# Environmental Hazard Evaluation/Environmental Hazard Management Plan

## Maintenance and Storage Facility

# Honolulu Rail Transit Project

## July 13, 2012

Prepared for:
Honolulu Authority for Rapid Transportation

Concurrence Letter Issued July 12, 2012 by the
Hazard Evaluation and Emergency Response (HEER) Office of the
Hawaii Department of Health (HDOH)

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## Acronyms and Abbreviations

| | |
|---|---|
| AIHA | American Industrial Hygiene Association |
| ANSI | American National Standards Institute |
| bgs | Below Ground Surface |
| BMP | Best Management Practice |
| BTEX | Benzene/ toluene/ ethylbenzene/ xylenes |
| COPC | Contaminant of Potential Concern |
| CY | Cubic Yards |
| DLNR | Department of Land and Natural Resources |
| DOH | Department of Health |
| EAL | Environmental Action Level |
| EATI | Eurofins Air Toxics, Inc. |
| ECP | Environmental Compliance Plan |
| EHE/EHMP | Environmental Hazard Evaluation/Environmental Hazard Management Plan |
| EM | Environmental Monitor |
| EPA | U.S. Environmental Protection Agency |
| ERP | Emergency Response Plan |
| FEIS | Final Environmental Impact Statement |
| GEC | General Engineering Consultant |
| HART | Honolulu Authority for Rapid Transportation |
| HCMHSP | Hazardous and Contaminated Materials Health and Safety Plan |
| HEER | Hazard Evaluation and Emergency Response |
| HRTP | Honolulu Rail Transit Project |
| IDW | Investigation-Derived Waste |
| JHA | Job Hazard Analysis |
| KKJV | Kiewit/ Kobayashi, a Joint Venture |
| LCC | Leeward Community College |
| MTBE | Methyl tertiary-butyl ether |
| MSDS | Material Safety Data Sheet |
| MSF | Maintenance and Storage Facility |
| MSL | Mean Sea Level |
| NAPL | Non-Aqueous Phase Liquids |
| NPDES | National Pollution Discharge Elimination System |
| NAVFAC | Naval Facilities Engineering Command |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| OSHA | Occupational Safety and Health Administration |
| PAHs | Polynuclear Aromatic Hydrocarbons |
| PCB | Polychlorinated biphenyl |
| PCS | Petroleum Contaminated Soil |
| PID | Photoionization detector |
| PPE | Personal Protective Equipment |
| ppm | Parts Per Million |
| SHWB | Solid and Hazardous Waste Branch |
| SPCC | Spill Prevention Control and Countermeasures Plan |
| SSSP | Site Safety and Security Plan |

| | |
|---|---|
| TGM | Technical Guidance Manual |
| TMK | Tax Map Key |
| TPH | Total Petroleum Hydrocarbons |
| TPH-D | Total Petroleum Hydrocarbons as Diesel |
| TPH-G | Total Petroleum Hydrocarbons as Gasoline |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compound |
| WHS | Waipahu High School |

# 1.0 *Introduction and Purpose*

This combined Environmental Hazard Evaluation/Environmental Hazard Management Plan (EHE/EHMP) was prepared on behalf of the Honolulu Authority for Rapid Transportation (HART) in anticipation of construction at the Maintenance and Storage Facility (MSF) associated with the Honolulu Rail Transit Project (HRTP).

The purpose of the EHE is to document the extent and magnitude of remaining contamination and the potential hazards posed by the contamination. While sections 1 though 4 are introductory and common to both the EHE and the EHMP, sections 5-6 are part of the EHE only.

The EHMP starts with section 7 and also includes the introductory material found in sections 1 through 4. The EHMP is to ensure the contamination is properly managed during construction and long term in a manner that is protective of human health and the environmental. The EHMP has been developed to reduce the potential exposure of workers to Contaminants of Potential Concern (COPCs) during construction, and the likelihood of a COPC release to the environment and to specify the requirements to manage contaminated soil, groundwater, soil vapor and stormwater. This plan is not intended to address all health and safety concerns that might be encountered during the construction. Additional hazards and additional contaminated soil not identified through pre-construction testing and not anticipated by this plan may exist. During construction, the contractor remains responsible for protecting the environment and the health and safety of its employees, workers, and the general public. Prior to the initiation of construction activities and implementation of this plan, the contractors should review applicable Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and State of Hawaii Department of Health (DOH) regulations and guidance. If hazards, health and safety concerns, or contamination not addressed in this plan are encountered, the contractor is expected to take appropriate measures to continue to protect workers, the public and the environment.

The contractor has in place many plans to comply with environmental regulations and worker health and safety. These include a Spill Prevention Control and Countermeasures Plan (SPCC), a Hazardous and Contaminated Materials Health and Safety Plan (HCMHSP), Site Safety and Security Plan (SSSP), and an Environmental Compliance Plan (ECP). In addition, the Kiewit / Kobayashi Joint Venture (KKJV) or HART has obtained numerous environment permits and clearances to allow construction.

# 2.0 *Background*

Details concerning the selection of the MSF location are in the June 2010, Final Environmental Impact Statement / Section 4(f) Evaluation (FEIS). An evaluation of potential hazardous materials expected to be encountered by the project is in the

Honolulu High-Capacity Transit Corridor Project Hazardous Materials Technical Report (2008) produced in support of the FEIS.

Three sites were evaluated for the MSF for the HRTP. The Ewa Fuel Drumming Facility was selected and acquired by HART because it was a well located, good Brownfield redevelopment, and helped preserve agricultural lands. The site, however, has a well known history of contamination. Contaminated soil could be encountered during the site development.

## 2.1 Site Location and Description

The future MSF is located north of the Middle Loch of Pearl Harbor (Figure 1). The site covers 44 acres in size and its southern boundary varies from 250 to 700 feet north of the shoreline. The Tax Map Keys (TMKs) are 1-9-4-08:10 and 1-9-6-03:44. The site has been inactive from the early 1970s and is presently overgrown with vegetation. All former buildings' appurtenant structures have been removed.

Several watercress farms are between the southern boundary of the site and the harbor.

Leeward Community College (LCC) is east of the site; Waipahu High School (WHS) is to the west; and Farrington Highway borders the site to the north.

## 2.2 Environmental Setting

### 2.2.1 Climate

Climatologic conditions in the area of the site consist of warm to moderate temperatures and low to moderate rainfall. The site is leeward of the prevailing northeasterly trade winds. The average annual precipitation is approximately 31.5 inches, occurring mainly between November and April (State of Hawaii Department of Land and Natural Resources (DLNR), 1986). Average temperatures range from the low 60's to high 80's (degrees Fahrenheit) (Atlas of Hawaii, 1983). The majority of plants currently at the site are drought resistant species such as California grass and Kiawe trees.

### 2.2.2 Geology

The MSF is located on a relatively flat alluvial plain of the Koolau volcanic shield. These alluvial sediments consist of consolidated non-calcareous deposits, typically deeply weathered, nearly impermeable, friable conglomerates. In the Pearl Harbor area, these sediments grade into partly consolidated sands and silts that are emerged delta deposits. The soil in the area of the Site is classified as Waipahu Series, which typically is developed in old alluvium derived from basic igneous rock. This material has moderately slow permeability. Runoff is also slow and the erosion hazard is none to slight.

### 2.2.3 Water Resources

Groundwater in Hawaii exists in two principal types of aquifers; basal aquifers and caprock aquifers. The first and most important type, in terms of drinking water resources, is the basal aquifer. The basal aquifer exists as a lens of fresh water floating on and displacing seawater within the pore spaces, fractures, and voids of the basalt that forms the underlying bulk of each Hawaiian island. In parts of Oahu, including the area of the Site, groundwater in the basal aquifer is confined by the overlying caprock and is under pressure. Waters that flow freely to the surface from wells that tap the basal aquifer are referred to as artesian. Several artesian springs feed the watercress farms south of the project site.

The second type of aquifer is the caprock aquifer, which consists of various kinds of unconfined and semi-confined groundwater. In the area of the MSF, the caprock is a thick sequence of permeable to semi-permeable limestone interbedded with nearly impermeable clay layers. This sequence of limestone and clays separates the caprock aquifer from the basal aquifer. These caprock materials and the artesian nature of the basal aquifer severely restrict the downward migration of groundwater from the upper caprock aquifer.

Groundwater in the area of the MSF, which is part of the Waiawa Aquifer System of the Pearl Harbor Aquifer Sector (Mink and Lau, 1990), consists of a basal aquifer that is a drinking water source. It is fresh water and is highly vulnerable to contamination.

# 3.0 *Description of Historical Site Use/Past Releases*

The Ewa Fuel Drumming Facility was constructed in 1943 as a fuel drumming and transportation terminal. There were originally 24 structures and associated appurtenances on the site relating to the drumming activities. These included the former drumming plant, a truck loading facility, valve pits, two 585,000 gallon underground storage tanks (UST) and one 5000 gallon UST.

In March 1971, vandals activated a fuel pump at one of the two underground storage tanks on the property releasing approximately 315,000 gallons of gasoline onto the ground. The spill was discovered the next day and the Navy began recovery operations.

Besides this catastrophic release, there were likely other small petroleum releases during plant operation.

# 4.0 *Current/Future Land Use*

Today the site is vacant and overgrown with vegetation. All preexisting facilities have been removed in accordance with local, state and federal regulations.

The Ewa Fuel Drumming Facility was selected and acquired by HART for the MSF for HRTP. The $195,258,000 MSF DB Contract was awarded to KKJV. The MSF will require grading, paving, track work, trenching for pipelines, electrical and communication cables and other utilities, and the construction of several buildings. Figure 2 shows the location of the facilities to be constructed. The detention basin is located at the property's low elevation close to Pearl Harbor to treat stormwater runoff.

# 5.0 *Contamination at the Site*

The site has a well known history of petroleum contamination. Although other contaminants are unlikely to be encountered, additional hazards and contaminated soil not identified through pre-construction testing and not anticipated by this plan may exist. Health and Safety and Personal Protective Equipment (PPE) requirements are in place to protect workers against inadvertent, unknown discoveries. During construction, the contractor remains responsible for protecting the environment and the health and safety of its employees, workers, and the general public.

## 5.1 Characteristics of Petroleum Contamination

Petroleum substances include a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is separated in various components through distillation. The composition of the petroleum substance and the impact on the environment and health are a function of the type of released material. In the case of the MSF, a large release of gasoline occurred in 1971 and this gasoline remains to be a COPC.

## 5.2 Potential Hazards Associated with Petroleum

In locations with gasoline releases, soil and groundwater is often found to contain benzene, toluene, xylenes, naphthalene, fluorene, and dozens of aliphatic (long-chain) hydrocarbon compounds. These substances can create both acute and chronic health effects, move easily through soil, and disperse in water.

Inhaled gasoline vapors can cause central nervous system depression. Effects such as eye and throat irritation are seen after exposure to low concentrations. Dizziness, headaches, a lack of appetite, drowsiness and poor coordination can all be attributed to exposure to gasoline vapors. Individual components of gasoline are suspected of causing cancer (e.g., benzene).

When gasoline is not trapped against the skin and can freely evaporate, it is typically only mildly irritating or not at all irritating. Gasoline can absorb through the skin, but the rate of absorption is normally slow.

Other hazards could include the explosive hazard of combustible soil vapors, leaching to groundwater, impacting aquatic receptors, and contaminating stormwater.

## 5.3 Media Affected by Petroleum Contamination

Gasoline spilled onto a ground surface, particularly an unpaved surface, will quickly saturate the pore spaces between the soil particles. As additional gasoline enters the soil, the gasoline typically moves both downward and laterally until reaching the uppermost water-bearing zone. Free product will disperse on the water table, and some of the more soluble components of the gasoline will diffuse into the groundwater. Fluctuations of the water table will “smear” gasoline above the water table, and facilitate the diffusion of gasoline constituents into the groundwater.

# 6.0 *Description of the Environmental Hazard Evaluation Process*

## 6.1 Historic Evaluations by Others

The site has been evaluated extensively. Figure 3 illustrates the location of selected facilities, remediation efforts and the contamination plume associated with the 1971 release. Figure 4 shows the contamination in relationship to the future facilities on site.

After vandals activated a fuel pump at one of the two underground storage tanks on the property releasing approximately 315,000 gallons of gasoline onto the ground the Navy began recovery operations immediately after the spill was reported and, during those efforts, 32,000 to 47,000 gallons were recovered or evaporated from the ground surface. The remaining fuel infiltrated into the ground. Extraction wells and an interceptor trench were constructed to prevent the infiltrated fuel from reaching the watercress farms south of the property. More than 100,000 gallons were recovered during the first year of cleanup efforts.

A Phase II Remedial Investigation (Department of the Navy, 2000), initiated in 1998, confirmed that the fuel spill had not impacted the farm area downgradient of the spill and would not be likely to affect it in the future. Maximum concentrations detected in caprock groundwater in 1998 and 1999 were below screening criteria. Based on these results, on March 8, 2002 the Hazard Evaluation and Emergency Response (HEER) issued a letter stating no further action was required in reference to the 315,000 gallon spill.

In 2005 the Agency for Toxic Substances and Disease Registry of the U.S. Department of Health and Human Services Public Health Service also reviewed the site and determined that there are no adverse human health effects that have or will result from the 1971 release.

In a 1998 Memorandum of Agreement pursuant to Hawaiian Home Lands Recovery Act of 1995, the Navy agreed to transfer ownership of the Ewa Drum site to the Department of Hawaiian Home Lands for the construction of housing. An

Environmental Assessment (Disposal of the Ewa Drum Property) was performed by the Navy in June 2005 to evaluate the property transfer. The assessment did not identify any significant impacts on human health or the environment. However, it did recommend that the transfer include a deed restriction to prohibit extraction/penetration to groundwater to prevent inadvertent introduction of hazardous and regulated materials into the groundwater.

The site is now vacant. The USTs were removed and soil tested at the end of 2005 (NAVFAC, 2007. "Final Unrecorded 5,000 Gallon Underground Storage Tank (UST) Closure Report"). The DOH Solid and Hazardous Waste Branch issued a No Further Action letter on August 27, 2007 for the storage tanks.

