CITY OF OAKLAND

DALZIEL BUILDING · 250 Frank H. Ogawa Plaza · Suite 5301·OAKLAND, CALIFORNIA 94612-2034
Oakland Public Works FAX (510) 238-7286
Environmental Services Division TDD (510) 238-3254

RECEIVED
By Alameda County Environmental Health 11:33 am, Sep 11, 2017

Mr. Keith Nowell
Hazardous Materials Specialist
Alameda County Department of Environmental Health
1131 Harbor Bay Pkwy
Alameda, California 94502

Subject: Additional Investigation Work Plan
City of Oakland Municipal Service Center (MSC)
7101 Edgewater Drive Oakland California

Reference: ACDEH Fuel Leak Case No. RO0000293; GeoTracker Global ID T0600100375

Dear Mr. Nowell:

The City of Oakland is pleased to submit the attached Additional Investigation Work Plan prepared by Terraphase. I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document submitted on City's behalf to ACDEH's FTP server and the SWRCB's GeoTracker website.

Please contact me at (510) 238-7314 if you have any questions or comments.

Sincerely,

Kayleigh Lim
Environmental Program Specialist

ADDITIONAL INVESTIGATION WORK PLAN
CITY OF OAKLAND MUNICIPAL SERVICES CENTER
7101 EDGEWATER DRIVE, OAKLAND, CALIFORNIA

Prepared for

City of Oakland
250 Frank Ogawa Plaza
Suite 5301
Oakland, California 94612

Prepared by

Terraphase Engineering Inc.
1404 Franklin Street, Suite 600
Oakland, California 94612

September 8, 2017

Project Number 0064.007.001

terraphase engineering

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ACRONYMS AND ABBREVIATIONS

ACDEH	Alameda County Department of Environmental Health
ACPWA	Alameda County Public Works Agency
Arcadis	Arcadis US
BTEX	benzene, toluene, ethylbenzene and total xylenes
bgs	below ground surface
COPCs	contaminants of potential concern
CPT	Cone Penetration Test
COCs	Contaminants of Concern
CSM	Conceptual Site Model
DP	direct push
DPE	dual-phase extraction
DTSC	Department of Toxic Substances Control
EBRP	East Bay Regional Parks
EC	electrical conductivity
EPA	United States Environmental Protection Agency
HASP	Health and Safety Plan
IDW	investigation-derived waste
LTCP	Low Threat Underground Storage Tank Closure Policy
LNAPLs	light non-aqueous phase liquids
MIP	Membrane Interface Probe
MTBE	methyl tert-butyl ether
PAH	polycyclic aromatic hydrocarbon
SGC	silica gel cleanup
SVOC	semi-volatile organic compound
the Site	Oakland Municipal Service Center, 7101 Edgewater Drive, Oakland, California
SWRCB	State Water Resources Control Board
Terraphase	Terraphase Engineering Inc.
TOC	Total organic carbon
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline

TPH-mo	total petroleum hydrocarbons as motor oil
UST	underground storage tank
UVOST	Ultra-Violet Optical Screening Tool
UV	Ultra-Violet
VOC	volatile organic compounds

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CERTIFICATION

Information, conclusions, and recommendations in this document have been prepared by a California Professional Geologist.

September 8, 2017

Andrew Romolo
California Professional Geologist (8110)

Date

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1.0 INTRODUCTION

Terraphase Engineering Inc. (Terraphase) has prepared this *Additional Investigation Work Plan* (the Work Plan) on behalf of the City of Oakland (the City) for the Oakland Municipal Service Center Facility located at 7101 Edgewater Drive, Oakland, California (the Site; Figure 1). In 2016, a data gap investigation was completed at the Site to assess if the environmental conditions at the Site complied with the criteria stipulated by the Low-Threat Underground Storage Tank Case Closure Policy (the LTCP). Based on the results of the data gap investigation, in a meeting on May 31, 2017, the Alameda County Department of Environmental Health (ACDEH) requested additional characterization be completed to assess the nature and extent of post-remedial residual contamination detected in soil and groundwater at the Site. In an email dated May 31, 2017 (Appendix A), the ACDEH required a Work Plan be prepared to describe the procedures of the investigation. Terraphase has prepared this Work Plan in accordance with the ACDEH requirements.

1.1 Objective

The objective of this Work Plan is to develop the procedures to further characterize the nature and extent of chemical contaminants in soil and groundwater at the Site that are residual of previous remedial activities. Contaminants of potential concern (COPCs) that will be assessed during this additional investigation will include volatile organic compounds (VOCs), particularly benzene, and light non-aqueous phase liquids (LNAPLs). The activities proposed in this work plan are designed to assess the lateral and vertical extent of COPCs in vadose and saturated zones along the western periphery of the Site.

The proposed investigation will utilize *in-situ* sensing technologies, which provide rapid Site characterization capabilities, little to no investigation-derived waste (IDW) production, and real-time data acquisition. The selected technologies are Cone Penetration Testing (CPT) equipped with an Ultra-Violet Optical Screening Tool (UVOST) or Membrane Interference Probe (MIP). The UVOST and MIP data will be evaluated to support the following:

- Assessment of the current groundwater monitoring well network. If determined to be warranted, the information to be collected can support the design and siting of additional groundwater monitoring wells.
- Identification of data gaps necessary to be addressed to support an evaluation for regulatory closure of the Site in accordance with the Regional Water Quality Control Board Low Threat Closure Policy.
- If determined to be warranted, the selection and design of potential additional remedial methods and programs.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 Site Location and Current Use

The Site is comprised of approximately 17 acres located adjacent to the San Leandro Bay, and is currently leased by the City of Oakland from the Port of Oakland. The Site is located in a primarily industrial area. The facilities and on-Site buildings (see Figure 2) house several City of Oakland service branches. The Public Works Building houses the administrative offices for the Office of Public Works, Bureau of Facilities and Environment and Bureau of Engineering and Construction. The 911 Call Center contains the Communications Section for the Oakland Police Department, where emergency calls are received and police, fire and ambulance units are dispatched. Building 5 houses the Equipment Services Division, which provides maintenance and fueling for the City of Oakland's vehicles and equipment. The Admin Building houses administrative offices for the Bureau of Infrastructure and Operations, which maintains electrical services, traffic signals, street lights, sewers and storm drains, and tree services.

2.2 Geology and Hydrogeology

The Site was originally a waterfront tidal marsh, with soft silty clay (young Bay Mud), underlain by Old Bay Mud deposits of silty clay with sand lenses. Bedrock is estimated at 800 feet below ground surface (bgs) (Baseline 2001). The earliest available aerial photograph of the Site in 1947 shows that a manmade dike was constructed from near the mouth of Damon Slough to the north, through the current Site, and extending to the Elmhurst Channel in the south. The marsh within the dike boundaries was reportedly progressively filled landward with miscellaneous construction/grading debris and soils. The nature and source fill materials are not well documented, though old borings indicate that it is comprised of miscellaneous construction/grading debris and soils (Baseline 2001).

Fill thickness and relative permeability are substantially greater on the bayward side of the dike, where thicknesses are estimated at greater than 20 feet. Fill thickness on the landward side is estimated at 6 to 15 feet, and overlies emergent lands constructed by meandering streams (Arcadis 2013). The uppermost water-bearing zone at the Site is unconfined and the water table level can fluctuate freely, and is likely partially influenced by tides in San Leandro Bay. Groundwater elevation at the Site ranges from approximately 2 to 9.5 feet above mean sea level (Arcadis 2013, Terraphase 2017). Groundwater in the north portion of the Site flows towards the northwest, towards Damon Slough, and flows towards the southwest in the south portion of the Site, towards San Leandro Bay (Arcadis 2014).

2.3 Previous Investigation and Remedial Activities

The Site has been the subject of numerous environmental investigations, beginning in 1989. A summary of previous investigations is provided in the September 2013, *Conceptual Site Model and Request for Low-Threat Closure, City of Oakland Municipal Services Center, 7101 Edgewater*

Drive, Oakland, California 94621 prepared by Arcadis US (Arcadis) (the CSM Report) (Arcadis 2013). Based on the environmental data collected across the Site, COPCs included VOCs and petroleum hydrocarbons. The sources of the COPCs include 14 former underground storage tanks (USTs), and a gasoline and diesel fuel subsurface pipeline and dispenser system. Former and existing floor drain waste collection pits, sumps, and other features have been previously investigated but do not appear to be source(s) of chemical impacts to the subsurface.

