Final Site Inspection Report
Munitions Response Program

WAIKANE VALLEY TRAINING AREA
KANEOHE, HAWAII

November 2009

Commander
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

Contract Number N62742-05-D-1868, CTO 0004

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EXECUTIVE SUMMARY

OBJECTIVE

The objective for this task order was to perform a Site Inspection (SI) with respect to past use of Munitions and Explosives of Concern (MEC) for the Munitions Response Site (MRS) called Waikane Valley Training Area (WVTA), Kaneohe, on the island of Oahu, Hawaii (see Figure A-1). The SI, as the second component of the overall site evaluation following the Preliminary Assessment (PA), is not intended as a full-scale study of the nature and extent of contamination or explosives hazards. The National Oil and Hazardous Substances Contingency Plan identifies the SI as the on-site investigation to determine whether there is a release or potential release and the nature of the associated threats. Its purpose is to augment the data collected in the PA and to generate, if necessary, sampling and other field data to determine if further response action or remedial investigation (RI) is appropriate. The objective of performing the SI is to efficiently gather data necessary to make this determination.

SITE BACKGROUND

The MRS consists of 187 acres located in the Waiahole and Waikane Valley, on Oahu's windward side approximately 10 miles northwest of Kaneohe Bay. It was once part of a 2,000 acre lease used for jungle training and field maneuvers. The remaining acreage falls under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) and is not addressed under this SI.

WVTA's military history dates back to the early 1940's when the Army leased over 2,000 acres in the Waiahole and Waikane Valleys for jungle training, field maneuvers and a bombing range for air-to-ground ordnance delivery practice. The area was known as the Waiahole Training Area and managed by the United States (U.S.) Army as property of Fort Hase.

Between 1943 and 1953, the Army leased this property for maneuvers, jungle training, and small arms, artillery, and mortar firing. The United States Marine Corps (USMC) leased 1061 acres of the training area in 1953. Training consisted of small arms fire, 3.5-inch rockets, and possibly medium artillery fire. Live fire apparently stopped in the early 1960's. Due to fire hazards, incendiaries were prohibited and all ammunition in excess of .50 caliber was to be fired into the designated impact area. The lease was terminated in 1976 and returned to the original owners who farmed and developed it.

In 1944, four people were injured, two fatally, when a 60 millimeter (mm) mortar discovered in Waikane Valley accidentally detonated. Three children were injured in 1963 when a souvenir rifle grenade reportedly discovered in Waikane Valley exploded after it was thrown against a wall. There are no other reports of fatalities or injuries attributable to MEC discovered at Waikane Valley.

The USMC conducted ordnance clearance sweeps in 1976 and 1984. The 1976 clearance effort resulted in the removal of over 24,000 pounds of practice ordnance and fragments, including 42 items of unexploded ordnance. The after action report stated that 187 acres of the WVTA can never be certified free of unexploded ordnance due to the ground cover and topography. In December 1983, heavy rain exposed ordnance on the property and USMC Explosive Ordnance Disposal (EOD) removed a number of 3.5-inch rockets. In January 1984, the USMC conducted a sweep and removed 480 3.5-inch rockets. In June 1984, an intensive ordnance clearance resulted in the removal of 16,000 pounds of demilitarized practice ordnance and 190 items of unexploded ordnance from the parcel. The after action report supported the conclusions of the 1976 report that the property could never be certified clear of ordnance.

In 1989, the government acquired title to the 187-acre ordnance impacted area of the original WVTA. Fencing of the property was completed in 1992 and remains as government property due to it being deemed improbable that it can be cleared of all ordnance. The area is currently controlled and maintained by Marine Corps Base Hawaii (MCBH). The project site is managed as an "other than operational range", with access controlled by MCBH such that civilians may only enter the property when accompanied by EOD personnel.

SITE INSPECTION ACTIVITIES AND RESULTS

Site inspection activities were conducted at WVTA from 29 September to 30 October 2008. The field activities included an instrument aided field reconnaissance survey and the collection of surface soil samples.

An instrument-aided field reconnaissance survey was conducted to evaluate and document the presence of MEC, munitions constituents (MC), or other munitions-related finds. The field teams surveyed 9.55 acres in transects and 5.2 acres within 42 cells, for a total of 14.75 surveyed acres. The soil sampling team collected 35 composite samples in the lower elevations of the site and 10 discrete samples at locations where MEC items had been found. Samples were analyzed for 9 metals and for nitroaromatics and nitroamines. The analytical results were compared against Project Action Limits (PALs) consisting of United States Environmental Protection Agency (USEPA) Region 9 residential regional screening levels (RSLs), State of Hawaii Department of Health (HDOH) Tier 1 Environmental Action Levels (EALs), and Soil Background Criteria. MEC reconnaissance and MC analytical results are discussed in detail in Sections 2 and 3.

Many items of munitions debris (MD), which are remnants of munitions items not presenting an explosive hazard, were noted during the site inspection. Seventy MEC items were found, all fired and fuzed and therefore considered unexploded ordnance (UXO). The UXO items included sixty-six 3.5-inch shoulder fired High Explosive Anti-Tank (HEAT) Rockets, one 2.36 inch shoulder fired HEAT Rocket warhead, and three HEAT Rifle Grenades.

The analysis of four soil samples reveals a potential for copper and lead impacts above the PALs. These samples (MEC019, MEC021, MEC042, and MEC043) were located within very localized areas. The localized concentrations of copper and lead are believed to be related to high concentrations of munitions debris and the results of past operational practices.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the instrument-aided reconnaissance and the analytical sampling, MEC was found and MC exceeding PALs was found. These findings indicate that further action is recommended at WVTA to address explosives risk and risk to human health and the environment.

An RI is recommended, consisting of a 100 percent surface clearance of MEC areas identified by this SI and shown on Figure A-8. This surface clearance should focus on accessible terrain north of the Waikane stream within or below the suspected target locations, clearing the areas of all surface MEC and MD.

Following the surface clearance, a subsurface anomaly investigation should be completed within the surface-cleared areas in order to determine depth of penetration and density of MEC within each target area. Grids of 50 feet by 50 feet, with 8 grids spread across the target (a total of 2 acres for the 4 targets) will be sufficient to characterize the MEC hazard at the targets. Within these grids, 100 percent of the anomalies should be investigated to depth of detection using hand-held metal detectors.

Soil samples should also be taken near the sites of previous Samples MEC019, MEC021, MEC042, and MEC043 to establish the extent of the localized copper and lead impacts. Sediment samples should be taken at Waikane Stream to determine whether copper or lead have reached the stream. Upon the completion of the RI, a feasibility study, if needed, should explore the various remediation alternatives for dealing with the residual risk.

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ACRONYMS AND ABBREVIATIONS

ASR	Archives Search Report
COPC	Chemical(s) of Potential Concern
CSM	Conceptual Site Model
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
EA	Environmental Assessment
EAL	Environmental Action Level
EE/CA	Engineering Evaluation/Cost Analysis
EOD	Explosive Ordnance Disposal
FUDS	Formerly Used Defense Sites
GIS	Geographical Information System
GPS	Global Positioning System
HDOH	Hawaii Department of Health
HE	High Explosive
HEAT	High Explosive Anti-Tank
MC	Munitions Constituents
MD	Munitions Debris
MCBH	Marine Corps Base Hawaii
MEC	Munitions and Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site
PA	Preliminary Assessment
PAL	Project Action Limit
RSL	Regional Screening Level
RI	Remedial Investigation
RIPRA	Range Investigation and Preliminary Range Assessment
SI	Site Inspection
U.S.	United States
USAE	USA Environmental, Incorporated
USEPA	United States Environmental Protection Agency
USMC	United States Marine Corps
UXO	Unexploded Ordnance
WVTA	Waikane Valley Training Area

1.0 INTRODUCTION

This report describes the Site Inspection (SI) activities with respect to past use of Munitions and Explosives of Concern (MEC) and Munitions Constituents (MC) associated with the Waikane Valley Training Area (WVTA) Munitions Response Site (MRS) located near Kaneohe, Hawaii. USA Environmental, Incorporated (USAE) conducted this SI and prepared this SI Report in accordance with the Performance Work Statement, dated 3 August 2006. A location map is included in Appendix A as Figure A-1 and the study site is depicted on Figure A-2.

The purpose of this SI was to generate the field data necessary to determine whether further investigation or response action is warranted. Soil samples were taken and analyzed to determine whether MC (such as heavy metals or explosives) have contaminated the site. An instrument-aided reconnaissance survey was conducted in order to collect surface evidence of MEC hazards such as munitions debris (MD) (remnants of munitions items not presenting an explosive hazard), impact craters, target locations, fighting positions, or actual MEC items (which present an explosive hazard).

In accordance with the Comprehensive Environmental Response Compensation, and Liability Act, this SI was not intended as a full-scale study of the nature and extent of contamination or explosives hazards; rather, it was to use the field data and available information from the Preliminary Assessment (PA) to confirm or deny the presence of contamination and provide necessary data for informed decision making.

1.1 SITE HISTORY AND BACKGROUND

The MRS consists of 187 acres located in the Waiahole and Waikane Valleys, on Oahu's windward side, approximately 10 miles northwest of Kaneohe Bay. It was once part of a 2,000 acre lease used for jungle training and field maneuvers. The remaining acreage outside of the 187 acres falls under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) and is not addressed under this SI.

1.1.1 PRELIMINARY ASSESSMENT

The 187-acre MRS was identified for further evaluation as a result of a Range Investigation and Preliminary Range Assessment (RIPRA) and Archives Search Report (ASR) completed in 1998. Most of the historical information within this SI report is drawn from the RIPRA/ASR.

WVTA's military history dates back to the early 1940's when the Army leased over 2,000 acres in the Waiahole and Waikane Valleys for jungle training, field maneuvers and a bombing range for air-to-ground ordnance delivery practice. The area was known as the Waiahole Training Area and managed by the United States (U.S.) Army as property of Fort Hase.

Between 1943 and 1953, the Army leased this property for maneuvers, jungle training, and small arms, artillery, and mortar firing. The United States Marine Corps (USMC) leased 1061 acres of the training area in 1953. Training consisted of small arms fire, 3.5-inch rockets, and possibly medium artillery fire. Live fire apparently stopped in the early 1960's. Due to fire hazards, incendiaries were prohibited and all ammunition in excess of .50 caliber was to be fired into the designated impact area. The lease was terminated in 1976 and returned to the original owners who farmed and developed it.

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1.1.2 ENVIRONMENTAL ASSESSMENT

The *Draft Environmental Assessment (EA) for the Proposed United States Marine Corps (USMC) Jungle Warfare Training Waikane Valley, Oahu, Hawaii* (2004) evaluated the effects of a Proposed Action of conducting non-live fire jungle orientation and maneuver training within the 187-acre property. The Proposed Action was cancelled in September 2004 after the USMC determined that Waikane Valley is unsuitable for troop training because of safety concerns. Much of Section 1.2 of this report is based on information published within the EA.

During the EA, surface water samples were collected to determine if explosive compounds were being mobilized during rain events. Five surface water samples collected on May 9, 2003 from Waikane Stream during what was considered a "dry period" (i.e., little to no rainfall for several days) at two locations within the parcel and along Kamehameha Highway contained no measurable explosive compounds above the laboratory's method reporting limit. Five additional water samples were collected from the same locations in Waikane Stream on June 16, 2003 following a rain event during which rain fell constantly from the prior evening into the following morning. Laboratory analytical results also revealed no explosive compounds above the method reporting limit thereby indicating no mobilization of contaminants of concern.

Ten surface and near-surface soil samples collected on May 9, 2003 proximal to Waikane Stream at the east and west ends of the project site did not exhibit targeted explosive compounds above the analytical laboratory's method reporting limit. Results of both sampling events, although not validated, are included in Appendix C for information.

1.1.3 ENGINEERING EVALUATION/COST ANALYSIS OF FUDS PORTION OF WVTA

From June 2005 until May 2006, U.S. Army Corps of Engineers conducted field work for an Engineering Evaluation/Cost Analysis (EE/CA) under DERP-FUDS, evaluating MEC risks over 874 acres of the FUDS property adjoining the southern and western boundaries of the MRS. The EE/CA consisted of evaluation of 150 grids (100 feet [ft] by 100 ft) and 9 miles of transect. During the investigation, seven MEC items were recovered; two 81mm high explosive (HE) rounds, three 60mm HE rounds, and two 37mm HE projectiles. All of the MEC items were recovered in the southeastern portion of the FUDS site, which adjoins the southern boundary of the MRS. Projectile fragmentation, fuze pieces, tail fins, base plates, and other munitions debris were located throughout the valley.

1.1.4 SITE INSPECTION HISTORICAL RECORDS REVIEW

The USAE Site Manager contacted and visited both off-site and on-site historical record data repositories. The data repositories included regional archives, libraries, and local historical sources.

1.1.4.1 U.S. Army Museum of Hawaii at Fort DeRussy

The Site Manager met with Ms. Judith Bowman, Curator for the U.S. Army Museum of Hawaii located at Fort DeRussy. He reviewed several binders of historical documents and black and white photos dating back to the 1920's that Ms. Bowman thought might have some information regarding the WVTA and the former Camp Hase areas. Several photos pertaining to U.S. Army training activities at the former WVTA were located and scanned copies were obtained from Ms. Bowman. These photos are included in Appendix D. The Site Manager also looked over a folder of maps that Ms. Bowman presented to him. One map (June 1944) depicting all the Island of Oahu Training Areas, Camps, and Centers following the bombing of Pearl Harbor was noted, reviewed and photo copied. These maps also showed the impact areas for each of the training areas, but at too large of a scale to be of value to this report. No additional information was noted.

1.1.4.2 University of Hawaii at Manoa Library Records

The Site Manager conducted a historical records search at the Hawaii War Records Depository of the Manoa Library's Archives and Manuscripts Department. No historical information related to WVTA was revealed during this search.

1.1.4.3 After Action Reports

The Site Manager was allowed to review and copy records retained at the offices of Donaldson Enterprises, Inc. in Honolulu pertaining to the WVTA. Several after action reports prepared by MCBH Kaneohe Bay EOD units were discovered which related specifically to the MRS, and are included in Appendix D. All of these reports were summarized in the RIPRA.

An after-action report dated 20 September 1976 described an EOD clearance operation conducted in August and September of that year, in which over 24,400 pounds of practice ordnance were lifted out of the site by helicopter and 42 items of explosive ordnance were disposed of by detonation on the site. The report concluded that the area could never be certified clear of ordnance due to the ground cover and ordnance being buried or unable to be located for various reasons.

An after action report dated 6 January 1984 describes an attempt to determine the extent of ordnance hazard at WVTA.

An after action report dated 7 June 1984 describes a surface clearance of the entire 187 acre MRS where operations were conducted from 2 February until 13 April 1984. During that specific clearance operation, 16,000 pounds of demilitarized practice ordnance was flown out of WVTA, 190 HE rounds were destroyed, and 3822 practice rounds were demilitarized. This report concluded that the surface clearance had been 85 percent (%) effective, and noted that EOD responded to the site a month later to remove 35 more 3.5-inch practice rockets either exposed by erosion or missed by the clearance team.

An EOD operations report dated 4 September 1987 indicates that Kaneohe Police Department responded to a find of dud ordnance in Waikane Valley, and in turn called an EOD unit which disposed of the HE rifle grenade by blowing in place.

1.2 PHYSICAL AND ENVIRONMENTAL SETTING

1.2.1 DESCRIPTION OF MUNITIONS RESPONSE SITE

The 187-acre MRS has had no modern construction. The property is bounded to the north, south, and west by undeveloped forest lands owned by Kualoa Ranch and SMF Enterprises, Inc. According to the EA, the City and County of Honolulu began to acquire lands in 1997 to the southeast of the project site from Azabu USA Corporation. These lands were then designated as the Waikane Nature Preserve. The Roberts family owns a small parcel adjacent to the southern border of the project site. Non-contiguous coastal lands to the east of the project site include a mix of residential areas, beach parks, and private property.

1.2.2 TOPOGRAPHY AND GEOLOGY

According to the EA, Waikane Valley is one of several valleys with watersheds draining into the northern part of Kaneohe Bay. Windward Oahu is the remnant of the Koolau Volcano. Waikane was carved into the basalt of the Koolau Range through erosion. Some of the gravel and clay formed by weathering and erosion of the shield were deposited on valley floors. In addition, alluvium of marine origin accumulated in the valleys as the sea level rose during interglacial periods and fell during glacial periods.

The project site extends along a gradient from 100 feet above mean sea level at the southern boundary to approximately 1,400 feet along the northern boundary. Much of the project area has slopes exceeding 45 percent, with some sections containing steep vertical cliffs.

According to the U.S. Department of Agriculture, Soil Conservation Service *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* (1972), the five soil types within the project site exhibit the following characteristics:

- <u>Waikane silty clay, 25 to 40 percent slope (WpE)</u>. This soil type is found on steep terraces and alluvial fans. WpE soils are very strongly acid in the surface layer and subsoil, with moderately rapid permeability, medium to rapid runoff, and a moderate to severe erosion hazard.
- <u>Waikane silty clay, 40 to 70 percent slope (WpF)</u>. On WpF soil, runoff is rapid to very rapid and the erosion hazard is severe.
- <u>Waikane silty clay, 40 to 70 percent slope (WpF2)</u>. This soil type is very similar to WpE except that it is very steep. Most of the surface layer and, in some places, part of the subsoil has eroded. Soft weathered rock is exposed in a few areas. On WpF2 soil, runoff is rapid to very rapid and the erosion hazard is very severe.
- <u>Rock land (rRK)</u>. This classification refers to areas where exposed rock covers 25 to 90 percent of the surface. The main characteristics of rRK are rock outcrops (of mainly basalt and andesite) and very shallow soils.
- Hanalei silty clay, 0 to 2 percent slope (HnA). This soil type is found on stream bottoms and flood plains. HnA soils are strongly acid to very strongly acid in the surface layer and neutral in the subsoil, with moderate permeability. On HnA soil, runoff is very slow and the erosion hazard is no more than slight.

The EA report indicates that Waikane Series soils (WpE, WpF, and WpF2) are found on approximately 75 percent or the majority of the project site, and that the WpE soils type is primarily found below the 300-foot contour. According to the EA report, land at the top of the ridge at the northern boundary of the project comprises rRK whereas HnA is found at the southeastern corner of the site along Waikane Stream.

1.2.3 GROUNDWATER

The United States Geological Survey Ground Water Atlas of the United States HA 730-N indicates that WVTA site is located in the Koolau Rift Zone groundwater area of Oahu. This area consists mostly of dike-intruded Koolau Basalt, which is the principal aquifer. Regional ground-water movement is from the highlands to adjacent ground-water areas and directly to the ocean. Dike-impounded water is most important in this ground-water area, and some water levels are as much as 1,000 feet above sea level.

According to the HDOH map of Oahu's Underground Injection Control Areas, WVTA lies inland of the Underground Injection Control line, and therefore the underlying aquifer is considered a drinking water source.

1.2.4 BIOLOGICAL RESOURCES

The EA cited literature and field surveys of the project site conducted by biologists and environmental specialists which resulted in the following findings regarding flora and fauna resources.

1.2.4.1 Vegetation

According to the EA, the project site has been highly disturbed in the past such that only remnants of native vegetation remain. Native plant communities such as *'Ohi'a Scrub* and *Koa/'Uluhe Woodland* occur on some of the ridges that extend to the northern ridge line. The *Ohi'a Scrub* community occurs on the ridges at the north side of the project site, and particularly on the eastern end. It is characterized by low and shrubby *'ohi'a* trees with dense clumps of the native fern *pala'a (Sphenomeris chinensis)* between the shrubs. *Koa/'Uluhe Woodland* dominates the northwestern portion of the project site on the ridge leading up the hills that separate Waikane Valley from Kaaawa Valley. This plant community comprises *Dicranopteris linearis ('uluhe)*. Two plant communities (i.e., Managed Land Vegetation and Secondary Forest) found in most of the flat to sloping areas south of the hills on the northern portion of the project site reflect extensive disturbance. Managed Land Vegetation exhibits the characteristics of abandoned agricultural clearings that cover large patches on the alluvial plain of the Waikane Stream, and the areas around the abandoned living sites. Most of the lowlands of the site are covered by Secondary Forest, which is a plant community almost entirely dominated by alien tree species. The most prevalent of these alien tree species is *Paraserianthes falcataria ("albizia")*, which is a huge, fast-growing tree with an open, spreading canopy. No distinct wetlands were found within the project site.

A total of 104 vascular plant species were recorded. Of the 104 species, 17 are native but only five of the native species are endemic to Hawaii: *Cibotium chamissoi (haupu'u 'i'i), Acacia koa (koa), Scaevola gaudichaudiana (naupaka kuahiwi), Metrosideros polymorpha ('ohi'a lehua)*, and *Wikstroemia oahuensis ('akia).*

1.2.4.2 Fish and Wildlife

The EA indicates that non-native arthropod, mammalian, and avian species identified at the project site are consistent with the habitat found at the project site. Many common non-native species are present. Medically important species (i.e., centipedes, scorpions, widow spiders, western yellow jacket wasps, and common paper wasps) were not observed but may be present. Four mammalian species – domestic dog *(Canis f. familiaris)*, small Indian mongoose *(Herpestes a. auropunctatus)*, domestic cat *(Felis catus)*, and feral pig *(Sus s. scrofa)* – were observed. Fifteen species of birds from 11 separate families were observed. The findings of the avian survey were consistent with the habitat and altitude of the study area. No native avian species were detected. A few native species of aquatic life were found in the middle and lower reaches of Waikane Stream, but were noted as not especially unusual or unique.

1.2.4.3 Listed Species

The EA indicates that previous surveys of the project site in 1989 and 2003 found no federally listed threatened or endangered plant species and no plants proposed for such status. Snail species listed as threatened or endangered under federal or state statutes (i.e., *Achatinella*) were not found. The EA states that endemic Hawaiian sub-species of the Short-eared Owl *(Asio flammeus sandwichensis)* was not detected during surveys but may occasionally use resources present within the site, especially in the more open *'uluhe* dominated higher elevations of the valley wall. According to the EA, the Oahu population of this sub-species is listed as endangered by the State of Hawaii, but it is not listed under federal statutes. Typical nesting habitat used by the threatened Newell's Shearwater *(Puffinus auricularis newelli)* is found on the upper *'uluhe* covered slopes. There are no known nesting colonies of this species on Oahu; however, a small number of these birds are downed annually on the island, most near the lighted entrances to the Pali Highway tunnel.

1.2.5 WATER RESOURCES

The EA states that Waikane Stream traverses the project site along its southern border at approximately the 150-foot elevation. The United States Geological Survey has monitored stream flow at the 75-foot elevation approximately 1,150 feet downstream from the eastern border of the property since 1959. Its records indicate Waikane Stream to be perennial.

According to the EA, the Waiahole Ditch Tunnel System has intercepted water at the most productive portion of the Waikane catchment upstream from the site since 1916, thereby altering flow volume and other hydrological characteristics of Waikane Stream.

The EA indicates that water quality sampling of the perennial Waikane Stream was accomplished in May 2003 at four sampling stations from above to below the project area to measure temperature, pH, conductivity, dissolved oxygen, turbidity, total suspended solids, and nutrients (as ammonia, nitrate plus nitrite, total nitrogen, and total phosphorous). Differences between stations were found to be small and values were within ranges indicating good water quality.

1.2.6 CLIMATE

The climate of Hawaii is warm and humid year round. The Juvik and Juvik *Atlas of Hawaii (1998)* states that the daily average temperature on Oahu ranges between 65 to 85 degrees Fahrenheit (°F) with relative humidity ranging from 30 to 90 percent. The project site is located in the interior of the forested Waikane Valley. All of these windward valleys, from Kaneohe in the south to Hakipuu in the north, support lush vegetation owing to an abundance of water.

1.2.7 CULTURAL AND NATURAL RESOURCES

The EA notes that field investigations and ethnographic interviews were conducted in 2003, and a *heiau* or shrine within National Register of Historic Places was identified and recorded in February 2004. The project site was divided into three sampling zones based on terrain variations in Waikane Valley. Zone A, along Waikane Stream where archaeological sites had previously been identified, was subjected to a systematic and intensive survey and re-recordation of previously documented sites. Zone B, a transition area between the flatter areas near Waikane Stream and the extremely steep slopes along the valley walls, was subjected to a reconnaissance level survey. Zone C, comprising extremely steep slopes along the valley walls, was visually inspected from available vantage points in Zone B and from the ridgeline above. Seven sites were evaluated, several of them within a National Historic Register site. Four were reconfirmed as significant, two were recommended for deletion from state inventory, and one was newly identified as historic. All culturally significant sites appear to be located in Zone A, less than 0.2 kilometers from Waikane Stream.

Archeological monitoring was conducted during the SI fieldwork. Cultural materials, when encountered, were avoided.

1.2.8 PRESENCE OF MEC

According to the ASR, four people were injured in 1944, two fatally, when a 60mm mortar discovered in Waikane Valley accidentally detonated. Three children were injured in 1963 when a souvenir rifle grenade reportedly discovered in Waikane Valley exploded after it was thrown against a wall. Historic use of the project site as an impact area resulted in the USMC conducting ordnance clearance sweeps in 1976 and 1984. The 1976 clearance effort resulted in the removal of over 24,000 pounds of practice ordnance and scrap from the impact areas in Waikane Valley. An additional 16,000 pounds of demilitarized practice ordnance were removed from the site in 1984. The continued presence of MEC at the site was evidenced in 1990 when unexpended mortar rounds, a grenade, and shrapnel were discovered during an archaeological inventory of the FUDS property to the south and west of the WVTA MRS (U.S. Army Engineer District Honolulu 1996). Potential MEC at WVTA are as follows:

- Mortars, 60mm and 81mm;
- Rockets, 2.36 inch and 3.5 inch
- Grenades, HE and smoke;
- Projectiles, HE
- Signals
- Demolition Explosives
- Small arms

The presence of MEC is relevant because it may be an explosive hazard. MEC in the surface and subsurface soil may also release MC into the site soils through impact and detonation, corrosion, or leakage. Based on evidence collected from archives research work performed to date, chemical warfare materiel has not been used at WVTA.

1.2.9 PRESENCE OF MUNITIONS CONSTITUENTS

Based on the type of munitions used at WVTA and their composition, explosives and metals were the main components of the munitions used. Nitroaromatics, nitroamines, and 9 heavy metals (aluminum, antimony, barium, chromium, copper, iron, lead, nickel, and zinc) associated with the specific MEC were selected for analysis during the SI. Localized concentrations of copper and lead were detected for 4 of the samples, and these concentrations are believed to be related to high concentrations of munitions debris at the sampling locations.

1.2.10 CONTAMINANT MIGRATION ROUTES

Migration of MC may occur naturally through surface soil erosion, plant or animal uptake, or by human activities. Hawaiian rains are essentially free of the industrial acids and other chemicals typically associated with dissolving metals in soils, and therefore metals do not migrate easily through subsurface soil to the groundwater.

1.2.11 RECEPTORS

Potential human receptors include future onsite residents and construction workers, current and future offsite residents, and current and future recreational users. Human exposure routes are incidental ingestion of and dermal contact with soil. Recreational users are expected to have intermittent frequency of exposure on the site and will most likely be exposed to MC in the surface soil only. Future residents would have the most frequent and intimate exposure to surface and subsurface soil on the site, followed by construction or maintenance contractors.

Although chemicals from MEC items may have leached into the surface soil, the nature of local rainwater is not conducive to migration of heavy metals contaminants through subsurface soil to the groundwater. Hawaiian rains are essentially free of the industrial acids and other chemicals typically associated with dissolving metals in soils, and therefore metals do not migrate easily through subsurface soil to the groundwater.

Because the maximum penetration depth of munitions used at WVIA is 2-feet bgs, it is unlikely for MC to have migrated to depths greater than 3-feet bgs. In addition, groundwater at the site quickly empties into Waikane Stream because of the steep terrain and underlying rock strata, and is transported to the Pacific

Ocean approximately one mile downstream. This significantly reduces the potential for human exposure to MC in groundwater.

Ecological receptors include terrestrial plants (e.g., *Ohi'a* scrub) and animals living on or near the range. Terrestrial fauna may include soil invertebrates, mammals, and birds. Mammals observed at WVTA, including domestic dog, small Indian mongoose, domestic cat, and feral pig, are not native species, and are considered pests that potentially compete for native species habitat. Given this, native birds rather than mammals are considered species of concern for the ecological risk assessment. Exposure routes for birds typically include ingestion of soil, dermal contact with soil, inhalation of dust, and ingestion of plants and/or prey organisms that may assimilate or bioaccumulate MC. The majority of plant uptake, if occurring, is expected to occur from near surface adsorption through the root system, since MC presence is expected to be limited to the top 12 inches of soil.

1.2.12 NEARBY POPULATIONS

The EA indicates that the population of the Waikane community was 726 (U.S. Census 2000). The EA also indicated that the Waikane community had experienced some growth since the census, but that the family units closest to the project site have remained the same (Social Research Pacific, Inc.) Observations during the SI field activities were that there are approximately a dozen residences within a mile of WVTA, and that local residents frequently use the site for hunting boar and riding all-terrain vehicles.

1.2.13 BUILDINGS NEAR/WITHIN SITE

No buildings are located within the 187-acre MRS of WVTA. A residence is located adjacent to the boundary fence at the southeastern corner of the MRS. The next closest residence is located approximately 500 yards farther south.

1.2.14 UTILITIES ON OR NEAR SITE

No utilities are known to exist within the vicinity of the MRS.

1.2.15 LAND USE

The WVTA is currently unused and undeveloped. Approximately 52 acres (less than 28 percent) of the southern portion of the project site were leased for agricultural purposes prior to land acquisition by the federal government. The State of Hawaii land use classification for this leased area was Agriculture. Roughly 17 acres (33 percent) of this leased area was farmed with edible crops. Five vacant living units existed within the leased area. The remaining 135 acres are lands designated by the State of Hawaii Land Use Commission as Conservation and were within the area designated as the Waiahole Forest Reserve.

The EE/CA report indicates that the City and County of Honolulu has produced a Master Plan to develop the FUDS property adjacent to WVTA (874 acres) into the Waikane Valley Nature Park. The plan involves establishment of trails, rest and picnic areas, and lookouts to view surrounding landmarks, a ceremonial gathering place (halau), re-vegetation areas for native plants, stream ecology study areas, ponds for aquatic wildlife studies, agricultural fields, parking areas, and a visitor orientation area.

The majority of the acreage within Waikane Valley consists of inaccessible terrain that cannot be developed due to steep gulches, canyons, rocky outcrops, and mountains rising over 2,200 feet above sea level. However, evidence shows that the whole of Waikane Valley has been used, and will continue to be used, by sportsmen hunting wild boar and other game.

1.2.16 ACCESS CONTROLS OR RESTRICTIONS

The 187-acre MRS is fenced along the western, southern, and eastern boundaries. The eastern and western boundary fences terminate at higher elevations where the terrain is too steep for fence construction. The northern boundary is defined by the mountain ridge. The MRS fence is clearly marked with warning signs. Access is limited by dense vegetation, rugged terrain, a fence with three gates that remain locked, and warning signs. There is an entrance gate and access road to the WVTA located off of Waikane Valley Road approximately one mile west of the MRS. This gate remains locked to control access, but many of the local property owners have keys to the gate lock. Since the site is over 10 miles distance from MCB Hawaii, United States Marines security forces do not patrol the site constantly. Trespassers cut holes in the fence in order to access the restricted area by vehicle or on foot.

2.0 SUMMARY OF FIELD ACTIVITIES

This section documents the approach, methods, and operational procedures USAE employed to execute the SI. From 1 October to 30 October 2008, the SI Field Team conducted MEC reconnaissance operations within the 187-acre MRS. From 14 to 21 October 2008, the subcontractor Wil Chee Planning conducted soil sampling.

Fieldwork was conducted in accordance with the approved Work Plan by a USAE team consisting of a Site Manager, Senior UXO Supervisor, a dual-hatted UXO Safety Officer/Quality Control Specialist, a UXO Technician III, three UXO Technicians II, two UXO Technicians I, and an Emergency Medical Technician. Two environmental technicians from subcontractor Wil Chee Planning conducted the soil sampling with support from USAE UXO Technicians. Fieldwork consisted of mobilization, boundary surveying, limited vegetation clearance as needed, and an instrument-assisted reconnaissance survey of the MRS to identify any evidence of MEC.

2.1 VISUAL SURVEY

During the SI fieldwork, the USAE Team surveyed the MRS for the purpose of confirming the presence of MEC and collecting physical data on munitions location, type, and density, where applicable. The reconnaissance overview map at Figure A-2 depicts the MRS and the instrument-assisted ground reconnaissance areas surveyed.

The survey design goal was to inspect 36 cells and approximately 10 acres of transects. Survey transects were represented on design drawings as running in straight lines across the site, with the work plans explaining that actual transects and grids would be determined in the field because straight-line transects and evenly-spaced grids would be impossible to accomplish in the steep terrain. During field operations, the reconnaissance team found that it was more practical to survey transects in an up-down direction rather than to follow contour lines. The field team also found that the steep terrain and dense vegetation made it impossible to always establish 100 foot by 100 foot cells, and adjusted sizes and locations of cells as necessary to obtain the required acreage and to ensure representative coverage of the 187-acre site.

During design, areas of the site above the 700-foot elevation contour were considered inaccessible for SI purposes, and the higher portions of the site were originally excluded from survey. During field execution, survey teams were able to run several transects to the northern boundary at the top of the ridge, at higher than 1000 feet in elevation.

During the reconnaissance survey, 9.55 acres in transects and 42 cells amounting to 5.2 acres were surveyed, for a total of 14.75 acres. This acreage exceeded the scoped requirement of 14 acres. Data collected during the reconnaissance, along with existing archival data, is used to determine the amount and location of areas requiring further investigation. Figure A-2 depicts the MRS and actual areas in which instrument-assisted ground reconnaissance was conducted. Daily and weekly status reports from the field effort are included in Appendix C.

2.1.1 DATA ASSESSMENT AND PLANNING

The scope of the MEC inspection was to conduct reconnaissance survey with the aid of metal detectors of at least 14 acres out of the total 187 acres to the highest elevations possible. The Work Plan goal was to inspect 36 cells totaling 8.3 acres and 10 acres of transects, for a total of 18.3 acres. The reconnaissance survey was designed to address the accessible areas of the MRS, and to collect soil samples. The reconnaissance teams were only expected to reach as high as the 700-foot elevation because of the difficult terrain, but during the actual survey they were able to extend to 900 feet in several locations.

2.1.2 INSTRUMENT TEST PLOT AND DAILY INSTRUMENT CHECKS

To ensure the quality of the reconnaissance survey data relative to anomaly detection, USAE established an instrument test plot within the southeast corner of the MRS. The test plot was used to evaluate and select the optimal detection instrument and appropriate instrument settings for the site. The test plot included two inert MK2 hand grenades, two inert 37mm projectiles, one inert 60mm Drill mortar, one inert 81mm Drill mortar, one inert 2.36 inch Anti-Tank Rocket, and one inert 75mm projectile, buried in horizontal orientation at various depths. The site management team evaluated the performance and suitability of both the Schonstedt GA-52cx hand-held magnetometer and Minelab Explorer II hand-held all metals detector within the selected munitions seed items specific settings for an instrument-assisted survey.

The Site Management Team reviewed the instrument test results and selected the Minelab Explorer II based on site geology and detection performance demonstrated during the on-site initial instrument test. After the initial instrument test, the team tested the metal detectors each workday at the test plot prior to field activities. This test included a functions check as recommended by the instrument manufacturer and the location check at the test plot.

The Initial Instrument Test and Daily Instrument Checks were also performed with the Trimble GeoXT handheld global positioning system (GPS). In order to ensure consistent and reliable data, instrument tests were performed each morning at the instrument test plot prior to commencing survey operations.

2.1.3 MEC DATA COLLECTION

USAE began the instrument aided reconnaissance survey of the MRS on 6 October 2008. The survey team was equipped with a Minelab Explorer II handheld metal detector to assist in detecting magnetic material potentially obscured by surface vegetation and debris. For data collection, navigation, and GPS tracking, the team used the ruggedized GPS/data collection tool with integrated Geographical Information System (GIS) software and site topographical map overlain with idealized survey transects and cells. Through a series of check-selection and pull-down menus, the GPS/data collection tool provided the ability to digitally record the information collected. The team recorded the following data during the survey:

- The size, type, and location coordinates of each MEC item encountered
- The location and type of any MPPEH, munitions debris, or significant site feature
- The number of surface and subsurface anomaly contacts
- The actual traversed survey tracks
- The actual surveyed cell locations.

At the end of each workday, the USAE Site Manager downloaded, post processed and transferred the electronic survey data to the USAE GIS Manager. The USAE GIS Manager downloaded and retains the electronic data in the USAE GIS Server. The GIS Manager incorporated the electronic data into the Waikane Valley GIS project and created maps to graphically represent the survey data (See Appendix A).

The USAE Team surveyed a total of 14.75 acres within the MRS, completing the instrument-aided reconnaissance survey on 30 October 2008. Figure A-2 provides an overview of the survey. Specific findings of the survey are detailed in Section 3 and Figures A-3 and A-4.

2.2 SOIL SAMPLE COLLECTION

Soil sample collection for the MRS was conducted from 14 through 21 October 2008. The sample collection team consisted of two Environmental Technicians (from subcontractor Wil Chee Planning) collecting samples and two UXO Technicians from USAE providing escort and anomaly avoidance support. Prior to sampling, the UXO Technicians identified any surface anomalies, and swept each sample location with a metal detector to ensure there were no subsurface magnetic anomalies. If a subsurface magnetic anomaly was encountered, it was assumed to be possible MEC and the sample location was relocated.

Concurrent surface soil sampling for evidence of MC was conducted as part of the field effort. Given the topography of the site and expected depth of MC resulting from the type of munitions known to be used at the site, the design for soil sampling for MC constituents at the MRS consisted of the following:

- Five 10-point composite samples collected within ravines situated along the north valley wall.
- Thirty 10-point composite samples collected in the area downgradient of the north valley wall ravines and scarps toward Waikane Stream and the valley floor.
- Ten discrete samples collected at surface MEC discoveries.
- Five quality control (QC) sample (10 percent of the total primary soil samples).

Composite soil samples were collected at 35 locations throughout the MRS (Figure A-7). Due to heavy vegetation, mountainous topography, and presence of MEC at the MRS, systematic gridding to establish sampling nodes was not possible. Instead, a central sampling node was established at each of the 35 locations and an area of up to 50-feet in diameter was sampled by collecting a 10-point composite sample. Using disposable scoops, two ounces of soil was collected from 0 to 6 inches below ground surface at the center node and placed in a foil-lined mixing bowl. Nine additional increments were also collected at locations radiating outwards between 10 and 50 feet from the center node and placed in the same foil-lined mixing bowl. The soil was then thoroughly mixed using the plastic scoop and gloved hands until a consistent physical appearance was achieved. The composite sample was then transferred from the bowl to a sample container for shipment to the off-site analytical laboratory. A total of 35 primary and 4 QC soil samples were collected from these areas.

Additional biased soil sampling was also employed during the field survey as surface MEC discoveries were made. A total of 10 discrete soil samples and 1 QC sample were collected from 0 to 6 inches below ground surface using disposable plastic scoops. Ten discrete soil samples were collected as described below:

- MEC036 – Collected from target area where small arms bullet projectiles and 3.5 inch HEAT rockets were visibly present.
- MEC037 – Collected from target area where small arms bullet projectiles and 3.5 inch HEAT rockets were visibly present.
- MEC038 – Collected adjacent and downgradient from one, 3.5 inch HEAT rocket.
- MEC040 – Collected adjacent and downgradient from one, 2.36 inch HEAT rocket warhead.
- MEC042 – Collected from a target area where small arms bullet projectiles and 3.5 inch HEAT rockets were visibly present.
- MEC043 – Collected from a target area where small arms bullet projectiles and 3.5 inch HEAT rockets were visibly present.
- MEC044 – Collected adjacent and downgradient from one, 3.5 inch HEAT rocket. Located within a ravine area where many 3.5 inch rocket remnants are present.
- MEC046 – Collected adjacent and downgradient from one, 3.5 inch HEAT rocket. Located inside Grid 18.
- MEC049 – Collected adjacent and downgradient from one, 3.5 inch HEAT rocket. Located within a ravine area where many 3.5 inch HEAT rocket remnants are present.
- MEC050 – Collected adjacent and downgradient from one, 3.5 inch HEAT rocket.

Field QC soil samples consisted of co-located field duplicates collected and analyzed at a frequency of 10 percent of the primary soil samples (i.e., 1 QC sample for every 10 primary samples). A total of 5 co-located field duplicates were collected as follows: 4 from the 35 sampling locations below the north valley wall and 1 from a discrete MEC discovery area. Co-located field samples were acquired by collecting soil increments up to 6 inches from the original increment location in the same manner as the primary soil sample.

2.2.1 SUMMARY OF ANALYTICAL RESULTS

Fifty soil samples (45 primary, and 5 QC duplicates) were collected during this site investigation and submitted for laboratory analysis. The analytical laboratory, Curtis and Tompkins, used standard analytical methods as outlined in the USEPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Metho*ds (USEPA, 1998). Primary and QC analytical results are presented in table format in Appendix B. Soil samples were analyzed for the following:

- Nitroaromatics and Nitroamines by USEPA Method 8330
- Heavy Metals (aluminum, antimony, barium, chromium, copper, iron, lead, nickel, and zinc) by USEPA Method 6010B

Analytical results were screened against the PALs which consisted of the revised 2009 Hawaii Department of Health (HDOH) Environmental Action Levels (EALs), or USEPA Region 9 2009 residential Regional Screening Levels (RSLs), whichever was more stringent. The HDOH EALs consider both ecological endpoints and human health endpoints. Given this, the screening against EALs is considered to be consistent with the objectives and requirements of Tier 1 (Screening Risk Assessment, or SRA) of the U.S. Department of Navy's overall tiered framework for ecological risk assessment (Navy, 2003).

In order to differentiate between naturally-occurring background levels of MC at WVTA, the analytical results for metals in the soil samples were also compared to the 95th percentile background concentrations of metals from the *Environmental Background Analysis of Metals in Soil at Navy Oahu Facilities*, Pacific Division, Naval Facilities Engineering Command (Earth Tech, 2006). Koolau soils described in Section 1.2.2 are covered under this background analysis. The Koolau volcanic series is the type of Caprock from which the soil at Waikane Valley was derived.

A comparison of analytical results to PALs and background levels is presented in Appendix B, 2008 Summary Table of Analytical Results. For all but four samples (MEC019, MEC021, MEC042, and MEC043), the results indicate the soil sample concentrations are well below the screening criteria (background concentration and PALs), as shown in the Summary Table.

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3.0 SITE INSPECTION FINDINGS

3.1 MUNITIONS AND EXPLOSIVES OF CONCERN

Significant evidence of MEC was discovered on the ground surface (Figure A-3), and visual evidence of MD appeared in similar distribution to the MEC (Figure A-4). A total of 70 UXO items were found, including 1 2.36-inch shoulder fired HEAT rocket warhead, 66 3.5-inch shoulder fired HEAT rockets, and 3 HEAT rifle grenades. MD consisted mostly of debris from 2.36-inch and 3.5-inch rockets, rifle grenades, and expended small arms rounds, along with one base section from a 75 mm projectile and an expended M32 percussion primer from a 60mm mortar ignition cartridge. No other evidence of mortars or projectiles was found.

During the reconnaissance, numbers and locations of surface and subsurface anomalies were collected on GPS/data collection tools. USAE analyzed the ground reconnaissance results in order to establish contour maps for surface and subsurface density distribution. A multiplier (total site acreage divided by acreage surveyed) was applied to the surface and subsurface counts. The surface and subsurface counts were then multiplied by the calculated multiplier. By applying this multiplier, the surface and subsurface counts better represent actual conditions throughout the entire site, not just the areas surveyed. The reconnaissance data is then run through the Density function inside Spatial Analyst, a module of ArcGIS. This density function analyzes each point in the reconnaissance data, searches for other data points within a pre-determined radius and uses the values to interpolate density contours for the entire area that was surveyed. The resulting density data can then have colors assigned to density ranges and can be displayed on a map (see Figures A-5 and A-6).

Since the spatial density maps are based on interpolation of data, the color contours cannot be relied on alone for location of target areas. For example, some contours on the eastern and southern boundaries extend outside the boundaries of WVTA when in fact no reconnaissance was performed outside the boundaries. The purpose for developing the contours was to determine approximately where the denser concentrations of MEC may exist. USAE compared the contour data to hard evidence of MEC and personal observations of the Site Manager to outline four distinct target areas (Figure A-8 and Photos D-24 and D-25).

The suspected target locations are characterized by steep slopes, severe erosion, and various degrees of vegetation densities. It was noted during the survey that, over the years since munitions were last fired into these suspected target locations, severe erosion has caused significant movement of the MEC and MD from original locations on higher ground where targets were once situated to the lower valleys and flat land areas to the south. Traversing the terrain within the suspected target locations is very difficult. A majority of the steep slopes are inaccessible, but most of the valleys within these locations, and the flat land areas below the targets south towards Waikane stream are accessible.

3.2 MUNITIONS CONSTITUENTS

The analysis of soil samples reveals a potential for copper and lead contamination above PALs within very localized areas (MEC019, MEC021, MEC042, and MEC043). The localized concentrations of copper and lead are believed to be related to high concentrations of munitions debris and the results of past operational practices (see Figure A-7). Validated analytical results are presented in Appendix B.

3.2.1 NITROAROMATICS AND NITROAMINES

No nitroaromatics or nitroamines were detected at concentrations exceeding the PALs. In addition, all laboratory reporting limits were below the respective PALs for each nitroaromatic and nitramine compound.

3.2.2 METALS

Aluminum (Al)

All fifty samples (45 primary and 5 QC) contained detectable concentrations of aluminum ranging from 25,000 milligrams per kilogram (mg/kg) to 73,000 mg/kg, below the PAL of 77,000 mg/kg. All laboratory reporting limits for aluminum were below PALs.

The 95th percentile background concentration of aluminum found in Koolau volcanic soils is 93,900 mg/kg, suggesting that detections of aluminum may be a result of naturally occurring processes (Earth Tech, 2006). Based on these factors, aluminum is not considered a chemical of potential concern (COPC) for this site.

Antimony (Sb)

Seven samples (5 primary and 2 QC) contained detectable concentrations of antimony ranging from 0.2 mg/kg to 4.3 mg/kg, below the PAL of 6.3 mg/kg. All laboratory reporting limits for antimony were below PALs.

The 95th percentile background concentration of antimony found in Koolau volcanic soils is 6.9 mg/kg, suggesting that detections of antimony may be a result of naturally occurring processes (Earth Tech, 2006). Based on these factors, antimony is not considered a COPC for this site.

Barium (Ba)

All fifty samples (45 primary and 5 QC) contained detectable concentrations of barium ranging from 14 mg/kg to 120 mg/kg, below the PAL of 750 mg/kg. All laboratory reporting limits for barium were below PALs.

The 95th percentile background concentration of barium found in Koolau volcanic soils is 181 mg/kg, suggesting that all detections of barium may be a result of naturally occurring processes (Earth Tech, 2006). Based on these factors, barium is not considered a COPC for this site.

Chromium (Cr)

All fifty samples contained concentrations of chromium ranging from 210 mg/kg to 400 mg/kg, below the PAL of 500 mg/kg. All laboratory reporting limits for chromium were below PALs.

The 95th percentile background concentration of chromium found in Koolau volcanic soils is 483 mg/kg, suggesting that all detections of chromium may be a result of naturally occurring processes (Earth Tech, 2006). Based on these factors, chromium is not considered a COPC for this site.

Copper (Cu)

Four samples (3 primary and 1 QC) contained concentrations of copper which exceed the PAL of 230 mg/kg. Primary samples MEC019, MEC042, MEC043, and QC sample MEC021 contained copper at respective concentrations of 350 mg/kg, 1,300 mg/kg, 360 mg/kg, and 250 mg/kg. The remaining forty-six samples contained concentrations of copper ranging from 62 mg/kg to 190 mg/kg, below the PAL of 230 mg/kg. All laboratory reporting limits for copper were below PALs.

The 95th percentile background concentration for copper in Koolau volcanic soils is 183 mg/kg. Based on these factors, copper detected in concentrations exceeding the PAL of 230 mg/kg is considered a COPC for this site. To further evaluate the potential for ecological risk from copper, an assessment consistent with the objectives and requirements of Step 3a of Tier 2 (Baseline Ecological Risk Assessment, or

BERA) of the Navy's overall tiered process was conducted, and is provided as Appendix F. The results indicate that risk to ecological receptors is *de minimis* and meets the HDOH regulatory limits for copper.

Iron (Fe)

All fifty samples (45 primary and 5 QC) contained concentrations of iron which exceed the PAL of 55,000 mg/kg. Detection of iron ranged in concentration from 64,000 mg/kg to 140,000 mg/kg. All laboratory reporting limits for iron were below PALs.

The 95th percentile background concentration of iron found in Koolau volcanic soils is 177,000 mg/kg, suggesting that detections of iron may be a result of naturally occurring processes (Earth Tech, 2006). Based on these factors, iron is not considered a COPC for this site.

Lead (Pb)

Two primary samples contained concentrations of lead which exceed the PAL of 200 mg/kg. Samples MEC019 and MEC042 contained lead at respective concentrations of 350 mg/kg and 960 mg/kg. In addition, forty-one samples (36 primary and 5 QC) contained lead at concentrations ranging from 0.25 mg/kg to 120 mg/kg, below the PAL of 200 mg/kg. All laboratory reporting limits for lead were below PALs.

The 95th percentile background concentration of lead found in Koolau volcanic soils is 100 mg/kg. Based on these factors, lead detected in concentrations exceeding the PAL of 200 mg/kg is considered a COPC for this site. To further evaluate the potential for ecological risk from lead, an assessment consistent with the objectives and requirements of Step 3a of Tier 2 (Baseline Ecological Risk Assessment, or BERA) of the Navy's overall tiered process was conducted, and is provided as Appendix F. The results indicate that risk to ecological receptors is *de minimis* and meets the HDOH regulatory limits for lead.

Nickel (Ni)

Twelve primary samples contained concentrations of nickel ranging from 150 mg/kg to 230 mg/kg, exceed the PAL of 150 mg/kg. The remaining thirty-eight samples (33 primary and 5 QC) contained nickel at concentrations ranging from 33 mg/kg to 140 mg/kg, below the PAL of 150 mg/kg. All laboratory reporting limits for nickel were below PALs.

The 95th percentile background concentration of nickel found in Koolau volcanic soils is 346 mg/kg, suggesting that detections of nickel may be the result of naturally occurring processes. Based on these factors, nickel is not considered a COPC for this site.

Zinc (Zn)

All fifty samples (45 primary and 5 QC) contained detectable concentrations of zinc ranging from 50 mg/kg to 190 mg/kg, below the PAL of 600 mg/kg. All laboratory reporting limits for zinc were below PALs.

The 95th percentile background concentration of zinc found in Koolau volcanic soils is 197 mg/kg, suggesting that detections of nickel may be the result of naturally occurring processes. Based on these factors, zinc is not considered a COPC for this site.

4.0 REVISED CONCEPTUAL SITE MODEL

The conceptual site model (CSM) (Figure A-8) describes the site and its environmental setting and presents information regarding MEC and MC contaminant sources, MEC and MC migration pathways, and receptor exposure pathways potentially present at the MRS. The data collected during this SI has been used to revise the CSM, and to confirm or deny the preliminary conclusions presented with the Preliminary CSM during work plan development.

4.1 SOURCE AREA AND SOURCE MEDIA

The preliminary assessment identified the source areas for WVTA as impact areas on the steep slopes above Waikane Stream. Source media was assumed to be the following types of MEC:

- Mortars, 60mm and 81mm
- Rockets, 2.36 inch and 3.5 inch
- Grenades, Smoke and HE
- Projectiles, HE
- Signal Flares
- Small Arms.

During the SI, the entire suspect area was investigated and sampled for the continued presence of source media (e.g., impacted soils and munitions) and sampled for the continued presence of MC.

The SI confirmed presence of small arms, rifle grenades, and 2.36-inch and 3.5-inch rockets as source media at WVTA. In addition, evidence gathered during the reconnaissance survey indicates that 4 distinct target areas were used within the MRS. These target areas are shown on Figure A-8. The targets were apparently used for practice firing of rockets and rifle grenades. The 75 mm base plate and percussion primer for a mortar ignition cartridge found during the SI were apparently kick-outs from detonations at other targets on the adjacent FUDS property.

The preliminary CSM considered aluminum, antimony, barium, chromium, copper, iron, lead, nickel, and zinc as potential MC because of their use in production of the above source media. Nitroamines and nitroaromatics were potential MC because of their use as propellants and explosives.

SI sampling results for all analytes showed that four samples (MEC019, MEC021, MEC042, and MEC043) exceeded the 230 mg/kg PAL for copper (maximum concentration 1,300 mg/kg) and two of those four samples (MEC019 and MEC042) exceeded the 200 mg/kg PAL for lead (maximum concentration 960 mg/kg. None of the samples exceeded PALs for explosives. The 4 samples were taken from points shown on Figure A-7, and are located within the target areas identified in Figure A-8.

4.2 RELEASE PROFILE, EXPOSURE MEDIA, AND EXPOSURE ROUTES

4.2.1 MUNITIONS AND EXPLOSIVES OF CONCERN

The release profile for the potential MEC contamination at or below the ground surface is identified to be MEC transported through human activities, surface water run-off, or soil erosion. The potential exposure media would include surface soil, subsurface soil, and inland surface water sediments. Transport pathways leading to potential exposure to on-site receptors tend to result in reduced MEC exposure at receptor points distant from the site. The target areas identified during the SI are located in steep, unstable areas subject to erosion. The exposure route for MEC hazards is exclusively direct contact.

4.2.2 MUNITIONS CONSTITUENTS

The release profile for the potential MC contamination is identified as MC transported with soil erosion, surface water, or groundwater. The potential exposure media would include surface soils, subsurface soil, and inland surface water sediments.

Transport pathways leading to potential exposure to on-site receptors also tend to result in reduced MC concentrations at receptor points distant from the MRS. Although chemicals from MEC items may have leached into the soil, conditions at the site are not conducive to migration of heavy metals contaminants through subsurface soil to the groundwater. In addition, groundwater at the site quickly empties into Waikane Stream because of the steep terrain and underlying rock strata, and is transported to the Pacific Ocean approximately one mile downstream. This significantly reduces the potential for human exposure to MC in groundwater.

Chemical transport with groundwater may result in MC entering the Waikane Stream, which is down-gradient from the four sampling locations which exceeded PALs. Attenuation processes are likely to reduce chemical concentrations to the point that exposure at the Stream is insignificant, and therefore this pathway is considered incomplete for all on-site receptors. The potential risks to ecological receptors associated with surface water and sediment will be further evaluated during a Remedial Investigation (RI).

4.3 RECEPTORS

4.3.1 HUMAN

The CSM evaluates three potential human receptor groups: (1) future onsite residents and construction workers, (2) current and future offsite residents, and (3) current and future recreational users. There are currently no onsite residents.

4.3.2 ECOLOGICAL

The ecological receptor CSM evaluates two potential receptor groups: (1) terrestrial wildlife, and (2) aquatic wildlife. No nitrates exceeding PALs were found during the SI. To further evaluate the potential for ecological risk from copper and lead, an assessment consistent with the objectives and requirements of Step 3a of Tier 2 (Baseline Ecological Risk Assessment, or BERA) of the Navy's overall tiered process was conducted, and is provided as Appendix F. The Hawaiian short-eared owl, or pueo, was selected as the assessment endpoint because it is a species of concern in the State of Hawaii, may at times forage on small animals at WVTA, and is therefore a potential receptor of contaminants occurring there. The pueo would be expected to experience a high-end exposure to any potential MC due to its position in the food web, and therefore is considered a conservative representation of other birds using the site.

4.4 PATHWAY ANALYSIS

Figure A-8 represents the revised CSM that illustrates both MEC and MC source-receptor interactions at WVTA.

4.4.1 HUMAN

Analysis of the profile information allowed USAE to identify source-receptor interactions (exposure pathways) for the MRS. For MEC, exposure pathways at WVTA include source, access, activity and receptor. For MC, exposure pathways include source, and exposure medium, and exposure route, and receptor.

