N60200.AR.004828
NAS CECIL FIELD, FL
5090.3a

LETTER OF TRANSMITTAL AND TETRA TECH RESPONSE TO FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS AND ERRATA PAGES FOR FEASIBILITY STUDY REPORT FOR OPERABLE UNIT 5 (OU 5) SITE 15 NAS CECIL FIELD FL
5/18/2007
TETRA TECH NUS INC

7653-3.58.3

TETRA TECH NUS, INC.
661 Andersen Drive • Pittsburgh, PA 15220
Tel 412.921.7090 • Fax 412.921.4040 • www.tetratech.com

PITT-05-7-038

May 18, 2007

Project N7653

BRAC PMO SE
Attn: Mr. Mark Davidson
4130 Faber Place Dr.
Suite 202
North Charleston, South Carolina 29405

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order 0039

Subject: Final Feasibility Study for Operable Unit 5, Site 15 – Errata Pages
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Davidson:

Enclosed please find one copy of the Errata Pages (3) for the Final Feasibility Study (FS) Report for OU 5, Site 15. These errata pages are for minor revisions based on FDEP comments. A copy of the response to comments is attached.

The attached pages replace the pages in the April 2007 FS. Discard the three April 2007 pages and replace them with the attached pages. The electronic version will be revised.

If you have any questions, please call me at (412) 921-8916 or Rob Simcik at (412) 921-8163.

Sincerely,

For

Mark P. Speranza, P.E.
Project Manager

MPS/kf

Enclosures

cc: D. Brittain, U.S. EPA (electronic copy to be provided)
S. Ball, U.S. EPA (electronic copy to be provided)
D. Grabka, FDEP (1 copy)
M. Halil, J. A. Jones (1 copy)
D. Humbert, Tetra Tech NUS (cover letter only)
M. Perry, Tetra Tech NUS File 7653 (1 copy unbound)

NAS CECIL FIELD
SITE 15 FINAL FEASIBILITY STUDY

RESPONSE TO FDEP COMMENTS FROM EMAIL DATED MAY 14, 2007

1. **Page 1-6, first paragraph, last line of the paragraph, the word "selected" is misspelled.**

   Response: The text will be revised as indicated.

2. **In the Table on page 2-7, FDEPs residential SCTL is 100 ug/kg or .1 mg/kg.**

   Response: The table will be revised to 100 ug/kg.

3. **In the Table at the top of page 2-9, the maximum BaPEq concentration is 1,573,000 ug/kg, which seems high. Most PAHs have only a fraction of the carcinogenicity of benzo(a)pyrene and to have a sample with that much BaP equivalents would seem to need to be almost pure PAHs in it. I would have to wonder what the total PAHs concentration would be. Please make sure that this is not a total PAHs concentration that inadvertently got into the table. Also, please note that the maximum BaPEq concentration detected in the Table at the top of page 2-10 has a different value, 956,000 ug/kg.**

   Response: A duplicate sample was collected at the location with the maximum BaPEq value (CF15SS249). Thus, there are three sets of data associated with the sample location: the sample, the duplicate, and the average of the pair. The BaPEq concentration for the sample is 1,573,000 µg/kg, and the BaPEq concentration of the average of the pair is 956,000 µg/kg. For statistical analysis of the data, the average value was used. Because statistical methods were used in the determination of cleanup goals, the concentration on page 2-9 will be revised to 956,000 µg/kg. This is consistent with the maximum value given on Page 2-10.

   To check you concern regarding pure product, the total PAH concentration was calculated from the analytical results in Appendix C-1.1, Page 49 of 106. The sum of the PAH concentrations in sample CF15SS249 is 13,330,000 µg/kg, which is les than the "pure" concentration of 1,000,000,000 µg/kg. (Note that in this calculation, if a compound had a concentration less than detection limit, the detection limit was used.)

confirmatory, and supplemental programs. Figure 1-16 shows monitoring well locations and groundwater sampling results for arsenic during the RI and subsequent sampling at Site 15.

The following provides a chronological list of the investigations conducted at Site 15:

- 1985 - An Initial Assessment Study (IAS) was prepared for NAS Cecil Field by Envirodyne Engineers under the Navy Assessment and Control of Installation Pollutants (NACIP) program, which was eventually replaced by the Navy's Installation Restoration (IR) Program. The IAS consisted of the following stages: (1) records search, (2) on-site survey, (3) confirmation study ranking, (4) site ranking, and (5) confirmation study recommendations.

