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By Alameda County Environmental Health at 3:10 pm, Feb 05, 2013

January 17, 2013

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6540

Re: Draft Submittal – Risk Management Plan for the former Underground Storage Tanks MF 25/26 - Toxic Leaks Case RO0000414 (MOIA United Airlines) at the Oakland International Airport, Oakland, California

Dear Mr. Nowell:

On behalf of the Port of Oakland, URS is pleased to submit the attached draft risk management plan (RMP) for the former underground storage tanks MF 25/26 located at the economy parking lot at 1100 Airport Drive at the Oakland International Airport in Oakland, California. This submittal is provided for your review and approval in conjunction with the Closure Documentation Report submitted on November 5, 2012.

Sincerely,

URS CORPORATION

LOIS Autié

Lois Autié, P.E.
Senior Project Manager

Attachment (1)

cc: Doug Herman, Port of Oakland
Yane Nordhav, BASELINE

Declaration:
I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

1/17/13

Douglas Herman Date
Project Manager
Port of Oakland

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D R A F T R M P

RISK MANAGEMENT PLAN FORMER OAKLAND MAINTENANCE CENTER, OAKLAND INTERNATIONAL AIRPORT OAKLAND, CALIFORNIA

Prepared for

Port of Oakland
530 Water Street
Oakland, California 94607

January 17, 2013

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26818373

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Acronyms

BMP	best management practice
BTEX	Benzene, toluene, ethylbenzene, and xylenes
Cal/OSHA	California Occupational Safety and Health Administration
CASQA	California Stormwater Quality Association
CCR	California Code of Regulations
COC	Contaminants of Concern
County	Alameda County Environmental Health Department
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EPA	U.S. Environmental Protection Agency
ESLs	environmental screening levels
HASP	health and safety plan
MMP	Materials Management Plan
NPDES	National Pollutant Discharge Elimination System
PPE	personal protective equipment
RMP	Risk Management Plan
RWQCB	California Regional Water Quality Control Board (San Francisco Bay Region)
SMP	Soil Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TPH	total petroleum hydrocarbon
TPH-d	total petroleum hydrocarbon quantified as diesel
TPH-jf	total petroleum hydrocarbon quantified as jet fuel
UST	Underground Storage Tanks
YBM	Young Bay Mud

URS Corporation has prepared, on behalf of the Port of Oakland (Port), this Risk Management Plan (RMP) for the former underground storage tanks (USTs) MF 25/26 (the Site) located at the Oakland International Airport. Figure 1 provides the approximate proposed restricted area, which is to be defined by an ALTA survey and recorded as part of the land use restriction. This RMP provides protocols for handling soil and groundwater from the site that may contain residual diesel and jet fuel in the restricted area. The procedures provided in this RMP have been developed considering the Port's Materials Management Program (MMP) and the Port-Wide Soil Management Protocol (SAIC 2010).[1]

1.1 BACKGROUND

This RMP was prepared after performing environmental investigations, risk-based evaluation, and remediation work at the Site. The investigations, analyses, and remedial actions were conducted with the Alameda County Environmental Health Department (County) oversight principally between 1988 and 2012. All applicable reports and communications are on file at the Geotracker website.

In summary, Phase I and II investigations were performed in 1988 on the former USTs at the Site (installed in 1978 and removed in 1992). The results of the Phase II investigation indicated that the tanks had leaked total petroleum hydrocarbons (TPH), oil and grease, and VOCs. At the time of their removal, approximately 940 cubic yards of soil was removed from the excavation in addition to the two tanks and associated piping. Soil and groundwater samples were collected in the excavation. Subsequently, groundwater monitoring wells were installed: MW-1 (1992), MW-2 and MW-3 (1995), and MW-4 through MW-8 (1998). In December 1998, the first round of ORC injection was conducted in the existing wells. A second round was conducted in June 2000. Groundwater monitoring continued at MF 25/26 in 2003 (ERM 2004). Groundwater and soil sampling was conducted along the east-northeast boundary of the former MF 25/26 area and toward the UAL leasehold and former operations. Groundwater investigation conducted by SCA (SCA 2006) indicated that groundwater flow was to the south-southwest and that concentrations of COCs are limited to the proximity of the original excavation area.

Additional investigation was conducted in 2011 (Kennedy/Jenks Associates 2012) that indicated the presence of contaminants of concern (COCs), namely TPH quantified as diesel (TPH-d) and TPH quantified as jet fuel (TPH-jf) evidently rebounded to concentrations similar to the pre-remediation concentrations, but had remained within close proximity of the former excavation area. The figures from the Kennedy/Jenks investigation are provided in Appendix A, and include a figure, which delineates the area where residual concentrations of TPH-d and TPH-jf remain in soil and groundwater.

