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NSTC GREAT LAKES
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LETTER REGARDING ILLINOIS ENVIRONMENTAL PROTECTION AGENCY COMMENTS
ON THE DRAFT REMEDIAL INVESTIGATION/RISK ASSESSMENT REPORT FOR SITE 12
HARBOR DREDGE SPOIL AREA NSTC GREAT LAKES IL
12/8/2011
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY



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December 8, 2011

NAVFAC Midwest IPT EV
Attn: Ms. Terese Van Donsel
Building 1A, 201 Decatur Avenue
Great Lakes, Illinois 60088-2801

Re: Draft Remedial Investigation/Risk Assessment
Report for the Site 12, Harbor Dredge
Spoil Area, Naval Station Great Lakes
Great Lakes, Illinois

0971255048 – Lake
Great Lakes Naval Station
Superfund/Technical

Dear Ms. Van Donsel:

The Illinois Environmental Protection Agency (Illinois EPA or Agency) is in receipt of the Navy's Draft Remedial Investigation/Risk Assessment Report for Site 12 – Harbor Dredge Spoil Area, Naval Station Great Lakes, Great Lakes, Illinois. It was dated June 2011 and was received on July 1, 2011. The Remedial Investigation (RI) was conducted to determine the nature of fill material that was placed in the Harbor Dredge Spoil Area and to identify current or potential human health or ecological risks associated with the site. The Agency has conducted a review of the submitted report and is herein providing comments generated during that review.

- 1) **Executive Summary, Section E.3** – The discussion presented here regarding the possible origin of contamination in the dredged sediment once again omits the potential contribution of the Navy from on-base releases. The text here should match that provided in Section 2.3 in the opening paragraph.
- 2) **Executive Summary, Section E.6** – The results presented here are only compared to Illinois EPA's Tiered Approach to Corrective Action Objectives (TACO) remediation objectives. According to the SAP, the "Project Action Limits (PALs) are set at the lowest matrix-specific, risk-based or regulatory human health screening criteria appropriate for the site." Those TACO values are not always the lowest criteria. Please review the results and the PALs (listed on Worksheet #15 of the SAP) and revise the discussion to compare the data to the agreed upon PALs.

- 3) **Executive Summary, Section E.6** – The first and third bullet items under surface soil are basically the same, save the remediation objective value. Please review and revise as necessary.
- 4) **Executive Summary, Section E.6** – The last bullet item under surface soil lists the heptachlor TACO remediation objective as 900 µg/kg. The proper TACO value is 100 µg/kg. However, the PAL according to the SAP is 1.6 µg/kg.
- 5) **Executive Summary, Section E.6** – The last bullet item under subsurface soil lists the lead TACO residential remediation objective as both 400 and 800 mg/kg. The 800 mg/kg value is the TACO value for the Industrial Commercial ingestion soil remediation objective. The TACO value for the Construction Worker is 700 mg/kg. The PAL is listed as 107 mg/kg.
- 6) **Executive Summary, Section E.7** – In several locations in this section, there is a comparison made of average contaminant concentrations to the TACO Background values. Arithmetic means are generally unacceptable for use as exposure point concentrations in human health risk evaluations. The procedures outlined in the USEPA Pro UCL user's guide should be followed. The presented discussion would be more appropriate in the uncertainty section of the risk assessment.
- 7) **Section 3.9** – At the end of this section, there appears to be duplicate sentences discussing the location of the IDW manifests and Certificates of Disposal. Please review and revise as necessary.
- 8) **Table 3-2** – Only one soil sample is reported here as being collected in the saturated zone. According to the SAP, one third of the samples were to be collected from below the water table. Please explain the lack of samples from the saturated zone.
- 9) **Figure 3-1** – This figure appears to be the same as Figure 17-1 from the SAP. Has it been updated to show the actual sample locations as collected in the field? Also, the note has not been updated to discuss what did occur rather than what will.
- 10) **Section 4.4.1** – The TACO remediation objective for heptachlor is mistakenly given as 900 µg/kg. The residential objective is 100 µg/kg.
- 11) **Section 4.4.2** – As in the Executive Summary, for lead, it lists the TACO residential ingestion remediation objective as both 400 and 800 mg/kg. The 800 mg/kg value is the TACO value for the Industrial Commercial ingestion soil remediation objective. The TACO value for the Construction Worker is 700 mg/kg.
- 12) **Section 4.5** – The last paragraph discusses the number of exceedances identified when the data are compared only to the TACO Residential and Industrial/Commercial ingestion and inhalation screening criteria. This is in contrast to the number of exceedances identified when the data are compared to the PALs which include the soil to groundwater criteria. The Agency understands this line of reasoning, but fails to see why the USEPA screening criteria are not included and discussed as well.