Several phases of active and passive in-situ remediation have been undertaken to address impacts to soil and groundwater at the Site. A brief summary of completed actions is below. Soil excavation and groundwater pumping during abandonment of USTs, piping, and other former Site features is not included in this summary.

- March – October 1998: groundwater extraction system operated at well TBW-1, following removal of fuel pipelines.
- 2000: use of passive skimmers or absorbent socks in wells TBW-1, TBW-2, TBW-3, TBW-5, MW-6, and MW-16.
- 2002: Dual-phase extraction (DPE) from wells RW-B3 and RW-B4, and from wells RW-C4, RW-C5, RW-C6, and RW-C7. Removal of a total of 20,000 gallons of groundwater and LNAPL mixture.
- 2002: Hydrogen peroxide injections into wells OB-A1, RW-A1, RW-A2, TBW-3, TWB-4, MW-5, MW-16, and MW-17.
- 2004-2009: Hydrogen peroxide injections in historical Plume C wells.
- 2006: DPE at RW-D1, RW-D2, RW-D3, RW-D4, RW-D5, TBW-5 and RW-1.
- 2007: DPE continuation in historical Plume D area, with addition of wells RW-D6 through RW-D11.
- 2010-2013: Hydrogen peroxide injections into remediation wells, approximately quarterly.

Upon completion of remedial activities, Arcadis prepared the 2013 CSM Report and included a request for closure in accordance with the LTCP. The ACDEH required that additional environmental investigation be completed to verify that the environmental conditions at the Site are in compliance with the requirements stipulated by the LTCP. Therefore, in June of 2016, Arcadis conducted a Site-wide soil and groundwater investigation to further characterize the Site and address data gaps for assessing if closure under LTCP was feasible. The investigation planned to collect additional data to further delineate the edges of historic LNAPL plumes.

A total of 47 soil borings were advanced on the Site to approximate depths of 15 to 20 feet bgs. One or more soil samples were collected from all 47 soil borings; in 16 of the soil borings, two

samples were collected: one shallow sample and one deep sample. The soil samples were tested for total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and total xylenes (BTEX) and methyl tert-butyl ether (MTBE). Additionally, 15 soil samples were tested for the presence of polycyclic aromatic hydrocarbons (PAHs) in the Site fill material. A total of 16 grab groundwater samples were collected and tested for TPH, MTBE and BTEX. Results of this investigation were presented in the *Data Gap Status Update* (Terraphase 2017, Enclosure 2). Figures 3 and 4 in this Work Plan present soil and groundwater data (respectively) from this 2016 investigation. The data demonstrate that residual contamination in soil and groundwater at the Site require further characterization to evaluate if the LTCP could be applied to the environmental conditions at the Site. This Work Plan has been prepared to propose additional investigation activities to further assess the nature and extent of residual contamination at the Site.

3.0 PROPOSED INVESTIGATION

3.1 Objectives

The objectives of this investigation are to collect data that will allow for the following assessments and evaluations:

- An assessment of the presence of residual LNAPLs at the Site, with a focus on field observations and chemical data of data gap sampling, bordering areas with limited or no existing data, and the western Site perimeter;
- An assessment of the presence of VOCs, particularly benzene, at the Site;
- Confirmation, via quantitative grab groundwater sampling, of lateral and vertical extents of impacts in the saturated zones;
- Confirmation of lithology and hydrogeology in the immediate vicinity of well MW-1, to evaluate the appropriateness of well construction design;
- Additional characterization of the subsurface geology and hydrogeology across the Site for updating the Site Conceptual Model;
- Evaluation of the current groundwater monitoring network; and
- Data evaluation to assess if additional characterization and/or remedial activities are warranted.

3.2 Scope of Work

The proposed investigation includes:

- Advancement of 17 total MIP borings.
    - 16 MIP borings will be advanced with direct push (DP)
    - Advancement of one CPT/MIP boring adjacent to existing well MW-1 for lithologic and hydrologic assessment as well as chemical data.
- Advancement of 13 CPT/UVOST borings; and
- Collection of confirmation grab groundwater samples using a CPT or DP rig equipped with a Hydropunch™ (or similar) sampling apparatus.

The proposed boring locations are presented on Figure 6. Table 1 presents a sample matrix with proposed borings, sample type, and location rationale.

3.3 Pre-Field Activities

3.3.1 Health and Safety Plan

The Site-specific and activity-specific Health and Safety Plan (HASP) will be modified to include the activities and safety procedures for the proposed work. Health and safety meetings will be conducted in the field at the start of the field investigation and at the beginning of each day of field work. Field work will be monitored according to the HASP to ensure that appropriate health and safety procedures are followed. A copy of the HASP will be kept on-Site during scheduled field activities.

3.3.2 Permitting

A parcel soil boring permit application will be obtained from the Alameda County Public Works Agency (ACPWA). For proposed boring locations located off-Site in the East Bay Regional Parks (EBRP) bike path area, an encroachment permit will be obtained from EBRP.

3.4 Utility Survey

Proposed soil boring locations will be marked out with white paint. Underground Service Alert will be notified a minimum of 48 hours prior to commencing drilling activities.

A private subsurface utility locating company will mark out detectable subsurface structures within a 10-by-10-foot area surrounding each of the proposed boring locations. Utility location will be performed with a combination of radio detection, ground-penetrating radar, and electro-magnetic induction, as necessary.

Due to the shallow depth of groundwater at the Site (approximately 3 to 6 feet bgs), and the importance of gathering data at the capillary zone and first encountered groundwater, each CPT or DP boring will begin at ground surface. Advanced clearance for utilities will therefore not be possible in the actual MIP/UVOST boring. Additional utility clearance will be performed by hand auguring one boring location immediately adjacent (within approximately 2 feet laterally) to each proposed boring location. The hand auger will be used to excavate and inspect soil at each clearance boring location to a depth of approximately 5 feet bgs.

3.5 Sample Types, Locations, and Depths

The proposed sampling locations are shown on Figure 6. The precise location of each boring may differ from those shown on Figures depending on encountered field conditions, real-time data evaluation, and the results of the utility survey.

The borings will be completed to a minimum depth of approximately 15 feet bgs and may be advanced to total depths not exceeding 30 feet bgs. The depths of the borings will be modified based on field conditions and real-time UVOST and/or MIP responses.

UVOST and MIP boring locations are placed along the western periphery of the Site in areas of known or suspected residual impacts, including adjacent to select data gap borings, existing groundwater monitoring or remediation wells, and existing soil gas wells (Figure 6). While historic plume areas were the target of previous active remedial actions, residual LNAPL may remain in the fringes of these source areas. UVOST and/or MIP boring locations were also selected based on results of the 2016 data gap investigation (Figures 3 and 4), 2017 groundwater monitoring and sampling results (Figure 5), and recently acquired soil gas data collected in July 2017 (not yet finalized for reporting). Potential step-out borings may be advanced based on significant UVOST and/or MIP sensor response at nearby locations.

3.6 Sampling Methodology

First, MIP borings will be advanced Site-wide. UVOST borings will be advanced following a field-review of MIP results, to better anticipate locations which may exhibit residual LNAPLs. The final phase of the proposed investigation will be collection of grab groundwater confirmation samples, following a review of all MIP and UVOST data.

3.6.1 CPT and DP Soil Borings

Soil borings will be advanced by a CPT or DP rig. Terraphase will subcontract a California-licensed drilling contractor to advance the soil borings under the supervision of Terraphase field staff working under the direction of a California Professional Geologist. Once the asphalt pavement has been cored, the drilling rig will advance borings continuously from at or near surface to the target depth.

