

**Attachment 8**  
**Responses to TAG Advisor Comments on HHRA**

Third Bullet Paragraph: "Several contaminants in groundwater currently exceed risk criteria for the ingestion pathway; however groundwater ... (is not likely to be used) ... as a source of drinking water." Comment: *Groundwater also exceeds the risk criteria for inhalation by trench workers if there is no wind velocity in the trench assumed, and if the assumed cumulative exposure time is greater than one year.*

**Response ES-11:** We agree that the groundwater exposure to a trench worker exceeds risk criteria for inhalation of VOCs. For comparison to the risks and hazards estimated for the trench worker using the model that DTSC recommended, we calculated risk using the Virginia Department of Environmental Quality's trench worker model which assumes no wind velocity in the trench. The results show a risk greater than  $10^{-4}$  ( $6 \times 10^{-4}$ ) and an HI that exceeds 1 (34). Remedial alternatives for addressing groundwater contamination will be evaluated as part of the feasibility study.

Fifth Bullet Paragraph: "Elevated lead concentrations were detected at several properties ... occupying the same block as the former AMCO facility." Question: *Because other residences have no-doubt been affected by the off-site "industrial, non-industrial, and non-point sources", shouldn't other residences in other nearby blocks also be investigated and soil removed where appropriate?*

**Notes for Response ES-12:** US EPA's Emergency Response Group is evaluating lead contamination at residences located between Mandela, Peralta, 7th and 3<sup>rd</sup> Streets separate from the AMCO investigation.

Seventh Bullet Paragraph: "At ... (the site, and in off-site locations) ... soil, soil gas, and groundwater would pose an unacceptable risk to site workers. However, ... (concrete) isolates workers from the contaminated soil, soil gas, and groundwater underneath." Comment: *The current concrete pavement at the AMCO facility will provide no protection to future construction and trench workers as it will no doubt be removed during such operations.*

**Response ES-13:** This bullet is intended to address current site workers and has been revised to clarify.

## Human Health Risk Assessment

Second Paragraph: "An ecological risk assessment ... (was not performed because) ... there are no reasonable and unambiguous pathways for contaminant transport from the Site to any wildlife or sensitive habitats, including Oakland harbor ..." Comment: *The Oakland Inner Harbor lies approximately three thousand feet south of the site. Linear groundwater flow velocities in the lower portion of the upper aquifer were found up to about 50 feet per year. It is therefore possible for contaminants originating at the AMCO site to reach the Oakland Inner Harbor within about sixty years from the time they were discharged. Because AMCO began operations in the 1960s, it is conceivable that contaminants could reach the Oakland Inner Harbor within the next 10-20 years. This is a reasonable pathway for contaminants to reach sensitive ecological receptors. Because weak tidal effects were observed in the upper aquifer monitoring wells, it is an unambiguous pathway.*

**Notes for Response 7-1:** Ned Black, the Regional Ecologist and Microbiologist for the Superfund Support Team, reviewed the information gathered for HRS screening memo and along with his familiarity with the location of the site, suggested that it would be highly unlikely that an ecological risk assessment would be required for the Remedial Investigation.

Reference Internal Memorandum from Ned Black to Brunilda Davila: Review of Need for Ecological Risk Assessment at AMCO Site.

## 7.2 Risk Assessment Methodology

### 7.2.1 Toxicity Assessment

Last Paragraph, Second to the Last Sentence: “The model equations were developed to calculate cleanup goals such that there would be no more than a 5 percent probability that fetuses exposed to lead would exceed a blood lead (PbB) of 10 µg/deciliter.” Comment: *This means that the lead cleanup goal would be set so that, on average, 5 fetuses out of 100 pregnancies would have a blood lead level that is known to cause permanent brain damage in small children. This compares unfavorably with the 1 in 10,000 to 1 in 1,000,000 that is generally considered acceptable for lifetime excess cancer risk in adults. The model equations should be developed to calculate a much lower cleanup goal so as not to deny environmental justice to the children of West Oakland.*

**Notes for Response to Comment 7-2:** In the updated assessment, lead concentrations at the site are screened against the 2009 residential and industrial CHHSLs developed by OEHHA for lead.

