SDMS DOCID# 1110527

"Wallin, Sharon"
<WallinSL@cdm.com>
06/22/2007 04:57 PM

To Christopher Lichens/R9/USEPA/US@EPA

cc <edm@demaximis.com>, <tpschmidt@earthlink.net>, <tperina@ch2m.com>, <LParnass@dtsc.ca.gov>, "Lavelle, James" <LavelleJM@cdm.com>, "Tzou, Kassandra"

bcc

Subject Response to EPA's Comments to the Revised Risk Assessment Report

History: This message has been forwarded.

Chris - the attached document provides a response to EPA's comments dated June 8th to the Revised Risk Assessment Report. If you have any questions please feel free to call.

Have a nice weekend!

Regards,

Sharon Wallin, P.G.
CDM
18581 Teller Ave., Suite 200
Irvine, CA 92612

Phone 949 / 752-5452
Direct Phone 949 / 930-2941
Fax 949 / 752-1307
email wallinsl@cdm.com

<<RTC_Jun22_07_EPA2.pdf>> RTC_Jun22_07_EPA2.pdf

18581 Teller Avenue, Suite 200
Irvine, California 92612
tel: 949 752-5452
fax: 949 752-1307

June 22, 2007

Chris Lichens, Superfund Project Manager
USEPA REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: EPA June 8, 2007 Comments on Human Health Risk Assessment for On-Site Soils, Omega Chemical Superfund Site (CDM, April 17, 2007)

Dear Mr. Lichens:

Below are OPOG's responses to EPA comments dated June 8, 2007 to the Human Health Risk Assessment for On-Site Soils, Omega Chemical Superfund Site, CDM, dated April 17, 2007. The response to comment is organized by repeating the original EPA comment in italics followed by OPOG's response in regular text.

GENERAL COMMENTS

*1. **Executive Summary** The report should present key findings of the Human Health Risk Assessment (HHRA) at the beginning of the report. This will be useful to those readers who are not inclined to read through the entire document.*

An Executive Summary will be added to the revised HHRA.

*2. **Inhalation of Outdoor Air Vapors** Because the contaminants of concern at the Omega site are primarily volatile, receptors could potentially be exposed to vapors emanating from the subsurface to the surface. Therefore, outdoor air exposures should be evaluated for the VOCs detected in soil and soil gas. Since this evaluation had previously been agreed to, and the exposure pathway is included in the Site Conceptual Model (see final Workplan, 9/29/03), it came as a surprise to EPA that this pathway was omitted in the latest version of the HHRA report.*

Potential migration of vapors from soil to outdoor air for future commercial/industrial and residential exposures can be estimated using the volatilization factors (VF) presented in Section 4.2.3 of the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (SSLs, EPA 2002).

Default parameters for the Los Angeles area can be used (e.g., the Q/C term) to estimate a site-specific VF. However, this may be an unnecessary expenditure of time and resources, as the VF factors published by Region 9 (http://www.epa.gov/region09/waste/sfund/prg/index.html) are already based on the LA Area (see PRG User's Guide, 2004).

The most straightforward method for estimating outdoor air concentrations is to simply divide the chemical-specific VOC concentration in soil by its respective VF. However, EPA recognizes that there are limited soil data for PCE and other VOCs in shallow soils (< 12 feet below ground surface). If necessary, soil gas measurements could be used in conjunction with partitioning equations to calculate VOC concentrations in soil. The uncertainties associated with limited data and/or the use of partitioning equations should be highlighted in the uncertainty section of the report.

Statements such as "Inhalation of ambient air was not evaluated for commercial workers because VOCs would be rapidly diluted." (page1-5) must be deleted because they are inconsistent with EPA risk assessment and soil screening guidance.

The issue of release of VOCs to ambient air came up in the context of the construction worker, who could be exposed in an excavation should the site be redeveloped. This receptor would was thought to be the only one that might be threatened by released of VOCs to ambient air.

In any event, the approach described for estimating releases to ambient air does not appear to be well based technically. Basically, we understand that EPA is suggesting that OPOG take subsurface vapor concentrations, assume that these concentrations exist in surface soils, calculate soil concentrations in surface soils, then finally use these soil concentrations to re-estimate volatilization and dispersion using generic volatilization factors (VFs). The issue however is not VOCs that exist in liquid phase in surface soils. In an open system, the vapor phase is favored and any liquid phase VOCs will quickly volatilize. Thus, the real issue is the release of vapors from subsurface to ambient air. Since vapor estimates are already available, artificial estimation of surface soil concentrations (which cannot exist according to basic gas laws) is neither necessary nor technically correct. Instead, measured shallow vapor concentrations should be used to estimate possible releases. For this estimate, diffusion equations (e.g. those in the J&E model) can be used to model transport from shallow soil gas to the surface. An emission rate is then needed to estimate air concentrations. The most straightforward means is to assume an average soil gas flow rate. For construction workers, the default in the J&E model was used as a conservative measure. This flow rate is based on the assumption of a constant pressure differential, and should be conservative for releases to ambient air where, clearly, barometric pumping will cause pressure differentials to reverse at times.

Net flow of soil vapors to ambient air is expected however because shallow soil gas is often depleted beneath uncovered soil. Barometric pumping is apparently much more efficient than diffusion of vapors from deeper soil not affected by barometric pressure. Thus, if one uses shallow soil vapors from beneath hardscape (e.g. data collected at the Omega site), releases rates will be conservative in the long term.

Assuming a net flow rate sufficient to maintain an ambient air concentration equal to the Region 9 PRG (0.32 $\mu g/m^3$) suggests rather dramatic release of vapors. For example, over the course of a year, all of the VOCs in over 60,000 m^3 of soil would have to be released to ambient air. The analysis assumes a constant shallow soil vapor PCE concentration of 150,000 $\mu g/m^3$, the EPC for the site excluding surrounding parcels, and the wind filed estimated for construction workers. This volume is greater than all of the soil beneath the site above the 30' clay layer.

This finding is independent of liquid phase VOCs in the subsurface. Currently, vapor concentrations in the shallow subsurface are likely to represent something of a worst-case, in that hard scape will "close" the system to some extent and allow vapors to build toward equilibrium. Higher vapor concentrations near the surface would not be expected if this hardscape (or buildings) were removed.

The flow rate implied by the above analysis is about 6 times the default in the J&E model. Thus, even the conservative flow rate from J&E suggests very high release rates along with ambient air concentrations substantially less than the PRG. Given the inefficient transport of vapors via diffusion discussed above, it seems unlikely that releases to ambient air could support significant ambient air concentrations for chronic exposure periods.

OPOG will continue to use soil vapor concentrations to estimate releases to ambient air and will extend this analysis to chronic exposure scenarios. Initial calculations suggest that possible risks will be low, below 1E-06.

*3. **Trench Worker Scenario** EPA was unable to follow the approach that was taken to estimate VOC air concentrations within a trench. The authors apparently tried to use the J&E model to do this. However, this is problematic because the predominant mechanism for vapor intrusion (advection) would appear to be different than the primary mechanism for vapor emissions into a trench (diffusion). To estimate this exposure, EPA suggests using the volatilization factor for transport of chemicals from soil to outdoor air from Table X.3.4, of the American Society for Testing and Materials (ASTM) Standard Guide for the Provisional Risk-Based Corrective Action (ASTM, 1998). A conservative wind speed, such as 1/10th of the average wind speed for the LA area should be used to represent the reduced*

airflow expected in a shallow trench. Conservative assumptions regarding the size of the trench should also be applied.

See above discussion. The analysis assumed a soil gas to ambient air flow rate of 5L/min and local wind speed divided by 5 to estimate potential concentrations in ambient air. Diffusion equations inherent in J&E algorithms were used to estimate transport from the subsurface. Source of VOCs was assumed to be infinite. Since this very conservative approach suggested that maximum risks would be less than the lower end of the EPA risk range, a more rigorous approach does not seem necessary. However, if EPA has a better means to estimate gas flow across the surface, OPOG will consider use of such alternative approaches.

