	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20 Grid 20	MD, Frag Unknown MD, Frag Unknown	MD0718 MD0719	West West	626651.10 626651.01	2360540.42	231.19	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0719 MD0720	West	626654.63	2360532.85	257.45	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Fuze component	MD0721	West	626646.53	2360532.05	240.38	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0722	West	626642.16	2360526.99	229.81	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0723	West	626644.02	2360524.35	226.43	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Fuze component	MD0724	West	626641.38	2360533.90	224.06	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20 Grid 20	MD, Frag Unknown	MD0725 MD0726	West West	626642.34 626657.24	2360532.24 2360538.68	222.65 226.44	10/10/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20 Grid 20	MD, Frag Unknown MD, Frag Unknown	MD0726 MD0727	West	626657.24	2360538.68	226.44	10/10/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0727 MD0728	West	626668.66	2360535.38	228.95	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 20	MD, Frag Unknown	MD0729	West	626669.24	2360533.36	223.12	10/10/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0801	West	626757.92	2361981.62	204.15	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Fuze component	MD0802	West	626756.40	2361985.60	206.34	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0803	West	626760.17	2361998.73	205.66	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0804	West	626754.33	2362000.33	210.32	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0805 MD0806	West	626752.66	2362004.03 2361998.26	202.71	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 06 Grid 06	MD, Frag Unknown MD, Frag Unknown	MD0807	West West	626759.49 626760.38	2361998.26	200.08	10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0807 MD0808	West	626762.41	2361977.82	204.12	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Fuze component	MD0809	West	626769.92	2361989.90	205.77	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0810	West	626775.14	2361992.39	212.29	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0811	West	626777.62	2361998.75	204.58	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0812	West	626768.21	2361998.72	201.08	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 06 Grid 06	MD, Frag Unknown MD, Frag Unknown	MD0813 MD0814	West West	626755.77 626749.22	2362009.25 2361990.68	201.35 210.82	10/15/2013	<1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0814 MD0815	West	626749.44	2361988.70	207.11	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 06	MD, Frag Unknown	MD0816	West	626738.40	2361990.22	202.39	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0817	West	627027.67	2361283.23	167.24	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze, PD M48	MD0818	West	627022.45	2361280.34	168.20	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze, PD M48	MD0819	West	627020.32	2361278.97	169.94	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze, PD M48	MD0820	West	627025.02	2361277.87	169.32	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	MD, 75mm Projectile, Shrapnel MK1 MD, Frag Unknown	MD0821 MD0822	West West	627022.79 627031.62	2361277.98	169.96 179.43	10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0823	West	627026.85	2361277.19	168.96	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0824	West	627027.06	2361283.67	169.05	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0825	West	627029.94	2361283.11	167.33	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0826	West	627027.03	2361283.94	168.69	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0827	West	627011.73	2361279.34	170.16	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0828 MD0829	West	627008.75	2361277.09	170.51	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	MD, Frag Unknown MD, Frag Unknown	MD0829 MD0830	West West	627001.92 626991.43	2361276.87 2361275.55	171.70 172.74	10/15/2013 10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown MD, Frag Unknown	MD0830 MD0831	West	626989.81	23612/5.55	172.74	10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze component	MD0832	West	626994.91	2361269.78	171.60	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze component	MD0834	West	627017.40	2361279.45	170.74	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0835	West	627004.65	2361275.54	171.53	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0836	West	627008.67	2361270.12	169.94	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0837 MD0838	West	627009.29	2361267.70	169.99	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	MD, Frag Unknown MD, Frag Unknown	MD0838 MD0839	West West	627015.00 627017.46	2361264.68 2361266.32	168.16 166.60	10/15/2013 10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, 81mm Mortar, Tail Boom	MD0839 MD0840	West	627020.50	2361266.32	169.20	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0841	West	627021.09	2361270.20	168.79	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0842	West	627016.95	2361271.69	171.29	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze component	MD0843	West	627015.81	2361268.55	166.18	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0844	West	627011.24	2361270.21	169.50	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0845	West	627007.50	2361264.28	168.87	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0846	West	627000.18	2361259.99	168.65	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	Small Arms	MD0847 MD0848	West	626999.71	2361264.01	168.93 169.70	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
	Small Arms		West	626995.64	2361260.95		10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
	MD Frag Unknown	MD0849	West	626994 12	2361263.06	169.64	10/15/2013	<1 ft hos	<1 lb	None				
Grid 16 Grid 16 Grid 16	MD, Frag Unknown Small Arms	MD0849 MD0850	West	626994.12 626992.84	2361263.06 2361268.50	169.64 171.76	10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal

T /		Item						Depth below	Estimated	T. C.			F ( )	
Transect / Grid Number	Description	Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/ orientation	Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
Grid 16	MD, Frag Unknown	MD0852	West	626998.08	2361272.87	173.54	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0853	West	626999.79	2361269.13	170.55	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0854	West	627001.71	2361272.41	170.89	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0855	West	626998.89	2361275.43	173.04	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0856 MD0857	West	626990.76 626999.37	2361270.13	172.33	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16 Grid 16	Small Arms Small Arms	MD0857 MD0858	West West	626999.37	2361265.65 2361261.07	169.29 170.04	10/15/2013	<1 ft bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 16	Small Arms	MD0859	West	627003.91	2361261.07	174.27	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Fuze component	MD0860	West	627009.70	2361266.09	169.50	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, 81mm Mortar, Tail Boom	MD0861	West	627004.34	2361268.16	169.98	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0862	West	627013.65	2361265.49	168.99	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 16	MD, Frag Unknown	MD0863	West	627015.63	2361264.84	171.87	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 19	MD, Fuze, PD M48	MD0833	West	627352.07	2360981.28	164.92	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 21 Grid 21	MD, Frag Unknown MD, Frag Unknown	MD0864 MD0865	West West	626914.77 626892.06	2360510.42 2360504.74	219.97	10/15/2013 10/15/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
Grid 21	MD, Frag Unknown	MD0866	West	626893.52	2360494.22	223.90	10/15/2013	<1 ft bgs	<1 lb	None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 21	MD, Frag Unknown	MD0867	West	626904.84	2360494.35	221.40	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 21	MD, Frag Unknown	MD0868	West	626903.95	2360490.74	222.46	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 21	MD, Frag Unknown	MD0869	West	626930.01	2360485.09	222.22	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 21	MD, Frag Unknown	MD0870	West	626927.46	2360493.75	222.04	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 21	MD, Frag Unknown	MD0871	West	626917.48	2360494.92	222.26	10/15/2013	<1 ft bgs	<1 lb	None	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
Grid 21 Grid 21	MD, Frag Unknown	MD0872 MD0873	West West	626910.30 626913.70	2360487.28	222.47 221.26	10/15/2013 10/15/2013	<1 ft bgs <1 ft bgs	<1 lb <1 lb	None	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
Grid 22	MD, Frag Unknown MD, Frag Unknown	MD0873 MD0874	West	627382.90	2360881.92	164.42	10/15/2013	<1 it bgs <1 ft bgs	<1 lb	None None	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0875	West	626800.07	2362399.65	253.95	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0876	West	626800.84	2362398.65	254.12	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0877	West	626797.84	2362400.51	254.59	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Fuze, PD M48	MD0878	West	626799.02	2362398.93	254.21	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0879	West	626784.57	2362387.92	252.08 252.86	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown MD, Frag Unknown	MD0880 MD0881	West West	626770.68 626763.94	2362382.83 2362373.42	252.86	2/10/2014 2/10/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0881 MD0882	West	626762.74	2362375.42	251.10	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0883	West	626636.29	2362341.56	259.75	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0884	West	626631.96	2362337.20	259.79	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0885	West	626620.34	2362327.29	261.89	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Fuze Component	MD0886	West	626545.17	2362266.31	268.87	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01 MWD01	MD, Frag Unknown	MD0887 MD0888	West West	626538.22 626530.27	2362263.16 2362246.12	268.00 268.74	2/10/2014 2/10/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown MD, Frag Unknown	MD0889	West	626530.83	2362246.12	270.85	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0890	West	626512.42	2362231.13	271.33	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0891	West	626510.37	2362221.41	270.20	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0892	West	626509.85	2362218.89	270.95	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0893	West	626503.54	2362162.31	270.28	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0894	West	626499.15	2362158.90	271.68	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01 MWD01	MD, Frag Unknown	MD0895 MD0896	West	626488.40	2362153.49 2362147.96	272.17 284.01	2/10/2014 2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown MD, Frag Unknown	MD0896 MD0897	West West	626481.01 626482.22	2362147.96	284.01	2/10/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0897 MD0898	West	626479.94	2362131.57	271.10	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0899	West	626475.71	2362125.22	265.71	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0900	West	626475.75	2362123.93	272.34	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0901	West	626474.62	2362120.36	274.37	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0902	West	626476.94	2362119.11	277.30	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0903	West	626473.95	2362097.71	271.45	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01 MWD01	MD, Frag Unknown MD, Frag Unknown	MD0904 MD0905	West West	626479.43 626481.23	2362088.58 2362084.03	269.67 269.46	2/10/2014 2/10/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD01	MD, 37mm, APCT M59	MD0905	West	626475.30	2362070.93	265.71	2/10/2014	<1 ft bgs	1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0907	West	626482.84	2362065.13	265.85	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0908	West	626485.40	2362063.20	268.91	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0909	West	626485.79	2362061.07	267.29	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0910	West	626489.01	2362052.89	268.57	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0911	West	626495.09	2362043.84	267.40	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01 MWD01	MD, Frag Unknown MD, Fuze Component	MD0912 MD0913	West West	626497.38 626497.89	2362040.43	268.07 267.94	2/10/2014 2/10/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0913 MD0914	West	626489.82	2362039.26	267.94	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0914 MD0915	West	626491.41	2362017.40	269.61	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD01	MD, Frag Unknown	MD0916	West	626491.31	2362006.96	268.21	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0917	West	626500.55	2361982.61	269.49	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0918	West	626505.53	2361975.60	270.05	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0919	West	626507.29	2361970.50	270.60	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	Small Arms MD. Frag Unknown	MD0920 MD0921	West West	626503.47 626479.91	2361965.59 2361961.30	270.48 272.98	2/10/2014 2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	MD, Frag Unknown MD, Frag Unknown	MD0921 MD0922	West	626479.91	2361961.30	272.98	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
IVI W D02	MD, Flag URKHOWN	W11/09/22	west	020409.24	2301939.43	200.47	2/10/2014	<1 It Dgs	<1 ID	INA	INA	IVI V IA	INA	Locked Container (55 G uram), awaiting finai disposal

		Item						Depth below	Estimated					
Transect / Grid Number	Description	Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/ orientation	Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
MWD02	MD For a Holonoon	MD0923	W+	626443.87	2361952.29	276.86	2/10/2014	<1 ft bgs	<1 lb	NIA	NIA	MVIA	NTA	Ladad Castains (55 C days) assistant final disease.
MWD02	MD, Frag Unknown MD, Frag Unknown	MD0923	West West	626441.55	2361952.35	282.42	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0925	West	626436.05	2361949.31	276.65	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0926	West	626429.76	2361940.16	280.03	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0927	West	626429.74	2361929.45	281.05	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0928	West	626429.69	2361925.27	281.76	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	MD, Frag Unknown MD, Frag Unknown	MD0929 MD0930	West West	626430.09 626430.58	2361921.22 2361912.22	277.23	2/10/2014 2/10/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0930 MD0931	West	626431.29	2361906.22	278.99	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0932	West	626424.54	2361897.16	278.36	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Fuze, PD M48	MD0933	West	626425.48	2361895.20	278.19	2/10/2014	<1 ft bgs	2 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0934	West	626415.48	2361884.92	282.03	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0935	West	626407.51	2361876.83	280.84	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	MD, Frag Unknown	MD0936 MD0937	West West	626419.82 626430.28	2361864.28	280.79 280.77	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	MD, Frag Unknown MD, Frag Unknown	MD0937 MD0938	West	626469.80	2361856.01	284.82	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0939	West	626468.44	2361831.30	285.11	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0940	West	626469.27	2361825.55	286.32	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0941	West	626467.74	2361825.71	286.57	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Fuze, PD M48	MD0942	West	626467.29	2361822.23	287.35	2/10/2014	<1 ft bgs	2 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0943	West	626468.98	2361808.71	290.14	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0944	West	626468.65	2361805.59	290.71	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	MD, Fuze Component MD, Frag Unknown	MD0945 MD0946	West West	626461.65 626460.13	2361802.09 2361804.67	290.83 288.52	2/10/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD02 MWD02	MD, Frag Unknown	MD0940 MD0947	West	626450.25	2361793.76	288.05	2/10/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Fuze Component	MD0948	West	626444.65	2361787.42	289.65	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0949	West	626440.61	2361785.61	289.17	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD02	MD, Frag Unknown	MD0950	West	626417.78	2361773.62	293.63	2/10/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	Small Arms	MD0951	West	626409.58	2361777.61	294.11	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	Small Arms	MD0952 MD0953	West	626386.28 626377.68	2361769.58 2361768.72	294.82 295.03	2/11/2014 2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown MD, Fuze Component	MD0953 MD0954	West West	626359.84	2361764.52	295.03	2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0955	West	626361.90	2361761.59	305.75	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0956	West	626366.29	2361751.06	298.91	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0957	West	626368.28	2361740.40	297.09	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0958	West	626369.83	2361738.33	299.65	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0959	West	626362.43	2361722.74	304.82	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown	MD0960 MD0961	West West	626361.36 626357.91	2361713.88 2361709.04	295.81 292.73	2/11/2014 2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown MD, Frag Unknown	MD0961 MD0962	West	626359.51	2361705.96	292.73	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0963	West	626394.46	2361669.87	292.54	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0964	West	626400.26	2361669.18	296.84	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0965	West	626401.45	2361668.11	293.53	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0966	West	626403.38	2361665.55	291.35	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0967	West	626404.62	2361665.24	292.78	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown MD, Frag Unknown	MD0968 MD0969	West West	626412.08 626425.38	2361663.32 2361658.36	293.36 291.30	2/11/2014 2/11/2014	<1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0970	West	626427.20	2361657.59	290.55	2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0971	West	626433.16	2361654.48	290.14	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0972	West	626439.73	2361653.81	289.66	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0973	West	626443.35	2361651.67	289.27	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0974	West	626459.39	2361641.71	290.03	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0975	West	626439.75	2361633.11	293.27	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown MD, Frag Unknown	MD0976 MD0977	West West	626435.16 626418.13	2361632.00	292.35 291.82	2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0977 MD0978	West	626419.26	2361632.47	291.82	2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0978 MD0979	West	626406.85	2361629.80	290.81	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0980	West	626389.67	2361629.19	297.37	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0981	West	626345.35	2361636.26	300.93	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0982	West	626333.20	2361638.00	298.01	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0983	West	626325.71	2361597.40	298.01	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown MD, Frag Unknown	MD0984 MD0985	West West	626315.24 626339.31	2361585.34 2361589.61	296.88 287.91	2/11/2014 2/11/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown MD, Frag Unknown	MD0985 MD0986	West	626339.31	2361589.61	287.91	2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown MD, Frag Unknown	MD0986 MD0987	West	626302.49	2361580.02	286.41	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0987 MD0988	West	626290.79	2361522.92	279.70	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0989	West	626283.62	2361519.71	282.74	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0990	West	626293.28	2361504.33	277.84	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0991	West	626291.91	2361487.58	275.07	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0992	West	626288.33	2361488.63	275.86	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0993	West	626285.28	2361473.12	274.10	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0994	West	626276.65	2361461.97	275.41	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
MWD03	MD, Frag Unknown	MD0995	West	626272.23	2361457.09	275.99	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0996	West	626275.24	2361453.44	274.84	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown MD, Frag Unknown	MD0997 MD0998	West West	626275.78 626260.38	2361451.76 2361432.14	276.60 273.32	2/11/2014 2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD0998	West	626257.40	2361432.14	273.59	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1000	West	626204.96	2361406.15	270.20	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1001	West	626163.20	2361407.01	273.06	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1002	West	626148.50	2361411.29	271.56	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Fuze, PD M48	MD1003	West	626125.85	2361415.74	275.45	2/11/2014	<1 ft bgs	1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD03	MD, Frag Unknown	MD1004 MD1005	West West	626110.56 626118.59	2361406.57 2361397.62	277.93 278.28	2/11/2014 2/11/2014	<1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown MD, Frag Unknown	MD1003	West	626120.81	2361397.02	278.80	2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1007	West	626127.01	2361370.94	277.54	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1008	West	626125.74	2361354.21	282.04	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1009	West	626113.24	2361350.60	283.63	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1010	West	626108.12	2361332.58	272.81	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03	MD, Frag Unknown	MD1011	West	626177.38	2361329.47	282.03	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD03 MWD04	MD, Frag Unknown MD, Frag Unknown	MD1012 MD1013	West West	626186.64 626238.74	2361327.42 2361269.22	286.36 288.82	2/11/2014 2/11/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1013	West	626235.79	2361265.49	289.24	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1015	West	626256.95	2361245.97	288.90	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1016	West	626261.41	2361240.44	290.66	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1017	West	626269.84	2361243.36	289.75	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1018	West	626271.33	2361241.58	293.65	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1019	West	626282.54	2361243.60	288.24	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04 MWD04	MD, 81mm Mortar, Tail Boom MD, Frag Unknown	MD1020 MD1021	West West	626311.93	2361212.92 2361209.14	291.04 292.85	2/11/2014 2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD04 MWD04	MD, Frag Unknown	MD1021 MD1022	West	626303.64	2361205.19	295.25	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1023	West	626296.84	2361195.86	292.59	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, 81mm Mortar, Tail Boom	MD1024	West	626290.06	2361193.50	318.49	2/11/2014	<1 ft bgs	1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1025	West	626279.47	2361172.36	292.88	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1026	West	626272.26	2361168.96	297.69	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04 MWD04	MD, Frag Unknown	MD1027	West	626257.03	2361149.11	296.46 292.21	2/11/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD04 MWD04	MD, Frag Unknown MD, Frag Unknown	MD1028 MD1029	West	626239.92 626238.59	2361130.08	292.21	2/11/2014	<1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1030	West	626202.45	2361117.92	288.37	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1031	West	626199.27	2361114.13	287.01	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1032	West	626232.69	2361108.52	280.03	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04	MD, Frag Unknown	MD1033	West	626238.96	2361110.20	281.35	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD04 MWF01	MD, Frag Unknown	MD1034	West	626243.57	2361110.09	281.24	2/11/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown MD, Frag Unknown	MD1035 MD1036	West West	627610.29 627528.28	2361585.06 2361566.88	101.20 105.53	2/12/2014 2/12/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1037	West	627338.40	2361536.80	142.04	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1038	West	627309.11	2361516.79	142.09	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	Small Arms	MD1039	West	627183.55	2361427.61	155.55	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Fuze, PD M48	MD1040	West	627155.20	2361431.86	166.08	2/12/2014	<1 ft bgs	1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Fuze, PD M48	MD1041	West	627160.70	2361429.51	156.62 159.66	2/12/2014	<1 ft bgs	2 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01 MWF01	MD, Frag Unknown MD, Fuze, PD M48	MD1042 MD1043	West West	627158.19	2361428.96 2361428.39	159.66	2/12/2014	<1 ft bgs <1 ft bgs	1 lb 1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Fuze, PD M48 MD, Frag Unknown	MD1043 MD1044	West	627158.34	2361426.13	158.94	2/12/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1045	West	627157.63	2361426.03	159.79	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	Small Arms	MD1046	West	627154.93	2361426.97	159.44	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, 2.36in Rkt, M7A1, Practice	MD1047	West	627144.92	2361420.33	160.11	2/12/2014	<1 ft bgs	2 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1048	West	627149.78	2361424.47	161.17	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01 MWF01	Small Arms Small Arms	MD1049 MD1050	West West	627153.99 627170.41	2361423.83 2361426.12	156.77 155.24	2/12/2014 2/12/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1050 MD1051	West	627140.80	2361426.12	155.24	2/12/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, 60mm Mortar, Tail Boom	MD1051 MD1052	West	627130.30	2361415.95	162.14	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF01	Small Arms	MD1053	West	627132.74	2361414.99	161.91	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1054	West	627133.35	2361418.10	160.08	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, 60mm Mortar, Tail Boom	MD1055	West	627131.33	2361422.09	163.45	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01	MD, Frag Unknown	MD1056	West	627130.72	2361413.14	165.09	2/12/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF01 MWF02	MD, Fuze, PD M48	MD1057 MD1058	West	627130.42	2361414.37	163.04	2/12/2014	<1 ft bgs	1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF02 MWF02	Small Arms Small Arms	MD1058 MD1059	West West	627214.38	2361411.03	143.84 144.25	2/13/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF02	Small Arms	MD1059	West	627219.15	2361407.45	139.80	2/13/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF02	MD, 2.36in Rkt, M7A1, Practice	MD1061	West	627209.66	2361415.41	145.57	2/13/2014	<1 ft bgs	2 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF03	Small Arms	MD1062	West	627126.68	2361411.61	163.51	2/13/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF03	Small Arms	MD1063	West	627125.64	2361411.36	161.27	2/13/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
				627123.37	226141121	163.97	2/13/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF03 MWF03	MD, Frag Unknown MD, Frag Unknown	MD1064 MD1065	West West	627117.57	2361411.21 2361414.48	163.00	2/13/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

		Item						Depth below	Estimated					
Transect / Grid Number	Description	Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	ground surface/ orientation	Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
MWF03	MD, Frag Unknown	MD1067	West	627071.07	2361340.20	157.80	2/13/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF03	MD, Frag Unknown	MD1068	West	627068.87	2361334.63	158.44	2/13/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF03	MD, 60mm Mortar, Tail Boom	MD1069	West	627061.99	2361323.24	173.96	2/13/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04	MD, Frag Unknown	MD1108	West	627008.93	2361276.31	173.70	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04	MD, Frag Unknown	MD1109	West	627005.57	2361275.37	173.58	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04 MWF04	Small Arms Small Arms	MD1110 MD1111	West West	627001.20 626983.13	2361275.66	172.28 175.32	2/18/2014 2/18/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF04	MD, Frag Unknown	MD1111 MD1112	West	626977.69	2361272.60	175.26	2/18/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF04	MD, 81mm Mortar, Tail Boom	MD1113	West	626831.57	2361271.41	194.29	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04	MD, Frag Unknown	MD1114	West	626828.76	2361275.63	195.55	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04	MD, 81mm Mortar, Tail Boom	MD1115	West	626823.70	2361277.39	199.55	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04	Small Arms	MD1116	West	626805.14	2361287.71	203.15	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF04 MWF04	MD, 81mm Mortar, Tail Boom MD, Frag Unknown	MD1117 MD1118	West West	626774.78	2361299.43	213.65 173.92	2/18/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 81mm Mortar, Tail Boom	MD1070	West	627060.52	2361323.78	163.44	2/18/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF05	Small Arms	MD1071	West	627043.65	2361325.75	168.67	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1072	West	627058.05	2361330.15	164.03	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1073	West	627065.85	2361333.12	162.80	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 60mm Mortar, Tail Boom	MD1074	West	627057.36	2361322.08	164.78	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05 MWF05	MD, Fuze, PD M48 MD, 37mm APCT M51	MD1075 MD1076	West West	627059.29 627059.25	2361320.03 2361317.86	162.35 158.04	2/18/2014 2/18/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 60mm Mortar, Tail Boom	MD1076 MD1077	West	627059.23	2361317.86	158.04	2/18/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 2.36in Rkt, M7A1 Copper Cone	MD1077	West	627065.74	2361320.28	164.03	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 60mm Mortar, Tail Boom	MD1079	West	627060.81	2361313.06	163.12	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 37mm, APCT M59	MD1080	West	627061.18	2361320.71	162.73	2/18/2014	<1 ft bgs	1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1081	West	627059.05	2361320.02	159.72	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 60mm Mortar, Tail Boom	MD1082	West	627061.12	2361315.82	160.62	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1083 MD1084	West	627062.88	2361317.05 2361321.78	164.14 165.74	2/18/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown MD, 60mm Mortar, Tail Boom	MD1084 MD1085	West West	627075.81 627075.04	2361321.78	163.74	2/18/2014 2/18/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1086	West	627064.79	2361322.47	162.80	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1087	West	627065.54	2361323.33	162.74	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1088	West	627072.69	2361328.06	160.41	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1089	West	627061.88	2361315.08	165.58	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05 MWF05	MD, Frag Unknown MD, Frag Unknown	MD1090 MD1091	West West	627062.88 627066.48	2361318.16 2361318.41	156.53 156.86	2/18/2014 2/18/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Ulkilowii MD, 60mm Mortar, Tail Boom	MD1091 MD1092	West	627069.37	2361316.96	162.23	2/18/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1093	West	627070.12	2361321.45	157.54	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 81mm Mortar, Tail Boom	MD1094	West	627074.43	2361324.50	150.21	2/18/2014	<1 ft bgs	1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1095	West	627076.31	2361320.56	158.68	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1096	West	627081.15	2361320.92	158.78	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05 MWF05	MD, Frag Unknown	MD1097 MD1098	West West	627073.92 627066.22	2361318.99 2361311.07	159.97 156.02	2/18/2014 2/18/2014	<1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 81mm Mortar, Tail Boom MD, 81mm Mortar, Tail Boom	MD1098 MD1099	West	627082.15	2361311.07	157.74	2/18/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 81mm Mortar, Tail Boom	MD1100	West	627062.34	2361304.81	157.80	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 60mm Mortar, Tail Boom	MD1101	West	627064.47	2361301.61	161.17	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 81mm Mortar, Tail Boom	MD1102	West	627062.09	2361302.62	163.29	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MD, Frag Unknown	MD1103	West	627063.46	2361298.52	164.20	2/18/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF05 MWF05	MD, Frag Unknown MD, Frag Unknown	MD1104 MD1105	West West	627066.31 627069.40	2361301.29	161.95 164.55	2/18/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF05 MWF05	MD, Frag Unknown MD, 81mm Mortar, Tail Boom	MD1105 MD1106	West	627069.40	2361303.31	164.55	2/18/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF05	MD, 81mm Mortar, Tail Boom	MD1100	West	627072.74	2361301.47	166.20	2/18/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF05	MEC, 37mm, HE M63 with BD M58 Fuze	MEC0006	West	627070.50	2361320.86	161.93	2/18/2014	<1 ft bgs	1 lb	BD	Fired	MVIA	NA	Disposed of by Detonation
MWD05	MD, Frag Unknown	MD1119	Central	629240.88	2360476.98	184.47	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD05	MD, Frag Unknown	MD1120	Central	629117.64	2360311.08	195.78	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD05 MWD05	Small Arms	MD1121 MD1122	Central	628949.92 628880.86	2360278.68 2360282.98	209.78 215.22	2/19/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD05 MWD05	MD, Frag Unknown MD, Frag Unknown	MD1122 MD1123	Central Central	628880.86	2360282.98	215.22	2/19/2014 2/19/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD05	MD, Fuze Component	MD1124	Central	628854.87	2360160.31	229.12	2/19/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD05	MD, Frag Unknown	MD1125	Central	628892.97	2360141.22	239.08	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD05	MD, Frag Unknown	MD1126	Central	628889.22	2360128.23	237.26	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD05	MD, Frag Unknown	MD1127	Central	628854.98	2360045.13	233.81	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD05 MWD05	MD, Frag Unknown	MD1128 MD1129	Central	628804.85 628784.09	2360073.60 2360091.43	238.30 240.95	2/19/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD05 MWD05	MD, Frag Unknown MD, Frag Unknown	MD1129 MD1130	Central Central	628784.09	2360091.43	240.95	2/19/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD05	MD, Frag Unknown	MD1130	Central	628753.19	2360136.03	241.21	2/19/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1132	Central	628619.39	2360207.82	235.50	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1133	Central	628593.36	2360184.73	236.24	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1134	Central	628594.36	2360179.20	235.82	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1135	Central	628599.87	2360132.96	242.88	2/19/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, 81mm Mortar, Tail Boom MD, Frag Unknown	MD1136 MD1137	Central Central	628599.88 628591.85	2360123.78	241.58	2/19/2014 2/19/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
IVI W DUO	MD, FING UNKNOWN	MID113/	Centrai	020391.83	2300112.89	241.31	2/19/2014	<1 It Dgs	<1 ID	NΑ	INA	IVI V IA	INA	Locked Container (55 G uram), awaiting final disposal

