February 23, 2012
Project No. 4018969001

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Environmental Health
Health Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Well Inspection Report and Groundwater Sampling Work Plan
Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California 94501
Fuel Leak Case # RO0000382
Geotracker Global ID # T0600100980

Dear Mr. Wickham:

On behalf of the Lily A. Chun Trust, Ninyo & Moore is pleased to submit this Well Inspection Report and Groundwater Sampling Plan to the Alameda County Environmental Health (ACEH), for the above-referenced site (site). This letter is being written in response to the ACEH Case File Review and Technical Comments dated September 8, 2011.

SITE BACKGROUND

The site is located at 2301 Santa Clara Avenue, in Alameda, County of Alameda, California, as presented on **Figure 1.** The site is a former gasoline service station, and has been the subject of numerous subsurface assessments, remedial action plans, groundwater monitoring and closure petitions since 1993, when three underground storage tanks (USTs) were removed from the site. The project site is located in a mostly commercial area with residential buildings. A Site Vicinity map is presented on **Figure 2**.

Based on the Case File Review and the most recent Monitoring Report dated August 8, 2011, the ACEH stated the following in its September 2011 letter:

- Previous site investigation activities have shown that a significant mass of petroleum hydro-carbons remains at the site and has migrated to the east beneath an adjacent commercial and residential building;

- Soil vapor sampling at the adjacent property has detected volatile organic compounds (VOCs) at highly elevated concentrations that exceed applicable screening levels for potential vapor intrusion to indoor air;
- Indoor air sampling in the adjacent building has detected VOCs at concentrations that exceed indoor air screening levels; and
- The site requires both additional investigation and remediation.

The ACEH presented Technical Comments and requested a Well Inspection and Groundwater Sampling Work Plan and a Draft Corrective Action Plan. This document summarizes the results of the Well Inspection conducted by Ninyo & Moore and proposes a Groundwater Sampling Work Plan.

RESULTS OF MONITORING WELL INSPECTION

On January 21, 2012, Ninyo & Moore personnel mobilized to the site to inspect the condition of the on-site and off-site wells. An additional inspection was conducted on February 14, 2012, to inspect wells which were inaccessible during the first site visit. The following wells were located and are presented on **Figure 3**:

1. Seven on-site 2-inch monitoring wells, MW-1 through MW-7;
2. One on-site 2-inch soil vapor well, SV-1;
3. Six on-site 4-inch monitoring/extraction wells, EW-12 through EW-17;
4. Three off-site, and reportedly up and side gradient, 2-inch monitoring wells, MW-8 through MW-10; and
5. Eight off-site, and reportedly downgradient, 2-inch monitoring wells, MW-11, BF, BG, BH, BJ, BK, BL and BM.

In each well, the condition of the well cap and top-of-casing (TOC) were noted, the seal was inspected to the extent possible, and the wells were sounded for total depth. Observations, as well as well construction details obtained from online databases, are presented on **Table 1**.

Well Conditions

Overall, the condition of monitoring wells MW-1 through MW-7 is poor. Ninyo & Moore recommends the abandonment of these wells, for the following reasons:

- The depth of the riser in wells MW-1 to MW-6 is below the water table. Therefore, previous monitoring of liquid phase hydrocarbons (LPH) is most likely inaccurate and unreliable.
- Monitoring well MW-7 was reportedly damaged by a construction contractor in 1995. In addition to 11 feet of soil entering the well, a passive recovery bailer is lodged in the well.
- There are absorbent oxygen release compound (ORC) socks in wells MW-2 and MW-7, apparently placed by a previous consultant. The ORC socks are stuck in the wells and cannot be removed.
- Due to the age of these monitoring wells, poor seals, old well caps and damage to the TOC in at least two wells (MW-5 and MW-7), there appears to be up to 6 feet of silt in the bottom of the wells.

The total depth of well SV-1 is 9.5 feet below ground surface (bgs) and groundwater was measured at 8.5 feet bgs. This well should be abandoned.

There are six 4-inch on-site wells labeled EW, presumably installed for future groundwater extraction purposes. Ninyo & Moore recommends that these wells be re-developed, repaired and/or abandoned as follows:

- The riser in EW-12 is set 0.5 feet below the lowest recorded depth-to-groundwater measurement. This well should be abandoned.
- The sanitary seal in EW-13 is cracked. Although additional concrete has been added to the top of the well, the seal is still cracked and does not hold water. In addition, the well has historically contained LPH, and continues to exhibit a strong, petroleum odor. This well should be abandoned.
- The TOC in well EW-14 needs to be cut down by inch or two, as the manhole lid does not fit properly over the well cap.
- Wells EW-14, EW-15, EW-16 and EW-17 contain water with black and rusty particles and need to be redeveloped. All EW wells, except EW-16, exhibited strong petroleum odors.

Three off-site monitoring wells, MW-8, MW-9 and MW-10 are reportedly located in upgradient or cross-gradient locations. Ninyo & Moore recommends that these wells be re- developed, for the following reasons:

- Monitoring well MW-8 is located across Santa Clara Avenue, southwest of the site, appears to be constructed correctly and contains minimal silt (0.10 foot). This well should remain in place, although it should be noted that the total depth is only 14 feet bgs. Groundwater in this well contained PVC shavings.

- Monitoring wells MW-9 and MW-10 are located north and northwest of the site, reportedly upgradient of the site, and contain 5.1 feet and 3.1 feet of silt, respectively. Groundwater in both wells contained PVC shavings.

- The depth of the riser in MW-10, 6.5 feet bgs, is below the lowest reported depth-to-water of 4.44 feet bgs. However, the depth-to-water in this well was measured at 7.34 feet bgs on February 14, 2012.

Monitoring wells MW-11, BF, BG, BH, BJ, BK, BL and BM are reportedly located downgradient of the site. During the two site inspections conducted by Ninyo & Moore, well BH was inaccessible due to a parked car and wells BJ and BK required access through a locked building. Ninyo & Moore recommends that select wells be re-developed for the following reasons:

- In well MW-11, there is approximately 5.2 feet of silt on the bottom of the well, the well has historically contained LPH, the well does not appear to be constructed of Schedule 40 PVC, and the integrity of the sanitary deal is questionable. This well should be replaced.

- Well BF should be re-developed to remoce the 3.5 feet of silt on the bottom.

- When accessible, wells BH, BJ and BK should be inspected, and cleaned and repaired if necessary.

- With the exception of MW-11, the screened intervals on these downgradient wells vary. Groundwater elevation data collected from these wells should not be included on groundwater elevations maps.

PROPOSED GROUNDWATER SAMPLING WORK PLAN

Based on the results provided above and to obtain updated, accurate and technically sound data, Ninyo & Moore proposes to conduct the tasks described below.

Pre-field Activities

Ninyo & Moore will conduct the following pre-field activities:

- Prepare a Health and Safety Plan, as required in 29CFR Part1910.120. The HASP will specifically address health and safety concerns with respect to the field activities proposed by Ninyo & Moore;
- Obtain a drilling permit from the ACEH; and
- Conduct utility clearance activities, including marking the boring locations for Underground Service Alert (USA) clearance and clearance of each boring location by a private utility locating firm.

Monitoring Well Abandonment

Monitoring wells MW-1, MW-3 through MW-6, SV-1, EW-12 and EW-13 will be properly destroyed by backfilling with neat cement using a tremie-grout system, as required by State and local regulations. Grout will be poured into the borehole through a tremie pipe, filling the hole from the total depth to approximately 0.5 feet bgs.

The well vaults will be removed and the surface pavement will be patched to match the existing surface. A representative from the Alameda County Public Works Agency (ACPWA) will be notified of the drilling schedule and may visit the site to observe borehole grouting.

Monitoring wells MW-2 and MW-7 will first be overdrilled using a larger diameter auger size, in order to remove the well casing, the lodged ORC socks, and the passive bailer reportedly lodged in MW-7.

Monitoring Well Installation

Five on-site wells and one off-site well will be installed, by hollow-stem auger. The wells will be 2-inch wells and will be constructed with screen intervals from 5 feet to 20 feet bgs, to cover seasonal groundwater fluctuations. Ninyo & Moore proposes to install the wells at the following locations:

- within the cluster of existing wells SV-1, EW-12 and MW-2 (new well);
- north and adjacent to existing wells MW-7 and EW-13 (new well);
- south and adjacent existing MW-5 location, (replacement well);

- south and adjacent to existing well MW-6 location (replacement well);
- between existing wells MW-3 and MW-4 (new well); and
- northeast and adjacent to existing MW-11 location (replacement well).

The locations of the proposed monitoring wells are presented on **Figure 3**. As conditions in the field may vary, minor modifications may be implemented to monitoring well installation as presented in this plan. Sampling locations may be adjusted according to information obtained from underground utility locating conducted prior to sampling or due to accessibility issues. When appropriate, the Ninyo & Moore Project Manager will be notified and a verbal approval will be obtained before implementing the changes. Modifications to the approved plan will be documented in the project report.

Monitoring Well Development

At least 72 hours or more subsequent to well installation, each of the new wells will be developed. Existing wells EW-13 through EW-17, and MW-8 through MW-10 will be re-developed to remove accumulated silt, PVC shavings and other particles. In the event that poor groundwater recovery is encountered in a well, a surge pump system will be used to assist in cleaning the well's filter pack.

Soil Logging and Soil Sample Collection

Soil samples will be collected continuously from surface to groundwater using decontaminated split-spoon samplers for soil description purposes and potential laboratory analyses. If field observations such as staining, odor, photo-ionization detector (PID) readings indicate petroleum contamination, soil samples will be collected for laboratory analyses of petroleum compounds.

Groundwater Sample Collection

Groundwater samples will be collected from all on and off-site wells, using the low flow method or passive diffusion bags, to reduce the amount of purge water generated and the time required for purging.

Sample Laboratory Analyses

Laboratory analyses of groundwater and soil samples for total petroleum hydrocarbons (TPH) as gasoline by EPA Method 8015B and full suite volatile organic compounds (VOCs) by EPA Method 8260B will be conducted by a State Certified Laboratory.

Quality Assurance/Quality Control (QA/QC) Samples

Field QA/QC samples in the form of duplicate samples and equipment rinsate samples will be collected from the project site during field sample collection. The number of duplicate samples will be dependent upon the number of samples collected in one field day and the various sample media (i.e. soil or groundwater). At a minimum, one duplicate sample per media will be collected. Sample duplicates will be submitted blind to the analytical laboratory.

In the event that reusable sampling equipment is used, equipment rinsate blanks will be collected to evaluate field sampling and decontamination procedures by pouring deionized water through or over the decontaminated sampling equipment used. One equipment rinsate blank will be collected for each day that sampling equipment is decontaminated in the field.

Laboratory QA/QC

Laboratory QA/QC will include the preparation of method blanks, surrogates, lab control samples, and matrix spike and matrix spike duplicate samples. Ninyo & Moore will perform Level II Data Validation on all chemical analysis, as a check of overall quality. The data quality check process will include a review of change-of-custody forms, holding times, laboratory analytical reports, method blanks, surrogate recoveries, matrix spike, matrix spike duplicates, lab control samples, and detection limits. The laboratory analytical report Case Narrative will also be reviewed for accuracy. A laboratory QA/QC section will be included in the final report discussing general comments in the laboratory analytical report.

Disposal of Drill Cuttings and Development Water

Drill cuttings and development water will be placed in 55-gallon drums for temporary on-site storage, pending laboratory analysis. Development water may be placed directly into a vacuum truck for proper, off site disposal.

Site Survey and Top-of-Casing Elevation Survey

The newly installed monitoring wells will need to be surveyed. Due to repairs and changes made to the TOC elevations in existing wells, conflicting groundwater flow directions and generally unreliable historical data, a Professional Land Surveyor will conduct a survey of the site, including surface and TOC elevations of all on-site and off-site wells.

Report Preparation and Uploading to the ACEH and Geotracker Databases

A Groundwater Monitoring Report will be prepared and upload to the online databases. The report will include:

- Documentation of pre-field activities;
- Documentation of drilling and sampling methods;
- Laboratory Analytical Reports;
- Field and laboratory QA/QC procedures;
- A discussion of Findings, Conclusions and Recommendations;
- A Surveyed Site Plan with updated TOCs;
- A series of figures showing results, based on professionally surveyed locations;
- A tabular presentation of soil and groundwater analytical data;
- Soil boring logs; and
- Monitoring well construction logs.

RESPONSE TO TECHNICAL COMMENTS PRESENTED BY THE ACEH

1. **Corrective Action is required** – Ninyo & Moore concurs with this comment. However, additional soil, soil vapor and groundwater assessment will be required for the preparation of a technically sound Corrective Action Plan (CAP).

2. **Elevated Concentrations of VOCs in Soil Vapor and Potential Vapor Intrusion are a concern** – Ninyo & Moore concurs. Vapor Intrusion will be properly assessed in the CAP.

3. **Groundwater flow directions and hydraulic gradients presented in previous environmental reports may not represent actual conditions** – Ninyo & Moore concurs. Groundwater flow directions have been stated as north, southeast and southwest in historical reports for the site. Using depth-to-groundwater measurements subsequent to well re-development and new surveyed TOC elevation data may provide a more accurate elevation contour map. Measurements from wells with different screen intervals and from wells with LPH will not be included.

4. **Conditions of Monitoring Wells and Data Quality** – The physical conditions of the monitoring wells are presented in **Table 1** and discussed above. Following the proposed well installation and replacement, re-development and removal of silt from remaining wells, and updated TOC elevation measurements, the data obtained during future sampling events should be more reliable.

5. **Historic Groundwater Flow Direction** – Please refer to Comment 4 above. Shallow groundwater flow on the Island of Alameda can be influenced by tidal action, production wells, the type of fill soil at a specific site, and the proximity of a site to one of the surrounding water bodies. Groundwater flow directions presented in historical monitoring reports has been reviewed and Ninyo & Moore concurs with the ACEH that this data may not be representative of current site conditions.

6. **Surveying of Monitoring Wells** – The surveying of existing and new-installed monitoring wells by a Professional Land Surveyor has been proposed above.

7. **ORC Socks** – The ORC socks logged in wells MW-2 and MW-7 will be removed when the wells are overdrilled and the casing is removed, as proposed above.

8. **Extent of Groundwater Contamination to the North –** An open leaking underground storage tank (LUST) site, the City of Alameda Police Department, is located north of the subject site, at 1555 Oak Street. Based on the most recent monitoring report available online (April 2011), groundwater from well MW-9, located north of the subject site, did not contain detectable concentrations of TPH as gasoline or VOCs. Further evaluation

will be conducted if results from future groundwater sampling events indicate petroleum compounds in groundwater from this well, or new groundwater data indicates a groundwater flow direction to the north.

9. **Existing Building at Northeast End of Property Parcel** – The potential for vapor intrusion to indoor air in this building, the residences located to the southeast, and the clothing store (former flower shop) will be evaluated in a later project phase.

10. **Fill and Rubble in Shallow Soils** – The statement made in a previous report "since the building is very old, and fill soils and rubble have been encountered in subsurface excavations, there may be numerous migratory pathways not yet accounted for" could probably be said about any site located in an urban area. Soils will be logged during the installation of the proposed monitoring wells and potential migratory pathways will be reassessed, if necessary.

11. **Sewer line from Chun Property to Flower Shop** – An evaluation of this sewer line and other utilities will be included in the Draft CAP.

12. **Analytical Data Tables** – Ninyo & Moore concurs that the presentation of analytical data in previous reports is confusing and difficult to interpret. Historical monitoring data will be presented in a clear and concise manner in future reports.

13. **Groundwater Concentration Trend Lines** – Ninyo & Moore concurs with the ACEH that figures in previous reports showing groundwater concentrations, water level elevations and trend lines do not present a valid basis for predicting future groundwater concentrations. Data from several wells presented on one figure essentially render this information invalid. Ninyo & Moore will present historical information in an accurate manner in future reports.

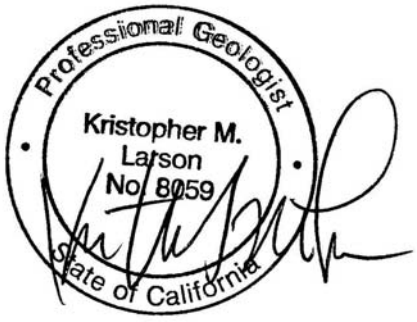
SCHEDULE

Ninyo & Moore anticipates that field work will begin within 2 to 3 weeks of approval of this Work Plan, depending upon subcontractor availability. The monitoring well installations and abandonment activities should be completed within approximately 5 field days. Groundwater sampling activities should be completed in 2 field days, and the site and well survey should be completed in 1-2 days.

A Groundwater Monitoring Report will be submitted to the ACEH approximately 4 weeks following the receipt of final laboratory reports. Additional assessment will most likely be required to assess soil, soil vapor and possibly groundwater conditions on and off the site, prior to the preparation of a CAP.

Should you have any questions regarding this Work Plan, please conduct us at your convenience.

Sincerely,
NINYO & MOORE



Lise Marie Bisson
Senior Geologist

Kris M. Larson, PG
Principal Environmental Geologist

LMB/KML/cab/csj

Attachments: Table 1 – Monitoring Well Information
Figure 1 – Site Location
Figure 2 – Site Vicinity
Figure 3 – Monitoring Well Locations

Distribution: (1) Addressee (uploaded to ACEH and Geotracker websites)
(1) Ms. Carolyn Fong (hard copy)

February 23, 2012

To: Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
Health Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Perjury Statement
Well Inspection Results and Groundwater Sampling Work Plan
Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California 94501
SLIC # RO0000382
Geotracker Global ID # T0600100980

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

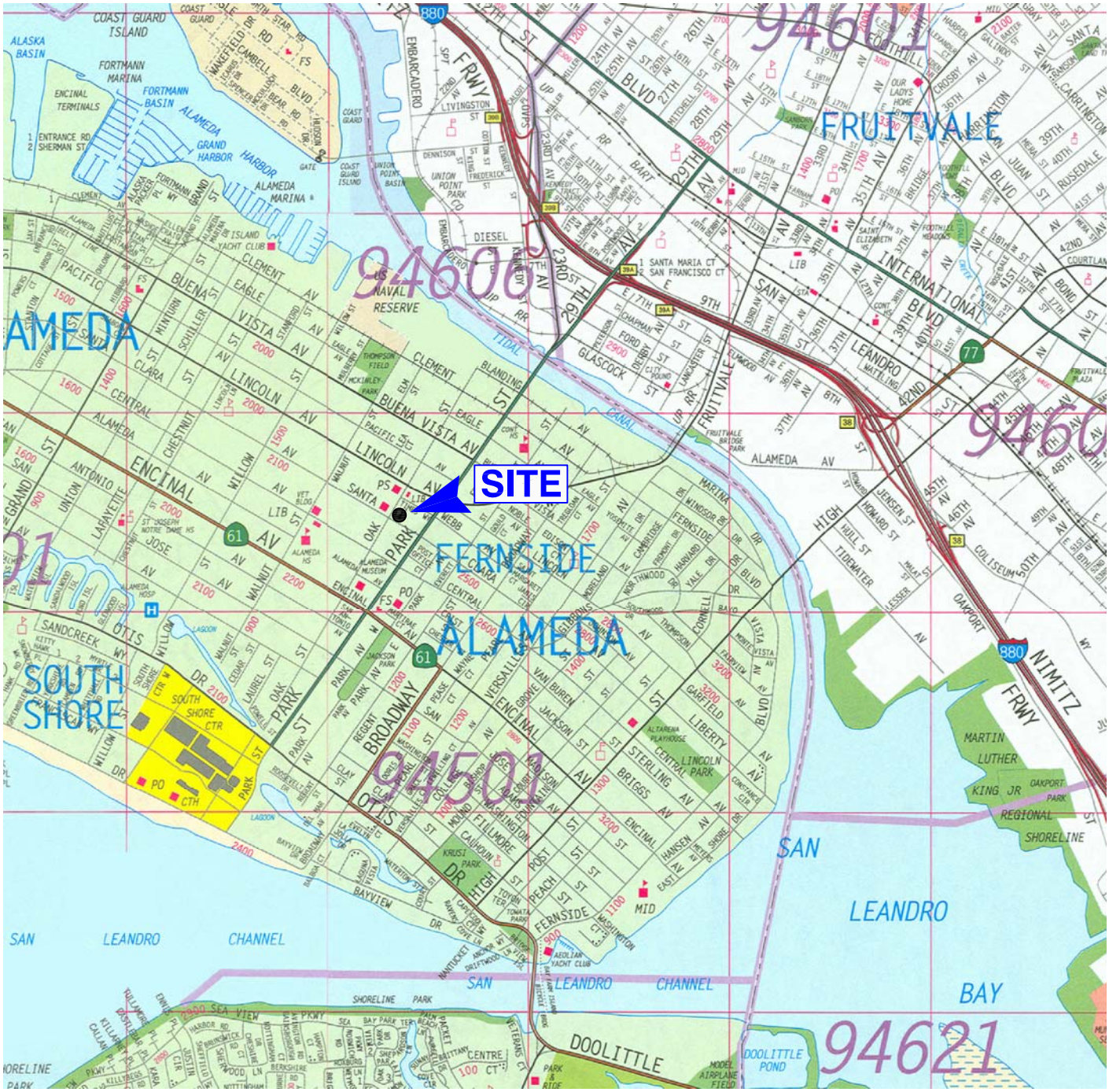
Carolyn Fong, trustee

Ms. Carolyn Fong
Trustee for Lily A. Chun 1991 Trust
711 E. Hermosa Drive
San Gabriel, CA 91755

TABLE 1
MONITORING WELL INFORMATION

Monitoring Well ID	Date Installed	Total Depth bgs[1]	Total Depth Measured bgs [2]	Riser Interval bgs[1]	Min. Depth to Water bgs [1]	DTW[2] bgs 2012	Screened Interval bgs[1]	Casing Diameter	Notes
MW-1	1993	25.0	23.4	0-10	6.77	9.21	10-25	2"	Riser too deep/very strong odor
MW-2	1993	25.0	sock @2.5'	0-10	6.92	--	10-25	2"	ORC sock stuck/strong odor
MW-3	1993	25.0	18.9	0-10	7.4	9.9	10-25	2"	Riser too deep/ 6 feet of silt on bottom
MW-4	<2000	25.0	20.55	0-7	6.6	9.65	7-25	2"	Riser too deep/ 4.5 feet of silt
MW-5	<2000	25.0	21.25	0-7	6.2	--	7-25	2"	TOC has hole / 3.5 feet of silt
MW-6	<2000	25.0	18.0	0-7	6.29	9.05	7-25	2"	Riser too deep/ 7 feet of silt
MW-7	<2000	25.0	sock @ 4.2'	0-7	7.51	--	7-25	2"	TOC has hole/ prev. damaged/ORC sock stuck
MW-8	<2000	14.0	13.9	0-5	7.08	8.1	5-14	2"	PVC shavings in well
MW-9	<2000	20.0	14.9	0-5	5.2	7.26	5-20	2"	5 feet of silt on bottom/ PVC shavings in well
MW-10	<2000	16.5	13.4	0-6.5	4.44	7.34	6.5-16.5	2"	Riser too deep/ 3 feet of silt on bottom/ PVC shavings in well
MW-11	<10/2002	20.0	14.82	0-5	6.79	8.21	5-20	2"	Not schedule 40 PVC (too thin)/ >5 feet of silt
EW-12	<10/2002	25 [3]	23.5	0-7	6.47	8.26	7-22	4"	Riser too deep/very strong odor
EW-13	<10/2002	25 [3]	24.1	0-7	7.8	9.2	7-22	4"	Seal is cracked/very strong odor
EW-14	<9/2003	25 [3]	23.6	0-7	8.08	9.48	7-22	4"	TOC needs to be cut down / black particles / very strong odor
EW-15	1/15/2004	25[3]	23.95	0-7	7.62	8.6	7-22	4"	Concrete on inside of cap/ very strong odor
EW-16	1/15/2004	25[3]	24.05	0-7	7.91	9.16	7-22	4"	Water is rusty
EW-17	1/15/2004	25[3]	23.97	0-7	7.45	8.92	7-22	4"	Water very silty/black particles/ strong odor
SV-1	--	--	9.5	--	--	8.5	--	2"	Water very dirty/black particles/strong odor
BF	5/2005	15.0	11.5	0-5	5.87	8.97	5-15	2"	in greenhouse/ 3.5 feet of silt / shallow screen
BG	5/2005	20.0	20.1	0-15	6.32	10.9	15-20	2"	intermediate screen/no apparent odor
BH	5/2005	30.0	--	0-20	6.18	--	20-30	--	inaccessible/ under car
BJ	5/2005	13.0	--	0-8	4.25	--	8-13	--	inaccessible/behind fence/need permission to enter
BK	5/2005	11.0	--	0-6	4.17	--	6-11	--	inaccessible/behind fence/need permission to enter
BL	5/2005	24.0	24.5	0-14	5.15	10.16	14-24	2"	intermediate screen/no apparent odor
BM	5/2005	30.0	29.5	0-20	5.81	8.58	20-30	2"	deep screen/no apparent odor

NOTES:
(1) As reported on Geotracker.
(2) Approximate depth and depth-to-water recorded by Ninyo & Moore in January or February 2012.
(3) Reported as 22 feet bgs in Geotracker, and at 25 feet bgs in historical reports.
-- indicates not known or verified.
bgs = feet below ground surface
TOC = top of casing
ORC = oxygen release compound



REFERENCE: METRO AREAS OF ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO, AND SANTA CLARA COUNTIES, THOMAS GUIDE, 2008.

N

SCALE IN FEET

0 2000 4000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	SITE LOCATION	FIGURE
PROJECT NO. 401896001 / DATE 2/12	2301 SANTA CLARA AVENUE ALAMEDA, CALIFORNIA	1

401896001-FIG1.dwg, Feb 22, 2012, 8:46am, snguyen

REFERENCE: GOOGLE EARTH, 2012.

