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PITT-09-0-079

September 25, 2000

Project Number 5003

Ms. Meghan Cassidy
Environmental Protection Agency
Region I (Mail Code: HBT)
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, Maine 04333-0017

Reference: Contract No. N62472-90-D-1298 (CLEAN)
Contract Task Order No. 201

Subject: Response to Comments on the Round 1 Interim Offshore Monitoring Data Package
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Ms. Cassidy/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. is pleased to provide to the U.S. Environmental Protection Agency Region I (USEPA) and to the Maine Department of Environmental Protection (MEDEP) 4 copies each of the response to comments on the data package for Round 1.

If you have any comments or questions, or if additional information is required, please contact Mr. Fred Evans at 610-595-0567 x 159.

Sincerely,

Deborah Cohen, P.E.
Project Manager

DC/kf

Enclosure

NORTHDIV, (Code 1823/FE, F. Evans) (4 copies)
PNS (Code 106.3R, M. Raymond) (4 copies)
NOAA (K. Finkelstein)
ME Dept. of Marine Resources (D. Card)
Mr. Doug Bogen
Ms. Michele Dionne
Ms. Mary Marshall
Mr. Jack McKenna
Mr. Onil Roy
Dr. Roger Wells
PNS Code 100PAO (w/o enclosure)

US Fish & Wildlife Service (K. Munney)
NH Fish & Game (C. McBane)
Mr. Jeff Clifford
Ms. Eileen Foley
Mr. Phil McCarthy
Ms. Mary Menconi
Ms. Johanna Lyons (SAPL)
Ms. Carolyn Lepage
COMSUBGRU TWO (R. Jones)

RESPONSE TO MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION INFORMAL COMMENTS DATED FEBRUARY 17, 2000 OFFSHORE MONITORING PROGRAM, ROUND 1 DATA PACKAGE PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1. **Comment:** Detection of 1113 ug/kg 4,4-DDT at Station 1 (shipyard end of the bridge at the gate house). This is about 5 times higher than the highest concentration seen at Sullivan Point during the seep/sediment monitoring. The other two samples at Station 1 were not nearly as high but still at or above the ER-M (46 ug/kg and 109 ug/kg).

   Response: Comment noted. The sample location at MS-1 will be included in the toxicity testing during Round 2 and the Navy is continuing to research possible pesticide uses at PNS.

2. **Comment:** Mussels at Sullivan Point had 631 ug/kg 4,4-DDT. I downloaded data from NOAA's National Status and Trends webpage and found that nationwide, between 1986 and 1996, the highest DDT concentration seen in mussels was 314 mg/kg in San Francisco Bay. That is, the concentration seen in mussels at Sullivan Point was over twice as high as seen in any other mussels nationwide over a 10 year period. Apparently, this high level is pretty localized as the two other mussel samples collected from the Sullivan Point Station (Sta. 10) were 6.4 ug/kg and 9 ug/kg.

   The level of DDT in sediment colocated with the mussels exhibiting high DDT concentrations was also relatively high, 48 ug/kg which is just above the ERM of 46 ug/kg. This is pretty much the same concentration seen there in Rounds 9 and 10 (45 ug/kg and 49 ug/kg respectively).

   Response: The main objective of the NOAA Status and Trends program was to determine contaminant concentrations in mussels that are representative of regions/areas, not capture the highest contaminant concentrations in the country. The following text is a small excerpt from the NOAA web site that indicates that they recognize that there are sites throughout the country that will have higher concentrations. "Sampling on a much finer spatial scale than the NS&T Program could yield much higher levels of contamination, but they would be of little spatial significance from a national perspective. However, this fact illustrates the need for more detailed monitoring programs in selected areas for local decision making:"[1]

3. **Comment:** DDT concentrations in reference station sediments were very low. Several Shipyard stations also had similarly low levels of DDT in sediments. However, the only stations exhibiting elevated levels of DDT in sediments were around the Shipyard. Thus we believe the concentrations of DDT seen at Shipyard stations are due to some source at the shipyard, and not from general area-wide impact. I will spend more time reviewing the data but for now those issues really stand out. At this time I don't have any recommended actions to take beyond the sampling already planned. However, we do need to keep a close eye on these stations and perhaps consider searching for sources of DDT around Sullivan Point and Monitoring Station 1. Also, could you please have TtNUS send me the data in an electronic format (XL)?