13) **Table 4-1** – Several comments were generated pertaining to Table 4-1, the summary of regulatory screening values. Our specific concerns are listed below.

- The non-TACO Construction Worker ingestion screening value for aluminum should be corrected to 200,000 mg/kg.
- The TACO residential ingestion and TACO industrial/commercial ingestion entries for arsenic are given as “NC”. TACO tables direct the user to use TACO Appendix A, Table G background values as the objectives. The lower background concentration of 11.3 mg/kg should be the screening value for each of the subject receptors.
- There currently are no non-TACO criteria for iron.
- The minimum TACO criterion for zinc should be 23,000 mg/kg.
- This table reports “NC” as the screening criteria for alpha-chlordane and gamma-chlordane. When not otherwise specified, chemicals with slight chemical variations but the same functional group should be summed and compared to the TACO objective for the functional group. Thus combined site concentrations of alpha- and gamma-chlordane should be compared to the TACO objective for chlordane. This practice also applies to endosulfan and endrin in the subject table.
- Non-TACO values are available for 2-methylnaphthalene.
- The non-TACO Class I soil to groundwater criterion for phenanthrene should be 210,000 µg/kg.
- Non-TACO residential and industrial/commercial ingestion values are available for dibenzofuran and should be included.
- Explain why the Table 4-1, USEPA-SSL inhalation column values do not always agree with the Exhibit A-1 and A-2 values in the SSL guidance (OSWER 9355.4-24, December 2002)
- Include columns for the USEPA-SSL ingestion values for the residential and industrial/commercial worker scenarios.
- Provide the details of the calculated USEPA-SSL construction worker ingestion and inhalation screening values presented in this table.
- Explain the sources of the USEPA-RSL screening values for acenaphthylene, benzo(g,h,i)perylene, and phenanthrene.

14) **Section 4 Figures** – Suggest placement of the information boxes for each sample in the same relative location in all of the figures for ease of reference. For example, the information box for sample SB26 can be found in the northeast corner in Figure 4-7, in the center in Figure 4-8, on the western edge in Figure 4-9, etc...

15) **Figure 4-15** – The note on the figure states that sample depths were from 0-6 feet. This should read from 0-6 inches, if the data are from the surface soil as the title states.

16) **Table 5-1** – Explain the last column in the subject table titled “Mobility Index”. Is this an accepted indicator? Provide a literature reference explaining the rationalization for and usefulness of this factor.

215X 17) **Section 6.3.1** – The first bullet item repeats the words “Soil Remediation Objectives.”

- 18) **Section 6.3.3** – The third sentence in the third paragraph states that several of the USEPA-SSL construction worker screening values were exceeded. The sentence mistakenly includes naphthalene and mercury.
- 19) **Section 6.4.3** – Include the USEPA, 1993 citation in the reference section of this report.
- 20) **Section 6.4.4** – In the second paragraph, second bullet, first open bullet, the exposure point concentration is discussed for several receptors. The USEPA, 1993 guidance cited in Section 6.4.3 of this report, directs that the EPC for both the RME and the CTE should be the 95% UCL.
- 21) **Section 6.4.5.1** – In the inhalation of dusts and vapors portion of this section, the last paragraph discusses two PEF values. The second value should be identified as to which receptors it was applied and the value should be corrected to a positive exponential (10^{+9}).
- 22) **Section 6.6** – The first paragraph in the subject section describes averaging cancer risks and non-cancer hazards across the two investigated depths. This is contrary to guidance. For instance, dust will not be generated from subsurface soil and volatiles are usually absent from surface soils. We suggest a method similar to that presented in Exhibit 3-1 of the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9335.4-24, December 2002). Thus the soil ingestion EPC for the residential receptor will contain 20 sample results (10 surface plus 10 subsurface) and the dust EPC will contain only the ten surface soil results. Averaging the strata-specific risks and hazards as describe here is unacceptable.
- 23) **Section 6.6.1** – In the first paragraph of this section, the cancer risk range for TACO Tiers 1 and 2 are stated. This is repeatedly done in this document. Since this is a hybrid Tier 3 CERCLA evaluation, it is unnecessary to state and restate the risk criteria for TACO Tier 1 and 2 evaluations.
- 24) **Section 6.7.2.2** – This section discusses the uncertainty associated with the biased selection of sampling locations. In this case, the sample locations were fairly evenly spaced across the entire site. Except for the fact that there was a defined study area, the sample locations were not biased toward areas more likely to detect contamination. Therefore, the selection of sampling locations likely did not overestimate the risks to potential receptors, as is stated.
- 25) **Section 6.7.4** – There are 33 different contaminants listed here and in Table 6-15 that were detected at levels exceeding the migration of soil to groundwater pathway screening values in surface soil. There are 38 different contaminants listed here and in Table 6-16 that were detected at levels exceeding the migration of soil to groundwater pathway screening values in subsurface soil. That pathway is not considered in the risk assessment. It is understood that human exposure to groundwater at Site 12 is not expected due to the specifics of this site. However, there does not appear to be an analysis of the potential release of contaminants in the site 12 groundwater to a surface water body (Lake Michigan). Given the number of listed exceedances, the proximity of the lake, and the use of Lake Michigan water as a drinking water source, this pathway must be evaluated. As part of that evaluation, consideration should be given to the collection of at least a few groundwater samples to determine if the listed contaminants are actually leaching to the groundwater on site.

