N00129.AR.000985
NSB NEW LONDON
5090.3a

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

May 14, 2003

Mark Evans, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Draft Thames River Rapid Sediment Characterization Pilot Study

Dear Mr. Evans:

Thank you for the opportunity to review the *Draft Thames River Rapid Sediment Characterization Pilot Study Work Plan/Sampling Plan Naval Submarine Base - New London, Groton, CT*, dated March 2003. Detailed comments are provided in Attachment A.

The 1998 Ecological Risk Assessment (ERA) recommended a data gap evaluation for Zones 4 and 7. This Work Plan appears to fill the sediment sampling and analyses gaps identified in the RI. Data are to be combined with results of the RI to determine risk in Zones 4 and 7. The proposed numbers of sediment samples for the Rapid Sediment Characterization (RSC) should meet the Data Quality Objectives (DQO) for these Zones, as well as for Pier 1, as stated in Tables 1, 2, and 3. The spatial coverage and sample sizes for the RSC (n=31 for Zone 7, n=15 for Zone 4, and n=12 for Pier 1, plus previously collected data) should meet the DQO of characterizing the spatial extent of COPC. Similarly, the sample sizes for confirmatory samples (n=15 for Zone 7 and n=11 for Zone 4) should meet the DQO of supporting the SLERA for each of these Zones. The DQO related to the chemical analyses may not be met, however, as detailed in some of the following comments. Further, the spatial coverage of confirmatory samples cannot be reviewed at present, as locations will be determined later.

While the number of RSC samples may be sufficient to characterize the spatial extent of selected COPC, the RSC method presents a limitation. The rationale for the focus on copper, lead, and zinc as the selected trace metals is not clear. The 1998 ERA identified arsenic, chromium, mercury, and selenium as well as other inorganic COPC for Zone 4 and Zone 7. In Zone 4, chromium exceeded ER-Ms. At Pier 1, mercury, copper, lead, nickel, and zinc exceeded ER-Ms. In addition, for both Zone 4 and 7, the AVS/SEM evaluation in the ERA suggested that copper, lead, and zinc may be below levels of concern. Unless evidence can be provided showing that high concentrations of copper, lead, and zinc can be used to accurately track high concentrations of the other inorganic COPC, this screening method could miss areas with high concentrations of the other inorganic COPCs. This limitation should be addressed in the Work Plan.

Step 3 of the DQOs for all the sites indicates that confirmatory samples will be selected based on RSC results and will span the range of RSC concentrations. As these confirmatory sample results are to be used in a SLERA for Zone 7 and Zone 4, the bias should be toward the more highly contaminated RSC results. It is understood that a greater proportion of confirmatory samples will be analyzed from locations within the upper range of RSC results for Zones 7 and 4 (8 to 10 of 15 in Zone 7 and 7 of 11 in Zone 4), with fewer confirmatory samples analyzed at locations with lower RSC results. The most conservative approach for the SLERA would be to collect confirmatory samples only at locations with the highest RSC results. Because the sample sizes in these zones is sufficient, and because the need for developing a correlation between RSC results and fixed lab results at lower concentrations, as well, is recognized, the approach is acceptable for Zones 7 and 4. At Pier 1, however, because the sample size is smaller (n=3), confirmatory sampling should focus on areas with the highest RSC results rather than over a range of results.

The number of samples (n = 4 for each area) at the reference areas should provide an adequate comparison for the NSBNL sediment results. The spatial coverage of samples at the reference locations versus study site locations might lessen comparability, however. Paragraph 2 of Section 4.0 states that "Samples from the reference stations will be collected along two transects at similar distances from the shore as the sample stations in Zones 4 and 7 to maximize data comparability." Figure 4, that provides a rough picture of the reference sample locations, indicates that reference samples will be collected from approximately 100 to 700 feet from shore. Figures 2 and 3 show sample locations for Zones 7 and 4 to be much closer to shore, with several locations just off shore. If these figures are accurate, the spatial configuration of sample locations is not entirely comparable. Please address.