1.2 PURPOSE

The pavement and soil overburden at the Site are considered a cap that prevents contact with humans and the environment. The RMP is applied to any activity that causes a disturbance to the

[1] The Port's MMP addresses stockpiling and processing of concrete rubble, asphalt rubble, asphalt grindings, and soil generated from Port and Port-tenant projects and other construction projects on Port-owned properties, and the reuse of soil excavated on Port-owned property on Port property. The procedures for determining whether soil excavated from a Port-owned property may be stored or reused at Port-owned properties is provided in the Port-Wide Soil Management Protocol (SAIC 2010).

cap at the Site. This RMP was prepared solely for use within the Site, and is not intended to be applied for the management of soil within any area or project not otherwise explicitly identified in this RMP. Although this RMP sets forth the requirements to appropriately manage COCs in soil and groundwater at the Site, the RMP is not intended to catalogue all other legal requirements that may apply to the Port.

The current use of the Site includes parking at the OIA's long-term parking lot. There are no immediate plans for building construction at the site.

The following risk management procedures will be implemented for all subsurface work at the Site. Earthwork activities include, but are not limited to, clearing, grading, excavations, and utility installations. The requirements in this RMP are not intended to supersede the requirements of the Port-Wide Soil Management Protocol (SAIC 2010).

2.1 HEALTH AND SAFETY PLAN

All earthwork at the site will be performed in accordance with a site-specific Health and Safety Plan (HASP), prepared in accordance with Division of Occupational Safety and Health (Cal/OSHA) regulations (Title 8 California Code of Regulations Section 5192) for the protection of construction workers. This requires that workers be notified of any potential exposure to chemicals, including exposure to residual contaminants in the soil, and adhere to specific work practices, as described below.

The HASP preparation and implementation is the responsibility of individual contractors engaged by the Port. The HASP must include, at a minimum, the following elements:

General Information. This portion of the HASP must include the name of the preparer of the HASP, as well as 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 HASP must include the name of the safety officer who will be responsible for implementation of the provisions of the HSP. Furthermore, the HSP must include the names of any other personnel responsible for emergency response or health and safety issues.

Site Information. The HASP must describe the site history and the COCs: TPH-d and TPH-jf.

Hazard Analysis. The HASP must include a description of the symptoms of exposure and regulatory exposure limits for each COC. The HSP must describe the methods to be undertaken to eliminate exposure hazards (e.g., personal protective equipment).

Personal Protective Equipment (PPE). The HASP must describe the PPE to be donned by workers who come into direct contact with contaminated soil or are exposed to dust. The types of appropriate PPE must be specified by the preparer of the HASP and relate to the specific chemicals (TPH-d and TPH-jf) that are known to be present at the site.

Work Zones and Site Security. The HASP must identify the work zones where workers could come into direct contact with contaminated soil. The work zones must be delineated by tape, fencing, or definitive access controls. Support zones outside the work zones must be identified in the HASP. The support zones must 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 HASP must identify the decontamination procedures to be employed by workers and equipment that have come into direct contact with contaminated soil. The HSP must also include provisions for management of clothes and PPE that have been in direct contact with soil containing contaminants.

Safe Work Practices. The HASP must include a discussion of general safe work practices to be undertaken at the site. Such safe work practices must include restrictions on site access, tailgate

meetings, eating and smoking restrictions, personal hygiene, warning signs, and any other conditions that are unique to earthwork work planned.

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

2.2 DUST CONTROL MEASURES

Construction activities that involve earthwork 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. Proper implementation of dust control measures will minimize worker exposure to dust containing contaminants and reduce off-site migration of both contaminants and nuisance dust. The following dust control measures will be implemented during any earthwork activities at the Site:

- Dampen soil by spraying water over soil when performing dust-creating activities;
- Minimize drop heights while loading or unloading soil;
- Cover all soil stockpiles when not being added to or removed. This measure must include providing an effective technique of ensuring that the cover is not blown off the stockpile (if generated) by the wind (e.g., sand bags, tires);
- Limit vehicle speeds in the remediation area to 15 miles per hour;
- All visible mud or dirt track-out onto adjacent public roads must be removed using wet power vacuum street sweepers at least once per day; the use of dry power sweeping is prohibited; and
- Cease soil-disturbing activities when wind speed exceeds 25 miles per hour.

Additional dust control measures may be required if visible dust emissions are observed off-site.

2.3 DECONTAMINATION OF EQUIPMENT AND VEHICLES

Construction equipment and vehicles used for earthwork activities on the Site may result in deposits of contaminated soil adhering to surfaces, particularly on the wheels and wheel wells. Removal of these soil deposits will be performed prior to the equipment or vehicles leaving the site. Earthmoving equipment and soil transport trucks will be visually inspected and dry brushed, as necessary, to remove soil prior to leaving the site. For large earthmoving projects, gravel exit pads may be used to assist in the removal of soil from tires.