CPT is a process where soil characteristics are determined when a cone penetrometer is driven into the subsurface. The CPT provides a graphical output estimating the soil stratigraphy, relative density, strength and hydrogeologic information (static and dynamic pore pressure, hydraulic conductivity) (Gregg 2016a). The continuous log of the Site lithology will be reviewed real-time in the field during the testing as well as transferred electronically to the project manager for review. The CPT will be equipped with UVOST sensor assembly to assess target COPCs distribution continuously from ground surface to the total target depth. MIP borings may be advanced either with CPT or with DP drilling technology, depending on the boring location and nearby CPT data from paired UVOST locations.

MIP technology is discussed in more detail in Section 2.4.2; UVOST technology is discussed in Section 2.4.3 below.

3.6.2 MIP

MIP is a direct push tool which mobilizes and measures VOCs as the CPT or DP tool is advanced to produce real-time, in-situ chemical and physical data of the vadose and saturated zones. The MIP tool is advanced with standard drill rods that contain tubing for carrier gas and a conductivity cable. As the MIP tool is advanced to depth, it heats a semi-permeable membrane

adjacent to the soil and groundwater to 120˚C which releases vapors that are carried across the membrane and to the surface via a closed, inert gas loop. The gas stream is analyzed by three detectors at the surface. A Halogen Specific Detector converts halogen-containing compounds to their oxidation products and free halogen atoms, the latter of which adsorb to an activated platinum surface and the resulting thermionic emission can be converted to a usable voltage reading. The photo-ionization detector detects petroleum hydrocarbons by first irradiating the gas with high-energy ultraviolet light leaving compounds with lower irradiation energy that are ionized and collect in an electrical field, with a current proportional to the compound's concentration. The flame ionization detector detects methane by utilizing a hydrogen/air flame to combust the gas stream, which produce ions collected on an electrode that generates an electrical signal. The MIP tool is equipped with a soil conductivity probe which measures the electrical conductivity (EC) of the soil matrix. Zones with low EC are analogous with more permeable sandy layers and could serve to identify dominant flow paths for VOC migration, whereas depths with high EC represent clayey layers that could serve to trap the contaminant.

3.6.3 UVOST

UVOST is a laser induced fluorescence technology that transmits laser light into the subsurface as the CPT tool is advanced. Petroleum hydrocarbons including gasoline, diesel fuel, and heavier oils, exhibit strong fluorescence signatures that return a signal to the UVOST detector. This provides real time, in-situ data regarding the relative quantity and type of free phase hydrocarbon product present in the subsurface.

The UVOST works by emitting Ultra-Violet (UV) light from a laser emitted through a window in the cone causing hydrocarbon molecules to fluoresce. Fiber optic cables transmit fluorescence to the surface where intensity and decay are recorded every 2 inches. Decay signatures determine the type of hydrocarbon contaminant and signal intensity determines the location.

The type and presence of the hydrocarbon product encountered during the CPT/UVOST testing is determined by measuring the intensity and wavelength of the fluoresced PAH. Dissolved TPHs do not give a UVOST response; LNAPL presence and distribution is therefore the target of UVOST investigation technology.

Performing CPT-UVOST soundings at multiple locations across a Site will provide detailed stratigraphic logging along with the location of the product present at the Site (Gregg 2016b).

3.6.4 Confirmation Grab Groundwater Sampling

A Hydropunch™ or similar sampler will be used to obtain grab groundwater samples at specified depth intervals. A 1 ¾ inch hollow push rod with a filter tip will be advanced in a closed configuration to the base of the desired sampling interval. Once the desired sample depth is reached, the push rods will be retracted approximately 3 feet and the encased filter screen is exposed to the formation allowing groundwater to infiltrate from the formation to the screen.

The tool is then retracted and the check valves close, trapping the groundwater sample in the sample chamber, and the sample is then pulled to the surface.

Locations of grab groundwater sample will be dependent upon the results of the MIP investigation, as follows:

- One grab groundwater sample will be collected from first encountered groundwater at each advanced MIP boring location (anticipated at approximately 5 feet bgs).
- A deep grab groundwater sample will be collected where notably elevated MIP and /or UVOST readings are observed in shallow groundwater. Deep sample depths will be based on the sensor response at each location, and will target the depth interval below significant response to provide vertical delineation of impacts.
- In addition, two grab groundwater samples will be collected in the vicinity of well MW-12. These samples are intended to evaluate the extents of dissolved TPH-d present in well MW-12. The locations will be down-gradient of well MW-12, off-Site on the EBRP path (Figure 6).

Grab groundwater samples will be collected in laboratory-supplied containers, properly labeled, placed into an ice-chilled chest, and submitted to an analytical laboratory for chemical analysis of the following analytes:

- TPH as gasoline (TPH-g), TPH as diesel (TPH-d), and TPH as motor oil (TPH-mo) by the United States Environmental Protection Agency (EPA) Method 8015B
- BTEX and MTBE by EPA Method 8260

Analytical laboratory methods, sample requirements, and reporting limits for the proposed grab groundwater samples are shown in Table 2.

3.6.5 Soil Boring for Lithologic Data

One CPT/MIP boring will be advanced adjacent to MW-1 (MIP-1, Figure 6) to a minimum of approximately 15 feet bgs. Lithologic response from the CPT, and pore dissipation test(s), will be recorded. This exercise will provide data to determine if MW-1 is screened appropriately, and if the well provides representative data at this location as currently constructed. If warranted, a replacement well at this location may be proposed, with construction details based on the encountered lithology. The replacement well construction details will be provided under separate cover.

3.7 Equipment Decontamination

To prevent potential cross-contamination between sample locations, non-disposable equipment that comes into contact with soil, solids, or water will be decontaminated before work is

initiated at each subsequent sampling location and depth interval. Equipment will be decontaminated using a three-step process: (1) non-phosphate detergent wash, (2) potable water rinse, and (3) distilled water rinse.

3.8 Borehole Abandonment

After soil and groundwater sampling is complete, the borings will be abandoned using a neat cement grout in accordance with ACPWA boring permit requirements. Following retraction of all down-hole equipment, the boreholes will be filled with the neat-cement grout to the surface. For borings completed to total depths of over approximately 10 feet, a tremie pipe will be utilized for grout emplacement.

3.9 Soil Boring Survey

Following the completion of sampling activities, the soil boring locations will be surveyed using a Global Positioning System device with sub-meter accuracy.

3.10 Investigation-Derived Waste

Equipment wash water and waste soil cuttings generated during this investigation will be stored in separate 55-gallon drums and handled and disposed of in accordance with state and federal requirements. The drums will be labeled properly, and temporarily staged at the Site in a location approved by the facility manager.

Terraphase will collect grab samples of the waste soil and water IDW generated during the drilling for profiling and disposal purposes. The waste soil and water samples will be collected in laboratory supplied containers, properly labeled, placed into an ice-chilled chest, and submitted to an analytical laboratory for chemical analysis of the following analytes:

- Title 22 metals: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc, by the EPA Method 6010/7470
- TPH-g, TPH-d, and TPH-mo by EPA Method 8015B
- BTEX and MTBE by EPA Method 8260B

Following characterization, the waste soil and water will be transported and disposed of at an appropriate facility.

4.0 ADDITIONAL GROUNDWATER MONITORING EVENT

4.1 Second Semiannual 2017 Groundwater Monitoring

The second semiannual 2017 groundwater monitoring event will be conducted in approximately October-November 2017 at the Site. The first semiannual event was conducted in May 2017, with a supplemental sampling conducted in July 2017 to collect samples at wells inaccessible in May. Monitoring and sampling will be conducted at the Site on an on-going semiannual basis.

During monitoring and sampling events, an oil-water interface probe will be used when gauging all wells. Samples will be collected using low flow sampling methods, if feasible; if draw-down is excessive, three well volume purging or purge and recharge methods will be used. A flow-through cell water quality meter will be used to measure water quality parameters in the field including dissolved oxygen, oxidation-reduction potential, conductivity and pH. Groundwater samples will be collected and analyzed for the following:

- TPH-d, TPH-g, TPH-mo
- BTEX
- MTBE
- Total organic carbon (TOC)

Chromatographs of TPH data will be closely evaluated to determine the nature and condition of detected hydrocarbons, characterize variation across the Site, and assess relative stability of the material.