For the source area (targets) identified in Figure A-8, the MEC contaminants are mortars, rockets, grenades, and small arms. MEC exists on the surface and subsurface. If disturbed or handled inappropriately, the MEC items could pose a serious explosive hazard. Interaction for the MEC component of this CSM requires an exposure route (access) and exposure media. Current access to the source area is somewhat restricted by heavy vegetation, rough terrain, and a chain-link fence, but there is ample evidence that humans access the source area. Activities, which can bring receptors into contact with potential MEC are boar hunting, all-terrain vehicle riding, recreational use, and potential future residential or construction activities. All on-site receptors have the potential for exposure.

For the MC source area (targets) identified in Figure A-8, the COPC are copper and lead. The source-receptor interaction requires an exposure medium and an exposure route. The MC exposure media for this MRS has been identified as surface soil, subsurface soil, surface water/sediments, and groundwater. Surface soil, subsurface soil, and surface water/sediment exposure routes are dermal contact and incidental ingestion. Inhalation of windblown particulates is not considered a potentially complete exposure route because of the wet climate, heavy vegetation, and high canopy which provides protection from the wind. The potential risks to human receptors associated with surface water and sediment will be further evaluated during the RI.

Excavation conducted by future onsite residents, construction workers, and recreational users (or trespassers) may result in direct contact with exposure to MEC and exposure to MC contaminated subsurface soil. Serious erosion of the target areas has occurred in the past and further erosion is anticipated in the future, but there is no evidence that this previous erosion has caused migration of MEC to Waikane Stream, where it would be subject to transport off site. The exposure pathway to off-site receptors is considered incomplete because of the attenuating effect of distance from the site.

Hawaiian rains are essentially free of the industrial acids and other chemicals typically associated with dissolving metals in soils, and therefore metals do not migrate easily through subsurface soil to the groundwater. Although a drinking water aquifer is located below this site, groundwater at the site passes quickly into Waikane Stream because of the steep terrain, and empties into the Pacific Ocean approximately a mile downstream. Since metals in soil have a low affinity for dissolving in the local waters, and since the groundwater passes quickly through the site and to the ocean, this pathway is considered incomplete.

4.4.2 ECOLOGICAL

Analysis of the profile information allowed USAE to identify source-receptor interactions (exposure pathways) for the MRS. Onsite ecological receptors may be exposed to MEC lying on the surface or in the root zone. Terrestrial animals are subject to exposure to MEC hazards, either by traveling across the surface or burrowing.

Foraging activities of onsite terrestrial ecological receptors (such as the short-eared owl) may result in direct contact exposure to contaminated soil, and burrowing activities may result in direct contact exposure to contaminated subsurface soil. The pathway is incomplete for terrestrial animals to contact MC in on-site groundwater, since metals have a low affinity for dissolving in the local waters, and since the groundwater passes quickly through the site and to the ocean. The potential risks to ecological receptors associated with surface water and sediment will be further evaluated during the RI.

The BERA results indicate that risk to ecological receptors is *de minimis* and meets the HDOH regulatory limits for copper and lead. Therefore, any residual risk from these metals would be limited to potential human exposures.

5.0 MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL

In 2001, Congress directed that the DoD identify and then prioritize their munitions response sites (MRSs). The protocol was published as a rule on 5 October 2005 (35 CFR Part 179). The protocol was designed to: 1) maximize use of the latest MRS-specific data, and 2) be applied early in the munitions response process. The protocol assigns a relative priority to each location in the DoD's inventory of defense sites known or suspected of containing UXO, DMM, or MC, and prescribes procedures for prioritizing the defense sites and general component responsibilities.

The site priority ranking is based on the risk posed by potential hazards captured in data entered for three hazard evaluation modules of the munitions response site prioritization protocol (MRSPP): explosive hazard evaluation (EHE) module, chemical warfare materiel (CWM) hazard evaluation (CHE) module, and the health hazard evaluation (HHE) module. Separate MRSPP tables (EHE Tables 1 through 10, CHE Tables 11 through 20, HHE Tables 21 through 28, MRS Priority Table 29, and MRS Background Information Table A) were completed.

MRS priorities range from 1 (highest priority) to 8 (lowest priority). Alternative module rates can include *evaluation pending*, *no longer required*, or *no known or suspected explosive (explosive, CWM, and/or MC) hazard*. Only sites with a CHE rating of A qualify for a MRS priority of 1. The Waikane Valley Training Area was not known or suspected to have CWM. MRS priorities were initially assigned to the site in 2007. Updated MRS priority tables are presented in Appendix E and summarized below.

Table 5-1: Summary of MRS Priority or Alternative MRS Rating

Munitions Response Site	EHE Priority	CHE Priority	HHE Priority	MRS Priority
Former Waikane Valley Impact Area (UXO 0022)	3	--	--	3

Note:

-- No known or suspected CWM, or HHE hazard, as applicable

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

SI activities were conducted at WVTA. Field activities included an instrument-aided reconnaissance and collection of surface soil samples. The visual inspection entailed inspection of a total of 14.75 acres.

The survey team found substantial evidence of MEC remaining at the MRS. The heaviest concentrations of MEC are associated with four target areas identified on Figure A-8. The suspected target locations are characterized by steep slopes, severe erosion, and lack of vegetation. The steepest slopes are inaccessible except by rappelling, but the areas below the targets are accessible. The following MEC items, which were considered as UXO because they were fired and fuzed, were found:

- 2.36-inch HEAT rocket warhead – 1 UXO
- 3.5-inch HEAT rockets – 66 UXO
- HEAT rifle grenades – 3 UXO.

MD consisted mostly of debris from 2.36-inch and 3.5-inch rockets, rifle grenades, and expended small arms rounds, along with one base plate from a 75 mm projectile and a percussion primer for a mortar ignition cartridge. No other evidence of mortars or projectiles was found.

A total of 50 surface soil samples were collected, including 35 composite samples collected between Waikane stream and the north wall, 10 discrete samples at locations of MEC finds, and 5 QC samples. The samples were tested for explosives (nitroaromatics and nitroamines) and heavy metals (aluminum, antimony, barium, chromium, copper, iron, lead, nickel, and zinc). The analytical results were compared against criteria specified in Section 3 of this report, which included EPA Region 9 RSLs, HDOH EALs, and soil background criteria. SI sampling results for all analytes showed that four samples (MEC019, MEC021, MEC042, and MEC043) exceeded the 230 mg/kg PAL for copper (maximum concentration 1,300 mg/kg) and two of those four samples (MEC019 and MEC042) exceeded the 200 mg/kg PAL for lead (maximum concentration 960 mg/kg). The localized concentrations of copper and lead are believed to be related to high concentrations of munitions debris and the results of past operational practices (Figure A-7). The results of the BERA indicate that risk to ecological receptors is *de minimis* and meets the HDOH regulatory limits for copper and lead. Therefore, any residual risk from these metals would be limited to potential human exposures. The results indicate no detectable concentrations of explosive MC.

6.2 RECOMMENDATIONS

Historical data and survey results support the need for further munitions response at the MRS under the MMRP. An RI is recommended, consisting of a 100% surface sweep of MEC areas identified by this SI and shown on Figure A-8. This surface sweep should focus on accessible terrain north of the Waikane stream within or below the suspected target locations, clearing the areas of all surface MEC and MD.

Following the surface clearance, a subsurface anomaly investigation should be completed within the surface-cleared areas in order to determine depth of penetration and density of MEC within each target area. Grids of 50 feet by 50 feet, with 8 grids spread across the target (a total of 2 acres for the 4 targets) will be sufficient to characterize the MEC hazard at the targets. Within these grids, 100 percent of the anomalies should be investigated to depth of detection using hand-held metal detectors.

Soil samples should also be taken near the sites of previous Samples MEC019, MEC021, MEC042, and MEC043 to establish the extent of the localized copper and lead impacts. Sediment samples should be taken at Waikane Stream to determine whether copper or lead have reached the stream. Upon the completion of the RI, a feasibility study, if needed, should explore the various remediation alternatives for dealing with the residual risk.

7.0 REFERENCES

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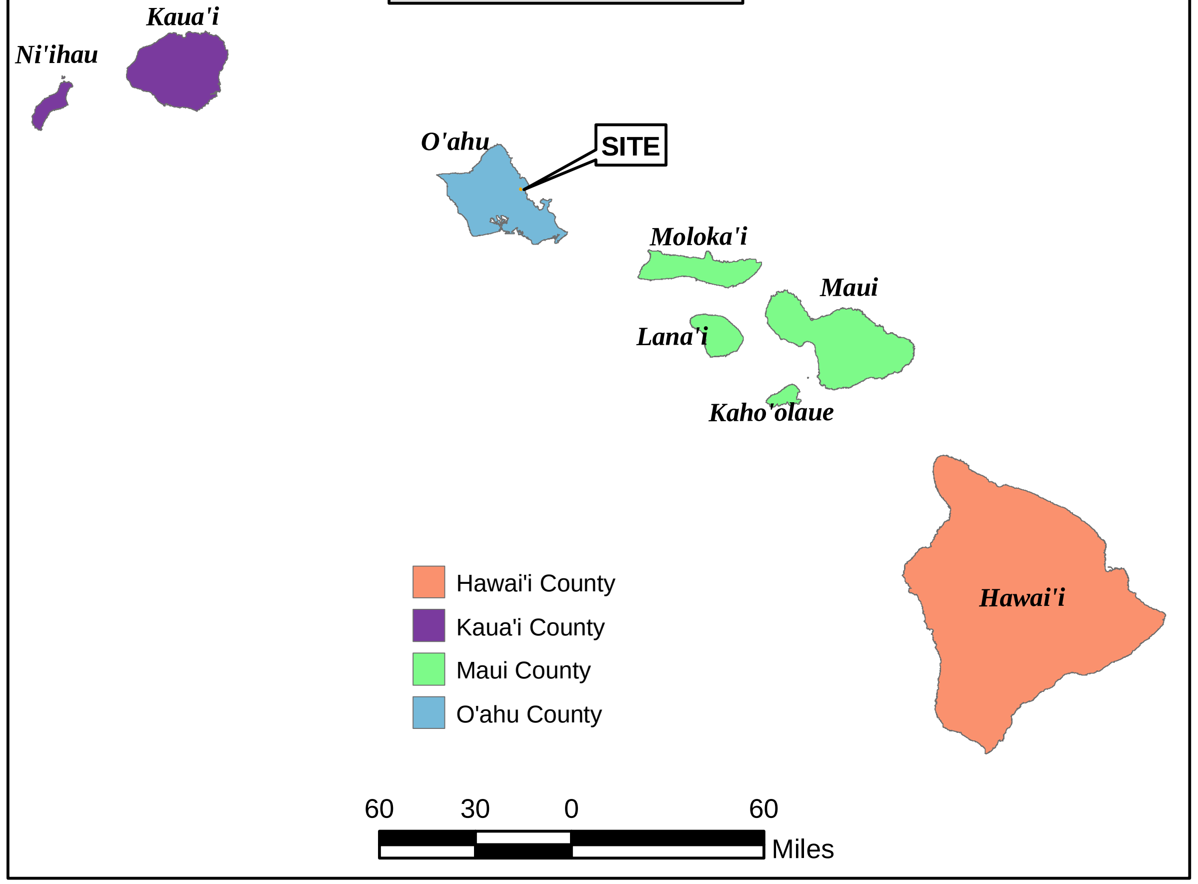
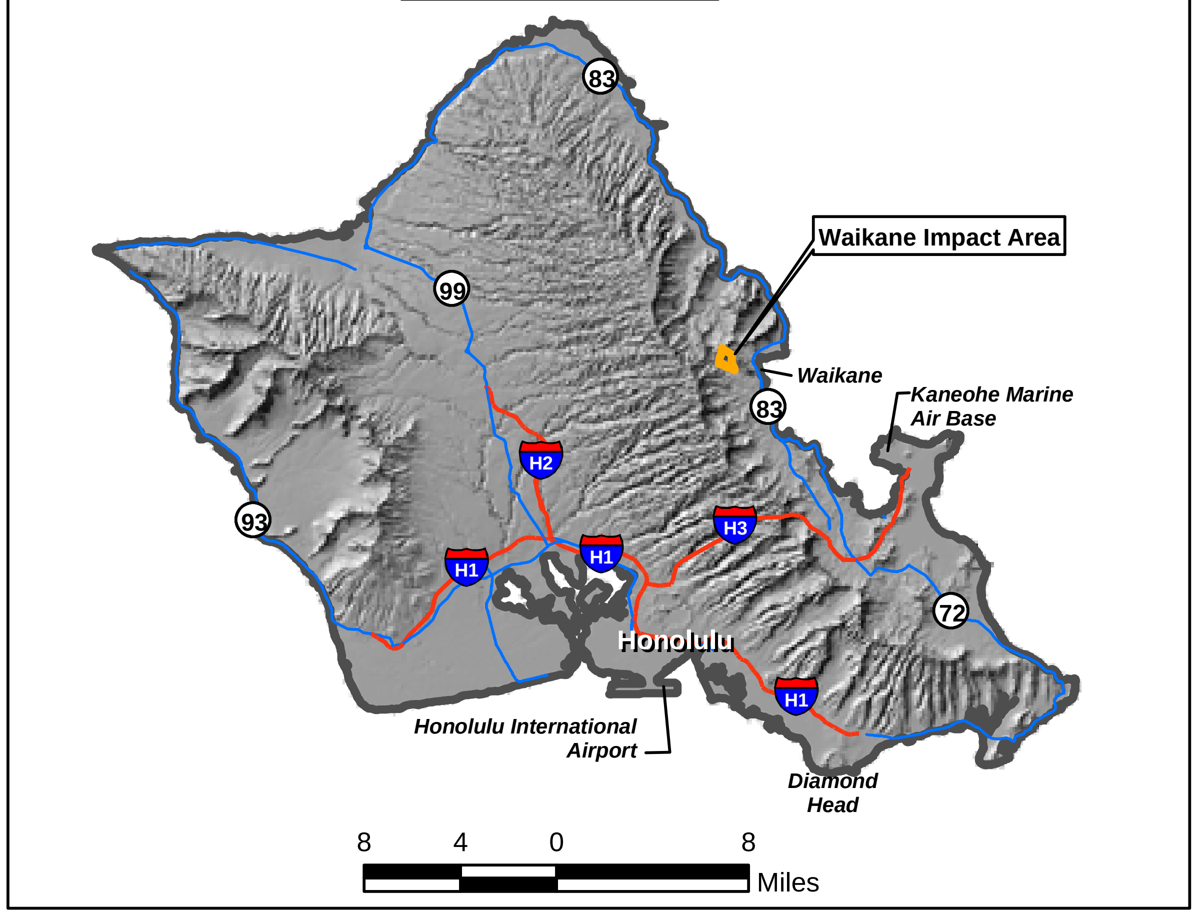
APPENDIX A. SITE MAPS AND FIGURES

This appendix contains the following figures:

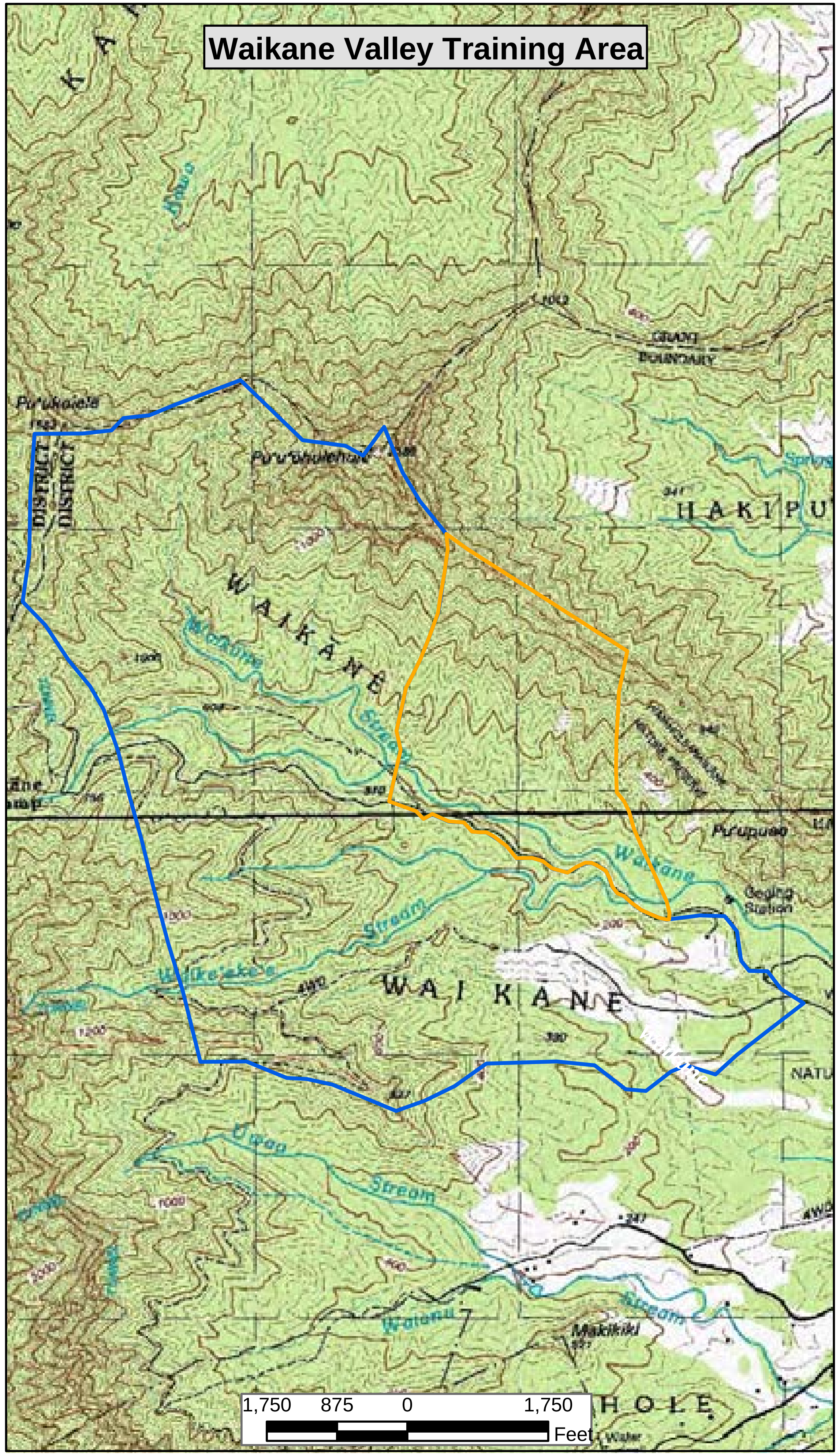
Hawaiian Islands



Island of O'ahu



Waikane Valley Training Area



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Data is projected to the State Plane Coordinate System:
Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-1

Location Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

🟧 Training Area Boundary

🟦 Waikane FUDS Boundary

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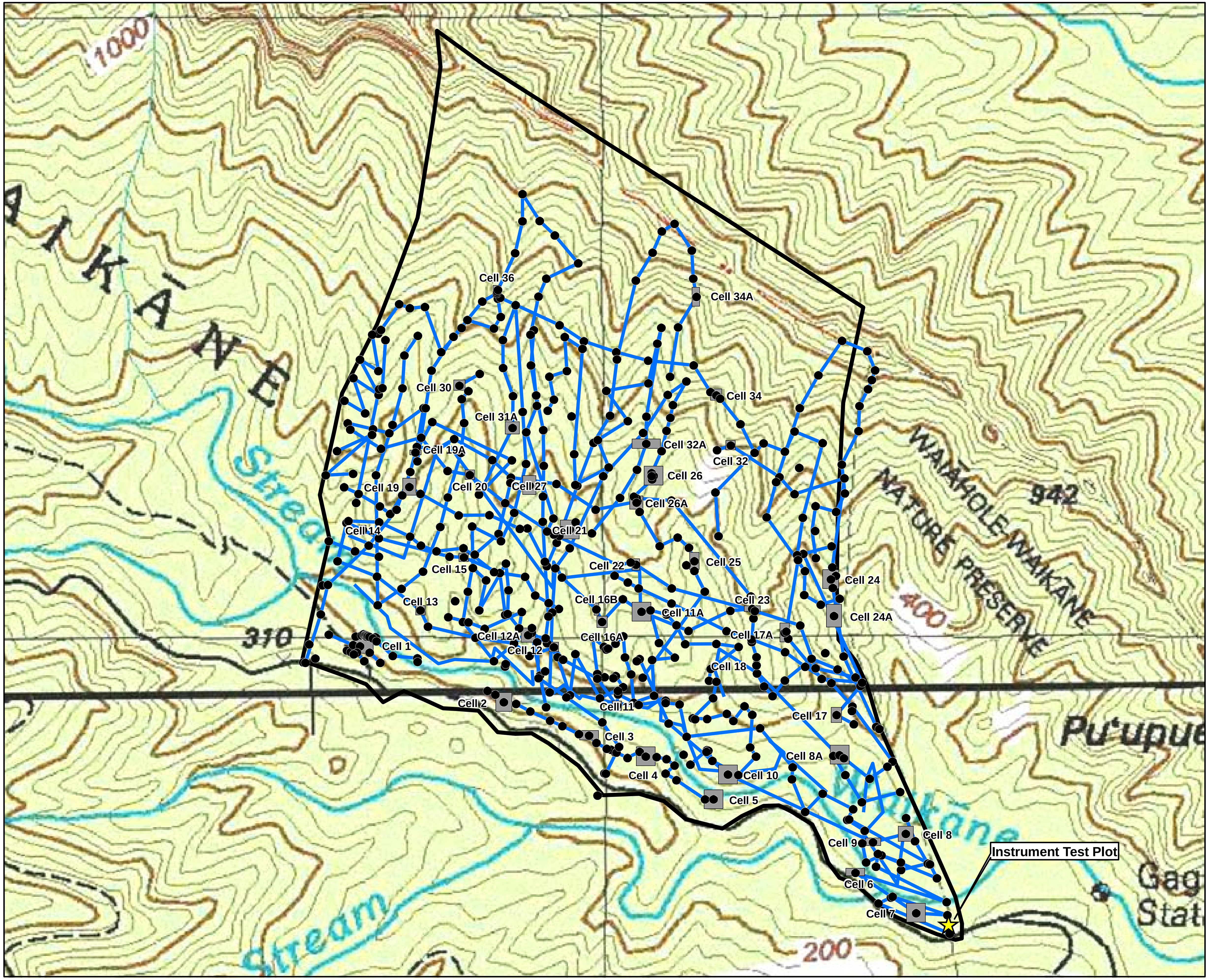

N

500 250 0 500

Feet

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-2

Reconnaissance Overview Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

- ● Recon Data Points
- — Traversed Track (9.5 ac.)
- ▨ Cell Locations (5.2 ac.)
- ☐ Waikane Boundary

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Submitted By:	RN	Revision Date:		

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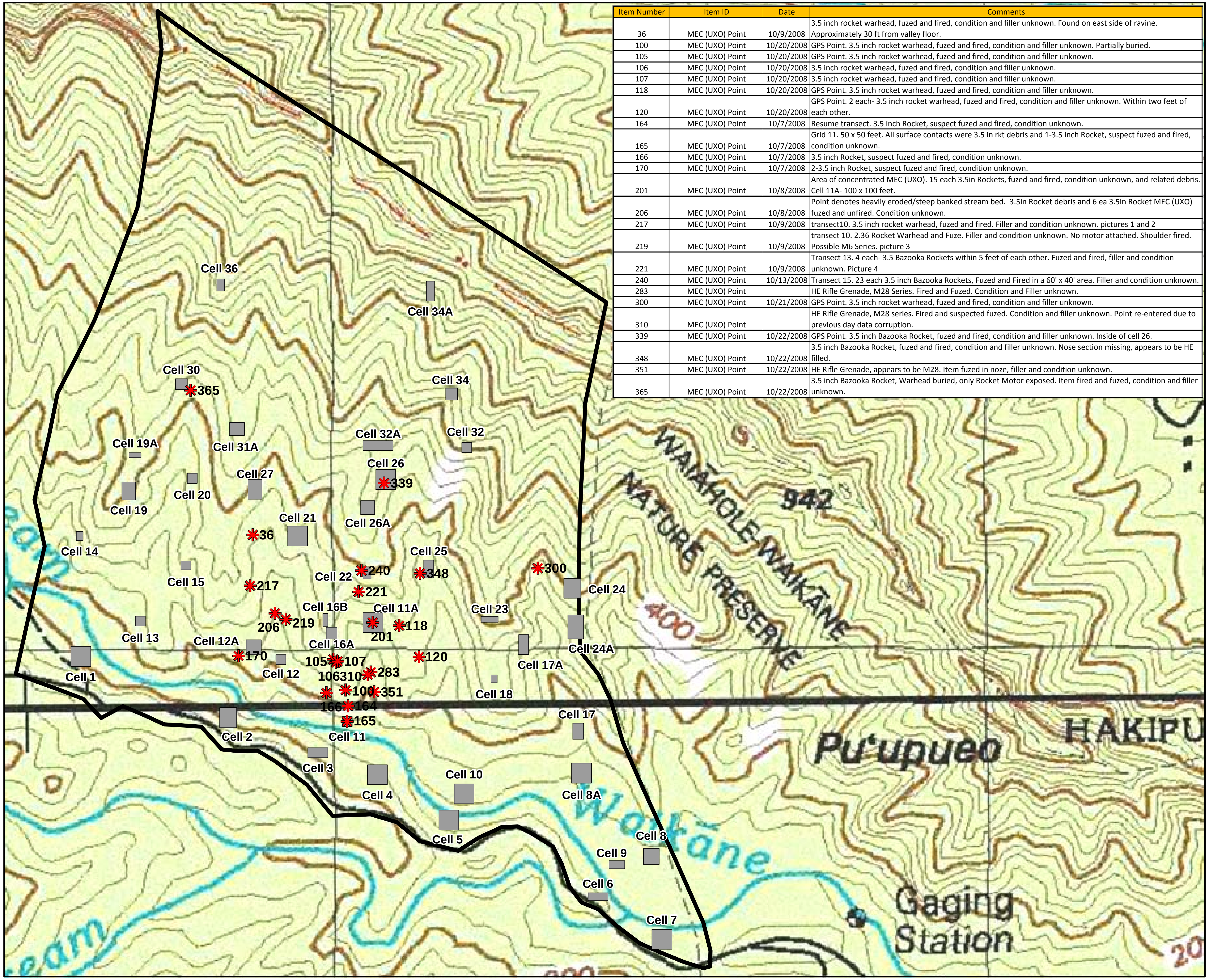

Item Number	Item ID	Date	Comments
36	MEC (UXO) Point	10/9/2008	3.5 inch rocket warhead, fuzed and fired, condition and filler unknown. Found on east side of ravine. Approximately 30 ft from valley floor.
100	MEC (UXO) Point	10/20/2008	GPS Point. 3.5 inch rocket warhead, fuzed and fired, condition and filler unknown. Partially buried.
105	MEC (UXO) Point	10/20/2008	GPS Point. 3.5 inch rocket warhead, fuzed and fired, condition and filler unknown.
106	MEC (UXO) Point	10/20/2008	3.5 inch rocket warhead, fuzed and fired, condition and filler unknown.
107	MEC (UXO) Point	10/20/2008	3.5 inch rocket warhead, fuzed and fired, condition and filler unknown.
118	MEC (UXO) Point	10/20/2008	GPS Point. 3.5 inch rocket warhead, fuzed and fired, condition and filler unknown.
120	MEC (UXO) Point	10/20/2008	GPS Point. 2 each- 3.5 inch rocket warhead, fuzed and fired, condition and filler unknown. Within two feet of each other.
164	MEC (UXO) Point	10/7/2008	Resume transect. 3.5 inch Rocket, suspect fuzed and fired, condition unknown.
165	MEC (UXO) Point	10/7/2008	Grid 11. 50 x 50 feet. All surface contacts were 3.5 in rkt debris and 1-3.5 inch Rocket, suspect fuzed and fired, condition unknown.
166	MEC (UXO) Point	10/7/2008	3.5 inch Rocket, suspect fuzed and fired, condition unknown.
170	MEC (UXO) Point	10/7/2008	2-3.5 inch Rocket, suspect fuzed and fired, condition unknown.
201	MEC (UXO) Point	10/8/2008	Area of concentrated MEC (UXO). 15 each 3.5in Rockets, fuzed and fired, condition unknown, and related debris. Cell 11A- 100 x 100 feet.
206	MEC (UXO) Point	10/8/2008	Point denotes heavily eroded/steep banked stream bed. 3.5in Rocket debris and 6 ea 3.5in Rocket MEC (UXO) fuzed and unfired. Condition unknown.
217	MEC (UXO) Point	10/9/2008	transect10. 3.5 inch rocket warhead, fuzed and fired. Filler and condition unknown. pictures 1 and 2
219	MEC (UXO) Point	10/9/2008	transect 10. 2.36 Rocket Warhead and Fuze. Filler and condition unknown. No motor attached. Shoulder fired. Possible M6 Series. picture 3
221	MEC (UXO) Point	10/9/2008	Transect 13. 4 each- 3.5 Bazooka Rockets within 5 feet of each other. Fuzed and fired, filler and condition unknown. Picture 4
240	MEC (UXO) Point	10/13/2008	Transect 15. 23 each 3.5 inch Bazooka Rockets, Fuzed and Fired in a 60' x 40' area. Filler and condition unknown.
283	MEC (UXO) Point		HE Rifle Grenade, M28 Series. Fired and Fuzed. Condition and Filler unknown.
300	MEC (UXO) Point	10/21/2008	GPS Point. 3.5 inch rocket warhead, fuzed and fired, condition and filler unknown.
310	MEC (UXO) Point		HE Rifle Grenade, M28 series. Fired and suspected fuzed. Condition and filler unknown. Point re-entered due to previous day data corruption.
339	MEC (UXO) Point	10/22/2008	GPS Point. 3.5 inch Bazooka Rocket, fuzed and fired, condition and filler unknown. Inside of cell 26.
348	MEC (UXO) Point	10/22/2008	3.5 inch Bazooka Rocket, fuzed and fired, condition and filler unknown. Nose section missing, appears to be HE filled.
351	MEC (UXO) Point	10/22/2008	HE Rifle Grenade, appears to be M28. Item fuzed in noze, filler and condition unknown.
365	MEC (UXO) Point	10/22/2008	3.5 inch Bazooka Rocket, Warhead buried, only Rocket Motor exposed. Item fired and fuzed, condition and filler unknown.

N

475 237.5 0 475

Feet

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-3

MEC (UXO) Surface Findings Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

✱	MEC (UXO) Point
▨	Cell Locations (5.2 ac.)
☐	Waikane Boundary

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Submitted By:	RN	Revision Date:			

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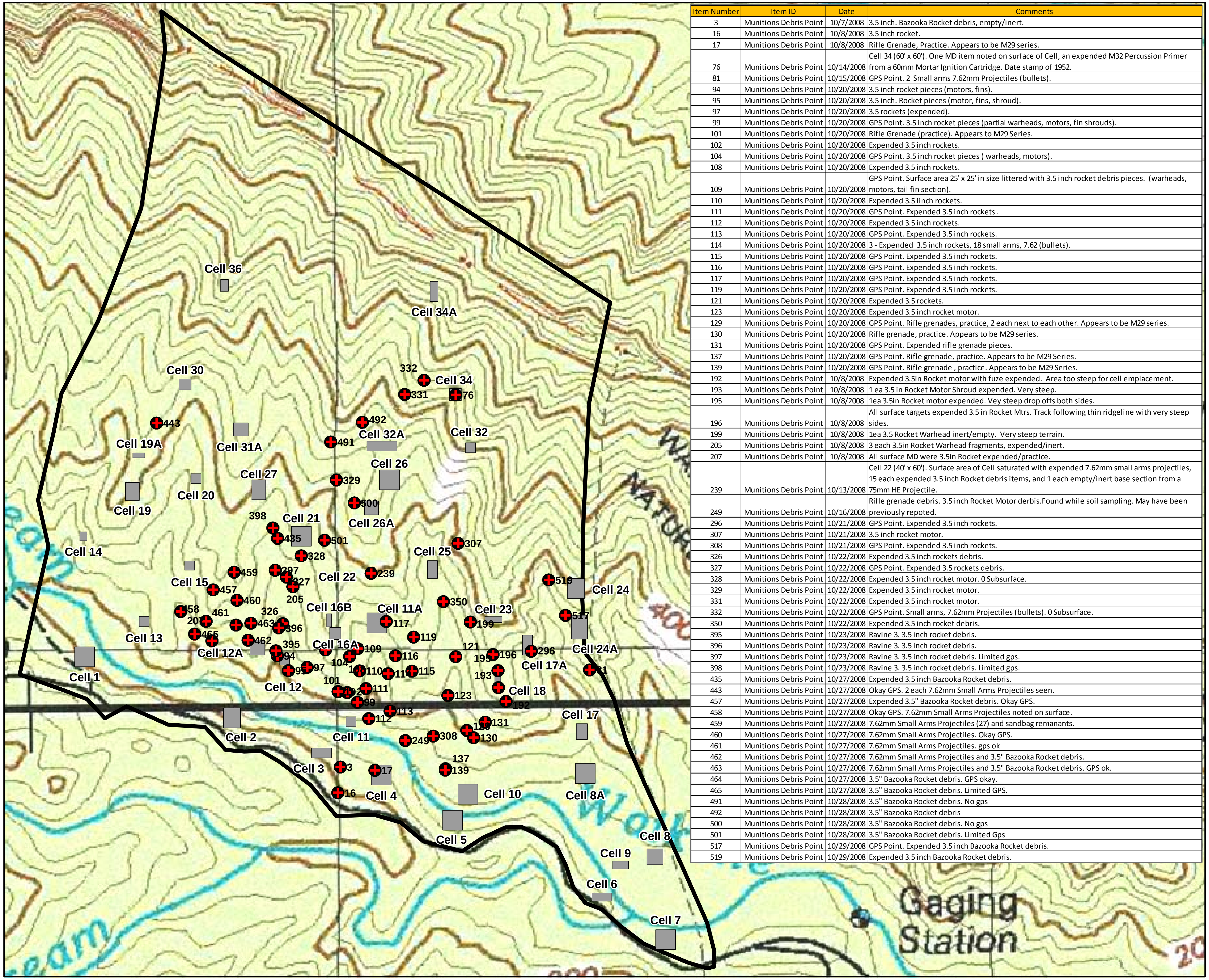

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Item Number	Item ID	Date	Comments
3	Munitions Debris Point	10/7/2008	3.5 inch. Bazooka Rocket debris, empty/inert.
16	Munitions Debris Point	10/8/2008	3.5 inch rocket.
17	Munitions Debris Point	10/8/2008	Rifle Grenade, Practice. Appears to be M29 series.
76	Munitions Debris Point	10/14/2008	Cell 34 (60' x 60'). One MD item noted on surface of Cell, an expended M32 Percussion Primer from a 60mm Mortar Ignition Cartridge. Date stamp of 1952.
81	Munitions Debris Point	10/15/2008	GPS Point. 2 Small arms 7.62mm Projectiles (bullets).
94	Munitions Debris Point	10/20/2008	3.5 inch rocket pieces (motors, fins).
95	Munitions Debris Point	10/20/2008	3.5 inch. Rocket pieces (motor, fins, shroud).
97	Munitions Debris Point	10/20/2008	3.5 rockets (expended).
99	Munitions Debris Point	10/20/2008	GPS Point. 3.5 inch rocket pieces (partial warheads, motors, fin shrouds).
101	Munitions Debris Point	10/20/2008	Rifle Grenade (practice). Appears to M29 Series.
102	Munitions Debris Point	10/20/2008	Expended 3.5 inch rockets.
104	Munitions Debris Point	10/20/2008	GPS Point. 3.5 inch rocket pieces (warheads, motors).
108	Munitions Debris Point	10/20/2008	Expended 3.5 inch rockets.
109	Munitions Debris Point	10/20/2008	GPS Point. Surface area 25' x 25' in size littered with 3.5 inch rocket debris pieces. (warheads, motors, tail fin section).
110	Munitions Debris Point	10/20/2008	Expended 3.5 iinch rockets.
111	Munitions Debris Point	10/20/2008	GPS Point. Expended 3.5 inch rockets .
112	Munitions Debris Point	10/20/2008	Expended 3.5 inch rockets.
113	Munitions Debris Point	10/20/2008	GPS Point. Expended 3.5 inch rockets.
114	Munitions Debris Point	10/20/2008	3 - Expended 3.5 inch rockets, 18 small arms, 7.62 (bullets).
115	Munitions Debris Point	10/20/2008	GPS Point. Expended 3.5 inch rockets.
116	Munitions Debris Point	10/20/2008	GPS Point. Expended 3.5 inch rockets.
117	Munitions Debris Point	10/20/2008	GPS Point. Expended 3.5 inch rockets.
119	Munitions Debris Point	10/20/2008	GPS Point. Expended 3.5 inch rockets.
121	Munitions Debris Point	10/20/2008	Expended 3.5 rockets.
123	Munitions Debris Point	10/20/2008	Expended 3.5 inch rocket motor.
129	Munitions Debris Point	10/20/2008	GPS Point. Rifle grenades, practice, 2 each next to each other. Appears to be M29 series.
130	Munitions Debris Point	10/20/2008	Rifle grenade, practice. Appears to be M29 series.
131	Munitions Debris Point	10/20/2008	GPS Point. Expended rifle grenade pieces.
137	Munitions Debris Point	10/20/2008	GPS Point. Rifle grenade, practice. Appears to be M29 Series.
139	Munitions Debris Point	10/20/2008	GPS Point. Rifle grenade , practice. Appears to be M29 Series.
192	Munitions Debris Point	10/8/2008	Expended 3.5in Rocket motor with fuze expended. Area too steep for cell emplacement.
193	Munitions Debris Point	10/8/2008	1 ea 3.5 in Rocket Motor Shroud expended. Very steep.
195	Munitions Debris Point	10/8/2008	1ea 3.5in Rocket motor expended. Vey steep drop offs both sides.
196	Munitions Debris Point	10/8/2008	All surface targets expended 3.5 in Rocket Mtrs. Track following thin ridgeline with very steep sides.
199	Munitions Debris Point	10/8/2008	1ea 3.5 Rocket Warhead inert/empty. Very steep terrain.
205	Munitions Debris Point	10/8/2008	3 each 3.5in Rocket Warhead fragments, expended/inert.
207	Munitions Debris Point	10/8/2008	All surface MD were 3.5in Rocket expended/practice.
239	Munitions Debris Point	10/13/2008	Cell 22 (40' x 60'). Surface area of Cell saturated with expended 7.62mm small arms projectiles, 15 each expended 3.5 inch Rocket debris items, and 1 each empty/inert base section from a 75mm HE Projectile.
249	Munitions Debris Point	10/16/2008	Rifle grenade debris. 3.5 inch Rocket Motor derbis.Found while soil sampling. May have been previously repoted.
296	Munitions Debris Point	10/21/2008	GPS Point. Expended 3.5 inch rockets.
307	Munitions Debris Point	10/21/2008	3.5 inch rocket motor.
308	Munitions Debris Point	10/21/2008	GPS Point. Expended 3.5 inch rockets.
326	Munitions Debris Point	10/22/2008	Expended 3.5 inch rockets debris.
327	Munitions Debris Point	10/22/2008	GPS Point. Expended 3.5 rockets debris.
328	Munitions Debris Point	10/22/2008	Expended 3.5 inch rocket motor. 0 Subsurface.
329	Munitions Debris Point	10/22/2008	Expended 3.5 inch rocket motor.
331	Munitions Debris Point	10/22/2008	Expended 3.5 inch rocket motor.
332	Munitions Debris Point	10/22/2008	GPS Point. Small arms, 7.62mm Projectiles (bullets). 0 Subsurface.
350	Munitions Debris Point	10/22/2008	Expended 3.5 inch rocket debris.
395	Munitions Debris Point	10/23/2008	Ravine 3. 3.5 inch rocket debris.
396	Munitions Debris Point	10/23/2008	Ravine 3. 3.5 inch rocket debris.
397	Munitions Debris Point	10/23/2008	Ravine 3. 3.5 inch rocket debris. Limited gps.
398	Munitions Debris Point	10/23/2008	Ravine 3. 3.5 inch rocket debris. Limited gps.
435	Munitions Debris Point	10/27/2008	Expended 3.5 inch Bazooka Rocket debris.
443	Munitions Debris Point	10/27/2008	Okay GPS. 2 each 7.62mm Small Arms Projectiles seen.
457	Munitions Debris Point	10/27/2008	Expended 3.5" Bazooka Rocket debris. Okay GPS.
458	Munitions Debris Point	10/27/2008	Okay GPS. 7.62mm Small Arms Projectiles noted on surface.
459	Munitions Debris Point	10/27/2008	7.62mm Small Arms Projectiles (27) and sandbag remanants.
460	Munitions Debris Point	10/27/2008	7.62mm Small Arms Projectiles. Okay GPS.
461	Munitions Debris Point	10/27/2008	7.62mm Small Arms Projectiles. gps ok
462	Munitions Debris Point	10/27/2008	7.62mm Small Arms Projectiles and 3.5" Bazooka Rocket debris.
463	Munitions Debris Point	10/27/2008	7.62mm Small Arms Projectiles and 3.5" Bazooka Rocket debris. GPS ok.
464	Munitions Debris Point	10/27/2008	3.5" Bazooka Rocket debris. GPS okay.
465	Munitions Debris Point	10/27/2008	3.5" Bazooka Rocket debris. Limited GPS.
491	Munitions Debris Point	10/28/2008	3.5" Bazooka Rocket debris. No gps
492	Munitions Debris Point	10/28/2008	3.5" Bazooka Rocket debris
500	Munitions Debris Point	10/28/2008	3.5" Bazooka Rocket debris. No gps
501	Munitions Debris Point	10/28/2008	3.5" Bazooka Rocket debris. Limited Gps
517	Munitions Debris Point	10/29/2008	GPS Point. Expended 3.5 inch Bazooka Rocket debris.
519	Munitions Debris Point	10/29/2008	Expended 3.5 inch Bazooka Rocket debris.

Figure A-4

Munitions Debris Surface Findings Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

● Waikane_Recon_Data

▨ Cell Locations (5.2 ac.)

☐ Waikane Boundary

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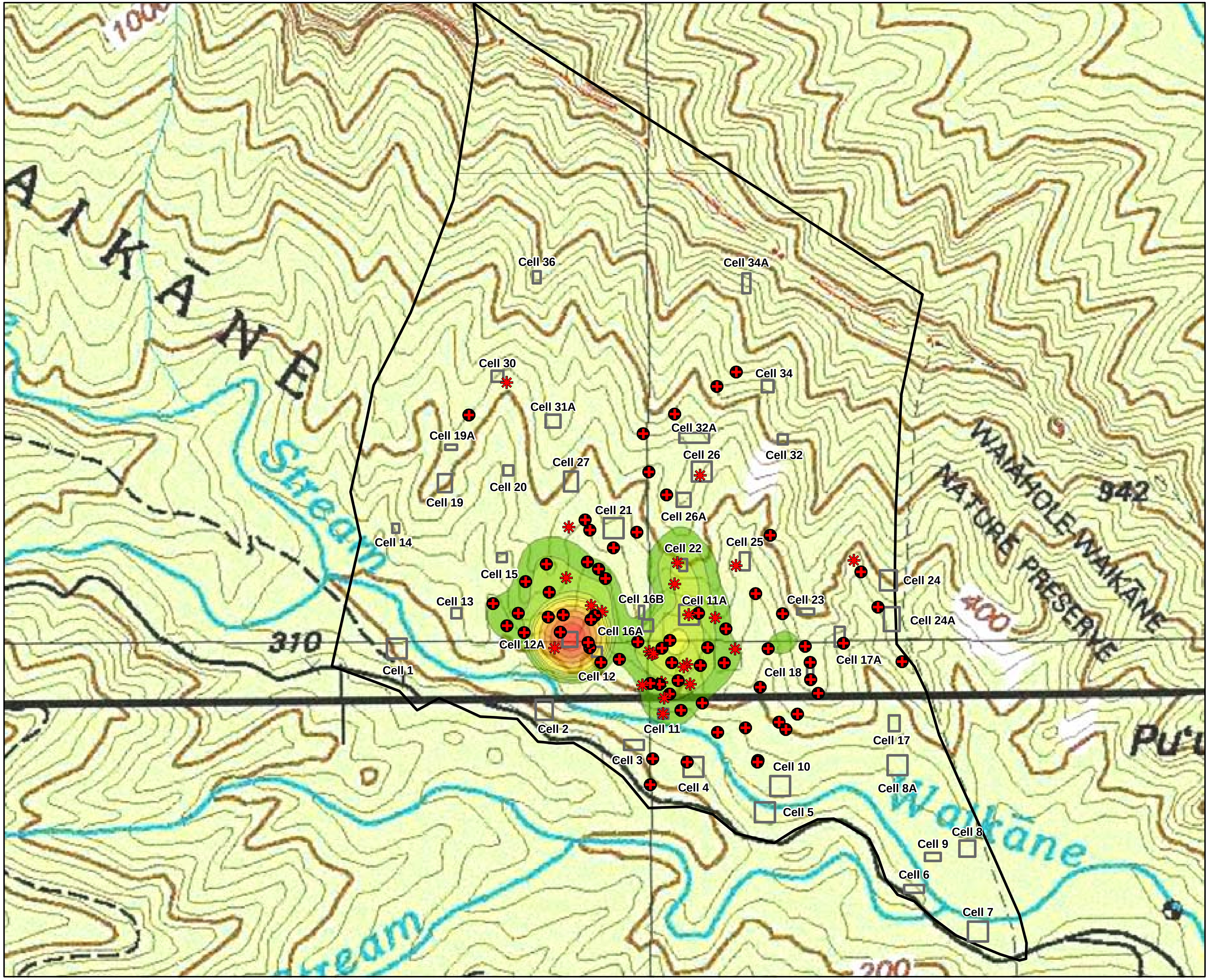

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475 237.5 0 475
Feet

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-5

Estimated MEC/MD Surface Density Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

Recon Data Points
- ✱ MEC (UXO) Point
- ⊕ Munitions Debris Point
- ☐ Cell Locations (5.2 ac.)
- ☐ Waikane Boundary

Surface Items Per Acre
- ☐ 0-200
- 🟩 201-400
- 🟩 401-600
- 🟩 601-800
- 🟨 801-1000
- 🟨 1001-1500
- 🟧 1501-2000
- 🟧 2001-2500
- 🟥 2501-3000
- 🟥 3001-4000

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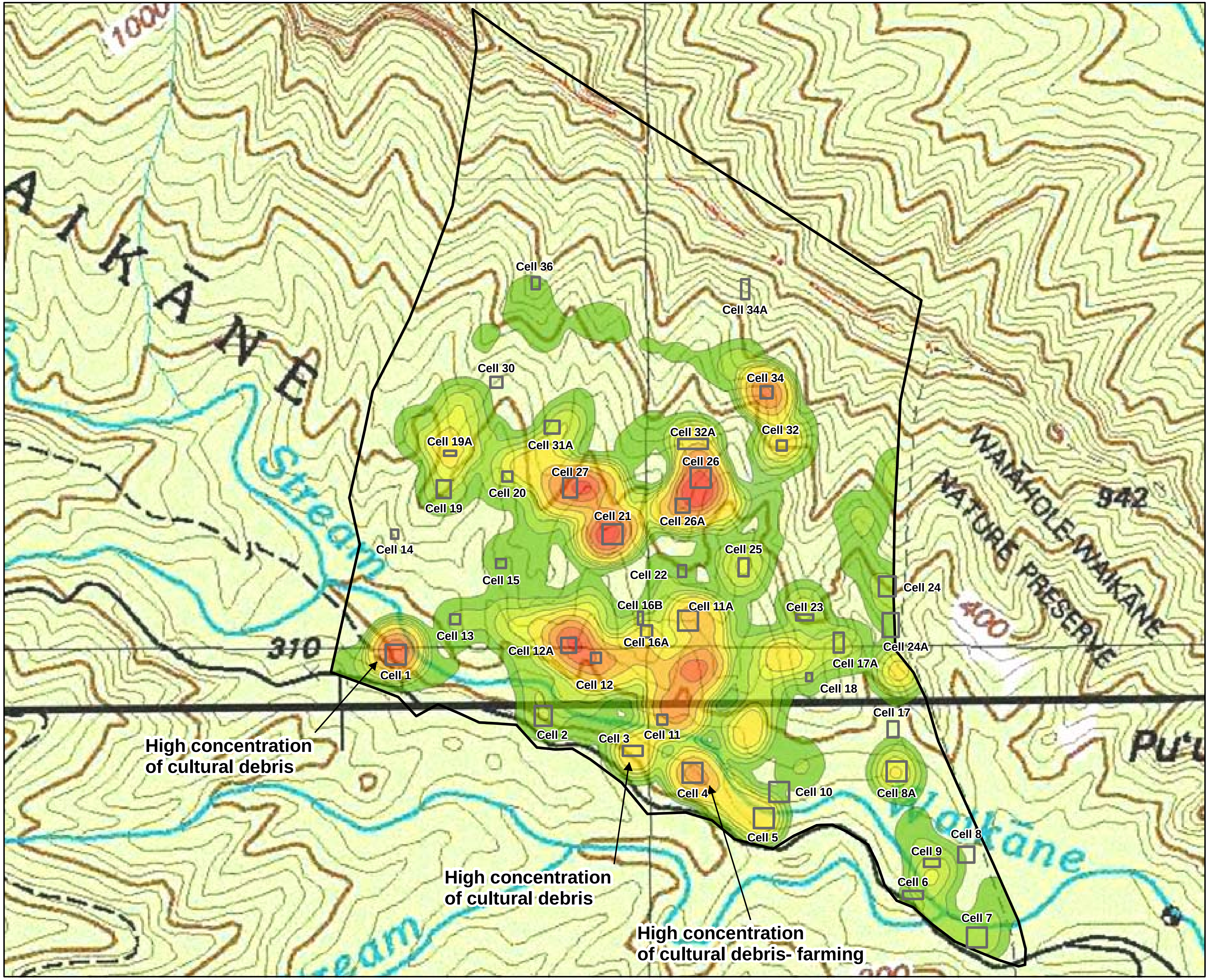

High concentration of cultural debris

High concentration of cultural debris

High concentration of cultural debris- farming

N

475 237.5 0 475

Feet

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-6

Estimated Subsurface Anomaly Density Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

☐ Cell Locations (5.2 ac.)
☐ Waikane Boundary

Subsurface Anomalies Per Acre

⬜ 0-200
🟩 201-400
🟩 401-600
🟩 601-800
🟨 801-1000
🟨 1001-1500
🟧 1501-2000
🟧 2001-2500
🟥 2501-3000
🟥 3001-4000

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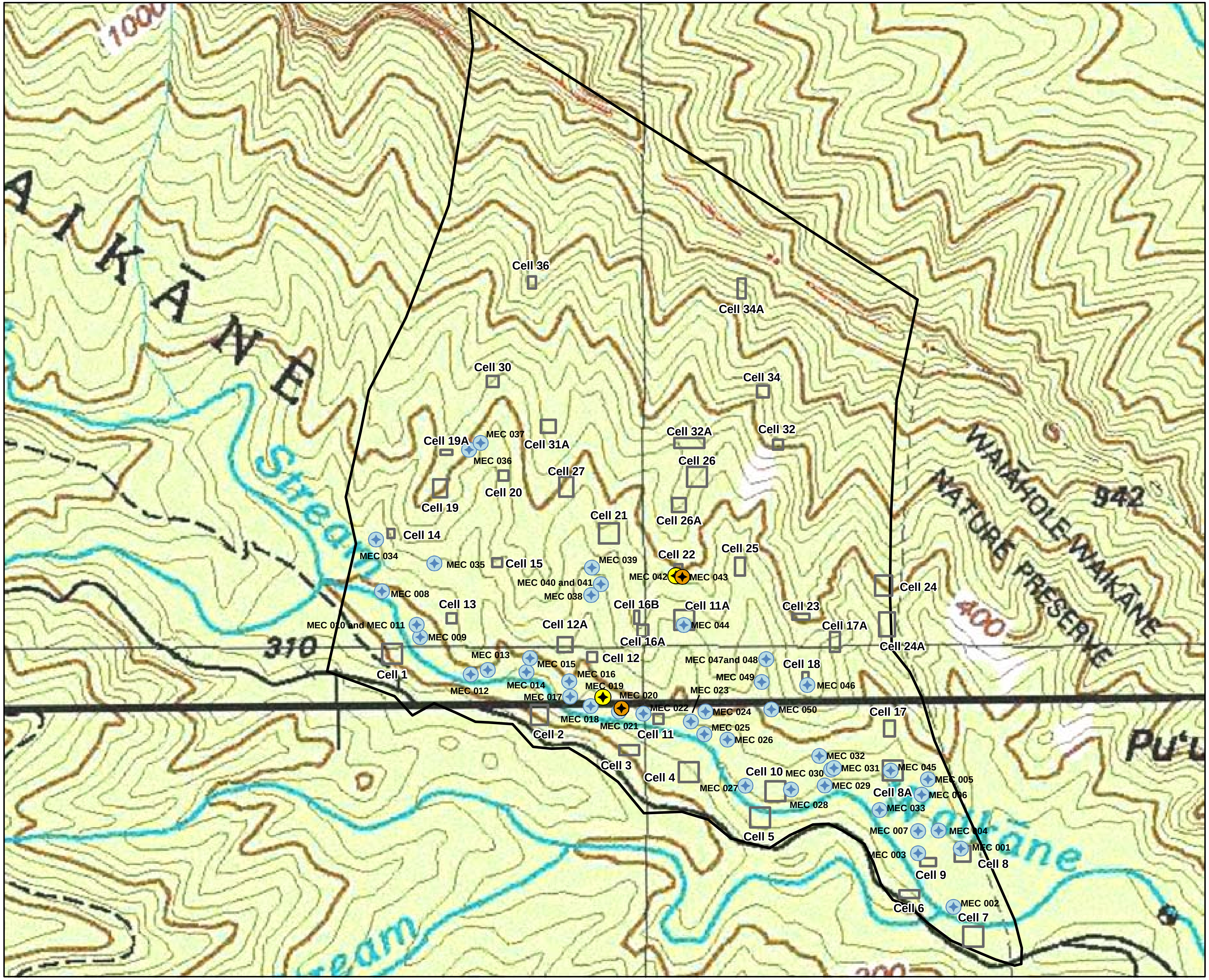

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Feet

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-7

Soil Sample Location Map

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

Soil Sample Locations

✦	Under acceptable criteria
✦	Exceeded criteria for Copper
✦	Exceeded criteria for Copper and Lead
☐	Cell Locations (5.2 ac.)
☐	Waikane Boundary

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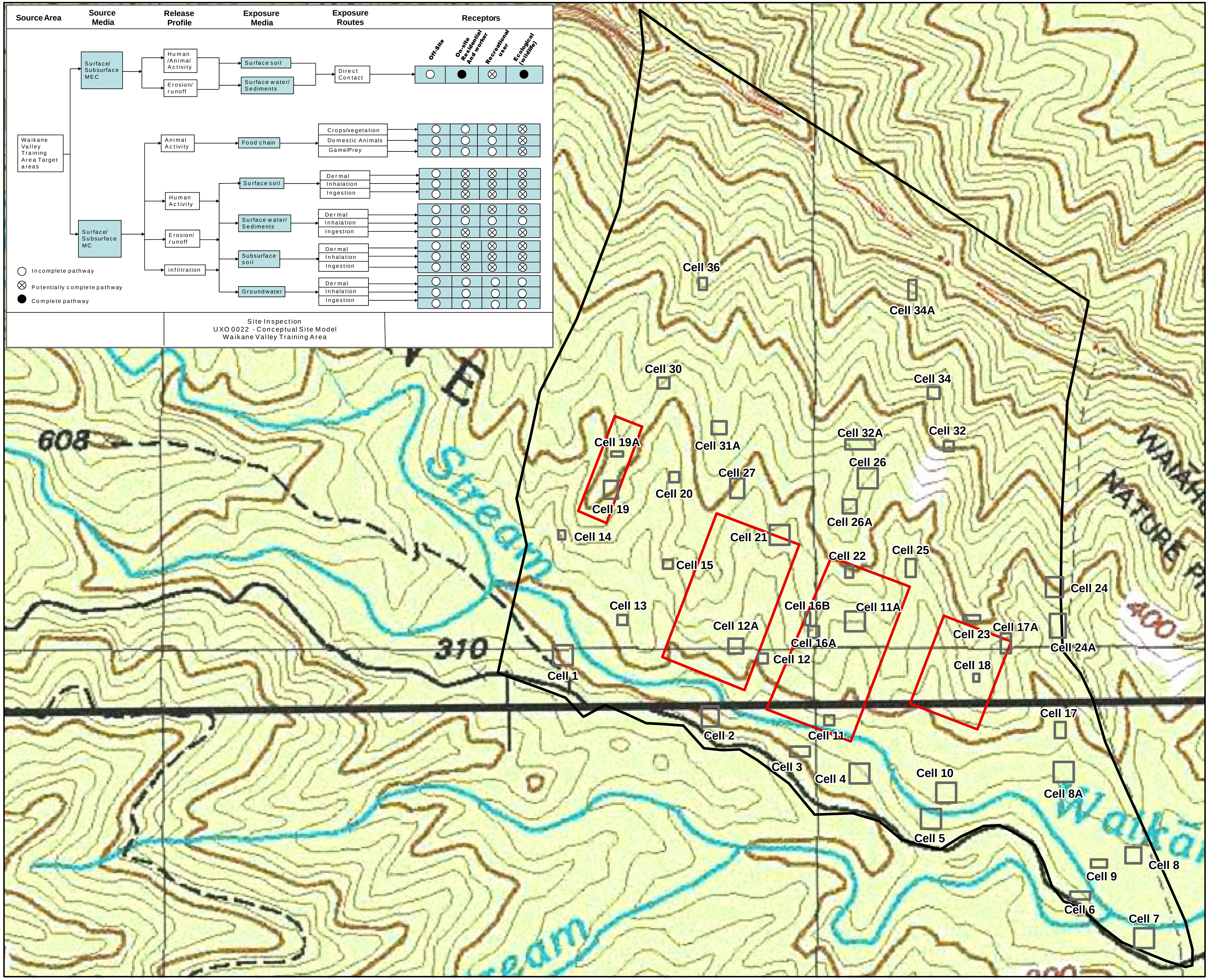
soil sample map.mxd



Source Area	Source Media	Release Profile	Exposure Media	Exposure Routes	Off-Site	On-site Residential And worker	Recreational user	Ecological (wildlife)
Waikane Valley Training Area Target areas	Surface/ Subsurface MEC	Human /Animal Activity Erosion/ runoff	Surface soil Surface water/ Sediments	Direct Contact	○	●	⊗	●
	Surface/ Subsurface MC	Animal Activity	Food chain	Crops/vegetation	○	○	○	⊗
				Domestic Animals	○	○	○	⊗
				Game/Prey	○	○	○	⊗
		Human Activity Erosion/ runoff infiltration	Surface soil	Dermal	○	⊗	⊗	⊗
				Inhalation	○	⊗	⊗	⊗
				Ingestion	○	⊗	⊗	⊗
			Surface water/ Sediments	Dermal	○	⊗	⊗	⊗
				Inhalation	○	○	○	○
				Ingestion	○	⊗	⊗	⊗
			Subsurface soil	Dermal	○	⊗	⊗	⊗
				Inhalation	○	⊗	⊗	⊗
				Ingestion	○	⊗	⊗	⊗
			Groundwater	Dermal	○	○	○	○
				Inhalation	○	○	○	○
				Ingestion	○	○	○	○

○ Incomplete pathway
⊗ Potentially complete pathway
● Complete pathway

Site Inspection
UXO 0022 - Conceptual Site Model
Waikane Valley Training Area

N

475 237.5 0 475
Feet

Data is projected to the State Plane Coordinate System: Hawaii 4 Zone, NAD83, Units in Feet.

