PORT OF OAKLAND

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Alameda County
Environmental Health

1 March 2009

Mr. Steve Plunkett
Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: RO#0000010_Risk Management Plan - Port of Oakland, 651 Maritime Street, Oakland, California_2009-03-01

Dear Mr. Plunkett:

Please find enclosed our Risk Management Plan ("RMP") for the Port of Oakland ("Port") Harbor Facilities Complex, located at 651 Maritime Street in Oakland, California. This RMP has been prepared as required by the San Francisco Regional Water Quality Control Board ("Water Board") in a letter from Mr. Roger Brewer of the Water Board to Mr. Barney Chan of Alameda County Health Care Services Agency ("County"), dated 18 December 2002[1]. This RMP will serve as an engineering control tool for managing the site, in conjunction with a deed restriction that the Port submitted to the County for review and comment via e-mail on 12 January 2009.

In response to your letter to the Port dated 30 September 2008[2], we met on-site at the Harbor Facilities Complex (15 October 2008) for a field meeting, along with our consultant, BASELINE Environmental Consulting ("BASELINE"). We discussed facility history and conditions, including seeking County concurrence to manage the site in the future using engineering and institutional controls. The Port has been actively engaged in passive and active free product removal at the site since 1997. We are currently evaluating the efficiency of the on-site product removal system, but do not expect to achieve site closure in the near future. Therefore, the Port proposes to manage the residual subsurface free product at the site using engineering and institutional controls.

The efficiency of the product removal system is currently being undertaken by shutting down the system for progressively longer periods of time and observing the effects of

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[1] Letter from Mr. Roger Brewer (San Francisco Regional Water Quality Control Board) to Mr. Barney Chan (Alameda County Health Care Services Agency) regarding *Review of Human Health Risk Assessment for Future Port of Oakland Field Support Services Complex, 2225 and 2277 Seventh Street, Oakland, CA*, dated December 18, 2002.

[2] Letter from Mr. Steven Plunkett (County) to Mr. Jeffrey Rubin (Port) regarding *Fuel Leak Case RO0000187 (Global ID# T0600100892), Port of Oakland, 651 Maritime Street, Oakland, CA*, dated September 30, 2008.

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free product accumulation; this activity is expected to continue through at least the end of 2009. At the same time, the Port is routinely (about weekly) removing the free product that accumulates in monitoring well MW-3, which is not part of the product removal system. Following this product removal system evaluation (estimated to be at the end of 2009 or first quarter of 2010), we will submit evaluation results to the County, along with recommendations for future continued removal, monitoring of product accumulation, and/or additional actions.

In the aforementioned 30 September 2008 letter, you requested that the Port prepare a Site Conceptual Model ("SCM"), including a discussion of on- and off-site hydrogeology, source areas, contaminant distribution, pathways, and data gaps (referenced under Technical Comment #4). As we discussed during our 10 October 2008 meeting in the field, extensive investigations have been conducted at this site since 1993. The work included a risk evaluation using a Conceptual Site Model ("CSM") by IRIS Environmental ("IRIS") in 2003. The enclosed RMP summarizes the work performed by IRIS and their CSM. The report prepared by IRIS was submitted to the County on 2 July 2003. We trust that the CSM and risk evaluation prepared by IRIS responds to your request in your 30 September 2008 letter to the Port.

We thank you for your guidance on remediation of this site and hope that we will be able to reach an appropriate management option to ensure protection of public health and the environment. We look forward to your comments on this RMP and also receiving any comments that you may have on the previously submitted draft deed restriction. If you have any questions or comments, please contact either of the respective undersigned at (510) 627-1134 or (510) 627-1360.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report prepared by Baseline are true and correct to the best of my knowledge. Please note that the report is stamped by both a Professional Geologist and Registered Professional Engineer in the State of California.

Sincerely,

Jeffrey L. Rubin, CPSS, REA
Port Associate Environmental Scientist
Environmental Programs and Safety

Jeffrey R. Jones
Supervisor
Environmental Programs and Safety

Enclosure: noted

Cc (w encl.): Michele Heffes

Cc (w/o encl.): James McCarty (BASELINE Environmental)
Yane Nordhav (BASELINE Environmental)

BASELINE

ENVIRONMENTAL CONSULTING

25 February 2009
Y5395-06.00655

Mr. Jeff Rubin
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Subject: Risk Management Plan, Port of Oakland, 651 Maritime Street, Oakland, California

Dear Mr. Rubin:

Enclosed please find a Risk Management Plan ("RMP") for the Port of Oakland's ("Port") properties at 651 and 555 Maritime Street (former 2277 and 2225 Seventh Street sites) for your review and comment. This RMP has been prepared as requested by the San Francisco Regional Water Quality Control Board ("Water Board") in a letter from Roger Brewer of the Water Board to Barney Chan of Alameda County Department of Environmental Health ("ACEH") dated 18 December 2002. The requirement for the preparation of an RMP was also included as a recommendation in the *Final Human Health Risk Assessment for Future Port of Oakland Field Support Services Complex*, prepared by IRIS Environmental and dated 6 May 2003, which was approved by a letter from ACEH to the Port dated 2 July 2003.

Sincerely,

Yane Nordhav
Principal
Prof. Geologist No. 4009

PROFESSIONAL GEOLOGIST
YANE NORDHAV
No. 4009
STATE OF CALIFORNIA

James McCarty
Project Engineer
Prof. Engineer No. C62618

REGISTERED PROFESSIONAL ENGINEER
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CIVIL
STATE OF CALIFORNIA

jgm
Enclosure

cc: Michele Heffes, Esq., Port of Oakland

RISK MANAGEMENT PLAN

Port of Oakland
651 Maritime Street
Oakland, California

FEBRUARY 2009

Prepared for:

PORT OF OAKLAND
OAKLAND, CALIFORNIA

Y5395-06

5900 Hollis Street, Suite D • Emeryville, California 94608 • (510) 420-8686

RISK MANAGEMENT PLAN

Port of Oakland
651 Maritime Street
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Prepared for:

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Port of Oakland, Oakland, California

1.0 INTRODUCTION

This Risk Management Plan ("RMP") has been prepared by BASELINE Environmental Consulting on behalf of the Port of Oakland ("Port") for two leaking underground storage tank ("LUST") sites, formerly referred to as 2277 Seventh Street and 2225 Seventh Street, respectively, in Oakland, California (Figure 1). These two LUST sites are located adjacent to each other and the properties are owned by the Port. For the purpose of this RMP, the two LUST sites are cumulatively referred to as the "Site" (Figures 2 and 3). The Site has been redeveloped since releases from the former underground fuel storage tanks ("USTs") occurred and is currently being used as the Harbor Facilities Complex ("HFC") at 651 Maritime Street and a portion of the Maritime Support Center ("MSC") at 555 Maritime Street (Figure 4). The Site covers a 13.8-acre area; the eastern 8 acres are 651 Maritime Street and the western 5.8 acres are a portion of 555 Maritime Street. The HFC is comprised of shops, warehouses, and administrative support, (Building C-510); a vehicle washing and fueling facility with an aboveground storage tank; and asphalt paved areas for vehicle parking and equipment and supplies storage for the Port maintenance and construction activities. The MSC is a container storage yard.