In March 2009, the Naval Facilities Engineering Command (NAVFAC) released the Environmental Condition of Property (ECP) Report for the site to evaluate the existing environmental conditions of the property and assess any environmental risks. The ECP examined a full range of potential environmental conditions at the site including asbestos, lead, medical/biohazardous waste, pesticides, radon, and unexploded ordnance. As described in the ECP, lead was encountered during the removal of the USTs on site. The sites were overexcavated and the successful removal of lead contaminated soil was confirmed. In another area on site PCB Aroclor 1260, metals and pesticides were detected but at concentrations that did not require a removal or remedial response. All facilities have been removed from the site. The report concludes that there are no land use controls or restrictions necessary for the Navy to transfer ownership of the site.

## 6.2 Recent Evaluation by KKJV/HART

As the natural degradation of the petroleum contamination caused by the 1971 release continues to occur, the current soil and groundwater analyses performed in relationship to the MSF construction are most indicative of the actual contamination still remaining on site.

### 6.2.1 Borings

KKJV conducted a limited site screening investigation at the MSF during the geotechnical investigation phase of the project in order to avoid or minimize costly delays once mass grading and utility installation activities commence. KKJV's overall goal of the limited site screening investigation was to determine whether physical indications of petroleum contaminants existed in soils that may be disturbed, and whether contaminated soils could be addressed during earthwork and other construction activities. If such physical indications of petroleum contamination existed, KKJV wanted to identify what special handling and/or management would be required.

The investigation included the advancement of 44 soil borings across the MSF site using a direct-push rig (Figure 5). The 44 boring locations correlated with planned geotechnical borings and test pits. The boring depths varied based on the planned activities in the area (i.e., cut areas, fill areas, utility lines installation, etc.), but were generally between five and 25 feet below ground surface (bgs) (The maximum cut depths based on geotechnical investigation work plan was identified as 18 feet bgs. An additional five to seven feet were added to account for utility installation after mass grading). The plan had been for an on-site environmental scientist to screen soil from each boring using visual/olfactory observations and a photoionization detector (PID), and to collect and submit samples for analysis if petroleum or other contaminants were detected. The field screening did not detect any contaminants in soil from the targeted depths; therefore KKJV did not collect or analyze soil samples these activities. If contaminants had been detected both an ambient and a headspace reading from the PID would have been recorded.

Although no contaminants were found during the environmental study, the geotechnical engineer encountered indications of petroleum contamination in soil at in two borings (BH-3 and BH-14) (Figure 6), during the subsequent geotechnical investigation. The surface elevation for BH-14 is 82.8 feet MSL and BH-3 is 31 feet MSL. The depth at which suspect petroleum contamination was encountered was approximately 20 feet bgs in BH-3 and approximately 71 feet bgs in BH-14. Groundwater was not encountered in BH-14. Groundwater in BH-3 was located at a depth of approximately 20 feet bgs.

Borings BH-3 and BH-5 had concrete debris noted in the drill log indicating that they are likely located near former facilities.

#### 6.2.1.1 Sampling Methodology

The direct-push rig was used to collect a soil sample from the boring adjacent to BH-3 for analysis for petroleum hydrocarbons. Soil sample BH3B was collected from the 20- to 22-foot interval in new, laboratory-provided containers for laboratory analysis. The soil sample was kept in a cooler with ice and chain-of-custody documentation was completed.

#### 6.2.1.2 Results

As part of the limited screening investigation, groundwater grab samples were collected from three temporary monitoring wells installed within and downgradient of the historic gasoline release (boring locations BH-3, TP-D6, and TP-F4) (Figure 6). After the completion of soil screening in each of these boring locations, the borings were advanced down through the groundwater table and a pre-packed, 1.5-inch diameter PVC well was placed into the borehole. The pre-packed wells were set at depths that would allow the groundwater table to cross the perforated, screen section of the well. A dedicated, 0.75-inch diameter polyethylene bailer was then used to purge groundwater from each well until temperature, pH, and conductivity readings (measured using a Horiba U-52 water quality meter) were relatively stable. Grab groundwater samples were then collected from each well using the dedicated bailers and placed in new, laboratory-provided containers.

The laboratory data (Table 1) indicated that the following chemicals were detected at concentrations exceeding the laboratory reporting limits:

gasoline-range organics (GRO), diesel-range organics (DRO), n-propylbenzene, 1-methylnaphthalene, 2-methylnaphthalene and naphthalene. These analytical data indicate that weathered gasoline was present, consistent with historic data regarding the former gasoline release at the MSF.

The concentrations of the detected constituents have been compared to current DOH Tier 1 Environmental Action Levels (EALs).

**Table 1: Analysis of Soil Sample from BH-3B**

| constituent | BH-3B mg/kg | Tier 1 DOH EAL mg/kg[1] |
|---|---|---|
| GRO | 942 | 100 |
| DRO | 90.5 | 100 |
| 1-methylnaphthalene | 0.456 | 0.79 |
| 2-methylnaphthalene | 1.33 | 0.87 |
| naphthalene | 0.213 | 4.4 |

[1]Tier 1 EALs used are at unrestricted sites over drinking water aquifer within 150 meters of a surface water body

Only GRO and 2-methylnaphthalene concentrations in soil sample BH-3B exceeded their DOH EALs.

KKJV did not collect samples from the 71-foot depth adjacent to BH-14 since it was anticipated that the contaminant source was the same as that found in BH3.

Resultant analytical data (Table 2) from the three groundwater grab samples collected from these borings indicated that weathered gasoline was present. The concentrations of TPH-g and TPH-d confirm the presence of non-aqueous phase liquids (NAPLs). No product was observed although the water in two borings had a slight sheen. Previous investigations summarized in the ECP, have shown that contaminants in the groundwater are generally not migrating off-site and therefore do not impact the aquatic flora and fauna at groundwater discharge points.

**Table 2: Analytical Data – Groundwater Samples**

| Analyte | BH-3 | TP-D6 | TP-F4 | DOH EAL |
|---|---|---|---|---|
| GRO | **10,200** | **21,000** | **11,000** | 100 |
| DRO | **4,560** | **9,450** | **2,180** | 100 |
| RRO | **1,070** | ND<80 | ND<85.7 | 100 |
| VOCs | | | | |
| 1,1-Dichloroethane | 0.420 J | ND<2.0 | **ND<4.0** | 2.4 |
| 1,2-Dichloropropane | 0.580 J | ND<3.0 | ND<3.5 | 5 |
| 1,1,2,2-Tetrachloroethane | **0.700 J** | **ND<1.8** | **ND<3.0** | 0.067 |
| Benzene | 1.75 J | ND<2.6 | **73** | 5 |
| Bromodicholomethane | **0.940 J** | **7.1 J** | **ND<3.0** | 0.12 |
| Chlorobenzene | 0.770 J | ND<2.4 | ND<3.6 | 25 |
| Chloroform | 0.940 J | 9.0 J | ND<3.3 | 70 |
| Ethylbenzene | **988** | **240** | **170** | 30 |
| Naphthalene | **907** | 11 J | **44 J** | 17 |
| Toluene | 4.89 J | ND<5.0 | 4.7 J | 40 |
| Trichloroethylene | 4.75 J | ND<2.6 | ND<2.6 | 5 |
| Total Xylenes | 8.37J | **501** | **50** | 20 |
| PAHs | | | | |
| 1-Methylnapththalene | **125** | **42.5** | **23** | 2.1 |
| 2-Methylnapththalene | **310** | **171** | **50.2 E** | 2.1 |
| Acenaphthene | 0.373 | 0.748 | 0.0910 J | 20 |
| Acenaphthylene | 0.0953 J | ND<0.467 | ND<0.0500 | 30 |
| Anthracene | ND<0.0386 | 0.0824 J | ND<0.0500 | 0.73 |
| Fluoranthene | ND<0.0477 | 0.100 J | ND<0.0500 | 8 |
| Fluorene | 0.176 J | 0.514 | ND<0.0500 | 3.9 |
| Naphthalene | **438** | **ND<46.7** | **24.0** | 17 |
| Phenanthrene | 0.104 J | 0.352 | ND<0.100 | 4.6 |
| Pyrene | ND<0.0501 | 0.138 | ND<0.100 | 2 |

All values in micrograms per liter (μ/l)
Only detected analytes listed in the table
DOH EAL = Tier 1 for areas where groundwater is a current of potential drinking water source and where the nearest water body is less than 150 meters for the site.
J= estimated value, below reporting limit but exceeds method detection limit
E= estimated value, value exceeded calibration range
ND= Not Detected
Boldfaced, underline values exceed Tier 1 DOH EAL

KKJV's findings from the limited site screening investigation are consistent with the known historic releases that occurred on the property. KKJV concluded that the original source of petroleum contamination appeared to have been the historic UST release. Residual petroleum contaminated groundwater was suspected to remain in the soil at or near the groundwater table.

PB believes the identified petroleum contaminants will not have a significant impact on planned site development activities. The depth of contamination is below the depths to which earthwork and trenching will occur. With current plans, excavation/grading activities are not anticipated to disturb petroleum impacted soil and groundwater. If, however, contaminated soil and groundwater are encountered, they will be managed as described in sections 8.1 and 8.2.

### 6.2.2 Vapor Tests

HEER sent a letter dated April 2, 2012 to HART regarding Management of Environmental Concerns at the Ewa Junction Fuel Drumming Facility during Construction of the Maintenance and Storage Facility. In this letter, DOH HEER expressed its concern with a data gap regarding potential soil vapor emissions due to underlying petroleum impacts in the soil and groundwater. The DOH HEER Office suggested that HART "collect three to five soil vapor samples at five feet bgs from areas of the site with the highest concentrations of petroleum contamination." Details of the investigation are in the EnviroServices Soil Vapor Sampling Summary Letter provided to DOH HEER and are summarized below. Results of the soil vapor test show that all analytes were not detected or below EALs.

#### 6.2.2.1 Sampling Objectives

The overall objective of the sampling activities was to measure contaminant concentrations in the shallow soil gas above and in the vicinity of the residual petroleum contaminated soil and groundwater plume. This data will help to bridge the gap in identifying environmental hazards existing at the MSF site and will be used to determine whether additional activities (e.g., remediation, engineering controls, administrative controls, etc.) may be warranted to protect public health and the environment.

#### 6.2.2.2 Contaminants of Potential Concern

Based on existing information about the project site, the following COPCs were identified for soil vapor sampling activities:

- Total petroleum hydrocarbons (TPH) as gasoline (TPH-G) (carbon range C5-C12, C5-C24)
- TPH as diesel (TPH-D) (carbon range C5-C24)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX)
- Methyl tertiary-butyl ether (MTBE)
- Naphthalene
- Methane

#### 6.2.2.3 Sample Locations and Methodology

A total of five soil vapor sample locations were identified by HART and are shown in on Figure 7. These locations were placed within the area where residual subsurface petroleum contamination is anticipated based on documents referenced in the March 2009 ECP report and areas where there may be potential vapor intrusion concerns into planned, enclosed structures.

The sampling was performed in accordance with the DOH's Interim Final Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, November 2009 (TGM). Collection of soil vapor samples was performed on June 4, 2012.

The soil vapor probes were installed to a depth of 5 feet below ground surface (bgs) using the hydraulic hammer on the direct push rig at each sample location. The systems were allowed to equilibrate and were purged. New 6 liter Summa canisters were connected and checked for leaks. Helium gas was also used as a quantitative leak check to determine whether the soil vapor sample drawn into the sample containers included air from the ground surface surrounding the borehole.

To collect the sample, the initial vacuum pressure in the Summa canister was recorded and the valve on the Summa canister was opened. The flow controllers connected to the Summa canisters were all calibrated by the laboratory to allow a flow rate of no more than 100 milliliters per minute. Each Summa canister valve was left open for 50 minutes. Five samples and one duplicate were collected. All sample containers were labeled with the project name, sample identification number, date/time of sample collection, sampler's initials, and the requested analyses. The samples were kept in a sample storage container pending delivery to FedEx with completed chain of custody documentation.

#### 6.2.2.4 Analysis and Results

Six soil vapor samples were shipped via FedEx on June 5, 2012 accompanied by completed chain of custody documentation to Eurofins Air Toxics, Inc. (EATI) in Folsom, California. Samples were received by EATI on June 6, 2012. ETC requested that EATI analyze the samples for total petroleum hydrocarbons (TPH) as gasoline (TPH-G), methyl tertiary butyl ether (MtBE), benzene, toluene, ethylbenzene, xylenes, and naphthalene via EPA Method TO-15 modified (Summa canisters); TPH-G and TPH as diesel (TPH-D) via EPA Method TO-17 VI modified (sorbent tubes); and methane and helium via Modified ASTM D 1946.

Tables 3 and 4 show that the results do not exceed residential or commercial/industrial EALs.