2.4 STORMWATER POLLUTION CONTROLS

Construction projects at the Site that disturb one or more acres of soil, or projects that disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are subject to the requirement to obtain coverage under the California State Water Resources Control Board (SWRCB) General Permit for Discharges of Storm Water Associated with Construction and Land Disturbance Activities (Construction General Permit, SWRCB

2009). Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling, excavation, or installation of overhead or underground linear facilities, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must be prepared and certified by a Qualified SWPPP Developer.

Storm water runoff from the site that occurs during construction may contain sediment due to exposure of surface soils, excavations, and the modification of established drainage patterns. To ensure that contaminants in the soil are not transported off-site in storm water runoff, the Port will require construction contractors to implement best management practices (BMPs) designed to reduce sediments in storm water runoff to the extent possible for all earthwork at the site.

The required Best Management Practices (BMPs) are based on guidance from the September 2009 California Stormwater Quality Association's (CASQA) *Stormwater Best Management Practice Handbook: Construction* (CASQA 2009), and, at minimum, must include the following:

- Silt fences around the perimeter of the site to impede off-site migration of sediment;
- Gravel bag berms to control storm water flow directions;
- Sandbag or straw bale barriers around storm drain inlets to prevent sediments from entering the storm drain system;
- Plastic sheeting (or an environmentally friendly alternative where feasible) to cover stockpiles and ensure that stockpiles do not accumulate water; and
- Stabilized entrances/exits to the construction area to reduce tracking of sediment onto public roads by equipment and vehicles.

The Construction General Permit also includes mandatory BMPs for site management housekeeping for waste management, non-storm water management, erosion and sediment controls, run-on and runoff controls, and inspection, maintenance, and repair requirements.

Finally, the Construction General Permit requires for medium and high risk sites[2] preparation of a Rain Event Action Plan 48 hours prior to any likely precipitation event (by a Qualified SWPPP Practitioner) for the purpose of protecting all exposed portions of the construction site.

2.5 STOCKPILE MANAGEMENT

Future construction or maintenance activities at the Site may include excavation and stockpiling of contaminated soil. The stockpiled soil may either be reused (in accordance with the requirements of the Port-Wide Soil Management Protocol) or characterized for off-site disposal.

The contaminated stockpiled soil must be managed separately from other soil generated during earthwork activities. The excavated contaminated soil must be placed on 10-mil Visqueen or other equivalent impermeable material and then covered with secured Visqueen when not being actively worked (i.e., added to or loaded onto vehicles for off-site storage/reuse or disposal). Soil characterization for off-site storage and possible reuse under the Port MMP will be performed in

[2] The Construction General Permit requires a risk determination based on the project sediment risk, and the potential to discharge to a sediment-sensitive waterbody.

accordance with the Port-Wide Soil Management Protocol (SAIC 2010). If the soil to be reused on-site is excavated from two feet or more below ground surface, it must be ultimately covered with two feet of clean soil.

Excavation for construction activities at the Site are expected to generate three general types of materials (depending on the depth of excavation): artificial fill, Young Bay Mud (YBM), and/or native sediments underneath the YBM. In order to reuse the soil on Port property, each type of material to be excavated will be segregated and characterized separately in a representative manner. This requires both identification of the COCs for each type of material excavated, and the implementation of an appropriate sampling methodology in terms of both the number of samples and choice of sample locations.

In accordance with the Port-Wide Soil Management Protocol, the following analyses will be required:

- Title 22 Metals in accordance with U.S. Environmental Protection Agency (EPA) Methods 6010B/7000 series;
- TPH-d and TPH-jf (with silica gel cleanup preparation) in accordance with EPA Method 8015M;
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) in accordance with EPA Method 8021B or 6260B.

If the soil is determined to be unacceptable for reuse in accordance with the Port-Wide Soil Management Protocol (SAIC 2010), the soil must be characterized in accordance with landfill requirements, which may require additional analyses.

2.6 FILL SOIL

Fill may be imported onto the site for use in future development of the site or replace excavated soil that is unacceptable for reuse. The source of the fill may be soil from other Port-owned properties provided that the soil meets the reuse requirements of the Port-Wide Soil Management Protocol (SAIC 2010).

If imported fill, not from the Port-owned properties, is to be imported onto the site, it must come from uncontaminated properties and the contractor must certify that the fill is uncontaminated. This certification must be based on representative analytical data from the fill; the analyses performed on the fill must include organic and inorganic compounds. The soil must be tested in accordance with Department of Toxic Substances Control (DTSC) guidance *Information Advisory, Clean Imported Fill Material*, dated October 2001 (DTSC 2001). This document provides guidance on the frequency for sampling and the types of analyses that should be performed. With the exception of arsenic, the concentration of chemical or chemical compounds must be below Port-specific background (SAIC 2010) or the San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for commercial/industrial land use where groundwater is not a potential drinking water source (Regional Water Board, 2008). Arsenic must be below the Port-specific background concentration of 16.4 mg/kg for fill soil (SAIC 2010).