The purpose of this RMP is to provide risk management measures to minimize the exposure of future construction and maintenance workers and the general public to residual chemicals in the soil and groundwater at the Site and to control off-site migration, which could impact the environment. The risk management measures consist of both institutional and engineering controls.

2.0 BACKGROUND

From the late 1960s through the early 1990s, the Site contained USTs. Between 1990 and 1992, Dongary Investments (the Port tenant at the time) removed nine USTs, adjacent to Building C-407 (seven diesel USTs and two oil USTs) at 2225 Seventh Street (Figure 3) (IRIS, 2003a). At 2277 Seventh Street, the Port removed four USTs (one waste oil UST, two gasoline USTs, and one oil UST) adjacent to Building C-401 in 1993 (Figure 3) (IRIS, 2003a). Subsurface investigations have indicated that the groundwater underlying the Site contains co-mingled plumes consisting of free-phase petroleum hydrocarbons in the diesel range (Figure 5).

The Alameda County Department of Environmental Health ("ACEH") provides regulatory oversight for the Site under the Local Oversight Program ("LOP"). Because of the historical separation of the two leaseholds, the ACEH LOP formerly managed the Site as two LUST sites, with LOP case numbers for 2277 and 2225 Seventh Street as RO0000010 and RO0000187, respectively. The two sites are now combined as one LUST site with the address of 651 Maritime Street under RO0000010.

At 2225 Seventh Street, the National Environmental Service Company ("NESCO") removed a UST in March 1990 on behalf of Dongary Investments after it failed a tank integrity test in 1989. Ramcon Engineering and Environmental Contracting ("Ramcon") removed the remaining eight USTs in 1992. Soil and groundwater samples collected following the UST removal process indicated the presence of petroleum hydrocarbons in the diesel range and benzene, toluene, ethylbenzene, and xylenes ("BTEX") compounds. In addition, Ramcon observed free product on the groundwater in the excavation areas following UST removal in 1992. In 1993, Ramcon, on behalf of Dongary Investments, installed three groundwater monitoring wells at the 2225 Seventh Street site as part of a soil and groundwater assessment. Quarterly groundwater monitoring began in 1994, as required by ACEH (ACEH, 1994).

In 1993, on behalf of the Port, Uribe and Associates ("Uribe") removed four USTs historically operated as gasoline and waste oil tanks at 2277 Seventh Street (IRIS, 2003a). Uribe collected soil samples from the waste oil UST excavation; analytical results did not indicate the presence of diesel, gasoline, or BTEX above detection limits. However, analytical results of soil samples from the gasoline UST excavation indicated the presence of gasoline, diesel, and BTEX. Additionally, free product was observed on the groundwater in the gasoline UST excavation area.

In 1994, Uribe, on behalf of the Port, installed three groundwater monitoring wells at the 2277 Seventh Street site and in 1995 Alisto Engineering Group, on behalf of the Port, installed five additional monitoring wells (IRIS, 2003a). Quarterly groundwater monitoring was initiated in 1996 in accordance with an approved ACEH workplan. Petroleum hydrocarbons in the gasoline range have been detected in a monitoring well located on the western edge of the 2277 Seventh Street property. In 1998, ACEH requested that groundwater samples be analyzed for methyl tert butyl ether ("MTBE"). Uribe installed, on behalf of the Port, a free-product recovery system in 1997, consisting of one active skimmer pump and two passive skimmer pumps. Operation of the recovery system ceased in 2003 to facilitate redevelopment of the Site.

The HFC and the MSC were constructed on Port property in 2003 and 2006, respectively. In 2002, a Phase I and Phase II environmental site assessment was prepared by IRIS Environmental ("IRIS") for the Port in support of the proposed HFC (IRIS, 2003a). Three monitoring wells located at the 2225 Seventh Street site were abandoned during development of the HFC. A new free-product recovery system was installed by Dillard Construction on behalf of the Port at the Site in 2004, consisting of nine recovery wells, a 250-gallon aboveground storage tank, and associated equipment (Figures 4 and 5). IRIS also prepared a Human Health Risk Assessment ("HHRA") for the Site (IRIS, 2003a) (see detailed discussion in Section 3.0, below). The HHRA concluded that future construction workers could be exposed to residual chemicals in the groundwater and soil. The Water Board, which had been assisting ACEH on the Site, requested that an RMP be developed to protect future construction workers (Water Board, 2002).

In December 2008, ENV America Inc., installed four new groundwater monitoring wells (MW-9, MW-10, MW-11, and MW-12) to replace the wells abandoned during the site redevelopment (Figures 4 and 5). The Port continues to recover free-phase product from the subsurface using the product recovery system and perform groundwater monitoring on a semi-annual basis.

Land uses around the Site are industrial. The Port's Joint Intermodal Transport Railway and the Bay Area Rapid Transit rights-of-way are located along the northern boundary of the Site. Maritime Street is located along the northern boundary, and to the south and west of the Site are other Port properties with Port-related activities. The nearest residential community is more than one-half mile to the southwest.

Soil at the Site generally consists of imported fill material placed over soft clay or "Bay Mud". The upper fill material is either hydraulic fill dredged from San Francisco Bay or a mix of gravel, sand, and silt, often containing debris such as bricks, wood fragments, glass, and slag-like waste (IRIS, 2003a).

Prior to redevelopment of the Site, approximately two feet of clean engineered fill was imported to raise the grade of the Site. The surface of the Site was finished with eight inches of aggregate base-rock and six inches of asphalt concrete. The existing groundwater monitoring wells were raised to match the new grade elevation.

The depth of groundwater below the surface at the Site has ranged from 9.74 to 14.34 feet below ground surface ("bgs") since the site was redeveloped (MSE, 2009). The hydraulic conductivity at the Site may be low as slow recharge of groundwater into temporary wells has been observed (IRIS, 2003a).

3.0 HUMAN HEALTH RISK ASSESSMENT

IRIS prepared a baseline HHRA that focused on potential health risks to construction workers and future users of the Site (IRIS, 2003a). The HHRA evaluated potential exposure to residual chemicals in the soil and groundwater to on-Site construction workers during development of the HFC, on-Site commercial workers, and future on-Site maintenance and construction workers. Protective measures were incorporated into the design of the HFC to limit exposure for commercial users of the HFC, including a passive soil venting system for Building C-510 and an asphalt cap that covers the entire Site. The purpose of this RMP is therefore to provide procedures for protection of future on-Site maintenance and construction workers, since measures have already been developed and implemented for protection of commercial workers on-Site.

The HHRA identified 27 volatile organic compounds ("VOCs"), 11 semi-volatile organic compounds ("SVOCs"), total petroleum hydrocarbons ("TPH"), five metals, and methane as chemicals of potential concern ("COPCs") (Table 1). The complete exposure pathways for future maintenance and construction workersof the Site were identified as: ingestion of COPCs in soil; dermal contact with COPCs in soil; inhalation of vapors from volatilization and dispersion of COPCs in soil, soil gas, and groundwater; and inhalation of airborne particulates resulting from dust emissions and dispersion of COPCs in soil.

