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INNER HARBOR NAVIGATION CANAL
ANALYTICAL SUMMARY
Detected Volatile Compounds
Water and Rinsate Samples

Field I.D.	IHC-W1-1 008562-14 WATER UG/L	IHC-W2-1 008544-03 WATER UG/L	IHC-W3-1 008544-05 WATER UG/L	IHC-F-1 RINSATE 008539-13		IHC-R-2 RINSATE 008542-12		IHC-R-3 RINSATE 008542-13	
				WATER UG/L	WATER UG/L	WATER UG/L	WATER UG/L	WATER UG/L	WATER UG/L
1,2,4-TRIMETHYLBENZENE	ND	ND	39.0	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND	3.0	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE	ND	ND	ND	ND	3.0	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	3.0	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	13	ND	ND	ND	ND
ISOPROPYLBENZENE	ND	ND	6.0	ND	ND	ND	ND	ND	ND
m & p-XYLENE	ND	ND	8.0	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	6.5	6.0	ND	6.0	ND	ND	ND	ND	ND
n-PROPYLBENZENE	ND	ND	7.0	ND	ND	ND	ND	ND	ND
NAPHTHALENE	ND	ND	32.0	ND	ND	ND	ND	ND	ND
p-ISOPROPYL TOLUENE	ND	ND	4.0	ND	ND	ND	ND	ND	ND
sec-BUTYLBENZENE	ND	ND	3.0	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	3.0	ND	2.0	2.0	2.0	2.0	2.0
TRICHLOROETHENE	ND	ND	2.0	ND	ND	ND	ND	ND	ND

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INNER HARBOR NAVIGATION CANAL
ANALYTICAL SUMMARY
 Detected Semi-Volatile Compounds
 Water and Rinsate Samples

Field I.D.	IHNC-W1-1	IHNC-W2-1	IHNC-W2-1B	IHNC-R-2 RINSATE	IHNC-W3-1	IHNC-R-3 RINSATE
Lab I.D.	008562-14	00854403	008544-04	008542-12	008544-05	008542-13
	WATER UG/L	WATER UG/L	WATER UG/L	WATER UG/L	WATER UG/L	WATER UG/L
2-METHYLNAPHTHALENE	NC	ND	ND	ND	26.0	ND
ACENAPHTHENE	ND	ND	ND	ND	1.0	ND
BIS(2-ETHYLHEXYL)PHTHALATE	NC	5.0	ND	3.0	ND	62
DIETHYLPHTHALATE	0.96	1.0	2.0	ND	ND	ND
DI-N-BUTYLPHTHALATE	NC	ND	ND	ND	ND	1.0
FLUORENE	NC	ND	ND	ND	3.0	ND
NAPHTHALENE	NC	ND	ND	ND	15	ND
PHENANTHRENE	NC	ND	ND	ND	2.0	ND

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INNER HARBOR NAVIGATION CANAL
ANALYTICAL SUMMARY
Detected Metals
Water, Rinsate and Field Blanks

Field I.D. Lab I.D.	IHNC-W1-1	IHNC-R-1 RINSATE	IHNC-FB-1	IHNC-W2-1	IHNC-W2-1B	IHNC-R-2 RINSATE	IHNC-W3-1
	WATER MG/L	WATER MG/L	WATER MG/L	WATER MG/L	WATER MG/L	WATER MG/L	WATER MG/L
ALUMINIUM	18.9	0.062	ND	6.9	7.5	1.1	1.9
ARSENIC	0.043	ND	ND	0.07	0.041	ND	0.027
BARIUM	1.5	0.014	0.012	0.27	0.2	0.071	0.36
BERYLLIUM	0.0013	ND	ND	ND	ND	ND	ND
CALCIUM	220	0.46	ND	115	83.8	47.7	154
CHROMIUM	0.026	ND	ND	0.021	0.014	ND	ND
COBALT	0.018	ND	ND	ND	ND	ND	ND
COPPER	0.048	0.014	ND	0.11	0.099	0.011	ND
IRON	86.7	2.1	ND	27.5	23.2	21.5	13.8
LEAD	0.051	ND	ND	0.18	0.16	ND	ND
MAGNESIUM	159	ND	ND	32.8	22.0	12.1	12.9
MANGANESE	3.1	0.018	ND	1.8	1.5	0.15	1.7
NICKEL	0.06	ND	ND	ND	0.021	ND	ND
POTASSIUM	26.9	ND	ND	7	5.7	3.9	4.9
SILVER	ND	ND	ND	ND	ND	ND	ND
SODIUM	1250	0.46	ND	79.3	50.9	20.9	65.8
VANADIUM	0.052	ND	ND	0.017	0.019	ND	0.0058
ZINC	0.23	0.026	ND	0.53	0.25	0.047	0.057
PETROLEUM HYDROCARBONS	ND	QNS	ND	ND	ND	0.35	0.87

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INNER HARBOR NAVIGATION CANAL
ANALYTICAL SUMMARY
Detected Metals
Water, Rinsate and Field Blanks

Field I.D.	IHNC-R-3 RINSATE
Lab I.D.	008542-13
	WATER MG/L
ALUMINUM	0.054
ARSENIC	ND
BARIUM	0.011
BERYLLIUM	ND
CALCIUM	ND
CHROMIUM	ND
COBALT	ND
COPPER	ND
IRON	0.068
LEAD	ND
MAGNESIUM	ND
MANGANESE	ND
NICKEL	ND
POTASSIUM	ND
SILVER	ND
SODIUM	ND
VANADIUM	ND
ZINC	0.0051
PETROLEUM HYDROCARBONS	ND

1. Laboratory Blanks - Includes method and associated instrument blanks for all organic fractions. Blank summary forms are also included which list those samples which correspond to the blank.
2. Surrogate Spike Results - Includes surrogate recovery results for all samples and blanks for all organic fractions. Sample results for reanalyses due to surrogate recovery failures are included as required.
3. Matrix Spike Samples - Matrix spike sample recovery results are reported for both organic and inorganic analyses.
4. Duplicate Samples - Included as a matrix spike duplicate analysis for organics and sample duplicate for inorganic analyses. The relative percent difference is reported for all duplicate analyses.
5. Laboratory Control Samples - Laboratory control sample results are reported for inorganic analyses and control limits are specified as required.

Laboratory reports on file with the USACE, St. Louis District Office contain both organic and inorganic case narratives which contain any problems that occurred for the analysis of the respective sample group. For the most part, major areas of concern noted were matrix interferences present, reanalyses due to surrogate or internal standard failures, out of control spike or duplicate results for inorganics and subsequent analyses required.

6.3.2 Field Triplicates

The contract laboratory analyzed all field QC triplicate samples as required. Table 6.10 is a list of those samples split and sent to the QA laboratory. A comparison of triplicate detected compound results and the relative percent difference for the detected values in the QA/QC investigation is shown in Table 6.11.

TABLE 6.10
Summary of QA/QC Triplicates

<u>Matrix</u>	<u>Field Sample I.D.</u>	<u>Corresponding QC Sample I.D.</u>	<u>Corresponding QA Sample I.D.</u>
	<u>Field I.D.</u> <u>Lab I.D.</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	<u>Field I.D.</u> <u>Lab I.D.</u>
<u>Soil</u>	IHNC-SIDB8 008562-12	IHNC-SIDB-8B 008562-13	IHNC-SIDB-8A 96060851
	IHNC-S3-2 008543-15	IHNC-S3-2B 008543-16	IHNC-S3-2A 96050749
	IHNC-S3DB-2 008564-02	IHNC-S3DB-2B 008564-03	IHNC-S3DB-2A 96060942
	IHNC-S4-4 008541-04	IHNC-S4-4B 008541-05	IHNC-S4-4A 96050355
	IHNC-S4DB-4 008564-17	IHNC-S4DB-4B 008564-18	IHNC-S4DB-4A 96060943
	IHNC-S6DB-4 008565-10	IHNC-S6DB-4B 008565-11	IHNC-S6DB-4A 96060944
	IHNC-S9-6 008539-05	IHNC-S9-6B 008539-06	IHNC-S9-6A 96050354
	IHNC-S9DB-8 008541-18	IHNC-S9DB-8B 008541-19	IHNC-S9DB-8A 96050356
<u>Water</u>	IHNC-W2-1 008544-03	IHNC-W2-1B 008544-04	IHNC-W2-1A 96050750

TABLE 6.11
Field Triplicate Comparison for Detected Parameters

	(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% <u>(1) : (2)</u>	RPD% <u>(1) : (3)</u>	RPD% <u>(2) : (3)</u>
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-S1DB-8 008562-12	IHNC-S1DB-8B 008562-13	IHNC-S1DB-8A 96060851		
<u>VOA (ug/Kg)</u>						
Acetone		64.6	109	ND	51	---
Methylene Chloride		18.5	20.8	ND	12	---
<u>SVOA (ug/Kg)</u>						
Benzo(a)pyrene		472	468	ND	1	---
Bis(2-Ethylhexyl) Phthalate		235	231	ND	2	---
Di-N-Butylphthalate		ND	83.2	ND	---	---
<u>Metals (mg/Kg)</u>						
Aluminum		8050	7190	16400	11	68
Arsenic		ND	4.6	13	---	95
Barium		129	123	146	5	12
Beryllium		0.65	0.6	1.0	8	42
Calcium		13500	13700	13000	1	4
Chromium		11.4	10.3	21	10	59
Cobalt		9	8.2	10	9	11
Copper		22.5	20.0	23	12	2
Iron		16800	14700	22600	13	29
Lead		15.1	17.1	15.4	12	2
Magnesium		7020	6890	8400	2	18
Manganese		594	584	602	2	1
Nickel		22.6	21.0	24	7	6
Potassium		2500	2320	3830	7	42
Silver		ND	1	ND	---	---
Sodium		4440	4140	4020	7	10
Vanadium		17.7	17.6	39	1	75
Zinc		68.8	63.7	73	8	6

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% (1) : (2)	RPD% (1) : (3)	RPD% (2) : (3)
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-S3-2 008543-15	IHNC-S3-2B 008543-16	IHNC-S3-2A 96050749			
<u>VOA (ug/Kg)</u>							
Acetone		68	65	ND	5	---	---
Methylene Chloride		9.0	9.0	ND	0	---	---
<u>SVOA (ug/Kg)</u>							
Acenaphthene		460	330	4000	33	159	170
Acenaththylene		140	150	ND	7	---	---
Anthracene		600	350	2100	53	111	143
Benzo(a)anthracene		1800	1100	2100	48	15	63
Benzo(a)pyrene		1800	1200	1900	40	5	45
Benzo(b)fluoranthene		2700	1800	2500	40	8	33
Benzo(g,h,i)perylene		770	470	700	48	10	39
Benzo(k)fluoranthene		1100	820	1500	29	31	59
Bis(2-Ethylhexyl)phthalate		76.0	100	1200	27	176	169
Chrysene		1800	1400	2800	25	43	67
Bibenzo(a,h)anthracene		290	200	ND	37	---	---
Dibenzofuran		92.0	ND	ND	---	---	---
Fluoranthene		4100	2500	7700	48	61	102
Fluorene		320	180	2800	56	159	176
Indeno(1,2,3-cd)pyrene		760	500	700	41	8	33
Phenanthrene		2200	1200	6100	59	94	134
Pyrene		3400	2200	5600	43	49	87
<u>Metals (mg/Kg)</u>							
Aluminum		3800	5870	13300	43	111	78
Antimony		ND	ND	1.5	---	---	---
Arsenic		9.7	16.8	7	54	32	82
Barium		136	134	177	1	26	28
Beryllium		0.4	0.56	0.8	33	67	35
Calcium		91200	24200	21200	116	125	13
Chromium		9.5	11.4	19	18	67	50
Cobalt		5.9	9.9	8	51	30	21
Copper		28.0	33.6	27	18	4	22
Iron		9920	15000	20000	41	67	29

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	<u>RPD%</u> <u>(1) : (2)</u>	<u>RPD%</u> <u>(1) : (3)</u>	<u>RPD%</u> <u>(2) : (3)</u>
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-S3-2 008543-15	IHNC-S3-2B 008543-16	IHNC-S3-2A 96050749			
<u>Metals (mg/Kg) (Con'd)</u>							
Lead		190	169	97	12	65	54
Magnesium		2550	3790	4630	39	58	20
Manganese		1010	876	860	14	16	2
Nickel		16.9	23.5	21	33	22	11
Potassium		853	1260	2450	39	97	64
Silver		ND	1	ND	---	---	---
Sodium		697	245	230	96	101	6
Thallium		ND	ND	0.3	---	---	---
Vanadium		12.8	18.3	32	8	124	128
Zinc		136	147	101	8	30	37
Mercury		0.11	ND	0.3	---	93	---
<u>Pest/PCB (ug/Kg)</u>							
4,4' - DDD		15.0	32.0	ND	72	---	---
4,4' - DDE		4.4	9.6	ND	74	---	---
4,4' - DDT		3.8	4.6	ND	19	---	---
<u>TCLP Metals (mg/l)</u>							
Barium		1.6	1.2	---	29	---	---
Lead		0.035	ND	---	---	---	---

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% <u>(1) : (2)</u>	RPD% <u>(1) : (3)</u>	RPD% <u>(2) : (3)</u>
Detected Parameter	Field I.D. Lab I.D.	IHNC-S3DB-2 008564-02	IHNC-S3DB-2B 008564-03	IHNC-S3DB-2A 96060942			
<u>VOA (ug/Kg)</u>							
Acetone		35.2	114	ND	106	---	---
Methylene Chloride		9.8	11.1	ND	12	---	---
<u>SVOA (ug/Kg)</u>							
Benzo(a)anthracene		34.3	ND	ND	---	---	---
Bis(2-Ethylhexyl)phthalate		277	268	ND	3	---	---
Chrysene		54.2	ND	ND	---	---	---
Fluoranthene		73.7	ND	ND	---	---	---
Pyrene		81.0	ND	ND	---	---	---
<u>Metals (mg/Kg)</u>							
Aluminum		4780	9820	26700	69	139	92
Arsenic		5.2	ND	6	---	14	---
Barium		66.9	170	265	87	119	44
Beryllium		0.38	0.72	1.4	62	115	64
Calcium		4650	9600	7580	69	48	24
Chromium		7.1	13.6	31	63	125	78
Cobalt		5.9	10.5	10	56	52	5
Copper		9.6	17.5	38	58	119	74
Iron		8610	18700	28200	74	106	41
Lead		14.1	15.9	42.1	12	100	90
Magnesium		3070	6210	7190	68	80	15
Manganese		106	979	327	161	102	100
Nickel		15.2	24.1	30	45	65	22
Potassium		701	1350	3790	63	138	95
Silver		ND	0.91	ND	---	---	---
Sodium		85.3	183	310	73	114	52
Vanadium		11.7	16.7	60	35	135	113
Zinc		37.2	63.5	105	52	95	49

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) QC	(3) QA	RPD% (1) : (2)	RPD% (1) : (3)	RPD% (2) : (3)
Detected Parameter	Field I.D. Lab I.D.	IHNC-S4-4 008541-04	IHNC-S4-4B 008541-05	IHNC-S4-4A 96050355			
VOA (ug/Kg)							
Acetone		72	39	ND	59	---	---
Methylene Chloride		26	65	ND	86	---	---
SVOA (ug/Kg)							
Bis(2-Ethylhexyl)phthalate		62	110	ND	56	---	---
Di-N-butylphthalate		110	ND	ND	---	---	---
Metals (mg/Kg)							
Aluminum		12000	10400	23900	14	66	79
Arsenic		6.2	ND	9	---	37	---
Barium		200	140	233	35	15	50
Beryllium		0.95	0.94	1.2	1	23	24
Calcium		12300	15600	9600	24	25	48
Chromium		16.3	14.0	26	15	46	60
Cobalt		10.9	8.9	9	20	19	1
Copper		24.8	24.0	26.0	3	5	8
Iron		18200	15100	28000	19	42	60
Lead		20.8	23.7	20.9	13	0	13
Magnesium		7280	6050	8730	18	18	36
Manganese		528	517	509	2	4	2
Nickel		25.4	21.9	27	15	6	21
Potassium		2650	2450	4380	8	49	57
Silver		1.2	ND	ND	---	---	---
Sodium		595	894	770	40	26	15
Vanadium		27.7	18.8	47	38	52	86
Zinc		76.9	77.1	85	0	10	10
Mercury		ND	ND	0.2	---	---	---

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% <u>(1) : (2)</u>	RPD% <u>(1) : (3)</u>	RPD% <u>(2) : (3)</u>
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-S4DB-4 008564-17	IHNC-S4DB-4B 008564-18	IHNC-S4DB-4A 96060943			
<u>VOA (ug/Kg)</u>							
Acetone		107	86.1	ND	22	---	---
Methylene Chloride		8.8	7.4	ND	17	---	---
<u>SVOA (ug/Kg)</u>							
Benzo(a)pyrene		735	473	ND	43	---	---
<u>Metals (mg/Kg)</u>							
Aluminum		11100	9440	19800	16	56	71
Arsenic		ND	4.3	8	---	---	60
Barium		176	158	180	11	2	13
Beryllium		0.95	0.81	1	16	5	21
Calcium		15500	14200	13100	9	17	8
Chromium		15.0	12.9	24	15	46	60
Cobalt		9.5	8.6	9	10	5	5
Copper		29.2	25.7	23	13	24	11
Iron		20200	17700	24600	13	20	33
Lead		18.9	18.1	16.1	4	16	12
Magnesium		7990	7180	8360	11	5	15
Manganese		678	600	597	12	13	1
Nickel		26.0	21.9	22	17	17	0
Potassium		2740	2450	3850	11	34	44
Selenium		ND	ND	1.1	---	---	---
Silver		0.89	ND	ND	---	---	---
Sodium		1830	1700	1360	7	29	22
Vanadium		21.6	18.4	45	16	70	84
Zinc		83.9	81.4	70	3	18	15

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% <u>(1):(2)</u>	RPD% <u>(1):(3)</u>	RPD% <u>(2):(3)</u>
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-S6DB-4 008565-10	IHNC-S6DB-4B 008565-11	IHNC-S6DB-4A 96060944			
<u>VOA (ug/Kg)</u>							
Acetone		83.7	90.9	ND	8	---	---
Methylene Chloride		25.5	32.5	ND	24	---	---
<u>SVOA (ug/Kg)</u>							
Benzo(a)pyrene		76.6	80.8	ND	5	---	---
Bis(2-Ethylhexyl)phthalate		17.3	ND	ND	---	---	---
<u>Metals (mg/Kg)</u>							
Aluminum		8480	14700	23900	54	95	48
Arsenic		ND	ND	11	---	---	---
Barium		142	229	252	47	56	10
Beryllium		0.61	1.3	1.4	72	79	7
Calcium		3410	6380	6480	61	62	2
Chromium		11.6	18.0	30	43	88	50
Cobalt		9.1	14.3	16	44	55	11
Copper		15.9	29.0	29	58	58	0
Iron		19900	22200	36800	11	60	49
Lead		12.2	22.9	18.9	61	43	19
Magnesium		3300	5490	6910	50	71	23
Manganese		344	521	579	41	51	11
Nickel		19.1	35.0	32	59	50	9
Potassium		1380	2310	3550	50	88	42
Silver		0.96	0.99	ND	3	---	---
Sodium		431	800	1020	60	81	24
Vanadium		18.1	21.5	54	17	100	86
Zinc		55.7	81.7	89	38	46	9

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% (1) : (2)	RPD% (1) : (3)	RPD% (2) : (3)
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-S9-6 008539-05	IHNC-S9-6B 008539-06	IHNC-S9-6A 96050354			
<u>VOA (ug/Kg)</u>							
Methylene Chloride		16	17	ND	6	---	---
<u>SVOA (ug/Kg)</u>							
Benzo(a)anthracene		ND	53	ND	---	---	---
Benzo(a)pyrene		ND	47	ND	---	---	---
Bis(2-Ethylhexyl)phthalate		480	270	ND	56	---	---
Chrysene		ND	57	ND	---	---	---
Di-N-Butylphthalate		ND	50	ND	---	---	---
Fluoranthene		ND	110	ND	---	---	---
Phenanthrene		ND	66	ND	---	---	---
Pyrene		ND	85	ND	---	---	---
<u>Metals (mg/Kg)</u>							
Aluminum		7710	6190	11700	22	41	62
Arsenic		7.7	10.3	7	29	10	38
Barium		127	140	142	10	11	1
Beryllium		0.63	0.46	0.7	31	11	41
Calcium		4340	18200	9900	123	78	59
Chromium		10.7	8.6	16	22	40	60
Cobalt		8.2	6.5	7	23	16	7
Copper		15.4	14.0	14	10	10	0
Iron		14400	10100	18900	35	27	61
Lead		20.9	97.1	27.4	129	27	112
Magnesium		3140	3630	4250	14	30	16
Manganese		369	357	470	3	24	27
Nickel		18.1	12.6	18	36	1	35
Potassium		1260	1020	2080	21	49	68
Silver		0.78	ND	ND	---	---	---
Sodium		79.9	190	ND	82	---	---
Vanadium		14.6	17.8	29	20	66	48
Zinc		61.8	50.1	53	21	15	6
<u>TCLP Metals</u>							
Barium, TCLP Mg/L		1.5	1.4	2.	7	29	38
Lead, TCLP Mg/L		0.032	ND	ND	---	---	---
<u>Inorganic Tests</u>							
Corrosivity (pH)		7.0	6.2	---	12	---	---
Ignitability (Degree °F)		>210	>210	>212	0	1	1
Sulfide, Total (mg/Kg)		148	167	ND	12	---	---

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) QC	(3) QA	RPD% (1) : (2)	RPD% (1) : (3)	RPD% (2) : (3)
Detected Parameter	Field I.D. Lab I.D.	IHNC-S9DB-8 008541-18	IHNC-S9DB-8B 008541-19	IHNC-S9DB-8A 96050356			
VOA (mg/Kg)							
Acetone		65	45	ND	36	---	---
Methylene Chloride		56	53	ND	6	---	---
SVOA (ug/Kg)							
Benzo(a)pyrene		350	340	ND	3	---	---
Bis(2-Ethylhexyl)phthalate		390	690	ND	56	---	---
Metals (mg/Kg)							
Aluminum		6380	6030	11800	6	60	65
Arsenic		6.7	6	6	11	11	0
Barium		166	142	200	16	19	34
Beryllium		0.51	0.4	0.6	24	16	40
Calcium		16600	14300	16500	15	1	14
Chromium		9.9	9.5	15	4	41	45
Cobalt		7.2	6.2	8	15	11	25
Copper		13.3	9.6	15	32	12	44
Iron		15400	9910	14000	43	10	34
Lead		12.6	8.6	9.9	38	24	14
Magnesium		6980	6580	8650	6	21	27
Manganese		469	269	372	54	23	32
Nickel		17.4	15.4	21	12	19	31
Potassium		1920	1570	2870	20	40	59
Silver		0.83	ND	ND	---	---	---
Sodium		2370	1900	2230	22	6	16
Vanadium		15.4	14.1	28	9	58	66
Zinc		47.6	40.9	52	15	9	24
Pest/PCB (ug/Kg)							
Methoxychlor		10	3.2	ND	103	---	---

TABLE 6.11 (Con'd)
Field Triplicate Comparison for Detected Parameters

		(1)	(2) <u>QC</u>	(3) <u>QA</u>	RPD% <u>(1) : (2)</u>	RPD% <u>(1) : (3)</u>	RPD% <u>(2) : (3)</u>
<u>Detected Parameter</u>	<u>Field I.D.</u> <u>Lab I.D.</u>	IHNC-W2-1 008544-03	IHNC-W2-1B 008544-04	IHNC-W2-1A 96050750			
<u>VOA (ug/l)</u>							
Methylene Chloride		6.0	ND	ND	---	---	---
<u>SVOA (ug/l)</u>							
Bis(2-Ethylhexyl)phthalate		5.0	ND	ND	---	---	---
Diethylphthalate		1.0	2.0	ND	67	---	---
<u>Metals (mg/l)</u>							
Aluminum		6.9	7.5	13.3	8	63	56
Arsenic		0.07	0.041	0.07	52	0	52
Barium		0.27	0.2	0.3	30	11	40
Calcium		115	83.8	122	31	6	37
Chromium		0.021	0.014	0.03	40	35	73
Copper		0.11	0.099	0.17	11	43	53
Iron		27.5	23.2	37.1	17	30	46
Lead		0.18	0.16	0.284	12	48	59
Magnesium		32.8	22.0	34	39	4	43
Manganese		1.8	1.5	2.18	18	19	37
Nickel		ND	0.021	ND	---	---	---
Potassium		7	5.7	7	20	0	20
Sodium		79.3	50.9	81	44	2	46
Vanadium		0.017	0.019	ND	11	---	---
Zinc		0.53	0.25	0.60	72	12	82

7.0 CONCLUSION

Area 1 (IHNC-S1) currently utilized by the Port of New Orleans Maintenance Department had samples collected and analyzed which revealed low level contaminants in both the soils and groundwater. Volatile compounds carbon disulfide and 2-Butanone were detected in soil samples at 14 and 111 parts per billion (ppb), respectively. Semivolatile contaminants were detected in the soil samples collected from Area 1. Chrysene (semivolatile) was detected at 14 parts per million (ppm) at approximately three feet (3') in depth and was the highest concentration of a semivolatile contaminant identified from Area 1. Concentrations of contaminants decreased into the parts per billion range in samples collected below the three foot (3') depth.

Total metals analysis for some samples collected from Area 1 were elevated above naturally occurring levels. TCLP analysis was performed on three (3) samples from Area 1. Results revealed the presence of barium and lead at detectable levels but below the TCLP regulatory limits for classification as a hazardous waste. No other TCLP contaminants were detected within the samples analyzed from Area 1.

Pesticide analysis detected 4,4'-DDD at 7.4 ppb from one (1) sample (IHNC-S1-1) collected within Area 1. Sample IHNC-S1-1 was collected from a depth of 2.9 feet.

Groundwater analysis from Area 1 (Sample No. IHNC-W1-1) revealed elevated concentrations for the metals aluminum, iron, lead, manganese and sodium, which exceed federal safe drinking water limits.

Area 2 (IHNC-S2) is the northern end of the area currently utilized by the U.S. Coast Guard. Low levels of volatile compounds in the parts per billion range were detected in soil samples collected from the area. Semivolatile compounds were detected in concentrations from parts per billion to parts per million. The semivolatile compound fluoranthene detected at 5.1 ppm in sample IHNC-S2-16 was the highest level of semivolatile contaminant detected in Area 2. The sample was collected at a depth of approximately 5.5 feet. Semivolatile contaminants were detected to a depth of 20 feet within the area. Twenty feet (20') was the maximum depth of the investigation for Area 2.

Analytical results for total metals within samples collected from Area 2 revealed elevated total metals concentrations above the expected naturally occurring levels. TCLP analysis was performed on thirteen (13) soil samples from Area 2. Results revealed the presence of arsenic, barium and lead at detectable levels but below the TCLP regulatory limits for classification as a hazardous waste. No other TCLP contaminants were detected within the samples analyzed from Area 2.

Pesticide analysis detected the compound 4,4'-DDD in one (1) sample (IHNC-S2-3) and the compound methoxychlor in one (1) sample (IHNC-S2-11) at 5.2 and 5.3 ppb, respectively.

Groundwater analysis from Area 2 revealed elevated metal concentrations for aluminum, arsenic, iron, lead, manganese and sodium which exceed federal safe drinking water limits.

Area 3 is currently utilized by the Coast Guard as a maintenance area. The sampling was conducted in the area of Buildings 10, 13 and 14 (Refer to Figure 3). The volatile compound carbon disulfide was detected at 12.4 ppb in one (1) sample (IHNC-S3-5). One (1) sample (IHNC-S3-9) detected p-isopropyltoluene and toluene at 142 ppb and 10.3 ppb respectively. Semivolatile analysis detected the presence of several semivolatile compounds within samples collected from Area 3. The highest level detected was the compound Fluoranthene at 4.1 ppm (Sample IHNC-S3-2), collected from a depth of six feet (6').