- 1988 - A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) was performed for NAS Cecil Field by Harding Lawson Associates (HLA) (1988a). The goals of the RFI were to verify the existence of suspected hazardous constituents at various waste disposal sites, to delineate the boundaries of potentially contaminated sites, to investigate the surficial aquifer and potable water supply wells, and to investigate selected surface areas for possible contamination. One surface soil sample was collected at Site 15 as part of the RFI. A geophysical survey was also conducted at the site.

- July 1993 - As part of the Basewide Ecological Assessment, one soil sample was collected at Site 15 (HLA, 1998b).

- August 1994 to April 1995 - As part of the OU 5 RI (ABB-ES, 1997) a field screening program consisting of an unexploded ordnance (UXO) survey, surface and subsurface soil screening, and installation of piezometers was completed. The UXO survey was completed at the site prior to the sampling activities. No UXO was found; however, several pieces of metal shell casings and similar items were located and removed. The soil screening program was designed to delineate the nature and extent of PAH, lead, TNT, and TRPH contamination in surface soil using on-site and off-site data analysis. Surface soil screening consisted of sample collection from 0 to 1 foot bgs at 100-foot grid spacing over an area approximately 2,000 feet by 3,000 feet, except in the area around the burn chamber and blast platform, where the grid spacing was increased to 25 feet over an area of 100 feet by 100 feet. Collection and analysis of samples for target screening parameters continued outward from the burn chamber and firing pad until a "no detection" result was obtained for that particular parameter, thus delineating the extent of contamination for that parameter. Analyses for other target parameters with detections continued outward. This screening technique resulted in varying combinations of analyses for samples collected from 409 locations. A total of 324 samples were collected for off-site lead analysis, 263 samples were collected for on-site PAH analysis, 146 samples

were collected for on-site TNT analysis, and 136 samples were collected for on-site TRPH analysis during the surface soil screening program. Subsurface soil screening consisted of the collection of 16 subsurface soil samples from four soil borings advanced in the area of the burn chamber and blast platform. Samples were collected at depths of 0 to 1 foot bgs, 1 to 3 feet bgs, 3 to 5 feet bgs, and 5 to 7 feet bgs at each of the four borings. Subsurface soil samples were analyzed off site for lead and on site for volatile organic compounds (VOCs), PAHs, and TRPH. Four temporary piezometers were installed to determine the direction of groundwater flow in the surficial aquifer. Evaluation of water level data collected on three separate occasions indicated that groundwater flow is to the southwest toward Yellow Water Creek. A groundwater screening program was not implemented at Site 15 because the chemicals of concern (COCs) were known to be relatively immobile when sorbed to site soil. However, eight monitoring wells, which would be used during the confirmatory sampling event, were installed at locations selected based on water level data.

- July and August 1995 - As part of the OU 5 RI, ABB-ES performed confirmatory sampling and analysis for surface and subsurface soil at Site 15 to refine the nature and extent of contamination in soil determined during the screening process. During this sampling round, 34 surface soil samples were collected at depths of 0 to 1 foot bgs and analyzed for Target Compound List (TCL) organics, Target Analyte List (TAL) inorganics, TRPH, and nitroaromatics. Six additional surface soil samples were analyzed for lead, four additional surface soil samples were analyzed for PAHs, and three additional surface soil samples were analyzed for nitroaromatics. Two of the surface soil samples were also analyzed for pH, moisture content, sieve and hydrometer size distribution, bulk density, and cation exchange capacity. Also during this sampling round, 12 subsurface soil samples were collected at depths of 1 to 3 feet (immediately above the water table) and were analyzed for TCL organics, TAL inorganics, TRPH, and nitroaromatics. In addition, four of these samples were analyzed for total organic carbon (TOC). One additional subsurface soil sample was analyzed for PAHs only, and one additional subsurface soil sample was analyzed for nitroaromatics only. Confirmatory groundwater samples collected from the eight Site 15 monitoring wells were analyzed for TCL organics, TAL inorganics, TRPH, and nitroaromatics. Selected groundwater samples were also submitted for TOC analysis, and slug tests on the monitoring wells were performed. A confirmatory surface water and sediment sampling program was completed to assess potential contaminant migration through groundwater-surface water interaction, surface runoff, and/or soil erosion, and to aid in assessment of potential human health and ecological risks. One surface water/sediment sample upgradient of the site and two downgradient surface water/sediment samples were collected and analyzed for TCL organics, TAL inorganics, TRPH, and nitroaromatics. Surface water samples were analyzed for cyanide, hexavalent chromium, sulfide, total dissolved solids (TDS), alkalinity, hardness, total phosphate, and Kjeldahl nitrogen. Field measurements of surface water pH,

when a soil pica event while at play is most likely, ingesting 10 grams of soil in an episode. The basis for this determination is presented in more detail in Appendix F.

