ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP)
For Hazardous Materials Releases
1131 HARBOR BAY PARKWAY, SUITE 250
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December 14, 2017

Lily A. Chun 1991 Trust
Carolyn C. Fong, Trustee
711 East Hermosa Drive
San Gabriel, CA 91775
(*Sent via E-mail to: carolynfong1@sbcglobal.net*)

Subject: Directive to Cease and Desist From Operating Lily A. Chun 1991 Trust Groundwater Recirculation System Operation, Request for Remediation System Effectiveness and Gasoline Plume Migration Evaluation, Request for Revised Corrective Action Plan, Request for Site Investigation Work Plan, and Modification of Groundwater Monitoring Program, Fuel Leak Case No. RO0000382 and T0600100980, Bill Chun Service Station, 2301 Santa Clara Avenue, Alameda, CA 94501

Dear Ms. Fong:

Alameda County Department of Environmental Health (ACDEH) staff has reviewed the case file for the above-referenced site, including the following reports:

- 1st Quarter 2017 Groundwater Monitoring and System Evaluation Report, dated 31 July 2017
- *Vapor Intrusion Assessment Report*, dated 7 June 2017
- *Corrective Action Plan Addendum*, dated 26 February 2014
- *Corrective Action Plan*, dated 1 August 2013

These four documents were prepared by Ninyo and Moore Geotechnical and Environmental Sciences Consultants (NAM), on your behalf. Based on the data submitted by NAM, we request that you immediately cease operation of the groundwater remediation system. We further request that you: (1) submit a report evaluating the remedial system effectiveness, and petroleum migration beneath the site and adjacent properties; (2) revise the Corrective Action Plan (CAP) for the site; (3) submit a workplan for additional subsurface investigation; and (4) conduct semi-annual groundwater monitoring.

This letter summarizes the data presented in the above-listed reports technical comments, and technical reports that you are required to submit to the ACDEH.

SUMMARY OF DATA AND FINDINGS

Between 21 November 2014 and 28 March 2017, NAM reports extraction of 1,345,790 gallons of groundwater, treatment of the extracted groundwater with a granular activated carbon system to remove petroleum compounds, addition of 4,050 lbs of a nutrient mix and 240 gallons of a surfactant, and reinjection of the amended water. Groundwater is extracted from wells EW-21 and EW-22 which are located offsite at 2305 Santa Clara Avenue, and well EW-20 which is located onsite, adjacent to the sidewalk at the corner

of Santa Clara Avenue and Oak Street. Reinjection is conducted onsite through perforated horizontal pipes (IN-1, IN-2, and IN-3) and injection wells (EW-14, EW-15, EW-16, EW-17, EW-18, and EW-19).

Based on March 2017 groundwater elevation measurements in monitoring wells, NAM interprets a groundwater mound onsite, with radial groundwater flow away from the northwest portion of the site. The perforated horizontal injection piping is located in the northwest portion of the site. The depth to groundwater beneath the site varies between approximately 5 and 10 feet below ground surface (bgs).

Following system startup, the concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene in groundwater in offsite and site perimeter wells increased. Concurrently, TPHg and benzene concentrations in well MW-7R, located adjacent to the horizontal injection piping, decreased. Graphs 1 and 2 from NAM's 31 July 2017 Groundwater Monitoring Report illustrate these observations. In 2014 and in 2015, no benzene was detected in well MW-11R, located approximately 50 feet east of the former USTs. During operation of the groundwater recirculation system, the benzene concentration in well MW-11R increased to up to 2,900 ug/L. In June 2014, prior to operation of the recirculation system, the benzene concentration reported in well MW-12 was 350 ug/L. Well MW-12 is located approximately 100 feet north of the former UST system. In December 2016, the reported benzene concentration in this well was 1,900 ug/L.

In March 2017, NAM interpreted the TPHg, benzene, and naphthalene plumes in groundwater to be greater than 200 feet long, and extending from Santa Clara Avenue to Times Way, and from Oak Street onto the property at 2309 Santa Clara Avenue. NAM's Figure 8 of the Groundwater Monitoring Report indicates that benzene has migrated offsite to the north during operation of the groundwater recirculation system.

In April 2017, NAM collected soil, soil gas, and crawlspace air samples. Sampling was performed offsite beneath the structure at 1510 Oak Street, offsite beneath the structure at 2305 Santa Clara Avenue (labelled by NAM as a green house), offsite in the driveway on the east side of the residential property at 2305 Santa Clara Avenue, and onsite in a parking area. TPHg up to 12,000 mg/kg was reported in soil from boring NMB-13, collected from the property at 1510 Oak Street. Benzene and naphthalene were detected in the crawlspace sample at concentrations greater than the Tier 1 Environmental Screening Level (ESL) for indoor air. NAM speculates that the crawlspace concentrations may be related to ambient conditions; however, no ambient samples were collected by NAM. The California Department of Toxic Substances Control (DTSC) recommends collection and analysis of at least 3 ambient air samples when indoor air samples are collected. NAM reported petroleum concentrations ranging up to 500 ug/m3 benzene, 1,500 ug/m3 ethylbenzene, and 28 ug/m3 naphthalene in the soil gas samples. NAM collected the soil gas samples from depths ranging from 4.0 to 5.0 feet bgs. NAM recommends collecting a sub-slab soil gas sample at 1510 Oak Street and re-sampling soil vapor probes NMB-3B, NMB-6B, NMB-9B, NMB-11B, NMB-13, NMB-14, and NMB-15.

DIRECTIVE TO CEASE AND DESIST FROM OPERATING THE LILY A. CHUN 1991 TRUST GROUNDWATER RECIRCULATION SYSTEM OPERATION

The data and interpretations submitted by NAM to the ACDEH indicate that operation of the groundwater recirculation system is spreading petroleum to neighboring properties. The system began operating over 3 years ago and has extracted and re-injected into the ground over one million gallons of groundwater. The system has been operating for over 1,100 days. Between 2014 and 2017, NAM injected over 4,050 lbs of a nutrient mix and 240 gallons of a surfactant. In 2013, NAM estimated the mass of TPHg in soil and groundwater at the site as 6,711 lbs. and estimated that the remedial system would be operated for 730 days. Petroleum concentrations in offsite groundwater monitoring wells increased following start-up and operation of your groundwater recirculation system.

ACDEH requests that you immediately cease operating the recirculation system. Induced petroleum migration to adjoining properties needs to be abated, and any subsurface petroleum concentrations indicating a threat to human health or the environment need to be cleaned up.

TECHNICAL COMMENTS

ACDEH requests that you cease and desist from operating the groundwater recirculation system and:

I. Submit a report evaluating the remedial system effectiveness, and petroleum migration beneath the site and adjacent properties.
II. Revise the Corrective Action Plan (CAP) for the site.
III. Submit a workplan for additional subsurface investigation.
IV. Conduct semi-annual groundwater monitoring.

Your remediation system effectiveness and petroleum migration report must address technical comments 1 through 5, below.

1. **Mobilization of Trapped Residual LNAPL.** The addition of surfactant(s) and creation of a groundwater mound increase the potential for mobilizing petroleum as a light non-aqueous phase liquid (LNAPL). Mobile product may accumulate and migrate under dynamic groundwater conditions. NAM's Groundwater Monitoring Report does not indicate inspection of wells for mobile LNAPL (i.e., free product). All wells need to be inspected for free product, including a sheen on the groundwater surface prior to purging or sampling. Review your records, including field sheets completed during monitoring events, to determine if free product was likely present in monitoring wells during any of the monitoring events conducted between November 2014 and December 2017. Summarize your findings in a table.

2. **Solubilization of Residual LNAPL.** Surfactants may increase the solubility of a petroleum product Increased groundwater concentrations concurrent with an increased groundwater gradient away from a source area are likely to induce migration of petroleum compounds. The groundwater recirculation system is not designed to fully capture injected surfactant or dissolved petroleum. Evaluate current offsite petroleum concentrations and compare these concentrations to pre-remediation concentrations. Provide tables summarizing the data and graphs illustrating concentration trends.

3. **Extent of Benzene Plume in Groundwater.** NAM's Figure 8 in the Groundwater Monitoring Report shows that the extent of benzene in groundwater is no longer defined to the northeast or southwest of the site. Evaluate the benzene extent in groundwater based on monitoring during the Second and Third Quarters of 2017, and if necessary propose additional groundwater monitoring wells to define the extent of the benzene plume.

4. **Capture Zone Evaluation.** Evaluate the capture zone of the extraction wells and delineate the capture area on a site plan. Include a flownet showing equipotential and groundwater flow lines on at least two cross-sections of the site.

5. **Storm Sewer Location.** Identify the location and depths of the storm sewers near the site and provide a map showing locations and depths relative to the groundwater table.

Your revised CAP must address technical comments 6 through 8, below.

6. **Offsite Spreading of Petroleum.** Operation of a remediation system must reduce both the extent and mass of impacts soil and groundwater. Evaluate the relative cost to (1) reconfigure the recirculation system such that petroleum will no longer be spread to surrounding properties (e.g., reverse operation to inject treated groundwater upgradient and extract petroleum from the source area), and (2) implement an alternative cleanup approach.

7. **Rebound.** Collect and analyze groundwater samples from your monitoring wells according to the semi-annual groundwater monitoring schedule specified in this directive letter, and evaluate groundwater concentrations. Injection of groundwater treated with GAC adjacent to well MW-7R is likely to have diluted petroleum-impacted groundwater in this well.