4. ***Chronic vs. Short-term Exposure*** *Scenarios EPA anticipates that the risk results presented in Section 5.2 of the 2nd draft HHRA will change once a comprehensive evaluation of commercial/industrial and residential land use exposure pathways are evaluated, consistent with the Site Conceptual Model (see Final Work Plan, 9/29/03). EPA appreciates the evaluation and discussion of the construction worker for the sake of completeness. However, the construction worker is rarely the receptor that drives remedial decisions. Remedial decisions are typically based on chronic exposures that would be associated with a commercial/industrial worker and/or a resident. Higher cancer risk estimates will likely result once long-term exposures are fully addressed in the revised HHRA. Long-term chronic exposures will also provide the basis for estimating soil preliminary remediation goals for the site.*

As indicated in response to EPA General Comment #2, the issue of air exposure came up in the context of construction workers. OPOG is pleased to see that EPA has accepted that this pathway is not likely to be important overall for remediation decisions. OPOG had foreseen this result in the original risk assessment. See responses to Comments 2 and 3 for discussion of analysis of chronic releases of VOCs to ambient air. OPOG disagrees that cancer risks will go up substantially due to estimated exposure to VOCs released to ambient air.

5. ***Preliminary Remediation Goals (PRGs) vs. HBRGs*** *EPA has published guidance on calculating PRGs for soils (RAGS Part B, 1991; Soil Screening Level Guidance 1996, 2002; Region 9 Users Guide, 2004) that reflect Superfund's concept of a reasonable maximum exposure (RME). In accordance with national guidance, Region 9 has published a PRG table that lists risk-based PRG values for most of the contaminants of concern at the Omega Chemical site, assuming either a residential and/or commercial/industrial land use scenario. A site-specific decision to use the published PRG values as final cleanup levels for soils has not been made at this time. However, these are the defaults to be used if no site-specific information is provided that would indicate an adjustment should*

be made. At this time, EPA is not convinced that the values should be adjusted for the Omega site. If there is such information, it should be brought to EPA's attention.

The "Health Based Risk Goals" (HBRGs, Section 5.3) that are described in the draft risk assessment (version 2) do not follow EPA PRG guidance with respect to deriving cleanup goals for VOCs in soils. This terminology should be removed and replaced with the term "PRG" in subsequent iterations of the HHRA report. A revised Section 5.3 should include a presentation of PRG equations and default exposure assumptions that EPA Region 9 uses to calculate generic PRGs. This will clarify what site-specific adjustments to the generic PRGs are being proposed. Any adjustment to the PRG default assumptions should be documented and defended. However, the primary pathways that are incorporated in the PRG calculations must be included. For example, it would appear that the HBRG calculations did not incorporate a VF that takes into account inhalation of VOCs that off-gas from soils to outdoor air. This pathway should be included per risk assessment guidance for Superfund (RAGS, Part B).

See discussions of the air pathway in responses to EPA General Comments #2 and #3. The air pathway is not likely to contribute significantly to overall cancer risks and hence will not be important in defining HBRGs. OPOG will evaluate inhalation exposures, however, and will use the pathway in HBRG calculations. OPOG notes that Region 9 PRG tables do not have any values appropriate for estimating remediation goals for soil vapors. Site-specific values are necessary for this media.

*6. **J&E Modeling of the Vapor Intrusion Pathway**. With respect to the vapor intrusion pathway, EPA recommends the following:*

Based on EPA's vapor intrusion guidance (EPA 2002), J&E model manual (EPA 2004) and consultation with EPA's consultant, EPA has determined that the most appropriate soil type for the Omega site are "Loam soils". Please rerun the J&E model assuming Loam soils. The author's choice of clay is not supported and is not conservative (health-protective).

OPOG will use loam as the soil type for the J & E model. However, OPOG notes that measured effective conductivity for shallow soils at the site (Ks (cm/h)) are significantly lower than the default value used for loam in the lookup tables in the model.

J&E modeling at the former Skateland parcel excludes some of the highest soil gas concentrations measured near the former building. From EPA's perspective, the modeling effort exclusive to Skateland parcel is unnecessary. EPA would prefer that a single estimate for future workers be provided that reflects an exposure point concentration representative of a reasonable maximum exposure (i.e., 95

UCL or maximum value if site data are limited). It is not acceptable to exclude the highest soil gas measurements when estimating a maximum exposure for the vapor intrusion pathway.

See response to EPA Specific Comment #14. To address this comment, future onsite commercial/industrial workers calculations will be revised to incorporate data on the Skateland property and the text revised accordingly. The highest measurements will be included and suitability of these maximum data to represent the entire site will be discussed in the uncertainty section.

Future indoor worker risks should be modeled separately from the future resident. Combining these receptors, as was done for the RAGS D tables is not appropriate. And, it is further noted, that the future worker risks were not carried through the analysis in the RAGS D tables. Please use the J&E model to estimate potential risks to future workers as well as for future residents. Future onsite commercial/industrial workers were already evaluated for indoor air based on soil gas concentrations separately from the future resident. These calculations are provided in Appendix A3-7.7 and 7.8. Resident calculations are provided in Appendix A3-7.5 and 7.6.

*7. **RAGS Part D Tables.** In Sections 2, 3 and 4 in the body of the RI HHRA report sets of Tables are presented which have a similarity/resemblance to the RAGS Part D Tables presented in Appendix A-3. However these tables are organized slightly differently:*

- *Section 2; Tables with the general title, "Summary of Detected Chemicals in Surface Soil Samples" (e.g. Table 2-1 appears to be a simplified version of Appendix A-3, RAGS D Table A3-2.1A).*

- *Section 3; Tables with the general title, "Summary of Exposure Point Concentrations for Surface Soil" (e.g. Table 3-4 appears to be a simplified version of Appendix A-3, RAGS D Table A3-3.2A).*

- *Section 4; Tables with the general title, "Cancer Toxicity Data – Oral/Dermal". (e.g., Table 4-1 appears to be a version of Appendix A-3, RAGS D Table A3-6.1).*

Since these sets of tables contain so much data and appear to be so similar to the corresponding sets of RAGS Part D Tables in Appendix A-3, if the tables in Sections 2, 3, and 4 can be replaced by the Tables in Appendix A-3, please consider doing so. It is a duplication of effort to review similar tables, which present the same information, in both locations.

As noted by the comment, the aforementioned tables contain similar information. The versions in the text were simplified to provide the reader with information supporting the text discussion, but in not as detailed a format as provided in the Appendix RAGS D tables.

The simplified presentation is intended to make the text tables easier to understand for a layman while the Appendix RAGS D tables are provided for those who require more detail on the calculations.

In the revised version, the text tables will be replaced with the more complex Appendix RAGS D tables.

SPECIFIC COMMENTS

*1. **Section 1, Introduction, Paragraph 1.** Evaluation of habitat and ecological receptors (page 1-1) should be performed separately from the human health risk assessment. EPA will perform such an evaluation.*

Comment noted. We acknowledge that EPA will be conducting an evaluation of habitat and ecological receptors.

*2. **Section 1, Introduction, Paragraph 2.** The reference for "CalEPA Supplemental Guidance for Human Health Multimedia Risk Assessments…"should be added to the list of references.*

The reference will be added to the list in the revised HHRA.

*3. **Section 1.3.2, Facility Processes and Chemical Usage, page 1-4**. EPA had previously requested that the authors support their statement that the "Material found within the loading dock sump contained the highest concentrations of VOCs found anywhere on-site". However, it would appear that this statement is incorrect for PCE. The text on page 1-4 states that the SG10R sump sample had measured PCE at 104,000 ppb/v (or approximately 705,000 ug/m3) whereas the highest on-site soil gas measurement for PCE is about an order of magnitude higher at 3,390,000 ug/m3 Table 2-7). Please delete or edit the statement to reflect this point.*

Text will be revised to reflect that the concentration in the sump was not the highest concentration on-Site.

