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NSB NEW LONDON
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DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO

5090
Code 1823/ME

11 AUG 1998

Mr. Kenneth Finkelstein
U.S. Department of Commerce
National Oceanic and Atmospheric Admin.
c/o EPA Office of Site Remediation and Restoration (HIO)
J.F. Kennedy Federal Building
Boston, MA 02203

Dear Mr. Finkelstein:

SUBJ: RESPONSES TO NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) COMMENTS DATED MAY 19, 1998 ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR THE LOWER SUBASE SITE, NAVAL SUBMARINE BASE - NEW LONDON (NSB-NLON), GROTON, CT

Please find enclosed the Navy's responses to your comments of May 19, 1998 on the Draft Remedial Investigation Report for the Lower Subase site at NSB-NLON.

If you have any other question or comments please do not hesitate to call me at (610) 595-0567 ext. 162.

Sincerely,

MARK EVANS
By direction of the
Commanding Officer

Copy to:
Mr. Jeff Sullivan, NSB-NLON
Ms. Kymberlee Keckler, USEPA Region I
Mr. Mark Lewis, CT DEP
Mr. Corey Rich, TetraTech NUS - Pittsburgh

DRAFT RESPONSES TO NOAA's MAY 19, 1998 LETTER OF COMMENTS REGARDING THE APRIL, 1998 DRAFT REMEDIAL INVESTIGATION REPORT FOR THE LOWER SUBASE NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

August 7, 1998

Comment 1: The RI was a comprehensive report that presented extensive data collected at NSB-NLON since 1989, and from the volume of data it is apparent that the types and extent of contamination on site and in the Thames River adjacent to the site have been thoroughly characterized. One unusual aspect of the report was the fact that it contained a fairly rigorous coverage of the ecology of the Thames River, including information on plankton, marine algae, benthic invertebrates, shellfish, finfish, birds, and endangered/threatened species. Despite the decision not to complete any toxicity tests the RI report was generally well done.

Response: Agree. Data from several historical studies, including a large volume of ecological data, were available to augment the Phase II RI and Lower Subase RI data. Since extensive sediment toxicity testing had been performed during several previous investigations, it was not necessary to conduct additional toxicity testing for the Lower Subase RI. Sediment toxicity testing will be conducted if the results of the proposed Lower Subase tiered groundwater monitoring program indicate that such testing is warranted.

Comment 2: Total petroleum hydrocarbons, PAHs, and trace elements, particularly lead and mercury, were the primary contaminants reported both in on-site soils and in sediments of the Thames River. Based on soil and groundwater data from the seven zones, there is evidence that on-site contamination, particularly from Zones 4 and 7, may have, and may still be, contributing to contamination in sediments of the Thames River. It seems likely that fuel storage, fuel transport, and refueling activities at the site are the major contributors of petroleum hydrocarbon and PAH contamination in on-site soils and sediments. Additionally, lead storage batteries that were previously used (up to the 1950s) to power submarines while submerged, and activities involved in the handling, transport, maintenance, and storage of these batteries may have been responsible for the extensive lead contamination reported in on-site soils and sediments. Mercury contamination seemed to be present throughout the system, upstream and downstream of the site, so it is not clear what the source(s) of this contamination may be.

Response: Agree. On-site contamination may have, and may still be, contributing contaminants to the Thames River. The ongoing contribution of contamination to the Thames River will be assessed during the proposed tiered groundwater monitoring program. Mercury does appear to be slightly elevated throughout the Thames River, and could be due to naturally elevated conditions.

Comment 3: Groundwater data, for the most part, did not indicate that groundwater contamination was particularly high, and thus this may not be a major pathway for the transport of contamination from the site to the Thames River, although some trace element contamination is undoubtedly due to groundwater transport.

Response: Agree. The possibility of discharge of contaminants via groundwater to the Thames River will be addressed as part of the proposed groundwater monitoring program.

Comment 4: One point that was made in the RI for each of the seven zones was the extent to which each of the zones is covered by buildings and pavement. Considering this, it may be that only a fraction of the precipitation falling on the site is percolating through contaminated soils at the site and leaching soil contaminants to the groundwater. Although addressed just briefly in the RI, surface transport of site-related contaminants via storm sewers may be an import transport mechanism. As an example, in Zone 5 sediments collected from storm sewers had lead concentrations as high as 85,600 mg/kg (see NOAA work plan review letter dated 12 August 1997). No information was presented in the RI on the number of storm sewer discharges entering the Thames River from NSB-NLON. Considering the high concentrations of lead reported in storm sewer sediments from Zone 5, it may be advisable to conduct a survey of storm sewers across the facility to determine the extent to which these sewers may be responsible for contamination in the Thames River. It is certainly possible that sediments in these storm sewers may be acting as continuing sources of contamination to the river.

Response: A majority of the Lower Subase is covered by buildings or pavement. Therefore, as stated in the comment, it is likely that only a small fraction the precipitation that falls on the area percolates into the ground. A majority of the precipitation is directed to storm sewers which eventually discharge to the Thames River. Because the surface water typically does not contact contaminated soils, it is unlikely that surface water runoff is a significant mechanism for contaminant transport from the Lower Subase.

Figures 4-1, 5-1, 6-1, 7-1, 8-1, 9-1, and 10-1 show the storm sewer systems within the Lower Subase and the storm sewer outfalls to the Thames River. The maps show that there are 22 storm sewer outfalls between Pier 2 and Pier 33 (i.e., the area considered as the Lower Subase). The inverts of these outfalls are generally at or above the low tide elevation of the Thames River. Therefore, the storm sewers could only act as a contaminant transport pathway for groundwater under high tide conditions and if the sewers are damaged and allow groundwater infiltration.

The quality of the storm water discharged from NSB-NLON will continue to be monitored by the Navy as required by the NPDES permit. Appropriate actions will be taken to maintain compliance with the permit.

As discussed in the report, the contamination detected in the sediment of the storm sewer in Zone 5 is most likely the result of a single spill event and not a continuing source. The Navy will consider cleaning the storm sewer catch basins of Zone 5 as a remedial alternative. Remedial alternatives will be evaluated during the Feasibility Study for the Lower Subase. Additional sampling of the storm sewers will be completed as part of the proposed Monitoring Program after the appropriate remedial alternatives are completed.

Comment 5: Extensive PAH and trace element contamination was evident in sediments of the Thames River adjacent to the facility. Based on the aquatic ERA conducted for each of the zones and in the Thames River, the recommendation was made in the RI that the river should be further evaluated only if the recommended tiered, zone-specific groundwater monitoring programs indicate potential migration problems. According to the ERA, the RI indicated that only low to moderate risks to sediment-dwelling organisms, but these risks are generally similar to those in sections of the river that do not appear to be influenced by NSB-NLON. Because the Thames River in the vicinity of the NSB-NLON is a salt-wedge estuary under tidal influence, it is likely that the facility could be impacting sediments that are upstream of the site due to tidal movement of contaminants upstream of the site.

Response: PAH and inorganic contaminants were elevated in Thames River sediments near the Lower Subase, but for the most part elevated concentrations appeared to be localized. In addition, the ranges of concentrations of most contaminants in sediments near the Lower Subase were similar to those in other portions of the Thames River, including upstream and downstream. Although the salt-wedge in the Thames River could carry contaminants from the Lower Subase upstream, it appears that samples were

collected far enough upstream of the Lower Subase (up to approximately 1 mile) to adequately characterize non-Lower Subase related contaminant inputs.

Comment 6: Sediment toxicity testing was not conducted during the latest round of sampling, however, the RI did summarize the results of sediment toxicity tests conducted during the 1990 SEAWOLF EIS and the Phase II RI. Sediment toxicity testing using the amphipod *Ampelisca* and toxicity/bioaccumulation studies using the estuarine clam *Macoma* and the polychaete worm *Nereis* were conducted as part of the SEAWOLF EIS. Sediment samples were collected from various locations along the river, including Piers 32 and 33 (Zone 5). No statistically significant mortality was observed in sediments from any sampling locations for *Ampelisca* or *Nereis*.

Response: Agree. No statistically significant mortality was observed in Phase II RI sediment toxicity tests in Zone 5 using *Ampelisca* and *Leptocheirus*. Also, sediment toxicity testing using *Ampelisca* and *Nereis* conducted during the 1990 SEAWOLF EIS showed no statistically significant mortality.

Comment 7: Survival for *Macoma* in sediments from Piers 32/33 was reported to be significantly lower than that in control and reference sediments, but the differences reported disappeared if an outlier (not identified) was removed from the statistical calculations.

Response: Agree. Survival in sediment toxicity tests conducted as part of the EIS using *Macoma* was significantly lower than in control and reference sediments, but only if an outlier is included in the data set.

Comment 8: The RI also reported that sediment toxicity tests conducted with two species of amphipods, *Ampelisca* and *Leptocheirus*, during the Phase II RI ERA suggested a similar trend. No statistically significant mortality was observed in any of the *Leptocheirus* toxicity tests using sediments from the Lower Subase and in other sections of the river. Two of nine *Ampelisca* sediment samples exhibited statistically significant mortality, yet later toxicity tests from these two locations indicated that there was no statistically significant difference from reference/controls. Sediment from these two locations was subsequently dredged and replaced with clean sediment. It was reported in the RI that the results of sediment toxicity tests near the Lower Subase appear to be similar to other sections of the Thames River, and any potential toxicity to benthos near the Lower Subase is localized, and that broader community and ecosystem effects from sediment contaminants near the Lower Subase may be unlikely.

Response: Agree. The results of a majority of sediment toxicity tests conducted using Thames River sediments collected near the Lower Subase and in other portions of the river showed no significant mortality to the various test organisms. Areas near the Lower Subase with potentially toxic sediments appear to be localized, limiting the possibility of broader, ecosystem-level effects.

Comment 9: The results of AVS/SEM studies conducted with sediments from the Thames River near the Lower Subase may somewhat explain the sediment toxicity results. Generally, AVS concentrations exceeded SEM concentrations, indicating that the divalent trace elements, cadmium, copper, lead, nickel, and zinc are not bioavailable, or have reduced bioavailability. Although the concentrations of a number trace elements, particularly lead exceeded their ERL or ERM values, these elevated concentrations may not be a true indicator of the actual toxicity being exerted by these trace elements.

Response: Agree. The results of the AVS/SEM analyses indicate that cadmium, copper, nickel, lead, and zinc are not available to cause toxicity in Thames River sediments despite exceedances of guideline values. This may, at least in part, account for the absence of widespread mortality in sediment toxicity tests.

Comment 10: One point that was repeatedly made throughout the RI was the fact that periodic dredging of the navigational channel of the Thames River and along the piers where submarines and naval vessels are berthed removes contaminated sediment, thus ameliorating potential impacts from contaminants in those sediments. However, it is doubtful that sediments under the piers are being removed, so that it is very possible, and quite likely, that sediments beneath piers could be impacting biota in the river and acting as a continuing source of contamination newly exposed, "clean" sediments. It may be advisable to conduct sediment sampling beneath piers (e.g., Pier 33 in Zone #5) to determine the extent of contamination and to determine if sediments beneath piers could pose continuing threats to biota of the river.

Response: Although the nature and extent of contamination in sediments under the piers may not be fully characterized, these areas constitute only a small portion of the Thames River near the Lower Subase. As a result, even if sediments under some of the piers were toxic to sediment-dwelling organisms, potential risks would likely be localized, and ecosystem-level effects would be unlikely. Furthermore, tidal action in the river would probably move sediments under the piers into adjacent areas in each zone. Thus, sediment samples collected in these adjacent areas may be somewhat representative of conditions under the piers. Likewise, sediments in the areas adjacent to the piers, which have been well characterized, could move under the piers via tidal action. Therefore, the Navy does not advocate collection of sediment samples beneath the piers because the effort would be difficult because of access problems, the effort would be costly, and, as discussed above, the effort may not provide any more relevant data to evaluate the nature and extent of contamination or risks to ecological receptors than the existing data from the berthing areas.

Comment 11: Although the sediments do not appear to be posing great risks to riverine biota, it may be advisable to remove "hot spots" (e.g., adjacent to Zone 4) to insure that potential risks are removed. Additionally, it is recommended that source controls be implemented to prevent the further migration of contaminants from the site to the river. Although some removal actions have already been implemented on the NSB-NLON facility, additional "hot spot" removals of contaminated soils, particularly in Zones 4 and 7, may be advisable to further stem the transport of site contaminants to the Thames River. As recommended in the RI, a groundwater monitoring program should definitely be implemented to monitor the migration of contaminants from the site to the river. Furthermore, as recommended above, the potential input from storm sewers should be addressed, as this could be a critical transport route of contamination to the river.

Response: The risks to riverine biota from sediments adjacent to the Lower Subase do not seem to be significant; therefore, the Navy does not agree that "hot spot" removal is required in the Thames River. The Navy agrees that contaminant migration from the Lower Subase to the Thames River should be minimized. Appropriate remedial alternatives will be developed for each zone during the Feasibility Study to address contaminant migration.

Please refer to Response to Comment 4 regarding contaminant transport via storm sewers.