The HHRA assumed that the future maintenance and construction workers would be on-Site two days a year for 25 years. Exposure pathways included dermal contact, ingestion, and inhalation of dust and vapors. The inhalation of vapors was modeled by assuming the workers would work in an excavation one meter deep (3.3 feet). The HHRA concluded that the excess cancer risk due to COPCs to on-Site future maintenance and construction workers involved in subsurface excavations was 3.83×10^{-6}. This is within U.S. Environmental Protection Agency's ("U.S. EPA") acceptable incremental cancer risk range of 1×10^{-4} and 1×10^{-6}. The excess non-cancer health index ("HI") was estimated to be 0.03, well below the target HI of 1.0.[1]

The HHRA also identified methane gas as a potential explosive hazard. The lower explosive limit and upper explosive limit of methane are five percent and 15 percent, respectively. Soil gas samples collected during Site assessment activities by IRIS (2003a) indicated that methane gas was present at concentrations above five percent in the soil gas over the product plume area.

This RMP may need to be revised should further development of the site occur. Measures such as passive soil venting systems or other engineering controls may be necessary in future buildings to provide protection against vapor intrusion into the building.

4.0 RISK MANAGEMENT MEASURES

4.1 Exposure Assessment

Prior to beginning any subsurface work at the Site, an exposure assessment will be preformed by a Certified Industrial Hygienist ("CIH"). Information will be provided by the Port Engineering Department about the proposed work location, dates of work, description of the work, and total depth of excavation, as identified in the Exposure Assessment Form provided in Appendix A. The CIH will review the information provided to determine if there is a potential for worker exposure to Site COPCs. If the work in confined to the upper three feet (three feet or less below the asphalt and baserock), the work may be performed under the Port's *Maritime Environmental Health And Safety Plan For Shallow Excavation For Port Facilities Staff And Port Contractors*. If the work involves excavations deeper than three feet below ground surface, or contact with groundwater, the specific health and safety procedures in this RMP must be followed. The Exposure Assessment Form must be signed and dated by the CIH before subsurface work can proceed.

4.2 Engineering Controls

The purpose of risk management measures is to protect on-Site maintenance and construction workers from exposure to residual COPCs in the soil and groundwater present in the subsurface. Specific engineering controls must be implemented when the work extends greater than three feet bgs. This section describes the requirements for health and safety plans, dust control measures and stockpile management, equipment decontamination, and stormwater pollution control.

4.2.1 Health and Safety Plan

All work that involves subsurface excavations in excess of three feet bgs will be undertaken in accordance with a Site-specific Health and Safety Plan ("HSP"), prepared in accordance with

[1] A non-carcinogenic risk level is measured using a Hazard Index ("HI"). The HI is calculated by summing the hazard quotients for substances that affect the same target organ or organ system (e.g., respiratory system). The hazard quotient is the ratio of potential exposure to the substance and the level at which no adverse health effects are expected. An HI of less than 1 indicates no adverse health effects are expected as a result of exposure and an HI greater than 1 indicates adverse health effects are possible.

Title 8 California Code of Regulations ("CCR") Section 5192 and Title 29 Code of Federal Regulations 1910.120. These sections specifically apply to: 1) clean-up operations or hazardous substance removal work required by a governmental body; 2) corrective actions involving hazardous waste clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 ("RCRA"); 3) voluntary clean-up operations at sites recognized by federal, state, local or other governmental bodies as uncontrolled hazardous waste sites; 4) operations involving hazardous wastes that are conducted at treatment, storage, and disposal ("TSD") facilities; or 5) emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard. However, since subsurface work in excess of three feet bgs would potentially put workers in close proximity to COPCs and may require incidental cleanup of COCPs by excavation and disposal, the Port will require that workers have Hazardous Waste Operations and Emergency Response ("HAZWOPER") training and medical surveillance.

The HSP preparation and implementation is the responsibility of individual contractors engaged by the Port or its lessees; the HSP must be submitted to the Port prior to any excavation greater than three feet bgs in accordance with the Exposure Assessment (Section 4.1). The HSP will include, as a minimum, the following elements:

General Information. This portion of the HSP will include the name of the preparer of the HSP. It shall also include a description of the Site location and the general hazards that are expected to be present that could affect the health and safety of construction and/or maintenance workers, the public, and the environment.

Key Personnel and Responsibilities. The HSP will include the name of the safety officer who will be responsible for implementation of the provisions of the HSP. Furthermore, the HSP shall include the responsibilities of all workers coming into contact with contaminated materials. The HSP shall identify those personnel who should be HAZWOPER trained. All personnel who are in contact with contaminated soil, encountered during breaching of the cap, must be HAZWOPER trained.

Site Information. The HSP will describe the Site history and the COPCs at the Site that are likely to be encountered, based on the Site history as well as the data collected to date.

Hazard Analysis. The HSP will include a listing of all COPCs likely to be encountered at the Site. The COPCs have been identified in the *Final Human Health Risk Assessment and Abbreviated Phase II Environmental Site Assessment Report, Future Port of Oakland Field Support Services Complex, 2225 and 2277 Seventh St., Oakland, California,* prepared by IRIS (2003a) and summarized in Table 1. The HSP will include a description of the symptoms of exposure and regulatory exposure limits for each COPC. The HSP will describe the methods to be undertaken to eliminate exposure hazards (e.g., personal protective equipment) and explosion hazards.

Air Monitoring Approach. The HSP will include an air monitoring strategy that will assist in identifying if construction and/or maintenance workers and the public may be exposed to COPCs above specific action levels. The HSP shall identify the types of air monitoring instruments to be used, calibration of the equipment, monitoring points, and monitoring frequency. The HSP shall also define action levels above which workers must don personal protective equipment, as well as levels above which work must be stopped or engineering or administrative controls employed to eliminate the exposure of workers or the public to COPCs.

For excavations that meet the definition of confined space,[2] the HSP will also contain provisions for methane monitoring. Monitoring the air in excavations will be performed continuously using a gas meter equipped with an alarm. The alarm will be set to alert workers if the methane concentration reaches two percent by volume. If the methane concentration reaches two percent, engineering controls, such as fans, must be used to maintain the methane concentration below this level. If measurements indicate that the methane level is five percent or more, the work will be stopped until the concentration decreases to below five percent.

Personal Protective Equipment. The HSP will describe the types of personal protective equipment to be donned by workers who come into direct contact with contaminated soil and/or are exposed to dust. The types of appropriate personal protective equipment will be specified by the preparer of the HSP and relate to the specific COPCs that are present at the Site.

Work Zones and Site Security. The HSP will identify the work zones where workers may come into direct contact with contaminated soil. The work zones will be delineated by tape, fencing, and/or definitive access controls. Outside the work zone(s), the support zone will be identified in the HSP. The support zone will be large enough to provide opportunities for decontamination of workers and equipment, including removal of dirt from truck tires prior to exiting the Site.

Decontamination Procedures. The HSP will identify the decontamination procedures to be employed for workers who have come into direct contact with contaminated soil and also decontamination of equipment (including sampling equipment). The HSP will also include provisions for management of clothes that have been in direct contact with COPCs.

Safe Work Practices. The HSP will include a discussion of general safe work practices to be undertaken at the Site. Such safe work practices shall include restrictions of Site access, tailgate meetings, eating and smoking restrictions, personal hygiene, warning signs, and other conditions that would be unique to the Site.