## Table 3: Soil Vapor Data - VOCs

**Soil Vapor Data - VOCs**
EPA TO-15 (Summa Canister), EPA TO-17 (Sorbent Tube)

| Sample ID | 11-2012.SV1 | 11-2012.SV6 | 11-2012.SV2 | 11-2012.SV3 | 11-2012.SV4 | 11-2012.SV5 | *DOH EAL (Residential) | *DOH EAL (Commercial/ Industrial) |
|---|---|---|---|---|---|---|---|---|
| Lab ID | 1206096A-01A 1206096C-07A | 1206096A-06A 1206096C-12A | 1206096A-02A 1206096C-08A | 1206096A-03A 1206096C-09A | 1206096A-04A 1206096C-10A | 1206096A-05A 1206096C-11A | | |
| Date Collected | 6/4/2012 | 6/4/2012 | 6/4/2012 | 6/4/2012 | 6/4/2012 | 6/4/2012 | | |
| | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ | $\mu g/m^3$ |
| Methyl Tert-butyl ether | *nd<4.0* | *nd<3.3* | *nd<3.3* | *nd<3.2* | *nd<3.4* | *nd<3.2* | **9,400** | **31,000** |
| Benzene | 3.0 | *nd<2.9* | *nd<2.9* | *nd<2.8* | 5.7 | 3.5 | **310** | **1,000** |
| Toluene | 7.2 | 7.7 | *nd<3.4* | 4.0 | *nd<3.5* | 5.7 | **1,000,000** | **2,900,000** |
| Ethylbenzene | *nd<4.0* | *nd<4.0* | *nd<3.9* | *nd<3.8* | *nd<4.1* | *nd<3.8* | **970** | **3,300** |
| m,p-Xylenes | 4.7 | 4.9 | *nd<3.9* | *nd<3.8* | *nd<4.1* | *nd<3.8* | **NA** | **NA** |
| o-Xylenes | *nd<4.0* | *nd<4.0* | *nd<3.9* | *nd<3.8* | *nd<4.1* | *nd<3.8* | **NA** | **NA** |
| Xylenes, total | 4.7 | 4.9 | *nd<3.9* | *nd<3.8* | *nd<4.1* | *nd<3.8* | **21,000** | **58,000** |
| Naphthalene | *nd<19* | *nd<19* | *nd<19* | *nd<18* | *nd<20* | *nd<18* | **72** | **240** |
| TPH-G (MW=100) | 270 | *nd<190* | 360 | 320 | *nd<190* | *nd<180* | **130,000** | **370,000** |
| TPH-G (Sorbent Tube) | 26,000 | *nd<20,000* | *nd<20,000* | *nd<20,000* | 22,000 | *nd<20,000* | **130,000** | **370,000** |
| TPH-D (Sorbent Tube) | *nd<20,000* | *nd<20,000* | *nd<20,000* | *nd<20,000* | *nd<20,000* | *nd<20,000* | **130,000** | **370,000** |

All results presented in micrograms per cubic meter ($\mu g/m^3$) as noted
*DOH EALs based on information provided by HART and approved by the DOH HEER Office.
DOH EAL = Fall 2011 Hawaii Department of Health (DOH) Environmental Action Levels (EALs) for Shallow Soil Gas in areas of residential and commercial/industrial land use.
Sample SV6 is a field duplicate of SV1
Xylenes, total = sum of m,p-Xylenes and o-Xylenes
Italicized values = Not Detected at the MDL, MDL value listed

## Table 4: Soil Vapor Data- Methane and Helium

**Soil Vapor Data - Methane & Helium**
Modified ASTM D-1946 (Methane/Helium)

| Sample ID | Lab ID | Date Collected | Methane | | Helium | |
|---|---|---|---|---|---|---|
| | | | %(v/v) | ppmv | %(v/v) | ppmv |
| 11-2012.SV1 | 1206096B-01A | 6/4/2012 | 0.00047 | 4.7 | *nd<0.092* | *nd<920* |
| 11-2012.SV6 (SV1 Dup) | 1206096B-06A | 6/4/2012 | 0.00046 | 4.6 | *nd<0.092* | *nd<920* |
| 11-2012.SV2 | 1206096B-02A | 6/4/2012 | *nd<0.00018* | *nd<1.8* | *nd<0.090* | *nd<900* |
| 11-2012.SV3 | 1206096B-03A | 6/4/2012 | *nd<0.00018* | *nd<1.8* | *nd<0.088* | *nd<880* |
| 11-2012.SV4 | 1206096B-04A | 6/4/2012 | *nd<0.00018* | *nd<1.8* | *nd<0.094* | *nd<940* |
| 11-2012.SV5 | 1206096B-05A | 6/4/2012 | *nd<0.00018* | *nd<1.8* | *nd<0.088* | *nd<880* |
| ***Action Level** | | | **NA** | **5,000** | **NA** | **NA** |

All results presented in percent and parts per million by volume (ppmv)
*Action Level based on information provided by HART and approved by DOH HEER Office.
Action Level = 10% of the lower explosive limit (LEL) for methane.

# 7.0 *Sources, Receptors and Pathways for Contaminants of Potential Concern*

The beginning of this report was the EHE and documented the extent and magnitude of remaining contamination and the potential hazards posed by the contamination. The EHMP begins here with section 7 and includes sections 1-4 as introductory material. The EHMP will ensure the contamination is properly managed during construction and in the long term in a manner that is protective of human health and the environment. This EHMP has been developed to reduce the potential exposure of workers to COPCs during construction, and the likelihood of a COPC releases to the environment and to specify the requirements to manage contaminated soil, groundwater, soil vapor and stormwater.

## 7.1 Regulation of Contaminants of Potential Concern

COPCs that may be encountered during these construction activities and their environmental action levels are summarized below in Table 5. The list of substances is not exhaustive, rather it includes the substances believed to be most likely to be encountered, and the applicable criteria that should be considered during the HRTP construction activities. The U.S. EPA and DOH have created standards for additional substances and potential exposure scenarios that might need to be considered as additional information about contamination is discovered, or if additional pathways for exposure or damage to the environment exist.

**Table 5: Environmental Action Levels**

| Constituent | Tier 1 Soil EAL (mg/kg) | Construction / Trench Worker Direct Exposure EAL (mg/kg) | Lowest Groundwater EAL (µg/L) | Hawaii Surface Water Standards | |
|---|---|---|---|---|---|
| | | | | Freshwater (µg/L) | Saltwater (µg/L) |
| Benzene | 0.3 | 29 | 5.0 | 1,800 | 1,700 |
| Ethylbenzene | 3.7 | 150 | 30 | 11,000 | --- |
| Toluene | 3.2 | 820 | 40 | 5,800 | 2,100 |
| Xylene | 2.1 | 390 | 20 | --- | --- |
| MTBE | 0.028 | 1,200 | 5.0 | --- | --- |
| TPH (gasolines) | 100 | 1,700 | 100 | --- | --- |
| TPH (mid-range) | 100 | 500 | 100 | --- | --- |
| TPH (residual fuels) | 500 | 250,000 | 100 | --- | --- |
| Tetrachloroethylene | 0.088 | 17 | 5.0 | 1,800 | 145 |
| Trichloroethylene | 0.26 | 27 | 5.0 | 15,000 | 700 |
| cis-1,2-dichloro-ethylene | 0.31 | 24 | 70 | --- | --- |
| Vinyl chloride | 0.072 | 10 | 2.0 | --- | --- |
| PCBs | 1.1 | 25 | 0.014 | 0.014 | 0.03 |
| DBCP | 0.0009 | 0.39 | 0.04 | --- | --- |
| EDB | 0.00037 | 0.86 | 0.04 | --- | --- |
| Chlordane | 16 | 520 | 0.004 | 0.0043 | 0.004 |
| Aldrin | 0.91 | 22 | 0.004 | 3 | 1.3 |
| Dieldrin | 1.5 | 36 | 0.0019 | 0.0019 | 0.0019 |
| Dioxins/Furans | 0.00024 | 0.0015 | 0.000005 | 0.003 | --- |

| Constituent | Tier 1 Soil EAL (mg/kg) | Construction / Trench Worker Direct Exposure EAL (mg/kg) | Lowest Groundwater EAL (µg/L) | Hawaii Surface Water Standards | |
|---|---|---|---|---|---|
| | | | | Freshwater (µg/L) | Saltwater (µg/L) |
| Arsenic | 24 | 130 | 10 | 190 | 36 |
| Lead | 200 | 800 | 5.6 | 29 | 5.6 |
| Mercury | 4.7 | 90 | 0.025 | 0.55 | 0.025 |
| Tier 1 Soil EALs and the lowest Groundwater EALs assume unrestricted land use, that a drinking water resource exists, and that the distance to surface water is less than 150 meters.<br>Construction worker standards assume that exposure to substances will be by direct contact of workers with soils in trenches.<br>Surface water standards shown are the lower of either the chronic or acute toxicity standards identified by HDOH. HDOH had not adopted surface water standards for some compounds. | | | | | |

## 7.2 Sources of Contaminants of Potential Concern

Petroleum contaminated soil, groundwater, stormwater and soil vapor are the potential concerns at the MSF. If not properly managed, however, excavated soils could come into contact with rainwater, and be transported off-site as stormwater runoff, creating a third source of COPC exposure. The construction project will involve the removal, relocation, and installation of subsurface utility pipelines and electrical and communication cables and extensive grading (Figure 8). Currently, there are no plans to disturb soil or groundwater at depths near the existing groundwater table in areas where petroleum contaminated soil and/or groundwater is anticipated based on historic environmental reports and recent environmental screening activities.

Free product is unlikely to be encountered during construction due to the following:

- The construction work only being near the ground surface.
- Although concentrations of TPH in groundwater indicate the presence of free product in some locations, free product has not been observed on site in about a decade.

## 7.3 Potential Receptors

The potential receptors on the Site include individuals in the following capacities:

- MSF Construction Workers
- Landscapers
- Authorized visitors to MSF

- Trespassers to MSF
- Workers employed during the operation of transit

Off-site receptors include the flora and fauna in Pearl Harbor and the watercress farms which could be impacted if contamination reached beyond the site.

## 7.4 Potential Environmental Hazards Created by Contamination

Construction activities at the MSF could release contamination in soil and effect workers, the public, and the environment. The MSF will require grading, paving, trackwork, trenching for pipelines, electrical and communication cables and other utilities, and the construction of several buildings. These activities could expose previously-buried contaminated soil, and increase the potential for stormwater infiltration in the exposed areas. The current site development plans, however, do not require excavation/grading activities that will disturb petroleum impacted soil and groundwater, thus special handling and management requirements are not needed to minimize/eliminate direct human contact with contaminants. Furthermore, cut and fill quantities on site have been balanced, allowing all soil to stay on the property.

If contaminated material is encountered, environmental impacts created by these activities could include the following:

- Workers, visitors and trespassers could have direct contact with contaminated soil during excavation activities, and the removal and installation of utilities.
- Contaminated soil could be washed from a newly exposed ground surface or soil piles during storm events.
- Stormwater could infiltrate and leach from the base of stockpiled soils, and flow to surface water.
- Stormwater infiltrating uncontained stockpiled soil could leach COPCs and transport them into underlying soils and groundwater.
- Volatile COPCs could become airborne and be inhaled.
- Dry contaminated soil could become airborne and inhaled as particulate matter.

## 7.5 Exposure Pathways

The potential exposure pathways in which humans could be exposed to hazardous substances include ingestion, inhalation, and dermal contact. These are described briefly below.

### 7.5.1 Ingestion

Ingestion is the oral intake of a solid or liquid material. The ingestion of contaminated soil or groundwater is a direct exposure hazard. Accidental ingestion of contaminated soil could occur during construction at the MSF where contaminated soil is exposed. Ingestion of COPCs is most likely to occur when workers fail to clean their hands prior to eating and smoking.

### 7.5.2 Inhalation

Inhalation is the act of drawing air, other gases, vapors, fumes, smoke, dust, or mists into the lungs. Some chemicals in contaminated soil volatilize when the soil and or groundwater is exposed. During excavation and construction activities, contaminated subsurface soils may be disturbed, thus increasing the potential release of dust and volatile compound into the work area, and the risk that COPCs could be inhaled.

### 7.5.3 Dermal Contact

Dermal contact is the direct exposure of skin to solids, liquids, or gases with contaminated soil, groundwater, or vapor. Upon contact, some substances have the potential to absorb directly into the body through the skin. During excavation contaminated soils could be encountered, thus increasing the potential for dermal contact.

# 8.0 *Exposure Prevention and Control Plan*

This exposure prevention and control plan has been developed to reduce the potential exposure of workers to COPCs during construction, and the likelihood of a COPC releases to the environment. The plan consists of several individual plans, each addressing a specific potential COPC source. The individual plans include the following:

- Soil Management Plan
- Groundwater Management Plan
- Vapor Management Plan
- Storm Water Management Plan

## 8.1 Management of Environmental Hazards during Construction Activities

An environmental monitor (EM) or designee with experience in managing the remediation of contaminated properties should be present while working in areas where contaminated media is known to exist or when visible or olfactory evidence of contamination is observed by construction workers. The role of the EM will be to:

- Monitor excavated soil for visible or olfactory evidence of contamination
- Monitor groundwater in excavations for visible or olfactory evidence of contamination
- Perform field testing of soil and samples

- Direct collection of samples for laboratory analysis
- Direct the placement of excavated soil in appropriate waste disposal containers
- Direct the appropriate use of excavated soils as backfill
- Provide health and safety guidance related to the potential exposure of workers to COPCs
- Monitor the work activities to ensure compliance with this environmental hazard management plan.
- Coordinate with government regulatory agencies as required.

A communications plan is an important part of an environmental hazard management program. KKJV's HCMHSP clearly identifies which individuals should be notified about changes in site conditions, how to report the existence of evidence of contamination and what efforts are being taken to protect workers, the public and the environment from possible exposure to COPCs. The plan also identifies the roles, responsibilities, and authority each individual has in making decisions regarding how the health and safety of the worksite is monitored, the requirements for worker protection, and what additional efforts might need to be taken to protect the general public and the environment.

In addition, KKJV also has a SSSP which details who is allowed on-site, how construction site hazards are communicated, what training programs individuals must have to work in various areas, fire prevention, PPE, and other information on all the general hazards that can be encountered at a construction site.

### 8.1.1 Soil Management Plan

The purpose of the soil management plan is to help ensure that areas with contaminated soil encountered during construction are identified, the risks associated with working in these areas are understood, and that these risks are appropriately addressed. As discussed previously, the main hazards created by contaminated soil are direct exposure, ingestion of COPCs, inhalation of vapors or dust containing COPCs, and releases of COPCs to the environment through contact with stormwater.

### 8.1.2 Soil Screening for Contamination

Currently, there are no plans to disturb soil at depths near the existing groundwater table in areas where petroleum contaminated soil and/or groundwater is anticipated based on historic environmental reports and recent environmental screening activities. The worksite and soils excavated from the construction areas will be screened by KKJV using the following process:

- Visual observations (gray or black staining/discoloration, melted glass, petroleum sheen, old construction debris such as concrete pieces, slag, drums, etc.).

