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11:32 am, Jul 28, 2011

Alameda County
Environmental Health

July 22, 2011

Mr. Mark Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Re: Kerry & Associates – Palace Garage
14336 Washington Avenue
San Leandro, California
ACEH Case No. RO0000208

Dear Mr. Detterman,

I declare, under penalty of perjury, that the information and/or recommendations contained in the **Additional Investigation and Remediation Pilot Test Work Plan** is true and correct to the best of my knowledge.

Sincerely,

Mr. Jeffrey Kerry

July 22, 2011

Mr. Mark Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Re: Additional Investigation and Remediation Pilot Test Work Plan
Kerry & Associates – Palace Garage
14336 Washington Avenue
San Leandro, California
ACEHS Case No. RO0000208
SFRWQCB LUFT Case No. 01-1133

Dear Mr. Detterman,

On behalf of Kerry & Associates, Closure Solutions Inc. (Closure Solutions) has prepared this *Additional Assessment and Remediation Pilot Test Work Plan* (Work Plan) for the Palace Garage Site located at 14336 Washington Avenue, San Leandro, California (the Site, Figure 1). This Work Plan has been prepared in response to the letter received by the Alameda County Health Care Services (ACHCS) dated May 18, 2011 (Attachment A). This letter requests the preparation of a work plan for the collection of additional soil and groundwater data and the completion of work necessary to undertake corrective actions at the site.

1.0 SITE BACKGROUND

A 550-gallon gasoline underground storage tank (UST) was removed from the site in 1991. Subsequent investigations included the installation of 3 monitoring wells and the drilling of 15 borings. Based on data obtained from the wells and borings, impacted unsaturated-zone soil is confined to the area of the former dispenser pad and UST. The primary groundwater flow direction is toward the southwest.

In December 2002, Professional Service Industries, Inc. (PSI) conducted a soil and groundwater investigation to evaluate the lateral extent of petroleum hydrocarbons in the soil and groundwater at the site. Borings SB-16 and SB-17 were advanced to between 20 and 24 feet below ground surface (bgs). Boring SB-16 was converted into monitoring well MW-4. Concentration of total petroleum hydrocarbons as gasoline (TPHg) and gasoline related contaminants were detected only in soil from boring SB-17 and groundwater from wells MW-1 and MW-2. The locations of the monitoring wells and soil borings are presented in Figure 1.

Closure Solutions conducted a Sensitive Receptor Survey to identify all water supply wells and sensitive receptors within a 2,000-foot radius of the Site. The closest water supply wells are two industrial wells approximately 450 feet northwest (cross-gradient) of the Site. The closest domestic well is approximately 1,500 feet southeast (cross-gradient) of the Site. The closest down-gradient well is an irrigation well located approximately 1,400 feet southwest of the Site. No surface water bodies were identified within a 2,000-foot radius of the Site. Results of the Sensitive Receptor Survey are presented in the *Sensitive Receptor Survey* report dated August 27, 2008.

Closure Solutions prepared and submitted a *Site Conceptual Model* (SCM) dated September 30, 2008 for the Site. The preparation of the SCM was requested by ACEHS in their letter dated September 2, 2008.

In an email dated June 12, 2009 Mr. Steve Plunkett with the ACEHS approved the reduction of groundwater monitoring to a Semi-annual basis conducted in second and fourth quarters. Mr. Plunkett also approved the recommendation to eliminate the fuel oxygenates from the suite of laboratory analytes.

On October 15, 2009 Closure Solutions discussed the Site status with ACEHS. Data gaps presented in the SCM and other information that ACEHS would require for site closure was identified. Closure Solutions submitted the *Soil Vapor Probe and Additional Assessment Work Plan* on November 13, 2009 to address the work necessary to move the site toward closure.

On July 26, 2010 a Closure Solutions' representative was on site to oversee the installation and sampling of three temporary soil vapor probes (SV-1 through SV-3) and the advancement of one downgradient soil boring (SB-18). A *Soil Vapor Testing and Additional Assessment Report* describing field activities and discussing analytical soil and soil vapor results was submitted to the ACEHS on August 30, 2010.

Closure Solutions continues to conduct groundwater monitoring and sampling on a semi-annual basis during second and fourth quarters.

2.0 FIELD INVESTIGATION

At the request of the ACHCS, Closure Solutions proposes the following scope of work for the collection of additional soil and groundwater data and the completion of work necessary to undertake corrective actions at the site:

- Installation of two additional groundwater monitoring wells for further hydrocarbon contaminant delineation and to determine a radius of influence during extraction pilot testing;

- Surveying all existing and proposed groundwater monitoring wells to meet GeoTracker standards;

- Collecting groundwater parameters from the site to determine if microbial activity will assist in the mitigation of residual down-gradient groundwater contamination; and

- Conducting a three day pilot test at the Site to evaluate if dual phase extraction (DPE) is an effective remedial option to mitigate residual contamination beneath the subject site.

2.1 Preliminary Field Activities

Prior to initiating field activities, Closure Solutions will obtain the necessary drilling permits, prepare a Site Health and Safety Plan (HASP) for the proposed work, and clear the Site for subsurface utilities. The utility clearance will include notifying Underground Service Alert (USA) of the pending work a minimum of 48 hours prior to initiating the field investigation, and securing the services of a private utility locating company to confirm the absence of underground utilities at each boring location.

A HASP will be prepared for use by personnel implementing the Work Plan. The HASP will address hazards associated with the proposed fieldwork. A copy of the HASP will be available on-Site during fieldwork. The subcontractor(s) performing field activities will be provided with a copy of the HASP prior to initiating work. A safety tailgate meeting will also be conducted daily to review the Site hazards and work scope.

2.2 Monitoring Well Installation

Closure Solutions personnel will supervise the completion of two groundwater monitoring wells (MW-5 and MW-6). One well will be located adjacent to the north corner of the site building; the second will be located in the vicinity of borings SB-17 and SB-18 (Figure 2). Both wells will be advanced to a total depth of approximately 25 feet bgs. A hollow stem auger drilling rig will be used to advance the borings. As a further measure of protection for utilities that may not have been located during pre-field utility clearance activities, the borings will be hand cleared to approximately five feet bgs.

Soil samples will be collected at a minimum of every 5 vertical feet for lithologic determination with a minimum of one soil sample collected at the approximate capillary fringe zone retained for laboratory analysis. Collected samples will be classified by field personnel according to the Unified Soil Classification System (USCS) and examined using visual and manual methods for parameters including odor, staining, color, grain size, and moisture content. Additionally, soil samples will be field screened for the presence of residual petroleum hydrocarbon vapor concentrations using a photo-ionization detector (PID). Samples retained for laboratory analysis will be submitted under Chain-of-Custody protocols to a California State-certified analytical laboratory, as described in Section 2.4.

Wells MW-5 and MW-6 will be constructed with 2-inch diameter schedule 40 polyvinyl chloride (PVC) blank casing and 0.020-inch slotted PVC well screen. The screened intervals will be 15 feet in length, extending from approximately 10 feet to 25 feet bgs, based on first encountered groundwater. Each well will be completed with a #3 sand filter pack placed within the annulus of the borehole from the bottom of the boring to approximately 1 foot above the top of the well screen, followed by a 2-foot well transition seal consisting of bentonite. The remaining borehole annulus will be sealed with neat cement to ground surface.

Each wellhead will be completed at the ground surface with a locking well cap and traffic-rated bolt-down well vault. The vaults will be installed slightly above the surrounding surface grade and finished with a cement apron to provide positive relief away from the wellheads.

2.3 Well Development and Groundwater Sampling

After allowing the wellhead and grout to cure for at least 48-hours, Closure Solutions will measure the total depth in each well and depth to water using a water level indicator calibrated to within 0.01 foot. Closure Solutions will also check for the potential presence of separate phase hydrocarbons (free product) using an interface probe capable of detecting free product thicknesses to 1 millimeter. The wells will be developed by alternately swabbing and surging using a hand held surge block. Closure Solutions will then remove 8 to 10 casing volumes of water from each well by pumping and/or bailing, while monitoring the removed water for parameters such as pH, turbidity, temperature, and conductivity.

A minimum of 48 hours after development, Closure Solutions will gauge MW-5 and MW-6 and collect initial groundwater samples as described in Section 2.4. The newly installed wells will be incorporated into the groundwater sampling program for the Site.

2.4 Sample Handling and Analysis

Each soil sample retained for laboratory analysis will be collected in six inch brass liners, covered at each end with Teflon™ sheeting, capped with plastic end caps, labeled, and placed in an ice-filled cooler for preservation and shipment.

Groundwater samples from wells MW-5 and MW-6 will be collected by lowering dedicated, disposable bailers into each well and decanting the collected water into laboratory-supplied sample containers. Samples will then be labeled and placed in an ice-filled cooler for preservation.

Collected soil and groundwater samples will be submitted under chain-of-custody protocol to a California State-certified analytical laboratory and analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethyl-benzene and total xylenes (BTEX compounds) using EPA Method 8260B.

During the fourth quarter 2011 groundwater monitoring event, bio-attenuation parameters will be collected form well MW-4 to determine if microbial activity will assist in mitigating the residual down-gradient groundwater contaminant plum. Additionally, samples collected from MW-4 will be analyzed for a full volatile organic compound scan by EPA Method 8260.

2.5 Monitoring Well Surveying

Following completion of wells MW-5 and MW-6, a California-licensed land surveyor will be contracted to survey all existing groundwater monitoring wells. Wellhead elevations and locations will be surveyed with respect to mean sea level (msl) in accordance with GeoTracker requirements.

2.6 Waste Disposal

Investigation derived waste (IDW) will be temporarily stored on-site in 55-gallon, DOT-approved 17H drums, pending characterization and disposal. The IDW will be characterized in accordance with waste disposal or recycling facility acceptance requirements. Closure Solutions will coordinate the transfer and disposal of the IDW at an approved facility with a California-licensed waste transporter.

3.0 THREE DAY DUAL-PHASE EXTRACTION PILOT TEST

Closure Solutions proposes to conduct a three day DPE pilot test at the Site from 2-inch diameter well MW-1 and proposed well MW-6 (Figure 2). This test will be conducted to evaluate the effectiveness of DPE in mitigating residual contamination in both on and offsite soil, as well as the ongoing contaminant contribution to groundwater from residual soil contamination beneath the subject site. DPE is a remedial method that simultaneously extracts groundwater and soil vapor in the same process stream under high vacuum. This technology is a common technique for remediating sites impacted with elevated concentrations of petroleum hydrocarbons where the hydrocarbon smear zone at the capillary fringe represents a significant source of groundwater contamination.

Specific goals of the three day extraction pilot test will be to determine:

- Groundwater drawdown and extraction rates;
- The induced vacuum radius of influence;
- Soil vapor extraction vacuum and flow rates;
- Vapor-phase hydrocarbon concentrations and trends in extracted vapor; and
- Contaminant mass removal rates.

3.1 Pilot Test Equipment and Procedures

Closure Solutions will perform a three day (72 hour) DPE pilot test using a trailer-mounted thermal/catalytic oxidizer and liquid-ring vacuum pump. The vacuum pump will be capable of generating approximately 28 inches of mercury ("Hg) vacuum. Soil vapor and groundwater will be extracted from the test well through a 1.5-inch diameter clear 'stinger' hose lowered into the well. The stinger hose will be inserted through a rubber boot fitting installed on the top of the well casing. The rubber boot fitting will act as a well head seal, and will allow high vacuum to be applied to the well casing, enhancing soil vapor and groundwater flow rates. After extraction from the well, the soil vapor/groundwater mixture will be routed through a vapor/liquid separator, where soil vapor will be routed to the thermal/catalytic oxidizer for treatment before being discharged to the atmosphere, and groundwater will be pumped to a 6,500-gallon Baker tank for storage. Depending on disposal costs, extracted groundwater will either be stored in the tank for transportation and disposal at an appropriately-licensed facility, or will be discharged under permit to the sanitary sewer.

At the start of the test, Closure Solutions anticipates lowering the inlet of the stinger hose slowly into the water table to minimize 'dead-heading' of the vacuum pump and to avoid excessive groundwater production. Depending on the observed water level drawdown and groundwater production rates, the inlet of the stinger hose may be lowered deeper into the well during the latter stages of the test.

3.2 Field Measurements and Sample Collection

Before commencing DPE test activities, Closure Solutions will measure water levels and collect background vacuum readings from Site wells and test wells MW-1 and MW-6. During pilot testing, Closure Solutions will collect water level measurements and induced vacuum readings from these wells to record changes in water levels and induced vacuum. Closure Solutions will also collect influent hydrocarbon vapor concentration readings using a photo-ionization (PID) detector, and soil vapor flow rates using a hot-wire anemometer. Applied vacuum rates will be recorded during testing at the extraction wellhead and at the inlet of the liquid-ring vacuum pump. Groundwater production rates from the pilot test well will be estimated based on water flow observed through the clear stinger hose and the water level indicator on the vapor/liquid separator.

During pilot testing, Closure Solutions anticipates collecting soil vapor samples for laboratory analysis to confirm hydrocarbon concentrations measured with the PID and to calculate hydrocarbon mass removal rates. Soil vapor samples will be collected in one-liter Tedlar bags, and submitted to a State-certified analytical laboratory. Vapor samples will be analyzed for TPHg, and BTEX compounds by EPA Method 8260B.

4.0 SUMMARY REPORT

Upon completion of field activities and receipt of all laboratory analytical data, Closure Solutions will finalize and submit a summary report. The report will document the results of the investigation. If warranted the report will provide recommendations for additional work or a recommendation for no further action.

4.1 GeoTracker

In accordance with GeoTracker requirements, Closure Solutions will upload analytical reports, copies of bore logs and the final report related to this investigation to the GeoTracker website.

5.0 PROPOSED SCHEDULE

Upon receiving written approval of this Work Plan, Closure Solutions will proceed with the proposed work. Closure Solutions will obtain all necessary permits to complete the proposed work. Closure Solutions anticipates submitting the report within 60 days of receipt of all laboratory analytical results from investigation activities.

6.0 LIMITATIONS

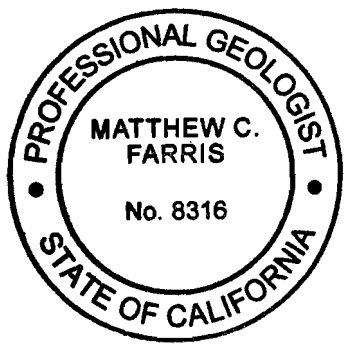
This report is based on Site conditions, data, and other information available as of the date of the report, and the conclusions and recommendations herein are applicable only to the time frame in which the report was prepared. Background information used to prepare this report including, but not limited to, previous field measurements, analytical results, Site plans and other data have been furnished to Closure Solutions by Kerry & Associates and their previous consultants or as available on the GeoTracker website. Closure Solutions has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

We appreciate the opportunity to submit this work plan and trust that this document meets with your approval. If you have any questions or concerns, feel free to contact Kathleen Waldo at (916) 760-7025 or kwaldo@closuresolutions.com.

Sincerely,

Closure Solutions, Inc.

Kathleen Waldo.
Senior Project Engineer

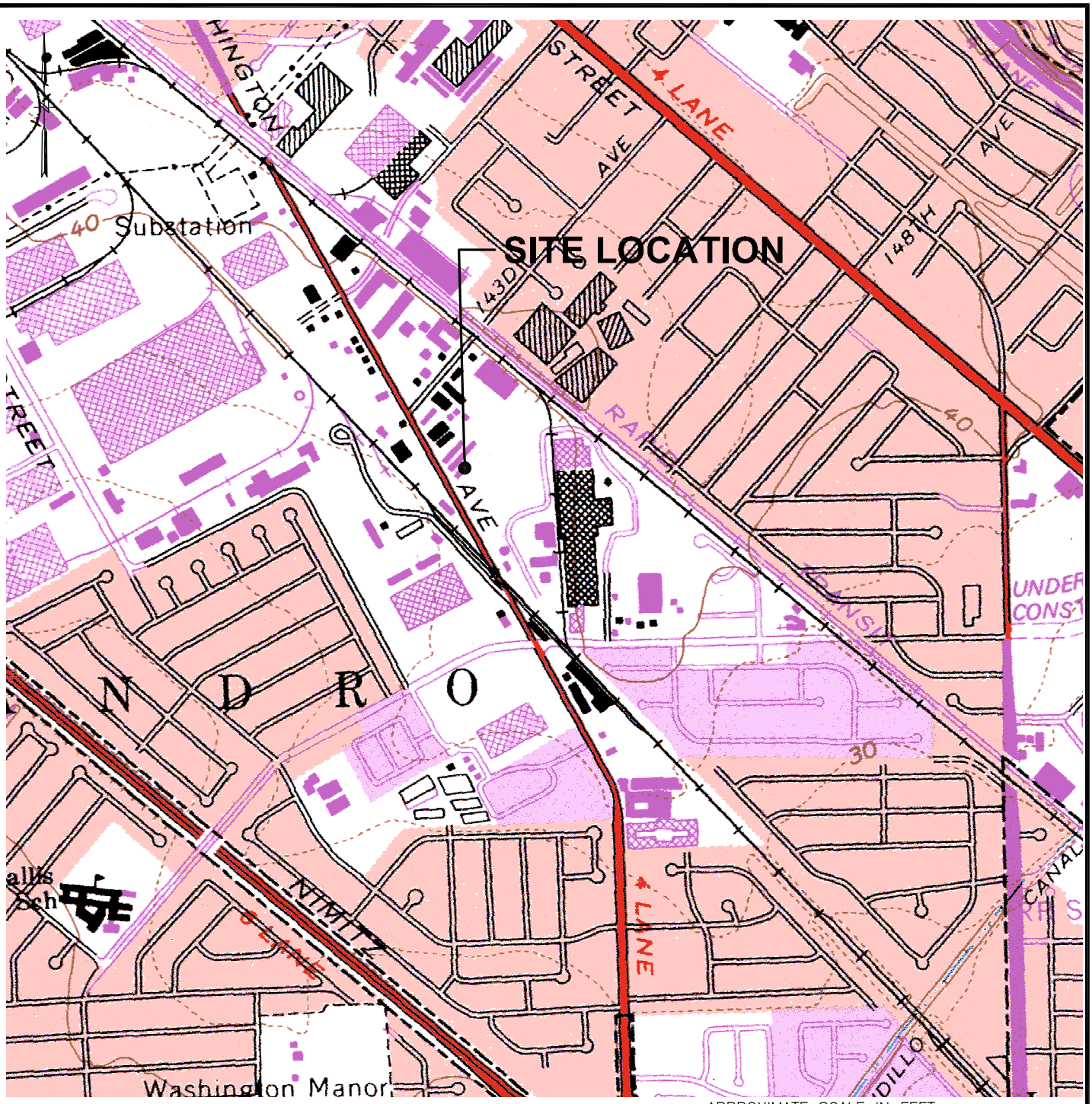


Matthey Farris P.G.
Project Geologist

Attachments:

Figure 1	Site Location Map
Figure 2	Proposed Boring Location Map
Attachment A	ACHCS Correspondence

cc: Mr. Jeff Kerry, Kerry & Associates



REFERENCE:
USGS 7.5 MIN QUAD MAP TITLED:SAN LEANDRO, CALIFORNIA DATED: 1959 REV: 1980

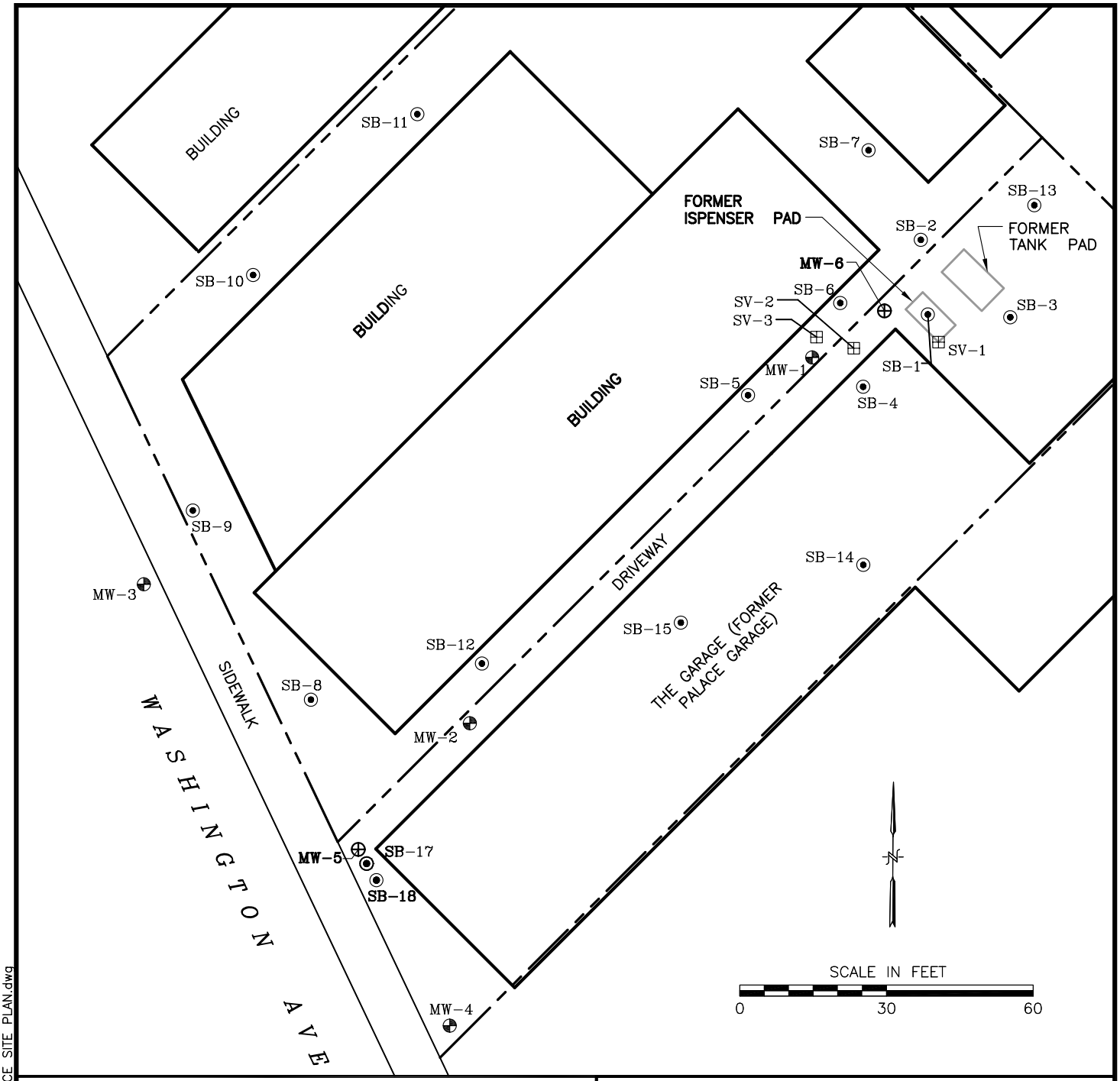
FIGURE 1

SITE LOCATION MAP

PALACE GARAGE
14336 WASHINGTON AVENUE
SAN LEANDRO, CALIFORNIA

CLOSURE SOLUTIONS, INC.
4600 Northgate Boulevard • Suite 230
Sacramento • California • 95834
Phone: (800) 988-7880

20101130.14161396 D:\Client Drawings\Closure\palace garage\PALACE GARAGE VICINITY MAP.dwg



LEGEND:

- ⊕ PROPOSED GROUNDWATER MONITORING WELL LOCATION
- ◒ GROUNDWATER MONITORING WELL LOCATION
- ⊙ SOIL BORING LOCATION
- ⊞ SOIL VAPOR PROBE
- —— PROPERTY LINE

NOTES:

1. BASEMAP SOURCE: MORROW SURVEYING, 2/05/03

FIGURE 2

PROPOSED BORING LOCATION MAP

PALACE GARAGE
14336 WASHINGTON AVENUE
SAN LEANDRO, CALIFORNIA

CLOSURE SOLUTIONS, INC.
4600 Northgate Boulevard • Suite 230
Sacramento • California • 95834
Phone: (800) 988-7880

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ATTACHMENT A

ACHCS Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH DEPARTMENT
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

May 18, 2011

Mr. Jeff Kerry
Kerry & Associates
151 Callan Avenue, Suite 300
San Leandro, CA 94577

Mr. Jeffery Kerry
Jeffery & Dolores Kerry Trust & Jame Donnelley Et. Al.
19655 North Ripon Road
Ripon, CA 95366

Subject: Request for a Work Plan; Fuel Leak Case No. RO00000208; Palace Garage (Global ID #T0600101043), 14336 Washington Avenue, San Leandro, CA 94578

Dear Mr. Kerry:

Alameda County Environmental Health (ACEH) staff has reviewed the case file including the *Soil Vapor Testing and Additional Assessment Work Plan,* dated November 13, 2009, the *Soil Vapor Testing and Additional Assessment Report,* dated August 30, 2010, and the *Fourth Quarter 2010 Groundwater Monitoring Report,* dated November 30, 2010. The reports were prepared and submitted on your behalf by Closure Solutions, Inc. (Closure Solutions). Thank you for submitting the reports; they help to inform future actions. Based on ACEH staff review of the case file, we request that you address the following technical comments and send us the reports described below.

TECHNICAL COMMENTS

1. **Residual Soil Sources –** Significant residual contamination appears to remain in soil beneath the site. A review of groundwater analytical data for the site indicates significant seasonal pulses of contamination are being contributed to groundwater beneath the site. In November or December of recent years (2007, 2008, 2009, and 2010) groundwater in well MW-1 reach yearly minimum concentrations, but are then followed by significant increases in the first or second quarter of the following year (for example 75 µg/l TPHg and 6.0 µg/l benzene in November 2009 and 18,000 µg/l TPHg ad 300 µg/l benzene in May 2010). Approximately six months later, generally in the following groundwater monitoring and sampling event, concentrations further downgradient at well MW-2 undergo a corresponding increase (for example 950 µg/l TPHg and 14 µg/l benzene in May 2010, and 1,900 µg/l TPHg and 45 µg/l benzene in November 2010). Wells MW-3 and MW-4 are further downgradient than well MW-2 and remain non-detectable for TPHg and BTEX; however, the wells also appear to be laterally distant from a relatively narrow plume, possibly suggestive of a preferential conduit pathway, by 30 to 60 feet. Generally nondetectable grab groundwater concentrations collected from bore SB-18 in August 2010 closer to the plume centerline could either indicate a seasonal low concentration, or could indicate a very narrow plume pathway such as a utility conduit.

   Additional data supporting a significant residual source at the site is analytical data collected from onsite soil bore SB-1 (in addition to offsite bores SB-5, SB-6 [with offsite residual concentrations up to 3,200 mg/kg TPHg and 22 mg/kg benzene], and other near source soil bores, both on and offsite). Bore SB-1 was installed through the former dispenser island location and significant concentrations are present at depths greater than approximately 10 feet in the bore (residual concentrations up to 4,700 mg/kg TPHg and 12 mg/kg benzene). Because the former UST system was a suction system, significant concentrations would typically not be expected beneath a suction dispenser system as gravity drainage returns product to the UST once a hole is developed; thus the primary source would be expected to be beneath the location of the former UST. Consequently, while the UST excavation is reported to have extended up to approximately 18 or 20 feet below grade surface, it appears that

the lateral extent was not resolved or mitigated. Lack of UST removal sidewall characterization samples further support this interpretation.

It appears appropriate to undertake corrective actions, or an investigation to allow such, in the source vicinity to mitigate residual contamination in both on and offsite soil, as well as the ongoing contaminant contribution to groundwater from residual soil contamination beneath the subject site, and beneath the adjacent site. It also appears appropriate to collect groundwater parameters at the site to determine if microbial activity will assist in the mitigation of the residual downgradient groundwater contaminant plume. As a consequence, ACEH requests a work plan, by the date identified below, for the implementation of these activities.

2. **Utility Lateral Preferential Pathway Survey –** Thank you for providing the utility maps contained in Appendix G of the *Site Conceptual Model*, dated September 30, 2008. The as-built utility map obtained from the City of San Leandro depicts a lateral that extends toward the property at the approximate location of the paved drive between the site building and the adjacent building to the north. Because utility laterals also create vadose zone migration pathways for contaminants migrating through shallow soil sources, please also account for all utility laterals to the site or the immediate vicinity.

3. **Groundwater Monitoring –** In a review of bore logs ACEH has noted that the log for well MW-4 (SB-16) contained a number of elevated PID detections (up to 1,221 ppm PID units) without the collection of appropriate soil samples at those intervals. Please additionally analyze groundwater from well MW-4 a minimum of one time, for a full volatile organic compound scan (EPA Method 8260). This request is an attempt to understand these detections as indications of potential contamination.

4. **Soil Vapor Survey Data –** ACEH also seeks to clarify a statement in the *Soil Vapor Testing and Additional Assessment Report*. The report references an indoor worker breathing zone sample; however, the only additional sample that was denoted on Table 3 was labeled “Outdoor Air”. It also was not located on a figure. While it is surmised these may be the same sample, the discrepancy will be a source of confusion now and in the future, and it was thought appropriate to clarify, or rectify, this assumption now.

5. **Geotracker Well Survey –** At this time, all wells at the site have not been surveyed to Geotracker well survey standards; this is a state requirement. Please survey the wells, and upload the resulting GEO_XY and GEO_Z data files to Geotracker.

TECHNICAL REPORT REQUEST

Please submit the following deliverable to ACEH (Attention: Mark Detterman), according to the following schedule:

- **June 24, 2011 –** Work Plan or Corrective Action Plan (CAP)
- **June 24, 2011 –** Groundwater Monitoring Report
- **90 Days After Approval of Work Plan / ICAP –** Interim Corrective Action 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.

Should you have any questions, please contact me at (510) 567--6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

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

cc: Kathleen Waldo, Closure Solutions, Inc, 4600 Northgate Blvd, Suite 230, Sacramento, CA 95834 (sent via electronic mail to: kwaldo@closuresolutions.com)
Donna Drogos, ACEH, (sent via electronic mail to donna.drogos@acgov.org)
Mark Detterman, ACEH, (sent via electronic mail to mark.detterman@acgov.org)
Geotracker, Electronic File