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Alameda County Environmental Health Paulette Satterley 14601 Guadalupe Dr. Rancho Murieta, Ca 95683 Telephone 916-768-2003

January 25, 2010

Ms. Barbara Jakub Alameda County Environmental Health Services 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502

Re: Fuel Leak Case No: RO0000133

Enclosed please find the Additional Site Investigation Work Plan dated January 22, 2010 for the former City of Paris Cleaners site located at 3516 Adeline Street, Oakland, CA 94608. This work plan was prepared by Taber Consultants of West Sacramento, California.

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

Sincerely,

Paulette Satterley

Paulette Satterley

ADDITIONAL SITE INVESTIGATION WORK PLAN

Former City of Paris Cleaners 3516 Adeline Street Oakland, California 94608

USTCF Claim #002192

Prepared For:

Ms. Paulette Satterley 14601 Guadalupe Drive Rancho Murieta, CA 95683

Prepared By:

Taber Consultants 3911 West Capitol Avenue West Sacramento, CA 95691

January 22, 2010



www.taberconsultants.com

Project No. 051074

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1.0 INTRODUCTION

1.1 **Project Description**

On behalf of the responsible party, Taber Consultants (Taber) has prepared this Additional Site *Investigation Work Plan* for submittal to the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and Alameda County Health Care Services Agency (ACHSA). The scope of work conducted during this project complies with existing SRWQCB and ACHSA directive letters.

1.2 Site Location and Description

The former City of Paris Cleaners, located at 3516 Adeline St., Oakland, CA, is a former dry cleaning, laundry and dyeing operation currently owned by Mrs. Debra Runyon. The facility operated as City of Paris Cleaners and Dyers for about 40 years until the 1960's, but cleaning materials and tanks were not completely removed from the site until 1992. The site buildings remained vacant for a number of years following the closure of the dry cleaning operation, and then the owner converted them to residential and light commercial use.

The site lies at the southern corner of the intersection of 35th Street and Adeline Street at approximately 30 feet above mean sea level (amsl) in the northwest portion of the City of Oakland, California. The site buildings currently house on-site living quarters and City of Paris Studios, a workshop for art, art restoration, collectibles and hobbies. Mrs. Runyon acquired the site in July 2000.

1.3 Chronological Site History and Previous Subsurface Investigations

In 1987, Frank Champion, the owner at that time, applied for permits for remove Stoddard Solvent storage tanks at the site. Mr. Champion applied for five permits, obtaining permission to remove two 1000-gallon tanks, a 500-gallon tank, a 250-gallon tank and a 150-gallon tank. Underground storage tanks at the site were used to store Stoddard Solvent, the dry cleaning solvent used during operation of the dry cleaning facility until the 1960s when the facility was closed.

On October 4, 1990, Semco Company of San Mateo excavated and reported removing one 750-gallon and two 1,000-gallon underground tanks used to store Stoddard Solvent. Six soil samples were collected in conjunction with the UST removal.

On July 31 and August 1 and 2, 1991, Uriah Inc. (UES) performed a soil vapor survey at the site in an attempt to define the approximate boundaries of soil impacted by Stoddard Solvent. Soil vapors were found to be widely distributed across the site, but due to physical impediments posed by site structures, sidewalks, etc., the full extent of the impacted soil was not defined.

UES contracted W.A. Craig to overexcavate the eastern portion of the tank pit on August 30, 1991. Approximately 44 cubic yards were excavated and placed in a cell for on-site bioremediation of the impacted soil. During overexcavation, EUS reports that the contractor discovered an additional 250-gallon UST containing "a small volume of liquid" that was stored in

Additional Site Investigation Work Plan Former City of Paris Cleaners 3516 Adeline Street, Oakland, CA



a 55-gallon drum on site after removing an aliquot for analysis. This UST was removed and disposed by W.A. Craig on October 31, 1991. An additional 15 cubic yards was overexcavated from the tank pit by W.A. Craig on January 27, 1992 and added to the on-site bioremediation cell.

No additional soils were excavated due to safety concerns regarding building foundation integrity, however soil samples were collected from the tank pit side walls. On March 31, 1992, composite samples of the on-site bioremediated soil were analyzed to verify that sufficient hydrocarbon degradation had occurred so that the soil could be reused as fill on the site. ACHCSA approved use of the bioremediated soil as backfill, and W. A. Craig backfilled the tank pit with bioremediated soil and clean fill on April 21, 1992.

On October 29 and 30, 1992, UES supervised on-site installation of ground water monitoring wells. Soils Exploration Services of Vacaville, California, installed three 30-foot monitoring wells. Initial depth to groundwater measurements in the wells ranged from 13 to 14 feet below grade. Beginning November 18, 1992, groundwater samples were analyzed for Total Petroleum Hydrocarbons (as Stoddard Solvent, TPH-SS), Total Petroleum Hydrocarbons (as diesel, TPH-D), Total Petroleum Hydrocarbons (as gasoline, TPH-G), methyl tertiary butyl ether (MtBE), benzene, toluene, ethylbenzene and total xylenes (BTEX). Samples from all three monitoring wells contained TPH-SS ranging from 630 parts per billion (ppb) in MW-2 to 11,000 ppb in MW-3. TPH-D, TPH-G, MtBE and BTEX concentrations were below laboratory detection limits.

On March 19, 1998, Dugan Associates of San Jose, California (Dugan) advanced six on and off-site soil borings to a total depth of 18 feet below grade. Five of the soil borings were advanced on the north side of 35th Street in the projected downgradient direction from the site (EB-2 through EB-6). One soil boring was advanced on-site to the northwest of the former UST location (EB-1). At each soil boring, Dugan collected a soil sample at 5, 10 and 15 feet below grade and one grab-groundwater sample at 18 feet below grade . The on-site soil boring (EB-1) groundwater sample concentration was 270,000 ppb TPH-SS, with one off-site groundwater sample (EB-5) reporting 780 ppb TPH-SS. Concentrations of analytes for all other groundwater samples from the soil borings were below laboratory detection limits. Soil samples at EB-1 contained 310 and 340 ppb of TPH-SS at 10 and 15 ft. below grade, respectively, and trace amounts of total xylenes and/or toluene.

