Interim Final Area-Wide EHE/EHMP Document

Kahului Harbor Area
Kahului, Maui

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Version 1.0

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State of Hawai‘i Department of Health (HDOH)

Hazard Evaluation and Emergency Response Office (HEER Office)

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APPENDICES

ACRONYMS

bgs	Below ground surface
BMP	Best management practice
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
COPC	Contaminant of potential concern
COC	Contaminant of concern
CPR	Cardiopulmonary resuscitation
cy	Cubic yard
DCS	Debris-contaminated soil
EAL	Environmental action level
EC	Engineering Control
EHE	Environmental Hazard Evaluation
EHMP	Environmental Hazard Management Plan
EPA	U.S. Environmental Protection Agency
eV	Electron volt
GPS	Global Positioning System
HAR	*Hawaii Administrative Rules*
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDOH	Hawaii Department of Health
HDOT	Hawaii Department of Transportation
HEER Office	Hazard Evaluation and Emergency Response Office
HIOSH	Hawaii Occupational Safety and Health Division
HRS	*Hawaii Revised Statutes*
HSERC	Hawaii State Emergency Response Commission
HSP	Health and Safety Plan
HVOC	Halogenated volatile organic compound
IAP	Incident Action Plan
IC	Institutional control
kg	Kilogram
KHID	Kahului Industrial District
LEL	Lower explosive limit
LEPC	Local Emergency Planning Committee
LNAPL	Light non-aqueous phase liquid

mg	Milligram
ml	Milliliter
MTBE	Methyl tertiary butyl ether
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic aromatic hydrocarbon
PCS	Petroleum-contaminated soil
PEL	Permissible exposure limit
PID	Photoionization detector
PPE	Personal protective equipment
ppm	Parts per million
ppmv	Parts per million by volume
PRP	Potentially responsible party
RP	Responsible party
RQ	Reportable quantity
SOSC	State On-scene Coordinator
STEL	Short-term exposure limit
TCLP	Toxicity Characteristic Leaching Procedure
TGM	Technical Guidance Manual
TPH	Total petroleum hydrocarbons
TPH-d	Total petroleum hydrocarbons as diesel fuel
TPH-g	Total petroleum hydrocarbons as gasoline
TPH-o	Total petroleum hydrocarbons as oil
TWA	Time-weighted average
UGP	Underground pipeline
UIC	Underground injection control
USDA	United States Department of Agriculture
UST	Underground storage tank
VOC	Volatile organic compound

1.0 INTRODUCTION

Kahului Harbor is located in Kahului Bay on the north shore of the isthmus connecting east and west Maui (Figure 1). Kahului Harbor is one of ten commercial harbors in the State of Hawaii and the only deep-draft commercial harbor that services ocean shipping for the Island of Maui. Three harbor piers are located on the east and west side of the harbor, where cargo ships, barges and passenger ships dock.

Historical and current land uses are primarily industrial and commercial—docking and unloading of ships and trains (Figure 2), an auto storage yard, a power plant, warehousing, container, molasses, and cement storage, bulk petroleum storage with associated pipelines, and sugar processing and storage. Between the east and west breakwaters is a strip of land that is currently occupied by restaurants, hotels, and other commercial facilities. The main industrial area is located on the eastern side of the harbor. This main industrial area is the focus of this Environmental Hazard Evaluation/Environmental Hazard Management Plan (EHE/EHMP) and will be referred to as Kahului Harbor Industrial District (KHID) EHE/EHMP.

The KHID encompasses approximately 1,300 acres of land (see Figures 1 & 2). The State of Hawaii is a large landowner in the KHID and these state lands are principally managed by the Hawaii Department of Transportation (HDOT) Harbors Division. Other portions of the KHID are privately owned.

The Hazard Evaluation and Emergency Response Office (HEER Office) of the Hawaii Department of Health (HDOH) is overseeing assessment and cleanup of historical impacts in the KHID associated with 1) petroleum handling activities that have resulted in petroleum hydrocarbon releases from storage tanks and underground pipelines (UGP), (2) impacts by metals (e.g. lead or arsenic) resulting from past industrial or imported fill activities, and (3) historic soil contamination around the foundations of buildings or tank structures and on former railroad rights-of-way resulting from past use of lead paint, arsenic or pentachlorphenol mixtures for weed control, or use of termiticides (e.g. chlordane) for termite control at wooden structures.

Cleanup measures and long-term Institutional Controls (ICs) have been and continue to be implemented to prevent hazards to human health and the environment within the Kahului Harbor Area. Potentially hazardous contaminants of concern (COC) are present in soil, groundwater, and soil gas at various locations within the KHID. Some of these COCs, primarily oil compounds, have been removed, and removals or other cleanup options will continue. Management of potential hazards associated with any remaining (also referred to as residual) COCs is addressed by ICs, which are described in Environmental Hazard Management Plans (EHMPs). These plans—an HDOH requirement where contamination is managed on-site —are described in HDOH's Technical Guidance Manual (TGM, Section 19; www.hawaiidoh.org).

Site/parcel-specific EHMPs have been implemented or are currently being prepared within the KHID, developed by parties HDOH considers responsible for residual COCs on specific parcels.. Site-specific EHMPs are developed after completion of site assessments and implementation of any cleanup actions. Site-specific EHMPs include those developed by potentially responsible parties such as petroleum companies, HDOT, or other parcel/site operators/owners. EHMPs for large operating facilities such as petroleum distribution terminals may have an "Interim" status due to limited (and on-going) environmental assessments as a result of site access constraints from existing structures or work activities. Figure 3 shows the areas for which site-specific EHMPs have been established and for which this Area-Wide

EHMP applies. Copies of site-specific EHMPs are available at the HEER Office in Honolulu. As environmental impacts are identified at other sites within the KHID, HDOH may require preparations of additional site-specific EHMPs in the future.

Under current conditions, which include existing (extensive) soil cover by gravel, asphalt, cement, or building structures, and any administrative or engineering controls utilized for parcel-specific EHMPs, the COCs within the KHID are not believed to pose hazards to human health and the environment. However, exposures to residual COCs could occur during (1) future subsurface activities—including belowground constructions of utility trenches (for water, natural gas, electricity, telephone, cable), box culverts and storm drain laterals, sanitary sewers, street lights, traffic lights, grease traps, and septic tanks; (2) construction activities within roadways and common areas, and (3) surface soil disturbance activities around (or under) the foundation areas of current or former buildings or large tank structures, and on former railroad rights-of-way. This Area-Wide EHE/EHMP and the existing parcel-specific EHMPs specify requirements, procedures, and guidelines intended to prevent occurrences of potential exposures to or re-location of soils that could pose hazards to human health and the environment.

Area-Wide EHE/EHMPs address sites of known or suspected presence of COCs where no previous site investigations have occurred and for which no parcel-specific EHMPs have been established. These sites are shown on Figure 3 as "Area Covered by the KHID Area-Wide EHMP." HDOH may update the extent of this area periodically. Importantly, pursuant to the Environmental Response Law (*Hawaii Revised Statutes* [HRS] 128-D) and the State Contingency Plan (*Hawaii Administrative Rules* [HAR] 11-451), affected parties are expected to know about and comply with this Area- Wide EHE/EHMP to the extent feasible.

Parties may utilize this Area-Wide EHE/EHMP as is, and HDOH expects this for small-scale projects involving soil excavation on public and private sites, public and private roadways, and common areas. Construction projects involving soil excavations within utility rights-of-way, roadways, and common areas may encounter COCs that must be properly managed by the construction and/or environmental contractors.

Alternatively, parties can refine or modify the details of this Area-Wide EHE/EHMP in order to better address site-specific requirements. So in effect, parties have the option to create their own site-specific construction EHMPs provided the site is properly characterized based on the Area-Wide EHE/EHMP.

1.1 Regulatory Framework

Under state laws and regulations, entities and individuals involved with surface or subsurface excavations are ultimately responsible for proper handling of contaminated materials and environmental media, reporting releases where encountered, preventing migration of existing contamination, and ensuring compliance with the law (owners, operators, generators, and transporter are liable). Entities conducting subsurface excavations are also responsible for training of contractors and subcontractors on the requirements presented in this EHE-EHMP. This EHE-EHMP is not intended to address chemicals and hazards introduced by contractors during the course of their work. Additional environmental hazards not identified in this plan may exist. During construction, each contractor remains responsible for protecting the environment and the health and safety of its employees, workers, and the general public. Before construction, the contractors should review applicable Hawai‘i Occupational Safety and Health Division (HIOSH), U.S. Environmental Protection Agency (USEPA), and State of Hawaii Department of Health (HDOH) regulations and guidance.

This EHE-EHMP is not intended to identify all agencies and environmental statutes and

regulations that may be required during construction but instead focuses on the relevant requirements for managing contamination or potential contaminated soil or groundwater encountered in the field.

Statutory requirements for identification, reporting, and responding to releases are described in Hawaii laws and regulations that are administered by the HDOH Hazard Evaluation and Emergency Response (HEER) Office, and include the following:

Hawaii Revised Statutes – (HRS)

- HRS 128-D, Hawaii Environmental Response Law (HERL)

- Hawaii Administrative Rules – (HAR)
  - HAR 11-451, Hawaii State Contingency Plan (Hawaii SCP)

Statutory requirements for managing waste are described in Hawaii laws and regulations administered by the HDOH, Solid and Hazardous Waste Branch (SHWB).

2.0 PURPOSE

The purpose of this Area-Wide EHE/EHMP is to specify consistent and effective practices for managing the following COCs if these are encountered during subsurface excavation activities within the KHID: petroleum-contaminated soil (PCS), debris- or sewage-contaminated soil (DCS), and metal or pesticide contaminated surface soil located adjacent to building or tank foundations, or on former railroad rights-of-way that commonly contain high levels of petroleum compounds, metals, and sometimes organochlorine pesticides, petroleum- or dissolved metals-contaminated groundwater, or elevated soil vapors from petroleum compounds or their degradation products. Petroleum contamination, metals, and pesticides are emphasized because these are the most common contaminants found within harbor industrial areas. The scope of this EHE/EHMP includes all sites within the KHID for which a site-specific EHE has not been carried out and a site-specific EHMP has not been established (see Figures 2 and 3). Activities covered by this document include: (1) subsurface work within utility trenches (for water, natural gas, electricity, telephone, cable), box culverts and storm drain laterals, sanitary sewers, street lights, traffic lights, grease traps, and septic tanks; (2) subsurface construction activities within roadways or common areas, and (3) excavations of exposed surface soils around (within about 3 feet surrounding) or under the foundation areas of older (or former) buildings and storage tanks as well as on former railroad rights-of-way. Note that large projects involving extensive amounts of subsurface work within the KHID area will need to develop a project-specific construction EHMP and the HEER Office should be consulted in these cases.

If unsure whether this Area-Wide EHE/EHMP is detailed enough to provide appropriate guidance for planned subsurface construction activities, contact HDOH prior to commencing the project.

Under the present conditions (e.g. the amount of existing soil covered with gravel, asphalt, cement, or buildings, and parcel-specific controls, contamination within the KHID is not known to pose a threat to human health or the environment. This KHID Area-wide EHE/EHMP does not supersede existing site/parcel-specific EHE/EHMPs or replace the need to develop site-specific construction EHMP documents for land development on specific parcels or for large construction projects.

HDOH recognizes that developing independent, site-specific EHE/EHMPs for smaller-scale projects within public and private sites, roadways, and common areas can lead to delays in construction because of the requirement that HDOH approve new plans prior to construction. In

addition, construction within roadways and common areas may encounter contamination that must be properly managed by construction and/or environmental contractors. This Area-wide EHE/EHMP can be used to deal with these contingencies. The Area- Wide EHE/EHMP can also be used by landowners, tenants, and utility companies to assist in developing individual EHE/EHMPs for large construction activities. The EHE/EHMP is therefore a vehicle to avoid costly delay in construction due to the discovery or suspicion of contaminated soil or groundwater.

Important: Complete site characterization must precede full-scale redevelopment (including construction of additional buildings or major building alterations) within areas of known or suspected contamination. If contamination is encountered, a release must be reported in accordance with HRS 128D and HAR 11-451 (see Section 9), and preparation of a site-specific construction EHE/EHMP must be carried out to address contamination within the site boundary.

Where responsibility for COC releases are clearly determined, the identified responsible party(s) (RPs) must conduct the site assessment and necessary cleanup actions.

This Area-wide EHE-EHMP presents guidance for surface or subsurface excavation work for utility construction/repair projects on sites that do not have an EHE/EHMP, and for work within roadways and common areas owned by Maui County, the State., or other public or private organizations.

3.0 AREA COVERED

The area covered by this document is the KHID. The KHID lies north of Kaahumanu Avenue, north and east of Hana Highway, east of N. Puunene Avenue, north and west of Kanaha Pond, and includes the Wailuku-Kahului sewage treatment plant on the northwest border (see Figures 1 to 3). Kanaha Pond is a State Wildlife (Bird) Sanctuary, and protected wetland with endangered species (Hawaiian coot and Hawaiian stilt).

Technical approaches presented in this document can also be applied to other areas of Maui with similar COCs and lithology, and with non-drinking water utility.

3.1 History and Background

In 1863, the first warehouses were constructed in Kahului Bay and in 1879 the first landing was constructed. Intensive harbor development occurred during the early 1900s in response to the growing sugar industry and construction of the breakwater on the east side of the harbor. Kahului Railroad was built in 1879 to haul sugar cane from the fields to the mills and finished sugar to the harbor. A network of railroad tracks is documented for the KHID (USGS, 1954; Figure 2). Piers 1 and 2 were constructed in stages between 1921 and 1963. Pier 3 was constructed in 1979. Petroleum storage and distribution in the KHID has been documented since at least the 1920s. Evolution of Kahului Bay into a full-scale commercial harbor coincided with rebuilding of Kahului town after the Chinatown area was burnt to ground in 1900 to rid the town of plague carrying rats (Ikeda, 1985). The first bulk-sugar storage plant of the Hawaiian Islands started operating at the harbor in 1942. The Kahului power plant was built in 1948 and expanded in 1954 (MECO, 2016). Harbor dredging was conducted in 1961 and earlier to widen and deepen the harbor. The upland area of Kahului Harbor was constructed on fill material. This includes areas filled with material from dredging, bagasse and slurry from sugar mills, and soil excavated and imported from other areas of the island (Foote et al., 1972). Debris from the Kahului town fire may have also been used or incorporated as fill material.

For the past 100 years, the KHID area has been dominated by Port activities, docking and unloading of ships, warehousing, bulk petroleum storage with associated pipelines, heavy industry, support industries, petroleum, and other commercial/industrial activities. The area remains dominated by heavy industry and Port activities. Numerous petroleum releases occurred over the years, and contaminated fill was used to raise the ground level in some areas. Because of numerous petroleum releases over the years and use of fill in the KHID, site redevelopment activities in the area often encounter both PCS and fill. In addition, past chemical use for weed or rat control adjacent to structures, termite control around (or under) wooden building structures, or weed control on railroad rights-of-way, as well as the use of lead-based paints for building exteriors/interiors and storage tanks for many years may have resulted in contaminated surface soils in areas of the KHID.

4.0 HOW TO USE THIS DOCUMENT

The intent of this document is to provide guidance when subsurface excavations encounter contaminated soil and groundwater at properties for which site-specific EHE/EHMPs have not been established, most typically for repair or small construction projects on utility rights-of-way or public rights-of-way. An EHE assesses hazards to human health and the environment from contaminants in soil and groundwater that exceed HDOH environmental action levels (EALs). An EHMP details how contaminants are to be managed when encountered or suspected during surface soil excavation in specific areas, or during subsurface soil excavation. Properties, roadways, and common areas within the KHID may be contaminated by various chemical constituents that are presently in the subsurface under soil, gravel, or hard surfaces such as asphalt or cement, and do not present a significant hazard unless the subsurface material is exposed during excavation work. In addition, exposed surface soils adjacent to current or former building and tank foundations (e.g. within a 3-foot perimeter or under foundations) or on former railroad rights-of-way may be contaminated by metals or pesticides due to past practices for control of weeds, rodents, or termites. Use of an EHE to identify contamination is presented in Sections 6 and 7. Basic components of an EHMP to manage contamination is found in Sections 8 through 17. Appendices A and B provide guidelines and forms for landowners, tenants, utility companies, and construction contractors responsible for implementation of the EHMP and proper management of contaminated media and reporting.

Note: In this document, the terms “encounter” and “release” are synonymous where applied to contamination exposed within a medium during surface or subsurface construction/excavation activity.

Following procedures specified in this document will help minimize the need to stop work when contamination is encountered or suspected. An environmental consultant or a supervisor knowledgeable in dealing with contaminated soil and groundwater should be on site during construction activities at sites with known or suspected contamination. The first person to notice gross contamination (visual or odor signs) is typically the backhoe or heavy equipment operator. This machine operator relays the discovery of the contamination to the designated on-site environmental consultant or supervisor, who then reports this information to the project director or property owner. The project director or property owner, or at their direction the environmental consultant, are then required to report a “release” to HDOH (see Section 9 and Appendix B.1) and ensure that management of contaminated soil and/or groundwater is then carried out in accordance with the EHE and EHMP. When exposed surface soils are planned to be excavated adjacent to building or tank foundation areas, or on former railroad rights-of-way, soil can be presumed contaminated and handled appropriately, or analyzed, if feasible, to determine the need for special handling.

The EHMP provides a range of options for dealing with contaminated soil and groundwater. The Guidelines for Landowners, Tenants, Utilities Companies and Construction Contractors (Appendix A) provides graphic and photographic examples of how to deal with contaminated soil and groundwater, and includes a Project Implementation Form. This form is a checklist based on HDOH experience with a wide range of events that can occur during construction.

Use of the forms in Appendix B is required to document proper handling of gross contamination discovered, provide record keeping for the project, and fulfill reporting requirements for HDOH. The forms should detail deviations from standard practices in the text, and explain how those deviations were protective of human health and the environment.

If subsurface excavations or surface excavations of soils adjacent to building or tank foundations or on former railroad rights-of-way are planned within the KHID:

1. Review the EHMP and identify known or suspect areas of contamination;
2. Read the EHE section of this document to become familiar with the potential hazards associated with contaminated soil and groundwater;
3. Prepare a brief, project-specific EHMP to outline specific management requirements as needed (e.g., contacts for reporting gross contamination, stockpile area locations, stormwater management, reuse and disposal options, etc.; see sections 9-17 and associated appendices);
4. Develop a site-specific Health and Safety Plan (HSP) (Section 10 and Appendix B.2).

During subsurface construction work, if contaminated media, inactive pipelines, or underground storage tanks (USTs) are encountered, take the following necessary steps as applicable to ensure proper handling of contaminated media:

- Report any contaminated soil, groundwater, or surface water encountered to the HEER Office (Section 9 and Appendix B.1). Petroleum contaminated soil and sheen or petroleum product on groundwater are usually the most obvious indicators of contamination, but unusual odors can also be an indicator.
- Follow the Construction Activities Release Response Plan (Section 11 and Appendix B.3).
- If inactive pipelines or USTs are encountered, follow the Inactive Pipeline and UST Removal Plan (Section 12 and Appendix B.4).
- If contaminated soil is encountered, follow the Soil Management Plan (Section 13 and Appendix B.5).
- If contaminated groundwater is encountered, follow the Groundwater Management Plan (Section 14 and Appendix B.6).
- If free product is encountered, follow the Free Product Management Plan (Section 15 and Appendix B.7).
- If elevated soil vapor is encountered, follow the Soil Vapor Management Plan (Section 16 and Appendix B.8).
- If contaminated soil and/or groundwater is in or could be in contact with stormwater, follow the Stormwater Management Plan (Section 17 and Appendix B.9).

Fill out the individual plans in Appendix B by following approved practices in the EHMP sections of the document (Sections 9 through 17). Record actions taken on the appropriate form(s), keep a copy for your records, and submit a copy to the HEER Office to fulfill reporting

requirements.

If responsible parties elect not to adhere to guidance in this document, then the subsurface activities must be halted upon the discovery of gross contamination and the contamination reported to the HEER Office Emergency Preparedness and Response Section. Recommencement of work should not be initiated until the site has been inspected by an On- Scene Coordinator or otherwise directed by the HEER Office. Failure to report a release could lead to fines of up to $10,000 per day. Failure to properly handle soil and groundwater could lead to fines from HDOH departments or other agencies, including the HDOH Solid and Hazardous Waste Branch and Clean Water Branch as well as the U.S. Coast Guard.

Disclaimer:

The procedures, information, guidelines, and sample hazard management plans referred to herein are not intended to be a comprehensive description of all rules, regulations, laws, and other requirements applicable to a construction project. They are only intended to provide general information and should not be used in place of appropriately qualified personnel. Each landowner, tenant, and construction contractor is responsible for complying with all applicable rules, regulations, laws, and other requirements, and for preparing their own hazard management plans for their own site-specific project.