2.7 GROUNDWATER AND STORM WATER

The depth to groundwater at the Site ranges from 3 to 8 feet below ground surface (depending on season and location). Subsurface construction work may require the dewatering of excavation or trenches due to groundwater or storm water inflows. Groundwater or storm water may be disposed of in one of three ways:

- Discharge to the storm drain system under a National Pollutant Discharge Elimination System (NPDES) permit;
- Discharge to the East Bay Municipal Utility District (EBMUD) sanitary sewer system under a wastewater or groundwater discharge permit; or
- Off-haul to a permitted recycling facility.

Samples of groundwater or storm water that are discharged under an NPDES permit or an EBMUD sanitary sewer system permit must be analyzed, as required, by the conditions of the permit. Samples of groundwater or storm water that are off-hauled to a permitted recycling facility must be analyzed in accordance with the requirements of the facility.

Groundwater or storm water 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.

No planned activities are currently anticipated. However, these administrative provisions are put in place in case any activities are planned or implemented that affect the Site.

3.1 NOTIFICATIONS

Any persons who conduct activities that breach the cap on the Site are subject to the requirements of this RMP. Any owners of property within the RMP Area shall notify the County and Port of each of the following:

1. the type, cause, location and date of any disturbance to any asphalt pavement, and any remedial measures taken or remedial equipment installed, and
2. the type and date of repair of such activity.

Notification to the County and Port shall be made by registered mail within ten (10) working days of both the discovery of such disturbance and the completion of repairs.

3.1.1 Future Owners or Tenants

All purchasers, lessees, or possessors of any portion of the Site shall be subject to the restrictions contained herein.

The Port is responsible to communicate requirements to contractors, employees, tenants, or licensees.

3.1.2 Agencies

All notifications to the County shall be to the following person(s):

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6540
phone: 510/567-6764
fax: 510/337-9335
email: keith.nowell@acgov.org

3.1.3 Port

All notifications to the Port shall be to the following person(s):

Doug Herman or Jeffrey Jones
530 Water Street
Oakland, CA 94607
(510) 627-1100
dherman@portoakland.com
jjones@portoakland.com

3.2 MODIFICATIONS

To ensure that the RMP and any addendum continue to accurately describe conditions on the Site as they pertain to remaining COCs, addenda may be written to document future activities that result in a significant change in any of the following features:

1. changes in land use or built environment
2. the condition of the asphalt pavement
3. information gleaned from groundwater and soil sampling that is pertinent to this RMP.
4. Boundary changes that subdivide or split the Site.

Any additional addenda will be submitted to the County for approval and shall be added to the RMP. The revised RMP shall be uploaded to the Geotracker website.

CASQA (California Stormwater Quality Association). 2009. *Stormwater Best Management Practice Handbook: Construction.* November.

DTSC. 2001. Information Advisory, Clean Imported Fill Material, October.

ERM. 2004. Former United Airlines Maintenance Center, Site Investigation and Risk Assessment, Oakland International Airport, prepared by ERM for United Airlines. June.

Kennedy Jenks. 2012. Letter Report for Additional Investigation of Former Tanks MF-25 and MF-26, Oakland Maintenance Center, Oakland International Airport, prepared by Kennedy Jenks. January 10.

SAIC. 2010. Port-Wide Soil Management Protocol, Part of Port of Oakland Materials Management Program, February.

RWQCB. 2008. Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater November 2007, Updated May 2008. California EPA, http://www.waterboards.ca.gov/sanfranciscobay/esl.htm.

SCA. 2006. Groundwater Sampling and Analysis Report, Former United Airlines Hanger and Economy Parking Area, Oakland International Airport, prepared by SCA for the Port of Oakland. August.

SWRCB. 2009. NPDES General Permit for Storm Water Discharge Associated with Construction and Land Disturbance Activities. Order No. 2009-0009–DWQ. No. CAS000002. September 2.