No site-specific cleanup goals have been developed for the AMCO site. Cleanup goals for the site will be developed as part of the feasibility study.

## 7.3 Results of Quantitative Risk Evaluation

### 7.3.1 Soil

7.3.1.1 Former AMCO Facility – Comment: *Soil at this location poses a human health risk generally 2 to 15 times higher than what is normally considered acceptable.*

7.3.1.2 Parking Lot – Comment: *Soil at this location poses a human health risk generally 2 to 28 times higher than what is normally considered acceptable.*

7.3.1.3 Large Vacant Lot - Comment: *Soil at this location poses a human health risk generally 2 to 11 times higher than what is normally considered acceptable.*

7.3.1.4 Small Vacant Lot - Comment: *Soil at this location poses a risk to children generally 3 to 12 times higher than what is normally considered minimally acceptable.*

**Response 7-3:** We agree that the noncancer hazards for soil are higher than what is considered acceptable for the future child resident. As mentioned in many sections of the report, a soil removal action to address high concentrations of lead was performed at the residential properties adjacent to and near the former AMCO facility.

### 7.3.2 Groundwater

Second Paragraph, First Sentence: “For the potential residential RME scenario, the ELCR is  $1 \times 10^{-1}$  for exposure to groundwater.” Comment: *This means that for the reasonable*

*maximum exposure to groundwater, the excess cancer risk for humans is one additional cancer per ten persons exposed. This is an extremely high cancer risk, 1000 to 100,000 times higher than what is normally considered acceptable. Although no one is likely to drink the groundwater where these levels of contaminants were found, and therefore such exposures are not currently likely, this high risk level points out the need for the EPA to give priority to this site for cleanup as a matter of environmental justice. It also points out the need to fully investigate the usable groundwater deeper under the site, which could be used for drinking water in the future.*

**Response 7-4:** We agree that the concentrations of contaminants in groundwater on the former AMCO facility are extremely high and not within the acceptable risk management range. Deep groundwater monitoring wells have been installed and results of the sampling will be evaluated. Remedial alternatives for addressing groundwater contamination will be evaluated as part of the feasibility study.

Second Paragraph, Second Sentence: “The HI for the child is 1153; and the HI for the adult is 484.” Comment: *This means that the other (non-cancer) risks from groundwater are in the range of about 500 to over 1000 times higher than is normally considered being acceptable. These data also highlight the environmental justice issues at this site, and the need for thorough and complete investigation and cleanup.*

**Response 7-5:** We agree. Remedial alternatives for addressing groundwater contamination will be evaluated as part of the feasibility study. Cleanup goals for groundwater will be based on drinking water standards – MCLs.

Third Paragraph, Second Sentence: “For the trench worker RME scenario, the ELCR is  $1 \times 10^{-4}$  for exposure to groundwater.” Comment: *This means that the excess lifetime cancer risk for trench workers under the reasonable maximum exposure scenario, as calculated in the Draft RI, is 1 cancer per ten thousand exposures. This is generally considered minimally acceptable for such workers. However, unreasonable assumptions for minimum wind velocity in the trench (30 feet per minute) and for reasonable maximum cumulative exposure time (1 year) have been made in this calculation. The actual ELCR is higher for the trench workers than has been calculated in the Draft RI, and is outside the range that is generally considered acceptable.*

**Response 7-6:** We agree that the ELCR estimated for a trench worker's exposure to groundwater is outside the range that is considered acceptable. Risk estimates using the Virginia Department of Environmental Quality's trench worker model which assumes no wind velocity in the trench show a risk greater than  $10^{-4}$  ( $6 \times 10^{-4}$ ) and an HI that exceeds 1 (34). Remedial alternatives for addressing groundwater contamination will be evaluated as part of the feasibility study.

## **Appendix H - Human Health Risk Assessment**

### **Executive Summary**

Second Paragraph: “...there are no reasonable and unambiguous pathways for contaminant transport from the site to any wildlife or sensitive habitats including Oakland harbor (EPA 2004d).