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
Manage	MD 01 M . T TD	MD1138	0 . 1	628583.86	2360089.44	241.55	2/10/2014			27.4	27.4	2074	N/A	T 1 10 (55 0 1 ) (5 1 F 1
MWD06 MWD06	MD, 81mm Mortar, Tail Boom MD, Frag Unknown	MD1138 MD1139	Central Central	628583.86	2360089.44	241.55 242.49	2/19/2014 2/19/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Fuze Component	MD1140	Central	628559.86	2360063.17	241.72	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1141	Central	628532.51	2360090.34	244.15	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1142	Central	628522.75	2360114.72	243.23	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1143	Central	628482.51	2360132.23	249.92	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06	MD, Frag Unknown	MD1144	Central	628467.83	2360119.32	252.67	2/19/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD06 MWD06	MD, Frag Unknown MD, Frag Unknown	MD1145 MD1146	Central Central	628473.01 628499.29	2360094.31 2360058.19	255.57 268.00	2/19/2014 2/19/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD07	MD, Frag Unknown MD, Frag Unknown	MD1146 MD1147	Central	628394.38	2359830.58	316.38	2/20/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD07	MD, Frag Unknown	MD1148	Central	628374.96	2359887.31	318.37	2/20/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD07	MD, Frag Unknown	MD1149	Central	628165.07	2359823.63	325.39	2/20/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD07	MD, Frag Unknown	MD1150	Central	628074.51	2359934.74	299.13	2/20/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD07	MD, Frag Unknown	MD1151	Central	627966.61	2359918.59	295.46	2/20/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD08	MD, Frag Unknown	MD1152	Central	627750.97	2359967.79	309.97	2/20/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD08 MWD08	MD, Frag Unknown	MD1153 MD1154	West West	627628.50 627610.44	2360038.91 2360050.26	301.28 298.56	2/20/2014 2/20/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD08	MD, Fuze Component MD, Frag Unknown	MD1154 MD1155	West	627574.99	2360030.26	304.34	2/20/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD08	MD, Frag Unknown	MD1156	West	627535.84	2360037.42	306.54	2/20/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown	MD1157	West	627482.80	2360129.42	316.87	2/25/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown	MD1158	West	627459.09	2360113.18	314.86	2/25/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown	MD1159	West	627402.46	2360107.47	311.98	2/25/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown	MD1160	West	627332.99	2360049.78	301.89	2/25/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown	MD1161	West	627274.04	2360113.61	307.08	2/25/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD11 MWD11	MD, Frag Unknown	MD1162 MD1163	West West	627278.43 627242.96	2360121.12 2360165.83	306.19 306.13	2/25/2014 2/25/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown MD, Frag Unknown	MD1163 MD1164	West	627238.48	2360189.47	294.86	2/25/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD11	MD, Frag Unknown	MD1165	West	627225.10	2360200.39	287.49	2/25/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1166	West	627184.17	2360238.05	279.54	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1167	West	627178.35	2360248.94	280.91	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1168	West	627171.34	2360253.19	282.28	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1169	West	627145.90	2360270.03	281.58	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1170	West	627137.07	2360283.46	280.55	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown	MD1171 MD1172	West	627113.20 627111.78	2360267.59 2360266.53	280.89 280.76	2/26/2014	<1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown MD, Frag Unknown	MD1172 MD1173	West West	627093.51	2360249.53	280.76	2/26/2014 2/26/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1173	West	627093.31	2360249.33	280.53	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1175	West	627092.78	2360248.71	280.59	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1176	West	627086.68	2360245.72	279.70	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1177	West	627083.18	2360240.80	281.88	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1178	West	627074.18	2360226.49	290.55	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Fuze Component	MD1179 MD1180	West West	627069.62 627052.04	2360217.45 2360205.11	282.15 283.40	2/26/2014 2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown MD, Frag Unknown	MD1180 MD1181	West	627052.04	2360205.11	283.40	2/26/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown MD, Frag Unknown	MD1181 MD1182	West	627056.59	2360202.70	285.01	2/26/2014	<1 it bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1183	West	627057.54	2360225.99	285.48	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1184	West	627056.60	2360229.08	286.91	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1185	West	627052.16	2360234.59	288.39	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1186	West	627055.34	2360233.23	286.08	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1187	West	627052.06	2360252.06	281.87	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1188	West	627052.64	2360254.19	281.20	2/26/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown MD, Frag Unknown	MD1189 MD1190	West West	627050.10 627049.70	2360264.85 2360269.87	281.21 280.65	2/26/2014 2/26/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1190 MD1191	West	627049.05	2360276.27	281.92	2/26/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1192	West	627045.19	2360279.97	282.51	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1193	West	627041.06	2360280.39	281.80	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1194	West	627035.02	2360285.28	282.14	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1195	West	627029.37	2360288.08	281.89	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1196	West	627026.40	2360295.26	281.26	2/26/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown MD, Frag Unknown	MD1197 MD1198	West	627029.00	2360313.94	281.94 282.98	2/26/2014 2/26/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown MD, Frag Unknown	MD1198 MD1199	West	627032.19	2360329.99	282.98	2/26/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown MD, Frag Unknown	MD1199 MD1200	West	627034.46	2360335.55	281.86	2/26/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1200	West	627035.72	2360333.90	281.26	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1202	West	627037.56	2360359.20	281.06	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1203	West	627043.41	2360377.94	281.07	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Fuze Component	MD1204	West	627045.67	2360383.36	280.51	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Fuze Component	MD1205	West	627044.98	2360383.85	279.78	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1206	West	627029.64	2360388.44	280.25	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD12	MD, Frag Unknown	MD1207	West	627022.91	2360389.56	280.67	2/26/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD12 MWD12	MD, Frag Unknown	MD1208 MD1209	West West	627021.35 627018.05	2360389.32 2360389.46	280.36 281.52	2/26/2014 2/26/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
IVI W D12	MD, Frag Unknown	IVID 1209	west	027018.03	2300389.40	201.32	2/20/2014	<1 it bgs	<1 ID	INA	INA	IVI V I.A.	INA	Locked Container (55 G utdin), awaiting final disposal

Transect /	Description	Item Identification	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/	Estimated Weight	Type of	Condition	Location	External	Disposition
Grid Number	·	Number						orientation	(lbs)	Fuzing			Markings	·
MWD12	MD, Frag Unknown	MD1210	West	627012.52	2360387.36	281.63	2/26/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze Component	MD1211	West	626273.92	2361103.68	269.19	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1212	West	626268.24	2361101.09	270.86	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1213 MD1214	West West	626259.96 626233.14	2361092.97 2361061.47	270.26 269.07	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1214 MD1215	West	626246.87	2361059.55	272.26	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze Component	MD1216	West	626245.18	2361057.29	269.32	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1217	West	626250.77	2361056.91	268.77	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1218	West	626260.59	2361057.85	270.93	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1219	West	626264.77	2361053.15	262.77	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1220	West	626270.17	2361053.31	270.22	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1221 MD1222	West West	626272.68 626286.18	2361051.35	270.71 272.22	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13	MD, 81mm Mortar, Tail Boom	MD1222	West	626305.28	2361057.38	274.96	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1223	West	626305.88	2361058.48	274.12	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1225	West	626307.77	2361056.68	273.89	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1226	West	626311.38	2361061.46	278.06	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze Component	MD1227	West	626315.72	2361060.42	276.88	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1228	West	626317.94	2361059.17	274.35	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown	MD1229 MD1230	West	626327.88	2361063.96	274.20 277.18	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1230 MD1231	West West	626334.92	2361062.97	277.18	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1231 MD1232	West	626348.45	2361065.26	276.56	2/27/2014	<1 ft bgs	<1 lb	NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1232	West	626345.85	2361049.76	276.61	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1234	West	626342.55	2361036.95	278.70	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1235	West	626339.54	2361027.15	278.54	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1236	West	626331.33	2361015.32	277.86	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1237	West	626323.02	2361007.85	281.17	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1238	West	626319.09	2361006.64	279.31	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown	MD1239 MD1240	West	626308.53 626276.54	2360992.97	283.92 275.86	2/27/2014 2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Fuze, PD M48 MD, Fuze Component	MD1240 MD1241	West West	626274.43	2360951.60 2360942.71	275.86	2/27/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1241 MD1242	West	626266.02	2360936.02	273.44	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1243	West	626260.34	2360930.38	273.89	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1244	West	626255.52	2360925.95	274.20	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1245	West	626235.65	2360902.32	271.29	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1246	West	626230.82	2360897.52	271.79	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1247	West	626238.22	2360864.20	269.35	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze Component	MD1248	West	626258.84	2360827.13	267.58	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1249 MD1250	West West	626260.44 626254.26	2360805.06 2360798.42	266.50 268.71	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze, PTT M1907	MD1250 MD1251	West	626256.73	2360792.78	277.04	2/27/2014	<1 ft bgs	<1 lb	NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze, PD M48	MD1252	West	626261.08	2360785.31	275.59	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1253	West	626261.88	2360784.43	279.16	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1254	West	626270.95	2360781.48	270.15	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1255	West	626307.13	2360765.93	269.99	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze, PD M48	MD1256	West	626313.66	2360769.29	271.23	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze Component	MD1257	West	626319.53	2360751.33	270.76	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1258 MD1259	West West	626325.67 626335.88	2360748.31 2360744.83	269.01 276.27	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1259 MD1260	West	626341.19	2360744.83	275.54	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1260 MD1261	West	626345.59	2360745.51	273.27	2/27/2014	<1 ft bgs	<1 lb	NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1262	West	626356.42	2360741.38	281.69	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1263	West	626371.98	2360727.61	278.56	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1264	West	626400.41	2360709.61	276.94	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1265	West	626404.46	2360707.30	277.48	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1266	West	626406.80	2360706.81	277.05	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1267	West	626409.97	2360706.07	277.86	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1268 MD1269	West West	626419.74 626423.34	2360702.24	274.64 278.84	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze Component	MD1209	West	626427.76	2360696.96	281.24	2/27/2014	<1 ft bgs	<1 lb	NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1271	West	626435.81	2360691.19	279.84	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1272	West	626436.95	2360690.02	285.49	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1273	West	626440.30	2360688.61	282.26	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1274	West	626440.32	2360688.60	282.24	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Fuze, PD M48	MD1275	West	626439.66	2360688.13	284.62	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1276	West	626443.85	2360687.09	283.34	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Fuze Component	MD1277 MD1278	West West	626447.63 626450.09	2360685.51	283.52 285.80	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
	MD, Fuze Component MD, Frag Unknown	MD1278 MD1279	West	626450.09	2360685.39	285.80	2/27/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD13				. 020.00.10	25555500.72	200.00	2,2,,2017	-1 11 UEO	~1 10	4 12 1	4 1/4 1	414 / 1/1		commune (55 C arani), awaiting intai disposar
MWD13 MWD13	MD, Frag Unknown	MD1280	West	626459.74	2360676.97	286.57	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

#### MEC/MPPEH/MD TRACKING LOG

Transect / Grid Number	Description	Item Identification Number	Subarea	X-Coordinate	Y-Coordinate	Z-Coordinate	Date	Depth below ground surface/ orientation	Estimated Weight (lbs)	Type of Fuzing	Condition	Location	External Markings	Disposition
MWD13	MD, Frag Unknown	MD1282	West	626454.82	2360666.51	287.37	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1283	West	626408.66	2360642.11	288.56	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13	MD, Frag Unknown	MD1284	West	626348.08	2360629.97	288.17	2/27/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD13 MWD13	MD, Frag Unknown MD, Frag Unknown	MD1285 MD1286	West West	626339.52 626335.73	2360625.81 2360621.72	289.80 293.09	2/27/2014 2/27/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWD13 MWD14	MD, Frag Unknown MD, Fuze, PTT TSQ M54	MD1286 MD1287	West	626342.14	2360557.19	289.00	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1288	West	626352.48	2360527.29	295.28	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1289	West	626360.45	2360524.65	291.75	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1290	West	626367.66	2360518.03	291.54	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1291	West	626391.95	2360499.17	290.68	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1292	West	626402.55	2360494.46	291.14	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1293	West	626406.91 626403.38	2360468.30	296.22 300.24	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14 MWD14	MD, Frag Unknown MD, Frag Unknown	MD1294 MD1295	West West	626403.38	2360414.01 2360407.17	300.24	3/3/2014 3/3/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1293 MD1296	West	626398.18	2360407.17	302.26	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1297	West	626405.99	2360385.24	310.98	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1298	West	626443.77	2360398.18	300.02	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1299	West	626437.43	2360388.32	300.35	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Fuze Component	MD1300	West	626433.81	2360384.58	299.52	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1301	West	626427.17	2360342.54	301.00	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1302	West	626424.91	2360328.75	299.87	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14 MWD14	MD, Frag Unknown MD, Frag Unknown	MD1303 MD1304	West West	626443.50 626453.86	2360292.78 2360288.03	306.06 298.14	3/3/2014 3/3/2014	<1 ft bgs <1 ft bgs	<1 lb <1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD14 MWD14	MD, Frag Unknown	MD1304 MD1305	West	626454.08	2360283.21	301.32	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1305	West	626453.89	2360284.52	301.78	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Fuze Component	MD1307	West	626467.92	2360285.58	294.57	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1308	West	626504.09	2360257.23	302.02	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Fuze, PTT M1907	MD1309	West	626516.65	2360252.57	304.31	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1310	West	626532.07	2360250.40	303.65	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1311 MD1312	West	626549.57 626575.42	2360254.00	298.68	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14 MWD14	MD, Frag Unknown MD, Frag Unknown	MD1312 MD1313	West West	6265/5.42	2360210.62	301.76 298.99	3/3/2014 3/3/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1313 MD1314	West	626649.65	2360217.53	299.38	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Fuze Component	MD1315	West	626680.72	2360286.05	295.91	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1316	West	626705.03	2360281.39	294.72	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1317	West	626713.53	2360335.33	291.85	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1318	West	626727.18	2360347.99	292.05	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1319	West	626793.40	2360369.10	289.31	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD14 MWD14	MD, Frag Unknown MD, Frag Unknown	MD1320 MD1321	West West	626793.98 626799.73	2360363.70 2360340.29	289.75 290.36	3/3/2014 3/3/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD14	MD, Frag Unknown	MD1321 MD1322	West	626812.17	2360340.29	293.88	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1323	West	626818.51	2360299.97	290.21	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1324	West	626837.77	2360294.86	288.28	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1325	West	626845.33	2360317.27	287.38	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Fuze, PTT TSQ M54	MD1326	West	626854.14	2360339.11	285.82	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1327	West	626861.11	2360359.64	284.28	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1328	West	626905.86	2360362.38	283.48	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD15 MWD15	MD, Frag Unknown MD, Frag Unknown	MD1329 MD1330	West West	626912.96	2360357.77	287.06 285.24	3/3/2014 3/3/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown MD, Fuze, PTT TSQ M54	MD1330 MD1331	West	626934.71	2360354.72	282.24	3/3/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1331 MD1332	West	626959.05	2360360.35	282.82	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1333	West	626979.57	2360379.05	281.21	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1334	West	626984.90	2360379.15	282.64	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1335	West	626994.82	2360383.44	281.41	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1336	West	627000.97	2360382.90	282.80	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD15	MD, Frag Unknown	MD1337	West	627001.85	2360383.89	283.75	3/3/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWD16 MWD16	MD, Frag Unknown MD, Frag Unknown	MD1338 MD1339	West West	626697.83 626690.03	2362429.31 2362435.67	251.33 250.04	3/4/2014 3/4/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal Locked Container (55 G drum), awaiting final disposal
MWF06	MD, Frag Unknown MD, Frag Unknown	MD1339 MD1340	West	627213.31	2362435.67	148.60	3/4/2014	<1 ft bgs <1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal  Locked Container (55 G drum), awaiting final disposal
MWF06	MD, Frag Unknown	MD1341	West	627203.82	2361373.46	167.81	3/4/2014	<1 ft bgs	<1 lb	NA NA	NA NA	MVIA	NA NA	Locked Container (55 G drum), awaiting final disposal
MWF06	MD, Frag Unknown	MD1342	West	627195.29	2361374.06	133.37	3/4/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF02	MD, Frag Unknown	MD1347	West	627219.61	2361369.31	122.90	3/5/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF07	MD, Frag Unknown	MD1343	West	627200.69	2361296.19	117.02	3/5/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF07	MEC, 37mm, HE M63 with BD M58 Fuze	MEC0007	West	627207.88	2361321.89	121.02	3/5/2014	<1 ft bgs	1 lb	BD	Fired	MVIA	NA	Disposed of by Detonation
MWF07	MD, Frag Unknown	MD1345	West	627221.23	2361353.85	121.00	3/5/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal
MWF07	MD, Frag Unknown	MD1346	West	627223.67	2361359.40	122.77	3/5/2014	<1 ft bgs	<1 lb	NA	NA	MVIA	NA	Locked Container (55 G drum), awaiting final disposal

	DI RI OD FRO CE N	0 7 23 24 25 26 27 28 29 45 46 47 48 49 50 51 52 53 54 55 50 57 58 50 50 61 62 63 54 65 66 67 68 60 70 71 72 73  M & N S S I S MENTARY I U TRI- ADDRESS G N BU- R ADDRESS G D TION	741/51/61///81/9/80	OTAL PRICE	S Maunaw Oahu, H	ning Camp ili Valley, I	3. SHIP TO CAMETO 364 & S LA, CA,	1-X 82 20011
IENT	24, DOCUMENT NUMBER & SUFFIX (30-44)	Location: Pali Training Camp, Maunawili Valley, Oahu, Hawaii Contractor: Huikala Container Identification: USACE/PTC, Oahu, HI/Huikala, LLC/0001	5. DOC DATE   6. NMFC		1 -		CRAP	9, PS
T DOCUM	24. DOCU	Seal Identification: 8196805	16. FREIGHT CLÀSSIF ORDNANCE REL. 17. ITEM NOMENCLAT	ATED SCRAP				
RELEASE/RECEIPT DOCUMENT	25. NATIONAL. STOCK NO. 8 ADO (8-22)	Certified by: Gregory B. Jacobs, Huikals LLC, Senior Unexploded Ordnance Supervisor 3375 Koapaka Street, Suite F-200, Honolulu, HI 96819 Office: 808-629-7000 Cell: 808-343-0696	ORDNANCE REL.  18. TY CONT   19. NO CO.  122. RECEIVED BY	ATED SCRAP. ONT 20. TO	, STEEL/MI	2	LS (MDAS) TOTAL CUB  DATE RECI	EIVED
91 (EG) ISSUE	26. RIC (4-5) UI (23-24) OTY (25-25) CON CODE (71) DIST (55-36)	(Statement IAW EM 1110-1-4009, Chapter 14) "This certifies and verifies that the mater belief, are inert and/or free of explosives or related materials."	ial listed has been 1	00 percent insp	ected and to	the best of o	ur knowleda	ge and
DD FORM 1348-1A, JUL	27. ADDITIONAL DATA	I, Michael Brison, Huikala LLC, Unexploded Ordnance Quality Control Specialist, verifi 3375 Kospaka Street, Suite F-200, Honolulu, HI 96819 Office: 808-629-7000 Cell: 530-249-3308	ed the scrap process	<b>3</b> .		,		

Adoba Designer 6.0



# CMX

# Certificate of Destruction of MDAS / RRD scrap

"I certify that the items/assets listed were demilitarized in accordance with guidelines in DoD 4160.21-M-1 and have been smelted or shredded and are only identifiable by their basic content."

Customer E.R.R.G.

Origin Pali Training Camp, Maunawili Valley, Oahu, Hi

Tracking # 8196805

Gross lbs 165.7 net

Name Mac Martinez

Signature\_

Title Management

Date 5-1-14





#### CALIFORNIA METAL-X

PURCHASE RECEIVING REPORT

COMPANY:	E.R.R.G.	OUR P.O. #	VERBAL
DATE RECEIVED:	4/16/2014	OUR R.T.#	Y26186
CARRIER:	T-T	VERIFIED BY:	MAC
		SEAL #:	see cert of desctruction

INV CODE	COMMODITY	GROSS	TARE	NET	cost	ss '	VALUE
1519-13-00	STEEL SCRAP (MUNITION DEBRIS)	408	50	358	NO VALUE	\$	-
1710-00-00	BRASS SHELLS	4	0	4	NO VALUE	\$	-
		***************************************	***************************************	0		\$	-
				0		\$	•
				0		\$	
				0		\$	_
				0		\$	-
				0		\$	-
				0		\$	*
***************************************				0		\$	-
				0		\$	_
				0		\$	
				0		\$	-
				0		\$	
				0		\$	-
				0		\$	-
				0		\$	
				0		\$	-
				0		\$	-
				0		\$	
OTALS		412	50	362			\$0.00

#### WEIGHTMASTER CERTIFICATE

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weightmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chaper 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division fo Measurement Standards of the California Department of Food and Agriculture.

Signature

CALIFORNIA METAL - X

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii Receiving



TO 0003

California Metal-X 366 E. 58th St. Los Angeles, CA 90011

Revision 3

	· · · · · · · · · · · · · · · · · · ·		And the second s	The second secon		Y	1100
From QC	PC Com	mercial r		MX	/	Date	1-16-14
Carrier/Vehicle#	Hon	· · · · · · · · · · · · · · · · · · ·	+NP85	Service	Seal #	None	
License #	*		Time	In			-
			1	1	T	T	
	Descripti	on <del>(`                                    </del>	Package	Gross	Tare	NET	
1steel	Secon	MOSTSON	Drum	106	32	74	_
2 deloses	2) 1		, ú	302	118	186	
3	517-13	<u>OO</u>					
4				408	50	358	10 value
5				·			
6	···						
7							-
8	~W~ 1=		0	1 1	<b>-</b>	 	to valve.
Bross-	SNEW		Bag	<u>"</u>		January Land	Lo Valori
10	1710-0	0-00	$\sim$			······································	
12						-	-
13							-
14						······································	4
15							-
16							_
17							-
18							-
19							-
20				······································		·····	-
21							
22							-
23							
24							
25							-
26				····			-
27							-
28					····	***************************************	
29							
30							1
31						·····	
Shipper's Net	CMX Net	Difference					
Contract No. W91	2DY-10-D-0053		I-23				November 2014

# Honolulu Freight Service HLFS CERTIFIED FREIGHT FORWARDER ICC-FF 267 See back for REMITTANCE

Final Remedial Investigation Report Pali Training Comp, Oahu, Hawaii

See back for REMITTANCE ADDRESS

							í.	1000		<i>M</i> .	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Deliver To:	CALI	FORNITA	-RETALS		Shipper's Numbers: 77 17 0								
		E SOTH		and the second second second second	Vanco.								
ì		ANGELE	s, ca søøil	State of the state	- MARW NA								
Bill To:					Shippe								
			MMERCIAL SVO	36					RCIAL S	WOR	)		
		OX 235						LAI S					
\$	HOMO	LULU, I	HI 96853		14	lettijt:	tuta ky	HI 94	574977				
Vessel & Voya	age		Contr# - B/L Date	From - To	Page	F	Recvid & I	nv. Date	Freight Bill Nur	nber			
			MATUP53844	HIVIL			03/3	1/14					
MOKIH	AMA:	270	03/31/14	1 <u></u> (4) X	<u></u>		04/0	9714	1458	<u> 42</u>			
Pieces	Unit	Commodity De				Wei	•	Rate	Prepaid		Collect		
1			/B REGULAR (		- 1		470	)					
		1	IRAP METAL F	WELLD AND									
		1PLT	ms v. v v v v v v v v v v v v v v v v v v										
		1 110 101 101	34-9881 CE DL/ICD9/:	rénc									
			FREIGHT	de territorioni									
			R FUEL	•								ran baasa F	
		WHARFI								Ė.			
			MAL HANDLIM	3									
ngar 1 1800 co - 1110 c - 1110 c		•					reservate and re-						
			OTAL CUBE=				470	1					
			JH 23, 2014										
			el Surchary							:		٠	
incr	10 M S (	e from	34.5% to 35	9. 5%	•								
			er.										
	100/0		Droty III door dollars	CVCCCC ACAVO	ren. ce	E CO	MELINAED	INEORMATIO	N ON REVERSE	,	J	o <del>n.</del>	
ECEIVED THE		SCRIBED PROI	PERTY IN GOOD CONDITION	EXCEPT AS NOT	icu. Xt	as COI	Date	HALOHAMATIO	Delivered by	<del>, /</del>	7		
				1/ 1/		Aren Care	4 1 1 1 1 1 1 1	11 11		1/0	$M_{\rm e} = 10^{-3}$	1	

CONTROL THE ABOVE DESCRIBED I NOT ENTIT IN GOOD CONE	anone and the second	Joseph 0 00112-1112	
2 Firm	By Marine Marine	Date	Delivered by:
CONSIGNEE DELIVERY RECEIPT	REGULATIONS REQU	THE PAYMENT OF FREIGHT BIL	LS WITHIN JOAYS JUY



# www.hisnet.con

# Final Remedial Investigation Report HFS: H45842 ining Camp, Oahu, Hawaii

933 A. N. Nimitz Wy, Handalah, Hi. 96817 P. 808-831-0268 • 2326 Aimput Wy. South, Scattle, Wil. 98134 206-622-0955 • 7615 N. Upland Dr. Portland, OR. 97203 P. 503-286-1737

1400 Dale	St, Mo	eleballe, CA 9084	0 P: 323-007-6	777 + 2964	Alvarado Si, Uri K, S	iii Liàndro, C	94577	510-61	1-2100 •	1717 S	angainetti En,	Stockton,	CA 95205 P	209-466-8618	
SHIPPER'S NAME	. 1	acific (	omme	Voial	501400	43				£					
Stree Address	91	- 254 (	) Lavi e	struct		1	Qale:/	" <b>(3</b>	[31]	14					
City, State Zip	1/0			76-10-	TO SEE A PROPERTY OF THE PROPE		SSEL 'AGE			171	:				
Phone No	<del></del>	<del></del>	599	***		Copi	lainer mber				······································	*************	<del></del>		
		343 - 4	21. 815.0	00			Juote			******	·····				
NEUMINEN, SIBIBUT I	սասե	iassoilarenis am	11 14138871113134 3-78	BRIBLIT SPEEBLE	CSNi.C	i ine gale oi k	No: ne issue	of this Bi	I of Ladii	ng, the p	property desc	ribed he	rein, in app	arent good or	der, except
as noted (contents a contract as meaning leliver to another ca carty at any time inte ion(s) and Hopolulu	nd,con any pr rrier or rested Freigh	idition of content erson of corpora in the route to sai fin all or any of s at Service Tariffs	is of packages dion in posse id destination, said property, on the date o	s unknown), a ssion of the . It is mutual that every so at shinment	marked, consigned property under the y agreed as to each rvice to be perfore Shipper hereby c	l, and destine e contract) ag ch carrier of a med hereunde ertifics that h	d as indi rees to d Il or any er shall b e is fami	icated ab carry to i of, said i de subjec liar with	ove Which ts usual   property t to all th all the Bi	n said ca place of overall d e Bill of ll of Lac	erner (the wo delivery at s or any portion Lading terms ling terms ar	ord carrie aid desti n of said s and cor id condit	r being und nation, if o route to de aditions in t ions in the	lerstood throu n its route, ot estination and the governing noverning cla	rghout this therwise to as to each classifica- assification
und Honolulu Freight hat Honolulu Freight iability, Honolulu Fre	Servi	ce is tendered ar	nd does transi	nort a shipm	ent for which, at t	he time of shi	pment, i	no prior a	igreemer	it, confii	med in writi	ng, had t	ocen made	regarding a li	n the event mitation of
CONSIGNED TO Name:	*****	aliforu		£ ,		BIL	L TO ame:	Pac	ific					servic	Cls
.Street Address:			58 th				treet ress:	P.0	. B	OΧ	235	117	7		
City, State	Lo	A	•		90011	City,	State Zip:	HOL	plu	Tu	446	91	0823		
Phone No:	2		,4.9		700-	Р	hone No:				599				
Email		<b>6</b>	74 1	<i>V</i> 01.	<u>.</u>		Email		<del></del>						
Address:		·					ress:							305-9200	1172 F(S)
Number Packages	(X) HiM	KINI		•	SCRIPTION O		ES,		Weight	- 1	lass Ci Rate	ube		BE PAID	
/ Longoo	19.9	drun		scrap	meta	_	·	9	1801		14	97H'	I <b>∠</b> Ship	0.000	
7U				Ì							Ac	<u>~</u>	☐ Con:	<del>-</del> .	
<u> </u>			· .					/	<u>/ ~ </u>			4,		d Party	
	-	48	3×402	<u> 40 </u>				- (	170	_		7	chiement ic	Section 7 of the of this Bill of La to be delivered	I to The con-
	<u> </u>	•		•				-		_			signee with signor, the following st	out receases of consignor sha atement. The delivery of this yment of freighten	on the con- all sign the carrier-shall
													not make without pa charges.	Jelivery of thi yment of freig	s shipment ght and all
				······································									, -	nature of Consig	gnor)
TEMPERATURE  • CHILL Cargo* shi	ipped :	at 34° 10 35° F	ED BY SH	IPPER	REVIDE 6 Na	( <b>0) 9 9 0</b> me:							<b>€. ②</b> . □ Cash c	D. SHIP or Certified	MENT Check
• FROZEN Cargo* s * <i>Unless otherwise a</i>			HEC			reet			•					any Check ( or COD Am	
SPECIFY Reefer			and the second second	1 at °	F Addr	<del></del>					<u> </u>	<sup>L</sup>	Uniy F∢ ⊄.	or cod am	ount or
	ar.		•	· ·		Zip:							c.ö́.b.	Fees to be	paid by:
	(Sig	nature of Shippen	Agent)			one No:		· •••					Shipp	per 🗆 Co	nsignee
NOTE: HFS rates are except for lesser limi	predic lation:	cated on a limit o s on Personal Ef	f liability for l lects as chose	oss or/dama in by the ship	ge that shall not oper at time of shi	exceed \$1000 pment, or, un	.00 per j less othe	piece or p erwise st	cackage, ated by ti	or wher ne Shipp	e no piece of er to be not	package exceedin	count, per g \$	customary fr	reight unit,
ag reed to in writing t NOTE: Failure to pay	y HFS	s, prior to actual	acceptance of	f shipment.				-		* : : : : : : : : : : : : : : : : : : :	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				
Shipper:	. }	1.1	<u>π</u> /1		Car	4.	455	10	1+	132			Vrite measuren		<u> </u>
Shipper Signature:	1	the 1	re		Car Signa	rier:	-	* * * · ·						-	
, Print	LV	IL DA	E. P.A.	A		rint	7 /							. (	くけん

Name:

Date: Date: Permanent address of barrier: Honolulu Freight Service, 2326 Airport Way, Seattle, WA 99134

Seattle Office 206 622-0955\*800 216-0582\*Fax 206 625-9625/Honolulu Office 800 532-0258\* Fax 808 599-6091

SERVICE REQUESTED.

