Programmatic EHE/EHMP Document

Iwilei District
Honolulu Hawaii

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Prepared by:

HAWAII STATE DEPARTMENT OF HEALTH

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ACRONYMS

AST	Aboveground storage tank
bgs	Below ground surface
BMP	Best management practice
BTEX	Benzene, toluene, ethylbenzene, and xylenes
C&C	City and County
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
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	Hazard Evaluation and Emergency Response
HIOSH	Hawaii Occupational Safety and Health
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
ID	Iwilei District
IDN	Iwilei District North
IDPP	Iwilei District Participating Parties
IDS	Iwilei District South
kg	Kilogram

LEL	Lower explosive limit
LEPC	Local Emergency Planning Committee
LOC	Letter of Completion
LNAPL	Light non-aqueous phase liquid
mg	Milligram
mil	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
OU	Operational unit
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
SPH	Separate phase hydrocarbons
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
UST	Underground storage tank
VOC	Volatile organic compound
VRP	Voluntary Response Program

1.0 INTRODUCTION

The Iwilei District (ID) encompasses approximately 315 acres of land north and south of Nimitz Highway. The ID includes land owned privately and by the State of Hawaii, and is managed by the Hawaii Department of Transportation (HDOT). Historical and current land uses are primarily industrial and commercial—docking and unloading of ships, warehousing, and bulk petroleum storage with associated pipelines, and minor residential use.

The Hazard Evaluation and Emergency Response (HEER) Office of the Hawaii Department of Health (HDOH) is overseeing remediation of historical impacts associated with (1) petroleum handling activities that have resulted in petroleum hydrocarbon releases from now-inactive storage tanks and underground pipelines (UGP), and (2) impacts by metal and other compounds resulting from past industrial or imported fill activities.

Both engineered remedial measures and long-term Institutional Controls (IC) have been and continue to be implemented to prevent hazards to human health and the environment within the ID. Potentially hazardous contaminants of concern (COC) are present in soil, groundwater, and soil gas at various locations within the ID. Some of these COCs have been removed, and removals of these will continue via engineered remedies. Management of potential hazards associated with the remaining (also referred to as residual) COCs is addressed by ICs, which are described in Environmental Hazard Management Plans (EHMP). These plans—an HDOH requirement —are described in HDOH's Technical Guidance Manual (TGM).

Site-specific EHMPs have been implemented within the ID, developed by parties HDOH considers responsible for residual COCs at specific parcels or sites. Site-specific EHMPs are developed after completion of site characterization and implementation of any required engineered remedies. Site-specific EHMPs include (1) those developed under the Voluntary Response Program (VRP) by a group of potentially responsible parties referred to as the Iwilei District Participating Parties (IDPP), and (2) other EHMPs already prepared by HDOT and other parcel/site operators/owners. Figure 1 shows the areas for which site-specific EHMPs have been established and for which site-specific EHMPs are under preparation. Copies of these site-specific EHMPs are or will be available at the HEER office in Honolulu. As environmental impacts are identified at other sites within the ID, HDOH may require preparations of additional site-specific EHMPs in the future.

Under present conditions and controls, which include implementations of engineered remedies, the COCs within the ID do not currently pose hazards to human health and the environment. However, exposures to residual COCs could occur during (1) minor 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; and (2) minor construction activities within roadways and common areas. This Programmatic Environmental Hazard Evaluation (EHE)/EHMP and the relevant site-specific EHMPs specify requirements, procedures, and guidelines intended to prevent occurrences of these potential exposures that would pose hazards to human health and the environment.

This Programmatic EHE/EHMP addresses sites of known or suspected presence of COCs where no previous site investigations have occurred and for which no EHMPs have been established. These sites are shown on Figure 1 as "Area Covered by HDOH's Programmatic 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), parties are required to comply with this Programmatic EHE/EHMP.

Parties may utilize this Programmatic EHE/EHMP as is, and HDOH expects this for small-scale projects within private sites, roadways, and common areas. Off-site construction within roadways and common areas will likely encounter COCs that must be properly managed by construction and environmental contractors.

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

2.0 PURPOSE

The purpose of this Programmatic EHE/EHMP is to specify consistent and effective practices for managing the following COCs if these are encountered during minor subsurface activities within the ID: petroleum-contaminated soil (PCS) and debris-contaminated soil (DCS) normally containing high levels of metals, petroleum- or dissolved metals-contaminated groundwater, or elevated soil vapors. Petroleum-related contamination and metals are emphasized because these are the most common contaminants found within most if not all of the affected areas. Activities covered by this document include: (1) minor work at the subsurface 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; and (2) minor construction activities within roadways, common areas, and sites for which a site-specific EHE has not occurred and a site-specific EHMP has not been established.

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

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, preparation of a site-specific EHE/EHMP must be prepared to address contamination within the site boundary.

3.0 AREA COVERED

The area covered by this document is the ID of Honolulu. The ID consists of two distinctly separate parcels—Iwilei District North (IDN) and Iwilei District South (IDS). The IDN is bordered north by Dillingham Hwy. and south by North Nimitz Hwy. The IDS is bordered north by North Nimitz Hwy. and south by Honolulu Harbor. The eastern boundary of both parcels is North King Street, and the western boundary is the Kapalama Canal (Figure 1). Technical approaches presented in this document can also be applied to other areas of Oahu with similar COCs and lithology, and with non-drinking water utility.

3.1 History and Background

Iwilei District North. For the past 100 years, the IDN has been dominated by heavy industry, including pineapple canning and support industries, a box manufacturing plant, a manufactured gas plant, a petroleum bulk storage facility, and a chemical manufacturing and storage facility. These industries required large volumes of petroleum products that were supplied by pipelines originating at Honolulu Harbor, and were stored on site in aboveground storage tanks (AST) and underground storage tanks (UST).