Select samples will be run for side-by-side TPH-d and TPH-mo analyses with and without silica gel cleanup (SGC) procedures. SGC has generally been utilized during previous groundwater monitoring and sampling activities at the Site. The procedure removes biogenic hydrocarbons and polar compounds. Terraphase recommends assessing the appropriateness of utilizing SGC at the Site, to ensure that the procedure is not biasing data.

5.0 DATA EVALUATION AND REPORTING

UVOST and MIP logs will be reviewed and the results will be assessed in context with recent and historical soil and groundwater data. Analytical data from the grab groundwater confirmation sampling will provide quantitative results which will be evaluated in combination with the qualitative MIP and UVOST results. Data will be used to assess if amendments to the groundwater monitoring network is warranted. In addition, the data will be evaluated to assess if additional soil gas data is required at the Site.

A report will be prepared summarizing the results of the field investigation. The report will include:

- CPT lithologic logs;
- UVOST logs;
- MIP logs;
- graphical presentations of investigation results;
- a discussion of findings and the interpretation of the analytical results, including an assessment of well MW-1;
- recommendations for any additional investigation, if warranted; and
- recommendations for any additional active remediation, if warranted.

The report will be reviewed and signed by a California Professional Geologist.

6.0 SCHEDULE

The work will commence following approval of the Work Plan by ACDEH. Field activities will be dependent on obtaining appropriate permits and approvals and on subcontractor availability. The field work is anticipated to take approximately two weeks to complete. A report will be submitted to the ACDEH in approximately March 2018, following the proposed February 2018 meeting with ACDEH.

7.0 REFERENCES

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TABLES

Table 1
Sample Matrix: UVOST and MIP
Additional Investigation Work Plan
City of Oakland Municipal Service Center
7101 Edgewater Drive, Oakland California

Sample ID				Purpose / Rationale	Proposed Analyses and Methods		
	UVOST	MIP	GGW		TPH-g (EPA 8260)	TPH-d, -mo (EPA 8015)	BTEX, MTBE (EPA 8260)
MIP-1		X	X	Lithology at MW-1; define lateral extents of VOCs and TPH-g in former underground piping area	X	X	X
MIP-2		X	X	Define lateral extents of VOCs and TPH-g downgradient of historical piping area and Plume D, at Site boundary	X	X	X
MIP-3		X	X	Define lateral extents of VOCs and TPH-g near Public Works Bldg	X	X	X
MIP-4		X	X	Define lateral extents of VOCs and TPH-g downgradient of historical Plume D area, at Site boundary	X	X	X
MIP-5		X	X	Define lateral extents of historical Plume D, VOCs and TPH-g in vicinity of RW-D6, RW-D7 and SB-43	X	X	X
MIP-6		X	X	Confirm impacts between historical Plumes C and D, VOCs and TPH-g in vicinity of SB-28	X	X	X
MIP-7		X	X	Define lateral extents of VOCs and TPH-g downgradient of historical Plume C, at western Site boundary	X	X	X
MIP-8		X	X	Define lateral extents of VOCs and TPH-g in vicinity of SG-9 and Storage Bldg	X	X	X
MIP-9		X	X	Define lateral extents of VOCs and TPH-g west of Storage Bldg, upgradient of MW-9	X	X	X
MIP-10		X	X	Characterize VOCs and TPH-g between SB-25 and Site boundary	X	X	X
MIP-11		X	X	Characterize VOCs and TPH-g in vicinity of SB-25	X	X	X
MIP-12		X	X	Characterize VOCs and TPH-g between SB-22 and Building 5 (within former Bldg 5 footprint)	X	X	X
MIP-13		X	X	Characterize VOCs and TPH-g in the vicinity of SB-22	X	X	X
MIP-14		X	X	Characterize VOCs and TPH-g in vicinity of SB-23	X	X	X
MIP-15		X	X	Define lateral extent VOCs and TPH-g towards southern Site boundary and west of historical Plume A+B	X	X	X
MIP-16		X	X	Define lateral extents of VOCs and TPH-g towards southern/southwestern Site boundary	X	X	X
MIP-17		X	X	Define lateral extents of VOCs and TPH-g towards southern Site boundary	X	X	X
UVOST-1	X			Define potential residual LNAPLs west of SB-41 at Site boundary	--	--	--
UVOST-2	X			Define potential residual LNAPLs between historical Plume D and historical Plume C, in the vicinity of SB-28	--	--	--
UVOST-3	X			Define potential residual LNAPLs west of SB-35, at Site boundary	--	--	--
UVOST-4	X			Define potential residual LNAPLs in the vicinity of SG-9 and the Storage Building	--	--	--
UVOST-5	X			Define potential residual LNAPLs west of SG-9, west of Storage Building, upgradient of MW-9	--	--	--
UVOST-6	X			Define potential residual LNAPLs near Site Boundary west of SB-25	--	--	--
UVOST-7	X			Define potential residual LNAPLss in vicinity of SB-25	--	--	--
UVOST-8	X			Define potential residual LNAPLs between SB-22 and Building 5 (in former Bldg 5 footprint)	--	--	--
UVOST-9	X			Define potential residual LNAPLs in vicinity of SB-22	--	--	--
UVOST-10	X			Define potential residual LNAPLs in the vicinity of SB-23	--	--	--
UVOST-11	X			Define potential residual LNAPLs in the vicinity of RW-B3, RW-B4 and SB-10	--	--	--
UVOST-12	X			Define potential residual LNAPLs at southwestern Site boundary	--	--	--
UVOST-13	X			Define potential residual LNAPLs near southern Site boundary	--	--	--
GGW-1			X	Lateral/downgradient delineation of elevated TPH-d detection in MW-12	X	X	X
GGW-2			X	Lateral/downgradient delineation of elevated TPH-d detection in MW-12	X	X	X

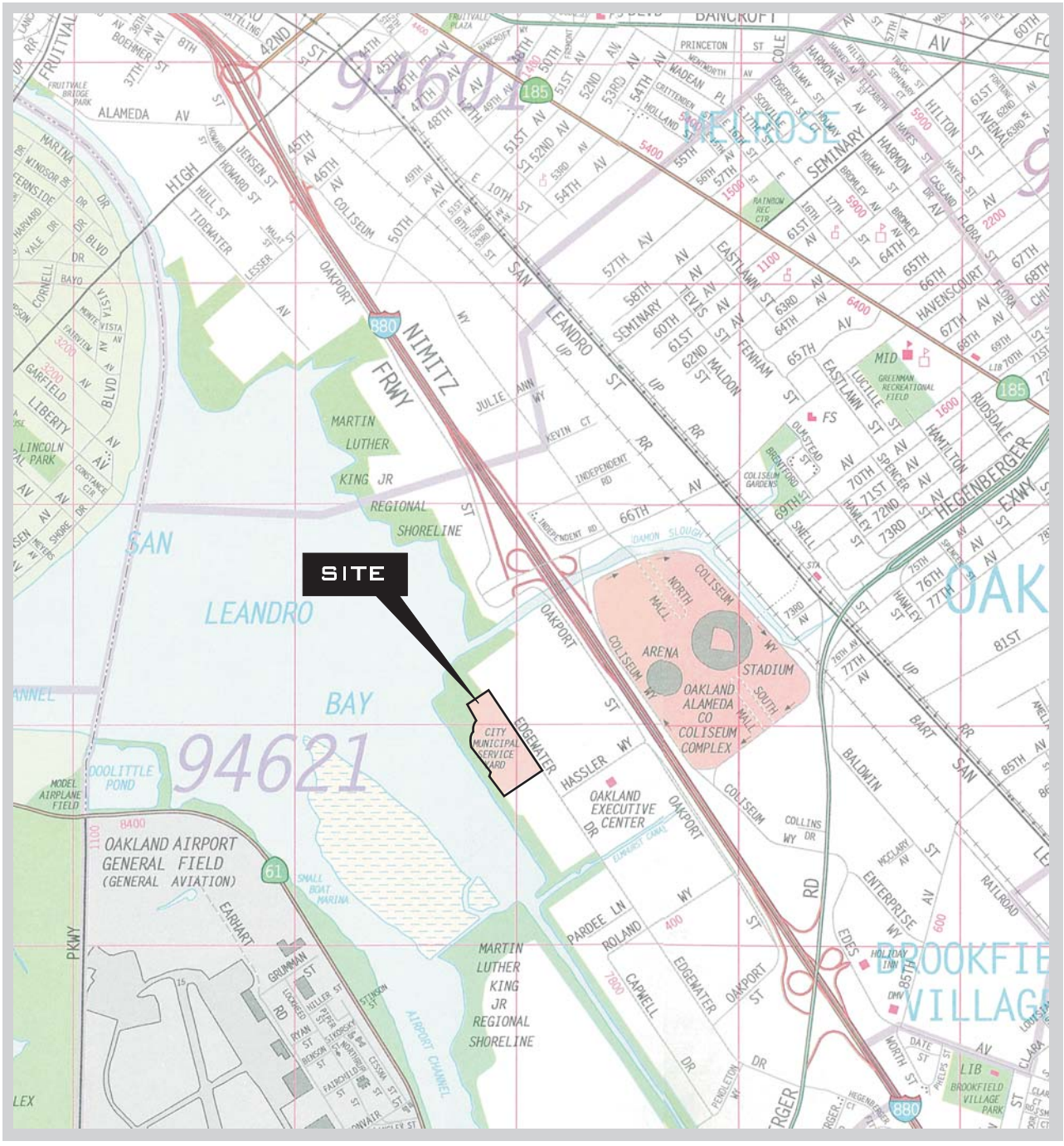
Notes:
BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = Environmental Protection Agency
GGW = grab groundwater
MIP = Membrane Interface Probe
MTBE = methyl, tert-butyl ether
TPH-g = total petroleum hydrocarbons as gasoline
TPH-d = total petroleum hydrocarbons as diesel
TPH-mo = total petroleum hydrocarbons as motor oil
UVOST = Ultra-Violet Optical Screening Tool
X = to be analyzed

