FIGURES

ENV_BORING_PLAN_SOUTHISLAND

HRCP-L-ENV-078
HRCP-L-ENV-079
HRCP-L-ENV-023
HRCP-L-ENV-081
HRCP-L-ENV-024
HRCP-L-ENV-025
HRCP-L-ENV-082
HRCP-L-ENV-026
HRCP-L-ENV-027
HRCP-L-ENV-083
HRCP-L-ENV-084
HRCP-L-ENV-085

LEGEND:
- Proposed environmental boring

Scale: 1" = 100'

FINAL PLAN REVISIONS SUBMITTAL DATE:

NO.	DATE	AUTH.	DESCRIPTION	NO.	DATE	AUTH.	DESCRIPTION

Hampton Roads Connector Partners | VDOT | Mott MacDonald

Designed: ELS
Drawn: CEM
Checked: EKM

STRUCTURE AND BRIDGE DIVISION
DATE: March 15, 2019

TWIN BORED TUNNEL
SOUTH ISLAND
ENVIRONMENTAL BORING LOCATION PLAN

FIGURE 1

Sheet No. ENV(002)

TABLES

Table 1
HRBT Expansion
Summary of Analytical Results
Sediment - Standard Chemistry

Parameter	Unit	Most Stringent	TEL*	PEL*	GW SSL*	ESSL*	ISSL***	RSSL***	ERMs****	Weanack Exclusion Criteria	Weanack Clean Fill Criteria	HRCP-L-ENV-024 19D1291 4/25/2019 1:30:00 PM			HRCP-L-ENV-025 19E0632 5/9/2019 5:15:00 PM			HRCP-L-ENV-026 19D1291 4/26/2019 12:10:00 PM			HRCP-L-ENV-027 19D1291 4/27/2019 12:40:00 PM			HRCP-L-ENV-082 19D1291 4/24/2019 4:00:00 PM			HRCP-L-ENV-083 19D1291 4/28/2019 9:30:00 PM			HRCP-L-ENV-084 19D1291 4/28/2019 9:30:00 PM			HRCP-L-ENV-085 19E0632 5/13/2019 9:30:00 AM		
												Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL
1,1,1-Trichloroethane	µg/kg	1810	--	--	1810	--	3600000	810000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1,2,2-Tetrachloroethane	µg/kg	0.44	--	--	0.44	127	2700	600	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1,2-Trichloroethane	µg/kg	29	--	--	29	300	5000	1100	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1-Dichloroethane	µg/kg	8	--	--	8	300	16000	3600	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2,4-Trichlorobenzene	µg/kg	10	--	--	7210	10	110000	24000	--	400000	68000	ND		1.5	ND		1.5	ND		1.6	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
1,2-Dichlorobenzene	µg/kg	10	--	--	21200	10	930000	180000	--	10,000,000	5,100,000	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
1,2-Dichlorobenzene	µg/kg	10	--	--	21200	10	930000	180000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Dichloroethane	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Dichloropropane	µg/kg	300	--	--	--	300	4400	1000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Diphenylhydrazine	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,3-Dichlorobenzene	µg/kg	10	--	--	225	10	930000	180000	--	5,100,000	5,100,000	ND		1.2	ND		1.2	ND		1.3	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2
1,4-Dichlorobenzene	µg/kg	10	--	--	3390	10	11000	2600	--	570,000	13,000	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7
1-Methylnaphthalene	µg/kg	--	--	--	--	--	--	--	--	--	--	2.1		1.5	ND		1.5	1.6		1.5	ND		1.5	2.7	J	1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