Figure A-8

Conceptual Site Model

Waikane Valley Training Area
Koolaupoko District, O'ahu, Hawai'i

Legend

- ☐ Cell Locations
- 🟥 Suspected Target Locations
- ■ Waikane Boundary

USA Environmental, Inc.

Drawn By:	JAL	Scale:	1 inch = 475 feet	Rev:	1
Checked By:	DM	Date Drawn:	12-16-2008		
Submitted By:	RN	Revision Date:	5-13-2009		

Path:
S:\Waikane\Report\
MXD Files\A-8 CSM Map.mxd

APPENDIX B. MC DATA SUMMARY TABLE AND DATA VALIDATION REPORTS

This appendix contains the following tables:

- Summary Table of Analytical Results
- Data Validation Reports.
- Environmental Assessment sampling results – 9 May 2003
- Environmental Assessment sampling results – 16 June 2003

2008 Summary of Analytical Results

Sample Number		Project background concentrations (mg/kg)	Project Action Limit (mg/kg)	MEC001	MEC002	MEC003	MEC004	MEC005	MEC006	MEC007	MEC008	MEC009	MEC010	MEC011	MEC012	MEC013	MEC014	MEC015	MEC016
Sample Date				10/14/2008	10/14/2008	10/14/2008	10/14/2008	10/14/2008	10/14/2008	10/14/2008	10/15/2008	10/15/2008	10/15/2008	10/15/2008	10/15/2008	10/15/2008	10/15/2008	10/15/2008	10/15/2008
Sample Type				PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	QC	PS	PS	PS	PS	PS
EPA Method SW6010B (mg/kg)																			
Aluminum	MDL	93,900	77,000[1]	15	20	16	18	13	18	16	16	16	18	18	14	15	16	18	19
	RL			160	210	170	190	140	190	170	170	170	190	190	150	160	170	190	200
	Result			29,000	34,000	30,000	34,000	35,000	30,000	33,000	46,000	73,000	36,000	33,000	46,000	52,000	46,000	35,000	42,000
Antimony	MDL	6.9	6.3	0.24	0.32	0.26	0.29	0.22	0.3	0.26	0.26	0.27	0.29	0.3	0.23	0.25	0.26	0.29	0.31
	RL			0.82	1.1	0.89	0.98	0.76	1	0.94	0.88	0.94	0.96	1	0.81	0.91	0.91	1	1.1
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	MDL	181	750	0.055	0.072	0.058	0.065	0.049	0.068	0.059	0.06	0.061	0.066	0.068	0.051	0.057	0.059	0.065	0.07
	RL			0.41	0.53	0.45	0.49	0.38	0.51	0.47	0.44	0.47	0.48	0.51	0.4	0.45	0.45	0.5	0.53
	Result			77	69	75	63	19	26	79	120	45	52	52	79	83	75	71	68
Chromium (total)	MDL	483	500	0.05	0.066	0.053	0.06	0.045	0.062	0.054	0.054	0.055	0.06	0.062	0.047	0.052	0.054	0.059	0.064
	RL			0.41	0.53	0.45	0.49	0.38	0.51	0.47	0.44	0.47	0.48	0.51	0.4	0.45	0.45	0.5	0.53
	Result			150	170	160	390	340	270	170	220	320	230	260	160	210	300	180	180
Copper	MDL	183	230	0.084	0.11	0.09	0.1	0.075	0.1	0.091	0.092	0.093	0.1	0.1	0.079	0.087	0.091	0.1	0.11
	RL			0.41	0.53	0.45	0.49	0.38	0.51	0.47	0.44	0.47	0.48	0.51	0.4	0.45	0.45	0.5	0.53
	Result			88	94	100	110	120	99	100	120	110	79	85	100	120	110	78	110
Iron	MDL	177,000	55,000[1]	14	19	15	17	13	18	15	15	16	17	18	13	15	15	17	18
	RL			160	210	170	190	140	190	170	170	170	190	190	150	160	170	190	200
	Result			64,000	78,000	72,000	120,000	97,000	92,000	77,000	81,000	110,000	83,000	96,000	77,000	81,000	75,000	85,000	82,000
Lead	MDL	100	200	0.087	0.12	0.093	0.1	0.078	0.11	0.094	0.095	0.097	0.11	0.11	0.082	0.091	0.094	2.1	0.11
	RL			0.41	0.53	0.45	0.49	0.38	0.51	0.47	0.44	0.47	0.48	0.51	0.4	0.45	0.45	6.2	0.53
	Result			0.26 J	1.5	2.7	3.5	ND	ND	1.6	0.33 J	5.1	7.1	8.2	5.3	3	4.5	ND	7.2
Nickel	MDL	346	150	0.071	0.094	0.076	0.085	0.064	0.088	0.077	0.077	0.079	0.086	0.088	0.067	0.074	0.077	0.084	0.091
	RL			0.41	0.53	0.45	0.49	0.38	0.51	0.47	0.44	0.47	0.48	0.51	0.4	0.45	0.45	0.5	0.53
	Result			74	77	72	81	120	86	81	150	170	97	94	190	150	130	96	160
Zinc	MDL	197	600	0.13	0.17	0.14	0.15	0.11	0.16	0.14	0.14	0.14	0.15	0.16	0.12	0.13	0.14	0.15	0.16
	RL			1.6	2.1	1.8	2	1.5	2	1.9	1.8	1.9	1.9	2	1.6	1.8	1.8	2	2.1
	Result			66	75	85	83	64	52	80	85	68	78	86	84	100	99	77	130
EPA Method SW8330B (mg/kg)																			
2-Amino-4,6-Dinitrotoluene	MDL		0.25	0.032	0.032	0.032	0.032	0.031	0.031	0.031	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Amino-2,6-Dinitrotoluene	MDL		0.2[2]	0.058	0.057	0.057	0.057	0.056	0.056	0.056	0.057	0.057	0.057	0.057	0.057	0.058	0.057	0.057	0.057
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	MDL		0.2[2]	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	MDL		2.7	0.018	0.018	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.018	0.017	0.017	0.018	0.018	0.017	0.018
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	MDL		2.6	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HMX	MDL		100	0.06	0.059	0.059	0.059	0.058	0.058	0.058	0.059	0.059	0.059	0.059	0.058	0.059	0.059	0.059	0.059
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.092 J b	ND	ND	ND	ND	ND
Nitrobenzene	MDL		0.11	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	0.019 J b	ND	ND	ND	0.021 J b	ND	ND	ND	ND	ND	ND
2-Nitrotoluene	MDL		0.0032	0.043	0.043	0.043	0.043	0.042	0.042	0.042	0.042	0.042	0.043	0.042	0.042	0.043	0.043	0.043	0.043
	RL			0.4	0.4	0.4	0.4	0.39	0.39	0.39	0.4	0.39	0.4	0.39	0.39	0.4	0.4	0.4	0.4
	Result			ND	ND	ND	ND	ND	0.078 J b	ND	0.059 J b	0.1 J b	0.11 J b	0.076 J b	ND	0.063 J b	ND	ND	ND
3-Nitrotoluene	MDL		6.7	0.044	0.044	0.044	0.044	0.043	0.043	0.043	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
	RL			0.4	0.4	0.4	0.4	0.39	0.39	0.39	0.4	0.39	0.4	0.39	0.39	0.4	0.4	0.4	0.4
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrotoluene	MDL		0.22	0.067	0.067	0.067	0.067	0.066	0.066	0.066	0.067	0.066	0.067	0.066	0.066	0.067	0.067	0.067	0.067
	RL			0.4	0.4	0.4	0.4	0.39	0.39	0.39	0.4	0.39	0.4	0.39	0.39	0.4	0.4	0.4	0.4
	Result			ND	ND	0.069 J b	ND	0.068 J	0.074 J b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RDX	MDL		0.02	0.043	0.043	0.043	0.043	0.042	0.042	0.042	0.042	0.042	0.043	0.042	0.042	0.043	0.043	0.043	0.043
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	0.08 J b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trinitrobenzene	MDL		5.4	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trinitrophenylmethylnitramine	MDL		49	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trinitrotoluene	MDL		0.68	0.0079	0.0078	0.0078	0.0078	0.0077	0.0077	0.0077	0.0078	0.0077	0.0078	0.0077	0.0077	0.0078	0.0078	0.0078	0.0078
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[1] : EPA Region 9 residential RSL, no HDOH EAL exists

[2] : The HDOH EALs for 1,3-dinotrobenzene, and 4-amino-2,6-dinitrotoluene are 0.095 mg/kg and 0.12 mg/kg respectively. Since these levels are below both the analytical method and laboratory detection limits, the project action levels will be set at the laboratory quantitation limit of 0.2 mg/kg

b: The target analyte detection is below one half the reporting limit. These estimated detections are qualified not only with a J, but also with a b.

C: Presence confirmed, but relative percent difference between columns exceeds 40%

J: The quantitation is an estimation

PS: Primary sample

QC: Quality control sample

bold values exceed the background value and the Project Action Limit

Background values are the 95th percentile from the Environmental Background analysis of Metals in soil at Navy Oahu Facilities, Pacific Division, Naval Facilities Engineering Command 2006.

2008 Summary of Analytical Results

Sample Number		Project background concentrations (mg/kg)	Project Action Limit (mg/kg)	MEC017	MEC018	**MEC019**	MEC020	**MEC021**	MEC022	MEC023	MEC024	MEC025	MEC026	MEC027	MEC028	MEC029	MEC030	MEC031	MEC032	MEC033	MEC034
Sample Date				10/15/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/16/2008	10/20/2008
Sample Type				PS	PS	PS	PS	QC	PS	PS	PS	PS	PS	PS	PS	PS	PS	QC	PS	PS	PS
EPA Method SW6010B (mg/kg)																					
Aluminum	MDL	93,900	77,000[1]	16	15	16	18	19	18	17	18	17	22	14	20	14	18	17	19	19	18
	RL			170	160	160	190	200	190	180	190	180	230	150	210	150	190	180	200	200	180
	Result			46,000	44,000	44,000	45,000	48,000	34,000	51,000	38,000	25,000	36,000	37,000	28,000	49,00	35,000	27,000	27,000	42,000	61,000
Antimony	MDL	6.9	6.3	0.27	0.25	0.25	0.29	0.31	0.29	0.28	0.29	0.28	0.35	0.23	0.32	0.23	0.29	0.28	0.31	0.31	0.29
	RL			0.93	0.91	0.85	1	1	1	0.98	0.96	0.91	1.2	0.81	1.1	0.82	0.94	0.94	1.1	1	0.94
	Result			ND	ND	0.57 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5 J
Barium	MDL	181	750	0.061	0.057	0.058	0.066	0.069	0.067	0.063	0.065	0.062	0.079	0.053	0.073	0.053	0.065	0.064	0.071	0.069	0.065
	RL			0.46	0.45	0.42	0.5	0.51	0.51	0.49	0.48	0.45	0.6	0.4	0.54	0.41	0.47	0.47	0.54	0.51	0.47
	Result			28	82	17	35	40	59	57	30	39	50	72	73	94	65	55	70	100	85
Chromium (total)	MDL	483	500	0.055	0.052	0.053	0.06	0.063	0.061	0.057	0.06	0.057	0.072	0.049	0.067	0.049	0.06	0.058	0.065	0.063	0.059
	RL			0.46	0.45	0.42	0.5	0.51	0.51	0.49	0.48	0.45	0.6	0.4	0.54	0.41	0.47	0.47	0.54	0.51	0.47
	Result			290	270	310	310	330	200	250	240	240	190	140	140	170	140	140	150	180	260
Copper	MDL	183	230	0.093	0.087	0.089	0.1	0.11	0.1	0.097	0.1	0.096	0.12	0.082	0.11	0.082	0.1	0.098	0.11	0.11	0.1
	RL			0.46	0.45	0.42	0.5	0.51	0.51	0.49	0.48	0.45	0.6	0.4	0.54	0.41	0.47	0.47	0.54	0.51	0.47
	Result			81	150	**350**	190	**250**	83	87	90	97	93	83	77	110	88	84	83	110	100
Iron	MDL	177,000	55,000[1]	16	15	15	17	18	17	16	17	16	20	14	19	114	17	16	18	18	17
	RL			170	160	160	190	200	190	180	190	180	230	150	210	150	190	180	200	200	180
	Result			100,000	80,000	120,000	110,000	110,000	83,000	87,000	77,000	86,000	82,000	81,000	85,000	81,000	83,000	65,000	79,000	99,000	100,000
Lead	MDL	100	200	0.097	0.091	0.092	0.11	0.11	0.11	0.1	0.1	0.1	0.13	0.085	0.12	0.085	0.1	0.1	0.11	0.11	0.1
	RL			0.46	0.45	0.42	0.5	0.51	0.51	0.49	0.48	0.45	0.6	0.4	0.54	0.41	0.47	0.47	0.54	0.51	0.47
	Result			4.8	47	**350**	120	84	6.3	2.5	3.6	1.5	0.39 J	0.37 J	0.54 J	1.6	0.25 J	0.6	2	3.7	ND
Nickel	MDL	346	150	0.079	0.074	0.075	0.086	0.09	0.087	0.082	0.085	0.081	0.1	0.069	0.095	0.069	0.085	0.082	0.092	0.09	0.084
	RL			0.46	0.45	0.42	0.5	0.51	0.51	0.49	0.48	0.45	0.6	0.4	0.54	0.41	0.47	0.47	0.54	0.51	0.47
	Result			84	160	68	100	120	77	180	98	76	91	90	80	180	86	73	73	120	180
Zinc	MDL	197	600	0.14	0.13	0.13	0.15	0.16	0.15	0.15	0.15	0.14	0.18	0.12	0.17	0.12	0.15	0.15	0.16	0.16	0.15
	RL			1.9	1.8	1.7	2	2	2	2	1.9	1.8	2.4	1.6	2.2	1.6	1.9	1.9	2.2	2	1.9
	Result			53	120	66	93	99	92	78	60	80	83	57	66	120	74	67	69	140	73
EPA Method SW8330B (mg/kg)																					
2-Amino-4,6-Dinitrotoluene	MDL		0.25	0.032	0.032	0.031	0.032	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.031	0.049	0.018	0.018	0.018	0.032
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Amino-2,6-Dinitrotoluene	MDL		0.2[2]	0.058	0.057	0.056	0.057	0.039	0.039	0.039	0.039	0.038	0.039	0.039	0.039	0.056	0.045	0.038	0.038	0.039	0.057
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	MDL		0.2[2]	0.013	0.013	0.013	0.013	0.0046	0.0046	0.0046	0.0046	0.0045	0.0046	0.0045	0.0046	0.013	0.011	0.0045	0.0045	0.0045	0.013
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	MDL		2.7	0.018	0.017	0.017	0.018	0.02	0.021	0.021	0.021	0.02	0.021	0.02	0.021	0.017	0.027	0.02	0.02	0.02	0.017
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	MDL		2.6	0.031	0.031	0.031	0.031	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.03	0.026	0.022	0.022	0.022	0.031
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.072 J b	ND	ND	ND	ND	ND	ND	ND
HMX	MDL		100	0.059	0.059	0.058	0.059	0.015	0.015	0.015	0.015	0.014	0.015	0.014	0.015	0.058	0.022	0.014	0.014	0.014	0.059
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	0.039 J b	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	MDL		0.11	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.026	0.016	0.016	0.016	0.017
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			0.035 J b	0.025 J b	ND	ND	ND	ND	ND	0.043 J b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrotoluene	MDL		0.0032	0.043	0.042	0.42	0.043	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.042	0.027	0.028	0.028	0.028	0.042
	RL			0.4	0.39	0.39	0.4	0.39	0.4	0.4	0.4	0.39	0.4	0.39	0.39	0.39	0.38	0.39	0.39	0.39	0.39
	Result			ND	ND	0.061 J b	0.082 J b	ND	ND	ND	0.1 J b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitrotoluene	MDL		6.7	0.044	0.044	0.043	0.044	0.04	0.04	0.04	0.04	0.039	0.04	0.039	0.04	0.043	0.042	0.039	0.039	0.039	0.044
	RL			0.4	0.39	0.39	0.4	0.39	0.4	0.4	0.4	0.39	0.4	0.39	0.39	0.39	0.38	0.39	0.39	0.39	0.39
	Result			ND	ND	ND	ND	ND	ND	ND	0.091 J b	ND	0.23 C J	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrotoluene	MDL		0.22	0.067	0.066	0.066	0.067	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.065	0.049	0.028	0.028	0.028	0.066
	RL			0.4	0.39	0.39	0.4	0.39	0.4	0.4	0.4	0.39	0.4	0.39	0.39	0.39	0.38	0.39	0.39	0.39	0.39
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27 C J	ND	ND	ND	0.11 C J	ND	ND	ND	ND
RDX	MDL		0.02	0.043	0.042	0.042	0.043	0.021	0.021	0.021	0.021	0.02	0.021	0.02	0.021	0.042	0.025	0.02	0.02	0.02	0.042
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trinitrobenzene	MDL		5.4	0.015	0.015	0.015	0.015	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.015	0.018	0.027	0.027	0.027	0.015
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	0.041 J b	0.042 J b	ND	ND	ND	ND	ND	0.027 J b	ND	ND	ND	ND	ND	ND
Trinitrophenylmethylnitramine	MDL		49	0.028	0.028	0.028	0.028	0.028	0.029	0.029	0.029	0.028	0.029	0.028	0.029	0.028	0.028	0.028	0.028	0.028	0.028
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.052 J b	ND	ND
2,4,6-Trinitrotoluene	MDL		0.68	0.0078	0.0077	0.0077	0.0078	0.03	0.03	0.03	0.031	0.03	0.03	0.03	0.03	0.0076	0.025	0.03	0.03	0.03	0.0077
	RL			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.19	0.19	0.19	0.19	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[1] : EPA Region 9 residential RSL, no HDOH EAL exists

[2] : The HDOH EALs for 1,3-dinotrobenzene, and 4-amino-2,6-dinitrotoluene are 0.095 mg/kg and 0.12 mg/kg respectively. Since these levels are below both the analytical method and laboratory detection limits, the project action levels will be set at the laboratory quantitation limit of 0.2 mg/kg

b: The target analyte detection is below one half the reporting limit. These estimated detections are qualified not only with a J, but also with a b.

C: Presence confirmed, but relative percent difference between columns exceeds 40%

J: The quantitation is an estimation

PS: Primary sample

QC: Quality control sample

bold values exceed the background value and the Project Action Limit

Background values are the 95th percentile from the Environmental Background analysis of Metals in soil at Navy Oahu Facilities, Pacific Division, Naval Facilities Engineering Command 2006.

2008 Summary of Analytical Results

Sample Number		Project background concentrations (mg/kg)	Project Action Limit (mg/kg)	MEC035	MEC036	MEC037	MEC038	MEC039	MEC040	MEC041	**MEC042**	**MEC043**	MEC044	MEC045	MEC046	MEC047	MEC048	MEC049	MEC050
Sample Date				10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/20/2008	10/21/2008	10/21/2008	10/21/2008	10/21/2008	10/21/2008	10/21/2008
Sample Type				PS	PS	PS	PS	PS	PS	QC	PS	PS	PS	PS	PS	PS	QC	PS	PS
EPA Method SW6010B (mg/kg)																			
Aluminum	MDL	93,900	77,000[1]	17	12	14	15	15	17	18	29	14	24	15	14	18	17	14	15
	RL			180	130	140	160	160	180	180	310	140	250	190	150	190	180	140	160
	Result			42,000	50,000	59,000	41,000	52,000	40,000	45,000	42,000	72,000	33,000	32,000	27,000	40,000	41,000	46,000	51,000
Antimony	MDL	6.9	6.3	0.28	0.19	0.22	0.24	0.25	0.23	0.29	0.19	0.22	0.38	0.23	0.24	0.29	0.28	0.22	0.24
	RL			0.98	0.7	0.71	0.82	0.88	0.94	0.98	0.66	0.75	1.3	0.96	0.77	0.96	0.94	0.81	0.82
	Result			ND	0.2 J	ND	ND	ND	ND	0.78 J	4.3	ND	1.2 J	ND	ND	ND	0.54 J	ND	ND
Barium	MDL	181	750	0.065	0.044	0.05	0.055	0.056	0.091	0.065	0.043	0.05	0.087	0.094	0.053	0.067	0.064	0.05	0.055
	RL			0.49	0.35	0.36	0.41	0.44	0.47	0.49	0.33	0.37	0.63	0.48	0.38	0.48	0.47	0.4	0.41
	Result			36	20	40	84	50	14	15	36	16	23	54	19	60	59	59	58
Chromium (total)	MDL	483	500	0.059	0.04	0.046	0.05	0.051	0.028	0.059	0.039	0.046	0.079	0.029	0.049	0.061	0.058	0.046	0.05
	RL			0.49	0.35	0.36	0.41	0.44	0.47	0.49	0.33	0.37	0.63	0.48	0.38	0.48	0.47	0.4	0.41
	Result			300	400	320	190	210	320	310	230	200	220	170	210	270	270	250	180
Copper	MDL	183	230	0.099	0.068	0.077	0.084	0.086	0.065	0.1	3.3	0.077	0.13	0.067	0.082	0.1	0.098	0.077	0.085
	RL			0.49	0.35	0.36	0.41	0.44	0.47	0.49	15	0.37	0.63	0.48	0.38	0.48	0.47	0.4	0.41
	Result			99	110	120	80	120	62	86	**1,300**	**360**	180	77	63	140	120	97	91
Iron	MDL	177,000	55,000[1]	17	28	13	14	14	17	17	28	13	22	18	14	17	16	13	14
	RL			180	310	140	160	160	180	180	310	140	250	190	150	190	180	140	160
	Result			91,000	140,000	110,000	68,000	97,000	130,000	140,000	100,000	120,000	110,000	75,000	130,000	110,000	110,000	93,000	78,000
Lead	MDL	100	200	0.1	0.07	0.08	0.087	0.089	0.084	0.1	3.4	0.08	0.14	0.087	0.085	0.11	0.1	0.08	0.088
	RL			0.49	0.35	0.36	0.41	0.44	0.47	0.49	10	0.37	0.63	0.48	0.38	0.48	0.47	0.4	0.41
	Result			0.32 J	ND	ND	ND	2.7	11	6.2	**960**	77	53	7.1	4.4	3.8	3.3	0.71	1
Nickel	MDL	346	150	0.083	0.057	0.065	0.071	0.073	0.057	0.084	0.056	0.065	0.11	0.059	0.069	0.087	0.082	0.065	0.072
	RL			0.49	0.35	0.36	0.41	0.44	0.47	0.49	0.33	0.37	0.63	0.48	0.38	0.48	0.47	0.4	0.41
	Result			140	110	230	150	98	71	66	130	210	78	96	33	85	85	110	100
Zinc	MDL	197	600	0.15	0.1	0.12	0.13	0.13	0.3	0.15	0.1	0.12	0.2	0.31	0.15	0.15	0.15	0.12	0.13
	RL			2	1.4	1.4	1.6	1.8	1.9	2	1.3	1.5	2.5	1.9	1.5	1.9	1.9	1.6	1.6
	Result			70	50	56	75	80	65	62	190	130	92	79	53	80	75	68	72
EPA Method SW8330B (mg/kg)																			
2-Amino-4,6-Dinitrotoluene	MDL		0.25	0.032	0.032	0.032	0.032	0.031	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.032	0.032
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Amino-2,6-Dinitrotoluene	MDL		0.2[2]	0.057	0.057	0.057	0.057	0.056	0.058	0.058	0.057	0.057	0.058	0.057	0.057	0.057	0.056	0.057	0.057
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	MDL		0.2[2]	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	MDL		2.7	0.017	0.018	0.017	0.018	0.017	0.018	0.018	0.017	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	MDL		2.6	0.031	0.031	0.031	0.031	0.03	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HMX	MDL		100	0.059	0.059	0.059	0.059	0.058	0.059	0.059	0.059	0.059	0.06	0.059	0.059	0.059	0.058	0.059	0.059
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	MDL		0.11	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrotoluene	MDL		0.0032	0.042	0.043	0.042	0.043	0.042	0.043	0.043	0.043	0.043	0.043	0.043	0.042	0.042	0.042	0.042	0.042
	RL			0.4	0.4	0.39	0.4	0.39	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.39	0.39	0.39
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.073 J b	0.055 J b	ND	ND
3-Nitrotoluene	MDL		6.7	0.044	0.044	0.044	0.044	0.043	0.044	0.044	0.044	0.044	0.045	0.044	0.044	0.044	0.043	0.044	0.044
	RL			0.4	0.4	0.39	0.4	0.39	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.39	0.39	0.39
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrotoluene	MDL		0.22	0.067	0.067	0.066	0.067	0.065	0.067	0.067	0.067	0.067	0.068	0.067	0.067	0.067	0.066	0.066	0.066
	RL			0.4	0.4	0.39	0.4	0.39	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.39	0.39	0.39
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RDX	MDL		0.02	0.042	0.043	0.042	0.043	0.042	0.043	0.043	0.043	0.043	0.043	0.042	0.042	0.042	0.042	0.042	0.042
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trinitrobenzene	MDL		5.4	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.015	0.015	0.015	0.015	0.015	0.015
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trinitrophenylmethylnitramine	MDL		49	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.029	0.028	0.028	0.028	0.028	0.028	0.028
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trinitrotoluene	MDL		0.68	0.0078	0.0078	0.0077	0.0078	0.0076	0.0078	0.0078	0.0078	0.0078	0.0079	0.0078	0.0078	0.0078	0.0077	0.0077	0.0077
	RL			0.2	0.2	0.2	0.2	0.19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Result			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

[1] : EPA Region 9 residential RSL, no HDOH EAL exists

[2] : The HDOH EALs for 1,3-dinotrobenzene, and 4-amino-2,6-dinitrotoluene are 0.095 mg/kg and 0.12 mg/kg respectively. Since these levels are below both the analytical method and laboratory detection limits, the project action levels will be set at the laboratory quantitation limit of 0.2 mg/kg

b: The target analyte detection is below one half the reporting limit. These estimated detections are qualified not only with a J, but also with a b.

C: Presence confirmed, but relative percent difference between columns exceeds 40%

J: The quantitation is an estimation

PS: Primary sample

QC: Quality control sample

bold values exceed the background value and the Project Action Limit

Background values are the 95th percentile from the Environmental Background analysis of Metals in soil at Navy Oahu Facilities, Pacific Division, Naval Facilities Engineering Command 2006.

LDC Report# 19747A40

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Waikane Training Area
Collection Date:	October 14 through October 16, 2008
LDC Report Date:	November 26, 2008
Matrix:	Soil
Parameters:	Explosives
Validation Level:	Standard
Laboratory:	Curtis & Tompkins, Ltd.
Sample Delivery Group (SDG):	207059

Sample Identification

MEC001
MEC002
MEC003
MEC004
MEC005
MEC006
MEC007
MEC008
MEC009
MEC010
MEC011
MEC012
MEC013
MEC014
MEC015
MEC016
MEC017
MEC018
MEC019
MEC020
MEC021
MEC022
MEC023
MEC024
MEC025
MEC026
MEC027
MEC028
MEC029
MEC030
MEC031
MEC032
MEC033
MEC020MS
MEC020MSD
MEC033MS
MEC033MSD

Introduction

This data review covers 37 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Project Procedures Manual, U.S. Navy Environmental Restoration Program, NAVFAC Pacific (DON 2007) and the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version (January 2006).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U	Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
J	Indicates an estimated value.
R	Quality control indicates the data is not usable.
N	Presumptive evidence of presence of the constituent.
UJ	Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
A	Indicates the finding is based upon technical validation criteria.
P	Indicates the finding is related to a protocol/contractual deviation.
None	Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
QC467146-BLK1	10/26/08	4-Nitrotoluene	79 ug/Kg	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
MEC002	4-Nitrotoluene	89 ug/Kg	89U ug/Kg
MEC003	4-Nitrotoluene	69 ug/Kg	69U ug/Kg
MEC005	4-Nitrotoluene	68 ug/Kg	68U ug/Kg
MEC006	4-Nitrotoluene	74 ug/Kg	74U ug/Kg

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
MEC002	4-Nitrotoluene RDX	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects)	P
MEC003 MEC005	4-Nitrotoluene	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P
MEC006	Nitrobenzene 2-Nitrotoluene 4-Nitrotoluene	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects) NJ (all detects)	P
MEC008 MEC009 MEC013 MEC019 MEC020	2-Nitrotoluene	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P
MEC010	Nitrobenzene 2-Nitrotoluene	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects)	P
MEC011	HMX 2-Nitrotoluene	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects)	P

Sample	Compound	Finding	Criteria	Flag	A or P
MEC017 MEC018	Nitrobenzene	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P
MEC021 MEC022 MEC028	1,3,5-Trinitrobenzene	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P
MEC024	Nitrobenzene 2-Nitrotoluene 3-Nitrotoluene	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects) NJ (all detects)	P
MEC025	HMX	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P
MEC026	4-Nitrotoluene 3-Nitrotoluene	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects)	P
MEC027	2,6-Dinitrotoluene	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P
MEC032	Tetryl 4-Nitrotoluene	2nd column confirmation was not performed for these compounds.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects) NJ (all detects)	P

The sample results for detected compounds from the two columns were within 40.0% relative percent differences (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
MEC030	4-Nitrotoluene	41	J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples MEC010 and MEC011, samples MEC020 and MEC021, and samples MEC030 and MEC031 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

	Concentration (ug/Kg)		
Compound	**MEC010**	**MEC011**	**RPD (Limits)**
Nitrobenzene	21	200U	200 (≤100)
2-Nitrotoluene	110	76	37 (≤100)
HMX	200U	92	200 (≤100)

	Concentration (ug/Kg)		
Compound	**MEC020**	**MEC021**	**RPD (Limits)**
2-Nitrotoluene	82	390U	200 (≤100)
1,3,5-Trinitrobenzene	200U	41	200 (≤100)

	Concentration (ug/Kg)		
Compound	**MEC030**	**MEC031**	**RPD (Limits)**
4-Nitrotoluene	110	390U	200 (≤100)

Waikane Training Area
Explosives - Data Qualification Summary - SDG 207059

SDG	Sample	Compound	Flag	A or P	Reason
207059	MEC030	4-Nitrotoluene	J (all detects)	A	Compound quantitation and CRQLs (RPD)
207059	MEC002	4-Nitrotoluene RDX	NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC003 MEC005	4-Nitrotoluene	NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC006	Nitrobenzene 2-Nitrotoluene 4-Nitrotoluene	NJ (all detects) NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC008 MEC009 MEC013 MEC019 MEC020	2-Nitrotoluene	NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC010	Nitrobenzene 2-Nitrotoluene	NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC011	HMX 2-Nitrotoluene	NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC017 MEC018	Nitrobenzene	NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC021 MEC022 MEC028	1,3,5-Trinitrobenzene	NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC024	Nitrobenzene 2-Nitrotoluene 3-Nitrotoluene	NJ (all detects) NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC025	HMX	NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC026	4-Nitrotoluene 3-Nitrotoluene	NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs
207059	MEC027	2,6-Dinitrotoluene	NJ (all detects)	P	Compound quantitation and CRQLs

SDG	Sample	Compound	Flag	A or P	Reason
207059	MEC032	Tetryl 4-Nitrotoluene	NJ (all detects) NJ (all detects)	P	Compound quantitation and CRQLs

Waikane Training Area
Explosives - Laboratory Blank Data Qualification Summary - SDG 207059

SDG	Sample	Compound	Modified Final Concentration	A or P
207059	MEC002	4-Nitrotoluene	89U ug/Kg	A
207059	MEC003	4-Nitrotoluene	69U ug/Kg	A
207059	MEC005	4-Nitrotoluene	68U ug/Kg	A
207059	MEC006	4-Nitrotoluene	74U ug/Kg	A

Waikane Training Area
Explosives - Field Blank Data Qualification Summary - SDG 207059

No Sample Data Qualified in this SDG

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC001	Batch#:	144100
Lab ID:	207059-001	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	60
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.9
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	58
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	93	69-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC002	Batch#:	144100
Lab ID:	207059-002	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	80 J b NJ (*VI)	200	43
1,3,5-Trinitrobenzene	ND U	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND ↓	400	43
4-Nitrotoluene	89 J b U (B)	400	67
3-Nitrotoluene	ND U	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC003	Batch#:	144100
Lab ID:	207059-003	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	69 J b U(B)	400	67
3-Nitrotoluene	ND U	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC004	Batch#:	144100
Lab ID:	207059-004	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result		RL	MDL
HMX	ND	U	200	59
RDX	ND		200	43
1,3,5-Trinitrobenzene	ND		200	15
1,3-Dinitrobenzene	ND		200	13
Nitrobenzene	ND		200	17
Tetryl	ND		200	28
2,4,6-Trinitrotoluene	ND		200	7.8
2-Amino-4,6-dinitrotoluene	ND		200	32
4-Amino-2,6-dinitrotoluene	ND		200	57
2,4-Dinitrotoluene	ND		200	18
2,6-Dinitrotoluene	ND		200	31
2-Nitrotoluene	ND		400	43
4-Nitrotoluene	ND		400	67
3-Nitrotoluene	ND		400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

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ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC005	Batch#:	144100
Lab ID:	207059-005	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	58
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	31
4-Amino-2,6-dinitrotoluene	ND	200	56
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	68 J U (B)	390	66
3-Nitrotoluene	ND U	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	81	69-120

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC006	Batch#:	144100
Lab ID:	207059-006	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	58
RDX	ND ↓	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	19 J b NJ (*VI)	200	17
Tetryl	ND U	200	28
2,4,6-Trinitrotoluene	ND ↓	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	31
4-Amino-2,6-dinitrotoluene	ND	200	56
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	78 J b NJ (*VI)	390	42
4-Nitrotoluene	74 J b U (B)	390	66
3-Nitrotoluene	ND U	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	93	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit
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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC007	Batch#:	144100
Lab ID:	207059-007	Sampled:	10/14/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	58
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	31
4-Amino-2,6-dinitrotoluene	ND	200	56
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	66
3-Nitrotoluene	ND	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	90	69-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC008	Batch#:	144100
Lab ID:	207059-008	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	59 J b NJ (*VI)	400	42
4-Nitrotoluene	ND U	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC009	Batch#:	144100
Lab ID:	207059-009	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND ↓	200	31
2-Nitrotoluene	100 J b NJ (*VI)	390	42
4-Nitrotoluene	ND U	390	66
3-Nitrotoluene	ND ↓	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC010	Batch#:	144100
Lab ID:	207059-010	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	21 J bNJ (*VI)	200	17
Tetryl	ND U	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	110 J bNJ(*VI)	400	43
4-Nitrotoluene	ND U	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC011	Batch#:	144100
Lab ID:	207059-011	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	92 J b NJ (*VI)	200	59
RDX	ND U	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND ↓	200	31
2-Nitrotoluene	76 J b NJ (*VI)	390	42
4-Nitrotoluene	ND U	390	66
3-Nitrotoluene	ND ↓	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	90	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit
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67.0

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC012	Batch#:	144100
Lab ID:	207059-012	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	58
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	66
3-Nitrotoluene	ND	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

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ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC013	Batch#:	144100
Lab ID:	207059-013	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	58
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND ↓	200	31
2-Nitrotoluene	63 J b UJ (*JI)	400	43
4-Nitrotoluene	ND U	400	67
3-Nitrotoluene	ND ↓	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	90	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC014	Batch#:	144100
Lab ID:	207059-014	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	88	69-120

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ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

YL 111908

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC015	Batch#:	144100
Lab ID:	207059-015	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	89	69-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC016	Batch#:	144100
Lab ID:	207059-016	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result		RL	MDL
HMX	ND	U	200	59
RDX	ND		200	43
1,3,5-Trinitrobenzene	ND		200	15
1,3-Dinitrobenzene	ND		200	13
Nitrobenzene	ND		200	17
Tetryl	ND		200	28
2,4,6-Trinitrotoluene	ND		200	7.8
2-Amino-4,6-dinitrotoluene	ND		200	32
4-Amino-2,6-dinitrotoluene	ND		200	57
2,4-Dinitrotoluene	ND		200	18
2,6-Dinitrotoluene	ND		200	31
2-Nitrotoluene	ND		400	43
4-Nitrotoluene	ND		400	67
3-Nitrotoluene	ND		400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	89	69-120

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ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

TL 111908

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC017	Batch#:	144100
Lab ID:	207059-017	Sampled:	10/15/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	35 J b NJ (* VI)	200	17
Tetryl	ND U	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	58
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	89	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC018	Batch#:	144100
Lab ID:	207059-018	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	25 J b NJ (*II)	200	17
Tetryl	ND U	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	66
3-Nitrotoluene	ND	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC019	Batch#:	144100
Lab ID:	207059-019	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	58
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	31
4-Amino-2,6-dinitrotoluene	ND	200	56
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	61 J b NJ (*VI)	390	42
4-Nitrotoluene	ND U	390	66
3-Nitrotoluene	ND	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	90	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC020	Batch#:	144100
Lab ID:	207059-020	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	82 J b NJ (*II)	400	43
4-Nitrotoluene	ND U	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	81	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC021	Batch#:	144101
Lab ID:	207059-021	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	15
RDX	ND ↓	200	21
1,3,5-Trinitrobenzene	41 J b NJ (*VI)	200	27
1,3-Dinitrobenzene	ND U	200	4.6
Nitrobenzene	ND	200	16
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	20
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	ND	390	28
4-Nitrotoluene	ND	390	28
3-Nitrotoluene	ND ↓	390	40

Surrogate	%REC	Limits
1,2-Dinitrobenzene	89	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC022	Batch#:	144101
Lab ID:	207059-022	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	15
RDX	ND	200	21
1,3,5-Trinitrobenzene	42 J bNJ (+VI)	200	27
1,3-Dinitrobenzene	ND U	200	4.6
Nitrobenzene	ND	200	16
Tetryl	ND	200	29
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	21
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	ND	400	28
4-Nitrotoluene	ND	400	28
3-Nitrotoluene	ND	400	40

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC023	Batch#:	144101
Lab ID:	207059-023	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	15
RDX	ND	200	21
1,3,5-Trinitrobenzene	ND	200	27
1,3-Dinitrobenzene	ND	200	4.6
Nitrobenzene	ND	200	16
Tetryl	ND	200	29
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	21
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	ND	400	28
4-Nitrotoluene	ND	400	28
3-Nitrotoluene	ND	400	40

Surrogate	%REC	Limits
1,2-Dinitrobenzene	90	69-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit
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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC024	Batch#:	144101
Lab ID:	207059-024	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	15
RDX	ND	200	21
1,3,5-Trinitrobenzene	ND	200	27
1,3-Dinitrobenzene	ND	200	4.6
Nitrobenzene	43 J b NJ(*II)	200	16
Tetryl	ND U	200	29
2,4,6-Trinitrotoluene	ND	200	31
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	21
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	100 J b NJ(*II)	400	28
4-Nitrotoluene	ND U	400	28
3-Nitrotoluene	91 J b NJ (*II)	400	40

Surrogate	%REC	Limits
1,2-Dinitrobenzene	94	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC025	Batch#:	144101
Lab ID:	207059-025	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	39 J b NJ (*VI)	190	14
RDX	ND U	190	20
1,3,5-Trinitrobenzene	ND	190	27
1,3-Dinitrobenzene	ND	190	4.5
Nitrobenzene	ND	190	16
Tetryl	ND	190	28
2,4,6-Trinitrotoluene	ND	190	30
2-Amino-4,6-dinitrotoluene	ND	190	18
4-Amino-2,6-dinitrotoluene	ND	190	38
2,4-Dinitrotoluene	ND	190	20
2,6-Dinitrotoluene	ND	190	22
2-Nitrotoluene	ND	390	28
4-Nitrotoluene	ND	390	28
3-Nitrotoluene	ND	390	39

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC026	Batch#:	144101
Lab ID:	207059-026	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	15
RDX	ND	200	21
1,3,5-Trinitrobenzene	ND	200	27
1,3-Dinitrobenzene	ND	200	4.6
Nitrobenzene	ND	200	16
Tetryl	ND	200	29
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	21
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	ND	400	28
4-Nitrotoluene	270 C J NJ (*VI)	400	28
3-Nitrotoluene	230 C J	400	40

Surrogate	%REC	Limits
1,2-Dinitrobenzene	89	69-120

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C= Presence confirmed, but RPD between columns exceeds 40%
J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

RL 111908

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC027	Batch#:	144101
Lab ID:	207059-027	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	14
RDX	ND	200	20
1,3,5-Trinitrobenzene	ND	200	27
1,3-Dinitrobenzene	ND	200	4.5
Nitrobenzene	ND	200	16
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	20
2,6-Dinitrotoluene	72 J b NJ (*VI)	200	22
2-Nitrotoluene	ND U	390	28
4-Nitrotoluene	ND	390	28
3-Nitrotoluene	ND	390	39

Surrogate	%REC	Limits
1,2-Dinitrobenzene	94	69-120

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J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

L111908

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC028	Batch#:	144101
Lab ID:	207059-028	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	15
RDX	ND ↓	200	21
1,3,5-Trinitrobenzene	27 J b NJ (*VI)	200	27
1,3-Dinitrobenzene	ND U	200	4.6
Nitrobenzene	ND	200	16
Tetryl	ND	200	29
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	21
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	ND	390	28
4-Nitrotoluene	ND	390	28
3-Nitrotoluene	ND ↓	390	40

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

12/19/08

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC029	Batch#:	144101
Lab ID:	207059-029	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND	190	58
RDX	ND	190	42
1,3,5-Trinitrobenzene	ND	190	15
1,3-Dinitrobenzene	ND	190	13
Nitrobenzene	ND	190	17
Tetryl	ND	190	28
2,4,6-Trinitrotoluene	ND	190	7.6
2-Amino-4,6-dinitrotoluene	ND	190	31
4-Amino-2,6-dinitrotoluene	ND	190	56
2,4-Dinitrotoluene	ND	190	17
2,6-Dinitrotoluene	ND	190	30
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	65
3-Nitrotoluene	ND	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	93	69-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

12/19/08

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC030	Batch#:	144101
Lab ID:	207059-030	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/30/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	190	22
RDX	ND	190	25
1,3,5-Trinitrobenzene	ND	190	18
1,3-Dinitrobenzene	ND	190	11
Nitrobenzene	ND	190	26
Tetryl	ND	190	28
2,4,6-Trinitrotoluene	ND	190	25
2-Amino-4,6-dinitrotoluene	ND	190	49
4-Amino-2,6-dinitrotoluene	ND	190	45
2,4-Dinitrotoluene	ND	190	27
2,6-Dinitrotoluene	ND	190	26
2-Nitrotoluene	ND	380	27
4-Nitrotoluene	110 C J J (*VI)	380	49
3-Nitrotoluene	ND U	380	42

Surrogate	%REC	Limits
1,2-Dinitrobenzene	94	69-120

NAVFAC PACIFIC VALIDATED

C= Presence confirmed, but RPD between columns exceeds 40%
J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

l 1/19/09

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC031	Batch#:	144101
Lab ID:	207059-031	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	190	14
RDX	ND	190	20
1,3,5-Trinitrobenzene	ND	190	27
1,3-Dinitrobenzene	ND	190	4.5
Nitrobenzene	ND	190	16
Tetryl	ND	190	28
2,4,6-Trinitrotoluene	ND	190	30
2-Amino-4,6-dinitrotoluene	ND	190	18
4-Amino-2,6-dinitrotoluene	ND	190	38
2,4-Dinitrotoluene	ND	190	20
2,6-Dinitrotoluene	ND	190	22
2-Nitrotoluene	ND	390	28
4-Nitrotoluene	ND	390	28
3-Nitrotoluene	ND	390	39

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

JL 111908

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC032	Batch#:	144101
Lab ID:	207059-032	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	190	14
RDX	ND ↓	190	20
1,3,5-Trinitrobenzene	ND	190	27
1,3-Dinitrobenzene	ND	190	4.5
Nitrobenzene	ND	190	16
Tetryl	52 J b NJ (*II)	190	28
2,4,6-Trinitrotoluene	ND U	190	30
2-Amino-4,6-dinitrotoluene	ND ↓	190	18
4-Amino-2,6-dinitrotoluene	ND	190	38
2,4-Dinitrotoluene	ND	190	20
2,6-Dinitrotoluene	ND	190	22
2-Nitrotoluene	ND	390	28
4-Nitrotoluene	100 J b NJ (*II)	390	28
3-Nitrotoluene	ND U	390	39

Surrogate	%REC	Limits
1,2-Dinitrobenzene	86	69-120

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Page 1 of 1

NAVFAC PACIFIC VALIDATED

111908

Nitroaromatics and Nitroamines by HPLC

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC033	Batch#:	144101
Lab ID:	207059-033	Sampled:	10/16/08
Matrix:	Soil	Received:	10/21/08
Units:	ug/Kg	Prepared:	10/26/08
Basis:	as received	Analyzed:	10/28/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	14
RDX	ND	200	20
1,3,5-Trinitrobenzene	ND	200	27
1,3-Dinitrobenzene	ND	200	4.5
Nitrobenzene	ND	200	16
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	30
2-Amino-4,6-dinitrotoluene	ND	200	18
4-Amino-2,6-dinitrotoluene	ND	200	39
2,4-Dinitrotoluene	ND	200	20
2,6-Dinitrotoluene	ND	200	22
2-Nitrotoluene	ND	390	28
4-Nitrotoluene	ND	390	28
3-Nitrotoluene	ND	390	39

Surrogate	%REC	Limits
1,2-Dinitrobenzene	84	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Page 1 of 1

L 11/5/08

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LDC #: 19747A40
SDG #: 207059
Laboratory: Curtis & Tompkins, Ltd.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/13/08
Page: 1 of 1
Reviewer: FT
2nd Reviewer: JL

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/14 → 10/16/08
IIa.	Initial calibration	A	$r^2 \geq 0.990$
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	SW	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 10+11, 20+21, 30+31
X.	Field blanks	N	

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: soil

1 1	MEC001	11 1	MEC011	21 2	MEC021	31 2	MEC031
2 1	MEC002	12 1	MEC012	22 2	MEC022	32 2	MEC032
3 1	MEC003	13 1	MEC013	23 2	MEC023	33 2	MEC033
4 1	MEC004	14 1	MEC014	24 2	MEC024	34	MEC020MS
5 1	MEC005	15 1	MEC015	25 2	MEC025	35	MEC020MSD
6 1	MEC006	16 1	MEC016	26 2	MEC026	36	MEC033MS
7 1	MEC007	17 1	MEC017	27 2	MEC027	37	MEC033MSD
8 1	MEC008	18 1	MEC018	28 2	MEC028	38 1	QC467146
9 1	MEC009	19 1	MEC019	29 2	MEC029	39 2	QC467150
10 1	MEC010	20 1	MEC020	30 2	MEC030	40	

Notes:

VALIDATION FINDINGS WORKSHEET

_METHOD: ____GC ____HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,l)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L.. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	O.		O. Chlorpyrifos		
P. Pyrene	P.		P. Fenthion		
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichloronate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:____________________

LDC #: 19747A4O
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: PJ
2nd Reviewer: R

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were all samples associated with a given method blank?
[✓ Y] N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
[✓ Y] N N/A Was a method blank performed with each extraction batch?
[✓ Y] N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only
Y N [✓ N/A] (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N [✓ N/A] Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 10/26/08 Blank analysis date: 10/28/08 Associated samples: 1 → 20
Conc. units: ug/Kg

Compound	Blank ID	Sample Identification							
▨	QC467146-BLK1	2	3	5	6				
N	79	89/U	69/U	68/U	74/U				

Blank extraction date:________ Blank analysis date:_______ Associated samples:________________
Conc. units:________

Compound	Blank ID	Sample Identification							
▨									

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 19747A40
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: [✓ GC] __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N [✓ N/A] Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N [✓ N/A] Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	%RPD Bet. 2column Finding ≤40	Associated Samples	Qualifications
	N	~~240%~~ 41%	30	J/A det

Comments: See sample calculation verification worksheet for recalculations

LDC #: 19747A4O
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: FB
2nd Reviewer: K

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N [✓ N/A] Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N [✓ N/A] Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	N, B	no second column confirmation performed	2	NJ / P
	N	↓	3, 5 ~~, 30~~	↓
	F, L, N	↓	6	↓
	L	↓	8, 9, 13, 19, 20	↓
	F, L	↓	10	↓
	A, L	↓	11	↓
	F	↓	~~13~~ 17, 18	↓
	C	↓	21, 22, 28	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 19747A40
SDG #: See cover

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N [✓ N/A] Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N [✓ N/A] Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	F, L, M	no second column	24	NJ / P
		confirmation performed		↓
	A	↓	25	
	N, M	↓	26	
	K	↓	27	
	~~A~~ E, N	↓	32	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 19747A40
SDG #: see cover

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: ✓ GC __ HPLC

[✓ Y] N N/A Were field duplicate pairs identified in this SDG?

[✓ Y] N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		%RPD Limit ≤100	Qualification Parent only / All Samples
	10	11		
F	21	200U	100	
L	110	76	37	
A	200U	92	200	

Compound	Concentration (ug/kg)		%RPD Limit ≤100	Qualification Parent only / All Samples
	20	21		
L	82	390U	200	
C	200U	41	200	

LDC #: 19747A4O
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: R

METHOD: [✓ GC] __ HPLC

[✓ Y] N N/A Were field duplicate pairs identified in this SDG?

[✓ Y] N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		%RPD Limit ≤100	Qualification Parent only / All Samples
	30	31		
N	110	390u	200	

Compound	Concentration ( )		%RPD Limit ____	Qualification Parent only / All Samples

LDC Report# 19747A4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Waikane Training Area
Collection Date:	October 14 through October 16, 2008
LDC Report Date:	November 19, 2008
Matrix:	Soil
Parameters:	Metals
Validation Level:	Standard
Laboratory:	Curtis & Tompkins, Ltd.
Sample Delivery Group (SDG):	207059

Sample Identification

MEC001
MEC002
MEC003
MEC004
MEC005
MEC006
MEC007
MEC008
MEC009
MEC010
MEC011
MEC012
MEC013
MEC014
MEC015
MEC016
MEC017
MEC018
MEC019
MEC020
MEC021
MEC022
MEC023
MEC024
MEC025
MEC026
MEC027
MEC028
MEC029
MEC030
MEC031
MEC032
MEC033
MEC020MS
MEC020MSD
MEC021MS
MEC021MSD

Introduction

This data review covers 37 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Barium, Chromium, Copper, Iron, Lead, Nickel, and Zinc.