- Olfactory observations (petroleum or other unusual chemical odors emanating from the soil or groundwater).
- Soil vapor headspace readings (volatile organic compound vapors in soil as determined using a PID, useful for volatile organic compounds only).

### 8.1.3 Sampling and Analysis

If field screening indicates the necessity for quantifying contaminant concentrations, then samples may be collected from the affected materials. There are generally four types of sampling and analysis activities that may be reasonably anticipated over the course of site construction:

- Identification and quantification of unknown or unanticipated contaminants
- Characterization of excavated soil for re--use on-site
- Characterization of excavated soil for disposal off-site
- Characterization of excavation limits

The purpose of sample collection will dictate sampling methodology and laboratory request for analyses.

#### 8.1.3.1 Sampling Analysis for Identification

Sampling of hazardous or contaminated materials due to an unknown source will vary depending on the media and the physical characteristics of the unknown material. Generally, the following steps would be taken:

- Use physical characteristics to provide clues on the potential hazards. Such observations a sheen, staining, debris like chunks of concrete or old pipes can be indicative.
- Use field hazardous categorization tests (e.g., pH paper, oxidizer paper, flammability, liquid density relative to water, etc.) to obtain more information.
- Collect an aliquot of the material for a broad range of laboratory analyses. Any information obtained through the first two steps can be used to narrow down the list of laboratory analyses.
- Compare resultant analytical data to appropriate risk-based action levels to determine whether contaminant concentrations may present an environmental hazard.

#### 8.1.3.2 Sampling and Analysis for Contaminated Soil Re-Use

Soil with visible or olfactory evidence of petroleum contamination may be sampled to quantify the contaminant concentrations. This sampling may be performed immediately after excavation and/or after the soil has been stockpiled, aerated, or treated through land-farming (i.e., on-site “remediation” of petroleum contaminated soil prior to re-use).

If other contaminants are identified through field screening or testing representative samples may be collected to identify the average COPCs, and whether the soil can be re-used on-site.

If contamination is known or suspected to be present, a multi-incremental sampling approach will be followed to measure average contaminant concentrations in the soil being considered for re-use. Sample collection procedures will be in general accordance with the DOH HEER Office’s November 2008 Interim Final *Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan* (DOH HEER TGM).

- Each multi-incremental sample shall consist of 30 soil increments collected in a random, stratified manner from the entire volume of soil (200 CY) for which the sample will represent.
- Collect soil increments of the same relative volume/weight (i.e., each increment consisting of a 5-gram soil aliquot or similar).
- Use appropriate sample collection methodology to ensure preservation of VOCs by collecting at depths below 1 foot bgs or deeper. Details describing the containers needed for volatile soil samples are in Section 11.1.1.2 of the TGM.
- Label samples and place in designated sample container, assuring appropriate sample preservation techniques in accordance with standard Environmental Protection Agency (EPA) or equivalent procedures. The TGM, Section 11, specifies sample handling procedures such as types of sample containers, thermal preservation and hold times.
- Complete chain-of-custody documentation.

Samples will be delivered or shipped to a selected environmental laboratory experienced in analyzing for environmental contaminants. The laboratory will be instructed to prepare the multi-incremental samples following the DOH HEER TGM and will analyze the prepared samples for a combination of the following assuming known petroleum impacts:

- Total petroleum hydrocarbons (TPH) as gasoline (TPH-G)
- TPH as diesel (TPH-D)
- Benzene/toluene//ethylbenzene/xylenes (BTEX)
- Polynuclear aromatic hydrocarbons (PAHs), including methylnaphthalenes
- Total lead
- Other analyses would be requested in situations where there are suspected impacts from unknown contaminants.

Samples will be analyzed in general accordance with the EPA's *SW--846 On-line Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* or equivalent. The resultant data will be compared to appropriate DOH EALs provided in the DOH's Fall 2011 *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater*. If the concentrations of contaminants in the soil are below the relevant EALs the soil will be considered suitable for reuse on-site.

#### 8.1.3.3 Sampling and Analysis for Contaminated Soil Offsite Disposal

If contaminated soil will be transported off-site for disposal at a government-permitted solid waste disposal facility, either PVT Landfill or Waimanalo Gulch Sanitary Landfill on Oahu, samples will be collected and analyzed to conform to landfill disposal requirements. The test results will be used to prepare a waste profile for the submission to the selected facility for review.

#### 8.1.3.4 Confirmation Sampling and Analysis

Confirmation sampling and analysis is performed during remediation projects to document that the targeted contaminated materials have been sufficiently removed to satisfy the project-specific goals. Confirmation sampling is conducted to ensure that contamination left in place will not migrate to other media or locations, or otherwise affect human health and the environment. For this project, handling and management of contaminated soil is only incidental to achieving construction-related objectives. As such, complete removal of contaminated materials is not the goal and confirmation sampling will only be performed if documentation of contaminant concentrations to be left in-place is the objective. It may be appropriate to inter contaminated soil at certain depths but not at the surface. If the surface has been potentially impacted, confirmation samples are needed.

Confirmation sampling procedures, if required, will be dependent on the situation and data objectives. The multi-incremental sample collection approach described above in Section 8.1.3.2 will be the initial methodology considered. The steps will be the same, however the frequency will differ, depending on the contaminants that need to be characterized (e.g., an excavation wall, a trench floor, etc.).

The selected analysis for confirmation sampling and testing will be reflective of the known or suspected contaminants. The test results will be compared DOH EALs to evaluate the adequacy of the cleanup.

### 8.1.4 Work Activities When Removing Contaminated Soil

With current plans, excavation/grading activities are not anticipated to disturb petroleum impacted soil and groundwater. If encountered and removal is required, petroleum contaminated soil removal will likely be performed using an excavator capable of removing the contaminated soil from the depth at which they are located. Since any excavation into petroleum contaminated soil will be incidental to construction activities, the limits of excavation will be dictated by the construction plans.

KKJV will provide a minimum of seven calendar days notice to the GEC/HART prior to excavating in areas where there are indications that petroleum contaminated soil will be encountered. Contaminated soil excavation will generally include the following:

- The KKJV Environmental Monitor (EM) or designee will be on-site to assist with the segregation of contaminated soil from unaffected soil using field screening techniques.
- The designated soil stockpile area for contaminated soil will be lined with minimum 10-mil thickness polyethylene sheeting. The ground surface beneath the stockpile area will be cleared of any rocks exceeding 0.5 inches in diameter or other objects that could damage the polyethylene sheeting.
- Individual stockpiles shall not exceed 100 CY.
- Unaffected, or “clean,” soil will be stripped away using a different or decontaminated excavator and placed in a separate stockpile area pending re-use.
- Maintain a log of the excavation activities; record the depths and locations where contaminated soil is located, approximate quantities of contaminated soil removed, approximate quantity of soil removed, excavation dimensions, and other relevant information.
- Contaminated soil will be placed in the designated stockpile area described above or placed in roll-off bins lined with 10--mil polyethylene sheeting.
- After completion of contaminated soil excavation, the contaminated soil stockpile(s) will be covered with minimum 6-mil thickness polyethylene sheeting to prevent exposure to rainfall and minimize the generation of fugitive dust. Similarly, contaminated soil placed in roll-off bins will be covered using minimum 6-mil thickness polyethylene sheeting or similar to prevent fugitive dust generation in transit.
- At the edges of the stockpile, both the bottom liner (10-mil polyethylene sheeting) and the top cover (6-mil polyethylene sheeting) will be rolled together and weighted down to prevent contaminated soil from running off during rain events. The top cover will be anchored to prevent it from being removed by the wind.
- Equipment used to handle contaminated soil will be decontaminated as described in the equipment decontamination procedures in section 8.7 and rinsate will be allowed to soak into the stockpiled contaminated soil
- Stockpiles will be labeled to indicate whether the material is clean or contaminated.

- Workers will be instructed about the identification and different use of each stockpile as part of the Job Hazard Analysis (JHA) for the site and during safety briefings

Petroleum contaminated soil stockpiles to be treated on-site via aeration techniques and/or natural contaminant degradation for eventual re-use on the site as fill will be handled as follows:

- Provided that sufficient space is available, the petroleum contaminated soil stockpile will generally be limited to a height of two to three feet to allow adequate exposure of the soil to outside air.
- An excavator or backhoe will be used to “till” the soil on a regular basis (generally once a week) to ensure that the soil is adequately aerated and mixed.
- Use field screening techniques described in HCMHSP and the flow chart in section 8.3.3 to monitor the effectiveness of on-site treatment.
- Calibrate the PID in accordance with manufacturer’s recommendations at least once a day and as needed thereafter.
- Obtain an aliquot of soil to be screened and immediately place soil into a resealable container and seal the container.
- Break apart cohesive soils in the container to allow vapors to escape from the soil pore space.
- After allowing the sample to reach ambient temperature, place the probe end of the PID into the container and monitor the resultant reading.
- Once PID readings start dropping, remove the PID probe from the container and record the highest, stabilized PID reading in ppm.
- Field screening data will be evaluated based on the flow chart included in section 8.3.3.

Once analytical data indicate that petroleum- and petroleum-related constituent concentrations are below appropriate DOH EALs, the soil can then be used as fill on-site. Soil with TPH concentrations >500 ppm and <5,000 ppm may remain on-site with a 3-foot cap, preferably over the existing contamination plume and not near or under the detention basin. The cut and fill requirements at the MSF have been balanced so that all soil can remain on the site. Figure 5 shows the approximate limits of cut and fill on the site. The maximum amount of ‘cut’ proposed is approximately 18 feet while in some places there will be approximately 30 feet of fill.

### 8.1.5 Transportation and Disposal

All soil is expected to remain on-site. If, however, it is determined that contaminated soil must be transported off-site for disposal, samples will be collected and tested. Results from the sample analysis will be used to prepare a waste profile specific to the government-permitted solid waste disposal facility (either PVT Landfill or Waimanalo Gulch Sanitary Landfill on Oahu) and the completed waste profile will be submitted to the selected facility for review.

Once approval is received from the designated disposal facility, a loader or excavator will be used to load the soil into semi-trucks or roll-off bins. Each load will be covered with polyethylene sheeting, tarpaulin or similar to prevent generation of fugitive dust during transport. All loads will be accompanied by a completed waste manifest or bill of lading to track the shipment. Based on the contaminants that might need to be removed from the site, transport vehicles will not need specific placards or signage. Drivers shall maintain and submit to KKJV signed manifests and/or weight tickets received from the selected facility for each load delivered.

## 8.2 Groundwater Management Plan

Contaminated groundwater has been discovered while drilling geotechnical test borings and through prior environmental studies at the MSF. The identified petroleum contaminants, however, will not affect the planned site development activities. The current site development plans are not expected to disturb petroleum impacted groundwater, thus special handling and management requirements to minimize/eliminate direct human contact with petroleum impacted media are not expected. The detention basin is located above the groundwater table and, as the soils are fairly impermeable clays and silts, little infiltration is expected (Lyon Associates, 2012).

This groundwater management plan is intended to help ensure that if contaminated groundwater is encountered during construction it is properly managed. As discussed earlier, the main hazards created by contaminated water are direct exposure, ingestion of water containing COPCs, inhalation of volatile COPCs released from water, and releases of COPCs to the environment through contact of water with contaminated soil. Groundwater contamination can be spread through discharge to surface water and storm drains especially during dewatering activities, storm events, or poorly designed site drainage.

### 8.2.1 Site Preparation for Handling Contaminated Water

If contaminated groundwater is encountered on site, safe work practices and HDOH and U.S. EPA regulations and guidelines will control how the water is managed. Further work should proceed only when the contractor has ensured that the following precautions and preparations are in place:

- Workers have the appropriate level of PPE.
- Field oversight will be provided to identify contaminated groundwater and provide health and safety guidance related to the potential exposure of workers to COPCs.
- Water that flows from soils during removal from the excavation should be discharged back into the excavation.

### 8.2.2 Groundwater Treatment and Disposal

With current site development plans, excavation/grading activities are not anticipated to disturb groundwater. Even if petroleum contaminated soils must be removed below the water table, dewatering will be avoided. No NPDES Construction Dewatering permit is anticipated for the project and no water will be discharged to Waters of the U.S. If no feasible alternative exists and dewatering must occur, water removed from the excavation will be stored in drums or tanks on-site and tested to identify the concentrations of potential contaminants, and if needed, transported for off-site treatment and disposal. Potential options for treatment and disposal of contaminated water include wastewater treatment plants such as Unitek's or Philips Services'.

## 8.3 Vapor Management Plan

The purpose of the vapor management plan is to identify and address volatile substances that could degrade air quality, or create dangerous conditions during construction activities. The principal hazards posed by volatized COPCs above are direct exposure through inhalation, and the flammability and explosively of many COPC substances related to petroleum. Based on recently performed soil gas vapor studies (Section 6.2.2) soil vapor is not expected in undisturbed areas. Should soil vapor become an issue, it will be addressed in the vapor management plan. If soil gas vapors are encountered on site during construction, a vapor collection system and vapor barriers could be installed below buildings to protect long-term workers on the site

This plan describes the use of vapor monitoring to identify PCS and the necessary controls to minimize the exposure of workers to hazardous vapors, and reduce the risk of explosions and fires created by COPCs.

### 8.3.1 Vapor Management

If volatile COPCs are found during excavation activities, the concentrations of these vapors must be controlled pursuant to HDOH and EPA regulations and guidelines. The goal of response actions is to ensure workers are not exposed to hazardous volatized COPC concentrations, and that the public is not adversely affected. The tasks needed to manage vapor exposure are summarized below:

- If vapors are encountered while excavating soils, the concentrations of the vapors both within the workspace and at the perimeter of the work area need to monitored.
- Before workers enter an excavation, air monitoring inside the excavation must begin. Air monitoring of LEL and VOC vapor concentrations (including benzene) must continue as long as workers remain in the excavation.
- If air monitoring indicates that vapor concentrations exceed safe threshold levels, workers will be removed from the excavation until it has been properly vented. It is unlikely work will be necessary in areas requiring Level C or higher respiratory protection.