Comment: *Groundwater is a reasonable and unambiguous pathway for contaminant transport to sensitive habitats south of the site. Question: Because no one knows how far the*

*contaminated groundwater plume goes to the south of the site, doesn't this mean that the ecological risk south of the site should be examined?*

**Response H-1:** Response 7-1 addresses the need for an ecological risk assessment.

ES.1 Study Area, Second Paragraph: "...in accordance with input from the community and regulatory agencies, the potential risk of using groundwater underneath the Site as drinking water is evaluated." Question: *Isn't it true that only the shallow groundwater, which cannot be used for drinking water, was evaluated and the deeper groundwater that can be used was not evaluated?*

**Response H-2:** Only the shallow groundwater was evaluated for use as drinking water as part of this Risk Assessment. Based on the results of the remedial investigation, contamination from the AMCO site has not penetrated the Older Bay Mud aquitard. Deep wells have been installed and results of groundwater sampling from the deep aquifer will be evaluated in the feasibility study.

ES.1 Study Area, Third Paragraph: "Soil was sampled at six residential parcels in the immediate vicinity of the facility." Question: *Isn't it true that the source of the alarmingly high lead contamination for these properties was not found, and that residences that are even closer to the lead source could have even higher levels of lead?*

**Response H-3:** Based on the data collected during the RI, we do not believe that the former AMCO facility is source of the lead found in the residential soil. US EPA's Emergency Response Group is evaluating lead contamination at residences located between Mandela, Peralta, 7th and 3<sup>rd</sup> Streets separate from the AMCO investigation.

ES.2 Risk Assessment Methodology, Exposure Assessment, Second Paragraph: "In addition, direct contact with groundwater and outdoor inhalation of vapors from groundwater was evaluated for excavation/trench workers." Comment: *An assumed wind velocity in the trench of about half a foot per second, and a cumulative lifetime exposure of one year were used in the risk calculations. A trench more than four feet deep is actually a confined space with potentially stagnant air; trench workers working construction in West Oakland could potentially be exposed for their working career. Usually a lifetime exposure of 25 years is used in risk calculations for such workers. Question:* *Isn't it true that the excess cancer risk to trench workers calculated in the Draft RI was barely within the generally acceptable range, and that if the air was assumed to be stagnant in the trench and a lifetime exposure for industrial workers of 25 years were used, the calculated excess cancer risk for trench workers would be many times higher than acceptable?*

**Response H-4:** We agree that the ELCR estimated for a trench worker's exposure to groundwater exceeds the range that is considered acceptable. Risk estimates using the Virginia Department of Environmental Quality's trench worker model which assumes no wind velocity in the trench show a risk greater than  $10^{-4}$  ( $6 \times 10^{-4}$ ) and an HI that exceeds 1 (34). Remedial alternatives for addressing groundwater contamination will be evaluated as part of the feasibility study.

ES.2 Risk Assessment Methodology, Toxicity Assessment, Third Paragraph: "The model equations were developed to calculate cleanup goals such that there would be no more than a 5 percent probability that fetuses exposed to lead would exceed a blood lead (PbB) of 10 µg/deciliter." Comment: *A standard of five unacceptable blood levels per hundred fetuses exposed does not seem like a sufficiently protective criterion.*

**Response H-5:** In the updated assessment, lead concentrations at the site are screened against the 2009 residential and industrial CHHSLs developed by OEHHA for lead.

No site-specific cleanup goals have been developed for the AMCO site. Cleanup goals for the site will be developed as part of the feasibility study.

ES.4 Results for Screening Level Risk Evaluation, Residential Soil: “As a result (of soil removals performed at the residences in the same block as the former AMCO facility), the samples collected during the RI are no longer representative of the soil conditions at these properties.” ... “Lead exceeded the site-specific screening level for soil at each of the residential properties.” Comment: *It should be pointed out that the samples collected during the RI are no doubt representative of other properties in the area, particularly properties across Center Street that are close to the foundry, and that lead in these samples exceeded the site-specific screening level by many times.*

**Response H-6:** Based on the data collected during the RI, we do not believe that the former AMCO facility is source of the lead found in the residential soil. US EPA’s Emergency Response Group is evaluating lead contamination at residences located between Mandela, Peralta, 7th and 3<sup>rd</sup> Streets separate from the AMCO investigation.