This review follows the Project Procedures Manual, U.S. Navy Environmental Restoration Program, NAVFAC Pacific (DON 2007) and the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version (January 2006).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U	Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
J	Indicates an estimated value.
R	Quality control indicates the data is not usable.
N	Presumptive evidence of presence of the constituent.
UJ	Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
A	Indicates the finding is based upon technical validation criteria.
P	Indicates the finding is related to a protocol/contractual deviation.
None	Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium Copper Iron Lead Zinc	0.040 mg/Kg 0.055 mg/Kg 2.6 mg/Kg 0.086 mg/Kg 0.31 mg/Kg	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Barium Chromium Copper Lead	2.244 ug/L 2.038 ug/L 3.406 ug/L 2.416 ug/L	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020
ICB/CCB	Aluminum Iron	46.54 ug/L 88.37 ug/L	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020 MEC033
PB (prep blank)	Aluminum Chromium Copper Iron	3.8 mg/Kg 0.039 mg/Kg 0.13 mg/Kg 1.8 mg/Kg	MEC021 MEC022 MEC023 MEC024 MEC025 MEC026 MEC027 MEC028 MEC029 MEC030 MEC031 MEC032 MEC033

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Barium Chromium Copper Lead	2.392 ug/L 2.215 ug/L 4.540 ug/L 2.367 ug/L	MEC022 MEC023 MEC024 MEC025 MEC026 MEC027 MEC028 MEC029 MEC030 MEC031 MEC032 MEC033
ICB/CCB	Aluminum	43.66 ug/L	MEC022 MEC023 MEC024 MEC025 MEC026 MEC029 MEC030 MEC031 MEC032
ICB/CCB	Iron	75.92 ug/L	MEC022 MEC023 MEC024 MEC025 MEC026 MEC027 MEC028 MEC029 MEC030 MEC031 MEC032
ICB/CCB	Barium Chromium Copper Lead	2.262 ug/L 1.555 ug/L 3.315 ug/L 2.306 ug/L	MEC021

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MEC001	Lead	0.26 mg/Kg	0.26U mg/Kg
MEC008	Lead	0.33 mg/Kg	0.33U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
MEC026	Lead	0.39 mg/Kg	0.39U mg/Kg
MEC027	Lead	0.37 mg/Kg	0.37U mg/Kg
MEC028	Lead	0.54 mg/Kg	0.54U mg/Kg
MEC030	Lead	0.25 mg/Kg	0.25U mg/Kg

No field blanks were identified in this SDG.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MEC020MS/MSD (MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020)	Chromium Lead Antimony	71 (80-120) 69 (80-120) 55 (80-120)	- 67 (80-120) 57 (80-120)	- - -	J (all detects) UJ (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MEC020MS/MSD (MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020)	Nickel	143 (80-120)	131 (80-120)	-	J (all detects)	A
MEC021MS/MSD (MEC021 MEC022 MEC023 MEC024 MEC025 MEC026 MEC027 MEC028 MEC029 MEC030 MEC031 MEC032 MEC033)	Lead	79 (80-120)	-	-	J (all detects) UJ (all non-detects)	A
	Antimony	60 (80-120)	61 (80-120)	-	J (all detects) UJ (all non-detects)	

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
MEC020L	Iron	11 (≤10)	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020	J (all detects)	A

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MEC010 and MEC011, samples MEC020 and MEC021, and samples MEC030 and MEC031 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC010	MEC011	
Aluminum	36000	33000	9 (≤100)
Barium	52	52	0 (≤100)
Chromium	230	260	12 (≤100)

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC010	MEC011	
Copper	79	85	7 (≤100)
Iron	83000	96000	15 (≤100)
Lead	7.1	8.2	14 (≤100)
Nickel	97	94	3 (≤100)
Zinc	78	86	10 (≤100)

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC020	MEC021	
Aluminum	45000	48000	6 (≤100)
Barium	35	40	13 (≤100)
Chromium	310	330	6 (≤100)
Copper	190	250	27 (≤100)
Iron	110000	110000	0 (≤100)
Lead	120	84	35 (≤100)
Nickel	100	120	18 (≤100)
Zinc	93	99	6 (≤100)

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC030	MEC031	
Aluminum	35000	27000	26 (≤100)
Barium	65	55	17 (≤100)
Chromium	140	140	0 (≤100)
Copper	88	84	5 (≤100)
Iron	83000	65000	24 (≤100)

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC030	MEC031	
Lead	0.25	0.60	82 (≤100)
Nickel	86	73	16 (≤100)
Zinc	74	67	10 (≤100)

Waikane Training Area
Metals - Data Qualification Summary - SDG 207059

SDG	Sample	Analyte	Flag	A or P	Reason
207059	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020	Chromium Lead Antimony	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
207059	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020	Nickel	J (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
207059	MEC021 MEC022 MEC023 MEC024 MEC025 MEC026 MEC027 MEC028 MEC029 MEC030 MEC031 MEC032 MEC033	Lead Antimony	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
207059	MEC001 MEC002 MEC003 MEC004 MEC005 MEC006 MEC007 MEC008 MEC009 MEC010 MEC011 MEC012 MEC013 MEC014 MEC015 MEC016 MEC017 MEC018 MEC019 MEC020	Iron	J (all detects)	A	ICP serial dilution (%D)

Waikane Training Area
Metals - Laboratory Blank Data Qualification Summary - SDG 207059

SDG	Sample	Analyte	Modified Final Concentration	A or P
207059	MEC001	Lead	0.26U mg/Kg	A
207059	MEC008	Lead	0.33U mg/Kg	A
207059	MEC026	Lead	0.39U mg/Kg	A
207059	MEC027	Lead	0.37U mg/Kg	A
207059	MEC028	Lead	0.54U mg/Kg	A
207059	MEC030	Lead	0.25U mg/Kg	A

Waikane Training Area
Metals - Field Blank Data Qualification Summary - SDG 207059

No Sample Data Qualified in this SDG

Aluminum

Lab #: 207059
Client: Wil Chee Planning
Project#: UXOA-007
Analyte: Aluminum
Matrix: Soil
Units: mg/Kg

Location: Waikane Training Area
Prep: EPA 3050B
Analysis: EPA 6010B
Received: 10/21/08
Prepared: 10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	DilnFac	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	29,000	160	15	dry	39%	20.00	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	34,000	210	20	dry	53%	20.00	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	30,000	170	16	dry	44%	20.00	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	34,000	190	18	dry	49%	20.00	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	35,000	140	13	dry	34%	20.00	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	30,000	190	18	dry	51%	20.00	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	33,000	170	16	dry	47%	20.00	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	46,000	170	16	dry	43%	20.00	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	73,000	170	16	dry	47%	20.00	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	36,000	190	18	dry	48%	20.00	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	33,000	190	18	dry	51%	20.00	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	46,000	150	14	dry	38%	20.00	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	52,000	160	15	dry	45%	20.00	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	46,000	170	16	dry	45%	20.00	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	35,000	190	18	dry	50%	20.00	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	42,000	200	19	dry	53%	20.00	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	46,000	170	16	dry	46%	20.00	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	44,000	160	15	dry	45%	20.00	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	44,000	160	16	dry	41%	20.00	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	45,000	190	18	dry	50%	20.00	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	48,000	200	19	dry	51%	20.00	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	34,000	190	18	dry	51%	20.00	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	51,000	180	17	dry	49%	20.00	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	38,000	190	18	dry	48%	20.00	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	25,000	180	17	dry	45%	20.00	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	36,000	230	22	dry	58%	20.00	144046	10/16/08	10/27/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

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Aluminum

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Aluminum	Received:	10/21/08
Matrix:	Soil	Prepared:	10/23/08
Units:	mg/Kg		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Batch#	Sampled	Analyzed
MEC027	SAMPLE	207059-027	37,000	150	14	dry	38%	20.00	144046	10/16/08	10/29/08
MEC028	SAMPLE	207059-028	28,000	210	20	dry	54%	20.00	144046	10/16/08	10/29/08
MEC029	SAMPLE	207059-029	49,000	150	14	dry	39%	20.00	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	35,000	190	18	dry	47%	20.00	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	27,000	180	17	dry	47%	20.00	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	27,000	200	19	dry	54%	20.00	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	42,000	200	19	dry	51%	20.00	144046	10/16/08	10/28/08
	BLANK	QC466908	ND	5.0	0.47	as received		1.000	144044		10/28/08
	BLANK	QC466922	3.8 J	5.0	0.47	as received		1.000	144046		10/24/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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NAVFAC PACIFIC VALIDATED

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Curtis & Tompkins, Ltd.

Barium

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Barium	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	77	0.41	0.055	dry	39%	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	69	0.53	0.072	dry	53%	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	75	0.45	0.058	dry	44%	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	63	0.49	0.065	dry	49%	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	19	0.38	0.049	dry	34%	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	26	0.51	0.068	dry	51%	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	79	0.47	0.059	dry	47%	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	120	0.44	0.060	dry	43%	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	45	0.47	0.061	dry	47%	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	52	0.48	0.066	dry	48%	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	52	0.51	0.068	dry	51%	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	79	0.40	0.051	dry	38%	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	83	0.45	0.057	dry	45%	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	75	0.45	0.059	dry	45%	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	71	0.50	0.065	dry	50%	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	68	0.53	0.070	dry	53%	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	28	0.46	0.061	dry	46%	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	82	0.45	0.057	dry	45%	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	17	0.42	0.058	dry	41%	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	35	0.50	0.066	dry	50%	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	40	0.51	0.069	dry	51%	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	59	0.51	0.067	dry	51%	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	57	0.49	0.063	dry	49%	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	30	0.48	0.065	dry	48%	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	39	0.45	0.062	dry	45%	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	50	0.60	0.079	dry	58%	144046	10/16/08	10/27/08
MEC027	SAMPLE	207059-027	72	0.40	0.053	dry	38%	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	73	0.54	0.073	dry	54%	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	94	0.41	0.053	dry	39%	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	65	0.47	0.065	dry	47%	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	55	0.47	0.064	dry	47%	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	70	0.54	0.071	dry	54%	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	100	0.51	0.069	dry	51%	144046	10/16/08	10/27/08
	BLANK	QC466908	ND	0.25	0.035	as received		144044		10/28/08
	BLANK	QC466922	ND	0.25	0.035	as received		144046		10/24/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Chromium

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Chromium	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	150 J(Q)	0.41	0.050	dry	39%	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	170	0.53	0.066	dry	53%	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	160	0.45	0.053	dry	44%	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	390	0.49	0.060	dry	49%	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	340	0.38	0.045	dry	34%	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	270	0.51	0.062	dry	51%	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	170	0.47	0.054	dry	47%	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	220	0.44	0.054	dry	43%	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	320	0.47	0.055	dry	47%	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	230	0.48	0.060	dry	48%	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	260	0.51	0.062	dry	51%	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	160	0.40	0.047	dry	38%	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	210	0.45	0.052	dry	45%	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	300	0.45	0.054	dry	45%	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	180	0.50	0.059	dry	50%	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	180	0.53	0.064	dry	53%	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	290	0.46	0.055	dry	46%	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	270	0.45	0.052	dry	45%	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	310	0.42	0.053	dry	41%	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	310	0.50	0.060	dry	50%	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	330	0.51	0.063	dry	51%	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	200	0.51	0.061	dry	51%	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	250	0.49	0.057	dry	49%	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	240	0.48	0.060	dry	48%	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	240	0.45	0.057	dry	45%	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	190	0.60	0.072	dry	58%	144046	10/16/08	10/27/08
MEC027	SAMPLE	207059-027	140	0.40	0.049	dry	38%	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	140	0.54	0.067	dry	54%	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	170	0.41	0.049	dry	39%	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	140	0.47	0.060	dry	47%	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	140	0.47	0.058	dry	47%	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	150	0.54	0.065	dry	54%	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	180	0.51	0.063	dry	51%	144046	10/16/08	10/27/08
	BLANK	QC466908	0.040 J	0.25	0.032	as received		144044		10/28/08
	BLANK	QC466922	0.039 J	0.25	0.032	as received		144046		10/24/08

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

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Copper

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Copper	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	88	0.41	0.084	dry	39%	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	94	0.53	0.11	dry	53%	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	100	0.45	0.090	dry	44%	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	110	0.49	0.10	dry	49%	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	120	0.38	0.075	dry	34%	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	99	0.51	0.10	dry	51%	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	100	0.47	0.091	dry	47%	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	120	0.44	0.092	dry	43%	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	110	0.47	0.093	dry	47%	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	79	0.48	0.10	dry	48%	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	85	0.51	0.10	dry	51%	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	100	0.40	0.079	dry	38%	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	120	0.45	0.087	dry	45%	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	110	0.45	0.091	dry	45%	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	78	0.50	0.10	dry	50%	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	110	0.53	0.11	dry	53%	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	81	0.46	0.093	dry	46%	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	150	0.45	0.087	dry	45%	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	350	0.42	0.089	dry	41%	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	190	0.50	0.10	dry	50%	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	250	0.51	0.11	dry	51%	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	83	0.51	0.10	dry	51%	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	87	0.49	0.097	dry	49%	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	90	0.48	0.10	dry	48%	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	97	0.45	0.096	dry	45%	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	93	0.60	0.12	dry	58%	144046	10/16/08	10/27/08
MEC027	SAMPLE	207059-027	83	0.40	0.082	dry	38%	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	77	0.54	0.11	dry	54%	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	110	0.41	0.082	dry	39%	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	88	0.47	0.10	dry	47%	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	84	0.47	0.098	dry	47%	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	83	0.54	0.11	dry	54%	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	110	0.51	0.11	dry	51%	144046	10/16/08	10/27/08
	BLANK	QC466908	0.055 J	0.25	0.054	as received		144044		10/28/08
	BLANK	QC466922	0.13 J	0.25	0.054	as received		144046		10/24/08

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

11/9/08

Iron

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Iron	Received:	10/21/08
Matrix:	Soil	Prepared:	10/23/08
Units:	mg/Kg		

Field ID	Type	Lab ID	Result		RL	MDL	Basis	Moisture	Diln Fac	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	64,000	J(A)	160	14	dry	39%	20.00	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	78,000		210	19	dry	53%	20.00	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	72,000		170	15	dry	44%	20.00	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	120,000		190	17	dry	49%	20.00	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	97,000		140	13	dry	34%	20.00	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	92,000		190	18	dry	51%	20.00	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	77,000		170	15	dry	47%	20.00	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	81,000		170	15	dry	43%	20.00	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	110,000		170	16	dry	47%	20.00	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	83,000		190	17	dry	48%	20.00	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	96,000		190	18	dry	51%	20.00	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	77,000		150	13	dry	38%	20.00	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	81,000		160	15	dry	45%	20.00	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	75,000		170	15	dry	45%	20.00	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	85,000		190	17	dry	50%	20.00	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	82,000		200	18	dry	53%	20.00	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	100,000		170	16	dry	46%	20.00	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	80,000		160	15	dry	45%	20.00	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	120,000		160	15	dry	41%	20.00	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	110,000		190	17	dry	50%	20.00	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	110,000		200	18	dry	51%	20.00	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	83,000		190	17	dry	51%	20.00	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	87,000		180	16	dry	49%	20.00	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	77,000		190	17	dry	48%	20.00	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	86,000		180	16	dry	45%	20.00	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	82,000		230	20	dry	58%	20.00	144046	10/16/08	10/27/08
MEC027	SAMPLE	207059-027	81,000		150	14	dry	38%	20.00	144046	10/16/08	10/27/08

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

26.0

NAVFAC PACIFIC VALIDATED

n 11/9/08

Curtis & Tompkins, Ltd.

Iron

Lab #: 207059
Client: Wil Chee Planning
Project#: UXOA-007
Analyte: Iron
Matrix: Soil
Units: mg/Kg

Location: Waikane Training Area
Prep: EPA 3050B
Analysis: EPA 6010B
Received: 10/21/08
Prepared: 10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Batch#	Sampled	Analyzed
MEC028	SAMPLE	207059-028	85,000	210	19	dry	54%	20.00	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	81,000	150	14	dry	39%	20.00	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	83,000	190	17	dry	47%	20.00	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	65,000	180	16	dry	47%	20.00	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	79,000	200	18	dry	54%	20.00	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	99,000	200	18	dry	51%	20.00	144046	10/16/08	10/28/08
	BLANK	QC466908	2.6 J	5.0	0.45	as received		1.000	144044		10/28/08
	BLANK	QC466922	1.8 J	5.0	0.45	as received		1.000	144046		10/24/08

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

26.0

Curtis & Tompkins, Ltd.

NAVFAC PACIFIC VALIDATED

rL 111908

Nickel

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Nickel	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	74	0.41	0.071	dry J(&)	39%	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	77	0.53	0.094	dry	53%	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	72	0.45	0.076	dry	44%	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	81	0.49	0.085	dry	49%	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	120	0.38	0.064	dry	34%	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	86	0.51	0.088	dry	51%	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	81	0.47	0.077	dry	47%	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	150	0.44	0.077	dry	43%	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	170	0.47	0.079	dry	47%	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	97	0.48	0.086	dry	48%	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	94	0.51	0.088	dry	51%	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	190	0.40	0.067	dry	38%	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	150	0.45	0.074	dry	45%	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	130	0.45	0.077	dry	45%	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	96	0.50	0.084	dry	50%	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	160	0.53	0.091	dry	53%	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	84	0.46	0.079	dry	46%	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	160	0.45	0.074	dry	45%	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	68	0.42	0.075	dry	41%	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	100	0.50	0.086	dry	50%	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	120	0.51	0.090	dry	51%	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	77	0.51	0.087	dry	51%	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	180	0.49	0.082	dry	49%	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	98	0.48	0.085	dry	48%	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	76	0.45	0.081	dry	45%	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	91	0.60	0.10	dry	58%	144046	10/16/08	10/27/08
MEC027	SAMPLE	207059-027	90	0.40	0.069	dry	38%	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	80	0.54	0.095	dry	54%	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	180	0.41	0.069	dry	39%	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	86	0.47	0.085	dry	47%	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	73	0.47	0.082	dry	47%	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	73	0.54	0.092	dry	54%	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	120	0.51	0.090	dry	51%	144046	10/16/08	10/27/08
	BLANK	QC466908	ND	0.25	0.045	as received		144044		10/28/08
	BLANK	QC466922	ND	0.25	0.045	as received		144046		10/24/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

r 111908

Lead

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Lead	Received:	10/21/08
Matrix:	Soil	Prepared:	10/23/08
Units:	mg/Kg		

Field ID	Type	Lab ID		Result			RL		MDL	Basis	Moisture	Diln Fac	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001		0.26	J	UJ	0.41	(BQ)	0.087	dry	39%	1.000	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002		1.5		J	0.53	(@)	0.12	dry	53%	1.000	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003		2.7			0.45		0.093	dry	44%	1.000	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004		3.5			0.49		0.10	dry	49%	1.000	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	ND			UJ	0.38		0.078	dry	34%	1.000	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	ND				0.51		0.11	dry	51%	1.000	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007		1.6		J	0.47		0.094	dry	47%	1.000	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008		0.33	J	UJ	0.44	(BQ)	0.095	dry	43%	1.000	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009		5.1		J	0.47	(@)	0.097	dry	47%	1.000	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010		7.1			0.48		0.11	dry	48%	1.000	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011		8.2			0.51		0.11	dry	51%	1.000	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012		5.3			0.40		0.082	dry	38%	1.000	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013		3.0			0.45		0.091	dry	45%	1.000	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014		4.5			0.45		0.094	dry	45%	1.000	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	ND			UJ	6.2		2.1	dry	50%	20.00	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016		7.2		J	0.53		0.11	dry	53%	1.000	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017		4.8			0.46		0.097	dry	46%	1.000	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018		47			0.45		0.091	dry	45%	1.000	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019		350			0.42		0.092	dry	41%	1.000	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020		120			0.50		0.11	dry	50%	1.000	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021		84			0.51		0.11	dry	51%	1.000	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022		6.3			0.51		0.11	dry	51%	1.000	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023		2.5			0.49		0.10	dry	49%	1.000	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024		3.6			0.48		0.10	dry	48%	1.000	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025		1.5			0.45		0.10	dry	45%	1.000	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026		0.39	J	UJ	0.60	(BQ)	0.13	dry	58%	1.000	144046	10/16/08	10/27/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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NAVFAC PACIFIC VALIDATED

r 11/9/08

Lead

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Lead	Received:	10/21/08
Matrix:	Soil	Prepared:	10/23/08
Units:	mg/Kg		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Batch#	Sampled	Analyzed
MEC027	SAMPLE	207059-027	0.37 J UJ	0.40 (BQ)	0.085	dry	38%	1.000	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	0.54 J UJ	0.54 (Q)	0.12 (B)	dry	54%	1.000	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	1.6 J	0.41 ↓	0.085	dry	39%	1.000	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	0.25 J UJ	0.47 (BQ)	0.10	dry	47%	1.000	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	0.60 J	0.47 (Q)	0.10	dry	47%	1.000	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	2.0 ↓	0.54 ↓	0.11	dry	54%	1.000	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	3.7 ↓	0.51 ↓	0.11	dry	51%	1.000	144046	10/16/08	10/27/08
	BLANK	QC466908	0.086 J	0.25	0.056	as received		1.000	144044		10/28/08
	BLANK	QC466922	ND	0.25	0.056	as received		1.000	144046		10/24/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

rl 11/9/08

Curtis & Tompkins, Ltd.

Antimony

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Antimony	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	ND UJ	0.82 (2)	0.24	dry	39%	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	ND	1.1	0.32	dry	53%	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	ND	0.89	0.26	dry	44%	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	ND	0.98	0.29	dry	49%	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	ND	0.76	0.22	dry	34%	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	ND	1.0	0.30	dry	51%	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	ND	0.94	0.26	dry	47%	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	ND	0.88	0.26	dry	43%	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	ND	0.94	0.27	dry	47%	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	ND	0.96	0.29	dry	48%	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	ND	1.0	0.30	dry	51%	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	ND	0.81	0.23	dry	38%	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	ND	0.91	0.25	dry	45%	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	ND	0.91	0.26	dry	45%	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	ND	1.0	0.29	dry	50%	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	ND	1.1	0.31	dry	53%	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	ND	0.93	0.27	dry	46%	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	ND	0.91	0.25	dry	45%	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	0.57 J J	0.85	0.25	dry	41%	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	ND UJ	1.0	0.29	dry	50%	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	ND	1.0	0.31	dry	51%	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	ND	1.0	0.29	dry	51%	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	ND	0.98	0.28	dry	49%	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	ND	0.96	0.29	dry	48%	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	ND	0.91	0.28	dry	45%	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	ND	1.2	0.35	dry	58%	144046	10/16/08	10/27/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

r 11/9/08

Antimony

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Antimony	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC027	SAMPLE	207059-027	ND UJ (Q)	0.81	0.23	dry	38%	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	ND	1.1	0.32	dry	54%	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	ND	0.82	0.23	dry	39%	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	ND	0.94	0.29	dry	47%	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	ND	0.94	0.28	dry	47%	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	ND	1.1	0.31	dry	54%	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	ND	1.0	0.31	dry	51%	144046	10/16/08	10/27/08
	BLANK	QC466908	ND	0.50	0.15	as received		144044		10/28/08
	BLANK	QC466922	ND	0.50	0.15	as received		144046		10/24/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

44.0

Curtis & Tompkins, Ltd.

NAVFAC PACIFIC VALIDATED

r 11/19/08

Zinc

Lab #: 207059
Client: Wil Chee Planning
Project#: UXOA-007
Analyte: Zinc
Matrix: Soil
Units: mg/Kg

Location: Waikane Training Area
Prep: EPA 3050B
Analysis: EPA 6010B
Diln Fac: 1.000
Received: 10/21/08
Prepared: 10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC001	SAMPLE	207059-001	66	1.6	0.13	dry	39%	144044	10/14/08	10/28/08
MEC002	SAMPLE	207059-002	75	2.1	0.17	dry	53%	144044	10/14/08	10/28/08
MEC003	SAMPLE	207059-003	85	1.8	0.14	dry	44%	144044	10/14/08	10/28/08
MEC004	SAMPLE	207059-004	83	2.0	0.15	dry	49%	144044	10/14/08	10/28/08
MEC005	SAMPLE	207059-005	64	1.5	0.11	dry	34%	144044	10/14/08	10/28/08
MEC006	SAMPLE	207059-006	52	2.0	0.16	dry	51%	144044	10/14/08	10/28/08
MEC007	SAMPLE	207059-007	80	1.9	0.14	dry	47%	144044	10/14/08	10/28/08
MEC008	SAMPLE	207059-008	85	1.8	0.14	dry	43%	144044	10/15/08	10/28/08
MEC009	SAMPLE	207059-009	68	1.9	0.14	dry	47%	144044	10/15/08	10/28/08
MEC010	SAMPLE	207059-010	78	1.9	0.15	dry	48%	144044	10/15/08	10/28/08
MEC011	SAMPLE	207059-011	86	2.0	0.16	dry	51%	144044	10/15/08	10/28/08
MEC012	SAMPLE	207059-012	84	1.6	0.12	dry	38%	144044	10/15/08	10/28/08
MEC013	SAMPLE	207059-013	100	1.8	0.13	dry	45%	144044	10/15/08	10/28/08
MEC014	SAMPLE	207059-014	99	1.8	0.14	dry	45%	144044	10/15/08	10/28/08
MEC015	SAMPLE	207059-015	77	2.0	0.15	dry	50%	144044	10/15/08	10/28/08
MEC016	SAMPLE	207059-016	130	2.1	0.16	dry	53%	144044	10/15/08	10/28/08
MEC017	SAMPLE	207059-017	53	1.9	0.14	dry	46%	144044	10/15/08	10/28/08
MEC018	SAMPLE	207059-018	120	1.8	0.13	dry	45%	144044	10/16/08	10/28/08
MEC019	SAMPLE	207059-019	66	1.7	0.13	dry	41%	144044	10/16/08	10/28/08
MEC020	SAMPLE	207059-020	93	2.0	0.15	dry	50%	144044	10/16/08	10/28/08
MEC021	SAMPLE	207059-021	99	2.0	0.16	dry	51%	144046	10/16/08	10/24/08
MEC022	SAMPLE	207059-022	92	2.0	0.15	dry	51%	144046	10/16/08	10/27/08
MEC023	SAMPLE	207059-023	78	2.0	0.15	dry	49%	144046	10/16/08	10/27/08
MEC024	SAMPLE	207059-024	60	1.9	0.15	dry	48%	144046	10/16/08	10/27/08
MEC025	SAMPLE	207059-025	80	1.8	0.14	dry	45%	144046	10/16/08	10/27/08
MEC026	SAMPLE	207059-026	83	2.4	0.18	dry	58%	144046	10/16/08	10/27/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

50.0

Curtis & Tompkins, Ltd.

NAVFAC PACIFIC VALIDATED

2/11908

Zinc

Lab #:	207059	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Zinc	Diln Fac:	1.000
Matrix:	Soil	Received:	10/21/08
Units:	mg/Kg	Prepared:	10/23/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Batch#	Sampled	Analyzed
MEC027	SAMPLE	207059-027	57	1.6	0.12	dry	38%	144046	10/16/08	10/27/08
MEC028	SAMPLE	207059-028	66	2.2	0.17	dry	54%	144046	10/16/08	10/27/08
MEC029	SAMPLE	207059-029	120	1.6	0.12	dry	39%	144046	10/16/08	10/27/08
MEC030	SAMPLE	207059-030	74	1.9	0.15	dry	47%	144046	10/16/08	10/27/08
MEC031	SAMPLE	207059-031	67	1.9	0.15	dry	47%	144046	10/16/08	10/27/08
MEC032	SAMPLE	207059-032	69	2.2	0.16	dry	54%	144046	10/16/08	10/27/08
MEC033	SAMPLE	207059-033	140	2.0	0.16	dry	51%	144046	10/16/08	10/27/08
	BLANK	QC466908	0.31 J	1.0	0.081	as received		144044		10/28/08
	BLANK	QC466922	ND	1.0	0.081	as received		144046		10/24/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

2/11/908

LDC #: 19747A4

SDG #: 207059

Laboratory: Curtis & Tompkins, Ltd.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11-14-08

Page: 1 of 1

Reviewer: MG

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10-14-08 through 10-16-08
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A ~~SW~~	
V.	Matrix Spike Analysis	SW	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD
VIII.	Internal Standard (ICP-MS)	N	Not Utilized
IX.	Furnace Atomic Absorption QC	N	" "
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 10+11, D = 20+21, D = 30+31
XIV.	Field Blanks	N	

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: all soil

1	1	MEC001	11	1	MEC011	21	2	MEC021	31	2	MEC031
2	1	MEC002	12	1	MEC012	22	2	MEC022	32	2	MEC032
3	1	MEC003	13	1	MEC013	23	2	MEC023	33	2	MEC033
4	1	MEC004	14	1	MEC014	24	2	MEC024	34	1	MEC020MS
5	1	MEC005	15	1	MEC015	25	2	MEC025	35	1	MEC020MSD
6	1	MEC006	16	1	MEC016	26	2	MEC026	36	2	MEC021MS
7	1	MEC007	17	1	MEC017	27	2	MEC027	37	2	MEC021MSD
8	1	MEC008	18	1	MEC018	28	2	MEC028	38	1	PBS1
9	1	MEC009	19	1	MEC019	29	2	MEC029	39	2	PBS2
10	1	MEC010	20	1	MEC020	30	2	MEC030	40		

Notes:

LDC #: 19747A4
SDG #: 207059

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1 → 33	S	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN^-, ___ ___
QC 34→37	↓	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP Trace	S	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: Mercury by CVAA if performed

Met 09
10-24
(#21 only)

Met 09
10-27
(#22→33)

Met 09
10-28
(#1→20)

except Al, Fe for # 1→20, 33

LDC #: 19747A4
SDG #: 207059
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Blank concentration units, unless otherwise noted: μg/L

VALIDATION FINDINGS WORKSHEET
Prep Blank/ICB/CCB Findings

Associated Samples: all

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

	Blank Identification										
Analyte	**ICB**	**CCB1**	**CCB2**	**CCB3**	**PB ( )**	**ICB**	**CCB1**	**CCB2**	**CCB3**	**PB ( )**	**Analyte**
Al			43.66	43.54							Al
Sb											Sb
As											As
Ba	2.255	2.262	2.392	2.097	2.188	2.244					Ba
Be											Be
Cd											Cd
Ca											Ca
Cr	1.503	1.555	2.215	1.742	2.035	2.038					Cr
Co											Co
Cu	2.769	3.315	4.540	2.228	2.914	3.406					Cu
Fe			75.92	78.20	87.47	88.37					Fe
Pb	2.306		2.367	2.007	2.416						Pb
Mg											Mg
Mn											Mn
Hg											Hg
Ni											Ni
K											K
Se											Se
Ag											Ag
Na											Na
Tl											Tl
V											V
Zn											Zn
B											B
Mo											Mo
Sr											Sr

The highest concentration found in the Prep Blank and ICB/CCB for each analyte is circled on this worksheet and transferred to the PB/ICB/CCB Qualified Samples worksheet.

LDC #: 19747A4
SDG #: 207059
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50x
Associated Samples: 1 → 20 except Al, Fe CCB for # 1→20, 33

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	8								
Al			43.54	10.88										
Sb														
As														
Ba			2.244	0.56										
Be														
Cd														
Ca														
Cr	0.040		2.038	0.51										
Co														
Cu	0.055		3.406	0.85										
Fe	2.6		88.37	22.09										
Pb	0.086		2.416	0.60	0.26	0.33								
Mg														
Mn														
Hg														
Mo														
Ni														
K														
Se														
Ag														
Na														
Tl														
V														
Zn	0.31			1.55										
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 19747A4
SDG #: 207059
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50x
Associated Samples:

PB for # 21 → 33
CCBs for # 22 → 33
except Al CCB for # 22 → 26, 29 → 32
except Fe CCB for # 22 → 32

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	26	27	28	30 mg ~~29~~						
Al	3.8		43.66	19.00										
Sb														
As														
Ba			2.392	0.60										
Be														
Cd														
Ca														
Cr	0.039		2.215	0.55										
Co														
Cu	0.13		4.540	1.14										
Fe	1.8		75.92	18.98										
Pb			2.367	0.59	0.39	0.37	0.54	0.25						
Mg														
Mn														
Hg														
Mo														
Ni														
K														
Se														
Ag														
Na														
Tl														
V														
Zn														
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 19747A4
SDG #: 207059
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50 x
Associated Samples: 21

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification									
							No sample was qualified							
Al														
Sb														
As														
Ba			2.262	0.57										
Be														
Cd														
Ca														
Cr			1.555	0.39										
Co														
Cu			3.315	0.83										
Fe														
Pb			2.306	0.58										
Mg														
Mn														
Hg														
Mo														
Ni														
K														
Se														
Ag														
Na														
Tl														
V														
Zn														
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 19747A4
SDG #: 207059

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y [✓ N] N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

[✓ Y] N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	34/35	soil	Cr	71 (80-120)			1→20	J/UJ/A
	↓	↓	Ni	143 ( )	131 (80-120)		↓	J dets/A
			Pb	69 ( )	67 ( )			J/UJ/A
			Sb	55 ( )	57 ( )			↓
2	36/37		Pb	79 ( )			21→33	
	↓	↓	Sb	60 ( )	61 ( )		↓	

Comments:

LDC #: 19747A4
SDG #: 207059

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?
Y [✓ N] N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y [✓ N] N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:
Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1	10-28-08	20	soil	Fe	11 ≤10	1 → 20	J dets /A

Comments:

LDC#: 19747A4
SDG#: 207059

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

[✓ Y] N NA Were field duplicate pairs identified in this SDG?
[✓ Y] N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		(≤ 100) RPD	
	10	11		
Aluminum	36000	33000	9	
Barium	52	52	0	
Chromium	230	260	12	
Copper	79	85	7	
Iron	83000	96000	15	
Lead	7.1	8.2	14	
Nickel	97	94	3	
Zinc	78	86	10	

V:\FIELD DUPLICATES\FD_inorganic\19747A4.WPD

Compound	Concentration (mg/kg)		(≤ 100) RPD	
	20	21		
Aluminum	45000	48000	6	
Barium	35	40	13	
Chromium	310	330	6	
Copper	190	250	27	
Iron	110000	110000	0	
Lead	120	84	35	
Nickel	100	120	18	
Zinc	93	99	6	

V:\FIELD DUPLICATES\FD_inorganic\19747A4.WPD

LDC#: 19747A4
SDG#: 207059

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 2 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

[✓ Y] N NA Were field duplicate pairs identified in this SDG?
[✓ Y] N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		(≤100) RPD	
	30	31		
Aluminum	35000	27000	26	
Barium	65	55	17	
Chromium	140	140	0	
Copper	88	84	5	
Iron	83000	65000	24	
Lead	0.25	0.60	82	
Nickel	86	73	16	
Zinc	74	67	10	

LDC Report# 19760A40

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Waikane Training Area
Collection Date:	October 21, 2008
LDC Report Date:	November 19, 2008
Matrix:	Soil
Parameters:	Explosives
Validation Level:	Standard
Laboratory:	Curtis & Tompkins, Ltd.
Sample Delivery Group (SDG):	207226

Sample Identification

MEC045

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Project Procedures Manual, U.S. Navy Environmental Restoration Program, NAVFAC Pacific (DON 2007) and the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version (January 2006).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U	Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
J	Indicates an estimated value.
R	Quality control indicates the data is not usable.
N	Presumptive evidence of presence of the constituent.
UJ	Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
A	Indicates the finding is based upon technical validation criteria.
P	Indicates the finding is related to a protocol/contractual deviation.
None	Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

No field duplicates were identified in this SDG.

Waikane Training Area
Explosives - Data Qualification Summary - SDG 207226

No Sample Data Qualified in this SDG

Waikane Training Area
Explosives - Laboratory Blank Data Qualification Summary - SDG 207226

No Sample Data Qualified in this SDG

Waikane Training Area
Explosives - Field Blank Data Qualification Summary - SDG 207226

No Sample Data Qualified in this SDG

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207226	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC045	Batch#:	144284
Lab ID:	207226-001	Sampled:	10/21/08
Matrix:	Soil	Received:	10/28/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/03/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	84	69-120

NAVFAC PACIFIC VALIDATED

L 11 2008

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

LDC #: 19760A40

SDG #: 207226

Laboratory: Curtis & Tompkins, Ltd.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/17/08

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/21/08
IIa.	Initial calibration	A	$r^2 \geq 0.990$
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Soil

1	MEC045	11	QC467950	21	144204	31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC Report# 19760A4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Waikane Training Area

Collection Date: October 21, 2008

LDC Report Date: November 19, 2008

Matrix: Soil

Parameters: Metals

Validation Level: Standard

Laboratory: Curtis & Tompkins, Ltd.

Sample Delivery Group (SDG): 207226

Sample Identification

MEC045

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Barium, Chromium, Copper, Iron, Lead, Nickel, and Zinc.

This review follows the Project Procedures Manual, U.S. Navy Environmental Restoration Program, NAVFAC Pacific (DON 2007) and the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version (January 2006).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U	Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
J	Indicates an estimated value.
R	Quality control indicates the data is not usable.
N	Presumptive evidence of presence of the constituent.
UJ	Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
A	Indicates the finding is based upon technical validation criteria.
P	Indicates the finding is related to a protocol/contractual deviation.
None	Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Aluminum Copper Nickel	79.21 ug/L 1.614 ug/L 0.9097 ug/L	All samples in SDG 207226

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

No field blanks were identified in this SDG.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VI. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

Waikane Training Area
Metals - Data Qualification Summary - SDG 207226

No Sample Data Qualified in this SDG

Waikane Training Area
Metals - Laboratory Blank Data Qualification Summary - SDG 207226

No Sample Data Qualified in this SDG

Waikane Training Area
Metals - Field Blank Data Qualification Summary - SDG 207226

No Sample Data Qualified in this SDG

Curtis & Tompkins, Ltd.

Metals Analytical Report

Lab #:	207226	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Field ID:	MEC045	Batch#:	144200
Lab ID:	207226-001	Sampled:	10/21/08
Matrix:	Soil	Received:	10/28/08
Units:	mg/Kg	Prepared:	10/28/08
Basis:	dry		

Moisture: 48%

Analyte	Result		RL	MDL	Diln Fac	Analyzed
Aluminum	32,000		190	51	20.00	11/07/08
Antimony	ND	U	0.96	0.23	1.000	10/29/08
Barium	54		0.48	0.094	1.000	10/29/08
Chromium	170		0.48	0.029	1.000	10/29/08
Copper	77		0.48	0.067	1.000	10/29/08
Iron	75,000		190	18	20.00	11/07/08
Lead	7.1		0.48	0.087	1.000	10/29/08
Nickel	96		0.48	0.059	1.000	10/29/08
Zinc	79		1.9	0.31	1.000	10/29/08

NAVFAC PACIFIC VALIDATED

12/1/2008

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Page 1 of 1

LDC #: 19760A4
SDG #: 207226
Laboratory: Curtis & Tompkins, Ltd.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11-18-08
Page: 1 of 1
Reviewer: MG
2nd Reviewer: W

METHOD: Metals (EPA SW 846 Method 6010B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10-21-08
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	N	Client specified
VI.	Duplicate Sample Analysis	N	" "
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD
VIII.	Internal Standard (ICP-MS)	N	Not utilized
IX.	Furnace Atomic Absorption QC	N	" "
X.	ICP Serial Dilution	N	Not performed
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
soil

1	MEC045	11		21		31	
2	PBS	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 19760A4
SDG #: 207226

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	S	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
ICP Trace	S	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN$^-$, ____ ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ____ ____

Comments: Mercury by CVAA if performed

ELEMENTS.4

10-29-08
Met 08

11-7-08
20x dil Al/Fe

LDC #: 19760A4
SDG #: 207226
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Blank concentration units, unless otherwise noted: µg/L

VALIDATION FINDINGS WORKSHEET
Prep Blank/ICB/CCB Findings

Associated Samples: all

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

	Blank Identification										
Analyte	ICB	CCB1	CCB2	CCB3	PB ( )	ICB	CCB1	CCB2	CCB3	PB ( )	Analyte
Al				47.72	79.2						Al
Sb											Sb
As											As
Ba											Ba
Be											Be
Cd											Cd
Ca											Ca
Cr											Cr
Co											Co
Cu	1.614										Cu
Fe											Fe
Pb											Pb
Mg											Mg
Mn											Mn
Hg											Hg
Ni	0.9097										Ni
K											K
Se											Se
Ag											Ag
Na											Na
Tl											Tl
V											V
Zn											Zn
B											B
Mo											Mo
Sr											Sr

The highest concentration found in the Prep Blank and ICB/CCB for each analyte is circled on this worksheet and transferred to the PB/ICB/CCB Qualified Samples worksheet.

BLNKICB.4SW

LDC #: 19760A4
SDG #: 207226
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50x ; Al: 20x dil
Associated Samples: all

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification									
							No	sample	was	qualified				
Al			79.21	396.0										
Sb														
As														
Ba														
Be														
Cd														
Ca														
Cr														
Co														
Cu			1.614	0.40										
Fe														
Pb														
Mg														
Mn														
Hg														
Mo														
Ni			0.9097	0.23										
K														
Se														
Ag														
Na														
Tl														
V														
Zn														
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC Report# 19794A40

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Waikane Training Area
Collection Date:	October 20, 2008
LDC Report Date:	December 2, 2008
Matrix:	Soil
Parameters:	Explosives
Validation Level:	Standard
Laboratory:	Curtis & Tompkins, Ltd.
Sample Delivery Group (SDG):	207110

Sample Identification

MEC034
MEC035
MEC036
MEC037
MEC038
MEC039
MEC040
MEC041
MEC042
MEC043
MEC044
MEC046
MEC047
MEC048
MEC049
MEC050
MEC040MS
MEC040MSD

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Project Procedures Manual, U.S. Navy Environmental Restoration Program, NAVFAC Pacific (DON 2007) and the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version (January 2006).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U	Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
J	Indicates an estimated value.
R	Quality control indicates the data is not usable.
N	Presumptive evidence of presence of the constituent.
UJ	Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
A	Indicates the finding is based upon technical validation criteria.
P	Indicates the finding is related to a protocol/contractual deviation.
None	Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

b. Calibration Verification

Calibration verification was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
MEC047 MEC048	2-Nitrotoluene	2nd column confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the DOD QSM.	NJ (all detects)	P

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples MEC047 and MEC048 and samples MEC040 and MEC041 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

	Concentration (ug/Kg)		
Compound	MEC047	MEC048	RPD (Limits)
2-Nitrotoluene	73	55	28 (≤100)

Waikane Training Area
Explosives - Data Qualification Summary - SDG 207110

SDG	Sample	Compound	Flag	A or P	Reason
207110	MEC047 MEC048	2-Nitrotoluene	NJ (all detects)	P	Compound quantitation and CRQLs

Waikane Training Area
Explosives - Laboratory Blank Data Qualification Summary - SDG 207110

No Sample Data Qualified in this SDG

Waikane Training Area
Explosives - Field Blank Data Qualification Summary - SDG 207110

No Sample Data Qualified in this SDG

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC034	Batch#:	144284
Lab ID:	207110-001	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	10/31/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	66
3-Nitrotoluene	ND	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	89	69-120

NAVFAC PACIFIC VALIDATED

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ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC035	Batch#:	144284
Lab ID:	207110-002	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	10/31/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	42
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

40.0

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC036	Batch#:	144284
Lab ID:	207110-003	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

12/20/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC037	Batch#:	144284
Lab ID:	207110-004	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	66
3-Nitrotoluene	ND ↓	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

NAVFAC PACIFIC VALIDATED

9L 12/01/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC038	Batch#:	144284
Lab ID:	207110-005	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

NAVFAC PACIFIC VALIDATED

12/2008

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Nitroaromatics and itroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC039	Batch#:	144284
Lab ID:	207110-006	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	190	58
RDX	ND	190	42
1,3,5-Trinitrobenzene	ND	190	15
1,3-Dinitrobenzene	ND	190	13
Nitrobenzene	ND	190	17
Tetryl	ND	190	28
2,4,6-Trinitrotoluene	ND	190	7.6
2-Amino-4,6-dinitrotoluene	ND	190	31
4-Amino-2,6-dinitrotoluene	ND	190	56
2,4-Dinitrotoluene	ND	190	17
2,6-Dinitrotoluene	ND	190	30
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	65
3-Nitrotoluene	ND	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

12/20/08

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC040	Batch#:	144284
Lab ID:	207110-007	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	10/31/08
Diln Fac:	1.000		

Analyte	Result		RL	MDL
HMX	ND	U	200	59
RDX	ND		200	43
1,3,5-Trinitrobenzene	ND		200	15
1,3-Dinitrobenzene	ND		200	13
Nitrobenzene	ND		200	17
Tetryl	ND		200	28
2,4,6-Trinitrotoluene	ND		200	7.8
2-Amino-4,6-dinitrotoluene	ND		200	32
4-Amino-2,6-dinitrotoluene	ND		200	58
2,4-Dinitrotoluene	ND		200	18
2,6-Dinitrotoluene	ND		200	31
2-Nitrotoluene	ND		400	43
4-Nitrotoluene	ND		400	67
3-Nitrotoluene	ND		400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	82	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC041	Batch#:	144284
Lab ID:	207110-008	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	58
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	88	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

12/20/08

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC042	Batch#:	144284
Lab ID:	207110-009	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	90	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC043	Batch#:	144284
Lab ID:	207110-010	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	67
3-Nitrotoluene	ND	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

NAVFAC PACIFIC VALIDATED

JL 1/2018

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC044	Batch#:	144284
Lab ID:	207110-011	Sampled:	10/20/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	60
RDX	ND	200	43
1,3,5-Trinitrobenzene	ND	200	16
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	29
2,4,6-Trinitrotoluene	ND	200	7.9
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	58
2,4-Dinitrotoluene	ND	200	18
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	400	43
4-Nitrotoluene	ND	400	68
3-Nitrotoluene	ND ↓	400	45

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

12/20/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC046	Batch#:	144284
Lab ID:	207110-012	Sampled:	10/21/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result		RL	MDL
HMX	ND	U	200	59
RDX	ND		200	42
1,3,5-Trinitrobenzene	ND		200	15
1,3-Dinitrobenzene	ND		200	13
Nitrobenzene	ND		200	17
Tetryl	ND		200	28
2,4,6-Trinitrotoluene	ND		200	7.8
2-Amino-4,6-dinitrotoluene	ND		200	32
4-Amino-2,6-dinitrotoluene	ND		200	57
2,4-Dinitrotoluene	ND		200	17
2,6-Dinitrotoluene	ND		200	31
2-Nitrotoluene	ND		400	42
4-Nitrotoluene	ND		400	67
3-Nitrotoluene	ND		400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	93	69-120

NAVFAC PACIFIC VALIDATED

2/20/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC047	Batch#:	144284
Lab ID:	207110-013	Sampled:	10/21/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.8
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND ↓	200	31
2-Nitrotoluene	73 J b NJ (*VI)	400	42
4-Nitrotoluene	ND U	400	67
3-Nitrotoluene	ND ↓	400	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

2/20/09

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC048	Batch#:	144284
Lab ID:	207110-014	Sampled:	10/21/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/01/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	58
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	31
4-Amino-2,6-dinitrotoluene	ND	200	56
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND ↓	200	31
2-Nitrotoluene	55 J b NJ (*VI)	390	42
4-Nitrotoluene	ND U	390	66
3-Nitrotoluene	ND ↓	390	43

Surrogate	%REC	Limits
1,2-Dinitrobenzene	91	69-120

NAVFAC PACIFIC VALIDATED

J= Estimated value
b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

12/20/08

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC049	Batch#:	144284
Lab ID:	207110-015	Sampled:	10/21/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/03/08
Diln Fac:	1.000		

Analyte	Result	RL	MDL
HMX	ND U	200	59
RDX	ND	200	42
1,3,5-Trinitrobenzene	ND	200	15
1,3-Dinitrobenzene	ND	200	13
Nitrobenzene	ND	200	17
Tetryl	ND	200	28
2,4,6-Trinitrotoluene	ND	200	7.7
2-Amino-4,6-dinitrotoluene	ND	200	32
4-Amino-2,6-dinitrotoluene	ND	200	57
2,4-Dinitrotoluene	ND	200	17
2,6-Dinitrotoluene	ND	200	31
2-Nitrotoluene	ND	390	42
4-Nitrotoluene	ND	390	66
3-Nitrotoluene	ND	390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

12/20/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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53.0

Nitroaromatics and Nitroamines by HPLC

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 8330
Project#:	UXOA-007	Analysis:	EPA 8330
Field ID:	MEC050	Batch#:	144284
Lab ID:	207110-016	Sampled:	10/21/08
Matrix:	Soil	Received:	10/23/08
Units:	ug/Kg	Prepared:	10/30/08
Basis:	as received	Analyzed:	11/03/08
Diln Fac:	1.000		

Analyte	Result		RL	MDL
HMX	ND	U	200	59
RDX	ND		200	42
1,3,5-Trinitrobenzene	ND		200	15
1,3-Dinitrobenzene	ND		200	13
Nitrobenzene	ND		200	17
Tetryl	ND		200	28
2,4,6-Trinitrotoluene	ND		200	7.7
2-Amino-4,6-dinitrotoluene	ND		200	32
4-Amino-2,6-dinitrotoluene	ND		200	57
2,4-Dinitrotoluene	ND		200	17
2,6-Dinitrotoluene	ND		200	31
2-Nitrotoluene	ND		390	42
4-Nitrotoluene	ND		390	66
3-Nitrotoluene	ND		390	44

Surrogate	%REC	Limits
1,2-Dinitrobenzene	92	69-120

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

IL /20108

LDC #: 19794A40

SDG #: 207110

Laboratory: Curtis & Tompkins, Ltd.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/21/08

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/20/08
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 7+8*, 13+14
X.	Field blanks	N	

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Soil

1	MEC034	11	MEC044	21	QC467950-BLK	31	
2	MEC035	12	MEC046	22		32	
3	MEC036	13	MEC047	23		33	
4	MEC037	14	MEC048	24		34	
5	MEC038	15	MEC049	25		35	
6	MEC039	16	MEC050	26		36	
7	MEC040	17	MEC040MS	27		37	
8	MEC041	18	MEC040MSD	28		38	
9	MEC042	19		29		39	
10	MEC043	20		30		40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ____HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L.. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	O.		O. Chlorpyrifos		
P. Pyrene	P.		P. Fenthion		
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichloronate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:______________________________

LDC #: 19794A4U
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N [✓ N/A] Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N [✓ N/A] Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	L	~~not~~ ~~no~~ 2nd column ~~conf~~ confirmation not performed	13, 14	NJ / P

Comments: See sample calculation verification worksheet for recalculations

LDC #:
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: P
2nd reviewer: K

METHOD: ___ GC ___ HPLC
Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		%RPD Limit ≤100	Qualification Parent only / All Samples
	13	14		
L	73	55	28	

Compound	Concentration ( )		%RPD Limit ____	Qualification Parent only / All Samples

LDC Report# 19794A4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Waikane Training Area
Collection Date:	October 20 through October 21, 2008
LDC Report Date:	November 21, 2008
Matrix:	Soil
Parameters:	Metals
Validation Level:	Standard
Laboratory:	Curtis & Tompkins, Ltd.
Sample Delivery Group (SDG):	207110

Sample Identification

MEC034
MEC035
MEC036
MEC037
MEC038
MEC039
MEC040
MEC041
MEC042
MEC043
MEC044
MEC046
MEC047
MEC048
MEC049
MEC050
MEC040MS
MEC040MSD

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Metals. The metals analyzed were Aluminum, Antimony, Barium, Chromium, Copper, Iron, Lead, Nickel, and Zinc.

This review follows the Project Procedures Manual, U.S. Navy Environmental Restoration Program, NAVFAC Pacific (DON 2007) and the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version (January 2006).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U	Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
J	Indicates an estimated value.
R	Quality control indicates the data is not usable.
N	Presumptive evidence of presence of the constituent.
UJ	Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
A	Indicates the finding is based upon technical validation criteria.
P	Indicates the finding is related to a protocol/contractual deviation.
None	Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Aluminum Chromium Iron	4.4 mg/Kg 0.019 mg/Kg 3.3 mg/Kg	All samples in SDG 207110
ICB/CCB	Aluminum	54.92 ug/L	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC040 MEC041 MEC043 MEC044 MEC046 MEC047 MEC048 MEC049 MEC050

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Barium	2.649 ug/L	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC041 MEC042 MEC043 MEC044 MEC047 MEC048 MEC049 MEC050
ICB/CCB	Chromium	2.699 ug/L	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC041 MEC042 MEC043 MEC046 MEC047 MEC048 MEC049 MEC050
ICB/CCB	Copper	2.842 ug/L	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC041 MEC043 MEC046 MEC047 MEC048 MEC049 MEC050
ICB/CCB	Iron	170.9 ug/L	MEC034 MEC035 MEC037 MEC038 MEC039 MEC040 MEC041 MEC043 MEC044 MEC046 MEC047 MEC048 MEC049 MEC050

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Lead	2.908 ug/L	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC041 MEC043 MEC044 MEC047 MEC048 MEC049 MEC050
ICB/CCB	Copper	1.482 ug/L	MEC040
ICB/CCB	Barium	2.184 ug/L	MEC046
ICB/CCB	Chromium	2.450 ug/L	MEC044
ICB/CCB	Lead	2.771 ug/L	MEC042 MEC046

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MEC035	Lead	0.32 mg/Kg	0.32U mg/Kg
MEC049	Lead	0.71 mg/Kg	0.71U mg/Kg

No field blanks were identified in this SDG.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MEC040MS/MSD (All samples in SDG 207110)	Chromium	-	77 (80-120)	-	J (all detects) UJ (all non-detects)	A
	Antimony	56 (80-120)	57 (80-120)	-	J (all detects) UJ (all non-detects)	

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
MEC040L	Aluminum Iron	15 (≤10) 16 (≤10)	All samples in SDG 207110	J (all detects) J (all detects)	A

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples MEC040 and MEC041 and samples MEC047 and MEC048 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC040	MEC041	
Aluminum	40000	45000	12 (≤100)
Antimony	0.23U	0.78	200 (≤100)
Barium	14	15	7 (≤100)
Chromium	320	310	3 (≤100)
Copper	62	86	32 (≤100)
Iron	130000	140000	7 (≤100)
Lead	11	6.2	56 (≤100)
Nickel	71	66	7 (≤100)
Zinc	65	62	5 (≤100)

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC047	MEC048	
Aluminum	40000	41000	2 (≤100)
Antimony	0.29U	0.54	200 (≤100)
Barium	60	59	2 (≤100)
Chromium	270	270	0 (≤100)
Copper	140	120	15 (≤100)
Iron	110000	110000	0 (≤100)

Analyte	Concentration (mg/Kg)		RPD (Limits)
	MEC047	MEC048	
Lead	3.8	3.3	14 (≤100)
Nickel	85	85	0 (≤100)
Zinc	80	75	6 (≤100)

Waikane Training Area
Metals - Data Qualification Summary - SDG 207110

SDG	Sample	Analyte	Flag	A or P	Reason
207110	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC040 MEC041 MEC042 MEC043 MEC044 MEC046 MEC047 MEC048 MEC049 MEC050	Chromium Antimony	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
207110	MEC034 MEC035 MEC036 MEC037 MEC038 MEC039 MEC040 MEC041 MEC042 MEC043 MEC044 MEC046 MEC047 MEC048 MEC049 MEC050	Aluminum Iron	J (all detects) J (all detects)	A	ICP serial dilution (%D)

Waikane Training Area
Metals - Laboratory Blank Data Qualification Summary - SDG 207110

SDG	Sample	Analyte	Modified Final Concentration	A or P
207110	MEC035	Lead	0.32U mg/Kg	A
207110	MEC049	Lead	0.71U mg/Kg	A

Waikane Training Area
Metals - Field Blank Data Qualification Summary - SDG 207110

No Sample Data Qualified in this SDG

Aluminum

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Aluminum	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Sampled	Analyzed
MEC034	SAMPLE	207110-001	61,000 J(A)	180	18	dry	47%	20.00	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	42,000	180	17	dry	49%	20.00	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	50,000	130	12	dry	29%	20.00	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	59,000	140	14	dry	30%	20.00	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	41,000	160	15	dry	39%	20.00	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	52,000	160	15	dry	43%	20.00	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	40,000	180	17	dry	47%	20.00	10/20/08	10/29/08
MEC041	SAMPLE	207110-008	45,000	180	18	dry	49%	20.00	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	42,000	310	29	dry	24%	50.00	10/20/08	10/30/08
MEC043	SAMPLE	207110-010	72,000	140	14	dry	33%	20.00	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	33,000	250	24	dry	60%	20.00	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	27,000	150	14	dry	35%	20.00	10/21/08	10/29/08
MEC047	SAMPLE	207110-013	40,000	190	18	dry	48%	20.00	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	41,000	180	17	dry	47%	20.00	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	46,000	140	14	dry	38%	20.00	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	51,000	160	15	dry	39%	20.00	10/21/08	10/29/08
	BLANK	QC467179	4.4 J	5.0	0.47	as received		1.000		10/29/08

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

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2.0

NAVFAC PACIFIC VALIDATED

120108

Curtis & Tompkins, Ltd.