### 8.3.2 Soil Vapor Headspace Screening

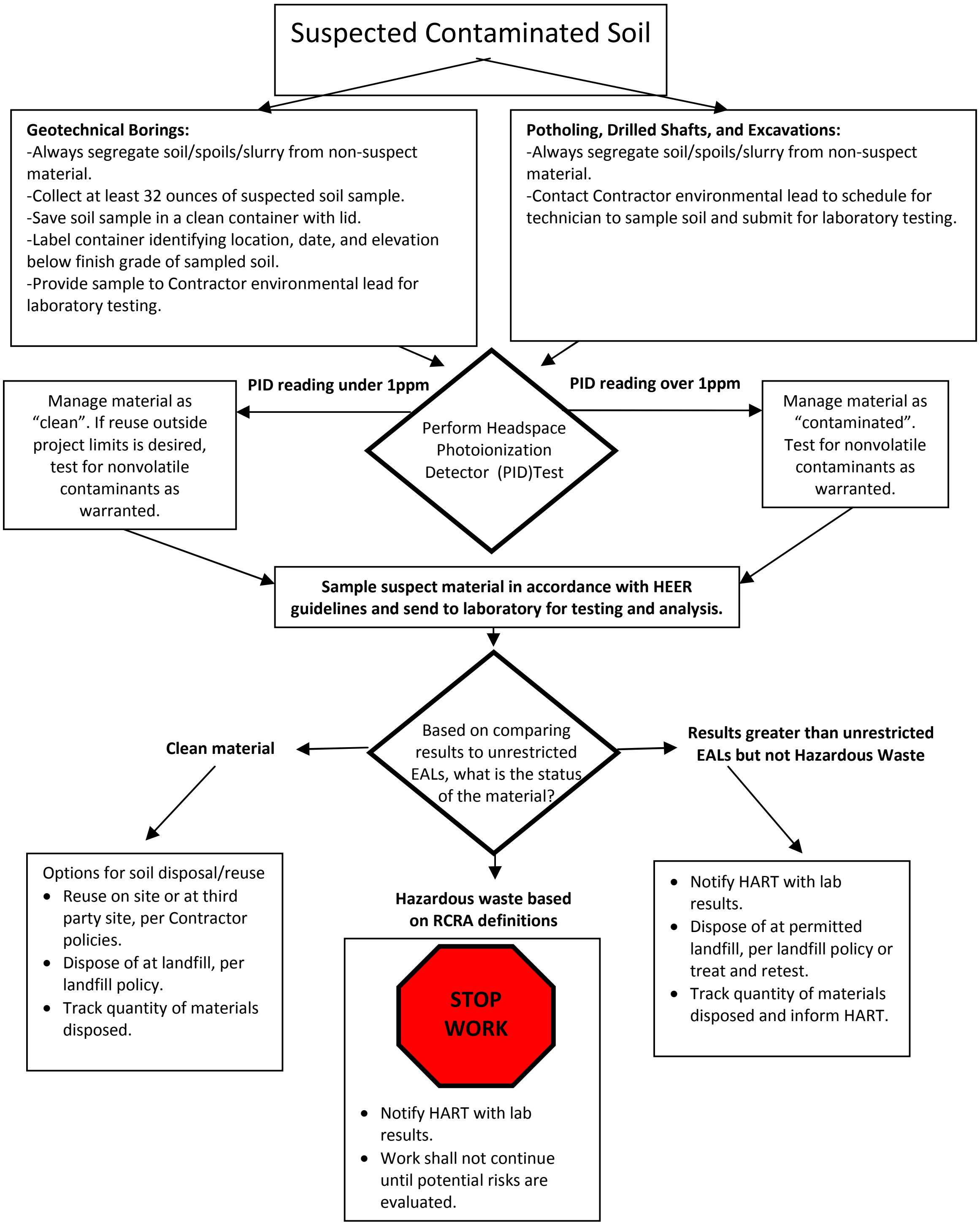
Screening soil vapor headspace samples for volatile organic compounds (VOC) using a PID is a useful method to detect petroleum impacts in the absence of physical observations. Soil vapor headspace analysis can also provide a rough estimate on the magnitude of petroleum impact based on the relative VOC concentrations detected by the PID. Note, however, that screening soil vapor headspace samples with a PID is a qualitative method only, and should not be relied upon to make quantitative estimates. Soil vapor headspace samples will be collected as follows:

- Calibrate the PID in accordance with manufacture's recommendations at least once a day and as needed thereafter.
- Obtain an aliquot of soil to be screened (approximately 30- to 500-grams, or about a handful) and immediately place soil into a re-sealable container (e.g., Ziploc™ bag) and seal the container.
- Break apart cohesive soils in the container to allow vapors to escape from the soil pore space.
- After allowing the sample to reach ambient temperature, place the probe end of the PID into the container and monitor the resultant readings.
- Once PID readings start dropping, remove the PID probe from the container and record the highest, stabilized PID reading in parts per million (ppm).

As previously mentioned, the analysis of soil vapor headspace samples using a PID is only effective for VOCs. If other COPCs are suspected, this method will not be effective for identifying their presence.

### 8.3.3 Threshold Screening Levels

There are currently no reliable regulatory threshold levels for field screening of potential petroleum contaminated soils. For the purposes of this project, site personnel will need to rely on their judgment, along with soil vapor headspace readings with a PID, to assess whether petroleum impacts are significant. Soil with significant petroleum staining or strong petroleum odors should be considered suspect and trigger the need to segregate these soils for further evaluation as described in the following flow chart. Caution should be exercised when screening shafts and excavations for potentially explosive vapors in areas of suspected petroleum contamination. If there is a potential explosive hazard, the crew should stop work.


Suspected Contaminated Soil
Geotechnical Borings:
-Always segregate soil/spoils/slurry from non-suspect material.
-Collect at least 32 ounces of suspected soil sample.
-Save soil sample in a clean container with lid.
-Label container identifying location, date, and elevation below finish grade of sampled soil.
-Provide sample to Contractor environmental lead for laboratory testing.
Potholing, Drilled Shafts, and Excavations:
-Always segregate soil/spoils/slurry from non-suspect material.
-Contact Contractor environmental lead to schedule for technician to sample soil and submit for laboratory testing.
Perform Headspace Photoionization Detector (PID)Test
PID reading under 1ppm
Manage material as “clean”. If reuse outside project limits is desired, test for nonvolatile contaminants as warranted.
PID reading over 1ppm
Manage material as “contaminated”. Test for nonvolatile contaminants as warranted.
Sample suspect material in accordance with HEER guidelines and send to laboratory for testing and analysis.
Based on comparing results to unrestricted EALs, what is the status of the material?
Clean material
Options for soil disposal/reuse
Reuse on site or at third party site, per Contractor policies.
Dispose of at landfill, per landfill policy.
Track quantity of materials disposed.
Hazardous waste based on RCRA definitions
STOP WORK
Notify HART with lab results.
Work shall not continue until potential risks are evaluated.
Results greater than unrestricted EALs but not Hazardous Waste
Notify HART with lab results.
Dispose of at permitted landfill, per landfill policy or treat and retest.
Track quantity of materials disposed and inform HART.

### 8.3.4 Exposure Monitoring

In addition to soil vapor headspace screening, the PID will also be used to monitor the relative concentrations of VOCs in the breathing zone if petroleum contaminated soils are encountered. When monitoring is being done, PID readings in the breathing zone will be compared to background VOC concentrations (readings from ambient air outside and upwind of the immediate work area). These background concentrations will be measured with the PID approximately every two hours to provide a baseline and allow for comparison with the PID measurements of ambient air in the breathing zone. If the PID measurements in the breathing zone exceed 20 parts per million (ppm) (or background plus 20 ppm), then the KKJV Project Safety Manger will be consulted; and respirator use and more intensive worker air monitoring (i.e., monitoring for specific, petroleum-related VOC, such as benzene, toluene, methylbenzene, xylems, etc.) will be used until PID measurements fall below 20 ppm.

## 8.4 Stormwater Management Plan

HART obtained an NPDES Construction Stormwater Permit HI R10D955 effective Oct 20 2011 which details the general handling of stormwater on site and the prevention of stormwater leaving the site. This plan has been developed to identify how contact of rainfall runoff with contaminated soil can be prevented, and to provide appropriate response methods if contact does occur.

Contaminated stormwater allowed to leave construction areas could expose downstream individuals and ecological receptors (marine flora and fauna in Pearl Harbor) to COPCs. Although stormwater runoff from construction areas containing high concentrations of uncontaminated soil and non-hazardous water could also harm these populations, the potential harm increases where contaminated soil or groundwater is present.

This plan describes the measures needed to control stormwater in all construction areas. Preventing stormwater from coming into contact with contaminated media is the main goal. The primary activities that create this risk are:

- Stormwater could wash contaminated soil from pavement, unpaved areas, equipment or soil piles, carry particulate matter to storm sewers and waterways, and impact aquatic species.
- Stormwater could leach through stockpiled soils, and the leachate could flow to surface water.
- Stormwater leaching through soil stockpiled on an unsealed surface could carry COPCs into underlying soils and water-bearing zones.
- Stormwater entering soil stored in lined roll-off boxes could generate contaminated water, and this water would leach out at storage facilities or at final disposal locations.

### 8.4.1 Stormwater Management during Construction

The best method to prevent environmental impacts from stormwater is to control the release of contaminated soil and groundwater, and prevent contact of stormwater with contaminated soil or water during rainfall events. The following activities are recommended:

- Contaminated soil stored in dump containers or roll-off boxes that should not be immediately transported for disposal should be covered with plastic sheeting as soon as the box has been filled. The plastic sheeting must be mechanically anchored to the roll-off box.
- Uncontained soil stockpiles should be created by laying down 10-mil polyethylene plastic sheeting in designated soil stockpiling areas. When multiple segments of plastic sheeting are needed to create a stockpile base, a higher-elevation plastic sheet layer should overlap a lower-elevation sheet by a minimum of one foot. The edges of the plastic sheeting must be underlain by bermed soil sufficiently high to contain stormwater runoff. Excavated soil must be placed inside the bermed area on top of the plastic sheeting, and covered at the end of each day or before it rains with well-anchored plastic sheeting to reduce the potential for dust generation and to prevent contact with rainwater and stormwater runoff. Plastic covers should be anchored outside the bermed area, and be able to withstand strong winds at all times.
- Stockpiles should be labeled to distinguish between contaminated and uncontaminated soil.
- Soils accidently released in work areas should be removed and the area should be swept.
- Site conditions should be periodically inspected to identify contaminated media that has been released and could be exposed to stormwater runoff.
- A daily inspection of contaminated stockpiles to insure they are containing any contamination will be noted in the log book. Stockpiles will be thoroughly inspected as described in NPDES Construction Stormwater Permit HI R10D955 (Section 3.9 of the Site Specific Construction Best Management Practice Plan). Inspections will be performed weekly or on an ‘as needed basis’ depending on the location and conditions that are present. Inspection will also be performed after a rain event of more than 0.5-inch over a 24-hour period. All measures will be maintained in good working order.
- Engineering stormwater controls should be constructed to divert runoff water from active work areas. The control measures should be inspected as detailed in the NPDES permit to evaluate their adequacy.
- Open excavations should be backfilled as soon as practicable to limit when stormwater runoff and direct precipitation could enter the excavation.
- Where possible, the edges of excavations should be bermed, thus preventing stormwater runoff from entering.

- Open excavations should be inspected each day to ensure that rainwater won't overflow the sides of the excavation.
- The weather should be regularly monitored throughout each work day for signs of approaching storms and/or heavy rains.

### 8.4.2 Permanent Storm Water Management

During operation of the MSF, permanent BMPs, such as an oil water separator and detention basin, are in place to protect stormwater quality. If the water in the detention basin is discharged into Pearl Harbor, the oil/water separator must be in operation and the discharge is to be covered under an MS4 permit. Any discharge must meet requirements of the Clean Water Branch of DOH.

## 8.5 Long Term Engineering and Administrative Controls and Monitoring Requirements

The MSF site has been extensively studied and numerous studies and agencies have concurred that redevelopment is appropriate and, with the exception of a recommendation about groundwater use in the Navy's 2005 Disposal of Property report, no restrictions were placed or suggested for the site.

- HEER issued a letter stating no further action was required in reference to the 315,000 gallon spill based on a Phase II Remedial Investigation.
- The Agency for Toxic Substances and Disease Registry of the U.S. Department of Health and Human Services Public Health Service determined that there are no adverse human health effects that have or will result from the 1971 release.
- An Environmental Assessment (Disposal of the Ewa Drum Property) to evaluate the property transfer to Hawaiian Home Lands did not identify any significant impacts on human health or the environment. It did, however, recommend that the transfer include a deed restriction to prohibit extraction/penetration to groundwater.
- The DOH Solid and Hazardous Waste Branch issued a No Further Action letter for removal of the drumming site's storage tanks.
- NAVFAC's Environmental Condition of Property (ECP) Report concluded that there are no land use controls or restrictions necessary for the Navy to transfer ownership of the site.

Figure 4 shows that the location of potential contamination was considered when facilities at the MSF site were sited. None of the main buildings are in the area where the contaminate plume is located. Recent testing did not detect soil gas vapors. If soil gas vapors are encountered during construction, the permanent protection of building occupants and others on site will have to be reassessed. Building design may have to include vapor barriers or other engineering controls to protect worker safety. Long term monitoring may be required.

Documentation regarding the observations of any contamination encountered during construction must be reviewed before new buildings or facilities are added to the site. HART might impose restrictions on where new facilities are located to avoid compromising worker safety. Long-term monitoring may be required.

Depending on the extent of contamination encountered, HART may consider imposing a restriction on the use of the groundwater in the caprock aquifer as suggested in the Navy's 2005 Disposal of Property report. At this time, no caprock groundwater use on the site is foreseen as it is considered non potable and too saline for other uses. However, if using groundwater for irrigation or another purpose is proposed, contamination levels would have to be assessed and monitoring may have to occur.