Total metals analyses revealed the presence of metals at concentrations above the naturally occurring levels which would be expected for soils. TCLP analysis was performed on six (6) soil samples from Area 3. The TCLP analysis detected arsenic, barium and lead at levels which were below the TCLP regulatory limits for classification as a hazardous waste. No other TCLP compounds were detected in the samples analyzed from Area 3.

Pesticide analysis of samples collected within Area 3 detected the presence of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT in one (1) sample (IHNC-S3-2) at 15 ppb, 4.4 ppb and 3.8 ppb respectively. In addition, one (1) sample (IHNC-S3-1) detected 4,4'-DDD at 5.9 ppb.

Eleven (11) volatile compounds were detected in the water sample IHNC-W3-1 collected from Area 3. The compound 1,2,4-Trimethylbenzene was detected at 39 ppb within the sample and was the highest concentration for volatile compounds detected. The semivolatile compounds 2-methylnaphthalene, acenaphthene, fluorene, naphthalene, and phenanthrene were all detected in the water sample from Area 3.

Area 4 is currently used by the Corps of Engineers for the maintenance area for the Inner Harbor Lock System. Samples collected from the area detected the volatile compounds 1,1-dichloroethane, 1,1-dichlorethene and chloroethane in the parts per billion range.

Semivolatile compounds were detected in the parts per billion range. The majority of contaminants were detected in near surface soil samples (0' - 3'). The semivolatile compound Benzo(a)pyrene was detected in the parts per billion range within all the samples collected from the deep boring (IHNC-S4DB). The total depth of the boring was 22 feet.

Total metals analysis detected levels of metals which were reasonably close to concentrations which would be expected to occur naturally. TCLP analysis was not performed on any of the samples collected from Area 4.

Pesticide analysis detected methoxychlor at 12 ppb in one (1) sample (IHNC-S4DB-1). The sample was collected at a depth of five feet (5').

Area 5 is adjacent to the Coast Guard Buildings 7, 8 and 9 and the Floodwall (refer to Figure 3). Samples collected from the area detected semivolatile compounds in the parts per billion to parts per million range. The majority of semivolatile contaminants were detected in soil samples collected at six feet (6') or less. The compound Benzo(a)pyrene was detected in the deep boring (IHNC-S5DB) at 64.8 ppb. Sampling depth was 19 feet.

Analysis of total metals revealed elevated concentrations above levels which would be expected to occur naturally in samples collected from Area 5. Two (2) samples from Area 5 had TCLP analysis performed. TCLP analysis results detected arsenic, barium, cadmium, chromium and silver at levels which were below the TCLP regulatory limits for classification as a hazardous waste. No other TCLP compounds were detected in the samples analyzed from Area 5.

Pesticides were detected in near surface soil samples collected from Area 5. The analysis of sample IHNC-S5-1 detected 4,4'-DDD and 4,4'-DDT at 6 ppb and 3.3 ppb, respectively.

Bulk asbestos analysis detected a trace level of chrysotile asbestiform minerals in sample IHNC-S5-1 collected from a depth of 3 feet within Area 5.

Area 6 is adjacent to the parking lot used by Buildings 3 and 4 (refer to Figure 3) and the toe of the lock embankment. The semivolatile compound Benzo(a)pyrene was detected in the deep boring samples IHNC-S6DB-2 (depth 9.5 feet) and IHNC-S6DB-48 (depth 19 feet) at 76.6 ppb and 80.8 ppb, respectively.

Total metals analysis detected levels of metals which were reasonably close to concentrations which would be expected to occur naturally in soil. TCLP analysis was not performed on any of the samples collected from Area 6.

The pesticide methoxychlor was detected in samples IHNC-S6DB-1 and 2 at 1.8 ppb and 9.0 ppb, respectively.

Total metals analysis detected levels of metals which were reasonably close to concentrations which would be expected to occur naturally in soil. TCLP analysis was not performed on any of the samples collected from Area 6.

The pesticide methoxychlor was detected in samples IHNC-S6DB-1 and 2 at 1.8 and 9.0 ppb, respectively.

Area 7 is located adjacent to Building 3 (Coast Guard Facility) on the west side. The sample IHNC-S7-1 collected at 3.4 feet detected the volatile compound 2-butanone at 47 ppb. Semivolatile compounds were detected in the parts per billion range. Total metals analysis detected levels which were elevated above concentrations which would be deemed as naturally occurring in soils.

TCLP analysis was performed on one (1) sample (IHNC-S7-1) from Area 7. TCLP analysis detected barium and lead at levels which were below the TCLP regulatory limits for classification as a hazardous waste. No other TCLP compounds were detected in the sample analyzed from Area 7.

Pesticides were not detected in any of the samples collected from Area 7.

Area 8 is located on the west side of the Inner Harbor Canal between the toe of the levee and the New Orleans Military Terminal (NOMT) perimeter fence. Sample IHNC-S8-3-1 collected from a depth of 2.7 feet had the volatile compound sec-butylbenzene detected at 47 ppb. Semivolatile compounds were detected in the parts per billion range. In addition, the semivolatile contaminant phenanthrene was detected at 2.3 ppm in sample IHNC-S8-3-1 collected from a depth of 2.7 feet.

Total metals analysis of soil samples from Area 8 revealed elevated levels of metals above concentrations which would occur naturally. TCLP analysis of three (3) soil samples from Area 8 detected the presence of arsenic, barium and lead at levels which were below the TCLP regulatory limits for classification as a hazardous waste. No other TCLP compounds were detected in the samples analyzed from Area 8.

Pesticides were not detected in any of the samples collected from Area 8.

Area 9 is located on the west side of the Inner Harbor Canal at the southern part of the project. One (1) soil sample (IHNC-S9DB-2), collected and analyzed from Area 9 detected the presence of the volatile compound Naphthalene at 4 ppb. Several semivolatile compounds were detected in the parts per billion range in several of the soils collected from Area 9. Sample IHNC-S9-2 detected nine (9) semivolatile compounds in the parts per million range with the compound Benzo(b)fluoranthene detected at 1.6 ppm being the highest concentration detected. Sample IHNC-S9-2 was collected from a depth of five feet (5'). Sample IHNC-S9-5 detected the compound phenanthrene at 1.4 ppm and was collected from a depth of 2.5 feet.

Total metals analysis of soil samples collected from Area 9 revealed elevated levels of metals above concentrations which would occur naturally. TCLP analysis of seven (7) soil samples from Area 9 detected the presence of arsenic, barium, cadmium, chromium and lead at levels which were below the TCLP regulatory limit for classification as a hazardous waste. No other TCLP compounds were detected in the samples analyzed from Area 9.

Pesticide analysis of soil samples from Area 9 detected the presence of 4,4'-DDD, 4,4'-DDE and methoxychlor at 29, 27 and 10 ppb, respectively. The compounds 4,4'-DDD and 4,4'-DDE were detected in sample IHNC-S9-2 which was collected at a depth of five feet (5'). Methoxychlor was detected in sample IHNC-S9DB-8 which was collected at 40 feet.

Area 10 is located on the east bank of the Inner Harbor Canal at the southernmost part of the project area. Methylene chloride, a common laboratory contaminant, was the only volatile compound detected in soil samples analyzed from Area 10. The semivolatile compounds bis(2-ethyhexyl)phthalate and di-n-butylphthalate which are both common laboratory contaminants, were the only semivolatiles detected in the soil samples collected from Area 10.

Total metals analysis detected levels of metals which were reasonably close to concentrations which would be expected to occur naturally. TCLP analysis was not performed on any of the samples collected from Area 10.

Pesticides were not detected in any of the soil samples collected from Area 10.

The QA/QC results on field triplicate samples could be deemed good for the majority of sample analysis. A few parameters do have some outliers. The variations could be contributed to the soil samples not being homogenous. For the majority, the QA/QC results fall within acceptable limits of four times the method detection limit and/or fifty percent relative percent difference.

8.0 RECOMMENDATIONS

The data provided by the assessment confirm that contaminants are present within Area 1 through Area 9 located on the west bank of the Inner Harbor Navigation Canal. Data suggest that contaminants present in the soil do not exceed regulatory limits which would classify the soil as hazardous. Groundwater analysis data suggest that contaminants are present at levels which do exceed the regulatory limit as defined by the safe drinking water standards.

Based upon the assessment data, the following recommendations are presented for consideration:

1. Current lock replacement plans should be reviewed to assess which, if any, of the contaminated soil areas will require excavation for the construction phase. In addition, the plans should be reviewed to assess areas which may require a dewatering process during construction. Processing of waters may be required prior to discharge if the dewatering zone is within a contaminated groundwater area.
2. Louisiana Department of Environmental Quality (LDEQ) should be notified of the presence of contaminants at the site and interfacing should begin to assess the LDEQ's requirements for remediation and possible permitting requirements for the construction phase soil excavation/remediation/dewatering and discharge.
3. Groundwater monitoring wells should be planned to monitor the current and future impact that contaminants have and will have on the project area.
4. Contaminant sources (i.e.: Coast Guard/Port Authority and Corps of Engineer petroleum storage tanks, hazardous material and hazardous waste storage facilities, maintenance and equipment servicing operations) should be reviewed with the responsible party in an effort to eliminate additional contributions of contaminants to the soil and groundwater within the area.