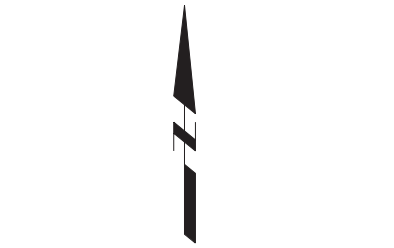
Table 2
Analytical Laboratory Methods, Sample Requirements, and Reporting Limits for Groundwater
Additional Investigation Work Plan
City of Oakland Municipal Service Center
7101 Edgewater Drive, Oakland California

Analyte	Matrix	Method	Container	Minimum Sample Volume	Preservation	Hold Time (days)	Reporting Limits*
TPH-d, -mo	water	EPA 8015B	1 L amber glass	500 mL	chill to 4 ± 2°C	14	50 - 300 µg/L
TPH-d, -mo (with SGC)	water	EPA 8015B	1 L amber glass	500 mL	chill to 4 ± 2°C	14	50 - 300 µg/L
TPH-g	water	EPA 8015B	3 x 40mL VOA	40 mL	hydrochloric acid; chill to 4 ± 2°C	14	50 µg/L
BTEX	water	EPA 8260B	3 x 40mL VOA	40 mL	hydrochloric acid; chill to 4 ± 2°C	14	0.5 µg/L
MTBE	water	EPA 8260B	3 x 40mL VOA	40 mL	hydrochloric acid; chill to 4 ± 2°C	14	0.5 µg/L
TOC	water	SM 5310C	250 mL glass	40mL	sulfuric acid; chill to 4 ± 2°C	28	1.0 mg/L

Notes:
*reporting limits may vary depending on matrix interference and dilution
°C = degrees Celsius
EPA = Environmental Protection Agency
TPH-d = total petroleum hydrocarbons as diesel
TPH-mo = total petroleum hydrocarbons as motor oil
TPH-g = total petroleum hydrocarbons as gasoline
BTEX = benzene, toluene, ethylbenzene and xylene
MTBE = methyl tert-butyl ether
VOA = volatile organics analysis vial
L = liter
mg/L = milligrams per liter
mL = milliliter
µg/L = micrograms per liter
SGC = Silica Gel Cleanup Method

FIGURES





SOURCE: 2002 THOMAS GUIDE FOR ALAMEDA AND CONTRA COSTA COUNTIES

SITE LOCATION

Oakland Municipal Service Center
7101 Edgewater Drive, Oakland, California

terraphase engineering

FIGURE
1

DESIGN\09225\11\000\09225 MSC SiteVicinity.CDR

Edgewater Dr

911 Center

Admin Building

Public Works Building

Building No. 5

Crafts and Storage

Storage

MW-1
MW-2
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-18
TBW-6

SG-1
SG-2
SG-3
SG-5
SG-6
SG-7
SG-9
SG-10
SG-11
SG-12
SG-13

RW-A1
RW-A2
RW-B1
RW-B2
RW-B3
RW-B4
RW-C1
RW-C2
RW-C3
RW-C4
RW-C5
RW-C6
RW-C7
RW-D1
RW-D2
RW-D3
RW-D4
RW-D5
RW-D6
RW-D7
RW-D8
RW-D9
RW-D10
RW-D11
RW-1

OB-A1
OB-C1
OB-D2
OBD-1

San Leandro Bay

Legend

- Soil Gas Location
- Monitoring Well Location
- Fence
- Building

Notes: Aerial imagery source - NAIP June 2014.

0 75 150 225 300 Feet

1 inch = 150 feet

N

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terraphase engineering

CLIENT: Municipal Service Center

PROJECT: 7101 Edgewater Drive, Oakland CA

PROJECT NUMBER: 0064.007.001

Site Plan

FIGURE 2

File: K:\GIS\Prj\0064.007 Oakland Municipal Service Center\MXDs\Site Layout_0064-007-001.mxd 9/1/2017 Created by: JL Checked by: AB Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

SB-45		
Sample Date	6/8/2016	6/9/2016
Sample Depth	5.5	2
Benzene	<0.5	<0.0047
TPH-d	1,300	5.6Y
TPH-g	290Y	<0.96
TPH-mo	190	48

SB-27		
6/7/2016		
Sample Depth	1.5	9.5
Benzene	<0.005	<5
TPH-d	9.8Y	150Y
TPH-g	<1	3,900
TPH-mo	58	15

SB-43	
6/9/2016	
Sample Depth	8.5
Benzene	0.019
TPH-d	380
TPH-g	6.3Y
TPH-mo	320

SB-29		
6/7/2016		
Sample Depth	2	9
Benzene	<0.0046	<1
TPH-d	200Y	1,100Y
TPH-g	1.7Y	1,300
TPH-mo	240	1,000

SB-33	
6/7/2016	
Sample Depth	8.5
Benzene	0.81
TPH-d	390Y
TPH-g	1,100
TPH-mo	130

SB-24	
6/6/2016	
Sample Depth	10
Benzene	32
TPH-d	5,000Y
TPH-g	14,000
TPH-mo	920

SB-11		
6/2/2016		
Sample Depth	5.5	8
Benzene	<0.026	0.44
TPH-d	540	2,000
TPH-g	220Y	1,800Y
TPH-mo	<25	260

SB-03		
6/1/2016		
Sample Depth	2	6
Benzene	<0.0048	<0.05
TPH-d	15Y	3,000
TPH-g	<0.95	220Y
TPH-mo	41	<250

SB-06	
6/1/2016	
Sample Depth	6.5
Benzene	<0.047
TPH-d	1,200
TPH-g	150Y
TPH-mo	81

SB-04	
6/1/2016	
Sample Depth	8
Benzene	0.06
TPH-d	610
TPH-g	180Y
TPH-mo	120

SB-07	
6/2/2016	
Sample Depth	8.5
Benzene	2.2
TPH-d	29,000
TPH-g	3,400
TPH-mo	3,000

SB-08	
6/2/2016	
Sample Depth	7
Benzene	0.96
TPH-d	13,000Y
TPH-g	15,000Y
TPH-mo	2,500

SB-41	
6/9/2016	
Sample Depth	12.5
Benzene	<0.5
TPH-d	6,900
TPH-g	33,000Y
TPH-mo	790