   Response: As per the response to Comment 1, the Navy is continuing to research possible pesticide uses at PNS. The data will be sent in an Excel spreadsheet after all of the lobster data (tomalley and dissected muscle) from Round 1 is compiled.

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[1] http://seaserver.nos.noaa.gov/projects/nsandt/spatial.html

RESPONSE TO EPA COMMENTS DATED MARCH 13, 2000
OFFSHORE MONITORING PROGRAM, ROUND 1 DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

GENERAL COMMENTS

1. **Comment:** As stated previously, the interim offshore monitoring program is intended to identify potential impacts to the offshore through the evaluation of sediment, mussel and/or juvenile lobster analytical data and to determine whether current and future concentrations of chemicals of concern (COCs) in the offshore areas of PNS are at acceptable levels.

   A review of the data identifies the presence of many known contaminants. However, an evaluation of the data to benchmark criteria has not been included and is outside the scope of this review. The Interim Offshore Monitoring Plan dated October, 1999 states that data reviews and some data assessments will be performed as data are received from each sampling round. The current report is a data report only, with no assessment component. It is not clear when an evaluation of the data will be made.

   Response: The data assessment will be conducted after each round and reported as part of the Baseline Report following Round 4 of the interim offshore monitoring program. Data quality problems identified during the data assessment that may impact the program will be reported earlier, as necessary, to ensure the quality of the interim monitoring program.

SPECIFIC COMMENTS

2. **Comment: Page 2-3, Section 2.1.2, *Mussel Sample Collection*.** The second paragraph on this pages states *"all mussels selected for analysis were cleaned with a brush and seawater or with a garden hose with tap water..."*. The Interim Offshore Monitoring Plan for OU4 dated October, 1999 Section 5.1.2 on page 5-3 lists only seawater to be used for cleaning purposes. It is recommended that if seawater is unavailable, distilled, deionized water be substituted for cleaning.

   Response: For the second and future rounds, mussel selected for analysis will be cleaned with a brush and seawater as indicated in the Interim Offshore Monitoring Plan for OU4. However, the Navy believes the mussel samples for round 1 were not distorted because the mussel shells were closed while they were rinsed with a garden hose with tap water.

3. **Comment: Page 3-2, Section 3.1.2, *Analytical Data*.** This section states that "AVS (0-2 cm) was subtracted from the SEM that was collected from 0-10 cm, because it is assumed that the SEM concentrations will be the same throughout the 0-10 horizon". The approved Interim Offshore Monitoring Plan for OU4 dated October, 1999 states that since "sediment in the 0-2 cm range may be more oxygenated and therefore have lower AVS concentrations, than sediment from 0-10 cm samples collected from the 0-10 cm range may result in potential underestimation of the bioavailability of metals in the sediment. Therefore, to determine the difference between AVS concentrations in the two ranges, sediment from both ranges will be collected and analyzed during the first four rounds of interim offshore monitoring". SEM was not collected from the 0-2 cm sediment depth. Whenever possible, both AVS and SEM should be analyzed for samples taken at each depth.

   Response: Samples were not collected from the 0 to 2 cm range for SEM analysis because of the assumption that sediment metals concentrations would be relatively homogeneous in the top 10 cm because of bioturbation. The rationale for collecting SEM from the 0 to 10 cm interval only and taking AVS concentrations at two sampling intervals (0 to 2 cm and 0 to 10 cm), was agreed to

during the June 29 and 30 Data Quality Objectives meeting (please see page 7 of the meeting minutes in Appendix B of the Interim Offshore Monitoring Plan (TtNUS, 1999)).