Contingency/Emergency Plans. The HSP will include a description of the procedures to be followed during emergencies. Specifically, the HSP will describe the locations of emergency equipment (including eyewash, first aid kit, and fire extinguisher), and emergency routes to hospital(s), and emergency telephone numbers.

Medical Surveillance. The HSP will include requirements for medical surveillance of those workers who will be involved in activities that involve “cleanup operations” or “hazardous substance removal work,” as defined in the California and federal regulations, identified above.

[2] Title 8, CCR, § 5157. A confined space means a space that: (1) is large enough and so configured that an employee can bodily enter and perform assigned work; (2) has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and (3) is not designed for continuous employee occupancy.

4.2.2 Dust Control Measures and Stockpile Management

Construction or maintenance activities that breach the cap and would excavate to a depth greater than three feet bgs may generate visible dust, especially during the dry season. Dust emissions may result from excavation and grading activities, vehicle or equipment movement, wind blowing across the Site or over soil stockpiles, and loading or unloading of soil. Dust control would minimize worker exposure to dust containing COPCs and reduce off-Site migration of both COPCs and nuisance dust. The following dust control measures will be implemented during construction activities:

- Dampen soil by spraying water over soil when performing dust-creating activities;
- Limit the number of soil disturbing activities being performed at one time;
- Minimize drop heights while loading or unloading soil;
- Contaminated soil must be managed and stockpiled separately from other soil generated during construction activities. The contaminated soil must be placed on 10-mil visquene or other impermeable material;
- Cover all soil stockpiles when they are not being added to or removed. This measure will include providing an effective technique of ensuring that the cover is not blown off the stockpile by the wind (e.g., sand bags, tires);
- Sweep paved roadways on-Site and off-Site near exit routes daily, or more frequently, if necessary; and
- Cease soil-disturbing activities when wind speed exceeds 25 miles per hour.

Additional dust control measures may be required if air monitoring or observation indicates that dust emissions from the Site exceed levels defined in the HSP or exceed the legally permissible discharge limits, if any, established by state or local requirements.

4.2.3 Decontamination of Equipment and Vehicles

Construction equipment and vehicles used during the breach of the cap that would excavate to a depth greater than three feet bgs may have deposits of soil containing COPCs adhering to surfaces, particularly on the wheels and wheel wells. Vehicles will be inspected and soil deposits removed prior to the equipment or vehicles leaving the Site. Soil removed from vehicles will be placed in stockpiles with other excavated material.

4.2.4 Stormwater Pollution Controls

Stormwater runoff from the Site during a breach of the cap may contain sediments due to exposure of surface soils, excavations, and the modification of established drainage patterns. Construction sites one acre or larger are required to manage stormwater in accordance with California's National Pollutant Discharge Elimination System ("NPDES") General Construction Permit. The Port must file a Notice of Intent ("NOI") with the California State Water Resources Control Board and have a Storm Water Pollution Prevention Plan ("SWPPP"). The General Construction Permit requires construction contractors to implement best management practices ("BMPs") designed to reduce sediments in stormwater runoff to the extent possible.

If proposed construction involving the breaching of the cap is less than one acre in size, the Port is not required to file an NOI or prepare a SWPPP; however, an Erosion and Sediment Control

Plan will still be prepared and implemented to ensure control of stormwater runoff from the area where the cap is breached. The plan must be prepared by the Port (or its lessee or the contractor). It shall be kept on file at the Port's Environmental Programs and Planning Division and will be made available to the ACEH at their request.

BMPs shall be based on the September 2004 California Stormwater Association, *Stormwater Best Management Practice Handbook*, construction, and updates, such as the following:

- The use of silt fences around the perimeter of the Site to impede off-Site migration of sediment;
- Sediment basin or traps where sediments can settle out of stormwater runoff;
- Gravel bag berms to control stormwater flow directions;
- Sandbag or straw bale barriers around storm drain inlets to prevent sediments from entering the storm drain system; and
- Covering stockpiles with plastic sheeting and ensuring that stockpiles do not accumulate water.

In addition to erosion and sediment control, hazardous materials releases, such as any spills of oil, petroleum fuels, or hydraulic fluids shall be considered. The SWPPP and/or Erosion and Sediment Control Plan must contain procedures for responding to hazardous materials releases, such as use of absorbent material and proper management of the resultant waste.

5.0 SOIL CHARACTERIZATION

Future construction and/or maintenance activities at the Site may include excavation and stockpiling of subsurface soils. Excavated soil may consist of shallow fill or potentially contaminated soil from below the shallow fill. The soil from below the shallow fill may be visibly contaminated.[3] Excavated soil may either be reused under the pavement cap within the excavations or characterized for off-Site disposal. Excavated soil designated for on-Site reuse must be characterized in accordance with *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Chapter 9, dated 1986, as updated ("SW-846"). Excavated soil designated for off-Site disposal may be characterized in accordance with SW-846 or landfill-specific criteria. Soil sampling frequency for excavated material to be reused shall be in accordance with the guidelines presented on Table 2. The frequency of samples collected for off-Site disposal shall be in accordance with specific landfill requirements.

The soil samples collected for reuse or off-Site disposal shall be analyzed by a California-licensed analytical laboratory for the following chemicals:

- Total extractable petroleum hydrocarbons ("TEPH") as diesel/motor oil with silica gel cleanup in accordance with EPA Method 8015 modified;
- TPH as gasoline in accordance with EPA Method 8015 modified;
- VOCs in accordance with EPA Method 8260B;
- SVOCs in accordance with EPA Method 8270C;

[3] Visibly contaminated soil is soil that shows evidence of TPH impact.

- Title 22 metals in accordance with EPA Methods 6010B and 7471A; and
- Hexavalent chromium in accordance with EPA Method 7196.

5.1 Waste Classification

The first step in classification of the visibly contaminated soils for reuse or off-Site disposal is to determine whether the soil is a California or federal hazardous waste. Soils that are a California or federal hazardous waste cannot be reused on-Site and must be disposed of at a permitted landfill.

The analytical results of the soil samples will be compared against the Total Threshold Limit Concentration ("TTLC") (Title 22, CCR).[4] Total chemical concentrations that exceed the TTLC are designated as California hazardous waste. Analytical results shall also be compared to the Soluble Threshold Limit Concentration ("STLC"); soluble concentrations exceeding the STLCs are characterized as a California hazardous waste. The theoretical maximum soluble concentration in a sample using the Waste Extraction Test ("WET") is ten percent of the total concentration because the test performed by the laboratory uses a ten-fold dilution of the sample during the extraction process. Therefore, soil samples in which the total metals results exceed ten times the STLC must also be analyzed for soluble concentrations using the WET. Soil containing chemicals exceeding the STLC are also classified as a California hazardous waste.

If the sample results exceed the STLC and are twenty percent of the RCRA threshold limit, the samples shall also be analyzed for soluble content using the Toxicity Characteristic Leaching Procedure ("TCLP"). These results will be compared against RCRA hazardous waste thresholds (Title 40, CFR). Soil containing chemicals exceeding the RCRA hazardous waste thresholds are designated RCRA hazardous waste. Any soil classified as a California or RCRA hazardous waste will be disposed of off-Site at a permitted facility.