| Door to Door | Door to Dock |
| Dock to Door | Dock to Dock |

# Appendix J Transect and Grid Logs

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

Revision 3

#### TRANSECT SUMMARY TABLE (PRIMARY TRANSECTS JULY - OCTOBER 2013)

Transect	Lot	Initial Transect Distance (m)	Added Meandering Transect Distance (m)	Surveyed (m)	Swept (m)	QC'd (m)	Date QC'd	QA'd (m)	Date QA'd	Unsurveyable (m)	Notes
1		307.8								307.8	On Castle Property
2		706.5								706.5	
3		408.4								408.4	
4		1,010.0									
5	17	658.6		268.6	268.6	268.6	9/16/2013	268.6	9/16/2013		Corrected transect length in GIS database: 262.3m
6	17	551.3		596.4	596.4	596.4	9/16/2013	596.4	9/16/2013		
7		193.6								193.6	
8	16	1,243.5		451.9	329.6	329.6	9/16/2013	329.6	9/16/2013	256.6	
9	14	716.4		133.3	133.3	133.3	9/16/2013	133.3	9/16/2013	138.9	
10	12	720.7		330.2	330.2	330.2	9/16/2013	330.2	9/16/2013	406.7	
11	12	555.1 935.9		578.4	578.4	578.4	9/16/2013	578.4	9/16/2013	935.9	
13		635.4								635.4	
14	1	433.3		925.9	925.9	925.9	8/8/2013	925.9	8/14/2013	033.4	
15	3	572.8		738.5	738.5	738.5	8/13/2013	738.5	8/14/2013	67.7	
16	3	305.8		379.7	379.7	379.7	8/13/2013	379.7	8/14/2013	07.7	
17	1	1,016.7		1,153.0	1,153.0	1,153.0	8/8/2013	1,153.0	8/14/2013	112.4	
18	3	960.1		1,156.5	1,156.5	1,156.5	8/13/2013	1,156.5	8/14/2013	98.5	
19	1	1,183.4		977.1	977.1	977.1	8/8/2013	977.1	8/14/2013	384.8	
20	2	1,022.7		1,343.9	1,343.9	1,343.9	8/8/2013	1,343.9	8/14/2013	50.10	
21	2	1,001.4		1,238.1	1,238.1	1,238.1	8/8/2013	1,238.1	8/14/2013	37.8	
26		224.8		, in the second	ŕ	,		,			
27	25	419.7		204.6	204.6	204.6	10/3/2013	204.6	10/7/2013		
28	13	865.6		114.1	114.1	114.1	9/16/2013	114.1	9/16/2013		
29	4	315.1		337.1	337.1	337.1	8/19/2013	337.1	8/19/2013	20.9	
30		232.5								232.5	
31	4	627.3		986.0	986.0	986.0	8/19/2013	986.0	8/19/2013	49.4	
32		173.4								173.4	
33	4	601.2		453.8	453.8	453.8	8/19/2013	453.8	8/19/2013	277.7	
34	4	460.3		444.9	444.9	444.9	8/19/2013	444.9	8/19/2013	68.7	
35	4	156.3		171.4	171.4	171.4	8/19/2013	171.4	8/19/2013	25.6	
36		196.1								196.1	
37		117.8								117.8	
38		113.5								113.5	
39		75.5								75.5	
40		389.4								389.4	
41		7.2 169.1								169.1	
43		130.4								130.4	
45		83.6								83.6	
46		72.5								72.5	
47		134.2								134.2	
48		73.1								73.1	
49		234.2								234.2	
50		269.4								269.4	
51		373.3								373.3	
52		111.0								111.0	
53		242.6								242.6	
54	26	1,746.2		1,260.0	1,625.8	1,625.8	10/3/2013	1,625.8	10/7/2013	341.0	
55	27	294.7		211.9	211.9	211.9	10/3/2013	211.9	10/7/2013	120.4	
56		577.3								59.5	
57		361.9								361.9	
58		577.7								577.7	
59		136.7		136.7							
60	26	49.6		58.5	40.2	40.2	10/3/2013	40.2	10/7/2013		

## TRANSECT SUMMARY TABLE (PRIMARY TRANSECTS JULY - OCTOBER 2013)

Transect	Lot	Initial Transect Distance (m)	Added Meandering Transect Distance (m)	Surveyed (m)	Swept (m)	QC'd (m)	Date QC'd	QA'd (m)	Date QA'd	Unsurveyable (m)	Notes
62	24	326.2		96.0	96.0	96.0	9/24/2013	96.0	9/24/2013		
63	28	162.9		219.2	219.2	219.2	10/3/2013	219.2	10/7/2013		
64	25	372.2		325.5	325.5	325.5	10/3/2013	325.5	10/7/2013		
65	29	234.0		168.4	168.4	168.4	10/3/2013	168.4	10/7/2013	112.8	
66	30	845.2		297.0	297.0	297.0	10/3/2013	297.0	10/7/2013		
67	25	268.4		301.8	301.8	301.8	10/3/2013	301.8	10/7/2013	29.5	
68 69	28	747.7		506.1	506.1	506.1	10/3/2013	506.1	10/7/2013	111.7	
70		111.5								111.5 200.6	
70		200.6 55.4								55.4	
72		152.9								152.9	
73		161.6								161.6	
74	25	1,665.0		395.9	315.7	315.7	10/3/2013	315.7	10/7/2013	212.3	
75	28	2,044.7		448.8	394.4	394.4	10/3/2013	394.4	10/7/2013	322.9	
76		1,858.8		440.0	374.4	374.4	10/3/2013	374.4	10/1/2013	198.9	
91		269.4								228.4	
92		241.3								241.3	
93		359.8								359.8	
94		688.0		143.0						72.0	
95	16	482.3		49.1	49.1	49.1	9/16/2013	49.1	9/16/2013		
96	16	291.1		74.6	74.6	74.6	9/16/2013	74.6	9/16/2013	43.8	
97	16	153.1		63.3	63.3	63.3	9/16/2013	63.3	9/16/2013		
98	4	92.2		102.5	102.5	102.5	8/19/2013	102.5	8/19/2013		
99	3	116.9		200.5	200.5	200.5	8/13/2013	200.5	8/14/2013		
100	4	200.8		172.2	172.2	172.2	8/19/2013	172.2	8/19/2013	54.7	
101	3	47.5		76.9	76.9	76.9	8/13/2013	76.9	8/14/2013		
102		375.1								375.1	
106	14	1,135.7		184.5	184.5	184.5	9/16/2013	184.5	9/16/2013	190.1	
107	13	1,032.2		793.4	708.3	708.3	9/16/2013	708.3	9/16/2013	238.8	
108	13	1,516.7		1,053.8	1,053.8	1,053.8	9/16/2013	1,053.8	9/16/2013	348.8	
109		397.1		71.10	7112	5110	0.41.5120.1.2	7112	0/15/2012	207.1	
110	12	1,021.3		714.2	714.2	714.2	9/16/2013	714.2	9/16/2013	307.1	
111 112	12	100.7 934.4		648.2	648.2	648.2	9/16/2013	648.2	9/16/2013	286.2	Corrected transect length in GIS database: 642.1m
113	30	2,187.2		429.2	221.7	221.7	10/3/2013	221.7	10/7/2013	547.4	Corrected transect length in Ols database: 642.111
113		1,925.7		131.7	221.7	221.7	10/3/2013	221.7	10/7/2013	618.3	
115	31	797.6		94.3	94.3	94.3	10/3/2013	94.3	10/7/2013	018.3	
116	26	780.3		185.1	185.1	185.1	10/3/2013	185.1	10/7/2013		
117	14	280.1		130.6	54.6	54.6	9/16/2013	54.6	9/16/2013	149.5	
118	15	1,198.1		576.8	388.6	388.6	9/16/2013	388.6	9/16/2013	317.6	
119	5	,	1,541.7	1,541.7	1,541.7	1,541.7	9/3/2013	1,541.7	9/3/2013		Added meandering transect
120	7		1,298.4	1,298.4	1,298.4	1,298.4	9/3/2013	1,298.4	9/3/2013		Added meandering transect
121	6		1,988.5	1,988.5	1,988.5	1,988.5	9/3/2013	1,988.5	9/3/2013		Added meandering transect
122	11		209.8	209.8	209.8	209.8	9/9/2013	209.8	9/9/2013		Added meandering transect
123	11		874.7	874.7	874.7	874.7	9/9/2013	874.7	9/9/2013		Added meandering transect
124	10		1,428.5	1,428.5	1,428.5	1,428.5	9/9/2013	1,428.5	9/9/2013		Added meandering transect
125	9		976.5	976.5	976.5	976.5	9/9/2013	976.5	9/9/2013		Added meandering transect
126	8		2,227.4	2,227.4	2,227.4	2,227.4	9/9/2013	2,227.4	9/9/2013		Added meandering transect
127	15		1,825.0	1,825.0	1,825.0	1,825.0	9/16/2013	1,825.0	9/16/2013		Added meandering transect
128	16		594.2	594.2	594.2	594.2	9/16/2013	594.2	9/16/2013		Added meandering transect
129	14		1,560.9	1,560.9	1,560.9	1,560.9	9/16/2013	1,560.9	9/16/2013		Added meandering transect  Corrected transect length in GIS database: 1,559.1m
130	23		1,462.4	1,462.4	1,462.4	1,462.4	9/24/2013	1,462.4	9/24/2013		Added meandering transect
131	18		1,932.2	1,932.2	1,932.2	1,932.2	9/16/2013	1,932.2	9/16/2013		Added meandering transect
132	19		1,860.9	1,860.9	1,860.9	1,860.9	9/16/2013	1,860.9	9/16/2013		Added meandering transect

## TRANSECT SUMMARY TABLE (PRIMARY TRANSECTS JULY - OCTOBER 2013)

Transect	Lot	Initial Transect Distance (m)	Added Meandering Transect Distance (m)	Surveyed (m)	Swept (m)	QC'd (m)	Date QC'd	QA'd (m)	Date QA'd	Unsurveyable (m)	Notes
133	20		1,645.7	1,645.7	1,645.7	1,645.7	9/16/2013	1,645.7	9/16/2013		Added meandering transect
134	16		767.5	767.5	767.5	767.5	9/16/2013	767.5	9/16/2013		Added meandering transect Corrected transect length in GIS database: 672.4m
135	24		1,130.0	1,130.0	1,130.0	1,130.0	9/24/2013	1,130.0	9/24/2013		Added meandering transect
136	24		836.9	836.9	836.9	836.9	9/24/2013	836.9	9/24/2013		Added meandering transect
137	23		642.9	642.9	642.9	642.9	9/24/2013	642.9	9/24/2013		Added meandering transect
138	31		603.4	603.4	603.4	603.4	10/3/2013	603.4	10/7/2013		Added meandering transect
139	22		1,430.2	1,430.2	1,430.2	1,430.2	9/24/2013	1,430.2	9/24/2013		Added meandering transect
140	29		1,220.5	1,220.5	1,220.5	1,220.5	10/3/2013	1,220.5	10/7/2013		Added meandering transect
141	31		821.3	821.3	821.3	821.3	10/3/2013	821.3	10/7/2013		Added meandering transect
142	22		676.3	676.3	676.3	676.3	9/24/2013	676.3	9/24/2013		Added meandering transect
143	29		385.4	385.4	385.4	385.4	10/3/2013	385.4	10/7/2013		Added meandering transect
144	26		140.7	140.7	140.7	140.7	10/3/2013	140.7	10/7/2013		Added meandering transect
145	21		227.8	227.8	227.8	227.8	9/24/2013	227.8	9/24/2013		Added meandering transect
146	21		1,268.6	1,268.6	1,268.6	1,268.6	9/24/2013	1,268.6	9/24/2013		Added meandering transect
147			721.4	721.4							Added meandering transect
148	21		203.3	203.3	203.3	203.3	9/24/2013	203.3	9/24/2013		Added meandering transect
149	30		1,112.8	1,112.8	1,112.8	1,112.8	10/3/2013	1,112.8	10/7/2013		Added meandering transect
150	30		297.5	297.5	297.5	297.5	10/3/2013	297.5	10/7/2013		Added meandering transect
151	27		1,047.0	1,047.0	1,047.0	1,047.0	10/3/2013	1,047.0	10/7/2013		Added meandering transect
152	27		441.7	441.7	441.7	441.7	10/3/2013	441.7	10/7/2013		Added meandering transect
153	29		197.2	197.2	197.2	197.2	10/3/2013	197.2	10/7/2013		Added meandering transect
154	28		493.0	493.0	493.0	493.0	10/3/2013	493.0	10/7/2013		Added meandering transect
155	31		438.3	438.3	438.3	438.3	10/3/2013	438.3	10/7/2013		Added meandering transect
Total (m)		51,584.1	36,530.6	59,763.5	58,164.4	58,164.4		58,164.4		15,722.5	
Total (miles)		32.1	22.7	37.1	36.1	36.1		36.1		9.8	
Total (acres)		12.7	9.0	14.8	14.4	14.4		14.4		3.9	

## TRANSECT SUMMARY TABLE (ADDITIONAL TRAIL TRANSECTS FEBRUARY - MARCH 2014)

Transect	Lot	Transect Distance (m)	Surveyed (m)	Swept (m)	QC'd (m)	Date QC'd	QA'd (m)	Date QA'd	Unsurveyable (m)	Notes
MWD01	45	851.3	851.3	851.3	851.3	3/6/2014	851.3	3/17/2014		Swept 2/10/2014
MWD02	44	395.9	395.9	395.9	395.9	3/6/2014	395.9	3/17/2014		Swept 2/10/2014
MWD03	44	1,235.9	1,235.9	1,235.9	1,235.9	3/6/2014	1,235.9	3/17/2014		Swept 2/11/2014
MWD04	42	403.3	403.3	403.3	403.3	3/6/2014	403.3	3/17/2014		Swept 2/11/2014
MWD05	39	2,004.8	2,004.8	2,004.8	2,004.8	3/3/2014	2,004.8	3/6/2014		Swept 2/19/2014
MWD06	43	794.5	794.5	794.5	794.5	3/6/2014	794.5	3/17/2014		Swept 2/19/2014
MWD07	40	2,009.5	2,009.5	2,009.5	2,009.5	3/3/2014	2,009.5	3/6/2014		Swept 2/20/2014
MWD08	41	1,019.7	1,019.7	1,019.7	1,019.7	3/3/2014	1,019.7	3/6/2014		Swept 2/20/2014
MWD09	45	934.4	934.4	934.4	934.4	3/6/2014	934.4	3/17/2014		Swept 2/21/2014
MWD10	43	465.4	465.4	465.4	465.4	3/6/2014	465.4	3/17/2014		Swept 2/24/2014
MWD11	41	859.9	859.9	859.9	859.9	3/3/2014	859.9	3/6/2014		Swept 2/25/2014
MWD12	43	525.3	525.3	525.3	525.3	3/6/2014	525.3	3/17/2014		Swept 2/26/2014
MWD13	42	1,069.2	1,069.2	1,069.2	1,069.2	3/6/2014	1,069.2	3/17/2014		Swept 2/27/2014
MWD14	46	1,241.0	1,241.0	1,241.0	1,241.0	3/6/2014	1,241.0	3/17/2014		Swept 3/3/2014
MWD15	46	311.2	311.2	311.2	311.2	3/6/2014	311.2	3/17/2014		Swept 3/3/2014
MWD16	45	87.3	87.3	87.3	87.3	3/6/2014	87.3	3/17/2014		Swept 3/4/2014
MWF01	47	718.6	718.6	718.6	718.6	3/6/2014	718.6	3/17/2014		Swept 2/12/2014
MWF02	48	307.8	307.8	307.8	307.8	3/6/2014	307.8	3/17/2014		Swept 2/13/2014
MWF03	48	129.5	129.5	129.5	129.5	3/6/2014	129.5	3/17/2014		Swept 2/13/2014
MWF04	48	875.6	875.6	875.6	875.6	3/6/2014	875.6	3/17/2014		Swept 2/18/2014
MWF05	48	33.8	33.8	33.8	33.8	3/6/2014	33.8	3/17/2014		Swept 2/18/2014
MWF06	48	103.8	103.8	103.8	103.8	3/6/2014	103.8	3/17/2014		Swept 3/4/2014 Corrected transect length in GIS database: 105.3m
MWF07	48	185.0	185.0	185.0	185.0	3/6/2014	185.0	3/17/2014		Swept 3/5/2014
MWF08	48	1,220.0	1,220.0	30.0	30.0	3/6/2014	30.0	3/17/2014		Swept 3/5/2014
Total (m)		17,782.5	17,782.5	16,592.5	16,592.5		16,592.5		-	
Total (miles)		11.0	11.0	10.3	10.3		10.3		-	
Total (acres)				8.5	8.5		8.5		-	

#### GRID SUMMARY TABLE

Grid	Lot	Subarea	Status	Area [square feet]	Area [acres]	Vegetation Removed [acres]	Swept [acres]	QC'd [acres]	Date QC'd	QA'd [acres]	Date QA'd	Note
01	32	East	Swept	8,352.73	0.19	0.19	0.19	0.19	10/1/2013	0.19	10/10/2013	Approved LOT Form: 0.20 acres
02	32	East	Swept	10,280.44	0.24	0.24	0.24	0.24	10/1/2013	0.24	10/10/2013	Approved LOT Form: 0.23 acres
03	32	East	Swept	13,600.78	0.31	0.31	0.31	0.31	10/1/2013	0.31	10/10/2013	Approved LOT Form: 0.19 acres
04	34	West	Swept	11,753.25	0.27	0.27	0.27	0.27	10/7/2013	0.27	10/10/2013	Approved LOT Form: 0.26 acres
05	36	West	Swept	4,092.38	0.09	0.09	0.09	0.09	10/10/2013	0.09	10/16/2013	
06	36	West	Swept	16,490.71	0.38	0.38	0.38	0.38	10/15/2013	0.38	10/16/2013	Approved LOT Form: 0.21 acres
07	33	West	Swept	10,159.69	0.23	0.23	0.23	0.23	10/7/2013	0.23	10/10/2013	Approved LOT Form: 0.26 acres
08	33	West	Swept	12,339.05	0.28	0.28	0.28	0.28	10/3/2013	0.28	10/10/2013	Approved LOT Form: 0.25 acres
09	33	West	Swept	5,571.35	0.13	0.13	0.13	0.13	10/2/2013	0.13	10/10/2013	Approved LOT Form: 0.10 acres
10	34	West	Swept	8,288.95	0.19	0.19	0.19	0.19	10/3/2013	0.19	10/10/2013	Approved LOT Form: 0.20 acres
11	34	West	Swept	8,627.95	0.20	0.20	0.20	0.20	10/2/2013	0.20	10/10/2013	
12	35	West	Swept	13,801.78	0.32	0.32	0.32	0.32	10/10/2013	0.32	10/16/2013	Approved LOT Form: 0.30 acres
13	35	West	Swept	11,334.96	0.26	0.26	0.26	0.26	10/10/2013	0.26	10/16/2013	
14	35	West	Swept	10,198.15	0.23	0.23	0.23	0.23	10/10/2013	0.23	10/16/2013	Approved LOT Form: 0.27 acres
15	35	West	Swept	12,096.28	0.28	0.28	0.28	0.28	10/9/2013	0.28	10/16/2013	Approved LOT Form: 0.26 acres
16	37	West	Swept	11,132.31	0.26	0.26	0.26	0.26	10/15/2013	0.26	10/16/2013	
17	37	West	Swept	9,327.70	0.21	0.21	0.09	0.09	10/10/2015	0.09	10/16/2013	Approved LOT Form: 0.08 acres
18	36	West	Swept	14,684.85	0.34	0.34	0.34	0.34	10/9/2013	0.34	10/16/2013	Approved LOT Form: 0.31 acres
19	37	West	Swept	10,141.48	0.23	0.23	0.23	0.23	10/15/2013	0.23	10/16/2013	Approved LOT Form: 0.22 acres
20	38	West	Swept	9,643.07	0.22	0.22	0.22	0.22	10/15/2013	0.22	10/16/2013	
21	38	West	Swept	10,877.45	0.25	0.25	0.25	0.25	10/15/2013	0.25	10/16/2013	Approved LOT Form: 0.26 acres
22	38	West	Swept	26,606.48	0.61	0.61	0.61	0.61	10/15/2013	0.61	10/16/2013	Approved LOT Form: 0.51 acres
Total			•	249,401.80	5.72	5.72	5.60	5.60		5.60		

<sup>\*</sup> Due to the Federal Government shutdown in Fall 2013, grid data was not post-processed until after the Lots had been QC'd/QA'd. This caused a discrepancy in area between the Lot Forms and the final GIS database.

# Appendix K QC Documentation

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

#### DID WERS-004.01 GRID MAPPING TABLE

Grid Number	Team	Completed Date	Terrain	Lane Width	Geophysical Sensors	Team Leader Function Test Pass or Fail	Serial Number	Operation 1 Function Test Pass or Fail	Serial Number
01	Sweep	9/30/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
02	Sweep	10/1/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
03	Sweep	10/1/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
04	Sweep	10/8/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
05	Sweep	10/10/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
06	Sweep	10/15/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13436
07	Sweep	10/7/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
08	Sweep	10/7/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
09	Sweep	10/2/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
10	Sweep	10/8/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
11	Sweep	10/8/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
12	Survey	10/10/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	694	Pass	964
13	Survey	10/10/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	694	Pass	964
14	Sweep	10/9/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
15	Sweep	10/9/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
16	Sweep	10/15/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13436
17	Sweep	10/10/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
18	Sweep	10/9/2019	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13437
19	Survey	10/15/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	13434	Pass	13434
20	Survey	10/9/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	13435	Pass	13435
21	Survey	10/15/2013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	13434	Pass	13437
22	Sweep	10/15/21013	Rough and Heavy Vegetation	5 Foot	MineLab Explorer SE	Pass	1006	Pass	13436

#### DID WERS-004.01 GRID QC TABLE

Grid Number	LOT Number	QC Date	Geophysical Sensors	QC Lane Width	QC Percentage Coverage (not less than)	Anomalies Detected	Anomaly Detect Failures	Anomaly Detection Pass Justification	Blind Seeds Removed	Blind Seed Pass Justification	Coverage Seeds Recovered	Coverage Seed Pass Justification	QC Pass
01	32	10/01/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	4	No Discrepancies Noted	Pass
02	32	10/01/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
03	32	10/01/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	4	No Discrepancies Noted	Pass
04	34	10/07/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	2	No Discrepancies Noted	4	No Discrepancies Noted	Pass
05	36	10/10/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
06	36	10/15/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
07	33	10/07/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
08	33	10/03/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
09	33	10/02/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	6	No Discrepancies Noted	Pass
10	34	10/03/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	4	No Discrepancies Noted	Pass
11	34	10/02/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	4	No Discrepancies Noted	Pass
12	35	10/10/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
13	35	10/10/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	0	No Discrepancies Noted	Pass
14	35	10/10/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	0	No Discrepancies Noted	Pass
15	35	10/10/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
16	37	10/15/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
17	37	10/10/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	4	No Discrepancies Noted	Pass
18	36	10/09/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	0	No Discrepancies Noted	Pass
19	37	10/15/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	4	No Discrepancies Noted	Pass
20	38	10/15/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	0	No Discrepancies Noted	Pass
21	38	10/15/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	0	No Discrepancies Noted	0	No Discrepancies Noted	Pass
22	38	10/15/13	MineLab Explorer SE	5ft Meandering Pattern	20%	0	0	No Discrepancies Noted	3	No Discrepancies Noted	4	No Discrepancies Noted	Pass

#### DID WERS-004.01 DETECTION SEED TABLE

Grid	Detection Seed Number	Seed Description (ISO)	Easting	Northing	Depth (in)	Orientation	Inclination (Degree's)	LOT Number
01	QC Seed 04	Large	629116.96	2360751.31	20	Horizontal	0	32
	QC Seed 05	Small	629118.79	2360769.07	3	Vertical	90	32
	QC Seed 06	Small	629120.44	2360786.82	5	Horizontal	0	32
03	QC Seed 07	Large	628243.12	2361083.52	20	Horizontal	0	32
	QC Seed 08	Small	628259.31	2361056.17	5	Horizontal	0	32
	QC Seed 09	Small	628259.74	2361055.47	3	Horizontal	0	32
04	QC Seed 10	Large	627517.32	2361259.68	21	Horizontal	0	34
	QC Seed 11	Small	627502.33	2361274.87	7	Horizontal	0	34
09	QC Seed 12	Small	626446.04	2361937.77	3	Horizontal	0	33
	QC Seed 13	Small	626452.32	2361936.40	5	Horizontal	0	33
	QC Seed 14	Large	626585.19	2361979.68	18	Vertical	90	33
10	QC Seed 18	Large	626500.66	2361129.36	18	Vertical	90	34
	QC Seed 19	Small	626492.21	2361128.54	5	Horizontal	0	34
	QC Seed 20	Small	626495.31	2361137.18	5	Horizontal	0	34
15	QC Seed 15	Large	626421.76	2361053.07	20	Horizontal	0	35
	QC Seed 16	Small	626425.89	2361063.88	5	Horizontal	0	35
	QC Seed 17	Small	626419.66	2361087.37	5	Horizontal	0	35
11	QC Seed 21	Medium	626603.03	2361130.66	9	Horizontal	0	34
	QC Seed 22	Small	626599.45	2361134.72	5	Horizontal	0	34
	QC Seed 23	Small	626592.72	2361132.01	3	Vertical	90	34
18	QC Seed 24	Medium	626425.90	2361008.29	16	Horizontal	0	36
	QC Seed 25	Small	626423.72	2361007.36	5	Horizontal	0	36
	QC Seed 26	Small	626427.87	2361000.44	5	Horizontal	0	36
19	QC Seed 27	Medium	627355.22	2360995.66	11	Horizontal	0	37
	QC Seed 28	Small	627360.32	2360997.18	7	Horizontal	0	37
	QC Seed 29	Small	627360.39	2361001.32	3	Horizontal	0	37
22	QC Seed 30	Medium	627359.31	2360917.49	11	Horizontal	0	38
	QC Seed 31	Small	627370.74	2360915.10	5	Vertical	90	38
	Qc Seed 32	Small	627395.21	2360918.10	7	Horizontal	0	38

#### DID WERS-004.01 COVERAGE SEED TABLE

Grid Number	Grid Area	Coverage Seeds Placed	LOT Number	Grid Number	Coverage Seeds Recovered	Completed Date	QC Pass
01	0.19	4	32	01	4	9/30/2013	Pass
02	0.24	4	32	02	4	10/1/2013	Pass
03	0.31	4	32	03	4	10/1/2013	Pass
04	0.27	4	34	04	4	10/8/2013	Pass
05	0.09	4	36	05	4	10/10/2013	Pass
06	0.38	4	36	06	4	10/15/2013	Pass
07	0.23	4	33	07	4	10/7/2013	Pass
08	0.28	4	33	08	4	10/7/2013	Pass
09	0.13	6	33	09	6	10/2/2013	Pass
10	0.19	4	34	10	4	10/8/2013	Pass
11	0.20	4	34	11	4	10/8/2013	Pass
12	0.32	4	35	12	4	10/10/2013	Pass
15	0.28	4	35	15	4	10/9/2013	Pass
16	0.26	4	37	16	4	10/15/2013	Pass
17	0.09	4	37	17	4	10/10/2013	Pass
19	0.23	4	37	19	4	10/15/2013	Pass
22	0.61	4	38	22	4	10/15/21013	Pass

#### DID WERS-004.01 FUNCTION TEST TABLE

Operator	Instrument Number	Location	Instrument Settings	Sweep Technique	Number of Seeds Scanned	Number of Seeds Detected	Pass/Fail	Remarks
Mark	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Kevin	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Clyde	13434	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Kai	13435	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Kevin	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Mark	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Clyde	13436	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Tim	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Kai	13435	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Mark	13434	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Kai	13435	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Tim	13435	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Mark	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Tim	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Kai	13435	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Mark	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Clyde	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Tim	964	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Mark	964.0	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Clyde	13434	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	1006	IVS	Site Specific	Level Inches AGL	5	5	Pass	
Gil	13437	IVS	Site Specific	Level Inches AGL	5	5	Pass	

#### DID WERS-004.01 TRAIL TRANSECTS MAPPING TABLE

Transect Number	Team	Completed Date	Terrain	Trail Width	Geophysical Sensors	Team Leader Function Test Pass or Fail	Serial Number	Operation 1 Function Test Pass or Fail	Serial Number
MWD01	Sweep	2/10/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13436	Pass	13435
MWD02	Sweep	2/10/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13434	Pass	1006
MWD03	Sweep	2/11/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	13436
MWD04	Sweep	2/10/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	13436
MWD05	Sweep	2/19/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	964	Pass	13436
MWD06	Sweep	2/19/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	964	Pass	13436
MWD07	Sweep	2/20/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	964	Pass	13435
MWD08	Sweep	2/20/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	964	Pass	13435
MWD09	Sweep	2/21/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	13436
MWD10	Sweep	2/24/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13436	Pass	1006
MWD11	Sweep	2/25/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13436	Pass	964
MWD12	Sweep	2/26/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	1006	Pass	964
MWD13	Sweep	2/27/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	964
MWD14	Sweep	3/3/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	964	Pass	13435
MWD15	Sweep	3/3/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	964	Pass	1006
MWD16	Sweep	3/4/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	13437
MWF01	Sweep	2/12/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	13436
MWF02	Sweep	2/13/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	1006
MWF03	Sweep	2/13/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	1006
MWF04	Sweep	2/18/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	1006	Pass	13435
MWF05	Sweep	2/18/2014	Public Access Trail	Variable	MineLab Explorer SE	Pass	1006	Pass	13435
MWF06	Sweep	41702	Public Access Trail	Variable	MineLab Explorer SE	Pass	13435	Pass	13437
MWF07	Sweep	41703	Public Access Trail	Variable	MineLab Explorer SE	Pass	968	Pass	13436
MWF08	Sweep	41703	Public Access Trail	Variable	MineLab Explorer SE	Pass	968	Pass	13436

#### DID WERS-004.01 TRAIL TRANSECTS QC TABLE

Transect Number	LOT Number	QC Date	Geophysical Sensors	QC Lane Width	QC Percentage Coverage (not less than)	Anomalies Detected	Anomaly Detect Failures	Anomaly Detection Pass Justification	Blind Seeds Removed	Blind Seed Pass Justification	Coverage Seeds Recovered	Coverage Seed Pass Justification	QC Pass
MWD05	39	03/03/14	MineLab Explorer SE	Variable - Trail Width	3.16	8	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD07	40	03/03/14	MineLab Explorer SE	Variable - Trail Width	2.92	0	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD08	41	03/03/14	MineLab Explorer SE	Variable - Trail Width	5.85	2	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD11	41	03/03/14	MineLab Explorer SE	Variable - Trail Width	5.85	2	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD04	42	03/05/14	MineLab Explorer SE	Variable - Trail Width	9.71	15	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD13	42	03/05/14	MineLab Explorer SE	Variable - Trail Width	9.71	15	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD06	43	03/05/14	MineLab Explorer SE	Variable - Trail Width	10.13	8	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD10	43	03/05/14	MineLab Explorer SE	Variable - Trail Width	10.13	8	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD12	43	03/06/14	MineLab Explorer SE	Variable - Trail Width	10.13	8	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD02	44	03/06/14	MineLab Explorer SE	Variable - Trail Width	8.19	19	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD03	44	03/06/14	MineLab Explorer SE	Variable - Trail Width	8.19	19	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD01	45	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.96	15	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD09	45	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.96	15	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD16	45	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.96	15	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD14	46	03/06/14	MineLab Explorer SE	Variable - Trail Width	6.58	13	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWD15	46	03/06/14	MineLab Explorer SE	Variable - Trail Width	6.58	13	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF01	47	03/06/14	MineLab Explorer SE	Variable - Trail Width	5.96	2	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF02	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF03	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF04	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF05	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF06	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF07	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass
MWF08	48	03/06/14	MineLab Explorer SE	Variable - Trail Width	7.69	21	0	No Discrepancies Noted	0	NA	0	NA	Pass

#### DID WERS-004.01 DETECTION SEED TABLE

Transect	Detection Seed Number	Seed Description (ISO)	UXOQCS Placement Easting	UXOQCS Placement Northing	Team Leader Location Easting	Team Leader Location Northing	Depth (in)	Orientation	Inclination (Degree's)	LOT Number
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

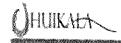
#### Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

#### DID WERS-004.01 COVERAGE SEED TABLE

Transect Number	Transect Distance [meters]	Coverage Seeds Placed	LOT Number	Grid Number	Coverage Seeds Recovered	Completed Date	QC Pass
NA	NA	NA	NA	NA	NA	NA	NA

#### DID WERS-004.01 FUNCTION TEST TABLE

Operator	Date	Instrument Number	Location	Instrument Settings	Sweep Technique	Number of Seeds Scanned	Number of Seeds Detected	Pass/Fail
Keola	2/10/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Mark	2/10/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Clyde	2/10/2014	13434.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/10/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Clyde	2/11/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/11/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Mark	2/11/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Clyde	2/12/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	2/12/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	2/12/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/13/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	2/13/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	2/13/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	2/18/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/18/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	2/18/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	2/19/2014	964.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/19/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	2/19/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Mark	2/19/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	2/20/2014	964.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Clyde	2/20/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/20/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Clyde	2/21/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/21/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	2/21/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/24/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	2/24/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/25/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	2/25/2014	964.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	2/26/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	2/26/2014	964.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	2/26/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	2/27/2014	964.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	2/27/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Gil	3/3/2014	964.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	3/3/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	3/3/2014	1006.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
QC	3/3/2014	13434.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	3/4/2014	13437.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	3/4/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	3/5/2014	968.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Keola	3/5/2014	13436.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Kai	3/5/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass
Tim	3/6/2014	13435.00	IVS	Site Specific	Level Inches AGL	5	5	Pass



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist LOT: 01 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-19	977.1 Meters	8/8/2013	Michael Brison
Pali Trng Camp	T-17	1,153.0 Meters	8/8/2013	Michael Brison
Pali Trng Camp	T-14	925.9 Meters	8/8/2013	Michael Brison
Total		3,056.0 Meters		

#### QC Notes:

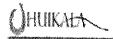
Dynamic Repeatability - QC'd 2.2% (50 meters) 8 anomalies were flagged by the team, 8 anomalies detected by QC. No discrepancies noted. Coordinates of QC'd area: Start N2360847.584 E629933.977, Stop N2360874.877 E629975.97

Anomaly Resolution - 159 Anomalies dug - 41 Anomalies QC'd no discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

No MD/MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	8/8/2013
The above listed transect(s)	have passed QA Inspection and have b	een accepted by Mr H	armon Slappy.
QA Notes:			
Mr. Harmon Slappy:	H Story	_ Date:	8/14/2013



LOT: 02 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To:

HNL USACE OESS: Mr. Harmon Slappy Quality Control (QC) Inspection

Re: From:

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-20	1,343.9 Meters	8/8/2013	Michael Brison
Pali Trng Camp	T-21	1,238.1 Meters	8/8/2013	Michael Brison
			-	
Total		2,582.0 Meters		

#### QC Notes:

Hadlant oo or .