*4. **Section 1.4, Potential Risk Issues, First Paragraph**. The parcels to the four compass directions in relation to the Omega site are identified with reference to the current commercial tenant and are also identified in this manner on the Site Vicinity Map. For consistency, please continue to identify the tenant in all references to these properties (this is done only sporadically elsewhere and in the RAGS Part D tables and makes the HHRA less transparent and harder to follow). It would also help to identify the property to the south as the "former location of Skateland" for ease of reference.*

Properties will be renamed as requested in the comment.

5. ***Section 1.4, Potential Risk Issues, Paragraph 5.*** *The "presence of high concentrations of total dissolved solids (TDS) in groundwater is mentioned here and other places in the HHRA as a reason for non-potable use of the groundwater in this area. The range of TDS listed in Tables 2-4 and 2-5 is 630 to 1700 ppm for samples collected from 2001 to 2006. Please present these values in a table and compare them to the EPA secondary standard of 500 mg/L and the Cal/EPA TDS MCL range of 500 mg/L (recommended) / 1,000 mg/L (upper) / 1,500 mg/L (short term).*

Table will be added in the revised HHRA.

6. ***Section 2, page 2-1.*** *The risk assessment is intended to be a stand-alone document. Therefore, it should include sample location maps similar to those contained in the RI. It is not necessary, however, to include analytical summary tables from the RI, as this information is already covered in the RAGS D tables. Please edit the text (page 2-1) accordingly.*

Sample location maps similar to the RI will be added to Section 2 and a reference to these maps will be added in the introductory text of this section.

7. ***Section 2, Data Analysis and Identification of COPCs, Paragraph 2.*** *Please update the date of the cited revised On-site Soils RI Report.*

Date of the revised On-Site RI Report will be updated in the revised HHRA.

8. ***Section 2.1, Data to Support Human Health Risk Assessment****. The text on page 2-3 should be revised to indicate that the 30-foot clay unit "inhibits" rather than "acts as an impediment to" the upward migration of soil vapors… Likewise, the text should state that the 30-foot clay unit "inhibits" rather than "restricts" the vertical migration of contaminants from moving to greater depths.*

Text will be revised as recommended by the comment.

9. ***Section 2.3, Identification of Chemicals of Potential Concern****. A number of chemicals are screened out as chemicals of potential concern because they were infrequently detected and below screening levels. It is noted that additional useful information is provided in the RAGS Part D tables contained in Appendix A-3 to the HHRA report. Please refer the reader to the appropriate section in the RAGS D tables for more detailed information regarding the contaminant screening process.*

Reference to appropriate section of the RAGS Part D Table will be added in the revised HHRA.

*10. **Section 2.3, Identification of Chemicals of Potential Concern.** It has been established that PCE and TCE were processed on the former Omega property, and that soil, soil gas, and groundwater have been contaminated by PCE and TCE. Please include PCE and TCE as COPCs.*

PCE was selected as a COPC for all media where it was detected above detection limits. Surface soil samples 0 to 2.2 feet bgs were not analyzed for VOCs. As such, PCE and TCE were not selected as COPCs for surface soil samples. PCE and TCE were also not selected as COPCs for indoor air at the North Medlin and Sons building because they were not detected above detections limits in the one indoor air sample collected from this building. TCE was not selected as a COPC for subsurface soils collected to 12 feet bgs because it was only detected in one out of 2 samples and at a concentration that was less than one-tenth the PRG.

- ***Table A3-2.1A** – Parcel A: Surface soil 0′ to 2.2′ ("Parcel A" this is assumed to be the Omega property and needs to be clearly identified), presents the "Occurrence, Distribution, and Selection of Chemicals of Chemicals of Potential Concern" for surface soil 0′ to 2.2′. Apparently, up to 36 soil samples were collected and analyzed for surface soil contaminants.*

Additionally, in this table many of the COPCs not selected for quantitative evaluation in the HHRA are detected at frequencies equal to or greater than 5%, and based on frequency of detection should be retained as COPCs. Section 2.3: Identification of COPCs, states, "Chemicals detected with a frequency less than 5%, provided that other criteria as described below were met, were eliminated" (this means that chemicals with 5% or greater frequency of detection will be quantitatively evaluated in the HHRA.) A similar comment was previously made by DTSC: "…the HERD recommends that all chemicals detected with a frequency of detection of equal to or greater than five percent be quantitatively evaluated in this risk assessment." (DTSC HERD February 15, 2007, Specific Comment #5).

In Table A3-2.1A, 36 of 50 potential COPCs were screened out from quantitative evaluation in the HHRA. Of these 36 eliminated chemicals, 29 chemicals had frequency of detection greater than 5%, but were eliminated. All 29 chemicals need to be considered further for quantitative evaluation in the HHRA.

- ***Table A3-2.2A** – Parcel Site: Surface and Subsurface soil to 12′, presents the "Occurrence, Distribution, and Selection of Chemicals of Chemicals of Potential Concern" for surface and subsurface soil to 12′. Up to 60 soil samples were collected and analyzed for soil contaminants, but only 2 soil samples are reported to have been analyzed for PCE and TCE. Although the detection frequency of TCE was 50%, it was not evaluated quantitatively. In this table, 48 of 59 potential COPCs were*

eliminated. However, 34 of those chemicals had frequency of detection of greater than 5%. Therefore, those 34 chemicals (including TCE) need to be reconsidered for quantitative evaluation in the HHRA.

- ***Table A3-2.3A** – Parcel Site: Surface and Subsurface soil to 30′, presents the "Occurrence, Distribution, and Selection of Chemicals of Chemicals of Potential Concern" for surface and subsurface soil to 30′. Up to 64 soil samples were collected and analyzed for contaminants over this depth range. In this table 31 potential COPCs, which had frequency of detection of greater than 5%, were eliminated. Those 31 chemicals need to be reconsidered for quantitative evaluation in the HHRA.*

- *The "Occurrence, Distribution, and Selection of Chemicals of Chemicals of Potential Concern" for all soil, soil gas, and indoor air datasets need to consider the retention of COPCs which have a frequency of detection of greater than 5%.*

COPC screening was tiered. First, chemicals present at maximum concentrations less than 1/10th of screening levels were eliminated. Retained chemicals were subsequently screened against the 5% criterion. This process appropriately reduced the list of COPCs to those that will be important for risk management. Including a large number of additional chemicals present only at low concentrations will not add useful information to the risk assessment.

*11. **Section 2.3.1, Non-Toxic and Essential Minerals, page 2-4.** EPA requests that fluoride, nitrite, and nitrate not be eliminated from the risk assessment because they are "non-toxic". EPA disagrees with this assertion. Evaluate these constituents as chemicals of potential concern, unless there is background data to support that these chemicals are non-site related.*

Nitrate and nitrite do not have screening criteria for soil and will not be COPCs for soil. Water concentrations are far below levels of concern, and potential exposure via drinking water is not evaluated in the HHRA. Since these constituents are not volatile, no potential exposure pathways exist and these chemicals will not be quantitatively evaluated. Fluoride does have soil screening criteria, but no soil data are available for fluoride. This chemical is also nonvolatile. Since groundwater exposure is not evaluated, fluoride also will not be quantitatively evaluated. Text will be added to clarify issues for nitrate, nitrite and fluoride.

*12. **Section 2.3.2, Analysis of Ambient Concentrations of Arsenic**. The statement (page 2-5) that "the single higher value of 21 mg/kg is an obvious statistical outlier" should be deleted unless the HHRA documents that appropriate statistics were performed to support the conclusion that this arsenic concentration in soils is an outlier.*

Text will be revised as recommended by the comment.