2,2'-Oxybis[1-Chloropropane]	µg/kg	5.41	--	--	5.41	--	4700000	310000	--	2,300,000	2,300,000	2.4		2.4	ND		2.5	ND		2.5	ND		2.5	ND		2.4	ND		2.5	ND		2.4	ND		2.5	ND		2.5
2,3,7,8-Tcdd	ng/kg	0.199	--	--	6060	0.199	22	4.8	--	18000000	4300000	0.00015	J	0.000039	0.0002	J	0.000069	0.00012	J	0.000034	ND		0.00024	0.00018	J	0.000043	0.000099	J	0.000025	0.0001	J	0.000028	0.00012	J	0.000033			
2,3,7,8-Tcdf	ng/kg	38.5	--	--	--	38.5	--	--	--	--	--	0.00012	J	0.000015	ND		0.000026	0.00087	J	0.000056	ND		0.00011	0.000037	J	0.00002	0.000029	J	0.000014	0.000033		0.0000067	ND		0.000029			
2,4,6-Trichlorophenol	µg/kg	100	--	--	--	100	210000	49000	--	160000	62000	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8
2,4'-Ddd	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.094	ND		0.11	ND		0.1	ND		0.018	ND	*	0.11	ND		0.018	ND		0.019	ND		0.019	ND		0.019
2,4'-Dde	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.14	ND		0.15	ND		0.15	ND		0.026	ND		0.16	ND		0.026	ND		0.028	ND		0.028	ND		0.028
2,4'-Ddt	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.21	ND		0.23	ND		0.23	ND		0.039	ND	*	0.24	ND		0.039	ND		0.043	ND		0.043	ND		0.043
2,4-Dichlorophenol	µg/kg	3	--	--	3.45	3	250000	19000	--	12,000,000	1,100,000	ND		2.5	ND		2.6	ND		2.6	ND		2.5	ND		2.6	ND		2.5	ND		2.6	ND		2.6	ND		2.6
2,4-Dimethylphenol	µg/kg	10	--	--	323	10	1600000	130000	--	1,800,000	170000	ND		2	ND		2.1	ND		2.1	ND		2	ND		2.1	ND		2	ND		2.1	ND		2.1	ND		2.1
2,4-Dinitrophenol	µg/kg	3	--	--	3	60.9	160000	13000	--	1,200,000	110000	ND		88	ND		89	ND		90	ND		87	ND		89	ND		88	ND		89	ND		89	ND		89
2,4-Dinitrotoluene	µg/kg	1.39	--	--	1.39	1280	7400	1700	--	1,200,000	--	ND		2	ND		1.6	ND		1.7	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6
2,6-Dinitrotoluene	µg/kg	5.92	--	--	5.92	32.8	1500	360	--	620000	61000	ND		2	ND		2	ND		2.1	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
2-Butanone (Mek)	µg/kg	552	--	--	552	--	19000000	2700000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2-Chloroethyl Vinyl Ether	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2-Chloronaphthalene	µg/kg	12.2	--	--	7000	12.2	6000000	480000	--	--	--	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
2-Chlorophenol	µg/kg	10	--	--	173	10	580000	39000	--	5,100,000	280000	ND		1.5	ND		1.5	ND		1.6	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
2-Methylnaphthalene	µg/kg	20.2	20.2	201.3	1010	29000	300000	24000	670	4,100,000	--	2.1	J	1.6	ND		1.6	1.8	J	1.6	ND		1.6	2.1	J	1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6
2-Methylphenol	µg/kg	100	--	--	429	100	4100000	320000	--	2,800,000	2,800,000	ND		9.4	ND		9.5	ND		9.6	ND		9.3	ND		9.5	ND		9.4	ND		9.5	ND		9.5	ND		9.5
2-Nitrophenol	µg/kg	1600	--	--	--	1600	--	--	--	--	--	ND		30	ND		5.3	ND		5.3	ND		5.2	ND		5.3	ND		5.2	ND		5.3	ND		5.3	ND		5.3
3,3-Dichlorobenzidine	µg/kg	18.7	--	--	18.7	646	5100	1200	--	490,000,000	10,000,000	ND		30	ND		31	ND		31	ND		30	ND		31	ND		30	ND		31	ND		31	ND		31
4,4'-Ddd	µg/kg	1.22	1.22	7.81	13900	21	9600	2300	20	--	--	ND		0.23	ND		0.25	ND		0.25	ND		0.043	ND	*	0.26	ND		0.043	ND		0.047	ND		0.047	ND		0.047
4,4'-Dde	µg/kg	2.07	2.07	374	4710	21	9300	2000	27	7200	3000	ND		0.11	ND		0.12	ND		0.12	ND		0.12	ND		0.02	ND	*	0.12	ND		0.02	ND		0.022	ND		0.022
4,4'-Ddt	µg/kg	1.19	1.19	4.77	21400	21	8500	1900	7	5100	2000	ND		0.21	ND		0.23	ND		0.23	ND		0.04	ND	*	0.24	ND		0.039	ND		0.043	ND		0.043	ND		0.043
4,6-Dinitro-2-Methylphenol	µg/kg	0.136	--	--	0.136	144	6600	510	--	--	--	ND		56	ND		57	ND		58	ND		56	ND		57	ND		56	ND		57	ND		57	ND		57
4-Bromophenyl Phenyl Ether	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3
4-Chloro-3-Methylphenol	µg/kg	7470	--	--	7470	7950	8200000	630000	--	10,000,000	10,000,000	ND		1.5	ND		1.6	ND		1.6	ND		1.5	ND		1.6	ND		1.5	ND		1.6	ND		1.6	ND		1.6
4-Chlorophenyl Phenyl Ether	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
4-Nitrophenol	µg/kg	100	--	--	--	100	--	--	--	--	--	ND		23	ND		23	ND		23	ND		23	ND		23	ND		23	ND		23	ND		23	ND		23
Acenaphthene	µg/kg	6.7	6.7	88.9	17200	29000	4500000	360000	500	33,000,000	3,400,000	4.5	J	1.9	ND		1.9	2.2	J	1.9	ND		1.9	5.7	J	1.9	ND		1.9	ND		1.9	ND		1.9	ND		1.9
Acenaphthylene	µg/kg	5.9	5.9	127.9	66300	29000	4500000	360000	640	--	--	1.9	J	1.4	ND		1.5	4.1	J	1.5	ND		1.4	3.3	J	1.5	ND		1.4	ND		1.5	ND		1.5	ND		1.5
Acrolein	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Acrylonitrile	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Aldrin	µg/kg	2.5	--	--	3.36	2.5	180	39	--	110	40	ND		0.16	ND		0.18	ND		0.18	ND		0.031	ND		0.19	ND		0.031	ND		0.034	ND		0.034	ND		0.034
Alpha-Bhc	µg/kg	0.461	--	--	0.461	2.5	360	86	--	--	--	ND		0.13	ND		0.15	ND		0.14	ND		0.025	ND		0.15	ND		0.025	ND		0.027	ND		0.027	ND		0.027
Aluminum	mg/kg	7700	--	--	24000	--	110000	7700	--	--	--	ND		3.04	19800		343	ND		3.49	ND		2.75	ND		3.23	9760		295	3330		289	8340		337			
Ammonia As N	mg/kg											131		12.2	138		14.3	89.2		14.4	ND		11.5	121		13.4	19.1		12.2	19.9		11.7	ND		14			
Anthracene	µg/kg	46.9	46.9	245	185000	29000	23000000	1800000	1100	170,000,000	10,000,000	2.4	J	1.7	ND		1.7	4.2	J	1.7	ND		1.7	3.2	J	1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7
Antimony	mg/kg	0.3	--	--	2.7	0.3	47	3.1	--	410	14	ND		6.07	0.317	J	0.281	ND		6.99	ND		5.51	ND		6.46	ND		5.89	ND		5.77	ND		0.276			
Arsenic	mg/kg	0.68	7.24	41.6	2.9	18	3	0.68	70	41	20	4.63		1.21	3.66		1.37	2.6		1.4	3.02		1.1	2.56		1.29	2.23		1.18	ND		1.15	2.34		1.35			
Barium	mg/kg	330	--	--	822	330	22000	1500	--	19,000	700	33.6		0.607	32.3		0.686	22.3		0.699	15.1		0.551	27.6		0.646	16.7		0.589	6.53		0.577	14.2		0.675			
Benzene	µg/kg	24.6	--	--	24.6	50	5100	1200	--	--	--	ND		6.24	ND		5.95	ND		7.2	ND		5.84	ND		6.71	ND		6.17	ND		5.95	ND		6.98			
Benzidine	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		250	ND		250	ND		250	ND		240	ND		250	ND		250	ND		250	ND		250			