If the visibly contaminated soil is not a California or RCRA hazardous waste and will be reused on-Site, it will be screened against appropriate ESL values;[5] shallow fill[6] placed on the Site during recent Site redevelopment can be segregated and reused without sampling. The applicable ESLs for the Site are for the commercial land use where groundwater is not a current or potential source of drinking water. The ESL values for arsenic has been adjusted to the Portwide background levels of 16.4 milligram per kilogram ("mg/kg") for fill and 5.6 mg/kg for native ("Bay Mud") materials, as developed by BASELINE Environmental Consulting (BASELINE, 2008) (Table 3).

For chemical constituents that exceed the respective ESL value, a 95% UCL (one-tailed) of the data will be calculated based on the U.S. EPA Guidance (2002). The 95% UCL shall be compared to the applicable ESL values, as modified, in Table 3. If the 95% UCL is below the ESLs, then the material can be reused on-Site.

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[4] The analytical results may be evaluated by calculating the one-tailed 90 percent upper confidence level (90% UCL) of the sample mean in accordance with U.S. EPA Guidance (EPA, 2002).

[5] Table B of the Water Board document *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* (February 2005), as modified in Table 3 of this RMP.

[6] Top two feet.

6.0 GROUNDWATER AND STORMWATER

Subsurface construction work may require the dewatering of excavation or trenches. Groundwater or stormwater may be disposed of in one of three ways:

- Discharge to the storm drain system under an NPDES permit;
- Discharge to the East Bay Municipal Utility District's ("EBMUD") sanitary sewer system under a permit from EBMUD; or
- Off-haul to a permitted recycling facility.

Samples of groundwater or stormwater that is discharged under an NPDES permit or an EBMUD permit will be analyzed, as required, by the conditions of the permit. Samples of groundwater or stormwater that is off-hauled to a permitted recycling facility shall be analyzed for the following:

- TEPH as diesel/motor oil with silica gel cleanup in accordance with EPA Method 8015 modified;
- TPH as gasoline in accordance with EPA Method 8015 modified;
- VOCs in accordance with EPA Method 8260B;
- SVOCs in accordance with EPA Method 8270C; and
- Title 22 metals in accordance with EPA Methods 6010B and 7471A.

Groundwater or stormwater hauled off-Site must be transported in accordance with federal, state, and local regulations under appropriate waste manifests and disposed of or recycled at a permitted facility.

7.0 INSTITUTIONAL CONTROLS

A Covenant to Restrict Use of Property ("CRUP") will be executed by the Port and filed with ACEH. The CRUP will restrict Site uses such that no residential or sensitive land uses are allowed on-Site. The Port (and any future Site owners) would have the responsibility for administering the CRUP.

8.0 REFERENCES

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Water Board, 2002, Letter from Roger Brewer of Water Board to Barney Chan of the ACHS, Review of Human Health Risk Assessment for Future Port of Oakland Field Support Services Complex, 2225 and 2277 Seventh St., Oakland, CA, 18 December.

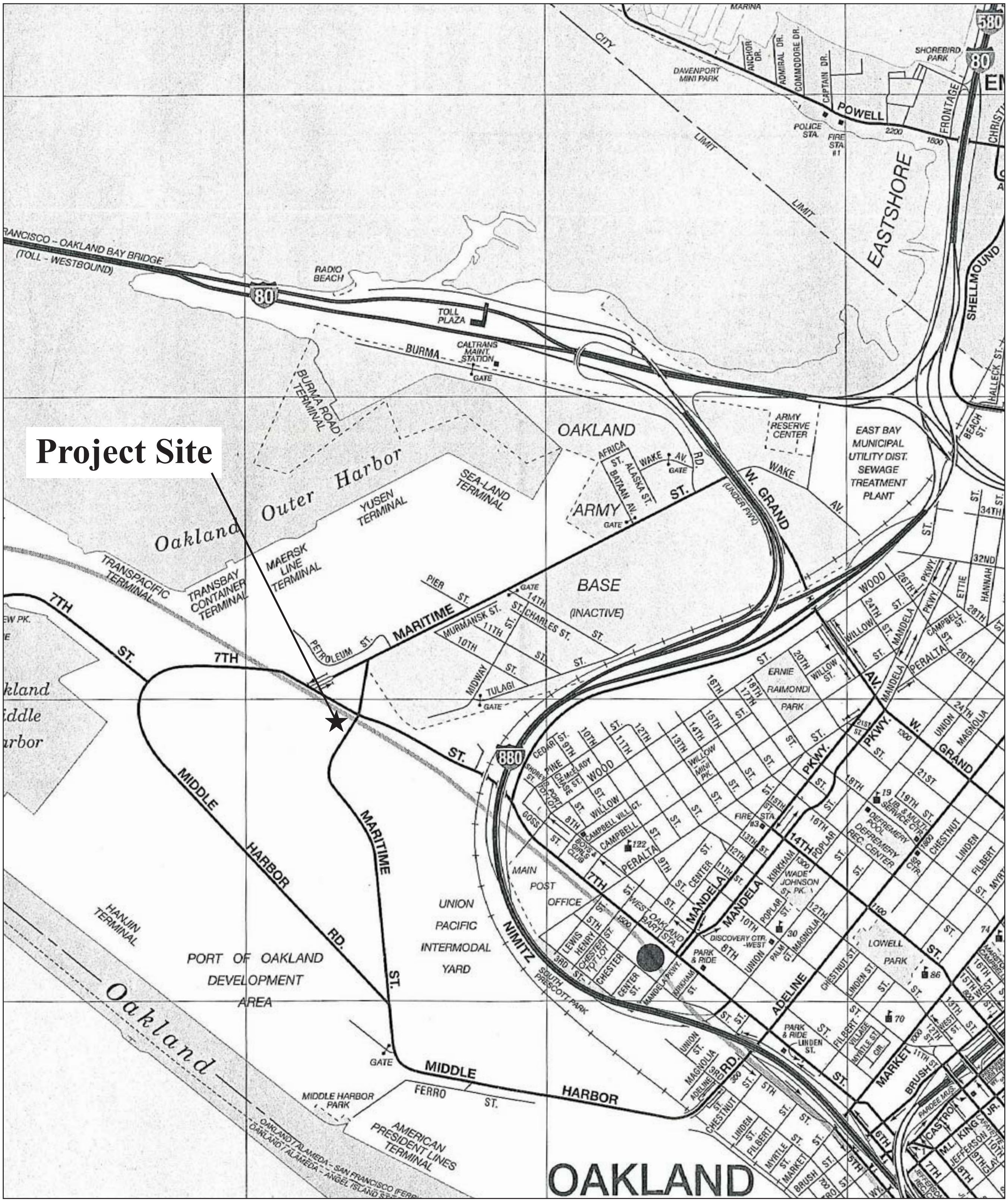
United States Environmental Protection Agency ("EPA"), 2002, Calculating Upper Confidence Limits for Exposure Point Concentration at Hazardous Waste Sites, December.