In September, 1999, ACHSA issued a directive letter which required groundwater analysis for semivolatile organics (SVOCs) and volatile organics (VOCs) historically associated with dry cleaning operations. In December 1999, using EPA method 625 and 3510, or 8270 and 3550, 1,2-dichlorobenzene (DCB), 1,1-dichloroethane (1,1 DCA), 2-methylnaphthalene and naphthalene were detected in samples from one or more wells. Concentrations of other SVOC and VOC analytes were below laboratory detection limits, including denser than aqueous phase liquids (DNAPLs, i.e. pentachlorophenol (PCP)). At that time Dugan defined a north-trending groundwater gradient at 0.003 ft./ft.

In their September, 1999 letter, the ACHSA also noted that according to a database search they believed a 97-foot industrial well had been drilled at the site. The well was located southeast of Monitoring Well 3 (Figure 2).

In March 2002, in compliance with an ACHSA directive letter, WellTest, Inc. (formerly Dugan and Associates) redeveloped the three monitoring wells (by purging 10 well-volumes) and

Additional Site Investigation Work Plan Former City of Paris Cleaners 3516 Adeline Street, Oakland, CA



sampled the three wells pursuant to quarterly monitoring responsibilities. WellTest, Inc. also sampled the industrial well on-site. The analytical results of the sampling indicated up to 11,000 μ g/L of TPH-SS in the sample from MW-1, no BTEX above laboratory detection limits, up to 31 μ g/L MtBE in the sample from MW-3, 0.61 μ g/L DCB in the sample from MW-1, and 130 ug/l Naphthalene in MW-1. The groundwater gradient was also defined to the southeast at 0.14 ft./ft., which appears to be an anomalously steep gradient for this site. This steep gradient may be a result of sediment blocking some or all of the screened section of one or more well. When Dugan redeveloped the wells in 2002, they appear to have adversely impacted the ability of the wells to adjust to changing water levels.

Taber Consultants (Taber), formerly Western Resource Management (WRM), assumed environmental consulting responsibilities for the site commencing in June 2007. Taber performed groundwater monitoring at the site for the first and second semiannual periods of 2009. In response to a query by ACHSA, Taber submitted a well completion report request to the California Department of Water Resources, in which undated well boring logs for a well at the City of Paris Cleaners, at 3516 Adeline Street, indicated a 97-foot industrial well on the site. Taber also found well drilling information for another industrial well drilled in 1927 for the City of Paris Cleaners, drilled to 295 feet. The location of this well is unknown, and the well could have been covered by buildings constructed after the well was taken out of service.

July 28, 2009, ACHCSA advised Responsible Parties that The California State Water Resources Control Board (State Water Board) had approved Resolution No. 2009-0042, which reduced quarterly groundwater monitoring requirements to semiannual or less frequent monitoring at all sites. In 2009, Taber reduced monitoring at the City of Paris Cleaners site to two semiannual monitoring events at the site in February and August. Corresponding reports were the First Semiannual and Second Semiannual Monitoring Reports



2.0 PURPOSE

This Additional Site Investigation Workplan is in response to ACHSA's March 10, 2009, letter regarding further site investigation and tasks at the City of Paris Cleaners site. ACHSA requested Taber perform the additional work and provide technical information that will refine estimated plume boundaries, provide information about groundwater flow in the area, better define hydrocarbon characteristics at the site and improve understanding of the site hydrogeology for the Site Conceptual Model.

Taber has divided the action items into logical categories for discussion and planning in this *Continuing Site Investigation Work Plan* as follows: Current Site Investigation Status, Site Conceptual Model (SCM), and Reports.



3.0 CURRENT SITE INVESTIGATION STATUS

In 1987, Frank Champion, owner of City of Paris Cleaning and Dyeing, obtained permits to remove underground storage tanks at the site. Subsurface and groundwater investigation at the site in the following 20 years has consisted of soil sampling of excavated materials during tank excavation (October 1990), pit sidewalls (January 1992) and soil borings (March 1998), Photo Ionisation Detector (PID) sampling (August 1991), and groundwater sampling of monitoring wells and the shallow industrial well (since 1992). Tables 1 – 3 summarize soil, groundwater and PID data. Upon approval of this *Additional Site Investigation Work Plan*, Taber will use this historical data in conjunction with new site data to prepare the Site Conceptual Model.

In addition to a number of issues ACHSA raised in their March 10, 2009 letter, that have been incorporated into and discussed in the proposed work below, Taber believes the following issues have been resolved satisfactorily:

• Identify presence of other dry cleaning solvents, if any.

In September, 1999, ACHSA issued a directive letter which required groundwater analysis for semi-volatile organics (SVOCs) and volatile organics (VOCs) historically associated with dry cleaning operations. In December 1999, Dugan used EPA method 625 and 3510, or 8270 and 3550, to detect 1,2-dichlorobenzene (DCB), 1,1-dichloroethane (1,1 DCA), 2-methylnaphthalene and naphthalene in one or more wells. Concentrations of other SVOC and VOC analytes were below laboratory detection limits, including denser than aqueous phase liquids (DNAPLs, i.e. pentachlorophenol (PCP)). At that time Dugan defined a north-trending groundwater gradient at 0.003 ft./ft.

• Discuss no-purge Hydrasleeve sampling results and compare with purge sampling results, compare no-purge protocol to purge protocol and resulting monitoring impacts.

Please see the *Second Semiannual Monitoring Report 2009* submitted by Taber in November, 2009 for discussion of HydraSleeve[®] no-purge protocol and comparison of no-purge to purge results observed during August 11, 2009, groundwater monitoring of the site.