Dynamic Repeatability - QC'd 2.4% (50 meters) 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted. Coordinates of QC'd area: Start N2361633.397 E630684.574 Stop N2361584.632 E630671.342

Anomaly Resolution - 62 Anomalies dug - 37 Anomalies QC'd no discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

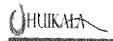
No MD/MPPEH/MEC found by Team or QC.

Hulkala QC Signature:	Michael Brison		8/8/2013	
The above listed transect(s) I	have passed QA Inspection and have beer	accepted by Mr.	Harmon Slappy.	
QA Notes:				
Mr. Harmon Slappy:	4 Stone	Date:	8/14/2013	

LOT: 03

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From:

Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-18	1,156.5 Meters	8/13/2013	Michael Brison
Pali Trng Camp	T-15	738.5 Meters	8/13/2013	Michael Brison
Pali Trng Camp	T-16	379.7 Meters	8/13/2013	Michael Brison
Pali Trng Camp	T-99	200.5 Meters	8/13/2013	Michael Brison
Pali Trng Camp	T-101	76.9 Meters	8/13/2013	Michael Brison
Total		2,552.1 Meters	<u> </u>	Midiaci Disoit

#### QC Notes:

Dynamic Repeatability - QC'd 2.5% (55 meters) 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted.

Coordinates of QC'd Area: N2361707.842 E630500.897 Stop N2361660.615 E630471.640

Anomaly Resolution - 17 Anomalies dug - 17 Anomalies QC'd no discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

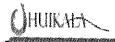
No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	luikala QC Signature: Michael Brison		8/13/2013	
The above listed transect(s)	have passed QA Inspection and hav	e been accepted by Mr.H	armon Slappy.	
QA Notes:				
	. 1			
Mr. Harmon Slappy:	/ Farmon Sloppy	Date:	8/14/2013	

LOT: 04

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-29	337.1 Meters	8/19/2013	Michael Brison
Pali Trng Camp	T-31	986.0 Meters	8/19/2013	Michael Brison
Pali Trng Camp	T-33	453.8 Meters	8/19/2013	Michael Brison
Pali Trng Camp	T-34	444.9 Meters	8/19/2013	Michael Brison
Pali Trng Camp	T-35	171.4 Meters	8/19/2013	Michael Brison
Pali Trng Camp	T-98	102.5 Meters	8/19/2013	Michael Brison
Pali Trng Camp	T-100	172.2 Meters	8/19/2013	Michael Brison
Total		2,667.9 Meters		THIS CHARLE CONTROLL

#### QC Notes:

Dynamic Repeatability - QC'd 2.2% (48 meters) 8 anomalies were flagged by the team, 8 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2362337.06 E630659.22, End N2363681.33 E630641.19

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 144 excavations were investigated, 144 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

No MD/MPPEH/MEC found by Team or QC.

luikala QC Signature: <u>Michael Brison</u>		Date:	8/19/2013	
The above listed transect(s) ha	ve passed QA inspection and have been ac	cepted by Mr.H	armon Slappy.	
QA Notes:				
Mr. Harmon Słappy:	186mg	Date:	8/19/2013	

LOT: 05 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

(HUIKAHA)
-----------

To: Re:

HNL USACE OESS: Mr. Harmon Slappy Quality Control (QC) Inspection

From:

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-119	1,541.7 Meters	8/28/2013	Michael Brison
				***************************************
Total		1541.7 Meters		

#### QC Notes:

Dynamic Repeatability - QC'd 3.31% (51 meters). 21 anomalies were flagged by the team, 21 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361682.21 E626370.26, End N2361664.70 E626418.42

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 142 excavations were investigated, 142 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

25 lbs of MD was found by Team none by QC. No MPPEH/MEC found by Team or QC.

Hulkala QC Signature:	Michael Brison	Date:	9/3/2013	
The above listed transect(s) have pas	sed QA Inspection and have been	accepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Harmon Eg	Date:	9/3/2013	

LOT: 06

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-121	1988.5 Meters	8/29/2013	Michael Brison
Total		1988.5 Meters		

#### QC Notes:

Dynamic Repeatability - QC'd 2.41% (48 meters). 17 anomalies were flagged by the team, 17 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360901.72 E628411.45, End N2360855.04 E628413.55

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 72 excavations were investigated, 72 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

No MD/MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/3/2013	
The above listed transect(s) have	passed QA Inspection and have been	accepted by Mr.Harr	non Slappy.	
QA Notes:				
	Λ			
Mr. Harmon Slappy:	Harmon Slop	Date:	9/3/2013	
	· /	7		

LOT: 07

**Huikala LOT** 

Contract/TO#: W912DY-10-D-0053 TO 0003

()HUIKAHA
-----------

To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dist	ance	OC Date	QC Rep
Pali Trng Camp	T-120	1298.44	Meters	8/29/2013	Michael Brison
			<del></del>		
Total		1298.44	Meters		

#### QC Notes:

Dynamic Repeatability - QC'd 4.7% (61 meters). 5 anomalies were flagged by the team, 5 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360832.38 E627718.88, End N2360982.59 E627708.78

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 33 excavations were investigated, 33 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government acceptance

<1 Lbs of MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/3/2013	
The above listed transect(s) have passe	ed QA Inspection and have been acce	epted by Mr.Ham	non Siappy.	
QA Notes:				
Mr. Harmon Slappy:	Hormo Story	Date:	9/3/2013	- The second second

	IIIIKAHA_	
No.	HARLONG IV	_

To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection
Huikala Quality Control Specialist

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

LOT: 08 Huikala LOT
Contract/TO#: W912DY-10-D-0053 TO 0003

 MRS
 Transect
 Distance
 QC Date
 QC Rep

 Pali Trng Camp
 T-126
 2,227.40
 Meters
 9/5/2013
 Michael Brison

 Image: Company of the part of th

#### QC Notes:

Dynamic Repeatability - QC'd 2.43% (54.07 meters). 1 anomalies were flagged by the team, 1 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360555.97 E628914.84, End N2360557.29 E628946.93

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 56 excavations were investigated, 56 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

4 LBS of MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/9/2013	
The above listed transect(s) have passed Q	A Inspection and have been accep	oted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Hormon Doppy	Date:	9/9/2013	

LOT: 09

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection

**Huikala Quality Control Specialist** 

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-125	976.5 Meters	9/5/2013	Michael Brison
Total		976.5 Meters		

#### QC Notes:

Dynamic Repeatability - QC'd 2.91% (28.4 meters). 2 anomalies were flagged by the team, 2 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360551.89 E628890.57, End N2360556.52 E628915.23

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 15 excavations were investigated, 15 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

<1 LBS of MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/9/2013	
The above listed transect(s) have pa	ssed QA Inspection and have been	accepted by Mr.Harn	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Harnes Story	Date:	9/9/2013	

OHUKAET.	٠.,
A485c	

To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC inspection and are ready for QA inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-124	1,428.50 Meters	9/4/2013	Michael Brison
Total		4 400 -		
Total		1,428.5 Meters	1 1	

#### QC Notes:

Dynamic Repeatability - QC'd 4.65% (66.37 meters). 7 anomalies were flagged by the team, 7 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361615.57 E628528.25, End N2361558.42 E628548.83

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 60 excavations were investigated, 60 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	9/9/2013
The above listed transect(s) have passed QA	Inspection and have been accepte	ed by Mr.Harmoi	n Slappy.

QA Notes:

Mr. Harmon Slappy:

Harmon Sloppy

Date:

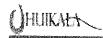
9/9/2013

LOT: 10

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

Contract/TO#: W912DY-10-D-0053 TO 0003



LOT: 11 **Huikala LOT** To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dista	nce	QC Date	QC Rep
Pali Trng Camp	T-122	209.8	Vieters	9/5/2013	Michael Brison
Pali Trng Camp	T-123	874.7	Meters	9/5/2013	Michael Brison
Total		1,084.5	Vieters		

## QC Notes:

Dynamic Repeatability - QC'd 4.94% (53.57 meters). 31 anomalies were flagged by the team, 31 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361930.80 E626429.63, End N2361936.66 E626476.10

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 180 excavations were investigated, 180 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

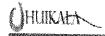
All flagging ribbon will be removed upon Government Acceptance

MEC 001 and MEC 002 and 30 LBS MD found by Team. None by QC.

Huikala QC Signature:	Michael Brison	Date:	9/9/2013	
The above listed transect(s) have pas	sed QA Inspection and have been	accepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Hormas Slapp	Date:	9/9/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dis	tance	QC Date	QC Rep
Pali Trng Camp	T-10	330.2	Meters	8/21/2013	Michael Brison
Pali Trng Camp	T-11	578.4	Meters	8/22/2013	Michael Brison
Pali Trng Camp	T-110	714.2	Meters	9/16/2013	Michael Brison
Pali Trng Camp	T-112	648.2	Meters	9/16/2013	Michael Brison
					· · · · · · · · · · · · · · · · · · ·
Total		2,271.0	Meters		

### QC Notes;

Dynamic Repeatability - QC'd 5.89% (133.85 meters). 7 anomalies were flagged by the team, 7 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start N2362532.78 E629068.25, End 2362598.44 E629046.48

Dynamic Repeatability - Coordinates of QC'd Area 2: Start N2362540.47 E629181.33, End 2362478.58 E629200.09

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 25 excavations were investigated, 25 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

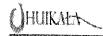
All flagging ribbon will be removed upon Government Acceptance

No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	9/16/2013	
The above listed transect(s) have p	assed QA inspection and have been	accepted by Mr.Han	mon Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Harmon Dayy	Date:	9/16/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-28	114.1 Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-107	708.3 Meters	9/10/2013	Michael Brison
Pali Trng Camp	T-108	1053.8 Meters	9/9/2013	Michael Brison
		w		
Total		1,876.2 Meters		

## QC Notes:

Dynamic Repeatability - QC'd 2.84% (53.3 meters). 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start N2361763.82 E628935.73, End N2361811.81 E628914.39

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 15 excavations were investigated, 15 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

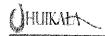
All flagging ribbon will be removed upon Government Acceptance

No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	9/16/2013
The above listed transect(s) have passed Q	A Inspection and have been accepte	d by Mr.Harmon	Slappy.
QA Notes:			
Mr. Harmon Slappy:	Harris Stops	Date:	9/16/2013

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-9	133.3 Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-106	184.5 Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-117	54.6 Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-129	1,560.9 Meters	9/10/2013	Michael Brison
				***************************************
Total		1,933.3 Meters		

### QC Notes:

Dynamic Repeatability - QC'd 3.45% (66.7 meters). 4 anomalies were flagged by the team, 4 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360962.93 E628705.38, End N2360974.33 E628769.98

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

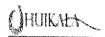
Anomaly Resolution - 51 excavations were investigated, 51 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	9/16/2013	
The above listed transect(s) have pa	ssed QA Inspection and have been	accepted by Mr.Harr	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Idamos Stag	Z Date:	9/16/2013	

Contract/TO#: W912DY-10-D-0053 TO 0003



LOT: 15 Huikala LOT

To: HNL USACE OESS: Mr. Harmon Slappy Re:

Quality Control (QC) Inspection From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dist	tance	QC Date	QC Rep
Pali Trng Camp	T-118	388.6	Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-127	1,825.0	Meters	9/9/2013	Michael Brison
Total		2,213.6	Meters	-	

#### QC Notes:

Dynamic Repeatability - QC'd 5.81% (128.53 meters). 8 anomalies were flagged by the team, 8 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1 : Start N2362365.26 E628889.70, End N2362317.52 E628847.56

Dynamic Repeatability - Coordinates of QC'd Area 2: Start N2361529.73 E628691.06, End N2361487.07 E628731.22

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 71 excavations were investigated, 71 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

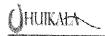
All flagging ribbon will be removed upon Government Acceptance

No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	9/16/2013	
The above listed transect(s) have pas	ssed QA inspection and have been	accepted by Mr.Ham	on Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Burner Stoppy	_ Date;	9/16/2013	

LOT: 16 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dis	tance	QC Date	QC Rep
Pali Trng Camp	T-8	329.6	Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-95	49.1	Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-96	74.6	Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-97	63.3	Meters	8/15/2013	Michael Brison
Pali Trng Camp	T-128	594.2	Meters	9/9/2013	Michael Brison
Pali Trng Camp	T-134	767.5	Meters	9/11/2013	Michael Brison
Total		1,878.3	Meters		·····

## QC Notes:

Harden Cook

Dynamic Repeatability - QC'd 7.68% (144.32 meters). 4 anomalies were flagged by the team, 4 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start N2360829.72 E628679.15, End N2360819.80 E628781.96 Dynamic Repeatability - Coordinates of QC'd Area 2: Start N2360907.98 E629035.24, End N2360900.12 E628973.37

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 114 excavations were investigated, 114 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

1lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Hulkala QC Signature:	Michael Brison	_ Date:	9/16/2013	
The above listed transect(s) have	passed QA inspection and have been	accepted by Mr.Ham	mon Slappy.	
QA Notes:				
Mr. Harmon Slappy:	14.82 pg	_ Date:	9/16/2013	

Contract/TO#: W912DY-10-D-0053 TO 0003

HUKAEN

LOT: 17 Huikala LOT To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection Huikala Quality Control Specialist From:

The following work areas have passed QC inspection and are ready for QA inspection:

MRS	Transect	Dis	tance	OC Date	QC Rep
Pali Trng Camp	T-5	268.6	Meters	9/11/2013	Michael Brison
Pali Trng Camp	T-6	596.4	Meters	8/27/2013	Michael Brison
		************************************			
7-1-1					
Total		865.0	Meters	1	

### QC Notes:

Dynamic Repeatability - QC'd 7.84% (67.79 meters). 5 anomalies were flagged by the team, 5 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360885.02 E629184.38, End N2360861.75 E629120.71

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 30 excavations were investigated, 30 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

3lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/16/2013	
The above listed transect(s) have passed	I QA Inspection and have been a	accepted by Mr.Harm	on Slappy.	
QA Notes:				
Mr. Harmon Slappy:	H. Stappy	Date:	9/16/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC inspection and are ready for QA inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-131	1,932.2 Meters	9/11/2013	Michael Brison
	W			
				·
Total		1,932.2 Meters		

## QC Notes:

Dynamic Repeatability - QC'd 2.9% (56 meters). 3 anomalies were flagged by the team, 3 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2360507.95 E629333.01, End N 2360500.24 E629384.21

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 15 excavations were investigated, 15 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

1lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

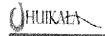
QC was completed IAW DID-WERS-004.01.

Huikala OC Signature:

ramala de orginatare,	Michael Brison	Date:	9/16/2013	
The above listed transect(s) have pas	sed QA inspection and have been	accepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	1 Strym	Date:	9/16/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-132	1,860.9 Meters	9/11/2013	Michael Brison
Total		1,860.9 Meters		

#### QC Notes:

Dynamic Repeatability - QC'd 6.53% (121.5 meters). 7 anomalies were flagged by the team, 7 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start N2360052.59 E629333.01, End N2360045.18 E628801.43

Dynamic Repeatability - Coordinates of QC'd Area 2: Start N2359759.34 E628433.22, End N2359805.86 E628404.74

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

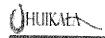
Anomaly Resolution - 40 excavations were investigated, 40 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

1lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/16/2013	
The above listed transect(s) have	passed QA inspection and have been	accepted by Mr.Ham	mon Slappy.	
QA Notes:				
Mr. Harmon Slappy:	16. Stoppy	Date:	9/16/2013	***

Contract/TO#: W912DY-10-D-0053 TO 0003



To: HNL USACE OESS: Mr. Harmon Slappy Contract/TO#: W012DV.10.D.005

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-133	1645.7 Meters	9/11/2013	Michael Brison
Total		1645.7 Meters		

### QC Notes:

Dynamic Repeatability - QC'd 4.31% (70.9 meters). 5 anomalies were flagged by the team, 5 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2359937.87 E628057.30, End N2359868.60 E628066.37

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 60 excavations were investigated, 60 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

2lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

ndikala do signature:	Michael Brison	_ Date:	9/16/2013	
The above listed transect(s) have pass	sed QA Inspection and have been	accepted by Mr.Harm	on Slappy.	
QA Notes:				
Mr. Harmon Slappy:	45	D. C.		
Silving (Supp),	· Coppy	Date:	9/16/2013	***************************************

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-145	227.8 Mete	rs 9/19/2013	Michael Brison
Pali Trng Camp	T-146	1,268.6 Mete	rs 9/19/2013	Michael Brison
Pali Trng Camp	T-148	203.3 Mete	rs 9/19/2013	Michael Brison
Total		1,699.7 Mete	rs	

### QC Notes:

Dynamic Repeatability - QC'd 3.9% (66.33 meters). 14 anomalies were flagged by the team, 14 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361723.00 E627014.16, End N2361745.16 E627059.69

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 105 excavations were investigated, 105 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

17lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/24/2013	
The above listed transect(s) have	passed QA Inspection and have beer	accepted by Mr.Ham	mon Slappy.	
QA Notes:				
Mr. Harmon Slappy:	12 Stoppen	_ Date:	9/24/2013	
	' ' / /			

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To: Re:

From:

HNL USACE OESS: Mr. Harmon Slappy

Quality Control (QC) Inspection

**Huikala Quality Control Specialist** 

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-139	1,430.2 Meters	9/17/2013	Michael Brison
Pali Trng Camp	T-142	676.3 Meters	9/17/2013	Michael Brison
Total		2,106.5 Meters		

#### QC Notes:

Dynamic Repeatability - QC'd 3.1% (65.28 meters). 21 anomalies were flagged by the team, 21 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361134.81 E626707.71, End N2361131.71 E626661.23

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 154 excavations were investigated, 154 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

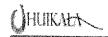
All flagging ribbon will be removed upon Government Acceptance

12lbs MD found by Team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/24/2013	
The above listed transect(s) have passe	d QA Inspection and have been a	ccepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	Harnos Slope	Date:	9/24/2013	
	1			

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC inspection and are ready for QA inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-130	1462.4 Mete	The state of the s	Michael Brison
Pali Trng Camp	T-137	642.9 Mete	rs 9/12/2013	Michael Brison
Total		2105.3 Mete	rs	

## QC Notes:

Dynamic Repeatability - QC'd 2.69% (56.7 meters). 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361570.04 E627633.03, End N2361592.14 E627586.53

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 34 excavations were investigated, 34 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

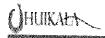
All flagging ribbon will be removed upon Government Acceptance

No MD/MPPEH/MEC found by Team or QC. QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	9/24/2013	
The above listed transect(s) have p	assed QA Inspection and have been	accepted by Mr.Harr	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	D. Stappy	Date:	9/24/2013	

LOT: 24 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To: HNL USACE OESS: Mr. Harmon Slappy

Re: From:

Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC inspection and are ready for QA inspection:

MRS	Transect	Dis	tance	QC Date	QC Rep
Pali Trng Camp	T-62	96.0	Meters	9/11/2013	Michael Brison
Pali Trng Camp	T-135	1,130.0	Meters	9/11/2013	Michael Brison
Pali Trng Camp	T-136	836.9	Meters	9/11/2013	Michael Brison
	***************************************		<del></del>		
Total		2,062.9	Meters		

### QC Notes:

Dynamic Repeatability - QC'd 2.97% (61.3 meters). 2 anomalies were flagged by the team, 2 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start N2361338.00 E627657.17, End N2361336.43 E627715.44

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 46 excavations were investigated, 46 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

2LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	9/24/2013	
The above listed transect(s) have passed	QA Inspection and have been a	ccepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	12 Scappy	Date:	9/24/2013	



To: Re: From: HNL USACE OESS: Mr. Harmon Slappy

Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC inspection and are ready for QA inspection:

LOT: 25	Huikala LOT
Contract/TO#:	W912DY-10-D-0053 TO 0003

MRS	Transect	Distance	QC Date I	QC Rep
Pali Trng Camp	T-27	204.6 Meters	10/1/2013	Michael Brison
Pali Trng Camp	T-64	325.5 Meters	10/1/2013	Michael Brison
Pali Trng Camp	T-67	301.8 Meters	10/1/2013	Michael Brison
Pali Trng Camp	T-74	315.7 Meters	10/1/2013	Michael Brison
Total		1,147.6 Meters		

## QC Notes:

Dynamic Repeatability - QC'd 5.51% (63.26 meters). 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start E628701.35 N2361774.52, End E628722.70 N2361716.80

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 49 excavations were investigated, 49 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

4LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	
The above listed transect(s) have pass	ed QA Inspection and have been	accepted by Mr.Harm	ion Slappy.	
QA Notes:				
Mr. Harmon Stanum	4 0			
Mr. Harmon Slappy:	( Olaypay	_ Date:	10/3/2013	

Contract/TO#: W912DY-10-D-0053 TO 0003



LOT: 26 Huikala LOT To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection Huikala Quality Control Specialist From:

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distanc	;e	QC Date	QC Rep
Pali Trng Camp	T-54	1,625.8 Me	eters	9/25/2013	Michael Brison
Pali Trng Camp	T-60	40.2 Me	eters	9/30/2013	Michael Brison
Pali Trng Camp	T-116	185.1 Me	eters	9/26/2013	Michael Brison
Pali Trng Camp	T-144	140.7 Me	eters	9/18/2013	Michael Brison
			······································		
Total		1,991.8 Me	eters		

### QC Notes:

Dynamic Repeatability - QC'd 2.2% (43.9 meters). 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start E627407.44 N2360951.76, End E627440.43 N2360923.86

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

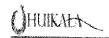
Anomaly Resolution - 80 excavations were investigated, 80 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

8 LBS MD found by team none by QC. MEC 003, 37mm Projectile M63 found by Team none by QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	
The above listed transect(s) have passed Q	A Inspection and have been acce	epted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	A Stappy	Date:	10/3/2013	

Contract/TO#: W912DY-10-D-0053 TO 0003



LOT: 27 Huikala LOT

To: HNL USACE OESS: Mr. Harmon Slappy

Re: Quality Control (QC) Inspection From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-55	211.9 Mete		Michael Brison
Pali Trng Camp	T-151	1,047.0 Mete		Michael Brison
Pali Trng Camp	T-152	441.7 Mete	ers 9/25/2013	Michael Brison
Total		1,700.6 Mete	ers	

#### QC Notes:

Dynamic Repeatability - QC'd 7.37% (125.4 meters). 1 anomalies were flagged by the team, 1 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E626576.88 N2361254.95, End E626600.80 N2361232.71

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E627571.98 N2360588.85, End E627611.21 N2360642.36

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 33 excavations were investigated, 33 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

7 LBS MD found by team none by QC. MEC 04/05 81mm Mortar, M43A1 found by Team none by QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	
The above listed transect(s) have	e passed QA inspection and have been	accepted by Mr.Ham	mon Slappy.	
QA Notes:				
Mr. Harmon Slappy:	10 Bloggy	Date:	10/3/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From:

Quality Control (QC) Inspection

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance	QC Date	QC Rep
Pali Trng Camp	T-63	219.2 Meters	10/1/2013	Michael Brison
Pali Trng Camp	T-68	506.1 Meters	10/1/2013	Michael Brison
Pali Trng Camp	T-75	394.4 Meters	9/25/2013	Michael Brison
Pali Trng Camp	T-154	493.0 Meters	9/26/2013	Michael Brison
	······			
Total		1,612.7 Meters		

### QC Notes:

Dynamic Repeatability - QC'd 12.64% (203.8 meters). 6 anomalies were flagged by the team, 6 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E626463.30 N2360919.67, End E626414.87 N2360957.90

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E627063.58 N2360768.44, End E627015.84 N2360800.20

Dynamic Repeatability - Coordinates of QC'd Area 3: Start E627900.71 N2360822.71, End E627860.24 N2360873.21

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 35 excavations were investigated, 35 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

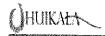
All flagging ribbon will be removed upon Government Acceptance

7 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	
The above listed transect(s) have passed (	QA Inspection and have been ac	cepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	A. Stoppy	Date:	10/3/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dis	tance	QC Date	QC Rep
Pali Trng Camp	T-65	168.4	Meters	9/23/2013	Michael Brison
Pali Trng Camp	T-140	1,220.5	Meters	9/23/2013	Michael Brison
Pali Trng Camp	T-143	385.4	Meters	9/23/2013	Michael Brison
Pali Trng Camp	T-153	197.2	Meters	9/23/2013	Michael Brison
Total		1.971.5	Meters		

# QC Notes:

Dynamic Repeatability - QC'd 3.33% (65.65 meters). 3 anomalies were flagged by the team, 3 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area: Start E627088.33 N2360821.21, End E627054.31 N2360777.17

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 17 excavations were investigated, 17 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

3 LBS MD found by team none by QC. No MPPEH/MEC found by Team none by QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	······
The above listed transect(s) have passed	QA Inspection and have been	accepted by Mr.Ham	non Slappy.	
QA Notes:				
Mr. Harmon Slappy:	128 Cappy	Date:	10/3/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From:

Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Dista	nce	QC Date	QC Rep
Pali Trng Camp	T-66	297.0	Meters	9/26/2013	Michael Brison
Pali Trng Camp	T-113	221.7	Meters	9/24/2013	Michael Brison
Pali Trng Camp	T-149	1,112.8	Meters	9/24/2013	Michael Brison
Pali Trng Camp	T-150	297.5	Meters	9/24/2013	Michael Brison
Total		1,929.0	Meters		

## QC Notes:

Dynamic Repeatability - QC'd 7.72% (148.94 meters). 4 anomalies were flagged by the team, 4 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E628886.55 N2360375.32, End E628841.09 N2360338040

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E628152.17 N2361213.58, End E628207.43 N2361192.38

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 49 excavations were investigated, 49 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

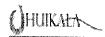
All flagging ribbon will be removed upon Government Acceptance

3 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	
The above listed transect(s) have pa	ssed QA Inspection and have been	accepted by Mr.Ham	mon Slappy.	
QA Notes:				
	(1 -			
Mr. Harmon Slappy:	1d. Stappy	_ Date:	10/3/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Harmon Slappy

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distan	ce	QC Date	QC Rep
Pali Trng Camp	T-115	94.3 M	eters	9/25/2013	Michael Brison
Pali Trng Camp	T-138	603.4 Me	eters	9/12/2013	Michael Brison
Pali Trng Camp	T-141	821.3 Me	eters	9/16/2013	Michael Brison
Pali Trng Camp	T-155	438.3 Me	eters	9/30/2013	Michael Brison
			······································		
Total		1957.3 Me	eters		

## QC Notes:

Dynamic Repeatability - QC'd 6.72% (131.45 meters). 7 anomalies were flagged by the team, 7 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E630500.90 N2361707.84, EndE630472.00 N2361660.86

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E626332.26 N2361294.55, End E626367.77 N2361289.69

Dynamic Repeatability - Coordinates of QC'd Area 3: Start E626414.54 N2360963.52, End E626371.19 N2360911.87

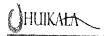
Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instument. No discrepancies noted.

Anomaly Resolution - 65 excavations were investigated, 65 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

7 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	10/3/2013	
The above listed transect(s) have passed Q	A inspection and have been	accepted by Mr.Harmo	on Slappy.	
QA Notes:				
Mr. Harmon Slappy:	14.5 Capy	Date:	10/3/2013	Widow was a second



To:

HNL USACE OESS: Mr. Michael Mullen

Re: From: Quality Control (QC) Inspection

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

LOT: 32 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

MRS	Grid	D	stance	QC Date	QC Rep
Pali Trng Camp	1	0.20	Acre	10/01/13	Michael Brison
Pali Trng Camp	2	0.23	Acre	10/01/13	Michael Brison
Pali Trng Camp	3	0.19	Acre	10/01/13	Michael Brison
					····
				<del>- </del>	
Total	******	0.62	Acre		

# QC Notes:

Huiteda OO Otalia

Coverage - 12 coverage seeds placed, 12 coverage seeds recovered. No discrepancies noted.

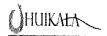
Detection & Recovery - 1 operator in LOT, 2ea large ISO and 4ea small ISO placed. All recovered, no discrepances noted.