__________, 1986, Test Methods for Evaluation Solid Waste, Physical/Chemical Methods, SW-846, as updated.

FIGURES

REGIONAL LOCATION

Figure 1



651 Maritime Street
Port of Oakland
Oakland, California

0 2000 Feet

BASELINE

Y5395-03.00655.Fig1.cdr 2/25/09

SITE BOUNDARIES

Figure 2

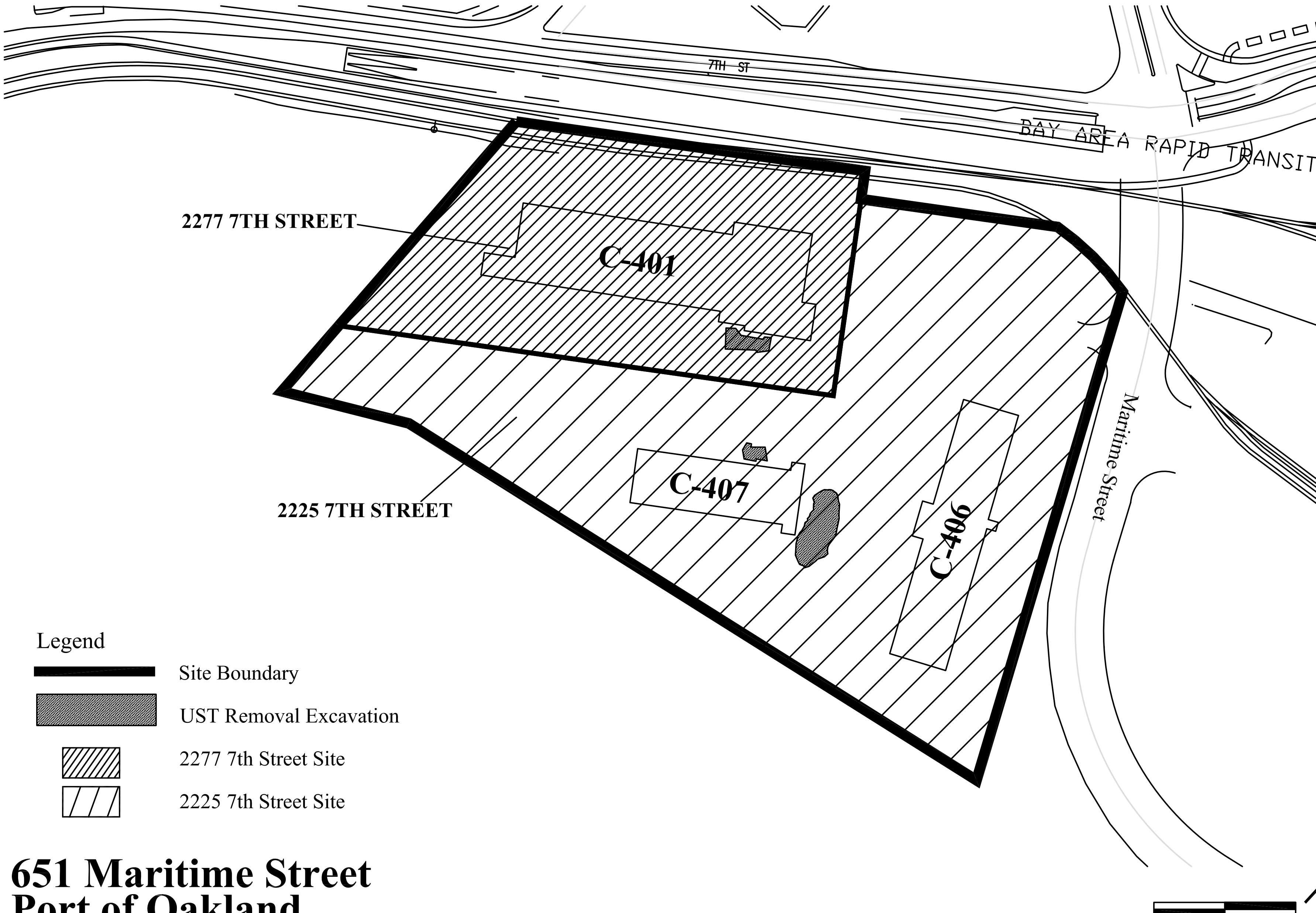
651 Maritime Street
Port of Oakland
Oakland, California

BASELINE

Y5395-06.00655.Fig2.dwg 2/25/09

UST REMOVAL EXCAVATION SITES

Figure 3



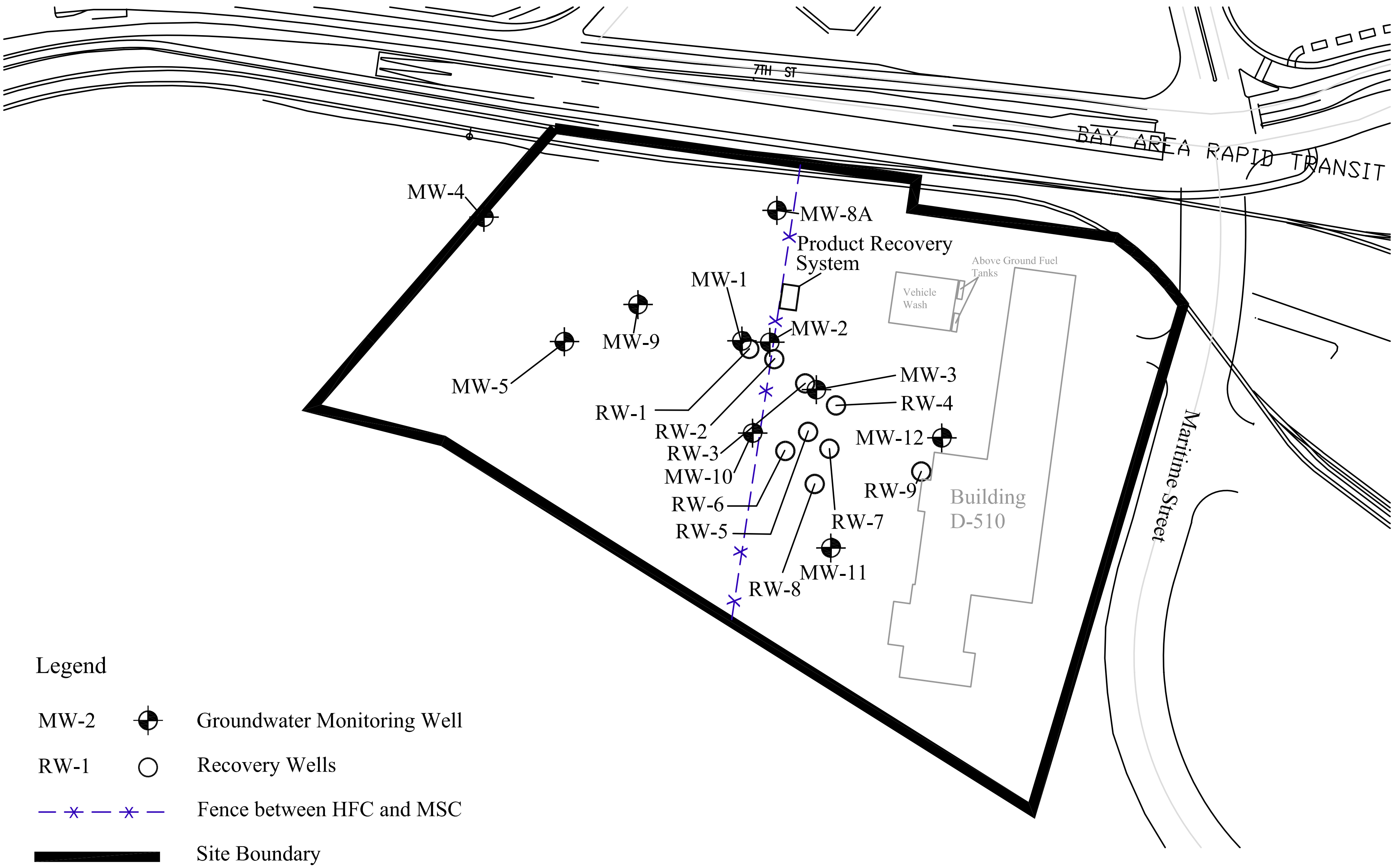
651 Maritime Street
Port of Oakland
Oakland, California