5.0 AREA GEOLOGY & HYDROGEOLOGY

The KHID is located on the isthmus between the two volcanoes, West Maui and Haleakala which formed the island of Maui. Surface geology on the isthmus is dominated by Holocene and Pleistocene Alluvium (Sherrod et al., 2007) that eroded from lava formations of the two volcanoes. The alluvium comprises unconsolidated deposits of silt, sand, and gravel along stream and valley bottoms. Other surficial deposits, specifically at the coastline are dominantly calcareous sand and coral gravel strand-line deposits worked by surf. Soil covering the deposits are silty loams on alluvial fans and beach deposits developed from basaltic substrate, coral and seashells. In the KHID surface soils are described as fill land. Fill land includes areas filled with material from dredging, bagasse and slurry from sugar mills, and soil excavations (Foote et al., 1972). These materials were dumped and spread over marshes and low-lying areas along coastal flats. Debris from the 1900 Kahului (Chinatown area) fire may have been used or incorporated as fill material as well.

No active drinking water wells are present within the KHID. The area is seaward (makai) of the underground injection control (UIC) line (HDOH,1983). Due to the close location to the ocean, groundwater is likely to be encountered during shallow subsurface activities at the KHID. Shallow groundwater is situated in a sedimentary, unconfined aquifer (Mink and Lau, 1990) and is not a drinking water source. Deeper groundwater is situated in an unconfined basaltic flank aquifer. Both aquifers have low salinity and are ecologically important. Previous environmental investigations at the KHID reported groundwater tables at depths ranging from 2 to 7 feet depth below the ground surface (HIES, 1997a, EnviroServices, 2014). A tidal study conducted revealed water table elevation oscillations in response to inland tidal forcing with little landward attenuation (HIES, 1997b).

6.0 ENVIRONMENTAL HAZARD EVALUATION

6.1 Contaminants of Potential Concern

The EHE consists of Sections 6 and 7.

Based on the site history of the industrial area, the following contaminants of potential concern (COPC) may be encountered in soil and groundwater during subsurface construction projects in the KHID due to industrial activities.

The COPCs are further broken down to petroleum related contaminants and non-petroleum related contaminants.

Petroleum related contaminants:

- Total petroleum hydrocarbons (TPH) as gasoline (TPH-g), as diesel (TPH-d), and as oil (TPH-o)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX)
- Methyl tertiary butyl ether (MTBE)
- Halogenated volatile organic compounds (HVOC)

- Polycyclic aromatic hydrocarbons (PAH)
- Lead, Cadmium
- PCBs
- Light non-aqueous phase liquid (LNAPL)/free product (e.g., gasoline, diesel fuel, fuel oils, lubricating oils, benzene, toluene, xylenes)
- Methane

The PAHs identified in this area include acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[a]pyrene, benzo[g,h,i]perylene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, 2- methylnaphthalene, naphthalene, phenanthrene, and pyrene.
Petroleum products are likely to be encountered near fuel storage areas (Figure 4) and in the vicinity of current or historical pipelines. The latter cross/crossed and run/ran alongside and underneath roads in the KHID (Figure 5).

Non-Petroleum related contaminants:

Treated wood in railway tracks and weeds/brush lining railway tracks might have been treated with metals and organochlorine pesticides. Pesticides such as pentachlorophenol and 2,4,5-T and Silvex can be sources of dioxins and furans. Dioxin/Furan contamination is anticipated to be very localized along railway lines (see railway lines in Figure 2). Organochlorine pesticides and arsenic are likely to be more widespread due to their (former) use for termite, weed, and rodent control around structures (see Figure 4 for potential locations around above ground storage tanks (ASTs) and pre-1988 buildings) and railway tracks (Figure 2). Lead was a significant constituent of some paints used on structures until at least 1978 (Figure 4).

Pesticide related contaminants

- Organochlorine Pesticides
- Dioxins/Furans
- Copper, Chromium, Arsenic (treated wood, former railroad rights-of-way)
- Arsenic (herbicide, rodenticide)

Fill, sewage, or paint related contaminants

- Metals (arsenic, cadmium, chromium, and lead).

Metal contamination associated with fill, sewage, or paint may be impacting at least portions of the KHID as a result of historic activities. Fill can be encountered in the area labeled “Fd” in the USDA soil map in Figure 6. Metal COCs that may have impacted the area include arsenic, cadmium, chromium, lead.

6.2 Gross Contamination

Gross contamination refers to physical conditions that present odor, nuisance, and general pollution concerns. It includes free product, sheen, objectionable odors and tastes (in drinking water), and general resource degradation. At high levels, certain types of gross contamination can become a physical hazard (e.g., presence of flammable vapors or liquids, such as those associated with gasoline). Methane gases can be produced in

petroleum contaminated areas under anaerobic conditions, if it is under pressure, and mixes with oxygen in the right proportions. These conditions may be encountered during utility trench excavations or in utility vaults or buildings and can lead to flashbacks or explosions.

Contaminants in areas considered grossly contaminated are typically relatively immobile and of low toxicity to humans, though they are considered a nuisance or other hazard due to characteristics noted above. In the absence of ICs and/or engineered controls, future human populations and ecological receptors at a property could be exposed to gross contamination (e.g., free product, objectionable odors).

6.3 Direct Exposure

Direct exposure hazards involve human contact with contaminated soil, groundwater, or soil vapor, either directly or indirectly. Direct contact can occur via incidental ingestion or dermal contact, or inhalation of dust in outdoor air. Indirect contact can occur via inhalation of soil vapors in outdoor air. In general, contaminants in areas considered to present a direct exposure hazard are relatively immobile and are potentially toxic to humans.

In the absence of cleanup measures or ICs, direct exposures to contaminants exceeding HDOH EALs may result in current or, future human populations at the property being exposed to contaminated soil (including contaminated dust), groundwater, or soil vapor..

6.4 Soil Vapor Intrusion

Vapor intrusion involves exposure of human populations to volatile chemical compounds that have entered a building or other enclosed structure from contaminated subsurface soil or contaminated groundwater. In general, contaminants in areas considered to present a vapor intrusion hazard are volatile chemicals that are toxic to humans via inhalation of vapors. These volatile chemicals can either be directly from the source material or volatiles produced by degradation of source materials (e.g., methane).

In the absence of cleanup measures or ICs, soil vapors at levels exceeding applicable HDOH EALs may result in current or future human users of the property to be exposed to volatile organic compound (VOC) vapors.

6.5 Leaching

Leaching is movement of contaminants from vadose zone soils into underlying groundwater through chemical and physical mechanisms. The principal chemical mechanism is dissolution of contaminants into water (e.g., percolating rainwater, irrigation water) moving downward through the vadose zone. Physical mechanisms include (1) entrainment of contaminants bound in a colloid phase by water moving through the vadose zone, and (2) mass movement of contaminants through the vadose zone by infiltrating water. Most contaminants in areas considered to present a leaching hazard typically are mobile, volatile chemicals that are toxic to humans and may threaten ecological receptors at sites close to surface water bodies (including Kahului Harbor).

In the absence of cleanup measures or ICs, groundwater could be contaminated via leaching of contaminants from vadose zone soils by infiltrating groundwater.

6.6 Ecotoxicity

6.6.1 Terrestrial Ecotoxicity

Ecotoxicity refers to the capability of a contaminant to damage an ecological population, ecological community, or ecosystem. The ecotoxicity of a contaminant typically is based on its toxicity to one or more species, its persistence in the environment, and its ability to bioaccumulate. Flora and/or fauna in terrestrial (i.e., land) habitats may be affected.

Impacts on terrestrial flora and fauna can occur through exposure of populations to contaminated soil or discharge into Kanaha Pond. Kanaha Pond is a State Wildlife (Bird) Sanctuary, and protected wetland with endangered species (Hawaiian coot and Hawaiian stilt). Therefore, protection of this area from contamination is essential.

Most contaminants in areas considered to present a terrestrial eco-toxicity hazard are typically relatively immobile, non-volatile chemicals that are toxic to ecological receptors. Because no current or future sensitive ecological receptors are or will be present within the KHID, terrestrial eco-toxicity is not considered a concern and will not be evaluated further. In the absence of concerns regarding terrestrial flora or fauna in the area, terrestrial eco-toxicity is not considered an environmental hazard.

6.6.2 Aquatic Ecotoxicity

Impacts on aquatic (i.e., freshwater or marine) flora and fauna can occur through discharge of contaminated groundwater into surface waters or via surface runoff into aquatic habitats. Most contaminants in areas considered to present an aquatic eco-toxicity hazard are typically mobile, volatile chemicals that are toxic to ecological receptors. In the absence of control measures or ICs, sensitive populations could be exposed to groundwater contaminants or soil contaminants entering surface water bodies such as the ocean, streams, or wetlands via migration through the Harbor wall, surface runoff, or other preferential pathway (e.g., current and future storm drains).

7.0 EXPOSURE PATHWAYS

Identified potential exposure pathways to human and ecological receptors within the KHID include ingestion, inhalation, and dermal contact. These are described briefly below.

7.1 Ingestion

Ingestion is oral intake of a solid or liquid material. Ingestion of contaminated soil or groundwater is a human health risk, ecological risk and a direct exposure hazard. Accidental ingestion of contaminated soil or groundwater by human receptors will be of concern during construction when contaminated soil and groundwater are encountered. Ingestion of contaminated soil, sediment, and groundwater is a concern for sensitive receptors at Kanaha Pond and Kahului Bay if contaminants are flushed into these areas via groundwater, storm drain or other potential preferential pathways, or surface water flow and are ingested directly or via the food chain.

7.2 Inhalation

Inhalation is the act of drawing air, other gases, vapors, fumes, smoke, dust, or mists into the lungs. Inhalation of contaminated soil (as dust) is a human health risk and a direct exposure hazard. VOC vapors released from surface soil potentially pose an indirect exposure hazard.

During excavation and construction activities, contaminated subsurface soils may be disturbed, thus increasing potential for release of dust into the work area.

7.3 Dermal Contact

Dermal contact is direct exposure of skin to solids, liquids, or gases. Dermal contact with contaminated soil, groundwater, or soil vapor is a direct exposure hazard. During excavation and construction activities, contaminated subsurface soils and groundwater are likely to be encountered, thus increasing potential for dermal contact. Dermal contact with contaminated soil, groundwater, and soil vapor (and contact with free product) may be of concern during construction activities when contaminated soil and groundwater are encountered.
Dermal contact with petroleum, contaminated soil, sediment, and groundwater is a concern for sensitive receptors at Kanaha Pond and Kahului Bay if petroleum or contaminants are flushed into these areas via groundwater, storm drain/preferential pathways, or surface water flow.
Methane gas, if produced and mixed with oxygen in the right proportion, could cause explosions and/or backflashes that could lead to dermal exposure and burns of the skin.

8.0 ENVIRONMENTAL HAZARD MANAGEMENT PLAN

The EHMP consists of Sections 8 through 17.

This EHMP has been developed to mitigate potential exposure of utility and construction workers, other on-site workers, and the aquatic ecosystem (Kahului Harbor and Kanaha Pond) to COCs during excavation activities in the KHID. The EHMP consists of nine individual plans presented as Sections 9 through 17 as follows, each addressing potential sources of COCs (see Section 6.1) and methods of handling contaminated media:

- Section 9 - Release Reporting Plan
- Section 10 - Health and Safety Plan (HSP)
- Section 11 - Construction Activities Release Response Plan
- Section 12 - Inactive Petroleum Pipeline and UST Management Plan
- Section 13 - Soil Management Plan
- Section 14 - Groundwater Management Plan
- Section 15 - Free Product Management Plan
- Section 16 - Vapor Management Plan
- Section 17 - Stormwater Management Plan

The plans address engineering and administrative controls, as well as requirements for personal protective equipment (PPE) and a monitoring program. Prior to initiation of construction work, on-site workers need to be informed and educated about potential hazards posed by COCs and methods used to prevent exposure.

Construction activities in contaminated media are to be reported by filling out appropriate form(s) in **Appendix B** and submitting the forms to the HEER Office.

9.0 RELEASE REPORTING PLAN

Encounters with obvious petroleum contaminated soil, debris-contaminated soils (DCS), or other identified contaminated soil or groundwater during surface or subsurface excavation activities is considered a release discovery and must be reported to the HEER Office according to the following procedures. This includes unexpected contamination not identified in this plan, ”fresh” sources of release, and large releases that cannot be managed under this plan. Releases that occur during construction activities or releases due to contingencies should also be reported by following the directions in this Section.

The contractor must immediately notify the Hawaii State Emergency Response Commission (HSERC)/HEER Office in Honolulu) at 808-586-4249 or 808-247-2191 after work hours, and the Maui County Local Emergency Planning Committee (LEPC) (808-270-7900; LEPC contact currently Jeffrey Kihune) after discovery of contaminated soil and/or groundwater.

A release of oil within the KHID would be indicated by any of the following:

- Any amount of oil that causes a sheen on the groundwater in an excavation.

- Any free product that appears on groundwater.
- Visual or olfactory (odor) evidence of oil contamination in soil or groundwater.

If free product is encountered in soil or groundwater, report the release in accordance with this section. It is not necessary to stop work if you follow the procedure specified in this document.

Note that any release of oil to Kahului Harbor falls under the Oil Pollution Act (OPA) of 1992. Releases of Reportable Quantities (RQ) of CERCLA hazardous substances or oil that cause a sheen on water (e.g., ocean, stream, storm drain leading to ocean) must be reported to the National Response Center (1-800-424-8802) as a release to surface water. The National Response Center will then notify the Coast Guard.

9.1 Immediate Verbal Notification

In the event of a release that causes an imminent threat to human health or the environment, the first call shall be to 9-1-1.

Immediate verbal notification shall be provided to the HSERC/HEER Office and the Maui County LEPC either via telephone or in person. HSERC/HEER Office will not accept initial notification via fax or e-mail. In addition, unless it is specifically stated that a verbal notification is being given to a HEER Office State On- scene Coordinator (SOSC) on the scene during an incident, mere presence of a HEER Office SOSC does not constitute a notification. When in doubt, the contractor should call and speak to a HEER Office SOSC. There is no penalty for reporting a release unnecessarily, but there are large penalties for not reporting a release (up to $10,000 per day).

Notification should occur within 20 minutes of discovery of the release. Provide the following information to the extent known at the time of notification (do not delay notification if notification information regarding the release is incomplete):

- Name and telephone number of the caller
- Name and telephone number of a contact person (if different from the caller) who can provide timely information as the incident is occurring
- Name (trade and chemical) of the hazardous substance that has been released
- Approximate quantity of the hazardous substance that has been released
- Location of the incident
- Date and time of spill, release, or threatened release
- Description of what happened (source and cause of the release)
- Immediate danger or threat posed by the release
- Name, address, and telephone number of the RP or potentially responsible party (PRP)
- Measures taken or proposed to be taken in response to the release as of the time of notification
- Any known injuries or advice regarding medical attention necessary for exposed individuals
- Names and phone numbers of other federal, state, or local government agencies that have been notified of the release

- Any other information that may help emergency personnel respond to the incident.

Once the information has been conveyed, the caller will be provided with a HEER Office Incident Case Number, which shall be referenced in any future correspondence including the follow up written notification submittal—federal requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and OPA.

9.2 Written Follow-Up Notification Contents

Notification, including all information provided in the verbal notification described above and any other pertinent information not previously provided, shall also be made in writing to the HSERC/HEER Office. This written notification shall be sent to HSERC/HEER Office no later than thirty (30) days after initial discovery of a release. The written notification can be sent by certified mail, fax, hand-delivery, or another means that provides proof of delivery. Photos should be included to document the incident. A copy of the Written Follow-up Notification Form B.1, is in Appendix B.1. The HSERC/HEER Office mailing address is:

Attn: EPCR Data Manager
State of Hawai‘i
Department of Health
Hazard Evaluation and Emergency Response Office
2385 Waimano Home Road, Suite 100
Pearl City, Hawaii 96782

9.3 Recordkeeping Requirements for Encountered Contamination

Fill out Form B.1 for your records and send a copy to the HEER Office at the address noted above.

10.0 HEALTH AND SAFETY PLAN (HSP)

Provide a HSP for workers performing excavations who will encounter or potentially encounter the COCs and hazards described in Sections 6 and 7 (EHE). The HSP should generally include the following:

- Requirements that workers be trained in dealing with petroleum compounds, whether occurring as free product, soil residues, contaminated groundwater, or as soil vapor, and protection from other chemical substances and hazards that may be encountered, including, but not limited to, use of appropriate PPE
- General site control and safety requirements such as site access controls, information on emergency medical facilities, and good worker practices.
- Description of present and potential hazards, including COCs, action levels, and applicable actions (see Appendix B, Form B.2, Table 1 for oil hazards example and lead) .
- Emergency contact information.

A HSP is not a substitute for Hawai‘i Occupational Safety and Health Division (HIOSH) requirements. Employers of construction workers/utility workers must comply with all applicable OSHA/HIOSH requirements. See Appendix B, form B.2 for additional guidance.

11.0 CONSTRUCTION ACTIVITIES RELEASE RESPONSE PLAN

Parties should operate under a site-specific release response plan. The sample Construction Activities Release Response Plan provided in Appendix B.3 can be used as a starting point.

On-site workers need to minimize probability of releases from excavations during construction. They should familiarize themselves with site conditions and potential presence of petroleum in the subsurface. An HSP and soil and groundwater management plans should be prepared.

If uncontrolled releases of petroleum, DCS or petroleum-impacted soil, and petroleum- and/or metals-impacted groundwater could occur, human health concerns would include possible direct contact, exposure to fire hazards, and disruptions to site activities, including possibly local traffic. Environmental impacts of concern would be discharges of metals-contaminated groundwater, petroleum contamination in soil or groundwater, or sheen to harbor waters either directly or via a storm drain or other type of surface water conveyance.

A response plan to deal with uncontrolled releases should be available to the construction workers and other parties. It should include descriptions of the types of releases, a list of names and contact information regarding the release response team and the parties that must be notified, a list of available response equipment, descriptions of response procedures, and an outline of release reporting requirements.

12.0 INACTIVE PETROLEUM PIPELINE AND UST MANAGEMENT PLAN

This section provides guidance on how to prepare for and manage belowground inactive petroleum pipelines or USTs located or exposed during excavation or other subsurface activities.

12.1 Preparatory Work

Prior to performing any subsurface work, parties should review Figures 4 and 5, historical documents and plans and contact the Hawaii One Call Center at 1-866-423-7287 or 811 for information on inactive pipelines, utilities, or USTs identified to date. Hawaii State Law requires that excavators provide at least 5 working days' notice prior to any subsurface excavation. However, accuracy and completeness of this information are not warranted or guaranteed because historical pipeline information has not been well documented. In some instances, previously unknown inactive pipelines or USTs may be discovered for the first time during excavation or other subsurface activities.

Notify the HEER Office if any inactive pipelines or USTs are encountered.

12.2 General

Parties should manage soil from the excavation or other subsurface activities in accordance with the soil management plan Section 13. If an inactive buried suspect fuel pipeline is discovered, refer to the known/suspect fuel pipeline map in this EHE/EHMP, check with landowners/operators in the area, and contact the HEER Office to discuss status of the line (i.e. do we know if the pipeline has been previously identified, drained of any product, and may be left in place?) and, as necessary, discuss options to check or drain and remove any product (and/or the pipe segment) from the required excavation. If a UST is discovered, it

must be removed as per HEER Office or Solid and Hazardous Waste Branch requirements.

12.3 Pipeline Tapping, Draining, and Removal

If a pipeline or UST is discovered, attempt to identify the nature of the pipeline or UST, and to confirm that it is not active. Prior to any excavation work, confirm that any pipeline segments to be removed are inactive by contacting the HEER Office or others, including Hawaii One Call Center and the appropriate utility company or nearby petroleum terminal operator if one can be identified. Parties undertaking their own pipeline or UST removal should prepare and use a site-specific plan that incorporates the procedures described in this section. The site-specific plan can be based on the sample Inactive Pipeline or UST Removal Plan provided in Appendix B.4.

Do not attempt to remove USTs or pipeline segments without first draining the UST or pipeline segment or determining that it is empty. To the extent practicable, any drainable fluids must be drained before cutting the pipeline or UST. Petroleum fluids recovered must be representatively sampled and tested to determine how they can be recycled or disposed of in full accordance with Title 11, 58.1 and Chapters 260-279 of HAR and any other state and federal regulation governing this activity.

Only personnel knowledgeable and trained in pipeline and UST removal should cut, drain, and remove USTs and pipelines. Remove the required pipeline segments by cutting. If an explosion hazard is possible, cutting should be with a wet saw or some other non-sparking tool. If the pipelines are suspected to be asbestos-covered, a qualified contractor must direct this work and recommend appropriate procedures and PPE, including procedures for removal. Ensure that the area below and adjacent to cutting locations is covered with plastic sheeting and absorbent material. In addition, place a catch basin directly beneath the cutting location. Because pipelines may be under pressure, a vacuum truck should be on site during cutting to recover any released fluids. Pipeline fluids collected in the catch basin should be pumped out.

