

Contract No. 15350  
**Sediment Sampling at the Former Atlantic Creosote and Wood  
Preserving Works**

**Final Report**  
May 22, 2012

Submitted by:  
Elizabeth River Project



Submitted to:  
Virginia Department of Environmental Quality  
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## **INTRODUCTION**

This sediment sampling results report summarizes field activities and sediment chemistry data collected by the Elizabeth River Project off-shore of the former Atlantic Creosoting and Wood Preserving Works (Atlantic Creosoting) site located on the Eastern Branch of the Elizabeth River, in Norfolk, Virginia.

## **SUMMARY**

On January 19, 2012 a sampling team composed of representatives from the Elizabeth River Project (ERP) and the Virginia Institute of Marine Science (VIMS) collected 45 near surface sediment samples over a 32 acre investigation area located east of the Norfolk Southern Rail Bridge and off-shore of Atlantic Creosoting. Twenty two samples were selected for laboratory analysis and submitted to a Virginia Certified Laboratory (Test America) for analysis of polycyclic aromatic hydrocarbons (PAH) and total organics carbon (TOC). The remaining samples were released to the Department of Environmental Quality (DEQ) and were frozen for long term storage. Twenty one of the twenty two sediment samples initially analyzed by the laboratory contained individual PAH compounds at concentrations above the laboratory reportable limit. To address a number of data gaps from the initial data set, four additional sediment samples kept frozen at DEQ were submitted to Test America for analysis of PAH compounds and TOC. Total PAH (TPAH) concentrations from the final sediment sample data set ranged from non-detectable to 332.5 mg/Kg. TPAH concentrations were found to be highest in the drainage ditch area located on the west side of the former Atlantic Creosoting property.

## **SITE BACKGROUND**

The Atlantic Creosoting site is located at 1000 Lansing Street in Norfolk, Virginia (Latitude: 36<sup>o</sup> 50' 6.83" N, Longitude 36<sup>o</sup> 16' 31.47" W) within an industrial area of Norfolk (Figure 1). The former Atlantic Creosoting operation was located on 17 acres currently owned and occupied by Allied Terminals, Inc. and utilized as a bulk liquid storage facility.

Previous investigation conducted by the United States Environmental Protection Agency (USEPA) and DEQ identified the presence of PAH compounds in upland soils, near-shore sediment, surface water, and potentially, groundwater at the former Atlantic Creosoting site. Site history indicates the source of the PAH compounds is likely a result of former creosoting operation practices. Because there is currently a limited amount of sediment quality data available off shore of the Atlantic Creosoting site, DEQ hired the Elizabeth River Project to conduct a preliminary sediment quality investigation. The Elizabeth River Project developed a Sediment Sampling Plan dated September 1, 2011 and DEQ verbally approved the Sediment Sampling Plan on January 18, 2012. The purpose of the preliminary sediment investigation is to collect near surface sediment samples and determine if river sediment adjacent to the former Atlantic Creosote site is impacted with PAH compounds.

## **SEDIMENT SAMPLING**

On January 19, 2012 a sampling team comprised of members from ERP and VIMS collected 45 near-surface sediment samples off shore of the former Atlantic Creosoting Site. A Ponar grab sediment sampler capable of penetrating sediment to a depth of four to six inches was used to collect each discrete sediment sample (Photo 1). The Ponar grab samples were collected in a grid pattern orientation using a 200-square-foot spacing covering an area of approximately 32 acres (Figure 2). Sediment sample logs were completed at each sample location and recorded the GPS coordinates, time, date, water depth and physical description of each sediment sample. The sediment physical description documented the sediment type (sand, silt or clay), grain size, color, visible marine life present and physical evidence of petroleum-impact (typically sheen and odor). A copy of the sediment sample log summary is included as Table 1 to this report. Representative sediment from each sample location was placed in a laboratory-supplied sample container, labeled and stored on ice. Sediment sample handling was conducted using a chain of custody protocol.

Twenty two samples were initially selected for laboratory analysis and submitted to a Virginia Certified Laboratory (Test America) for analysis of polycyclic aromatic hydrocarbons (PAH) and total organics carbon (TOC). The remaining samples were released to the Department of Environmental Quality (DEQ) and were frozen for long-term storage. After reviewing the results of the initial data set, a number of data gaps were observed and four additional sediment samples were selected for laboratory analysis. The additional samples were submitted to Test America for analysis of PAHs and TOC on March 30, 2012.