13. ***Section 2.4.5, Selection of COPCs for Soil, Paragraph 1.*** *It is stated: "Samples from depths below 12 feet bgs were not used in the in the quantitative risk assessment; however, these samples were examined to help ensure that no constituents were being overlooked. That is, these data were examined for high concentrations of constituents that were not observed in shallower soils, or were eliminated from further consideration in the COPC screening. No such constituents were identified." This statement should be reevaluated and the data for samples from depths below 12 feet bgs should be more carefully examined to help ensure that no constituents were being overlooked.*

Table 2-3 (Summary of Detected Chemicals in Surface and Subsurface Soil Samples, 0 to 30 feet bgs) reveals PCE was detected at concentrations up to 1,300 mg/kg and TCE was detected at concentrations up to 140 mg/kg. Neither PCE nor TCE were listed as COPCs in Table A3-3.1A – Parcel Site, which presents EPCs for Surface soil, 0 to 2.2 ft. TCE is also not listed as a COPC in Table A3-3.2A – Parcel Site, which presents EPCs for Surface and Subsurface soil to 12 ft.

The reason to evaluate deeper soil data was to determine if chemicals exist at the site in this medium that have not been detected elsewhere. PCE is clearly the major COPC for the site, and is present in shallow soils and soil vapor.

PCE and TCE are not evaluated for soil as an exposure medium for reasons discussed in above responses . EPA guidance recognizes the futility of assessing any direct contact with soil. For example, dermal contact with VOCs in soil is discouraged because of expected rapid volatilization. The major pathway of concern is vapor intrusion to indoor air spaces. As discussed above, release of VOC to ambient air will also be included.

14. ***General Comment #6, above****. As noted above, EPA is requesting that a single soil gas exposure point concentration be used to estimate risks to future indoor workers. Therefore, there is no need to perform a J&E model risk estimate exclusive to the former Skateland property. The J&E modeling for future indoor workers should reflect a reasonable worst-case that reflects the maximum impact location on-site. Please perform a global search and remove all references to J&E modeling specific to the Skateland property.*

Future onsite commercial/industrial workers were already evaluated for indoor air based on soil gas concentrations. These calculations are provided in Appendix A3-7.7 and 7.8. The Skateland property was evaluated separately because for all other parcels, indoor air data from existing buildings was available to evaluate current exposure. Since the Skateland building was demolished, only soil gas was available to evaluate current and future exposure on this parcel. To address this comment, future onsite commercial/industrial workers

calculations will be revised to incorporate data on the Skateland property and the text revised accordingly.

15. ***Section 3.2, Site Setting, Paragraph 5.*** *It is stated: "The Site has never been used for residential purposes in the past, and given its zoning, it is unlikely that it will be used for residential purposes in the future. …Specifically, City representatives have stated that it is unlikely that the Omega property will be redeveloped for residential uses (Adams, 2007)". The use of the word "unlikely" seems to mean that it is still possible, though "unlikely", that the property could be used for residential redevelopment. For that reason the evaluation of residential land use is a reasonable, health protective approach for this RI HHRA.*

Comment noted.

16. ***Section 3.3, Site Conceptual Exposure Model (Figure 3-1).*** *Please edit the Site Conceptual Model (Figure 3-1) so that it is consistent with the final Workplan. This will require that soil gas-to-ambient air pathway be quantitatively evaluated for residential and commercial/industrial exposures.*

See responses to EPA General Comments 2, 3 and 4 for discussion of analysis of chronic releases of VOCs to ambient air. This pathway is not likely to be important overall for remediation decisions. OPOG had foreseen this result in the original risk assessment. OPOG disagrees that cancer risks will go up substantially due to estimated exposure to VOCs released to ambient air. However, a quantitative evaluation of this pathway will be included in the revised version.

17. ***Section 3.3.1.1, Hypothetical Future Residents, Paragraph 1.*** *The first sentence, which begins "Potentially complete exposure pathways for residents consist of incidental ingestion of surface and subsurface soil…", should have the following phrase added at the end of the sentence: "as well as inhalation of airborne particulates from surface soil".*

Text will be revised as recommended by the comment.

18. ***Section 3.3.2.6, Inhalation of Ambient Air. The statement (page 3-8****) "Therefore, commercial/industrial workers and hypothetical future residents were not evaluated for exposure to ambient air" does not conform to EPA risk assessment and soil screening guidance. Furthermore, this language is inconsistent with the final Work Plan, wherein OPOG had agreed to evaluate these pathways quantitatively. Please delete this and other similar statements in the draft HHRA report.*

See responses to EPA General Comments 2, 3 and 4 for discussion of analysis of chronic releases of VOCs to ambient air. This pathway is not likely to be important overall for

remediation decisions. OPOG had foreseen this result in the original risk assessment. OPOG disagrees that cancer risks will go up substantially due to estimated exposure to VOCs released to ambient air. However, a quantitative evaluation of this pathway will be included in the revised version.

*19. **Section 3.4, Exposure Parameter Assumptions.***

Section 3.4.1.4, Exposure Frequency. The RME construction worker was evaluated for an exposure frequency of 250 days/year. This parameter value needs to be presented in Table 3-2, Exposure Parameters, as well.

Text will be revised as recommended by the comment.

The exposure duration parameters used for an adult resident needs to be clarified and consistent with EPA guidance. In Section 3.4.1.5, Exposure Duration for an adult resident is presented as 30 years. In Table 3-2, Exposure Parameters it is presented as both 30 years and 8,760 days (24 years). In the RAGS Part D Table A3-4.1 it is listed as both 30 years and 24 years.

These tables are in error in that they represent an incomplete conversion to calculate a 30-year lifetime cancer risk as the sum of risks for 24 years exposure as an adult and 6 years of exposure as a child per RAGS Part D guidance Appendix D–see EPA specific comment #44. These tables will be revised for consistency and to calculate the Adult/Child scenario.

*20. **Section 3.4.2.1, Soil and Interior Dust Ingestion**. The statement (page 3-10) " There is no standard ingestion rate for construction workers . . . 480 mg per day, respectively, are used for the construction worker (EPA 1997)." should be edited to reflect Exhibit 5-1 in EPA's Supplemental SSL Guidance (2002). Per the SSL Guidance, the default ingestion rate to be assumed for RME construction worker is 330 mg per day.*

Text and calculations will be revised as recommended by the comment.

*21. **Section 3.4.2.2, Inhalation of Fugitive Dust**. The inhalation rate for an RME commercial/industrial worker is 20 m3 per worker day (RAGS Part B, 1992). Please note that the "worker day" according to RAGS Part B is defined as that part of the day that an individual spends at the workplace. It appears that the authors (page 3-11) are defining "day" differently by assuming 24 hours per day. While this is appropriate for the resident, the 24 hours per day assumption is not consistent with how RAGS defines a worker day. Please edit the text accordingly so that the 20 m3 per worker day reflects an 8-10 hour exposure and not a 24-hour exposure.*

Text and calculations will be revised as recommended by the comment to represent the RME exposure for the commercial/industrial worker. Using an inhalation rate of 20 m^3/day for an 8-hour workday is equivalent to an hourly inhalation rate of 2.5 m^3/hr. This 2.5 m^3/hr represents the inhalation rate of an adult male involved in moderate activities, such as major indoor repairs and alteration and climbing stairs. It seems overly conservative to assume that all commercial/industrial workers would be engaged in such a high level of activity. The inhalation rate for CTE exposure will use 1.2 m^3/hr (instead of the 0.83 m^3/hr used for residents) to address some variability in this factor.

*22. **Section 3.4.2.3, Inhalation of Indoor Air.** Please revise the text (page 3-12) "Site soil was assumed to be clay, consistent with data from soil borings. " to " Site soil was assumed to be loam soil, consistent with data from soil borings." For more information, please see EPA's general comment regarding J&E modeling.*

See response to EPA General Comment #6.