8. **Duration of Active Remediation**. NAM estimated 2 years of active remediation. The recirculation system operated for over 3 years. Estimate the time period needed to (1) correct the current system, and (2) implement an alternative cleanup approach.

Your Additional Soil Gas Investigation Workplan must address technical comments 9 through 13, below.

9. **Additional Soil Gas Investigation.** Additional investigation of concentrations and extent of petroleum compounds in soil gas is needed. Additional soil and soil gas samples need to be collected beneath: (1) the mixed-use structure at 2305 Santa Clara Avenue, in a location east of the former USTs; (2) the meeting hall at 1510 Oak Street; and (3) the onsite garage at the northern end of the property. If a soil gas sample cannot be collected from 5 feet beneath the bottom of the foundation at 1510 Oak Street, then sub-slab soil gas data may be used to evaluate petroleum vapor intrusion concerns. Multiple sub-slab soil gas sampling points will be required. Construction details including foundation depths and configurations must be provided for 1510 Oak Street and 2305 Santa Clara Avenue.

10. **LUFT Manual.** You must submit a workplan describing tasks needed to perform this work. Refer to the Leaking Underground Fuel Tank Guidance Manual (LUFT Manual), prepared by the California State Water Resources Control Board, and revised December 2015. The LUFT Manual

may be downloaded at: https://www.waterboards.ca.gov/ust/luft_manual/manual_dec2015.pdf. Your workplan submittal is required to include the following elements:

a. Proposed Work
b. Technical Approach
c. Assumptions
d. Analytes and Methods
e. Reporting
f. Performance Measures
g. Work Notice
h. Implementation Schedule

11. **Performance Measures**. This section of a workplan is critical to the successful execution and progress of a site toward cleanup and closure. Identify the standards to be used to evaluate the sample results, and subsequent response actions. Your discussion must consider multiple scenarios to accommodate all likely investigation results.

12. **Report Distribution and Work Notices.** The workplan must provide a list of stakeholders including the property owner and his/her legal representative, tenants or operators at the site, adjoining property owners and occupants (including 1510 Oak Street and 2305 and 2309 Santa Clara Avenue), the ACDEH, and any other stakeholders. Report copies, copies of ACDEH directives, and written notice in advance of field activities may be provided to this list.

13. **Implementation Schedule**. A detailed schedule for implementation of the workplan must be included as a section of the workplan. The schedule must include anticipated dates of work notices, field dates, and report submittal dates.

A groundwater monitoring report presenting the results of Second and Third Quarter 2017 monitoring events is required by 29 December 2017. Subsequent semi-annual monitoring must address comment 14, below.

14. **Semi-Annual Groundwater Monitoring.** Semi-annual groundwater monitoring is required at this site until further notice from the ACDEH. Wells MW-2R, MW-4R, MW-5R, MW-6R, MW-7R, MW-8, MW-9, MW-10, MW-11R, MW-12, MW-13, MW-14, MW-15, and MW-16 must be gauged and sampled during each monitoring event. The next groundwater monitoring event must be conducted no later than 31 January 2018 and the first Semi-Annual Monitoring Report (SAMR) must be submitted no later than 31 March 2018. Subsequent groundwater monitoring events shall be conducted during the 1st month of the 1st and 3rd Quarters of each year, and reports must be submitted no later than the last day of the sampling quarter. Written notice to the ACDEH 72 hours prior to groundwater sampling is required prior to each monitoring event.

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

ACDEH requires a Submittal Acknowledgement Statement, signed by the Responsible Party (RP), as a cover letter to technical reports and submittals. The requirement is described in Attachment 1. The language for the Submittal Acknowledgement Statement is as follows:

"I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to the State Water Resources Control Board's GeoTracker website."

TECHNICAL REPORT REQUEST

Please upload technical reports to the State Water Resources Control Board's GeoTracker website according to the following schedule and file-naming convention:

- 31 January 2018 – Remediation System Effectiveness and Petroleum Migration Evaluation Report
  File to be named: RO-382_ADD_R_yyyy-mm-dd
- 15 February 2018 – Additional Soil Gas Investigation Workplan
  File to be named: RO-382_WP_R_yyyy-mm-dd
- 31 March 2018 – Groundwater Monitoring Report – 1st Half 2018
  File to be named: RO-382_GWM_yyyy-mm-dd
- 31 December 2018 – Revised Corrective Action Plan
  File to be named: RO-382_WP_R_yyyy-mm-dd
- 31 March and 30 September Each Year – Semi-Annual Groundwater Monitoring Report
  File to be named: RO-382_GWM_yyyy-mm-dd

If you have any questions, please call me at (510) 567-6721 or send me an electronic mail message at robert.schultz@acgov.org. Online case files are available for review at the following website: http://www.acgov.org/aceh/index.htm.

Sincerely,

Robert W. Schultz, CHG
Senior Hazardous Materials Specialist

Attachment: Attachment 1 - Responsible Party(ies) Legal Requirements/Obligations

cc: Peter Sims, Ninyo & Moore, 1956 Webster Street, Suite 400, Oakland, CA 94612 *(Sent via E-mail to: psims@ninyoandmoore.com)*
Kris Larson, Ninyo & Moore, 1956 Webster Street, Suite 400, Oakland, CA 94612 *(Sent via E-mail to: klarson@ninyoandmoore.com)*
Amanda Chiu, 2305 Santa Clara Ave., Alameda, CA *(Sent via E-mail to: amandachiu@gmail.com)*
Andy Chiu, 911 Fitchburg Avenue, Alameda, CA 94502-6715 *(Sent via E-mail to: adi.design@yahoo.com)*
Dilan Roe, ACDEH (*Sent via E-mail to: dilan.roe@acgov.org*)
GeoTracker, eFile

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** December 14, 2017
	ISSUE DATE: July 25, 2012
	PREVIOUS REVISIONS: September 17, 2013, May 15, 2014, December 12, 2016
SECTION: ACDEH Procedures	**SUBJECT:** Responsible Party(ies) Legal Requirements / Obligations

REPORT & DELIVERABLE REQUESTS

Alameda County Department of Environmental Health (ACDEH) Cleanup Oversight Programs, Local Oversight Program (LOP) and Site Cleanup Program (SCP) require submission of all reports in electronic form to the State Water Board's (SWB) GeoTracker website in accordance with California Code of Regulations, Chapter 30, Division3, Title 23 and Division 3, Title 27.

Leaking Underground Fuel Tank (LUFT) Cases

Reports and deliverable requests are 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 (RP) in conjunction with an unauthorized release from a petroleum underground storage tank (UST) system.

Site Cleanup Program (SCP) Cases

For non-petroleum UST cases, reports and deliverables requests are pursuant to California Health and Safety Code Section 101480.

ELECTRONIC SUBMITTAL OF REPORTS

A complete report submittal includes the PDF report and all associated electronic data files, including but not limited to GEO_MAP, GEO_XY, GEO_Z, GEO_BORE, GEO_WELL, and laboratory analytical data in Electronic Deliverable Format™ (EDF). Additional information on these requirements is available on the State Water Board's website (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

- Do not upload draft reports to GeoTracker
- Rotate each page in the PDF document in the direction that will make it easiest to read on a computer monitor.

GEOTRACKER UPLOAD CERTIFICATION

Each report submittal is to include a GeoTracker Upload Summary Table with GeoTracker valid values[1] as illustrated in the example below to facilitate ACDEH review and verify compliance with GeoTracker requirements.

GeoTracker Upload Table Example

Report Title	Sample Period	PDF Report	GEO_MAPS	Sample ID	Matrix	GEO_Z	GEO_XY	GEO_BORE	GEO_WELL	EDF
2016 Subsurface Investigation Report	2016 S1	✓	✓	Effluent	SO	☐	☐	☐	☐	✓
2012 Site Assessment Work Plan	2012	✓	✓			☐	☐	☐	☐	☐
2010 GW Investigation Report	2008 Q4	✓	✓	SB-10	W	✓	☐	☐	☐	✓
				SB-10-6	SO	☐	☐	☐	☐	✓
				MW-1	WG	✓	✓	✓	✓	✓
				SW-1	W	✓	✓	✓	✓	✓

[1] GeoTracker Survey XYZ, Well Data, and Site Map Guidelines & Restrictions, CA State Water Resources Control Board, April 2005

ACKNOWLEDGEMENT STATEMENT

All work plans, technical reports, or technical documents submitted to ACDEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to the State Water Board's GeoTracker website." This letter must be signed by the Responsible Party, or legally authorized representative of the Responsible Party.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6731, 6735, and 7835) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately licensed or certified professional and include the professional registration stamp, signature, and statement of professional certification. Additional information is available on the Board of Professional Engineers, Land Surveyors, and Geologists website at: http://www.bpelsg.ca.gov/laws/index.shtml.

UNDERGROUND STORAGE TANK CLEANUP FUND

For LUFT cases, RP's non-compliance with these regulations may result in ineligibility to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse the cost of cleanup. Additional information is available on the internet at: https://www.waterboards.ca.gov/water_issues/programs/ustcf/

AGENCY OVERSIGHT

Significant delays in conducting site assessment/cleanup or report submittals may result in referral of the case to the Regional Water Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.