

## Detterman, Mark, Env. Health

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**From:** Heriberto Robles <hrobles@enviro-tox.com>  
**Sent:** Monday, December 05, 2016 5:05 PM  
**To:** Detterman, Mark, Env. Health; Roe, Dilan, Env. Health  
**Cc:** Kyle S. Flory  
**Subject:** Re: Risk Assessment Work Plan for site located at 6701-6707 Shellmound Street in Emeryville  
**Attachments:** Enviro-Tox HHRA Review Memo 12.05.2016.pdf  
**Categories:** Red Category

Hi Mr. Detterman and Ms. Roe:

I have completed review of the Human Health Risk Assessment report for the referenced site. In general, I agree with SLR in that cancer risks and health hazards estimated for future hypothetical residential receptors, construction workers and maintenance workers exceed levels considered acceptable to California health and environmental protection agencies. I also agree with SLR in that the site can be safely developed into a residential apartment complex provided that risk management and control measures are included during site redevelopment. My observations and comments are summarized in the attached memorandum. Please give me a call or send me a note if you have any comments or questions.

Thank you.

Heriberto Robles, M.S., Ph.D., D.A.B.T.  
Enviro-Tox Services, Inc.  
20 Corporate Park, Suite 220  
Irvine, California 92606  
[hrobles@enviro-tox.com](mailto:hrobles@enviro-tox.com)  
ph: 949-387-0700

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On Oct 24, 2016, at 12:51 PM, Heriberto Robles <[hrobles@enviro-tox.com](mailto:hrobles@enviro-tox.com)> wrote:

Hi Mr. Detterman and Ms. Roe:

I have completed review of the Human Health Risk Assessment Work Plan for the referenced site. I believe the Work Plan is complete as is and it meets EPA and DTSC risk assessment guidance and requirements. A formal letter summarizing my review is attached. Please give me a call or send me a note if you have any comments or questions.

Thank you.

## Memorandum

**To:** Mr. Mark Detterman and Ms. Dilan Roe / Alameda County Health Care Services

**From:** Heriberto Robles, Ph.D., D.A.B.T. 

**Date:** December 05, 2016

**Subject:** **Review of “Human Health Risk Assessment Report, 6701-6707 Shellmound Street, Emeryville, California” Prepared by SLR International Corporation**

Enviro-Tox Services, Inc. (Enviro-Tox) reviewed the document titled “Human Health Risk Assessment Report, 6701-6707 Shellmound Street, Emeryville, California,” dated November, 2016. The risk assessment was reviewed with emphasis on the methodology, assumptions and parameters used to estimate potential health risks posed by the site. In addition, the calculations were reviewed and the results were independently corroborated. Enviro-Tox did not review issues concerning site assessment including soil, groundwater and soil gas sampling; laboratory analysis validation; and site characterization. Minor grammatical or typographical errors that do not affect the evaluation have not been noted.

It is ETSI’s opinion that the Risk Assessment for the site was conducted following risk assessment guidance established by the U.S. Environmental Protection Agency (USEPA) and the California Department of Toxic Substances Control (DTSC).

In general, Enviro-Tox agrees with SLR International Corporation (SLR) in that cancer risks and health hazards estimated for future hypothetical residential receptors, construction workers and maintenance workers exceed levels considered acceptable to California health and environmental protection agencies. According to the report, the most important risk drivers identified are arsenic and Aroclor 1260 in soil; TPH-diesel in groundwater; vinyl chloride and cis-1,2-dichloroethene in soil vapor.

Enviro-Tox agrees with SLR in that the site can be safely developed into a residential apartment complex provided that risk management and control measures are included during site redevelopment. Risk management options should include engineering and institutional controls designed to prevent or minimize future onsite receptors from contacting chemical-impacted soil, soil vapor and/or groundwater while at the site.

Enviro-Tox also supports the recommendation that a vapor barrier be installed and maintained beneath new building(s) at the site.