The area has since transitioned from heavy industry to retail outlets. The retail outlets in the IDN include Costco, Home Depot, Lowe's, Best Buy, Brewer Environmental Industries, Latour Plaza, and Best Buy. A number of these retail outlets entered the HDOH VRP, and have received or will soon receive Letters of Completion (LOC) exempting them from liability for COCs remediated under the VRP. Site-specific EHE/EHMPs have been established for some VRP sites within the IDN, and therefore this document does not apply to those sites.

Because of numerous petroleum releases over the years, site redevelopment activities in the area often encounter both PCS and DCS. DCS is normally attributed to fill material from the two Chinatown fires. For few sites in the IDN have approved, site-specific EHE/EHMPs been established. No guidance presently exists for construction within roadways and common areas owned by the City and County (C&C) or the State, or for properties lacking site-specific EHE/EHMPs.

Iwilei District South. IDPP is a group of responsible parties (RP), including HDOT, that has signed an enforceable agreement (May 2006) with the State to remediate certain parcels of land called operational units (OU) in the Iwilei Harbor area, which includes the IDS.

For the past 100 years including the present, the IDS 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, although some retail activities have recently developed within the area (i.e., the Fishing village). Numerous petroleum releases occurred over the years, and contaminated fill was used to raise the ground level. Site redevelopment activities within the area often encounter contamination. For some IDPP OUs, HDOH-approved site-specific EHE/EHMPs are in place. Little guidance presently exists for construction on sites not included in IDPP OUs, and for work within roadways and common areas owned by C&C and/or the State.

Most land within the IDS is owned by the HDOT Harbors Division. Some properties within the IDS where responsibility for release(s) is clearly defined must be remediated by the RP(s).

***Under the present conditions and controls, contamination within the ID does not pose a threat to human health or the environment*.** This document does not supersede existing site-specific EHE/EHMPs or the need to develop site-specific documents for land development and large construction projects. HDOH recognizes that developing independent, site-specific EHE/EHMPs for small-scale projects within 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, off-site construction within roadways and common areas will likely encounter contamination that must be properly managed by construction and environmental contractors. EHE/EHMPs currently do not exist to deal with these contingencies. This Programmatic EHE/EHMP can also be used by landowners, tenants, and utilities companies to assist in developing individual EHE/EHMPs for large construction activities.

4.0 HOW TO USE THIS DOCUMENT

An EHE assesses hazards to human health and the environment from contaminant concentrations in soil and groundwater that exceed HDOH environmental action levels (EAL). An EHMP details how contaminants are to be managed when encountered during subsurface work. Many properties, roadways, and common areas within the ID are contaminated by various chemical constituents that are presently managed in place. The intent of this document is to provide guidance when relatively minor subsurface excavations encounter contaminated soil and groundwater at properties for which site-specific EHE/EHMPs have not been established. The EHE consists of Sections 6 and 7 while the EHMP consists of Sections 8 through 17.

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

This document is meant for use in the field upon encounter with contamination during subsurface activities. Following procedures specified in this document precludes need to stop work upon encounter with contamination. The first person to notice contamination is typically the backhoe or heavy equipment operator. An environmental consultant or a supervisor knowledgeable in dealing with contaminated soil and groundwater should be on site during construction activities. The machine operator relays the discovery of the contamination to the designated on-site environmental consultant or supervisor, who then phones in this information, communicates with others involved in the chain of command, and ensures that the EHE/EHMP is followed in dealing with the contaminated soil and groundwater. Based on the nature and type of construction, the EHE is broad enough to detail potential hazards. 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 contamination, 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 construction is planned within the ID:

1. Read the EHE section of this document to become familiar with the potential hazards associated with contaminated soil and groundwater.
2. Develop a site-specific Health and Safety Plan (HSP) (Section 10 and Appendix B.2).

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

- Report any petroleum-contaminated soil or groundwater to the HEER Office (Section 9 and Appendix B.1).
- 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 RPs do not follow this document, they must follow previously established procedures that include halting excavation when contamination is discovered, reporting the release to HEER Emergency Preparedness and Response Section, and/or waiting for an inspection by an On-scene Coordinator prior to re-commencing excavation. 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 other agencies such as the Solid and Hazardous Waste Branch, the Clean Water Branch, and 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 his/her/its own hazard management plans for his/her/its own site-specific project.

5.0 AREA GEOLOGY

The Iwilei area is on the southeast coastal plain of the Island of Oahu, which was formed on the eroded banks of two shield volcanoes, the Koolau and the Waianae. The volcanic series underlying the site was formed by rapid succession of volcanic flows with little evidence of erosion between eruptive events (Stears 1966, MacDonald et al 1983). The mode of emplacement produced vesicular and fractured basalt formations with a very high permeability. Groundwater in the basalt is referred to as the basal aquifer and is the primary major water supply for the island (Mink and Lau, 1990).

The basal aquifer beneath the Iwilei area is overlain by at approximately 600 feet of interlayered marine and terrestrial sediments, as well as thin volcanic tuff and basalt units. These formations are collectively referred to as the "caprock," since they form a confining layer over the underlying basalt. Shallow sediments are primarily composed of porous, coarse-grained gravels and sands). A laterally continuous, confining layer occurs within the caprock at a depth of approximately 40 feet below ground surface (bgs) and extends to a depth of approximately 65 to 75 feet bgs. The unit is composed of inorganic, finer-grained sediments that are described in the geotechnical borings as stiff to hard silts. Soil classification tests indicate that the silt has low permeability and is plastic with a substantial amount of clay. This unit is underlain by several hundred feet of coral and additional marine and terrestrial sediments.