4.0 SITE CONCEPTUAL MODEL

4.1 Source Area Evaluation

The hydrocarbons at the site result from leaking underground storage tanks for Stoddard Solvent (TPH-SS) used by the City of Paris Cleaners operation. Although the tanks have been removed, TPH-SS still impacts soil and groundwater at the site. Relatively minor concentrations of BTEX occur at the site, likely as a result of the mixed carbon length character of TPH-SS and degradation processes. Although samples have tested positive for TPH-G, the occurrence of TPH-G concentrations in groundwater has strongly mirrored TPH-SS concentrations, whereas a separate release of TPH-G should produce a distinct pattern of detections (see Figures 4A, 5A and 6A). The additional site investigation proposed below will be used to determine the lateral and vertical extent of the plume in order to produce refined estimates of the TPH-SS mass remaining and enable Taber to characterize groundwater flow at the site.

4.2 Fate and Transport Analysis

4.2.1 Geology

The City of Paris site is located in older alluvium of Quaternary deposits in the San Francisco Basin (Jennings, 1994). At the edge of the Alameda Formation, the depositional units in the North Oakland of the San Francisco Basin are filled with an alternating sequence of marine and continental units (S. Figuers, 1999). Generally, the area in North Oakland lies along the divide of the former colluvial table lands that filled with continental and marine sediments as the depocenters filled (S. Figuers, 1999). Overlying the Yerba Buena Mud are lenses of shallow groundwater-bearing gravel and sand units and below the Yerba Buena Mud are deeper groundwater-bearing units (San Francisco Bay Regional Water Quality Control Board, June 1999). Franciscan basement bedrock underlies the upper alluvial strata, composed of metamorphic, sedimentary and igneous rocks of Jurassic and Cretaceous periods.

4.2.2 Hydrogeology

City of Paris hydrogeology is complex, with characteristic alluvial morphology of interbedded strata of sandy gravel, clayey sand and sandy clays described in the site wells' drill logs. The shallow industrial well log (undated, appears to correspond to a well shown in the 1912 Sanborn map) shows predominant clay layers from 37 to 97 feet, a feature which is echoed in the deep 1927 industrial well log noting a yellow clay zone from 70 to 120 feet. While both older well logs indicate "black adobe" or top soil in the upper surface layer, the monitoring wells drill logs from 1992 note sandy gravel for the first 10 feet, suggesting later use of fill material at the site after 1927. Based on the 1992 monitoring well drilling logs, water bearing strata appear to range from 20 feet to 30 feet bgs.



4.2.3 Plume Characteristics

Between 1992 and 2009, highest groundwater sample concentrations appear to trend along a north-south axis between MW1 and MW3, with lower sample concentrations in MW2 and W-IND. A groundwater grab sample taken at 18 feet during the 1998 soil boring activities had a TPH-SS concentration of 750 μ g/l, north and east of MW1. See Figure 2 for monitoring well locations. Additional site investigation is necessary to fully characterize the lateral extent of the plume.

	addit rang root	2 20001		
Monitoring Well	10-100 μg/l	100-1,000 μg/l	1,000-10,000 μg/l	10,000-100,000 μg/l
MW1	-	4	8	9
MW2	1	11	5	
MW3	1	3	12	3
W-IND		2		

TPH-SS Concentration Tally 1992-2009.

4.3 Potential Pathway Analysis

4.3.1 <u>Utility Corridors</u>

Utilities corridors include water service, storm line drain, sanitary sewer line, gas main, and others. After approval of this *Additional Site Investigation Workplan* underground utilities will be surveyed using an Underground Alert Service prior to drilling, and information obtained will be used to update preferential flow analysis in the Site Conceptual Model.

4.3.2 Product Piping

No product piping has been observed at the site.

4.3.3 Geologic Pathways

Taber has observed water bearing sand/gravel zones (5-10 feet thick) at the site which may serve as geologic pathways of transmission for TPH-SS. However, groundwater gradient information is questionable due to the need to resurvey the wells on site (addressed in Section 5.3.4 below). Additional soil probe work and well surveying at the site will add significant detail to Taber's understanding of the geologic pathways.

4.4 Potential Exposure Analysis

4.4.1 Basin Groundwater Plan

The 1999 *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* designates shallow groundwater less than 300 feet as Zone B - groundwater that is unlikely to be used as a drinking water resource.

4.4.2 <u>Sensitive Receptors</u>

Upon approval of this *Additional Site Investigation Workplan*, Taber will complete a Sensitive Receptor Report as described in Section 5.5 below.



References:

Environmental Data Resources, Inc., Certified Sanborn Map Report, November 23, 2009.

Figuers, Sands, Groundwater Study and Water Supply History of the East Bay Plain, Alameda and Contra Costa Counties, CA, 1998.

Jennings, Charles, Geology Map of California, Division of Mines and Geology, State of California, 1994.

East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, June 1999.



5.0 SCOPE OF WORK

The scope of work required to discern the boundaries of vertical and lateral impacts to soil and groundwater at the City of Paris includes the installation and sampling of five (5) soil borings. As a contingency, three (3) of the borings may be converted to additional groundwater monitoring wells if impacted groundwater is encountered during the advancement of the soil borings. The following discussion details the activities necessary to fulfill the proposed scope of work for the subject site:

5.1 Project Planning and Permitting

Taber will obtain the required boring permits and work plan approval from Alameda County Public Works. Underground Service Alert (USA) will be notified a minimum of 48 hours prior to the installation of the soil borings to locate any utilities in the vicinity of the planned boring locations. As a further precaution against encountering underground utilities during drilling, the upper five feet of all borings will be augered by hand.

Prior to initiating fieldwork, a site-specific health and safety plan (HASP) will be prepared according to 29 CFR 1910.120. The HASP will include safety procedures for work to be performed, chemical hazard information, site safety officers, and a medical emergency location. The HASP will be kept on site at all times during the site investigation work.