SB-34		
6/8/2016		
Sample Depth	12.5	2
Benzene	5.5	<0.0049
TPH-d	2,500	9.7Y
TPH-g	3,800Y	<1
TPH-mo	2,900	66

SB-23		
6/6/2016		
Sample Depth	10	2
Benzene	12	<0.0049
TPH-d	2,500Y	7.9Y
TPH-g	10,000	<1
TPH-mo	200	40

SB-10		
6/2/2016		
Sample Depth	12.5	2
Benzene	0.22	<0.0047
TPH-d	420Y	10Y
TPH-g	55	<1.1
TPH-mo	1,300	91

SB-09	
6/2/2016	
Sample Depth	11
Benzene	0.029
TPH-d	700Y
TPH-g	420Y
TPH-mo	660

SB-40	
6/9/2016	
Sample Depth	9
Benzene	0.52
TPH-d	950
TPH-g	9,800
TPH-mo	440

SB-28	
6/7/2016	
Sample Depth	9
Benzene	0.12
TPH-d	200Y
TPH-g	23
TPH-mo	120

SB-36	
6/8/2016	
Sample Depth	8.5
Benzene	0.0056
TPH-d	410
TPH-g	40
TPH-mo	190

Legend

- Boring log indicated presence of LNAPL

Sample Locations

- 2016 Data Gap Sample Location (Arcadis)
- Monitoring Well Location
- Remediation Well Location

Soil Results (mg/kg)

- Benzene detected above the Reporting Limit
- TPH and/or Benzene Exceeds ESL (direct exposure CI)

Notes:
mg/kg = micrograms per kilogram
Depths are presented in feet below ground surface
TPH-d = TPH as Diesel; TPH-g = TPH as Gasoline; TPH-mo = TPH as Motor Oil
< = analyte not detected above laboratory reporting limit

Concentrations which exceed the SFRWQCB Commercial-Industrial Shallow Exposure ESL are highlighted gray
SFRWQCB - San Francisco Regional Water Quality Control Board
All Screening Critieria are revision #3, May 2016

Notes: Aerial imagery source - NAIP June 2014.

0 50 100 150 200 Feet

1 inch = 104 feet

N

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terraphase engineering

CLIENT: Municipal Service Center

PROJECT: 7101 Edgewater Drive, Oakland CA

PROJECT NUMBER: 0064.007.001

Data Gap Investigation: Exceedances in Soil

FIGURE 3

File: K:\GIS\Prj\0064.007 Oakland Municipal Service Center\MXDs\Soil Exceedances 0064-007-001.mxd 9/1/2017 Created by: JL Checked by: AR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

SB-45	
6/9/2016	
Benzene	0.5
TPH-d	1,200
TPH-g	5,600Y
TPH-mo	420

RW-D2	
Feb 2015	
Benzene	500
TPH-d	1,000
TPH-g	2,300
TPH-mo	640

RW-D1	
Feb 2015	
Benzene	1000
TPH-d	2,200 Y
TPH-g	7,800
TPH-mo	<300

SB-38	
6/8/2016	
Benzene	<1
TPH-d	3,500Y
TPH-g	8,300Y
TPH-mo	<400

SB-27	
6/7/2016	
Benzene	15
TPH-d	150Y
TPH-g	360
TPH-mo	370

SB-46	
6/9/2016	
Benzene	<0.5
TPH-d	97,000
TPH-g	7,400Y
TPH-mo	10,000

RW-D7	
Feb 2015	
Benzene	940
TPH-d	130 Y
TPH-g	480
TPH-mo	<300

RW-C2	
Feb 2015	
Benzene	110
TPH-d	600
TPH-g	530
TPH-mo	<300

SB-25	
6/6/2016	
Benzene	120
TPH-d	<50
TPH-g	680
TPH-mo	<300

SB-22	
6/6/2016	
Benzene	<10
TPH-d	6,300Y
TPH-g	3,000,000
TPH-mo	830

SB-24	
6/6/2016	
Benzene	3,000
TPH-d	2,700Y
TPH-g	29,000
TPH-mo	<350

OB-D1	
Feb 2015	
Benzene	230
TPH-d	2,800
TPH-g	360
TPH-mo	1,800

OB-D2	
Feb 2015	
Benzene	520
TPH-d	330 Y
TPH-g	1,000
TPH-mo	<300

SB-40	
6/9/2016	
Benzene	1,400
TPH-d	34,000
TPH-g	20,000
TPH-mo	11,000

SB-28	
6/7/2016	
Benzene	6,700
TPH-d	27,000
TPH-g	220,000
TPH-mo	23,000

SB-23	
6/6/2016	
Benzene	1,600
TPH-d	1,300Y
TPH-g	37,000
TPH-mo	<300

Legend

Comment

- Monitoring Well Location
- Remediation Well Location
- 2016 Data Gap Sample Location (Arcadis)

Groundwater Results (µg/L)

- No Exceedances
- TPH and/or Benzene Exceeds ESL (Ecotox Non-Drinking Water and/or VI Shallow GW for Commercial-Industrial)

Notes:
µg/L= micrograms per Liter
TPH-d = TPH as Diesel; TPH-g = TPH as Gasoline; TPH-mo = TPH as Motor Oil
< = analyte not detected above laboratory reporting limit

Concentrations which exceed the SFRWQCB GW Saltwater Ecotox are red font
Concentrations which exceed the SFRWQCB GW VI Shallow for Commercial-Industrial are highlighted gray
SFRWQCB - San Francisco Regional Water Quality Control Board
All Screening Critieria are revision #3, May 2016

Notes: Aerial imagery source - NAIP June 2014.

0 50 100 150 200 Feet

1 inch = 104 feet

N

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CLIENT: Municipal Service Center

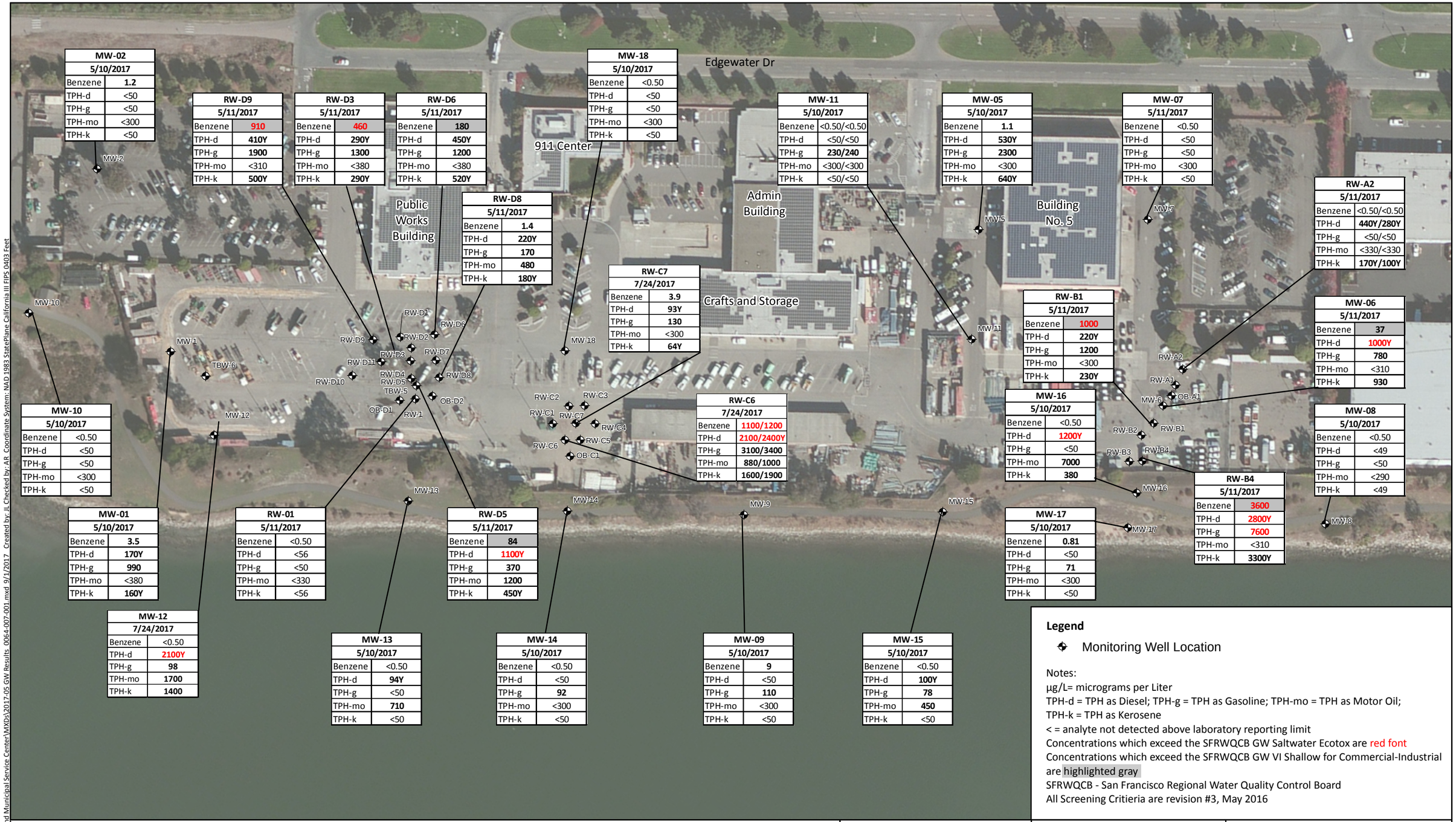
PROJECT: 7101 Edgewater Drive, Oakland CA