BASELINE

Y5395-06.00655.Fig3.dwg 2/25/09

SITE PLAN

Figure 4



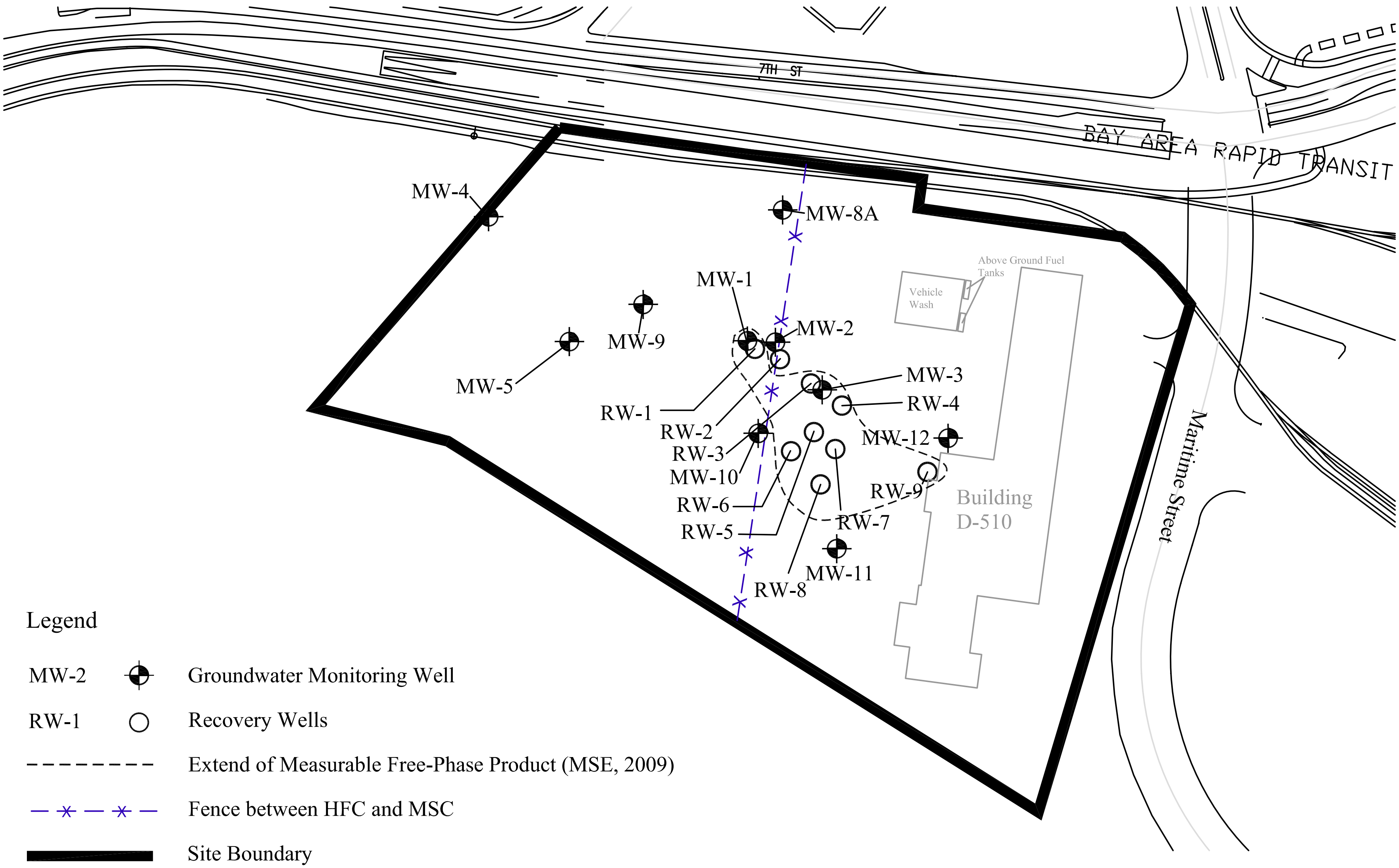
651 Maritime Street
Port of Oakland
Oakland, California

BASELINE

Y5395-06.00655.Fig4.dwg 2/25/09

LIMITS OF FREE-PHASE PRODUCT

Figure 5



651 Maritime Street
Port of Oakland
Oakland, California

BASELINE

Y5395-06.00655.Fig5.dwg 2/25/09

TABLES

Table 1: **Chemicals of Potential Concern**
651 Maritime Street
Risk Management Plan
Port of Oakland, Oakland, California

Volatile Organic Compounds	Media
1,1-dichloroethene	Soil/groundwater
1,1-dichloroethane	Groundwater
1,2,4-trimethylbenzene	Soil/groundwater/soil gas
1,2-dichloroethane	Groundwater
1,2-dichloropropane	Groundwater
1,3,5-trimethylbenzene	Soil/groundwater
Acetone	Soil
Benzene	Soil/groundwater/soil gas
Chlorobenzene	Soil
Chloroethane	Groundwater
cis-dichloroethene	Groundwater/soil gas
trans-dichloroethene	Groundwater
di-isopropyl ether (DIPE)	Groundwater
Ethylbenzene	Soil/groundwater/soil gas
Isopropylbenzene	Soil/groundwater/soil gas
Methyl tert-butyl ether (MTBE)	Soil/groundwater/soil gas
Naphthalene	Soil/groundwater
n-butylbenzene	Soil/groundwater
n-propylbenzene	Soil/groundwater/soil gas
sec-butylbenzene	Soil/groundwater/soil gas
Tetrachloroethene	Soil/groundwater
Toluene	Soil/groundwater/soil gas
Trichloroethene	Soil/groundwater/soil gas
Trichlorofluoromethane	Soil gas
Trichlorotrifluoroethane	Soil gas
Vinyl chloride	Groundwater/soil gas
Xylene(s)	Soil/groundwater/soil gas
Total Petroleum Hydrocarbons	
Diesel	Soil/groundwater
Gasoline	Soil/groundwater/soil gas
Motor oil	Soil/groundwater
Semi-volatile Organic Compounds	
2-methylnaphthalene	Soil/groundwater
Acenaphthene	Soil
Anthracene	Soil
Benzo(a)anthracene	Soil
Chrysene	Soil
Dibenzofuran	Soil/groundwater
Fluoranthene	Soil
Fluorene	Soil/groundwater
Naphthalene	Soil/groundwater
Phenanthrene	Soil/groundwater
Pyrene	Soil
Metals	
Arsenic	Soil
Cadmium	Soil
Copper	Soil
Lead	Soil
Zinc	Soil
Other	
Methane	Soil gas

Source: Iris, 2003b.