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SCALE IN FEET

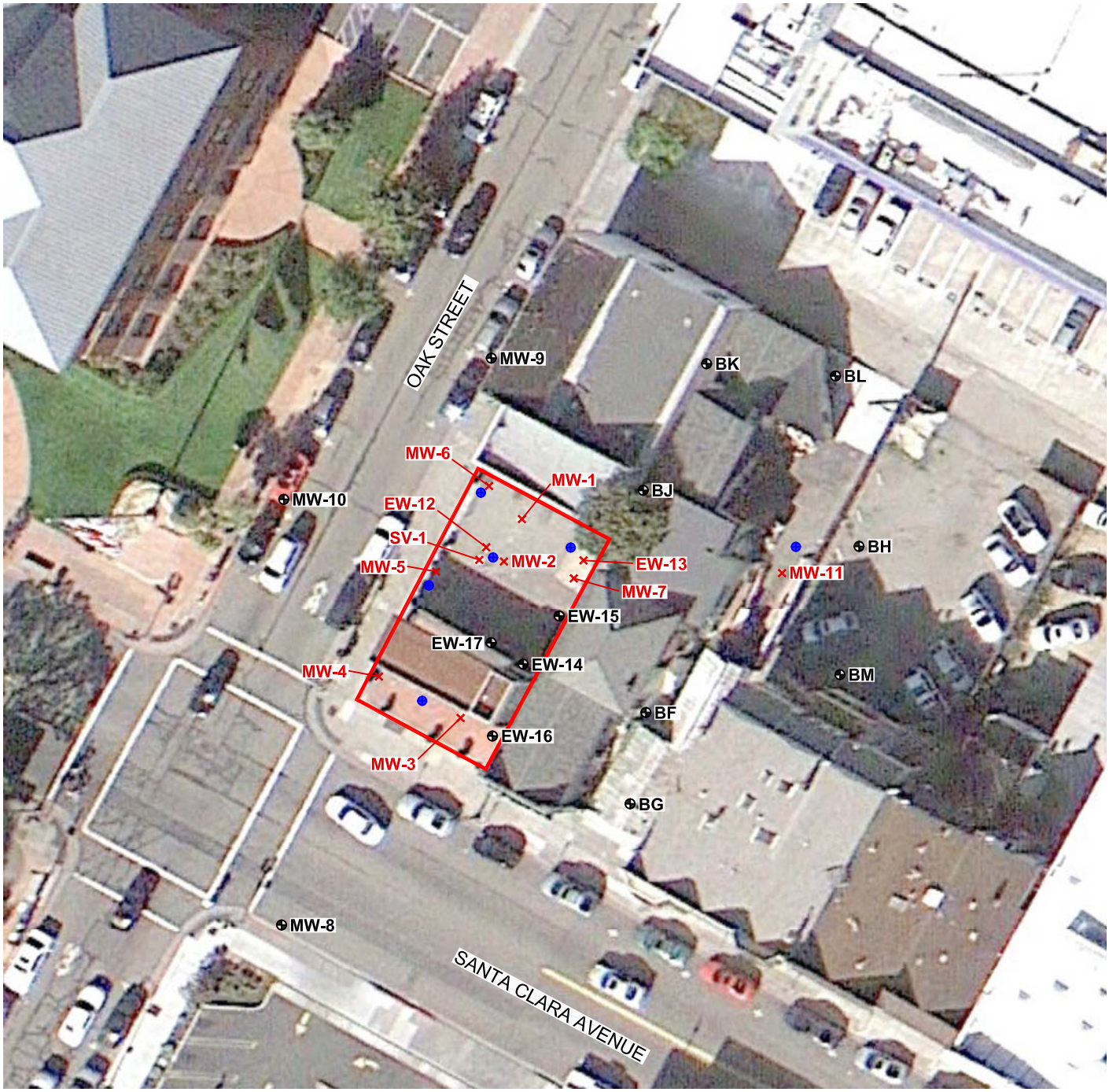
0 40 80

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND	
	APPROXIMATE SITE BOUNDARY

Ninyo & Moore	SITE VICINITY	FIGURE
PROJECT NO. 401896001 / DATE 2/12	2301 SANTA CLARA AVENUE ALAMEDA, CALIFORNIA	2

401896001-FIG2.dwg, Feb 22, 2012, 8:48am, snguyen



REFERENCE: GOOGLE EARTH, 2012.

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SCALE IN FEET

0 40 80

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

- APPROXIMATE SITE BOUNDARY
- ⊕ MW-10 MONITORING WELL TO REMAIN
- × EW-13 MONITORING WELL TO BE ABANDONED
- ● MONITORING WELL TO BE INSTALLED

LOCATIONS ARE APPROXIMATE AND HAVE NOT BEEN SURVEYED

Ninyo & Moore	MONITORING WELL LOCATIONS	FIGURE
PROJECT NO. 401896001 / DATE 2/12	2301 SANTA CLARA AVENUE ALAMEDA, CALIFORNIA	3

401896001-FIG3.dwg, Feb 22, 2012, 8:50am, snguyen