5.2 Soil Boring Installation

A subsurface investigation consisting of five (5) soil borings drilled using hollow stem auger drilling techniques is proposed to define the vertical and lateral extent of impacted soil and groundwater at the site. Based on the results of soil sampling conducted during excavation activities, vapor testing and previous soil borings, the proposed soil borings will be down gradient of the current monitoring well locations, to the northeast, north, northwest of the former tank pit to investigate the extent of groundwater impacts and determine plume boundaries north and northeast of the site. Proposed boring locations are shown on Figure 7. In the event that underground utilities are located at the proposed boreholes, Taber will reposition the soil boring so that the utility is not affected but close enough to the original location to accomplish the boring objective.

Soil samples from the borings will be screened for organic vapors with a photoionization detector (PID) to determine the extent of petroleum hydrocarbon impacts. Soil borings will be drilled to 30 feet below ground surface (bgs). However, where field techniques indicate petroleum hydrocarbon groundwater impacts, the borings will be converted to groundwater monitoring wells.

5.2.1 Soil Sampling and Analysis

During the advancement of the soil borings, undisturbed soil samples will be collected at 5-foot intervals using a split spoon undisturbed soil samples will be collected at 5-foot intervals using a split spoon sampler and brass sample sleeves. A field geologist will log each of the undisturbed soil samples for hydrogeologic and lithologic characteristics according to the Unified Soil Classification System and screen each sample for organic vapors using a PID. Based on field

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observations and PID measurements, two to three soil samples per boring will be submitted for laboratory analysis. Additional soil samples may be submitted for analysis if required to adequately characterize the site.

The soil samples will be sealed with Teflon@ film and plastic end caps, labeled, packaged in an iced cooler, and transported with chain-of-custody documentation to a state of California-certified hazardous waste testing laboratory for analysis. Each of the soil samples will be analyzed on a standard turn-around time for TPH-G and BTEX by EPA Method 8260B.

5.2.2 Boring Abandonment and Site Restoration

Upon completion, if they have not been converted to groundwater monitoring wells, the soil borings will be sealed with neat cement grout for their entire depth in accordance with State of California and Lake County regulations. The surface will be restored to its pre-drilling configuration.

5.2.3 Groundwater Monitoring Well Installation (Contingency)

Should field screening methods or laboratory analytical results indicate that groundwater is impacted by petroleum hydrocarbons, the borings will be converted to groundwater monitoring wells.

5.3 Monitoring Well Construction

Groundwater monitoring wells will be constructed with 2-inch diameter, flush threaded, Schedule 40 PVC blank casing and 0.020-inch well screen. The well screen will extend from approximately 5-feet above to 15-feet below the measured static groundwater level (from 10 feet bgs to 30 feet bgs, consistent with existing monitoring wells at the site). The well casing and screen will be set through the augers. Filter pack and seal materials will be tremied into the well annulus through the augers. The well head will be completed within a traffic-rated vault box. A representative well construction diagram is included as Figure 8.

All well construction installation work will be performed in accordance with County regulations, California Code of Regulations, Title 23, Section 2647 and 2648, and the California Department of Water Resources Bulletins 74-81 and 74-90. Drilling and well installation activities will be overseen by a California registered Professional Geologist.

5.3.1 Well Development

Groundwater monitoring wells will be developed using a surge block and/or submersible pump to remove fines and develop the sand pack and nearby aquifer materials. Turbidity will be monitored to check the effectiveness of development.

5.3.2 Groundwater Sampling and Analysis

The newly developed wells will be allowed to equilibrate for a minimum of 48-hours prior to purging for sampling. Prior to purging, depths to groundwater in all wells will be measured to the nearest 0.01-foot. A minimum of three casing volumes of groundwater will then be pumped from each well prior to groundwater sampling. Specific conductance, pH, temperature, and

Additional Site Investigation Work Plan Former City of Paris Cleaners 3516 Adeline Street, Oakland, CA



turbidity will be measured during the purging process. When these parameters have stabilized, the wells will be allowed to recharge and will then be sampled.

Groundwater samples will be collected after the wells have sufficiently recovered to the static groundwater levels, or in the event that the well is pumped dry during purging, when the water level recovers to at least 80% of the original water level. Groundwater samples will be collected using a new disposable bailer, decanted from the bailer into laboratory provided containers appropriate for the analytical method requested and transported in a chilled cooler to a state certified laboratory under proper chain-of-custody documentation.

The soil and groundwater samples will be analyzed by Sparger Technology, Inc. (Sparger), of Rancho Cordova, California, a state certified analytical laboratory (ELAP Certification #1614), in accordance with state guidelines and EPA protocol. The groundwater samples will be analyzed for Total Petroleum Hydrocarbons as Stoddard solvent (TPH-SS) and Total Petroleum Hydrocarbons as gasoline (TPH-G) by EPA Method 8015B, benzene, toluene, ethyl benzene and xylenes (BTEX), and oxygenate methyl tertiary butyl ether (MtBE) by EPA Method 8260B.

5.4 New and Existing Monitoring Well Survey

Following installation of the groundwater monitoring wells, the top-of-casing elevations will be surveyed to the nearest 0.01 vertical foot. The elevations will be tied to an established benchmark to establish vertical datum in relationship to mean sea level. Existing monitoring wells at the site will also be resurveyed.

Latitude and longitude locations of the new groundwater monitoring wells, soil borings, existing monitoring wells and the 97 foot industrial well will be established to using GPS instrumentation capable of achieving a horizontal accuracy of less than one meter.

The 1927 deep-industrial well has not been located within site. It could have been decommissioned and/or buried under buildings that appear on Sanborn maps after the 1950s. Taber will make all reasonable attempts to locate the well or discover its fate using historical information and site observations.

5.5 Video Logging of Monitoring Wells and Industrial Wells

Because of the apparently anomalous gradient between the monitoring wells, and the apparent discrepancy between drilling logs and observed depth for the industrial well, Taber will conduct a video survey of the wells in order to determine the physical state of the existing monitoring wells and the industrial well at the site.