PROJECT NUMBER: 0064.007.001

Data Gap Investigation: Exceedances in Groundwater

FIGURE 4

File: K:\GIS\Prj\0064.007 Oakland Municipal Service Center\MXDs\GW Exceedances 0064-007-001.mxd 9/1/2017 Created by: JL Checked by: AR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet



Legend

Monitoring Well Location

Notes:
µg/L= micrograms per Liter
TPH-d = TPH as Diesel; TPH-g = TPH as Gasoline; TPH-mo = TPH as Motor Oil;
TPH-k = TPH as Kerosene
< = analyte not detected above laboratory reporting limit
Concentrations which exceed the SFRWQCB GW Saltwater Ecotox are red font
Concentrations which exceed the SFRWQCB GW VI Shallow for Commercial-Industrial are highlighted gray
SFRWQCB - San Francisco Regional Water Quality Control Board
All Screening Critieria are revision #3, May 2016

Notes: Aerial imagery source - NAIP June 2014.

0 125 250 375 Feet

1 inch = 125 feet

N

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CLIENT: Municipal Service Center

PROJECT: 7101 Edgewater Drive, Oakland CA

PROJECT NUMBER: 0064.007.001

May and June 2017 Groundwater Sampling Results

FIGURE 5

File: K:\GIS\Prj\0064.007 Oakland Municipal Service Center\MXDs\2017-05 GW Results 0064-007-001.mxd 9/1/2017 Created by: JL Checked by: AR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Legend

- Proposed MIP & Grab Groundwater Sample Location
- Proposed UVOST
- Grab Groundwater Sample Location
- Data Gap Sample Location (Arcadis 2016)
- Soil Gas Well Location (Terraphase 2017)
- Monitoring Well Location
- Fence
- Building

Notes: Aerial imagery source - NAIP June 2014.

0 75 150 225 300 Feet

1 inch = 150 feet

N

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CLIENT: Municipal Service Center

PROJECT: 7101 Edgewater Drive, Oakland CA

PROJECT NUMBER: 0064.007.001

Proposed MIP, UVOST and Groundwater Boring Locations

FIGURE 6

File: K:\GIS\Prj\0064.007 Oakland Municipal Service Center\MXDs\Fig. 3_MIP_Phases_0064-007-001.mxd 9/7/2017 Created by: JL Checked by: AB Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

APPENDICES

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP) FOR
HAZARDOUS MATERIALS RELEASES
1131 HARBOR BAY
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

July 19, 2017

City of Oakland Public Works
Attn.: Mark Arniola
250 Frank H. Ogawa Plaza, Suite 4314
Oakland, CA 94612
(*Sent via electronic mail to marniola@oaklandnet.com*)

Subject: Conditional Work Plan Approval; Fuel Leak Case No. RO0000293 and GeoTracker Global ID T0600100375, City of Oakland Municipal Service Center, 7101 Edgewater Drive, Oakland, CA 94612

Dear Mr. Arniola:

Thank you for the recent submittal of the document entitled *Work Plan for Soil Gas Investigation* (Work Plan), dated June 15, 2017 and prepared by Terraphase Engineering Inc. (Terraphase) for the subject case. Alameda County Department of Environmental Health (ACDEH) staff has reviewed the case file including the aforementioned document. The Work Plan was prepared at the request of ACDEH in our meeting with you and Kayleigh Lim of the City of Oakland, Diane Heinze of the Port of Oakland, and Andrew Romolo and Anna Behrens of Terraphase on May 31, 2017 and in our letter of the same date.

In our letter of May 31, 2017, ACDEH requested the following items:

A. Electronic submittal of information;

B. Groundwater monitoring; and

C. Work plan submittals in a phased approach for:

i. Soil vapor and groundwater investigation;

ii. MIP-UVOST investigation; and

iii. Soil and groundwater investigation.

Terraphase has submitted the Work Plan which addresses Item B and Item C. To address Item C(i) above, Terraphase is proposing to install 13 permanent soil vapor probes advanced to a depth of three feet below the ground surface (bgs) around the outer perimeter of buildings at the site. As stated, the proposed work will be performed in accordance with the DTSC guidance document entitled *Active Soil Gas Advisory* (2011). Terraphase proposes to analyze the soil vapor samples for total petroleum hydrocarbons as gasoline (TPHg); benzene, toluene, ethylbenzene, and xylenes (collectively BTEX); and naphthalene; the fixed gases, methane, and helium. Due to shallow groundwater at the site, Terraphase has alternatively proposed the installation of soil vapor pins for the collection of sub-slab soil vapor should groundwater interfere with the collection of the soil vapor samples from the permanent soil vapor probes.

Seven groundwater monitoring wells were found to inaccessible during the May 2017 groundwater monitoring event due to material stored over the well cover or by the well cover having been cemented. In addressing Item B, Terraphase proposes to gain access to these wells and include them in the next groundwater monitoring event.

ACDEH generally concurs with the proposed scope of work. The proposed work scope may be implemented provided that the modifications requested in the technical comments below are addressed and incorporated during the field implementation. ACDEH requests submittal of the technical reports described below.

TECHNICAL COMMENTS

1. **Electronic Submittal of Information** – Since our meeting of May 31, 2017, two submittals have been made to the State Water Resources Control Board's (SWRCBs) GeoTracker website- a laboratory analysis data file (as an EDF) for a May 11, 2017 groundwater monitoring event, and the subject Work Plan (as a GEO_REPORT). Hence, the case remains out of compliance with state regulations. ACDEH requests a review of the GeoTracker case file and submittal of missing documentation to bring the case into compliance. Please provide ACDEH, Attention Keith Nowell, with a list of the documents submitted to GeoTracker by the date specified below.

2. **Well Access** – Once made accessible, ACDEH requests an evaluation of the condition of each 'inaccessible' well be performed to determine if the well has been damaged or sufficiently compromised, requiring redevelopment, rehabilitation or replacement.

3. **Guidance Document** – ACDEH requests the soil vapor study be performed in accordance with the more recent July 2015 guidance document entitled *Advisory- Active Soil Gas Investigations* (Advisory) prepared by California Environmental Protection Agency/ Department of Toxic Substances Control (Cal EPA / DTSC), and the Regional Water Quality Control Boards of the Los Angeles (LARWQCB) and San Francisco (SFRWQCB) regions.

4. **Naphthalene Analysis** – In accordance with the Advisory, ACDEH requests naphthalene concentrations be confirmed by test method TO-17 for at least three (3) of the soil vapor samples.

5. **Contingency Sampling** – ACDEH is in general concurrence with the installation of soil vapor pins should elevated groundwater conditions prevent collection of soil vapor samples. ACDEH requests submittal of a revised work plan depicting the proposed locations of the soil vapor pins if the pins are to be installed.