*23. **Section 3.4.2.5 Exposure to Lead**. The Cal/EPA DTSC LeadSpread 7 is the DTSC Lead Risk Assessment Spreadsheet for child and adult lead exposures and should be used for the Site. Unlike the EPA's Adult Lead Methodology, LeadSpread 7 evaluates child exposures. The HHRA states: "..the DTSC indicated in recent discussions that the LeadSpread model was currently being revised and they were not recommending its use". However, the LeadSpread 7 model is still posted on the DTSC website and is available for download (DTSC, May 2007).*

The EPA's Adult Lead Model was used to calculate lead exposure for a Future Adult Resident scenario. However, in Appendix A-2, the Adult Lead Model spreadsheet, for the Future Hypothetical Resident (Table A2-3), has the subheading within the table that states "Values for Non-Residential Exposure Scenario". Please clarify the use of this spreadsheet model for a residential receptor.

Leadspread does not address a pregnant worker, which must be addressed using the Adult Lead Methodology (ALM). ALM has not been evaluated or approved by DTSC. Leadspread will be added for the evaluation of children.

*24. **Section 3.6.2 Dermal Contact with Soils and Interior Dust.** The evaluation of dermal exposures to chemicals in soil needs to be based on EPA guidance in RAGS Part E, "Supplemental Guidance for Dermal Risk Assessment", Final (July 2004). The recommended values for dermal absorption fraction (ABS) are presented on Page 3-16, of RAGS Part E, Exhibit 3-4, "Recommended Dermal Absorption Fraction from Soil". The appropriate ABS values used in the HHRA should be presented in a table.*

Note that RAGS Part E states, "There are no default dermal absorption values presented for volatile organic compounds nor inorganic classes of compounds. The rationale for this is that in the considered soil exposure scenarios, volatile organic compounds would tend to be volatilized for the soil on skin and should be accounted for via inhalation routes in the combined exposure pathway analysis. For inorganics, the speciation of the compound is critical to the dermal absorption and there are too little data to extrapolate a reasonable default value." The Region 9 PRG Table identifies VOCs in the "VOC" column in the PRG Table (October 2004).

The calculations used ABS values provided in the DTSC PEA guidance (1999). These will be revised to use the ABS values provided in RAGS Part E, "Supplemental Guidance for Dermal Risk Assessment", Final (July 2004). (Also applicable to EPA specific comment #28.)

*25. **Section 3, Exposure Assessment, Site Conceptual Exposure Model, Figure 3-1.** The Site Conceptual Exposure Model does not include several Potential Exposure Pathways, which are presented in the RI/FS Work Plan (Site Conceptual Exposure Model (Figure 3-2)). As a result, it appears that the following exposure routes are not quantitatively evaluated in the HHRA:*

- *Soil Gas to Ambient Air (Inhalation)*
  - *Future On-site Adult/Child Resident*
  - *Current and Future On-site Industrial Worker*
- *Surface Soil (Inhalation of Particulates)*
  - *Future On-site Adult/Child Resident*
  - *Current and Future On-site Industrial Worker*
  - *Future On-site Construction Worker*
- *Subsurface Soil (Inhalation of Particulates)*
  - *Future On-site Construction Worker*

These exposure routes need to be included and quantitatively evaluated in the HHRA to comply with the Omega RI/FS Work Plan. Figure 3-1 and Table 3-1, "Summary of Receptors and Pathways of Concern" also need to be revised.

See responses to EPA General Comments 2, 3 and 4 for discussion of analysis of chronic releases of VOCs to ambient air. This pathway is not likely to be important overall for remediation decisions. OPOG had foreseen this result in the original risk assessment. OPOG disagrees that cancer risks will go up substantially due to estimated exposure to VOCs released to ambient air. However, a quantitative evaluation of this pathway will be included in the revised version. Future on-site construction workers were already evaluated for inhalation of particulates from surface and subsurface soil. These calculations are provided in Appendix Table A3-7.3 and 7.4 under exposure point,"Fugitive Dust".

Inhalation of particulates from surface soil was not calculated for current industrial/commercial workers because the site is completely paved or covered by buildings and landscaping, leaving little exposure to soil particulates.

Inhalation of particulates from surface soil will be added as a completed exposure pathway for future industrial/commercial workers and the hypothetical on-site adult/child resident.

26. ***Section 3, Table 3-3, "Summary of Exposure Point concentrations for Surface Soil (0 to 1.5 ft bgs).*** *Should this table actually present data for 0 to 2.2 ft bgs.? Please clarify and revise table as needed.*

This table in the text is in error and should have been replaced with the data for 0 to 2.2 ft bgs. However, the correct table was included as Appendix A-3, Table A3-3.2A.

27. ***Section 4, Toxicity Assessment, page 4-1****. The HHRA indicates that the highest priority for toxicity information is the Cal/EPA OEHHA toxicity database, followed by IRIS (page 4-1). For Region 9 EPA risk assessments conducted in California, the agreed upon approach is to use the more health-protective toxicity value between EPA and Cal/EPA OEHHA. Hence, the language and risk assessment calculations should be modified to reflect this approach. The one exception that EPA will allow, would be for TCE. Although there is currently no final EPA toxicity value for TCE, EPA's external draft TCE toxicity assessment indicates that inhalation risks could be roughly two orders of magnitude higher than what is estimated using the Cal/EPA value. The potential impact of this EPA draft toxicity value on the risk assessment calculations should be discussed in the uncertainty section of the report.*

The uncertainty discussion will be revised to include the entire range of slope factors from the withdrawn TCE risk assessment, and the basis for this range.

*28. **Section 4, Toxicity Assessment: Table 4-1, 4-2**; Cancer and Noncancer Toxicity Data – Oral/Dermal; Oral Absorption Efficiency for Dermal, and Absorbed Cancer Slope Factors/RfDs for Dermal (also, Appendix A-3, RAGS D Tables; Cancer and Noncancer Toxicity Data Tables A3-5.1 A3-6.1). The approach and methodology presented in RAGS Part E guidance should be followed for the "adjustment in oral toxicity factor (to account for "absorbed dose" in the dermal exposure pathway" (RAGS Part E, Page 4-2 to 4-4, and Exhibit 4-1). This approach should be described in the HHRA along with a table with the ABSGI values used from Exhibit 4-1.*

"The recommended GI absorption values (ABSGI) for those compounds with chemical specific absorption values are presented in Exhibit 4-1. For those organic chemicals that do not appear on the table, the recommendation is to assume a 100% ABSGI value, based on a review of the literature, indicating that organic compounds are generally well absorbed (>50%) across the GI Tract" (RAGS Part E). Note that Exhibit 4-1 does not recommend an adjustment for any of the organic chemicals listed in Exhibit 4-1, as well.

Absorption data for inorganics are also presented in Exhibit 4-1. Toxicity value adjustment is recommended only for some metals. The recommendation is to assume a 100% ABSGI value for inorganics that do not appear in Exhibit 4-1.

See response to EPA specific comment #24.

*29. **Section 5, Risk Characterization**. Once the comments contained in EPA's letter are addressed, the risk characterization section of the HHRA will need to be revised. A more thorough review of the risk characterization section will be performed in the next version of the HHRA report. Please ensure that the requested changes contained in this letter are incorporated in the risk characterization chapter of the HHRA to avoid further lengthy reviews by EPA and the State.*

Comment noted.

*30. **Section 5.2.1, Cancer Risks, Paragraph 1.** Residential cancer risks are summarized separately for adult and child receptors. However, residential 30-year lifetime cancer risks, which are the sum of 24-years of adult exposures plus 6-years of child exposures, need to be presented (as per EPA Guidance including RAGS Part D; Region 9 PRG Table; RAGS Part B; Soil Screening Level Guidance).*

In RAGS Part D, the summation of Adult plus Child Cancer Risks is presented in Appendix D, Example Scenarios, Example Scenario No. 8, "Child/Adult Lifetime Cancer Risk".

See response to EPA specific comment #19 and #44. The tables and calculations will be revised for consistency and to calculate the Adult/Child scenario.

