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U S NAVY RESPONSE TO REGULATOR COMMENTS TO REVISION 1 HUMAN HEALTH RISK EVALUATION FOR CONSTRUCTION EQUIPTMENT DEPARTMENT SOILS WITH TRANSMITTAL NCBC DAVISVILLE RI
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TETRA TECH

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PITT-02-13-070

February 22, 2013

Project No. 112G01813

Mr. Jeff Dale
Remedial Project Manager
Naval Facilities Engineering Command, Mid-Atlantic
4911 South Broad Street
Bldg. 679, PNBC
Philadelphia, Pennsylvania 19112-1303

Reference: Contract No. N62470-08-D-1001
Contract Task Order (CTO) Number WE-01

Subject: Response-to-Comments Document for EPA/RIDEM Comments on
Revision 1 of the Human Health Risk Evaluation for
The Construction Equipment Department Soils at
The Former Naval Construction Battalion Center, Davisville
North Kingstown, Rhode Island

Dear Mr. Dale:

Enclosed is the response-to-comments (RTCs) document for comments received from the United States Environmental Protection Agency (USEPA) Region I and the State of Rhode Island Department of Environmental Management (RIDEM) on Revision 1 of the *Human Health Risk Evaluation* of soils at the Construction Equipment Department (CED) area at the Former Construction Battalion Center, Davisville, Rhode Island. The USEPA Region I comments were presented in correspondence dated December 10, 2012. The RIDEM comments were presented in correspondence dated January 25, 2013.

Please call me at 412-921-8608 if you have any questions regarding the enclosed documents.

Sincerely,

Lee Ann Sinagoga

for Scott Anderson
Contract Task Order (CTO) Manager

SA/mlg
Enclosures (2)

cc: Mr. David Barney, BRAC Environmental Coordinator (1 copy)
Ms. Christine Williams, EPA Region I (2 copies, 2 CDs)
Mr. Richard Gottlieb, RIDEM (2 copies)
Ms. Bonnie Capito, NAVFAC (1 copy)
Mr. Andrew Glucksman, Mabbett and Associates (1 copy)
Mr. P. Steinberg, Mabbett and Associates (1 copy)
Mr. Steve King, QDC (1 copy)
Mr. John Reiner, Town of North Kingstown (1 copy)
Mr. John Trepanowski, Tetra Tech, Inc. (1 copy)
Ms. Lee Ann Sinagoga, Tetra Tech, Inc., Project Manager NCBC Davisville (1 copy)
Ms. Leigh Ciofani, Tetra Tech, Inc., Risk Assessment Specialist (1 copy)
Mr. Joe Logan, Tetra Tech, Inc., Feasibility Study Engineer (1 copy)
NIRIS RDM (1 copy and 1 CD)
Tetra Tech Project Files, Sharon Currie (1 copy)

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ENCLOSURE 1

**Navy Response to United States Environmental Protection Agency (USEPA)
New England - Region I Comments on
Human Health Risk Evaluation for Construction Equipment Department
Dated November 2012, OU7 at
The Former Naval Construction Battalion Center (NCBC) Davisville
Davisville, Rhode Island
(USEPA Region I Correspondence Dated December 10, 2012)**

February 2013

Navy Response to United States Environmental Protection Agency (USEPA) New England - Region I Comments on Human Health Risk Evaluation for Construction Equipment Department Dated November 2012, OU7 at The Former Naval Construction Battalion Center (NCBC) Davisville Davisville, Rhode Island (USEPA Region I Correspondence Dated December 10, 2012)

General Comments

EPA General Comment No. 1 – Recalculation of Hazard Indices: Table 1 shows the recalculations using the Aroclor 1254 toxicity data for Aroclor 1260. The non-cancer PRGs for Aroclor 1254 were used; the development of the PRGs was verified by reviewing the Tables in Appendix C-1 and the Exposure Assumptions in Table 4-6. The Exposure Assumptions were appropriate and conservative, and consistent with RAGS guidance. The calculations in Appendix C used the Aroclor 1254 RfD and the Assumptions in Table 4-6 to develop the Risk-Based Concentration or PRG concentration for the four receptors, the construction worker, industrial worker, recreational user, and resident. Therefore, the values developed for Aroclor 1254 were checked, and were then used to evaluate non-cancer toxicity from exposure to Aroclor 1260.