Barium

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Barium	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Sampled	Analyzed
MEC034	SAMPLE	207110-001	85	0.47	0.065	dry	47%	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	36	0.49	0.064	dry	49%	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	20	0.35	0.044	dry	29%	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	40	0.36	0.050	dry	30%	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	84	0.41	0.055	dry	39%	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	50	0.44	0.056	dry	43%	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	14	0.47	0.091	dry	47%	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	15	0.49	0.065	dry	49%	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	36	0.33	0.043	dry	24%	10/20/08	10/29/08
MEC043	SAMPLE	207110-010	16	0.37	0.050	dry	33%	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	23	0.63	0.087	dry	60%	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	19	0.38	0.053	dry	35%	10/21/08	10/30/08
MEC047	SAMPLE	207110-013	60	0.48	0.067	dry	48%	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	59	0.47	0.064	dry	47%	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	59	0.40	0.050	dry	38%	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	58	0.41	0.055	dry	39%	10/21/08	10/29/08
	BLANK	QC467179	ND	0.25	0.050	as received			10/27/08

NAVFAC PACIFIC VALIDATED

2/20/08

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Chromium

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Chromium	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Sampled	Analyzed
MEC034	SAMPLE	207110-001	260 J(Q)	0.47	0.059	dry	47%	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	300	0.49	0.059	dry	49%	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	400	0.35	0.040	dry	29%	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	320	0.36	0.046	dry	30%	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	190	0.41	0.050	dry	39%	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	210	0.44	0.051	dry	43%	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	320	0.47	0.028	dry	47%	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	310	0.49	0.059	dry	49%	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	230	0.33	0.039	dry	24%	10/20/08	10/29/08
MEC043	SAMPLE	207110-010	200	0.37	0.046	dry	33%	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	220	0.63	0.079	dry	60%	10/20/08	10/30/08
MEC046	SAMPLE	207110-012	210	0.38	0.049	dry	35%	10/21/08	10/29/08
MEC047	SAMPLE	207110-013	270	0.48	0.061	dry	48%	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	270	0.47	0.058	dry	47%	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	250	0.40	0.046	dry	38%	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	180	0.41	0.050	dry	39%	10/21/08	10/29/08
	BLANK	QC467179	0.019 J	0.25	0.015	as received			10/27/08

NAVFAC PACIFIC VALIDATED

JL 120108

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Copper

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Copper	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Sampled	Analyzed
MEC034	SAMPLE	207110-001	100	0.47	0.10	dry	47%	1.000	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	99	0.49	0.099	dry	49%	1.000	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	110	0.35	0.068	dry	29%	1.000	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	120	0.36	0.077	dry	30%	1.000	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	80	0.41	0.084	dry	39%	1.000	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	120	0.44	0.086	dry	43%	1.000	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	62	0.47	0.065	dry	47%	1.000	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	86	0.49	0.10	dry	49%	1.000	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	1,300	15	3.3	dry	24%	50.00	10/20/08	10/30/08
MEC043	SAMPLE	207110-010	360	0.37	0.077	dry	33%	1.000	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	180	0.63	0.13	dry	60%	1.000	10/20/08	10/30/08
MEC046	SAMPLE	207110-012	63	0.38	0.082	dry	35%	1.000	10/21/08	10/29/08
MEC047	SAMPLE	207110-013	140	0.48	0.10	dry	48%	1.000	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	120	0.47	0.098	dry	47%	1.000	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	97	0.40	0.077	dry	38%	1.000	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	91	0.41	0.085	dry	39%	1.000	10/21/08	10/29/08
	BLANK	QC467179	ND	0.25	0.035	as received		1.000		10/27/08

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

R|20|08

11.0

Iron

Lab #: 207110
Client: Wil Chee Planning
Project#: UXOA-007
Analyte: Iron
Matrix: Soil
Units: mg/Kg

Location: Waikane Training Area
Prep: EPA 3050B
Analysis: EPA 6010B
Batch#: 144107
Received: 10/23/08
Prepared: 10/26/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Sampled	Analyzed
MEC034	SAMPLE	207110-001	100,000 J(A)	180	17	dry	47%	20.00	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	91,000	180	17	dry	49%	20.00	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	140,000	310	28	dry	29%	50.00	10/20/08	10/30/08
MEC037	SAMPLE	207110-004	110,000	140	13	dry	30%	20.00	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	68,000	160	14	dry	39%	20.00	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	97,000	160	14	dry	43%	20.00	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	130,000	180	17	dry	47%	20.00	10/20/08	10/29/08
MEC041	SAMPLE	207110-008	140,000	180	17	dry	49%	20.00	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	100,000	310	28	dry	24%	50.00	10/20/08	10/30/08
MEC043	SAMPLE	207110-010	120,000	140	13	dry	33%	20.00	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	110,000	250	22	dry	60%	20.00	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	130,000	150	14	dry	35%	20.00	10/21/08	10/29/08
MEC047	SAMPLE	207110-013	110,000	190	17	dry	48%	20.00	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	110,000	180	16	dry	47%	20.00	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	93,000	140	13	dry	38%	20.00	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	78,000	160	14	dry	39%	20.00	10/21/08	10/29/08
	BLANK	QC467179	3.3 J	5.0	0.45	as received		1.000		10/29/08

J= Estimated value
RL= Reporting Limit
MDL= Method Detection Limit

17.0

NAVFAC PACIFIC VALIDATED

2/2008

Curtis & Tompkins, Ltd.

Nickel

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Nickel	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Sampled	Analyzed
MEC034	SAMPLE	207110-001	180	0.47	0.084	dry	47%	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	140	0.49	0.083	dry	49%	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	110	0.35	0.057	dry	29%	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	230	0.36	0.065	dry	30%	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	150	0.41	0.071	dry	39%	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	98	0.44	0.073	dry	43%	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	71	0.47	0.057	dry	47%	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	66	0.49	0.084	dry	49%	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	130	0.33	0.056	dry	24%	10/20/08	10/29/08
MEC043	SAMPLE	207110-010	210	0.37	0.065	dry	33%	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	78	0.63	0.11	dry	60%	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	33	0.38	0.069	dry	35%	10/21/08	10/30/08
MEC047	SAMPLE	207110-013	85	0.48	0.087	dry	48%	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	85	0.47	0.082	dry	47%	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	110	0.40	0.065	dry	38%	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	100	0.41	0.072	dry	39%	10/21/08	10/29/08
	BLANK	QC467179	ND	0.25	0.031	as received			10/27/08

NAVFAC PACIFIC VALIDATED

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

9L/2008

Lead

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Lead	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Diln Fac	Sampled	Analyzed
MEC034	SAMPLE	207110-001	ND	0.47	0.10	dry	47%	1.000	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	0.32 J U (B)	0.49	0.10	dry	49%	1.000	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	ND	0.35	0.070	dry	29%	1.000	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	ND	0.36	0.080	dry	30%	1.000	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	ND	0.41	0.087	dry	39%	1.000	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	2.7	0.44	0.089	dry	43%	1.000	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	11	0.47	0.084	dry	47%	1.000	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	6.2	0.49	0.10	dry	49%	1.000	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	960	10	3.4	dry	24%	50.00	10/20/08	10/30/08
MEC043	SAMPLE	207110-010	77	0.37	0.080	dry	33%	1.000	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	53	0.63	0.14	dry	60%	1.000	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	4.4	0.38	0.085	dry	35%	1.000	10/21/08	10/30/08
MEC047	SAMPLE	207110-013	3.8	0.48	0.11	dry	48%	1.000	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	3.3	0.47	0.10	dry	47%	1.000	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	0.71 U (B)	0.40	0.080	dry	38%	1.000	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	1.0	0.41	0.088	dry	39%	1.000	10/21/08	10/29/08
	BLANK	QC467179	ND	0.25	0.046	as received		1.000		10/27/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

NAVFAC PACIFIC VALIDATED

12/20/08

Curtis & Tompkins, Ltd.

Antimony

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Antimony	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Sampled	Analyzed
MEC034	SAMPLE	207110-001	0.50 J J	0.94 ②	0.29	dry	47%	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	ND UJ	0.98	0.28	dry	49%	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	0.20 J J	0.70	0.19	dry	29%	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	ND UJ	0.71	0.22	dry	30%	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	ND	0.82	0.24	dry	39%	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	ND	0.88	0.25	dry	43%	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	ND ↓	0.94	0.23	dry	47%	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	0.78 J J	0.98	0.29	dry	49%	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	4.3 ↓	0.66	0.19	dry	24%	10/20/08	10/29/08
MEC043	SAMPLE	207110-010	ND UJ	0.75	0.22	dry	33%	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	1.2 J J	1.3	0.38	dry	60%	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	ND UJ	0.77	0.24	dry	35%	10/21/08	10/29/08
MEC047	SAMPLE	207110-013	ND ↓	0.96	0.29	dry	48%	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	0.54 J J	0.94	0.28	dry	47%	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	ND UJ	0.81	0.22	dry	38%	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	ND ↓	0.82 ↓	0.24	dry	39%	10/21/08	10/29/08
	BLANK	QC467179	ND	0.50	0.12	as received			10/27/08

NAVFAC PACIFIC VALIDATED

JL 1/20/08

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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28.0

Zinc

Lab #:	207110	Location:	Waikane Training Area
Client:	Wil Chee Planning	Prep:	EPA 3050B
Project#:	UXOA-007	Analysis:	EPA 6010B
Analyte:	Zinc	Batch#:	144107
Matrix:	Soil	Received:	10/23/08
Units:	mg/Kg	Prepared:	10/26/08
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	MDL	Basis	Moisture	Sampled	Analyzed
MEC034	SAMPLE	207110-001	73	1.9	0.15	dry	47%	10/20/08	10/29/08
MEC035	SAMPLE	207110-002	70	2.0	0.15	dry	49%	10/20/08	10/29/08
MEC036	SAMPLE	207110-003	50	1.4	0.10	dry	29%	10/20/08	10/29/08
MEC037	SAMPLE	207110-004	56	1.4	0.12	dry	30%	10/20/08	10/29/08
MEC038	SAMPLE	207110-005	75	1.6	0.13	dry	39%	10/20/08	10/29/08
MEC039	SAMPLE	207110-006	80	1.8	0.13	dry	43%	10/20/08	10/29/08
MEC040	SAMPLE	207110-007	65	1.9	0.30	dry	47%	10/20/08	10/27/08
MEC041	SAMPLE	207110-008	62	2.0	0.15	dry	49%	10/20/08	10/29/08
MEC042	SAMPLE	207110-009	190	1.3	0.10	dry	24%	10/20/08	10/29/08
MEC043	SAMPLE	207110-010	130	1.5	0.12	dry	33%	10/20/08	10/29/08
MEC044	SAMPLE	207110-011	92	2.5	0.20	dry	60%	10/20/08	10/29/08
MEC046	SAMPLE	207110-012	53	1.5	0.12	dry	35%	10/21/08	10/29/08
MEC047	SAMPLE	207110-013	80	1.9	0.15	dry	48%	10/21/08	10/29/08
MEC048	SAMPLE	207110-014	75	1.9	0.15	dry	47%	10/21/08	10/29/08
MEC049	SAMPLE	207110-015	68	1.6	0.12	dry	38%	10/21/08	10/29/08
MEC050	SAMPLE	207110-016	72	1.6	0.13	dry	39%	10/21/08	10/29/08
	BLANK	QC467179	ND	1.0	0.17	as received			10/27/08

NAVFAC PACIFIC VALIDATED

rc/2008

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

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32.0

LDC #: 19794A4

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11-20-08

SDG #: 207110

Page: 1 of 1

Laboratory: Curtis & Tompkins, Ltd.

Reviewer: MG

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10-20-08 through 10-21-08
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD
VIII.	Internal Standard (ICP-MS)	N	Not utilized
IX.	Furnace Atomic Absorption QC	N	" "
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 7+8 , D = 13+14
XIV.	Field Blanks	N	

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
all soil

1	MEC034	11	MEC044	21		31	
2	MEC035	12	MEC046	22		32	
3	MEC036	13	MEC047	23		33	
4	MEC037	14	MEC048	24		34	
5	MEC038	15	MEC049	25		35	
6	MEC039	16	MEC050	26		36	
7	MEC040	17	MEC040MS	27		37	
8	MEC041	18	MEC040MSD	28		38	
9	MEC042	19	PBS	29		39	
10	MEC043	20		30		40	

Notes:

LDC #: 19794A4
SDG #: 207110

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1→16	S	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN^-, ___ ___
QC 17,18	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP Trace	S	[✓ Al, Sb], As, [✓ Ba], Be, Cd, Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, V, [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: Mercury by CVAA if performed

10-27-08
Met08

10-29-08
Met 09

10-30-08
Met 09

LDC #: 19794A4 (#7 only)
SDG #: 207110
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Blank concentration units, unless otherwise noted: µg/L

VALIDATION FINDINGS WORKSHEET
Prep Blank/ICB/CCB Findings

Associated Samples: all

Page: 1 of 1
Reviewer: MG
2nd Reviewer: L

	Blank Identification										
Analyte	ICB	CCB1	CCB2	CCB3	PB ( )	ICB	CCB1	CCB2	CCB3	PB ( )	Analyte
Al			54.92								Al
Sb											Sb
As											As
Ba			1.450	2.649		2.184					Ba
Be											Be
Cd											Cd
Ca											Ca
Cr			1.503	2.699		2.450					Cr
Co											Co
Cu	1.482		2.842								Cu
Fe			67.41	170.9							Fe
Pb			2.908			2.771					Pb
Mg											Mg
Mn											Mn
Hg											Hg
Ni											Ni
K											K
Se											Se
Ag											Ag
Na											Na
Tl											Tl
V											V
Zn											Zn
B											B
Mo											Mo
Sr											Sr

The highest concentration found in the Prep Blank and ICB/CCB for each analyte is circled on this worksheet and transferred to the PB/ICB/CCB Qualified Samples worksheet.

LDC #: 19794A4
SDG #: 207110
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50 x
Associated Samples:

PB for all
CCB Al for # 1→8, 10→16
CCB Ba for # 1→6, 8→11, 13→16
CCB Cr, ~~Cu~~ for # 1→6, 8→10, 12→16
CCB Cu for # 1→6, 8, 10, 12→16
CCB Fe for # 1, 2, 4→8, 10→16 / CCB Pb # 1→6, 8, 10, 11, 13→16

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	2	15								
Al	4.4		54.92	22.00										
Sb														
As														
Ba			2.649	0.66										
Be														
Cd														
Ca														
Cr	0.019		2.699	0.67										
Co														
Cu			2.842	0.71										
Fe	3.3		170.9	42.72										
Pb			2.908	0.73	0.32	0.71								
Mg														
Mn														
Hg														
Mo														
Ni														
K														
Se														
Ag														
Na														
Tl														
V														
Zn														
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 19794A4
SDG #: 207110
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50 x
Associated Samples: 7 (>5x)

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification									
					— No sample was qualified —									
Al														
Sb														
As														
Ba														
Be														
Cd														
Ca														
Cr														
Co														
Cu			1.482	0.37										
Fe														
Pb														
Mg														
Mn														
Hg														
Mo														
Ni														
K														
Se														
Ag														
Na														
Tl														
V														
Zn														
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 19794A4
SDG #: 207110
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 50 x
Associated Samples:

Ba for #12
Cr for #11
Pb for #9,12 (75x)

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB^a (mg/Kg)	Maximum PB^a (ug/L)	Maximum ICB/CCB^a (ug/L)	Blank Action Limit	Sample Identification									
					—	—	No samples	were	qualified	—				
Al														
Sb														
As														
Ba			2.184	0.55										
Be														
Cd														
Ca														
Cr			2.450	0.61										
Co														
Cu														
Fe														
Pb			2.771	0.69										
Mg														
Mn														
Hg														
Mo														
Ni														
K														
Se														
Ag														
Na														
Tl														
V														
Zn														
Sn														
B														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 19794 A4
SDG #: 207110

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y [✓ N] N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

[✓ Y] N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	17/18	Soil	Cr		77 (80-120)		all	J/UJ/A
	↓	↓	Sb	56 (80-120)	57 (↓)		↓	↓

Comments:

LDC #: 19794A4
SDG #: 207110

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MG
2nd Reviewer: Lw

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?

Y [✓ N] N/A Were ICP serial dilution percent differences (%D) ≤10%?

Y [✓ N] N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1	10-29-08	7	Soil	Al	15 (≤10)	all	J dets /A
	↓	↓	↓	Fe	16 (↓)	↓	↓

Comments:

LDC#: 19794A4
SDG#: 207110

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

[✓ Y] N NA Were field duplicate pairs identified in this SDG?
[✓ Y] N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		(≤ 100) RPD	
	7	8		
Aluminum	40000	45000	12	
Antimony	0.23U	0.78	200	
Barium	14	15	7	
Chromium	320	310	3	
Copper	62	86	32	
Iron	130000	140000	7	
Lead	11	6.2	56	
Nickel	71	66	7	
Zinc	65	62	5	

V:\FIELD DUPLICATES\FD_inorganic\19794A4.WPD

Compound	Concentration (mg/kg)		(≤ 100) RPD	
	13	14		
Aluminum	40000	41000	2	
Antimony	0.29U	0.54	200	
Barium	60	59	2	
Chromium	270	270	0	
Copper	140	120	15	
Iron	110000	110000	0	
Lead	3.8	3.3	14	

LDC#: 19794A4
SDG#: 207110

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 2 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

[✓ Y] N NA Were field duplicate pairs identified in this SDG?
[✓ Y] N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		(≤ 100) RPD	
	13	14		
Nickel	85	85	0	
Zinc	80	75	6	

V:\FIELD DUPLICATES\FD_inorganic\19794A4.WPD

Memo to File

Date: 5/9/03
Project: TO:0048 EA for proposed USMC JWTC
Sampler: Lance Higa
Purpose: Collect baseline soil and water samples.

Summary/Notes:

Based on info from previous archeological and UXO reports on the area, most of the ordnance uncovered in recent years (20 years to date) has been uncovered by erosion. This does not give us an over all idea of what areas were used as firing ranges, however it tell us that the stream action and rainfall has a realistic possibility to transport UXO or any residue associated with ordnance. Based on this I decided that samples collected in stream areas, might give us the best potential to determine if any explosive residue remains in the former training area. Samples were collected using a stainless steel trowel. The top one-two inches of soil were cleared away and the trowel was used to loosen the soil. The soil was then packed into the glass containers using a gloved hand. The sample was packed in wet ice for transport back to the company sample refrigerator to be chilled prior to shipment. The samples were wrapped, and placed in the refrigerator and were picked up by Colombia Labs (Tracie Sober) on 5/12/03. Note that the hold times on the water samples were critical (5 day) due to the sampling on a Friday (5/9/03).

Several notes on the sampling, I spoke to Sgt Norris (USMC EOD) and he had indicated that the area was used for hunting (unauthorized) and that the area below the proposed training area had been recently been used to make several films. (Specifically, *Tears of the Sun*). During the making of this film, Sgt Norris noted that small arms were used during the filming. If the lab results from the water sample collected near Kam Hwy. contain detections, while samples from the valley do not, the hits **may** be attributed to this event as small arms fire and pyrotechnic explosives were likely used during the filming. I also noted that the lithology near the farm area (roadside of the dogleg pool) consisted of highly weathered basalt rather than alluvium. This may indicate that the native bedrock may be shallow or exposed in this area.

-Lance Higa
5/15/03

SAMPLE INVENTORY LOG

PROJECT: EA for Proposed USMC JWTC Waikane
PERSONNEL: Lance Higa, Ty Hiraki
PAGE: 1 OF 1
TO #: 0048

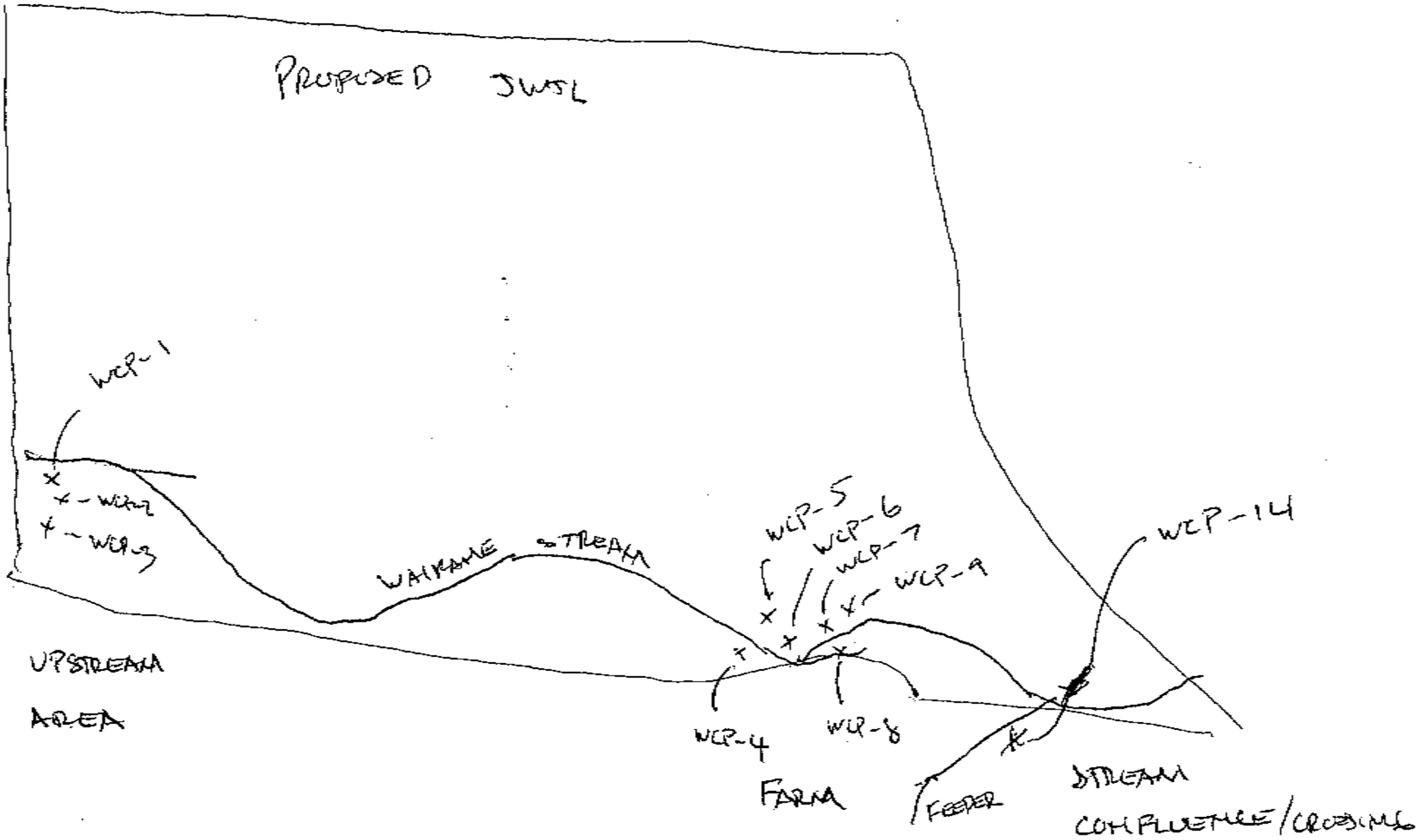
EPA NUMBER		SAMPLE INFORMATION							SPECIFIC PROJECT SITE	COMMENTS
		Date	Time	Location	Type (soil, water, product)	# Per Location	QC Note (S, D, X)	Depth (feet bgs)		
WCP	1	5/9/2003	830	Waikane	Soil	1	-	-	Upstream Area	Western border, Stream bed
WCP	2	5/9/2003	835	Waikane	Soil	1	-	-	Upstream Area	Western Border, Stream bank
WCP	3	5/9/2003	840	Waikane	Soil	1	-	-	Upstream Area	West. Border, Upper stream bank (hunt. struct.)
WCP	4	5/9/2003	904	Waikane	Soil	1	-	-	Farm	Before Stream dogleg (road side bank)
WCP	5	5/9/2003	910	Waikane	Soil	1	-	-	Farm	Before Stream dogleg (valley side bank)
WCP	6	5/9/2003	913	Waikane	Soil	1	-	-	Farm	At Stream dogleg (valley side bank)
WCP	7	5/9/2003	918	Waikane	Soil	1	-	-	Farm	Downstream dogleg (valley side bank)
WCP	8	5/9/2003	920	Waikane	Soil	1	-	-	Farm	Downstream dogleg (road side bank)
WCP	9	5/9/2003	925	Waikane	Soil	1	-	-	Farm	Downstream dogleg (valley side bank)
WCP	10	5/9/2003	935	Waikane	Water	6	-	-	Farm	Upstream of dogleg pool
WCP	11	5/9/2003	945	Waikane	Water	6	-	-	Farm	At exit of dogleg pool
WCP	12	5/9/2003	1005	Waikane	Water	6	-	-	Road X-ing	After stream confluence, main and feeder.
WCP	13	5/9/2003	1015	Waikane	Water	6	-	-	Road X-ing	Before confluence, feeder stream
WCP	14	5/9/2003	1020	Waikane	Soil	1	-	-	Road X-ing	Before confluence, feeder stream. Next to road.
WCP	15	5/9/2003	1055	Waikane	Water	6	-	-	Kam. Hwy	Across street venders. Stream crossing.
WCP										
WCP										
WCP										
WCP										
WCP										
WCP										
WCP										
WCP										
WCP										
WCP										

25 samples per page

QC Note: S = Primary Sample, D = Duplicate Sample, X = QA Triplicate Sample

12:12 PM - 5/15/2003 / 03 WCP Sample Inventory Log.xls

ROUGH ESTIMATE OF THE LOCATION OF
SOIL SAMPLES



N

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

5090 Caterpillar Road • Redding, CA 96003 • (530) 244-5227 • 800-695-7222 x10 • FAX (530) 244-4109

PAGE 1 OF 2

COC# 002028

SR #

CAS Contact

Project Name [illegible]

Project Number T010048

Project Manager [illegible]

Report CC

Company/Address [illegible]

[illegible] #4128

[illegible]

Phone # [illegible]

FAX# [illegible]

Samplers Signature

Sampler's Printed Name [illegible]

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

				PRESERVATIVE		1	1	3	3	3	4	4/5	2						
CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	SW 8260	SW 8015-V	OIL & GREASE	AMMONIA	TKN	CYANIDE	SULFIDE	METALS	[illegible]	[illegible]	[illegible]	[illegible]		REMARKS/ ALTERNATE DESCRIPTION
														✓	–	–			
[illegible]		[illegible]	[illegible]	[illegible]										✓	X	–			
[illegible]		[illegible]	[illegible]	[illegible]										✓	X	–			
[illegible]		[illegible]	[illegible]	[illegible]										✓	–	–			
[illegible]		[illegible]	[illegible]	[illegible]										✓	X	–			
[illegible]		[illegible]	[illegible]	[illegible]										✓	X	–			
[illegible]		[illegible]	[illegible]	[illegible]										✓	X	–			
[illegible]		[illegible]	[illegible]	[illegible]										X	X	–			
[illegible]		[illegible]	[illegible]	[illegible]										X	X	✓			
[illegible]		[illegible]	[illegible]	[illegible]										✓	X	X			
[illegible]		[illegible]	1355	[illegible]	[illegible]									✓	X	✓			

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other ______

SPECIAL INSTRUCTIONS/COMMENTS

See QAPP ☐

TURNAROUND REQUIREMENTS

_____ RUSH (SURCHARGES APPLY)

✓ STANDARD

REQUESTED FAX DATE

____

REQUESTED REPORT DATE

____

REPORT REQUIREMENTS

_____ I. Results Only

_____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)

_____ III. Results + QC and Calibration Summaries

_____ IV. Data Validation Report with Raw Data

_____ V. Specialized Forms / Custom Report

Edata _____ Yes _____ No

INVOICE INFORMATION

PO#

BILL TO:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: __________ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name	Printed Name [illegible]	Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm	Firm	Firm	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

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SR#: ________

PAGE ____ OF ____ COC # ________

PROJECT NAME [illegible]

PROJECT NUMBER [illegible]

PROJECT MANAGER [illegible]

COMPANY/ADDRESS [illegible]

[illegible]

PHONE # [illegible] FAX # [illegible]

SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐	Volatile Organics 624☐ 8260☐ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐	☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 413.1☐ 418.1☐ 1664 SGT☐ 1664 HEM☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	GC/MS-SIM PAH☐ Phenol☐ Phthalates☐	Metals, Total or Dissolved (See list below)	Cyanide☐ Hex-Chrom☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle)	TOX 9020☐ AOX 1650☐ 506☐	[illegible]	[illegible]	[illegible]		REMARKS
WCP-011	5/6/05	0945		[illegible]	6																\	\	X		
WCP-012	5/6/05	[illegible]		[illegible]	6																\	\	X		
WCP-013	5/6/05	[illegible]		[illegible]	6																\	\	\		
WCP-014	5/6/05	[illegible]		[illegible]	1																\	\	\		
WCP-015	5/6/05	[illegible]		[illegible]	6																\	\	\		

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

___ V. EDD

INVOICE INFORMATION

P.O. # ________

Bill To: ________

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.

___ 5 Day

✓ Standard (10-15 working days)

___ Provide FAX Results

________ Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:______ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
	5/6/05 1050	[illegible]	5/6/05 1050				
Signature	Date/Time	Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
[illegible]	[illegible]	[illegible]	[illegible]				
Printed Name	Firm	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Organic Analysis:
Nitroaromatics and Nitramines (Explosives)

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Service Request: K2303565

Cover Page - Organic Analysis Data Package
Nitroaromatics and Nitramines (Explosives)

Sample Name	Lab Code	Date Collected	Date Received
WCP-001	K2303565-001	05/09/2003	05/13/2003
WCP-002	K2303565-002	05/09/2003	05/13/2003
WCP-003	K2303565-003	05/09/2003	05/13/2003
WCP-004	K2303565-004	05/09/2003	05/13/2003
WCP-005	K2303565-005	05/09/2003	05/13/2003
WCP-006	K2303565-006	05/09/2003	05/13/2003
WCP-007	K2303565-007	05/09/2003	05/13/2003
WCP-008	K2303565-008	05/09/2003	05/13/2003
WCP-009	K2303565-009	05/09/2003	05/13/2003
WCP-010	K2303565-010	05/09/2003	05/13/2003
WCP-011	K2303565-011	05/09/2003	05/13/2003
WCP-012	K2303565-012	05/09/2003	05/13/2003
WCP-013	K2303565-013	05/09/2003	05/13/2003
WCP-014	K2303565-014	05/09/2003	05/13/2003
WCP-015	K2303565-015	05/09/2003	05/13/2003
WCP-015MS	KWG0307016-1	05/09/2003	05/13/2003
WCP-015DMS	KWG0307016-2	05/09/2003	05/13/2003
WCP-001MS	KWG0307313-2	05/09/2003	05/13/2003
WCP-001DMS	KWG0307313-3	05/09/2003	05/13/2003

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name: Meena Shah

Date: 5/28/03

Title: Scientist

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-010	**Units:**	ug/L
Lab Code:	K2303565-010	**Basis:**	NA
Extraction Method:	EPA 3535	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.31	1	05/16/03	05/17/03	KWG0307016	
RDX	ND	U	2.0	0.19	1	05/16/03	05/17/03	KWG0307016	
1,3,5-Trinitrobenzene	ND	U	2.0	0.23	1	05/16/03	05/17/03	KWG0307016	
1,3-Dinitrobenzene	ND	U	2.0	0.14	1	05/16/03	05/17/03	KWG0307016	
TETRYL	ND	U	2.0	0.26	1	05/16/03	05/17/03	KWG0307016	
Nitrobenzene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.13	1	05/16/03	05/17/03	KWG0307016	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
2,4,6-Trinitrotoluene	ND	U	2.0	0.15	1	05/16/03	05/17/03	KWG0307016	
2,6-Dinitrotoluene	**0.41**	JN	2.0	0.24	1	05/16/03	05/17/03	KWG0307016	
2,4-Dinitrotoluene	ND	U	2.0	0.12	1	05/16/03	05/17/03	KWG0307016	
2-Nitrotoluene	ND	U	2.0	0.41	1	05/16/03	05/17/03	KWG0307016	
4-Nitrotoluene	ND	U	2.0	0.47	1	05/16/03	05/17/03	KWG0307016	
3-Nitrotoluene	ND	U	2.0	0.30	1	05/16/03	05/17/03	KWG0307016	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	93	64-113	05/17/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-011	**Units:**	ug/L
Lab Code:	K2303565-011	**Basis:**	NA
Extraction Method:	EPA 3535	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.31	1	05/16/03	05/17/03	KWG0307016	
RDX	ND	U	2.0	0.19	1	05/16/03	05/17/03	KWG0307016	
1,3,5-Trinitrobenzene	ND	U	2.0	0.23	1	05/16/03	05/17/03	KWG0307016	
1,3-Dinitrobenzene	ND	U	2.0	0.14	1	05/16/03	05/17/03	KWG0307016	
TETRYL	ND	U	2.0	0.26	1	05/16/03	05/17/03	KWG0307016	
Nitrobenzene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.13	1	05/16/03	05/17/03	KWG0307016	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
2,4,6-Trinitrotoluene	ND	U	2.0	0.15	1	05/16/03	05/17/03	KWG0307016	
2,6-Dinitrotoluene	ND	U	2.0	0.24	1	05/16/03	05/17/03	KWG0307016	
2,4-Dinitrotoluene	ND	U	2.0	0.12	1	05/16/03	05/17/03	KWG0307016	
2-Nitrotoluene	ND	U	2.0	0.41	1	05/16/03	05/17/03	KWG0307016	
4-Nitrotoluene	ND	U	2.0	0.47	1	05/16/03	05/17/03	KWG0307016	
3-Nitrotoluene	ND	U	2.0	0.30	1	05/16/03	05/17/03	KWG0307016	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	102	64-113	05/17/03	Acceptable

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-012	**Units:**	ug/L
Lab Code:	K2303565-012	**Basis:**	NA
Extraction Method:	EPA 3535	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.31	1	05/16/03	05/17/03	KWG0307016	
RDX	ND	U	2.0	0.19	1	05/16/03	05/17/03	KWG0307016	
1,3,5-Trinitrobenzene	ND	U	2.0	0.23	1	05/16/03	05/17/03	KWG0307016	
1,3-Dinitrobenzene	ND	U	2.0	0.14	1	05/16/03	05/17/03	KWG0307016	
TETRYL	ND	U	2.0	0.26	1	05/16/03	05/17/03	KWG0307016	
Nitrobenzene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.13	1	05/16/03	05/17/03	KWG0307016	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
2,4,6-Trinitrotoluene	ND	U	2.0	0.15	1	05/16/03	05/17/03	KWG0307016	
2,6-Dinitrotoluene	ND	U	2.0	0.24	1	05/16/03	05/17/03	KWG0307016	
2,4-Dinitrotoluene	ND	U	2.0	0.12	1	05/16/03	05/17/03	KWG0307016	
2-Nitrotoluene	ND	U	2.0	0.41	1	05/16/03	05/17/03	KWG0307016	
4-Nitrotoluene	ND	U	2.0	0.47	1	05/16/03	05/17/03	KWG0307016	
3-Nitrotoluene	ND	U	2.0	0.30	1	05/16/03	05/17/03	KWG0307016	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	97	64-113	05/17/03	Acceptable

Comments: ______________________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Water

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name: WCP-013
Lab Code: K2303565-013

Extraction Method: EPA 3535
Analysis Method: 8330

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.31	1	05/16/03	05/17/03	KWG0307016	
RDX	ND	U	2.0	0.19	1	05/16/03	05/17/03	KWG0307016	
1,3,5-Trinitrobenzene	ND	U	2.0	0.23	1	05/16/03	05/17/03	KWG0307016	
1,3-Dinitrobenzene	ND	U	2.0	0.14	1	05/16/03	05/17/03	KWG0307016	
TETRYL	ND	U	2.0	0.26	1	05/16/03	05/17/03	KWG0307016	
Nitrobenzene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.13	1	05/16/03	05/17/03	KWG0307016	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
2,4,6-Trinitrotoluene	ND	U	2.0	0.15	1	05/16/03	05/17/03	KWG0307016	
2,6-Dinitrotoluene	ND	U	2.0	0.24	1	05/16/03	05/17/03	KWG0307016	
2,4-Dinitrotoluene	ND	U	2.0	0.12	1	05/16/03	05/17/03	KWG0307016	
2-Nitrotoluene	ND	U	2.0	0.41	1	05/16/03	05/17/03	KWG0307016	
4-Nitrotoluene	ND	U	2.0	0.47	1	05/16/03	05/17/03	KWG0307016	
3-Nitrotoluene	ND	U	2.0	0.30	1	05/16/03	05/17/03	KWG0307016	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	96	64-113	05/17/03	Acceptable

Comments:

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Water

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name: WCP-015
Lab Code: K2303565-015

Extraction Method: EPA 3535
Analysis Method: 8330

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.31	1	05/16/03	05/17/03	KWG0307016	
RDX	ND	U	2.0	0.19	1	05/16/03	05/17/03	KWG0307016	
1,3,5-Trinitrobenzene	ND	U	2.0	0.23	1	05/16/03	05/17/03	KWG0307016	
1,3-Dinitrobenzene	ND	U	2.0	0.14	1	05/16/03	05/17/03	KWG0307016	
TETRYL	ND	U	2.0	0.26	1	05/16/03	05/17/03	KWG0307016	
Nitrobenzene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.13	1	05/16/03	05/17/03	KWG0307016	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
2,4,6-Trinitrotoluene	ND	U	2.0	0.15	1	05/16/03	05/17/03	KWG0307016	
2,6-Dinitrotoluene	ND	U	2.0	0.24	1	05/16/03	05/17/03	KWG0307016	
2,4-Dinitrotoluene	ND	U	2.0	0.12	1	05/16/03	05/17/03	KWG0307016	
2-Nitrotoluene	ND	U	2.0	0.41	1	05/16/03	05/17/03	KWG0307016	
4-Nitrotoluene	ND	U	2.0	0.47	1	05/16/03	05/17/03	KWG0307016	
3-Nitrotoluene	ND	U	2.0	0.30	1	05/16/03	05/17/03	KWG0307016	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	99	64-113	05/17/03	Acceptable

Comments: ______________________________

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitroaromatics and Nitramines (Explosives)

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0307016-4	**Basis:**	NA
Extraction Method:	EPA 3535	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.31	1	05/16/03	05/17/03	KWG0307016	
RDX	ND	U	2.0	0.19	1	05/16/03	05/17/03	KWG0307016	
1,3,5-Trinitrobenzene	ND	U	2.0	0.23	1	05/16/03	05/17/03	KWG0307016	
1,3-Dinitrobenzene	ND	U	2.0	0.14	1	05/16/03	05/17/03	KWG0307016	
TETRYL	ND	U	2.0	0.26	1	05/16/03	05/17/03	KWG0307016	
Nitrobenzene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.13	1	05/16/03	05/17/03	KWG0307016	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.17	1	05/16/03	05/17/03	KWG0307016	
2,4,6-Trinitrotoluene	ND	U	2.0	0.15	1	05/16/03	05/17/03	KWG0307016	
2,6-Dinitrotoluene	ND	U	2.0	0.24	1	05/16/03	05/17/03	KWG0307016	
2,4-Dinitrotoluene	ND	U	2.0	0.12	1	05/16/03	05/17/03	KWG0307016	
2-Nitrotoluene	ND	U	2.0	0.41	1	05/16/03	05/17/03	KWG0307016	
4-Nitrotoluene	ND	U	2.0	0.47	1	05/16/03	05/17/03	KWG0307016	
3-Nitrotoluene	ND	U	2.0	0.30	1	05/16/03	05/17/03	KWG0307016	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	92	64-113	05/17/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-001	**Units:**	mg/Kg
Lab Code:	K2303565-001	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.7	0.069	1	05/22/03	05/27/03	KWG0307313	
RDX	ND	U	2.7	0.14	1	05/22/03	05/27/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.7	0.083	1	05/22/03	05/27/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.7	0.073	1	05/22/03	05/27/03	KWG0307313	
TETRYL	ND	U	2.7	0.17	1	05/22/03	05/27/03	KWG0307313	
Nitrobenzene	ND	U	2.7	0.085	1	05/22/03	05/27/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.7	0.090	1	05/22/03	05/27/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.7	0.098	1	05/22/03	05/27/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.7	0.077	1	05/22/03	05/27/03	KWG0307313	
2,6-Dinitrotoluene	**0.15**	JN	2.7	0.12	1	05/22/03	05/27/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.7	0.092	1	05/22/03	05/27/03	KWG0307313	
2-Nitrotoluene	ND	U	2.7	0.11	1	05/22/03	05/27/03	KWG0307313	
4-Nitrotoluene	ND	U	2.7	0.15	1	05/22/03	05/27/03	KWG0307313	
3-Nitrotoluene	ND	U	2.7	0.094	1	05/22/03	05/27/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	79	65-107	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-002	**Units:**	mg/Kg
Lab Code:	K2303565-002	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	3.7	0.093	1	05/22/03	05/27/03	KWG0307313	
RDX	**0.34**	JN	3.7	0.19	1	05/22/03	05/27/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	3.7	0.12	1	05/22/03	05/27/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	3.7	0.099	1	05/22/03	05/27/03	KWG0307313	
TETRYL	ND	U	3.7	0.23	1	05/22/03	05/27/03	KWG0307313	
Nitrobenzene	ND	U	3.7	0.12	1	05/22/03	05/27/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	3.7	0.13	1	05/22/03	05/27/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	3.7	0.14	1	05/22/03	05/27/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	3.7	0.11	1	05/22/03	05/27/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	3.7	0.16	1	05/22/03	05/27/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	3.7	0.13	1	05/22/03	05/27/03	KWG0307313	
2-Nitrotoluene	ND	U	3.7	0.15	1	05/22/03	05/27/03	KWG0307313	
4-Nitrotoluene	ND	U	3.7	0.21	1	05/22/03	05/27/03	KWG0307313	
3-Nitrotoluene	ND	U	3.7	0.13	1	05/22/03	05/27/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	82	65-107	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-003	**Units:**	mg/Kg
Lab Code:	K2303565-003	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	3.8	0.11	1	05/22/03	05/27/03	KWG0307313	
RDX	**0.22**	JN	3.8	0.21	1	05/22/03	05/27/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	3.8	0.13	1	05/22/03	05/27/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	3.8	0.12	1	05/22/03	05/27/03	KWG0307313	
TETRYL	ND	U	3.8	0.26	1	05/22/03	05/27/03	KWG0307313	
Nitrobenzene	ND	U	3.8	0.13	1	05/22/03	05/27/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	3.8	0.14	1	05/22/03	05/27/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	3.8	0.16	1	05/22/03	05/27/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	3.8	0.12	1	05/22/03	05/27/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	3.8	0.18	1	05/22/03	05/27/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	3.8	0.15	1	05/22/03	05/27/03	KWG0307313	
2-Nitrotoluene	ND	U	3.8	0.17	1	05/22/03	05/27/03	KWG0307313	
4-Nitrotoluene	ND	U	3.8	0.24	1	05/22/03	05/27/03	KWG0307313	
3-Nitrotoluene	ND	U	3.8	0.15	1	05/22/03	05/27/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	80	65-107	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-004	**Units:**	mg/Kg
Lab Code:	K2303565-004	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.5	0.072	1	05/22/03	05/27/03	KWG0307313	
RDX	**0.18**	JN	2.5	0.15	1	05/22/03	05/27/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.5	0.088	1	05/22/03	05/27/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.5	0.077	1	05/22/03	05/27/03	KWG0307313	
TETRYL	ND	U	2.5	0.18	1	05/22/03	05/27/03	KWG0307313	
Nitrobenzene	ND	U	2.5	0.090	1	05/22/03	05/27/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.5	0.095	1	05/22/03	05/27/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.5	0.11	1	05/22/03	05/27/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.5	0.081	1	05/22/03	05/27/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/27/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.5	0.097	1	05/22/03	05/27/03	KWG0307313	
2-Nitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/27/03	KWG0307313	
4-Nitrotoluene	ND	U	2.5	0.16	1	05/22/03	05/27/03	KWG0307313	
3-Nitrotoluene	ND	U	2.5	0.10	1	05/22/03	05/27/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	86	65-107	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-005	**Units:**	mg/Kg
Lab Code:	K2303565-005	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.5	0.073	1	05/22/03	05/28/03	KWG0307313	
RDX	ND	U	2.5	0.15	1	05/22/03	05/28/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.5	0.089	1	05/22/03	05/28/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.5	0.077	1	05/22/03	05/28/03	KWG0307313	
TETRYL	ND	U	2.5	0.18	1	05/22/03	05/28/03	KWG0307313	
Nitrobenzene	ND	U	2.5	0.090	1	05/22/03	05/28/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.5	0.096	1	05/22/03	05/28/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.5	0.11	1	05/22/03	05/28/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.5	0.081	1	05/22/03	05/28/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/28/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.5	0.097	1	05/22/03	05/28/03	KWG0307313	
2-Nitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/28/03	KWG0307313	
4-Nitrotoluene	ND	U	2.5	0.16	1	05/22/03	05/28/03	KWG0307313	
3-Nitrotoluene	ND	U	2.5	0.10	1	05/22/03	05/28/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	81	65-107	05/28/03	Acceptable

Comments:

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-006	**Units:**	mg/Kg
Lab Code:	K2303565-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.0	0.059	1	05/22/03	05/28/03	KWG0307313	
RDX	ND	U	2.0	0.12	1	05/22/03	05/28/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.0	0.072	1	05/22/03	05/28/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.0	0.062	1	05/22/03	05/28/03	KWG0307313	
TETRYL	ND	U	2.0	0.14	1	05/22/03	05/28/03	KWG0307313	
Nitrobenzene	ND	U	2.0	0.073	1	05/22/03	05/28/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.0	0.077	1	05/22/03	05/28/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.0	0.084	1	05/22/03	05/28/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.0	0.066	1	05/22/03	05/28/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.0	0.096	1	05/22/03	05/28/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.0	0.079	1	05/22/03	05/28/03	KWG0307313	
2-Nitrotoluene	ND	U	2.0	0.094	1	05/22/03	05/28/03	KWG0307313	
4-Nitrotoluene	ND	U	2.0	0.13	1	05/22/03	05/28/03	KWG0307313	
3-Nitrotoluene	ND	U	2.0	0.081	1	05/22/03	05/28/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	80	65-107	05/28/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-007	**Units:**	mg/Kg
Lab Code:	K2303565-007	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.5	0.079	1	05/22/03	05/28/03	KWG0307313	
RDX	ND	U	2.5	0.16	1	05/22/03	05/28/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.5	0.096	1	05/22/03	05/28/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.5	0.083	1	05/22/03	05/28/03	KWG0307313	
TETRYL	ND	U	2.5	0.19	1	05/22/03	05/28/03	KWG0307313	
Nitrobenzene	ND	U	2.5	0.097	1	05/22/03	05/28/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.5	0.11	1	05/22/03	05/28/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/28/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.5	0.088	1	05/22/03	05/28/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.5	0.13	1	05/22/03	05/28/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.5	0.11	1	05/22/03	05/28/03	KWG0307313	
2-Nitrotoluene	ND	U	2.5	0.13	1	05/22/03	05/28/03	KWG0307313	
4-Nitrotoluene	ND	U	2.5	0.18	1	05/22/03	05/28/03	KWG0307313	
3-Nitrotoluene	ND	U	2.5	0.11	1	05/22/03	05/28/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	78	65-107	05/28/03	Acceptable

Comments: ____________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-008	**Units:**	mg/Kg
Lab Code:	K2303565-008	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.9	0.081	1	05/22/03	05/28/03	KWG0307313	
RDX	ND	U	2.9	0.16	1	05/22/03	05/28/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.9	0.098	1	05/22/03	05/28/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.9	0.086	1	05/22/03	05/28/03	KWG0307313	
TETRYL	ND	U	2.9	0.20	1	05/22/03	05/28/03	KWG0307313	
Nitrobenzene	ND	U	2.9	0.10	1	05/22/03	05/28/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.9	0.11	1	05/22/03	05/28/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.9	0.12	1	05/22/03	05/28/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.9	0.090	1	05/22/03	05/28/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.9	0.14	1	05/22/03	05/28/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.9	0.11	1	05/22/03	05/28/03	KWG0307313	
2-Nitrotoluene	ND	U	2.9	0.13	1	05/22/03	05/28/03	KWG0307313	
4-Nitrotoluene	ND	U	2.9	0.18	1	05/22/03	05/28/03	KWG0307313	
3-Nitrotoluene	ND	U	2.9	0.12	1	05/22/03	05/28/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	83	65-107	05/28/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-009	**Units:**	mg/Kg
Lab Code:	K2303565-009	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.5	0.073	1	05/22/03	05/28/03	KWG0307313	
RDX	ND	U	2.5	0.15	1	05/22/03	05/28/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.5	0.089	1	05/22/03	05/28/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.5	0.077	1	05/22/03	05/28/03	KWG0307313	
TETRYL	ND	U	2.5	0.18	1	05/22/03	05/28/03	KWG0307313	
Nitrobenzene	ND	U	2.5	0.090	1	05/22/03	05/28/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.5	0.096	1	05/22/03	05/28/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.5	0.11	1	05/22/03	05/28/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.5	0.082	1	05/22/03	05/28/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/28/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.5	0.097	1	05/22/03	05/28/03	KWG0307313	
2-Nitrotoluene	ND	U	2.5	0.12	1	05/22/03	05/28/03	KWG0307313	
4-Nitrotoluene	ND	U	2.5	0.16	1	05/22/03	05/28/03	KWG0307313	
3-Nitrotoluene	ND	U	2.5	0.10	1	05/22/03	05/28/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	82	65-107	05/28/03	Acceptable

Comments: ______________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-014	**Units:**	mg/Kg
Lab Code:	K2303565-014	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8330		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	2.7	0.067	1	05/22/03	05/28/03	KWG0307313	
RDX	**0.14**	JN	2.7	0.13	1	05/22/03	05/28/03	KWG0307313	
1,3,5-Trinitrobenzene	ND	U	2.7	0.081	1	05/22/03	05/28/03	KWG0307313	
1,3-Dinitrobenzene	ND	U	2.7	0.071	1	05/22/03	05/28/03	KWG0307313	
TETRYL	ND	U	2.7	0.16	1	05/22/03	05/28/03	KWG0307313	
Nitrobenzene	ND	U	2.7	0.083	1	05/22/03	05/28/03	KWG0307313	
4-Amino-2,6-dinitrotoluene	ND	U	2.7	0.088	1	05/22/03	05/28/03	KWG0307313	
2-Amino-4,6-dinitrotoluene	ND	U	2.7	0.096	1	05/22/03	05/28/03	KWG0307313	
2,4,6-Trinitrotoluene	ND	U	2.7	0.075	1	05/22/03	05/28/03	KWG0307313	
2,6-Dinitrotoluene	ND	U	2.7	0.11	1	05/22/03	05/28/03	KWG0307313	
2,4-Dinitrotoluene	ND	U	2.7	0.089	1	05/22/03	05/28/03	KWG0307313	
2-Nitrotoluene	ND	U	2.7	0.11	1	05/22/03	05/28/03	KWG0307313	
4-Nitrotoluene	ND	U	2.7	0.15	1	05/22/03	05/28/03	KWG0307313	
3-Nitrotoluene	ND	U	2.7	0.092	1	05/22/03	05/28/03	KWG0307313	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	84	65-107	05/28/03	Acceptable

Comments:

Organic Analysis:
Nitroglycerin and PETN

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048

Service Request: K2303565

Cover Page - Organic Analysis Data Package
Nitroglycerin and PETN

Sample Name	Lab Code	Date Collected	Date Received
WCP-001	K2303565-001	05/09/2003	05/13/2003
WCP-002	K2303565-002	05/09/2003	05/13/2003
WCP-003	K2303565-003	05/09/2003	05/13/2003
WCP-004	K2303565-004	05/09/2003	05/13/2003
WCP-005	K2303565-005	05/09/2003	05/13/2003
WCP-006	K2303565-006	05/09/2003	05/13/2003
WCP-007	K2303565-007	05/09/2003	05/13/2003
WCP-008	K2303565-008	05/09/2003	05/13/2003
WCP-009	K2303565-009	05/09/2003	05/13/2003
WCP-010	K2303565-010	05/09/2003	05/13/2003
WCP-011	K2303565-011	05/09/2003	05/13/2003
WCP-012	K2303565-012	05/09/2003	05/13/2003
WCP-013	K2303565-013	05/09/2003	05/13/2003
WCP-014	K2303565-014	05/09/2003	05/13/2003
WCP-015	K2303565-015	05/09/2003	05/13/2003
WCP-011MS	KWG0306960-1	05/09/2003	05/13/2003
WCP-001MS	KWG0307314-1	05/09/2003	05/13/2003
WCP-001DMS	KWG0307314-2	05/09/2003	05/13/2003

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name: Meena Shah

Date: 5/28/03

Title: Scientist

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Water

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Nitroglycerin and PETN

Sample Name: WCP-010
Lab Code: K2303565-010

Extraction Method: METHOD
Analysis Method: 8332

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.0	0.36	1	05/15/03	05/15/03	KWG0306960	
Pentaerythritol Tetranitrate	ND	U	2.0	0.51	1	05/15/03	05/15/03	KWG0306960	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	90	70-130	05/15/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-011	**Units:**	ug/L
Lab Code:	K2303565-011	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.0	0.36	1	05/15/03	05/15/03	KWG0306960	
Pentaerythritol Tetranitrate	ND	U	2.0	0.51	1	05/15/03	05/15/03	KWG0306960	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	89	70-130	05/15/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-012	**Units:**	ug/L
Lab Code:	K2303565-012	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.2	0.38	1	05/15/03	05/15/03	KWG0306960	
Pentaerythritol Tetranitrate	ND	U	2.2	0.54	1	05/15/03	05/15/03	KWG0306960	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	83	70-130	05/15/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-013	**Units:**	ug/L
Lab Code:	K2303565-013	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.2	0.38	1	05/15/03	05/15/03	KWG0306960	
Pentaerythritol Tetranitrate	ND	U	2.2	0.54	1	05/15/03	05/15/03	KWG0306960	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	78	70-130	05/15/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Water

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Nitroglycerin and PETN

Sample Name: WCP-015
Lab Code: K2303565-015

Extraction Method: METHOD
Analysis Method: 8332

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.3	0.40	1	05/15/03	05/15/03	KWG0306960	
Pentaerythritol Tetranitrate	ND	U	2.3	0.57	1	05/15/03	05/15/03	KWG0306960	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	85	70-130	05/15/03	Acceptable

Comments: ______________________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitroglycerin and PETN

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0306960-4	**Basis:**	NA
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.0	0.36	1	05/15/03	05/15/03	KWG0306960	
Pentaerythritol Tetranitrate	ND	U	2.0	0.51	1	05/15/03	05/15/03	KWG0306960	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	86	70-130	05/15/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-001	**Units:**	mg/Kg
Lab Code:	K2303565-001	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.6	0.37	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.6	0.44	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	65	43-108	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-002	**Units:**	mg/Kg
Lab Code:	K2303565-002	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	3.5	0.51	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	3.5	0.60	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	61	43-108	05/27/03	Acceptable

Comments: ______

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-003	**Units:**	mg/Kg
Lab Code:	K2303565-003	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	4.0	0.57	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	4.0	0.67	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	64	43-108	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-004	**Units:**	mg/Kg
Lab Code:	K2303565-004	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.6	0.39	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.6	0.47	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	80	43-108	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-005	**Units:**	mg/Kg
Lab Code:	K2303565-005	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.3	0.39	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.3	0.47	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	67	43-108	05/27/03	Acceptable

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-006	**Units:**	mg/Kg
Lab Code:	K2303565-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.2	0.32	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.2	0.38	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	71	43-108	05/27/03	Acceptable

Comments: ____________________

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-007	**Units:**	mg/Kg
Lab Code:	K2303565-007	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.6	0.43	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.6	0.50	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	59	43-108	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-008	**Units:**	mg/Kg
Lab Code:	K2303565-008	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	3.1	0.44	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	3.1	0.52	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	63	43-108	05/27/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Nitroglycerin and PETN

Sample Name:	WCP-009	**Units:**	mg/Kg
Lab Code:	K2303565-009	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8332		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.6	0.40	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.6	0.47	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	66	43-108	05/27/03	Acceptable

Comments: ______

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Soil

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Nitroglycerin and PETN

Sample Name: WCP-014
Lab Code: K2303565-014

Extraction Method: METHOD
Analysis Method: 8332

Units: mg/Kg
Basis: Dry

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Nitroglycerin	ND	U	2.5	0.36	1	05/22/03	05/27/03	KWG0307314	
Pentaerythritol Tetranitrate	ND	U	2.5	0.43	1	05/22/03	05/27/03	KWG0307314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	68	43-108	05/27/03	Acceptable

Comments: ______________________________

Organic Analysis:
Picric Acid

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Service Request: K2303565

Cover Page - Organic Analysis Data Package
Picric Acid

Sample Name	Lab Code	Date Collected	Date Received
WCP-001	K2303565-001	05/09/2003	05/13/2003
WCP-002	K2303565-002	05/09/2003	05/13/2003
WCP-003	K2303565-003	05/09/2003	05/13/2003
WCP-004	K2303565-004	05/09/2003	05/13/2003
WCP-005	K2303565-005	05/09/2003	05/13/2003
WCP-006	K2303565-006	05/09/2003	05/13/2003
WCP-007	K2303565-007	05/09/2003	05/13/2003
WCP-008	K2303565-008	05/09/2003	05/13/2003
WCP-009	K2303565-009	05/09/2003	05/13/2003
WCP-010	K2303565-010	05/09/2003	05/13/2003
WCP-011	K2303565-011	05/09/2003	05/13/2003
WCP-012	K2303565-012	05/09/2003	05/13/2003
WCP-013	K2303565-013	05/09/2003	05/13/2003
WCP-014	K2303565-014	05/09/2003	05/13/2003
WCP-015	K2303565-015	05/09/2003	05/13/2003
WCP-015MS	KWG0307048-1	05/09/2003	05/13/2003
WCP-015DMS	KWG0307048-2	05/09/2003	05/13/2003
WCP-001MS	KWG0307315-5	05/09/2003	05/13/2003
WCP-001DMS	KWG0307315-6	05/09/2003	05/13/2003

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Christina Quinn

Name: CHRISTINA QUINN

Date: 6/9/03

Title: SCIENTIST

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-010	**Units:**	ug/L
Lab Code:	K2303565-010	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	05/16/03	06/18/03	KWG0307048	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	73	70-130	06/18/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Water

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Picric Acid

Sample Name: WCP-011
Lab Code: K2303565-011
Extraction Method: EPA 3510M
Analysis Method: 8151M

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	05/16/03	06/18/03	KWG0307048	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	100	70-130	06/18/03	Acceptable

Comments: ____________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-012	**Units:**	ug/L
Lab Code:	K2303565-012	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	**Result**	**Q**	**MRL**	**MDL**	**Dilution Factor**	**Date Extracted**	**Date Analyzed**	**Extraction Lot**	**Note**
Picric Acid	ND	U	6.8	1.9	1	05/16/03	06/18/03	KWG0307048	

Surrogate Name	**%Rec**	**Control Limits**	**Date Analyzed**	**Note**
4-Bromo-2,6-dichlorophenol	66	70-130	06/18/03	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Water

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Picric Acid

Sample Name: WCP-013
Lab Code: K2303565-013

Units: ug/L
Basis: NA

Extraction Method: EPA 3510M
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	05/16/03	06/18/03	KWG0307048	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	73	70-130	06/18/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Water	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-015	**Units:**	ug/L
Lab Code:	K2303565-015	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	05/16/03	06/18/03	KWG0307048	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	73	70-130	06/18/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Picric Acid

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0307048-5	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	05/16/03	06/18/03	KWG0307048	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	72	70-130	06/18/03	Acceptable

Comments:

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Soil

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Picric Acid

Sample Name: WCP-001
Lab Code: K2303565-001

Units: ug/Kg
Basis: Dry

Extraction Method: METHOD
Analysis Method: 8151M

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	140	89	1	05/23/03	06/18/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	51	70-130	06/18/03	Outside Control Limits

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-002	**Units:**	ug/Kg
Lab Code:	K2303565-002	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	190	130	1	05/23/03	06/18/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	58	70-130	06/18/03	Outside Control Limits

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-003	**Units:**	ug/Kg
Lab Code:	K2303565-003	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	210	140	1	05/23/03	06/18/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	75	70-130	06/18/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-004	**Units:**	ug/Kg
Lab Code:	K2303565-004	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	140	94	1	05/23/03	06/18/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	47	70-130	06/18/03	Outside Control Limits

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-005	**Units:**	ug/Kg
Lab Code:	K2303565-005	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	140	94	1	05/23/03	06/18/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	54	70-130	06/18/03	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Waikane JWTC/TO:0048
Sample Matrix: Soil

Service Request: K2303565
Date Collected: 05/09/2003
Date Received: 05/13/2003

Picric Acid

Sample Name: WCP-006
Lab Code: K2303565-006

Extraction Method: METHOD
Analysis Method: 8151M

Units: ug/Kg
Basis: Dry

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	120	76	1	05/23/03	06/18/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	54	70-130	06/18/03	Outside Control Limits

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-007	**Units:**	ug/Kg
Lab Code:	K2303565-007	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	150	110	1	05/23/03	06/19/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	44	70-130	06/19/03	Outside Control Limits

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-008	**Units:**	ug/Kg
Lab Code:	K2303565-008	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	150	110	1	05/23/03	06/19/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	54	70-130	06/19/03	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-009	**Units:**	ug/Kg
Lab Code:	K2303565-009	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	130	95	1	05/23/03	06/19/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	52	70-130	06/19/03	Outside Control Limits

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2303565
Project:	Waikane JWTC/TO:0048	**Date Collected:**	05/09/2003
Sample Matrix:	Soil	**Date Received:**	05/13/2003

Picric Acid

Sample Name:	WCP-014	**Units:**	ug/Kg
Lab Code:	K2303565-014	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	140	86	1	05/23/03	06/19/03	KWG0307315	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	62	70-130	06/19/03	Outside Control Limits

Comments:

16 Jun 03

Jungle Warfare Training EO

0810 Depart WCP

0845 Arrive Waikane Valley parking area. Gate open when arrived.

Weather upon arrival - Overcast. Wet roads, some ponding.