31. ***Section 5.2.1, Cancer Risks, Risks Associated with Soil Exposure, Paragraph 3.*** *Please delete the following statement, "A source for non-vapor phase PCE has not been identified at the site to date." Table 2-3 (Summary of Detected Chemicals in Surface and Subsurface Soil Samples, 0 to 30 feet bgs) reveals PCE has been detected in soil at concentrations up to 1,300 mg/kg.*

Statement will be deleted. As noted in Section 5.2.3 of the RI,"*The high concentrations of individual VOCs in groundwater, most notably PCE, suggest the presence of a dense non-aqueous phase liquid (DNAPL). MIP data, discussed in the following section, demonstrate the highest content of VOCs within the capillary fringe, suggesting that DNAPL is present as residual saturation in this depth interval. The DNAPL is likely a continuous source of groundwater contamination at the former Omega Chemical property, as evidenced by persistently high VOC concentrations in groundwater at Putnam Street.*" Text describing this subsurface liquid phase source will be added in the risk summary section.

32. ***Section 5.2.1, Cancer Risks, Risks Associated with Indoor Air Exposure, Paragraph 6****. It is stated "Chloroform, though detected in soil gas and groundwater, is also common in municipal water as a result of chlorination, and is a common indoor air contaminant. Chloroform concentrations detected in indoor air are relatively low (0.14 to 0.68 ug/m^3) and are certainly consistent with a source in municipal water."*

The Region 9 Ambient Air PRG for chloroform is 0.083 ug/m^3, which is far lower than the highest level detected in indoor air. Please substantiate that these indoor air concentrations of chloroform "are certainly consistent with a source in municipal water" and supply a clarification in the text, as appropriate.

OPOG will include a list of references and concentration ranges to provide clarification in the text regarding chloroform.

33. ***Section 5.2.2, Chronic Non-Cancer Hazards.*** *Please delete the first two paragraphs on page 5-7. The comments regarding "non-vapor phase PCE" and "minimal risks" to surrounding parcels are speculative comments that are not supported by the data.*

Text will be revised as recommended by the comment.

34. ***Section 6.2 Uncertainties in the Database, page 6-1.*** *states, "To make this selection process more conservative, only one-tenth of the PRGs and groundwater target concentrations were used for the screening to allow for the additive effects of multiple chemicals. Since the list of chemicals with CHHSLs is short, this additional conservatism was not utilized for soil gas and indoor air samples".*

Please revise document such that one-tenth of the CHHSLs are used for screening in a manner similar to that which was performed for the PRGs. Additional CHHSLs can be readily derived by taking the Region 9 air PRG and dividing by the average attenuation factor that was used to derive the CHHSLs for VOCs in soil gas (see PRG User's Guide for more information, link is included above).

Values without screening values were not eliminated from the evaluation unless they failed to meet some other criteria. As such, the screening was conservative and consistent with DTSC policy.

*35. **Section 8, References.** The personnel communication via email from the City of Whittier Planning Services manager concerning Omega Chemical Site future land uses is cited as the first reference. Please supply a copy of the email as an Appendix.*

A copy of the referenced email will be added as an Appendix.

*36. **Appendix A-1, UCL Summaries: Summary of UCLs for Soil Gas 5 - 6 ft bgs, and Summary of UCLs for Soil Gas 5 - 12 ft bgs.** Soil gas data and statistical evaluations in this HHRA should be presented in units of ug/m3 and not ppbv (and not mg/kg).*

Data were presented in ppbv because the majority of the analytical results were reported by the analytical laboratory in units of ppbv. Summary tables, tables in text, and RAGS D calculation tables were revised to list units in ug/m^3.

*37. **Appendix A-3, RAGS D Tables**: Please insert a completed RAGS D Table 0, "Site Risk Assessment Identification Information" as the first table in this Appendix (Table 0 summarizes a lot of site specific information).*

Table 0 will be added in the revised HHRA.

*38. **Appendix A-3, RAGS D Tables: Table A3-3.5A.** This table is modified to present 4 different EPCs, including values for soil gas and modeled indoor air concentrations. The source table for each of these EPC values needs to be identified within the table.*

Footnotes to this table will be modified to indicate the source of these EPCs:

- EPC soil gas values are the maximum detected concentrations located in Table A3-2.5C.
- Modeled indoor air concentrations are summarized in Appendix Table A4-1.

- Minimum value is the minimum detected concentrations shown in Table A3-2.5C.
- Minimum indoor air values are summarized in Appendix Table A4-1

39. ***Appendix A-3, RAGS D Tables: Table A3-5.2, Noncancer Toxicity Data - Inhalation.*** *Some of the Toxicity data attributed to OEHHA appears to be from IRIS. Please confirm the citations for 1,4-dichlorobenzene, and acetaldehyde. For xylene, the presented OEHHA inhalation RfC and RfD appear to be less heath protective than the corresponding IRIS values (posted in the Region 9 PRGs); please confirm.*

The inhalation RfC for 1,4-dichlorobenzene in Table A3-5.2 is the chronic inhalation REL from the OEHHA toxicity criteria database (http://www.oehha.ca.gov/risk/ChemicalDB/chronicreference.asp?name=1%2C4%2DDichlorobenzene&number=106467).

The inhalation RfC for acetaldehyde in Table A3-5.2 is the chronic inhalation REL from the OEHHA toxicity criteria database (http://www.oehha.ca.gov/risk/ChemicalDB/chronicreference.asp?name=Acetaldehyde&number=75070).

The comment is correct that the OEHHA inhalation RfC for xylene (0.7 mg/m^3) is less health protective than the corresponding IRIS value of 0.1 mg/m^3. This value will be revised to be the IRIS value in the calculation.

40. ***Appendix A-3, RAGS D Tables: Tables A3-6.1 and A3-6.2, Cancer Toxicity Data – Oral/Dermal and Inhalation.*** *The dieldrin toxicity data in these tables attributed to OEHHA appears to be from IRIS; please confirm.*

The oral slope factor and inhalation slope factor shown for dieldrin on these tables are from the OEHHA toxicity criteria database (http://www.oehha.ca.gov/risk/ChemicalDB/cancerpotency.asp?name=Dieldrin&number=60571).

41. ***Appendix A-3, RAGS D Tables: Table A3-7.3A, Parcel Site, CTE, Calculation of Chemical Cancer Risks and Noncancer Hazards.*** *Some of the soil EPC concentrations presented in this table and used to calculate risks and hazards could not be confirmed; please revise, as needed.*

EPC soil concentrations on this table should have been from Table A3-3.2. These EPC values have been corrected and will be presented in the revised report.

42. ***Appendix A-3, RAGS D Tables: Tables A3-7.1A to A3-7.8 (Calculation of Risks and Hazards).*** *These appear to be modified RAGS D Tables (which are not explained) for on site exposures and seem to calculate risks for soil exposures plus risks for both minimum and maximum indoor air exposures on the same two to four page table. Each table then sums total risks for both sets of calculations, in a modified format left to the reader to interpret. This (62-page) set of modified tables needs to be completely explained/clarified/justified so that what is presented is transparent to the reader. This is a confusing format modification and it would be simpler and more transparent to perform the two sets of calculations on two separate sets of tables.*

Minimum and maximum values were shown on the same table to prevent duplication of information and adding additional pages of calculations. These tables will be revisited and either a clearer explanation of these calculations will be provided in the footnotes or a separate set of calculations will be added to the report.

Additionally, some of the tables in this 62-page numbered sequence of soil and soil gas risk calculation tables seem to contain tandem sets of duplicate copies, which need to be resolved:

- *Table A3-7.3A is presented twice: as pages 23 to 26, and as pages 27 to 30*
- *Table A3-7.4A is presented twice: as pages 31 to 34, and as pages 35 to 38*
- *Table A3-7.5A is presented twice: as pages 39 to 41, and as pages 42 to 44*
- *Table A3-7.6A is presented twice: as pages 45 to 47, and as pages 48 to 50*
- *Table A3-7.7A is presented twice: as pages 51 to 53, and as pages 54 to 56*
- *Table A3-7.8A is presented twice: as pages 57 to 59, and as pages 60 to 62*

These "duplicate" sets actually represent separate calculations for 3 Kings Construction and Star City Auto, respectively. Appropriate titles will be added so that these tables may be differentiated.