Anomaly Resolution - 131 excavations were investigated, 131 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

UXOQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

13 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Hulkala QC Signature:	Michael Brison	Date:	10/9/2013	
The above listed transect(s) have pas	ssed QA Inspection and have been a	sccepted by Mr.Harm	on Slappy.	
QA Notes:				
	MUMA			
Mr. Michael Mullen:	A CONTRACTOR OF THE PARTY OF TH	Date:	10/10/2013	



To:

HNL USACE OESS: Mr. Michael Mullen

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

LOT: 33 Huikala LOT

Contract/10#;	W912DY-10-D-0053 10 0003

MRS	Grid	Distance	QC Date	QC Rep
Pali Trng Camp	7	0.26 Acre	10/07/13	Michael Brison
Pali Trng Camp	8	0.25 Acre	10/03/13	Michael Brison
Pali Trng Camp	9	0.10 Acre	10/02/13	Michael Brison
Total		0.61 Acre		

## QC Notes:

Coverage - 14 coverage seeds placed, 14 coverage seeds recovered. No discrepancies noted.

Detection & Recovery - 1 operator in LOT, 1ea large ISO and 2ea small ISO placed. All recovered, no discrepances noted.

Anomaly Resolution - 504 excavations were investigated, 504 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

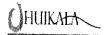
UXOQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

62 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Bricon	Date:	10/9/2013	
The above listed transect(s) have	passed QA inspection and have been	accepted by Mr.Harm	on Slappy.	-
QA Notes:				
	allorM M	P		
Mr. Michael Mullen:	Melsanall	Date:	10/10/2013	

Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003



To:

HNL USACE OESS: Mr. Michael Mullen

Re: From: Quality Control (QC) Inspection Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Grid	Distance	QC Date	QC Rep
Pali Trng Camp	4	0.26 Acre	10/07/13	Michael Brison
Pali Trng Camp	10	0.20 Acre	10/03/13	Michael Brison
Pali Trng Camp	11	0.20 Acre	10/02/13	Michael Brison
······································				
Total		0.66 Acre		

### QC Notes:

Coverage - 12 coverage seeds placed, 12 coverage seeds recovered. No discrepancies noted.

Detection & Recovery - 1 operator in LOT, 2ea large ISO, 1ea Medium ISO and 6ea small ISO placed. All recovered, no discrepances noted.

Anomaly Resolution - 301 excavations were investigated, 301 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

UXOQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

15 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date:	10/9/2013	
The above listed transect(s) have pas	ssed QA inspection and have been a	accepted by Mr.Harm	on Slappy.	
QA Notes:				
	MilDe Mall	P		
Mr. Michael Mullen:		Date:	10/10/2013	

JHUKAEA_	
----------	--

LOT: 35 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To:

HNL USACE QESS: Mr. Michael Mullen

Re:

Quality Control (QC) Inspection

From:

Huikala Quality Control Specialist

The following work areas have passed QC inspection and are ready for QA inspection:

MRS	Grid	Distance	QC Date	QC Rep
Pali Trng Camp	12	0.30 Acre	10/10/13	Michael Brison
Pali Trng Camp	13	0.26 Acre	10/10/13	Michael Brison
Pali Trng Camp	14	0.27 Acre	10/10/13	Michael Brison
Pali Trng Camp	15	0.26 Acre	10/09/13	Michael Brison
Total		1 09 Acre		**************************************

## QC Notes:

Coverage - 8 coverage seeds placed, 8 coverage seeds recovered. No discrepancies noted.

Detection & Recovery - 1 operator in LOT, 1ea large ISO, and 2ea small ISO placed. All recovered, no discrepances noted.

Anomaly Resolution - 162 excavations were investigated, 162 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted. UXDQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

24 LBS MO found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael B	rison	Date:	10/15/2013	
The above listed transect	s) have passed QA inspectio	n and have been accepte	ed by Mr.Micl	hael Mullen.	
QA Notes:					
	MULLEN.MICHAEL.KA	ON: 1=03, D=0.5. GOVERNMENT, ODSERDLI,			
Mr. Michael Mullen:	MUELA.1180170444	ou=PKI, ou=USA, cn=MALLEN MICHAEL, KAMUELA.118017D4: Date: 2013.10.16 05:09:14 - (0'00'	H Date		



LOT: 36 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To: HNL USACE OESS: Mr. Michael Mullen

Re: Quality Control (QC) Inspection

From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Grid	Distance	QC Date	QC Rep
Pali Trng Camp	5	0.09 Acre	10/10/13	Michael Brison
Pali Trng Camp	6	0.21 Acre	10/15/13	Michael Brison
Pali Trng Camp	18	0.31 Acre	10/09/13	Michael Brison
Total		0.61 Acre		

### QC Notes:

Coverage - 12 coverage seeds placed, 12 coverage seeds recovered. No discrepancies noted.

Detection & Recovery - 1 operator in LOT, 1ea medium ISO, and 2ea small ISO placed. All recovered, no discrepancies noted.

Anomaly Resolution - 218 excavations were investigated, 218 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

UXOQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

34 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	10/15/2013	
The above listed transect(s) ha	ave passed QA Inspection and have been a	ccepted by Mr. Mic	hael Mullen.	
QA Notes:				
Mr. Michael Mullen:	MULLEN.MICHAEL.KA Digitally signed by MULLEN.MICHAEL.KAMU ON: C-US, 0-US. Government, our-DoD, our-MULLEN.MICHAEL.KAMUELA. 118017044  Date: 2013.10.16 06:0629-10'00'	PKI, ou=USA,		



LOT: 37 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To: HNL USACE OESS: Mr. Michael Mullen

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Grid	Distance	QC Date	QC Rep
Pali Trng Camp	16	0.26 Acre	10/15/13	Michael Brison
Pali Trng Camp	17	0.08 Acre	10/10/13	Michael Brison
Pali Trng Camp	19	0.22 Acre	10/15/13	Michael Brison
Total		0.56 Acre		

#### QC Notes:

Coverage - 12 coverage seeds placed, 12 coverage seeds recovered. No discrepancies noted.

Detection & Recovery - 1 operator in LOT, 1ea medium ISO, and 2ea small ISO placed. All recovered, no discrepancies noted.

Anomaly Resolution - 103 excavations were investigated, 103 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

UXOQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

11 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Hulkala QC Signature:	Michael Brison	Date:	10/15/2013	
The above listed transect(s) ha	ive passed QA Inspection and have been accepte	d by Mr. Mic	hael Mullen.	
QA Notes:				
Mr. Michael Mullen:	MULLEN.MICHAEL.KA  MULLEN.MICHAEL.KAM  MULLEN.MICHAEL.KAMUELA.1180170444  DN: c=US, Government, ou=DoD, ou=PKI, ou=USA, cn=MULLEN.MICHAEL.KAMUELA.1180170444  Date: 2013.10.16.66.04.22 - 1.0700′	Date:		



LOT: 38 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To: HNL USACE OESS: Mr. Michael Mullen

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Grid	Distance	QC Date	QC Rep
Pali Trng Camp	20	0.22 Acre	10/15/13	Michael Brison
Pali Trng Camp	21	0.26 Acre	10/15/13	Michael Brison
Pali Trng Camp	22	0.51 Acre	10/15/13	Michael Brison
Total		0.99 Acre		

#### QC Notes:

Coverage - 4 coverage seeds placed, 4 coverage seeds recovered. No discrepancies noted.

Detection & Recovery - 1 operator in LOT, 1ea medium ISO, and 2ea small ISO placed. All recovered, no discrepancies noted.

Anomaly Resolution - 118 excavations were investigated, 118 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

UXOQCS conducted QC inspection of not less than 20% of grids utilizing a Minelab Explorer SE metal detector. Used a meandering pattern to perform a search for anomalies in the grids. No discrepancies noted.

7.5 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	10/15/2013	
The above listed transect(s) have	passed QA Inspection and have been accept	ed by Mr. Mic	hael Mullen.	
QA Notes:				
Mr. Michael Mullen:	MULLEN.MICHAEL.KA  MULLEN.GOMELAMUELA.1180170444  MULLEN.GOMELAMUELA.1180170444  DiscU.S., Geul.S. Government, qui-Dol, qui-PR, qui-USA, communication de Com	Date:		



Lot: 39 **Huikala LOT** 

3/3/2014

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Quality Control (QC) Inspection Re: From: **Huikala Quality Control Specialist** 

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD05	2004.8	4917	2/19/2014	Michael Brison
Total		2004.8	4917		

#### QC Notes:

Dynamic Repeatability - QC'd 3.16% (63.3 meters). 8 anomalies were flagged by the team, 8 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E629503.7 N2360632.4, End E629460.7 N2360586.4

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instrument. No discrepancies noted.

Anomaly Resolution - 94 excavations were investigated, 94 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

K-49

Date:

All flagging ribbon will be removed upon Government Acceptance

3 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Michael Brison

QC was completed IAW DID-WERS-004.01.

			0,0,2011	
The above listed transect(s) have	e passed QA Inspection and have been	ı accepted by Mr. M	ichael Mullen.	
QA Notes:	MULLEN.MICHAEL.KAMUELA.11801/0444			
AMUELA.1  Mr. Michael Mullen:	1801/044 ou=PKI, ou=USA, cn=MULLEN.MICHAEL.KAMUELA.1180170444 Date: 2014.03.05 10:53:42 -10'00'	Date:	3/4/2014	

Huikala QC Signature:

November 2014



Lot: 40 Huikala LOT

3/3/2014

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD07	2009.5	3708	2/20/2014	Michael Brison
Total		2009.5	3708		

## QC Notes:

Dynamic Repeatability - QC'd 2.92% (58.7 meters). 0 anomalies were flagged by the team, 0 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E628508.3 N2359864.0, End E628474.3 N2359888.6

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instrument. No discrepancies noted.

Anomaly Resolution - 27 excavations were investigated, 27 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

K-50

Date:

All flagging ribbon will be removed upon Government Acceptance

2 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Michael Brison

QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:

Transacta 40 Orginataro.			<b>D</b> 4101	
The above listed trans	sect(s) have passed QA Ins	pection and have been accep	ted by Mr. N	lichael Mullen.
QA Notes:				
	MULLEN.MICHAEL.KA	Digitally signed by MULLEN.MICHAEL.KAMUELA.1180170444 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI. ou=USA.		
Mr. Michael Mullen:	MUELA.1180170444	cn=MULLEN.MICHAEL.KAMUELA.1180170444 Date: 2014.03.05 10:56:23 -10'00'	Date:	3/3/2014

Contract No. W912DY-10-D-0053



Lot: 41 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

To: HNL USACE OESS: Mr. Michael Mullen

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD08	1019.7	2101	2/20/2014	Michael Brison
Pali Trng Camp	MWD11	859.9	1334	2/25/2014	Michael Brison
Total		1879.6	3435		

### QC Notes:

Dynamic Repeatability - QC'd 5.85% (110 meters). 2 anomalies were flagged by the team, 2 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E627857.4 N2359943.5, End E627820.1 N2359915.2

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E627526.2 N2360155.0, End E627485.5 N2360130.2

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instrument. No discrepancies noted.

The following work areas have passed QC Inspection and are ready for QA Inspection:

Anomaly Resolution - 194 excavations were investigated, 194 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

9 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature	Michael Brison	Date: _	3/3/2014
The above listed trans	sect(s) have passed QA Inspection and have	been accepted by Mr. M	ichael Mullen.
QA Notes:  Mr. Michael Mullen:	MULLEN.MICHAEL.  KAMUELA.118017  O444  Digitally signed by MULLEN.MICHAEL.KAMUELA. DDN: c=125, o=1.5. Governmen ou=USA, cn=MULLEN.MICHAEL.KAMUI Date: 2014.03.05 10:58:53 -10	t, ou=DoD, ou=PKI, ELA.1180170444	3/3/2014



Lot: 42 Huikala LOT

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
rng Camp	MWD04	403.3	919	2/11/2014	Michael Brison

The following work areas have passed QC Inspection and are ready for QA Inspection:

IVIRO	Transect	Distance (m)	Area (m.)	QC Date	QC Rep
Pali Trng Camp	MWD04	403.3	919	2/11/2014	Michael Brison
Pali Trng Camp	MWD13	1069.2	2144	2/27/2014	Michael Brison
Total		1472.5	3063		

## QC Notes:

Dynamic Repeatability - QC'd 9.7% (142.9 meters). 15 anomalies were flagged by the team, 15 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E626275.2 N2361114.1, End E626269.9 N2361054.0

Anomaly Resolution - Team Leader completed 100% QC of lot with a separate instrument. No discrepancies noted.

Anomaly Resolution - 193 excavations were investigated, 193 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

33 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

MICNAEI Brison	Date: _	3/6/2014	
nave passed QA Inspection and have be	en accepted by Mr. M	ichael Mullen.	
MULLEN.MICHAEL. KAMUELA.11801700  MULLEN.MICHAEL.KAMUELA.1180170444  DN: C=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, Cn=MULLEN.MICHAEL.KAMUELA.1180170444  DN: C=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, Cn=MULLEN.MICHAEL.KAMUELA.1180170444  Date: 2014.03.1111.03.118.1000	Date:	3/11/2014	
	MULLEN.MICHAEL.  MULLEN.MICHAEL.  MULLEN.MICHAEL.  MULLEN.MICHAEL.MUELA.1180170444  KAMUELA.11801704  MULLEN.MICHAEL.KAMUELA.1180170444  MULLEN.MICHAEL.KAMUELA.1180170444	MULLEN.MICHAEL.  Digitally signed by MULLEN.MICHAEL.  KAMUELA.1180170444  NN.C-US.G-US.Government, ou=DoD, au=PKI, ou=USA, or-MULLEN.MICHAEL.KAMUELA.1180170444	MULLEN.MICHAEL.  MULLEN.MICHAEL.  MULLEN.MICHAEL.  MULLEN.MICHAEL.  MULLEN.MICHAEL.  MULLEN.MICHAEL.  Digitally signed by MULLEN.MICHAEL.KAMUELA.1180170444  DN: c=US, o=US, Government, ou=DoD, ou=FN, ou=USA, con-MULLEN.MICHAEL.KAMUELA.1180170444



Lot: 43 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD06	794.5	1786	2/19/2014	Michael Brison
Pali Trng Camp	MWD10	465.3	904	2/24/2014	Michael Brison
Pali Trng Camp	MWD12	525.3	1129	2/26/2014	Michael Brison
Total		1785.1	3819		

HNL USACE OESS: Mr. Michael Mullen

#### QC Notes:

To:

Dynamic Repeatability - QC'd 10.13% (180.81 meters). 8 anomalies were flagged by the team, 8 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E628631.8 N2360217.1, End E628590.0 N2360192.6

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E629646.0 N2360943.7, End E629605.7 N2360912.2

Dynamic Repeatability - Coordinates of QC'd Area 3: Start E627201.2 N2360246.1, End E627167.1 N2360259.1

Anomaly Resolution - 521 excavations were investigated, 521 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

13 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison		Date:	3/6/2014
The above listed transect(s	) have passed QA Inspec	tion and have been acce	oted by Mr. Mic	hael Mullen.
QA Notes:	IVIOLLLIN.IVIICI I V MU	gitally signed by JLLEN.MICHAEL.KAMUELA.1180170444		
Mr. Michael Mullen:	AEL.KAMUELA.	l: c=US, o=U.S. Government, ou=DoD, =PKI, ou=USA, =MULLEN.MICHAEL.KAMUELA.11801704 te: 2014.03.11 11:07:33 -10'00'	Date:	3/11/2014



Lot: 44 Huikala LOT

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD02	395.9	1044	2/10/2014	Michael Brison
Pali Trng Camp	MWD03	1235.9	2577	2/11/2014	Michael Brison
Total		1631.8	3621		

#### QC Notes:

Dynamic Repeatability - QC'd 8.19% (133.7 meters). 19 anomalies were flagged by the team, 19 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E626495.4 N2361993.2, End E626452.4 N2361955.6

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E626407.1 N2361772.6, End E626361.7 N2361768.1

Anomaly Resolution - 196 excavations were investigated, 196 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

K-54

All flagging ribbon will be removed upon Government Acceptance

20 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	<u> </u>	Date:	3/6/2014	
The above listed transe	ct(s) have passed QA Ins	spection and have been acc	epted by Mr. M	ichael Mullen.	
QA Notes:					
	MULLEN.MICHAEL.	Digitally signed by MULLEN,MICHAEL,KAMUELA,1180170444			
	KAMUELA.1180170				
Mr. Michael Mullen:	444	cn=MULLEN.MICHAEL.KAMUELA.1180170444 Date: 2014.03.11 11:09:49 -10'00'	Date:	3/11/2014	



Lot: 45 Huikala LOT

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD01	851.3	2012	2/10/2014	Michael Brison
Pali Trng Camp	MWD09	934.4	3008	2/21/2014	Michael Brison
Pali Trng Camp	MWD16	87.3	222	3/4/2014	Michael Brison
Total		1873.0	5242		

#### QC Notes:

Dynamic Repeatability - QC'd 7.96% (149.1 meters). 15 anomalies were flagged by the team, 15 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E626730.4 N2362414.8, End E626799.8 N2362397.6

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E629929.9 N2360852.6, End E629886.1 N2360901.1

Anomaly Resolution - 276 excavations were investigated, 276 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

7 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Huikala QC Signature:	Michael Brison	Date:	3/6/2014	
The above listed transect	(s) have passed QA Inspection and have	e been accepted by Mr. N	lichael Mullen.	
QA Notes:				
	MULLEN.MICHAE Digitally signed by MULLEN.MICHAEL.KAMUELA.	1180170444		
	L.KAMUELA.1180 DN: c=U.S, o=U.S. Governmen ou=Pki, ou=USA.			
Mr. Michael Mullen:	170444 444 Date: 2014.03.11 11:11:21 -10	Dete	3/11/2014	



Lot: 46 Huikala LOT

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWD14	1241	2717	3/3/2014	Michael Brison
Pali Trng Camp	MWD15	311.2	556	3/3/2014	Michael Brison
Total		1552.2	3273		

#### QC Notes:

Dynamic Repeatability - QC'd 6.58% (102.2 meters). 13 anomalies were flagged by the team, 13 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E626338.4 N2360570.6, End E626360.7 N2360525.6

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E626981.8 N2360378.5, End E627010.3 N2360386.0

Anomaly Resolution - 90 excavations were investigated, 90 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

Data

2/6/2014

All flagging ribbon will be removed upon Government Acceptance

15 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

Michael Brican

QC was completed IAW DID-WERS-004.01.

Huikala OC Signatura

nuikaia QC Signature.	WICHAEL BIISOH	Date.	3/0/2014	-
The above listed transec	ct(s) have passed QA Inspection a	and have been accepted by Mr. I	Michael Mullen.	
QA Notes:				
Mr. Michael Mullen:	MULLEN.MICHAEL.K Digitally signed by MULLEN.MICHAEL AMUELA.118017044 DN: c=US, o=US, C. Cn=MULLEN.MICHAEL ALLEN Date: 2014.03.111	overnment, ou=DoD, AEL.KAMUELA.1180170444	3/11/2014	



Lot: 47 Huikala LOT

To: HNL USACE OESS: Mr. Michael Mullen Contract/TO#: W912DY-10-D-0053 TO 0003

Re: Quality Control (QC) Inspection
From: Huikala Quality Control Specialist

The following work areas	have passed QC Inspection	n and are ready for QA Inspection:
--------------------------	---------------------------	------------------------------------

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWF01	718.6	1064	3/3/2014	Michael Brison
Total		718.6	1064		

#### QC Notes:

Dynamic Repeatability - QC'd 5.96% (42.8 meters). 2 anomalies were flagged by the team, 2 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E627406.3 N2361546.3, End E627366.6 N2361533.8

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E626981.8 N2360378.5, End E627010.3 N2360386.0

Anomaly Resolution - 97 excavations were investigated, 97 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

14 LBS MD found by team none by QC. No MPPEH/MEC found by Team or QC.

QC was completed IAW DID-WERS-004.01.

Huikala QC Signature:	Michael Brison	Date: _	3/6/2014	
The above listed transect(s)	have passed QA Inspection and ha	ve been accepted by Mr. Mi	chael Mullen.	
QA Notes:				
Mr. Michael Mullen:		Date:		



Lot: 48 Huikala LOT

Contract/TO#: W912DY-10-D-0053 TO 0003 To: HNL USACE OESS: Mr. Michael Mullen

Quality Control (QC) Inspection Re: From: **Huikala Quality Control Specialist** 

The following work areas have passed QC Inspection and are ready for QA Inspection:

MRS	Transect	Distance (m)	Area (m <sup>2</sup> )	QC Date	QC Rep
Pali Trng Camp	MWF02	307.8	404	3/3/2014	Michael Brison
Pali Trng Camp	MWF03	129.5	176	3/3/2014	Michael Brison
Pali Trng Camp	MWF04	875.6	954	3/3/2014	Michael Brison
Pali Trng Camp	MWF05	33.8	893	3/3/2014	Michael Brison
Pali Trng Camp	MWF06	103.8	106	3/3/2014	Michael Brison
Pali Trng Camp	MWF07	185	287	3/3/2014	Michael Brison
Pali Trng Camp	MWF08	30	145	3/3/2014	Michael Brison
Total		1665.5	2965		

#### QC Notes:

Dynamic Repeatability - QC'd 7.69% (128.1 meters). 21 anomalies were flagged by the team, 21 anomalies detected by QC. No discrepancies noted.

Dynamic Repeatability - Coordinates of QC'd Area 1: Start E627274.4 N2361303.2, End E627318.1 N2361262.8

Dynamic Repeatability - Coordinates of QC'd Area 2: Start E627047.7 N2361315.4, End E627015.0 N2361279.8

Anomaly Resolution - 362 excavations were investigated, 362 excavations were QC'd by Team Leader with a separate instrument. No discrepancies noted.

All flagging ribbon will be removed upon Government Acceptance

38 LBS MD located by team. MEC006 and MEC007 2ea 37mm M63 found by team. None by QC.

QC was completed IAW DID-WERS-004.01.

Huikala QC Signat	ure:	Michael Brison	1	Date:	3/6/2014	_
The above listed to	ransect(s) hav	e passed QA Ins	spection and have been acc	epted by Mr. I	Michael Mullen.	
QA Notes:	MULLEN	I.MICHAEL				
	.KAMUE	LA.11801	Digitally signed by MULLEN.MICHAEL.KAMUELA.1180170444 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=MULLEN.MICHAEL.KAMUELA.1180170444 Date: 2014.03.12 12:14:06-10'00'			
Mr. Michael Muller	70444			Date:	3/12/2014	

# Appendix L QA Documentation

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
TO: Huikala JV, LLC	<b>Date/Time:</b> 14 August 2013/1230 hrs.	
CONTRACT #: W9128DY-10-D-053	PROJECT LOCATION:	
DO #:	Pali Training Camp Task Order #003 R/I	
SUBJECT ITEM(S)	(Check all that apply):	
☐ Work Plan	🛱 Quality Control	
Safety Violation	Other	
Safety Comments		
Check: Lot: 01 consistin  NFE  Prompt correction or complian  SLAPF  LAMAF	government quality acceptance ag of transits T-14, T-17 and T-19  nce with contract specifications is requested.  PY.HARMON  PY.HARMON  R. 1066337320  Dec. 2013.08.14 14:07:47-1000  USACE Site Representative	
	Contractor's Representative	
ACTION TAKEN:		
CEHNC FORM 948 (Revised) 1 APR 96		

Contract No. W912DY-10-D-0053 TO 0003

Contractor's Representative	U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
Pali Training Camp Task Order #003 R/I  SUBJECT ITEM(S)  (Check all that apply):  Work Plan  Safety Violation  Safety Comments  DESCRIPTION: Following Lot passed a government quality acceptance check: Lot: 02 consisting of transects T-20 and T-21 NFE  Prompt correction or compliance with contract specifications is requested. SLAPPY.HARMON.  LAMAR. 1066337320  Back Prishmonia. Mark 1066337200  Description of transects T-20 and T-21 NFE  Contractor's Representative	<b>TO:</b> Huikala JV, LLC	Date/Time: 14 August 2013/1230 hrs.	
SUBJECT ITEM(S)  (Check all that apply):  Work Plan  Safety Violation  Other  Safety Comments  DESCRIPTION: Following Lot passed a government quality acceptance check: Lot: 02 consisting of transects T-20 and T-21 NFE  Prompt correction or compliance with contract specifications is requested. SLAPPY.HARMON. SLAPPY.HARMON.LAMAR.106837320  SLAPPY.HARMON.LAMAR.106837320  USACE Site Representative  Contractor's Representative		PROJECT LOCATION:	
Prompt correction or compliance with contract specifications is requested.  SLAPPY HARMON.  LAMAR. 1066337320  USACE Site Representative  Contractor's Representative	DO #:	• •	
Prompt correction or compliance with contract specifications is requested.  SLAPPY HARMON SLAPPY HARMON SLAPPY HARMON LAMAR 1066337320  LAMAR. 1066337320  USACE Site Representative  Contractor's Representative	SUBJECT ITEM(S)	(Check all that apply):	
Prompt correction or compliance with contract specifications is requested.  SLAPPY.HARMON.  LAMAR. 106633 7320  Disact Plantage of the Representative  Contractor's Representative	- '		
Prompt correction or compliance with contract specifications is requested.  SLAPPY HARMON LAMAR 106633720  LAMAR. 106633 7 320  USACE Site Representative  Contractor's Representative	Safety Violation	•	
Prompt correction or compliance with contract specifications is requested.  SLAPPY HARMON.  SL	·	,	
Contractor's Representative	Prompt correction or compliant SLAP	ance with contract specifications is requested. PY.HARMON SLAPPY HARMON LAMAR 1066337320 AR.1066337320 Date: 2013 08 41 41:504-17000	
Contractor's Representative	RECEIPT ACKNOLEDGED:	n. l. O. F. K.	
	our colonia de la colonia de l		
	ACTION TAKEN:		

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
<b>TO:</b> Huikala JV, LLC	<b>Date/Time:</b> 14 August 2013/1230 hrs.	
CONTRACT #: W9128DY-10-D-053 DO #:	PROJECT LOCATION:  Pali Training Camp Task Order #003  R/I	
SUBJECT ITEM(S)  Work Plan Safety Violation Safety Comments  DESCRIPTION: Following Lot passed a check: Lot: 03 consistin and T-101 NFE  Prompt correction or compliant SLAPF AMAR	· ·	
CEHNC FORM 948 (Revised) 1 APR 96		

Contract No. W912DY-10-D-0053 TO 0003

PROJECT LOCATION: W9128DY-10-D-053 POO #:  SUBJECT ITEM(S)  (Check all that apply):    Work Plan	U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
## Pall Training Camp Task Order #003  ## Pall Training Camp Task Order #003  ## Pall Training Camp Task Order #003  ## Check all that apply):    Work Plan	<b>TO:</b> Huikala JV, LLC	<b>Date/Time:</b> 19 August 2013/1230 hrs.	
SUBJECT ITEM(S)  (Check all that apply):  Work Plan  Safety Violation  Safety Comments  DESCRIPTION: Following Lots passed a government quality assurance check: Lot: 04 consisting of transects T-29, T-31, T-33, T-34, T-35, T-98 and T-100 NFE  Prompt correction or compliance with contract specifications is requested.  SLAPPY.HARMON Subject to Subj	CONTRACT #: W9128DY-10-D-053		
Work Plan  Safety Violation  Other  Safety Comments  DESCRIPTION: Following Lots passed a government quality assurance check: Lot: 04 consisting of transects T-29, T-31, T-33, T-34, T-35, T-98 and T-100 NFE  Prompt correction or compliance with contract specifications is requested.  SLAPPY.HARMONor Management of the second of the se	DO #:		
Prompt correction or compliance with contract specifications is requested.  SLAPPY.HARMONO.  LAMAR.1066337320  USACE Site Representative  ECEIPT ACKNOLEDGED:  Contractor's Representative  CTION TAKEN:	SUBJECT ITEM(S)	(Check all that apply):	
DESCRIPTION: Following Lots passed a government quality assurance check: Lot: 04 consisting of transects T-29, T-31, T-33, T-34, T-35, T-98 and T-100 NFE  Prompt correction or compliance with contract specifications is requested. SLAPPY.HARMONON SHAPPY.HARMONON LAMAR 1086373200 BARNAR 108637320 BARNAR 108	☐ Work Plan	X Quality Control	
DESCRIPTION: Following Lots passed a government quality assurance check: Lot: 04 consisting of transects T-29, T-31, T-33, T-34, T-35, T-98 and T-100 NFE  Prompt correction or compliance with contract specifications is requested. SLAPPY.HARMON SLAPPY.HARMON SLAPPY.HARMON LAMAR.1066337320 USACE Site Representative  ECEIPT ACKNOLEDGED:  Contractor's Representative  CTION TAKEN:	Safety Violation	☐ Other	
Following Lots passed a government quality assurance check: Lot: 04 consisting of transects T-29, T-31, T-33, T-34, T-35, T-98 and T-100 NFE  Prompt correction or compliance with contract specifications is requested.  SLAPPY.HARMON of Contract of Contractor's Representative  ECCEIPT ACKNOLEDGED:  Contractor's Representative  CTION TAKEN:	Safety Comments		
SLAPPY.HARMON on Decide signed by LAMAR 1066337320 LAMAR 1066337320 Decided by LAMAR 106637320 Decided	check: Lot: 04 consisting	g of transects T-29, T-31, T-33, T-34,	
Contractor's Representative  CTION TAKEN:	SLAPF	PY.HARMON Dipitally signed by STAP 1066337320 STAPPS HARMON LAMAR 1066337320 DIPITAL STAPPS HARM	
CTION TAKEN:	RECEIPT ACKNOLEDGED:	Milleffer	
		Contractor's Representative	
CEHNC FORM 948 (Revised) 1 APR 96	ACTION TAKEN:		
Contract No. W912DY-10-D-0053	CEHNC FORM 948 (Revised) 1 APR 96		

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
<b>TO:</b> Huikala JV, LLC	Date/Time: 03 Septemer 2013/1230 hrs.	
CONTRACT #: W9128DY-10-D-053	PROJECT LOCATION:	
DO#:	Pali Training Camp Task Order #003 R/I	
SUBJECT ITEM(S)	(Check all that apply):	
☐ Work Plan		
Safety Violation	<b>Other</b>	
Safety Comments		
check: Lot: 05 consistin	g of transect T-119, Lot: 06 -121 and Lot 07 consisting of	
SLAPF	PY. HARMON Display signed by September 1, 200 points of the Control of the Contro	
RECEIPT ACKNOLEDGED:	USACE Site Representative  Mulfill Contractor's Representative	
ACTION TAKEN:		
CEHNC FORM 948 (Revised) 1 APR 96		