Once construction is completed, permanent stormwater BMPs are included in the design. These include a detention basin and oil water separator. The MSF will be covered by an MS4 Permit, thus the site will continue to be regulated by the DOH.

## 8.6 Exposure Management

Two contractor documents describe details of exposure management – KKJV's HCMHSP and the SSSP. These documents have been reviewed and will be accepted by HART and the GEC.

Access to the construction site is restricted as discussed in KKJV's SSSP. Visitors to the project will be escorted as determined necessary by KKJV. Everyone entering the project that will be exposed to construction activities will be required to attend a site specific project orientation by KKJV staff. In addition, if that individual is a GEC or HART employee, they must have attended a class given by the HRTP Health and Safety Manager.

Prior to starting any work that would entail handling and management of hazardous or contaminated materials, KKJV personnel involved in the task will prepare a job JHA to detail the potential hazards associated with the work activity. Potential hazards to site personnel will be identified and controls to mitigate such hazards will be reviewed and listed. Mitigation measures specified in the JHA may include specific training/certification requirements, PPE, environmental monitoring, engineering controls, etc. Health and Safety practices and policies specific to the MSF site are described in the contractor's SSSP. Before beginning construction work, workers must be informed about the potential hazards posed by COPCs they may encounter and how they can avoid exposure. If dewatering becomes necessary or if wet soil is removed, workers will be apprised of the presence of NAPLs.

Use of personal protective equipment (PPE) is required by KKJV personnel. All persons on site outside of an office environment or parking facility are required to be properly outfitted for the area. At a minimum, all persons will have and wear:

- An approved hard hat.
- ANSI approved Eye protection.

- T-shirt with a standard 44 inch sleeve measured from the seam. (Tank tops and/or cutoffs are not approved).
- Reflective Safety Vest (Class II minimum).
- Durable long pants (sweat or jogging pants are not approved).
- Sturdy leather work boots that rise above the ankle.
- Gloves applicable to the operation.
- Any other task specific PPE required by the operation and JHA.

Personnel conducting screening activities must use appropriate PPE (e.g., disposable latex/polyethylene/nitrite gloves and eye protection, at a minimum) when handling any potentially-contaminated media. Use of additional PPE (i.e., chemical-resistant suits, respirators, etc.) will be considered if field screening indicates the presence of hazardous or contaminated substances. Health and safety procedures are further discussed in the SSSP and the HCMHSP.

KKJV's Emergency Response Plan (ERP) includes general emergency procedures for urgent situations on site and for directions to the nearest medical facility.

## 8.7 Decontamination

Heavy equipment components that come into contact with hazardous and/or contaminated material, such as excavator buckets, loader buckets, semi-truck beds, and/or roll-off bins will be decontaminated after use or prior to being demobilized from the project area. In an all operations, KKJV will make every effort to avoid exposure of heavy equipment tracks or tires from coming into contact with hazardous and/or contaminated materials to avoid cross-contamination and frequent decontamination requirements. After equipment has been used to move potentially contaminated soil, gross decontamination of buckets, tires, tracks and other parts will be performed prior to using the same equipment to move clean soil at the project site.

Heavy equipment decontamination procedures may include pressure -washing, steam cleaning, wet wiping, dry brushing or other common industry practices. Regardless of the selected method, the resultant liquid or debris generated during decontamination will need to be containerized and disposed appropriately depending upon the contaminants being addressed.

If a wet method (e.g., pressure washing, steam cleaning, wet wiping) is selected, rinsate will need to be captured and containerized. The resultant waste stream can then be poured over the contaminated soil stockpile (ensuring that excess liquids do not run-off from the stockpile) to be characterized and transported off-site for disposal.

If dry methods (brushing excess soil off of semi-truck beds) are used, the excess soil removed will need to be handled and managed in the same manner as the contaminated soil.

## 8.8 Investigation Derived Waste

Investigation-derived waste (IDW) includes disposable PPE, disposable sampling equipment, decontamination fluids, and any other material that may have come in contact with potentially contaminated materials. For all practical purposes, KKJV anticipates that used PPE and disposable sampling equipment will be handled and managed as solid waste. Waste generated during equipment decontamination will either be placed with the contaminated soil stockpile or characterized and disposed off-site at an appropriate government-permitted facility.

## 8.9 Documentation

Documentation of hazardous or contaminated materials management will be performed by maintaining a project file for areas where such materials are encountered. KKJV will document the findings in an Environmental Incident Report. The following records should be included in the Environmental Incident Report:

- Field screening records
- Chain-of-custody and laboratory reports for any samples collected and analyzed.
- Waste profiles created to provide information to the disposal facility regarding the waste stream proposed for delivery.
- Manifests or bills of lading unused to track any transport of contaminated materials off-site.
- Weight tickets received from the disposal facility for each load of soil brought to the site.

In addition, records of where excavated soil has been relocated to during the grading process and the contents of soil stockpiles will provide valuable information if contamination is later identified.

Records of workspace monitoring and changes to PPE requirements must be maintained. Daily monitoring results and sampling locations should be documented in field logs. All affected workers should be informed of elevated PID readings and modifications to PPE.

If groundwater is encountered, detailed records of workspace monitoring activities, water storage, treatment, and disposal processes, and spill response activities must be maintained.

Records of storm events, inspections of BMPs, engineering controls, repairs, and response activities will be maintained as part of the NPDES construction stormwater permit inspection program.

Once the site construction is completed, any record keeping and reporting of issues involved with stormwater discharge from the MSF will be part of the reporting requirements imposed by the MS4 Permit.

Based on the baseline environmental conditions, findings from the site screening investigation, and depths of known petroleum contamination, KKJV does not anticipate encountering hazardous and/or contaminated materials during the course of construction activities. The potential for encountering hazardous or contaminated materials may be due to one or a combination of the following:

- Change in construction plans may require excavation within areas and to depths at which petroleum contaminated soil and groundwater are known to exist.
- Unanticipated subsurface hazardous or contaminated material in the subsurface encountered during the course of construction activities.
- Accidental spills or releases of hazardous materials from KKJV operations.

# 9.0 *Contingency Planning*

## 9.1 Changes in Construction Plans

If construction plans change and excavation into petroleum contaminated soils is required, plans will be prepared to mitigate the affect of the changed work activities. KKJV will notify HART through the GEC's EM at least seven calendar days prior to starting work. KKJV personnel will also complete a JHA to identify potential hazards associated with thee planned work activities and list specific controls that will be implemented to mitigate the hazards. All new activities will be conducted as described in the EHE/EHMP are needed, the requested changes will be submitted to HEER for approval.

## 9.2 Unanticipated Findings

The historical uses at the MSF site, suggest unanticipated hazardous and/or contaminated materials may be encountered during site grading. These materials include unidentified USTs used to store fuel or waste products, or demolition debris from former buildings containing lead-based paint or asbestos. Melted glass could indicate the presence of incinerator ash that could be high in such contaminants as metals or dioxin. Handling and management of unanticipated hazardous or contaminated materials will be dependent on the type and hazards associated with the finding.

If an unanticipated UST is found, procedures to decommission the UST, dispose of the UST contents and associated reinstate, and assess the soils surrounding the USST for the presence of contaminants will follow the DOH's March 2000 *Technical Guidance Manual for Underground Storage Tank Closure and Release Response*. Such activities would include:

- Reporting the discovery of the UST to the DOH Solid and Hazardous Waste Branch (SHWB).
- Documenting of the UST location and condition, including the presence of

any ancillary piping.

- Identifying and removing the UST contents (if any).
- Excavating, decommissioning, and removing of the UST system, including draining any existing piping and the cleaning of the tank interior.
- Characterizing, transporting, and disposing of the UST system contents and any rinsate generated during decommissioning.
- Collecting and analyzing of soil samples to assess the surrounding soil for the presence of a UST release.
- Removing contaminated soil.
- Documenting of the UST removal and decommissioning in an UST Closure Report.

If the unanticipated finding includes the discovery of demolished building materials potentially containing asbestos or lead, construction activities will be stopped as described in the Construction Contingency Plan. If directed, KKJV team personnel experienced in conducting hazardous materials surveys (EPA-certified Lead Risk Assessor, DOH-certified Asbestos Inspector) will be mobilized to collect samples of the suspect materials and submit samples to a National Voluntary Laboratory Accreditation Program (NVLAP) and American Industrial Hygiene Association (AIHA) certified laboratory for analysis. If the materials are positively identified to contain asbestos, lead, or other suspect hazardous materials, at the direction of HART, KKJV will subcontract a State-licensed abatement contractor to remove and dispose of the hazardous building materials.

## 9.3 Spill Contingency Plan

In the event of any spill or releases of hazardous material, including petroleum hydrocarbons, KKJV personnel will stop the equipment (if applicable) and immediate steps will be taken to stop and contain any hazardous materials that may have been released. KKJV personnel will follow the procedures described in their SPCC Plan. In general, the following steps may be taken to address accidental spills or releases that occur during KKJV operations.

Non-emergency, controllable releases of petroleum or other hazardous materials that may be used at the site are defined as spills that will not reach storm drains our navigable waters and do not pose a potential safety or health hazard such as fire, explosion, and chemical exposure and can be absorbed, or otherwise controlled at the time of release by personnel in the immediate spill area. Steps to be taken include:

- Alert any employees in the vicinity.
- Attempt to control the source of the spill by plugging any holes or transferring contents.
- If the spill originates during equipment operations, alert the operator to shut

down vehicles and equipment.

- Prevent vehicles and equipment from driving in or near the spill.
- Workers should protect themselves with the PPE specified by the product materials safety data sheet (MSDS).
- Access the nearest Spill Response Kit.
- Stop the spill from spreading: Contain the spill by building a dike or berm around the spill with absorbent material.
- Document and log the event in an Environmental Incident Report and follow all notification procedures.

The State of Hawaii requires immediate notification if: (1) the spill exceeds 25 gallons, (2) cannot be cleaned up within 72 hours, or (3) spill has any impact on surface water or groundwater (Section 128D of the Hawaii Revise Statutes; Title 11, Chapter 451 of the Hawaii Administrative Rules).

Uncontrollable releases are spills that pose a potential safety or health hazard such as fire, explosion; knowledge that a spill has reached surface water or storm drain; or the spill cannot be absorbed, neutralized, or otherwise controlled d at the time of release by personnel in the immediate area.  Steps and notifications for uncontrollable spills are detailed in the SPCC and could include calling DOH, 911, or the Coast Guard as appropriate.

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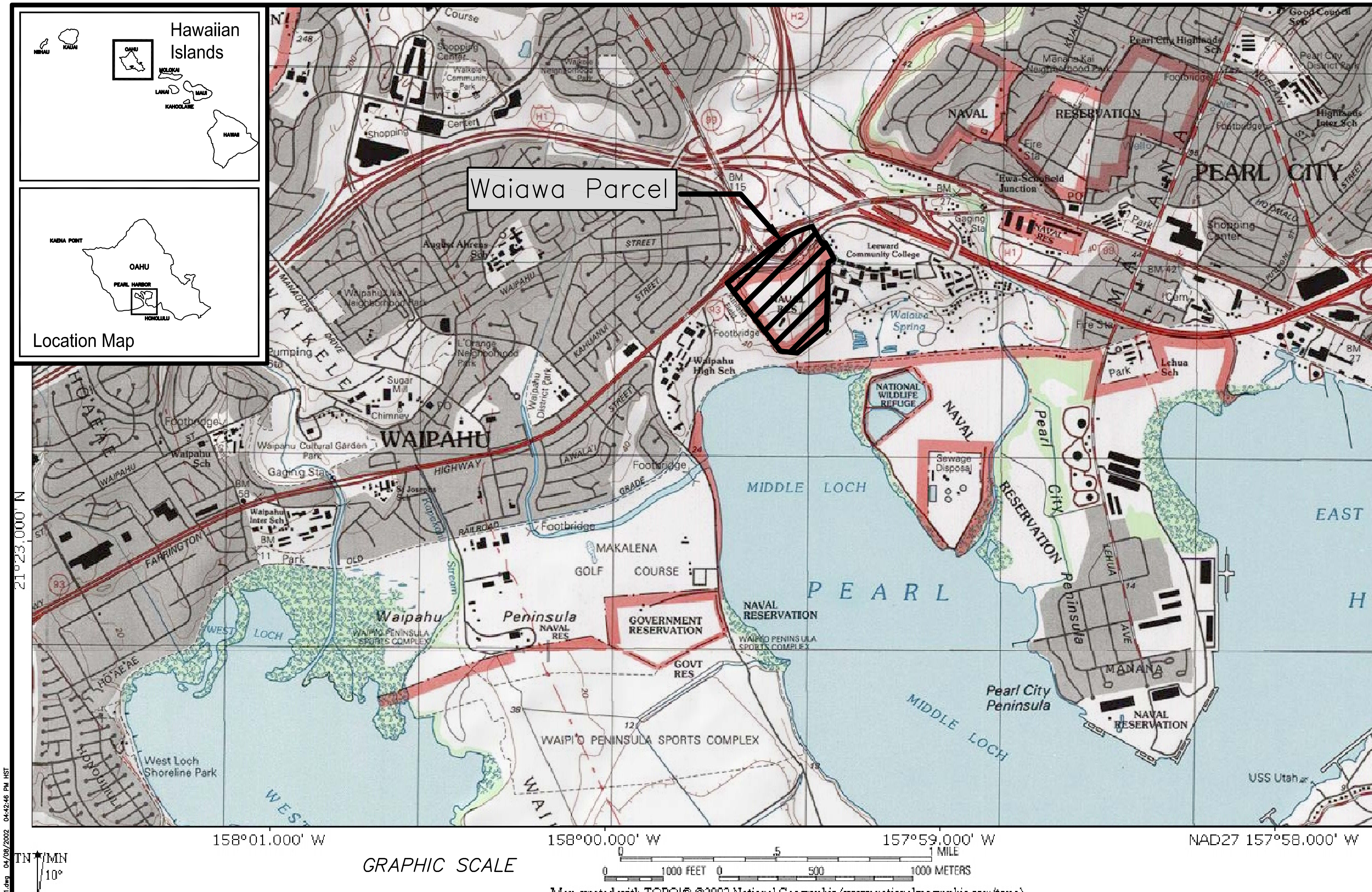
# Figure 1