Cut-off ends of remaining pipeline segments must be appropriately sealed, or otherwise closed, to prevent any potential leakage. Suitable seals include cement plugs, blind flanges, or other methods not involving hot welding. Welding is not appropriate due to the potentially explosive nature of petroleum and its associated vapors.

12.4 Removed UST and Pipe Handling

In many cases, sections of removed pipeline and USTs contain heavy viscous petroleum products that appear to be immobile. However, once the pipes and product heat up on the surface, the product can liquefy and cause a release. If sections of waste pipe or USTs are stored on site prior to disposal, the area should be lined with plastic and bermed to contain any petroleum that may mobilize due to atmospheric heating. All removed pipelines and USTs should be properly disposed of or recycled.

12.5 Other Sub-Surface Utilities

Other subsurface utilities such as cable, water and sewage lines, and electrical lines may also be discovered during excavations. The nature of the utilities and whether they are presently active should be determined prior to removal. The One Call Center at 1-866-423-7287 (or 811) can help identify the nature and origin of active subsurface utilities.

12.6 Record Keeping

Parties should record field observations that include the location of the UST and pipeline relative to fixed landmarks (including Global Positioning System coordinates); depth, diameter, and type of pipeline and any other distinguishing features; type of petroleum; beginning and ending fluid levels; volumes of each type of fluid removed (e.g., water and petroleum); flow rates; direction of flow; and any other information pertinent to the UST or pipeline contents. Provide records of field observations with detailed photographs to the HEER Office, and, if requested, to the landowners. Major deviations from the EHE/EHMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and documented; complete Appendix B.4 for your records and send a copy to HDOH.

13.0 SOIL MANAGEMENT PLAN

The purpose of the soil management plan is to ensure proper handling and management of PCS, DCS, and pesticide-related contamination in soil that could be encountered during future construction. The principal hazards posed by these contaminants in soil are direct exposure, gross contamination, leaching to groundwater, and/or vapor intrusion into existing or future buildings. Contaminated soil cannot be re-used off site prior to laboratory testing and confirmation that testing results meet the most restrictive EALs (for unrestricted use, within 150 meters of a water body over a drinking water resource). or soils are determined to be potentially contaminated and need to be handled with certain precautions.

PCS falls into two categories: (1) moderately contaminated soil with slight petroleum odors and exhibiting staining, and (2) heavily contaminated soil with a very strong petroleum odor, very dark staining, and potentially mobile free product. From an analytical standpoint, heavily contaminated soil is defined as soil with total TPH concentration exceeding 5,000 milligrams per kilogram (mg/kg) (subsurface gross contamination). Gasoline and diesel free product in soil could be mobile at concentrations as low as 5,000 mg/kg. Although somewhat arbitrary, this serves as a useful tool for distinguishing heavily contaminated soil from less contaminated soil. Test to determine if soil exceeds 5,000 mg/kg TPH include laboratory analysis and field tests such as the glove test and the paper towel test (also see HEER Office TGM (www.hawaiidoh.org) Section 8.4.2 on field screening options for petroleum contamination in soils). The glove test consists of squeezing a handful of soil in a gloved hand. If oil droplets remain on the glove, assume the soil exceeds the 5,000 mg/kg threshold and do not reuse the soil on site. The paper towel test consists of squeezing a handful of soil in a paper towel. If droplets of oil appear on the paper towel, assume the soil exceeds the 5,000 mg/kg threshold and do not reuse the soil on site. PCS exceeding 5.000 mg/kg should be excavated and disposed of in an approved landfill, when feasible. The soil used in the field tests should be representative of the soil in the trench or stockpile, meaning a multi-increment (MI) sample should be collected in accordance with the HEER TGM and fill guidance. If the soil contains free product, it should be handled as per Section 15 Free Product Management Plan. Anticipated tasks associated with managing excavated soil are summarized as follows:

- Notify the HDOH HEER Office at least 7 days prior to planned excavation activities that could disturb PCS, DCS, sewage-related, or pesticide-related contaminated soil (includes surface soils along former railroad tracks or exposed soils adjacent to building or tank foundations).
- If PCS or DCS, sewage related soil, bagasse, railroad lines or exposed soils along foundation areas are observed during excavation activities, provide field oversight to

direct the excavated soil to the appropriate stockpile, and to specify appropriate use of excavated soils as on-site backfill versus off-site disposal; and provide health and safety guidance related to potential exposure of workers to COCs.

- Oil-impacted stockpiled soils can also be placed in containers (such as 20-yard steel roll-off bins, super sacks, tri-wall boxes, or drums). Drain any liquid-phase oil or fuel product associated with the soil prior to stockpiling. Remove and properly dispose of any oil observed in the excavation.
- Soil must be stockpiled on site near the project area prior to reuse.
- Create soil stockpiles by laying down 10-millimeter (mil) black plastic (polyethylene) sheeting within a designated on-site soil stockpiling area. PCS, DCS, and surface soils from railroad rights-of-way or building and tank foundation areas should be in separate stockpiles. Underlay edges of the plastic sheeting with bermed soil. Ensure that the height of the bermed soil will be sufficient to prevent stormwater runoff from breaching it. Place excavated soil inside the bermed area on top of the plastic sheeting. At the end of each day or in the event of a significant rain event, cover the stockpiles with plastic sheeting. Secure the plastic covering with sufficient ballast (e.g., sandbags, boulders, concrete blocks) so that it will not be dislodged by strong winds.
- Segregate excavated contaminated from clean soil, and stockpile the contaminated soil on plastic sheeting. Cover both the clean soil and PCS stockpile(s) at the end of each day with plastic sheeting to mitigate potential dust concerns and to prevent contact with rainwater and stormwater runoff. See Appendix A for additional details.
- If soil is classified as moderately contaminated by petroleum compounds due to observed staining or odors (i.e., estimated TPH <5,000 mg/kg), the soil can be used as backfill on site if more than 100 feet from the Harbor wall and it is placed more than one foot above the tidally influenced high water level. Remove floating free product to the extent practicable prior to backfilling any excavation
- If PCS is classified as heavily contaminated (i.e., estimated TPH>5000 mg/kg), it must be profiled and disposed of at an appropriate landfill site.
- In determining whether excavated soil can be used for on-site backfill, consider also its structural suitability, although this is not a requirement under HDOH guidance. The soil could be considered not structurally suitable if it cannot support foundation loading of a structure intended to be placed over backfilled and compacted soil, or if it does not meet the technical specifications for backfilling of utility trenches, or if it does not meet other design or constructability requirements. If structurally suitable, DCS should be given preference for re-interment in the excavation.
- If PCS- or DCS-contaminated soil is to be used in roadways, the soil must also meet roadway design criteria of the County and Hawaii Department of Transportation (HDOT).
- Soil not structurally suitable for reuse should be reused at other areas of the site, or should be profiled and taken off site for appropriate disposal in a landfill.
- Place PCS, DCS, or surface soils from railroad rights-of-way or building and tank foundation areas used as backfill on site a minimum of 1 foot bgs above the tidally influenced high water table (to prevent leaching), cover it with clean soil, and as required, cap with asphalt or cement.
- If there is no place to stockpile PCS, DCS, or other suspect contaminated soil, profile it and haul it to a landfill for disposal. Stockpiling more than 1 cubic yard (cy) of PCS at an

off-site location requires a solid waste management permit from the Solid and Hazardous Waste Branch (see HRS, 2011).

- Decontaminate equipment used in contaminated areas before using it in non-contaminated areas. All liquid and solid waste resulting from on-site decontamination must be collected and appropriately disposed of at a certified landfill site (See TGM 5.10.)

13.2 Soil Sampling and Testing for Reuse or Disposal

Sample collection procedures should follow HDOH HEER's August 2017 "Interim Final Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan" (HDOH, 2017; or as updated), and HDOH HEER's October 2017 "Guidance for Stockpile Characterization and the Evaluation of Imported and Exported Fill Material (HDOH, 2017). For unrestricted relocation, the general sample collection procedures are as follows:

- Collect one multi-increment sample for every 20 to 100 cubic yards (CY) of affected soil (staged in stockpiles of 20-100 CY).
- Each multi-increment sample should consist of 50-100 soil increments collected in a random, stratified manner from the entire volume of soil (20-100 CY) for which the sample will represent (each sample for volatile analysis should at least contain 300 gram (g) of soil in methanol; each sample for non-volatiles should be comprised of at least 1-2 kg soil mass).
- Collect soil increments of the same relative volume/weight (for example, each increment consisting of a 50-gram soil aliquot or similar).
- Use appropriate sample collection methodology to preserve the COPCs to be tested.
- Label samples, place in designated sample container, and preserve in accordance with USEPA and HDOH TGM procedures.
- Complete chain-of-custody documentation.

If a soil is presumed to be contaminated, the testing of that soil will depend on the suspected contaminants.

Before relocation or disposal, soil must be tested to determine whether it contains COPCs above the HDOH Tier 1 EALs for unrestricted use and whether it is a hazardous waste under RCRA (Resource Conservation and Recovery Act). If a soil is presumed to be contaminated, the testing of that soil will be depend on the suspected contaminants. Collecting a representative sample of soil or bulk C&D waste is crucial to characterizing samples. If a sample is not representative, there are legal and environmental consequences (see HEER TGM Section 4.0).

Re-Use Testing. This testing involves field tests or laboratory tests for sewage-related, pesticide-related, PCS- and DCS-related COCs, and for other potentially relevant COCs (Section 6.1). Results of this testing are referenced to guide soil re-use, as described above. Note that this testing can occur either on stockpiled, excavated soils or on in-situ soils during pre-excavation field investigations.

Landfill Profile Testing. This testing involves determining suitability of the soil for use as daily cover or for disposal as a waste at a landfill. Soils not to be reused (backfilled), as described above, can generally be disposed of in a suitable landfill. Disposal of these soils would be subject to Landfill Profile Testing. Information regarding chemical analysis and disposal options (i.e., as cover or as waste) should be obtained from the relevant landfill. Soils that meet the

landfill's standards for interim/daily cover or longer term, intermediate cover should be used as such. The former typically requires that the soil meet HDOH EALs for commercial/industrial land use, while the latter typically requires that the soil meet EALs for unrestricted reuse. Costs for disposal of these soils are typically lower than for disposal of more contaminated soil that cannot be used for cover. Soils not suitable for use as cover or other uses at the landfill must be disposed of as waste. Soil testing to pre-profile the soil for off-site disposal can also occur as part of the pre-excavation field investigations.

Stockpile Testing. Recommendations for sampling soil stockpiles are provided in the HDOH guidance "Guidance for Stockpile Sampling and *Evaluation of Imported and Exported Fill Material* (HDOH 2017)". Qualified environmental professional should direct soil sample collection and testing methods in accordance with the most current TGM guidelines. Parties undertaking excavation are responsible for employing a qualified environmental professional and complying with the latest HEER TGM guidelines.

Making a Hazardous Waste Determination.
To determine whether soil is a hazardous waste, the generator must make a Hazardous Waste Determination in accordance with Hawai'i Administrative Rules (HAR) §11-262-11. Hazardous waste determination is a step-by-step process. First determine if the soil is considered a waste. For site under HEER oversight soil generally becomes a waste if it leaves the site and has concentrations exceeding the most restrictive Tier 1 EAL. If it is deemed a waste based on this criteria, determine if it is specifically exempted by HAR §11-261-4. Wastes that are not specifically excluded are further assessed as follows:

- Listed Wastes: Specifically listed as a hazardous waste in HAR chapter 11-261 subchapter D;
- Testing - Testing the waste for toxicity, ignitability, corrosivity, or reactivity according to the methods set forth in HAR chapter 11-261 subchapter C; and/or
- Knowledge (e.g., known flammable solvent).

The proper relocation or disposal of the soil depends on the category in which the soils fall. Soils and Fill material may fall into one of the following categories:

1) Unrestricted Use
2) Contaminated/Restricted Use
3) Hazardous Waste

Unrestricted Use
Unrestricted use soils are soils that do not contain COPCs above the HDOH Tier 1 EALs for unrestricted use, where sites are located within 150 meters (approximately 500 feet) from surface water and over a drinking water source (most restrictive EAL). After background information has been gathered regarding the potential for contamination in an area and testing has demonstrated that soil does not contain COPCs concentrations above the most restrictive EAL, unrestricted use soil can be reused within the Work Area or offsite.

Sampling will be required before reuse in sensitive areas. Further guidance on the use of non- regulated soil as fill is provided in "Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material" (HDOH, 2017).

Contaminated/Restricted Use.
If the soil contains any contaminants above the most restrictive Tier 1 EALs or the Tier 1 EALs for commercial/industrial use, but it is not a hazardous waste, it is considered contaminated and can be reused under specified circumstances, but only with the approval of the HEER office and the Hazardous Waste section. If the soil only exceeds the unrestricted EALs, and not the commercial/industrial EALs, it can be used within the Work Area and in some instances with prior approval, treated until the contaminant concentrations are below the Tier 1 EALs for unrestricted use within 150 meters (approximately 500 feet) from surface water and over a drinking water source, or disposed at a permitted landfill. If the contaminant concentrations exceed both unrestricted and commercial/industrial EALs, the soil can be used within the Work Area (if not grossly contaminated), treated to reduce concentrations to below Tier 1 EALs, or disposed at a permitted landfill. Mixing soils containing COPCs with soils that do not contain COPCs to reduce concentrations violates state and federal law.

Treatment of soil will require additional coordination with HDOH HEER and SHWB to identify permitting requirements, treatment methods and locations, best management practices at treatment locations, follow up testing, and other pertinent requirements.

Hazardous Waste

Hazardous waste regulations most commonly apply to soil that fails a leaching test criteria for disposal in a municipal landfill, referred to as the Toxicity Characteristics Leaching Procedure (TCLP). Material that meets the regulatory classification as "hazardous waste" must be disposed of at a permitted hazardous waste treatment, storage or disposal facility. There are currently no hazardous waste landfills in Hawai‘i. Therefore, soil classifiable as hazardous waste must be disposed of at a regulated facility on the mainland. Generators of hazardous waste are subject to additional regulations and must notify the Hazardous Waste section of their status. Further information can be found at http://health.hawaii.gov/shwb/hazwaste/ and by calling the Solid and Hazardous Waste Branch (Hazardous Waste section) at 808-586-4226.

13.3 Soil Contingency Plan

The Soil Contingency Plan provides guidelines for actions to be taken when engineering controls, administrative controls, or PPE fail, and risk of exposure to contaminated soil is imminent.

13.3.1 Open Excavations

During construction activities, subsurface contaminated soil could be exposed in excavations for utility corridors or other subsurface structures. If contaminated soil is encountered, more contaminated than anticipated, and could pose a direct exposure hazard to on-site workers, the following actions may be taken:

- If site conditions warrant, PPE will be upgraded from Level D to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section 9.4) and the Site-Specific HSP.
- If warranted, contaminated soil will be excavated and properly stockpiled prior to continuance of work. The stockpiling procedures are described in the Soil Management Plan (Section 13.1).

- If airborne dust generated from contaminated soil becomes significant, additional dust control measures will be implemented. This may require more frequent use of or an increased volume of applied water. Also, the dust screen cloth on the site boundary fence will be inspected for damage and repaired as necessary.

13.3.2 Soil Stockpiles

During construction activities or log-term exposure to sunlight, the plastic sheeting used to berm and cover soil stockpiles could be damaged through long-term exposure to sunlight, by strong winds or punctured by debris or other sharp objects. Such damage could allow on-site workers to come into contact with PCS. To prevent that from occurring, the following actions may be taken:

- Damaged sections of plastic sheeting will be replaced promptly.
- Damaged sections of the berm will be repaired promptly.

13.4 Engineering and Administrative Controls

Dust and vapor control methods may be necessary during construction-related work in which contaminated soil is encountered. These controls include use of plastic sheeting on soil stockpiles, vapor control using vapor suppressants, and dust suppression using applied water.

It is anticipated that Level D PPE will be appropriate for workers during future construction. Should site conditions warrant, the PPE will be upgraded to Level C. Ultimately, the contractor is responsible for monitoring site conditions and supplying site workers with appropriate training and PPE, in accordance with 29 *Code of Federal Regulations* (CFR) 1910 and 29 CFR 1926.

13.5 Periodic Inspections and Preventive Maintenance

A key component of the plan is routine inspections. Accordingly, all locations where exposure of on-site workers to PCS or DCS is possible (e.g., open excavations, soil stockpiles) will be inspected at a frequency appropriate for access and activities carried out on the site (e.g., daily for sites used or accessed on a daily basis). The site should also be inspected prior to and following adverse weather conditions that could disrupt control measures (e.g., heavy winds or rains). In addition, daily inspections of the security fence, locked gates, and dust screen will occur during construction and excavation activities. Replacement and repair of damaged or inadequate chain link fences, dust screens, stormwater control measures, stockpile covers, berms, etc., will occur immediately after discovery. PPE will be inspected for damage and defects before personnel don the PPE.

13.6 Record Keeping and Reporting

Detailed records will be maintained of workspace monitoring, PCS excavation, soil stockpiling and testing, soil testing, soil reuse and disposal, inspections, and maintenance and response activities. Any known or suspected contaminated soils (e.g. either PCS, DCS, metals, pesticides, or other) needs to be well documented via location on a map using GPS coordinates or physical measurements to nearby landmarks, and provided to the HEER Office. Significant issues also need to be communicated to site workers promptly. Major deviations from this EHE/EHMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and

documented; complete Appendix B.5 for your records and send a copy to HDOH.

14.0 GROUNDWATER MANAGEMENT PLAN

The purpose of the groundwater management plan is to ensure proper handling and management of contaminated groundwater that could be encountered during construction. Principal hazards posed by contaminated groundwater are gross contamination and aquatic ecotoxicity.

Shallow groundwater in the area is typically encountered at approximately 2 to 7 feet bgs. Results of previous site characterizations indicate that groundwater in the area has been impacted by COCs. Groundwater contamination may be apparent through visual evidence and olfactory detection. Contaminated groundwater may have a measurable thickness of free product, emit petroleum hydrocarbon odor, or exhibit sheen. It is unlikely that residual groundwater contamination is at a level warranting extensive response actions or disposal; however and importantly, additional site characterization may be required depending on conditions encountered in the field.

14.1 Groundwater Management

If contaminated groundwater is encountered during excavation activities, appropriate response actions must be taken that conform to HDOH and EPA regulatory guidelines. These response actions include ensuring that workers have the appropriate level of PPE and that free product, sheen, and groundwater are managed properly if dewatering is conducted. Anticipated tasks associated with managing groundwater are summarized as follows:

- If groundwater is encountered during construction excavation activities, provide field oversight to identify contaminated groundwater, direct appropriate dewatering if this is conducted, manage disposal of groundwater if this is necessary, and provide health and safety guidance related to potential exposure of workers to COCs.
- If free product is encountered during construction excavation activities, manage free product as described in Section 15.
- Dewatering is not generally anticipated during future utility-related work. However, if dewatering becomes necessary, water should be pumped into on-site infiltration pits or holding tanks, and should not be allowed to discharge off site.
- If off-site discharge is necessary, a Notice of Intent (NOI) for National Pollutant Discharge Elimination System (NPDES) coverage will be submitted to HDOH Clean Water Branch. The NOI will include a dewatering plan. Prior to discharge into a storm sewer or aquatic habitat, the water will be tested and, if necessary, treated to address both free product and dissolved-phase contamination. Water with contaminant concentrations exceeding EALs for chronic aquatic toxicity will not be discharged off site.
- Generation of groundwater requiring disposal is not generally anticipated during future utility-related work. However, if such disposal becomes necessary, the groundwater will be stored on site in appropriate containers (e.g., 55-gallon drums), sampled, analyzed for the appropriate COCs to determine disposal options, and disposed of properly. For additional details, see the Guidelines in Appendix A.

14.2 Vapor Control

Vapor control methods (e.g., vapor suppressants) may be necessary during construction-related work in which contaminated groundwater is encountered. It is anticipated that Level D PPE will generally be appropriate for workers. Should site conditions warrant, the PPE will be upgraded to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section 16.0).

14.3 Vector Control

If groundwater is filling open excavation it has the potential to attract disease vectors that will breed in standing water. Vectors can carry viruses and propagate diseases such as Dengue Fever and the Zika virus. Vector control methods (e.g., agitating standing water, addition of larvicides) may be necessary when excavations have standing water.

14.4 Groundwater Contingency Plan

The Groundwater Contingency Plan provides guidelines for actions to be taken when engineering controls, administrative controls, or PPE fail, and risk of exposure to contaminated groundwater is imminent.