1.0 Introduction, Third Paragraph: “The CSM (conceptual site model) for the former AMCO facility is presented in Figure 1.” Comment: *Figure 1 should show soil vapor as a secondary source of contamination to groundwater by the mechanism of dissolution.*

**Response H-7:** Considering the thin vadose zone, relatively low mass of VOCs in the soil gas, and the relatively low permeability of the soil, reduced further by moisture in the capillary fringe, migration of VOCs in the soil gas and dissolution into the soil and groundwater is not a significant transport mechanism.

1.1.4 Preliminary Assessment and Site Investigation Report, First Bullet: “Significant concentrations of chemicals have been found in soil on the on- and off-facility properties. However, the majority of the ground surface at these properties is covered with concrete. Therefore, the potential for workers and residents to come into direct contact with contaminated soil is minimized.” Comment: *The potential for workers and residents to come into contact with contaminated soil is still quite great. Concrete and other pavements are often removed while modifications or repairs are made to property. Because West Oakland is undergoing significant redevelopment, the high potential for removal of concrete and other pavements needs to be accounted for.*

**Response H-8:** This comment is intended to address current site workers. The bullet has been revised to clarify.

1.1.4 Preliminary Assessment and Site Investigation Report, Second Bullet: “Significant concentrations of vinyl chloride and other chemicals have been found in groundwater monitoring wells on and near the former AMCO facility that establish a release of chemicals to the regional groundwater. However, the regional groundwater is not used for drinking water, and there are no drinking water wells within 4 miles of the Site.” Comment: *The fact that usable drinking water underlies the site needs to be accounted for.*

**Response H-9:** Only the shallow groundwater was evaluated for use as drinking water as part of this Risk Assessment. Based on the results of the remedial investigation, contamination from the AMCO site has not penetrated the Older Bay Mud aquitard. Deep

wells have been installed and results of groundwater sampling from the deep aquifer will be evaluated as part of the feasibility study.

1.1.4 Preliminary Assessment and Site Investigation Report, Third Bullet: “A release to air of hazardous substances was observed in 1996, during the excavation of a trench for an on-facility treatment system. A sample collected at the time of the observed release documented that vinyl chloride, trichloroethene, and other volatile organic compounds (VOCs) were present in vapor observed emanating from the trench.” Question: *What were the concentrations of these compounds in the air, and how do these observed concentrations compare to the reasonable maximum exposure levels used in the risk calculations for trench workers?*

**Response H-10:** The Preliminary Assessment and Site Investigation Report does not provide the concentrations that were found in air in 1996. The risk calculations, included in the final Risk Assessment, are based on 2004 to 2009 crawl space and ambient air data, which represent current conditions. The on-facility treatment system, which extracted groundwater and soil gas from the trench location, was in operation for one year subsequent to the 1996 release. Therefore, conditions encountered prior to operation of the treatment facility are not necessarily representative of current conditions.

3.1.1 Exposed Populations, Last Paragraph: “Industrial, construction, and trench workers may be exposed to the same concentrations as a resident (by the same pathways), ...” Comment: *If this statement in the Draft RI were true, one could say that a resident’s exposure could be the same as a trench worker. This seems patently false. A trench worker’s exposure will be to higher concentrations than a resident, or other types of workers, because a trench worker’s breathing zone will be much closer to the groundwater and soil vapor sources of contaminants.*

**Response H-11:** The exposure point concentration assumptions are the same for all receptors. However, the assumptions are conservative to the resident in assessing risk using this value as opposed to not being protective to the trench worker. To evaluate risk from exposure to groundwater, the 95 percent Upper Confidence Limit on the Mean (UCL) or maximum detected concentration (for chemicals where the UCL exceeds the maximum) of the entire groundwater plume for each chemical was used for all receptors. This methodology for selecting an exposure point concentration is standard risk assessment procedure as outlined in *On the Computation of a 95% Upper Confidence Limit of the Unknown Population Mean Based Upon Data Sets with Below Detection Limit Observations* (EPA 2006). The 95 percent UCL takes into account the variability in the data set to ensure that the average exposure is not underestimated.