The top of the caprock unit is overlain by approximately 2 to 10 feet of fill material in most areas. Historically, the Iwilei area was filled with material from a variety of sources to raise the ground surface elevation for development and improvement of Honolulu Harbor facilities. The emplaced fill consisted of dredge spoils from the nearby harbor channels, as well as soil and debris imported from other areas, including debris from several significant Chinatown fires (one of which in 1866 leveled most of the 50-acre Chinatown district, and another of which, the "Great Chinatown Fire" in January 1900, was a historical Honolulu event). The fill is laterally discontinuous and generally consists of sands and clays similar to the underlying caprock unit sediments.

No active drinking water wells are present within the ID. The area is seaward (Makai) of the underground injection control (UIC) line, and the caprock groundwater is not considered a potential drinking water source (Mink and Lau 1990).

6.0 ENVIRONMENTAL HAZARD EVALUATION

6.1 Contaminants of Potential Concern

The EHE consists of Sections 6 and 7.

Based on previous investigations in the area, the following contaminants of potential concern (COPC) may be encountered in soil and groundwater during subsurface construction projects. 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)
- Styrene
- Halogenated volatile organic compounds (HVOC)
- Polycyclic aromatic hydrocarbons (PAH)
- Lead
- 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.

Non Petroleum related contaminants:

Metal COCs detected in the area include arsenic, barium, cadmium, chromium, lead, mercury, and silver.

Metals associated with DCS from landfill disposal after the Chinatown fires of 1886 and 1900 (lead, arsenic, and cadmium) have been identified in the area. Metals detected in the area also may be associated with DCS from previous industrial activities on site.

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). In general, contaminants in areas considered grossly contaminated are relatively immobile, are nontoxic to humans, and do not threaten ecological receptors.

Gross contamination in groundwater includes potentially mobile free product, nuisance odors from surface water, petroleum hydrocarbon sheen on surface water, and general resource degradation.

In the absence of ICs and/or engineered controls, future human populations and ecological receptors at the property could be exposed to gross contamination (e.g., free product, objectionable odors).

6.3 Direct Exposure

The direct exposure hazard involves human contact with contaminated soil and 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, are potentially toxic to humans, and do not threaten ecological receptors.

In the absence of ICs and engineered controls, future human populations at the property could be exposed to contaminated soil (including contaminated dust), groundwater, or soil vapor inside buildings

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.

In the absence of remediation, institutional controls (ICs), and engineered controls (EC), future human receptors at the property could 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 Honolulu Harbor).

In the absence of engineered controls, 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. Under consideration are flora and fauna in terrestrial (i.e., land) habitats and aquatic (e.g., marine) habitats.

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

7.0 EXPOSURE PATHWAYS

Identified potential exposure pathways to human receptors within the ID 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 and a direct exposure hazard. Accidental ingestion of contaminated soil or groundwater will be of concern during construction when contaminated soil and groundwater are encountered.

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) will be of concern during construction activities when contaminated soil and groundwater are encountered.

8.0 ENVIRONMENTAL HAZARD MANAGEMENT PLAN

The EHMP consists of Sections 8 through 17.

This EHMP has been developed to mitigate potential exposure of construction workers, other on-site workers, and the aquatic ecosystem to COCs during activities associated with future construction activities. The EHMP consists of nine individual plans presented as Sections 9 through 18 as follows, each addressing a specific potential source of COCs (see Section 6.1) and methods of handling contaminated media:

- Release Reporting Plan
- Health and Safety Plan (HSP)
- Construction Activities Release Response Plan
- Inactive Petroleum Pipeline and UST Management Plan
- Soil Management Plan
- Groundwater Management Plan
- Free Product Management Plan
- Vapor Management Plan
- Stormwater Management Plan

The plans include engineering and institutional controls, as well as requirements for personal protective equipment (PPE) and a monitoring program. Prior to initiation of construction work, on-site workers will 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 petroleum contaminated soil, DCS, or contaminated groundwater during subsurface construction activities is considered a release and must be reported to the HEER Office according to the following procedures. 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) (808-586-4249 or 808-247-2191 after work hours) and the Local Emergency Planning Committee (LEPC) (808-723-8960) after discovery of contaminated soil and/or groundwater.

A release of oil within the ID 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 evidence of oil contamination.

If free product is encountered, report the release in accordance with HAR 11-451. It is not necessary to stop work if you follow procedure specified in this document.

Note that any release of oil to Honolulu Harbor falls under the Oil Pollution Act (OPA) of 1992, and must be reported to the Coast Guard as a release to surface water.

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 and LEPC either via telephone or in person. HEER/HSERC 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 State On-scene Coordinator (SOSC) on scene during an incident, mere presence of an SOSC does not constitute a notification. When in doubt, the contractor should call and speak to an SOSC. There is no penalty for reporting a release unnecessarily, but there are large penalties for not reporting a release.

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 Incident Case Number, which shall be referenced in any future correspondence including the written notification submittal—federal requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and OPA.

Releases of Reportable Quantities (RQ) of CERCLA hazardous substances and releases of oil that cause a sheen on water must also be reported to the National Response Center at 1-800-424-8802.

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. This written notification shall be sent to HSERC/HEER 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 is in Appendix B.1.

9.3 Recordkeeping Requirements for Encountered Contamination

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

10.0 HEALTH AND SAFETY PLAN

Provide an HSP for workers performing excavations who will encounter or potentially encounter the COCs and hazards described in Sections 6.0 (EHE). The HSP should generally include the following:

- Requirements that workers be trained in dealing with separate phase hydrocarbons (SPH) and chemical substances and hazards, 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 COC action concentration levels, where appropriate
- Emergency contact information.

A HSP is not a substitute for OSHA/ Hawaii Occupational Safety and Health (HIOSH) requirements. Employers of construction workers/utility workers must comply with all applicable OSHA/HIOSH requirements. See 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 SPH in the subsurface. An HSP and soil and groundwater management plans should be prepared.