14.4.1 Open Excavations

During construction activities, contaminated groundwater could be exposed in excavations for utility corridors or other subsurface structures. If contaminated groundwater is encountered that could pose a direct exposure hazard to on-site workers, the following actions may be taken:

- If site conditions warrant, PPE will be upgraded from Level D to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section 9.4) and Site-Specific HSP.
- If appropriate, the excavation will be backfilled using appropriate materials (e.g., gravel, select borrow) to a level above the groundwater prior to continuance of work.
- If it becomes necessary to remove contaminated groundwater from the excavation, the groundwater will be stored on site in appropriate containers (e.g., 55-gallon drums), sampled, analyzed for the appropriate COCs to determine disposal options, and disposed of properly.

14.4.2 Dewatering Pits

Dewatering is not generally anticipated during future utility work . However, if dewatering is conducted, and contaminated dewatering water is encountered that could pose a direct exposure hazard to on-site workers, the following actions may be taken:

- If site conditions warrant, PPE will be upgraded from Level D to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section 9.4).
- If appropriate, dewatering will be discontinued until such time that contaminants at the source of the dewatering (i.e., an open excavation) can be mitigated.
- If it becomes necessary to discharge contaminated groundwater from a dewatering pit, such discharge will fully comply with the conditions of any required NPDES permit.

14.5 Periodic Inspections and Preventive Maintenance

A key component of the plan is routine inspections. Accordingly, all locations where exposure of on-site workers to contaminated groundwater is possible (e.g., open excavations, dewatering pits) will be inspected daily.

If groundwater requiring disposal is generated, the storage containers will be inspected regularly for rust and other signs of deterioration while they remain on site, pending disposal. If on-site dewatering is conducted, the infiltration pit(s) will be inspected daily to ensure that no accidental discharge occurs.

14.6 Record Keeping and Reporting

Detailed records will be maintained of workspace monitoring, dewatering (if performed), groundwater disposal (if conducted), and response activities. The location of any remaining sheens on groundwater, free product, or dissolved contaminates in groundwater above applicable HDOH EALs needs to be well documented on a map using GPS coordinates or physical measurements to nearby landmarks, and provided to the HEER Office. Significant issues need to be communicated to site workers on a regular basis. Major deviations from the EHE/EHMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and documented; complete Appendix B.6 for your records and send a copy to HDOH.

15.0 FREE PRODUCT MANAGEMENT PLAN

The purpose of the Free Product Management Plan is to ensure proper handling and management of free product encountered during subsurface construction activities. The principal hazards posed by free product are direct exposure and gross contamination. Additional related hazards include flammable/explosive vapors.

Free product within the KHID is likely confined to the general area of the capillary fringe of the water table, which is approximately 2 to 7 feet bgs. Free product often occurs as (1) free-flowing, black, viscous product; (2) a thin layer of black, viscous product; (3) a discontinuous layer of product; and (4) a petroleum hydrocarbon sheen. The free product is readily apparent visually and via olfactory detection.

Distribution of free product within the KHID has not been completely defined, and free product could be encountered during any subsurface activities approaching the shallow groundwater level. Free product recovery will be required where possible and practicable.

15.1 Free Product Management

If excavation occurs to the depth of the capillary fringe of the water table at approximately 2 to 7 feet bgs, free product may be encountered. However, anticipated problems associated with free product can be mitigated by performing the tasks described in this plan.

If free product is encountered during excavation, appropriate response actions will be taken that conform to HDOH and EPA regulatory guidelines. These response actions include ensuring that workers have the appropriate level of PPE, and that free product is managed properly. The anticipated tasks associated with managing free product are summarized as follows:

- If free product is encountered during construction excavation activities, field oversight should be provided to identify free product; to recover the product to the extent practicable using absorbent pads/booms, oil-water separators, and/or vacuum trucks to skim free product off the water table; and to provide health and safety guidance related to potential exposure of workers to the product. Following completion of product recovery, the absorbents, PPE, and plastic sheeting will be allowed to dry prior to mandatory proper disposal.
- If dewatering becomes necessary and free product is floating on the water in the on-site infiltration pit(s), the product will be recovered to the extent practicable, and any absorbent material such as absorbent pads will be disposed of properly.
- If free product produces vapors that could adversely affect air quality during construction activities in the area, follow the Vapor Management Plan Section 16.0.

15.2 Engineering and Administrative Controls

Generation of explosive vapors from free product is a slight possibility. Methane or other degradation products may be encountered near petroleum source zones. If generated, such vapors increase risk of fire and/or explosion. Accordingly, if free product is encountered, the lower explosive limit (LEL) of the workspace atmosphere will be monitored using a combustible gas indicator.

Vapor control methods (e.g., vapor suppressants) may be necessary during construction-related work in which free product is encountered. It is anticipated that Level D PPE will be appropriate for workers. If site conditions warrant, the PPE will be upgraded to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section16.2).

15.3 Periodic Inspections and Preventive Maintenance

A key component of the plan is routine inspections. Accordingly, all locations where exposure of on-site workers to free product is possible (e.g., open excavations, dewatering pits, hoses, pumps, tanks, or spills from any of these sources) will be inspected daily or more frequently as appropriate. In addition, daily inspections of the security fence and locked gates will occur during construction activities where free product is encountered. PPE will be inspected for damage and defects before personnel don the PPE. If respiratory protection is required, a daily positive pressure respirator fit test will be conducted at the start of each day, and filter cartridges will be replaced regularly as described in the site-specific HSP.

Excavations (including infiltration pit[s] if on-site dewatering is conducted) will be inspected daily for presence of free product on the water. If free product is present, removal of it will be attempted using absorbent pads, skimming with a vacuum truck, or applying other means such as processing through an oil-water separator.

15.4 Record Keeping and Reporting

Detailed records will be maintained of workspace monitoring (including LEL measurements), product recovery, and response activities. Significant issues will be communicated to site workers on a regular basis. Locations of free product discovery need to be mapped using GPS coordinates or physical measurements to nearby landmarks and reported to the HEER Office. Major deviations from the EHE/EHEMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and documented; complete Appendix B.7 for your records and send a copy to HDOH.

15.5 Free Product Contingency Plan

The Free Product Contingency Plan provides guidelines for actions to be taken when engineering controls, administrative controls, or PPE fail, and risk of exposure to free product is imminent.

15.5.1 Open Excavations

During construction activities, free product could be encountered on groundwater in excavations used for utility corridors or other subsurface structures. Free product can pose a fire and explosion hazard when close to utility line that can produce sparks. Also, utility corridors can create preferential pathways to the ocean. If free product is encountered that could pose a direct exposure hazard, fire/explosion hazard, or ecotoxicity hazard, the following actions may be taken:

- If site conditions warrant, PPE will be upgraded from Level D to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section16.2).
- If the volume of free product encountered is too great for absorbent pads to handle effectively, a vacuum truck will be used to pump product out of the excavation, and the product will be disposed of properly.
- If appropriate, following removal of free product and prior to continuance of work, the excavation will be backfilled using appropriate materials (e.g., gravel, select borrow) to a level above the groundwater.
- If fire/explosion hazards, or ecotoxicity hazards due to creation of preferential pathways are identified, utility corridors should be relocated.

15.5.2 Dewatering Pits

Dewatering is not anticipated during future utility work. However, if dewatering is conducted and free product is encountered that could pose a direct exposure hazard to on-site workers, the following actions may be taken:

- If site conditions warrant, PPE will be upgraded from Level D to Level C. Respiratory protection and vapor monitoring are described in the Vapor Management Plan (Section 16.2).
- If the volume of free product encountered is too great for absorbent pads to handle effectively, a vacuum truck will be used to pump product out of the dewatering pit, and the product will be disposed of properly.
- If appropriate, dewatering will be discontinued until such time that the free product can be recovered.
- Under no circumstances will water contaminated with free product be discharged from a dewatering pit.

16.0 VAPOR MANAGEMENT PLAN

The purpose of the Vapor Management Plan is to identify VOC vapors that could adversely affect air quality during construction activities within the area covered by this document. The principal hazards posed by VOC vapors at levels below LELs are direct exposure and gross contamination. The areas within which these hazards potentially pose the greatest concern are where contaminated soil, contaminated groundwater, and free product have been previously encountered.

Results of past site characterizations within the KHID indicate that soil vapor across most of the area has been impacted by one or more COCs. Soil vapor contamination is readily apparent throughout much of the KHID because the vapor has a petroleum hydrocarbon odor. The principal sources of contaminated soil vapor within the KHID are PCS, contaminated groundwater, and free product.

This EHE/EHMP describes the necessary controls for minimizing exposure of on-site workers to hazardous vapors. It also describes measures for minimizing exposure of off-site human populations (i.e., the general public) to hazardous vapors created as a result of construction activities. Included are procedures for identifying and mitigating potential physical hazards posed by generation of explosive vapors. Importantly, this EHE/EHMP describes general procedures for monitoring hazardous vapors during field activities. Rather than as a stand- alone document to address vapor issues, it should be considered a companion document to the site-specific HSP, which should describe in detail procedures and equipment for monitoring hazardous vapor concentrations, as well as PPE and engineering controls.

16.1 Vapor Management

If VOC vapors are encountered during excavation, appropriate response actions need to be taken that comply with HDOH and EPA regulatory guidelines. The response actions include ensuring that on-site workers have the appropriate level of PPE, and that the general public is not affected adversely. Anticipated tasks associated with managing VOC vapor exposure are summarized as follows:

- If VOC vapors below LELs are encountered during excavation activities, field oversight must be provided to identify VOC vapors and provide health and safety guidance related to potential exposure of workers to COCs.
- Air monitoring should be conducted during excavation associated with future construction activities. Air monitoring should also occur when workers are required to enter excavations regardless of whether PCS or free product is present. The monitoring should include both workspace (on site) and perimeter measurements of VOC vapors.
- If warranted by air monitoring results, on-site workers should be notified to upgrade PPE to include respiratory protection.
- Air monitoring required for confined space entry (if required) will be conducted by the contractor responsible for construction. Confined space entry and associated air monitoring requirements will be described in the site-specific HSP for construction.

16.2 Vapor Contingency Plan – Exposure Monitoring

To assess potential exposure of on-site workers to hazardous VOC vapors and determine the level of PPE that might be required, a baseline exposure assessment will be required. To conduct the assessment, both total VOC concentrations and benzene concentrations must be measured during excavation of a trench. Measurements of concentrations of these COCs within the workspace atmosphere and at the perimeter (off site) are required.

Based on results of the exposure assessment, exposure limits must be established for workers performing remedial excavation. The exposure limits are based on Occupational Safety and Health Administration (OSHA) permissible exposure limits (PEL). The exposure monitoring plan is summarized as follows:

- Level D PPE will be appropriate for on-site workers under normal working conditions.
- Both workspace (on site) and perimeter (off site) air monitoring will be conducted.
- Air monitoring will proceed using a conventional photoionization detector (PID) to determine total VOC concentration, and using an Ultra-Rae PID, which is benzene-specific, to determine benzene concentration.
- If total VOC concentration in the workspace atmosphere exceeds an 8-hour, time-weighted average (TWA) of 20 parts per million (ppm) or a 15-minute, short-term exposure limit (STEL) of 100 ppm, PPE requirements will be upgraded to Level C, and it may be necessary to implement a modified work schedule. These levels are based on a maximum benzene concentration in gasoline of 5 percent by volume.
- On-site workers will be notified immediately if benzene is detected in the workspace atmosphere at a concentration exceeding 0.5 ppm, and wearing respirators with organic vapor cartridges will be recommended (i.e., recommendation will be to upgrade respiratory protection to Level C).
- If benzene concentrations in the workspace atmosphere exceed the 8-hour TWA PEL (1 ppm) or the OSHA 15-minute STEL (5 ppm), PPE requirements will be upgraded to Level C, and it may be necessary to implement a modified work schedule.
- If benzene concentrations in the workspace atmosphere exceed the TWA PEL (1 ppm), short-term exposure monitoring will be conducted. To determine short-term exposure, a minimum of five samples will be collected within a 15-minute period.
- If daily average benzene concentrations in the workspace atmosphere exceed the OSHA STEL (5 ppm), or benzene concentrations exceed the OSHA acceptable ceiling concentration (25 ppm), PPE will be upgraded to Level C, with either full-face respirators or powered air-purifying respirators and protective goggles.
- If benzene concentrations in the workspace atmosphere exceed the OSHA 8-hour TWA for a 40-hour work week (10 ppm), or benzene concentrations exceed the OSHA acceptable maximum peak for an 8-hour shift (50 ppm), work will be stopped immediately, the on-site representative will be notified, and workers will be requested to leave the work zone.
- If benzene concentrations along the site perimeter (off site) exceed the 15-minute STEL (5 ppm) or the TWA PEL (1 ppm), the exclusion zone will be extended beyond the property boundary.

- If benzene concentrations along the site perimeter (off site) exceed the OSHA acceptable ceiling concentration (25 ppm), work will be stopped immediately, and the project on-site representative will be notified.

16.3 Engineering and Administrative Controls

Vapor control methods may be necessary during construction-related work in which VOC vapors are encountered. These controls include use of plastic sheeting on soil stockpiles, vapor suppressants, and supplied ventilation.

It is anticipated that Level D PPE will be appropriate for workers during future construction. If site conditions warrant, as described above, PPE will be upgraded to Level C.

In addition to respiratory protection practices, engineering controls and safe work practices will be employed. Engineering controls include barriers that prevent workers from unnecessarily entering work zones and use of recycled air conditioning in mobile equipment cabs. Safe work practices include monitoring wind direction and having workers stand upwind of VOC vapor sources whenever possible, or instituting a modified work schedule.

A natural control is that vapors originating within the KHID normally will be diluted by the prevailing northeasterly trade winds. If left undisturbed, surface soil (0 to 2 feet bgs) not impacted by VOCs provides a natural barrier, covering VOC-contaminated subsurface soil and groundwater, and thereby reducing potential for vapor emissions.

Because anaerobic degradation of petroleum products will continue in the area for many years, methane gas remains a potential problem for indoor workers within the KHID. In addition, TPH-g, TPH-d, and BTEX remain potential soil vapor COPCs in the area. HDOH therefore takes the most conservative approach when dealing with the vapor intrusion issue.

To ensure proper protection of inside workers from soil vapor intrusion, all existing buildings should be inspected for floor cracks and other areas that could allow a pathway for soil vapor. All cracks and pathways should be properly sealed with an appropriate epoxy sealant to prevent vapor intrusion.

While not under the purview of this document, modification of floors, major structural changes to existing buildings, or construction of new buildings may necessitate installation of vapor control measures such as a sub floor vapor barriers. This would necessitate proper characterization of the area and site-specific oversight by HEER.

If methane soil vapor intrusion issues have been identified, new vaults should be properly sealed to prevent soil vapor intrusion that could cause an explosion hazard during work in the vaults. Unsealed vaults should be tested for methane prior to entry.

16.4 Periodic Inspections and Preventive Maintenance

A key component of the plan is routine inspections and air monitoring. Accordingly, daily or more frequent (if appropriate) air monitoring will occur at all locations where exposure of on-site workers to hazardous vapors is possible (e.g., open excavations, soil stockpiles). PPE will be inspected for damage and defects before personnel don the PPE. If respiratory protection is required, a daily positive pressure respirator fit test will be performed at the start of each day, and filter cartridges will be replaced regularly.

Both the conventional PID and the benzene-specific Ultra-Rae PID require daily calibration. The conventional PID should be calibrated using a 100 ppm isobutylene standard. The Ultra-Rae PID should be calibrated using a 5 ppm benzene standard, and measurements of the standard will occur as needed to confirm that the calibration is maintained. Records of the recalibrations will be maintained.

16.5 Record Keeping and Reporting

Detailed records of workspace monitoring and changes to PPE requirements will be maintained. Daily monitoring results and sampling locations will be documented in field logs. Significant issues will be communicated to site workers on a regular basis. Major deviations from this EHE/EHMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and documented; complete Appendix B.8 for your records and send a copy to HDOH.

17.0 STORMWATER MANAGEMENT PLAN

The purpose of the stormwater management plan is to provide procedures to prevent stormwater runoff from coming into contact with contaminated soil or groundwater, and to provide contingencies in the event that such contact does occur. The principal hazards posed by stormwater runoff are direct exposure, gross contamination, and aquatic eco-toxicity. If contaminated stormwater is allowed to leave the construction site, downgradient human populations (the general public) and ecological receptors (marine flora and fauna in Kahului Harbor) could be exposed to COCs. Areas where these hazards potentially pose the greatest concern are where contaminated soil, contaminated groundwater, and free product have been encountered.

This plan describes the necessary measures for controlling stormwater within the area covered by this document during construction activities. Preventing stormwater from contacting contaminated media is the principal concern during future construction activities. Construction activities could expose stormwater runoff to contaminated media as follows:

- Subsurface excavation could expose stormwater to contaminated subsurface soil and/or groundwater.
- Stormwater could be exposed to excavated PCS or DCS stored temporarily in stockpiles.
- Although not anticipated, if dewatering is conducted that utilizes an on-site infiltration pit, stormwater could be exposed to contaminated groundwater.

17.1 Stormwater Management

If contaminated soil or groundwater is encountered during excavation, appropriate response actions will be taken that conform to HDOH and EPA regulatory guidelines. The response actions include ensuring that these media are not exposed to stormwater. Anticipated tasks associated with managing stormwater are summarized as follows:

- Field oversight will be provided during excavation activities associated with construction. The purpose of the oversight is to identify contaminated media that could be exposed to stormwater runoff, and to provide guidance related to controlling stormwater at the site.

In addition, weather will be monitored throughout each work day for signs of approaching storms and/or heavy rains.

- Inspections of engineering stormwater controls will occur each day to ensure that contaminated media will not be exposed to stormwater runoff, and that contaminated stormwater will not leave the construction site.
- All construction activities—including clearing, grading, and excavation—that result in disturbance of 1 or more acres of total land area will accord with the conditions of an HDOH Clean Water Branch-approved NPDES NOI permit for stormwater discharge associated with construction activity. Conditions of the permit include preparation of a Construction Site Best Management Practices (BMP) Plan. For projects involving disturbance of less than
  1 acre of land, an NPDES permit is not required; however, erosion controls or BMPs required or recommended by Maui County should be used at these disturbed areas.

17.2 Engineering and Administrative Controls Open Excavations

In the absence of engineering and administrative controls, PCS and/or groundwater exposed in open excavations could contact stormwater, thus potentially contaminating the stormwater with COCs. To prevent this, the following activities will occur:

1. Where possible, excavations will be backfilled as soon as practicable to limit the time they are open and potentially exposed to stormwater runoff and direct precipitation.
2. Where possible, the edges of excavations will be bermed, thus preventing stormwater runoff from entering.
3. Open excavations will be inspected each day to minimize potential for direct precipitation to cause the excavation to overflow.

Soil Stockpiles. In the absence of engineering and administrative controls, excavated PCS stored in stockpiles could contact stormwater, thus potentially contaminating the stormwater with COCs. To prevent this, the following activities will occur:

- Soil stockpiles will be placed on plastic sheeting, and the sheeting will be bermed at the edges, thus preventing contact with stormwater runoff.
- At the end of each day, or in the event of a storm, the soil stockpiles will be covered with plastic sheeting, thus preventing contact with direct precipitation.
- The soil stockpiles will be inspected each day to ensure that the plastic sheeting is intact.

Dewatering Infiltration Pits. In the absence of engineering and administrative controls, the water in infiltration pits used for on-site dewatering could contact stormwater. To prevent this, the following activities will occur:

- Where possible, infiltration pits will be backfilled as soon as practicable to limit the time they are open and potentially exposed to stormwater runoff and direct precipitation.
- Where possible, the edges of infiltration pits will be bermed, thus preventing entry of stormwater.

- Infiltration pits will be inspected each day or more frequently as appropriate to minimize potential for direct precipitation to cause the pit to overflow.

Erosion and sediment control measures will be in place and functional before construction activities commence. These measures will be maintained throughout the construction period. If stormwater discharge from the site is anticipated, the following preventive measures may be taken:

- Stormwater flowing towards active construction areas will be diverted using appropriate control measures, as practicable.
- Erosion control measures will be designed to handle the size of the disturbed or drainage area in order to detain runoff and trap sediment.
- Height of the property boundary can be increased using sandbags.
- Additional silt fencing will be added to affected property boundaries, if warranted.
- Berms surrounding soil stockpiles will be increased as necessary.
- Moveable booms will be available to contain spills.
- Absorbent pads will be employed if free product is observed in stormwater runoff.

17.3 Stormwater Contingency

Open Excavations. During construction activities, stormwater could come into contact with contaminated soil or groundwater exposed in excavations for utility corridors or other subsurface structures. If a storm event is more severe than anticipated and could result in entry of stormwater to an excavation or overflow of water from an excavation, the following actions may be taken:

1. Height of the berm along the edges of the excavation may be increased to prevent stormwater runoff from entering the excavation.
2. If feasible, stormwater runoff may be diverted away from the excavation.
3. The excavation may be covered with plastic sheeting to prevent entry of direct precipitation or stormwater runoff.