3.1.2 Exposure Pathways, Fourth Bullet: “(Construction/trench worker activity) is potentially the most significant exposure pathway for subsurface workers.” Comment: *Therefore, a one-year cumulative exposure duration for trench workers, who could spend an entire career working on subsurface disturbance activities, is inordinately short as used in the risk calculations.*

**Response H-12:** The site-specific exposure assumption of an exposure duration of 1 year for a trench worker is based on the reasonableness of a worker working in a trench on or adjacent to the former AMCO facility (approximately 1 acre in size). Although redevelopment in West Oakland is likely to go on for decades, the trench worker would not be exposed to the concentrations found in the groundwater at the AMCO site when they are working in trenches outside of the AMCO site.

3.1.2 Exposure Pathways, Fifth Bullet: “This (ecological) pathway, while potentially complete, was not quantitatively evaluated ...” Comment: *In view of the incomplete groundwater assessment down gradient, the Draft RI ignores potential impacts to sensitive ecological receptors in the Oakland Inner Harbor to the south and southwest of the site.*

**Response H-13:** Please see response to 7-1 regarding the need for an ecological risk assessment.

3.1.2 Exposure Pathways, Second to the Last Paragraph: “Inhalation of VOCs which (sic) volatilize from soil or groundwater into air can be absorbed into the bloodstream after being inhaled.” Comment: *This exposure pathway is not mentioned directly in the narrative discussions of potential exposures to trench workers in the Draft RI, while the much less important dermal exposure pathway is mentioned frequently. The inhalation pathway was evaluated in the risk calculations. Even with some very liberal (not very protective) assumptions in the risk calculations, the health risks to trench workers from the inhalation pathway are significant, and should be mentioned in the narrative.*

**Response H-14:** The inhalation of VOCs pathway has been added to the Sections 7.2.2.2 and 7.3.2 of the RI discussions of potential exposures to trench workers.

3.3.1 General Exposure Assumptions, Second Bullet: “The construction worker is assumed to be exposed for a period of one year.” Comment: *This is unreasonably short for a construction worker who may work on multiple projects in the contaminated area, given the widespread nature of the groundwater contamination down gradient, and the evidence for mobility of soil vapors in the subsurface.*

**Response H-15:** The site-specific exposure assumption of an exposure duration of 1 year for a trench worker is based on the reasonableness of a worker working in a trench on or adjacent to the former AMCO facility (approximately 1 acre in size). Although redevelopment in West Oakland is likely to go on for decades, the trench worker would not be exposed to the concentrations found in the groundwater at the AMCO site when they are working in trenches outside of the AMCO site.

4.2.3 Toxicity Values for Lead, First Paragraph: “EPA and Centers for Disease Control and Prevention (CDC) have identified childhood blood levels of 10 µg/dL as the level of concern above which significant health risks may occur (EPA 2003a)” Comment: *There are many studies that indicate much lower blood levels are harmful to children; lead can accumulate in bones and be released later, even though tests don’t show a 10 µg/dL blood lead level. Besides brain damage and learning disabilities, recently publicized studies have shown a correlation between lead exposure in childhood and later criminal behavior. The Draft RI has identified very high lead levels in soil in the study area. High lead levels in soil have been shown to have a direct correlation with high blood levels in children. The source and extent of lead contamination around the AMCO site have not been identified in the Draft RI. This deficiency in the Draft RI is very serious, and needs to be corrected. It does not seem that the lead issue is taken seriously enough, or given enough weight, in the Draft RI HHRA.*

**Response H-16:** EPA considers lead contamination to be a very serious issue, as shown by the emergency response removal action of soil conducted at the residential properties. In 2009, OEHHA lowered the CHHSL for lead based on a blood level of 10 µg/dL to 1 µg/dL. The revised CHHSL is now used as a screening level for lead instead of the site-specific screening levels.

4.2.3 Toxicity Values for Lead, Last Paragraph: “The model equations (for workers exposed to lead in soil) were developed to calculate cleanup goals such that there would be no more than a 5% probability that fetuses exposed to lead would exceed a blood lead (PbB) of 10 µg/dL.” Comment: *Given the extremely harmful effects of measurable blood lead levels in children, equations based on 5 known harmful levels in fetuses per 100 pregnant workers does not seem very protective of the health of pregnant workers or their unborn children.*

**Response H-17**: No site-specific cleanup goals have been developed for the AMCO site. Cleanup goals for the site will be developed as part of the feasibility study. In the updated assessment, lead concentrations at the site are screened against the 2009 residential and industrial CHHSLs developed by OEHHA for lead.

5.0 Risk Characterization, Third Paragraph: “Under (reasonable maximum exposure) conditions, the calculated risks are not likely to be exceeded by any member of the exposed population because of the health-protective exposure assumptions used. ... In other words, the most vulnerable people (e.g., children) are carefully considered to make sure all members of the public will be protected.” Comment: *It does not appear that this standard has been met in the assessment of lead exposure to pregnant industrial workers, or in the case of VOCs, exposure to trench workers.*

**Response H-18**: Exposure to lead in soil is evaluated by comparing a lead EPC to the residential (80 mg/kg) or industrial (320 mg/kg) CHHSL. The CHHSLs are health protective of children and other sensitive receptors.

As stated in responses to comments ES-11, 7-6, H-4, and H-22, we agree that the groundwater has unacceptable levels of VOCs for exposure by a trench worker.

5.4.5 Background Soil Risk Evaluation, Second Paragraph: “Risks and hazards from exposure to background concentrations of metals in soil were estimated using the City of Oakland *Survey of Background Metal Concentration Studies* (City of Oakland 1995). For a child resident, the ELCR is  $2 \times 10^{-4}$ . Arsenic contributed over 99% of the total background risk. The HI is 10 for the child resident and 1 for the adult. Thallium contributed 89% to the total background HI.” Comment: *Given this already high risk to children from West Oakland background soil, i.e. twice what is normally regarded as minimally acceptable for excess lifetime cancer risk and ten times the generally acceptable level for non-cancer health risk, the most protective cleanup standards should be used for remediation of the AMCO site.*

**Response H-19**: Cleanup goals will be developed as part of the feasibility study. The most protective cleanup goals that are feasible will be selected.

5.5 Groundwater Risk Evaluation: “... It is extremely unlikely that residents would drink groundwater underneath the Site in the future; ... TDS concentrations in all wells south of 3<sup>rd</sup> Street were above (the drinking water threshold of) 3,000 mg/L.” Comment: *This is not true for the deep aquifer under the site, which is known to be usable.*

**Response H-20**: The sentence states that “TDS concentrations *in all wells* south of 3<sup>rd</sup> Street were above (the drinking water threshold of) 3,000 mg/L.” All wells that are monitored as part of the RI are shallow aquifer wells. Deep wells have been installed and results of groundwater sampling from the deep aquifer will be evaluated in the feasibility study.

5.5.1 Shallow Groundwater, First Paragraph: “For the potential residential RME scenario, the excess lifetime cancer risk is  $1 \times 10^{-1}$  for groundwater. The HI for the child was 1,153 ...”

*Comment: The health risk for groundwater is 1000 times what is normally considered to be acceptable. This result is consistent with other human health risk studies that have been done at the site, and points out the need for completing the down-gradient investigation of the shallow aquifer, assessing the deep aquifer, and performing an ecological assessment down gradient of the site.*

**Response H-21:** We agree that the health risk from shallow groundwater beneath the former AMCO facility is well above acceptable levels. Remediation alternatives will be evaluated as part of the feasibility study.

5.5.1 Shallow Groundwater, Second Paragraph: “(For the trench worker) the total lifetime-excess cancer risk was  $1 \times 10^{-4}$  for groundwater (Table 2-14). The HI for the trench worker was 34 (Attachment 2, Table 2-15).” *Comment: Examination of Table 6 shows that a wind velocity of approximately half a foot per second was assumed. This is very unrealistic for a trench 10 feet deep, which would be classified as a confined space due to poor ventilation. Also, Table 6 shows that a cumulative lifetime exposure of 1 year was used for the trench workers. This is unrealistic for a worker who may spend a career working construction and could be exposed to subsurface conditions throughout that career. Use of more realistic assumptions for the trench workers’ reasonable maximum exposure (RME) would result in a much higher risk result that would be many times higher than the calculated result in the Draft RI HHRA.*

**Response H-22:** We agree that the groundwater exposure to a trench worker exceeds risk criteria for inhalation of VOCs. For comparison to the risk calculations for the trench worker using the model that DTSC recommended, we calculated risk using the Virginia Department of Environmental Quality’s trench worker model which assumes no wind velocity in the trench. The results show a risk greater than  $10^{-4}$  ( $6 \times 10^{-4}$ ) and an HI that exceeds 1 (34).