If uncontrolled releases of SPH, SPH-impacted soil, and SPH- and metals-impacted groundwater could occur, human health concerns would include possible contact with SPH, exposure to fire hazards, and disruptions to site activities, including possibly local traffic. Environmental impacts of concern would be discharges of metals-contaminated groundwater, SPH, 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.

The plan should also note that the HEER Office has developed an Incident Action Plan (IAP) to deal with any major accidental releases of COCs within the ID. If a release threatens to go beyond the control of the construction contractors or parties performing work at the site, the contacts listed in the IAP must be notified.

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 historical documents and plans for information on inactive pipelines or USTs identified to date. 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. To the extent possible, leave inactive pipelines in the ground if they extend beyond 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 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 SPH 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 SPH 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 SPH; beginning and ending fluid levels; volumes of each type of fluid removed (e.g., water and SPH); 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 and DCS that could be encountered during future construction. The principal hazards posed by PCS and DCS 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).

Previous results of the site characterization within the ID indicate that soil can be contaminated from the surface and into the saturated zone. Subsurface soil contamination is readily apparent through visual and olfactory detections. Typically, PCS is stained black or discolored and has a petroleum hydrocarbon odor, and DCS is a dark brown/black layer of silt/clay fill containing a significant amount of debris, such as scrap metal, piping, wire, wood, glass, and pottery shards.

Contaminated soil should be assessed during subsurface construction activities. Contractors that will work within areas of known contamination should be so notified prior to mobilization so they can properly prepare for dealing with contaminated soil.

Two landfills on Oahu are permitted by the State to accept contaminated soil for disposal: Waimanalo Gulch Sanitary Landfill and PVT Land Company Landfill. A Hazardous Waste Characterization must be performed on the soil prior to disposal. Contact the HDOH Solid and Hazardous Waste Branch at 808-586-4226 for further information, and see the HDOH *Construction and Demolition (C&D) Waste Disposal General Guidance* (HDOH 2011c). Potential characteristics that could cause PCS to be classified as Hazardous Waste include: (1) ignitability and (2) failure of contaminants in the soil—especially lead, cadmium, and arsenic—to pass the Toxic Characterization Leaching Procedure (TCLP). Soil classified as hazardous waste must be disposed of at a hazardous waste facility on the mainland. No permitted hazardous waste landfills are present in Hawaii.

Soil containing metal, wire, glass, pottery shards, and charred soil or wood may have originated as fill from the Chinatown fires or from on-site industrial activities. This soil could contain elevated levels of metals such as lead, cadmium, and arsenic, and must be properly managed during construction activities. These soils may fail TCLP testing, which would classify the soil as hazardous waste. Special precautions should be taken to avoid generation of excess hazardous waste during subsurface activities.

Refer to the HEER Office document *Evaluation of Imported and Exported Fill Material* for guidance on testing of soils for reuse or disposal (HDOH 2011b).

13.1 Soil Management

If contaminated subsurface soil is encountered during excavation, appropriate response actions will be taken and the actions will conform to HDOH and U.S. Environmental Protection Agency (EPA) regulatory guidelines. The response actions include ensuring that workers have the appropriate level of PPE, that the excavated PCS and DCS is segregated from clean soil, and that the PCS and DCS is managed properly following excavation. PCS is defined as soil that exhibits petroleum staining, and/or a petroleum hydrocarbon odor, with or without mobile free product. DCS is defined as a dark brown/black layer of silt/clay fill containing a significant amount of debris, such as scrap metal, piping, wire, wood, glass, and pottery shards, and may emit hydrocarbon odors. An environmental consultant will reference field observations and

measurements to assess the excavated soil. Based on professional experience and judgment, the consultant will determine whether or not the excavated soil is PCS or DCS.

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; see HDOH 2011a). 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. 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. The soil used in the field tests should be representative of the soil in the stockpile. 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 construction activities that could disturb PCS.
- If PCS or DCS is 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 and DCS 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 PCS from clean soil, and stockpile the PCS 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 (i.e., reported 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 iis place 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 soil is classified as heavily contaminated (i.e., reported TPH>5000 mg/kg), it must be profiled and disposed of at an appropriate landfill site.
- If structurally suitable, DCS should be given preference for re-internment in the excavation. If there is excess DCS classified as hazardous waste, develop a plan to reinter the soil at a known clean area of the site so the excess hazardous waste does not have to be shipped for mainland disposal.
- 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 PCS- or DCS-contaminated soil is to be used in roadways, the soil must also meet roadway design criteria of the C&C and 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 and DCS 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 or DCS 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 HDOH 2011c).
- 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.

13.2 Soil Testing

The two types of chemical testing detailed below may occur before stockpiled soil is placed back in the excavation (i.e., re-used) or disposed of in a suitable landfill (i.e., disposal, see also HDOH 2011c).

Re-Use Testing. This testing involves field tests or laboratory tests for 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 *Evaluation of Imported and Exported Fill Material* (HDOH 2011b). If the stockpile is less than 20 cy, one soil batch ("Decision Unit") should be tested using multi-increment sampling approaches. If the stockpile is larger than 20 cy, every 20 cy up to the first 100 cy should be tested. For stockpiles larger than 100 cy, multi-increment (MI) samples should be collected from a minimum of five Decision Units totaling up to 500 cy of soil (e.g., up to 100 cy each). Appropriate Decision Unit volumes for larger stockpiles of soil should be discussed with the HEER office on a case-by-case basis. If the cost of sampling and segregating clean soil from PCS is higher than the cost of disposal of all soil as PCS, the benefit of testing small volumes of PCS for potential reuse may be precluded. The 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 TGM guidelines.

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 PCS or DCS is imminent.