0905 SSGT Dave Alexander

Per SSGT Alexander, rained steadily all night last night. Not heavy, but steady. Intermittent Sat p.m. Very little difference in stream flow per SSGT Alexander.

0930 Derek taking 1st water sample from stream.
CP-016R.

0940 - Derek taking 2nd water sample from stream.
WCP-017R. Water somewhat turbid.

Sampling at this location completed 0950. Location across fenced farm w/ scarecrows.

Per SSGT Alexander, water level increase not appreciable. Less than 6" rise in water level. Maybe 3" or so.

1010 - Derek & Ty take samples where the river crosses the road. WCP-018R and WCP-019R.

1005 WCP-018, completed 1015. Water somewhat turbid.

1055 Arrive last sampling location along Kamehameha Hwy. Collect sample. Minimal turbidity. Per T. Hiraki, little or no change to water level.

1105 Sampling completed

Columbia Analytical Services INC.
An Employee-Owned Company
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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

6925 Canoga Ave. • Canoga Park, CA 91303 • (818) 587-5550 • 800-695-7222 x02 • FAX (818) 587-5555

PAGE 1 OF 1

SR #

CAS Contact

Project Name Jungle Warfare Training EA	Project Number DACA83-00-D-0012/0048
Project Manager Derek Yasaka	Report CC
Company/Address Wil Chee Planning Inc 1400 Rycroft St #928 Honolulu HI 96814	
Phone # 808-955-6088	FAX# 808-942-851
Sampler's Signature	Sampler's Printed Name Derek Yasaka

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	TPH Gas 8015m (purgeable)	TPH Diesel ☐ Fuel Char. ☐ 8015m (extractable)	BTEX ☐ MTBE ☐ 8021 / 602	Total Petroleum Hydrocarbons 418.1	Halogenated Volatiles 8021 / 601	VOA by GCMS ☐ Oxygenates ☐ 8260 / 624 / 524.2	SemiVOA by GCMS 8270 / 625	Pesticides ☐ PCBs ☐ 8081 / 8082 / 608	CCR Metals (17) 6010 / 6020 / 7000 / 200.7 / 200.8	Nitroaromatics/Nitroamines 8330	Picric Acid / Picramic Acid 8151M	Nitroglycerin 8332			REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE																				
WCP-016R		6/6/03	0930	Water	6										✓	✓	✓			
WCP-017R		↓	0940	↓	6										✓	✓	✓			
WCP-018R			1005		6										✓	✓	✓			
WCP-019R			1020		6										✓	✓	✓			
WCP-020R		↓	1055	↓	5										✓	✓	✓			

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other ______

SPECIAL INSTRUCTIONS/COMMENTS

See QAPP ☐

TURNAROUND REQUIREMENTS

✓ RUSH (SURCHARGES APPLY)

PLEASE CIRCLE WORK DAYS

1 2 3 [✓ 4]

______ STANDARD

REQUESTED FAX DATE 6/23/03

REQUESTED REPORT DATE ______

REPORT REQUIREMENTS

____ I. Results Only

____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)

____ III. Results + QC and Calibration Summaries

____ IV. Data Validation Report with Raw Data

____ V. Speicalized Forms / Custom Report

Edata ✓ Yes ____ No

INVOICE INFORMATION

PO#

BILL TO:
Wil Chee Planning Inc
Attn Derek Yasaka

SAMPLE RECEIPT: CONDITION/COOLER TEMP: ______

CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature Tracie Sober	Signature	Signature	Signature	Signature
Printed Name Derek Yasaka	Printed Name Tracie Sober	Printed Name	Printed Name	Printed Name	Printed Name
Firm Wil Chee Planning	Firm VNO CAS	Firm	Firm	Firm	Firm
Date/Time 6/6/03 1755	Date/Time 6/6/03 1755	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Organic Analysis:
Picric Acid

Summary Package

Sample and QC Results

Client: Wil Chee Planning
Project: Jungle Warfare Training EA/TO:0048DACA8300-D-0012
Service Request: K2304510

Cover Page - Organic Analysis Data Package
Picric Acid

Sample Name	Lab Code	Date Collected	Date Received
WCP-016R	K2304510-001	06/16/2003	06/18/2003
WCP-017R	K2304510-002	06/16/2003	06/18/2003
WCP-018R	K2304510-003	06/16/2003	06/18/2003
WCP-019R	K2304510-004	06/16/2003	06/18/2003
WCP-020R	K2304510-005	06/16/2003	06/18/2003
WCP-016RMS	KWG0309010-1	06/16/2003	06/18/2003
WCP-016RDMS	KWG0309010-2	06/16/2003	06/18/2003

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: ____________________ Name: Todd Poyfair

Date: 6/23/03 Title: ____________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003

Picric Acid

Sample Name:	WCP-016R	**Units:**	ug/L
Lab Code:	K2304510-001	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	06/19/03	06/20/03	KWG0309010	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	82	70-130	06/20/03	Acceptable

Comments:

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003

Picric Acid

Sample Name:	WCP-017R	**Units:**	ug/L
Lab Code:	K2304510-002	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	06/19/03	06/20/03	KWG0309010	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	80	70-130	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Jungle Warfare Training EA/TO:0048DACA8300-D-0012
Sample Matrix: Water

Service Request: K2304510
Date Collected: 06/16/2003
Date Received: 06/18/2003

Picric Acid

Sample Name: WCP-018R
Lab Code: K2304510-003

Extraction Method: EPA 3510M
Analysis Method: 8151M

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	06/19/03	06/20/03	KWG0309010	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	71	70-130	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003

Picric Acid

Sample Name:	WCP-019R	**Units:**	ug/L
Lab Code:	K2304510-004	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	06/19/03	06/20/03	KWG0309010	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	85	70-130	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003

Picric Acid

Sample Name:	WCP-020R	**Units:**	ug/L
Lab Code:	K2304510-005	**Basis:**	NA
Extraction Method:	EPA 3510M	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Picric Acid	ND	U	6.8	1.9	1	06/19/03	06/20/03	KWG0309010	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	82	70-130	06/20/03	Acceptable

Comments: ______

Organic Analysis:
Nitroaromatics and Nitramines (Explosives)

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Wil Chee Planning **Service Request:** K2304510
Project: Jungle Warfare Training EA/TO:0048DACA8300-D-0012

Cover Page - Organic Analysis Data Package
Nitroaromatics and Nitramines (Explosives)

Sample Name	Lab Code	Date Collected	Date Received
WCP-016R	K2304510-001	06/16/2003	06/18/2003
WCP-017R	K2304510-002	06/16/2003	06/18/2003
WCP-018R	K2304510-003	06/16/2003	06/18/2003
WCP-019R	K2304510-004	06/16/2003	06/18/2003
WCP-020R	K2304510-005	06/16/2003	06/18/2003
WCP-019RMS	KWG0309037-1	06/16/2003	06/18/2003
WCP-019RDMS	KWG0309037-2	06/16/2003	06/18/2003

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name: Elizabeth Schneider

Date: 6/23/03

Title: Chemist

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/20/2003
		Date Analyzed:	06/20/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-016R	**Units:**	ug/L
Lab Code:	K2304510-001	**Basis:**	NA
File ID:	J:\LC03\DATA\0620A03\0620A007.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	EPA 3535	**Extraction Lot:**	KWG0309037
Analysis Method:	8330	**Calibration ID:**	CAL2689
		Column1:	Restek 0.46 x
Sample Amount:	1.05 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
2691-41-0	HMX	0.31	U	2.0	0.31	
121-82-4	RDX	0.19	U	2.0	0.19	
99-35-4	1,3,5-Trinitrobenzene	0.23	U	2.0	0.23	
99-65-0	1,3-Dinitrobenzene	0.14	U	2.0	0.14	
479-45-8	TETRYL	0.26	U	2.0	0.26	
98-95-3	Nitrobenzene	0.17	U	2.0	0.17	
1946-51-0	4-Amino-2,6-dinitrotoluene	0.13	U	2.0	0.13	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.17	U	2.0	0.17	
118-96-7	2,4,6-Trinitrotoluene	0.15	U	2.0	0.15	
606-20-2	2,6-Dinitrotoluene	0.24	U	2.0	0.24	
121-14-2	2,4-Dinitrotoluene	0.12	U	2.0	0.12	
88-72-2	2-Nitrotoluene	0.41	U	2.0	0.41	
99-99-0	4-Nitrotoluene	0.47	U	2.0	0.47	
99-08-1	3-Nitrotoluene	0.30	U	2.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	95	64-113	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/20/2003
		Date Analyzed:	06/20/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-017R	**Units:**	ug/L
Lab Code:	K2304510-002	**Basis:**	NA
File ID:	J:\LC03\DATA\0620A03\0620A008.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	EPA 3535	**Extraction Lot:**	KWG0309037
Analysis Method:	8330	**Calibration ID:**	CAL2689
		Column1:	Restek 0.46 x
Sample Amount:	1.05 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
2691-41-0	HMX	0.31	U	2.0	0.31	
121-82-4	RDX	0.19	U	2.0	0.19	
99-35-4	1,3,5-Trinitrobenzene	0.23	U	2.0	0.23	
99-65-0	1,3-Dinitrobenzene	0.14	U	2.0	0.14	
479-45-8	TETRYL	0.26	U	2.0	0.26	
98-95-3	Nitrobenzene	0.17	U	2.0	0.17	
1946-51-0	4-Amino-2,6-dinitrotoluene	0.13	U	2.0	0.13	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.17	U	2.0	0.17	
118-96-7	2,4,6-Trinitrotoluene	0.15	U	2.0	0.15	
606-20-2	2,6-Dinitrotoluene	0.24	U	2.0	0.24	
121-14-2	2,4-Dinitrotoluene	0.12	U	2.0	0.12	
88-72-2	2-Nitrotoluene	0.41	U	2.0	0.41	
99-99-0	4-Nitrotoluene	0.47	U	2.0	0.47	
99-08-1	3-Nitrotoluene	0.30	U	2.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	91	64-113	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/20/2003
		Date Analyzed:	06/20/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-018R	**Units:**	ug/L
Lab Code:	K2304510-003	**Basis:**	NA
File ID:	J:\LC03\DATA\0620A03\0620A009.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	EPA 3535	**Extraction Lot:**	KWG0309037
Analysis Method:	8330	**Calibration ID:**	CAL2689
		Column1:	Restek 0.46 x
Sample Amount:	.80 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
2691-41-0	HMX	0.31	U	2.0	0.31	
121-82-4	RDX	0.19	U	2.0	0.19	
99-35-4	1,3,5-Trinitrobenzene	0.23	U	2.0	0.23	
99-65-0	1,3-Dinitrobenzene	0.14	U	2.0	0.14	
479-45-8	TETRYL	0.26	U	2.0	0.26	
98-95-3	Nitrobenzene	0.17	U	2.0	0.17	
1946-51-0	4-Amino-2,6-dinitrotoluene	0.13	U	2.0	0.13	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.17	U	2.0	0.17	
118-96-7	2,4,6-Trinitrotoluene	0.15	U	2.0	0.15	
606-20-2	2,6-Dinitrotoluene	0.24	U	2.0	0.24	
121-14-2	2,4-Dinitrotoluene	0.12	U	2.0	0.12	
88-72-2	2-Nitrotoluene	0.41	U	2.0	0.41	
99-99-0	4-Nitrotoluene	0.47	U	2.0	0.47	
99-08-1	3-Nitrotoluene	0.30	U	2.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	100	64-113	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/20/2003
		Date Analyzed:	06/20/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-019R	**Units:**	ug/L
Lab Code:	K2304510-004	**Basis:**	NA
File ID:	J:\LC03\DATA\0620A03\0620A010.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	EPA 3535	**Extraction Lot:**	KWG0309037
Analysis Method:	8330	**Calibration ID:**	CAL2689
		Column1:	Restek 0.46 x
Sample Amount:	1 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
2691-41-0	HMX	0.31	U	2.0	0.31	
121-82-4	RDX	0.19	U	2.0	0.19	
99-35-4	**1,3,5-Trinitrobenzene**	**0.37**	JN	2.0	0.23	
99-65-0	1,3-Dinitrobenzene	0.14	U	2.0	0.14	
479-45-8	TETRYL	0.26	U	2.0	0.26	
98-95-3	Nitrobenzene	0.17	U	2.0	0.17	
1946-51-0	4-Amino-2,6-dinitrotoluene	0.13	U	2.0	0.13	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.17	U	2.0	0.17	
118-96-7	2,4,6-Trinitrotoluene	0.15	U	2.0	0.15	
606-20-2	**2,6-Dinitrotoluene**	**0.39**	JN	2.0	0.24	
121-14-2	2,4-Dinitrotoluene	0.12	U	2.0	0.12	
88-72-2	2-Nitrotoluene	0.41	U	2.0	0.41	
99-99-0	4-Nitrotoluene	0.47	U	2.0	0.47	
99-08-1	3-Nitrotoluene	0.30	U	2.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	93	64-113	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/20/2003
		Date Analyzed:	06/20/2003

Nitroaromatics and Nitramines (Explosives)

Sample Name:	WCP-020R	**Units:**	ug/L
Lab Code:	K2304510-005	**Basis:**	NA
File ID:	J:\LC03\DATA\0620A03\0620A013.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	EPA 3535	**Extraction Lot:**	KWG0309037
Analysis Method:	8330	**Calibration ID:**	CAL2689
		Column1:	Restek 0.46 x
Sample Amount:	1.05 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
2691-41-0	HMX	0.31	U	2.0	0.31	
121-82-4	RDX	0.19	U	2.0	0.19	
99-35-4	1,3,5-Trinitrobenzene	0.23	U	2.0	0.23	
99-65-0	1,3-Dinitrobenzene	0.14	U	2.0	0.14	
479-45-8	TETRYL	0.26	U	2.0	0.26	
98-95-3	Nitrobenzene	0.17	U	2.0	0.17	
1946-51-0	4-Amino-2,6-dinitrotoluene	0.13	U	2.0	0.13	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.17	U	2.0	0.17	
118-96-7	2,4,6-Trinitrotoluene	0.15	U	2.0	0.15	
606-20-2	2,6-Dinitrotoluene	0.24	U	2.0	0.24	
121-14-2	2,4-Dinitrotoluene	0.12	U	2.0	0.12	
88-72-2	2-Nitrotoluene	0.41	U	2.0	0.41	
99-99-0	4-Nitrotoluene	0.47	U	2.0	0.47	
99-08-1	3-Nitrotoluene	0.30	U	2.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	94	64-113	06/20/03	Acceptable

Comments:

Organic Analysis:
Nitroglycerin and PETN

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Wil Chee Planning
Project: Jungle Warfare Training EA/TO:0048DACA8300-D-0012
Service Request: K2304510

Cover Page - Organic Analysis Data Package
Nitroglycerin and PETN

Sample Name	Lab Code	Date Collected	Date Received
WCP-016R	K2304510-001	06/16/2003	06/18/2003
WCP-017R	K2304510-002	06/16/2003	06/18/2003
WCP-018R	K2304510-003	06/16/2003	06/18/2003
WCP-019R	K2304510-004	06/16/2003	06/18/2003
WCP-020R	K2304510-005	06/16/2003	06/18/2003
WCP-016RMS	KWG0308966-1	06/16/2003	06/18/2003
WCP-016RDMS	KWG0308966-2	06/16/2003	06/18/2003

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name: Elizabeth Schneider

Date: 6/23/03

Title: Chemist

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/19/2003
		Date Analyzed:	06/21/2003

Nitroglycerin and PETN

Sample Name:	WCP-016R	**Units:**	ug/L
Lab Code:	K2304510-001	**Basis:**	NA
File ID:	J:\LC03\DATA\0621N03\0621N006.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	METHOD	**Extraction Lot:**	KWG0308966
Analysis Method:	8332	**Calibration ID:**	CAL2620
		Column1:	Pinnacle ODS
Sample Amount:	1.05 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
55-63-0	Nitroglycerin	0.94	U	2.0	0.94	
78-11-5	Pentaerythritol Tetranitrate	0.87	U	2.0	0.87	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	72	70-130	06/21/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/19/2003
		Date Analyzed:	06/20/2003

Nitroglycerin and PETN

Sample Name:	WCP-017R	**Units:**	ug/L
Lab Code:	K2304510-002	**Basis:**	NA
File ID:	J:\LC03\DATA\062003\06200010.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	METHOD	**Extraction Lot:**	KWG0308966
Analysis Method:	8332	**Calibration ID:**	CAL2620
		Column1:	Pinnacle ODS
Sample Amount:	1.05 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
55-63-0	Nitroglycerin	0.94	U	2.0	0.94	
78-11-5	Pentaerythritol Tetranitrate	0.87	U	2.0	0.87	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	81	70-130	06/20/03	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/19/2003
		Date Analyzed:	06/20/2003

Nitroglycerin and PETN

Sample Name:	WCP-018R	**Units:**	ug/L
Lab Code:	K2304510-003	**Basis:**	NA
File ID:	J:\LC03\DATA\062003\06200011.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	METHOD	**Extraction Lot:**	KWG0308966
Analysis Method:	8332	**Calibration ID:**	CAL2620
		Column1:	Pinnacle ODS
Sample Amount:	1.05 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
55-63-0	Nitroglycerin	0.94	U	2.0	0.94	
78-11-5	Pentaerythritol Tetranitrate	0.87	U	2.0	0.87	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	77	70-130	06/20/03	Acceptable

Comments: ______________________________

Client:	Wil Chee Planning	**Service Request:**	K2304510
Project:	Jungle Warfare Training EA/TO:0048DACA8300-D-0012	**Date Collected:**	06/16/2003
Sample Matrix:	Water	**Date Received:**	06/18/2003
		Date Extracted:	06/19/2003
		Date Analyzed:	06/20/2003

Nitroglycerin and PETN

Sample Name:	WCP-019R	**Units:**	ug/L
Lab Code:	K2304510-004	**Basis:**	NA
File ID:	J:\LC03\DATA\062003\06200012.D	**Level:**	Low
Instrument ID:	LC03		
Extraction Method:	METHOD	**Extraction Lot:**	KWG0308966
Analysis Method:	8332	**Calibration ID:**	CAL2620
		Column1:	Pinnacle ODS
Sample Amount:	0.95 L		
% Solids:	NA		
Dilution Factor:	1		

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
55-63-0	Nitroglycerin	0.99	U	2.2	0.99	
78-11-5	Pentaerythritol Tetranitrate	0.92	U	2.2	0.92	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	78	70-130	06/20/03	Acceptable

Comments: ______________________________

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Wil Chee Planning
Project: Jungle Warfare Training EA/TO:0048DACA8300-D-0012
Sample Matrix: Water

Service Request: K2304510
Date Collected: 06/16/2003
Date Received: 06/18/2003
Date Extracted: 06/19/2003
Date Analyzed: 06/20/2003

Nitroglycerin and PETN

Sample Name: WCP-020R
Lab Code: K2304510-005
File ID: J:\LC03\DATA\062003\06200013.D
Instrument ID: LC03

Units: ug/L
Basis: NA
Level: Low

Extraction Method: METHOD
Analysis Method: 8332

Extraction Lot: KWG0308966
Calibration ID: CAL2620

Column1: Pinnacle ODS

Sample Amount: 1.05 L
% Solids: NA
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
55-63-0	Nitroglycerin	0.94	U	2.0	0.94	
78-11-5	Pentaerythritol Tetranitrate	0.87	U	2.0	0.87	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Dimethyl-2,3-dinitrobutane	84	70-130	06/20/03	Acceptable

Comments:

APPENDIX C. FIELD EFFORT WEEKLY STATUS REPORTS

WEEKLY OPERATIONS SUMMARY

Week Of: 09/29/2008 – 10/03/2008 **PAGE 1 OF 6 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	0%	100%
(2) Preparation	N/A	N/A
(3) Mag & Flag	N/A	N/A
(4) Re-acquisition	N/A	N/A
(5) Intrusive	N/A	N/A
(6) Quality Control	N/A	N/A
(7) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	2	0
(2) Quality Assurance	0	0
(3) Safety	2	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Mobilize in the Site Manager, SUXOS, UXOSO/QCS and UXO Technician III to conduct logistics set-up operations. Participate in the Field Work Kick-Off Meeting with Naval Facilities Command Pacific (NAVFAC Pacific), MCBH Kaneohe Public Affairs Office, Pacific Consulting Services, Inc. and MCBH Kaneohe Environmental Department personnel. Conduct review of project Work Plan, Health and Safety Plan, and Accident Prevention Plan with all project field personnel. Conduct site training with all project field personnel.

3. MEC SUMMARY

a. **MEC Located:** No MEC located this week.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this week.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Weekly Man-hours:

Labor Category:	Task #	M/H Week:	M/H 0% :	M/H 4%	M/H Overtime
Site Manager	3	40	40	0	7
SUXOS	3	33	25	8	0
UXO Technician III	3	32	24	8	0
UXO Technician II	3	56	40	16	0
UXO Technician I	3	28	20	8	0
UXOSO	3	17	13	4	1
UXOQCS	3	17	13	4	1
EMT	3	28	28	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	20	12	8	0
DEI / UXO Tech I	3	20	12	8	0
Wil Chee Planning	3	0	0	0	0

b. Weekly Equipment:

Description:	Task:	Number of Units:	Basis:	Total Units for Week:	Remarks:
SUV Vehicle	3	3	Week	3	
Truck Crew Cab	3	1	Week	1	
MineLab Detector	3	6	Week	6	
Trimble GeoXT Handheld GPS	3	3	Week	3	
Brush Cutter	3	2	Week	2	
Laptop Computer	3	1	Week	1	
Cell Phone	3	1	Week	1	
Printer	3	1	Week	1	
Digital Camera	3	2	Week	2	
Hand Held Radio	3	6	Week	6	
EMT Medical Gear	3	1	Week	1	
Safety Equipment	3	2	Week	2	
Operating Equipment	3	2	Week	2	

5. Operational Remarks:

During the week's operations, the Site Manager, SUXOS, Dual-Hatted UXOSO/QCS, and UXO Tech III mobilized in to conduct the logistics set-up for the project and project Kick-Off meeting.

The Site Manager, SUXOS, UXOSO/QCS and UXO Tech III conducted all logistic preparations for project operations and lodging.

On Monday the 29th of September @1400, the Site Manager, SUXOS, UXOSO/QCS and UXO Tech III attended the Project Field Work Kick-Off meeting held at the MCBH Environmental Department. Personnel from NAVFAC Pacific, MCBH Environmental Department, MCBH Public Affairs Office, Pacific Consulting Services, Inc. and Wil Chee Planning were in attendance.

On Tuesday the 30th of September, the remainder of USA field personnel arriving from the U.S. Mainland and Hawaiian islands nearby mobilized in for commencement of field operations on Wednesday the 1st of October.

On Wednesday the 1st of October the following operations occurred on site:

During the week's field operations, the Site Manager and SUXOS conducted an Operations Brief with all site field personnel. The project dual-hatted UXO Safety Officer/Quality Control Supervisor conducted Site Specific Safety and Health Training and a review of all site specific Activity Hazard Analysis (AHA) with all site field personnel. All project field personnel received a Cultural Resources Awareness Briefing from the project site Archeologist team from Pacific Consulting Services, Inc. SI Team personnel on site in the field this week included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, and 2-Archeologist from Pacific Consulting. One UXO Technician II and one UXO Technician I was provided by USA Environmental sub-contractor DEI.

SI Field Team constructed the project Instrument Test Plot (ITP) just inside the site fence line located in the southeastern corner of the Waikane Valley Training Area, and completed an operational and acceptance test on all 6-project Minelab Explorer II hand-held detectors.

The SI Field Management Team conducted and completed training on the Minelab Explorer II hand-held detector and the Trimble GeoXT hand-held GPS/PDA with all site UXO personnel.

On Thursday the 2nd of October the following operations occurred on site:

The Reconnaissance Teams attempted to acquire GPS waypoints on the southeastern and southwestern corners of the existing fence line marking the SI boundaries. Due to the incorrect GPS projection being used this task was not accomplished.

The Reconnaissance Teams marked the eastern and western boundary fence line with flagging ribbon at 70 foot intervals to use as reference marks and location assistance due to the inability to acquire GPS satellites on the project site.

The Team also conducted in-field training on the proper and correct methods of performing the reconnaissance procedures.

Due to the lack of the correct GIS information for the Waikane SI project site, no actual reconnaissance operations were conducted this week, only training. On Monday the 6th of October it is expected that the correct GIS data will be on-hand and loaded into the Trimble hand-held units, and reconnaissance operations will commence.

6. Signature / Date:

__________Daniel Miller____________ **Date:** 10/03/2008
USA Environmental Site Manager

DAILY OPERATIONS SUMMARY

DATE: Monday, 10/06/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	10%	90%
(2) Survey Cells/Grids	03	33
(3) Mag & Flag	N/A	N/A
(4) Geophysical	N/A	N/A
(5) Intrusive	N/A	N/A
(6) Quality Control	Daily	Daily
(7) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Commence reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. UXO SUMMARY

a. MEC Located: No MEC located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. **Utilization**

   a. **Daily Man-hours:**

Labor Category:	**Task #**	**M/H Today:**	**M/H 0% :**	**M/H 4%**	**M/H 8%**
Site Manager	3	13	13	0	0
SUXOS	3	10	1	9	0
UXO Technician III	3	10	1	9	0
UXO Technician II	3	20	2	18	0
UXO Technician I	3	10	1	9	0
UXOSO	3	5.5	1	4.5	0
UXOQCS	3	5.5	1	4.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	1	9	0
DEI / UXO Tech I	3	10	1	9	0
Wil Chee Planning	3	0	0	0	0

   b. **Daily Equipment:**

Description:	**Task:**	**Number of Units**	**Hours Used Each:**	**Total Hours Used:**	**Remarks:**
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. Operational Remarks:

The SI field team commenced reconnaissance operations within the boundaries of the Former Waikane Valley Training Area.

It was noted at the beginning of the day's operations that there was still an issue with the provided GIS/ArcPad data shape files loaded in the Trimble GeoXT hand-held GPS/PDA units. The data files drop down check list folder was not functioning as should. The site manager was made aware of this and immediately contacted the USA Environmental GIS manager to email the corrected shape files in order to fix the problem.

The reconnaissance field team proceeded with conducting reconnaissance operations. The team had to temporarily resort to writing the collected data down in a field pocket note pad to be imputed into the GeoXT hand-held PDA latter when it is functioning properly.

The reconnaissance field team encountered extremely heavy underbrush vegetation and thick vegetation canopy throughout the day's operations. That along with the very wet environment conditions made it a very low productive day. Being able to acquire GPS Satellite coverage while conducting reconnaissance operations is a very difficult if not an impossible task, but the team does attempt to acquire a GPS waypoint when a clear to partial view of the sky is present during their traversed path.

It was noted by the team and brought to the Site Managers attention, that approximately 300 feet of the pink flagging ribbon that was placed on the southwestern fence line portion was ripped off and thrown on the ground over the weekend time period.

During the days reconnaissance operations the team did came across a couple of locations where they noted munitions debris items consisting of 3.5 inch Bazooka Rocket parts and pieces, and M125 series Hand Signaling (Slap Flare) Device on the surface of the traversed reconnaissance path.

As of the end of the day's operations, the reconnaissance team completed 10 percent of the scoped reconnaissance acreage and 3 of the scoped reconnaissance cell/grid locations.

6. Signature / Date:

__________Daniel Miller______________ **Date:** 10/06/2008

Site Manager

DAILY OPERATIONS SUMMARY

DATE: Tuesday, 10/07/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	5%	85%
(2) Survey Cells/Grids	07	23
(3) Mag & Flag	N/A	N/A
(4) Geophysical	N/A	N/A
(5) Intrusive	N/A	N/A
(6) Quality Control	Daily	Daily
(7) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. UXO SUMMARY

a. MEC Located:

Type:	**Quantity:**	**Live/Prac.**	**Remarks:**
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	05	Suspected HE Filled and Fuzed.	All 5 MEC (UXO) items were located on the reconnaissance traversed paths. Two items located at one point, the other three located at separate points.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	1	9	0
UXO Technician III	3	10	1	9	0
UXO Technician II	3	20	2	18	0
UXO Technician I	3	10	1	9	0
UXOSO	3	5.5	1	4.5	0
UXOQCS	3	5.5	1	4.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	1	9	0
DEI / UXO Tech I	3	10	1	9	0
Wil Chee Planning	3	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. Operational Remarks:

The SI field team continued reconnaissance operations within the boundaries of the Former Waikane Valley Training Area.

The issues experienced during previous day's operations with the Trimble GeoXT hand-held GPS/PDA units seemed to have been corrected and fixed. All three hand-held units worked very well and the reconnaissance team was able to input data throughout the day.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation and thick vegetation canopy throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team is having to traverse around a lot of the area that contain the *Hau* vegetation.

Being able to acquire GPS Satellite coverage while conducting reconnaissance operations continues to be very difficult if not an impossible task, but the team does attempt to acquire a GPS waypoint when a clear to partial view of the sky is present during their traversed path.

The local public continues to enter the site area outside the fence line at will. It appears that most of the personnel are there to go 4-Wheeling, Wild Pig Hunting or Vegetation Removal.

During the days reconnaissance operations the team did came across a couple of locations where they noted munitions debris items consisting of 3.5 inch Bazooka Rocket parts and pieces, and 4 separate MEC (UXO) locations on the surface of the traversed reconnaissance paths.

As of the end of the day's operations, the reconnaissance team completed 5 percent for a total of 15 percent of the scoped reconnaissance acreage and 7 for a total of 10 of the scoped reconnaissance cell/grid locations.

The reconnaissance data and track log shape files for the past two days of operations have been uploaded to the USA ftp site.

6. Signature / Date:

__________Daniel Miller______________ **Date:** 10/07/2008

Site Manager

DAILY OPERATIONS SUMMARY

DATE: Wednesday, 10/08/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:

	Number Completed	Total Remaining
(1) Survey	5%	80%
(2) Survey Cells/Grids	08	16
(3) Mag & Flag	N/A	N/A
(4) Geophysical	N/A	N/A
(5) Intrusive	N/A	N/A
(6) Quality Control	Daily	Daily
(7) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:

	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. UXO SUMMARY

a. MEC Located:

Type:	Quantity:	Live/Prac.	Remarks:
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	21	Suspected HE Filled and Fuzed.	All 21 MEC (UXO) items were located on the reconnaissance traversed paths.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	3	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations within the boundaries of the Former Waikane Valley Training Area.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation and thick vegetation canopy throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team is having to traverse around a lot of the area that contain the *Hau* vegetation.

Being able to acquire GPS Satellite coverage while conducting reconnaissance operations continues to be very difficult if not an impossible task, but the team does attempt to acquire a GPS waypoint when a clear to partial view of the sky is present during their traversed path.

During the days reconnaissance operations the team did came across a couple of locations where they noted munitions debris items consisting of 3.5 inch Bazooka Rocket parts and pieces, and MEC (UXO) items consisting of 3.5 inch Bazooka Rockets.

The team also noted a heavy concentration of munitions items, mainly 3.5 inch Bazooka Rockets, on the traversed path between the 300 foot and 400 foot terrain contour lines.

As of the end of the day’s operations, the reconnaissance team completed 5 percent for a total of 20 percent of the scoped reconnaissance acreage and 8 for a total of 18 of the scoped reconnaissance cell/grid locations.

The reconnaissance data and track log shape files for the past two days of operations have been uploaded to the USA ftp site.

6. **Signature / Date:**

__________Daniel Miller______________ **Date:** 10/08/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Thursday, 10/09/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	8%	72%
(2) Survey Cells/Grids	02	14
(3) Mag & Flag	N/A	N/A
(4) Geophysical	N/A	N/A
(5) Intrusive	N/A	N/A
(6) Quality Control	Daily	Daily
(7) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. UXO SUMMARY

a. MEC Located:

Type:	Quantity:	Live/Prac.	Remarks:
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	6	Suspected HE Filled and Fuzed.	All 6 MEC (UXO) items were located on the reconnaissance traversed paths within the SI boundary.
2.36 inch M6 Series Rocket Warhead, Fired.	1	Suspected HE Filled.	Item located on the reconnaissance traversed paths within the SI boundary.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	3	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. Operational Remarks:

The SI field team continued reconnaissance operations within the boundaries of the Former Waikane Valley Training Area.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation and thick vegetation canopy throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Being able to acquire GPS Satellite coverage while conducting reconnaissance operations continues to be very difficult if not an impossible task, but the teams do attempt to acquire a GPS waypoint when a clear to partial view of the sky is present during their traversed path. Today, both reconnaissance teams operated in the 400 foot terrain contour line. Both teams were able to capture GPS satellites more often during the day due to the sparse vegetation canopy cover, much better then the results in the southern portion of the site.

During the days reconnaissance operations the team did came across several locations where they noted munitions debris items consisting of 3.5 inch Bazooka Rocket parts and pieces, and MEC (UXO) items consisting of 3.5 inch and 2.36 inch shoulder fired Rockets.

The team also noted a heavy concentration of munitions items, mainly munitions debris, from miscellaneous shoulder fired Bazooka Rockets, on the traversed path between the east and west sections of 400 foot terrain contour line. To date, it appears that no munitions or munitions debris items are located in the western portion of the site.

There were 3 visitors on site today for approximately 7 hours. The visitors were Wray Kakugawa, Navy RPM, Naval Facilities Command Pacific, June Cleghorn, Archeologist, MCBH Kaneohe Environmental Department, and David Wong, Hawaii State Department of Health. The visitors were given an operational brief by the Site Manager and SUXOS. This operational brief included a description of what the teams have located to date; the difficulty of traversing the terrain within the SI boundaries, and an explanation of how the GeoXT hand-held unit works and the series of folders and drop down list that USA has created for its SI projects. The operational brief included taking the visitors to the project/site ITP and given a brief on the seed items and its operational use. They were also given a safety brief by the UXO Safety Officer prior to going out in the field. The 3 visitors along with the project SUXOS accompanied one of the reconnaissance teams for several hours during reconnaissance operations within the area of cell #19

As of the end of the day’s operations, the reconnaissance team completed 8 percent for a total of 28 percent of the scoped reconnaissance acreage and 2 for a total of 20 of the scoped reconnaissance cell/grid locations.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. Signature / Date:

__________ Daniel Miller__ ___________ **Date:** 10/09/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Monday, 10/13/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	6%	66%
(2) Survey Cells/Grids	02	14
(3) Mag & Flag	N/A	N/A
(4) Geophysical	N/A	N/A
(5) Intrusive	N/A	N/A
(6) Quality Control	Daily	Daily
(7) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. UXO SUMMARY

a. MEC Located:

Type:	Quantity:	Live/Prac.	Remarks:
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	23	Suspected HE Filled and Fuzed.	All 23 items are considered MEC (UXO) items. MEC items located on the reconnaissance traversed paths within the SI boundary.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	3	7	0
UXO Technician III	3	10	3	7	0
UXO Technician II	3	20	6	14	0
UXO Technician I	3	10	3	7	0
UXOSO	3	5	1.5	3.5	0
UXOQCS	3	5	1.5	3.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	3	7	0
DEI / UXO Tech I	3	10	3	7	0
Wil Chee Planning	3	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, and 2-Archeologist from Pacific Consulting.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Being able to acquire GPS Satellite coverage while conducting reconnaissance operations continues to be very difficult if not an impossible task, but the teams do attempt to acquire a GPS waypoint when a clear to partial view of the sky is present during their traversed path. Today, both reconnaissance teams operated in the 400 foot plus terrain contour line. Both teams were able to capture GPS satellites more often during the day due to the sparse vegetation canopy cover, much better then the results in the southern portion of the site.

During the days reconnaissance operations the team came across an area north of Idealized Cell #22 where they noted large amounts of munitions debris items consisting of 3.5 inch Bazooka Rocket parts and pieces, small arms rounds and MEC (UXO) items consisting of 3.5 inch shoulder fired Rockets. The area appears to be a former Target Area.

During the afternoon hours today, the field team experienced several hours of rain, and at times heavy down pours. This made it very difficult to traverse the already difficult terrain and operate the field electronic equipment. Several of the field personnel slipped, fell or tumbled while moving about the site. This only resulted in these personnel receiving bumps and bruises. The day ended with no one experiencing any reportable injuries, and no equipment including vehicles was damaged. However, we did have one of the Budget Rental Vehicles experience two flat tires prior to leaving the site. Both tires were changed out with available spare tires, and both flat tires were taken to the local Goodyear Tire Center for repair.

As of the end of the day’s operations, the reconnaissance team completed 6 percent for a total of 34 percent of the scoped reconnaissance acreage and 2 for a total of 22 of the scoped reconnaissance cell/grid locations.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. **Signature / Date:**

__________Daniel Miller_____________ **Date:** 10/13/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Tuesday, 10/14/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	4%	62%
(2) Survey Cells/Grids	03	11
(3) Incremental Samples	07	28
(4) Discreet Samples	0	10
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work. Commence soil sampling operations within the SI boundaries of the Former Waikane Valley Training Area.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	3	7	0
DEI / UXO Tech I	3	10	3	7	0
Wil Chee Planning	3	20	20	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations and commenced soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-Soil Sample Technicians from Wil Chee Planning, and 2-Archeologist from Pacific Consulting.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, one reconnaissance team operated in the southern end of the site with the Soil Sample Technicians while soil samples were being collected. The other reconnaissance team operated in northern most section of the site at the 900 foot plus terrain contour line. The team working in the northern section of the site was able to capture GPS satellites more often during the day due to the sparse vegetation canopy cover, much better then the results in the southern portion of the site.

No MEC (UXO) items were noted during the day’s operations. The team traversing the northern section of the site noted only one small munitions debris item which appears to be an expended base fuze from a 37mm projectile.

*It should be noted that during the reconnaissance operations on Monday the 13th of October, the team found evidence that **high explosive** shoulder fired rockets were indeed fired into/on the project site.*

Soil sample operations were commenced on site today. Wil Chee Planning collected samples at 7 separate Incremental locations within the southeastern portion of the site. Sample ID numbers MEC001 through MEC007 were collected during the day’s operations.

As of the end of the day’s operations, the project field team completed 4 percent for a total of 38 percent of the scoped reconnaissance acreage, 3 for a total of 25 of the scoped reconnaissance cell/grid locations, and 7 of the scoped 35 Incremental Samples and 0 of the scoped 10 Discreet Samples.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. **Signature / Date:**

__________ Daniel Miller______________ **Date:** 10/14/2008
Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Wednesday, 10/15/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	4%	58%
(2) Survey Cells/Grids	02	09
(3) Incremental Samples	09	19
(4) Discreet Samples	0	10
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations and soil sample operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. **MEC (UXO)/MPPEH Located:** No MEC or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	4	6	0
UXO Technician III	3	10	4	6	0
UXO Technician II	3	20	8	12	0
UXO Technician I	3	10	4	6	0
UXOSO	3	5	2	3	0
UXOQCS	3	5	2	3	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	4	6	0
DEI / UXO Tech I	3	10	4	6	0
Wil Chee Planning	3	20	20	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. Operational Remarks:

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-Soil Sample Technicians from Wil Chee Planning, and 2-Archeologist from Pacific Consulting.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, one 2-person UXO team operated in the southern end of the site with the Soil Sample Technicians while soil samples were being collected. The other reconnaissance team operated in northern most east section of the site at the 900 foot plus terrain contour line. The team working in the northern section of the site was able to capture GPS satellites more often during the day due to the sparse vegetation canopy cover, much better then the results in the southern portion of the site.

Today during a 2-hour period while on site, we experience a heavy down pour of rain which halted operations during that time frame. The teams took cover and hunkered down at their operational positions within the site until the heavy rain subsided. The project vehicles were moved to an area that was safe from flash flooding and mud slides. **NO** injuries to personnel or damage to equipment was experienced during this event or throughout the day. We only had 11 extremely wet and muddy personnel at the end of the day.

No MEC (UXO) or MPPEH items were noted during the day’s operations. The team traversing the northern section of the site noted only 5 each 7.62mm small arms projectiles (bullets) munitions debris items during the days operations.

Soil sample operations continued on site today. Wil Chee Planning collected samples at 9 separate Incremental locations and 1 duplicate sample, MEC011 within the southwestern portion of the site. Sample ID numbers MEC008 through MEC0017 were collected during the day’s operations.

As of the end of the day’s operations, the project field team completed 4 percent for a total of 42 percent of the scoped reconnaissance acreage, 2 cells/grids for a total of 27 of the scoped reconnaissance cell/grid locations, 9 for a total of 16 of the scoped 35 Incremental Samples, and 0 of the scoped 10 Discreet Samples.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. Signature / Date:

__________Daniel Miller______________ **Date:** 10/15/2008

Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Thursday, 10/16/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	4%	54%
(2) Survey Cells/Grids	01	08
(3) Incremental Samples	14	05
(4) Discreet Samples	0	10
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations and soil sample operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located:

Type:	**Quantity:**	**Live/Prac.**	**Remarks:**
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	02	Suspected HE Filled.	Both items are considered MEC (UXO) items. MEC items located on the reconnaissance traversed paths within the SI boundary.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	**Task #**	**M/H Today:**	**M/H 0% :**	**M/H 4%**	**M/H 8%**
Site Manager	3	12	12	0	0
SUXOS	3	10	3	7	0
UXO Technician III	3	10	3	7	0
UXO Technician II	3	20	6	14	0
UXO Technician I	3	10	3	7	0
UXOSO	3	5.5	2	3.5	0
UXOQCS	3	5.5	2	3.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	3	7	0
DEI / UXO Tech I	3	10	3	7	0
Wil Chee Planning	3	20	20	0	0

b. Daily Equipment:

Description:	**Task:**	**Number of Units**	**Hours Used Each:**	**Total Hours Used:**	**Remarks:**
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-Soil Sample Technicians from Wil Chee Planning, and 2-Archeologist from Pacific Consulting.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, one 3-person UXO team operated in the southern end of the site supporting the Soil Sample Technicians while soil samples were being collected. The one reconnaissance team also operated in the southern section of the site to fill in data gaps in that area.

No MPPEH items were noted during the day’s operations. The team traversing the southern section of the site noted 2 MEC (UXO) items, both 3.5 inch shoulder fired Rockets, and several 7.62mm small arms projectiles (bullets) munitions debris items.

Soil sample operations continued on site today. Wil Chee Planning collected samples at 14 separate Incremental locations and 2 duplicate sample, MEC021 and MEC031 within the south central portion of the site. Incremental Soil Sample ID numbers MEC018 through MEC033 were collected during the day’s operations.

As of the end of the day’s operations, the project field team completed 4 percent for a total of 46 percent of the scoped reconnaissance acreage, 1 cell/grid for a total of 28 of the scoped reconnaissance cell/grid locations, 14 for a total of 30 of the scoped 35 Incremental Samples, and 0 of the scoped 10 Discreet Samples.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. **Signature / Date:**

__________Daniel Miller____________ **Date:** 10/16/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Monday, 10/20/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	5%	49%
(2) Survey Cells/Grids	00	08
(3) Incremental Samples	05	00
(4) Discreet Samples	05	05
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations and soil sample operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located:

Type:	Quantity:	Live/Prac.	Remarks:
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	06	Suspected HE Filled.	Items are considered MEC (UXO) items. MEC items located on the reconnaissance traversed paths within the SI boundary.
Rifle Grenade, Fired and Suspected Fuzed.	01	Suspected HE Filled.	Item is considered a MEC (UXO) item. MEC item located on traversed path to soil sample location.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	3	7	0
UXO Technician III	3	10	3	7	0
UXO Technician II	4	20	4	16	0
UXO Technician I	4	10	2	8	0
UXOSO	3	5.5	2	3.5	0
UXOQCS	3	5.5	2	3.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	3	7	0
DEI / UXO Tech I	3	10	3	7	0
Wil Chee Planning	4	30	30	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, ***3-Soil Sample Technicians from Wil Chee Planning***, and 2-Archeologist from Pacific Consulting.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Again today the weather played a factor with regards to operations and the production rate. Constant rain fall was experienced during the entire morning on site. The afternoon was clear and sunny, with no rain.

Today, one 3-person UXO team operated in the central section of the site supporting the 3 Soil Sample Technicians while incremental and discrete soil samples were being collected. The one reconnaissance team also operated in the southern and central portion sections of the site to fill in data gaps in that area.

No MPPEH items were noted during the day’s operations. The team conducting reconnaissance operations noted 6 MEC (UXO) items, all which were 3.5 inch shoulder fired Rockets. The team supporting and escorting the Soil Sample Technicians noted 1 MEC (UXO) item which was a HE filled Rifle Grenade.

Soil sample operations continued on site today. Wil Chee Planning collected samples at 5 separate Incremental locations and 5 separate Discrete locations to include 1 duplicate sample in the central portion of the site. Soil Sample ID numbers MEC034 through MEC044 were collected during the day’s operations.

As of the end of the day’s operations, the project field team completed 5 percent for a total of 51 percent of the scoped reconnaissance acreage, no cells/grids for a total of 28 of the scoped reconnaissance cell/grid locations, 5 for a total of 35 of the scoped 35 Incremental Samples, and 5 of the scoped 10 Discreet Samples.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. **Signature / Date:**

___________ Daniel Miller______________ **Date:** 10/20/2008
Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Tuesday, 10/21/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	**Number Completed**	**Total Remaining**
(1) Survey	10%	39%
(2) Survey Cells/Grids	02	06
(3) Incremental Samples	05	00
(4) Discreet Samples	05	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	**Pass**	**Fail**
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations and soil sample operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located:

Type:	Quantity:	Live/Prac.	Remarks:
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	01	Suspected HE Filled.	Item is considered MEC (UXO) items. MEC item located on the reconnaissance traversed paths within the SI boundary.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	**Quantity:**	**Remarks:**

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	**Quantity:**	**Weight:**	**Remarks:**

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	4	12	2	10	0
UXO Technician II	3	8	2	6	0
UXO Technician I	4	6	1	5	0
UXO Technician I	3	4	1	3	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	4	12	12	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. Operational Remarks:

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-***Soil Sample Technicians from Wil Chee Planning***, and 2-Archeologist from Pacific Consulting Services, Inc.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, one 3-person UXO team operated in the central section of the site supporting the 2 Soil Sample Technicians while discrete soil samples were being collected. The one reconnaissance team operated in the eastern portion of the site to fill in data gaps in that area.

No MPPEH items were noted during the day’s operations. The team conducting reconnaissance operations noted 1 MEC (UXO) item which was a 3.5 inch shoulder fired Rocket.

Soil sample operations continued on site today and was completed by mid day. Wil Chee Planning collected samples at 5 separate Discrete locations to include 1 duplicate sample in the central portion of the site. Soil Sample ID numbers MEC045 through MEC050 were collected during the day’s operations.

As of the end of the day’s operations, the project field team completed 10 percent for a total of 61 percent of the scoped reconnaissance acreage, 2 cells/grids for a total of 30 of the scoped reconnaissance cell/grid locations, and 5 of the scoped 10 Discreet Samples.

Site Manager met with Ms. Judith Bowman the Curator for the U.S. Army Museum of Hawaii located at Fort DeRussy. Site Manager had a pre-arrange appointment with Ms. Bowman at 1000 today. Site Manager reviewed several binders of historical black and white photos dating back to the 1920’s that Ms. Bowman thought might have some information regarding the former Waikane Valley Training Area and the former Naval Air Station Kaneohe/Camp Hase areas. No photos pertaining to the scoped project sites/areas were located. Site Manager also looked over a folder of maps that Ms. Bowman presented to him. Two maps depicting all the Island of Oahu Training Areas, Camps, and Centers following the bombing of Pearl Harbor was noted, reviewed and photo copied. The map is dated June 1944. These maps also showed the impact areas for each of the training areas. No additional information was noted. The Site Manager spent approximately 2 hours reviewing the available historical photos and documents. Ms. Bowman stated that she would continue to research information on Waikane Valley and notify the Site Manager if she discovers any additional information that might be helpful.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. Signature / Date:

__________Daniel Miller____________ **Date:** 10/21/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Wednesday, 10/22/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	07%	32%
(2) Survey Cells/Grids	04	02
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located:

Type:	Quantity:	Live/Prac.	Remarks:
3.5 inch Rocket Warhead with Motor attached. Suspected Fuzed and Fired.	03	Suspected HE Filled.	Items are considered MEC (UXO) items. MEC items located on the reconnaissance traversed paths within the SI boundary.
Rifle Grenade, Fired and Fuzed. Appears to be M28.	01	Suspected HE Filled.	Item is considered a MEC (UXO) item. MEC item located on traversed path to soil sample location.

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	4	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. Operational Remarks:

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, and 2-Archeologist from Pacific Consulting Services, Inc.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, one reconnaissance team operated in the eastern portion of the site and the other reconnaissance team operated in the western portion of the site filling in data gaps in these areas, and traversing transects from south to north and north to south utilizing ravines and valleys to move about.

No MPPEH items were noted during the day’s operations. The reconnaissance teams noted a total of 4 MEC (UXO) items, 3 of which were 3.5 inch shoulder fired Rockets, possible M28A1 series, and 1 of which was a HE Rifle Grenade, possible M28.

As of the end of the day’s operations, the project field team completed 7 percent for a total of 68 percent of the scoped reconnaissance acreage, and 4 cells/grids for a total of 34 of the scoped reconnaissance cell/grid locations.

Site Manager attended a meeting today at MCBH Kaneohe Environmental Department to participate in the planning and scheduling for a RAB site visit to the Former Waikane Valley Training Area. Present at the meeting were Mr. Wray Kakugawa, RPM NAVFAC Pacific; Major Hudock, Environmental Officer, MCBH Kaneohe; Mr. Randall Hu, PM MCBH Kaneohe Environmental Dept.; Ms. Karen Desilets, Archeologist NAVFAC Pacific; Ms. Coral Rasmussen, Archeologist MCBH Kaneohe Environmental Dept. Personnel participating via phone conference were Major Crouch, PAO MCBH Kaneohe; and Steve Clark, Archeologist, Pacific Consulting Services, Inc. It was decided that the RAB would be offered to participate in a Waikane Valley Site Visit on Friday the 31st of October and Saturday the 1st of November. The Site Manager also presented a brief on the past and present ongoing operations on site to all meeting participants. The meeting lasted approximately 2 hours.

At the present operations production rate, it is expected that by the 31st of October the field team will have completed all field operations. We may or may not obtain or accomplish the scoped reconnaissance acreage by this time, but I feel that we will not be able to SAFELY traverse any more of the site to gain any additional data or acreage then what will have been completed by this time.

The reconnaissance data and track log shape files for the day’s operations have been uploaded to the USA ftp site.

6. Signature / Date:

__________Daniel Miller____________ **Date:** 10/22/2008
Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Thursday, 10/23/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	**Number Completed**	**Total Remaining**
(1) Survey	07%	25%
(2) Survey Cells/Grids	01	01
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	**Pass**	**Fail**
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. **Utilization**

   a. **Daily Man-hours:**

Labor Category:	**Task #**	**M/H Today:**	**M/H 0% :**	**M/H 4%**	**M/H 8%**
Site Manager	3	12	12	0	0
SUXOS	3	10	3	7	0
UXO Technician III	3	10	3	7	0
UXO Technician II	3	20	6	14	0
UXO Technician I	3	10	3	7	0
UXOSO	3	5.5	2	3.5	0
UXOQCS	3	5.5	2	3.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	3	7	0
DEI / UXO Tech I	3	10	3	7	0
Wil Chee Planning	4	0	0	0	0

   b. **Daily Equipment:**

Description:	**Task:**	**Number of Units**	**Hours Used Each:**	**Total Hours Used:**	**Remarks:**
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, and 2-Archeologist from Pacific Consulting Services, Inc.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, both reconnaissance teams operated in the western portion of the site filling in data gaps in these areas, and traversing transects from south to north and north to south utilizing ravines and valleys to move about.

No MPPEH or MEC (UXO) items were noted during the day’s operations.

As of the end of the day’s operations, the project field team completed 7 percent for a total of 75 percent of the scoped reconnaissance acreage, and 1 cell/grid for a total of 35 of the scoped reconnaissance cell/grid locations.

