

From: [David Stensby](#)
To: [Janda, Danielle L CIV NAVFAC SW](#)
Cc: [Sullivan, James B CIV NAVFACHO, BRAC PMO](#); [Clark, David J CIV NAVFAC SW](#); [Gerald Hiatt](#)
Subject: RE: NSTI Site 21 Human Health Risk Assessment Addendum
Date: Monday, September 10, 2012 11:42:22

Danielle,

Please see Gerry Hiatt's comments below. Let us know if you have questions.

David, Per your request I have reviewed comments provided by the Human and Ecological Risk Office (HERO) of Cal/EPA's Department of Toxic Substances Control (DTSC) on the Draft Human Health risk Assessment Addendum, Installation Restoration Site 21, Naval Station Treasure Island, San Francisco, California (DCN SHAW-1007-FZO1-0023.A1/D), dated July 2012. The HERO comments are contained in a memorandum from Tracy L. Behrsing, Ph.D. (HERO) to Remedios Sunga (Brownfields and Environmental Restoration Program), dated September 4, 2012. I also briefly reviewed selected segments of the document itself.

HERO Review & Comments: I generally concur with the comments made by HERO. The issues raised by HERO regarding vapor intrusion attenuation factors (see comments 6, 7, 8, 9 and 10) are especially pertinent and important. I would only add that revised U.S. EPA guidance on assessment of vapor intrusion is expected in the near future; U.S. EPA anticipates a November 2012 release. Since the current document reports the results of a draft risk assessment, it may be prudent to wait for release of U.S. EPA's vapor intrusion guidance before finalizing the assessment – unless, of course, there are signs of a significant delay. Since U.S. EPA has been collecting and summarizing data on attenuation factors from a number of vapor intrusion sites, I expect the revised guidance will focus on this issue.

Short-term TCE Exposures: HERO's comment 12.a.i about on-going work by U.S. EPA to address short-term exposures to TCE is especially important and merits close attention. Briefly, the recently revised IRIS (Integrated Risk Information System) toxicity assessment for TCE identified significant risks of congenital heart defects (CHDs) in infants born to women exposed to TCE during pregnancy as a concern at low TCE exposure levels. The IRIS re-assessment set a reference concentration (RfC) for this and other non-cancer health effects at 2 µg/m³ TCE in air; meaning that at inhalation exposures to TCE concentrations above the RfC the risk of CHDs starts to become a potential concern. Since CHDs are due to abnormal heart development in the fetus, this identifies the first trimester of pregnancy as a critical period for CHDs.; this is a time when some women do not even realize they are pregnant. Thus, short-term (days to weeks) inhalation exposures to TCE concentrations above 2 µg/m³ are of potential concern for women of reproductive age. As HERO notes, this issue is currently under consideration by U.S. EPA and ATSDR (Agency for Toxic Substances and Disease Registry) and should be followed by risk managers addressing vapor intrusion at Treasure Island.

General Recommendation re: Vapor Intrusion: The following is a general comment I provide at virtually all vapor intrusion sites. In adding this comment, I recognize however that specific conditions at this site, namely the small area impacted and the declining groundwater concentrations of chlorinated solvents, may make this issue less important for Site 21. On the other hand, as we have seen recently with TCE, future toxicity assessment revisions for one or more COPCs at the site may raise regulatory and health impact concerns around environmental concentrations previously thought acceptable. Should such concerns be thusly raised, having a vapor intrusion barrier/depressurization system in place may prove to have been a valuable investment.

Because this risk assessment addresses a future vapor intrusion exposure scenario there are inherent uncertainties in the assessment. These uncertainties are acknowledged in DTSC's "Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air" (December 2004, Interim Final):

"Making a reasonable prediction for vapor intrusion into future buildings is difficult. Many variables may alter subsurface vapor concentrations and the physical properties of the subsurface in the future, including but not limited to: 1) vapor concentrations in the subsurface may increase, accumulating directly under the foundation of a future building, 2)

moisture content of the vadose zone directly under a building may decrease due to the inability of rainwater to infiltrate under the building, and 3) air permeability and moisture content of the subsurface may be altered due to construction activities associated with building construction, thereby altering the subsurface air permeability and significantly increasing the potential for vapor intrusion to indoor air. Additionally, there may be significant variability in the quality of foundation materials as well as the construction quality of future buildings."

I would add that construction activities may create preferential vapor migration pathways not addressed by the Johnson-Ettinger model. Although generally useful, the Johnson-Ettinger model does not accurately predict indoor air concentrations at a small percentage of sites. This observation may be due to the existence of preferential pathways for vapor migration through the subsurface and into buildings which are not incorporated into the model.

For these reasons, I would recommend that installation, during construction, of a vapor barrier and sub-slab depressurization system be considered for any buildings constructed at the site in the future. A simple, inexpensive vapor barrier/depressurization system is described by the California Integrated Waste Management Board at 72 CCR 21190(g).

It is Region 9's experience that adding this type of appropriate engineering controls to the design and construction of any future development at a vapor intrusion site is a prudent and cost-effective way to ensure protection of public health - and mitigate potential liabilities - in the face of the uncertainties attendant upon the potential for vapor intrusion in this type of contamination situation.

Construction/Excavation Worker (Appendix D): In my professional opinion, it is not appropriate to develop risk-based screening levels using an exposure, such as that used for the construction excavation scenario in Appendix D, which represents only a small fraction of a working career. Doing so inherently assumes those workers have never before worked - and will never again work - in an environment with the potential for exposure to similar - or other Superfund-quality - contamination. In essence, developing such screening levels allows a lifetime's worth of risk to be accrued by the worker during his/her short (125 days in the case of the current risk assessment) stint at the facility. This is neither equitable nor appropriately health protective given the likelihood that a construction/excavation worker will very likely work at other contaminated sites during a career, perhaps even on Treasure Island.

Therefore, similar to HERO's comment 12.a.ii, I would recommend that any risk management decisions not be based on the construction/excavation scenario as currently constituted.

I can provide further details and suggestions on this issue, if needed.

Gerald F.S. Hiatt, Ph.D.
Senior Regional Toxicologist
U.S. EPA, Region 9
(415) 972-3064
Fax: 947-3520
hiatt.gerald@epa.gov