CONCLUSIONS

4. **Comment:** The Interim Offshore Monitoring Program Round 1 Data Package is a presentation of data collected to date, with no data evaluation component. The following questions were raised as a result of this review:

   - The SEM data is limited to the 0 to 10 cm depth range.
   - It is not clear at what intervals the data collected will be evaluated for trends and ecological risk.

   The questions regarding AVS/SEM sampling should be addressed before the next sampling round, in order to ensure that data needs outlined in the approved Work Plan will be fulfilled.

   Response: As per response to EPA Comment 3, the AVS and SEM analyses for Round 1 was conducted as per the Interim Offshore Monitoring Program.

   The data evaluation (trends and comparison to ecological-based interim remediation goals) is discussed in Section 3.0 of the Interim Offshore Monitoring Plan (TtNUS, October 1999). The intervals for data evaluation are after the first four rounds (baseline rounds) of sampling (reported as part of the Baseline Report) and then again after the 5 year review monitoring (reported as part of the 5-year review reports).

RESPONSE TO NOAA COMMENTS DATED MARCH 1, 2000
OFFSHORE MONITORING PROGRAM, ROUND 1 DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

[Note that the tables and figures referenced in NOAA comments were not repeated in these responses. In addition, the Navy did not check the tables and figures for accuracy.]

Comments:

Three sediment samples were collected at each of 14 monitoring stations, except for MS-11 located at the southern end of the site. Two samples were collected at this site due to lack of sediment, both dominated by sand (>93%). The report provides a good summary of the collection area (tidal zone, eelgrass or mussel beds present). The apparent redox discontinuity was measured showing very shallow redox zones (<1cm) in most of the stations, except for samples from MS-01, MS-12, MS-13, and MS-14. The depth of the apparent redox discontinuity was greater at the reference stations, with overall depths ranging from 0.5 to 5 cm.

The reference areas were also sampled for grain size and TOC, providing some baseline to data to evaluate the applicability of the sites selected for reference comparison. Grain size was quite variable both among the monitoring stations and within the individual samples collected at each station. Many of the stations had at least one sample dominated by sand (>70%). Exceptions to this were stations MS-03, MS-12, and MS-13. The reference areas appeared to be sandier overall, although no summary information was provided to evaluate this quantitatively. All the samples from RS-04 consisted dominantly of sand (>92%), whereas the other stations had higher levels of the fine-grained fraction. Consistent with the coarse grain size, TOC concentrations were generally low (<3%). The only exceptions were MS-02 (7.25% at one station), and one qualified value (J) at RS-03. Although the reference stations were sandier, the reference areas appear to be appropriate for the purposes of contaminant comparison.

Each of the major contaminant groups was evaluated by comparing the mean concentrations measured from the monitoring stations to the means measured at the reference stations from both the sediment and mussel tissue data. Selected parameters that appeared to have the greatest difference between the monitoring and reference station means were compiled in a summary table (Table 1). The maximum measured concentrations, and the location of the highest measured values, were also compiled on the table. Concluding remarks are provided below for each contaminant category.

Response: Comments noted.

POLYAROMATIC HYDROCARBONS (PAHS)

The mean concentration of all of the measured PAHs in sediment samples were within one standard deviation of the mean reference values (Figure 1). Several monitoring stations, however, were enriched in parent low molecular weight (LMW) and high molecular weight (HMW) compounds, including phenanthrene, fluoranthene, pyrene, and benzo(b)fluoranthene (Table 1). Maximum concentrations of PAH compounds measured in the sediments were uniformly measured at Station MS-12 located along the southern end of the PNS along the Piscataqua River. The presence of higher concentrations of petrogenic parent compounds relative to homologues at this station was indicative of a local unweathered source of these PAHs. Most of the mean PAH values measured in sediment were below the ER-L; most maximum concentrations were below the ER-M.