The Hazard Quotient for Aroclor 1260 could then be estimated by the following equation:

$$\frac{\text{EPC} \times \text{Target HI}=1}{\text{Risk Based Concentration}}$$

Table 1 shows the revised HIs for Aroclor 1260 exposure, which was found in surface soil Areas 01 and 04 and in subsurface soil in Area 04. All HIs are shown, however. Total HIs with an asterisk (*) did not change with the recalculation, either because Aroclor 1260 was not present (Sites 02 and 03) or that the inclusion of Aroclor 1260 made no difference in the calculation of total HI. All bold values are significant risks with HI>1.

HI values that are italicized in Table 1 changed based on the recalculation. HI values that are both bold and italicized are those that are now >1 based on the recalculation.

As indicated in Table 1, the recalculation results in HI>1 for construction worker contact with surface soil in Area 04 and for residential contact with surface and subsurface soil in Area 04. The respective HIs are 1.1, 3.5, and 2.2.

Table 2 shows the Target Organ HIs for these three receptors. Only the residential receptor contacting surface soil has significant risk based on Target Organ HIs. The Total HI for the resident contacting surface soil is 3.5, and the risk for immune/autoimmune effects is 2.6.

Therefore, based on the recalculation, Aroclor 1260 should be included as a risk driver for the hypothetical future resident in Area 04 based on contact with surface soil.

It is understood that this risk is low and may not warrant any remedial action. EPA, RIDEM, and Navy should continue risk management discussions.

Navy Response to General Comment No. 1: *Agree that hazard indices (HIs) for Aroclor-1260 should be recalculated using the non-cancer toxicity criteria (the reference dose) for Aroclor-1254. Agree that Aroclor-1260 is a risk driver (chemical of concern) for hypothetical residential exposures to Study Area No. 04 surface soil. We also agree that, as indicated by the reviewer, "this risk is low and may not warrant any remedial action". The Navy, EPA, and RIDEM should consider this fact when making risk management discussions for the Study Area No. 04.*

Specific Comments

EPA Specific Comment No. 1 – Section 4.1.3: Use of a DAF of 20 for the SSLs is consistent with EPA SSL Guidance and is appropriate for this HHRE. The Guidance, which can be found at (www.epa.gov/superfund/health/conmedia/soil/pdfs/appd_a.pdf), recommends use of DAF of 20 as a default value to account for natural processes in soil that reduce contaminant concentration in the subsurface, including dilution, attenuation, adsorption, oxidation, and reduction. A DAF of 1 should only be used when there is a direct connection between a source and a receptor well or when there is no attenuation. Specific examples include an extremely shallow water table under a source, fractured media, Karst topography, or a source area extending over more than 30 acres. None of these conditions exist at NCBC, and a DAF of 20 is conservative and appropriate.

Navy Response to Specific Comment No. 1: *Agree. Comment noted. No further response is required.*

EPA Specific Comment No. 2 – Sections 4.1.3.1 and 4.1.3.3: The methodology for evaluating groundwater protection COPCs in soil is logical and conservative. Evaluating surface soil, shallow subsurface soil, and groundwater in each area provides a mechanism for determining if there has been any negative impact on groundwater. This is appropriate for this site because the contaminants in soil have been in place for over 50 years and if they have not adversely affected groundwater quality in the past it is unlikely that they will do so in the future. The use of lead TCLP data is probably over-conservative. TCLP assesses leaching potential under more extreme conditions that would occur at the NCBC sites. TCLP simulates landfill conditions and is not a good indicator of leaching potential in natural or fill soils. In the TCLP analysis, the sample is extracted with an acetic acid solution buffered at pH 4.8 to simulate landfill conditions. Acetic acid is used because it is a common organic acid formed in landfill leachate.

Navy Response to Specific Comment No. 2: *Agree. Comment noted. No further response is required.*

EPA Specific Comment No. 3 – Section 4.2: The Exposure Assessment was reviewed in August 2011 and a sample of the calculations was checked and found to be appropriate and correct. The same methodology and assumptions were used in this revised document. Evaluating a residential receptor at this site is appropriate even though it is unlikely that the site will be developed for residential use. The information from the residential evaluation can be used in risk management decisions.