5.6 Sensitive Receptor Survey

In accordance with Section 2654(b)(2), Article 5, Chapter 16, Division 3, Title 23 of the California Code of Regulations, the location of all nearby water supply wells and those within 2,000 feet of the site, as well as surface water sources and other sensitive receptors will be identified and documented in the Site Investigation Report. In addition, the sensitive receptor survey will include data collection of the surrounding population, water quality and use, subsurface soil conditions and hydrology, locations of subsurface utilities and other preferential pathways, climatological conditions, and ecological receptors.



5.7 Site Investigation Report

Taber will prepare a *Site Investigation Report* to document this phase of work at the site and to propose appropriate remediation pilot testing. The report will include Taber's interpretation of information gathered during the investigation; an evaluation of the vertical and lateral extent of impacted soil at the site; an update of the Site Conceptual Model using the Alameda County Site Characterization Matrix approach; detailed descriptions of the methodologies used to collect and analyze the data; analytical results; boring logs; copies of laboratory reports with chain of custody documentation, and conclusions and recommendations. The report will also conform to the Preliminary Investigation and Evaluation Report format documented in *Appendix A – Reports, Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites* (2004).

5.8 Natural Attenuation Analysis

To estimate the time required for residual constituent concentrations present in site groundwater to naturally attenuate to below water quality objectives, and to predict plume migration patterns in the site vicinity, Taber will complete natural attenuation analyses using two modeling software programs. To estimate the concentrations of constituent compounds in groundwater over time, Taber will utilize the RBCA Tier 2 Analyzer, Version 1.2, developed by Waterloo Geologic, and the Dominico Tool included in the RBCA Tool Kit for Chemical Releases, Version 1.3b, developed by Groundwater Services, Inc.

To obtain the required input parameters for these natural attenuation analyses, Taber will utilize the dry bulk density, effective porosity, hydraulic conductivity, fraction of organic carbon (f_{OC}), and total organic carbon analytical results from one soil sample collected as per Section 5.2.1 of this work plan, and the analytical results from a groundwater sample to be collected from MW-1. The sample to be collected from MW-1 will be analyzed for the following electron receptors: manganese, nitrate as nitrogen, sulfate, sulfide, carbon dioxide, ferric iron and methane.



6.0 WASTE MANAGEMENT

Any rinseate and purge water generated by site investigation activities will be placed in DOTapproved 55-gallon drums and labeled accordingly. The drums will be stored at the site pending laboratory analyses and selection of an appropriate disposition. Disposal of the cuttings and water will be completed by Taber. Drill cutting and water disposal is expected to be completed within 60 days of the receipt of the analytical results.



7.0 SCHEDULE

Permitting for the soil borings will commence immediately upon approval of the work plan by Alameda County Public Works. The subsurface investigation is expected to be completed within 90 days of work plan approval, depending upon drill rig availability. The *Site Investigation Report* will be submitted within 90 days of the completion of the site investigation.



8.0 REPORT DISTRIBUTION

Ms. Paulette Satterley 14601 Guadalupe Drive Rancho Murieta, CA 95683

Ms. Barbara Jakub Alameda County Health Care Services Agency 1131 Harbor Parkway, Suite 250 Alameda CA, 94502

Ms. Cherie McCaulou San Francisco Bay Regional Water Quality Control Board 1515 Clay St., Suite 1400 Oakland, CA 94612



9.0 REMARKS AND SIGNATURE

The interpretations and/or conclusions contained in this report represent our professional opinions and are based in part on information supplied by the client. These opinions are based on currently available information and were developed in accordance with currently accepted geologic, hydrogeologic, and engineering practices at this time and for this specific site. Other than this, no warranty is implied or intended.

This report has been prepared solely for the use of Ms. Paulette Satterley. Any reliance on this report by third parties shall be at such parties' sole risk. The work described herein was performed under the direct supervision of the professional geologist, registered with the State of California, whose signature appears below.

We appreciate the opportunity to provide you with geologic, engineering and environmental consulting services and trust this report meets your needs. If you have any questions or concerns, please call us at (916) 371-1690.

Sincerely,

Taber Consultants

Ellen Pyatt, MSc. Project Geologist

) los E BA

Thomas E. Ballard, P.G. #7299 Senior Geologist



TABLES









Figure 4A. MW1 Analytical Concentrations TPH-SS and TPH-G





Log Concentration (ug/I)

Figure 4B. MW1 Analytical Concentrations BTEX





Figure 5A. MW2 Analytical Concentrations TPH-SS and TPH-G



1200 16 D • 14 1000 \mathbf{D} J. 12 12 \mathbf{D} Þ 800 10 Ű Water Level ft bgs Log Concentration (ug/I) 600 8 6 Ж 400 4 200 2 0 0 10/23/1992 10/21/2001 10/20/2007 10/23/1993 10/22/1996 10/22/1999 10/21/2003 10/20/2005 10/19/2008 10/23/1994 10/23/1995 10/22/1997 10/22/1998 10/21/2000 10/21/2002 10/20/2004 10/20/2006 10/19/2009 ж Benzene Toluene ж Ethylbenzene ۲ Xylenes + MtBE -----27----Water Level ×

Figure 5B. MW2 Analytical Concentrations BTEX





Figure 6A. MW3 Analytical Concentrations TPH-SS and TPH-G





Log Concentration (ug/I)