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

Project No. 5310.10
Date: 01/20/04
Drawn By: J. Estrada
CAD File: g:\5310\10\5310045.dwg

Storm Water Channel Discharge to Wetland/Storm Water Retention Pond (Approx. 1,500 Ft To Outfall)

TO OFFSITE STORM POND

DIVERSION CHANNEL TO STORM PONDS

TAXIWAY B

TAXIWAY B1

FUEL SPILL AREA ON TAXIWAY (16)

BOILER WITH DIESEL AST (6)

INDUSTRIAL WASTEWATER VAULT (3)

METALS TREATMENT PLANT

RECENT 90-DAY HAZARDOUS WASTE ACCUMULATION AREA (8)

AIRCRAFT WASH RACK (2)

FORMER JET FUEL USTs (NOT AOC)

FUEL BOWSER STORAGE AREA

FORMER 90-DAY HAZARDOUS WASTE ACCUMULATION AREA AND DEBRIS COMPACTOR (7)

STORM WATER CHANNEL

LEASE PARCEL RIGHT OF FIRST REFUSAL

PAVEMENT PERIMETER (19)

STORM DRAIN (14)

STORM DRAIN (14)

VEHICLE MAINTENANCE (5) CENTER

FORMER WORLD AIRWAYS CLEANING ROOM (1)

HAZARDOUS MATERIAL STORAGE AREA (9)

FORMER FUEL USTs (17)

FUEL STORAGE AST (4)

SMALL PARTS WASH RACK (1)

FORMER FUELING ISLAND (17)

HAZARDOUS MATERIAL STORAGE AREA (9)

Proposed Restricted Area

MW-5 MW-8 MW-2 MW-3 MW-4 MW-6 MW-7 MW-1

FORMER OFF-SITE WASTE OIL AND SOLVENT USTs

FORMER OFF-SITE WASTE OIL AND SOLVENT USTs (18)

HANGAR BUILDING

C CORE

WATERFALL PAINT SPRAY BOOTH (13)

BAY 2 BAY 3

CHEMICAL STORAGE AREA (10)

B CORE

AIRCRAFT FUELING/DEFUELING EQUIPMENT AREA (11)

AIRCRAFT FUELING/DEFUELING EQUIPMENT AREA (11)

BAY 1 BAY 4

FIRE FIGHTING SYSTEM WITH 7 GENERATOR SETS & DIESEL TANKS IN VAULT (12)

AIRCRAFT PARKING AND RUN UP AREA (15)

STORM WATER CHANNEL

SALLY RIDE WAY

UNIVERSAL WASTE & RECYCLE STORAGE AREA (NOT AOC)

HAZARDOUS MATERIAL STORAGE AREA (9)

EAST GATE

FORMER FIRE FIGHTING FOAM USTs (NOT AOC)

FIRE FIGHTING FOAM ASTs (NOT AOC)

STORM DRAIN (14)

FORMER UAL OMC LEASEHOLD

DISCHARGE TO SAN FRANCISCO BAY

AIRPORT DRIVE

Discharge to San Francisco Bay (Approx. 1,500 Ft To Outfall)

0 200 FEET

LEGEND

(5) AREA of CONCERN (AOC) FOR INVESTIGATION

SATELLITE HAZARDOUS WASTE ACCUMULATION POINTS (NOT AOC)

HAZARDOUS MATERIAL STORAGE AREA (9)

STORM WATER DRAIN CATCH BASIN (14)

STORM WATER SEWER LINE (14)

TRENCH DRAIN (14)

STORM WATER CHANNEL (14)

Reference: Figures 3 and 4 (ERM 2004)

URS	Project No. 26818373 Oakland International Airport Oakland, California	Proposed Restricted Area Soil and Groundwater Impacted Area Former USTs MF25/26	Figure 1

Appendix A

Figures from Kennedy Jenks Associates (2012) Report

Appendix A
Figures from Kennedy Jenks Associates (2012) Report

MW-8	
ug/l	
JFRO	< 50
DRO	< 50
MORO	< 100

MW-8

MW-3	
ug/l	
JFRO	**64,000**
DRO	**80,000**
MORO	**33,000**

MW-5	
ug/l	
JFRO	< 50
DRO	230
MORO	480

MW-5

MW-4	DUP
ug/l	
JFRO	**4,400**	**4,200**
DRO	**4,900**	**4,700**
MORO	< 200	< 200

MW-2	
ug/l	
JFRO	**15,000**
DRO	**17,000**
MORO	< 1,000

MW-1	
ug/l	
JFRO	**5,000**
DRO	**5,600**
MORO	< 200

MW-6	
ug/l	
JFRO	< 51
DRO	120
MORO	260

MW-7	
ug/l	
JFRO	< 51
DRO	73
MORO	140

B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-11, B-12, B-13, MW-1, MW-2, MW-3, MW-4, MW-6, MW-7

Approximate Over-Excavation Limits

John Glenn Dr

Note: All locations are approximate.

Path: Z:\Projects\Oakland Airport\Events\20110901_Figures\MXD\GW_Chemical_Conc.mxd

VICINITY MAP

Legend

- Light Pole
- 2011 Kennedy/Jenks Boring
- Monitoring Well
- Fence
- Approximate Over-Excavation Limits

Jet Fuel #4 (JP4)	-	JFRO
Diesel Range Organics C10-C28	-	DRO
Motor Oil Range Organics C24-C36	-	MORO

Note: Bold concentrations exceed Environmental Screening Level Final Gross Contamination Ceiling Level, groundwater NOT a source of drinking water, Table I-2

N

0 15 30

Scale: Feet

Kennedy/Jenks Consultants

Oakland Maintenance Center
Oakland International Airport
Oakland, California

Chemical Concentrations in Groundwater

K/J 1165013*00
January 2012

Figure 3

B-6		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	**4,700**	**4,800**
4	**12,000**	**12,000**
6	57	70
10	11	40

B-12		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	< 0.99	1.3
4	3.5	8.5
6	2.6	5.6
9	1.3	2.3

B-10		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	1,400	1,300
4	8.4	9.7
6	1.7	3.3
11	8.6	41

B-7		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	1.1	5.6
4	1.3	2.8
6	< 0.99	1.5
10	2.3	9.8

B-13		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	2,300	2,400
4	4.1	7.1
6	7.3	9.1
9.5	5.6	7.8

B-9		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	< 9.9	170
4	64	77
6	8.8	11
9	**4,400**	**4,400**

B-8		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	< 1.0	5
4	< 1.0	2.1
6	< 1.0	1.2
11	< 0.99	< 0.99

B-5		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	**7,200**	**7,300**
4	9.7	11
6	8.8	12
9.5	5.2	7.4

B-1		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	< 0.98	1.5
4	< 0.99	< 0.99
6	< 0.99	1.1
10	< 0.99	< 0.99

B-11		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	3.5	4.2
4	1.6	2.1
6	19	22
9	4.2	7.1

B-4		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	17	19
4	6.7	8.5
6	3	3.8
9.5	7.1	11

B-3		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	27	40
4	4.1	5.4
6	2.3	2.9
9.5	5.1	7.6

B-2		
mg/kg		
Depth (Ft.)	JFRO	DRO
2	< 0.99	< 0.99
4	< 0.99	2.5
6	< 0.98	< 0.98
10.5	1.6	1.5

MW-8, B-12, B-10, B-7, B-9, B-8, MW-3, B-6, B-13, MW-5, B-5, MW-2, MW-4, B-1, B-11, B-4, MW-1, B-3, B-2, MW-6, MW-7

Approximate Over-Excavation Limits

John Glenn Dr

Note: All locations are approximate.

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VICINITY MAP

Legend

- Light Pole
- 2011 Kennedy/Jenks Boring
- Monitoring Well
- Fence
- Approximate Over-Excavation Limits

Jet Fuel #4 (JP4) - JFRO
Diesel Range Organics C10-C28 - DRO

Note: Bold concentrations exceed Environmental Screening Level, Direct Exposure Soil Screening Levels - Construction/Trench Worker Exposure Scenario, Table K-3

N

0 15 30

Scale: Feet

Kennedy/Jenks Consultants

Oakland Maintenance Center
Oakland International Airport
Oakland, California

Chemical Concentrations in Soil

K/J 1165013*00
January 2012

Figure 4

Project No. 5310.10
Date: 01/19/04
Drawn By: J. Estrada
CAD File: g:\5310\10\53101042 AOC7_18.dwg

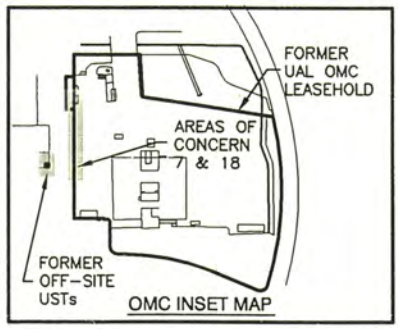
ABBREVIATIONS:

CLASS	Chemical Class
CHEM	Chemical Constituent
CONC	Concentration
STD	Standard
ND	Not Detected
EB	Ethylbenzene
VOCs	Volatile Organic Compounds
SVOCs	Semi Volatile Organic Compounds
1,2-DCE	1,2-Dichloroethene
c-1,2-DCA	cis-1,2-Dichloroethane
c-1,2-DCE	cis-1,2-Dichloroethene
TCE	Trichloroethene
TEPH	Total Extractable Petroleum Hydrocarbon
TPPH	Total Purgeable Petroleum Hydrocarbon
As	Arsenic

Notes:
Standards include USEPA Region IX PRG for Industrial Soil, RWQCB DSL for Commercial Soil and Ground Water, and USEPA MCLs for Ground Water.
Highlighted data indicates concentration greater than Standard.
Normal Text=ERM data.
Italic Text=Weiss data.
Soil data table (brown) on top or left.
Soil concentration results are in mg/kg.
Ground water data table (blue) on bottom or right.
Ground water concentration results are in µg/L.

● Sample Location
⊕ Monitoring Well
AOC 18 Area of Concern

* = Most recent ground water result from monitoring well (1/01). Off-site data from "Site Closure Report, UST Sites MF25 and MF26, Economy Parking Co., Oakland International Airport".



FORMER 90-DAY HAZARDOUS WASTE ACCUMULATION AREA AND DEBRIS COMPACTOR
AOC 7

W-B-16

CLASS	RESULT
TEPH	ND
TPPH	ND
VOCs	ND
Metals	<STD
CLASS	RESULT
TEPH	<STD
TPPH	ND
VOCs	<STD
Metals	<STD

W-B-17

CLASS	RESULT
TEPH	ND
TPPH	ND
VOCs	ND
Metals	<STD

ERM-MW-17

CLASS	RESULT
VOCs	<STD
As	ND

CLASS	RESULT	CHEM	CONC	STD
TEPH	<STD	–	–	–
TPPH	ND	–	–	–
VOCs	>STD	1,1-DCA	54	5
VOCs	>STD	1,1-DCE	59	6
SVOCs	ND	–	–	–
Metals	*<STD*	–	–	–

W-B-9

CLASS	RESULT	CLASS	RESULT
TEPH	*ND*	*TEPH*	*ND*
TPPH	*ND*	*TPPH*	*ND*
VOCs	ND	VOCs	<STD
Metals	*<STD*	*Metals*	*<STD*

W-B-18

CLASS	RESULT	CLASS	RESULT
TEPH	*ND*	*TEPH*	*ND*
TPPH	*ND*	*TPPH*	*ND*
VOCs	ND	*VOCs*	*ND*
Metals	*<STD*	*Metals*	*<STD*

FORMER OFF-SITE WASTE OIL AND SOLVENT USTs
AOC 18

CLASS	RESULT
TEPH	*ND*
TPPH	*ND*
VOCs	ND
Metals	*<STD*

W-B-19

CLASS	RESULT	COMP	CONC	STD
TEPH	*ND*	–	–	–
TPPH	*ND*	–	–	–
Metals	*ND*	–	–	–
VOCs	>STD	c-1,2-DCE	6.4	6
VOCs	>STD	TCE	56	5

W-B-20

CLASS	RESULT	CLASS	RESULT
TEPH	*ND*	*TEPH*	*ND*
TPPH	*ND*	*TPPH*	*ND*
VOCs	*ND*	*VOCs*	*ND*
Metals	*<STD*	*Metals*	*<STD*

INITIAL TANK EXCAVATION SOIL RESULTS

CLASS	RESULT	CHEM	CONC	STD
TEPH	>STD	–	1,000	500
TPPH	>STD	–	11,000	400
VOCs	>STD	Benzene	190	1.3
VOCs	>STD	EB	150	20
VOCs	>STD	Toluene	580	520
VOCs	>STD	Xylenes	700	420
VOCs	>STD	1,2-DCA	30	6
VOCs	>STD	TCE	100	0.11
Metals	<STD	–	–	–

MW-3*

CLASS	RESULT	CHEM	CONC	STD
TEPH	>STD	–	7200	640
TPPH	>STD	–	2400	500
VOCs	>STD	Benzene	2.3	1

MW-8*

CLASS	RESULT	CHEM	CONC	STD
TEPH	<STD	–	–	–
TPPH	ND	–	–	–
VOCs	>STD	Benzene	1.4	1
VOCs	>STD	1,1-DCA	250	5
VOCs	>STD	1,1-DCE	290	6

MW-5*

CLASS	RESULT
TEPH	<STD
TPPH	<STD
VOCs	ND

MW-4*

CLASS	RESULT	CHEM	CONC	STD
TEPH	>STD	–	3,300	640
TPPH	>STD	–	560	500
VOCs	>STD	Benzene	15	1
VOCs	>STD	1,1-DCA	42	5
VOCs	>STD	1,2-DCE	25	6

MW-6*

CLASS	RESULT
TEPH	ND
TPPH	ND
VOCs	ND

MW-7*

CLASS	RESULT	CHEM	CONC	STD
TEPH	ND	–	–	–
TPPH	ND	–	–	–
VOCs	>STD	1,1-DCA	18	5
VOCs	>STD	1,1-DCE	7.5	6

MW-2*

CLASS	RESULT	CHEM	CONC	STD
TEPH	>STD	–	21,000	640
TPPH	>STD	–	2700	500
VOCs	>STD	Benzene	45	1
VOCs	>STD	1,1-DCA	43	5
VOCs	>STD	1,2-DCE	80	6

MW-1*

CLASS	RESULT	CHEM	CONC	STD
TEPH	<STD	–	–	–
TPPH	<STD	–	–	–
VOCs	>STD	Benzene	3	1
VOCs	>STD	1,1-DCA	32	5
VOCs	>STD	1,2-DCE	11	6

FORMER OFF-SITE WASTE OIL AND SOLVENT USTs

APPROXIMATE EXTENT OF EXCAVATION

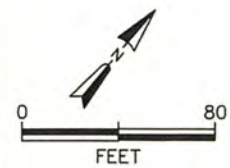
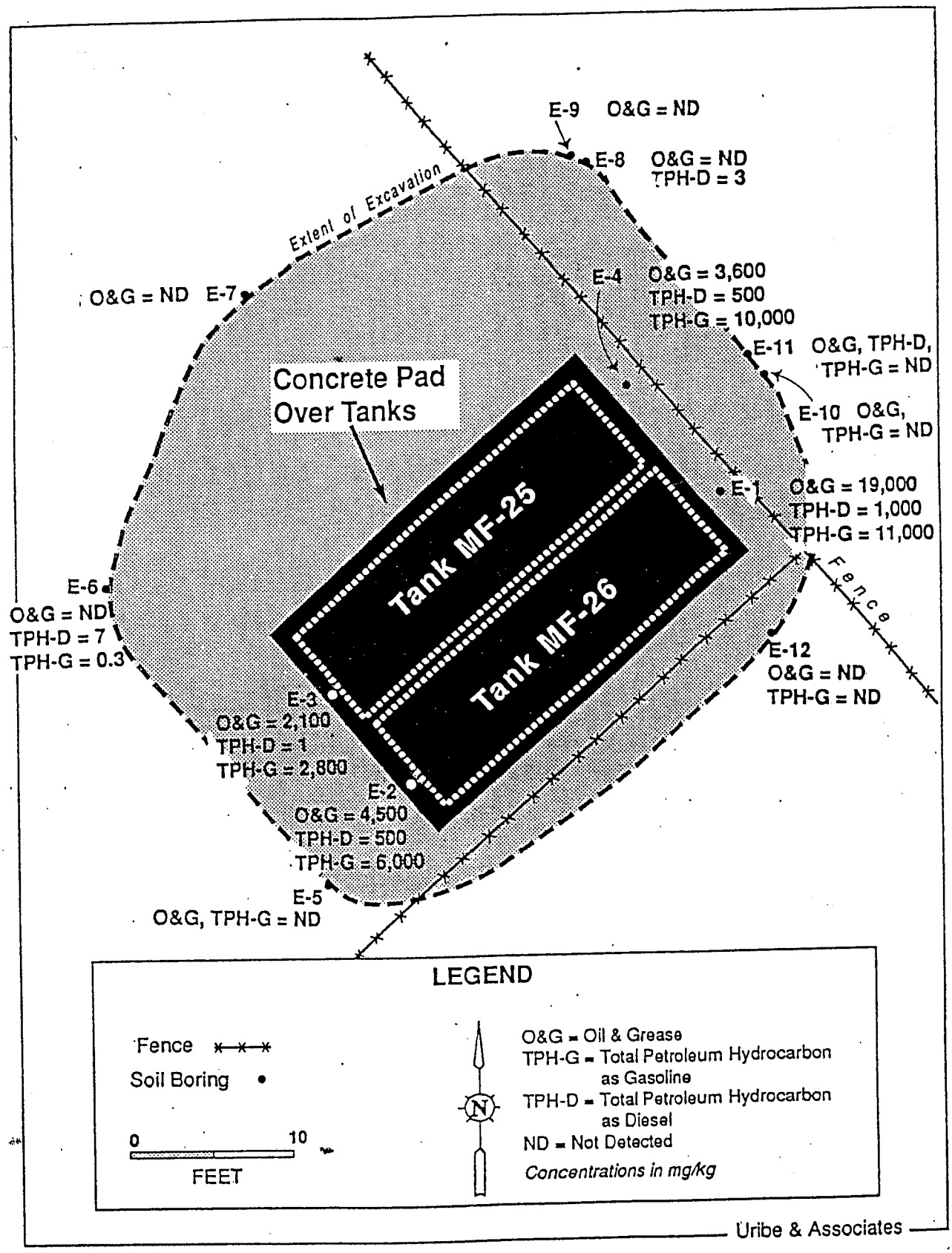


Figure 15

Areas of Concern 7 and 18, and Former Off-Site Waste Oil and Solvent USTs Soil and Ground Water Results
Former United Airlines Oakland Maintenance Center
Oakland International Airport, Oakland, California

ERM 01/04

Figure 6



Soil Sampling Locations Near Excavated Tanks

Reference: Port of Oakland. 2001.Site Closure Report, USTs MF25 & MF 26, Economy Parking Lot, Oakland International Airport. May 4.