In the mussel tissue samples, the mean concentrations of the LMW PAHs acenapthene, fluorene, anthracene, and the lower alkylated honologues of these LMW PAHs were greater than one standard

deviation above the reference mean concentrations. In addition, the pattern of the LMW PAHs in the monitoring stations showed decreasing values from the parent value through the homologue series suggesting a fresh source of petroleum-type PAHs consistent with sediment data (Figure 2). This was in opposition to the pattern measured in the mussel tissues collected at the reference areas, which showed higher concentrations in the homologues with greater degree of alkylation, indicating a more weathered source of petroleum-derived PAHs. The highest concentrations of LMW PAHs were measured, similar to sediments, at MS-12.

The mussel tissue data showed a similar pattern of HWM PAHs, with mean concentrations of fluoranthene, pyrene, benzo(a)anthracene greater than one standard deviation greater than the mean of the reference areas (Figure 2). The maximum concentrations of these selected HMW PAHs measured in mussel tissues were collected at MS-13 (e.g., 1,135 mg/kg fluoranthene; Table 1). Both MS-12 and MS-13 samples were collected in the subtidal zone, located along the southwestern side of the PNS, with MS-13 collected near Sites 5 and 31. Both MS-12 and MS-13 had a moderate sand content (MS-12 – 44-65%; MS-13 – 18-26%) with no great difference in lipids content between the mussel tissue of these two stations. These data would suggest that, although PAH concentration in the sediment sampled around the PNS are lower than the ER-M, PAHs are effectively bioaccumulated in the mussel tissue. However, these total PAH concentrations likely are not great enough to cause obvious injury to individual mussels or the resident population. Nevertheless, NOAA suggests that the Navy look into this possibility.

Response: The objective of the data package was to present the results of the sampling. The data will be evaluated and reported in the Baseline Report after the first four rounds of data are collected. The evaluation in the Baseline Report may not specifically address effects to individual mussels or the resident population, however, the Preliminary Remediation Goals (which will be used as interim remediation goals for the interim offshore monitoring program) that will be calculated after Round 2 will be used to evaluate impacts to aquatic biota.

PESTICIDES/PCBS

Most of the pesticides analyzed in both the monitoring and reference stations had low overall detected concentrations. The series of DDT and its degradation products DDE and DDD, however, were selected to show the levels of enrichment of, especially, 2,4-DDT and 4,4-DDT (Table 1). All of the mean DDT, DDE, and DDD compounds measured from the monitoring stations were elevated relative to reference value concentrations, and commonly higher than the ER-M. The highest concentration of any pesticide in sediment was 4,4-DDT (1,113 mg/kg), measured at Station MS-01 (sample 399A), located in a salt marsh near the oil gasification plant in the Back Channel area. This value was about five times higher than the highest concentration measured at Sullivan Point during the seep monitoring phase. The other two samples at this station had moderately high 4,4-DDT sediment concentrations (49 and 109 mg/kg). In contrast, the mussel samples that were co-located at MS-01 had 4,4-DDT concentrations that were below detection, and relatively low concentrations of the other DDT series parameters ranging from 0.31 (2,4-DDE) to 16 mg/kg (4,4-DDE). The report does note, however, that the mussels collected at this station were collected farther towards the water because of insufficient numbers at the salt marsh. Therefore, the incidence of the high sediment DDT value and its associated products in concentrations above the reference mean should be evaluated carefully, however, for future monitoring.

Individual tissue samples also showed elevated DDT concentrations. Maximum tissue concentrations of DDT, DDE, and DDD were measured consistently at Station MS-10 near Site 8. Aside from these very high values, the mean pesticide concentrations measured in the mussel tissues were only on the order of 2-3 times higher than the reference means.

Mean concentrations of PCBs congeners in sediments were elevated by an order of magnitude in comparison to reference levels. The highest concentrations (>20 mg/kg) were located at stations MS-03 in the Back Channel by Site 32, and MS-10 and MS-12 on the southern side of the PNS. Maximum PCB congener concentrations in sediments were all below 75 mg/kg. Tissue samples also showed similarly

elevated concentrations (or detected PCBs that were not detected in reference samples). Although there was some correlation between elevated PCBs in co-located sediment and tissue samples (especially at Station MS-03), additional data analysis would be required to differentiate regional ecological effects from localized PCB sources.

Response: Comments noted. Note that MS01-399A (the location of the highest 4,4'-DDT concentration) was a subtidal station and it was not collected in a saltmarsh. The Navy believes the station being referred to in the first paragraph as located in a saltmarsh is MS02-399A.

METALS

Mean metal sediment concentrations were high overall in the monitoring stations, especially those shown in Table 1. Mean concentrations of Cu, Pb, Ni, and Zn were higher than the ER-M values for those metals. The statistical means of metals data collected at the monitoring stations were skewed by exceptionally high values measured at one monitoring station. The highest values of all of these metals were measured uniformly at Station MS-11 (299A and 399A). These two samples were collected in the intertidal zone of the Piscataqua River near Sites 6 and 29 of the PNS. MS-11 was dominated by sand (>93% in both samples), and only two samples were collected due to the lack of sediment. The high metals values at this station (especially Pb) were due to the likely failure of the revetment allowing contaminated soil to fall in the area. Re-calculating the averages without the inclusion of MS-11 would provide a more realistic assessment of the distribution of metals values in sediment.

Overall, the mean metals concentrations measured in the monitoring stations in mussel tissue were only slightly higher than the overall reference mean values. The tissue samples from the collected mussels did not show the same pattern as in the sediments samples. The highest values of Cu and Pb were measured at Station MS-11, potentially due to release from the metals-contaminated soil located there. Other maximum metals concentrations were measured at a variety of other stations. The lack of correlation between sediment and tissue data as well as the overall moderate metals concentrations suggests that metals are not as important of an ecological concern. Because lead was originally a contaminant of concern, however, the distribution of lead in monitoring stations outside of MS-11 should be evaluated.

Response: The Navy agrees that the high metal concentrations at MS-11 may be skewing the statistical mean of the monitoring stations. Of note, this is being evaluated as part of the Data Quality Assessment and will be discussed in the Baseline Report.

DIOXINS/FURANS

Dioxin (2,3,7,8-TCDD) and furan (2,3,7,8-TCDF) were not detected in any sediment or mussel tissue sample from either the monitoring or reference stations. The calculated mean concentrations of the measured dioxin/furan congeners calculated from the monitoring station data were consistently slightly higher than the means calculated in the reference, but generally near or within one standard deviation of the reference mean. Because of the magnitude of the number of samples reported as below the detection limit (or qualified reported values below the normal detection limit), statistical comparison of the dioxin/furan congener values is more of an exercise in comparison of detection limits. The monitoring stations had a higher frequency of detection, and maximum concentrations ranged from near reference values to 2-3 times higher than the maximum values measured at the reference stations. The highest dioxin congener concentration (Total HPCDD) in both sediment and mussel tissue was measured at Station MS-10 (Table 1).

Response: Comment noted. Of note, the dioxin/furan data will continue to be collected and be evaluated further as part of the Data Quality Assessment and will be discussed in the Baseline Report issued after the first four rounds are collected.

AVS-SEM

Summary data are not presented on Table 1 for SEM-AVS data because no statistical summary was provided in the data report. The SEM-AVS data were relatively consistent among the reference stations, with the concentrations of acid volatile sulfides ranging from 1.6-35 mmol/g in both sets of samples. For the upper 2 cm, all of the AVS values were <10 mmol/g. The SEM-AVS calculations for the 0-10 cm samples in the reference areas ranged for –1.7 to –35 mmol/g. Again, the upper sediment samples had a narrower range of results (-0.19 to –19 mmol/g), but all SEM-AVS values were less than zero.

AVS-SEM results from the sediment stations were extremely variable. The two samples collected from MS-11 (with the highest metals values) was one of the few stations with positive SEM-AVS values (5.0 and 128 mmol/g) suggesting bioavailability of the divalent metals of this station. Other positive SEM-AVS values were calculated at selected samples from Stations MS-01, MS-04, MS-08, MS-09, MS-10, but all had relatively low values (< 10 mmol/g).

Response: Comment noted.