Figure 6B. MW3 Analytical Concentrations BTEX





Proposed Soil Boring/Contingent Monitoring Well

051074 December 24, 2009

Figure No. 7



FIGURES

TABLE 1 SUMMARY SOIL SAMPLE ANALYSES City of Paris Cleaners

3516 Adeline Street, Oakland, California 94608

			Analytical	Summary					
Location							Ethyl		
ID	Date	Comments	TPH-SS	TPH-G	Benzene	Toluene	benzene	Xylenes	MTBE
						— ug/l –			
TE-1	10/4/1990	750 g tank		290	<150	<150	400	5100	
TE-2	10/4/1990	750 g tank		560	<150	<150	<150	11000	
TE-3	10/4/1990	1000 g tank		370	<150	<150	<150	4700	
TE-4	10/4/1990	1000 g tank		1	<3	<3	<3	9	
TE-5	10/4/1990	1000 g tank		170	<30	54	<30	2100	
TE-6	10/4/1990	1000 g tank		1000	<150	<150	<150	19000	
		-							
		Pit Excavation							
N1-9	1/17/1992	Boundaries	14000	15000	<5.0	<5.0	<5.0	<5.0	
		Pit Excavation							
S1-9	1/17/1992	Boundaries	9800	<10	<5.0	<5.0	<5.0	<5.0	
		Pit Excavation							
E1-7	1/17/1992	Boundaries	140000	110000	<5.0	<5.0	<5.0	410	
		Pit Excavation							
W1-9	1/17/1992	Boundaries	47000	55000	<5.0	22	<5.0	16	
EB1-05	3/19/1998	e,j,h,i	ND		ND	ND	ND	ND	ND
EB1-10	3/19/1998	С	310		ND<0.02	0.1	ND<0.02	1.8	ND<0.40
EB1-15	3/19/1998	С	340		ND<0.01	ND<0.04	ND<0.01	1.6	ND<0.2
EB2-05	3/19/1998		ND		ND	ND	ND	ND	ND
EB2-10	3/19/1998		ND		ND	ND	ND	ND	ND
EB2-15	3/19/1998		ND		ND	ND	ND	ND	ND
EB3-05	3/19/1998		ND		ND	ND	ND	ND	ND
EB3-10	3/19/1998		ND		ND	ND	ND	ND	ND
EB3-15	3/19/1998		ND		ND	ND	ND	ND	ND
	2/10/1000								
EB4-05	3/19/1998								
ED4-10	3/19/1990								
ED4-10	3/19/1990		ND		ND	ND	ND	ND	ND
EB5-05	3/19/1998		ND		ЛЛ	ND	ND	סוא	ND
EB5-00	3/19/1998		ND		ND	ND	ND		ND
EB5-15	3/19/1998		ND		ND	ND	ND	ND	ND
200 10	5,10,1000								
EB6-05	3/19/1998		ND		ND	ND	ND	ND	ND
EB6-10	3/19/1998		ND		ND	ND	ND	ND	ND
EB6-15	3/19/1998		ND		ND	ND	ND	ND	ND

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Explanation:

TPHg = Total petroleum hydrocarbons as gasoline, analyzed by EPA Method 8260B. TPH-SS = Total petroleum hydrocarbons as stoddard solvent, analyzed by the 8015B. Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B. MTBE = Methyl tertiary-butyl ether, analyzed by EPA Method 8260B.

PID - Photo Ionization Detector in parts per million volume.

NA = Data not available

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<n = Below laboratory detection limit of n ppm. -- = not analyzed

TABLE 2 SUMMARY OF ANALYTICAL RESULTS FOR MONITORING AND GROUNDWATER GRAB SAMPLES City of Paris Cleaners

3516 Adeline Street, Oakland, California 94608

Monitoring Summary						Analytical Summary							
		Top of	Depth to	Groundwater					Ethyl				
Well ID	Date	Casing	Water	Elevation	TPH-SS	TPH-G	Benzene	Toluene	benzene	Xylenes	MTBE		
		•	— ft bgs		•			—ug/l —					
Creating	tor Completed		0					•					
Groundwa	ter Sample Loc	ations											
EB1-18	3/19/1998	18' bgs 0	Groundwater	Grab Sample	270000		ND<5.0	93	66	1700	ND<100		
EB2-18	3/19/1998	18' bgs 0	Groundwater	Grab Sample	ND		ND	ND	ND	ND	ND		
EB3-18	3/19/1998	18' bgs 0	Groundwater	Grab Sample	ND		ND	ND	ND	ND	ND		
EB4-18	3/19/1998	18' bgs 0	Groundwater	Grab Sample	ND		ND	ND	ND	ND	ND		
EB5-18	3/19/1998	18' bgs C	Groundwater	Grab Sample	780		ND	ND	ND	2	ND		
EB6-18	3/19/1998	18' bgs (Groundwater	Grab Sample	ND		ND	ND	ND	ND	ND		
MW-1	11/18/1992	17.44	13.99	3.45	1800	NA	<0.5	<0.5	<0.5	<0.5	NA		
MW-1	11/4/1993	17.44	16.79	0.65	2000	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-1	3/8/1994	17.44	14.14	3.3	150	NA	35	40	72	120	NA		
MW-1	8/2/1994	17.44	13.18	4.26	2100	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-1	2/8/1995	17.44	10.92	6.52	620	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-1	7/8/1996	17.44	11.62	5.82	37000	110000	1.6	<0.5	<0.5	74	7.9		
MW-1	10/9/1996	17.44	14.11	3.33	42000	NA	<0.5	5	<0.5	<0.5	NA		
MW-1	3/18/1997	17.44	12.37	5.07	2600	NA	<0.5	1.5	1.5	9.6	<6.0		
MW-1	6/19/1997	17.44	13.26	4.18	660	NA	<0.5	<0.5	1.2	0.71	<5.0		
MW-1	11/14/1997	17.44	11.45	5.99	10000	NA	<0.5	<0.5	110	1.2	<5.0		
MW-1	12/15/1999	17.44	11.31	6.13	<20	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-1	3/22/2002	17.44	8.97	8.47	11000						<5.0		
MW-1	4/15/2003	17.44	9.23	8.21	3900		<2.5	<2.5	<2.5	3	9		
MW-1	3/26/2004	17.44	10.32	7.12	30000	24000	<50	<50	<50	<50	<500		
MW-1	9/30/2004	17.44	11.53	5.91	3800	2600	<0.5	<0.5	<0.5	2.7	<5		
MW-1	9/9/2005	17.44	13.63	3.81	15000	11000	<5	<5	<5	15	<50		
MW-1	11/30/2007	17.44	13.95	3.49									
MW-1	12/20/2007	17.44	11.51	5.93	45000	110000	20	50	20	100	<5		
MW-1	5/23/2008	17.44	14.14	3.3	4200	<500	<1	<1	<1	20	<0.50		