Soil Stockpiles. During construction activities, stormwater could contact PCS stored in stockpiles. If a storm event is more severe than anticipated and could result in stormwater runoff coming into contact with stockpiled soil or in damage to the plastic covering the stockpile, the following actions may be taken:

- Berms surrounding soil stockpiles that are damaged by a storm will be repaired. Additional plastic sheeting may be necessary.
- Height of the berm surrounding the stockpile may be increased.
- If feasible, stormwater runoff may be diverted away from soil stockpiles.
- Plastic sheeting covering soil stockpiles that is damaged by a storm will be repaired or replaced. Additional plastic sheeting may be necessary.

Dewatering Pits. During construction activities, stormwater could come into contact with contaminated groundwater exposed in dewatering pits, if dewatering become necessary (not anticipated). If a storm event is more severe than anticipated (i.e., capable of overcoming engineering controls) and could result in stormwater runoff entering a dewatering pit or water overflowing a dewatering pit, the following actions may be taken.

- Height of the berm along the edges of the dewatering pit may be increased to prevent stormwater runoff from entering the excavation.
- If feasible, stormwater runoff may be diverted away from the dewatering pit.

Stormwater Run-on. During construction activities, stormwater run-on could enter the property and come into contact with contaminated soil or groundwater. If a storm event is more severe than anticipated and could result in stormwater run-on entering the property, the following action may be taken:

- Height of the property boundary can be increased using sandbags.

Off-Site Discharge of Contaminated Stormwater. If, during construction activities, stormwater comes into contact with contaminated soil or groundwater and that stormwater is not contained, contaminated stormwater could discharge off site. If a storm event is more severe than anticipated and could result in discharge of contaminated stormwater off site, the following actions may be taken:

- Height of the property boundary can be increased using sandbags.
- If feasible, stormwater runoff may be diverted away from the property boundary.
- Additional silt fencing may be added at affected property boundaries.
- Moveable, petroleum-absorbent booms may be deployed along the affected property boundary.
- Absorbent pads may be used if free product is observed on stormwater runoff.
- Moveable, petroleum-absorbent booms may be deployed in front of off-site storm drain entrances in the immediate vicinity of the property.

17.4 Inspection and Preventive Maintenance

A key component of the plan is routine inspections. Accordingly, all locations of possible contact of stormwater with contaminated media (e.g., open excavations, soil stockpiles, dewatering pits) should be inspected daily. During storm events, inspections should occur to minimize possibilities of stormwater runoff, contact of direct precipitation with soil stockpiles, and entry of stormwater runoff into open excavations or (if present) infiltration pits. If stormwater run-on occurs, accumulated water on the site should be inspected for visual and olfactory evidence of contamination (e.g., petroleum hydrocarbon sheen, discoloration, free product, petroleum hydrocarbon odors).

Storage containers, vehicles, and heavy equipment that could contact stormwater will be stored within one area and will be inspected regularly to ensure proper functioning. Signs of deterioration or leaks that could lead to an unanticipated release of petroleum-based products or hazardous substances will be reported immediately, and corrective measures will be taken.

General site inspections should occur periodically and should be documented. Engineering controls should be inspected and repaired as necessary. During prolonged rainfall, daily inspections may be necessary. Accumulated sediment at the silt fence should be removed once accumulation reaches one-third the height of the fence. If damaged, the silt fence should be repaired or replaced within 24 hours. During storm events, stormwater runoff will be inspected to assess whether it has been impacted by COCs or by contaminants associated with construction activities.

17.5 Record Keeping and Reporting

Detailed records of storm events, inspections of engineering controls, and response activities need to be maintained. Significant issues also need to be communicated to site workers and the project on-site representative on a regular basis. Reporting requirements of the NPDES stormwater discharge permit need to be followed strictly. Major deviations from this EHE/EHMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and documented; complete Appendix B.9 for your records and send a copy to HDOH.

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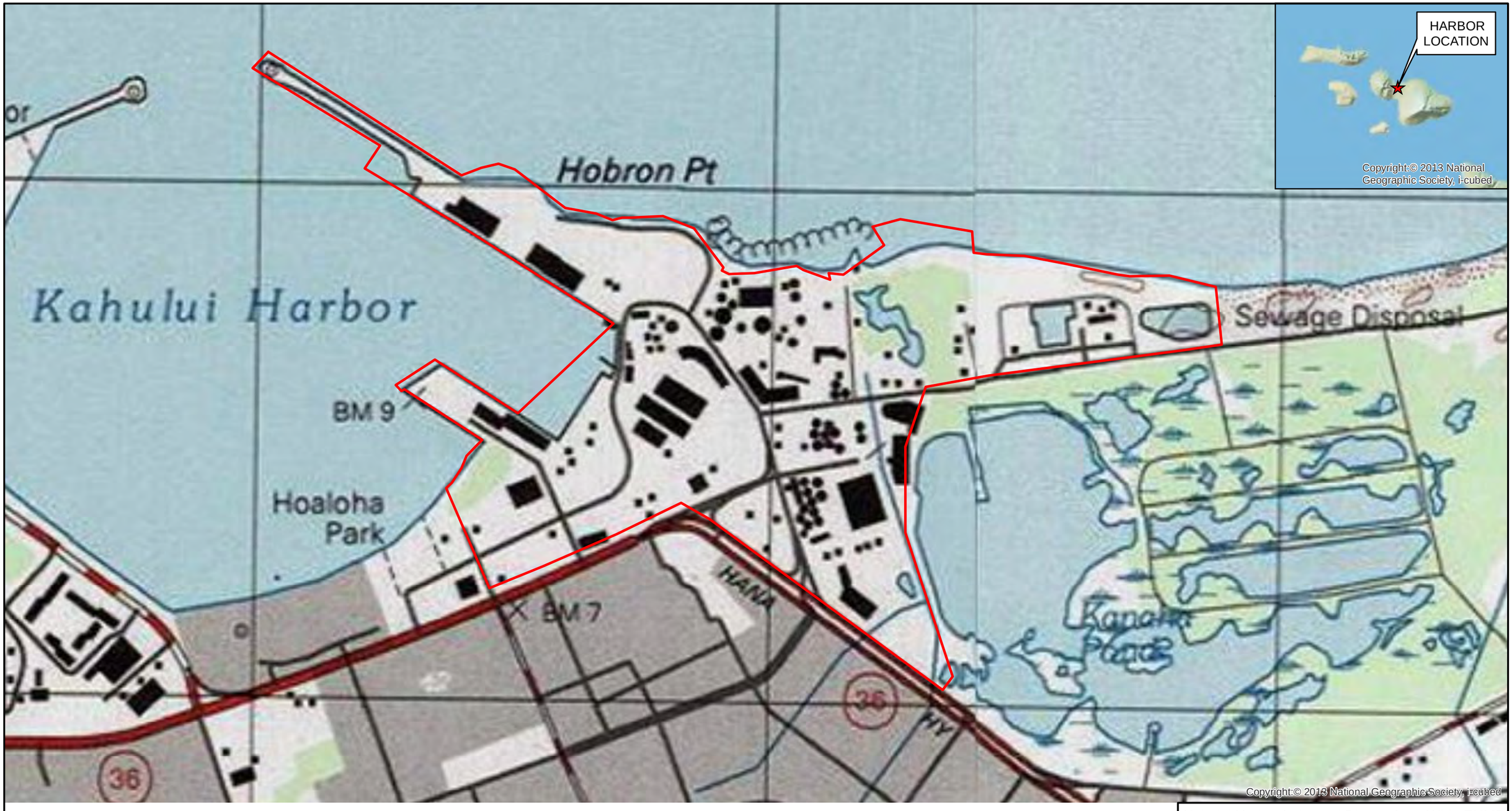
USGS, 1954.USGS Historical File, Topographic Division, Map of Maui, Hawaiian Islands, NF 4-16, AMS Series W532, Scale 1: 250,000; prepared by the Army Map Service, Corps pf Engineers, U.S. Army, Washington D.C., compiled in 1951.

Figures

Environmental Hazard Management Plan



Kahului Harbor Industrial District

N
W E
S

0 300 600
Feet

Note: This HDOH Area-Wide EHMP applies only to the areas inside the Kahului Harbor Industrial District boundary lines.

Kahului Harbor Industrial District Area-Wide EHMP
Kahului, Maui, Hawaii

FIGURE 1
HARBOR LOCATION

TETRA TECH

Date: 6/23/2016 User: Andrew.Carlson Path: C:\Users\andrew.carlson\Documents\ArcGIS\KH Industrial District Area-Wide EHMP_Fig1.mxd

Kahului Harbor Industrial District

TMK Parcel Boundaries

Railroads

UIC Line

N
W E
S

0 350 700
Feet

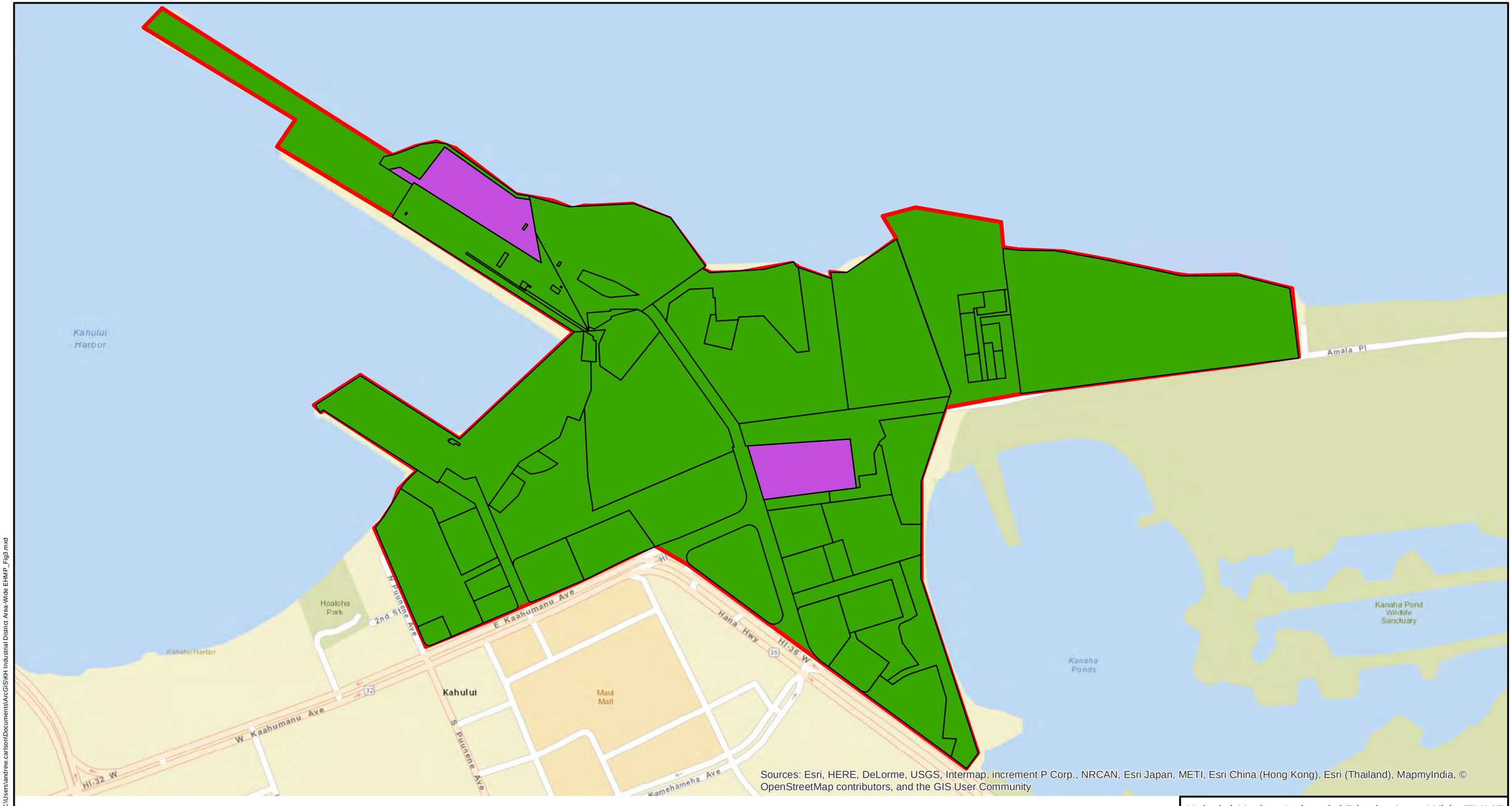
Note: This HDOH Area-Wide EHMP applies only to the areas inside the Kahului Harbor Industrial District boundary lines.

Kahului Harbor Industrial District Area-Wide EHMP
Kahului, Maui, Hawaii

FIGURE 2
HARBOR FEATURES

TETRA TECH

Date: 6/28/2016 User: Andrew.Carlson Path: C:\Users\andrew.carlson\Documents\ArcGIS\KH Industrial District Area-Wide EHMP_Fig2.mxd



Kahului Harbor Industrial District

TMK Parcel Boundaries

Area Covered by Other Site-Specific EHMP

Area Covered by HDOH Area-Wide EHMP

N
W E
S

0 250 500
Feet

Note: This HDOH Area-Wide EHMP applies only to the areas inside the Kahului Harbor Industrial District boundary lines.

TMK Parcel Boundaries Source: County of Maui GIS

Kahului Harbor Industrial District Area-Wide EHMP
Kahului, Maui, Hawaii

FIGURE 3
HARBOR PARCELS AND EHMP APPLICABILITY

TETRA TECH

Date: 6/27/2016 User: Andrew.Carlson Path: C:\Users\andrew.carlson\Documents\ArcGIS\KH Industrial District Area-Wide EHMP_Fig3.mxd

Date: 10/30/2017 User: andrew.carlson Path: \\emi\02\fs1\Shared\DOH_HEER_2017\TO 17110 (518) Kahului Harbor Conceptual Model\KHID Area-wide EHMP Figures\GIS\KH Industrial District Area-Wide EHMP_Fig4.mxd

Kahului Harbor Industrial District

Pre-1988 AST Locations with 3-foot Buffer

Pre-1988 Building Locations with 3-foot Buffer

N
W E
S

0 250 500
Feet

Source: Historical building and AST locations are based on 1950, 1960, 1965, 1976, and 1988 aerial imagery acquired from Environmental Data Resources, Inc. (EDR).

Note: This HDOH Area-Wide EHMP applies only to the areas inside the Kahului Harbor Industrial District boundary lines.

Kahului Harbor Industrial District Area-Wide EHMP
Kahului, Maui, Hawaii

Figure 4
Potential Areas of Termiticide, Lead, and/or Arsenic Contamination Based on 1988 Building Configuration

TETRA TECH

Date: 10/31/2017 User: andrew.carlson Path:\\emis021fs1\Shared\DOH_HEER_2017\TO 17110 (518) Kahului Harbor Conceptual Model\KHID Area-wide EHMP Figures\GIS

Kahului Harbor Industrial District

Current Aboveground Pipeline

Current Underground Pipeline

Historical Aboveground Pipeline

Historical Underground Pipeline

Abandoned-in-Place Underground Pipeline

Unknown Pipeline

N
W E
S

0 250 500
Feet

Note: This HDOH Area-Wide EHMP applies only to the areas inside the Kahului Harbor Industrial District boundary lines.

Kahului Harbor Industrial District Area-Wide EHMP
Kahului, Maui, Hawaii

Figure 5
Potential Areas of Petroleum Contamination

TETRA TECH

Map Unit Symbol	Map Unit Name
BS	Beaches
Fd	Fill land
JcC	Jaucas sand, saline, 0 to 12 percent slopes, MLRA 163
W	Water > 40 acres

Figure 6: Soil Types within KHID (USDA, 2017)

Appendix A

Environmental Hazard Management Plan

GUIDELINES FOR LANDOWNERS, TENANTS, UTILITIES COMPANIES, AND CONSTRUCTION CONTRACTORS

Environmental Hazard Evaluation

Environmental Hazard Management Plan

Kahului Harbor Area

GUIDELINES FOR LANDOWNERS, TENANTS, UTILITIES COMPANIES, AND CONSTRUCTION CONTRACTORS

Prepared by

HDOH

Version 1

June, 2018

These guidelines are for landowners, tenants, utility companies, and construction contractors involved in construction projects within the Kahului Harbor District (KHID) of Kahului, which is described in more detail below. They describe controls that provide protection from oil, oily soil and water, debris-contaminated soil (DCS), metals and pesticide-contaminated surface soils, and soil vapors. They will guide you through three steps on how to:

1. Determine if your project is within the area covered by the guidelines (see Figure 3 in EHE/EHMP).
2. Determine if you should consider these guidelines
3. If you follow these guidelines, use them as an aid in determining the controls you need to conduct your specific project safely and protect the environment.

Soil and groundwater within the KHID have been impacted by oil released from historical tanks and buried pipelines, and from contaminated fill material. Locally, surface soils can be contaminated by sewage,metals and pesticide-impacted soil (including organochlorine pesticides, dioxins/furans, lead, and arsenic).

Remediation has been undertaken at some properties within the KHID, and many areas have not been characterized. Because remedial activities did not remove all soil and groundwater contamination and undiscovered contaminated soil or groundwater may be present, appropriate precautions must be taken so that workers involved in excavating within the area are not exposed to risks related to remaining contamination on site.

These guidelines explain how parties performing construction work within the KHID shown on the map on Figure 3 can protect those who may be exposed to contamination in soil and groundwater.

Disclaimer:

The procedures, information, guidelines, and sample hazard management plans referred to herein are not intended to be a comprehensive description of all of the rules, regulations, laws, and other requirements applicable to a construction project. They are only intended to provide general information, and should not be used in place of appropriately qualified personnel. Each landowner, tenant, and construction contractor is responsible for complying with all applicable rules, regulations, laws, and other requirements, and for preparing his/her/its own hazard management plans for his/her/its own site-specific project.

Determine if you should consider these guidelines for work within the KHID:

- If you are landscaping, paving, or excavating to a depth of less than 2 feet, you probably do not need to consider these guidelines for potential oil contaminants. However, be vigilant for any evidence of oil, oily soil, oily water, soil containing debris, bagasse, or sewage. Surface soils from former railroad rights-of-way (potential pesticides, arsenic, and dioxins/furans) or from directly adjacent to building or tank foundations (potential lead, arsenic, organochlorine pesticides) are also suspect for contamination and warrant evaluation or special handling. Consult with the Hazard Evaluation and Emergency Response (HEER) Office if you encounter any of these materials.

- If you are excavating within 3 feet of a current or former building or aboveground storage tank (AST) build prior to 1988 (Figure 4), be aware that the surface soil may contain termiticides such as organochlorine pesticides, rodenticides, such as arsenic, or lead from lead-based paint. Consider these guidelines when implementing proper procedures to protect construction workers, tenants, visitors, or customers from hazards related to historical uses and applications of pesticides and lead-based paint. This type of contamination is likely not apparent, although paint-chips may readily be observed in the soil. At a minimum, this would include need to place excavation material (i.e. surface soils) in a temporary stockpile on plastic adjacent to work, and replace it back into the excavation area with a soil or gravel cover. This soil may not be reused offsite as fill, but can be disposed off at an approved landfill. Alternately, these soils could be appropriately sampled (DU-MIS) and tested for contaminants to determine need for any special handling precautions.

- If you are excavating deeper than 2 feet, replacing or repairing belowground utilities, consider these guidelines when implementing proper procedures to protect construction workers, tenants, visitors, or customers from hazards related to historical releases or fire and explosion. Check with the HEER Office for information and support.
- If you are replacing floor slabs, replacing or substantially modifying foundations, or constructing new buildings, contact the HEER Office to determine whether a site-specific assessment is required.

Some potential hazards that can occur during excavation and how they can be prevented are described below.

During excavations, workers may be exposed to oil, pesticides, dioxins/furans, or metals remaining in the soil or on groundwater. **Site-Specific Health and Safety Plans (HSP)** (which require appropriate protective clothing, equipment, and training) may be needed.

Backhoe excavation

Backhoe Excavation

Oil might seep from the side of an excavation and cause an oil sheen. It may be necessary to manage the oily water.

Contaminated soil may be inadvertently spread around the work area. Also, clean and contaminated soil could be mixed, increasing the volume of soil that must be disposed of.

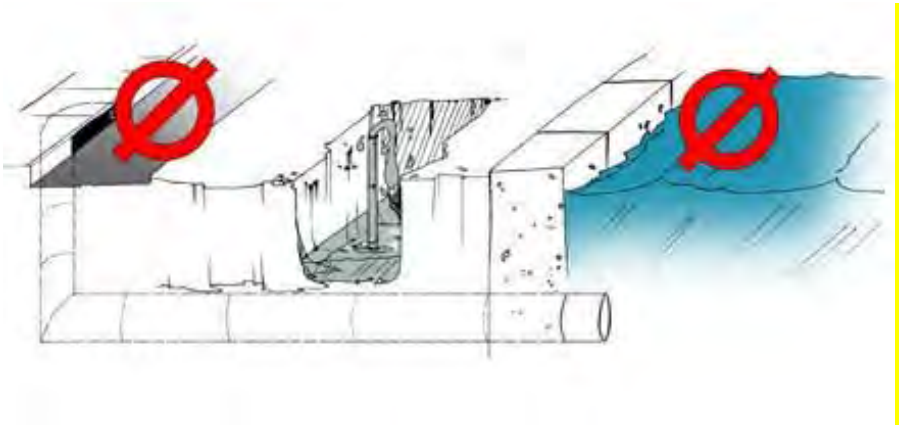
Site-Specific Environmental Hazard Management Plans (EHMP) with a Soil Management Plan approved by the HEER Office may be needed to prevent spreading oily soil or otherwise contaminated soil (Appendix B.5). Separate clean soil from contaminated soil. Always cover the contaminated soil stockpile with plastic sheeting and inspect sheeting for holes or degradation on a regular basis.