Please include a flowchart/diagram be added to the Work Plan/Field Sampling Plan that clearly presents the samples and locations to be collected. This flowchart should also clearly define the type of analysis planned for the specific samples. As written, it is difficult to understand which samples will be analyzed using RSC (and what analytes will be detected) and which samples will be submitted to the laboratory for analysis. To aid the clarity of the document, please include the intended use of the analytical results (*i.e.*, what results are planned for use in the ERA).

The RSC methods taken from the Navy's Space and Naval Warfare Systems Center (SSC SD) are not referenced. It is understood that X-ray fluorescence (XRF) will be used to screen for copper, lead, and zinc, and immunoassay techniques will be used for total PAHs and PCBs. The detailed methods are neither discussed nor cited in this Work Plan. The methods should be presented: detection limits, sample volume, *etc.*

The following comparison between RSC detection limits (taken from *The Use of Rapid Sediment Characterization Tools (RSC) in Sediment Assessment EPA Technical Support Project Meeting May 09, 2001Presented by: Victoria J Kirtay Environmental Sciences Division Space and Naval Warfare Systems Center San Diego*) with NOAA benchmarks shows that, for the selected chemicals, the detection limits are generally adequate to detect concentrations above ecological

benchmarks. If the detection limits are at the high end of the ranges for copper, lead, and PCBs, however, elevated concentrations may go undetected. These limitations should be discussed in the Work Plan.

Chemical	ER-L	ER-M	XRF Detection Limit	Immuno Assay Detection Limit
Inorganics (mg/kg)				
Copper	34	270	20-100	
Lead	47	218	10-50	
Zinc	150	410	20-100	
Organics (ug/kg)				
Total PAH	4022	44972		50-500
Total PCB	23	180		50-500

For appropriate risk determinations to be made at these locations, some data may be needed that are not proposed at this time. These include AVS/SEM analyses as well as toxicity tests and benthic surveys to complement the chemical data in a triad approach. While the concentrations of COPC in sediments may not merit collection of these data, it should be recognized that they may need to be collected in a separate effort in the future.

One of the DQOs for Zone 7 is to determine if the previous dredging effectively removed all or some of the contaminated sediments near Pier 17 and Pier 15. According to Figure 2, two sediment samples are proposed within the dredged area north of Pier 17 with one on the edge of the area, and one sediment sample is proposed within the dredged area south of Pier 17 with one on the edge of the area. All three samples near the Pier 15 dredged area appear to be within the dredge outline. If the figures are accurate, moving the edge samples into the dredged areas would better ensure that this DQO is addressed. Please consider repositioning these samples.

The EPA Region I Immunoassay Guidelines for Planning Environmental Projects was not referenced. It is not clear if it was used in the development of this Work Plan/Field Sampling Plan. All intended uses of immunoassay test kits should be conducted in accordance with EPA protocols specified in the guidelines. Particular concern may be the use of immunoassay test kits for determination of PCBs in sediment that may contain greater than 30% moisture.

According to the EPA publication Guidance for the Data Quality Objectives Process, EPA QA/G-4, Step 6 of the Data Quality Objectives process should include acceptable limits for decision errors relative to consequences. Tables 1, 2 and 3 do not include acceptable limits for decision errors. Please specify acceptable limits on decision errors as described in the guidance.

From the available literature on the RSC method, it appears that the XRF portion of the method has been formalized for only three metals (copper, lead, and zinc). Zone 4 of NSB-New London

has historically exceeded chromium benchmarks in sediment, yet the screening approach will not identify areas of high or low chromium, possibly resulting in false negative results. I therefore recommend that more samples be included for fixed-laboratory analysis for metals to reduce uncertainty in this area.