ONTRACT #: V9128DY-10-D-053	
	PROJECT LOCATION:
OO #:	Pali Training Camp Task Order #003
	R/I
SUBJECT ITEM(S)	(Check all that apply):
☐ Work Plan	▼ Quality Control
Safety Violation	☐ Other
Safety Comments DESCRIPTION:	
check: Lot: 08 cons consisting of transect T-124 and Lot 11 con NFE  Prompt correction or comp SLA	d a government quality assurance isting of transect T-126, Lot: 09 t T-125, Lot 10 consisting of transect sisting of transect T-122 and T-123  poliance with contract specifications is requested.  PPY.HARMON DISCONSIDER OF THE PROPERTY
ECEIPT ACKNOLEDGED:	m.hen
	11/11/1/11/2
	Contractor's Representative

Contract No. W912DY-10-D-0053

TO 0003

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
TO: Huikala JV, LLC	Date/Time: 16 Septemer 2013/1230 hrs.	
CONTRACT #: W9128DY-10-D-053	PROJECT LOCATION:	
DO #:	Pali Training Camp Task Order #003 R/I	
SUBJECT ITEM(S)	(Check all that apply):	
┌─ Work Plan	🔀 Quality Control	
☐ Safety Violation	Cother	
Safety Comments		
and T-112; Lot: 13 consisting	of transect T-10, T-11, T-110 sting of transect T-28, T-107 and of transect T-9, T-106, T-117 and of transect T-118 and T-127 NFE	
SLAPPY AMAR.	Ce with contract specifications is requested. Y.HARMONIAN STREET, 1000 SLAPPY, HARMONIAMAR, 1006337320 1066337320  USACE Site Representative	
***************************************	Contractor's Representative	
ACTION TAKEN:		
CEHNC FORM 948 (Revised) 1 APR 96	1 7	

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
13/1230 hrs.		
er #003		
ssurance 5, T-96, ransect T-5, ot 19 of transect  as is requested.  MAR 106637320 emment, curboo, purpox, analysis and analysis analysis analysis and analysis an		
/e		

November 2014 Revision 3

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
TO: Huikala JV, LLC	Date/Time: 23 Septemer 2013/1230 hrs.	
CONTRACT #: W9128DY-10-D-053	PROJECT LOCATION:  Pali Training Camp Task Order #003	
DO #:	R/I	
SUBJECT ITEM(S)	(Check all that apply):	
│ Work Plan	▼ Quality Control	
Safety Violation	Other Other	
Safety Comments		
check: Lot: 21 consisting T-148; Lot: 22 consisting 23 consisting of transect	government quality assurance ng of transect T-145, T-146 and g of transect T-139, and T-142; Lot t T-130 and T-137; Lot 24 62, T-135 and T-136—NFE	
SLAPP	PY.HARMONO Paterly stoned by PY.HARMONO PY.HARMONO PARTY Stoned by PY.HARMONO PARTY STONE	
RECEIPT ACKNOLEDGED:	My GD	
Contractor's Representative		
ACTION TAKEN:		
CEHNC FORM 948 (Revised) 1 APR 96		

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCED AND EXPLOSIVE GROUP MEMO		
TO: Huikala JV, LLC	<b>Date/Time:</b> 07 Oct 2013/1230 hrs.	
CONTRACT #: W9128DY-10-D-053	PROJECT LOCATION:	
DO #:	Pali Training Camp Task Order #003 R/I	
SUBJECT ITEM(S)	(Check all that apply):	
┌─ Work Plan	▼ Quality Control	
☐ Safety Violation	☐ Other	
Safety Comments		
DESCRIPTION: Following Lots passed a	government quality assurance	
	ng of transect T-27, T-64, T-67	
	ing of transect T-54, T-60, T-116	
	ting of transect T-55, T-151 and	
,	of transect T-63, T-68, T-75 and	
,	of transect T-65, T-140, T-143 and	
_	of transect T-66, T-113, T-149 and	
and T-155 NFE	of transect T-115, T-138, T-141	
WE THE		
SLAPP'	Ce with contract specifications is requested.  Y.HARIMONO.  Digitally signed by  A. 1066337320  DIGITAL SCOUNTING  L. 1066337320  DIGITAL SCOUNTING  CONSTRUCTOR  USACE Site Representative	
RECEIPT ACKNOLEDGED:		
- The	Mell Still	
ACTION TAKEN:	Contractor's Representative	
CEHNC FORM 948 (Revised) 1 APR 96		

TO: HUIKALA  CONTRACT NUMBER: W912DY-10-D-0053 Task Order: TO 0003 Task Order: TO 0003 Task Order: TO 0003  Task Order: TO 0003  CCheck all that apply) Guality Assurance Inspection Safety Violation Safety Violation Safety Comments DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item  948-001 issued by MK Mullen Prompt correction or compliance with contract specifications is requested.  MULLEN.MICHA Descriptions of the contr	U.S. ARMY ENGINEERING DISTRICT, HONOLULU Enviromental Branch MEMO			
CONTRACT NUMBER:  W912DY-10-D-0053  Task Order: TO 0003  SUBJECT ITEM(S)  Work Plan  Safety Violation  Safety Comments  DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item  948-001 issued by MK Mullen  Prompt correction or compliance with contract specifications is requested.  MULLEN.MICHA  PROJECT LOCATION: RI/FS PALI TRAINING CAMP HONOLULU, OAHU, HAWAII  Quality Assurance Inspection Other  Quality Assurance Inspection Other  And A Second S		<u> </u>	DATE:	TIME:
RI/FS PALI TRAINING CAMP HONOLULU, OAHU, HAWAII  Task Order: TO 0003  SUBJECT ITEM(S)  Work Plan  Safety Violation  Safety Violation  Safety Comments  DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item  948-001 issued by MK Mullen  Prompt correction or compliance with contract specifications is requested.  MULLEN.MICHA DELECTIONEL CONTRACT CO	HUIKALA		10/10/2013	0630
Task Order: TO 0003  SUBJECT ITEM(S)  Work Plan  Safety Violation  Safety Comments  DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item  948-001 issued by MK Mullen  Prompt correction or compliance with contract specifications is requested.  MULLEN.MICHA  Disably signed by MK Mullen  EL.KAMUELA.1  SURFICIAL STREET CONTROLES  SURFICIAL STREET CONTROLE  SURFICIAL STREET CONTROL  S	CONTRACT NUMBER:	PROJECT LO	CATION:	1
Task Order: TO 0003  SUBJECT ITEM(S)  Work Plan  Safety Violation  Safety Comments  DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item————————————————————————————————————	W912DY-10-D-0053		<b>4</b>	
SUBJECT ITEM(S) (Check all that apply)  Work Plan  Safety Violation  Safety Comments  DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item  948-001 issued by MK Mullen  Prompt correction or compliance with contract specifications is requested.  MULLEN.MICHA Display signed by MICHA Display signed by WULLEN MICHAE CONTROLL (AMULLEN AND ELLA 1) Conference (Author)  But And Display signed by MICHAE (AMULLEN AND ELLA 1907 TOMA)  Conference (Author)  WULLEN MICHA Display signed by MICHAE (AMULLEN AND ELLA 1907 TOMA)  Subject (Check all that apply)  Quality Assurance Inspection  Other  Other  Other  Contractor's Representative	Task Order:	HONOLULU,	OAHU, HAWAII	
Work Plan Safety Violation Safety Comments  DESCRIPTION: Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  Last Item  Prompt correction or compliance with contract specifications is requested.  MULLEN.MICHA Politable signed by MULLEN.MICHAE.AMAUELA.1180170444  EL.KAMUELA.1  ON-CHIS. ONLESS. GOVERNMENTAL. INFORMATION OF SERSED - 107007  USACE OESS  Contractor's Representative				
Government QA completed and accepts the following Lot #32, #33, #34 and being completed. QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  ———————————————————————————————————	☐ Work Plan ☐ Safety Violation	🔳 Qu	ality Assurance II	nspection
completed . QA utilizing a metal detector No discrepancies were noted. No MEC/MPPEH was discovered in Lot(s) by QA. This Form 948.  ———————————————————————————————————	DESCRIPTION:			
MULLEN.MICHA Digitally signed by MULLEN.MICHAEL.KAMUELA.1180170444  EL.KAMUELA.1 Div. culls. Government. cu=Dob., ourles. Government. cu=Dob., ourles. Government. cu=Dob., ourles. Cu=MULLEN.MICHAEL.KAMUELA.118017044  180170444 Date. 2013.10.10 06:28:56 -10700′  USACE OESS Contractor's Representative	completed . QA utilizing a metal det MEC/MPPEH was discovered in Lot	ector No discre (s) by QA. Thi Last Item	epancies were note s Form 948.	ed. No
EL.KAMUELA. 1 OUFFIX, OUFUSA,			specifications is req	juested.
180170444  USACE OESS  Date: 2013.10.10 06:28:58 - 10700'  USACE OESS  DIVINITY SEPTEMBLE. TANDELL. 118017044  Date: 2013.10.10 06:28:58 - 10700'  Contractor's Representative	FI KAMIFI A 1 ON: C=US, O=US, Government, ou=Def	1444 D,		
USACE OESS Contractor's Representative	ch=MULLEN.MICHAEL.KAMUELA.1180	)17044 	1.50	
			· · · · · · · · · · · · · · · · · · ·	
ACTION TAKEN:	USACE OESS	Contract	ors Representativ	e
	ACTION TAKEN:			
CEPOH FORM 948	CEDON FORM 042			

U.S. ARMY ENGINEERING DISTRICT, HONOLULU Enviromental Branch MEMO			
TO:		DATE:	TIME:
HUIKALA		10/16/2013	0630
CONTRACT NUMBER:	PROJECT LO	DCATION:	L.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
W912DR-09-D-0006	Hawaii Garris		Tomal
Task Order: DM03	Oahu, Hawaii	mmunition Storage	e runner
SUBJECT ITEM(S)  Work Plan Safety Violation Safety Comments	<b>■</b> Qu	k all that apply) ality Assurance Ir her	nspection
DESCRIPTION: Government QA completed and accompleted. QA utilizing a Mir No MEC/MPPEH was discovered in	ne Lab metal do Lot(s) by QA.	etector, No discrep	t37, and #38 as ancies were noted.
948-002 ISSUED BY MK MULLEN			
Prompt correction or compliance	with contract s	specifications is req	uested.
MULLEN.MICHAEL Digitally signed by MULLEN.MICHAEL.KAMUELA.118017 MULLEN.MICHAEL.KAMUELA.118017 DNI: C=US, GOVERNMENT, OV=D OU=PKI, OV=USA, OV=PKI, OV=USA, OV=PKI, OV=USA, OV=PKI, OV=USA, OV=KI, OV=KI, OV=USA, OV=KI, OV	70444 hob, 301704	12 Buttor's Representative	
	TOWN COLUMN TO THE REAL PROPERTY OF THE PROPER	·	
ACTION TAKEN:			
CEPOH FORM 948			

L-12

U.S. ARMY ENGINEERING DISTRICT, HONOLULU  Enviromental Branch MEMO			
TO:		DATE:	TIME:
HUIKALA		03/06/2014	0905
CONTRACT NUMBER:	PROJECT LO	CATION:	
W912DY-10-D-0053		RAINING CAMP OAHU, HAWAII	
Task Order: TO 0003			
SUBJECT ITEM(S)  Work Plan Safety Violation Safety Comments	🔳 Qu	k all that apply) Iality Assurance I her	nspection
DESCRIPTION:		J. 21 1 1 1 1 1	
Following Lot have been accepted # 39, 40 and 41			e as completed: lot
Prompt correction or compliance MULLEN.MICHA Digitally signed by MULLEN.MICHAEL KAMUELA 1180  PN: cutl, outly, 6. Government, outly, outly, outly, 6. Government, outly, outly, outly, 6. Government, outly,	170444 DOD, 18017044	specifications is re	
USACE OESS	Contrac	ctor's Representat	ve
ACTION TAKEN:			
CEPOH FORM 948			

U.S. ARMY ENGINE Environ	ERING DIS nental Branc MEMO	TRICT, HONG	OLULU
TO:		DATE:	TIME:
HUIKALA		03/17/2014	1420
CONTRACT NUMBER:	PROJECT LO	OCATION:	
W912DY-10-D-0053	The state of the s	RAINING CAMP OAHU, HAWAII	
Task Order: TO 0003	TIONOLULO,	OANO, NAVVAII	
SUBJECT ITEM(S)  Work Plan Safety Violation Safety Comments	■ Qu	k all that apply) ıality Assurance l her	nspection
DESCRIPTION:			
Following Lot have been accepted # 42, 43, 44, 45, 46, 47, and 48.	Last Item-		e as completed. lot
Prompt correction or compliance MULLEN.MICHA Digitally signed by MULLEN.MICHAELKAMUELA.1180 DN. c=US, o=U.S. Gövernment, ou=E  180170444 Date: 2014.03.17 14:16:01 -10'00'  USACE OESS	170444 DOD, 18017044	specifications is re	
ACTION TAKEN:			

# Appendix M Visual Sample Plan Report

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

GPR
MAGNETICS
ELECTROMAGNETICS
SEISMICS
RESISTIVITY
UTILITY LOCATION
UXO DETECTION
BOREHOLE CAMERA
STAFF SUPPORT

## **FINAL REPORT**

Use of Visual Sample Plan in Support of

Remedial Investigation/Feasibility Study
At Pali Training Camp

Koolaupoko District, Oahu, Hawaii

April 25, 2014

## 1 Introduction

Visual Sample Plan (VSP) is a Data Quality Objectives (DQO) based systematic planning software developed by Pacific Northwest National Laboratory (PNNL) designed to help guide and analyze sampling investigations. Prior to an investigation, the software helps to determine the number and location of samples/transects to ensure confident, statistically defensible decisions. After the investigation is complete, VSP can be used to perform statistical and data quality assessments in support of the decision making process. In the context of UXO remediation sites, VSP has become the preferred tool for designing and assessing sampling programs with the goal of identifying suspected impact areas. The software provides a built-in Expert Mentor to guide the use of VSP and to help select the right Sampling Design Module. Reports are generated automatically at each stage of the planning and analysis processes that summarize the design, objectives, approach, and assumptions.

# 2 Survey Design

The goal of the Remedial Investigation/Feasibility Study (RI/FS) at Pali Training Camp was to locate any impact areas having a radius of at least 500 feet. VSP was used to design a sampling plan that would achieve this goal. Refer to the MVIA – Survey Design attachment.

# 2.1 Parameter Inputs

The 500-foot radius for suspected impact areas was agreed upon in consultation with PNNL and the U.S. Army Corps of Engineers (USACE). The expected background anomaly density for the site was set at 50 anomalies per acre. This density was

NEW YORK 255 N Route 303 Suite 102 Congers New York 10920 (845) 268-1800 (845) 268-1802 Fax

VIRGINIA P.O. Box 7325 Charlottesville Virginia 22906 (434) 978-3187 (434) 973-9791 Fax believed to be a conservative estimate given that Hawaiian geology tends to produce elevated background anomaly rates when compared to other sites.

#### 2.2 Use of VSP

The values for the expected radius and expected background density were used as the basis for the evaluation of the transect design. The first analysis performed in VSP plotted the probability of detection of target areas across a range of transect spacings at several anomaly densities above background. The second analysis plotted the probability of detection of a range of average target densities above background at several different line spacings. Multiple iterations of each of these analyses were performed using a variety of target densities and transect spacings. Ultimately, a parallel transect spacing of 350 feet was selected as the most appropriate for this investigation. This design would provide approximately 0.9% coverage of the site while yielding 0.90 probability of detecting an impact area with at least 50 anomalies per acre above background density (100 anomalies per acre total density). Since impact areas routinely have total target densities much higher than that, it was expected that this survey design at Pali would in practice provide a greater than 90% probability of detecting an impact areas with a 500-foot radius.

# 2.3 Data Outputs

After completion of the survey design analysis, VSP offers a variety of outputs for the information developed in the program. A report was generated that summarizes all of the parameter inputs that were used, displays graphs of the probability curves for each of the evaluated line spacings, and includes a map of the survey area overlaid with the final transect design (See attached MVIA – Survey Design). In addition, the transects were exported as a Shape File (\*.shp) which could then be imported into a variety of GIS and Global Positioning System (GPS) platforms.

## 3 Analysis of Results

A suite of analysis tools are available in VSP for evaluating the results of a sampling program. Since the terrain at Pali did not allow the field teams to follow the planned straight-line, parallel transects, the first analysis goal was to determine the point at which sufficient data had been collected to achieve the project design parameters. Once that had been accomplished, the second goal was to generate an anomaly density map to identify any potential impact areas.

# 3.1 Parameter Inputs

As the initial transect surveys were being performed, course over ground data (transect path) were input into VSP in order to track the progress of the investigation. A tool within VSP was used which is designed to assess the probability of target area traversal based on the actual transect pattern. This tool uses the expected target area size (500-foot radius) and the course over ground transect data and provides results as a probability of traversal (See attached MVIA – Coverage Analysis). This tool does not take into account the probability of detection of the target area, but it was the most appropriate analytical method available at the time of the investigation.

Once sufficient field data had been collected, the locations of any recovered munitions and munitions-related debris were input into VSP along with the course over ground information. These data were then used to generate a map showing locations of elevated anomaly density. Areas of elevated density were defined as locations with more than 50 anomalies per acre using a 125-meter window diameter (selected based on the results of internal VSP selection tool) (See attached MVIA – Density Analysis).

#### 3.2 Use of VSP

When assessing the likelihood of traversing a target area, VSP generates a percent probability of traversal along with a map. The map depicts green markers at locations where a target area could remain untraversed by the surveyed transect pattern. Multiple iterations of these coverage maps were created as the project continued and the green markers were used as a guide for additional transect locations. The investigation was considered complete when the probability of traversal reached at least 90%.

VSP generates variograms to measure the spatial variation of a given dataset and then estimates the anomaly density in the underlying grid. A kriging algorithm was applied to the field data to generate an anomaly density contour map to aid in interpretation. (See attached MVIA – Density Analysis). The contouring parameters were adjusted such that areas with estimated densities of less than 50 targets per acre were shown as white. The gradational contouring was also adjusted in an attempt to have the red contours start at approximately 100 targets per acre, the anticipated threshold for a target area. The contoured density maps were used to guide follow-on investigations.

# 3.3 Data Outputs

Similar to the survey design stage, a variety of outputs were created from VSP after completion of the data analysis. Reports were generated that summarize all of the parameter inputs that were used, displays the variograms, and includes maps of the survey area overlaid with various density models. An image of the final density contours was exported as an "\*.asc" file which was imported into a GIS platform and used to create final maps.

## 4 Lessons Learned

The project team was able to incorporate the use of VSP before, during, and after the investigation in an efficient manner with few significant problems. However, it was determined that some minor modifications in the analysis stages could allow future investigations to proceed more efficiently:

1. VSP has recently released a new tool that allows an assessment of the probability of detection AND traversal, based on the actual transect pattern. This method takes into account the initial design pattern included the planned transect spacing, the expected background anomaly rate, and the expected anomaly rate above background for a target area. The software generates a polygon shape around areas that required additional investigation as well as a transect design to cover those areas. Both the polygons and the transects can be exported as shapefiles that can then be used in a variety of other

- programs. This technique would be the most appropriate way to evaluate investigations in the future.
- 2. During the density analysis phase, it was noted that the densities reported on the VSP maps did not always exhibit good correlation with the locations of recovered munitions and munitions-related debris. Through discussions with PNNL, it was determined that anomaly locations needed to fall within the footprint of the actual transect in order to be factored in the density estimates. Transect and anomaly location data were recorded in the field using hand-held GPS units. While a hand-held GPS is entirely appropriate for this type of investigation, its inherent precision relative to the transect width (1 meter) meant that some anomaly locations appeared to be off the nearest transect path. This situation was likely exacerbated by the heavy tree canopy found at the Pali Training Camp and throughout Hawaii. By using GIS tools to move the anomaly locations onto the nearest transect before importing the data into VSP, the calculated density maps matched the documented anomaly locations much more closely.

# 5 Usefulness of the VSP Program

The VSP software has been designed to provide a defensible method for the design and analysis of sampling programs. It proved to be a useful tool in accomplishing both of those goals during the Pali investigation. During the design phase it provides an easy method of testing and evaluation different sampling schemes and provides visual output throughout. Once the investigation is complete, there are a variety of methods available for identifying targets of interest. The main weakness of the software is that with so many parameters available it can be challenging to know what changes are appropriate under a given set of circumstances. It would be advisable that anyone attempting to utilize VSP participate in one of the training courses offered periodically by PNNL.

M-4

# **Attachments**

MVIA - Survey Design

MVIA - Coverage Analysis

MVIA - Density Analysis

## **Pali Training Camp**

May 31, 2013 - Version 2

# Transect Sampling for Unexploded Ordnance (UXO) Target Detection

### **Summary**

This report summarizes the probability of traversing and detecting a target area of specific size and shape for different target area densities above background. Simulation details and a power curve estimate how well the specified design would detect the target. The selected design statement is:

If 1 meter wide transects with a parallel pattern are spaced 350 feet between transects (353.281 feet on centers) over the entire site, these transects have an approximately 90% chance of traversing and detecting any 1000 foot diameter (500 foot radius) circular target area having a bivariate normal distribution with an average density of 49.8886 anomalies per acre above the background density of 50 anomalies per acre. This assumes the instrument false negative rate is 0% and flagged windows have at least 95% confidence they have density greater than background.

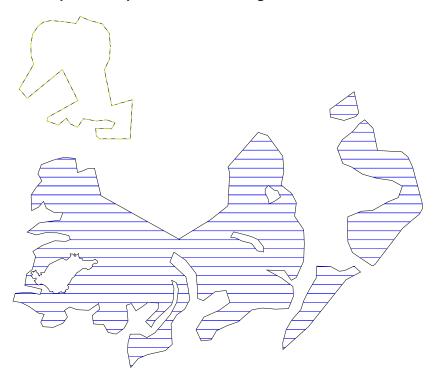
The following table summarizes the sampling design developed. A figure that shows the transect placement in the field is also provided below.

SUMMARY OF SAMPLING DESIGN			
Primary Objective of Design	Ensure high probability of traversing and		
	detecting a target area that has a specified		
	size and shape		
Required Probability of	100%		
Traversing the Target			
	ID TRANSECT INPUTS		
Type of Sampling Design	Transects		
Transect Pattern	Parallel		
Transect Width	1 meters		
Area of target area	785398.16 ft <sup>2</sup>		
Shape of target area of concern	Circular		
Radius of target area of concern	500 feet		
	OR PROBABILITY OF DETECTION		
Formula for calculating the probability	Monte Carlo Simulation		
of traversing and detecting target area	(method described below)		
Decision Rule	Flag if at least 95% confident an area has		
	density greater than background density		
Background Density of the Site	50 anomalies / acre		
Proposed Evaluation Transect Spacing	350 feet		
Distribution of target area	Bivariate Normal		
density above background			
Target Area density above	1 to 200 anomalies / acres		
background evaluation range	Target average		
Instrument false negative rate	0%		
Minimum precision	0.01		
Maximum error	0.01		
Search Window Diameter	900 feet		
PROPOSED TRANSECT DESIGN AND COST INFORMATION			
Number of selected sample areas <sup>a</sup>	1		
Specified sampling area <sup>b</sup>	1409.25 acres		
Computed spacing between transects	350 feet		
Computed spacing between	353.281 feet		

transect centers	
Number of transects to be surveyed	101
Transect Coverage	0.93% of total site area
Linear transect coverage	32.91 miles
Area of transect coverage	13.0887 acres

<sup>&</sup>lt;sup>a</sup> The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.

## **Site Map With Proposed Transect Design**



# **Primary Sampling Objective**

The primary purpose of sampling at this site is to traverse and detect target areas of a given size and shape with required high probability. The transect design tools provide a statistically defensible method to use transect survey data that covers only a small proportion of the total study area.

## **Selected Sampling Approach**

The specified sampling approach was random parallel transect sampling. If parameters change from those specified in the table above, then the probability of detecting the target area will be different from those computed by VSP and reported here.

### **Simulation Details**

To generate an estimated probability on a graph, VSP runs a Monte Carlo simulation based on the entered parameters. For each iteration, VSP creates a square site with the target area centered at the origin and rotated at a random angle. A parallel transect pattern is placed randomly so that 1 meters wide transects are parallel to the x axis.

<sup>&</sup>lt;sup>b</sup> The sampling area is the total surface area of the selected colored sample areas on the map of the site.

<sup>&</sup>lt;sup>c</sup> See the Cost of Sampling section for an explanation of the costs presented here.

VSP calculates the total area of the site traversed by transects,  $A_b$ , which can vary for each iteration.

The expected number of detected background anomalies,  $\lambda_b$  , is calculated as  $\lambda_b = D_b A_b \left(1 - P_{fh}\right)$ where  $D_b$  is the background density of 50 anomalies / acres and  $P_m$  is the instrument false negative rate of 0. A random number of detected background anomalies is generated using a Poisson distribution with parameter  $^{\lambda_b}$ . VSP randomly places these anomalies within the traversed areas of the site.

To simulate the number of additional anomalies in the target area, VSP uses an approximation technique to randomly place additional detected anomalies in the traversed areas of the target area. Portions of transects overlapping the target area are divided into small sections. For each section, the quantile of the target area in which it lies is determined, the expected number of additional anomalies is determined, and a random number of detected anomalies is determined using a Poisson distribution and placed within the section.

VSP uses a moving window along each transect to determine which areas have density significantly greater than background density. The window moves 1/6 of the search window diameter for each iteration. Where  $D_a$  is the actual density for the current window, the null and alternative hypotheses for determining if the area inside the window has density significantly greater than background density,  $\mathcal{D}_b$ , are as follows:

Null Hypothesis:  $H_o: D_a \leq D_b$ 

Alternative Hypothesis:  $H_a: D_a > D_b$ 

VSP checks each window to see if the actual number of detected anomalies is significantly greater than the expected number of anomalies for a Poisson distribution. If any windows intersecting the target area are flagged as significant, then we determine the target area has been detected.

250 iterations are run to begin the simulation to estimate a probability of detection. If the specified Maximum Error has not been achieved, additional iterations are run until the Maximum Error is met. If the total number of iterations is n and the proportion of target areas detected is p, then another iteration is run if

$$\text{Maximum Error} < \frac{1.96 * \sqrt{\frac{p(1-p)}{n}}}{n}$$

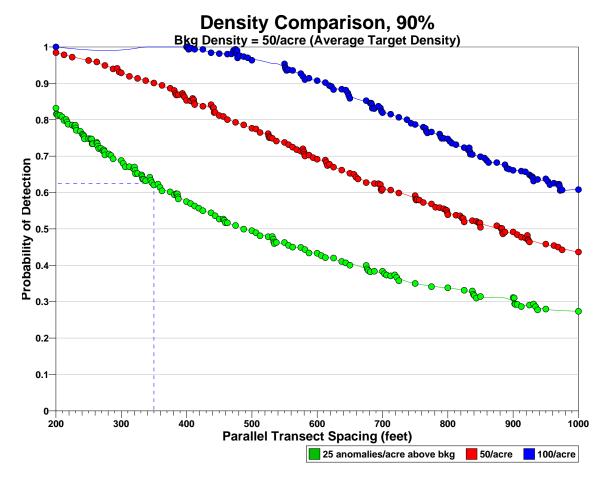
$$1.96*\sqrt{\frac{p(1-p)}{n}}$$

 $\sqrt{\frac{p(1-p)}{n}}$  is the 95th percentile of the standard error of the mean for a binomial distribution. We are 95% certain that the estimated probability is close to the true probability (within the maximum error). When all iterations are completed, VSP tabulates the estimated probability the target area has been detected, p / n. VSP repeats this process for a number of densities above background determined by simulation results and the minimum precision specified. The results are plotted in the power curve below.

#### **Target Detection Power Curve**

The following figure is a target detection performance diagram. It shows the probability of detecting the specified target area for a range of transect spacings. The estimated probability of detecting the target area is on the vertical axis, and a range of possible transect spacings are shown on the horizontal axis.

The legend at the bottom of the graph indicates the color of the line representing the target area densities above background used. Lines are fit by first smoothing the points using a moving average, then fitting the line using a cubic spline.