## **FIELD OBSERVATIONS**

The near surface sediment samples collected as part of this investigation consisted primarily of fine grained brown, grey and black organic silt with isolated findings of silty sand. The fine grained silt was typically covered in a thin algae coat and the upper ½-inch to ¾-inch of sediment was lighter in color, suggesting aerobic conditions. Deeper sediment was observed to be darker in color, suggesting anaerobic conditions (Photo 2). Several sample locations near the navigational channel encountered grey clay, gravel and oyster shell (Photo 3). Broken oyster, clam, mussel and other bi-valve shells ranging in size from ½ inch to 3-inches were observed in a majority of the samples (Photo 4). Visible benthic organisms consisting of polychaete worms, tunicate (sea squirt) and amphipods were observed at a number of sample locations (Photo 5). Oil sheen and creosote-like odor were observed in sediment collected from sample stations B-4 and B-6 (Photo 6). Two sediment sample containers were prepared for these two locations. No other sediment collected as part of this investigation exhibited oil sheen or odor.

## **LABORATORY RESULTS**

Twenty five of the twenty six near surface sediment samples analyzed by Test America contained PAH compounds at concentrations above the laboratory reportable limit. Each sediment sample was analyzed for 16 individual PAH compounds using EPA method 8270 and TOC using the Lloyd Kahn method. The 16 individual PAH compounds were numerically summed to create a total PAH (TPAH) concentration value.

The TPAH concentration in the sediment samples collected from the 32-acre sample area ranged from no detection at sediment sample station G-4 to 332.5 mg/kg at sediment sample station B-6 (see Figure 2 for grid locations). As presented in Figure 3, TPAH concentrations are highest in the vicinity of the drainage ditch on the west side of the property and extend northeastward as far as 500 feet off shore.

The TPAH values for each sediment sample were normalized to the total organic carbon concentrations detected within the samples (Table 2). The TPAH/TOC ratios ranged from 6 to 8,203 mg/kg.

### **CONCLUSIONS AND RECOMMENDATIONS**

Polycyclic aromatic hydrocarbons are present in near surface sediment samples collected adjacent to and off shore of the Former Atlantic Creosote property, located on the Eastern Branch of the Elizabeth River in Norfolk, Virginia. TPAH concentrations in the near surface sediment range from non-detectable to 332.5 mg/Kg. Determining the source and full extent of the PAH-impact was not the objective of this investigation, and additional investigation efforts are needed to better define the vertical and horizontal extent of PAH impact in sediment below the six inch depth. The results of this investigation are consistent with upland soil and near shore sediment sampling efforts conducted by others, and support a recommendation for continued off shore sediment characterization at this site. Based on the results of this investigation, the next phase of investigation should focus on the western side of the property, in the vicinity of the drainage ditch.

## Project Photographs



Photo 1 – Ponar Sampler



Photo 2 – Aerobic Sediment Layer



Photo 3 – Clayey Channel Sediment



Photo 4 – Bi-valve Shells

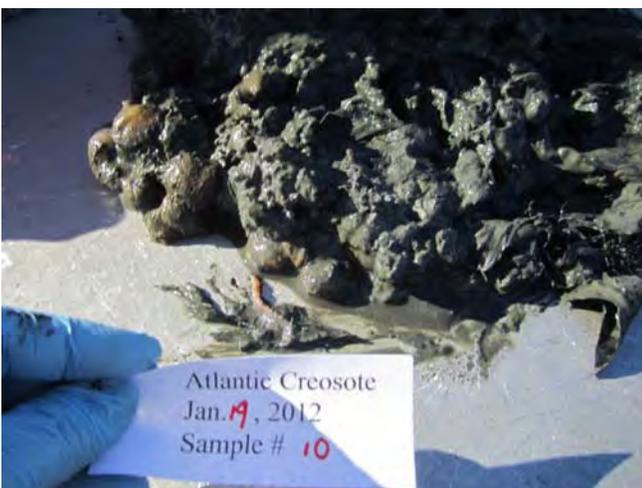


Photo 5 – Benthos in Sediment



Photo 6 – Oil Sheen in Sediment

TABLE 1  
Former Atlantic Creosote and Wood Preserving Works  
Sediment Sample Log Summary  
(January 19, 2012)

Sample Grid	Sampling Sequence	Latitude	Longitude deg/min	Time (LST)	GPS Id #	Depth (ft)	Lab Analysis	Sample Description
A-1	31	36° 50.364' N	76° 16.458' W	1337	330	36.3	no	Grey silty sand with some broken shells, no petroleum odor or sheen.
A-2	32	36° 50.332' N	76° 16.455' W	1343	331	26.5	yes	Brown to grey sandy silt with some broken shells and debris, no petroleum odor or sheen.
A-3	39	36° 50.300' N	76° 16.458' W	1420	338	18.7	no	Brown to black silt with sand and numerous oyster shells up to 3" long, no petroleum odor or sheen.
A-4	40	36° 50.264' N	76° 16.452' W	1425	339	5.9	yes	Brown to black silt with fine to coarse sand and numerous small shells, no petroleum odor or sheen.
B-1	30	36° 50.372' N	76° 16.415' W	1330	329	36.7	yes	Grey clay with numerous broken shells and one 4" polyeceate worm, no petroleum odor or sheen.
B-2	33	36° 50.329' N	76° 16.404' W	1348	332	28.1	no	Brown to black sandy silt with some broken shells, no petroleum odor or sheen.
B-3	38	36° 50.304' N	76° 16.417' W	1414	337	17.7	yes	Brown to grey silt with sand and numerous oyster shells, no petroleum odor or sheen.
B-4	41	36° 50.268' N	76° 16.416' W	1432	340	16.8	yes	Black organ silt with sand <b>some petroleum like odor and sheen in one corner of the grab sample.</b>
B-5	42	36° 50.234' N	76° 16.408' W	1442	341	12	yes	Black organic silt with sand. No petroleum odor or sheen.
B-6	43	36° 50.208' N	76° 16.408' W	1448	342	6	yes	Black organic silt with a trace of sand and <b>petroleum like odor and sheen throughout the sample, heavily-impacted.</b>
C-1	29	36° 50.364' N	76° 16.377' W	1324	328	35.2	no	Grey clay with numerous broken shells and 1 3/4" jelly fish, no petroleum odor or sheen.
C-2	34	36° 50.333' N	76° 16.368' W	1354	333	29.6	yes	Sticky grey clay with some broken shells, no petroleum odor or sheen.
C-3	37	36° 50.303' N	76° 16.376' W	1409	336	14.8	yes	Brown to grey silt with sand over sticky grey clay, no petroleum odor or sheen.
C-4	44	36° 50.263' N	76° 16.365' W	1458	343	11.2	yes	Black to grey silt with clay and trace sand, no petroleum odor or sheen.
C-5	4	36° 50.248' N	76° 16.376' W	1012	305	3.8	yes	Black organic silty sand, 1/4"-2" oyster shell, 1 live amphipod 4" long. No petroleum odor or sheen.
C-5.5	1	36° 50.241' N	76° 16.369' W	948	302	3	yes	Black organic silt with sand, 1/4"-2" oyster shell and 1 1/2" mussel shell. Numerous worm tubes and 1 live amphipod 4" long. No petroleum odor or sheen.
D-1	28	36° 50.366' N	76° 16.335' W	1318	327	35.5	no	Brown thin silt layer over grey clay with small broken shells. No petroleum odor or sheen.
D-2	35	36° 50.336' N	76° 16.333' W	1359	334	27.6	no	Brown to grey sandy silt with numerous oyster shells, no petroleum odor or sheen.
D-3	36	36° 50.304' N	76° 16.335' W	1404	335	17.6	yes	Brown to black organic silt with sand and several worm tubes. No petroleum odor or sheen.
D-4	45	36° 50.264' N	76° 16.329' W	1504	344	19.2	yes	Black organic silt with sand, no petroleum odor or sheen.
D-5	3	36° 50.240' N	76° 16.329' W	1004	304	15.4	yes	Grey to black organic silt, no shell, no petroleum odor or sheen.
D-6	2	36° 50.224' N	76° 16.339' W	958	303	2	yes	Black to grey silt with sand, wood debris and some oyster shell present. Algae mat is present on the surface. No petroleum odor or sheen.

TABLE 1  
Former Atlantic Creosote and Wood Preserving Works  
Sediment Sample Log Summary  
(January 19, 2012)

Sample Grid	Sampling Sequence	Latitude	Longitude deg/min	Time (LST)	GPS Id #	Depth (ft)	Lab Analysis	Sample Description
E-1	27	36° 50.365' N	76° 16.292' W	1311	326	34.7	no	Brown to grey sandy silt with trace sand and some small broken shells and gravel. No petroleum odor or sheen.
E-2	20	36° 50.326' N	76° 16.284' W	1228	an	12	yes	Brown to grey silt with sand and some small broken shells. No petroleum odor or sheen.
E-3	19	36° 50.304' N	76° 16.297' W	1158	319	2.4	no	Brown to grey silt with sand and thin algae mat on the surface. Some small shell and 1 2" gobie (fish). No petroleum odor or sheen.
E-4	12	36° 50.264' N	76° 16.292' W	1110	312	~4	no	Brown to grey silt with some sand and algae mat of the surface. No petroleum odor or sheen.
E-5	11	36° 50.231' N	76° 16.292' W	1104	311	~4	no	Brown to grey silt with trace sand and algae mat of the surface. No petroleum odor or sheen.
E-6	5	36° 50.214' N	76° 16.302' W	1023	306	2.2	yes	Black to grey fine silty sand with algae mat on the surface. Some small oyster shells. No petroleum odor or sheen.
F-1	26	36° 50.364' N	76° 16.256' W	1305	325	30.1	yes	Brown to black organic silt with coarse sand and numerous worm tubes. No petroleum odor or sheen.
F-2		36° 50.332' N	76° 16.255' W	1234	320	15.5	no	Brown to grey clay with oyster shell. No petroleum odor or sheen.
F-3	21	36° 50.301' N	76° 16.255' W	1151	318	7.9	yes	Brown to grey silt with sand and some shells. No petroleum odor or sheen.
F-4	13	36° 50.261' N	76° 16.253' W	1116	313	8.8	yes	Brown to grey silt with 3" oyster shells and wood debris present and live tunicate mat on the surface. No petroleum odor or sheen.
F-5	10	36° 50.219' N	76° 16.253' W	1057	310	7.5	no	Grey to black silt with a trace of sand. One polycete worm and live tunicate mat on the surface. No petroleum odor or sheen.
F-6	6	36° 50.199' N	76° 16.254' W	1031	an	10.6	no	Grey organic silt. Brown on top inch turning to dark grey below with trace sand. No petroleum odor or sheen.
G-1	25	36° 50.362' N	76° 16.208' W	1258	324	30.1	no	Brown to black organic silt with sand and no shells. No petroleum odor or sheen.
G-2	22	36° 50.334' N	76° 16.206' W	1240	321	10.7	yes	Brown to grey sandy silt with some small shells. No petroleum odor or sheen.
G-3	17	36° 50.303' N	76° 16.212' W	1145	317	5.6	no	Brown to grey organic silt with sand and some small shells. No petroleum odor or sheen.
G-4	14	36° 50.266' N	76° 16.211' W	1124	314	~6	yes	Grey silt and clay with trace sand and 1 5" oyster shell. No petroleum odor or sheen.
G-5	8	36° 50.230' N	76° 16.208' W	1050	309	12.2	no	Grey silt with trace sand 1/2 to 2" oyster shells and numerous live tunicates present. No petroleum odor or sheen.
G-6		Barge on station, no sample						
H-1	24	36° 50.363' N	76° 16.168' W	1252	323	28	no	Brown to black organic silt with sand and no shells. No petroleum odor or sheen.
H-2	23	36° 50.332' N	76° 16.165' W	1246	322	18.1	no	Brown to grey organic silt. No petroleum odor or sheen.
H-3	16	36° 50.305' N	76° 16.166' W	1138	316	15.5	yes	Brown to black organic silt with sand and no shells. No petroleum odor or sheen.
H-4	15	36° 50.267' N	76° 16.165' W	1131	315	13.2	no	Grey silt and clay with trace sand and trace small shells. No petroleum odor or sheen.
H-5	9	36° 50.232' N	76° 16.172' W	1043	308	13.9	yes	Grey silty clay with a 2 1/2" clam shells and numerous small oyster shells. No petroleum odor or sheen.
H-6	7	36° 50.202' N	76° 16.167' W	1038	307	12.5	no	Brown to grey, fine to medium sand with trace silt and small shell. No petroleum odor or sheen.

**TABLE 2**  
**Laboratory Results - Former Atlantic Creosoting and Wood Preservation Works (January 19, 2012)**

PARAMETER	Units	Sed 1 C-5.5	Sed 2 D-6	Sed 3 D-5	Sed 4 C-5	Sed 5 E-6	Sed 8 H-5	Sed 14 G-4	Sed 16 H-3	Sed 18 F-3	Sed 20 E-2						
Acenaphthene	ug/Kg	240	220	J	84	J	1000	71	J	26	J	nd	42	J	150	110	J
Acenaphthylene	ug/Kg	280	260		180	J	1200	93	J	61	J	nd	100	J	180	170	
Anthracene	ug/Kg	2800	810		350	J	20000	190		94	J	nd	150	J	460	330	
Benzo(a) anthracene	ug/Kg	740	1100		670		6300	490		230		nd	410		980	780	
Benzo(a) pyrene	ug/Kg	1500	1700		920		6000	630		350		nd	570		1300	1000	
Benzo(b) fluoranthene	ug/Kg	1600	1800		1000		6400	780		380		nd	820		1500	1600	
Benzo(ghi) perylene	ug/Kg	710	830		520		2500	360		200		nd	380		720	600	
Benzo(k) fluoranthene	ug/Kg	1100	1400		760		3900	420		270		nd	260		880	490	
Chrysene	ug/Kg	1000	1400		960		7000	600		240		nd	470		1100	1200	
Dibenzo(a,h) anthracene	ug/Kg	170	190	J	140	J	640	96	J	54	J	nd	85	J	160	140	
Fluoranthene	ug/Kg	1400	2200		1100		21000	790		360		nd	740		1700	1500	
Fluorene	ug/Kg	570	250		100	J	3200	64	J	38	J	nd	51	J	160	120	J
Indeno(1,2,3-cd) pyrene	ug/Kg	650	760		450		2300	310		160		nd	320		610	520	
Naphthalene	ug/Kg	1100	620		270	J	6300	170		74	J	nd	75	J	220	160	
Phenanthrene	ug/Kg	1100	1100		380		5300	320		140	J	nd	180		700	540	
Pyrene	ug/Kg	2600	2500		1100		18000	840		370		nd	740		1900	1500	
TPAH	ug/Kg	17,560	17,140		8,984		111,040	6,224		3,047		nd	5,393		12,720	10,760	
<b>TPAH</b>	<b>mg/kg</b>	<b>17.6</b>	<b>17.1</b>		<b>9.0</b>		<b>111.0</b>	<b>6.2</b>		<b>3.0</b>		<b>nd</b>	<b>5.4</b>		<b>12.7</b>	<b>10.8</b>	
Total Organic Carbon	mg/Kg	38,000	67,000		43,000		28,000	24,000		48,000		27,000	37,000		52,000	71,000	
Total Organic Carbon	Kg/Kg	0.0380	0.0670		0.0430		0.0280	0.0240		0.0480		0.0270	0.0370		0.0520	0.0710	
TPAH mg/ Kg Carbon		462	256		209		3,966	259		63		nd	146		245	152	
Percent Solids	%	46	53		38		62	62		43		44	40		48	49	

nd - Not detected  
J - Result is less than the RL  
H - Holding time  
RL - Reportable limit

**TABLE 2**  
**Laboratory Results - Former Atlantic Creosoting and Wood Preservation Works (January 19, 2012)**

PARAMETER	Units	Sed 22 G-2	Sed 26 F-1	Sed 30 B-1	Sed 32 A-2	Sed 34 C-2	Sed 36 D-3	Sed 38 B-3	Sed 40 A-4	Sed 41 B-4	Sed 42 B-5	Sed 43 B-6	Sed 44 C-4	Sed 13 F
Acenaphthene	ug/Kg	26 J	270 J	nd	220	nd	95 J	240	250	1500	570	300 J	22000	23
Acenaphthylene	ug/Kg	30 J	1300	nd	93 J	nd	210 J	410	330	520	800	480 J	1000	26
Anthracene	ug/Kg	86 J	1500	nd	270	20 J	360	570	630	3600	3400	1300	12000	37
Benzo(a) anthracene	ug/Kg	160	4100	18 J	320	49 J	800	1000	1000	1500	2000	2400	9000	74
Benzo(a) pyrene	ug/Kg	170	4900	18 J	460	39 J	1100	2000	1500	2400	3100	3100	4900	78
Benzo(b) fluoranthene	ug/Kg	310	5600	nd	670	59 J	1500	2400	1900	2800	3700	5200	9000	270
Benzo(ghi) perylene	ug/Kg	120 J	2300	nd	230	23 J	670	1100	1000	1200	1800	1500	2400	53
Benzo(k) fluoranthene	ug/Kg	77 J	2000	nd	270	nd	730	1200	1200	1200	1900	nd	nd	77
Chrysene	ug/Kg	190	4700	20 J	670	49 J	1100	1400	1300	1900	2400	2600	7200	89
Dibenzo(a,h) anthracene	ug/Kg	22 J	520	nd	58 J	nd	150 J	290	230	330	460	610	720	170
Fluoranthene	ug/Kg	350	5700	37 J	1100	87 J	1700	1700	1900	3400	3200	3100	36000	72
Fluorene	ug/Kg	31 J	260 J	nd	180	nd	140 J	270	280	2200	840	300 J	6400	22
Indeno(1,2,3-cd) pyrene	ug/Kg	110 J	2200	nd	200	24 J	620	910	870	1100	1700	1400	2200	150
Naphthalene	ug/Kg	48 J	200 J	nd	280	nd	200 J	750	990	2700	2900	880	4800	33
Phenanthrene	ug/Kg	170	920	nd	560	nd	560	620	760	5500	1800	990	39000	47
Pyrene	ug/Kg	380	7100	39 J	1300	80 J	1500	2800	2700	9100	7400	4600	34000	120
TPAH	ug/Kg	2,280	43,570	132	6,881	430	11,435	17,660	16,840	40,950	37,970	28,760	190,620	1,341
<b>TPAH</b>	<b>mg/kg</b>	<b>2.3</b>	<b>43.6</b>	<b>0.1</b>	<b>6.9</b>	<b>0.4</b>	<b>11.4</b>	<b>17.7</b>	<b>16.8</b>	<b>41.0</b>	<b>38.0</b>	<b>28.8</b>	<b>190.6</b>	<b>1.3</b>
Total Organic Carbon	mg/Kg	40,000	85,000	24,000	33,000	21,000	43,000	75,000	58,000	51,000	43,000	84,000	38,000	25,000
Total Organic Carbon	Kg/Kg	0.0400	0.0850	0.0240	0.0330	0.0210	0.0430	0.0750	0.0580	0.0510	0.0430	0.0840	0.0380	0.0250
TPAH mg/ Kg Carbon		57	513	6	209	20	266	235	290	803	883	342	5,016	54
Percent Solids	%	45	46	45	63	45	41	37	46	37	37	32	47	51

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**TABLE 2**  
**Laboratory Results - Former Atlantic Creosoting and Wood Preservation Works (January 19, 2012)**

PARAMETER	Units	-4	Sed 37 C-3	Sed 43 (2) B-6	Sed 45 D-4			
Acenaphthene	ug/Kg	J,H	70	J,H	46000	H	52	J,H
Acenaphthylene	ug/Kg	J,H	110	J,H	1800	H	95	J,H
Anthracene	ug/Kg	J,H	390	H	15000	H	160	H
Benzo(a) anthracene	ug/Kg	H	590	H	14000	H	450	H
Benzo(a) pyrene	ug/Kg	H	580	H	6500	H	530	H
Benzo(b) fluoranthene	ug/Kg	H	1100	H	9400	H	1000	H
Benzo(ghi) perylene	ug/Kg	J,H	340	H	3100	H	350	H
Benzo(k) fluoranthene	ug/Kg	H	350	H	4200	H	340	H
Chrysene	ug/Kg	H	810	H	13000	H	550	H
Dibenzo(a,h) anthracene	ug/Kg	H	450	H	3100	H	420	H
Fluoranthene	ug/Kg	H	920	H	72000	H	710	H
Fluorene	ug/Kg	J,H	90	J,H	8200	H	49	J,H
Indeno(1,2,3-cd) pyrene	ug/Kg	H	500	H	4000	H	510	H
Naphthalene	ug/Kg	J,H	250	H	8200	H	190	H
Phenanthrene	ug/Kg	J,H	300	H	69000	H	200	H
Pyrene	ug/Kg	H	900	H	55000	H	890	H
TPAH	ug/Kg	H	7,750	H	332,500	H	6,496	H
<b>TPAH</b>	<b>mg/kg</b>	H	<b>7.8</b>	H	<b>332.5</b>	H	<b>6.5</b>	H
Total Organic Carbon	mg/Kg	H	33,000	H	91,000	H	39,000	H
Total Organic Carbon	Kg/Kg	H	0.0330	H	0.0910	H	0.0390	H
TPAH mg/ Kg Carbon		H	235	H	3,654	H	167	H
Percent Solids	%		46		33		43	

nd - Not detected  
J - Result is less than the RL  
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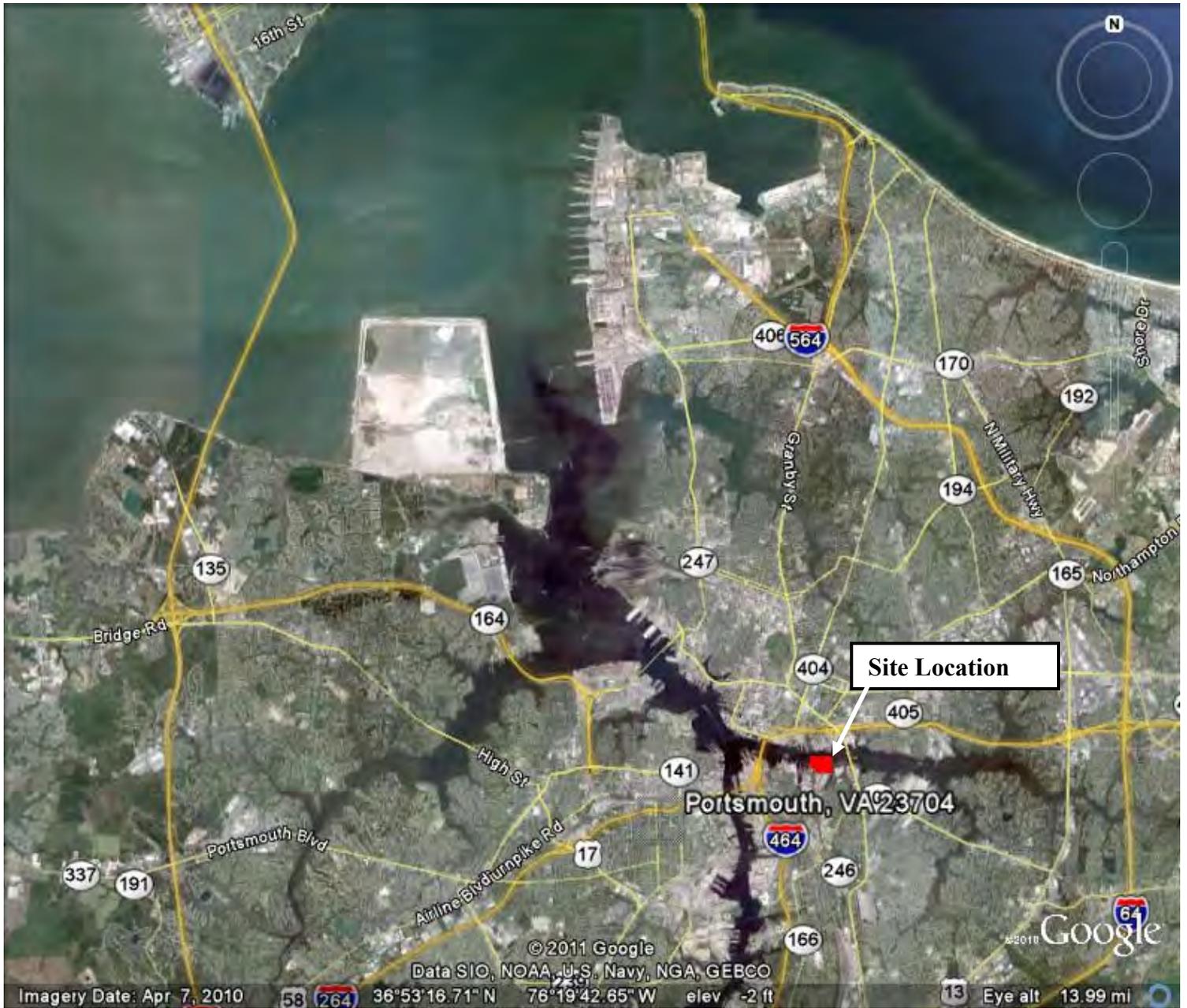


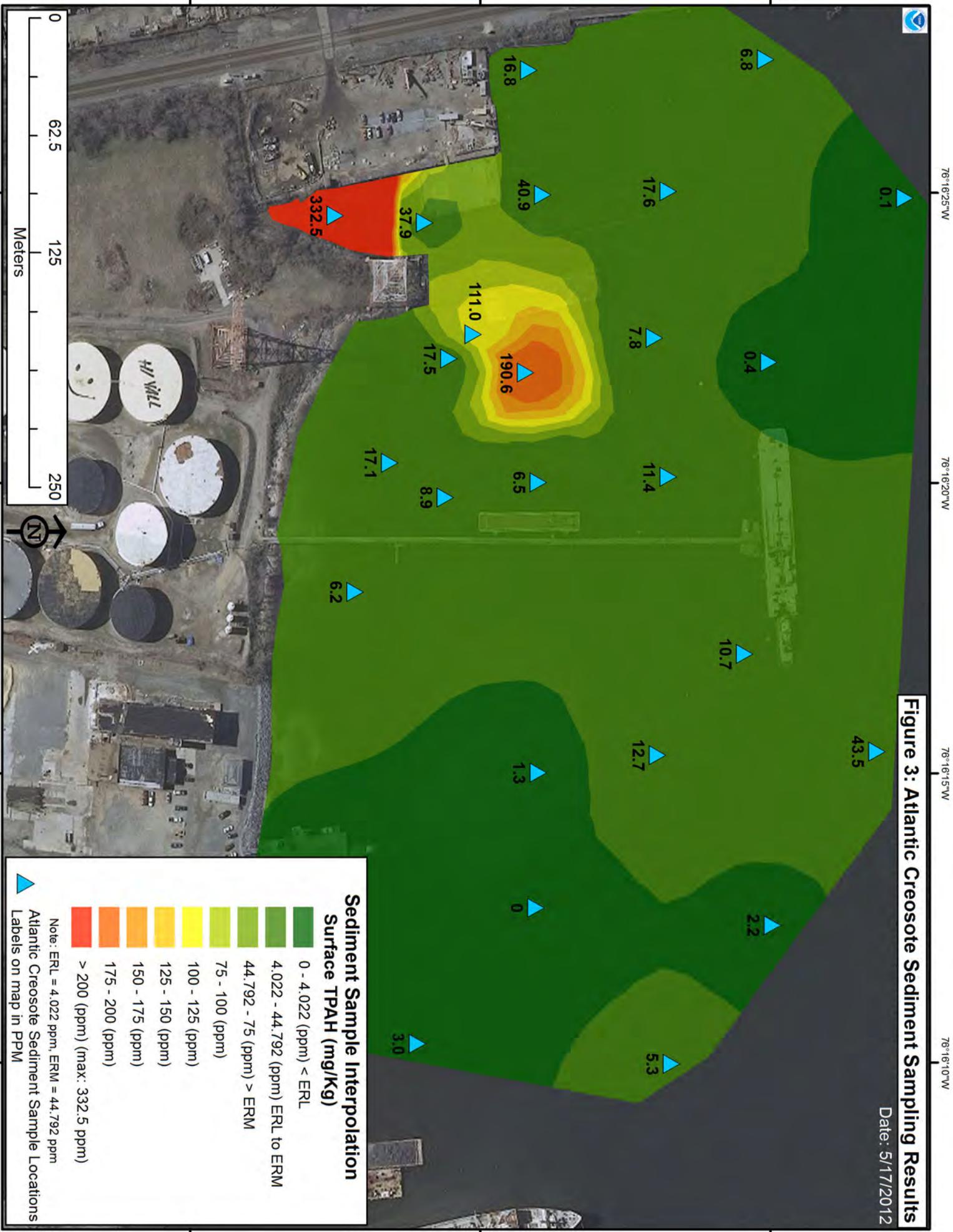
Figure 1 - Location Diagram - Former Atlantic Creosoting and Wood Preserving Works Norfolk, VA



Figure 2 – Sediment Sampling Grid (200 ft spacings)

**Figure 3: Atlantic Creosote Sediment Sampling Results**

Date: 5/17/2012



**Sediment Sample Interpolation  
Surface TPAAH (mg/kg)**

- 0 - 4.022 (ppm) < ERL
- 4.022 - 44.792 (ppm) ERL to ERM
- 44.792 - 75 (ppm) > ERM
- 75 - 100 (ppm)
- 100 - 125 (ppm)
- 125 - 150 (ppm)
- 150 - 175 (ppm)
- 175 - 200 (ppm)
- > 200 (ppm) (max: 332.5 ppm)

Note: ERL = 4.022 ppm, ERM = 44.792 ppm  
Atlantic Creosote Sediment Sample Locations  
Labels on map in PPM

36°50'10"N 36°50'15"N 36°50'20"N 76°16'25"W 76°16'20"W 76°16'15"W 76°16'10"W