43. ***Appendix A-3, RAGS D Tables: Tables A3-9.1A to A3-9.8 (Summary of Risks and Hazards).*** *These tables also appear to be modified RAGS D Tables (which are not explained) for on site exposures and seem to summarize risks/hazards for soil ingestion and dermal exposures, plus for both minimum and maximum indoor air inhalation exposures, on the same two to four page table. Each table then presents total risks/hazards summations for both sets of calculations, in a modified format left to the reader to interpret.*

Minimum and maximum values were shown on the same table to prevent duplication of information and adding additional pages of calculations. These tables will be revisited and either a clearer explanation of these calculations will be provided in the footnotes or a separate set of calculations will be added to the report.

Hazard summations for organ effects are especially confusing without written interpretation for these tables.

An interpretation of the hazard summations for organ effects will be added to the text and/or footnotes.

This (58-page) set of modified tables needs to be completely explained /clarified /justified so that what is presented is transparent to the reader. This is a confusing format modification and it would be simpler and more transparent to perform the two sets of risk summaries on two separate sets of tables.

Minimum and maximum values were shown on the same table to prevent duplication of information and adding additional pages of calculations. These tables will be revisited and either a clearer explanation of these calculations will be provided in the footnotes or a separate set of calculations will be added to the report.

Table A3-9-6, is labeled "Resident Adult" but seems to summarize risks/hazards for the "Resident Child", and needs to be revised, as appropriate.

Table A3-9.6 does summarize risks/hazards for the resident child. This table was mislabeled and will be corrected in the revised version.

Additionally, some of the tables in this 58-page numbered sequence of soil and soil gas risk calculation tables also seem to contain tandem sets of duplicate copies, which should be confirmed and resolved.

These"duplicate" sets actually represent separate calculations for 3 Kings Construction and Star City Auto, respectively. Appropriate titles will be added so that these tables may be differentiated.

*44. **Appendix A-3, RAGS D Tables: 30-year lifetime cancer risks**. Tables presenting a 30-year lifetime cancer risk which is the sum of risks for 24-years of adult exposures plus 6-years of child exposures need to be presented (as per EPA Guidance including RAGS Part D; Region 9 PRG Table; RAGS Part B; Soil Screening Level Guidance).*

In the RAGS Part D guidance document, the summation of Adult plus Child Cancer Risks is presented in Appendix D, Example Scenarios, Example Scenario No. 8, "Child/Adult Lifetime Cancer Risk".

See response to EPA specific comment #19 and #30. The tables and calculations will be revised for consistency and to calculate the Adult/Child scenario.

*45. **Appendix B, Arsenic Statistical Evaluation:** The arsenic statistical analysis should be performed using the EPA proUCL statistical program as was done for all the UCL summaries in Appendix A-1. The proUCL software gives an analysis of the type of data distribution (e.g., normal, lognormal, gamma), which appears to be the purpose of this exercise in Appendix B.*

The analysis in Appendix B was provided to support the discussion in Section 2.3.2 for calculation of ambient concentrations per DTSC guidance (1997). The analysis in Appendix B was not used for calculation of an EPC. Arsenic UCL calculations were performed using proUCL with the other data in Appendix A-1

HERD COMMENTS

General Comments

The HERD only reviewed the human health risk assessment and did not review the remedial investigation report. The HERD assumes that other Department of Toxic Substances Control (DTSC) staff has reviewed all documents and has evaluated the data with respect to meeting quality assurance and control objectives and to adequacy of site characterization.

This human health risk assessment indicates that inhalation of vapors intruding indoors from the sub-surface is the major exposure pathway at this site and on surrounding parcels and estimates cumulative risks to commercial/industrial workers of as high as 1 X 10-4 and cumulative risks to future potential residents of as high as 2 X 10^{-3}.

The HERD has the following specific comments on this revised report. Some of these comments are reiterations of those made in the HERD memorandum of February 5, 2007, if they remain applicable to this revised draft. The US EPA has already made comments on many issues of concern to HERD. The HERD has not repeated these comments unless emphasis is needed.

Specific Comments

1. The HERD agrees with the US EPA that this risk assessment report be revised as a stand-alone document with the inclusion of relevant figures and summary information from the remedial

investigation report. In addition, the HERD requests that specific citations be included identifying the report(s) where the details surrounding the collection and analysis of the subject information may be found. Examples of summary information that should be included are a description of the local hydrogeology, the depth to the shallow-most groundwater, the names of and depths to aquifers considered to have potential beneficial uses, and a description of the soil lithology from the surface down to groundwater.

As noted in the response to EPA Specific Comment #6, sample location maps similar to the RI will be added to Section 2 and a reference to these maps will be added in the introductory text of this section. Specific citations to sections in the RI and some summary information will be added to the HHRA to make the HHRA more of a stand-alone document.

2. *An ecological risk evaluation has not been performed for this site because of its urban location. The HERD understands that an ecological risk evaluation will be performed under the auspices of the US EPA.*

Comment noted. We acknowledge that EPA will be conducting an evaluation of habitat and ecological receptors as per EPA Specific Comment #1.

3. *Page 1-6 Section 1.4 Potential Risk Issues. The text states that the total dissolved solids (TDS) concentration is too high for the groundwater to be considered as having potential beneficial uses. A table of TDS concentrations should be included in this report to support this statement.*

Table will be added in the revised HHRA per EPA Specific Comment #5.

4. *Page 1-6 Section 1.5 Overview of Risk Assessment Findings. The text states that direct exposure to the soil is unlikely because most of the site is expected to be covered with buildings, concrete with asphalt. This statement should be removed, since there is not expected to be any legal requirement to cap the site in this manner.*

Statement will be revised to reflect the potential for removal of existing hardscape and buildings in the future.

5. *Page 2-3 Section 2.2 Data Evaluation. Multiple rounds of indoor air samples were collected in various buildings. References need to be added to this section identifying the report(s) in which methods used to collect these data are presented, what surveys were carried out to determine building sources prior to sampling, and criteria used to choose indoor air sampling locations and target analytes.*

All of this information is provided in the On-Site RI Report. A reference to this report will be added to this section in the revised HHRA.

6. Page 2-4 Section 2.3 Identification of Chemicals of Potential Concern. Chemicals were eliminated from further evaluation in this risk assessment based on a frequency of detection of less than five percent and on a comparison of maximum detected concentrations to health-based screening criteria for soil matrix, groundwater, soil gas, and indoor air. The chemicals eliminated are listed in each of these sections. In contrast to this methodology, the HERD recommends that all chemicals detected with a frequency of detection equal to or greater than five percent be quantitatively evaluated in this risk assessment without regard to comparison to any human health-based screening criteria.

See responses to EPA comments. OPOG notes that inclusion of large numbers of chemicals that contribute nothing to site-related risks takes considerable effort and provides neither the community nor risk managers information relevant to risk management.

7. Page 2-9 Section 2.3.5 Selection of COPCs for Soil, and Tables 2-1, 2-2, and 2-3 Summary of Detected Chemicals in Soil Samples. The methods used to collect and analyze soil matrix samples should be summarized either in the text or as footnotes to the tables. This comment also refers to the collection and analysis of groundwater samples. The HERD stresses that the method(s) used should have been those that minimize loss of volatile constituents during collection.

Even using such methods, OPOG notes that VOC analyses for soil are uncertain. For the subsurface, soil vapor measurements are the best data to use for exposure assessment.

8. Page 2-10, Section 2.3.7 Selection of COPCs for Soil Gas. A) The methods used to collect and analyze soil vapor samples should be summarized in the text with a reference included to identify where detailed descriptions of the soil vapor sampling events may be located. The HERD requests assurance that the collection apparatus was leak-free during collection of soil gas. B) The dates of the soil gas sampling events should be given in the text so that soil vapor concentrations may be evaluated to determine whether seasonal conditions could have affected measurements. C) Figures should be added to this health risk assessment depicting the soil vapor plumes for the individual COPCs at zero to six feet below ground surface (bgs), since these soil vapor plumes represent the environmental medium of greatest concern in the human health risk assessment. These figures may be modified from those included in the remedial investigation. However, all soil vapor sample locations should be depicted in these figures.