Today, the Site Manager conducted a historical records research at Donaldson Enterprises, Inc. (DEI) main office located in Honolulu; and the University of Hawaii at Manoa Library’s Archives & Manuscripts Department Hawaii War Records Depository (HWRD) in support of the Site Investigation (SI) Project at the Former Waikane Valley Training Area. The historical records research at DEI revealed several papers, documents and maps with reference to the Former Waikane Valley Training Area. These documents, papers and maps were flagged for copying once approved by the upper management at DEI. The total time spent researching records at DEI was approximately 2 hours. The historical records research at UOH Library’s HWRD revealed no historical information with regards to the Former Waikane Valley Training Area. The total time spent researching records at the HWRD was approximately 3.5 hours.

It is still expected that at the present operations production rate, by the 31st of October the field team will have completed all field operations. We may or may not obtain or accomplish the scoped reconnaissance acreage of 10 acres by this time, but I feel that we will not be able to SAFELY traverse any more of the site to gain any additional data or acreage then what will have been completed by this time.

6. **Signature / Date:**

__________Daniel Miller____________ **Date:** 10/23/2008
Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Monday, 10/27/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	06%	19%
(2) Survey Cells/Grids	03	00
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	**Quantity:**	**Remarks:**

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	**Quantity:**	**Weight:**	**Remarks:**

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	4	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-Archeologist from Pacific Consulting Services, Inc, and ***2-QA/UXO Techs from ECC***.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, both reconnaissance teams operated in the western portion of the site filling in data gaps in these areas, and traversing transects from south to north and north to south utilizing ravines and valleys to move about.

No MPPEH or MEC (UXO) items were noted during the day’s operations.

As of the end of the day’s operations, the project field team completed 6 percent for a total of 81 percent of the scoped reconnaissance acreage, and 3 cells/grids for a total of 37 of the scoped reconnaissance cell/grid locations.

Two personnel from ECC, Mr. Chris Talbot and Mr. Terry Stark were on site today to commence the Quality Assurance inspection of the SI Team and the process. Today was an administrative day for the ECC team.

It is still expected that at the present operations production rate, by the 31st of October the field team will have completed all field operations. We may or may not obtain or accomplish the scoped reconnaissance acreage of 10 acres by this time, but I feel that we will not be able to SAFELY traverse any more of the site to gain any additional data or acreage then what will have been completed by this time.

6. **Signature / Date:**

__________ Daniel Miller__ ____________ **Date:** 10/27/2008
Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Tuesday, 10/28/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	08%	11%
(2) Survey Cells/Grids	04	00
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. **MEC (UXO)/MPPEH Located:** No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	4	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations and soil sample operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-Archeologist from Pacific Consulting Services, Inc, and ***2-QA/UXO Techs from ECC***.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, both reconnaissance teams operated in the central to eastern portion of the site filling in data gaps in these areas, and traversing transects from south to north and north to south utilizing ravines and valleys to move about.

No MPPEH or MEC (UXO) items were noted during the day’s operations.

As of the end of the day’s operations, the project field team completed 8 percent for a total of 89 percent of the scoped reconnaissance acreage, and 4 cells/grids for a total of 41 of the scoped 36 reconnaissance cell/grid locations.

Two personnel from ECC, Mr. Chris Talbot and Mr. Terry Stark were on site today to continue with the Quality Assurance inspection of the SI Team and the process. Today was another administrative day for the ECC team.

Today, the Site Manager went to the Donaldson Enterprises, Inc. (DEI) main office located in Honolulu. During the previous historical records research conducted at DEI, several papers, documents and maps with reference to the Former Waikane Valley Training Area were flagged for copying once approved by the upper management at DEI. Today those copies were made and the Site Manager was able to obtain them. The total time spent copying records at DEI was approximately 1 hour.

It is still expected that at the present operations production rate, by the 31st of October the field team will have completed all field operations. We may or may not obtain or accomplish the scoped reconnaissance acreage of 10 acres by this time, but I feel that we will not be able to SAFELY traverse any more of the site to gain any additional data or acreage then what will have been completed by this time.

6. **Signature / Date:**

___________ Daniel Miller______________ **Date:** 10/28/2008
Site Manager

OPS-1 Form

DAILY OPERATIONS SUMMARY

DATE: Wednesday, 10/29/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	11%	00%
(2) Survey Cells/Grids	01	00
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Continue reconnaissance operations within the site investigation (SI) boundaries of the Former Waikane Valley Training Area as per the Project Work Plan and Scope of Work.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	12	12	0	0
SUXOS	3	10	2	8	0
UXO Technician III	3	10	2	8	0
UXO Technician II	3	20	4	16	0
UXO Technician I	3	10	2	8	0
UXOSO	3	5.5	1.5	4	0
UXOQCS	3	5.5	1.5	4	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	2	8	0
DEI / UXO Tech I	3	10	2	8	0
Wil Chee Planning	4	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

The SI field team continued reconnaissance operations within the boundaries of the Former Waikane Valley Training Area.

SI Team personnel on site in the field for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, 2-UXO Technicians I, 2-Archeologist from Pacific Consulting Services, Inc, and ***2-QA/UXO Techs from ECC***.

The reconnaissance field team continues to encounter extremely heavy underbrush vegetation, thick vegetation canopy and very steep and rough terrain throughout the site. The *Hau* vegetation within the site boundaries has proven to be very difficult to impossible to traverse through. The team has to traverse around a lot of the area that contain the *Hau* vegetation.

Today, both reconnaissance teams operated in the eastern portion of the site filling in data gaps in these areas, and traversing transects from south to north and north to south utilizing ravines and valleys to move about.

No MPPEH or MEC (UXO) items were noted during the day’s operations.

As of the end of the day’s operations, the project field team completed 11 percent for a total of 100 percent of the scoped reconnaissance acreage, and 1 cell/grid for a total of 42 of the scoped reconnaissance cell/grid locations totaling 5.2 acres.

Two personnel from ECC, Mr. Chris Talbot and Mr. Terry Stark were on site today to continue with the Quality Assurance inspection of the SI Team and the process. Today the ECC QA Team accompanied one of the reconnaissance teams while the team was conducting reconnaissance operations.

As of the end of the work day, the SI field team completed reconnaissance operations within the boundaries of the Former Waikane Valley Training Area. The teams have conducted reconnaissance operations in all possible areas that they were able to safely traverse. There are still several data gaps within the boundaries of the SI project site, but after several attempts to try and conduct reconnaissance operations in these identified data gap locations, the attempts were unsuccessful.

For Thursday’s operations, the SI field team will conduct site restoration, clean vehicles and equipment, and conduct equipment pack out.

On Friday the 31st of October, the SI Field Management Team will meet with the EOD Team from MCBH Kaneohe to conduct a project site brief and data orientation.

6. **Signature / Date:**

__________Daniel Miller______________ **Date:** 10/29/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Thursday, 10/30/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	**Number Completed**	**Total Remaining**
(1) Survey	00	00
(2) Survey Cells/Grids	00	00
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	Daily	Daily
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	**Pass**	**Fail**
(1) Quality Control	1	0
(2) Quality Assurance	0	0
(3) Safety	1	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Conduct site restoration; remove seed items from the Instrument Test Plot, clean equipment and package equipment for shipment.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	11	11	0	0
SUXOS	3	10	7	3	0
UXO Technician III	3	10	7	3	0
UXO Technician II	3	20	14	6	0
UXO Technician I	3	10	7	3	0
UXOSO	3	5	3.5	1.5	0
UXOQCS	3	5	3.5	1.5	0
EMT	3	10	10	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	10	7	3	0
DEI / UXO Tech I	3	10	7	3	0
Wil Chee Planning	4	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	12	36	
Truck Crew Cab	3	1	12	12	
MineLab Detector	3	6	10	60	
Trimble GeoXT Handheld GPS	3	3	10	30	
Brush Cutter	3	2	10	20	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	11	11	
Printer	3	1	10	10	
Digital Camera	3	2	10	20	
Hand Held Radio	3	6	10	60	
EMT Medical Gear	3	1	10	10	
Safety Equipment	3	2	10	20	
Operating Equipment	3	2	10	20	

5. **Operational Remarks:**

SI Team personnel for the day included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 3-UXO Technicians II, and 2-UXO Technicians I.

The SI field team conducted site restoration operations, removed all seed items from the Instrument Test Plot, cleaned all equipment and the rental Pick-up Truck. All equipment was packaged up for shipment except for the equipment items needed for Friday's and Saturday's on-site briefings and tour.

A total of 13 equipment packages were shipped back to USA Environmental corporate headquarters in Oldsmar today with a scheduled delivery of Monday the 3rd of November.

On Friday the 31st of October, the SI Field Management Team will meet with the EOD Team from MCBH Kaneohe to conduct a project on-site brief and data orientation. Mr. Wray Kakugawa, NAVFAC Pacific; Mr. Randall Hu, MCBH Environmental Department; and Major Crouch, MCBH Public Affairs Officer will accompany the Field Management Team and the Marine EOD Detachment during the on-site brief, tour and data orientation.

Following the on-site brief with Marine EOD, the Field Management Team will participate in a Informal Exit Briefing with NAVFAC Pacific and MCBH Environmental Personnel.

6. **Signature / Date:**

__________Daniel Miller______________ **Date:** 10/30/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Friday, 10/31/2008 **PAGE 1 OF 5 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:	Number Completed	Total Remaining
(1) Survey	00	00
(2) Survey Cells/Grids	00	00
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	N/A	N/A
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:	Pass	Fail
(1) Quality Control	0	0
(2) Quality Assurance	0	0
(3) Safety	0	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Participate and lead a site visit to the Waikane Valley Training Area with the MCBH EOD Detachment, MCBH Environmental Department, MCBH Public Affairs Office and NAVFAC Pacific.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	10	10	0	0
SUXOS	3	8	8	0	0
UXO Technician III	3	8	8	0	0
UXO Technician II	3	16	16	0	0
UXO Technician I	3	8	8	0	0
UXOSO	3	2	2	0	0
UXOQCS	3	2	2	0	0
EMT	3	8	8	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	0	0	0	0
DEI / UXO Tech I	3	0	0	0	0
Wil Chee Planning	4	0	0	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	8	24	
Truck Crew Cab	3	0	0	0	
MineLab Detector	3	1	8	8	
Trimble GeoXT Handheld GPS	3	3	8	24	
Brush Cutter	3	0	0	0	
Laptop Computer	3	1	14	14	
Cell Phone	3	1	10	10	
Printer	3	1	10	10	
Digital Camera	3	1	8	8	
Hand Held Radio	3	0	0	0	
EMT Medical Gear	3	1	8	8	
Safety Equipment	3	0	0	0	
Operating Equipment	3	0	0	0	

5. **Operational Remarks:**

SI Team personnel for the day's evolutions included a Site Manager, SUXOS, dual-hatted UXOSO/QCS, and 1-UXO Technician III.

The following personnel mobilized out from the Waikane SI Project: Craig Long, UXO Tech II; Matthew Busch, UXO Tech II; William Hong, UXO Tech I; and James Duffey, EMT. The UXOSO/QCS spent the day bringing/shuttling personnel mobbing out from the lodging to the Honolulu airport.

The remainder of the Site Management Team, the Site Manager, SUXOS and Team Leader conducted and participated in a Waikane Valley Training Area on-site visit, brief and data orientation with Mr. Wray Kakugawa, NAVFAC Pacific; Mr. Randall HU, MCBH Environmental Department; Major Crouch, MCBH Public Affairs Officer; CWO Hockett, Officer in Charge MCBH EOD Detachment.

Following the site visit and orientation, the same personnel from the Site Management Team participated in an informal Exit Briefing with Mr. Wray Kakugawa, NAVFAC Pacific; Major Hudock, MCBH Environmental Department; and Mr. Randall Hu, MCBH Environmental Department. During the Exit Briefing the USAE Site Manager briefed personnel on the work and results accomplished during the Site Investigation within the SI boundaries of the Waikane Valley Training Area.

On Saturday the 1st of November, all four personnel of the SI Field Management Team will meet with personnel from MCBH Kaneohe and NAVFAC Pacific to participate with the pre-scheduled RAB Site Visit at the Waikane Valley Training Area.

6. **Signature / Date:**

__________ Daniel Miller______________ **Date:** 10/31/2008
Site Manager

DAILY OPERATIONS SUMMARY

DATE: Saturday, 11/01/2008 **PAGE 1 OF 6 PAGES**

SITE: Waikane Valley Training Area Site Investigation Project, MCBH Kaneohe, HI

1. WORK SUMMARY

a. Work Accomplished:

Work Accomplished	Number Completed	Total Remaining
(1) Survey	00	00
(2) Survey Cells/Grids	00	00
(3) Incremental Samples	00	00
(4) Discreet Samples	00	00
(5) Quality Control	N/A	N/A
(6) Quality Assurance	N/A	N/A

b. Discrepancies: None

c. Inspection Results:

Inspection Results	Pass	Fail
(1) Quality Control	0	0
(2) Quality Assurance	0	0
(3) Safety	0	0

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE:

Actively participate with the scheduled RAB site visit to the Waikane Valley Training Area. Clean remaining rental vehicles and package remaining equipment.

3. MEC SUMMARY

a. MEC (UXO)/MPPEH Located: No MEC (UXO) or MPPEH located this day.

Type:	Quantity:	Live/Prac.	Remarks:

b. Demolition Supplies Expended: No demolition items expended this day.

Type:	Quantity:	Remarks:

c. MD/Scrap Generation / Deposition: No MD/Scrap generated or disposed of.

Type:	Quantity:	Weight:	Remarks:

4. Utilization

a. Daily Man-hours:

Labor Category:	Task #	M/H Today:	M/H 0% :	M/H 4%	M/H 8%
Site Manager	3	10	10	0	0
SUXOS	3	7	7	0	0
UXO Technician III	3	8	8	0	0
UXO Technician II	3	0	0	0	0
UXO Technician I	3	0	0	0	0
UXOSO	3	3.5	3.5	0	0
UXOQCS	3	3.5	3.5	0	0
EMT	3	0	0	0	0
Sub-Contractor Personnel (List by Category)					
DEI / UXO Tech II	3	0	0	0	0
DEI / UXO Tech I	3	0	0	0	0
Wil Chee Planning	4	4	4	0	0

b. Daily Equipment:

Description:	Task:	Number of Units	Hours Used Each:	Total Hours Used:	Remarks:
SUV Vehicle	3	3	8	24	
Truck Crew Cab	3	0	0	0	
MineLab Detector	3	1	4	4	
Trimble GeoXT Handheld GPS	3	1	4	4	
Brush Cutter	3	0	0	0	
Laptop Computer	3	1	12	12	
Cell Phone	3	1	10	10	
Printer	3	1	10	10	
Digital Camera	3	1	4	4	
Hand Held Radio	3	0	0	0	
EMT Medical Gear	3	1	4	4	
Safety Equipment	3	0	0	0	
Operating Equipment	3	0	0	0	

5. **Operational Remarks:**

SI Team personnel for the day’s evolutions included the Site Manager, SUXOS, dual-hatted UXOSO/QCS, 1-UXO Technician III, 1-Soil Sample Technician from Wil Chee Planning and 1-Archeologist from Pacific Consulting Services, Inc.

The Site Management Team; the Site Manager, SUXOS, dual-hatted UXOSO/QCS, Team Leader, Soil Sample Technician and Archeologist actively participated in the pre-scheduled RAB Site Visit within the SI boundaries of the Waikane Valley Training Area.

Personnel other than the field SI Team in attendance included 4 members from the RAB, 2 personnel from MCBH Environmental Department, a representative from NAVFAC Pacific, and 2 EOD personnel from MCBH EOD Detachment.

Major Hudock from MCBH Environmental Department was the lead for the Site Visit. Once introductions were made, Major Hudock turned the site visit briefing and orientation over to USA Environmental. The Site Manager gave the participants and overall brief of the areas that were to be visited, and gave a brief description of what our Scope of Work for the project involved, and what we expected to gain from our work on site.

The participants visited the project Instrument Test Plot (ITP) were the Site Manager and SUXOS gave a detailed brief on how the ITP was constructed, the purpose of the ITP, how it was used on a daily basis, and very detailed brief of the MineLab hand-held detector. The Site Manager and SUXOS fielded and answered many questions.

The two other areas visited during the site visit was the Cell/Grid location #4 and one of the site’s historical Agricultural Terraces located just east of Cell #4. At the Cell 4 location, the participants were giving a detailed brief on how the team conducted their reconnaissance operations, the different equipment and personnel that made up the team, and the data/information that we collected during the reconnaissance. At the Cell 4 location the participants were also shown one of the Munitions Debris items, a M29 Practice Rifle Grenade that was located during the reconnaissance survey of Cell #4.

At the Agricultural Terrace location, Ms. Coral Rasmussen, Archeologist from MCBH Environmental and Mr. Steve Clark, Archeologist from Pacific Consulting conducted a thorough brief about all the Agricultural Terraces that are within the project site and fielded and answered questions from the participants.

After the visit to Cell 4 and the Agricultural Terrace, the participants then moved over to the Southeastern area of the site which the team referred to as the “hole” where Mr. Matt Casey with Wil Chee Planning discussed in detail the Soil Sampling operations and procedures that were conducted within the SI boundaries. Mr. Casey answered several questions from the participants.

Following Mr. Casey's presentation, Major Hudock instructed the participants that the site visit was completed and conducted brief closing remarks. The outcome of the site visit appeared to be very successful, and was worth the time and effort by all organizers and participants. The RAB members in attendance had very positive feed back at the end.

For the remainder of the day, the USA crew spent several hours of thoroughly cleaning of the three Budget Rental Vehicles in order to make them ready for return/turn-in.

6. **Signature / Date:**

___________ Daniel Miller_______________ **Date:** 11/01/2008
Site Manager

APPENDIX D. OPERATIONAL PHOTOGRAPHS AND HISTORICAL DATA

This appendix contains the following information:

- Photographs taken during SI field operations (25)
- Photographs from U.S. Army Museum of Hawaii (4)
- Historical after-action reports.

The photographs from the SI field operations are as follows:

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Figure D-1: Instrument Test Plot Location Southeast Corner of MRS

Figure D-2: Construction of Instrument Test Plot

Figure D-3: Typical Vegetation within Boundaries of MRS

Figure D-4: *Hau* Vegetation Encountered in Southern Portion of MRS

Figure D-5: UXO Item ID 36. Fired & Fuzed 3.5" Shoulder Fired HEAT Rocket

Figure D-6: UXO Item ID 100. Partially Buried Fuzed & Fired 3.5" HEAT Rocket

Figure D-7: UXO Item ID 36. Fuzed 3.5" HEAT Rocket Warhead, Motor Buried

Figure D-8: UXO Item ID 206. Fuzed & Fired 3.5" HEAT Rocket, Fin Missing

Figure D-9: MD Item ID 3. Practice 3.5" Anti-Tank Rocket, Fired and Inert

Figure D-10: MD Item ID 16. Expended/Inert 3.5" Rocket Motor and Fuze

Figure D-11: Base Section Fragment, 75mm HE Projectile, Empty/Inert

Figure D-12: UXO Item ID 219. Fired & Fuzed 2.36" HEAT Rocket Warhead

Figure D-13: M127 Series Hand Signal Flare, Expended/Inert

Figure D-14: UXO Item ID 310. M28 HEAT Rifle Grenade, Nose Fuze Broken Off

Figure D-15: UXO Item ID 351. M28 HEAT Rifle Grenade, Fuzed

Figure D-16: MD Item ID 129. Two M29 Practice Rifle Grenades, Inert

Figure D-17: MD Item ID 130. M29 Practice Rifle Grenade Warhead

Figure D-18: Cell 22, Surface Area Saturated with Small Arms Projectiles

Figure D-19: Cell 22, Close-Up View Surface Area, Small Arms & Rocket Debris

Figure D-20: Cell 22, Copper Slug from 3.5” HEAT Rocket Warhead

Figure D-21: Cell 22, Suspected Target Location, 3.5” Rocket Motors Protruding

Figure D-22: Environmental Tech Collecting Soil Sample

Figure D-23: UXO Technician, Reconnaissance Survey within Cell Location

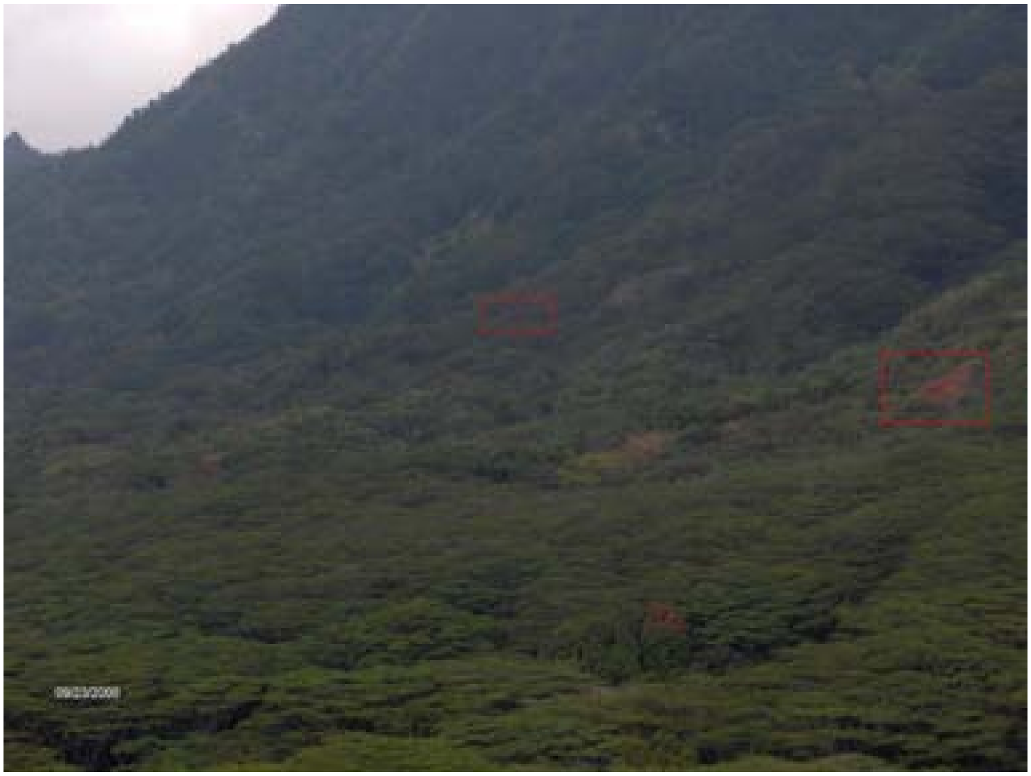
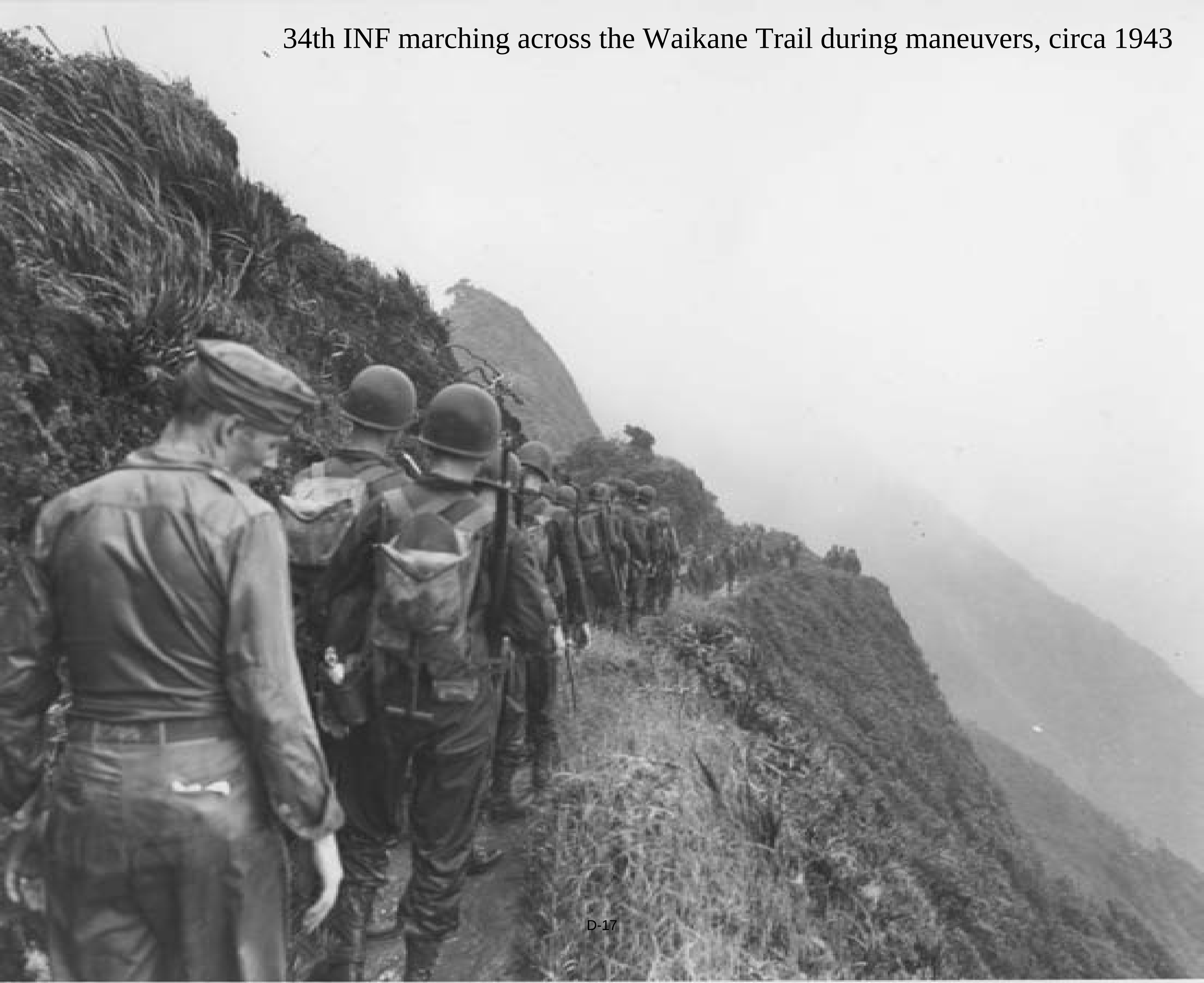


Figure D-24: Two Suspected Target Locations in Western Section of MRS

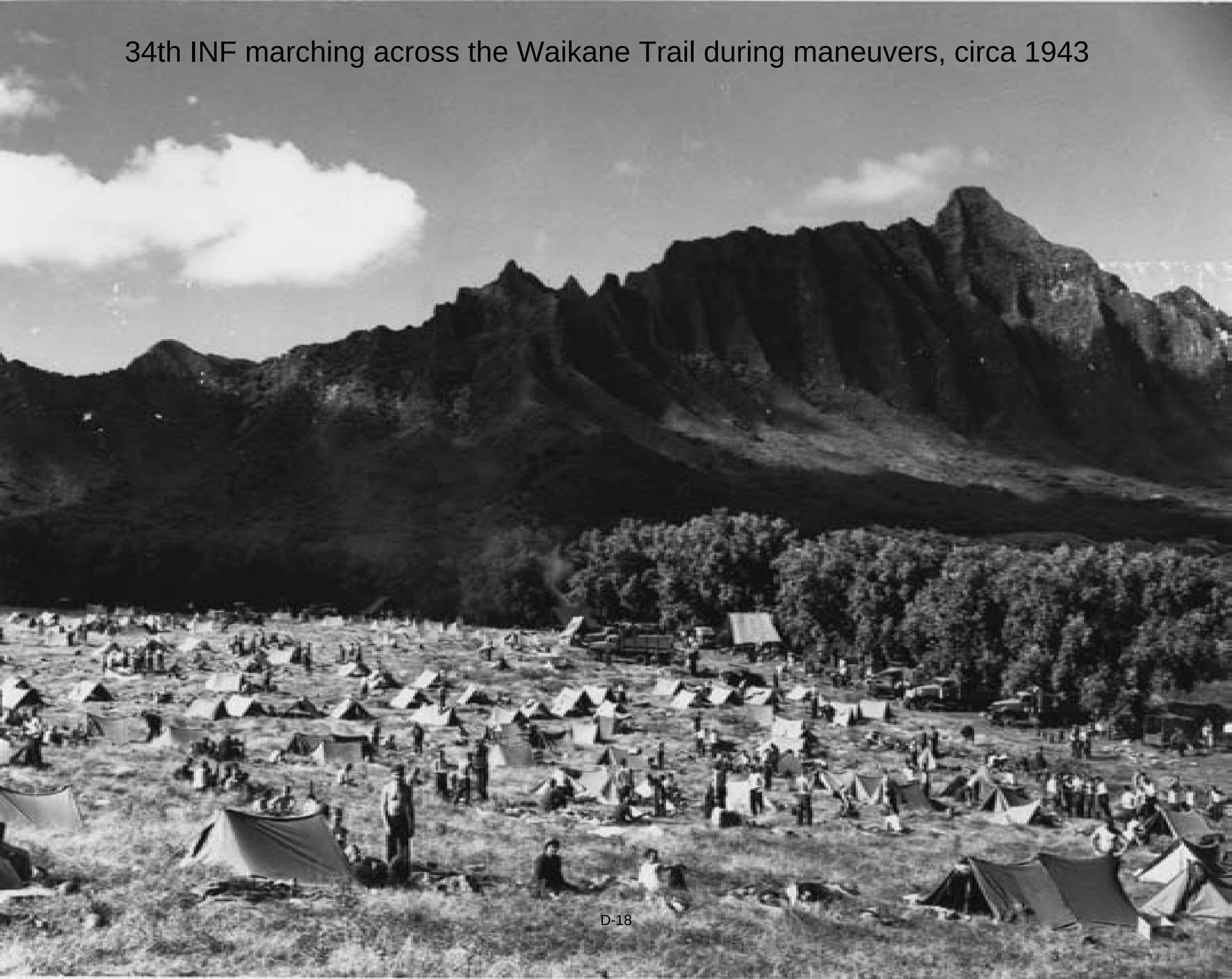
Figure D-25: Two Suspected Target Locations in Eastern Section of MRS

34th INF marching across the Waikane Trail during maneuvers, circa 1943



34th INF marching across the Waikane Trail during maneuvers, circa 1943

34th INF marching across the Waikane Trail during maneuvers, circa 1943



34th INF marching across the Waikane Trail during maneuvers, circa 1943

UNITED STATES MARINE CORPS
Explosive Ordnance Disposal Team
Brigade Service Support Group
1st Marine Brigade, Fleet Marine Force
FPO San Francisco, 96602

KWB:jwb
8027
20 September 1976

From: Project Officer
To: Commanding General, 1st Marine Brigade (ATTN: Assistant Chief of Staff, G-4)
Via: Commanding Officer, Brigade Service Support Group

Subj: After Action Report; Waikane Valley Training Area

Encl: (1) Dud Ordnance Destroyed
(2) Demolition Material Used
(3) Map of Waikane Valley Training Area
(4) List of Personnel Clearing Impact Area

1. BACKGROUND. By CG, FMFPac message 261956Z JUL 76, the 1st Marine Briga was assigned the task of decraterizing/removal of ordnance from the KAHAKA portion of the Waikane Valley Training Area. The Commanding General, 1st. Marine Brigade assigned the Brigade Service Support Group the project of clearing this area. Captain K. W. BERKEY 316 40 1161, Brigade Explosive Ordnance Disposal Officer, was assigned as overall Project Officer.

2. SUMMARY OF OPERATIONS. Three Planning Meetings were held with the Marine Corps Air Station Public Works Department, to formulate Operational Plans, Equipment/Personnel Requirements, etc..

a. Work started on the clearing operation on 9 August 1976, with person support from the following:
INDIA Company, 3/3
LIMA Company, 3/3
AMMO Technicians, BSSG
ENGR. Personnel, BSSG
EOD Technicians, BSSG
Radio Support, 3/3 and BSSG

b. Safety Lectures were held daily for all personnel working in the area. On 9 August 1976, two Companies of Infantry conducted a Sweep of the High Ground in Area 2 of enclosure (3). The dense jungle in the valleys precluded taking a large body of personnel into such areas as control, and movement was impossible. The Infantry troops policed the area of discarded ration cans, expended brass, and any other Government items located. One 37 High Explosive round was found at [illegible]. EOD personnel disposed of the round at [illegible] Demolition Range. All personnel from 3/3 were dropped after the first day due to the above and not being able to utilize these personnel in the impact areas.

ENCLOSURE (1)

[illegible]:jwb
8027
20 September 1976

c. From 10 to 17 August 1976, the main Impact Areas in Areas 1 and 2 (Map Sheet 5421 III SE and Sheet 5420 IV NE, enclosure (3)) were cleared of all surface ordnance located.

d. Explosive Ordnance Disposal Technicians, Engineers, and Ammunition Technicians would clear the Target Areas of practice ordnance and stack these items in large boxes for H.S.T. lifts to MCAS for further disposal. A total of 9 H.S.T. lifts were made, carrying over 24,400 pounds of practice ordnance and scrap from the area, 42 items of explosive ordnance were disposed of by detonation in the KAMAKA portion of the Training Areas 1 and (enclosure 1).

e. Explosives utilized in the destruction of dud ordnance found in the Impact Areas are listed in enclosure (2). A total of five shots were made.

f. The Engineer Company, NSSG, graded and compacted the roads in the Training Area. Work was finished on 13 September 1976. There were many delays due to wet weather conditions.

3. PROBLEMS. The following problems were encountered while clearing the Waikane Valley Training Area.

a. Due to the dense coverage and ground cover in the Impact Areas, all rounds could never be located and removed.

b. Due to the degree of incline of the Impact Area, I feel that several rounds have washed down the hills and are covered by a two to three foot layer of earth.

c. Due to the degree of incline which necessitated personnel to hang by ropes to remove practice 3.5 inch Rockets from the two Impact Areas.

d. Due to the extremely rough terrain and dense jungle most ordnance and trash found in the valleys of the Impact Areas had to be removed by hand and carried out in haversacks on the backs of the personnel.

4. CONCLUSIONS. The Waikane Valley Training Area can never be certified free of duds, practice ordnance, etc.. Due to the ground cover, ordnance being buried or items not located due to various reasons.

a. As the dense jungle growth is cleared or the ground in the Impact Area is bulldozed, it is highly probable that ordnance items will be uncovered. Hence, it is highly recommended that EOD personnel be made available when the [illegible] start to clear the roads and trails in the Impact Areas. I feel this will enhance the safety of the bulldozer operations and help keep the [illegible] [illegible] from a [illegible] due to an accidental detonation of buried ordnance.

ENCLOSURE 7( )

ENCLOSURE (3)

ENCLOSURE (1)

[illegible]
8027
20 September 1976

DEMOLITION MATERIAL USED

AMOUNT.	ITEM
15 pounds	C-4 explosive
5 each	Non-electric Blasting Caps
30 feet	Fuse, Time Safety
5 each	Fuse Igniters
37 each	Smoke Grenades

ENCLOSURE (2)

ENCLOSURE ( )

KTD:jwb
8027
20 September 1976

DUD ORDNANCE DESTROYED

AMOUNT	ITEM
32	75mm HE rounds
9	60mm HE Mortar rounds
1	M-28 HEAT Rifle Grenade
1	37mm HE round

ENCLOSURE (1)

ENCLOSURE (1)

KWB:jwb
8027
20 September 1974

b. Personnel clearing the Impact Areas are listed in enclosure (4).

K. W. BERKEY
CAPT USMC

Copy to:
G-3 1
CO,[illegible] 1
EOD 1
PAO 1
File 2
Bde Legal 2

3

ENCLOSURE 7

Kaneohe Bay, Hawaii 96

OMWE/SHN/sk
8027
6 JAN 1984

From: Explosive Ordnance Disposal Officer
To: Commanding Officer, Marine Corps Air Station, Kaneohe Bay
Via: Commanding Officer, Station Operations and Maintenance Squadron

Subj: After Action Report of Ordnance Survey on the Kamaka Portion of the Waikane Valley Training Area

Ref: (a) COMMARCORBASESPAC CAMP H M SMITH HI 241745Z DEC 83

Encl: (1) Map and photographs of Waikane Valley Training Area
(2) Project Officer, EOD Team, BSSG, 1stMarBde, After Action Report KWB:jwb 8027 of 20 Sep 1976
(3) NAVEODTECHCEN Technical Note 207

1. Background. Unexploded (dud) and training ordnance has been found in the Kamaka portion of the Waikane Valley Training Area (see enclosure (1)). The Waikane Valley Training Area is an area of Oahu which was leased by the Marine Corps for training from 1961 to 1976. This area was used by other services prior to 1961, including its use during WWII for air-to-ground ordnance. Upon termination of the Marine Corps lease in 1976, the Marine Corps conducted an extensive ordnance sweep of the training impact area and disposed of all surface ordnance which could be located. The after action report of the 1976 ordnance sweep concluded that the Waikane Valley Training Area can never be certified free of duds or training ordnance due to the ground cover and ordnance being buried (enclosure (2), paragraph 4). Land erosion is the primary cause for the recent reappearance of ordnance in the subject area.

2. Tasking. The reference assigns Marine Corps Air Station, Kaneohe Bay the responsibility to direct and supervise the overall operation of sweeping the Kamaka portion of the Waikane Valley Training Area for unexploded (dud) or training ordnance. 1st Marine Brigade is tasked to provide engineer/EOD/personnel/equipment support as necessary for sweeping subject area. Prior to issuing an operation plan for an ordnance sweep of the subject area, a combined EOD on-site survey was conducted 27-30 December 1983.

3. Ordnance Survey Results. The survey consisted of a complete walk-through of the Kamaka land and a testing of three tracts that were laid out by EOD personnel. Each tract was marked off with engineer's tape, 50 feet by 125 feet. The areas were surveyed by personnel at two-foot intervals on a line abreast of

ENCLOSURE (7)

each other, visually searching for ordnance items. The following information is the result of the three tests and ordnance found:

a. First tract: There were 60, 3.5-inch rockets and associated parts (rocket motors, fins, etc.) found, with an estimated 30,000 small arms.

b. Second tract: There were 160, 3.5-inch rockets and associated parts found.

c. Third tract: There were 260, 3.5-inch rockets and associated parts found, with an estimated 56,0000 small arms.

d. All three areas posed serious problems, both in sweeping technique and personnel safety. The terrain had steep hills and was covered with thick vegetation. In the second survey area, the survey personnel had to break branches and walk through thick underbrush. Keeping on line was difficult and slow. The most difficult problem for personnel was trying to look for ordnance while "tangling" with the environment. See enclosure (1).

e. The back part of the impact area near the base of the mountain, sweeping was most difficult to negotiate because of poor footing. Personnel had to depend mainly on upper body strength to traverse this area.

f. Various locations of the impact area had unexploded ordnance sticking out of the ground. The depth of penetration of the different type of ordnance is unknown at this time due to the lack of knowledge of what type of ordnance was fired. The fact remains that unexploded ordnance does exist beneath the surface, quantity and depth unknown.

4. Conclusion/Opinions

a. That Waikane Valley Training Area will be difficult to surface sweep and time-consuming. The weather will play an important part as to when personnel will be able to sweep. Rain will make the area slippery and unsafe.

b. It is my opinion that the surface sweep/search effectiveness will never be 100%, and that additional ordnance will remain subsurface. It is opined that the Marine Corps should consider purchasing the Kamaka portion of the Waikane Valley Training Area as total sanitation of the subject area cannot be accomplished without extensive subsurface clearance. Enclosure (3) contains similar case studies.

S. H. Negaknquet
S. H. NEGAHNQUET

ENCLOSURE (2)

[illegible]
Station Operations and Maintenance Squadron
Marine Corps Air Station
Kaneohe Bay, Hawaii 96863

OMWE/SHN/sk
8027
7 JUN 1984

From: Explosive Ordnance Disposal Officer
To: Commanding Officer, Marine Corps Air Station, Kaneohe Bay
Via: Commanding Officer, Station Operations and Maintenance Squadron

Subj: Explosive Ordnance Disposal (EOD) After Action Report of Ordnance Surface Clearance of Waikane Valley Training Area

Ref: (a) COMMARCORBASESPAC CAMP H M SMITH HI 241745Z DEC 83
(b) Fonecon btwn Col McKeown (FMFPac Force Engr) and LtCol Frizell (CO SOMS) of 6 Apr 1984

Encl: (1) Project Officer, EOD Team, BSSG, 1stMarBde, After Action Report KWB:jwb 8027 of 20 Sep 1976
(2) After Action Report of Ordnance Survey on Kamaka Portion of the Waikane Valley Training Area, OMWE/SHN/sk 8027 of 6 Jan 1984
(3) Joint LOI for the removal of surface ordnance from the Kamaka Portion of the Waikane Valley Training Area, OMO/DRE/sk Bde 4 8027 of 11 Jan 1984
(4) Maps and Photographs of the Waikane Valley Training Area
(5) List of personnel involved with clearance operations of the Waikane Valley Training Area

1. Background. Unexploded (dud) and training ordnance was recently found in the Kamaka portion of the Waikane Valley Training Area (WVTA). The WVTA is an area of Oahu which was leased by the Marine Corps for ordnance training from 1961 to 1976. The Kamaka family, currently owns the majority of land involved herein. This area was used by other services prior to 1961. Upon termination of the Marine Corps' lease in 1976, the Marine Corps conducted an extensive ordnance sweep of the training impact area and disposed of all surface ordnance which could be located. The after action report of the 1976 ordnance sweep (enclosure (1)) concluded at that time that the WVTA could never be certified free of duds or training ordnance due to the ground cover and ordnance being buried. Enclosure (2) is the 1984 EOD survey of the subject area which concluded that land erosion is the primary cause for the recent reappearance of ordnance.

2. Tasking. Reference (a) assigned the Commanding Officer, Marine Corps Air Station, Kaneohe Bay with the overall responsibility to direct and supervise the overall operation of sweeping the Kamaka portion of the WVTA for unexploded (dud) or training ordnance. Enclosure (3) is the joint MCAS Kaneohe Bay and 1st Marine Brigade Letter of Instruction (LOI) assigning various

COPY

units of both commands with individual taskings, with the 1st Marine Brigade being tasked primarily in providing engineer/EOD/ personnel/equipment support.

3. Operation Results. Sweep operations started on 2 February 1984 with 14 Marines, 2 Navy and 2 Army personnel present. The operation was supported by all four services. During the operational period, the amount of personnel varied due to various operational commitments. The Air Force EOD Team joined the sweep operation in late February. Prior to sweeping for ordnance, the EOD teams and 1st Battalion, 12th Marines conducted line surveys to establish sweep lanes within the operational area. These lanes helped to control the personnel on the sweep line and establish which areas had been swept.

a. Engineer Company, BSSG, 1st Marine Brigade, supported the operation with HST from road grader support. It was felt that the road in WVTA was in need of grading. Grading the road didn't work as planned because the road was all dirt and during the month of February, it rained almost everyday. Instead of the grader fixing the road, it made the road more slippery. The road grader was secured back to MCAS Kaneohe Bay for use at a later date. After talking with Mr. Kamaka, he indicated he did not want the road grader back. I feel the road in WVTA is in better shape now than it was before the operation started. Although the road was slippery during February, after the road dried, it is in better condition than before.

b. At 0715 each morning the EOD team, working party, and corpsmen departed the Station enroute for WVTA. Upon arrival, a safety lecture was given to all hands on the hazards of dud ordnance located within the training area and medevac procedures. After the safety lecture, all hands departed the CP area to commence sweep operations. Because of the hazardous conditions within the training area it was felt that a two-hour lunch break from 1100 to 1300 was needed for a rest. After the lunch period work was started once again until 1530. All hands were then loaded in vehicles and taken back to the Air Station.

c. During the sweep operations, all ordnance that was "live" was marked with red plastic tape to ensure relocation of the item. After sweeping an area that was saturated with ordnance, an explosive disposal day was set up. During these disposal days, there were no sweep operations, just destruction of dud and demilitarization of training ordnance.

d. The use of explosives to demilitarize practice warheads, fuzes, and rocket mortars was deemed to be economical and feasible. After testing different procedures for demilitarization, the most effective procedure was to have the warheads and rocket motor sections laid out with 30 rounds on line. Blocks of C-4 were cut in thirds lengthwise and molded around the break between the fuze and motor. The entire disposal system was then covered with two alternating layers of sandbags to help contain the rounds in place during detonation. Upon returning to the site, the ordnance was again inspected to determine if all demilitarization had been accomplished.

e. After destruction of dud ordnance and demilitarization of training ordnance, all pieces were picked up and placed in large boxes for helicopter lifts back to MCAS Kaneohe Bay. The weight of the boxes were approximately 2,000 pounds per box. There was a total of eight helicopter sorties. A total of 16,000 lbs of demilitarized practice ordnance was flown out of WVTA.

f. The following information is the amount of explosives that has been used, high explosive rounds that have been destroyed (some of these rounds may have been practice, but in their condition it was impossible to identify them), and practice rounds demilitarized:

(1) Explosives expended:

(a) 865 lbs of C-4.

(b) 9,950 ft. of time fuse.

(c) 2,000 feet of detonating cord.

(d) 422 nonelectric blasting caps.

(e) 354 fuse lighters.

(f) 6 thermite grenades.

(g) 10 red smoke grenades.

(h) 10 green smoke grenades.

(i) 10 yellow smoke grenades.

(2) High explosive rounds destroyed:

(a) 146 - 3.5" HEAT rounds.

(b) 24 - 2.36" HEAT rounds.

(c) 11 - M-28 HEAT rounds.

(d) 9 - M9A1 HEAT rounds.

(3) Practice rounds demilitarized:

(a) 87 - M29 practice rifle grenades.

(b) 3,735 - 3.5" practice rounds.

g. Search Effectiveness Probability (SEP)

(1) To validate the sweep procedures utilized during the clearance operation, a total of 20 test items were emplaced in various different vegetation areas throughout the valley. EOD personnel were informed of these emplacements and how they were marked.

(2) Sweep personnel had to inform the sweep leader when a test item was discovered. There were four different types of vegetation areas which effected the effectiveness of the sweeping operations. The following information is a list of the vegetation areas and the SEP:

(a) Bare ground - 100%.

(b) Sparse grass and vegetation - 90%.

(c) Heavy grass - 65%.

(d) Heavy vegetation - 85%.

(3) The following formula was used to determine the SEP:

100% + 90% + 85% + 65% = 85% effectiveness

(4) The only factor that has to be considered is the human one. The mood, desire, and level of intensity among the men were high. The experience level varied from mid-level to high. I would consider the figure of 85% to be close to correct.

(5) With this information, it is estimated that there was a 85% surface clearance of the WVTA.

h. Ordnance surveys of areas to the west and the south of the Kamaka portion of WVTA were conducted as the conclusion of the ordnance sweep directed by reference (b) (see enclosure (4) for area locations). The Kamaka portion of WVTA is approximately 187 acres; the west area is approximately 170 acres and the south area, 80 acres. During the ordnance survey, there was no ordnance found in either area.

i. The operation was finished on 13 April 1984. On 9 May 1984, the EOD team responded to a call from Mr. Kamaka. He found some more dud rounds in his area. There were 35, 3.5" practice rocket rounds located. Some of these items became exposed because of erosion, the other were missed during sweep operations. They were taken back to MCAS Kaneohe Bay for proper disposal.

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8027

4. Problems. There were several problems that were encountered during the operation. The following is a summary:

a. The terrain had steep hills and was covered with thick vegetation. This made sweeping slow and hazardous. Safety was the paramount consideration during this time.

b. When it rained during the operation, it made footing impossible on the sides of the hills. For personal safety, operations were secured from the slopes of the hills and sweeping operations were confined to flat terrain. Four-wheel drive was needed on vehicles during the rainy season.

c. Because of the terrain, all pieces of ordnance had to be hand carried to the top of the hills and be helo-lifted out.

d. Due to the terrain and thick vegetation not all of the ordnance in the WVTA could be located.

e. On one occasion, there was a fire in the Kamaka portion. The fire was started from a demolition disposal shot. The fire extinguished itself after burning for approximately 45 minutes. There were no other fire incidents after that.

5. Conclusion

a. The WVTA has an 85% surface clearance. The remaining 15% of ordnance is covered over with vegetation or was not located. The Kamaka portion cannot be considered safe.

b. Additional ordnance is subsurface, and some of these rounds will be exposed at a later date due to erosion. The quantity and depth of these rounds is unknown. Without subsurface clearance operations, this area can never be cleared of dud ordnance.

c. The support that was received from all units during the operation was nothing less than outstanding.

d. Personnel involved with the clearance operation of the WVTA are listed in enclosure (5).

S. H. NEGAHNQUET

```
LAPS                               ACTIVITY RECORD

REPORT NUMBER XB3042 DATE 09 04 87 TIME
OFFENSE MISC PUBLIC                           BEAT      DISTRICT
LOCATION WAIKANE VALLEY
DISPOSITION RECORDS ONLY

 KAMAKA,RAYMOND
 47 612 HUI KELU ST

(CLEAR) END SESSION                          (PF12) RETURN TO MENU

LAPS                               ACTIVITY RECORD

REPORT NUMBER C15185 DATE 04 11 88 TIME
OFFENSE MISC PUBLIC                           BEAT      DISTRICT
LOCATION WAIKANE VALLEY RD/KAMEHAMEHA HWY
DISPOSITION RECORDS ONLY

 KAMAKA RAY
 PO BOX 706 KANEOHE

(CLEAR) END SESSION                          (PF12) RETURN TO MENU
```

HPD Reports of Ordnance found

COPY

EXPLOSIVE ORDNANCE DISPOSAL, OPERATIONS REPORT

JEOD FORM
3571/1

Date Received	4 Sep 87	Incident Report #	101-87
Time Received	1140	Received By	Sgt Williams

Nature of Call: Dud Ordnance

Reported by/Assistance Requested by: Officer Mark Pacock | Organization/Unit: HPD

Address: Kaneohe Police Dept. | Telephone # 943-3328

Description (DODIC and LOT #): M28 HEAT Rifle Grenade

Length	15.5"	Weight	1.5 lb	Diameter	2.95"	Color	Green/Black

Location Assistance Required: Waikane Valley

ASSISTANCE PROVIDED TO

☐	Marine Corps	☐	Air Force	☐	Coast Guard
☐	Navy	☐	Army	☒	Civilian

Personnel Responding:
LT Peternel
GySgT Girouard
SSgT Collorafi
Sgt Williams
Sgt Thompson

Mode of Travel	☒	Vehicle	☐	Air	☐	Boat	☐	Other

ASSISTANCE PROVIDED	☐	Dud Lecture	☒	Dud Call	☐	Bomb Threat
	☐	Pick-up	☐	Training Exercise	☐	Accident/Incident Site
	☐	Class/Demonstration	☐	Grade III Operation	☐	Technical Assistance
	☐	Turn-In	☐	Runway Emergency	☐	

EOD ID	Round	M 28 HEAT RIFLE GRENADE	Fuze	PIBD
	Filler/WL	80/20 RDX/TNT 1 lb.	References (Round/Fuze)	TM 9-1385-51

RSP used/not used (REFERENCE)

BIP

Tools and Equipment used

1 blk C-4 2 elect blasting caps M122

DISPOSAL	☐	PUCA to SOA	☒	Blow in Place	☐	Return to Service
	☐	PUCA to CP	☐	Scrap	☐	Other

REMARKS

One M28 HEAT Rifle grenade was located on Mr Kamaka's land. The item was destroyed in place. Mr Kamaka stated that there were about 20 more located farther back on his land. Mr Kamaka requested our assistance to dispose of these rounds at a later date.

Departure (Time/Date) 1200 4 Sep 87	Completion (Time/Date) 1610 4 Sep 87	Total Man Hours 21

SIGNATURE Edward D Peternell

DATE 4 Sep 87

Commanding Officer, Station Operations and Maintenance Squadron

LT COL Medinger phone # 257-3584

Explosive Ordnance Disposal,

LT Peternel phone # 257-2466/3560/3677

APPENDIX E. MUNITIONS RESPONSE SITE PRIORITY PROTOCOL (MRSPP)

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with **all** the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	◆ UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). ◆ Hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	**30**
High explosive (used or damaged)	◆ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ DMM containing a high-explosive filler that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	**25**
Pyrotechnic (used or damaged)	◆ UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). ◆ DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	20
High explosive (unused)	◆ DMM containing a high-explosive filler that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	15
Propellant	◆ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrotechnics, or propellant	◆ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	◆ DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	10
Practice	◆ UXO that are practice munitions that are not associated with a sensitive fuze. ◆ DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	**5**
Riot control	◆ UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	◆ Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.)	**2**
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	***30***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

From Section 2.34.2 of the Range Identification and Preliminary Range Assessment (RIPRA), Marine Corps Base, Hawaii and Associated Sites, Oahu, Hawaii of Dec 2001, the site was identified as having the following munitions: 2.36-inch HEAT rocket, 2.36-inch practice rocket, 3.5-inch HEAT rocket, M28 HEAT rifle grenade, M29 practice rifle grenade, hand grenade (practice), 60 mm HE mortar, 60 mm practice mortar, 50 mm Japanese mortar, 105 mm HE projectile, 75 mm HE projectile, 37 mm HE projectile, and small arms. Based on the 2008 Site Investigation, this table has been updated because pyrotechnics were not observed (Draft Site Investigation Report, dated 2009).

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with **all** the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range, practice munitions, small arms range, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	**10**
Former munitions treatment (i.e., OB/OD) unit	◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	**5**
Former burial pit or other disposal area	◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	◆ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	***10***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

Between 1943 and 1953, the Army leased over 2000 acres for maneuvers, jungle training, and small arms, artillery, and mortar firing. The U.S. Marines leased 1061 acres of the training area in 1953 and continued the leases until 1976. Training consisted of small arms fire, 3.5-inch rockets and possibly medium artillery fire. After the Marines investigated and conducted an ordnance clearance in 1976, they reported 187 acres of the WVTA would never be free of duds, practice ordnance, etc. (From Section 3.1.2 of the Archive Search Reports, Marine Corps Base Hawaii and Associated Sites, Oahu, Hawaii of Dec 2001, and Section 2.34.2 of the Range Identification and Preliminary Range Assessment, Marine Corps Base Hawaii and Associated Sites, Oahu, Hawaii of Dec 2001).

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed, surface, subsurface, small arms ammunition, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS.	**25**
Confirmed subsurface, active	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	**20**
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	**15**
Suspected (physical evidence)	◆ There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that UXO or DMM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.)	1
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	***25***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

From Section 2.34.2 of the RIPRA, Marine Corps Base, Hawaii and Associated Sites, Oahu, Hawaii of Dec 2001, an Army sweep in 1945 found the following ammunition which were identified and destroyed: 8 each 2.36 inch HE rockets and 1 each 50mm mortar shell (HE). In August 1976, Marine EOD conducted a clearance operation in the main impact areas. The following ammunition was recovered and/or destroyed: 32 each 75mm HE; 9 each 60mm HE; 1 each M26 rifle grenade, AT; 1 each 37mm HE; and 24,400 pounds of practice ordnance and scrap. In January 1984, an ordnance survey (a complete walk through of the Kamaka land and three test tracts which discovered the following ammunition: 480 each 3.5 rockets and associated parts and an estimated 86,000 small arms. In April 1984, Marine EOD conducted a range clearance which recovered and/or destroyed the following ammunition: 146 each 3.5 inch HEAT rockets; 24 each 2.36 inch HEAT rockets; 9 each M9A1 HEAT rifle grenades; 11 each M28 HEAT rifle grenades; 87 each M29 practice rifle grenades; and 3,735 each 3.5 practice rockets. In May 1984, Marine EOD responded to the same area after heavy rains uncovered additional munitions. They found an additional 35 each 3.5 inch practice rockets.

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	◆ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	◆ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	**8**
Barrier to MRS access is complete but not monitored	◆ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	◆ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS	0
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	***8***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space provided.

From Section 1.2 of the Site Inspection Work Plan, Munitions Response Sites, Waikane Valley Training Area, Kaneohe, Hawaii of 28 Nov 2006, and site observation, most of the area is fenced off with warning signs and the area is restricted to authorized personnel only. Gaps in the fenceline are at stream crossings and at the steepest portions of the site. The area is currently controlled and maintained by MCBH Kaneohe Bay. Authorized entry into this area requires escort by Military Police and EOD personnel.

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	◆ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ◆ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	**0**
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	***0***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space provided.

From Section 4.1.21 of the Archives Search Report, Marine Corps Base Hawaii and Associated Sites, Oahu, Hawaii of Dec 2001 and Section 1.2 of the Site Inspection Work Plan, Munitions Response Sites, Waikane Valley Training Area, Kaneohe, Hawaii of 28 Nov 2006, the property is currently controlled and maintained by the Marine Corps.