Location Map

Figure 1: Location Map

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| | |
|---|---|
| Project No: F03-012 | Waiawa Parcel Environmental Condition of Property |
| Drawn By: J.Y | Site Location Map |
| Ref: USGS, Topographic Map Waipahu, HI. 1998 | |

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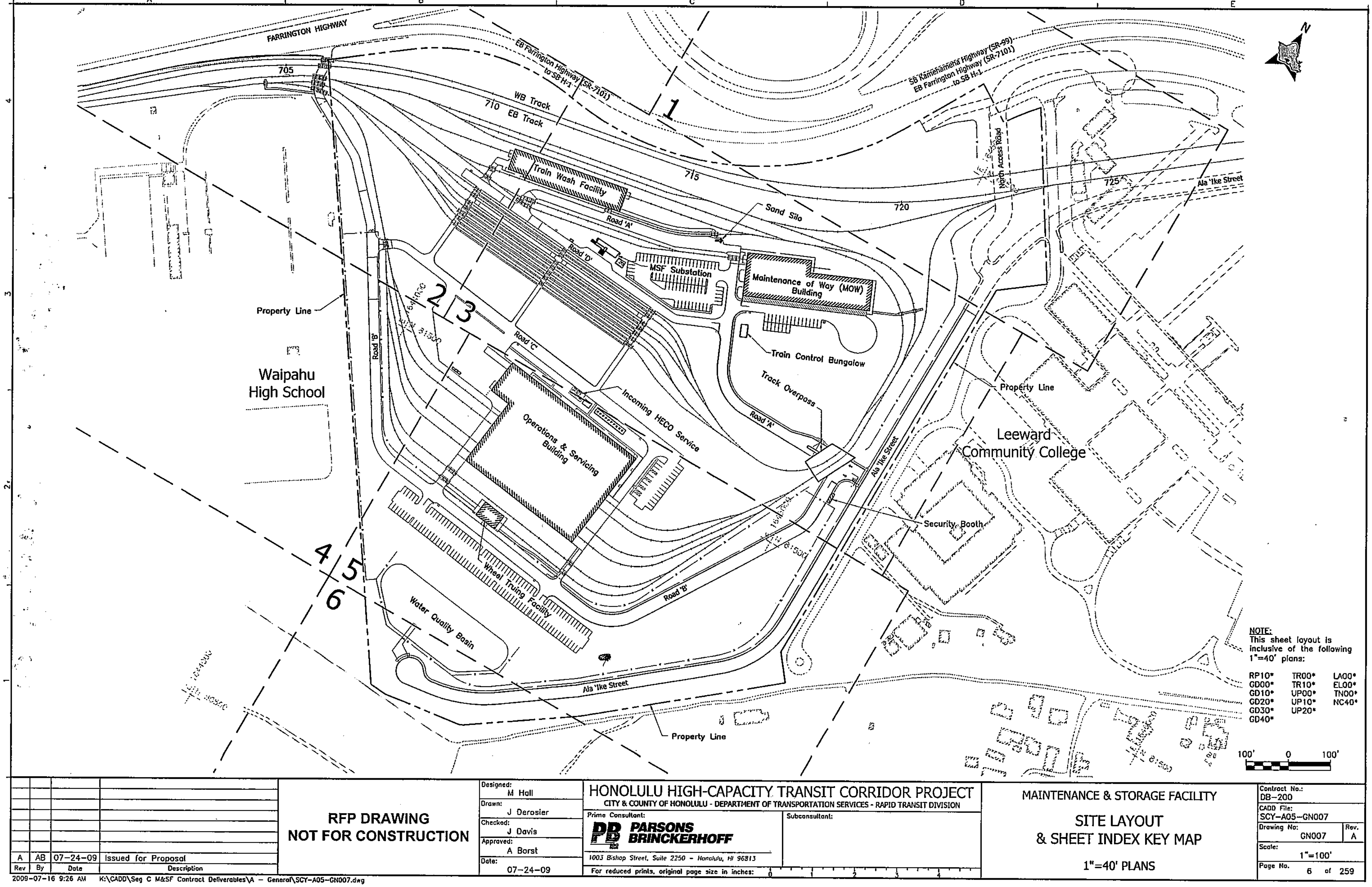
# Figure 2

## Site Layout and Sheet Index Key Map

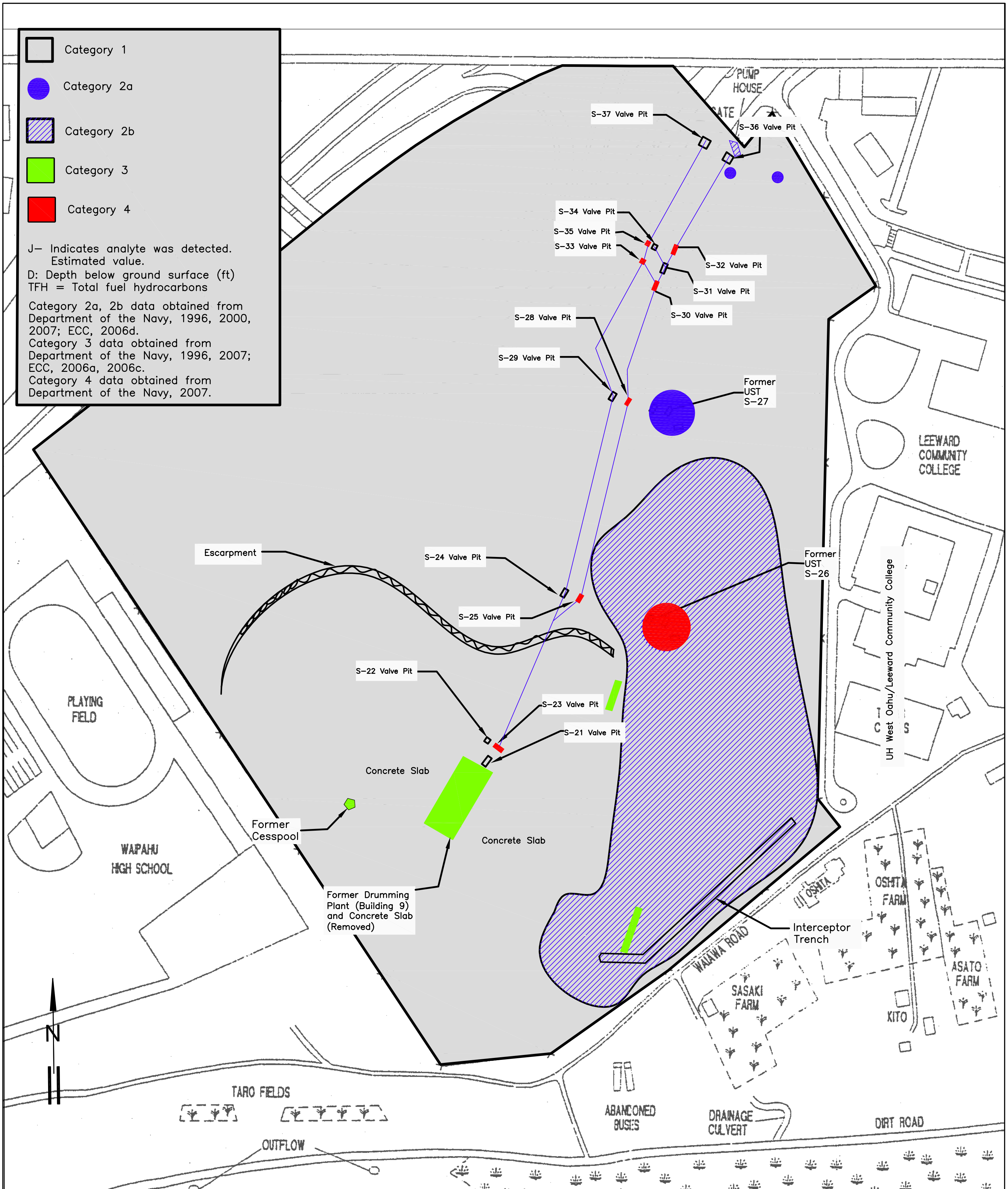
Figure 2: Site Layout and Sheet Index Key Map



# Figure 3

# Former Ewa Junction Fuel Drumming Facility Summary of Environmental Condition of Property

Figure 3: Former Ewa Junction Fuel Drumming Facility Summary of Environmental Condition of the Property

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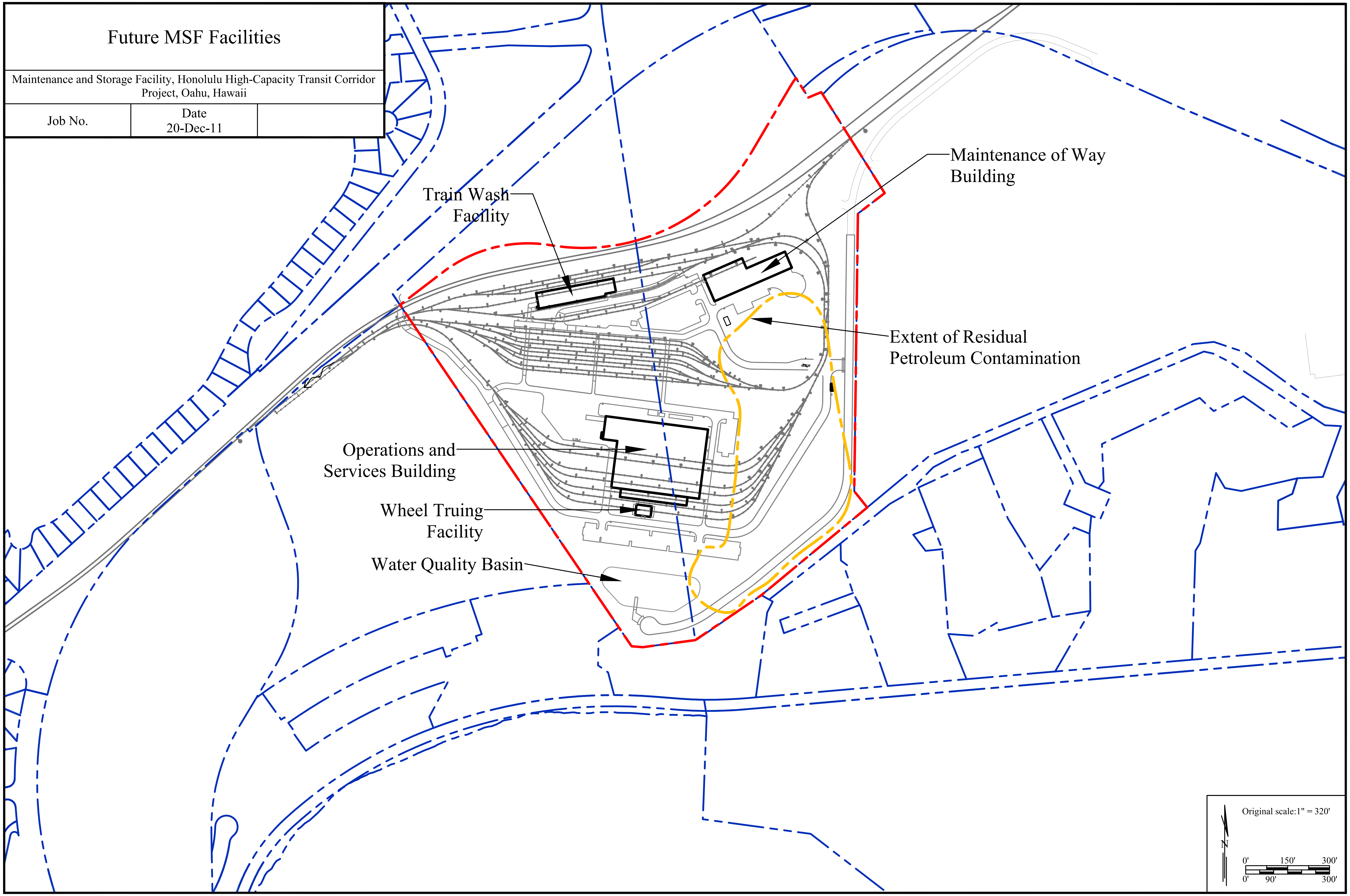
| | | |
|---|---|---|
| Project No: F03-012 | Waiawa Parcel Environmental Condition of Property | |
| Drawn By: S.J.D | Former Ewa Junction Fuel Drumming Facility<br>Summary of Environmental Condition of Property<br>Not To Scale | |
| Ref: Department of The Navy 1996, 2000, 2007; ECC 2006a, 2006c, 2006d | | |