Site-specific SCTLs were developed for the other COCs (antimony, arsenic, and lead) using the same exposure assumptions in conjunction with the toxicity factors and chemical properties used in developing FDEP SCTLs. Details regarding development of these SCTLs are presented in Appendix F.

Although the reuse plan for Site 15 stipulates that the site will be maintained as a green space with no development, determining the requirements for unrestricted use of the site (e.g., residential use) was evaluated to provide a basis of comparison. To achieve unrestricted use, the entire site must be remediated such that COC concentrations within 0.25-acre exposure units are less than the Chapter 62-777, F.A.C. residential SCTLs.

The following table summarizes the site-specific recreational SCTLs developed based on protection of human health and the Chapter 62-777 FDEP residential SCTLs for the Site 15 COCs.

SCTLs for Site 15 COCs		
COC	**Site-Specific Recreational SCTL**	**FDEP Residential SCTL**
BaPEqs	2,250 µg/kg	100 µg/kg
Lead (Acute)	6,500 mg/kg	NA
Lead (Chronic)	3,281 mg/kg	400 mg/kg
Antimony	1,440 mg/kg	27 mg/kg
Arsenic	36 mg/kg	2.1 mg/kg
TRPH	8,900 mg/kg	460 mg/kg

2.2.2 Development of Site-Specific Ecological Target Levels

The detailed development of target levels also identified as remediation goals for protection of ecological receptors is described in Appendix B. The methodologies through which the ecological target levels were developed have been approved by representatives of the Navy, U.S. EPA Region 4, and FDEP.

As discussed in Appendix B, the toxicity of PAHs to upper-level receptors such as birds and mammals via the terrestrial food web is negligible at the concentrations present at Site 15. The concentration of total PAHs (the sum of individual detected PAHs) believed to be potentially toxic to soil invertebrates at Site 15 is greater than 1,121,520 µg/kg, based on a site-specific toxicity test. This was the maximum total PAH concentration tested in the study.

Risk to invertebrates from lead in soil was evident at the highest concentration tested (5,470 mg/kg). There was no indication of lead-related impacts at concentrations less than 1,120 mg/kg. There is uncertainty regarding lead toxicity to invertebrates at soil concentrations between these two values. The soil target level for lead to be protective of insectivorous birds is 1,127 mg/kg (site-wide average lead concentration). The characterization of lead-related risk to insectivorous mammals is complicated by uncertainty regarding the most appropriate soil-to-invertebrate bioaccumulation factor (BAF). Based on the regression-derived BAF from 12 invertebrate and corresponding soil samples, the soil ecological target level for lead that is protective of insectivorous mammals is 2,512 mg/kg. Based on the median BAF, the soil ecological target level for lead that is protective of insectivorous mammals is 4,716 mg/kg. Both of the insectivorous mammal screening values apply to 2-acre average lead concentrations.

2.2.3 Determining the Extent of Remediation Required to Achieve Cleanup Goals

A statistically based approach was used to determine the concentrations above which soil must be removed to achieve UCLs or average concentrations less than or equal to site-specific SCTLs for a defined exposure unit, the area to which a receptor is assumed to be exposed. For human and avian receptors, the entire site is defined as the exposure unit. For mammalian receptors, the exposure unit is a 2-acre unit, which represents the home range of the shrew.

For Site 15, there is a need to achieve exposure concentrations less than site-specific SCTLs concurrently for BaPEqs and lead. The cleanup goals for all receptors are summarized below.

Summary of Cleanup Goals			
COC	**Receptor**	**Recreational and Ecological**	**Residential and Ecological(1)**
Lead	Human (Site-wide)	3,281 mg/kg	400 mg/kg
	Acute Toxicity Human (Site-wide)	6,500 mg/kg	6,500 mg/kg
	Avian (Site-wide)	1,127 mg/kg(2)	1,149 mg/kg
	Mammalian (2-Acre)	2,512 mg/kg(2)	2,512 mg/kg
BaPEqs	Human (Site-wide)	2,250 µg/kg	100 µg/kg
Arsenic	Human (Site-wide)	36 mg/kg	2.1 mg/kg
Antimony	Human (Site-wide)	1,440 mg/kg	27 mg/kg
TRPH	Human (Site-wide)	8,900 mg/kg	400 mg/kg

1 These values apply to 0.25-acre exposure units.
2 The minimum remedial goal for these receptors based on the uncertainty of the variables.

The pre-remediation conditions identifying maximum concentrations, UCLs, and average concentrations for the identified COCs are summarized below.