The site-specific exposure assumption of an exposure duration of 1 year for a trench worker is based on the reasonableness of a worker working in a trench on or adjacent to the former AMCO facility (approximately 1 acre in size). Although redevelopment in West Oakland is likely to go on for decades, the trench worker would not be exposed to the concentrations found in the groundwater at the AMCO site when they are working in trenches outside of the AMCO site.

Remedial alternatives for addressing groundwater contamination will be evaluated as part of the feasibility study.

5.5.1 Shallow Groundwater, Third Paragraph: “The chemicals that contribute most to the risk through exposure to groundwater include vinyl chloride, arsenic, ...” *Comment: It should be noted that vinyl chloride contributes 55% of the risk, and that the next highest contributor is only 5% as shown in Tables 2-10 and 2-11. This type of information is important for the evaluation of remedial alternatives that will follow in the Feasibility Study phase of the work.*

**Response H-23:** We agree. Risk assessment data will be incorporated into the evaluation of remedial alternatives performed during the feasibility study.

5.6 Residential Soil Gas, Ambient Air, and Crawlspace Air, Numbered Paragraph 3: “... it is clear (from the high VOC concentrations) that the VOCs are coming from the groundwater.” *Comment: High VOCs in groundwater northwest of the central and south-central areas of the site, in an apparent up-gradient direction, suggest that at least some of the soil vapors might*

be coming from vapor migration. Question: Was vapor migration considered by the EPA as one of the pathways?

**Response H-24:** The assessment has been revised to include a quantitative evaluation of the risks and hazards posed by the presence of VOCs in crawl space air and ambient air. Soil vapor and groundwater data have been used as lines of evidence that vapor intrusion is occurring but not quantitatively evaluated. An evaluation of vapor intrusion using groundwater data was not conducted, however, it is acknowledged that in a worst case scenario, the risks and hazards may be as high as when residential use of the groundwater is considered. The cancer risks estimated for future residents using the groundwater as tap water in the home ranges from  $1 \times 10^{-4}$  to  $7 \times 10^{-2}$ , which is significantly above the risk management range and clearly unacceptable. Hazard indices for a child is 628 and for an adult is 262 which are also significantly above the noncancer threshold of 1.

5.7.4 326 Center Street: "Lead was detected at concentrations ranging from 170 to 53,000 mg/kg." Comment: *The 53,000 mg/kg result is too high for airborne deposition and suggests that foundry waste(s) may have been improperly disposed at this property. If so, lead-contaminated hazardous waste could have been disposed at other properties in the vicinity as well.*

**Response H-25:** US EPA's Emergency Response Group is evaluating lead contamination at residences located between Mandela, Peralta, 7th and 3<sup>rd</sup> Streets separate from the AMCO investigation. We agree that the 53,000 mg/kg lead concentration is unlikely to be the result of airborne deposition. The improper disposal of foundry waste is one possible source of the lead at this location; however, other sources, including old lead-based paint, are possible. Lead-based paint manufactured prior to 1940 contained high percentages of lead - often 10 percent and sometimes as high as 50 percent.

7.0 Summary and Discussion of Human Health Risk Assessment Results, First Paragraph: "The risk assessment results will be one of the factors that EPA uses to determine if cleanup actions are warranted at the former AMCO facility." Comment: *For this reason, it is important that none of the risk levels, including risks from lead-contaminated media and groundwater, be understated. Because of the high levels of human health risk determined at this site, it is appropriate for this site to be given a high level of priority for cleanup.*

**Response H-26:** We agree that it is appropriate for this site to be given a high priority for remediation, which is why the site has been placed on the National Priorities List.

## References

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