TABLE 2 SUMMARY OF ANALYTICAL RESULTS FOR MONITORING AND GROUNDWATER GRAB SAMPLES

City of Paris Cleaners 3516 Adeline Street, Oakland, California 94608

	Analytical Summary										
		Top of	Depth to	Groundwater			-		Ethyl		
Well ID	Date	Casing	Water	Elevation	TPH-SS	TPH-G	Benzene	Toluene	benzene	Xylenes	MTBE
		•	— ft bgs		•			—ug/l —			── →
MW-1	8/12/2008	17.44	13.78	3.66	4000	12000	<1	<1	<1	<1	<0.50
MW-1	12/18/2008	17.44	10.71	6.73	9900	2700	<1	<1	<1	<1	<0.50
MW-1	2/19/2009	17.44	8.91	8.53	500	3100	<10	<10	<10	<10	<5
MW-1	8/11/2009	17.44	13.35	4.09	13000	7800	<10	<10	<10	<10	5.9
MW-1 NP	8/11/2009	17.44	13.35	4.09	6000	10000	<10	<10	<10	<10	<5
MW-2	11/18/1992	17.31	13.18	4.13	630	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-2	11/4/1993	17.31	14.84	2.47	3200	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	3/8/1994	17.31	11.5	5.81	45	NA	1.4	2	11	19	NA
MW-2	8/2/1994	17.31	13.14	4.17	170	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	2/8/1995	17.31	8.18	9.13	570	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	7/8/1996	17.31	11.06	6.25	1800	2800	<0.5	2.6	15	24	6.3
MW-2	10/9/1996	17.31	12.38	4.93	4100	NA	<0.5	0.57	<0.5	<0.5	NA
MW-2	3/18/1997	17.31	10.61	6.7	240	NA	<0.5	0.57	<0.5	<0.5	5.3
MW-2	6/19/1997	17.31	11.68	5.63	2500	NA	<0.5	<0.5	9.1	<0.5	<5.0
MW-2	11/14/1997	17.31	10.61	6.7	130	NA	<0.5	<0.5	0.9	1.2	<5.0
MW-2	12/15/1999	17.31	10.97	6.34	<20	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	3/22/2002	17.31	8.82	8.49	170	13000	410	1000	210	1100	<5.0
MW-2	4/15/2003	17.31	8.52	8.79	99		<0.5	<0.5	<0.5	0.76	10
MW-2	3/26/2004	17.31	9.32	7.99	120	93	<0.5	<0.5	<0.5	0.76	5.4
MW-2	9/30/2004	17.31	11.62	5.69	<50	<50	<0.5	<0.5	<0.5	<0.5	<5
MW-2	9/9/2005	17.31	12.75	4.56	120	98	<0.5	<0.5	<0.5	<0.5	<5
MW-2	11/30/2007	17.31	11.06	6.25							
MW-2	12/20/2007	17.31	9.95	7.36	<50	3000	<1	1.6	<1	2.4	2.9
MW-2	5/23/2008	17.31	12.46	4.85	300	1100	<1	<1	<1	<1	3.5
MW-2	8/12/2008	17.31	12.08	5.23	2200	350	<1	<1	<1	<1	<0.50
MW-2	12/18/2008	17.31	10.58	6.73	300	<50	<1	<1	<1	<1	7.3
MW-2	2/19/2009	17.31	8.22	9.09	300	300	<1	<1	<1	<1	3.4
MW-2	8/11/2009	17.31	13.00	4.31	600	610	<1	<1	<1	<1	3.8