Table 2: **Frequency of Soil Sampling**
651 Maritime Street
Risk Management Plan
Port of Oakland, California

Volume of Excavated Soils	Number of Samples
Up to 1,000 cubic yards	1 discrete sample per 250 cubic yards, with a minimum of 4 samples.
Between 1,000 and 5,000 cubic yards	4 samples for first 1,000 cubic yards, plus 1 discrete sample per additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards, plus 1 discrete sample per additional 1,000 cubic yards.

Source: DTSC, 2001.

Table 3: **Environmental Screening Levels**
651 Maritime Street Risk Management Plan
Port of Oakland, Oakland, California

CHEMICAL PARAMETER	**ESLs for Shallow Soils[1] (mg/kg)**
Acenaphthene	19
Acenaphthylene	13
Acetone	0.50
Aldrin	0.13
Anthracene	2.8
Antimony	40
Arsenic	16.4 (fill)/5.6 (native) [2]
Barium	1,500
Benzene	0.27
Benzo(a)anthracene	1.3
Benzo(a)pyrene	0.13
Benzo(b)fluoranthene	1.3
Benzo(g,h,i)perylene	27
Benzo(k)fluoranthene	1.3
Beryllium	8.0
Biphenyl,1,1-	6.5
Bis(2-chloroethyl)ether	0.16
Bis(2-chloroisopropyl)ether	0.077
Bis(2-ethylhexyl)phthalate	120
Boron	2.0
Bromodichloromethane	1.3
Bromoform	24
Bromomethane	2.3
Cadmium	7.4
Carbon tetrachloride	0.044
Chlordane	1.7
Chloroaniline, p-	0.053
Chlorobenzene	1.5
Chloroethane	0.85
Chloroform	1.5
Chloromethane	6.4
Chlorophenol, 2-	0.12
Chromium III	750
Chromium VI	8.0
Chrysene	23
Cobalt	80
Copper	230
Cyanide (free)	0.0036
Dibenzo(a,h)anthtracene	0.21
Dibromochloromethane	14
Dibromo-3-chloropropane, 1,2-	0.0045
Dibromoethane, 1,2-	0.044
Dichlorobenzene, 1,2-	1.6
Dichlorobenzene, 1,3-	7.4

Table 3: **Environmental Screening Levels**
651 Maritime Street Risk Management Plan
Port of Oakland, Oakland, California

CHEMICAL PARAMETER	**ESLs for Shallow Soils[1] (mg/kg)**
Dichlorobenzene, 1,4-	1.8
Dichlorobenzidine, 3,3-	2.6
Dichlorodiphenyldichloroethane (DDD)	10
Dichlorodiphenyldichloroethylene (DDE)	4.0
Dichlorodiphenyltrichloroethane (DDT)	4.0
Dichloroethane, 1,1-	1.9
Dichloroethane, 1,2-	0.48
Dichloroethylene, 1,1-	4.3
Dichloroethylene, cis 1,2-	18.0
Dichloroethylene, trans 1,2-	34.0
Dichlorophenol, 2,4-	3.0
Dichloropropane, 1,2-	1.0
Dichloropropene, 1,3-	0.36
Dieldrin	0.0023
Diethylphthalate	0.035
Dimethylphenol, 2,4-	0.74
Dimethylphthalate	0.035
Dinitrophenol, 2,4-	0.042
Dinitrotoluene, 2,4-	0.86
Dioxane, 1,4	30
Dioxin (2,3,7,8-TCDD)	0.000018
Endosulfan	0.0046
Endrin	0.00065
Ethylbenzene	4.7
Fluoranthene	40
Fluorene	8.9
Heptachlor	0.013
Heptachlor epoxide	0.014
Hexachlorobenzene	1.3
Hexachlorobutadiene	4.6
Hexachlorocyclohexane (gamma) lindane	0.0068
Hexachloroethane	41
Indeno(1,2,3-cd)pyrene	2.1
Lead	750
Mercury	10
Methoxychlor	19
Methyl ethyl ketone	13
Methyl isobutyl ketone	3.9
Methyl mercury	12
Methyl tert butyl ether	8.4
Methylene chloride	17.0
Methylnaphthalene (Total 1- & 2-)	0.25
Molybdenum	40
Naphthalene	2.8

Table 3: **Environmental Screening Levels**
651 Maritime Street Risk Management Plan
Port of Oakland, Oakland, California

CHEMICAL PARAMETER	**ESLs for Shallow Soils[1] (mg/kg)**
Nickel	150
Pentachlorophenol	5.0
Perchlorate	140
Phenanthrene	11
Phenol	3.9
Polychlorinated biphenyls (PCBs)	0.74
Pyrene	85
Selenium	10
Silver	40
Styrene	15
Tert-butyl alcohol	110
Tetrachloroethane, 1,1,1,2-	4.5
Tetrachloroethane, 1,1,2,2-	0.60
Tetrachloroethylene	0.95
Thallium	16
Toluene	9.3
Toxaphene	0.00042
TPH (gasolines)	180
TPH (middle distillates)	180
TPH (residual fuels)	2,500
Trichlorobenzene, 1,2,4-	7.6
Trichloroethane, 1,1,1-	7.8
Trichloroethane, 1,1,2-	1.1
Trichloroethylene	4.1
Trichlorophenol, 2,4,5-	0.18
Trichlorophenol, 2,4,6-	10
Vanadium	200
Vinyl chloride	0.047
Xylenes	11
Zinc	600

Notes:
ESLs = Environmental Screening Levels (RWQCB, 2008 and LBNL, 2002).
mg/kg = milligram per kilogram.
mg/L = microgram per liter.
ESLs listed in this table may change over time; future updates to the ESLs must be researched before using the values listed in this table.

[1] Source: SF Regional Water Quaity Control Board, 2008, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* , Table B-2, May.

[2] BASELINE, 2008, Evaluation of 95th Percentile Background Arsenic Concentrations for the Port of Oakland, California, 10 December.

APPENDIX A

Exposure Assessment Form

EXPOSURE ASSESSMENT FORM

TASK ORDER NO.: ____________________ **DATES OF WORK:** ____

LOCATION OF WORK:
(attach a site plan) ____

____

____

____

DESCRIPTION OF WORK: ____

____

____

____

____

____

____

____

DEPTH OF
EXCAVATIONS:
(below ground surface) ____

____

____

EXPOSURE ASSESSMENT

Workers will not be exposed to site contaminants.	☐	Yes [1]
Workers may be exposed to site contaminants.	☐	Yes [2]

[1] Use Port's standard construction health and safety procedures.

[2] Follow the procedures in the Risk Management Plan for 651 and 555 Maritime Street.

____ ____________________________

Sign (Certified Industrial Hygienist) Date