→ Compare to soil to get TACO values.
→ Natural background metals

- 26) **Section 6.7.4** – It should state at the end of this section that omitting the soil to groundwater data from the risk assessment, with numerous exceedances of the screening levels, may well underestimate the risks to potential receptors.
- 27) **Table 6-1** – The calculation of the “BAP EQUIVALENTS” has been an unending dilemma at NSGL sites. In the subject table, on page 1 of 6, the BAP equivalents maximum result is reported as 2083.63 µg/kg. Applying the USEPA order-of-magnitude relative potency factors to the concentration data on this table for the seven carcinogenic PAHs, we derive a value of 2247.7 µg/kg. However, there are several ways this value could be derived. The method to calculate the BAP equivalent values should be clearly stated such that we can confirm their accuracy.
- 28) **Table 6-9** – Several comments apply to this table of non-cancer oral/dermal toxicity values.
- The RfD for manganese should be corrected to 2.0E-02 mg/kg/day. The IRIS entry clearly states that a modifying factor of three should be applied to the RfD when evaluating non-dietary exposures. An additional modifying factor of two is suggested to account for increased bioavailability from non-food sources.
 - The RfD for metallic vanadium should be used. It is available in the PPRTV literature.
 - The ATSDR subchronic RfD for aluminum is listed as 1.0E+00 mg/kg/day.
 - The subchronic RfD for arsenic cannot be confirmed. HEAST gives a value of 3.0E-04 mg/kg/day.
 - ATSDR gives a subchronic RfD of 5.0E-03 mg/kg/day for chrome VI.
 - Subchronic RfDs are available for many more chemicals than listed in this table. ATSDR provides subchronic RfDs for naphthalene, chlordane, heptachlor, barium, cadmium, and copper. The PPRTVs provide values for antimony, cobalt, iron, and vanadium. The IRIS chronic RfD is based on a subchronic study which should be used.
 - Any RfD change, chronic and subchronic, will require a corresponding change in the dermal RfD value.
- 29) **Table 6-10** – Several comments are directed at the subject table of non-cancer inhalation toxicity values.
- It is inappropriate to convert the naphthalene RfC to an inhalation RfD.
 - The RfC for mercury is given in IRIS as 3.0E-04. A corresponding change should be made to the inhalation RfD.
 - The RfC in this table for vanadium is for vanadium pentoxide. No RfC is currently available for vanadium metal.
 - Subchronic RfC values can be identified for most of the listed chemicals. For those chemical for which no subchronic inhalation value can be determined, the chronic toxicity value should be used.
- 30) **Table 6-12** – A few comments arose from the table of inhalation cancer toxicity values.
- California EPA provides a cancer unit risk value of 3.4E-05 for naphthalene.

- The URF for vanadium is for vanadium pentoxide. No URF is currently available for vanadium metal.
- Conversion to inhalation slope factors is inappropriate if the target organ is part of the respiratory system (airway or lungs).
- Explain the inclusion of “TCDD TEQs” in this table.

31) **Figure 6-1** – The conceptual site model (CSM) does not account for the soil to groundwater exposure route. It is understood that exposure route is not part of the risk assessment calculations, but that route is still relevant. There are numerous exceedances of the screening levels. The CSM must account for all possible exposure scenarios at the site.

32) **Section 7.0** – The ecological risk assessment is very weak. This assessment lacks a clear definition of what is being protected. A biologic inventory should be performed to identify threatened and endangered species and any sensitive habitats. This area appears to be a rather low grade terrestrial habitat but that conclusion is never reached in this report. The focus is directed to the sediments and benthic organisms yet there is neither analytical sampling nor biological sampling.

33) **Section 7.1.5** – In the first paragraph, the rationale for comparing soil concentration data to sediment screening values is given. This approach is inappropriate. This process does not assess current conditions nor can it possibly predict future contaminant levels.

34) **Section 7.1.5** – In the second paragraph there is a reference to samples collected in 2006 and 2007 to be used as background sediment samples. The sample analysis results for those samples are included in Table 7-1. However, there is no reference included for that data. There is also no mention of who collected those samples, where they were collected, how they compared to other background samples, or if that data has been validated. Illinois EPA cannot agree to the use of those samples for comparison as background without being allowed to conduct a complete review of the data. Furthermore, if none of the previously-collected data is being used for the risk assessment, how is it that those samples can be used for a background comparison? (These samples are again referenced in Section 7.3 as well.)

35) **Section 7.3** – The final sentence in the third paragraph of the subject section is confusing. It states that pesticides were not detected in the sediment; however, the only sediments sampled and analyzed were the background samples. It also implies that pesticide contamination resulting from authorized historical uses is acceptable. In a risk assessment, it is the concentration-based risk that determines acceptability not the intended use of the contaminant.

36) **Table 7-1** – The NOAA reference provides a freshwater sediment screening level of 460 mg/kg for manganese.

The rationale for maintaining vanadium as a sediment COPC is given as background. Background data should be provided so this can be confirmed.

37) **Table 7-2** – The text should include the observation that the concentration of over one-half (14 of 27) of the contaminants listed on this table are over their respective PEC. Also noteworthy is that

the PEC is the probable effect level which is defined as, “the concentration above which adverse effects are expected to frequently occur.”

- 38) **Table 7-2** – The entry for heptachlor should be corrected to 16.0 µg/kg.
- 39) **Section 8.1** – In the first paragraph, the fourth bullet, the TACO residential ingestion value should be corrected to 100 µg/kg.
- 40) **Section 8.1** – Please explain in more detail why the TACO residential and industrial/commercial ingestion and inhalation screening values are repeatedly used for comparison, rather than the PALs.
- 41) **Section 8.2** – 35 Ill. Adm. Code 742.915 outlines several elements to include in a TACO-based appeal for cancer risks in excess of 10^{-6} . It would be supportive to address these elements in the conclusions section of this report.
- 42) **Section 8.2** – This section is supposed to present the conclusion(s) drawn from the results of the risk assessment. There is discussion of the data as compared to the published background values and a brief mention of the established contaminants of concern (COCs), but little in the way of drawing a conclusion. The report should conclude that there are unacceptable risks, both current and future, for exposure to the contaminants at this site which will need to be addressed in some manner. It should also conclude that, although not part of the risk assessment, there are numerous exceedances of the screening values for the soil to groundwater pathway. Those exceedances will need to be addressed as well.
- 43) **Section 8.4** – This section needs to be completed. Illinois EPA suggests a meeting be conducted between the Navy and Illinois EPA to determine the next step in this investigation and subsequently, what the recommendation for this site should be.
- 44) **Appendix B-4** – The chain-of-custody records have not been filled out correctly. Numerous revisions and changes have been made without the proper notations, i.e. initials and dates, etc. There are no received by signatures and dates upon receipt at the laboratory. Both pages are listed as 1 of 2, yet they are numbered consecutively.
- 45) **Appendix F** – There is an untitled table following Table 8.5a, which appears to discuss one, or more, past investigations at a number of subareas. Those subareas are listed as a concrete pad, loading dock, debris pile, and suspected disposal pit. There is no explanation for when, where, or how those investigations were conducted. Chemicals of potential concern (CPOCs) are listed, but no data is provided regarding contaminant concentrations. Please identify what is being presented on this table and explain how it is relevant to the investigation of Site 12.
- 46) **General Comment** – Due to the nature of some of our comments concerning the exposure assumptions and toxicity values, the Agency reserves our review of the actual risk calculations until agreement has been reached on the above factors.

Remedial Investigation/Risk Assessment Report
For the Site 12 – Harbor Dredge Spoil Area
Naval Station Great Lakes
December 8, 2011
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If you have any questions regarding anything in this letter or require any additional information, please contact me at (217) 557-8155 or via electronic mail at brian.conrath@illinois.gov.

In accordance with Public Act 96-0603, which went into effect on August 24, 2009, any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Sincerely,

Brian A. Conrath

Brian A. Conrath
Remedial Project Manager
Federal Facilities Unit
Federal Site Remediation Section
Bureau of Land

BAC:  \\rac:H\GLNTC\Site 12\Site12R\rvw

cc: Biff Cummings, Tetra Tech NUS, Inc.

Owen Thompson, USEPA (SR-6J)