Oil might seep from the side of an excavation and cause oil sheen. It may be necessary to manage the oily water.

Oil or contaminated water or soil extracted from excavations could be released and reach surface waters, including the ocean. Releasing any oil to surface waters, storm drains, or the harbor or the ocean is illegal.

Avoid creating preferential pathways that would allow oil, or contaminated soil and groundwater to reach the ocean.

Do not discharge extracted groundwater unless it meets the requirements of, or is approved by the HEER Office and other applicable government agencies. Prepare and follow a **Groundwater Management Plan (Appendix B.6)** and obtain necessary permits or approvals from the HEER Office and other applicable government agencies to appropriately manage any oil and oily water that is encountered.

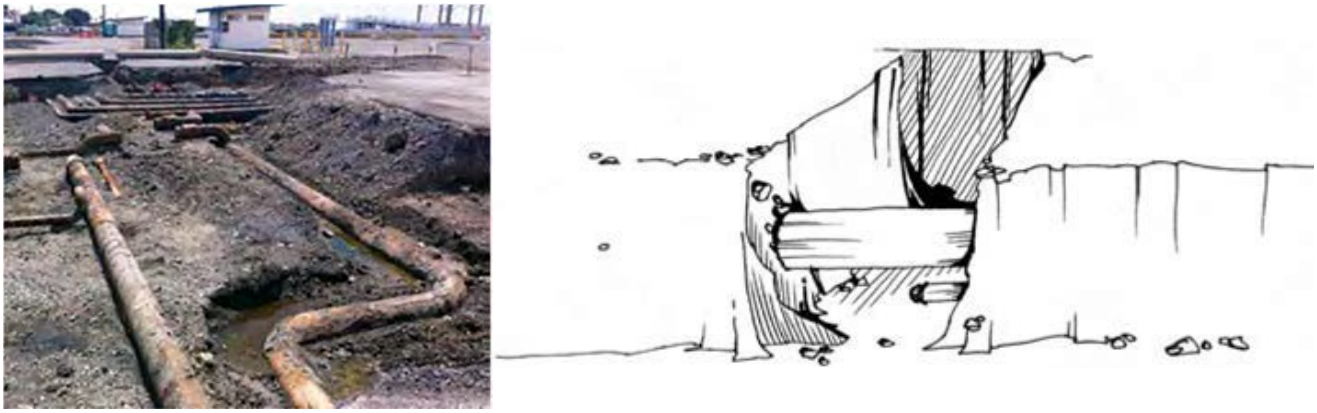


In some instances, oily water must be removed from excavations.
Do not discharge to the ocean or storm drains.

Upon acquisition of applicable government approval, contaminated water can be discharged into a newly excavated pit/trench within the impacted area.

Upon acquisition of applicable government approval, oily water can be hauled for off-site disposal.

Abandoned petroleum product pipelines or underground storage tanks (UST) may be discovered in excavations. If these are discovered, contact the HEER Office. If you need to remove a segment of an abandoned pipeline, develop an Inactive Pipeline Removal Plan (Appendix B.3), and tap, drain, cut, and cap the pipeline in accordance with the plan. Obtain HEER Office approval if you undertake removal.



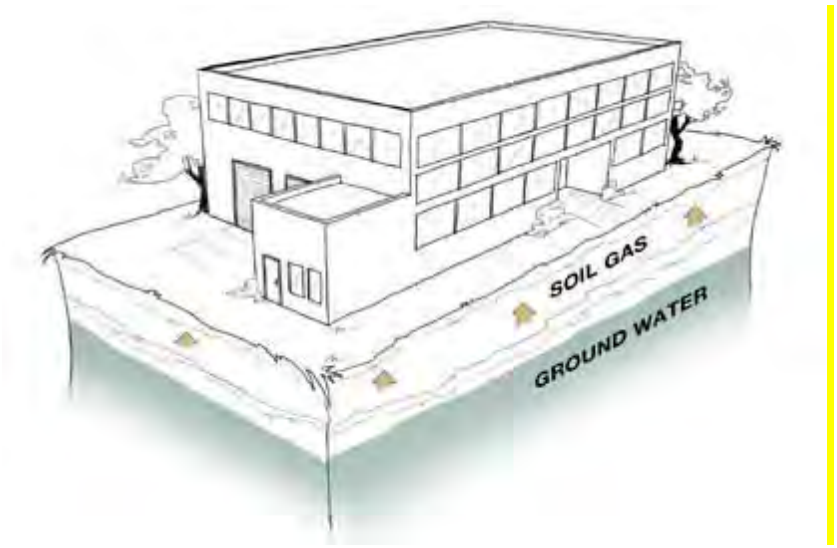
Exposed abandoned pipelines in the harbor area

Workers tapping and draining abandoned pipelines

Methane or other soil vapors can intrude into buildings. Vapor intrusion can occur when the floors are modified or major structural changes are made to buildings, resulting in need for vapor barriers. New buildings may also need vapor barriers to meet current HEER Office requirements. Accumulation of vapors can also lead to a fire or explosion hazard when exposed to sparks. Consult the HEER office on guidance regarding identifying fire and explosion hazards.

If you are modifying floors, constructing a new building, or making major structural changes to existing buildings, you may need to conduct a soil gas investigation and if appropriate, install control measures such as floor vapor barriers. This will require site-specific oversight by the HEER Office.

When modifying floors, be alert for evidence of existing vapor barriers or vapor mitigation systems. Do not compromise systems without prior consultation with the HEER Office.



Soil Vapor Figure

Large-scale excavations may emit vapors and odors.

An **Air Monitoring Plan** may be required for excavations. Develop a Vapor Management Plan (Appendix B-8). Contact the HEER Office for site-specific oversight to determine requirements and obtain any needed approvals.

Large-scale excavation in a harbor area

Emergency responses to releases of oily soil or water.

Accidental releases of oil, oily soil, DCS, or oily water can occur during construction. Sudden releases can also occur if a water line or other utility fails. Develop a Construction Activities Release Response Plan (Appendix B-2) that describes how to deal with an accidental release of oil, oily soil, or oily water during construction.

Emergency responses to releases of oily soil or water.

HOW TO PROCEED

Planned Projects:

Determine whether your project falls under these guidelines. If you have any questions, contact the HEER Office. (See Contacts on page 11.) If your project does fall under these guidelines, complete the following steps:

1. Notify the HEER Office as soon as possible about your project. The HEER Office can provide information and support.
2. Determine whether you need the support of an environmental consultant.
3. You are encouraged to read the attached "Project Implementation Form" because it provides a useful checklist of the items you should consider. Filling out the form will help the HEER Office determine how to support you. If necessary, have the HEER Office assist you in completing the form.
4. Consult with the HEER Office as needed.
5. Determine what steps you should take to protect your workers and the environment during construction, and have a qualified environmental professional complete the needed hazard management plan forms. Specific types of plans are listed on pages 4 through 7. Sample plans that can be considered by your environmental professional are at the back of these guidelines.
6. Proceed with your project.
7. As appropriate, keep the HEER Office informed.

Unplanned Release Responses:

If any releases associated with your project occur, you should act in accordance with your Construction Activities Release Response Plan. If you discover a release of oil, oily soil, or oily water within the property where you are working, do the following:

1. Review release reporting requirements (described in the HEER Technical Guidance Manual [TGM]), and Section 9.0 of this EHMP and if the release is determined to be reportable, notify the HEER Office immediately.
2. Notify the landowner or tenant for whom you are working.

HEER Office Contact:

HEER Office:

Steve Mow

e-mail: steven.mow@doh.hawaii.gov
phone: (808) 586-4249

The HEER web-site for Spill Reporting and Emergency Response is:

http://hawaii.gov/health/environmental/hazard/spill.html

DISCLAIMER:

The procedures described herein are not intended to be a comprehensive description of all requirements (e.g., federal, state, and local) with which landowners/tenants and others must comply while undertaking a construction project.

Filling out this form will help HEER determine what support to provide.

PROJECT IMPLEMENTATION FORM:

Project: _____

Project Owner: _____

Location: _____

Project Description: _____

_____

Completed By (Name): _____

Title/Company: _____

Phone Number: _____ e-mail: _____

Expected Date of Construction: _____ Date Form Completed: _____

Are you considering land use other than Commercial or Industrial?

YES: _____ NO: _____.

If Yes, explain: _____

_____

Are you considering Excavation below 2 Feet? YES: _____ NO: _____

Do you need the support of an environmental company? YES: _____ NO: _____

If yes, who do you intend to use? _____

_____

Other Comments: _____

_____

_____

Questions continued on next page

QUESTIONS	ANSWERS		Useful remarks by HEER and/or Tenant/Contractor
Have you reviewed the site background information available in the public record maintained by the HEER Office:	**YES**	**NO**	**Describe reports and information sources that may be useful:**
• **Site Characterization Reports?**	☐	☐	
• **Environmental Hazard Management Plan?**	☐	☐	
• **Monitoring Reports?**	☐	☐	
• **Appropriate As-built Reports describing past cleanup and construction reports?**	☐	☐	
Have you determined if your project may result in exposure to oily soil, DCS or potentially harmful soil gases:	**YES**	**NO**	**Further describe the hazards that may be encountered during construction:**
• **During construction?**	☐	☐	
• **At the completion of construction (of a new building for example)?**	☐	☐	
Do you understand potential hazards to:	**YES**	**NO**	**Refer to Environmental Hazard Management Plan, as necessary, for more details.**
• **Construction workers?**	☐	☐	
• **Building occupants?**	☐	☐	
• **Visitors or customers?**	☐	☐	
• **Ocean water, storm drains, etc.?**	☐	☐	
• **Do you understand the requirements and your responsibilities to prevent hazards from occurring?**	☐	☐	
• **Site-specific Health and Safety Plan?**	☐	☐	

QUESTIONS	ANSWERS	Useful remarks by HEER and/or Tenant/Contractor
• **Free Product Management Plan**	**YES** ☐ **NO** ☐	
• **Construction Activities Release Response Plan?**	☐ ☐	
• **Inactive Pipeline Removal Plan?**	☐ ☐	
• **Air Monitoring Plan?**	☐ ☐	
• **Soil Management Plan?**	☐ ☐	
• **Groundwater Management Plan?**	☐ ☐	
Are you undertaking additional environmental investigations for the project planning or implementation purposes:	**YES** **NO**	**What HEER support do you need in undertaking investigations?**
• **Soil and groundwater?**	☐ ☐	
1. Soil gas?	☐ ☐	
Based on soil gas investigation results, are you preparing designs for soil gas controls for buildings?	**YES** ☐ **NO** ☐	**What HEER support do you need in preparing designs?**
Are you complying with:	**YES** **NO**	**Remarks:**
• **Landowner's environmental requirements?** (These may be included in lease agreements or other legal documents)	☐ ☐	
Are the construction workers that may encounter contaminated soil or groundwater 40 hour HAZWOPER trained?	**YES** ☐ **NO** ☐	

[1] Either NO or NOT NEEDED.
[2] Routine air monitoring is included in the Health and Safety Plan. This plan is intended for large-scale excavations (i.e., down to five feet or deeper and over an area exceeding one half acre, or as required by the HEER Office).
[3]See sample plans at the back of these guidelines.

What is the HEER Office's role?

For Planned Projects, the HEER Office may be able to:

- Provide oversight and technical support for dealing with oil, oily soil, or otherwise contaminated soil, water, and soil vapors, and for implementing the Environmental Hazard Management Plan (EHMP).
- Suggest possible reimbursement of reasonable incremental environmental costs from known responsible parties (RP).
- Develop guidelines for consideration when implementing the EHMP.
- Monitor effectiveness of the EHMP in properly dealing with environmental issues during subsurface construction. This may require the HEER Office to access monitoring points on your parcel.

If an accidental release of oil occurs, and oily soil, or otherwise contaminated soil and water must be addressed, the HEER Office may be able to:

- Participate as a member of the emergency response team.
- Assist in providing the appropriate method(s) for proper management of oil, oily soil, and oily water.

What type of HEER Office technical and logistical support can I expect?

- The HEER Office's Project Manager is available to provide general guidance on how to comply with the EHMP, and to assist with the logistics of addressing oil, oily soil and water, or otherwise contaminated soil, groundwater, and soil vapors.
- The HEER Office will provide sample plans that can be considered by your environmental consultant in preparing plans that may be required for your project.
- The HEER Office can help identify environmental companies that can perform support services. The landowner or tenant and utilities companies are responsible for directing the work of the professional.

What are the responsibilities of Landowners?

The landowner is responsible for the following:

- Complying with applicable federal, state, and local laws and regulations
- Determining whether historical activities at the site may have resulted in release of possible non-petroleum and/or petroleum contaminants of concern (COC)
- Verifying that the site has been adequately characterized by identification of the nature and extent of contamination
- Identifying any site conditions requiring appropriate protection of human health and the environment that must be added to the plan template of this EHMP
- Complying with requirements of the EHMP
- Developing/complying with a Management Plan consistent with these guidelines
- Communicating requirements of the EHMP and these guidelines to whoever is undertaking construction work (e.g., excavation, building construction, etc.)
- Notifying the HEER Office about construction project plans within the KHID, contacting the HEER Office for support to help address requirements of the EHMP, and cooperating with the HEER Office by providing timely information and site access
- Ensuring appropriate hazard management plans are prepared and implemented, and providing appropriate documentation to the HEER Office
- Keeping the HEER Office informed regarding construction work
- Notifying the HEER Office of any accidental release of oil, oily soil, or oily water or DCS.

What is the Tenant's responsibility?

Any tenant undertaking excavation, building re-construction, or new construction should coordinate with the landowner; comply with applicable federal, state, and local laws and regulations; and ensure adherence to the EHMP and consideration of these guidelines.

What are the responsibilities of the Utilities Companies and Construction Contractor?

The Utilities Companies and Construction Contractors undertaking excavation, building reconstruction, or new construction work should (as appropriate to the size and nature of each project) operate under the appropriate Health and Safety Plans (HSP), implement air monitoring, manage soil and groundwater in accordance with the EHMP, and consider these guidelines. Utilities Companies and Contractors must identify tasks/actions not already covered in the plan templates included in the EHMP. The Contractor should request that the landowner make appropriate changes to the plan(s) prior to commencement of site work.

Contacts:

HEER Office:

Steve Mow

e-mail: steven.mow@doh.hawaii.gov
phone: (808) 586-4249

The HEER web-site for Spill Reporting and Emergency Response is:

http://hawaii.gov/health/environmental/hazard/spill.html

Environmental Statutes and Guidelines:

The following environmental statutes, regulations, and guidance documents, or any recent updates to these, may apply:

- The Hawaii Environmental Response Law (*Hawaii Revised Statutes* [HRS] Chapter 128D) and the State Contingency Plan (*Hawaii Administrative Rules* [HAR] 11 451 1 through 11 451 24). These outline legal requirements for protecting human health and the environment from releases or threatened releases of hazardous substances, including oil.
- The Hazard Evaluation and Emergency Response Office Technical Guidance Manual (TGM) for implementation of the State Contingency Plan (Interim Final, June 21, 2009). This provides many helpful guidelines and procedures to comply with the Hawaii Environmental Response Law and the State Contingency Plan.
- Hawaii Water Quality Standards (HAR Title 11, Chapter 54). This specifies standards for water quality discharge.
- Hawaii Ambient Air Quality Standards (HAR Title 11, Chapter 59). This specifies air quality standards. Specific standards may apply during soil excavation, remediation, and construction, or during other activities.
- Hawaii Occupational Safety and Health Standards (HAR Title 12, Chapter 99). This specifies health and safety requirements during remedial work and construction.

In addition to the TGM, current technical guidance issued by the HEER Office indicating how it can enforce requirements of the EHMP includes the following:

- Screening Environmental Hazards at Sites with Contaminated Soil and Groundwater (December 2011).
- Guidance Fact Sheet For Use When Petroleum Contamination is Encountered During Subsurface Soil Excavation (Interim Final, November 2008).
- Long-term Management of Petroleum Contaminated Soil and Groundwater (June 2007).
- EAL Surfer (Fall 2011).

Contact the HEER Office if you are interested in the latest version of these documents.

Appendix B

Reporting Forms

B.1 Written Follow-Up Notification Form

B.2 Health and Safety Plan

B.3 Construction Activities Release Response Plan

B.4 Inactive Pipeline Removal Plan

B.5 Soil Management Plan

B.6 Groundwater Management Plan

B.7 Free Product Management Plan

B.8 Vapor Management Plan

B.9 Stormwater Management Plan

The purpose of the reporting forms are to ensure consistency between actions taken and the associated management plans. Add notation to indicate all deviations from the management plans.

B.1

Hawaii Hazardous Substance Written Follow-Up Notification Form

PLEASE PROVIDE THE FOLLOWING INFORMATION

Incident Case No.: _____

Contact Information

Caller's Information:

Name: _____

Address: _____

City: _____ State: _____ Zip code: _____

Telephone Number: _____

Owner's Information:

Name: _____

Address: _____

City: _____ State: _____ Zip code: _____

Telephone Number: _____

Operator's Information:

Name: _____

Address: _____

City: _____ State: _____ Zip code: _____

Telephone Number: _____

Name of contact person at the facility or vessel where the release has occurred: _____

_____

Telephone Number: _____

Hazardous Substance Released

Name (trade and chemical) of the hazardous substance which has been released: _____

_____

Chemical Abstracts Service (CAS) Number (if applicable):

_____

Approximate quantity of the hazardous substance released: _____

Incident Information

Location of the release: _____

_____

Brief description of the release: _____

_____

Media into which the release occurred or is likely to occur (indicate all those that apply):

☐ Air ☐ Soil ☐ Groundwater ☐ Concrete ☐ Asphalt ☐ Stream ☐ Ocean ☐ Other

Cause of the release: _____

_____

Date of the release: _____

Time of the release: _____

Duration of the release: _____

Time when person in charge of construction learned of release:

_____

_____

Source of the release: _____

_____

Response Information

Response measures taken thus far: _____

_____

Any appropriate information regarding ability of the owner or operator of the facility or vessel where the release has occurred to pay for or perform any proposed or required response actions:

_____

_____

Names of other federal, state, or local government agencies that have been notified of the release:

_____

_____

Health Information

Known or anticipated acute health risks: _____

_____

Known or anticipated chronic health risks: _____

_____

Advice regarding medical attention necessary for exposed individuals: _____

_____

Potential impacts on public health or welfare:

_____

_____

Potential impacts on the environment:

_____

_____

"I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted information is true accurate and complete."

Signature: _____ **Date:** _____

Printed Name: _____

Title: _____

Company: _____

B.2

Health and Safety Plan

Prepared By: **Organization:** _____ **Name:** _____ **Signature:** _____	**Health and Safety Plan** **Environmental Hazard Management Plan** **Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific plans.

Revise this Sample Plan by:

1. Completing Table 2 with names and telephone numbers.
2. Attaching a Figure 1 map below at conclusion of Appendix B.2 to show locations of the work site and nearest medical facilities and hospitals. Alternatively, ensuring that on-site workers know locations of closest medical facilities.
3. Reviewing the Occupational Safety and Health Administration (OSHA) regulations to ensure that hazard levels described in Table 1 are still current.
4. Including any additional specific instructions.

Implement this Plan by:

5. Warning on-site workers that they may encounter oil, oily water, and oil-impacted soil in belowground excavations.
6. Making the on-site workers aware of need for proper safety procedures, and familiarizing them with the contents of this plan.
7. Making sure a copy of this completed plan is present at the construction site.

Note: If you are dealing with hazardous chemicals other than oil, oily water, and oil-impacted soil, you may need additional hazardous Chemical Response Plans and Procedures not covered in this plan.

Delete this box after completing this plan.

2. INTRODUCTION

Soil, groundwater, and vapor impacted by contaminants (metals, TPH, BTEX, PAHs, dioxins/furans, pesticides), and oil may be encountered during excavation projects. This Health and Safety Plan (HSP) provides information regarding potential hazards that may be encountered (Table 1 below), specifies protective measures and necessary monitoring (Table 1 below), and lists emergency contact information (Table 2 below).

