June 20, 2011

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: B&C Gas Mini Mart, Workplan Addendum for Monitoring and Reporting of Ozone Sparging, 2008 First Street, Livermore, California
Fuel Leak Case RO0000278

Dear Mr. Wickham:

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

Sincerely,

Balaji Angle

June 20, 2011 Project No. 053-7020

Mr. Jerry Wickham
Alameda County
Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: CORRECTIVE ACTION PLAN ADDENDUM FOR MONITORING AND REPORTING OF OZONE SPARGING, VALLEY GAS (B&C GAS MINIMART), 2008 1st STREET, LIVERMORE, CALIFORNIA (APN 097-0001-24-01)

Dear Mr. Wickham:

Golder Associates, Inc. (Golder) has prepared this letter on behalf of Valley Gas (B&C Gas Minimart) to serve as an addendum to the Corrective Action Plan for the former Desert Petroleum site at 2008 1st Street, Livermore, California. This addendum was prepared in response to a letter from the Alameda County Environmental Health Department (ACEHD) dated April 20, 2011. The ACEHD requested a description of the systems operation and performance monitoring to be conducted during future operation of the ozone sparging system. Additional monitoring activities proposed by Golder to meet these requirements are detailed in this letter and shall be included in future monitoring activities carried out at the site.

1.0 RATE OF OZONE SPARGING

The ozone sparging system was installed on November 6 through November 13, 2007, and pilot testing was conducted at SP-1B from November 14 through December 2007. The pilot test was discontinued in December 2007 because water levels had declined to the extent that the sparging well was not sufficiently submerged. The pilot test was continued on March 5, 2008 at SP-1A and B following rising water levels and was discontinued on March 15, 2008 for rebound testing. Following the rebound testing period, the system was operated beginning in mid-May 2008. In July 2008, sparge wells SP-2A and B and SP-4A and B were connected to the system and the injection system was programmed to include operating at these wells. The system operated through October 2008.

Ozone gas is produced at the site using a HiPro 2500 high-pressure ozone system, capable of producing up to 2.5 pounds of ozone per day (50 grams per hour) at a maximum injection pressure of 40 psi and with a gas flow rate of between 1 to 4 standard cubic feet per minute (SCFM). During normal operations the ozone sparging system is left unattended; controlled by a pre-programmed sparging procedure stored within a programmable logic controller (PLC). The program included sparging ozone into each well at 100 percent production capacity (approximately 2.5 pounds per day) for 20 minutes followed by a 5 minute purge of air and oxygen followed by a 20 minute rest period. The program cycles in this manner through each of the connected sparge points.

The ozone system is equipped with an automatic data recorder capable of recording various parameters during operation. The total hours of operation and total output of ozone (in pounds) delivered to each sparging well are recorded automatically, and in order to meet the system operation monitoring request of the ACEHD, Golder proposes that these records shall be downloaded and submitted quarterly in the form of a letter to the ACEHD.

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2.0 RADIUS OF INFLUENCE

The radius of influence around the sparging wells is dependent on the relative water levels at the well locations. During periods when water levels are low, such as following pilot testing in November 2007[1], the effectiveness of sparging is limited. The amount of air flow that can be applied to the saturated zone must be minimized to prevent the thin layer of groundwater located above the sparge screen from being easily pushed aside and preferential pathways created. Therefore, as air flow is varied, the radius of influence and potential mass transfer rates also fluctuate.

The ozone sparging system is currently connected to SP-1A and B, SP-2A and B, and SP-4A and B (see Figure 1). Sparge wells SP-3A and B; SP-5A, B, and C; and SP-6A, B, and C can be monitored to provide vertical and horizontal radius of influence information during sparging. Golder proposes field monitoring of these wells for dissolved oxygen (DO) and oxidation reduction potential (ORP) to assess the radius of influence during ozone sparging. Golder proposes that the frequency of radius of influence monitoring at SP-5A, B, and C and SP-6A, B, and C be quarterly with monthly radius of influence monitoring at SP-3A and B. The frequency of monitoring at SP-3A and B will be reduced if monitoring indicates stable conditions.

In addition, ACEHD requested additional monitoring to assess the mobilization of vapors during ozone sparging. Golder proposes monthly field monitoring of groundwater monitoring well MW-2 using a photoionization detector (PID) to assess vapor concentrations.

At the request of the ACEHD, Golder proposes to adjust the frequency of groundwater level monitoring from semi-annual to quarterly measurements. The results will be reported in semi-annual groundwater monitoring reports. Groundwater levels are directly related to the performance of the ozone sparging system, and during periods of low groundwater levels, it is necessary to adjust the sparging system to ensure ozone is delivered uniformly, rather than creating preferential pathways as explained above. Should the groundwater level monitoring indicate that the groundwater level is low enough to make soil vapor extraction (SVE) feasible, Golder will reevaluate the remedial approach to potentially include SVE.

3.0 POTENTIAL METALS MOBILIZATION

The potential for mobilization of metals within the source zone is currently monitored semi-annually by assessing geochemical parameters that would indicate the occurrence of a change in geochemical conditions. Parameters measured on-site include the groundwater pH, DO concentration and ORP. Samples are collected for analysis of sulfate, nitrate, alkalinity, dissolved iron and dissolved manganese (to assess natural hydrocarbon attenuation processes). Monitoring is carried out in wells that are located up-gradient of the source zone (MW-4), within the source zone (MW-2) and also down-gradient in the mid-plume (MW-14). Historical monitoring results generally indicate that contaminants in the source zone cause groundwater ORP to decrease (become less oxidizing). However, where ozone sparging is used it is likely that groundwater would become more oxidizing, possibly causing the oxidative dissolution of certain metals. The effects of oxidation would be localized to within the zone of influence for each well, and the metals would not remain mobilized within the plume.

Golder will continue to monitor the pH, DO and ORP of all groundwater samples collected during future monitoring events to assess whether the groundwater geochemical environment varies significantly across the site. Measurement of these parameters will provide a better determination between localized and regional effects than measuring the concentrations of metals at a limited number of wells.

4.0 MAINTENANCE AND SYSTEMS OPERATION

System operation and routine or non-routine maintenance work carried out on the ozone sparging system shall be reported quarterly to the ACEHD. Maintenance descriptions shall include an explanation of the

[1] Golder Associates, Inc. 2007: Pilot Test Report December 7, 2007. RO0000278

reason for maintenance, maintenance carried out and details of any time that the ozone sparging system was not operational. If monitoring indicates operational changes are warranted, these changes will be documented.

5.0 GROUNDWATER MONITORING ANALYTES

Per ACEHD's request, tert-butyl alcohol (TBA) will be included as an analyte during future groundwater monitoring events.

6.0 SUMMARY OF AMENDMENTS TO CORRECTIVE ACTION PLAN

As previously outlined in this letter, Golder proposes to complete the following additional monitoring activities:

- Implement quarterly measurement of groundwater levels in on-site single-screen wells: MW-2, MW-3, MW-4, and MW-6
- Continue to monitor the pH, DO, and ORP of all groundwater samples collected during future monitoring events
- Include TBA as an analyte for future groundwater monitoring events
- Perform radius of influence monitoring during ozone sparging monthly at SP-3A and B and quarterly at SP-5A, B, and C and SP-6A, B, and C
- Assess vapor off-gassing during ozone sparging monthly at MW-2
- Report quarterly system operation monitoring and maintenance, including total output of ozone to each well and any operational changes
- Reevaluate the remedial approach to potentially include SVE should the groundwater level monitoring indicate SVE is feasible.

All of the additional groundwater monitoring requirements proposed above shall be reported in the respective semiannual groundwater monitoring report. Results of systems operation monitoring and maintenance shall be reported to the ACEHD in the form of quarterly letter reports when the ozone sparging system is operating.

7.0 CLOSURE

If you have any questions or comments, please call Kris Johnson at (408) 220-9223 or Mark Naugle at (916) 786-2424.

Sincerely

GOLDER ASSOCIATES INC.