A&B) As per HERD specific comment #1, specific citations to sections in the RI containing the data in question and some summary information will be added to the HHRA to make the HHRA more of a stand-alone document.

C) As per EPA specific comment #6, sample location maps similar to the RI will be added to Section 2 and a reference to these maps will be added in the introductory text of this section.

9. Page 2-11 Section 2.3.7 Selection of COPCs for Soil Gas; Table 2-7 Summary of Detected Chemicals in Soil Gas 5 to 6 Feet bgs for All Parcels; and Table 3-5 Summary of Exposure Point concentrations for Soil Gas (5 to 6 feet bgs) – All Parcels. The text states that measured soil gas data for all parcels were used to quantitatively evaluate future residential indoor air exposure. The HERD recommends that the soil gas data be separated so that the residential indoor air exposure for the former Omega Chemical Property is evaluated separately from "all parcels". Importantly, the term "all parcels" should be defined to make clear the data set being used in the risk evaluation. Please elucidate if "all parcels" is equivalent to "on-site". Please clarify if "on-site" is equivalent to the former Omega Chemical Property, the area upon which Star City Auto Body and Former 3 Kings Construction buildings are now located.

Soil gas data will be separated so that the residential indoor air exposure for the former Omega Chemical Property is evaluated separately from the remaining parcels.

10. Table 2-10 Summary of Detected Chemicals in Soil Gas 6+ feet bgs. Convert concentrations from parts per billion (ppb) to ug/m^3.

Table will be revised as recommended by the comment.

11. Page 3-5 Section 3.3.1 Potentially Exposed Populations. A potentially sensitive population group is the patients visiting the oncology care office south of the site. A subsection should be added here discussing this population group. In particular, the proximity of the soil vapor plume to this building should be discussed. If the plume is within 100 feet of the building footprint, indoor air in that building could be affected currently or in the future.

This potentially sensitive population will be evaluated and a subsection discussing their potential risks and hazards will be added to the uncertainty section.

12. Page 3-6 Section 3.3.2.1 Ingestion and Dermal Contact with Groundwater: The text states that there is no evidence that contamination from this site has reached potable aquifers underlying the Gage unit. Provide a summary of evidence supporting this statement and a citation where that evidence may be found.

The text remains unchanged, as it is factually accurate; there is indeed no evidence that we are aware of that would indicate that a drinking water aquifer has been impacted. Asking for evidence to prove a negative in this instance is scientifically inappropriate.

13. Page 3-10 Section 3.4.1.2 Body Surface Area: The skin adherence factor for the construction worker should be increased from 0.37 mg/cm2 to 0.8 mg/cm2, based on the DTSC/HERD Human Health Risk Assessment (HHRA) Note Number 1 (October 2005).

Text and tables will be revised as recommended by the comment.

14. Page 3-12 Section 3.4.2.3 Inhalation of Indoor Air. It appears from the text that risks to future commercial/industrial workers using soil gas data were evaluated only for the former Skateland facility. The HERD requests that the risks and hazards to future commercial/industrial workers on the former Omega Chemical Property be evaluated using a single property-wide exposure point soil gas concentration representative of a reasonable maximum exposure and utilizing soil parameters descriptive for loam, rather than clay, in the vapor intrusion model, as recommended by the US EPA.

This text will be revised to distinguish between current and future commercial/industrial workers. As noted in the fourth statement in this section, future commercial/industrial workers on the Skateland parcel were evaluated for indoor air based on soil gas concentrations. This statement should have also indicated that future on-site commercial/industrial workers were also evaluated for indoor air based on soil gas concentrations. These calculations are provided in Appendix A3-7.7 and 7.8.

See response to EPA general comment #6 and specific comment #22 regarding the use of loam in the J&E model.

15. Page 3-13 Section 3.4.2.4 Inhalation of Ambient Air. The vapor intrusion model was modified to utilize only the diffusion of soil vapor in the sub-surface in order to evaluate the trench worker. The use of the model in this way has not been reviewed by any regulatory agency in California and, thus, should not be utilized for this scenario. Instead, as recommended by the US EPA, an emissions equation and box model should be employed for this evaluation.

Please see response to EPA general comment #3.

16. Tables 4-1 and 4-3 Cancer Toxicity Data: A) The California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) considers naphthalene to be a carcinogen by the inhalation route only. Therefore, the use of an oral cancer slope factor (CSF oral) is not appropriate for this human health risk assessment. B) The risk from the inhalation of

trichloroethylene (TCE) should be evaluated using both the US EPA CSF and the OEHHA CSF, since there is a significant difference between these two inhalation slope factors. As recommended by the US EPA, the difference in the TCE risk results should be discussed in the uncertainty section of the risk assessment report.

The naphthalene oral cancer slope factor will be removed from the calculations.

As stated in the response to EPA specific comment #27, the uncertainty discussion will be revised to include the entire range of slope factors from the withdrawn TCE risk assessment and the basis for this range.

17. Table 5-1 Summary of Chronic Cancer Risks and Chronic Non-Cancer Hazards. The future risks and hazards from exposure to chemicals at the Three Kings and Star City Auto Body parcels are identical. Briefly summarize in the text or a footnote to the table the data set(s) used to calculate the future risks at these two parcels.

The risks and hazards for Three Kings and Star City Auto Body are not exactly identical. Risks and hazards for exposure to surface soil 0 to 2.2 feet bgs and surface/subsurface soil to 12 feet bgs are the same for both buildings because there is only one set of soil data for the site. However, risks and hazards for inhalation exposure to indoor air is not the same for these two buildings because this exposure is based on indoor air samples collected and evaluated separately for each building. A footnote or text will be provided to clarify this distinction.

18. Page 5-3, Section 5.2.1 Cancer Risks: It would be informative to include graphs or figures to this assessment that apportions the fraction of cancer risk and non-cancer hazards due to specific COPCs.

CDM will consider incorporating graphs in the risk summary to better indicate the apportions of the fractions of cancer risks and non-cancer hazards to COPCs.

19. Page 5-4, Section 5.2.1 Cancer Risks: A rationale is presented to support the statement that benzene, chloroform and carbon tetrachloride detected in indoor air in some parcels represent ambient levels. Soil vapor data at those parcels should be evaluated to support this statement. If these chemicals are found in soil vapor, soil vapor must be considered as a potential source, and this should be so stated in the text.

Soil vapor at these parcels will be evaluated, and additional text added as appropriate.

20. Page 6-3, Section 6.3.3 Estimates of Indoor Air Concentrations: A) The text states that seasonal variation was addressed by collecting indoor air samples on two or more occasions. Provide the dates of these sampling events in the text. B) The text further states that, although indoor air data cannot be used to estimate indoor air risks in future buildings, it is likely that these future risks will be less than estimated in this risk assessment because of vapor barriers and ventilation rates required by building codes. However, these same building codes will require engineered fill under the foundation. Such fill may be more permeable than the clay assumed to currently be in place. In addition, vapor barriers will develop holes over time and would be considered effective only over a limited time. This section should be revised.

A) As per HERD specific comment #1 and 8, specific citations to sections in the RI containing the data in question and some summary information will be added to the HHRA to make the HHRA more of a stand-alone document.

B) Section regarding future risks will be revised taking into account these issues brought up by HERD.

Very truly yours,

Sharon Wallin, P.G.
Project Manager
Camp Dresser & McKee Inc.

Jim Lavelle, pH. D.
Principal Senior Toxicologist
Camp Dresser & McKee Inc.

cc: Ed Modiano, Project Coordinator
David C. Chamberlin, CDM
Kassandra Tzou, CDM