Navy Response to Specific Comment No. 3: *Agree. Comment noted. No further response is required.*

EPA Specific Comment No. 4 – Section 4.3: The Risk Characterization methodology is appropriate and consistent with RAGS guidance. The data in the Table on Page 4-19 should be revised to show the changes from Table 1 of this review.

Navy Response to Specific Comment No. 4: *Agree, the Table on Page 4-19 will be revised to reflect the changes that result from recalculating HIs for Aroclor-1260 using noncancer toxicity criteria (the reference dose) for Aroclor-1254.*

EPA Specific Comment No. 5 – Section 4.4: Some of the assumed background concentrations referenced in this section may not represent background for this site. The HHRE should provide stronger evidence that the values are consistent with background.

> **Manganese:** The maximum concentration of manganese in subsurface soil may not be representative of background. The maximum contaminate levels were found at Site 02 on the east and west sides of the leach field and may be site-related.
>
> **Cobalt:** The maximum concentration of cobalt in subsurface soil does not appear to be background. It was also found at the east and west sides of the leachfield and may be site-related.

Navy Response to Specific Comment No. 5: *A formal site-specific background soil data set is not available for the former NCBC Davisville CED area. Therefore, background values reported for the basewide background soil dataset and those reported in soils of the Eastern U.S. (as published in the scientific literature) were used for comparison. The Navy agrees that both of these datasets have certain limitations (e.g., the basewide dataset is somewhat limited [in size] and has not been completely accepted by EPA/RIDEM, the literature background is not specific to the site). However, they still provide a useful perspective. Additionally, while there appear to be a few outliers (elevated detections), based on the comparisons that are possible, most of the manganese and cobalt detections reported for Site 02 likely do reflect background conditions. More importantly, the comparison of the manganese and cobalt concentrations in the Site 02 soils versus these reported for these datasets was only one of the factors considered when determining whether or not these metals should be considered chemicals of concern (COC) for the Site 02 soils:*

- *Based on the direct-contact risk characterization results, cobalt was not selected as a direct-contact risk COC.*
- *Based on the direct-contact risk characterization results and the detailed discussion presented in Section 4.4 (Page 4-25), manganese was not selected as a direct contact risk COC.*
- *The Site 02 cobalt and manganese concentrations are within literature background levels. While some outliers may be present in the shallow subsurface soils (see Table 3-24), the elevated detections appear isolated and are not present in the deeper subsurface soils (see Table 3-25).*
- *The maximum manganese concentration in the shallow sub-surface soil was detected in a duplicate sample. The concentration in the corresponding original sample is significantly less than the concentration reported for the duplicate sample. The second greatest detection of manganese in the Site 02 subsurface soil data set was also detected in a duplicate sample with a concentration that was significantly less than that detected in the corresponding original sample. The results for these duplicate pairs suggest the outliers are not indicative of site-wide elevated concentrations that would create a significant threat to human health or groundwater quality.*

- *Section 4.4 of the HHRE stated, "Cobalt concentrations in Site 02 subsurface soil may not be solely attributable to background conditions; however, it is likely that cobalt concentrations in the study area are largely attributable to background." This statement was made because the maximum concentration of cobalt (82.7 mg/kg) slightly exceeds the upper end of the background literature range (70 mg/kg) and the mean concentration of cobalt in Site 02 subsurface soil (12.9 mg/kg) marginally exceeds the literature mean concentration (9.2 mg/kg). The maximum concentration of cobalt in subsurface soil was detected in a duplicate sample from sampling location B-02-08-04-S (Site 02 subsurface soil), and a cobalt concentration of 18 mg/kg was detected in the associated original sample with an average concentration of 50.4 mg/kg representing that sampling location. As noted above for manganese, the results for these duplicate pairs suggest the outliers (e.g., the isolated elevated detections, some near the former leach field) are not indicative of site-wide elevated concentrations that would create a significant threat to human health or groundwater quality.*

ENCLOSURE 2

Navy Response to Rhode Island Department of Environmental Management Comments on Human Health Risk Evaluation for Construction Equipment Department Dated November 2012, OU7 at The Former Naval Construction Battalion Center (NCBC) Davisville Davisville, Rhode Island (RIDEM Correspondence Dated January 25, 2013)

Navy Response to Rhode Island Department of Environmental Management Comments on Human Health Risk Evaluation for Construction Equipment Department Dated November 2012, OU7 at The Former Naval Construction Battalion Center (NCBC) Davisville Davisville, Rhode Island (RIDEM Correspondence Dated January 25, 2013)

RIDEM Comment No. 1: Page ES-2, Bullet 2: "Arsenic would also be considered a risk driver if evaluated as a COPC. However, arsenic concentrations in surface soil are within the range of literature background concentrations and within the range of NCBC Davisville background values. Additionally, arsenic concentrations in surface soil are less than the RIDEM direct exposure criterion, which is based on the 95 percent UCL of state-wide natural background data. Consequently, arsenic was not selected as a COPC."

If concentrations of arsenic are all below the RIDEM direct exposure criterion, arsenic may be eliminated from the list of site specific COPCs. Please be advised, however, that while background values from literature are useful pieces of information, the Remediation Regulations require that a site-specific investigation (using a statistical method which is appropriate for the distribution of contaminants) be conducted to evaluate available data for the purposes of defining background concentrations. Please delete the first two sentences and references to literature background studies to define background concentrations in the above section and in any other section of this report.

NAVY Response to Comment No. 1: *All concentrations of arsenic are less than the RIDEM direct exposure criterion; therefore, arsenic was eliminated from COPC selection. Because an approved site-specific background soil database is not available for metals in the NCBC Davisville CED area, it is recommended that discussions of the literature background values remain in the report for informational purposes. The limited background values available for NCBC Davisville (the base-wide background dataset) will also be further discussed. The text in question from Bullet 2 on Page ES-2 will be revised as follows:*

"Arsenic concentrations in surface soil are less than the RIDEM direct exposure criterion, which is based on the 95 percent UCL of state-wide natural background data. Because arsenic concentrations were less than the RIDEM direct exposure criterion, arsenic was not selected as a COPC."

The footnotes discussing arsenic for the tables included within the text of Sections 4.1.2, 4.3, and 4.5 will be revised to indicate that because arsenic concentrations were less than the RIDEM direct exposure criterion, arsenic was not selected as a COPC/COC.

RIDEM Comment No. 2: Page ES-3, Bullet 1 and Appendix C: "No site specific background data were available for manganese and aluminum. However, a comparison of site data to literature background values indicated that all detected manganese and aluminum concentrations were within range of naturally occurring background levels."

Please be advised that the Remediation Regulations require that a site-specific background investigation be conducted to evaluate available data for the purposes of defining background concentrations. Please revise the HHRE in this section and any other section of this report so that all references to use of literature studies to determine background concentrations are eliminated and carry manganese and aluminum further in the COC process.

Navy Response to Comment No. 2: *A site-specific background data set is not available for the CED area, and, as noted in the response to Comment No. 1, an approved background data set is not available for NCBC Davisville. Therefore, literature background values are included in the text for informational purposes. However, manganese and aluminum were eliminated from further consideration as chemicals of concern for direct contact risk primarily because of the uncertainty associated with the fact that a sub-chronic reference concentration is not available for manganese. This results in the use of a chronic reference concentration when evaluating the construction worker scenario and, thus, a likely over estimation of risk for that receptor. The justification for the elimination of manganese and aluminum from further consideration is presented in the second bullet on Page ES-3. The following will be added as the last sentence in Bullet 1 on Page ES-3: "Manganese and aluminum were eliminated from further consideration and were not retained as COCs based on the rationale provided in the next bullet."*

RIDEM Comment No. 3: Page ES-3, Bullet 3: Page 4-2, Section 4.1.1: "Risks to human receptors were not evaluated for deep subsurface soil (i.e., soil greater than 10 feet bgs) because human contact with deep subsurface soil is unlikely. No chemicals had significantly greater concentrations in deep subsurface soil than in shallower soil."

"The HHRE evaluated all of the available data for surface (0 to 2 feet bgs or 0 to 3 feet bgs for Study Area 4) and shallow subsurface (greater than 2 feet bgs to 10 feet bgs) soil samples collected from the referenced sites/study areas. Data for deep subsurface soil samples (i.e., those collected from deeper than 10 feet bgs) were not evaluated in the risk characterization step in the HHRE because it is unlikely that human receptors would be exposed to soil greater than 10 feet bgs."

It is unclear in the HHRE at what depth the water table is located and whether soils greater than 10 feet bgs are within the vadose zone. According to the Remediation Regulations, the residential direct exposure criterion shall be applied throughout the vadose zone for each Hazardous Substance in soil. Please delete and/or revise these statements above and anywhere that they occur throughout this report and ensure that soils located greater than 10 ft bgs be evaluated and included in the HHRE if they are above the water table.

Navy Response to Comment No. 3: *Groundwater data at the sites/study areas indicate that the depth to groundwater ranges from approximately 10 to 20 feet bgs. Variability in the depth to the water table occurs for reasons that include the location and time of year.*

It is appropriate to evaluate soil to a depth of 10 feet bgs for human exposures because soil deeper than 10 feet bgs may be saturated. (EPA Region I typically does not assume that receptors are routinely exposed to soils deeper than 10 feet bgs.) Additionally, the HHRE qualitatively evaluated data for soil deeper than 10 feet bgs (i.e., deep subsurface soil) in Section 4.4 (see last bullet), and this qualitative evaluation determined that contaminant concentrations in deep subsurface soil of Sites 02 and 03 do not significantly exceed concentrations in shallow subsurface soil, and no unacceptable risks are expected due to deep subsurface soil exposures at these sites. (It should be noted that soil samples for SA 01 and SA 04 were not collected at depths greater than 10 feet bgs. Also, it is very likely that regrading of the CED area will occur as a consequence of site development. This regrading is likely to result in a more consistent depth-to-groundwater across the CED area.)

The second sentence in Section 4.1.1 will be revised as follows: "Data for deep subsurface soil samples (i.e., those collected from deeper than 10 feet bgs) were not quantitatively evaluated in the risk characterization step in the HHRE because soil deeper than 10 feet bgs may be saturated (the groundwater table within the CED Area ranges from approximately 10 to 20 feet bgs)." Text throughout the report will be revised to indicate that soil greater than 10 feet bgs was not evaluated quantitatively because it likely is deeper than the water table.

RIDEM Comment No. 4: ES-4, Paragraph 2: "Construction workers were evaluated for exposures to total soil, commercial workers were evaluated for exposures to surface soil (0 to 1 foot bgs), and potential residents were evaluated for exposures to surface soil and total soil."

RIDEM's Remediation Regulations require that the industrial/commercial direct exposure criterion be applied to a depth of at least 2 feet bgs. Please revise this statement to reflect RIDEM's Remediation Regulations here and throughout the report.

Navy Response to Comment No. 4: *The sentence in question is referring to the Phase III RI Report, not the current evaluation. For clarity, the sentence will be revised as follows: "However, in the Phase III RI, construction workers and industrial workers were evaluated for exposures to chemicals in soil (construction workers were evaluated for exposure to surface and subsurface soil, but industrial workers were evaluated for exposures to surface soil only)."*

RIDEM Comment No. 5: Page 4-3, Summary of Surface Soil COPCs Table: "The maximum detected arsenic concentration in soil exceeds the toxicity screening levels, but arsenic concentrations do not exceed background concentrations reported for NCBC Davisville."

Arsenic is ruled out as a COPC based on all arsenic concentrations being less than the RIDEM R-DEC for arsenic. Please refer to Comment No. 1.

Navy Response to Comment No. 5: *Agree. Please see response to Comment No. 1.*

RIDEM Comment No. 6: Page 4-6, Section 4.1.3 Refinement of Groundwater Protection COPCs, Criterion #2: "The frequency of detections greater than the SSL at a DAF of 20 is less than 5 percent (when at least 20 samples are included in the data set and no contamination "hot spot" is present). Conservatively a "hot spot" is defined as a concentration that exceeds twice the SSL at a DAF of 20."

Under the Remediation Regulations an exceedance of leachability criteria does not get eliminated if detected infrequently. Please delete the entire paragraph and "rationale" in this section and in any other section of the report.

Navy Response to Comment No. 6: *Respectfully disagree. From a technical perspective, the frequency with which a contaminant exceeds a criterion should be taken into account. Considering frequency of detection is typically done in reports prepared under CERCLA, the primary contaminant driver for the sites and study areas evaluated.*

RIDEM Comment No. 7: Page 4-7, Section 4.1.3, Refinement of Groundwater Protection COPCs, Criterion #4: Please refer to Comment No. 1.

Navy Comment to Response No. 7: *Please see responses to Comments No. 1 and No.2. Additionally, a round of groundwater monitoring for metals is planned for selected shallow wells to aid in resolving any soil to groundwater migration issues for the sites/study areas evaluated.*

RIDEM Comment No. 8: Page 4-7, Section 4.1.3, Refinement of Groundwater Protection COPCs, Criterion #5 and #6: "Subsurface soil data do not show exceedances of migration to groundwater criteria."

"COPCs are not detected in the shallow groundwater at concentrations clearly exceeding background and SDWA MCLs (or EPA RSLs for tap water, if MCLs are not available)."

Please be advised that these criteria may potentially be under-conservative for Site 02, which is currently paved. Should the pavement be removed, the soil leaching potential may increase. Please refer to Comments Nos. 1, 2, and 3 mentioned above.

Navy Response to Comment No. 8: *Agree, the following sentences will be added at the end of the text in Sections 4.1.3.1 and 4.1.3.3 as part of the Site 02 discussion: "Subsurface soil and groundwater data were used to aid in the evaluation of migration from soil to groundwater under current conditions. However, Site 02 was previously paved and that pavement likely decreased leaching potential. It should also be noted that the entire CED area will likely be re-paved (as part of site re-development) and used for automobile storage."*

RIDEM Comment No. 9: Page 4-20, Section 4.3: "All carcinogenic risk estimates for exposure to surface and subsurface soil are less than or within EPA's target risk range of 1E-04 to 1E-06, and cancer risk estimates for construction workers, industrial workers and recreational users do not exceed the State of Rhode Island cumulative cancer risk limit of 1E-05."

In accordance to the Remediation Regulations the remedial goal for each carcinogenic substance may not exceed a 1E-06 excess lifetime cancer risk level. Please include this information and specify when risk for individual COPCs exceeds the RIDEM individual cancer risk limit in this section and throughout the document.

Navy Response to Comment No. 9: *Section 4.3 does not discuss remedial goals; therefore, the requirements for remedial goals from the Remediation Regulations will not be discussed. Please note that risk estimates for each of the individual COPCs evaluated in surface and subsurface soil are already presented in Tables 4-14 through 4-38 for each of the sites/study areas and receptors evaluated.*

RIDEM Comment No. 10: Page 4-20, Section 4.3, Risks from Lead: "Lead was selected as a COPC for surface and subsurface soil. The maximum and arithmetic mean lead concentrations for surface soils are listed below."

Please revise by using the 95 percent Upper Concentration Limit (UCL) as the EPC for lead, in this section and throughout the document. In addition please retain lead for further COC evaluation.

Navy Response to Comment No. 10: *Section 4.2 (4th paragraph) states, "Per EPA guidance, the arithmetic mean concentration was used as the EPC for lead (EPA, July 1994), and 95 percent Upper Confidence Limits (UCLs) on the arithmetic mean were used as the EPCs for other chemicals." To provide more explanation, this sentence will be revised to: "As stated in the guidance manual for the IEUBK model (EPA, July 1994) the arithmetic mean concentration was used as the EPC for lead, and 95 percent Upper Confidence Limits (UCLs) on the arithmetic mean were used as the EPCs for other chemicals." Additionally, the following sentence will be added as the third sentence under the "Risks from Lead" heading in Section 4.3: "Per EPA guidance, the arithmetic mean concentration was used as the EPC for lead (EPA, July 1994)."*

Because the mean concentrations of lead are less than the OSWER direct contact criterion (400 mg/kg), lead will not be retained for further COC evaluation.

RIDEM Comment No. 11: Page 4-20, Section 4.3 and Appendix C (Hazard Related to Manganese): Manganese is identified as a risk driver for the construction worker in Site 02, although not for the resident. The oral reference dose (RfD) the Navy used to derive the construction worker screening level (0.14 mg/kg/d) is different from that used by EPA to develop the RSL of 0.024 mg/kg/d). EPA recommends that a modifying factor of 3 be applied to the oral RfD when assessing risk from manganese in drinking water or soil. The RfD was also adjusted to account for dietary sources of manganese. This result is a more conservative RfD than that used for the resident RSL. Please use the same RfD for manganese for all receptors.

Additionally, the particulate emission factor (PEF) derived for the construction worker scenario is approximately three orders of magnitude lower than that used in derivation of the default residential RSLs. Because of this, and the relatively low reference concentration (RfD) for manganese, the resulting non-cancer hazard of the construction worker scenario is higher than that derived for the resident, when one would expect the residential hazard to be higher (this also occurs for aluminum). We also note that a PEF of 1k.1E10m³/kg was used for the recreational user scenario, and was cited as the EPA default. However, the EPA default PEF is 1.36E09 m³/kg. Please consistently apply PEFs to assess dust exposure among all receptors.

Navy Response to Comment No. 11: *Manganese was identified as a risk driver for the construction worker in Study Area 04 subsurface soil, not Site 02 subsurface soil. (Although the total HI for Site 02 subsurface soil exceeded 1, HIs did not exceed 1 on a target organ basis for Site 02 subsurface soil, and no risk drivers were identified.) The oral RfD of 0.14 mg/kg/day, which is presented for manganese (diet) in the Regional Screening Level Table was used to calculate the screening levels for construction workers and recreational users, while the RSLs for industrial soil and residential soil (that incorporate the RfD of 0.024 mg/kg/day) were used for the evaluation of industrial workers and hypothetical residents, respectively. The report will be revised to use the RfD for manganese (non-diet) for calculating screening levels for the construction worker and recreational user.*

The text in Appendix C.1 states, "Because air emissions resulting from fugitive dust emissions settings will be different than dust emissions generated during construction activities, a separate PEF was used for construction activities. The PEF for construction workers ($1.62 \times 10^{+6}$ m^3/kg) was calculated using the equations presented in the supplemental SSL guidance document (EPA, December 2002)." The following statement will be added: "The PEF for the construction worker is more conservative than the PEF used for other receptors because it is assumed that construction workers are exposed to dusty conditions." Additionally, a correction to the calculation of the construction worker PEF was made; the corrected PEF value ($1.40 \times 10^{+6}$ m^3/kg) will be incorporated into the HHRE.

For recreational users, Appendix C.1 states, "A PEF value of $1.1 \times 10^{+10}$ m^3/kg was obtained from EPA's Soil Screening Internet site located at http://risk.lsd.ornl.gov/calc_start.htm. This is the default value for Hartford, Connecticut, which is the closest city to Former NCBC Davisville listed on the Internet site." The EPA default PEF of $1.36 \times 10^{+9}$ m^3/kg, used to calculate the RSLs for the hypothetical resident or typical industrial worker, is more conservative than the PEF of $1.1 \times 10^{+10}$ m^3/kg (for the recreational user), which considers the site location. However, the inhalation pathway is not the dominant exposure pathway driving risk-based concentrations for the recreational user (risk-based concentrations for the inhalation pathway are significantly greater than those calculated for ingestion and/or dermal contact pathways) for the COPCs in this project (and in most projects). Therefore, although a more conservative PEF was incorporated into the risk-based concentrations (i.e., RSLs) used for industrial workers and residents, the overall risk assessment conclusions are not impacted by the use of less conservative (but, site specific) PEF value for the recreational user. No changes would be made to risk assessment conclusions on this basis.

RIDEM Comment No. 12: Page 4-26, Section 4.5, Site Specific RSL Development Tables: The Navy should document the source of each of the toxicity values used in the HHRE, in accordance with EPA risk assessment guidance.

Navy Response to Comment No. 12: *Agree, tables displaying the sources of the toxicity values used in the HHRE will be added to Appendix C.1.*

RIDEM Comment No. 13: Table 4-11, Construction Worker, Subsurface Soil, Site 02: Please refer to Comment No. 11.

Navy Response to Comment No. 13: *Please see response to Comment No. 11.*