It is not clear from the description of the RSC method exactly how the samples will be indexed from high to low contamination in order to determine which samples proceed with fixed-laboratory analysis. If a sample is high in metals but low in total PCBs, will it rank before or after a sample with high PCB and low metals when samples are selected for fixed-laboratory analysis? Please more clearly explain the methodology for ranking samples.

I assume that the screening-level assessment based on fixed-laboratory analysis will be consistent with EPA ecological risk assessment guidance, where the highest detected concentration within each area will be compared with the more conservative benchmark (*e.g.*, ER-L). Any chemical that exceeds the benchmark in any sample will be retained as a COPC. This approach is not explicitly described in the Work Plan. Please confirm that this approach will be used.

I look forward to working with you and the Connecticut Department of Environmental Protection to investigate the Thames River sediments. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,

Kymberlee Keckler, Acting Chief
Federal Facilities Superfund Section

Attachment

cc: Mark Lewis, CTDEP, Hartford, CT
Dick Conant, NSBNL, Groton, CT
Bart Hoskins, USEPA, Boston, MA
Jennifer Stump, Gannett Fleming, Harrisburg, PA

ATTACHMENT A

Page	Comment
p. 2, §2.0	The third paragraph states, "Confirmation samples will be selected based on two criteria: they will represent specific areas of interest, and will span the range of measured RSC concentrations." Please explain what is meant by, "specific areas of interest." While the selection of samples based on detected RSC concentrations is explained in more detail in the DQO tables, this first decision criterion is not explained. Please enhance the consistency between the DQO tables and Section 2.0 regarding the explanation of the selection of confirmatory samples.
p. 4, §4.1	The first sentence of the second paragraph states that 9 surface sediment samples are proposed for Pier 1. Figure 3, however, shows 12 sample locations at Pier 1, P1-47 through P1-58. Further, Step 7 of the DQO table for Pier 1 indicates a sample size of 12. Please confirm the number of samples proposed for Pier 1.
p. 6, §4.1.3	Please indicate the field duplicate precision criteria within the text of the Work Plan or QAPP. According to the Region I guidance, duplicates must also be analyzed for the immunoassay test method.
p. 13, Table 1	Please clarify the intent of the Subordinate Objective presented in Step 2: "Do the chemical constituents measured by RSC methods co-occur with other constituents measured in fixed laboratory confirmation samples?" The use of RSC should not include the objective of identification of "co-occurring" contaminants for use in an ecological risk assessment. Please explain the intent of this subordinate objective.
p. A-13, §A.2.4.1	A potential data quality concern is presented in the bulleted list on this page of the QAPP. This data quality concern involves maintaining an acceptable level of data quality to allow for statistically valid evaluation or pooling of the data. Please clearly explain the manner in which this data quality concern is being addressed. (Information related to pooling of data could be addressed in the flowchart/diagram suggested earlier.)
p. A-16, §A.2.6.1	This section states that version control is maintained and documented through the document header blocks, which identify the document version number and effective dates. This version control information is not found in the Draft version of the QAPP.

p. A-48, Table A-8	Please specify the acceptance criteria that will be applied to field duplicate samples. In addition, under the Corrective Action column, please specify the statements "Flag all data...." The added information should state the specific flag that should be applied to the data based on the specific QC criteria.

Health & Safety Plan

Page	Comment
p. 8, Table 5.1	Please correct the second sentence under the column header "Methods to Ensure Worker Safety."
p. 9, Table 5.2	Please ensure that all metals are included in this table which lists the toxicological properties of chemical compounds potentially present in sediments. According to Table 1 of the Field Sampling Plan, arsenic and mercury were previously detected in surface sediment grab samples for Zone 7. Copper and zinc were also found to be present in sediments at Pier I and Zone 4. Information concerning exposure to these metals in sediment should also be included in Table 5.2.
p. 12, §5.2.5	The second paragraph of this section should specify that the occupational exposure action level is for lead. Also, the correct units for this action level are micrograms per cubic meter, not micrograms per milligram.