3. WORKER AWARENESS

On-site workers who may be exposed to soil, groundwater, and vapor impacted by contaminants (metals, TPH, BTEX, PAHs, dioxins/furans, pesticides), and oil should have the appropriate and current level of Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard (29 *Code of Federal Regulations* [CFR] 191 0.120) training.

A daily on-site tailgate safety meeting should occur. These meetings should include a discussion of the day's work and an analysis of hazards that may be encountered.

If site or work conditions change, this HSP may have to be amended accordingly. Apprise on-site workers of any change

4. SITE CONTROL AND GENERAL HEALTH AND SAFETY REQUIREMENTS

Minimize exposure of workers and others to potential hazards by restricting workplace access.

Do not smoke, eat, or drink during and after entering the work zone. Conduct these activities upwind and outside of the work zone after first washing hands.

Avoid skin contact with oil, contaminated soil, groundwater, and vapor, and avoid inhalation of dust particles.

5. WORKSPACE AIR MONITORING AND ACTION THRESHOLDS

Monitor workspace air conditions during work activities to verify that safe conditions are maintained by comparing measurements to the action levels in Table 1.

If action levels are exceeded, take the actions listed in Table 1 or others, if necessary.

Use the field monitoring devices listed in Table 1, or equivalent, to monitor workspace air conditions.

Acute exposure to elevated concentrations of these constituents listed in Table 1 may cause the following symptoms, among others:

<u>Lead:</u>

Lead is a potent, systemic poison. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy. Signs of encephalopathy are:

- Seizures
- coma
- cardiorespiratory arrest.

Short term occupational exposures of this magnitude are highly unusual, but not impossible.

Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower

doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

Arsenic

- Dermatitis/hyperpigmentation of skin
- Peripheral neuropathy
- Gastrointestinal disturbances
- Respiratory irritation

Petroleum Hydrocarbons:

- Abnormal eye and nose irritation
  Dizziness
- Headache
- Giddiness
- Nausea
- Abnormal fatigue.

Dioxins/Furans

- Eye irritation
- Allergic dermatitis
- Chloracne
-

Technical Chlordane

- Blurred vision
- Confusion
- Delirium
- Cough
- Abdominal pain
- Nausea
- Vomiting
- Diarrhea
- Irritability
- Tremor
- Convulsion
- Anuria
- Inability to coordinate voluntary muscular movements

If any of these symptoms are observed during or following construction work, seek help from a physician.

Table 1: Action Levels

Contaminant	Medium/Hazard	Monitoring Instrument (See HEER 2009 for more information)	Monitoring Instructions	Action Levels and Applicable Actions (See OSHA for more information)
Methane	Air/Flammability	Combustible gas indicator	Take readings in excavations while work is ongoing to determine if flammable vapors are present.	<5% Lower Explosive Limit (LEL): No explosive hazard. Proceed with caution. > 5% LEL: Potential explosion hazard. Exit area immediately. Contact Health and Safety Manager (Table 2) for further direction.
TPH as gasoline TPH as diesel TPH residual Benzene Toluene Xylenes Naphthalene, HVOCs	Air/Inhalation	Photoionization detector(PID) with l0.6 electron volt (eV) Lamp	Monitor breathing zone while work is ongoing. Compare action thresholds to time-averaged breathing zone measurements.	<0.5 parts per million by volume (ppmv): Proceed with caution. 0.5 to 10 ppmv: Level D, use benzene-specific detector (see below).
Benzene		Draeger Benzene-specific detector tube (if necessary; see above)	Deploy benzene-specific detector tube for benzene if PID levels exceed 0.5 ppmv.	<0.5 ppmv: Level D personal protective equipment (PPE) >0.5 ppmv: Exit area and consult Health and Safety Manager (Table 2) for further direction.
TPH as gasoline TPH as diesel TPH residual Benzene Toluene Xylenes Naphthalene Metals, Dioxins/Furans	Soil(dust)/Inhalation	None (visual) – inspect workspace air for fugitive dust caused by work activities or high winds.		Evacuate area if visible fugitive dust is observed and cannot be readily mitigated. Contact Health and Safety Manager (Table 2) for further direction.

Contaminant	Medium/Hazard	Monitoring Instrument (See HEER 2009 for more information)	Monitoring Instructions	Action Levels and Applicable Actions (See OSHA for more information)
Lead	Soil(dust)/Inhalation and Ingestion	Mixed cellulose Ester (MCE) Filter cartridge 25 micron	Personal MCEs and/ or area sampling in the breathing zone, sampling upwind and downwind inspect workspace air for fugitive dust caused by work activities or high winds.	Respirator use: if lead > 30 $\mu g/m^3$ for 8-hour TWA Respirator upgrade : If > 0.5 mg/m^3 half mask air-purifying respirator with high efficiency filters or half-mask supplied - air respirators operated on demand (negative pressure) mode PEL = 50 $\mu g/m^3$ Other protective clothing: >200 $\mu g/m^3$ for 8-hour TWA medical surveillance: If exposed to > 30 $\mu g/m^3$ for more than 30 days in any consecutive 12 month and if blood lead is > 40 $\mu g/dl$.

If workers experience any of the above symptoms while conducting work involving exposure to oil, oily water, and oil-impacted soil, they should stop work, leave the work area, and consult the Health and Safety Manager (Table 2).

6. PROTECTIVE CLOTHING

A minimum of Occupational Safety and Health Administration (OSHA) Level D Personal Protective Equipment (PPE) should be used for activities involving disturbance, movement, sampling, or management of oil, oily water, and oil-impacted soil. Level D PPE consists of the following:

- Safety glasses
- Hard hat
- Surgical (rubber or nitrile) gloves
- Coveralls or full-length pants
- Boots with chemical-resistant steel toe and shank.

Additional PPE, such as respirators, may be required in response to project-specific hazards or unusual conditions, such as possible close contact of workers with oil seeping from soils or floating on groundwater.

7. EMERGENCY CONTACTS

Table 2: Emergency Contacts

Organization	Purpose	Phone
Contractor-designated Health and Safety Manager *Name*:	Hazarous work conditions	(_____) _____ - _____
For emergencies: Fire, Ambulance, or Police		**911**

8.0 REFERENCES

State of Hawaii Department of Health (HEER). 2009. Technical Guidance Manual for the Implementation of the Hawai'i State Contingency Plan, Interim Final. June 21.

Occupational Safety and Health Administration (OSHA), 29 *Code of Federal Regulations* (CFR) Sections 1910 and 1915.12 (b)(3).

Figure 1

Site and Hospital Map

(Insert appropriate map)

B.3

Construction Activities Release Response Plan

Prepared By: **Organization:**_____ **Name:** _____ **Signature:** _____	**Construction Activities Release Response Plan** **Environmental Hazard Management Plan Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific plan.

Revise this Sample Plan by:

1. Completing Tables 1 through 3.
2. Checking to make sure the Section9.1 notification requirements are current.
3. Including any additional specific instructions.

Implement this Plan by:

1. Warning on-site workers that they may encounter oil, oily water, oil-impacted soil, and debris-contaminated soil in belowground excavations.
2. Making the on-site workers aware of proper response procedures and familiarizing them with the contents of this plan.
3. Making sure a copy of the completed plan is present at the construction site.
4. Ensuring that on-site workers are familiar with surface drainage patterns, presence and flow directions of storm drains that could direct releases to harbor waters, locations of storm drain outlets to the harbor that may need to be protected with oil booms or other measures, potential locations for emergency storage tanks, etc. Obtain further information on these conditions from HEER, if necessary.

Additional details for completing this form are in Sections 9 and 11 of the EHMP.

Submit a copy of this form to HEER Office if contamination is encountered during subsurface activities.

Note: If you are dealing with hazardous chemicals other than oil, oily water, and oil-impacted soil or DCS, you may need additional hazardous Chemical Response Plans and Procedures not covered in this plan.

Delete this box after completing this plan.

1. INTRODUCTION

This Construction Activities Release Response Plan (Plan) describes how to proceed in the event of an unplanned discovery of, or accidental release of oil, oily water, or oil-impacted soil.

On-site workers must minimize the possibility of spills and releases of oil, oily water, and oil-impacted soil during excavation by:

- Familiarizing themselves with the site conditions
- Implementing appropriate Health and Safety, Soil and Groundwater Management Plans
- Being prepared at all times to encounter and manage oil, oily water, and oil-impacted soils.

Uncontrolled releases or spills of oil, oily water, and oil-impacted soil can occur. Such releases can pose a hazard to human health and/or the environment, and require an emergency response and/or regulatory agency notification. Human health concerns include human contact with oil, oily water, and oil-impacted soil; explosive or fire hazards; and disruptions to the normal operations in the area around the construction site, particularly disruptions to traffic flow. A major environmental impact of concern is discharge of oil or oily water to the harbor water either directly or via storm drains.

The responses described here apply to incidents that may occur during construction activities and that can be controlled by on-site workers undertaking the construction work.

2. TYPICAL RELEASES

The releases described below can occur during repair or replacement of deep utilities (water, sewer, electric, and fuel and communications lines) and buried utilities that require excavation and removal of oil, oily water, and oil-impacted soil and DCS.

Small incidental releases (e.g. < 1 cubic yard of soil or about three 55 gallon drums of soil) that do not spread and do not interfere with construction activities should be cleaned up as part of normal activities of the construction team.

For the following types of more significant release, respond immediately as outlined in this plan:

- Surface spillage of oil, oily water, and oil-impacted soil from excavations that actually spills, or threatens to spill, beyond the boundaries of the construction site.
- Breakages or other malfunctions of pipelines, storage facilities, groundwater treatment systems, or re- infiltration galleries/trenches used for belowground construction dewatering that continue to release oil or oily water.
- Oil-impacted soils or DCS temporarily stockpiled on the ground surface that are eroded or washed away by rain, and which continue to spread under the action of rain or other causes such as water from a water supply pipeline break.

- Spillage outside of the construction site during handling and disposal of oil, oily water, oil-impacted soils, or DCS removed from excavations.
- Release of oil from abandoned or active oil pipelines encountered and damaged during construction activities—that oil threatening to spill out of the excavation or actually doing so.

3. RELEASE RESPONSE TEAM

In the event of a release, the following team will determine the necessary response, make proper notifications, and conduct the response.

Table 1: Contractor Release Response Team

Name	Phone
Internal Contacts:	
Contractor-designated Release Response Coordinator Name:	(____) ____ - _____
Contractor-designated Health and Safety Manager Name:	(____) ____ - _____
On-site Construction Superintendent Name:	(____) ____ - _____
Landowner Contact Name:	(____) ____ - _____

4. RESPONSE PROCEDURES

4.1 General

The first priority of response action is protection of human health. The second priority is to ensure no impact on harbor water or the environment. **Immediate action is required**. Do not delay prudent response action.

In the event of a release:

- Notify the response coordinator (Table 1).
- Take immediate action to contain the release (do not wait if Release Response Coordinator is unavailable).

- In dangerous circumstances, give notice to evacuate the work area and notify persons in Table 1. If no persons listed in Table 1 are available, obtain assistance as necessary by contacting appropriate persons listed in Table 3.

Other general responses include:

- Use appropriate personal protective equipment (PPE).
- Eliminate or contain the source of the release.
- Put up signs or caution tape to let other workers know of a release and need to stay away.
- Place barriers or absorbents around the release to prevent spread of contamination.
- Secure impacted soil stockpiles by covering, repairing, or constructing containment berms around the stockpile, etc.
- Remove released material and clean all surfaces.
- Dispose of the released material as appropriate (see **Soil and Groundwater Management Plan**).
- Monitor air quality at the location of the release to assess the vapor hazards as defined in the Health and Safety Plan (HSP). Take appropriate action if hazardous conditions exist as required by the HSP.Use appropriate personal protective equipment (PPE).
- Eliminate or contain the source of the release.
- Put up signs or caution tape to let other workers know of a release and need to stay away.
- Place barriers or absorbents around the release to prevent spread of contamination.
- Secure impacted soil stockpiles by covering, repairing, or constructing containment berms around the stockpile, etc.
- Remove released material and clean all surfaces.
- Dispose of the released material as appropriate (see **Soil and Groundwater Management Plan**).

If the release occurs indoors, do the following:

- Close off vents and air ducts leading from the release area to other parts of the building.
- Use appropriate personal protective equipment (PPE).
- Eliminate or contain the source of the release.
- Put up signs or caution tape to let other workers know of a release and need to stay away.
- Place barriers or absorbents around the release to prevent spread of contamination.
- Secure impacted soil stockpiles by covering, repairing, or constructing containment berms around the stockpile, etc.
- Remove released material and clean all surfaces.

- Dispose of the released material as appropriate (see **Soil and Groundwater Management Plan**).

If electrical equipment is operating in the vicinity of the release and hydrocarbon vapors are detected near the explosivity limits (see **Health and Safety Plan**), turn off the equipment, preferably at the main breaker, to avoid sparking.

If necessary, protect nearby storm drains by use of adsorbent, booms, or drain covers; and protect potentially affected harbor water and storm drain outlets to the harbor by placing floating oil booms on the water.

To deal with either the incidental or more significant releases, equipment and materials listed in Table 2 are available either at the construction site or in storage nearby.

Table 2: Response Equipment and Materials

Equipment and Materials	Purpose	Source of Equipment and Materials
Spill kits	Cleanup of small releases to land	
Trucks and loading equipment	Excavation and transport of oil-impacted soil	
Steel roll-off bins	Temporary storage of oil-impacted soil pending waste profiling or on- site relocation	
Pumps, piping, storage tanks	Transfer of impacted water and oil to on-site tanks or approved disposal trenches	
Plastic sheeting	Cover and security of soil stockpiles	
Hay bales, silt fences, wattles	Erosion control and containment materials	
Oil absorbent pads	Absorption and containment of oil or fluids released to land or within excavations	
Sand bags or equivalent	Construction of a small dike along areas of the release to prevent releases from spreading or entering storm drains	
Floating oil booms	Absorption and containment of oils released to harbor waters	
Sediment and oil filters	Connection to the end of an excavation dewatering hose to filter out sediment and oil	

5. NOTIFICATION INFORMATION

If the release meets the Section9.1 notification requirements:

- Notify the person in the first entry in Table 3.
- If utilities are involved, notify the affected utility in Table 3.
- Notify the landowner in Table 3.

Table 3: Other Potential Contacts

Organization	Purpose	Phone
State Agency Contacts:		
Hawaii State Emergency Response Commission/the HEER Office	Any required release reporting	(808) 586-4249 (808) 247-2191 (after hours)
Fire, Ambulance, or Police	Required in the event of fire danger or injury	**911**
Underground Utility Contacts:		
Gas Utility Name:	Notification of any gas utility damage or break	(_____) _____ - _____
Electric Utility Name:	Notification of any electric utility damage or break	(_____) _____ - _____
Water Utility Name:	Notification of any water utility damage or break	(_____) _____ - _____
Landowner Contact:		
Landowner Name:	Notification of any significant release	(_____) _____ - _____
Federal Contact:		
U.S. Coast Guard Name:	Notification of any sheen on harbor waters	(_____) _____ - _____

6. RELEASE COMMUNICATIONS AND AGENCY REPORTING REQUIREMENTS

6.1 Circumstances under which agency notification is required

Pursuant to Title II, Chapter 451, *Hawaii Administrative Rules* [HAR] § 11-451-7, releases meeting ***any of the following criteria must be reported*** to the first agency contact appearing in Table 3 within 24 hours of first occurrence or observance:

- Any release causing surface water to exhibit sheen.
- Any release of petroleum or hazardous substances to navigable waters (e.g. the ocean and local canals and streams).
- Any release of oil to the environment greater than 25 gallons.
- Any release of oil less than 25 gallons that is not cleaned up within 72 hours.
- In addition, any sheens or oil or oily water releases to storm drains that have open connections to the harbor, even if contained within project boundaries and not yet impacting the harbor water.
- Sheen and oil observed in the harbor or in a storm drain should be reported to the U.S. Coast Guard and HEER Office in Table 3.
- Releases to other waters of the United States require reporting to the U.S. Coast Guard.

Sheen and oil observed in the harbor or in a storm drain should be reported to the U.S. Coast Guard and HEER Office in Table 3.

Releases to other waters of the United States require reporting to the U.S. Coast Guard.

Report the following information to agencies when notifying of a reportable release:

- Name of the person making the notification
- Location of the release
- Time and date of discovery
- Characteristics of the oil observed (color, viscosity, etc.)
- How the release occurred
- Removal actions taken and volume removed
- Whether the release poses an immediate threat to human health or the environment
- Other agencies that have been notified of the spill
- Known injuries resulting from the spill.

Provide details of actions taken consistent with Section 11 to deal with Construction Activities Release Response:

_____

_____

_____

B.4

Inactive Petroleum Pipeline and UST Management Plan

Prepared By **Organization:** _____ **Name:** _____ **Signature:** _____	**Inactive Petroleum Pipeline and UST Management Plan** **Environmental Hazard Management Plan Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific plan.

Revise this Sample Plan by:

1. Reviewing the requirements of this sample plan to ensure that construction workers can comply with its requirements, and modifying the plan, if necessary.

Implement this Plan by:

1. Making sure on-site workers are aware of a plan for dealing with inactive pipelines.
2. Making sure a copy of the completed plan is present at the construction site.
3. Accessing additional guidance for completing this form in Section 12 of the EHMP.
4. Keeping a copy for your records and sending a copy to the HEER Office.

Delete this box after completing this plan.

1. INTRODUCTION

Inactive pipelines may be encountered during excavation (activities) within the Kahului Harbor Industrial District (KHID). This Plan provides procedures and guidelines for dealing with these inactive pipelines if they are encountered.

2. PREPARATORY WORK

Prior to starting any belowground construction work, undertake the following:

- Contact Hawaii One Call at (866) 423-7287 to notify them of proposed excavation activities. Underground facilities owners must be notified to mark any of their underground utilities near the proposed excavation.
- Conduct an underground utility survey using geophysical surveying equipment (e.g., toning/metal detection, ground penetrating radar) before excavation begins.

In addition to the above, identify the location of any inactive pipelines that may not be included in the above-referenced information. To do this, review the most recent available reports including the Environmental Hazard Management Plan (EHMP) to determine if pipelines could be present within the work area. Contact the Hazard Evaluation and Emergency Response (HEER) Office at (808) 586-4249 for assistance in obtaining the most current pipeline information.

3. NOTIFICATION REQUIREMENTS

If unanticipated inactive pipelines are discovered during construction activities, notify as follows:

- Contact the HEER Office via telephone within 24 hours after encountering the unanticipated petroleum pipelines.

4. PIPELINE TAPPING AND DRAINING

Inactive piping may contain residual petroleum product and may be under pressure. This could present a possible safety and spill hazard if the line is cut prior to implementation of appropriate measures. If, through the notification process described in Section 12.3, the nature and use of the piping cannot be determined, tapping may be required to determine if fluids are present or if the piping is pressurized, and to provide a means to drain residual product.

If you are performing the work, follow the procedures in Sections 5.0 through 8.0 below.

5. PIPELINE CUTTING AND CAPPING

Follow these general procedures for cutting and capping the pipelines:

1. Prior to cutting, tap the pipeline using non-sparking tools, and drain the contents of the pipeline to the extent practical and possible.
2. Cover the area below and adjacent to the cutting location with plastic sheeting and absorbent material, and place a catch basin beneath the location of the cut. Use these devices to collect residual fluid that may drain from the pipeline during and after cutting.
3. Use precautionary measures to prevent explosive hazards. For example, cut the pipeline using non-sparking tools and remove the pipeline segment.

4. Cap the cut-off ends of remaining pipeline segments to prevent any potential future leakage. Suitable capping methods include concrete plugs, blind flanges, cement plugs with rebar, or other methods that do not involve hot welding. Hot work, including welding, is not considered appropriate due to potential explosiveness of petroleum and associated vapors.

Consider the need for the presence of a vacuum truck on standby during pipeline cutting and capping.

6. PRODUCT SAMPLING

Sample the residual product that has been drained and collected during this process, and have it analyzed by a laboratory to enable proper profiling and off-site disposal.

7. INVESTIGATION-DERIVED WASTE DISPOSAL

Dispose of petroleum and other wastes in accordance with applicable laws and regulations.

8. HEALTH AND SAFETY

Comply with the following health and safety measures whether or not these are included in the **Health and Safety Plan (HSP)**.

- Personnel conducting post-discovery work on abandoned petroleum pipelines should have current 40/24-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and air-purifying respirator fit test certifications. At least one on-site worker potentially exposed to chemical or physical hazards should have basic first aid and cardiopulmonary resuscitation (CPR) training.
- Select air-purifying respirators based on the type of contaminant encountered (i.e., petroleum).
- Conduct air monitoring to monitor potential hazardous vapors and worker exposure. If petroleum is encountered, air monitoring typically includes use of a photoionization detector (PID) to monitor organic vapors for potential inhalation hazards, and a methane and oxygen/combustible gas indicator to monitor for potential explosive hazards.