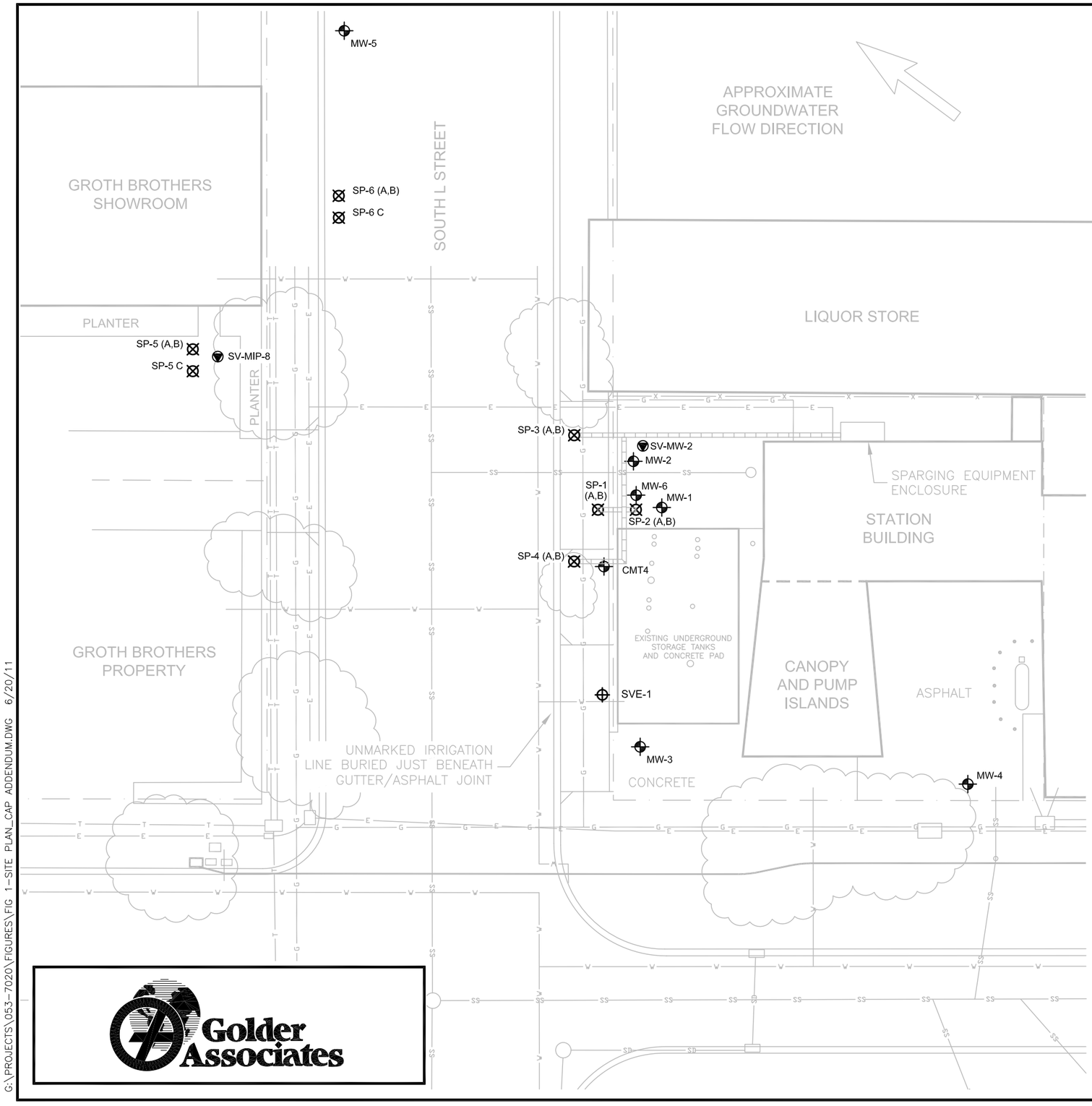
Mark Naugle, PE
Senior Consultant

Kris Johnson, C.E.G. 1763
Senior Consultant

PROFESSIONAL GEOLOGIST
KRIS H. JOHNSON
No. 1763
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Attachment:
Figure 1

ATTACHMENT



LEGEND

- RIGHT–OF–WAY LIMIT
- GAS LINE
- SANITARY SEWER LINE
- WATER LINE
- ELECTRIC LINE
- TELEPHONE LINE
- OZONE SPARGE/ MONITORING WELL
- SOIL VAPOR EXTRACTION/ MONITORING WELL
- GROUNDWATER MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- SPARGE CONVEYANCE LINES (UNDERGROUND)
- TREE (TYP.)

NOTES

1. APPROXIMATE LOCATIONS OF UTILITY LINES AND SURFACE FEATURES BASED FROM CITY OF LIVERMORE DRAWING TITILED FIRST STREET STREETSCAPE IMPROVEMENTS. DATE OF DRAWING: FEBRUARY 9, 2005.

25 0 25
SCALE FEET

Golder Associates

DATE	6/20/11
DWN	KMM
APP	GW
REV	0
PROJECT NO.	053-7020

FIGURE 1
CORRECTIVE ACTION PLAN ADDENDUM
B & C GAS MINI MART/VALLEY GAS
LIVERMORE, CALIFORNIA
SITE PLAN

Dimscale: 1 Ltscale: 1 Psltscale: 1=1
G:\PROJECTS\053-7020\FIGURES\FIG 1-SITE PLAN_CAP ADDENDUM.DWG 6/20/11