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	◆ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	**5**
100–500 persons per square mile	◆ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	3
< 100 persons per square mile	◆ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	***5***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space provided.

The 2000 U.S. Census Bureau, Hawaii Profile map of Hawaii indicates that the Waikane Valley area population is less than 15.0 persons per square mile. However, the Waikane and Waihole areas are within two miles of the WVTA. The Census map indicates that the population is between 200.0 to 999.9 persons per square mile.

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	◆ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	**5**
16 to 25 inhabited structures	◆ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	◆ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	◆ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	◆ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	◆ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	***5***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space provided.

Figure A-1 of the Site Inspection Work Plan, Munitions Response Sites, Waikane Valley Training Area, Kaneohe, HI of 28 Nov 2006 identifies single family homes, industrial or warehouse areas, and a park within two miles of the site.

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	**5**
Parks and recreational areas	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	**4**
Agricultural, forestry	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	**2**
No known or recurring activities	◆ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	***5***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

Section 1.2 and Figure A-1 of the Site Inspection Work Plan, Munitions Response Sites, Waikane Valley Training Area, Kaneohe, HI of 28 Nov 2006, identifies single family homes, industrial or warehouse areas, and a park within two miles of the site.

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	◆ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	◆ There are ecological resources present on the MRS.	3
Cultural resources present	◆ There are cultural resources present on the MRS.	**3**
No ecological or cultural resources present	◆ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	***3***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space provided.

From Sections 1.3.4 and 1.3.5 of the Site Inspection Work Plan, Munitions Reponse Sites, Waikane Valley Training Area, Kaneohe, HI of 28 Nov 2006, no ecological resources are present on the property. The Environmental Assessment notes that a heiau or shrine within the National Register of Historic Places was identified and recorded in Feb 2004. The property was divided into three zones; A, B and C. Zone A, along Waikane Stream; Zone b, a transition area between the flatter areas near Waikane Stream and the extremely steep slopes along the valley walls; and Zone C, the extremely steep slopes along the valley walls. Seven sites were evaluated, several of them within a National Historic Register site. Four were confirmed as significant, two were recommended for deletion from state inventory and one was newly identified as historic. All culturally significant sites appear to be located in Zone A, less than 0.2 kilometers from Waikane Stream.

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	**Score**	**Value**
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	**30**	**40**
Source of Hazard	Table 2	**10**	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	**25**	**33**
Ease of Access	Table 4	**8**	
Status of Property	Table 5	**0**	
Receptor Factor Data Elements			
Population Density	Table 6	**5**	**18**
Population Near Hazard	Table 7	**5**	
Types of Activities/Structures	Table 8	**5**	
Ecological and/or Cultural Resources	Table 9	**3**	
EHE MODULE TOTAL			**91**

EHE Module Total	**EHE Module Rating**
92 to 100	A
82 to 91	**B**
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**B**

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with **all** the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ◆ CWM that are UXO (i.e., CWM/UXO) ◆ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	◆ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ◆ Nonexplosively configured CWM/DMM either damaged or undamaged ◆ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	◆ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	◆ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0
CWM CONFIGURATION	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 30).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

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Table 12

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with **all** the sources of CWM hazards known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, CAIS/DMM, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Live-fire involving CWM	◆ The MRS is a former military range that supported live-fire of explosively configured CWM and the CWM/UXO are known or suspected of being present on the surface or in the subsurface. ◆ The MRS is a former military range that supported live-fire with conventional munitions, and CWM/DMM are on the surface or in the subsurface commingled with conventional munitions that are UXO.	10
Damaged CWM/DMM surface or subsurface	◆ There are damaged CWM/DMM on the surface or in the subsurface at the MRS.	10
Undamaged CWM/DMM surface	◆ There are undamaged CWM/DMM on the surface at the MRS.	10
CAIS/DMM surface	◆ There are CAIS/DMM on the surface.	10
Undamaged CWM/DMM, subsurface	◆ There are undamaged CWM/DMM in the subsurface at the MRS.	5
CAIS/DMM subsurface	◆ There are CAIS/DMM in the subsurface at the MRS.	5
Former CA or CWM Production Facilities	◆ The MRS is a facility that formerly engaged in production of CA or CWM, and CWM/DMM is suspected of being present on the surface or in the subsurface.	3
Former Research, Development, Testing, and Evaluation (RDT&E) facility using CWM	◆ The MRS is at a facility that formerly was involved in non-live-fire RDT&E activities (including static testing) involving CWM, and there are CWM/DMM suspected of being present on the surface or in the subsurface.	3
Former Training Facility using CWM or CAIS	◆ The MRS is a location that formerly was involved in training activities involving CWM and/or CAIS (e.g., training in recognition of CWM, decontamination training) and CWM/DMM or CAIS/DMM are suspected of being present on the surface or in the subsurface.	2
Former Storage or Transfer points of CWM	◆ The MRS is a former storage facility or transfer point (e.g., intermodal transfer) for CWM.	1
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0
SOURCES OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Sources of CWM*** classifications in the space provided.

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Table 13

CHE Module: Location of CWM Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

Note: The terms *confirmed, surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are CWM on the surface of the MRS. ◆ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report, that an incident or accident that involved CWM, regardless of configuration, occurred) indicates there are CWM on the surface of the MRS.	25
Confirmed subsurface, active	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed. ◆ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence, other than the documented presence of CWM, indicating that CWM may be present at the MRS.	10
Suspected (historical evidence)	◆ There is historical evidence indicating that CWM may be present at the MRS.	5
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that CWM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the CWM.	2
Evidence of no CWM	◆ Following investigation of the MRS, there is physical evidence that there is no CWM present or there is historical evidence indicating that no CWM are present.	0
LOCATION OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of CWM*** classifications in the space provided.

Table 14

CHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	◆ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	◆ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete but not monitored	◆ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	◆ There is a barrier preventing access to all parts of the MRS, and there is active continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space provided.

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Table 15

CHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	◆ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal or local governments; and land or water bodies managed by other federal agencies. ◆ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD controls access to the MRS 24 hours per day, every day of the calendar year.	0
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space provided.

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Table 16

CHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	◆ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100–500 persons per square mile	◆ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	3
< 100 persons per square mile	◆ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space provided.

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Table 17

CHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	◆ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5
16 to 25 inhabited structures	◆ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	◆ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	◆ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	◆ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	◆ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space provided.

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Table 18

CHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with **all** the activities/structures classifications at the MRS.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5
Parks and recreational areas	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	◆ There are no known of recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

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Table 19

CHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	◆ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	◆ There are ecological resources present on the MRS.	3
Cultural resources present	◆ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	◆ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space provided.

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Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	**Score**	**Value**
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11		
Sources of CWM	Table 12		
Accessibility Factor Data Elements			
Location of CWM	Table 13		
Ease of Access	Table 14		
Status of Property	Table 15		
Receptor Factor Data Elements			
Population Density	Table 16		
Population Near Hazard	Table 17		
Types of Activities/Structures	Table 18		
Ecological and/or Cultural Resources	Table 19		
CHE MODULE TOTAL			

CHE Module Total	**CHE Module Rating**
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

$$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$$

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard ☐

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios

CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

$$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$$

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record <u>**the CHF Value**</u> from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record <u>**the single highest value**</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L

RECEPTOR FACTOR	**DIRECTIONS:** Record <u>**the single highest value**</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard ☐

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

$$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$$

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard ☐

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (μg/L)	Comparison Value (μg/L)	Ratios
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard ☐

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

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Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	*CHF =* $\sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard ☐

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

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Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
Copper	1,300	3100	0.4194
Lead	960	400	2.4000
CHF Scale	**CHF Value**	**Sum the Ratios**	2.8194
CHF > 100	**H (High)**	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**M**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	**M**

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	**M**

No Known or Suspected Surface Soil MC Hazard ☐

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							
Surface Water/Human Endpoint (Table 22)							
Sediment/Human Endpoint (Table 23)							
Surface Water/Ecological Endpoint (Table 24)							
Sediment/Ecological Endpoint (Table 25)							
Surface Soil (Table 26)	M	M	M		MMM		D

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING: **D**

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	[✓ *3*]	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	[✓ *5*]
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		[✓ **No Known or Suspected CWM Hazard**]		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				*3*	

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: Waikane Valley Training Area

Component: Marine Corps

Installation/Property Name: Marine Corps Base Hawaii, Kaneohe Bay

Location (City, County, State): Kaneohe Bay, Honolulu, Hawaii

Site Name/Project Name (Project No.): MCBH Kaneohe Bay, UXO 0022

Date Information Entered/Updated: 22 Jan 2009

Point of Contact (Name/Phone): Wray Kakugawa (808) 472-1421

Project Phase (check only one):

☐ PA	☒ SI	☐ RI	☐ FS	☐ RD
☐ RA-C	☐ RIP	☐ RA-O	☐ RC	☐ LTM

Media Evaluated (check all that apply):

☐ Groundwater	☐ Sediment (human receptor)
☒ Surface soil	☐ Surface Water (ecological receptor)
☐ Sediment (ecological receptor)	☐ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type: Based on results of the Range Identification and Preliminary Range Assessment (RIPRA) completed in 2001, the Army leased this property for maneuvers, jungle training, and small arms, artillery, and mortar firing between 1943 and 1953. The U.S. Marines leased 1061 acres of the training area in 1953 and continued the leases until 1976. Training consisted of small arms fire, 3.5-inch rockets and possibly medium artillery fire. After the Marines investigated and conducted an ordnance clearance in 1976, they reported 187 acres of the WVTA would never be free of duds, practice ordnance, etc.

Description of Pathways for Human and Ecological Receptors From the Site Inspection Work Plan, Munitions Response Sites, Waikane Valley Training Area, Kaneohe, HI of 28 Nov 2006, potential human receptors include construction workers, and recreational users coming in direct contact or inhaling munitions constituents (MCs) in soil during construction activities. Terrestrial and aquatic wildlife may come in contact with subsurface soil containing MCs.

Description of Receptors (Human and Ecological): See above.

Table DP-1. Profile of General Demographic Characteristics: 2000

Geographic Area: Waikane CDP, Hawaii

[For information on confidentiality protection, nonsampling error, and definitions, see text]

Subject	Number	Percent
Total population	**726**	**100.0**
SEX AND AGE		
Male	356	49.0
Female	370	51.0
Under 5 years	54	7.4
5 to 9 years	65	9.0
10 to 14 years	50	6.9
15 to 19 years	61	8.4
20 to 24 years	33	4.5
25 to 34 years	107	14.7
35 to 44 years	88	12.1
45 to 54 years	117	16.1
55 to 59 years	55	7.6
60 to 64 years	27	3.7
65 to 74 years	43	5.9
75 to 84 years	21	2.9
85 years and over	5	0.7
Median age (years)	34.1	(X)
18 years and over	522	71.9
Male	254	35.0
Female	268	36.9
21 years and over	490	67.5
62 years and over	89	12.3
65 years and over	69	9.5
Male	25	3.4
Female	44	6.1
RACE		
One race	441	60.7
White	123	16.9
Black or African American	1	0.1
American Indian and Alaska Native	2	0.3
Asian	139	19.1
Asian Indian	-	-
Chinese	14	1.9
Filipino	52	7.2
Japanese	55	7.6
Korean	-	-
Vietnamese	-	-
Other Asian [1]	18	2.5
Native Hawaiian and Other Pacific Islander	163	22.5
Native Hawaiian	136	18.7
Guamanian or Chamorro	1	0.1
Samoan	2	0.3
Other Pacific Islander [2]	24	3.3
Some other race	13	1.8
Two or more races	285	39.3
Race alone or in combination with one or more other races: [3]		
White	318	43.8
Black or African American	6	0.8
American Indian and Alaska Native	13	1.8
Asian	344	47.4
Native Hawaiian and Other Pacific Islander	409	56.3
Some other race	56	7.7

Subject	Number	Percent
HISPANIC OR LATINO AND RACE		
Total population	**726**	**100.0**
Hispanic or Latino (of any race)	37	5.1
Mexican	9	1.2
Puerto Rican	18	2.5
Cuban	-	-
Other Hispanic or Latino	10	1.4
Not Hispanic or Latino	689	94.9
White alone	116	16.0
RELATIONSHIP		
Total population	**726**	**100.0**
In households	726	100.0
Householder	188	25.9
Spouse	111	15.3
Child	224	30.9
Own child under 18 years	116	16.0
Other relatives	150	20.7
Under 18 years	83	11.4
Nonrelatives	53	7.3
Unmarried partner	21	2.9
In group quarters	-	-
Institutionalized population	-	-
Noninstitutionalized population	-	-
HOUSEHOLD BY TYPE		
Total households	**188**	**100.0**
Family households (families)	157	83.5
With own children under 18 years	61	32.4
Married-couple family	111	59.0
With own children under 18 years	46	24.5
Female householder, no husband present	27	14.4
With own children under 18 years	12	6.4
Nonfamily households	31	16.5
Householder living alone	21	11.2
Householder 65 years and over	8	4.3
Households with individuals under 18 years	89	47.3
Households with individuals 65 years and over	51	27.1
Average household size	3.86	(X)
Average family size	4.09	(X)
HOUSING OCCUPANCY		
Total housing units	**198**	**100.0**
Occupied housing units	188	94.9
Vacant housing units	10	5.1
For seasonal, recreational, or occasional use	4	2.0
Homeowner vacancy rate (percent)	-	(X)
Rental vacancy rate (percent)	3.8	(X)
HOUSING TENURE		
Occupied housing units	**188**	**100.0**
Owner-occupied housing units	112	59.6
Renter-occupied housing units	76	40.4
Average household size of owner-occupied units	3.77	(X)
Average household size of renter-occupied units	4.00	(X)

- Represents zero or rounds to zero. (X) Not applicable.

[1] Other Asian alone, or two or more Asian categories.

[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.

[3] In combination with one or more of the other races listed. The six numbers may add to more than the total population and the six percentages may add to more than 100 percent because individuals may report more than one race.

Source: U.S. Census Bureau, Census 2000.

APPENDIX F. STEP 3A ECOLOGICAL RISK ASSESSMENT

TECHNICAL MEMORANDUM CH2MHILL

Ecological Risk Evaluation for Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

PREPARED FOR: NAVFAC Pacific
USA Environmental

PREPARED BY: Dennis Shelton/CH2M HILL
Jeff Schut/CH2M HILL

DATE: July 24, 2009

This memorandum provides the results of the ecological risk evaluation (ERE) for soil samples collected at the Waikane Valley Training Area (WVTA), Kaneohe, O'ahu, Hawaii. The objective of this ERE was to determine the nature, magnitude, and probability of actual or potential harm to the environment posed by the threatened or actual release of hazardous substances at or from the WVTA to soil. This ERE was conducted using a tiered framework consistent with U.S. Department of Navy (Navy, 2003) and U.S. EPA guidance (EPA 1997, 1998), and is consistent with the objectives and requirements of Step 3a of Tier 2 (Baseline Ecological Risk Assessment, or BERA) of the Navy’s overall tiered process. The results of Tier 1 (Screening Risk Assessment, or SRA) were provided in Section 3 of this Site Inspection (SI) Report.

1.0 Organization of the Ecological Risk Evaluation

This ERE includes the following components:

- **Exposure Pathways and Receptors of Concern** identifies the potentially complete pathways through which ecological receptors could be exposed to chemicals in soil (Section 2).
- **Chemicals of Potential Ecological Concern (COPEC)** identifies those constituents of greatest importance for evaluation in the ERE, based on available soil data (Section 3).
- **Ecological Risk Evaluation Methods and Results** provides the methodology for calculating site-specific risk estimates and the results (Section 4).
- **Uncertainties and Assumptions** identifies uncertainties and assumptions from the ecological risk evaluation (Section 5).
- **Conclusions** provide the overall conclusions of this ERE (Section 6).
- **References** provides citation of references used for the ERE (Section 7).

2.0 Exposure Pathways and Receptors of Concern

On the basis of the habitat types and wildlife using the area, this section identifies the means by which ecological receptors on or near the site may contact chemicals in soil. Considering the habitat types at or near WVTA, wildlife populations potentially using these habitats have been identified and are summarized in this section.

2.1 Ecological Setting

The ecological setting, including terrestrial and nearby aquatic habitats and wildlife, are described in Section 1.2 of this SI Report. Mechanical disturbances at the project site have left only remnants of native vegetation. Native plant communities such as *'Ohi'a Scrub* and *Koa/'Uluhe Woodland* occur on some of the ridges that extend to the northern ridge line. The *Ohi'a Scrub* community occurs on the ridges at the north side of the project site, and particularly on the eastern end. It is characterized by low and shrubby *'ohi'a* trees with dense clumps of the native fern *pala'a (Sphenomeris chinensis)* between the shrubs. *Koa/'Uluhe Woodland* dominates the northwestern portion of the project site on the ridge leading up the hills that separate Waikane Valley from Kaaawa Valley. This plant community comprises *Dicranopteris linearis ('uluhe)*. Two plant communities (that is, Managed Land Vegetation and Secondary Forest) found in most of the flat to sloping areas south of the hills on the northern portion of the project site reflect extensive disturbance. Managed Land Vegetation exhibits the characteristics of abandoned agricultural clearings that cover large patches on the alluvial plain of the Waikane Stream, and the areas around the abandoned living sites. Most of the lowlands of the site are covered by Secondary Forest, which is a plant community almost entirely dominated by alien tree species. The most prevalent of these alien tree species is *Paraserianthes falcataria ("albizia")*, which is a large, fast-growing tree with an open, spreading canopy. No distinct wetlands are found within the project site.

2.2 Conceptual Exposure Model for Ecological Receptors

The potential pathways for human and ecological exposures at the WVTA are depicted in Figure A-8 of this SI Report. On the basis of the current understanding of available habitat types and wildlife potentially using the WVTA, and the beneficial uses in the vicinity of the site, the most plausible potentially complete ecological pathway of exposure to soil is the potential bioaccumulation through the ingestion of food items (for example, prey) and surface soil by avian wildlife potentially using the WVTA. These exposure pathways are the focus of this ERE. The potential exposures to ecological receptors associated with surface water and sediment will be evaluated during the Remedial Investigation (RI).

2.3 Selection of Ecological Assessment Endpoints

Assessment endpoints define the environmental characteristics of actual value that, if found to be substantially affected, indicate a need for remediation (for example, the survival and health of avian species using WVTA). For the WVTA, assessment endpoints are based on the habitat types that occur within the locality of the project site. The selection of assessment endpoints depends on (EPA, 1997):

- contaminants present and their concentrations
- mechanisms of toxicity of the contaminants to different groups of organisms

- ecologically relevant receptor groups that are potentially sensitive or highly exposed to the contaminant and attributes of their natural history
- potentially complete exposure pathways

As an example, the ecological health of Hawaiian short-eared owl (*Asio flammeus sandwichensis*) or pueo is considered a significant assessment endpoint because pueo may occur in the terrestrial habitat areas and forage on small mammals and birds at WVTA, are highly valued, and are susceptible to exposure and toxicity from contaminants occurring there. An appropriate assessment endpoint for the WVTA would be the survival and health of terrestrial birds, as represented by the Hawaiian short-eared owl. This assessment endpoint meets the criteria listed above and is considered a primary endpoint for this ERE.

2.4 Measures of Exposure and Effect

Assessment endpoints frequently cannot be directly measured because they tend to correspond to complex ecosystem attributes. Because of this, the ERE identifies other related measures that serve as representations or surrogates of each assessment endpoint. These measures are called “measures of effect” and “measures of exposure” (EPA, 1998). The strength of the relationships between these measures and their corresponding assessment endpoints is critical to the identification of ecological adversity. For this ERE, these measures are defined as follows:

- Measures of exposure are quantitative or qualitative indicators of the occurrence and movement of a contaminant in the environment in a way that results in contact with the assessment endpoint. For this ERE, chemical concentrations measured in surface soil and modeled to prey tissue serve as direct measures of exposure via the food web to wildlife users of the WVTA (as represented by the Hawaiian short-eared owl).

- Measures of effect are measurable adverse changes in an attribute of an assessment endpoint (or its surrogate) in response to a chemical to which it is exposed. For this ERE, literature-derived critical toxicity values from available laboratory studies on birds are used to indicate when the Hawaiian short-eared owl may be adversely affected.

The assessment endpoints identified for WVTA, and the corresponding measures of exposure and effect, are summarized in Table 1.

2.5 Selection of Representative Endpoint Species

To facilitate quantitative evaluation of potential exposures and effects associated with constituent stressors and assessment endpoints, wildlife are identified that are considered representative of indigenous wildlife functional groups at a site. The endpoint species should preferably be one that has ecological relevance, is of social value, is susceptible to constituent stressors, and allows risk managers to meet policy goals. These four factors collectively describe the ecological value of the species selected, as well as the functional groups they represent. Another consideration in the selection of endpoint species is the availability of literature-based exposure parameters such as body weight. A short description of the species chosen to represent the potentially exposed wildlife is presented below.

2.5.1 Hawaiian Short-Eared Owl

The *Draft Environmental Assessment (EA) for the Proposed United States Marine Corps (USMC) Jungle Warfare Training Waikane Valley, Oahu, Hawaii* (2004) noted that the endemic Hawaiian short-eared owl (*Asio flammeus sandwichensis*) or pueo was not detected during surveys but may occasionally use resources present within the site, especially in the more open *'uluhe* dominated higher elevations of the valley wall. Pueo primarily feed on small rodents and occasionally on small birds and invertebrates. Pueo grow between 12 and 17 inches in size and are most active during dawn and dusk. Pueo are highly regarded by Hawaiians as a guardian spirit and a good omen. The Hawaiian short-eared owl was selected as a representative of terrestrial wildlife, particularly raptors and other owls, that may use the site because they are potential users (that is, foragers) of the habitat in the locality of WVTA, are highly valued by the society, and would be expected to have a high exposure to site-related constituents. The pueo is considered a species of concern in the State of Hawaii. Since the pueo would be expected to experience a high-end exposure to site-related constituents because of its position in the food web, risk assessment of this receptor would be anticipated to provide a conservative representation of other birds using the site.

3.0 Chemicals of Potential Ecological Concern

The following subsections describe the data used for this ERE, and the means for identification of COPECs.

3.1 Data Used for this Risk Evaluation

Data used for this ERE were collected in October 2008 as part of the SI. Samples used in this ERE are presented in Table 2. The data set evaluated for ecological risk includes surface soil samples collected for the purpose of site characterization. All chemicals detected in at least one sample were evaluated to identify COPECs. A detailed description of previous site investigations and analyses conducted are provided in Section 1 this SI Report. The sample location map is provided as Figure A-7 of the SI Report.

3.2 Comparison to Background and Ecological Screening Levels

For this ERE, the following screening process and benchmarks are used to identify COPECs for the WVTA:

1. First, maximum detected COPEC concentrations were screened against the State of Hawaii Department of Health (HDOH) Environmental Action Levels or EALs for sites where drinking water is threatened and less than 150 meters from the surface water (HDOH, March, 2009), conservative screening levels believed to be protective of potential terrestrial wildlife.
2. Second, maximum detected COPEC concentrations were compared with soil background levels from *Environmental Background Analysis of Metals in Soil at Navy Oahu Facilities*, Pacific Division, Naval Facilities Engineering Command (Earth Tech, 2006).

Table 3 provides the screening results for COPEC selection. Because EALs were developed as conservative benchmarks, along with the screening assumption that all wildlife exposure is limited to the location where samples were collected, exceedance of some of these benchmarks is not surprising. Only two constituents had maximum COPEC concentrations exceeding both the HDOH EALs and the background levels, as summarized below:

- Copper – maximum concentration (1,300 mg/kg) exceeds the EAL (230 mg/kg) by a factor of 5.7. The background level for copper is reported as 183 mg/kg.
- Lead – maximum concentration (960 mg/kg) exceeds the EAL (200 mg/kg) by a factor of 4.8. The background level for lead is reported as 100 mg/kg.

Additionally, ecological EALs are not available for several munitions-related constituents, including; 2,6-dinitrotoluene, HMX, nitrobenzene, 2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene, RDX, 1,3,5-trinitrobenzene, and trinitrophenylmethylnitramine.

Copper and lead were identified as exceeding Project Action Levels (PALs) in Section 3 of this SI Report (Tier 1 SRA), and are therefore considered the primary COPEC for the WVTA. For the purposes of this ESE (Step 3a of Tier 2) each of the munitions-related constituents listed above are also identified as COPECs (due to their lack of EALs) and carried forward to site-specific assessment for further evaluation.

4.0 Ecological Risk Evaluation Methods and Results

This ERE uses exposure estimates for receptors specific to the site to characterize risks, for those chemicals identified as COPECs. The methodology and results for this ERE are provided in the following subsections.

4.1 Estimation of Exposure to Wildlife

According to the conceptual exposure model, the most feasible means through which receptors may be exposed to site COPECs is through direct ingestion of surface soil and food-chain transfer of chemicals via ingestion of prey items (that is, small mammals and/or birds). Quantitative exposure estimates for the pueo are developed using food-web modeling procedures consistent with EPA guidance (EPA, 1993). These models use best available information for predicting the ability and extent of the movement of a chemical through the food chain with ultimate uptake into an endpoint species. In addition, the food web models consider concomitant chemical intake from soil incidentally ingested with food items and during preening or foraging activities.

For evaluating exposure to avian species through a food chain, the equation used to estimate chemical-specific intake is as follows:

$$I_{diet} = [C_s \ x \ DIR_f \ x \ AUF \ x \ ((BAF_m \ x \ Frac_m) + (Frac_s))]/BW$$

Where:

I_{diet} = Dietary exposure rate (mg/kg body weight-day)
C_s = Chemical concentration in soil (mg/kg dry weight)
DIR_f = Daily food ingestion rate (kg/day dry weight)
AUF = Area use factor (unitless)
BAF_m = Bioaccumulation factor for small mammals and birds (unitless)
$Frac_m$ = Fraction of diet represented by small mammals and birds (unitless)

$Frac_s$ = Fraction of diet represented by soil (unitless)
BW = Body weight of wildlife receptor (kg)

4.1.1 Exposure Parameters

As can be seen from the intake equation, to estimate avian exposure from surface soil and prey, media concentration data are needed, as well as exposure parameters that are specific to the endpoint species. Exposure point concentrations (EPCs) that serve as input to the intake equations (designated as C_s in the equation) were estimated by aggregating concentration data from soil samples collected from across the project site. The EPCs for aggregate risk estimation were calculated by using the best statistical estimate of an upper bound on the average exposure concentrations, in accordance with U.S. EPA guidance for statistical analysis of monitoring data (EPA, 2002). The 95 percent upper confidence limit (UCL) on the mean concentration is considered by these guidance documents as a conservative upper bound estimate that is not likely to underestimate the mean concentration and most likely overestimates that concentration. EPCs were calculated for each detected constituent using U.S. EPA's statistical program ProUCL, Version 4.00.04 (EPA, 2009). This procedure identifies the statistical distribution type (that is, normal, lognormal, or non-parametric) for each constituent within the defined exposure area and computes the corresponding 95 percent UCL for the identified distribution type. Summary statistics and UCLs for all detected soil constituents are provided in Table 4.

The species-specific exposure parameters used for this ERE include body weight, food intake rate, diet composition, percent of diet as soil, and area-use factor. The exposure parameters and references used for the Hawaiian short-eared owl (pueo) are summarized in Table 5. All weight-based exposure parameters are listed on a dry-weight basis. For this ERE, a body weight of 0.348 kg for the owl was used in the food-web model (INHS, 2004). The fraction of diet represented by each food item is obtained by evaluating the entire diet of the representative species; Hawaiian short-eared owls almost exclusively forage on small mammals and birds. Biological information was unavailable for some parameters. When this occurred, allometric equations were used to approximate some exposure parameters (EPA, 1993), such as the food ingestion rate. The allometric conversion for food ingestion is discussed below.

The area-use factor (AUF) represents the percentage of time the representative species is likely to forage in the study area. There are no available studies documenting the home range for the pueo in Hawaii, but the site-specific home range size is expected to be indirectly related to prey availability. As previously noted, the EA indicated that the Hawaiian Short-eared Owl was not detected during surveys but may occasionally use resources present within the site, especially in the more open *'uluhe* dominated higher elevations of the valley wall. Because the lower portions of the site are densely vegetated/forested (most predatory birds such as owls prefer to hunt/forage in more open settings), a conservative assumption was made that pueo could receive as much as 50 percent of their forage from the WVTA. Therefore an AUF of 0.5 was used in the food-web exposure model for the pueo.

The numerical results of exposure quantification are provided in Table 6.

4.1.2 Allometric Conversions for Food Intake Rate

Allometric equations provided in EPA (1993) are used to estimate daily food ingestion rates (in kg/day) for the pueo as follows:

$$\text{Non-passerine birds (kg/day)} = (0.301 * BW^{0.751})/1000$$

Where:

BW = Body weight (g)

Using this equation for the pueo with a body weight of 0.348 kg, the daily food intake rate is estimated to be 0.136 kg/day (dry weight basis).

4.1.3 Estimation of Bioaccumulation into Food Items

Bioaccumulation can be defined as the uptake and accumulation of chemicals by organisms from the nonliving (abiotic) environment and through the diet. The concentration of a site-related chemical in a food chain item is not always available, but often must be estimated. For the purposes of exposure estimation, partitioning of chemicals from soil to prey items is estimated from literature values (for example, small mammal bioaccumulation factors). Pueo almost exclusively forage on small mammals and birds. Chemical-specific bioaccumulation factors used to estimate chemical concentrations in prey items are provided in Table 7.

4.2 Ecological Effects Assessment

The ecological effects assessment identifies the toxicological properties associated with the chemical stressors at WVTA. It determines the type of effect that could result to the ecosystem if exposure is excessive, and identifies which benchmarks provide a measure of the potential for ecological effects.

The toxicity of chemicals to wildlife as a result of potential exposure to contaminated media at WVTA is identified by using literature-derived critical toxicity values. A literature review of the toxicological properties for site chemicals was conducted to identify the highest exposure level considered to be without adverse ecological impact. This exposure level is called the toxicity reference value (TRV). TRVs were derived by interpreting existing literature-derived toxicological studies and adjusting the data, if necessary, to obtain values that are expected to protect the selected endpoint species. When necessary, literature references citing use of laboratory animals that have similar sensitivity, life history, or habitat requirements are used as surrogates for the wild ecological receptor species. Additionally, a few munitions-related constituents that were detected do not have adequate toxicity information to quantify ecological risks. These are addressed in the uncertainties section. In some cases, data for surrogate chemicals (for example, 2,4-dinitrotoluene for other dinitrotoluenes) were used.

For the pueo, the primary toxicological endpoint used for development of the TRV is the chronic no observed adverse effects level (NOAEL). Because ecological populations are the primary focus of this ERE, population-type endpoints such as reproduction or survival are of greatest concern. NOAELs are obtained from studies using animal species that are as closely related as possible to the selected endpoints species (for example, with similar dietary habits), and the exposure route and duration are similar to those feasible at the project site.

Derivation of wildlife TRVs for the Hawaiian short-eared owl is a three-step process:

1. Conduct a literature search to compile toxicity data for the COPECs using surrogate (that is, laboratory test) avian species
2. Review these toxicity data to select the most appropriate values (that is, considering exposure duration, route, etc.) for each COPEC or chemical surrogate
3. Use uncertainty factors (UF) from the toxicology literature to derive a chronic NOAEL from other less sensitive endpoints (that is, subchronic lowest observed adverse effect level [LOAEL], etc.), if necessary

4.2.1 Toxicological Uncertainty Factors

Uncertainty factors are applied to the literature-derived toxic level to account for any differences in the reported effect level and exposure duration. For example, if a chronic NOAEL is unavailable and only the chronic LOAEL is reported, an uncertainty factor of 5 (that is, LOAEL/5) is applied to derive the NOAEL used to calculate the TRV. The following uncertainty factors are used in deriving chronic NOAELs for TRVs (Wentsel et al., 1996):

- Chronic NOAEL to Chronic NOAEL = 1
- Chronic LOAEL to Chronic NOAEL = 5
- Subchronic NOAEL to Chronic NOAEL = 10

The selected literature-derived toxic level, uncertainty factors applied, and the TRVs derived for each COPEC are provided in Table 8.

4.2.2 Toxicity Data Sources

Sources used for ecological toxicity information include:

- EPA Ecological Soil Screening Levels (http://www.epa.gov/ecotox/ecossl/)
- U.S. Army Wildlife Toxicity Reference Values (TRVs) for Ecological Risk Assessments (http://chppm-www.apgea.army.mil/erawg/tox/index.htm)

4.3 Ecological Risk Characterization

The purpose of the ecological risk characterization is to evaluate the evidence linking site contaminants with potential adverse ecological effects. This link is established by combining the ecological exposure assessment and ecological effects assessment through quantitative or qualitative evaluations, or both. The uncertainties associated with the evaluations are presented in Section 5.

4.3.1 Ecological Risk Quantification Method for Avian Wildlife

The primary means for quantifying ecological risk for avian species at WVTA is to determine the ratio of the estimated chemical exposure level for the endpoint species of concern with the chemical-specific TRV:

$$Ecological\ HQ = I/TRV$$

where:

HQ = Ecological hazard quotient (unitless)
I = Chemical intake level (mg/kg body weight-day)
TRV = Toxicity reference value (mg/kg body weight-day)

This ratio is called the ecological HQ. When the HQ exceeds unity, there is a potential for ecological risk. When a cumulative effect from potential exposure to more than one chemical is suspected or known, an ecological HI is calculated. An ecological HI is a measure of the potential for adverse effects due to multiple COPECs and is based on the assumption that the effects are additive for COPECs that act by the same toxicological mechanism. An ecological HI is the sum of all hazard quotients for chemicals with similar toxicological mechanisms and is calculated as follows:

$$HI = HQ_1 + HQ_2 + ... + HQ_i$$

where:

HI = Ecological hazard index (unitless)
HQ_i = Ecological hazard quotient for the i^{th} constituent (unitless)

For the COPECs identified at WVTA, this ERE calculates an HI for all organic munitions-related compounds, but the HQ estimates for copper and lead are considered toxicologically distinct.

4.3.2 Risk Characterization Results for Wildlife

Ecological HQs were derived for WVTA by comparing the calculated chemical intake of constituents detected in surface soil during the October 2008 SI with TRVs identified to be protective of the Hawaiian short-eared owl. Exposure was assumed to occur to COPECs in surface soil and prey items collectively. The results of the HQ and HI estimates for WVTA are provided in Table 6.

A total of 50 surface soil samples were used for this ERE. None of the 18 detected chemicals evaluated for ecological risk occur at concentrations resulting in an ecological NOAEL-based HQ exceeding 1.0 for the Hawaiian short-eared owl. Considering the aggregate ecological risk calculated for toxicologically-similar munitions-related compounds, the HI is 0.01, well below the regulatory limit of 1.0.

5.0 Uncertainties and Assumptions

Full characterization of ecological risks requires that numerical estimates of ecological health risks must be accompanied by a discussion of the uncertainties inherent in the assumptions used to estimate risks. Uncertainties in risk evaluation methods may result either in understating or in overstating the ecological risks.

Risk estimates are subject to uncertainty from a variety of sources, including:

- Sampling, analysis, and data evaluation

- Fate and transport estimation
- Exposure estimation
- Toxicological data

General and site-specific uncertainties, as well as the potential effects on risk evaluation results, are discussed in the following sections.

5.1 Sampling, Analysis, and Data Evaluation

Uncertainty associated with sampling and analysis includes the inherent variability (standard error) in the analysis, representativeness of the samples, sampling errors, and heterogeneity of the sample matrix. The QA/QC program used in the investigation serves to reduce these errors, but it cannot eliminate all errors associated with sampling and analysis. The degree to which sample collection and analyses reflect real EPCs partly determines the reliability of the risk estimates.

5.2 Fate and Transport

This ERE makes simplifying assumptions about environmental fate and transport of COPECs; specifically, that no chemical loss or transformation occurred. This assessment also assumes that the chemical concentrations detected in surface soil remain constant during the assessed exposure duration. In cases where natural attenuation processes are high, the analytical data chosen to represent EPCs may overstate actual long-term exposure levels.

5.3 Exposure

The estimation of exposure requires many assumptions to describe potential exposure situations. There are uncertainties regarding the likelihood of exposure, frequency of contact with contaminated media, the concentration of contaminants at exposure points, and the time period of exposure. Natural attenuation is not accounted for during these risk estimates. The assumptions used tend to simplify and approximate actual site conditions and may over- or underestimate the actual risks. In general, these assumptions are intended to be conservative and yield an overestimate of the true risk or hazard.

5.4 Toxicological Data

Uncertainties in toxicological data can also influence the reliability of risk management decisions. As with many contaminants, data on toxicity to wildlife is limited. In addition, the usefulness of existing toxicity information in assessing ecological impacts is constrained by several factors. Most wildlife toxicity information is generated by laboratory studies with selected test species. These studies frequently evaluate domestic animals under controlled laboratory conditions, with few tests involving native wildlife. Basic toxicity information can be extrapolated to native species in the wild, but consideration must be given to the species involved and specific site conditions. Where toxicity information on a particular contaminant is available for a species found onsite, such as the owl, consideration was given to the type of data available

The toxicity values used for quantifying risk in this assessment have varying levels of confidence that will affect how useful the resulting risk estimates are. Uncertainty factors were used for extrapolation between exposure durations (i.e., subchronic to chronic). The use of uncertainty factors in the derivation of the TRV while striving for protectiveness may result in an overestimation of risk. Because some of the constituents detected did not have available toxicity information on which to quantify risks, these constituents could not be evaluated. However, most of the constituents that have no available toxicity data are considered less toxic, because most of the toxicological literature focuses on those constituents considered more toxic to ecological receptors. In some cases where adequate toxicity data were unavailable, structurally similar surrogates were generally used. The use of surrogates for these chemicals may lead to overestimation of risk to ecological receptors if the surrogate is more toxic than the chemical with unavailable toxicity data.

Another uncertainty in the ERE is the bioavailability of the forms of metals that occur in soil at the site. Site-specific bioavailability data were unavailable. This assessment conservatively assumes that bioavailability from soil is the same as that in the toxicological studies from which the toxicity values were derived. Depending on whether the chemical form at the site is less or more bioavailable than assumed, actual risk would be proportionately lower or higher, respectively.

6.0 Conclusions

This ERE was conducted consistent with methodology recommended in the HDOH, Navy, and EPA guidances, focusing on site-related constituents, receptors, and areas where the greatest potential for ecological exposure might be expected. Specifically, this ERE is consistent with the objectives and requirements of Step 3a of Tier 2 (Baseline Ecological Risk Assessment, or BERA) of the Navy’s overall tiered process (Navy, 2003). The resulting characterization is expected to provide sufficient information for informed risk management decisions at the WVTA. As such, the results here are key for consideration by risk managers during the scientific management decision point (SMDP), as outlined in the tiered process.

The primary decision for which the results of the ERE provide input is whether additional actions are necessary at the site to reduce the potential threat of ecological risk. The results of the risk characterization for avian receptors potentially using habitat at WVTA, as represented by the Hawaiian short-eared owl, indicate that risk to these receptors is *de minimis* and meets the HDOH regulatory limits.

7.0 References

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TABLE 1
Ecological Assessment Endpoints and Endpoint Species
Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Assessment Endpoint Functional Group	Assessment Endpoint	Representative Endpoint Species	Measure of Exposure	Measure of Effect
Terrestrial Wildlife	Survival and health of terrestrial wildlife using the Waikane Valley Training Area, and potentially exposed to COPECs in surface soil and prey items	Represented by the Hawaiian Short-eared Owl or "pueo"	Measured COPEC levels in surface soil and modeled prey tissue	HDOH soil EALs protective of wildlife (for initial screening) and chronic no-observed adverse effect level (NOAEL) for birds, converted to a toxicity reference value for the Hawaiian short-eared owl (for site-specific evaluation)

TABLE 2
Samples Used in the Ecological Risk Evaluation for the NAVFAC Munitions Response Site
Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Sample ID Number	Sample Date	Sample Type	Media	Units
MEC001	10/14/2008	PS	Surface soil	mg/Kg
MEC002	10/14/2008	PS	Surface soil	mg/Kg
MEC003	10/14/2008	PS	Surface soil	mg/Kg
MEC004	10/14/2008	PS	Surface soil	mg/Kg
MEC005	10/14/2008	PS	Surface soil	mg/Kg
MEC006	10/14/2008	PS	Surface soil	mg/Kg
MEC007	10/14/2008	PS	Surface soil	mg/Kg
MEC008	10/15/2008	PS	Surface soil	mg/Kg
MEC009	10/15/2008	PS	Surface soil	mg/Kg
MEC010	10/15/2008	PS	Surface soil	mg/Kg
MEC011	10/15/2008	QC	Surface soil	mg/Kg
MEC012	10/15/2008	PS	Surface soil	mg/Kg
MEC013	10/15/2008	PS	Surface soil	mg/Kg
MEC014	10/15/2008	PS	Surface soil	mg/Kg
MEC015	10/15/2008	PS	Surface soil	mg/Kg
MEC016	10/15/2008	PS	Surface soil	mg/Kg
MEC017	10/15/2008	PS	Surface soil	mg/Kg
MEC018	10/16/2008	PS	Surface soil	mg/Kg
MEC019	10/16/2008	PS	Surface soil	mg/Kg
MEC020	10/16/2008	PS	Surface soil	mg/Kg
MEC021	10/16/2008	QC	Surface soil	mg/Kg
MEC022	10/16/2008	PS	Surface soil	mg/Kg
MEC023	10/16/2008	PS	Surface soil	mg/Kg
MEC024	10/16/2008	PS	Surface soil	mg/Kg
MEC025	10/16/2008	PS	Surface soil	mg/Kg
MEC026	10/16/2008	PS	Surface soil	mg/Kg
MEC027	10/16/2008	PS	Surface soil	mg/Kg
MEC028	10/16/2008	PS	Surface soil	mg/Kg
MEC029	10/16/2008	PS	Surface soil	mg/Kg
MEC030	10/16/2008	PS	Surface soil	mg/Kg
MEC031	10/16/2008	QC	Surface soil	mg/Kg
MEC032	10/16/2008	PS	Surface soil	mg/Kg
MEC033	10/16/2008	PS	Surface soil	mg/Kg
MEC034	10/20/2008	PS	Surface soil	mg/Kg
MEC035	10/20/2008	PS	Surface soil	mg/Kg
MEC036	10/20/2008	PS	Surface soil	mg/Kg
MEC037	10/20/2008	PS	Surface soil	mg/Kg
MEC038	10/20/2008	PS	Surface soil	mg/Kg
MEC039	10/20/2008	PS	Surface soil	mg/Kg
MEC040	10/20/2008	PS	Surface soil	mg/Kg
MEC041	10/20/2008	QC	Surface soil	mg/Kg
MEC042	10/20/2008	PS	Surface soil	mg/Kg
MEC043	10/20/2008	PS	Surface soil	mg/Kg
MEC044	10/20/2008	PS	Surface soil	mg/Kg
MEC045	10/21/2008	PS	Surface soil	mg/Kg
MEC046	10/21/2008	PS	Surface soil	mg/Kg
MEC047	10/21/2008	PS	Surface soil	mg/Kg
MEC048	10/21/2008	QC	Surface soil	mg/Kg
MEC049	10/21/2008	PS	Surface soil	mg/Kg
MEC050	10/21/2008	PS	Surface soil	mg/Kg

Notes:
PS = Primary sample
QC = Quality control sample

TABLE 3

Selection of Chemicals of Potential Ecological Concern (COPEC)

Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Constituent	Units	Maximum Detect	95% UCL	Background Concentration[b]	Maximum Detect Less than Background?	Soil Ecotoxicity Environmental Action Levels (EALs)[a]	Maximum Detect Less than EALs	Selected as COPEC
Aluminum	mg/Kg	73,000	43,824	93,900	Y	--	Y	N
Antimony	mg/Kg	4.3	0.49	6.9	Y	20	Y	N
Barium	mg/Kg	120	61	181	Y	750	Y	N
Chromium (total)	mg/Kg	400	251	483	Y	750	Y	N
Copper	mg/Kg	**1,300**	**248**	183	N	230	N	Y
Iron	mg/Kg	140,000	98,123	177,000	Y	--	Y	N
Lead	mg/Kg	**960**	125	100	N	200	N	Y
Nickel	mg/Kg	230	121	346	Y	150	Y	N
Zinc	mg/Kg	190	88.1	197	Y	600	Y	N
2,6-Dinitrotoluene	mg/Kg	0.072	0.072	--	--	--	--	Y
HMX	mg/Kg	0.092	0.043	--	--	--	--	Y
Nitrobenzene	mg/Kg	0.043	0.02	--	--	--	--	Y
2-Nitrotoluene	mg/Kg	0.11	0.06	--	--	--	--	Y
3-Nitrotoluene	mg/Kg	0.23	0.10	--	--	--	--	Y
4-Nitrotoluene	mg/Kg	0.27	0.08	--	--	--	--	Y
RDX	mg/Kg	0.08	0.08	--	--	--	--	Y
1,3,5-Trinitrobenzene	mg/Kg	0.042	0.03	--	--	--	--	Y
Trinitrophenylmethylnitramine	mg/Kg	0.052	0.052	--	--	--	--	Y

Notes:

Bold indicates value exceeds both the EAL and Background Level

EAL - Hawaii Environmental Action Level

-- - No value available or applicable

[a] EAL = State of Hawaii Department of Health Environmental Action Level (HDOH, March, 2009) for sites where drinking water is threatened and less than 150 meters from surface water.

[b] Background = Ambient background metal concentration established for Naval Oahu facilities (Earth Tech, 2006).

TABLE 4

Summary Statistics and 95% UCLs for Detected Constituents in Surface Soil

Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Soil Constituent	Units	No. Detects	No. Analyses	Frequency of Detection	Minimum Detect	Maximum Detect	Mean	Median	SD	95% UCL	Basis	Distribution
Aluminum	mg/Kg	50	50	100%	25,000	73,000	41,280	41,000	10,618	43,824	Gamma	95% Approximate Gamma UCL
Antimony	mg/Kg	7	50	14%	0.2	4.3	1.16	0.57	1.4	0.49	Nonparametric	95% KM (t) UCL
Barium	mg/Kg	50	50	100%	14	120	54.9	57.5	24.9	60.9	Normal	95% Student's-t UCL
Chromium (total)	mg/Kg	50	50	100%	140	400	234.2	225	68.2	251	Gamma	95% Approximate Gamma UCL
Copper	mg/Kg	50	50	100%	62	1300	138.7	99.5	178	248	Nonparametric	95% Chebyshev (Mean, Sd) UCL
Iron	mg/Kg	50	50	100%	64,000	140,000	93,600	86,500	19,076	98,123	Normal	95% Student's-t UCL
Lead	mg/Kg	43	50	86%	0.25	960	42.1	3.6	154	125	Nonparametric	95% KM (Chebyshev) UCL
Nickel	mg/Kg	50	50	100%	33	230	111.1	96.5	42.7	121	Normal	95% Student's-t UCL
Zinc	mg/Kg	50	50	100%	50	190	82.0	77.5	25.7	88.1	Normal	95% Student's-t UCL
2,6-Dinitrotoluene	mg/Kg	1	50	2%	0.072	0.072	0.072	0.072	N/A	0.072	Maximum Detect	Too few to calculate
HMX	mg/Kg	2	50	4%	0.039	0.092	0.0655	0.0655	0.04	0.043	Nonparametric	95% KM (t) UCL
Nitrobenzene	mg/Kg	5	50	10%	0.019	0.043	0.03	0.025	0.01	0.02	Nonparametric	95% KM (t) UCL
2-Nitrotoluene	mg/Kg	11	50	22%	0.055	0.11	0.078	0.076	0.02	0.06	Nonparametric	95% KM (t) UCL
3-Nitrotoluene	mg/Kg	2	50	4%	0.091	0.23	0.1605	0.1605	0.10	0.10	Nonparametric	95% KM (t) UCL
4-Nitrotoluene	mg/Kg	5	50	10%	0.068	0.27	0.12	0.074	0.09	0.08	Nonparametric	95% KM (t) UCL
RDX	mg/Kg	1	50	2%	0.08	0.08	0.08	0.08	N/A	0.08	Maximum Detect	Too few to calculate
1,3,5-Trinitrobenzene	mg/Kg	3	50	6%	0.027	0.042	0.037	0.041	0.01	0.03	Nonparametric	95% KM (t) UCL
Trinitrophenylmethylnitramine	mg/Kg	1	50	2%	0.052	0.052	0.052	0.052	N/A	0.052	Maximum Detect	Too few to calculate

Notes:
COPEC = chemicals of potential ecological concern
SD = standard deviation
UCL = upper confidence limit

TABLE 5
Wildlife Exposure Factors for Receptor of Concern
Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Endpoint Species	Body Weight (kg)[a]	Food Intake (kg/day)[b]	Area Use Factor	Food Ingestion from Site (kg/day)	% of Diet as Small Mammal/Birds	% of Diet as Soil
Hawaiian short-eared owl ("pueo") *Asio flammeus sandwichensis*	0.348	0.136	0.5	0.136	100	2

Notes:
All units are in terms of dry weight
[a] Body weight for the Short-eared owl (*Asio flammeus*) (INHS,2004)
[b] Food intake rate calculated using the following equation for non-passerines from the EPA Wildlife Exposure Factors Handbook (EPA, 1993):
FI (kg/day) = [0.301*BW0.751(g)]/1000

TABLE 6

Intake Estimation and Hazard Quotient for the Hawaiian Short-eared Owl ("pueo")

Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Soil Constituent	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor[c]	Daily Food Ingestion from Site (kg/day)	Fraction of Diet as Small Mammal/Bird	Soil-to-Mammal/Bird BAF	BAF Source	Fraction of Diet as Soil	Soil Concentration (mg/kg)	Chemical Intake (mg/kg-d)	NOAEL-based Toxicity Reference Value (mg/kg-d)	Short-eared Owl Hazard Quotient
Copper	0.348	0.136	0.5	0.068	1	0.07	a	0.02	2.48E+02	2.13E+00	4.05E+00	0.5
Lead	0.348	0.136	0.5	0.068	1	0.07	a	0.02	1.25E+02	1.11E+00	1.63E+00	0.7
2,6-Dinitrotoluene	0.348	0.136	0.5	0.068	1	0.0000013	b	0.02	7.20E-02	2.81E-04	1.00E-01	0.003
HMX	0.348	0.136	0.5	0.068	1	0.000000097	b	0.02	4.25E-02	1.66E-04	--	--
Nitrobenzene	0.348	0.136	0.5	0.068	1	0.0000016	b	0.02	2.10E-02	8.22E-05	--	--
2-Nitrotoluene	0.348	0.136	0.5	0.068	1	0.0000050	b	0.02	6.32E-02	2.47E-04	1.00E-01	0.002
3-Nitrotoluene	0.348	0.136	0.5	0.068	1	0.0000063	b	0.02	1.00E-01	3.92E-04	1.00E-01	0.004
4-Nitrotoluene	0.348	0.136	0.5	0.068	1	0.0000063	b	0.02	8.06E-02	3.15E-04	1.00E-01	0.003
RDX	0.348	0.136	0.5	0.068	1	0.000050	b	0.02	8.00E-02	3.13E-04	8.70E+00	0.00004
1,3,5-Trinitrobenzene	0.348	0.136	0.5	0.068	1	0.0000004	b	0.02	2.84E-02	1.11E-04	--	--
Trinitrophenylmethylnitramine	0.348	0.136	0.5	0.068	1	NA	b	0.02	5.20E-02	NA	--	--

Hazard Index for COPECs with Similar Toxicological Mechanisms

Receptor	Muntions-Related Compounds
Pueo	0.01

Notes:

a) Soil to small mammal regression (Sample et al., 1998); 90% UCL soil to small mammal BAF (Sample, 1998) - See Table 7

b) For COPECs without available regression equations for calculation of site-specific BAFs, Source: ORNL RAIS, 2009 - See Table 7

c) An area use factor of 0.5 was conservatively assumed with consideration of available habitat and since pueo are known to relocate to areas of higher prey populations.

- This ERE calculates an HI for all organic munitions-related compounds, but the HQ estimates for copper and lead are considered toxicologically distinct.

TABLE 7

Site-Specific Biotransfer Factors Using Log-Linear Regression Models and Other Available Resources

Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Soil Constituent	**Receptor**	**Soil EPC (mg/kg)**	**B0**	**B1**	**Prey Conc. (dry weight)**	**Small Mammal BAF**	**Source**	**Beef BAF**	**Source**
Copper	General Small Mammal	248	2.042	0.1444	17.1	0.069	a	0.009	b
Lead	General Small Mammal	125	0.0761	0.4422	9.1	0.073	a	0.0004	b
2,6-Dinitrotoluene	NA	0.072	NA	NA	NA	NA	NA	0.0000013	bc
HMX	NA	0.043	NA	NA	NA	NA	NA	0.000000097	bc
Nitrobenzene	NA	0.021	NA	NA	NA	NA	NA	0.0000016	bc
2-Nitrotoluene	NA	0.063	NA	NA	NA	NA	NA	0.0000050	bc
3-Nitrotoluene	NA	0.100	NA	NA	NA	NA	NA	0.0000063	bc
4-Nitrotoluene	NA	0.081	NA	NA	NA	NA	NA	0.0000063	bc
RDX	NA	0.080	NA	NA	NA	NA	NA	0.000050	bc
1,3,5-Trinitrobenzene	NA	0.028	NA	NA	NA	NA	NA	0.0000004	bc
Trinitrophenylmethylnitramine	NA	0.052	NA	NA	NA	NA	NA	NA	bc

Notes:

ln(Prey Conc.[dry]) = B0 + B1(ln[soil conc])

a) Source: Sample, B.E., J.J. Beauchamp, R.A. Efroymson, and G.W. Suter II. 1998. Development and Validation of *Bioaccumulation Models for Small Mammals* . Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-219.

b) Source: Oak Ridge National Laboratory Chemical-Specific Factors (ORNL RAIS, 2009) online at: http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=chem

c) Consistent with EPA 2007, Talmage et al. 1999, and considering their low log K_{ow}; munitions related compounds are readily metabolized and not expected to bioaccumulate.

NA = not available

EPC = exposure point concentration

BAF = bioaccumulation factor

TABLE 8

Calculation of Pueo NOAEL-Based Toxicity Reference Values (TRVs)

Waikane Valley Training Area, Kaneohe, O'ahu, Hawaii

Soil Constituent	Source for TRV	Chemical Form or Surrogate Tested	Laboratory Test Species Used in Selected Study	Toxicity Endpoint	Dose (mg/kg-bw-day)	Toxicity Endpoint UFs[a]	TRV (mg/kg-bw-day)
Copper	EPA Eco SSL (2007)	---	c	c	4.05	1	4.05
Lead	EPA Eco SSL (2005)	---	c	c	1.63	1	1.63
2,6-Dinitrotoluene	b	2,4-dinitrotoluene	Northern Bobwhite (quail)	Subchronic NOAEL	1.0	10	0.10
HMX	NA	NA	NA	NA	NA	NA	--
Nitrobenzene	NA	NA	NA	NA	NA	NA	--
2-Nitrotoluene	b	2,4-dinitrotoluene	Northern Bobwhite (quail)	Subchronic NOAEL	1.0	10	0.10
3-Nitrotoluene	b	2,4-dinitrotoluene	Northern Bobwhite (quail)	Subchronic NOAEL	1.0	10	0.10
4-Nitrotoluene	b	2,4-dinitrotoluene	Northern Bobwhite (quail)	Subchronic NOAEL	1.0	10	0.10
RDX	b	RDX	Northern Bobwhite (quail)	Chronic NOAEL	8.7	1	8.7
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	--
Trinitrophenylmethylnitramine	NA	NA	NA	NA	NA	NA	--

Notes:

a) Toxicity uncertainty factors used for extrapolating to chronic NOAELs are as provided by Wentsel et al., 1996

b) Wildlife Toxicity Reference Values (TRVs) for Ecological Risk Assessments: http://chppm-www.apgea.army.mil/erawg/tox/index.htm

c) EPA Ecological Soil Screening Levels conservatively compare the geometric mean of NOAELs for mortality, growth, and reproduction with the lowest LOAEL for multiple species. The geometric mean of the NOAELs is used if it is below the lowest LOAEL. If it exceeds the LOAEL, then the highest bounded NOAEL below the lowest LOAEL is used.

UF = uncertainty factor
NA = not available
NOAEL = no observed adverse effect level
LOAEL = lowest observed adverse effect level