9. DOCUMENTATION ACTIVITIES

Provide HEER with the following information:

- A description of where the pipeline was encountered (Global Positioning System [GPS] coordinates or location relative to prominent landmarks), number and lineal footage of pipelines encountered, size of pipelines, depth of pipelines, condition of pipelines, and actions taken following pipeline discovery such as cutting or petroleum removal
- A location map that shows where the pipeline was encountered. The map must include a north arrow and a scale
- Photographs of the exposed portion of the pipeline in the excavation
- Analytical laboratory reports for product recovered from the pipeline.

Provide details of pipeline removal activities consistent with Section 12 of the EHMP:

B.5

Soil Management Plan

Prepared By **Organization:** _____ **Name:** _____ **Signature:** _____	**Soil Management Plan** **Environmental Hazard Management Plan** **Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific plan.

Revise this Sample Plan by:

1. Reviewing the requirements of this sample plan to ensure that the construction worker can comply with its requirements, and modifying the plan, if necessary.

Implement this Plan by:

1. Making sure on-site workers are aware of this plan and that they follow this plan.
2. Making sure a copy of the completed plan is present at the construction site.
3. Accessing additional guidance for completing this form in Section13 of the EHMP
4. Keeping a copy for your records and sending a copy to the HEER Office.

Delete this box after completing this plan.

1. INTRODUCTION

These procedures are intended to protect construction workers, the environment, and tenants in buildings from contact with oil-impacted soil where such soils are known to exist, or where people may be exposed. These procedures also comply with requirements for excavating, stockpiling, re-using, and disposing of oil-impacted soils.

2. SOIL EXCAVATION AND STOCKPILING

If you encounter oil or oil-impacted soils, or otherwise contaminated soil, or if you are conducting soil surface excavations around former rail line tracks (Figure 2), within 3 feet of a former AST or within 3 feet of a current or former building built prior to 1988 (Figure 4) do the following:

- Always place contaminated soil or anticipated contaminated soil on plastic sheeting.
- For surface soil in the vicinity of railway tracks or within 3 feet of an AST or building built prior to 1988, assume the soil is impacted with pesticides, arsenic, and dioxins/furans in the railway track case and termiticides, arsenic, and lead in the latter (building and AST) case. At a minimum, place excavation material (i.e. surface soils) in a temporary stockpile on plastic adjacent to work.
- If the amount of excavated soil is less than one cubic yard (equivalent to about three 55-gallon drums), it can be replaced in the excavation upon completion of the work without further evaluation.
- For excavation volumes exceeding 1 cy, segregate unimpacted soil from the oil-impacted soil, DCS, or metals or pesticide-contaminated soils,and stockpile these separately.
- Have a qualified environmental professional direct any necessary collection of soil samples, direct testing of the samples in the field or at an off-site laboratory, and direct segregation of impacted soils from non-impacted soils.
- Place contaminated stockpiled soils in containers (such as 20-yard steel roll-off bins, super sacks, tri-wall boxes, or drums) or within lined containment areas (i.e., underlain by plastic sheeting). Drain any liquid phase oil or fuel product associated with the soil prior to stockpiling. Remove and properly dispose of any oil observed in the excavation.
- Cover stockpiles of contaminated soils and containerized soil with plastic sheeting or tarps to minimize dust, stormwater, and odor concerns. Inspect cover frequently for damage.
- Stockpile soil near the project area prior to reuse.

3. RE-USE OF EXCAVATED SOILS

This plan provides general guidelines. For more details, consult Section 13 of this Document and the HDOH Fill Guidance (HDOH 2017). Unimpacted soils can be used as backfill.

Excavated oil-impacted soil can be used as backfill only under the following conditions:

- The oil-impacted soil is placed within areas more than 100 feet from the harbor wall and up to 1 foot below surface grade.
- The oil-impacted soil does not contain any free oil, oil sheens, oil stains, or total petroleum hydrocarbon (TPH) concentrations exceeding 5000 parts per million (ppm).

- TPH concentration is determined either by an off-site laboratory or through use of a field test such as the paper towel or glove test described in Section 13. Soils determined to be heavily contaminated should be excavated and disposed at an approved landfill.
- In the backfilling procedure, the moderately impacted soil should be placed at the bottom of the excavation above the tidally influenced high water table, and the cleanest soil at the top. If the surface is not to be paved, at least 1 foot of non-impacted soil must be placed as the final backfill at the top.
- For surface soil in the vicinity of railway tracks or within 3 feet of an AST or building built prior to 1988, assume the soil is impacted with pesticides, arsenic, and dioxins/furans in the railway track case and termiticides, arsenic, and lead in the latter (building and AST) case. At a minimum, replace excavated material back into excavation area with at least some cover soil or gravel. Untested, the soil may not be re-located into another area of these soils (except to an approved landfill) or reuse of these soils off-site. Alternately, these soils could be appropriately sampled (DU-MIS) and tested for contaminants to determine need for any special handling precautions.

- Excavated soils can be used to backfill other excavations within proximity of the excavations with approval of the HEER Office.

Oil sampling and analysis may be necessary to determine whether soils are suitable and when they can be used as backfill. Qualified environmental professionals or the HEER Office may determine if sampling is required, and the HEER Office TGM can be used for guidance on sampling options and procedures.

If necessary, the following number of samples should be collected:

Less than 20 cy of soil:	1 sample
More than 20 cy of soil:	1 sample for each 20 cy up to the first 100 cubic yards
More than 100 cy of soil:	1 sample for every additional 100 cy

For further description of soil and soil stockpile characterization, review the current HEER Office guidance in Sections 3, 4, and 5 of the TGM at www.hawaiidoh.org/tgm.aspx.

4. OFF-SITE DISPOSAL

If you intend to transport the excavated soil to an off-site disposal facility, confirm with the disposal facility the number of soil samples needed for laboratory testing, as well as the standards for disposal.

5. EQUIPMENT DECONTAMINATION

Equipment used in contaminated areas must be decontaminated before use in non-contaminated areas. All liquid and solid waste resulting from on-site decontamination must be collected and appropriately disposed of.

6. SOILS MANAGEMENT DOCUMENTATION

Any known or suspected contaminated soils backfilled on site should be mapped with GPS coordinates or physical measurements to nearby landmarks. This documentation should be provided to the HEER Office in a concise letter or project follow up report. The HEER Office should also be notified if contaminated soils are excavated and disposed of off-site. In some instances, the HEER Office may require that you obtain its approval for how you intend to excavate, manage, and backfill or dispose of soil.
Provide details of how -contaminated soil was handled consistent with Section 13 of the EHMP:

B.6

Groundwater Management Plan

Prepared By Organization: _____ Name: _____ Signature: _____	**Groundwater Management Plan** **Environmental Hazard Management Plan** **Kahului Harbor Industrial District**
	Version: **Reference:** **Date:**

Project Name: _____

Project Location: _____

Revise this Sample Plan by:

1 If you intend to place excavated groundwater back into an excavation or trench, contacting *the Hazard Evaluation and Emergency Response (HEER) Office at (808) 586-4249 to obtain* an appropriate disposal location.

2 If you intend to discharge extracted water to local surfaces (including storm drains), contacting the HEER Office to obtain all applicable permits and approvals ahead of time because authorizations could take weeks or months.

3 If you intend to discharge extracted water to a local sanitary sewer, contacting the City and County (C&C) for approval to dispose of that water into a sanitary sewer. Water discharged to a sanitary sewer or storm drain may be required to meet Water Quality Standards. These standards are specified in the Environmental Hazard Management Plan (EHMP), and are available from the HEER Office.

4 Reviewing the requirements of this sample plan to ensure that construction workers can handle groundwater possibly impacted by petroleum hydrocarbons which may be encountered during soil excavation.

5 Consulting the HEER office for answers to any questions.

6 Preparing your own site-specific plan.

7 Accessing additional guidance for completing this form in Section 14 of the EHMP.

8 Keeping a copy of the completed form for your records and sending a copy to the HEER Office.

Implement this Plan by:

1. Ensuring that on-site workers are aware of this plan and that they follow it.

Note: If you are dealing with hazardous chemicals other than oil, oily water, and oil-impacted soil, you may need additional hazardous Chemical Response Plans and Procedures not covered in this plan.

Delete this box after completing this plan.

1. INTRODUCTION

These procedures are for handling groundwater encountered during excavation activities. Soil and groundwater may be impacted by petroleum hydrocarbons and/or dissolved metals, and may be encountered during soil excavation. Purposes of these procedures are to: (1) protect construction workers from contact with petroleum hydrocarbons and inhalation of associated vapors, and (2) protect the quality of the surface waters.

2. GROUND WATER MANAGEMENT PROCEDURES

The following requirements apply to oil or oily water encountered in an excavation:

- If petroleum free product is present in the extracted groundwater, separate it from groundwater and dispose of it at an appropriate off-site facility prior to transfer of the groundwater into a nearby trench or excavation.
- At least once daily, remove oil observed floating on the groundwater during excavation activities using a vacuum truck, absorbent pads, or other methods approved by the HEER Office. Excavations should not be backfilled until the floating oil is removed to the extent practicable, which is when further use of vacuum trucks, absorbent pads, or other approved methods does not result in further floating oil removal.
- If you intend to dispose of the groundwater off site, collect and analyze water samples as required by the disposal facility.
- **CAUTION**: Avoid releases of affected groundwater to surface water bodies or areas beyond the work area.
- If you are disposing of treated or untreated groundwater in accordance with a method approved by the HEER Office or by the City or County, provide the necessary notifications and record the information.

Provide information consistent with Section 14 on handling contaminated groundwater, including a mapped location for any contaminated groundwater encountered:

B.7

Free Product Management Plan

Prepared By **Organization:** _____ **Name:** _____ **Signature:** _____	**Free Product Management Plan** **Environmental Hazard Management Plan** **Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific Free Product Management Plan.

Revise this Sample Plan by:

1 Reviewing the requirements of this sample plan to ensure the construction worker can comply with its requirements, and modifying the plan, if necessary.

Implement this Plan by:

1. Making sure on-site workers are aware of this plan and the site-specific Health and Safety Plan (HSP), and that they follow both documents.
2. Making sure a copy of the completed plan is present at the construction site.
3. Accessing additional guidance for completing this form in Section15 of the EHMP.
4. Keeping a copy of the completed form for your records and sending a copy to the HEER Office.

Delete this box after completing this plan.

1. INTRODUCTION

These procedures are for handling free product encountered during excavation activities. Soil and groundwater may be impacted by petroleum hydrocarbons and may be encountered during soil excavation. Normally, free product is found floating on groundwater; however, it can also occur in oil- saturated soils. Purposes of these procedures are to: (1) protect construction workers from contact with petroleum hydrocarbons and inhalation of associated vapors, (2) protect the quality of surface water, and (3) provide guidance in the handling and disposal of free product.

2. FREE PRODUCT MANAGEMENT PROCEDURES

The following requirements apply to free product in soil or floating on groundwater encountered in an excavation:

- If free product is present in the extracted groundwater, it must be separated from groundwater and disposed of at an appropriate off-site facility prior to transfer of the groundwater into a nearby trench or excavation.
- At least once daily, remove oil observed floating on the groundwater during excavation activities using a vacuum truck, absorbent pads, or other methods approved by the HEER Office. Excavations should not be backfilled until the floating oil is removed to the extent practicable, which is when further use of vacuum trucks or absorbent pads, or other approved methods do not result in further floating oil removal.
- If free product is encountered in excavated soil, it must be separated from clean or moderately contaminated fill, profiled, and disposed of at an approved recycling/disposal site.
- Soil contaminated with free product cannot be used for backfill.
- **CAUTION**: Avoid releases of free product to the harbor or areas beyond the work area.

Provide details and mapped locations of free product discovery and how free product was managed (consistent with Section 15 of the EHMP):

B.8

Vapor Product Management Plan

Prepared By **Organization:** _____ **Name:** _____ **Signature:** _____	**Vapor Management Plan** **Environmental Hazard Management Plan** **Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific Vapor Management Plan.

Revise this Sample Plan by:

1. Reviewing the requirements of this sample plan to ensure that the construction worker can comply with its requirements, and modifying the plan, if necessary.

Implement this Plan by:

1 Making sure on-site workers are aware of this plan and the site-specific Health and Safety Plan (HSP), and that they follow both documents.

2 Making sure a copy of the completed plan is present at the construction site.

3 Accessing additional guidance for completing this form in Section16 of the EHMP.

4 Keeping a copy of the completed form for your records and sending a copy to the HEER Office.

Delete this box after completing this plan.

1. INTRODUCTION

These procedures are for handling petroleum vapors encountered during excavation activities. Soil and groundwater may be impacted by petroleum hydrocarbons and may be encountered during soil excavation. This type of contamination may produce soil vapor that must be properly handled during and after construction activities. Purposes of these procedures are to: (1) protect construction workers from contact with petroleum hydrocarbons and inhalation of associated vapors, (2) protect the quality of the surface water, and (3) provide guidance in the handling soil vapors.

2. VAPOR MANAGEMENT PROCEDURES

If volatile organic compound (VOC) vapors are encountered during excavation, appropriate response actions will be taken, and the actions will conform to Hawaii Department of Health (HDOH) and U.S. Environmental Protection Agency (EPA) regulatory guidelines. The response actions include ensuring that on-site workers have the appropriate level of personal protective equipment (PPE) and the general public is not affected adversely. Anticipated tasks associated with managing VOC vapor exposure are summarized as follows:

If VOC vapors are encountered during excavation activities, field oversight must be provided to identify VOC vapors and provide health and safety guidance related to the potential exposure of workers to COCs.

- Air monitoring will be conducted during excavation associated with future construction activities. Air monitoring will also be conducted when workers are required to enter excavations where PCS or free product is present. The monitoring will include both workspace (on-site) and perimeter measurements of VOC vapors.
- If warranted by the air monitoring results, on-site workers will be notified of the need to upgrade PPE to include respiratory protection.
- Air monitoring required for confined space entry (if required) will be conducted by the contractor responsible for construction. Confined space entry and associated air monitoring requirements will be described in the site specific health and safety plan for construction.

Air monitoring required for confined space entry (if required) will be conducted by the contractor responsible for construction. Confined space entry and associated air monitoring requirements will be described in the site-specific health and safety plan (HSP) for construction.

3. Exposure Management Procedures

- Level D PPE will be appropriate for on-site workers under normal working conditions.
- Both workspace (on site) and perimeter (off site) air monitoring will occur.
- Air monitoring will be conducted using a conventional photoionization detector (PID) to measure total VOC vapor concentrations, and an Ultra-Rae PID, which is benzene-specific, to determine benzene concentrations.
- If VOC vapor concentrations in the workspace atmosphere exceed an 8-hour time-weighted average (TWA) of 20 parts per million (ppm) or a 15-minute short-term exposure limit (STEL) of 100 ppm, PPE requirements will be upgraded to Level C, and it may be necessary to implement a modified work schedule. These levels are based on a maximum benzene concentration in gasoline of 5 percent by volume.

- On-site workers will be notified immediately if benzene is detected in the workspace atmosphere at a concentration exceeding 0.5 ppm, and wearing respirators with organic vapor cartridges will be recommended (i.e., recommended upgrade of respiratory protection to Level C).
- If benzene concentrations in the workspace atmosphere exceed the 8-hour TWA PEL (1 ppm) or the Occupational Safety and Health Administration (OSHA) 15-minute STEL (5 ppm), PPE requirements will be upgraded to Level C, and it may be necessary to implement a modified work schedule.
- If benzene concentrations in the workspace atmosphere exceed the TWA PEL (1 ppm), short-term exposure monitoring will be conducted. To determine short-term exposure, a minimum of five samples will be collected within a 15-minute period.
- If daily average benzene concentrations in the workspace atmosphere exceed the OSHA STEL (5 ppm) or benzene concentrations exceed the OSHA acceptable ceiling concentration (25 ppm), PPE will be upgraded to Level C, with either full-face respirators or powered air-purifying respirators and protective goggles.
- If benzene concentrations in the workspace atmosphere exceed the OSHA 8-hour TWA for a 40-hour work week (10 ppm) or benzene concentrations exceed the OSHA acceptable maximum peak for an 8-hour shift (50 ppm), work will be stopped immediately, the on-site representative will be notified, and workers will be requested to leave the work zone.
- If benzene concentrations along the site perimeter (off site) exceed the 15-minute STEL (5 ppm) or the TWA PEL (1 ppm), the exclusion zone will be extended beyond the property boundary.

If benzene concentrations along the site perimeter (off site) exceed the OSHA acceptable ceiling concentration (25 ppm), work will be stopped immediately and the project on-site representative will be notified.

Provide details of how soil vapor was managed (consistent with Section 16 of the EHMP) when encountered in groundwater or in soils:

B.9

Stormwater Management Plan

Prepared By **Organization:** _____ **Name:** _____ **Signature:** _____	**Stormwater Management Plan** **Environmental Hazard Management Plan** **Kahului Harbor Industrial District** **Version:** **Reference:** **Date:**

Project Name: _____

Project Location: _____

Parties may use this sample as a basis for preparing their own site-specific Stormwater Management Plan.

Revise this Sample Plan by:

1. Reviewing the requirements of this sample plan to ensure that the construction worker can comply with its requirements, and modifying the plan, if necessary.

Implement this Plan by:

1. Making sure on-site workers are aware of this plan and that they follow it.
2. Making sure a copy of the completed plan is present at the construction site.
3. Accessing additional guidance for completing this form in Section17 of the EHMP
4. Keeping a copy of the completed form for your records and sending a copy to the HEER Office.

Delete this box after completing this plan.

1. INTRODUCTION

If contaminated soil or groundwater is encountered during excavation, appropriate response actions will be taken, and the actions will conform to Hawaii Department of Health (HDOH) and U.S. Environmental Protection Agency (EPA) regulatory guidelines. The response actions include ensuring that these media are not exposed to stormwater. Anticipated tasks associated with managing stormwater are summarized below.

2. STORMWATER MANAGEMENT PROCEDURES

Field oversight will be provided during excavation activities conducted as part of construction. Purposes of the oversight are to identify contaminated media that could be exposed to stormwater runoff and to provide guidance related to controlling stormwater on the property. In addition, the weather will be monitored throughout each work day for signs of approaching storms and/or heavy rains.

Inspections of engineering stormwater controls will occur each day to minimize potential for exposure of contaminated media to stormwater runoff and minimize potential for contaminated stormwater to leave the construction site.

All construction will accord with the conditions of an HDOH-approved National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge associated with construction activity. Conditions of the permit include preparation of a Construction Site Best Management Practices Plan.

3. OPEN EXCAVATIONS

In the absence of engineering and administrative controls, PCS and/or groundwater exposed in open excavations could come into contact with stormwater, thus potentially contaminating the stormwater with contaminants of concern (COC). To prevent this, the following activities will occur:

- Where possible, excavations will be backfilled as soon as practicable to limit the time they are open and potentially exposed to stormwater runoff and direct precipitation.
- Where possible, the edges of excavations will be bermed, thus minimizing potential for entry of stormwater runoff.
- Open excavations will be inspected each day to minimize potential for direct precipitation to cause the excavation to overflow.

4. SOIL STOCKPILES

In the absence of engineering and administrative controls, excavated petroleum-contaminated soil (PCS) stored in stockpiles could come into contact with stormwater, thus potentially contaminating the stormwater with COCs. To prevent this, the following activities will occur:

- Soil stockpiles will be placed on plastic sheeting, and the sheeting will be bermed at the edges, thus minimizing potential for contact with stormwater runoff.
- At the end of each day, or in the event of a storm, the soil stockpiles will be covered with plastic sheeting, thus minimizing potential for contact with direct precipitation.
- The soil stockpiles will be inspected each day to ensure that the plastic sheeting is intact.

5. DEWATERING INFILTRATION PITS

In the absence of engineering and administrative controls, water in infiltration pits used for on-site dewatering could come into contact with stormwater. To prevent this, the following activities will occur:

- Where possible, infiltration pits will be backfilled as soon as practicable to limit the time they are open and potentially exposed to stormwater runoff and direct precipitation.
- Where possible, the edges of infiltration pits will be bermed, thus minimizing potential for entry of stormwater runoff.
- Infiltration pits will be inspected each day to minimize potential for direct precipitation to cause the pit to overflow.

Erosion and sediment control measures will be in place and functional before construction activities commence. These measures will be maintained throughout the construction period. If stormwater discharge from the site is anticipated, the following preventive measures may be implemented:

- Stormwater flowing toward active construction areas will be diverted using appropriate control measures, as practicable.
- Erosion control measures will be designed to handle the size of the disturbed or drainage area in order to detain runoff and trap sediment.
- Height of the property boundary can be increased using sandbags.
- Additional silt fencing will be added at affected property boundaries, if warranted.
- Berms surrounding soil stockpiles will be increased as necessary.
- Moveable booms will be available to contain spills.
- Absorbent pads will be employed if free product is observed in stormwater runoff.

Provide details of how stormwater was managed (consistent with Section 17 of the EHMP) when a significant storm event occurred during construction: