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NSY PORTSMOUTH
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LETTER REGARDING THE PRELIMINARY EVALUATION OF RESULTS FOR LEAD ANALYSIS NSY PORTSMOUTH ME
11/10/1999
NAVFAC NORTHERN

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/FE

10 NOV 1999

Ms. Meghan Cassidy
U.S. Environmental Protection Agency, Region I
JFK Federal Building HBT
Boston, MA 02203-2211

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

Dear Ms. Cassidy/Mr. McLeod:

SUBJECT: INTERIM OFFSHORE MONITORING PROGRAM FOR THE INSTALLATION RESTORATION PROGRAM, PORTSMOUTH NAVAL SHIPYARD, KITTERY, ME

Attached is a Preliminary Evaluation on the expedited laboratory results for samples analyzed for lead collected at Monitoring Stations MS-10, MS-11, and MS-12 from Round 1 of the Interim Offshore Monitoring, and a copy of Figure 3-1 from the Interim Offshore Monitoring Plan for your information.

The sediment and mussel samples collected during September, 1999 immediately offshore of DRMO were elevated for lead above samples collected at Monitoring Stations MS-10 and MS-12. It should be noted the levels of lead in mussel samples collected in September, 1999 were within the range of the mussel samples collected during the Estuarine Ecological Risk Assessment (EERA) (1991 and 1993).

The lead analyses from the juvenile lobster samples collected from MS-11 during the 1999 sampling appear to be an order of magnitude (10 times) greater than the lead analyses for the juvenile lobster samples collected from MS-10 and MS-12 during the same sampling event.

Based on the higher levels of lead detected in the most recent sampling of juvenile lobster, the Navy is proceeding with the following actions:

SUBJECT: INTERIM OFFSHORE MONITORING PROGRAM FOR THE INSTALLATION RESTORATION PROGRAM, PORTSMOUTH NAVAL SHIPYARD, KITTERY, ME

- Reanalyzing the lobster sample from DRMO,
- Comparing the laboratory results from Monitoring Stations MS-10, MS-11, and MS-12 to the laboratory results for the all stations when received,
- Determining what may be contributing to the higher detections of lead in juvenile lobster. The differences in the two data sets could be from one or a combination of factors including:
  - differences from the two sampling periods (6 year hiatus)
  - seasonal differences (fall vs spring summer),
  - laboratory bias (not ruled out), or
  - a combination of the above and other factors.

If additional information is required, please contact me at 610-595-0567, x159.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs Office at (207) 438-1140 or by writing to:

Portsmouth Naval Shipyard
Code 106.3R Bldg 44
Attn Marty Raymond
Portsmouth, NH 03804-5000

Sincerely,

Frederick J Evans

FREDERICK J. EVANS, P.E.
Remedial Project Manager
By direction of the
Commanding Officer

SUBJECT: INTERIM OFFSHORE MONITORING PROGRAM FOR THE INSTALLATION RESTORATION PROGRAM, PORTSMOUTH NAVAL SHIPYARD, KITTERY, ME

Copy to:

NOAA (K. Finkelstein)	US Fish & Wildlife Service (K. Munney)
ME Dept. of Marine Resources (D. Card)	NH Fish & Game (C. McBane)
Mr. Doug Bogen	Mr. Jeff Clifford
Ms. Michele Dionne	Ms. Eileen Foley
Ms. Mary Marshall	Mr. Phil McCarthy
Mr. Jack McKenna	Ms. Mary Menconi
Mr. Onil Roy	Ms. Johanna Lyons
Dr. Roger Wells	Ms. Carolyn Lepage
PNS Code 100PAO	TetraTech NUS (L. Klink, D. Cohen)
PNS (Code 106.3R, M. Raymond)	COMSUBGRU TWO (R. Jones)

Preliminary Evaluation
of
Interim Offshore Monitoring Round 1 Lead Results
from
Stations MS-10, MS-11, and MS-12
for
Portsmouth Naval Shipyard
Kittery, Maine

Samples were collected from the Round 1 of the Interim Offshore Monitoring Program in September, 1999 at Portsmouth Naval Shipyard (PNS), Kittery, Maine. Because of the soil erosion at the DRMO, and the elevated lead levels in the soil, the samples (sediment, mussel, and lobster) collected from stations MS-10 (at Sullivan Point Area of Concern [AOC], downstream of the DRMO), MS-11 (at DRMO), and MS-12 (at Dry Dock AOC, upstream of the DRMO) were analyzed for lead on a quick-turn basis. This paper presents an evaluation of the lead analyses conducted on those samples. It also provides historical data for comparison purposes, including the lead data for sediment, mussel, and juvenile lobster samples collected as part of the Estuarine Ecological Risk Assessment (EERA), and the sediment samples collected as part of the 1996-1997 Seep/Sediment Sampling Investigation.

The following table summarizes the results of the analyses from the samples collected at or near stations MS-10, MS-11, and MS-12 (see Tables 1, 2, and 3 for additional details). The Navy is currently determining whether laboratory methods may be contributing to the higher detections of lead in lobster and consulting with the principal investigator of the EERA, Dr. Robert Johnston, to assist in the data comparison effort.

Summary of Lead Sampling Results mg/kg

Station	EERA Sampling (1991-1993)			Seep/Sed. Invest. (1996-1997)	Interim Offshore Monitoring Program (September, 1999)		
	Sediment mg/kg	Mussel mg/kg	J. Lobster mg/kg	Sediment mg/kg	Sediment mg/kg	Mussel mg/kg	J. Lobster mg/kg
MS-10	55.6	3.04-15	0.04-0.05	29.5-184	29.5-184	2.84-10.2	0.342
MS-11	NS	11.8-273	NS	NS	166-14,200	2.45-199	4.59
MS-12	45.7-75.6	7.1-23.3	NS	NS	51.9-159	3.96-4.58	0.449

All units in mg/kg
NS – Not Sampled

MS-10 (Sullivan Point AOC)

The lead concentrations in the sediment and mussel samples were similar between the samples collected as part of the three investigations. Both of the high lead detections (184 mg/kg) were in samples collected near the same location, at the northwest corner of the causeway (Clark's Island).

MS-11 (DRMO AOC)

Sediment was not sampled from this location during the EERA sampling event because no sediment was present. Also, seeps are not located at this monitoring station so it was not included in the 1996-1997 sampling. The elevated lead detection (14,200 mg/kg) in sediment was located adjacent to the soil erosion area at DRMO. Very little sediment was available for collection at this location, the sediment which was collected was located in small depositional areas behind clumps of mussels and rocks in the intertidal zone. No sediment was available using a grab sampler as recommended in the sampling Standard Operating Procedure. However, a pocket of sediment was discovered behind one of the mussel samples collected at Site 6, DRMO, and sediment was collected within thirty feet of the mussel sample collected at Site 29, Incinerator Site. There was just enough sediment at each of the locations to fill a 550 milliliter sample jar (approx. one pint).

The lead concentrations in the mussel samples were similar between the samples collected as part of the two investigations. The elevated lead detections in the mussels from the EERA and Round 1 Interim Monitoring were from samples that were collected from approximately the same location, and corresponded with the location of the high lead detection in the sediment. The lead concentrations in the juvenile lobster samples collected at MS-11 was 4.59 mg/kg during the 1999 sampling. No previous juvenile lobster samples were collected near this station; however, the lead levels appear to be elevated compared to the concentrations in the lobster samples collected at MS-10 and MS-12.

MS-12 (Dry Dock AOC)

The lead concentrations in the sediment and mussel samples were similar between the samples collected as part of the two investigations. Seeps are not located at this monitoring station so it was not included in the 1996-1997 Seep/Sediment sampling. No previous juvenile lobster samples were collected near this station; however, the lead levels appear to be similar to the concentrations in the lobster sample collected at MS-10.

Overall Lead Concentrations

Tables 1, 2, and 3 present the results of the lead analyses from the sediment, mussel, and juvenile lobster samples, respectively, collected from all of the stations around PNS and from the reference stations as part of the various sampling investigations. With the exception of MS11-299A, the lead concentrations in the sediment and mussel samples collected from stations MS-10, MS-11, and MS-12 during the 1999 sampling generally appeared to be within the range of the lead concentrations at the other PNS stations and at the reference stations. The elevated DRMO sediment sample (MS11-299A) is likely a result of erosion of subsurface soil from the DRMO. Although elevated in concentration, the volume of sediment is small.

Based on the higher levels of lead detected in the most recent sampling of juvenile lobster, the Navy is proceeding with the following actions:

- Reanalyzing the lobster sample from DRMO,
- Comparing the laboratory results from Monitoring Stations MS-10, MS-11, and MS-12 to the laboratory results for the all stations when received,
- Determining whether laboratory methods are contributing to the higher detections of lead in juvenile lobster.

TABLE 1

LEAD CONCENTRATIONS IN SURFICIAL SEDIMENT SAMPLES[1]
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Area of Concern/ Reference Location	Station Number	Date	Depth	Concentration Range (mg/kg)
Back Channel	18	1991	Grab	86.6
	53	1992	0-10 cm	92.1-169
	54	1992	0-10 cm	35.8
	1016	1996-97	0-10 cm	73.35 - 214
	1017	1996-97	0-10 cm	49 - 124
	1018	1996-97	0-10 cm	97.7 - 344
	1020	1996-97	0-10 cm	106 - 354
Clark Cove	3	1991	0-8 cm and Grab	22.7-44.9
	4	1991	0-10 cm and Grab	65.5-82.4
	5	1991	0-10 cm and Grab	30.9-84.2
	6	1991	0-7 cm and Grab	84.1-104
	7	1991	Grab	42.9-122
	8	1991	0-8 cm and Grab	49.7-84.6
	51	1992	0-10 cm	35.8-76.5
	1004.3	1996-97	0-10 cm	76.9 - 516
	1004.5	1996-97	0-10 cm	133.3 - 542
	1011	1996-97	0-10 cm	14.8 - 59.65
DRMO	M11-299A	1999	0-10 cm	14200
	M11-399A	1999	0-10 cm	166
Dry Docks	10	1991	0-8 cm and Grab	45.7-75.6
	12	1991	0-8 cm and Grab	122-124
	13	1991	Grab	35
	17	1991	0-2 cm, 0-8 cm, and Grab	28.1-119
	M12-199A	1999	0-10 cm	159
	M12-299A	1999	0-10 cm	51.9
	M12-399A	1999	0-10 cm	86.3
Jamaica Cove	19	1991	2-4 cm, 0-8 cm, and Grab	28.1-119
	52	1992	0-10 cm	193
	1005	1996-97	0-10 cm	194 - 855
	1006	1996-97	0-10 cm	48.125 - 184
	1012	1996-97	0-10 cm	50.2 - 200
Sullivan Point	9	1991	Grab	55.6
	50	1992	0-10 cm	82.7-155
	1001	1996-97	0-10 cm	29.5 - 138
	1002	1996-97	0-10 cm	32.8 - 84.6
	1003	1996-97	0-10 cm	43.5 - 184
	M10-199A	1999	0-10 cm	33.0
	M10-299A	1999	0-10 cm	29.5
	M10-399A	1999	0-10 cm	184

TABLE 1

LEAD CONCENTRATIONS IN SURFICIAL SEDIMENT SAMPLES[1]
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Area of Concern/ Reference Location	Station Number	Date	Depth	Concentration Range (mg/kg)
Piscataqua River Reference Station	1	1991	0-10 cm and Grab	19.8
	2	1991	Grab	61.9
	11	1991	Grab	43.4
	14	1991	0-8 cm and Grab	17.9-27.4
	15	1991	Grab	24.1-106
	16	1991	Grab	19.8
	55	1992	0-10 cm	81.3-116
	11051	1992	0-2 cm, 6-8 cm	15.9-31.7
	11100	1992	0-2 cm	63.2-68.9
Spruce Creek Reference Location	20	1991	Grab	17.2
	21	1991	0-8 cm and Grab	41.3-46.8
	56	1992	0-10 cm	81.5-90.4
York River and York Harbor Reference Location	22	1991	Grab	25.2
	23	1991	Grab	14.6
	57	1992	0-10 cm	48.9-82.4

Notes:

[1] - Samples included in this table were collected as part of the Estuarine Ecological Risk Assessment (EERA) the 1996-1997 Seep/Sediment sampling investigation, and the 1999 round of the interim offshore monitoring program.

1991 - Phase I EERA

1992 and 1993 - Phase II EERA

1996-97 - Seep/Sediment Sampling Investigation

1999 - Round 1 of Interim Offshore Monitoring Program

Grab - Exact depth unknown but expected to be within top 15 cm

EERA data is included in the PNS database and provided in the Revised Draft Final EERA (NCCOSC, 1997)
NCCOSC, 1997 - Naval Command, Control, and Ocean Surveillance Center, Narragansett, RI, April 1997

1996-1997 Seep/Sediment data is included in the PNS database and provided in the Seep/Sediment Data Package for Round 10 (Portsmouth Naval Shipyard, Brown and Root Environmental, a Division of Halliburton NUS Corporation, Wayne, PA.).

TABLE 2

LEAD CONCENTRATIONS IN INDIGENOUS MUSSEL SAMPLES[1]
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Area of Concern/ Reference Location	Station Number	Date	EERA Phase	Concentration Range (mg/kg)
Back Channel	18	1991-1992	I	9.7-15.8
	18	1992	II	10.7-40.2
	167	1993	II	8.9-10.5
	168	1993	II	8.9-9.6
	169	1993	II	6.3-6.9
Clark Cove	3	1991-1992	I	3.5-8.8
	4	1992	II	6.2-6.4
	5	1991	I	10.8
	6	1991	I	9
	7	1991	I	10.7
	8	1991	I	12.3-13.6
	161	1993	II	6.1-7.5
	162	1993	II	7.8-8.0
	163	1993	II	6.7-8.5
	185	1993	II	4.5-6.6
DRMO	10.5	1991	I	26-37.1
	156	1993	II	11.8-15.5
	157	1993	II	200-273
	158	1993	II	19.2-31.1
	M11-199A	1999		15.3
	M11-299A	1999		199.0
	M11-399A	1999		2.45
Dry Docks	10	1991	I	13.5
	12	1991	I	11
	12.5	1991-1992	I	7.1-21.3
	12.5	1992	II	8.3-23.2
	17	1991-1992	I	2.1-7.5
	17	1992	II	4.7-5.3
	151	1993	II	4.7-5.2
	152	1993	II	3.6-4.9
	153	1993	II	3.3-3.6
	154	1993	II	5.6-7.8
	155	1993	II	3.9-4.5
	M12-199A	1999		4.58
	M12-299A	1999		3.96
Sullivan Point	9	1991-1992	I	5.4-10.2
	9	1992	II	5.1-8.0
	159	1993	II	3.0-4.0
	160	1993	II	8.6-15
	M10-199A	1999		2.84
	M10-299A	1999		4.59
	M10-399A	1999		10.2
Jamaica Cove	19	1991-1992	I	5-8.2
	19	1992	II	4.6-5.5
	164	1993	II	4.6-6.6
	165	1993	II	7.5-7.9
	166	1993	II	147-178

TABLE 2

LEAD CONCENTRATIONS IN INDIGENOUS MUSSEL SAMPLES[1]
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Area of Concern/ Reference Location	Station Number	Date	EERA Phase	Concentration Range (mg/kg)
Brave Boat Harbor	174	1993	II	1.3
	175	1993	II	1.5-1.8
	186	1993	II	1.6
Piscataqua River Reference Station	1	1991-1992	I	3.8-10.8
	1	1992	II	5.6-6.0
	2	1991	I	10
	11	1991	I	9.2
	14	1991	I	5.7
	16	1991-1992	I	3.8-9.1
	16	1993	II	0.05-3.0
	170	1993	II	4.7-4.9
	171	1993	II	3.3-5.1
	172	1993	II	7.5-7.6
	173	1993	II	4.8-7.3
Spruce Creek Reference Location	20	1991	I	6.7
	21	1991	I	6.4
Upper Estuary (at and above Dovers Pt) Reference Location	24	1991	I	5.8
	25	1991	I	3.9
	26	1991	I	5.1-7.8
	27	1991	I	5.8
	28	1991	I	2.8
York River and York Harbor Reference Location	22	1991	I	1.9
	23	1991-1992	I	1.4-3.1
	23	1992	II	1.8-2.1
	123	1993	II	2.1

Notes:
[1] - Samples included in this table were collected as part of the EERA and the 1999 round of the interim offshore monitoring program.
1999 - Round 1 of Interim Offshore Monitoring Program
Only results from indigenous mussel samples are presented in this table
EERA data is included in the PNS database and provided in the Revised Draft Final EERA (NCCOSC, 1997)

TABLE 3

LEAD CONCENTRATIONS IN JUVENILE LOBSTER SAMPLES[1]
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Area of Concern/ Reference Location	Station Number	Date	Concentration Range (mg/kg)
Clark Cove	3	1993	0.03
	516	1991	0.04-0.61
DRMO	M11-199A	1999	4.59
Dry Docks	17	1993	0.05-0.07
	524	1991	0.06
	M12-199A	1999	0.45
Jamaica Cove	19	1993	0.05
	522	1991	0.1
Sullivan Point	9	1993	0.04-0.05
	M10-199A	1999	0.34
Isles of Shoals Reference Location	306	1993	0.02-0.11
Piscataqua River Reference Station	514	1991	0.18-1.69

Notes:

[1] - Samples included in this table were collected as part of the EERA and the 1999 round of the interim offshore monitoring program.

1991 - Phase I Estuarine Ecological Risk Assessment

1993 - Phase II Estuarine Ecological Risk Assessment

1999 - Round 1 of Interim Offshore Monitoring Program

Only results for juvenile lobsters are included in this table except for the Phase I EERA data; several size classes of lobsters were used for these samples

EERA data is included in the PNS database and provided in the Revised Draft Final EERA (NCCOSC, 1997)