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Alameda County
Environmental Health



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May 22, 2007

Mr. Jerry Wickham
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: Multi-Phase Extraction Pilot Test
3609 International Boulevard
Oakland, California
Fuel Leak Case #RO0000265

Dear Mr. Wickham:

On behalf of the owner, Mr. Abolghassem Razi, SOMA Environmental Engineering, Inc. (SOMA) is pleased to notify the Alameda County Environmental Health Services (ACEHS) of a proposed multi-phase extraction (MPE) pilot test at 3609 International Boulevard, Oakland, Alameda County, California (the Site).

The objective of the MPE pilot test will be to evaluate MPE as a supplemental remedial action besides existing pump-and-treat to reduce the mass of fuel hydrocarbons impacting soil and groundwater within the chemical source area at the Site.

MPE Pilot Test

The results of groundwater monitoring events show that concentrations of petroleum hydrocarbons in the majority of groundwater monitoring wells has been reduced significantly during the last several groundwater monitoring events. However, a pocket of contaminants still exists at MW-3 and MW-1. These wells are located next to the USTs within the chemical source area. The maximum BTEX and TPH-g concentrations have been reported in MW-1 and MW-3 at slightly over 1 part per million. SOMA believes that once the chemical concentrations at MW-1 and MW-3 are reduced to environmental screening levels (ESLs), the site can be closed. This will benefit our client as well as the UST Fund by reducing the number of groundwater monitoring events. Figure 1 shows the location of all monitoring wells.

SOMA's review of the boring logs for MW-1 and MW-3 indicates the presence of a hydrocarbon smear zone (Smear Zone) above, at, and below the capillary fringe. The Smear Zone is identified as light gray, gray to blue-green gray staining of soils above, at, and below the capillary fringe, accompanied by moderate to strong hydrocarbon

odor. The thickness of the Smear Zone is approximately 20 feet in both wells. Over the period of record for quarterly monitoring at the Site, groundwater monitoring wells MW-1, and MW-3 have consistently exhibited elevated dissolved-phase constituents in groundwater samples collect from these wells. The distribution of dissolved-phase constituents in the groundwater over the period of record indicates elevated areas (halos) centered on and in close proximity to groundwater monitoring wells MW-1 and MW-3, suggesting that the Smear Zone at these locations is potentially the source of the dissolved-phase hydrocarbons in the samples collected from these wells. Based on the presence of a Smear Zone at groundwater monitoring wells MW-1 and MW-3, in addition to the potential that the Smear Zone is actively leaching dissolved-phase hydrocarbons to groundwater at these locations, SOMA proposes conducting MPE pilot testing to determine the feasibility of remediating the Smear Zone adjacent to the well screens in groundwater monitoring wells MW-1 and MW-3 using MPE methods and techniques.

A Smear Zone is developed as mobile light fuel hydrocarbons (light non-aqueous phase liquids [LNAPL]) are released to the water table, spread laterally as a non-wetting phase in soils below the water table, and are distributed vertically through the upper aquifer during seasonal water table fluctuations. As smearing continues the LNAPL become trapped as discontinuous ganglia within soil pores of the upper aquifer. Thus, the Smear Zone is an area of intimate contact between LNAPL and groundwater, representing a long-term source for dissolved-phase hydrocarbons in the groundwater.

The purpose of the MPE pilot tests is to determine the feasibility of dewatering the Smear Zone and removing LNAPL through vacuum-enhanced volatilization. Smear Zone dewatering is critical to MPE success. Pilot testing is required to determine the degree of steady-state dewatering necessary to expose the Smear Zone, air/water yields necessary to achieve steady-state drawdown, and VOC mass removal rates.

SOMA will utilize a self-contained mobile treatment system (MTS) to conduct the pilot testing. The MTS is equipped with an electrical generator, liquid ring vacuum pump, electrical submersible pumps, air/water separator vessel, discharge hoses and traffic-rated hose ramps, downhole stingers, and a thermal/catalytic oxidizer for vapor treatment. The oxidizer utilizes propane as supplemental fuel that is stored on board in a DOT-approved container, and operates under a valid various locations BAAQMD permit.

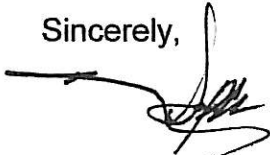
MPE pilot testing should continue long enough to define steady-state dewatering, rather than for an arbitrary time frame. The typical time frame to approach a steady-state dewatering condition varies, but is usually less than 72 hours. Therefore, each pilot test will not exceed 72 hours in duration. The pilot test will terminate when the soil vapor extraction concentrations begin to decrease, after steady-state dewatering is achieved. Extracted groundwater will be routed through the existing groundwater treatment system on the Site for treatment. Extracted soil vapor will be treated by the oxidizer on board the MTS.

Vacuum measurements will be collected at the well casing, the stinger, the manifold, and at adjacent monitoring wells MW-2, MW-7 and MW-6 using magnehelic gauges,

and at MW-1 and MW-3 when not in use as pilot test extraction wells. Groundwater-level measurements will also be collected from the same monitoring wells with an interface probe and drop tube installed inside each monitoring well. The frequency of measurements will be hourly for the first 8 hours and every 3 hours thereafter, until the end of the test. Extracted soil vapor concentrations will be measured continuously with a photo-ionization detector on board the MTS. Samples of the extracted soil vapor will be collected in Tedlar bags and analyzed for TPH-g, BTEX and MtBE using USEPA Test Method TO-3 and TO-15. The samples will be submitted to a California state-certified environmental laboratory for analyses. For each pilot test, samples will be collected at achievement of steady-state drawdown and at the end of the pilot test. A sample will also be obtained from the oxidizer stack at the end of each pilot test to demonstrate compliance with BAAQMD's various locations permit conditions.

SOMA appreciates your prompt attention to this matter. If you have questions or require additional information or clarification, please contact Matthew Spielmann or the undersigned at (925)734-6400. SOMA looks forward to receiving your approval to implement the MPE pilot test described above at this Site.

Sincerely,

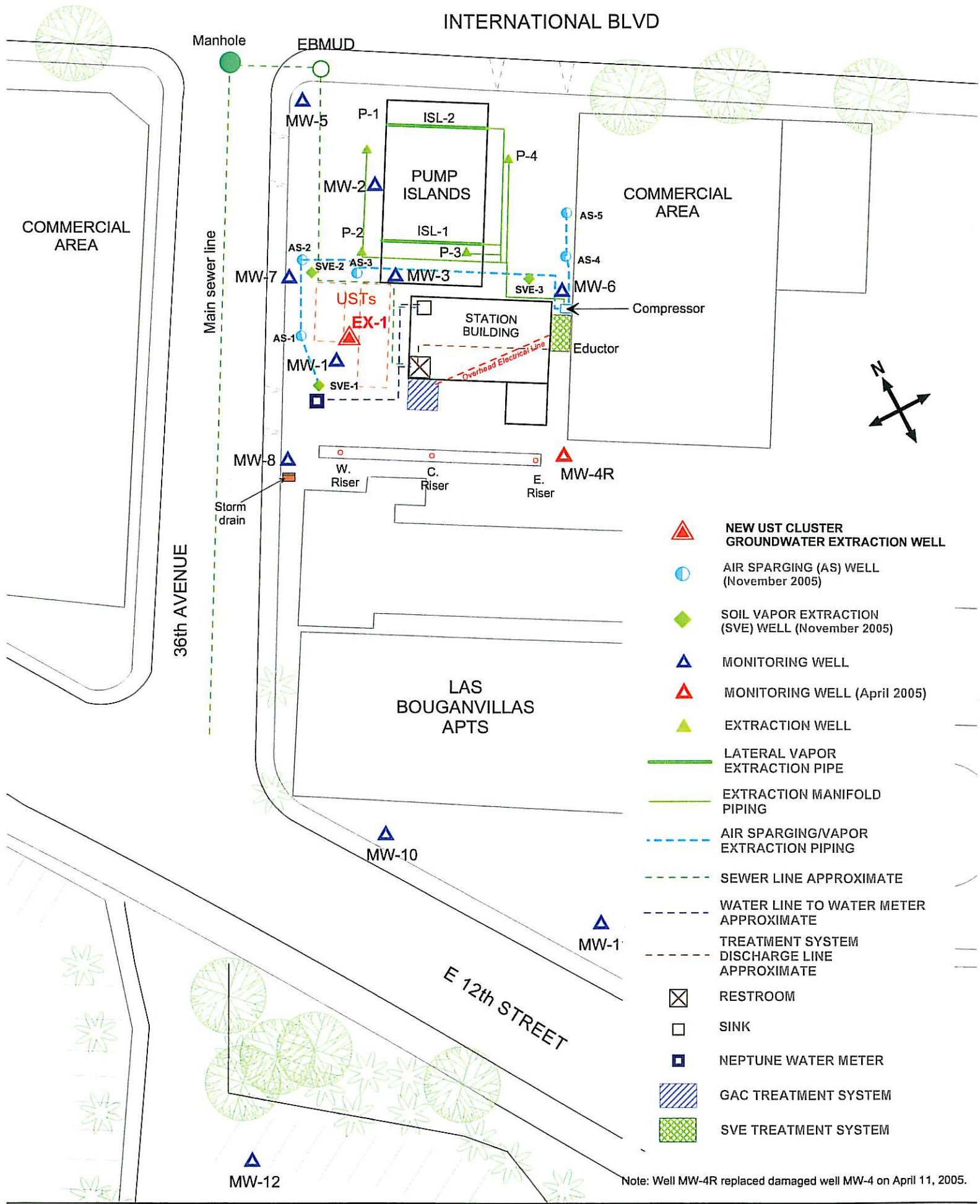


Mansour Sepehr, Ph.D., P.E.
Principal



Attachments

cc: Mr. Abolghassem Razi



- NEW UST CLUSTER
- GROUNDWATER EXTRACTION WELL
- AIR SPARGING (AS) WELL (November 2005)
- SOIL VAPOR EXTRACTION (SVE) WELL (November 2005)
- MONITORING WELL
- MONITORING WELL (April 2005)
- EXTRACTION WELL
- LATERAL VAPOR EXTRACTION PIPE
- EXTRACTION MANIFOLD PIPING
- AIR SPARGING/VAPOR EXTRACTION PIPING
- SEWER LINE APPROXIMATE
- WATER LINE TO WATER METER APPROXIMATE
- TREATMENT SYSTEM DISCHARGE LINE APPROXIMATE
- RESTROOM
- SINK
- NEPTUNE WATER METER
- GAC TREATMENT SYSTEM
- SVE TREATMENT SYSTEM

Note: Well MW-4R replaced damaged well MW-4 on April 11, 2005.

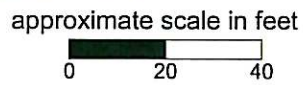


Figure 1: Site map showing the location of all monitoring wells.