Pre-Remediation Conditions			
COC	**Maximum Concentration**	**UCL**	**Average Concentration**
Lead	41,400 mg/kg	Not applicable	990 mg/kg
BaPEqs	956,000 µg/kg	13,000 µg/kg	9,400 µg/kg
Arsenic	451 mg/kg	29 mg/kg	17 mg/kg
Antimony	2,440 mg/kg	164 mg/kg	78 mg/kg
TRPH	2,380 mg/kg	273 mg/kg	96 mg/kg

The site-wide average lead concentration of 990 mg/kg is already less than its minimum site-wide goal of 1,127 mg/kg, the concentration protective of the avian receptor. Therefore, site-wide remediation for lead would not be required to be protective of avian receptors. However, to address acute toxicity to children, it was agreed that soil with lead concentrations greater than 6,500 mg/kg would be removed. Removal of soil with lead concentrations greater than 6,500 mg/kg results in a site-wide post-remedial concentration of 577 mg/kg, which is protective of human receptors under a low-intensity recreational reuse scenario and site-wide ecological receptors.

To address the mammalian ecological receptors represented by the least shrew, which has an average home range of 2 acres, Site 15 was divided into a grid of 2-acre exposure units. A statistical analysis was performed for each 2-acre exposure unit assuming removal of all soil with lead concentrations greater than 6,500 mg/kg. The average lead concentration in two 2-acre exposure units exceeded the remedial goal (2,512 mg/kg) for the least shrew. Therefore, additional removal of soil in these two 2-acre units with lead concentrations greater than 4,000 mg/kg would be required to achieve the mammalian ecological remedial goal.

In accordance with Chapter 62-780, F.A.C., soil with concentrations greater than three times the site-specific SCTLs would be removed based on acute toxicity. Based on the existing conditions and site-specific SCTLs, remediation or treatment would not be needed to address antimony contamination. Removal of soil with BaPEq and arsenic concentrations greater than three times their site-specific SCTLs is more than sufficient to result in site-wide UCLs less than site-specific SCTLs. To be protective of human and ecological receptors, the existing on-site TRPH concentrations indicate that remediation or treatment would not be needed. However, there are locations where TRPH concentrations exceed the leachability criterion of 340 mg/kg, the most restrictive FDEP SCTL for TRPH. Because the volume of soil associated with the exceedances of the leachability criterion was relatively insignificant, it was agreed that the pickup value for TRPH would be based on the leachability criterion.

The corresponding pickup values that comply with regulatory requirements and would obtain site-wide cleanup goals that allow for recreational use of the site are presented below.

Recreational Pickup Values			
COC	Maximum Detected Concentration	Recreational Use Cleanup Goal	Recreation Use Pickup Value
BaPEqs	956,000 µg/kg	2,250 µg/kg	6,750 µg/kg(1)
Arsenic	451 mg/kg	36 mg/kg	108 mg/kg(1)
Lead	41,400 mg/kg	3,281 mg/kg (chronic)	6,500 mg/kg(2)
TRPH	2,380 mg/kg	8,900 mg/kg	340 mg/kg(3)

1 Three times the site-specific recreational SCTL as per Chapter 62-780, F.A.C. for acute toxicity.
2 Site-specific acute toxicity SCTL.
3 Chapter 62-777, F.A.C. leachability SCTL.

The post-remedial conditions that exist after applying the recreational pickup values are presented below.

Post-Remediation Conditions		
COC	Maximum Concentration	Site-Wide Concentration(1)
Lead (site wide)	6,500 mg/kg	577(2) mg/kg
BaPEqs	6,750 µg/kg	695 µg/kg
Arsenic	34.5 mg/kg	7.3 mg/kg
Antimony	221 mg/kg	30.8 mg/kg
TRPH	114 mg/kg	39.4 mg/kg

1 Represented by the 95-percent UCL, except as noted.
2 Average concentration.

For lead, it is necessary to achieve a site-wide concentration of 1,127 mg/kg to protect the most sensitive receptor, the mockingbird, and to achieve 2-acre concentrations less than 2,512 mg/kg to protect the shrew. To be protective of an acute lead exposure, it was agreed that the maximum lead concentration remaining on site would be 6,500 mg/kg. Removal of soil with lead concentrations greater than 6,500 mg/kg results in attainment of the site-wide SCTL. Additional removal of soil with lead concentrations greater than 4,000 mg/kg was required in two 2-acre units to attain the mammalian ecological SCTL.

For cPAHs, it is necessary to achieve a site-wide BaPEq concentration of 2,250 µg/kg to protect the low-intensity recreational receptor. For arsenic, it is necessary to achieve a site-wide concentration of 36 mg/kg. Removal or treatment of soils with concentrations greater than three times their site-specific SCTLs results in post-remediation site-wide UCL concentrations less than these site-wide SCTLs.