TABLE 2 SUMMARY OF ANALYTICAL RESULTS FOR MONITORING AND GROUNDWATER GRAB SAMPLES

City of Paris Cleaners 3516 Adeline Street, Oakland, California 94608

Monitoring Summary						Analytical Summary							
	Top of Depth to Groundwater						Ethyl						
Well ID	Date	Casing	Water	Elevation	TPH-SS	TPH-G	Benzene	Toluene	benzene	Xylenes	MTBE		
		•	— ft bgs	→	+			—ug/l —					
MW-3	11/18/1992	17.44	13.93	3.51	11000	NA	<0.5	<0.5	<0.5	<0.5	NA		
MW-3	11/4/1993	17.44	15.16	2.28	320	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-3	3/8/1994	17.44	13.43	4.01	45	NA	0.8	0.9	5	10	NA		
MW-3	8/2/1994	17.44	12.82	4.62	<20	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-3	2/8/1995	17.44	7.62	9.82	<20	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-3	7/8/1996	17.44	10.97	6.47	2500	2200	1	<0.5	8.8	8	10		
MW-3	10/9/1996	17.44	11.84	5.6	2600	NA	<0.5	<0.5	<0.5	<0.5	NA		
MW-3	3/18/1997	17.44	10.16	7.28	2500	NA	<0.5	0.61	0.63	5.2	NA		
MW-3	6/19/1997	17.44	11.4	6.04	21000	NA	<0.5	<0.5	11	<0.5	<5.0		
MW-3	11/14/1997	17.44	10.71	6.73	1,400	NA	<0.5	<0.5	28	28	<5.0		
MW-3	12/15/1999	17.44	10.96	6.48	<20	<50	<0.5	<0.5	<0.5	<0.5	NA		
MW-3	3/22/2002	17.44	10.97	6.47	420	<50	<0.5	<0.5	<0.5	<0.5	31		
MW-3	4/15/2003	17.44	8.31	9.13	2700		<0.5	<0.5	<0.5	<0.5	40		
MW-3	3/26/2004	17.44	8.61	8.83	2700	1900	<1.7	<1.7	<1.7	4.3	<17		
MW-3	9/30/2004	17.44	11.1	6.34	3900	2600	<0.5	<0.5	<0.5	3.2	<10		
MW-3	9/9/2005	17.44	13.75	3.69	4000	2600	<0.5	<0.5	0.57	2.7	12		
MW-3	11/30/2007	17.44	13.9	3.54									
MW-3	12/20/2007	17.44	10.79	6.65	18000	12000	<1	1.6	1.1	2.4	9.2		
MW-3	5/23/2008	17.44	15.2	2.24	900	3000	<1	<1	<1	<1	9.1		
MW-3	8/12/2008	17.44	14.14	3.3	1900	4300	<1	<1	<1	<1	6.5		
MW-3	12/18/2008	17.44	12.53	4.91	5000	610	<1	1	<1	<1	20		
MW-3	2/19/2009	17.44	11.11	6.33	1500	1300	<1	1	<1	<1	9		
MW-3	8/11/2009	17.44	15.22	2.22	1000	2200	<10	<10	<10	<10	7.3		
MW-3 NP	8/11/2009	17.44	15.22	2.22	3000	6700	<10	<10	<10	<10	<5		
	2/22/2002	NIA			.50	400	-0 F	-0 F	-0 F	0.0	.5.0		
	3/22/2002				<50	190	<0.5	<0.5	<0.5	0.0	<5.0		
	4/15/2003						 -0 E	 -0 E	 -0 E	 -0 E			
	3/20/2004	INA NA			500	200	<0.5	<0.5	<0.5	<0.5	<0		
	9/30/2004	INA NA			<50	<50	<0.5	<0.5	<0.5	<0.5	<0		
	9/9/2005	INA NA			VC>	<00	<0.5	<0.5	<0.5	<0.5	<0		
vv-IND	11/30/2007	NA	12.92										

TABLE 2 SUMMARY OF ANALYTICAL RESULTS FOR MONITORING AND GROUNDWATER GRAB SAMPLES

City of Paris Cleaners 3516 Adeline Street, Oakland, California 94608

		Мо	onitoring Su	mmary			Analy	tical Summ	ary		
		Top of	Depth to	Groundwater					Ethyl		
Well ID	Date	Casing	Water	Elevation	TPH-SS	TPH-G	Benzene	Toluene	benzene	Xylenes	MTBE
		•	— ft bgs		4			—ug/l —			
W-IND	12/20/2007	NA	11.68		<50	500	<1	1	<1	2.2	<.50
W-IND	5/23/2008	NA	12.72		300	250	<1	3.7	<1	2.4	<0.50
W-IND	8/12/2008	NA	13.42		<50.0	<50.0	<1	<1	<1	<1	<0.50
W-IND	12/18/2008	NA	12.65		<50	<50	<1	<1	<1	<1	0.7
W-IND	2/19/2009	NA	9.74		<50	<50	<1	<1	<1	<1	<0.5
W-IND	8/11/2009	NA	14.13		<50	<50	<1	<1	<1	<1	<0.5

Explanation:

TPHg = Total petroleum hydrocarbons as gasoline, analyzed by EPA Method 8260B. TPH-SS = Total petroleum hydrocarbons as stoddard solvent, analyzed by the 8015B. Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B. MTBE = Methyl tertiary-butyl ether, analyzed by EPA Method 8260B.

fbg = Feet below grade.

NA = Data not available

<n = Below laboratory detection limit of n ppm.

-- = not analyzed

June 2007: Taber Consultants assumed environmental consulting responsibilities. 8/11/2009 Taber Consultants conducted No-Purge Sampling in MW1 and MW3

TABLE 3 PHOTOIONIZATION DETECTION SUMMARY

City of Paris Cleaners 3516 Adeline Street, Oakland, California 94608

Location ID	Date	PID
		ppmv
A-1-3	7/31-8/2/1991	ND
A-1-6	7/31-8/2/1991	16
A-1-9	7/31-8/2/1991	20
A-1-12	7/31-8/2/1991	12
A-2-3	7/31-8/2/1991	ND
A-2-6	7/31-8/2/1991	49
A-2-9	7/31-8/2/1991	ND
A-2-12	7/31-8/2/1991	ND
A-3-3	7/31-8/2/1991	
A-3-6	7/31-8/2/1991	24
A-3-9	7/31-8/2/1991	7
A-3-12	7/31-8/2/1991	6
A-4-3	7/31-8/2/1991	ND
A-4-6	7/31-8/2/1991	44
A-4-9	7/31-8/2/1991	5
A-4-12	7/31-8/2/1991	30
A-5-3	7/31-8/2/1991	ND
A-5-6	7/31-8/2/1991	21
A-5-9	7/31-8/2/1991	28
A-5-12	7/31-8/2/1991	26
A-6-3	7/31-8/2/1991	ND
A-6-6	7/31-8/2/1991	14
A-6-9	7/31-8/2/1991	110
A-6-12	7/31-8/2/1991	22
A-7-3	7/31-8/2/1991	ND
A-7-6	7/31-8/2/1991	17
A-7-9	7/31-8/2/1991	13
A-7-12	7/31-8/2/1991	15.5
A-8-3	7/31-8/2/1991	ND
A-8-6	7/31-8/2/1991	18
A-8-9	7/31-8/2/1991	13
A-8-12	7/31-8/2/1991	15.5
A-9-3	7/31-8/2/1991	ND
A-9-6	7/31-8/2/1991	10
A-9-9	7/31-8/2/1991	13
A-9-12	7/31-8/2/1991	ND

PID - Photo Ionization Detector in parts per million volume.

NA = Data not available

<n = Below laboratory detection limit of n ppm.

-- = not analyzed

June 2007: Taber Consultants assumed environmental consulting responsibilities.