Enviro-Tox noted that the risk assessment report requires some revisions before it can be used to define risk management options for the site. Enviro-Tox's observations and recommendations are summarized below.

1. For one particular chemical, hazard index estimates obtained by SLR are different from those obtained by Enviro-Tox. The chemical is TPH-diesel. According to SLR, a soil TPH-diesel concentration of 152 milligrams per kilogram (mg/kg) has an estimated hazard index of 2.6 (Table 34). Using the same TPH-diesel soil concentration and the same exposure parameters used by SLR, Enviro-Tox obtained a hazard index of 0.1. The source of the discrepancy is not clear as Enviro-Tox used the same exposure parameters and toxicity values as those used by SLR. It should be noted that the Environmental Screening Level for TPH-diesel is 230 mg/kg (RWQCB 2016). Therefore, per the San Francisco Water Quality Control Board, TPH-diesel concentrations lower than 230 mg/kg should have estimated hazard indices lower than 1.0.
2. According to Section 6.3.3.1, vinyl chloride detected in groundwater poses a potential cancer risk of  $2E-05$  for future hypothetical residential receptors. This estimated cancer risk exceeds the DTSC benchmark value of  $1E-06$ . Based on these results, risk-based cleanup levels for vinyl chloride in groundwater should be developed for the site. Cleanup levels should be developed following the same methodology as that applied to develop risk-based cleanup levels for vinyl chloride in soil vapor.
3. According to Section 6.3.3.1, groundwater data was used to evaluate potential vapor intrusion risks for future residents and commercial workers. However, only the risk estimated for residential receptors were found in the report and in Appendix C. It is recommended that potential vapor intrusion risks and hazards from groundwater volatilization be evaluated and included in the report and in Appendix C. If estimated risks and hazards exceed acceptable levels, risk-based cleanup levels for the protection of future onsite workers should be developed and presented in the report.
4. Appendix B. Soil gas sampling depth for ethylbenzene was set at 152.4 centimeters (cm). Sampling depth for all other chemicals evaluated was set at 304.8 cm. It is not clear why the sampling depth of ethylbenzene was different from that used for other chemicals. An explanation should be provided in the report.
5. According to Section 3.1.3 of the report (page 12), methane was detected in soil gas at the site. Methane is not considered toxic and was not evaluated in SLR's

- risk assessment. Enviro-Tox agrees with this decision. However, it is Enviro-Tox opinion that methanogenic conditions at the site should be considered when designing and evaluating risk management options for the site. We know methane can act as a carrier gas for potentially toxic gases and vapors (USEPA 2015). The active generation of methane because of anaerobic biodegradation processes increases subsurface pressures. The resulting increased pressure differentials are known to drive the migration of gases and vapors up to the surface where human receptors can be exposed (USEPA 2015). Methane can drive the advective migration of volatiles and gases at higher levels than the levels driven exclusively by pressure differentials caused by building indoor conditions (USEPA 2015).
6. Finding methane in the subsurface at the site is also of concern because degradation of organic matter is known to produce methane and hydrogen sulfide (USEPA 2015; DTSC 2015a; DTSC 2015b). The potential presence of hydrogen sulfide and its associated nuisance odor and health hazards should be considered and evaluated when designing risk control measures for the site.

#### **References:**

- California Department of Toxic Substances Control (DTSC). 2015a. Preliminary Endangerment Assessment Guidance Manual (A guidance manual for evaluating hazardous substance release sites). State of California Environmental Protection Agency. Sacramento, California.
- California Department of Toxic Substances Control (DTSC). 2015b. Advisory Active Soil Gas Investigations. California Environmental Protection Agency. July.
- Regional Water Quality Control Board - San Francisco Bay Region (RWQCB). 2016. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Lookup Tables and User Guide: Derivation and Application of Environmental Screening Levels (ESLs). Interim Final. February.
- U.S. Environmental Protection Agency (USEPA). 2015. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. Office of Solid Waste and Emergency Response. June.