13.3.1 Open Excavations

During construction activities, subsurface PCS could be exposed in excavations for utility corridors or other subsurface structures. If PCS or DCS is more contaminated than anticipated is encountered 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, the PCS or DCS will be excavated and properly stockpiled prior to continuance of work. The stockpiling procedures are described in the Soil Management Plan (Section 9.1).
- If airborne dust generated from PCS or DCS 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, the plastic sheeting used to berm and cover soil stockpiles could be damaged 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 PCS or DCS 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. Significant issues will 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 4 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.

Contaminated groundwater in the area has been encountered during a number of previous site characterizations and remedial activities. 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 anticipated during future construction. However, if dewatering becomes necessary, water will likely be pumped into on-site infiltration pits, and will 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. 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 anticipated during future construction. 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 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 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.

14.3.1 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.

14.3.2 Dewatering Pits

Dewatering is not anticipated during future construction. 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 dewater (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.

14.4 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.

14.5 Record Keeping and Reporting

Detailed records will be maintained of workspace monitoring, dewatering (if performed), groundwater disposal (if conducted), and response activities. Significant issues will 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 ID is confined to the general area of the capillary fringe of the water table, which is approximately 4 to 7 feet bgs. Results of the site characterization in the area indicate that the free product 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 ID has not been completely defined, and free product could be encountered during any subsurface activities. 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 4 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.
- Dewatering is not anticipated during future construction. However, 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. 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 (Section 9.4).

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. 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. If 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 6.4).
- 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.

15.5.2 Dewatering Pits

Dewatering is not anticipated during future construction. 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 6.4).
- 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 ID 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 ID because the vapor has a petroleum hydrocarbon odor. The principal sources of contaminated soil vapor within the ID 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 will 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 will be conducted during excavation associated with future construction activities. Air monitoring will also occur when workers are required to enter excavations regardless of whether PCS or free product is present. The monitoring will include both workspace (on site) and perimeter measurements of VOC vapors.
- If warranted by air monitoring results, on-site workers will 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 ID 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 ID. In addition, THP-g, TPH-d, and BETX 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 will be calibrated using a 100 ppm isobutylene standard. The Ultra-Rae PID will 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 Honolulu Harbor) could be exposed to COCs. Areas within which 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 coming into contact with 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-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, the C&C of Honolulu Department of Planning and Permitting requires erosion controls or implementations of BMPs at all 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 come into contact with 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 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 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 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 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 come into contact with 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) will be inspected daily. During storm events, inspections will 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 will 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 come into contact with 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 will occur periodically and will be documented. Engineering controls will be inspected and repaired as necessary. During prolonged rainfall, daily inspections may be necessary. Accumulated sediment at the silt fence will be removed once accumulation reaches one-third the height of the fence. If damaged, the silt fence will 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 will be maintained. Significant issues will be communicated to site workers and the project on-site representative on a regular basis. Reporting requirements of the NPDES stormwater discharge permit will 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.

Appendix A

Environmental Hazard Management Plan

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

Environmental Hazard Evaluation

Environmental Hazard Management Plan

North Iwilei Area

GUIDELINES FOR LANDOWNERS, TENANTS,

UTILITIES COMPANIES, AND CONSTRUCTION CONTRACTORS

Prepared by

HDOH

Version 1

March, 2015

These guidelines are for landowners, tenants, utility companies, and construction contractors involved in construction projects within the Iwilei District (ID) of Honolulu, which is described in more detail below. They describe controls that provide protection from oil, oily soil and water, debris-contaminated soil (DCS), 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 page A-3).
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.

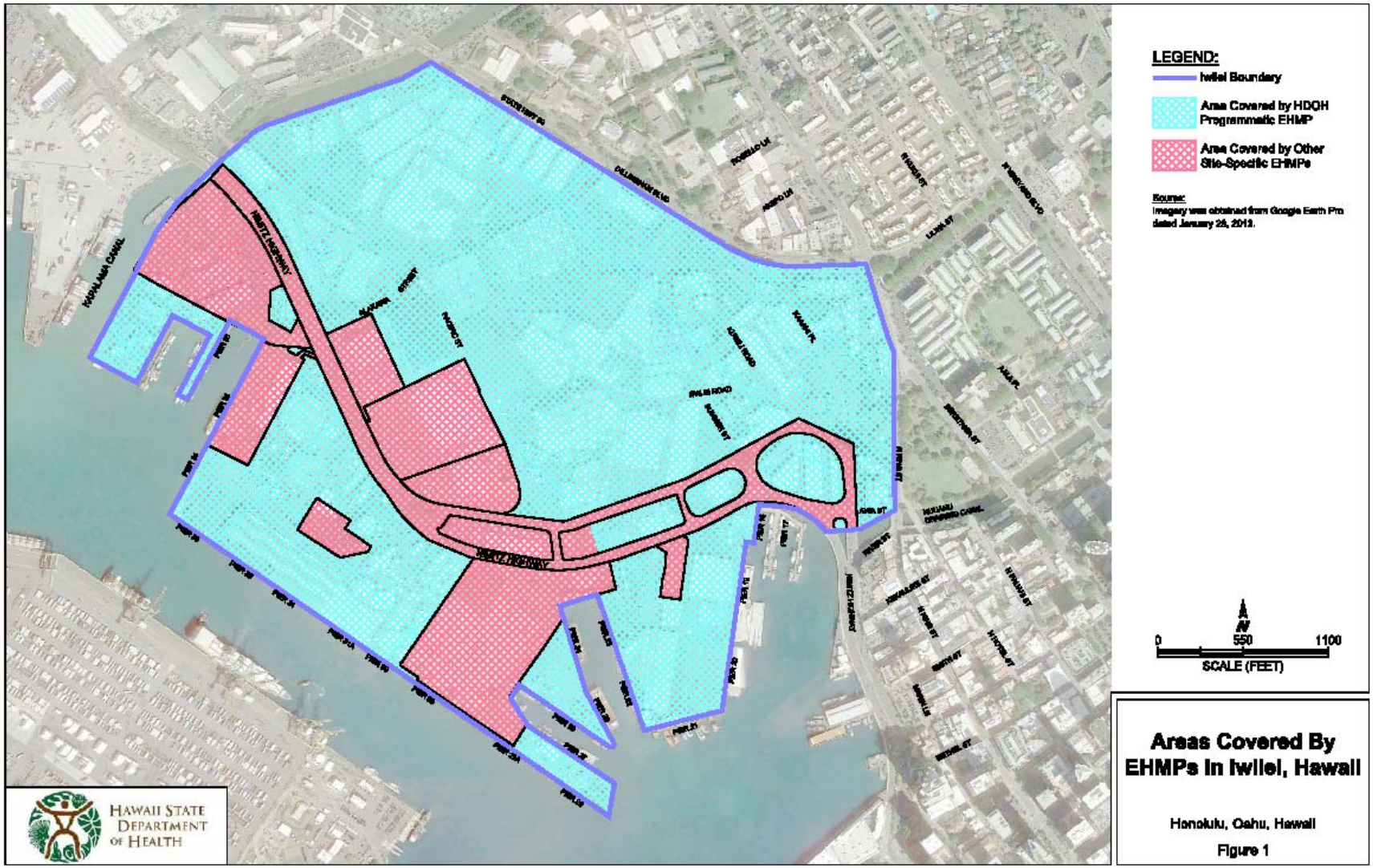
Soil and groundwater within the ID have been impacted by oil released from historical tanks and buried pipelines, and from contaminated fill material. The ID and site with site specific EHMPs are shown on the map on page A-3.