The transect spacings and the simulated probabilities of detecting the target area are shown in the table below:

Curve	Transect Spacing	Estimated Probability
		of Detecting the Target Area
1	200	0.831626
1	200.781	0.815834
1	201.563	0.815
1	203.125	0.811228
1	206.25	0.812244
1	209.375	0.808046
1	212.5	0.798186
1	215.625	0.800781
1	217.188	0.793837
1	218.75	0.787733
1	225	0.785185
1	228.125	0.78243
1	229.688	0.784988
1	230.469	0.777339
1	231.25	0.770931
1	237.5	0.767774
1	240.625	0.759966

1         242.188         0.7573476           1         243.75         0.747332           1         250         0.74782           1         253.125         0.747425           1         253.4688         0.746844           1         255.469         0.733915           1         256.25         0.733769           1         262.5         0.733769           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.74832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         306.25         0.670852           1         306.25         0.67076           1         312.5         0.66029           1 <th></th> <th></th> <th></th>			
1         243.75         0.74732           1         250         0.74782           1         253.125         0.747425           1         254.688         0.746844           1         255.469         0.733915           1         256.25         0.733769           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         266.625         0.720657           1         268.75         0.72162           1         271.875         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         281.25         0.701601           1         287.5         0.692383           1         300         0.687924           1         306.25         0.670594           1         312.5         0.67076           1         318.75         0.665229           1 <td>1</td> <td>242.188</td> <td>0.757795</td>	1	242.188	0.757795
1         250         0.74782           1         253.125         0.747425           1         254.688         0.746844           1         255.469         0.733915           1         256.25         0.733769           1         262.5         0.7375           1         263.281         0.734779           1         264.063         0.72308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         303.125         0.692383           1         303.125         0.670594           1         318.75         0.665229           1         318.75         0.665229           1         321.094         0.660956	1	242.969	0.753476
1         253.125         0.747425           1         254.688         0.746844           1         255.469         0.733915           1         256.25         0.733769           1         262.5         0.7377           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.6705852           1         306.25         0.670594           1         312.5         0.665229           1         321.875         0.665229           1         321.875         0.6652269           1         321.875         0.651647	1	243.75	0.747332
1         254.688         0.746844           1         255.469         0.733915           1         256.25         0.733769           1         262.5         0.73775           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.74832           1         273.438         0.716768           1         274.219         0.712563           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         281.25         0.705855           1         287.5         0.692383           1         300         0.687924           1         303.125         0.670852           1         306.25         0.670594           1         312.5         0.665229           1         321.875         0.665229           1         321.875         0.665229           1         321.875         0.665269 <td< td=""><td>1</td><td>250</td><td>0.74782</td></td<>	1	250	0.74782
1         255.469         0.733915           1         256.25         0.733769           1         262.5         0.73775           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         318.75         0.665229           1         321.875         0.660956           1         321.875         0.660956           1         321.875         0.651647           1         322.875         0.632321           1         332.831         0.636814	1	253.125	0.747425
1         255.469         0.733915           1         256.25         0.733769           1         262.5         0.7375           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         318.75         0.665229           1         321.875         0.660956           1         321.875         0.651647           1         321.875         0.651647           1         321.875         0.668229           1         331.25         0.648274 <t< td=""><td>1</td><td>254.688</td><td>0.746844</td></t<>	1	254.688	0.746844
1         256.25         0.733769           1         262.5         0.7375           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         318.75         0.665229           1         321.95         0.665229           1         321.975         0.651647           1         321.875         0.651647           1         321.875         0.648274           1         332.813         0.636814           1         332.813         0.636814 <t< td=""><td>1</td><td>255.469</td><td>0.733915</td></t<>	1	255.469	0.733915
1         262.5         0.7375           1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         281.25         0.705855           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         318.75         0.665229           1         318.75         0.665229           1         321.875         0.651647           1         322.875         0.651647           1         322.875         0.632269           1         331.25         0.648274           1         332.813         0.636814           1         332.813         0.636814 <td< td=""><td>1</td><td></td><td></td></td<>	1		
1         263.281         0.734779           1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         312.5         0.665229           1         318.75         0.665229           1         321.094         0.660956           1         321.875         0.651647           1         321.875         0.651647           1         332.813         0.636814           1         332.813         0.636814           1         334.375         0.636814           1         345.313         0.636814	1	262.5	
1         264.063         0.727308           1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         312.5         0.670776           1         318.75         0.665229           1         321.094         0.660956           1         321.875         0.651647           1         322.813         0.636814           1         332.813         0.636814           1         334.375         0.636814           1         334.375         0.636814           1         345.313         0.63339           1         346.875         0.626891			
1         265.625         0.720657           1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         318.75         0.665229           1         318.75         0.665229           1         321.094         0.660956           1         321.875         0.651647           1         322.875         0.652269           1         331.25         0.648274           1         332.813         0.636814           1         332.813         0.636814           1         334.375         0.632321           1         345.313         0.63339           1         346.875         0.626891			
1         268.75         0.72162           1         271.875         0.714832           1         273.438         0.716768           1         274.219         0.712563           1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         312.5         0.670776           1         318.75         0.665229           1         321.875         0.651647           1         321.875         0.651647           1         321.875         0.651647           1         332.813         0.636814           1         332.813         0.636814           1         334.375         0.632321           1         345.313         0.633321           1         345.313         0.63339           1         345.313         0.63339           1         346.875         0.626891			
1       271.875       0.714832         1       273.438       0.716768         1       274.219       0.712563         1       275       0.70334         1       281.25       0.705855         1       284.375       0.701601         1       287.5       0.692383         1       300       0.687924         1       303.125       0.679852         1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.875       0.651647         1       321.875       0.651647         1       332.813       0.636814         1       332.813       0.636814         1       332.813       0.636814         1       334.375       0.632321         1       345.313       0.63339         1       345.313       0.63339         1       346.875       0.626891         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178			
1       273.438       0.716768         1       274.219       0.712563         1       275       0.70334         1       281.25       0.705855         1       284.375       0.701601         1       287.5       0.692383         1       300       0.687924         1       303.125       0.679852         1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.875       0.651647         1       321.875       0.651647         1       332.813       0.636814         1       332.813       0.636814         1       334.375       0.632321         1       343.75       0.632321         1       345.313       0.63339         1       346.875       0.626891         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60478         1       385.938       0.59667         1       385.938       0.59667 </td <td></td> <td>+</td> <td></td>		+	
1       274.219       0.712563         1       275       0.70334         1       281.25       0.705855         1       284.375       0.701601         1       287.5       0.692383         1       300       0.687924         1       303.125       0.679852         1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670995         1       321.875       0.651647         1       321.875       0.651647         1       332.875       0.652269         1       331.25       0.648274         1       332.813       0.636814         1       332.813       0.636814         1       334.375       0.632321         1       343.75       0.632321         1       345.313       0.63339         1       346.875       0.626891         1       359.375       0.614015         1       362.5       0.604547         1       381.25       0.593966         1       384.375       0.596			
1         275         0.70334           1         281.25         0.705855           1         284.375         0.701601           1         287.5         0.692383           1         300         0.687924           1         303.125         0.679852           1         306.25         0.670594           1         312.5         0.670776           1         318.75         0.665229           1         320.313         0.670095           1         321.094         0.660956           1         321.875         0.651647           1         322.875         0.652269           1         331.25         0.648274           1         332.813         0.636814           1         332.813         0.636814           1         334.375         0.632321           1         343.75         0.641968           1         345.313         0.63339           1         346.875         0.626891           1         350         0.626891           1         359.375         0.614015           1         362.5         0.604547           1			
1       281.25       0.705855         1       284.375       0.701601         1       287.5       0.692383         1       300       0.687924         1       303.125       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.632321         1       345.313       0.63339         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       359.375       0.614015         1       362.5       0.604547         1       362.5       0.604547         1       381.25       0.593966         1       385.938       0.59621         1       385.938       0.59621 <td></td> <td>_</td> <td><del>-</del></td>		_	<del>-</del>
1       284.375       0.701601         1       287.5       0.692383         1       300       0.687924         1       303.125       0.679852         1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.813       0.636814         1       332.813       0.636814         1       334.375       0.632321         1       345.313       0.63339         1       346.875       0.626891         1       350.25       0.626891         1       359.375       0.614015         1       362.5       0.604547         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       385.938       0.59621         1       387.5       0.582325			
1       287.5       0.692383         1       300       0.687924         1       303.125       0.679852         1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       3343.75       0.632321         1       345.313       0.63339         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       350.25       0.620583         1       362.5       0.604547         1       385.935       0.59667         1       385.938       0.59621         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979			
1       300       0.687924         1       303.125       0.679852         1       306.25       0.670796         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       359.375       0.614015         1       362.5       0.604547         1       385.935       0.593966         1       385.938       0.59621         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.556961			
1       303.125       0.679852         1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       345.313       0.63339         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       359.375       0.614015         1       362.5       0.604547         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979			
1       306.25       0.670594         1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.566923     <			
1       312.5       0.670776         1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.566961			
1       318.75       0.665229         1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.569923         1       418.75       0.556961			
1       320.313       0.670095         1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       386.719       0.587835         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       321.094       0.660956         1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       386.719       0.587835         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       321.875       0.651647         1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       386.719       0.587835         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.556961			
1       325       0.652269         1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.556961			
1       331.25       0.648274         1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.593966         1       381.25       0.593966         1       385.938       0.59621         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.566961			
1       332.031       0.643612         1       332.813       0.636814         1       334.375       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       332.813       0.636814         1       334.375       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       334.375       0.63572         1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       337.5       0.632321         1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       386.719       0.587835         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       343.75       0.641968         1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       384.375       0.59667         1       385.938       0.59621         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1       345.313       0.63339         1       346.875       0.626891         1       350       0.620583         1       356.25       0.623154         1       359.375       0.614015         1       362.5       0.604547         1       375       0.60178         1       381.25       0.593966         1       385.938       0.59621         1       386.719       0.587835         1       387.5       0.582325         1       400       0.574979         1       406.25       0.569608         1       412.5       0.562923         1       418.75       0.556961			
1     346.875     0.626891       1     350     0.620583       1     356.25     0.623154       1     359.375     0.614015       1     362.5     0.604547       1     375     0.60178       1     381.25     0.593966       1     385.938     0.59621       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.556961			
1     350     0.620583       1     356.25     0.623154       1     359.375     0.614015       1     362.5     0.604547       1     375     0.60178       1     381.25     0.593966       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     356.25     0.623154       1     359.375     0.614015       1     362.5     0.604547       1     375     0.60178       1     381.25     0.593966       1     384.375     0.59667       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     359.375     0.614015       1     362.5     0.604547       1     375     0.60178       1     381.25     0.593966       1     384.375     0.59667       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     362.5     0.604547       1     375     0.60178       1     381.25     0.593966       1     384.375     0.59667       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     375     0.60178       1     381.25     0.593966       1     384.375     0.59667       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     381.25     0.593966       1     384.375     0.59667       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     384.375     0.59667       1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     385.938     0.59621       1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     386.719     0.587835       1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     387.5     0.582325       1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     400     0.574979       1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     406.25     0.569608       1     412.5     0.562923       1     418.75     0.556961			
1     412.5     0.562923       1     418.75     0.556961			
1 418.75 0.556961			
			0.562923
1 425 0.55			
	1	425	0.55

M-9

	1	1
1	437.5	0.544044
1	443.75	0.535983
1	450	0.52692
1	456.25	0.527083
1	457.813	0.523581
1	459.375	0.516965
1	462.5	0.516563
1	475	0.509263
1	487.5	0.499376
1	500	0.495212
1	506.25	0.489375
1	512.5	0.480953
1	525	0.478315
1	531.25	0.478837
1	532.813	0.471909
1	533.594	0.463912
1	534.375	0.459721
1	537.5	0.462635
1	550	0.462626
1	556.25	0.45466
1	562.5	0.449853
1	575	0.449105
1	581.25	0.443143
1	587.5	0.433656
1	600	0.433157
1	606.25	0.426702
1	612.5	0.421008
1	625	0.41994
1	637.5	0.410469
1	643.75	0.406514
1	650	0.40013
1	675	0.399414
1	676.563	0.390079
1	678.125	0.385569
1	681.25	0.382055
1	687.5	0.383709
1	700	0.383523
1	703.125	0.376656
1	706.25	0.373018
1	712.5	0.370874
1	718.75	0.373665
1	721.875	0.366746
1	725	0.357482
1	750	0.350091
1	775	0.341328
1	800	0.338092
1	825	0.331297
1	837.5	0.329451
1	839.063	0.320357
1	840.625	0.316496
1	843.75	0.310015
1	850	0.314249

	1	
1	900	0.311469
1	901.563	0.31019
1	902.344	0.29428
1	903.125	0.292588
1	906.25	0.292782
1	912.5	0.286474
1	925	0.290785
1	931.25	0.293424
1	934.375	0.28609
1	937.5	0.277518
1	950	0.279737
1	1000	0.273576
2	200	0.984375
2	212.5	0.978211
2	225	0.971939
2	250	0.962781
2	262.5	0.958835
2	275	0.949034
2	287.5	0.939545
2	293.75	0.941046
2	296.875	0.93123
2	300	0.928683
2	312.5	0.919118
2	325	0.913583
2	337.5	0.907555
2	350	0.900932
2	362.5	0.894252
2	375	0.886407
2	381.25	0.880424
	382.813	0.872201
2	384.375	0.867792
2	387.5	0.86833
	393.75	0.87243
2	395.313	0.866464
2	396.875	0.862091
2	400	0.853013
2	406.25	0.851669
2	409.375	0.858333
	410.938	0.854894
2	411.719	0.845694
2	412.5	0.841421
2	425	0.837006
2	437.5	0.841359
2	440.625	0.832785
2	441.406	0.833031
2	442.188	0.819843
2	443.75	0.82022
2	450	0.811311
2	456.25	0.809063
2	462.5	0.800228
2	475	0.792722
2	487.5	0.785648
L <del>-</del>	1.57.5	0.7 000 10

	1	T
2	500	0.776529
2	506.25	0.774588
2	512.5	0.764933
2	525	0.761839
2	525.781	0.755021
2	526.563	0.750667
2	528.125	0.751673
2	531.25	0.749031
2	537.5	0.741207
2	550	0.737634
2	556.25	0.731462
2	562.5	0.724453
2	568.75	0.717722
2	575	0.713619
2	578.125	0.719974
2	579.688	0.711929
2	580.469	0.705604
2	581.25	0.7003
2	587.5	0.702814
2	593.75	0.695711
2	600	0.691324
2	612.5	0.688956
2	614.063	0.682078
2	615.625	0.674171
2	618.75	0.677908
2	625	0.669567
2	637.5	0.661554
2	650	0.652663
2	656.25	0.649886
	659.375	0.642065
2	662.5	0.637107
2	675	0.627226
2	687.5	0.624445
2	693.75	0.624029
2	696.875	0.621831
2	697.656	0.609002
2	698.438	0.605459
2	700	0.609254
	712.5	0.606532
2	725	0.59857
2	750	0.591301
2	750.781	0.581828
2	751.563	0.579315
2	753.125	0.581192
2	756.25	0.579206
2	762.5	0.572491
2	775	0.56845
2	781.25	0.559544
2	787.5	0.558333
2	793.75	0.555122
2	796.875	0.55225
2	798.438	0.550479
	7 30.430	0.00013

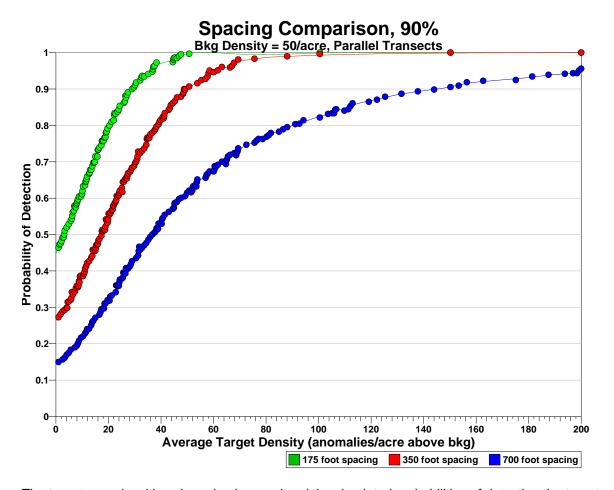
		1
2	799.219	0.543958
2	800	0.538945
2	812.5	0.537479
2	818.75	0.535774
2	821.875	0.529657
2	823.438	0.528718
	825	0.519183
2	837.5	0.522519
2	843.75	0.520538
2	846.875	0.517083
2	848.438	0.515938
2	849.219	0.516458
2	850	0.504267
2	875	0.508743
2	881.25	0.501665
2	882.813	0.501353
2	883.594	0.490216
2	884.375	0.486366
2	887.5	0.491465
2	900	0.49157
2	906.25	0.484063
2	912.5	0.477273
2	918.75	0.474792
2	921.875	0.482068
2	922.656	0.471282
2	923.438	0.468541
2	925	0.464197
2	950	0.458089
2	962.5	0.45424
	968.75	0.450105
2	975	0.442405
2	1000	0.436337
	200	1
3	400	1
3	401.563	1
3	402.344	1
3	403.125	0.993421
3	406.25	0.996094
	412.5	0.993421
3	425	0.993243
3	437.5	0.984091
3	450	0.981534
3	462.5	0.980308
3 3 3	468.75	0.980682
	471.875	0.990196
3	475	0.993421
3	475.781	0.984797
3	476.563	0.98067
3	477.344	0.989865
3	478.125	0.969613
3	481.25	0.976163
3	487.5	0.973425
	707.0	0.070720

	1	
3	493.75	0.970034
3	500	0.963398
3	550	0.953424
3	550.781	0.945064
3	551.563	0.940433
3	553.125	0.935364
3	556.25	0.937169
3	562.5	0.935389
3	575	0.926737
3	578.125	0.919071
3	581.25	0.910256
3	587.5	0.914042
3	600	0.907318
3	612.5	0.90205
3	618.75	0.893612
3	621.875	0.891258
3	625	0.882797
3	637.5	0.883721
3	643.75	0.881188
3	646.875	0.873377
3	648.438	0.865832
3	650	0.858575
3	675	0.852273
3	681.25	0.845426
3	682.813	0.845577
3	683.594	0.841556
3	684.375	0.831417
3	687.5	0.830699
3	693.75	0.837214
3	696.875	0.832037
3	698.438	0.823319
3	700	0.819347
	712.5	0.815172
3	725	0.806644
3	737.5	0.800028
3	743.75	0.790125
3	750	0.786683
3	762.5	0.779518
	765.625	0.77644
3	767.188	0.768151
3	768.75	0.763774
3	775	0.766367
3 3 3	787.5	0.760629
3	789.063	0.753459
	790.625	0.748799
3	790.625	0.748666
3	800	0.747122
2	803.125	
3		0.740557
3	806.25	0.735341 0.731462
	812.5	0.723363
3	825 831.25	0.7166
ა	031.25	U.1 100

3	832.813	0.722837
3	833.594	0.713288
3	834.375	0.705151
3	837.5	0.704445
	850	0.698461
3	856.25	0.694799
3	859.375	0.688288
	862.5	0.682253
3	875	0.682242
3	887.5	0.676301
3	890.625	0.666433
3	893.75	0.664412
3	900	0.660864
3	912.5	0.65897
3	918.75	0.656856
3	925	0.648458
3	928.125	0.644283
3	929.688	0.642663
3	930.469	0.639215
3	931.25	0.631485
3	937.5	0.635904
3	950	0.637601
3	953.125	0.630462
3	956.25	0.62146
3	962.5	0.625656
3	968.75	0.622453
3	970.313	0.622786
3	971.094	0.617401
3	971.875	0.605778
3	975	0.606668
3	1000	0.607969

The following figure is a target detection performance diagram. It shows the probability of detecting the specified target area for a range of target area densities above background. The estimated probability of detecting the target area is on the vertical axis, and a range of possible target area densities above background are shown on the horizontal axis.

The legend at the bottom of the graph indicates the color of the line representing the transect spacing used. Lines are fit by first smoothing the points using a moving average, then fitting the line using a cubic spline.



The target area densities above background and the simulated probabilities of detecting the target area are shown in the table below:

Target Density	Estimated Probability
	of Detecting the
	Target Area
1	0.463958
1.38867	0.472953
1.77734	0.475271
2.16602	0.481964
2.55469	0.491882
2.94336	0.49261
3.1377	0.50052
3.33203	0.5102
4.10938	0.519808
4.88672	0.528902
5.66406	0.538021
6.05273	0.543729
6.24707	0.551822
6.44141	0.561662
6.83008	0.564881
7.02441	0.57868
7.21875	0.575916
7.60742	0.574468
	1 1.38867 1.77734 2.16602 2.55469 2.94336 3.1377 3.33203 4.10938 4.88672 5.66406 6.05273 6.24707 6.44141 6.83008 7.02441 7.21875

	•						
1	7.80176	0.583369					
1	7.99609	0.586771					
1	8.19043	0.592044					
1	8.38477	0.596913					
1	8.77344	0.604221					
1	9.55078	0.604583					
1	9.93945	0.611099					
1	10.1338	0.619714					
1	10.3281	0.632722					
1	11.1055	0.6351					
1	11.2998	0.644559					
1	11.4941	0.646858					
1	11.6885	0.65241					
1	11.8828	0.659498					
1	12.6602	0.667291					
1	12.8545	0.670188					
1	13.0488	0.677698					
1	13.4375	0.678316					
1	13.8262	0.687836					
1	14.2148	0.697044					
1	14.6035	0.697927					
1	14.7979	0.699127					
1	14.9922	0.714539					
1	15.7695	0.714269					
1	15.9639	0.732219					
1	16.1582	0.73391					
1	16.5469	0.739606					
1	17.3242	0.74534					
1	17.5186	0.757075					
1	17.7129	0.757469					
1	18.1016	0.757353					
1	18.4902	0.765875					
1	18.8789	0.767574					
1	19.0732	0.77955					
1	19.2676	0.782204					
1	19.6563	0.791565					
1	20.4336	0.799902					
1	21.2109	0.809724					
1	21.9883	0.814045					
1	22.1826	0.828509					
1	22.377	0.834084					
1	22.7656	0.832095					
1	23.543	0.837886					
1	23.9316	0.843385					
1	24.3203	0.853369					
1	25.875	0.86179					
1	26.2637	0.865608					
1	26.458	0.880693					
1	26.6523	0.876183					
1	27.041	0.884004					
1	27.4297	0.890426					
1	28.9844	0.899713					
	+						

		<u>,                                      </u>					
1	29.7617	0.904558					
1	30.1504	0.910877					
1	30.5391	0.917711					
1	32.0938	0.92369					
1	32.4824	0.931927					
1	32.8711	0.935908					
1	33.6484	0.934406					
1	35.2031	0.941138					
1	36.7578	0.947695					
1	36.9521	0.954384					
1	37.1465	0.961047					
1	37.5352	0.963315					
1	38.3125	0.972603					
1	44.5313	0.973921					
1	44.7256	0.981164					
1	44.9199	0.984797					
1	45.3086	0.986486					
1	46.0859	0.984797					
1	46.8633	0.990196					
1	47.6406	0.994932					
1	50.75	0.996711					
1	100.5	1					
1	150.25	1					
1	200	1					
2	1	0.272786					
2	1.77734	0.281153					
2	2.55469	0.288627					
2	3.33203	0.292793					
2	4.10938	0.298784					
2	4.30371	0.298568					
2	4.49805	0.314551					
2	4.88672	0.315998					
	5.66406	0.320822					
2	5.8584	0.325213					
2	6.05273	0.34202					
2	6.44141	0.334986					
2	7.21875	0.343375					
2	7.60742	0.353122					
2	7.99609	0.35953					
2	8.38477	0.355472					
2	8.5791	0.359064					
2	8.77344	0.372039					
2	8.96777	0.369005					
2	9.16211	0.384943					
2	9.55078	0.387319					
2	10.3281	0.385741					
2	10.7168	0.392343					
2	10.9111	0.397325					
2	11.1055	0.406385					
2	11.4941	0.413071					
2	11.8828	0.421718					
2	12.6602	0.427128					
	.2.0002	0.121120					

r							
2	13.4375	0.436662					
2	13.8262	0.441245					
2	14.0205	0.458194					
2	14.2148	0.455581					
2	14.9922	0.455246					
2	15.1865	0.462835					
2	15.3809	0.471074					
2	15.7695	0.472849					
2	15.9639	0.473564					
2	16.1582	0.483333					
2	16.5469	0.488125					
2	17.3242	0.497086					
2	17.5186	0.509263					
2	17.7129	0.512708					
2	18.1016	0.509888					
2	18.4902	0.511979					
2	18.6846	0.512813					
2	18.8789	0.522065					
2	19.0732	0.541806					
2	19.2676	0.537898					
2	19.6563	0.532609					
2	19.8506	0.540729					
2	20.0449	0.557764					
2	20.4336	0.557764					
2	20.8223	0.55915					
2	21.2109	0.566525					
2	21.5996	0.568973					
2	21.7939	0.577965					
2	21.9883	0.57997					
	22.377	0.586159					
2	22.7656	0.590146					
2	22.7636	0.594289					
2	23.1543	0.606255					
2	23.543	0.605017					
2	23.9316	0.607098					
2							
	24.126	0.614974 0.620113					
2	24.3203						
	25.0977	0.62808					
2	25.292	0.617019 0.64419					
2	25.4863						
2	25.875	0.645114					
2 2 2	26.2637	0.650881					
2	26.6523	0.65553					
2	27.041	0.654214					
2	27.2354	0.66167					
2	27.4297	0.66831					
2	28.207	0.672026					
2	28.5957	0.677644					
2	28.9844	0.68371					
2	29.7617	0.688103					
2	30.1504	0.695919					
2	30.5391	0.700307					

	T	T					
2	30.9277	0.706996					
2	31.1221	0.714587					
2	31.3164	0.727858					
2	32.0938	0.723958					
2	32.8711	0.730641					
2	33.6484	0.736955					
2	34.4258	0.746562					
2	34.6201	0.762538					
2	34.8145	0.766222					
2	35.2031	0.764172					
2	35.5918	0.765498					
2	35.9805	0.775377					
2	36.7578	0.780045					
2 2 2	37.5352	0.785692					
2	37.9238	0.790515					
2	38.3125	0.796915					
2 2 2	39.0898	0.802813					
	39.4785	0.810637					
2	39.8672	0.814649					
2	40.6445	0.822546					
2	41.0332	0.818899					
2	41.2275	0.825353					
2	41.4219	0.833333					
2	42.9766	0.842691					
2	43.3652	0.847039					
2	43.7539	0.855875					
2	44.5313	0.861111					
2	45.3086	0.866682					
2	46.0859	0.876657					
2	47.6406	0.878883					
2	48.418	0.886532					
2	48.6123	0.890725					
2	48.8066	0.89977					
2	49.1953	0.898295					
2	50.75	0.906934					
2	53.8594	0.915878					
2	55.4141	0.924272					
2	56.9688	0.927746					
2	57.7461	0.934564					
2	58.1348	0.944015					
2	58.5234	0.950506					
2 2 2	60.0781	0.946429					
2	61.6328	0.951233					
2	63.1875	0.960366					
2	66.2969	0.958997					
2	67.0742	0.963624					
2	67.8516	0.97192					
2	69.4063	0.980856					
2	75.625	0.983173					
2	88.0625	0.989773					
2	100.5	0.996094					
2	150.25	1					
-							

	1						
2	200	1					
3	1	0.149714					
3	2.55469	0.156798					
3	3.33203	0.161346					
3	4.10938	0.169839					
3	4.88672	0.175091					
3	5.66406	0.183583					
3	7.21875	0.189865					
3	7.99609	0.194901					
3	8.38477	0.201041					
3	8.77344	0.207978					
3	9.55078	0.216476					
3	10.3281	0.220563					
3	11.1055	0.228244					
3	11.4941	0.232829					
3	11.8828	0.240363					
3	12.6602	0.241335					
3	13.4375	0.250901					
3	13.8262	0.25974					
3	14.2148	0.262594					
3	14.9922	0.271053					
3	16.5469	0.27991					
3	16.9355	0.286278					
3	17.3242	0.294919					
3	18.1016	0.298134					
3	18.2959	0.296813					
3	18.4902	0.31016					
3	18.8789	0.310751					
3	19.6563	0.319737					
3	20.4336	0.31833					
3	20.6279	0.329214					
3	20.8223	0.330198					
3	21.2109	0.332439					
3	22.7656	0.341551					
3	22.96	0.360434					
3	23.1543	0.360221					
3	23.543	0.357919					
3	23.9316	0.358759					
	24.126	0.367844					
3	24.3203	0.376179					
3	25.0977	0.379059					
3	25.4863	0.381424					
3	25.6807	0.395497					
3 3	25.875	0.392045					
3	26.2637	0.395997					
3	26.458	0.392842					
3	26.6523	0.407946					
3	27.4297	0.406224					
3	28.207	0.412554					
3	28.5957	0.419124					
3	28.9844	0.427083					
3	30.5391	0.435224					
-							

3	31.3164	0.442405					
3	31.5107	0.45466					
3	31.7051	0.466555					
3	32.0938	0.458403					
3	32.8711	0.463988					
3	33.6484	0.470447					
3	34.4258	0.476732					
3	35.2031	0.485637					
3	35.9805	0.493755					
3	36.7578	0.500416					
3	37.5352	0.505412					
3	37.9238	0.508743					
3	38.3125	0.517188					
3	38.7012	0.514687					
3	38.8955	0.51582					
3	39.0898	0.529971					
3	39.8672	0.5325					
3	40.2559	0.529449					
3	40.4502	0.542121					
3	40.6445	0.54513					
3	41.4219	0.553913					
3	42.9766	0.562236					
3	44.5313	0.570624					
3	44.9199	0.570624					
3	45.1143	0.584578					
3	45.3086	0.58691					
3	46.0859	0.589424					
3	46.8633	0.597511					
3	47.6406	0.600694					
	49.1953	0.605292					
3	49.9727	0.614675					
3	50.75	0.62054					
	51.5273	0.616307					
3	51.916	0.621145					
3	52.1104	0.6301					
3	52.3047	0.632841					
3	53.082	0.636324					
3	53.4707	0.63201					
	53.665	0.64365					
3	53.8594	0.651372					
3	56.9688	0.65576					
3	57.3574	0.66356					
3	57.7461	0.666823					
3 3 3	58.5234	0.67344					
	60.0781	0.673316					
3	60.2725	0.677644					
3	60.4668	0.687742					
3	60.8555	0.685328					
3	61.6328	0.691341					
3	63.1875	0.700074					
3	64.7422	0.69356					
3	64.9365	0.704625					
٥	04.3303	0.704023					

	65.1309	0.706142
	65.5195	0.714726
3	66.2969	0.719104
	67.8516	0.723738
	68.6289	0.718044
3	69.0176	0.726184
	69.2119	0.729758
	69.4063	0.736829
3	72.5156	0.746798
	75.625	0.752232
	76.4023	0.758105
	77.1797	0.762946
	78.7344	0.7625
	80.2891	0.769006
	81.0664	0.7734
3	81.8437	0.779053
3	84.9531	0.782551
	86.5078	0.789343
	88.0625	0.795121
	91.1719	0.803198
3	92.7266	0.804563
	94.2813	0.814073
	100.5	0.821578
	103.609	0.831481
	105.164	0.833333
	105.941	0.833444
	106.33	0.843114
	106.719	0.844461
	109.828	0.840364
	111.383	0.844493
	112.16	0.852819
	112.938	0.860585
	119.156	0.864973
	122.266	0.87052
	125.375	0.87861
3	131.594	0.88683
	137.813	0.893538
	144.031	0.89839
3	150.25	0.90534
3	153.359	0.909175
3	156.469	0.918403
3	162.688	0.922402
3	175.125	0.924544
	181.344	0.934226
3	187.563	0.938849
3	193.781	0.941698
3	196.891	0.943262
3	198.445	0.943471
	199.223	0.950873
	200	0.955882

This report was automatically produced\* by Visual Sample Plan (VSP) software version 6.4. Software and documentation available at http://vsp.pnnl.gov Software copyright (c) 2013 Battelle Memorial Institute. All rights reserved.

# Transect Augmentation Sampling for Unexploded Ordnance (UXO) Target Area Detection Maunawili Valley March 19, 2014

#### **Summary**

This report summarizes the probability of traversing and detecting a target area of specific size and shape using fixed distances between surveyed transects. A power curve derived through simulations provides estimates of how well the specified transect spacing would detect the target area of concern.

This design assumes that previous transect surveys or a known set of existing paths (roads, trails, etc.) to be surveyed are identified. Additional transects are placed in regions or "gap areas" where the transect spacing does not meet the designed objectives.

The selected design statement is:

If all existing paths are surveyed with 1 meter wide transects and then augmented by transects with a parallel pattern that are spaced 107 meters between transects (108 meters on centers) over the remaining gap areas, the entire set of transects has an approximately 90% probability of traversing and detecting any 1000 foot diameter (500 foot radius) circular target area having a bivariate normal distribution with an average density of 49.5546 anomalies per acre above the background density of 50 anomalies per acre.

The following table summarizes the sampling design that was developed. A figure that shows the transect placement in the field is also provided below.

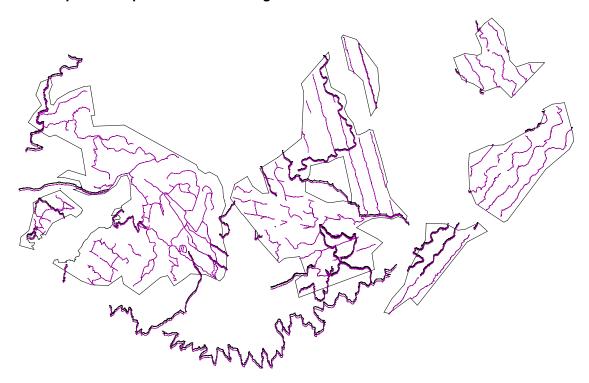
SUMMARY OF SAMPLING DESIGN					
Primary Objective of Design	Ensure high probability of traversing and				
, ,	detecting a target area that has a specified				
	size and shape				
Probability of traversing and	90%				
detecting target area					
	ND TRANSECT INPUTS				
Type of Sampling Design	Transects				
Transect Pattern	Parallel				
Transect Width	1 meters				
Area of target area	785398.16 ft <sup>2</sup>				
Shape of target area of concern	Circular				
Radius of target area of concern	500 feet				
SIMULATION PARAMETERS	FOR PROBABILITY OF DETECTION				
Formula for calculating the probability	Monte Carlo Simulation				
of traversing and detecting target area	(method described below)				
Decision Rule	Flag if at least 95% confident an area has				
	density greater than background density				
Background Density of the Site	50 anomalies / acre				
Proposed Evaluation Transect Spacing	107 meters				
Distribution of target area	Bivariate Normal				
density above background					
Target Area density above	1 to 250 anomalies / acres				
background evaluation range	Target average				
Instrument false negative rate	0%				
Minimum precision	0.01				
Maximum error	0.01				
Search Window Diameter	274.32 meters				
PROPOSED TRANSECT DESIGN AND COST INFORMATION					

Number of selected sample areas <sup>a</sup>	32				
Specified sampling area b	1004.08 acres				
Number of gap areas <sup>c</sup>	0				
Maximum distance from existing	106.68 meters				
paths to gap areas					
Area of smallest gap	0.0000 acres				
Average area of gaps	0.0000 acres				
Area of largest gap	0.0000 acres				
Total area of all gaps	0.0000 acres				
Spacing between transects	107 meters				
Spacing between transect centers	108 meters				
Total length of transects	0.00 km				
Total area of transects	0.0000 acres				
Transect Coverage	0.00% of total site area				
Total length of existing paths	69.28 km				

<sup>&</sup>lt;sup>a</sup> The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.

b The sampling area is the total surface area of the selected colored sample areas on the map of the site.

## Site Map With Proposed Transect Design



## **Primary Sampling Objective**

The primary purpose of sampling at this site is to traverse and detect target areas of a given size and shape with required high probability. The transect design tools provide a statistically defensible method to use transect survey data that covers only a small proportion of the total study area.

<sup>&</sup>lt;sup>c</sup> Gap areas smaller than 0.25 acres were ignored for transect placement and are not included in these statistics.

<sup>&</sup>lt;sup>d</sup> Excludes existing paths. See the Cost of Sampling section for an explanation of the costs presented here.

#### Selected Sampling Approach

The specified sampling approach was random parallel transect sampling. If parameters change from those specified in the table above, then the probability of detecting the target area will be different from those computed by VSP and reported here.

#### **Simulation Details**

To generate an estimated probability on a graph, VSP runs a Monte Carlo simulation based on the entered parameters. For each iteration, VSP creates a square site with the target area centered at the origin and rotated at a random angle. A parallel transect pattern is placed randomly so that 1 meters wide transects are parallel to the x axis.

VSP calculates the total area of the site traversed by transects,  $A_b$ , which can vary for each iteration. The expected number of detected background anomalies,  $\lambda_b$ , is calculated as  $\lambda_b = D_b A_b \left(1 - P_{fh}\right)$ where  $D_b$  is the background density of 50 anomalies / acres and  $P_{fh}$  is the instrument false negative rate of 0. A random number of detected background anomalies is generated using a Poisson distribution with parameter  $\lambda_b$ . VSP randomly places these anomalies within the traversed areas of the site.

To simulate the number of additional anomalies in the target area, VSP uses an approximation technique to randomly place additional detected anomalies in the traversed areas of the target area. Portions of transects overlapping the target area are divided into small sections. For each section, the quantile of the target area in which it lies is determined, the expected number of additional anomalies is determined, and a random number of detected anomalies is determined using a Poisson distribution and placed within the section.

VSP uses a moving window along each transect to determine which areas have density significantly greater than background density. The window moves 1/6 of the search window diameter for each iteration. Where  $D_a$  is the actual density for the current window, the null and alternative hypotheses for determining if the area inside the window has density significantly greater than background density.  $D_b$ . are as follows:

 $H_o: D_a \leq D_h$ Null Hypothesis:

Alternative Hypothesis:  $H_a:D_a>D_b$ 

VSP checks each window to see if the actual number of detected anomalies is significantly greater than the expected number of anomalies for a Poisson distribution. If any windows intersecting the target area are flagged as significant, then we determine the target area has been detected.

250 iterations are run to begin the simulation to estimate a probability of detection. If the specified Maximum Error has not been achieved, additional iterations are run until the Maximum Error is met. If the total number of iterations is n and the proportion of target areas detected is p, then another iteration is run

Maximum Error 
$$< 1.96 * \sqrt{\frac{p(1-p)}{n}}$$

 $\sqrt{\frac{p(1-p)}{n}}$  is the 95th percentile of the standard error of the mean for a binomial probability is close to the true probability (within the target) The quantity distribution. We are 95% certain that the estimated probability is close to the true probability (within the maximum error). When all iterations are completed, VSP tabulates the estimated probability the target

area has been detected, *p / n*. VSP repeats this process for a number of densities above background determined by simulation results and the minimum precision specified.

### **Gap Areas**

In order to locate the gap areas (areas where additional transects are required), a buffer is placed around all of the existing trails, roads and paths. This buffer represents the radius of a target area that would be traversed by an existing path. For this design, a buffer of 106.68 meters was used to define the gap areas. Details of the methodology used to find the gap areas are documented in **Methodology for Defining Gap Areas between Course-over-ground Locations** (Wilson, 2013, PNNL-22851).

#### **Transect Placement on Gaps**

New transects are placed in order to traverse potential target areas that would have been missed by transects on existing paths. Parallel transects are placed in gap areas while trying to minimize the total length of the transect. Details of the methodology used to place transects in the gap areas are documented in *Methodology for Augmenting Existing Paths with Additional Parallel Transects* (Wilson, 2013, PNNL-22770).

#### References

Wilson JE. 2013. *Methodology for Defining Gap Areas between Course-over-ground Locations*. PNNL-22851, Pacific Northwest National Laboratory, Richland, WA. http://www.pnl.gov/main/publications/external/technical\_reports/PNNL-22851.pdf

Wilson JE. 2013. *Methodology for Augmenting Existing Paths with Additional Parallel Transects*. PNNL-22770, Pacific Northwest National Laboratory, Richland, WA. http://www.pnl.gov/main/publications/external/technical\_reports/PNNL-22770.pdf

This report was automatically produced\* by Visual Sample Plan (VSP) software version 6.8.

Software and documentation available at http://vsp.pnnl.gov

Software copyright (c) 2014 Battelle Memorial Institute. All rights reserved.

 $\ensuremath{^{\star}}$  - The report contents may have been modified or reformatted by end-user of software.

## Geostatistical Estimation of Anomaly Density Maunawili Valley May 7, 2014

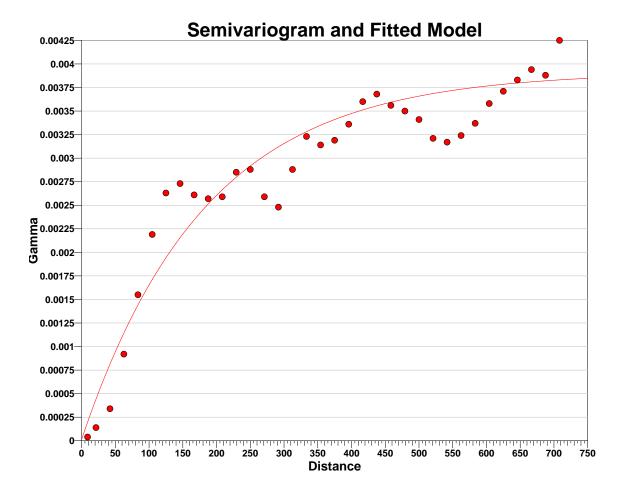
#### **Summary**

This report summarizes the parameters and processes used to generate kriging estimates of anomaly density from transect survey samples. The underlying variogram analyses for these results were performed using the GAM/GAMV codes<sup>1</sup>. The graphical user interface for these codes, GAM/GAMV GUI was developed by Sandia National Laboratories.

## Variogram

The following table and figure summarize the variogram analysis and model used in the kriging estimation.

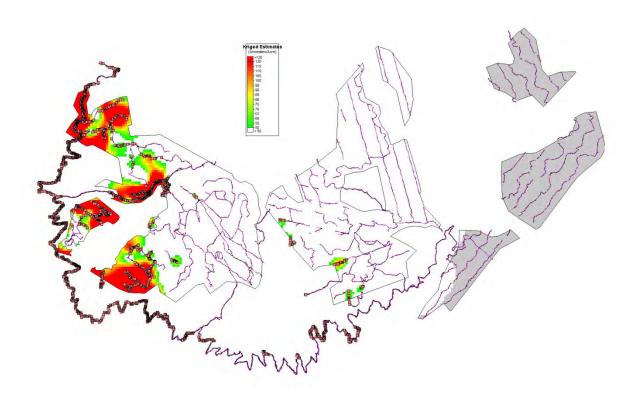
SUMMARY OF VARIOGRAM ANALYSIS						
Run Mode	Advanced					
Variogram Data Field	Anomaly Density					
Window Diameter	125 meters					
Variogram Control Parameters						
Distance Between Lags	20.83 meters					
Lag Tolerance Length	10.417 meters					
Variogram Model						
Nugget	1.20923e-005					
Model type 1	Exponential					
Range 1	549 meters					
Sill 1	0.0039					



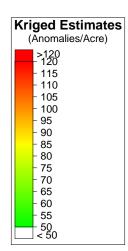
SUMMARY OF KRIGING ESTIMATION						
Run Mode	Advanced					
Window Diameter	125 meters					
Estimation Type	Anomaly Density					
Grid						
Number of X Nodes	247					
Number of Y Nodes	151					
X Origin	626092.05					
Y Origin	2359741.34					
X Block Size	20 meters					
Y Block Size	20 meters					
Search/Disci	retization					
Use Octant Search	True					
Max Number of Neighbors	8					
Kriging Minimum	2					
Kriging Maximum	50					
Max Search Radius	250 meters					
Min Search Radius	250 meters					
Reset Negative Values	True					

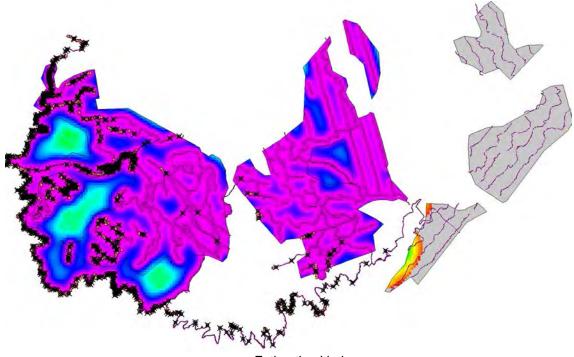
## Site Map With Kriging Results

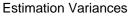
The following figures show the results from the kriging estimation. The maps shown are from the active (most recently created) kriging estimation. The top figure shows the estimate values with the variance of the estimates shown in the lower figure. Areas within the sample area but without color-shading indicate areas where estimation was not possible due to lack of data within the search neighborhood.

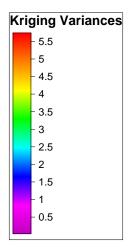


Kriged Estimates









#### **Primary Analysis Objective**

The primary purpose of this analysis is to generate a continuous estimate of anomaly density for the entire sample site based on limited geophysical transect data

## **Analytical Approach**

The kriging estimate is developed using observational data collected from field surveys along limited sampling transects. Prior to kriging, the observation data are transformed from location values to density values. This is done using a moving window which is translated along each sample transect. The total anomaly count and total transect sample area within the window area are used to compute a sample anomaly density value at a spacing of 1/6th the averaging window diameter along the transects. These sample anomaly density values are then used as conditioning data within the kriging estimator to estimate anomaly density values at un-sampled locations. The underlying spatial correlation of the sample anomaly density data is modeled with a variogram. The variogram model is then used within the Ordinary

Kriging estimator to generate estimates with minimized variance. No estimate is generated for locations with insufficient sample data within the kriging search radius. Estimated anomaly density values are in the units of anomalies per acre.

#### References

<sup>1</sup>Deutsch, C.V. and A.G. Journel. 1998. *GSLIB Geostatistical Software Library and User's Guide*, 2nd Edition, Applied Geostatistics Series, Oxford University Press, Inc. New York, NY.

This report was automatically produced\* by Visual Sample Plan (VSP) software version 6.5. Software and documentation available at http://vsp.pnnl.gov
Software copyright (c) 2014 Battelle Memorial Institute. All rights reserved.

\* - The report contents may have been modified or reformatted by end-user of software.

## UXO ESTIMATOR 2/6/2014

## **Develop a Sampling Plan**

Inputs

Total number of acres in Area Of Interest (AOI): 1050.51

Specify the UXO Target Density per acre in the AOI: 0.5

Specify the desired confidence level (e.g., 0.95): 0.9

Result

Minimum number of acres to be investigated: 4.587

**Transects** 

Select unit of measure: Meters Specify width: 1 The length is: 18,560.4

**Grids** 

Select unit of measure: Feet Specify Dimensions: 100 x 100 Number of grids: 19.99

## Appendix N MEC HA Worksheets

Final Remedial Investigation Report Pali Training Camp, Oahu, Hawaii

Page intentionally left blank.

#### **MEC HA Summary Information**

Site ID: H09HI027701R01-1 Date: 4/25/2014

Please identify the single specific area to be assessed in this hazard assessment. From this point forward, all references to "site" or "MRS" refer to the specific area that you have defined.

#### A. Enter a unique identifier for the site:

Maunawili Valley Impact Area (West), Oahu, Hawaii

Provide a list of information sources used for this hazard assessment. As you are completing the worksheets, use the "Select Ref(s)" buttons at the ends of each subsection to select the applicable information sources from the list below.

Ref. No. Title (include version, publication date)

- 1 CEPOH, 1994. Inventory Project Report
- 2 Zapata, 2008. Engineering Evaluation/Cost Analysis
- 3 Wil Chee, 2009. Site Investigation

Environet, 2012. Removal Action at Maunawili Valley

- 4 Impact Area
- 5 Huikala, 2013. RI Work Plan

#### B. Briefly describe the site:

1. Area (include units):

999.7 acres

2. Past munitions-related use:

Target Area

3. Current land-use activities (list all that occur):

Undeveloped forest, recreational (hiking, horseback riding, biking), agricultural.

- 4. Are changes to the future land-use planned?
- 5. What is the basis for the site boundaries?

The MRS boundaries are based on historical and current real estate records.

6. How certain are the site boundaries?

Former training activities in the area were fairly confined to the western portion of Mauanwili Valley, which naturally bowl-shaped.

Reference(s) for Part B:

CEPOH, 1994. Inventory Project Report

Zapata, 2008. Engineering Evaluation/Cost Analysis

Wil Chee, 2009. Site Investigation

Huikala, 2013. RI Work Plan



#### C. Historical Clearances

- 1. Have there been any historical clearances at the site?
- 2. If a clearance occurred:
  - a. What year was the clearance performed?

Yes, subsurface clearance

2012

b. Provide a description of the clearance activity (e.g., extent, depth, amount of munitions-related items removed, types and sizes of removed items, and whether metal detectors were used):

A removal action was conducted on 40 acres located in the southwest portion of the MRS. Approximately 1,067 pounds of MD was removed and 26 MEC items were identified. MEC items included (60-mm HE mortar, M49A2; 37-mm HE projectile, M63; 20-mm ball cartridge, MK1 (unfired); 75-mm shrapnel projectile, MK1; fuze of a projectile TSQ; fuze of a projectile PDSQ; 20-mm ball cartridge, M55A1 (unfired); 57-mm APT projectile, M70; 37-mm APCT projectile, M59; 2.36-inch rocket motor; 81-mm HE mortar, M43A1; and fuze of a projectile, M1907M.

Reference(s) for Part C:

Environet, 2012. Removal Action at Maunawili Valley Impact Area



D. Attach maps of the site below (select 'Insert/Picture' on the menu bar.)

Refer to Appendix A, Figure A5-1

N-1

Minimum

Site ID: H09HI027701R01-1

4/25/2014

#### **Cased Munitions Information**

	Munition Type (e.g., mortar,	Munition	Munition		Energetic Material	Is Munition		Fuze	Depth for Munition	Location of
Item No.	projectile, etc.)	Size	Size Units	Mark/ Model	Туре	Fuzed?	Fuzing Type	Condition	(ft)	Munitions
1	Mortars	81	mm	M43A1	High Explosive	Yes	Impact	Armed		Surface and Subsurface
2	Artillery	75	mm	м48	High Explosive	Yes	Impact	Armed		Surface and Subsurface
3	Artillery	75	mm	MK1	Low Explosive Filler in a fragmenting round	Yes	Impact	Armed		Surface and Subsurface
4	Mortars	60	mm	M49A2, M50A2	High Explosive	Yes	Impact	Armed		Surface and Subsurface
5	Artillery	57	mm	м70	High Explosive	Yes	Impact	Armed		Surface and Subsurface
6	Artillery	37	mm	M63, M51, M74, M59	High Explosive	Yes	Impact	Armed		Surface and Subsurface
7	Rockets	2.36	inches	M6A1,M7A1	High Explosive	Yes	Impact	Armed		Surface and Subsurface
8	Rockets	3.5	inches	м28	High Explosive	Yes	Impact	Armed		Surface and Subsurface
9										
10	Fuzes			PTT, M1907	High Explosive		Time	Armed		Surface and Subsurface
11	Fuzes			TSQ, M54	High Explosive		Impact	Armed		Surface and Subsurface
12	Fuzes			PDSQ, M48	High Explosive		Impact	Armed		Surface and Subsurface
13	Artillery	105	mm	м1	High Explosive	Yes	Impact	Armed		Surface and Subsurface

Reference(s) for table above: CEPOH, 1994. Inventory Project Report Zapata, 2008. Engineering Evaluation/Cost Analysis

Wil Chee, 2009. Site Investigation

Environet, 2012. Removal Action at Maunawili Valley Impact Area

Huikala, 2013. RI Work Plan

#### **Bulk Explosive Information**

Duik LA	Jiosive Illioilliation		
Item No.	Explosive Type	Comments	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Reference(s) for table above:

H09HI027701R01-1 Site ID:

4/25/2014 Date:

## **Activities Currently Occurring at the Site**

			Number of			
		Number of	hours per year	Potential		
		people per year	a single	Contact Time	Maximum	
Activity		who participate	person spends	(receptor	intrusive	
No.	Activity	in the activity	on the activity	hours/year)	depth (ft)	Comments
	1 Recreational (hikers)	54,750	2	109,500	0	150/day
	2 Agricultural	10	2,080	20,800	2	M-F: 8 hrs/day
	Occupational (maintenance,					
	3 construction)	5	120	600	2	10 hrs/month
	4					
	5					
	6					
	7					
	8					
	9					
1	0					
1	1					
1	2			1		
	Total Poten	ial Contact Time (r	eceptor hrs/yr):	130,900		
		Max	imum intrusive o	depth at site (ft):	2	

Reference(s) for table above: CEPOH, 1994. Inventory Project Report Zapata, 2008. Engineering Evaluation/Cost Analysis

Wil Chee, 2009. Site Investigation

Huikala, 2013. RI Work Plan

H09HI027701R

Site ID: **01-1**Date: **4/25/2014** 

## **Energetic Material Type Input Factor Categories**

The following table is used to determine scores associated with the energetic materials. Materials are listed in order from most hazardous to least hazardous.

	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
High Explosive and Low Explosive Filler in Fragmenting Rounds	100	100	100
White Phosphorus	70	70	70
Pyrotechnic	60	60	60
Propellant	50	50	50
Spotting Charge	40	40	40
Incendiary	30	30	30

The most hazardous type of energetic material listed in the 'Munitions, Bulk Explosive Info' Worksheet falls under the category 'High Explosive and Low Explosive Filler in Fragmenting Rounds'.

_			
C	$\sim$	r	_

Baseline Conditions:	100
Surface Cleanup:	100
Subsurface Cleanup:	100

### **Location of Additional Human Receptors Input Factor Categories**

- 1. What is the Explosive Safety Quantity Distance (ESQD) from the Explosive Siting Plan or the Explosive Safety Submission for the MRS?
- 2. Are there currently any features or facilities where people may congregate within the MRS, or within the ESQD arc?



3. Please describe the facility or feature.

The MRS includes public hiking trails, agricultural plots, municipal water and power sources, irrigation line. There is a residential area outside of the MRS but within the ESQD.

MEC Item(s) used to calculate the ESQD for current use activities

#### Item #13. Artillery (105mm)

The following table is used to determine scores associated with the location of additional human receptors (current use activities):



	Daseime	Surrace	Subsurface	
	Conditions	Cleanup	Cleanup	
Inside the MRS or inside the ESQD arc	30	30	30	)
Outside of the ESQD arc	0	0	0	)

4. Current use activities are 'Inside the MRS or inside the ESQD arc', based on Question 2.' Score

Baseline Conditions:	30
Surface Cleanup:	30
Subsurface Cleanup:	30

## **Site Accessibility Input Factor Categories**

The following table is used to determine scores associated with site accessibility:				
Baseline Surface Subsur				
	Description	Conditions	Cleanup	Cleanup
	No barriers to entry, including signage			
Full Accessibility	but no fencing	80	) 80	) 80
	Some barriers to entry, such as barbed			
Moderate Accessibility	wire fencing or rough terrain	55	5 55	5 55
	Significant barriers to entry, such as			
	unguarded chain link fence or			
	requirements for special transportation			
Limited Accessibility	to reach the site	15	5 15	5 15
	A site with guarded chain link fence or			
Very Limited	terrain that requires special equipment			
Accessibility	and skills (e.g., rock climbing) to access	5	5 5	5 5

Current Use Activities Score

Select the category that best describes the site accessibility under the current use scenario:

Moderate Accessibility
aseline Conditions:
urface Cleanup:
ubsurface Cleanup:

## **Potential Contact Hours Input Factor Categories**

The following table is used to determine scores associated with the total potential contact time:

	Description	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Many Hours	≥1,000,000 receptor-hrs/yr	120	90	30
Some Hours	100,000 to 999,999 receptor hrs/yr	70	50	20
Few Hours	10,000 to 99,999 receptor-hrs/yr	40	) 20	10
Very Few Hours	<10,000 receptor-hrs/yr	15	5 10	5

## Current Use Activities:

Input factors are only determined for baseline conditions for current use activities. Based on the 'Current and Future Activities' Worksheet, the Total Potential Contact Time is:

Based on the table above, this corresponds to a input factor score for baseline conditions of:

receptor 130,900 hrs/yr 70 Score

55 55 55

## **Amount of MEC Input Factor Categories**

The following table is	used to determine scores associated with t  Description	he Amount o Baseline Conditions	f MEC: Surface Cleanup	Subsurface Cleanup	
Target Area	Areas at which munitions fire was directed	180	120	30	
OB/OD Area	Sites where munitions were disposed of by open burn or open detonation methods. This category refers to the core activity area of an OB/OD area. See the "Safety Buffer Areas" category for safety fans and kick-outs.	180	110	30	
Function Test Range	Areas where the serviceability of stored munitions or weapons systems are tested. Testing may include components, partial functioning or complete functioning of stockpile or developmental items.	165	90	25	
Burial Pit	The location of a burial of large quantities of MEC items.	140	140	10	
Maneuver Areas	Areas used for conducting military exercises in a simulated conflict area or war zone	115	15	5	
Firing Points	The location from which a projectile, grenade, ground signal, rocket, guided missile, or other device is to be ignited, propelled, or released.	75	10	5	
Safety Buffer Areas	Areas outside of target areas, test ranges, or OB/OD areas that were designed to act as a safety zone to contain munitions that do not hit targets or to contain kick-outs from OB/OD areas.	30	10	5	
Storage	Any facility used for the storage of military munitions, such as earth-covered magazines, above-ground magazines, and open-air storage areas.	25	10	5	
Explosive-Related Industrial Facility	Former munitions manufacturing or demilitarization sites and TNT production plants	20	10	5	
Select the category that best describes the <i>most hazardous</i> amount of MEC:					Score
Target Area Baseline Conditions:					180
Surface Cleanup: Subsurface Cleanup:					120 30

## Minimum MEC Depth Relative to the Maximum Intrusive Depth Input Factor Categories

**Current Use Activities** 

The shallowest minimum MEC depth, based on the 'Cased Munitions Information' Worksheet: 2 ft The deepest intrusive depth:

The table below is used to determine scores associated with the minimum MEC depth relative to the maximum intrusive depth:

палінані інгозіче церат.	Baseline Conditions	Surface Cleanup	Subsurface Cleanup
Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.	240	150	95
Baseline Condition: MEC located surface and subsurface, After Cleanup: Intrusive depth does not overlap with subsurface MEC. Baseline Condition: MEC located only subsurface. Baseline	240	50	25
Condition or After Cleanup: Intrusive depth overlaps with minimum MEC depth.	150	N/A	95
Baseline Condition: MEC located only subsurface. Baseline Condition or After Cleanup: Intrusive depth does not overlap with minimum MEC depth.	50	N/A	25

Because the shallowest minimum MEC depth is less than or equal to the deepest intrusive depth, the intrusive depth will overlap after cleanup. MECs are located at both the surface and subsurface, based on the 'Munitions, Bulk Explosive Info' Worksheet. Therefore, the category for this input factor is 'Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.' For 'Current Use Activities', only Baseline Conditions are considered.

## **Migration Potential Input Factor Categories**

Is there any physical or historical evidence that indicates it is possible for natural physical forces in the area (e.g., frost heave, erosion) to expose subsurface MEC items, or move surface or subsurface MEC

If "yes", describe the nature of natural forces. Indicate key areas of potential migration (e.g., overland water flow) on a map as appropriate (attach a map to the bottom of this sheet, or as a separate worksheet).

steep slopes, erosion caused by overland water flow

The following table is used to determine scores associated with the migration potential:

Baseline	Surface	Subsurface
Conditions	Cleanup	Cleanup
30	30	10
10	10	10

Based on the question above, migration potential is 'Possible.'

Baseline Conditions: 30 Surface Cleanup: 30 Subsurface Cleanup: 10

Reference(s) for above information:

Possible Unlikely o ft

240 Score



Score

#### **MEC Classification Input Factor Categories**

Cased munitions information has been inputed into the 'Munitions, Bulk Explosive Info' Worksheet; therefore, bulk explosives do not comprise all MECs for this MRS.

The 'Amount of MEC' category is 'Target Area'. It cannot be automatically assumed that the MEC items from this category are DMM. Therefore, the conservative assumption is that the MEC items in this MRS are UXO.

Has a technical assessment shown that MEC in the OB/OD Area is DMM?

Are any of the munitions listed in the 'Munitions, Bulk Explosive Info' Worksheet:

- · Submunitions
- · Rifle-propelled 40mm projectiles (often called 40mm grenades)
- · Munitions with white phosphorus filler
- · High explosive anti-tank (HEAT) rounds
- · Hand grenades
- · Fuzes
- Mortars

At least one item listed in the 'Munitions, Bulk Explosive Info' Worksheet was identified as 'fuzed'

The following table is used to determine scores associated with MEC classification categories:

9		Baseline	Surface	Subsurface
	UXO Special Case	Conditions	Cleanup	Cleanup
UXO Special Case		180	180	180
UXO		110	110	110
Fuzed DMM Special Case		105	105	105
Fuzed DMM		55	55	55
Unfuzed DMM		45	45	45
Bulk Explosives		45	45	45

Based on your answers above, the MEC classification is "UXO Special Case".	Score	
Baseline Conditions:	180	
Surface Cleanup:	180	
Subsurface Cleanup:	180	

## **MEC Size Input Factor Categories**

The following table is used to determine scores associated with MEC Size:

Baseline Surface Subsurface
Description Conditions Cleanup Cleanup

Any munitions (from the 'Munitions, Bulk Explosive Info' Worksheet) weigh less than 90 lbs; small enough for a receptor to be able to move and initiate a

Small detonation 40 40 40

All munitions weigh more than 90 lbs;

Large too large to move without equipment 0 0 0

Based on the definitions above and the types of munitions at the site (see 'Munitions, Bulk Explosive Info' Worksheet), the MEC Size Input Factor is:

Small Score

Baseline Conditions:

Surface Cleanup:

40
Subsurface Cleanup:

40
40
40

## **Scoring Summary**

Site ID:	H09HI027701R01-1	a. Scoring Summary for Current Use Activities	
Date:	4/25/2014	Response Action Cleanup:	No Response Action
	Input Factor	Input Factor Category	Score
I. Ener	rgetic Material Type	High Explosive and Low Explosive Filler in Fragmenting Rounds	100
II. Location of a	Additional Human Receptors	Inside the MRS or inside the ESQD arc	30
III.	Site Accessibility	Moderate Accessibility	55
IV. Pote	ential Contact Hours	100,000 to 999,999 receptor hrs/yr	70
V.	Amount of MEC	Target Area	180
VI. Minimum MEC De	- ··	Baseline Condition: MEC located surface and subsurface. After Cleanup: Intrusive depth overlaps with subsurface MEC.	240
VII. N	Migration Potential	Possible	30
VIII.	MEC Classification	UXO Special Case	180
	IX. MEC Size	Small	40
		Total Score Hazard Level Category	925 1