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PITT-10-2-002

October 1, 2002

Project Number 2863

Ms. Kymberlee Keckler
Remedial Project Manager
U.S. Environmental Protection Agency – Region 1
1 Congress St.
Suite 1100 (HBT)
Boston, Massachusetts 02114-2023

Subject: Final Letter Work Plan for Geochemical Investigation at the Area A Landfill
Naval Submarine Base-New London, Groton, Connecticut

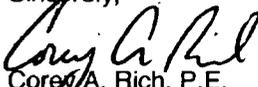
Reference: CLEAN Contract Number N62467-94-D-0888
Contract Task Order Number 0816

Dear Ms. Keckler:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. (TiNUS) is pleased to submit to the U.S. Environmental Protection Agency, Region 1 (EPA), 2 copies of the subject work plan. Minor changes were made during the preparation of the Work Plan to address EPA's September 23, 2002 comments. The Response-to-Comment document is attached. It should be noted that the EPA provided general concurrence with the responses via e-mail today (October 1, 2002). Other changes were also made to the text and Table 2 of the Work Plan to address comments received during internal review.

Field work associated with this Work Plan will begin today and should be completed within five working days. If you have any questions regarding the Work Plan or the field work, please contact Mr. Mark Evans of Engineering Field Activity Northeast at (610) 595-0567 (ext. 162) or me at (412) 921-8984.

Sincerely,


Corey A. Rich, P.E.
Project Manager

Enclosure(s)

c: Mr. Mark Lewis, CTDEP (1 copy)
Mr. Mark Evans, EFANE (2 copies)
Mr. Richard Conant, NSB-NLON (3 copies)
Mr. Roger Boucher, EFANE (w/o enclosure)
Ms. Jennifer Hayes Stump, Gannett Fleming (1 copy)
Mr. John Trepanowski, TiNUS-KOP (1 copy)
Mr. Rick Arnseth, TiNUS-OAK (1 copy)
Mr. Keith Simpson, TiNUS-PITT (2 copies)
CTO 816 – File Copy

**RESPONSES TO EPA SEPTEMBER 23, 2002 COMMENTS
LETTER WORK PLAN FOR THE
GEOCHEMICAL INVESTIGATION AT THE AREA A LANDFILL
AT NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT
October 1, 2002**

GENERAL COMMENTS (Body of Text)

1. General Comment: I recommend adding the collection and analysis of several soil samples to the program, particularly from the dredged material. Because much of the study, as proposed, is aimed at investigating the interactions of groundwater with solid phases (e.g., hydrous ferric oxides, sulfides, etc.) within the saturated overburden, a few analyses of solid phases would provide significant support to the interpretations. I recognize that mobilization of a drill rig would substantially increase the cost of the investigation; perhaps, as an alternative, some dredged material could be collected with a hand auger. The soils should be analyzed for the same inorganics that are proposed for the groundwater analyses, with particular emphasis on iron and arsenic. The results would provide further constraints and support for the development of the conceptual model.

Response: Disagree. The Navy does not believe that additional soil samples should be collected for geochemical analysis (mineralogy) or standard laboratory analysis. Soil samples were collected during the installation of the soil borings for monitoring wells 2WMW38DS through 2WMW47DS in May of 1999. A majority of the samples were dredge spoils. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, and TAL Inorganics. The analytical results were presented in the Round 1 Groundwater Monitoring Report for Area A Landfill (TtNUS, February 2000) and a summary of the data was also presented in Appendix G of the Draft Year 2 Annual Groundwater Monitoring Report for Area A Landfill (TtNUS, March 2002). The analytical results from these soil samples as well as other soil samples collected within the limits of the Area A Landfill during the Phase II RI will provide sufficient information and will be considered along with the new groundwater data during the geochemical evaluation of the site.

SPECIFIC COMMENTS (Attachment A)

1. Specific Comment: p. 4, §2.0 - The Work Plan specifies a field measurement of reduced iron using HACH kit Model IR-18C. While this may provide an independent determination of reduced iron on fresh samples immediately upon collection, EPA notes potential limitations to the method. The manufacturer's specifications for the IR-18C claim a range of 0 – 10 mg/L. The Round 10 analytical results for Area A Landfill groundwater monitoring showed iron in the downgradient wells up to 77.7 mg/L (in 2WMW47DS). Therefore, it is possible that some of the groundwater samples collected in the proposed investigation could have dissolved iron concentrations outside of the HACH kit's specified range. Furthermore, recent experience at an Army landfill site found that the manufacturer's specifications for the HACH kit's valid range are optimistic. Filtered samples, preserved by the standard methods, showed iron concentrations from 0.6 – 94.6 mg/L, while co-located HACH-kit measurements yielded concentrations of 0.8

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– 6 mg/L. At the high end of the laboratory results, the HACH kit was an order of magnitude low and not systematic relative to the lab determinations. (See attached figure.) If the field measurements of Fe(II) are to be meaningful, the field crew should be prepared to perform sample dilutions in the field to verify that the concentrations are not out of range. Alternatively, the field measurements might be dropped from the investigation, with the assumption that the laboratory determinations for dissolved iron are more reliable and are sufficient to support the interpretations. I note that the Work Plan also specifies field measurements of reduced manganese by another HACH kit. The expected range of manganese concentrations should be checked against the nominal range of this device before implementing this step.

Response: Agree with qualification. The commentor brings up a valid concern regarding the test kits. The common assumption made by the commentor is that the dissolved iron concentration measured by the laboratory is equal to the Fe(II) concentration and the difference between the total and dissolved concentration is equal to the Fe(III) concentration. This assumption may not be reliable when small (colloidal) particles are present in the groundwater. It is possible that these particles are present in the groundwater collected from within the dredge spoil and therefore the dissolved iron concentration (e.g., 77.7 mg/L) may be an over estimate of the Fe(II) concentration. To address this issue, the current Work Plan allows for the collection and analysis of both total and dissolved groundwater samples as well as field testing the samples using the HACH test kits for Fe(II). Because the field test kits are relatively inexpensive and the results may provide valuable information, the field tests will be performed. Field personnel will make every effort (i.e., use different test kits with different ranges and perform dilutions as necessary in the field) to measure accurate iron and manganese concentrations in the field.

2. Specific Comment: Table 1 - I recommend that the groundwater analyses include the major cations (i.e., Ca, Mg, Na, K) in order to allow for a complete assessment of the major-element composition of the groundwater, possible identification of hydrochemical facies (e.g., by means of Piper diagrams), etc. Please note that these elements can be added to the analytical program at modest cost, because a multi-element analysis is already being performed by ICP for the metals.

Response: Agree. The standard parameter list for TAL inorganics includes Ca, Mg, Na, and K. Because the proposed groundwater samples will be analyzed for the TAL inorganics parameter list, these major cations are already included in the currently proposed analytical program.