Remediation has been undertaken at many properties within the ID. Because remedial activities did not remove all oil or oily soil and groundwater, appropriate precautions must be taken so that workers involved in excavating within the area are not exposed to risks related to remaining petroleum product released on site. Installation of vapor barriers or other mitigation measures may also be needed to prevent methane, a flammable gas, or other harmful soil vapors from entering buildings, vaults, or other structures.

These guidelines explain how parties performing construction work within the ID shown on the map on page A-3 can protect those who may be exposed to oil, oily soil and groundwater, or DCS.

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.


LEGEND:
Iwilei Boundary
Area Covered by HDOH Programmatic EHMP
Area Covered by Other Site-Specific EHMPs
Source:
Imagery was obtained from Google Earth Pro dated January 26, 2013.
0
550
1100
SCALE (FEET)
Areas Covered By EHMPs in Iwilei, Hawaii
Honolulu, Oahu, Hawaii
Figure 1
HAWAII STATE DEPARTMENT OF HEALTH

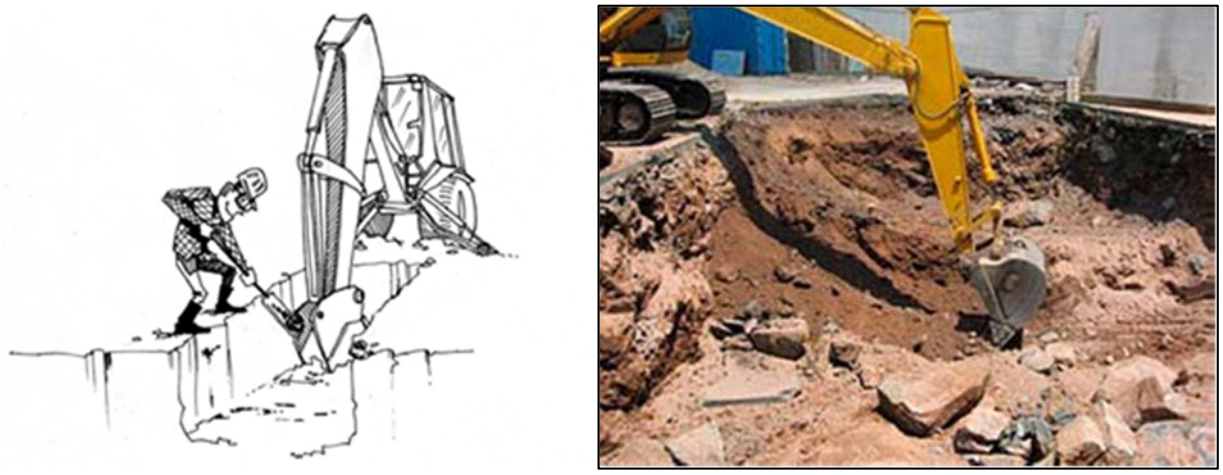
Determine if you should consider these guidelines for work within the ID:

- If you are landscaping, paving, or excavating to a depth of less than 3 feet, you probably do not need to consider these guidelines. However, be vigilant for any evidence of oil, oily soil, oily water, or soil containing debris, and consult with the Hazard Evaluation and Emergency Response (HEER) Office if you encounter any of these materials.
- If you are excavating deeper than 3 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. 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.

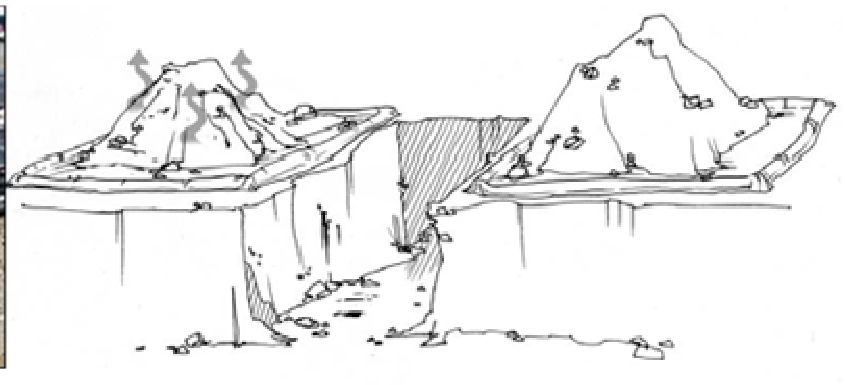
Some potential hazards that can occur during excavation and how they can be prevented are described below.