# Figure 4
Future MSF Facilities

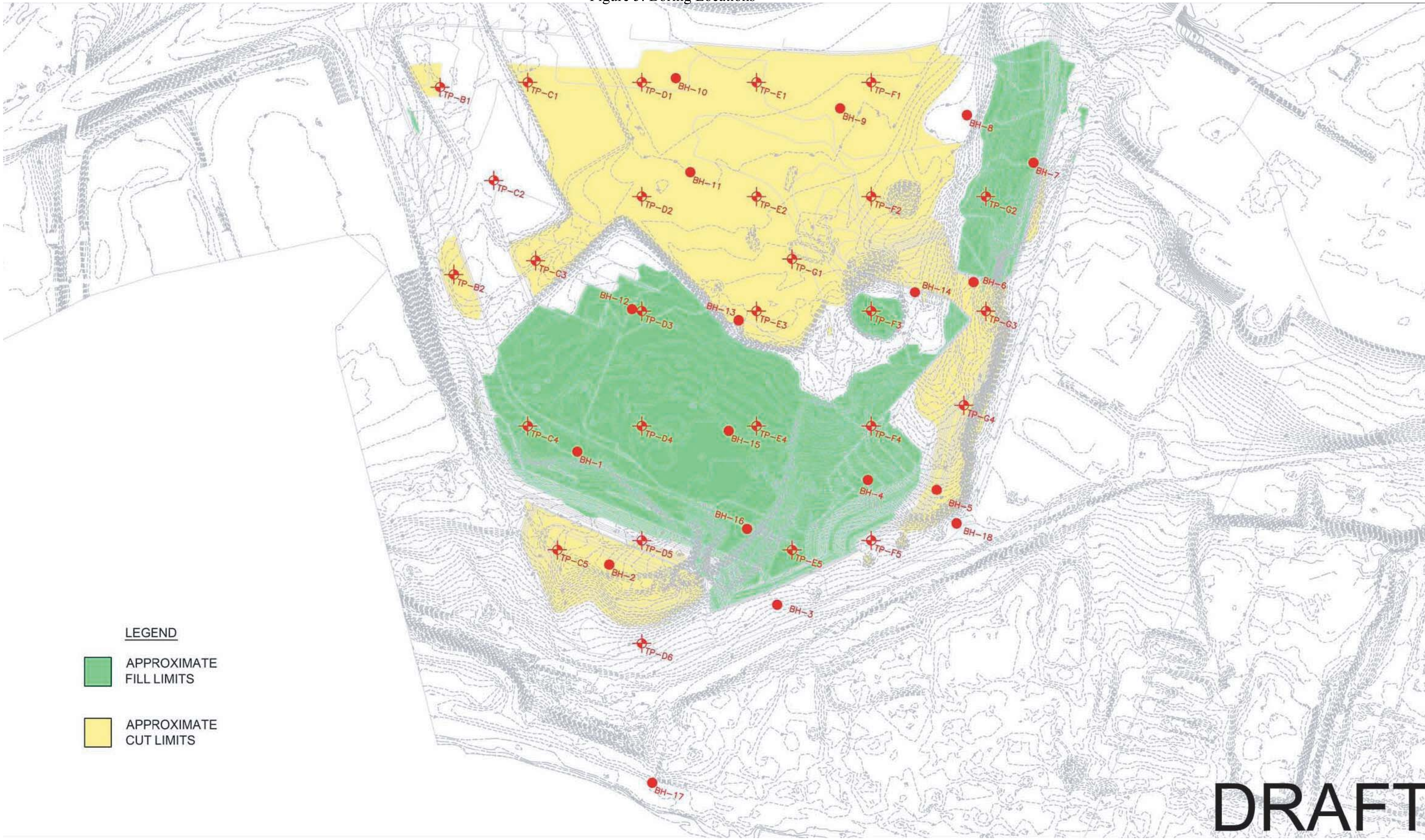
Figure 4: Future MSF Facilities



# Figure 5

## Boring Locations

Figure 5: Boring Locations




Reference: Yogi Kwong Engineers, LLC - September 28, 2011 Geotechnical Investigations Work Plan, Rev A

**Boring Locations**
Site Screening Investigation Report
Honolulu Rail Transit Project, Maintenance & Storage Facility
Project No. 11-2012

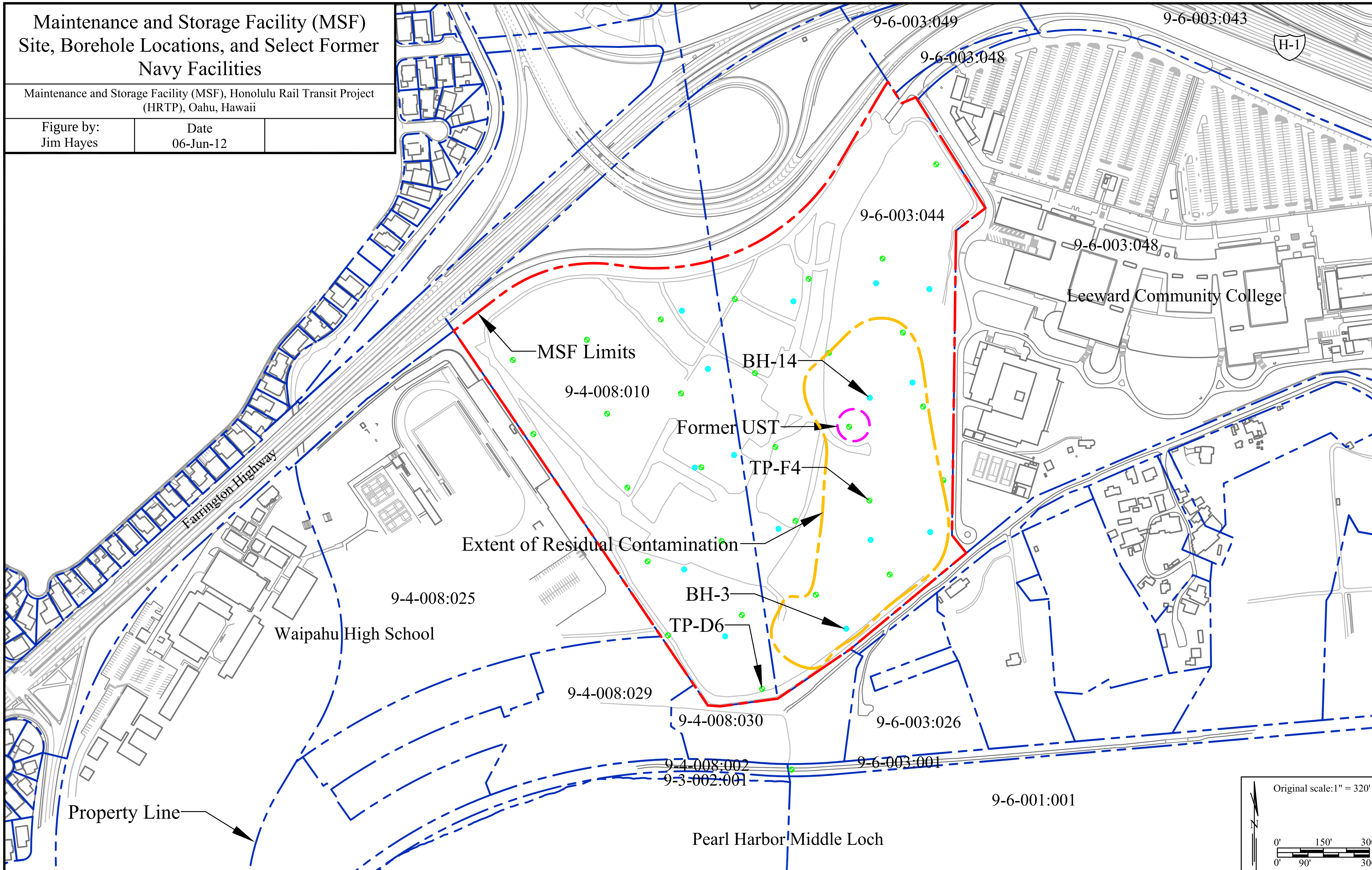
100' 0' 100' 200'
Approximate Scale: 1" = 200'

EnviroServices & Training Center LLC

# Figure 6

## Site, Borehole Locations, and Select Former Navy Facilities

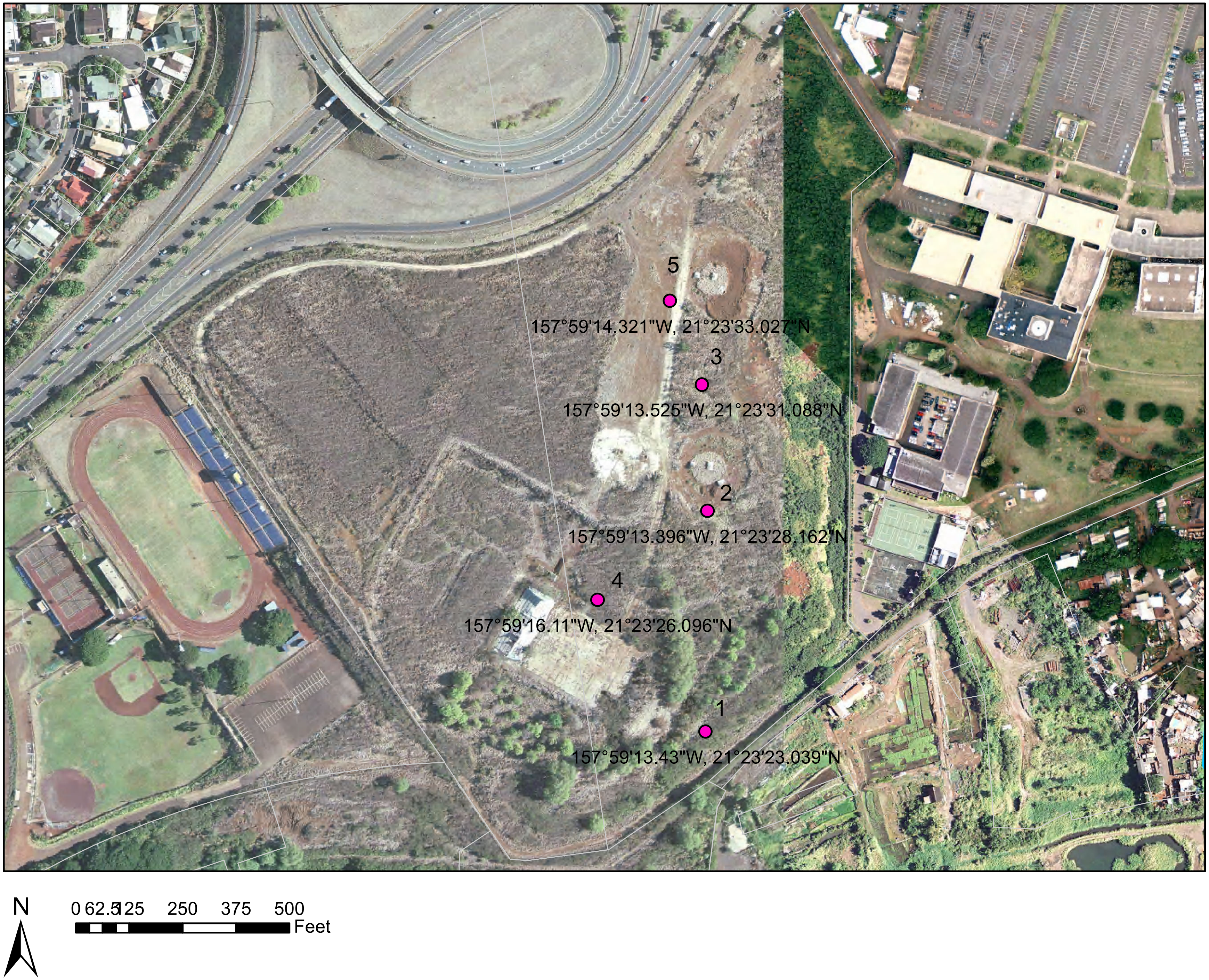
Figure 6: Site, Borehole Locations, and Select Former Navy Facilities



# Figure 7

Soil Vapor Sample Locations

Figure 7: Soil Vapor Sample Locations



# Figure 8
Overall Final Grading Plan

Figure 8: Overall Final Grading Plan


| Rev | By | Date | Description |
|---|---|---|---|
| C | | 05-08-12 | FD |
| B | | 02-21-12 | ID |
| A | | 12-07-11 | DD |

NICOLO A. ORENSE — LICENSED PROFESSIONAL ENGINEER No. 11774-C — HAWAII U.S.A.

This work was prepared by me or under my supervision.

Signature

4/30/14
Expiration date of license

Designed: N Orense
Drawn: G Nishimura
Checked: H Milles
Approved: M Yonamine
Date: 05-08-12

HONOLULU RAIL TRANSIT PROJECT
HONOLULU AUTHORITY FOR RAPID TRANSPORTATION

Prime Consultant: Kiewit/Kobayashi, a Joint Venture — HNTB

Subconsultant: LYON ASSOCIATES — Civil Engineering / Construction Management
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www.lyonassociates.com

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MAINTENANCE & STORAGE FACILITY
OVERALL FINAL GRADING PLAN
1"=100' PLANS

Contract No.: CT-DTS-10A0449
CADD File: SCY-B16-GD150
Drawing No: GD150 Rev. C
Scale: 1"=100'
Page No. 73 of 220

# Attachment 1

Concurrence Letter Issued July 12, 2012 by the Hazard Evaluation and Emergency Response (HEER) Office of the Hawaii Department of Health (HDOH)

# Attachment 1

Neil Abercrombie
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
ACTING DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File: EHA/HEER Office
2012-428-lmb

July 12, 2012

Ms. Vicki Barron Sumann
Assistant Project Officer,
Utility, Agency & Permit Coordination
Honolulu Authority for Rapid Transportation
City and County of Honolulu
Alii Place, 17th Floor
1099 Alakea Street
Honolulu, HI 96813

Facility/Site: Honolulu High-Capacity Transit Corridor Project

Subject: Concurrence with Environmental Hazard Evaluation/Environmental Hazard Management Plan, Maintenance and Storage Facility, Honolulu Rail Transit Project, dated July 9, 2012

Dear Ms. Barron Sumann:

The Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response Office (HEER) has reviewed the responses to HDOH comments on the Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP) for the Maintenance and Storage Facility site, and has no further comments at this time. Please proceed with finalization and distribution of the EHE/EHMP. Once the information in the final document has been distributed to the relevant site workers, the Honolulu Authority for Rapid Transportation (HART) may proceed with scheduled work at the site at their convenience.

As discussed during a phone conversation earlier today, a photoionization detection (PID) limit of 1 ppm may be conservative for identifying contamination on site. If several samples that are submitted for laboratory analysis based on a PID reading of 1 ppm show concentrations below site-screening levels, HART may coordinate with the HEER Office to adjust the PID limit higher. Other options such as field test kits may also be used to screen for contamination on site, if HART desires.

# Attachment 1



Should new information concerning on-site contamination become available, please notify the HEER Office as soon as possible. Should there be any questions, please do not hesitate to contact me at 586-4353. Thank you very much for your time and consideration in this matter.

Sincerely,

Lynn M Bailey

Lynn M. Bailey
Brownfields Voluntary Cleanup Program Specialist
Hazard Evaluation and Emergency Response Office