6. **Data Review** – Following collection of the soil vapor data, ACDEH requests submittal of the laboratory analysis report to ACDEH, Attention: Keith Nowell, as an electronic mail attachment and to the SWRCBs GeoTracker website by the date specified below.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACDEH FTP site (Attention: Keith Nowell), and to the SWRCBs GeoTracker website, in accordance with the following specified file naming convention and schedule:

- **August 17, 2017 – Electronic Submittal of Information**- List of documents submitted to GeoTracker (provided to ACDEH, Attention Keith Nowell, via electronic mail)

- **September 18, 2017 – Electronic Submittal of Information**- Soil Vapor Laboratory Analysis Report

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

Thank you for your cooperation. ACDEH looks forward to working with you and your consultants to advance the case toward closure. Should you have any questions regarding this correspondence or your case, please call me at (510) 567-6764 or send an electronic mail message at keith.nowell@acgov.org.

Sincerely,

Keith Nowell

Digitally signed by Keith Nowell
DN: cn=Keith Nowell, o=Alameda County, ou=Department of Environmental Health, email=keith.nowell@acgov.org, c=US
Date: 2017.07.19 10:53:28 -07'00'

Keith Nowell PG, CHG
Hazardous Materials Specialist

Enclosures: Attachment 1 – Responsible Party (ies) Legal Requirements / Obligations
Electronic Report Upload FTP) Instructions

cc: Kayleigh Lim, Environmental Program Specialist, Oakland Public Works, 250 Frank Ogawa Plaza, Suite 5301, Oakland CA 94612 (*Sent via electronic mail to:* klim@oaklandnet.com)

Andrew Romolo, Terraphase Engineering Inc., 1404 Franklin Street, Suite 600, Oakland, California 94612 (*Sent via electronic mail to*: andrew.romolo@terraphase.com)

Anna Behrens, Terraphase Engineering Inc., 1404 Franklin Street, Suite 600, Oakland, California 94612 (*Sent via electronic mail to: anna.behrens@terraphase.com*)

Diane Heinze, Port of Oakland, 530 Water Street, Oakland, CA 94604-2064 (*Sent via electronic mail to: dheinze@portoakland.com*)

Dilan Roe, ACDEH (*Sent via electronic mail to: dilan.roe@acgov.org*)
Paresh Khatri, ACDEH (*Sent via electronic mail to:paresh.khatri@acgov.org*)
Keith Nowell, ACDEH (*Sent via electronic mail to:* keith.nowell@acgov.org)
GeoTracker / File

Attachment 1

Responsible Party(ies) Legal Requirements / Obligations

REPORT REQUESTS

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

Alameda County Department of Environmental Health's (ACDEH) Environmental Cleanup Oversight Programs, Local Oversight Program (LOP) and Site Cleanup Program (SCP) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program File Transfer Protocol (FTP) site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to SCP sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/) for more information on these requirements.

ACKNOWLEDGEMENT STATEMENT

All work plans, technical reports, or technical documents submitted to ACDEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6731, 6735, and 7835) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately licensed or certified professional. For your submittal to be considered a valid technical report, you are to present site-specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this case meet this requirement. Additional information is available on the Board of Professional Engineers, Land Surveyors, and Geologists website at: http://www.bpelsg.ca.gov/laws/index.shtml.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, late reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** December 1, 2016
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010, July 25, 2010; May 15, 2014, November 29, 2016
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (LOP and SCP) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single portable document format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and acknowledgement and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to deh.loptoxic@acgov.org.
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Open File Explorer using the Windows  key + E keyboard shortcut.
      i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) On the address bar, type in ftp://alcoftp1.acgov.org.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive)
   d) Click Log On.
   e) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   f) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

From:	Nowell, Keith, Env. Health
To:	Mark Arniola Oakland (marniola@oaklandnet.com)
Cc:	"Lim, Kayleigh"; Andrew Romolo; Anna Behrens; "dheinze@portoakland.com"; Roe, Dilan, Env. Health
Subject:	RO293- City of Oakland Municipal Service Center, 7101 Edgewater Drive, GeoTracker Global ID T0600100375
Date:	Wednesday, May 31, 2017 4:15:55 PM
Attachments:	Attachment_1_and_ftpUploadInstructions_2016-12-15.pdf

Mark,

Thank you and Kayleigh Lim of the City of Oakland, Diane Heinze of the Port of Oakland, and Andrew Romolo and Anna Behrens of Terraphase for participating in the meeting with Alameda County Department of Environmental Health (ACDEH) staff today regarding the subject fuel leak case. The purpose of the meeting was facilitate a discussion regarding the status of work and a path forward to address data gaps identified for the site.

Electronic Submittal of Information-

One item noted for the case was the status of file submittals to the State Water Resources Control Board's GeoTracker website. Of particular note was the many documents associated with report submittals, e.g. EDFs, GEO_WELL, GEO_XY, GEO_Z, and GEO_BORES, are missing from the website. ACDEH requests a review of the county FTP and GeoTracker databases and upload documents that have not been submitted. Please complete your review and submittals by the date specified below. Please see Attachment 1 for submittal instructions.

Request for Work Plans-

As discussed at the meeting, please prepare a work plan for a soil vapor (SV) investigation and additional sampling of groundwater (GW) monitoring wells not accessible during the most recent montoring event. Please include selected groundwater samples to be anayzed for total extractible petroleum hydrocarbons (TEPH) using both with and without silica gel cleanup. Terraphase staff requested the use of low-flow sampling techniques for the additional groundwater sampling. ACDEH concurred with the request. Due to potentially elevated groundwater levels, include a contingency for the use of soil vapor pins (SVP) for evaluating sub-slab vapor conditions. ACDEH requests the soil vapor sampling methodologies include the installation of permenant sampling points and the inclusion of methane and oxygen in the scope of soil vapor analysis. Please submit the SV/SVP- GW work plan by the date specified below. Following ACDEH's review and approval, we request data collected for the investigation be provided via electronic mail for review and discussion of the findings.

Additional delineation of contaminant distribution was proposed using MIP and UVOST technologies. ACDEH requests work plan preparation and submittal for this phase of site characterization. The work plan should propose a fourth quarter (October) 2017 additional round of groundwater monitoring and an additional soil vapor sampling event. Please submit the MIP-UVOST work plan by the date specified below. Following ACDEH's review and approval, we request data collected for the investigation be provided via electronic mail for discussion of the findings at a meeting to be scheduled in mid-February.

Report Submittal-
Please submit the soil, groundwater, and soil vapor investigation report, including data collected in the two work plans referenced above, by the date specified below.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACDEH FTP site (Attention: Keith Nowell), and to the State Water Resources Control Board's GeoTracker website, in accordance with the following specified file naming convention and schedule:

- **June 30, 2017 – Electronic Submittal of Information**

- **June 30, 2017 – SV/SVP- GW Work Plan** (file name: RO0000293_SWI_R_yyyy-mm-dd)
- **August 30, 2017 – MIP-UVOST Work Plan** (file name: RO0000293_SWI_R_yyyy-mm-dd)
- **February 23, 2018– Tentative meeting date**
- **March 30, 2018 – Soil and Groundwater Investigation** (file name: RO0000293_SWI_R_yyyy-mm-dd)

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

Please note that ACDEH has updated it's Attachment 1 with regard to report submittals to ACDEH. ACDEH will now be requiring a Submittal Acknowledgement Statement, replacing the perjury statement, as a cover letter signed by the Responsible Party (RP). The language for the Submittal Acknowledgement Statement is as follows:

"I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website."

Please make this change to your submittals to ACDEH.

Thank you for your cooperation. If you have any questions or concerns regarding this correspondence or your case, please call me at (510) 567-6764 or send me an electronic mail message at *keith.nowell@acgov.org*.

Sincerely,
Keith Nowell, P.G., C.HG.
Hazardous Materials Specialist

Attachment 1- Responsible Party(ies) Legal Requirements/Obligations
ACDEH Electronic Report Upload (ftp) Instructions