During excavations, workers may be exposed to oil 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 in the North Iwilei Area.



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.

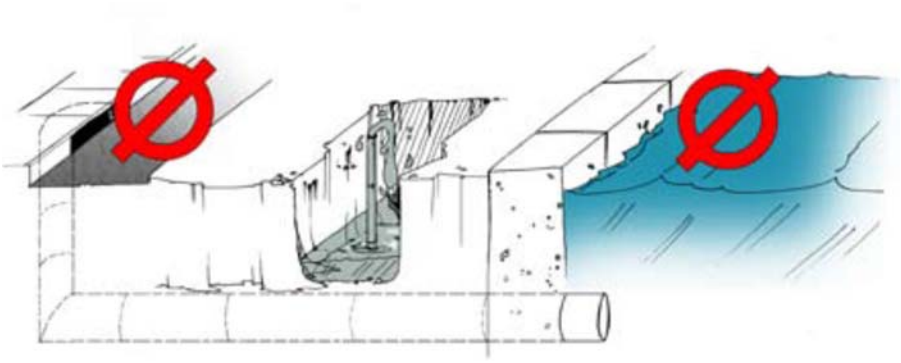
Oily soil or DCS may be inadvertently spread around the work area. Also, clean and oily soil could be mixed, increasing the volume of soil that must be disposed of.

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 DCS (Appendix B.5). Separate clean soil from PCS or DCS. Always cover the contaminated soil stockpile with plastic sheeting.

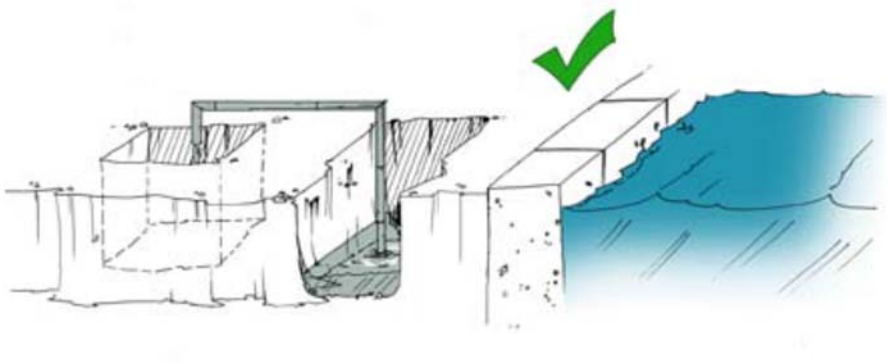
Oil might seep from the side of an excavation and cause oil sheen. It may be necessary to manage the oily water.

Oil or oily water or DCS 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.

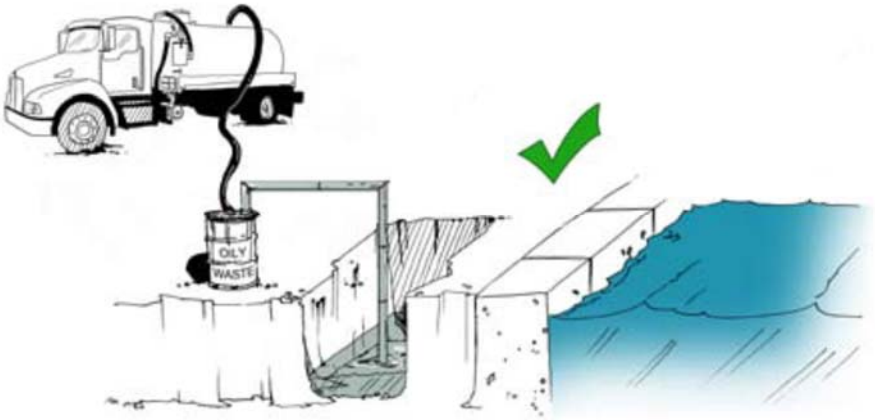
Do not discharge extracted groundwater unless it meets the requirements of, or is approved by the HEER Office and other applicable government agencies. Prepare and follow a **Groundwater Management Plan (Appendix B.6)** and obtain necessary permits or approvals from the HEER Office and other applicable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

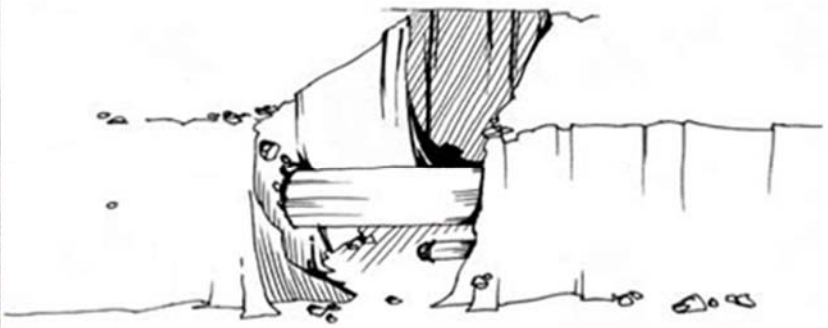


Upon acquisition of applicable government approval, contaminated water can be discharged into a newly excavated pit/trench within the impacted area.



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.



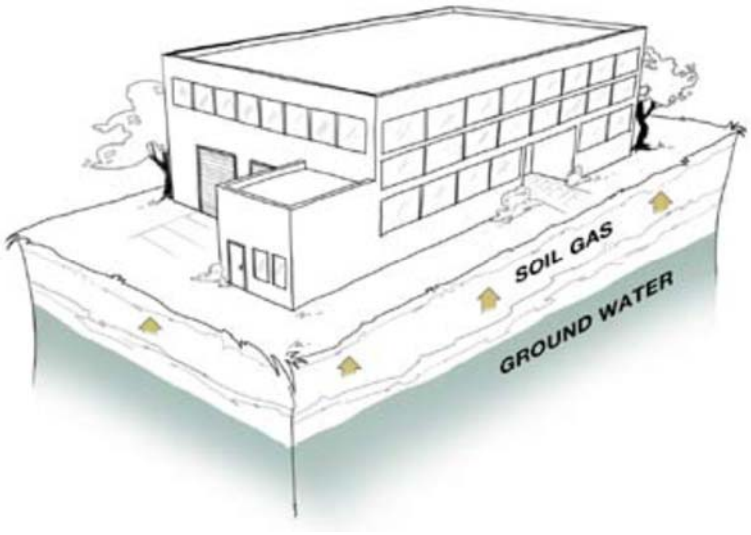
Exposed abandoned pipelines in the harbor area

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.

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 HEER.

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



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 the 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 15.) If your project does fall under these guidelines, complete the following steps:

1. Notify the HEER Office as soon as possible about your project. HEER 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 HEER determine how to support you. If necessary, have HEER 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
Honolulu Harbor/Iwilei District Project Manager

e-mail: steve.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 3 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?**	☐ ☐	
QUESTIONS	**ANSWERS**	**Useful remarks by HEER and/or Tenant/Contractor**

QUESTIONS	ANSWERS	Useful remarks by HEER and/or Tenant/Contractor
Are you preparing appropriate plans or documents[2] as detailed in Appendix B:	**YES NO**	**What HEER support do you need in preparing the Plans?**
• **Site-specific Health and Safety Plan?**	☐ ☐	
• **Free Product Management Plan**	☐ ☐	
• **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 HEER's role?

For Planned Projects, HEER may be able to:

- Provide oversight and technical support for dealing with oil, oily soil, DCS, oil- or DCS-contaminated 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 HEER to access monitoring points on your parcel.

If an accidental release of oil occurs, and oily soil, DCS, and oil-contaminated water must be addressed, HEER 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 technical and logistical support can I expect?

- HEER'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, and soil vapors.
- HEER will provide sample plans that can be considered by your environmental consultant in preparing plans that may be required for your project.
- HEER 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 HEER about construction project plans within the ID , contacting HEER for support to help address requirements of the EHMP, and cooperating with HEER 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 wateror 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
Honolulu Harbor/Iwilei District Project Manager

e-mail: steve.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 – Oil Hazards

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 – Oil Hazards

Prepared By: **Organization:**_____ **Name:** _____ **Signature:** _____	**Health and Safety Plan – Oil Hazards**
	Environmental Hazard Management Plan Iwilei 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

Oil, oily water, and oil-impacted soil 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 oil, oily water, oil-impacted soil and DCS 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, oily water, oil-impacted soil and debris, and contaminated soil, 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:

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

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.	<10% Lower Explosive Limit (LEL): No explosive hazard. Proceed with caution. > l0% 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	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).
		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.
	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.

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 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*:	Hazardous work conditions	(_____) _____ - _____
For emergencies: Fire, Ambulance, or Police		**911**

8. 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 Iwilei 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 Section 7.1 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 8 and 9 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 soilor 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 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. **However, if parties undertaking the work are not able to deal with the release, the Incident Action Plan (IAP) for the Hazard Management Areas should be immediately activated.** The IAP can be implemented by notifying the State HEER Office Emergency Response Team (see first entry in Table 3).

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 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.

5.

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	

6. NOTIFICATION INFORMATION

If the release meets the Section 7.1 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	(_____) _____ - _____

7. RELEASE COMMUNICATIONS AND AGENCY REPORTING REQUIREMENTS

7.1 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 **Iwilei 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 Section11 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.

- **INTRODUCTION**

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

1. 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.

2. 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.

3. 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.

4. 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 separate phase hydrocarbons (SPH) and associated vapors.

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

5. 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.

6. INVESTIGATION-DERIVED WASTE DISPOSAL

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

7. 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.

8. 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 Iwilei 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 Section11 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 the amount of excavated soil is less than 1 cubic yard (cy) (equivalent to about three 55-gallon drums), it can be re-placed in the excavation upon completion of the work without further evaluation.

If you encounter oil or oil-impacted soils, or debris-contaminated soil (DCS), do the following:

- 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, 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 oil-impacted soils from non-impacted soils.
- Place oil-impacted 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 anyliquid 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 impacted soils and containerized soil with plastic sheeting or tarps to minimize dust, stormwater, and odor concerns.
- 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. 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.
- In the backfilling procedure, the more highly 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.

- 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. The HEER Office will determine if sampling is required.

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 stockpile characterization, review the current HEER Office guidelines 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.

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The HEER Office should be notified if oil-impacted soils are excavated, segregated, and either backfilled or 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 petroleum-contaminated soil (PCS) was handled consistent with Section 13 of the EHMP:

B.6

Groundwater Management Plan

Prepared By	Groundwater Management Plan
Organization:_____	**Environmental Hazard Management Plan Iwilei District**
Name: _____	
Signature: _____	**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 14of 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.

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2. GRIUND 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:

B.7

Free Product Management Plan

Prepared By **Organization:**_____ **Name:** _____ **Signature:** _____	**Free Product Management Plan** **Environmental Hazard Management Plan Iwilei 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 of how free product was managed (consistent with Section 15 of the EHMP) when encountered floating on groundwater or in soils:

B.8

Vapor Product Management Plan

Prepared By **Organization:**_____ **Name:** _____ **Signature:** _____	**Vapor Management Plan** **Environmental Hazard Management Plan Iwilei 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 Iwilei 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.

- **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.

2. 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.

3. 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.

4. 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: