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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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July 11, 2002

Commander, Southern Division
Naval Facilities Engineering Command
Attn: Mr. Anthony Robinson
2155 Eagle Drive
North Charleston, South Carolina 29406

Re: Draft Remedial Investigation and Risk Assessment Report Site 17 – Pettibone Creek and Boat Basin

0971255048 – Lake
Great Lakes Naval Station
Superfund/Technical

Dear Mr. Robinson:

The Illinois Environmental Protection Agency (Illinois EPA) is in receipt of the Draft Remedial Investigation and Risk Assessment Report, Site 17 – Pettibone Creek and Boat Basin from Tetra Tech NUS, Inc. It was dated May 2002, and received at Illinois EPA on May 21, 2002. The Agency has reviewed the document and has the following comments:

1) **Acronyms** – In the definition of CERCLA and other places throughout the report, the word liability has an "s" added that doesn't belong. Please correct.

2) **Acronyms** – The definition of RAGS should be "Risk Assessment *Guidance* for Superfund."

3) **Executive Summary, page 2** – The first sentence of the second paragraph states, "VOCs are not significant site-related contaminants for Site 17." As is mentioned in the comment regarding Section 3.2.3.2 below, the sediment samples analyzed for VOCs may be invalid and might need to be re-collected and analyzed. Therefore, this statement may not be factual. Please re-visit this statement after sediment VOC sampling has been validated or repeated.

4) **Executive Summary, page 3** – In the second line it states, "... in the aforementioned off-site, upstream samples collected during previous environmental investigations." There are no environmental investigations mentioned previously in this document. Please correct.

5) **Executive Summary, page 3** – In the second paragraph it again references the aforementioned off-site, upstream samples collected during previous environmental

investigations." There are no environmental investigations mentioned previously in this document. Please correct.

6) **Executive Summary, page 4** – The second paragraph states that the primary sources of the COPCs at this site are probably due to releases upstream of NTC Great Lakes and most of the contamination is likely not related to past activities at NTC Great Lakes. This is a very bold statement to make at this point in the investigation and not necessarily accurate. Is there sufficient evidence to make this statement? Illinois EPA does not think so. The Navy needs to consider all the information at their disposal before making a statement denying the majority of responsibility for contamination in the creek.

7) **Executive Summary, page 5** – Suggest removing the fourth paragraph on this page. The statement referencing off-site sources may not be completely accurate and the site-specific biological studies have previously been mentioned.

8) **Executive Summary** - Several times in this section it states that the majority of the contamination is probably due to upstream sources, but nowhere does it state which contaminants are or could be due to on-site Navy sources. This should be spelled out as well. For example, the transformer storage area (PCBs), the ongoing RCRA investigation for TCE, and the historical coal storage areas (PAHs, arsenic, etc...) should be mentioned and discussed.

9) **Section 1.0 Introduction** – In the fourth sentence, suggest wording change to, "... since the 1970s to *investigate* facilities that are located upstream ..."

10) **Section 1.1** – In the second paragraph, the second sentence should state "...from upstream sources, *Navy mission-related activities*, as well as, stormwater outfalls from Navy and local roadways."

11) **Section 1.4.1** – In the first sentence of the third paragraph, it states that current land use consists of agriculture, industry, and suburbs. Illinois EPA suggests changing suburbs to residential areas.

12) **Section 1.4.5** – The first line of the last paragraph misspells the word *extending*. Please correct.

13) **Section 1.4.6** – In the first line of the third paragraph, please remove the word *thick*.

14) **Section 2.1.1, Pettibone Creek** – In the last paragraph, remove the words *were classified*. They are repetitive.

15) **Section 2.2** – This section should also mention the historical and on-going sampling and remedial efforts conducted at NTC Great Lakes, as the Pettibone creek watershed includes most of the base and these may have contributed to the contamination of the creek via the storm sewers.

16) **Section 2.2** – The table in this section references a figure to show where the samples were collected. It would be helpful to have a very brief description of location in this table. Please add a column for this to the table or else add it to the comments section.

17) **Section 2.2, page 4** – In the last line of the first paragraph, change the word *attributed* to *contributed.*

18) **Section 3.2.1** – The first paragraph references method 5035 as being used for TCL VOCs for surface water sampling. Method 5035 is used for sampling solid materials. Please verify that the appropriate method was used and correct the reference here.

19) **Section 3.2.2.1** – As in the previous comment, the first paragraph references method 5035. However, the sample log sheets do not confirm this as the sediment samples were reported as being collected in 4-ounce jars not in EnCore samplers or hermetically sealed containers. This is <u>not</u> according to method 5035. Table B-10 in the QAPP lists method 5035 for collecting sediment samples for VOCs. However, that table also lists 4-ounce jars as the container to be used. Unfortunately, neither the Navy nor Illinois EPA noticed this upon review of the document. This presents a problem, which will require some discussion. However, as per comment number 21 below, this point is moot, as none of these samples were extracted within the allowable hold time of 48 hours. In every case, the time from receipt at the lab to extraction was a minimum of 3 days.

20) **Section 3.2.2.2, page 4, third full paragraph** - See previous comment regarding method 5035.

21) **Section 3.2.3.2** – This section references Table B-10 from the QAPP regarding sediment sample preservation requirements. In Table B-10, for sediment VOC samples, it shows that no preservative is required and the hold time is 48 hours from sampling to extraction/preparation. There were 10 sediment samples to be analyzed for VOCs and none of them were extracted within this timeframe. Five of those samples were not even received at the laboratory within 48 hours of the sampling time, as recorded on the chain of custody forms. The data for these samples is therefore invalid. Sediment sampling for VOC analysis will need to be repeated.

22) **Section 4.1** – See comment number 15.

23) **Section 4.3** – Throughout this section, many statements are made as to the possible upstream, off-site sources of the contamination, but there are no statements to identify the possible on-site, Navy mission-related sources. These should be outlined as well. Please include this information also.

24) **Section 4.3.1** – What consideration, if any, was given the surface water samples with respect to the rain event that occurred on 9/23/01? The depth of the creek, the flow velocity, and the turbidity of the creek at the time of collection of those three samples,

collected during or following that rain event, would have a definite effect on the results. The possible ramifications should be discussed in the report.

25) **Section 4.3.1, VOCs** – Other possible sources should also be mentioned in this section. Those possible sources could include the on-going RCRA remedial actions at NTC Great Lakes.

26) **Section 4.3.1** – On page 5 it states, the data suggest that NTC Great Lakes is not a major contributor of VOCs to Pettibone Creek. This may not be the case. As per the information received from Mark Schultz during the meeting of June 5, 2002 in Charleston, S.C. This section may need to be revised.

27) **Section 4.3.2, Pesticides/PCBs** – On page 12, in the first paragraph, it states that the PCB data suggest a significant possible upstream source was contributing. This does not take into account the previous transformer storage area, which was located on the base. That area could have contributed greatly in the past. This needs to be discussed here.

28) **Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5, VOCs** – Due to the problems associated with the VOC sampling and analysis, these sections may need to be revised if additional VOC sediment samples will be collected and analyzed.

29) **Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5, SVOCs and PAHs** – The first paragraph states, ...the positive results reported for bis(2-ethylhexyl) phthalate and/or butyl benzyl phthalate may not be site-related. There is no reasoning presented to justify this statement. Please clarify.

30) **Section 4.3.2, 4.3.3, 4.3.4, and 4.3.5, SVOCs and PAHs** – The PAH concentrations are compared to values reported in scientific literature for background concentrations. Illinois EPA does not have generic background values for PAHs nor does it recognize the reported values. If the Navy wants to develop background values for PAHs at this site, Illinois EPA is willing to discuss the sampling strategy to accomplish this. However, without this determination, all of the tables listing background values for PAHs should be removed. Additionally, the historical coal storage areas on the base should be mentioned as possible sources of PAH contamination to the sediments of the creek.

31) **Section 4.3.4, page 20** – The first paragraph states that the PCB data suggest a significant possible upstream source was contributing. This does not take into account the previous transformer storage area, which was located on the base. That area could have contributed greatly in the past. This needs to be discussed here.

32) **Section 4.3.4, page 21** – The eighth line on this page references a sample ID (NTC17PCSD4901) twice. One of these should reference NTC17PCSD4801 instead. Please correct.

33) **Section 4.5** – In the conclusion for VOCs, it states that VOCs are not significant site-related contaminants for Site 17. Due to the possible unacceptability of the sediment VOC data, this statement may be unsubstantiated. This section may need to be re-written after sediment VOC sampling has been repeated, if necessary.

34) **Section 4.5** – In the conclusion for PAHs and SVOCs, a statement is made that the reported concentrations are within the range of concentrations reported as anthropogenic background for soils. Please remove this statement. Illinois EPA does not recognize the generic background concentrations that are being referenced as background concentrations in Illinois.

35) **Section 4.5** – It is mentioned in the conclusion section for PCBs that industrial sources upstream have contributed to the contaminant load detected in the Pettibone Creek watershed. It should also mention the possible Navy sources that may have contributed as well. One possible source would be the transformer storage area formerly located on Navy property.

36) **Section 5.4.1** – This section may require revision if sediment VOC sampling is repeated.

37) **Section 6.1.1** – There are several non-standard data qualifiers listed in the third paragraph. These codes need to be defined and their relevance to the risk assessment discussed.

38) **Section 6.1.2.1** – In the second paragraph, the discussion of the over-protectiveness of the Region 9 PRG tables should include mention that three exposure pathways (ingestion, dermal, and inhalation) are included in the Region 9 PRG values, when only two pathways are relevant at Site 17.

39) **Section 6.1.2.1** – The first paragraph on page 6-5 describes the comparison of site contaminant concentrations to the screening values. This paragraph should include a discussion of chemicals that have no corresponding screening or background values.

40) **Section 6.1.2.1** – The second paragraph on page 6-6 has a brief discussion regarding fish tissue contaminant concentration modeling. This should state that the process included normalization for organic carbon (sediment foc and fish lipid content).

41) **Section 6.1.3.5** – The first bullet listing PAHs can be eliminated and arsenic can be removed from the fifth bullet, since they are not a concern for bioaccumulation in fish.

42) **Section 6.2.3, bullet #3** – This states that a "best fit" procedure was used to assign a data distribution when it could not be defined empirically. The exact procedure used to determine best fit should be identified and justified. Illinois EPA's Toxicity Assessment Unit (TAU) presently recommends that a distribution free method be employed in these cases.

43) **Section 6.2.4.1, first bullet** – Illinois EPA is aware of the USEPA recommendation to use 25% of total body surface to estimate the surface area of unclothed skin. If that is the intent of this subject factor, this fact should be clearly stated along with a discussion of any uncertainty associated with it.

44) **Section 6.2.4.1** – The first full paragraph on page 6-19 discusses the basis for the activity-based soil-to-skin adherence values. The literature source states that the adherence values were derived from studies of teens playing soccer in moist conditions. This is inappropriate for Site 17, since soccer fields are typically comprised of heavy turf and do not resemble conditions in a sandy/mucky stream bed. Illinois EPA recommends that the USEPA RAGS Part E, Exhibit 3-3 values for children playing in wet soil (CT = 0.2 mg/cm^2 and RME = 3.3 mg/cm^2) be utilized.

45) **Section 6.2.4.4** – The last sentence lists the incidental surface water ingestion rate for the recreational receptor as 0.5 L/hour. This assumption is too large and probably a typographical error. Illinois EPA recommends a value between 0.05 and 0.025 L/hour.

46) **Section 6.3.1** – The bullets in this section present data sources for the toxicological values used in the human health risk assessment. However, the chemical-specific tables (Tables 6-12 and 6-13) never cite two of the sources, HEAST and NCEA. The discussion should be revised to state that the Region 9 data source relies on HEAST and NCEA or the tables should be edited to reflect the primary data sources.

47) **Section 6.4.3.1** – The fourth paragraph alleges to summarize the cancer risk to the RME receptor in the north branch of Pettibone Creek. Included in this, and subsequent discussions, is reference to the perceived sources of the contaminants. These discussions are irrelevant to the total risk and hazard at these sites and should be summarized in a separate section.

48) **Section 6.6, page 6-46** – In the next to last sentence in the third paragraph, the presence of PCBs, PAHs, and pesticides is attributed to activities upstream and offsite. Unless it can be determined that no electrical transformer has ever leaked at the center and that pesticides were never used for insect control around the creek, this statement should be removed or modified.

49) **Table 6-12** – The origins of the adult and child RfD values for iron could not be located in the reported source. Two RfDs are available for manganese; one for food sources, and a second for non-food sources. The non-food RfD includes ingestion of contaminated soil and water and is the RfD that is relevant to this project. Applying safety factors of 3 to protect children and 2 to focus on the environmental sources of manganese further refines the RfD for non-food sources. The relevant RfD for manganese is 0.02 mg/kg-day.

50) **Table 6-13** – This table presents cancer toxicity values for the contaminants of concern. The entries for beta-BHC and delta-BHC can be removed. Illinois EPA's TAU does

not require that contaminants with cancer rankings of "C" (beta-BHC) and "D" (delta-BHC) be evaluated for cancer potential.

51) **Section 7.0** – The second sentence in the second paragraph refers to Figure 1-1 as being the Navy's Ecological Risk Assessment tiered Approach. Figure 1-1 is an aerial photograph of the site and the Navy's ERA Approach figure could not be located. Please correct.

52) **Section 7.1.1, page 7-4** – The third paragraph should list the threatened or endangered species present or observed at this site and their locations in relation to the areas of concern should also be given.

53) **Section 7.1.2** – The last sentence in this section references Appendix E.1. Review of this appendix generated several comments.

- The page 7-5 text states that the conservative food chain model utilized the 90th percentile sediment-to-fish bioaccumulation factors and that the average food chain model used the median (50th percentile) bioaccumulation factors. However, the Appendix E.1 table of sediment uptake factors shows the conservative and average factors to be the same. Please clarify or correct.

- The bottom of the page explanation for note #2 has no corresponding reference within Table E.1. The literature citation for note #2 is incorrect.

- In note #4, the inclusion of a literature citation and a conversion factor for plants should be removed. This note also states that a dry to wet weight conversion factor of 0.16 was applied to the invertebrate sediment/soil uptake factors. It appears that a factor of 0.3448 was actually used. Furthermore, it is unclear whether conversion to wet weight is appropriate at this point. Typically this conversion is done following application of the uptake factor. If the conversion is made to the uptake factors, they should be renamed to indicate this adjustment.

- It should be stated in the Appendix E.1 table that the BASF values for organics have been normalized for percent organic carbon.

54) **Section 7.1.4.3** – The last sentence refers to Appendix E.2 and the receptor profiles for the food chain modeling. Several comments were also generated for this appendix.

- An explanation should be provided at the bottom of the page for note #3.

- The ingestion rate calculations following note #2 should be separated from note #2.

- The body weight data for the raccoon cannot be completely attributed to the given reference. The additional reference(s) should be provided.

- The regression equation for food consumption presented in note #1 does not yield the Table E.2-1 values for the raccoon.

- The soil/sediment ingestion rates and their literature sources should be included in TableE.2-1.

55) **Section 7.3, page 7-12, equations** – The two subject equations were used to calculate the raccoon's chronic daily contaminant intake values, organics, and inorganics. In both equations, the purpose of the first component of the calculation is to estimate the contaminant intake from ingestion of soil/sediment invertebrates. As is, the equation states that one-half of the food intake will be equal to the contaminant concentration in the sediment. This is incorrect. The sediment-to-invertebrate bioaccumulation rates will mediate the invertebrate contaminant concentrations. The BAF factor should be added to the first component of both equations.

The second component (for intake of contaminants from fish ingestion) of the first equation (inorganic intake) is incorrect. The ratio of the fish lipid content to the sediment fraction organic carbon should be removed. This ratio is only used for calculating intake of organic contaminants in fish.

In the definitions section following the subject equations, the definition for the fish lipid content (%L) should be revised. The %L of 3.56% is acceptable for human ingestion of filleted fish, but wildlife are expected to ingest whole fish and a corresponding %L should be used.

56) **Section 7.3, 3rd bullet** – This bullet states that the "conservative" body weight was used. Body weights were classified as maximum, minimum, and average. The conservative value must be defined or the subject text must be revised.

57) **Section 7.5.1.1** – This section may require revision if sediment VOC sampling will be repeated.

58) **Section 7.5.2** – In the first sentence, the acronym should be given as LOAEL.

59) **Section 7.6.1.1** – This section discusses risks to aquatic receptors from sediment contamination. This discussion includes comparisons to several agreed to benchmarks plus comparisons to additional "alternate" benchmarks. For this discussion to have increased relevance, the benchmark endpoints should be discussed. Some sediment benchmarks examine water column receptor toxicity, some examine benthic receptor toxicity, and others examine both. Additionally, it is inappropriate to compare average sediment concentrations to severe or lethal effects levels.

60) **Section 7.6.1.1.3** – The section titled "PCBS" should be "PCBs." Please correct.

61) **Section 7.6.1.2** – In the section titled "metals", aluminum is stated as not retained as a COC because it is not known to be related to site activities. Illinois EPA does not agree

with this. Whether or not it was related to known site activities has no effect on whether a contaminant poses risk. Aluminum should be retained as a COC. Please make this correction.

62) **Table 2** – It is inappropriate to list statewide background levels for organic constituents. Organic contaminants are not expected to be present in natural sediments. Furthermore, the background concentrations for organics presented in the IEPA reference are analytical detection limits and not true background concentrations of these chemicals.

The subject table also shows that four inorganic constituents have benchmark screening concentrations less than the Illinois background levels. This situation should be discussed in the text of the report.

63) **Tables 7-8 through 7-10 and 7-12 through 7-14** – The fraction of risk in the ecological effects quotient attributed to polynuclear hydrocarbon contamination from fish ingestion can be removed.

64) **Section 8.0** - This section may require revision if sediment VOC sampling will be repeated.

65) **Section 8.0, page 2** – Following the second bullet, there is a statement regarding the range of concentrations reported as anthropogenic background for PAHs. This statement should be removed.

66) **Section 8.0, page 2** – The last sentence following the third bullet, mentions industrial sources upstream of Site 17. Some discussion of the previous transformer storage area on NTC Great Lakes property should be included here.

67) **Section 8.0, page 3** – Regarding VOCs, see comment number 25.

68) **Section 8.0, page 3** – The last sentence on this page lists upstream industrial sources as a primary source of the contamination. This may well be true, however, the contribution by NTC Great Lakes should not be overlooked. Please include some discussion of this in this section.

69) **Section 8.0, page 5, first bullet** – Again, it is stated that the primary sources of the COPCs are probably due to upstream sources. This may be true, however, the possible contribution by NTC Great Lakes should not be overlooked. Please include some discussion of this in this section.

70) **Appendix E.3** – The table of NOAEL and LOAEL sources and endpoints should include the polynuclear hydrocarbon values and the open literature reference for their source. This information can be added to the footnote already in place.

Several calculations were checked as part of this review. During this exercise it was noted that some BASF values specified in the ecological effects quotient tables do not

agree with the specified literature source. This includes the Arochlors and several of the pesticides. Please correct.

71) **Appendix E.4** – Use of the Florida sediment screening levels criteria as alternate benchmarks is inappropriate since they are based on marine and estuarine habitats.

72) **General** – The document has a significant amount of typographical errors in the text. Please conduct a more thorough proof/review prior to submittal.

If you have any questions or require additional information, please contact me at (217) 557-8155 or by electronic mail at *brian.conrath@epa.state.il.us*.

Sincerely,

Brian A. Conrath

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Remedial Project Manager
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cc: Owen Thompson, USEPA (HSRL-5J)
Bob Davis, Tetra Tech NUS, Inc.
Mark Shultz, US Navy - EFA Midwest