Benzo(A)Anthracene	µg/kg	74.8	74.8	692.5	644	1100	2900	160	1600	2100	900	1.8	J	1.2	ND		1.3	13		1.3	ND		1.2	ND		1.3	ND		1.2	ND		1.3	ND		1.3	ND		1.3
Benzo(A)Pyrene	µg/kg	88.8	88.8	763.2	8870	1100	290	160	1600	660	210	ND		1.4	ND		1.4	13		1.5	ND		1.4	ND		1.4	ND		1.4	ND		1.4	ND		1.4	ND		1.4
Benzo(B)Fluoranthene	µg/kg	160	--	--	1820	1100	2900	160	--	2100	900	1.8	J	1.6	ND		1.6	16		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6
Benzo(Ghi)Perylene	µg/kg	1100	--	--	19400000	1100	2300000	180000	--	--	--	ND		1.4	ND		1.4	11		1.4	ND		1.4	ND		1.4	ND		1.4	1.4	J	1.4	1.4	J	1.4			
Benzo(K)Fluoranthene	µg/kg	1100	--	--	18200	1100	29000	1600	--	21000	900	ND		2	ND		2	6.4	J	2	ND		1.9	ND		2	ND		2	ND		2	ND		2	ND		2
Benzoic Acid	µg/kg	6000	--	--	6000	--	330000000	25000000	--	--	--	ND		35	ND		36	ND		36	ND		35	ND		36	ND		35	ND		36	ND		36			
Benzyl Alcohol	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		2.2	3	J	2.2	ND		2.3	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2			
Beryllium	mg/kg	16	--	--	31.6	21	230	16	--	2.000	160	ND		0.243	1.54		0.274	ND		0.28	ND		0.22	ND		0.258	0.83		0.236	0.313		0.231	ND		0.274	0.649		0.27
Beta-Bhc	µg/kg	1	--	--	1.58	1	1300	300	--	--	--	ND		0.15	ND		0.16	ND		0.16	ND		0.028	ND		0.17	ND		0.027	ND		0.03	ND		0.03			
Bis(2-Chloroethoxy)Methane	µg/kg	6.24	--	--	6.24	--	250000	19000	--	1,800,000	--	ND		1.6	ND		1.6	ND		1.6	ND		1.5	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6			
Bis(2-Chloroethyl)Ether	µg/kg	0.254	--	--	0.254	23700	1000	230	--	900	660	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2			
Bis(2-Ethylhexyl) Phthalate	µg/kg	182	182	2647	38000	925	160000	39000	--	120000	49000	ND		35	ND		35	ND		36	ND		35	ND		35	ND		35	ND		35	ND		35	ND		35			
Bromoform	µg/kg	516	--	--	516	15900	86000	19000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Bromomethane	µg/kg	1.48	--	--	1.48	235	3000	680	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Butyl Benzyl Phthalate	µg/kg	239	--	--	56400	239	1200000	290000	--	1,100,000	910000	30	J	22	38		23	32	J	23	28	J	22	32	J	23	30	J	22	29	J	23	28	J	23			
Cadmium	mg/kg	0.36	0.676	4.21	3.76	0.36	98	7.1	--	810	39	1.67		0.243	ND		0.274	0.999		0.28	0.685		0.22	1.39		0.258	0.83		0.236	0.313		0.231	ND		0.274			
Calcium Carbonate Equivalence	mg/kg	--	--	--	--	--	--	--	--	--	--	47000		1000	16000		1000	45000		1000	ND		1000	40000		1000	40000		1000	30000		1000	ND		1000			
Calcium	mg/kg	9.6	--	--	--	--	--	--	9.6	--	--	1860		304	2890		343	2440		349	3240		275	2990		323	3190		295	3250		289	3020		337			
Carbon Tetrachloride	µg/kg	79.4	--	--	79.4	300	2900	650	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chlordane	µg/kg	6	--	--	14500	--	7700	1700	6	--	--	ND		2.3	ND		2.5	ND		2.5	ND		0.43	ND		2.6	ND		0.43	ND		0.47	ND		0.47			
Chlorobenside	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.21	ND		0.23	ND		0.23	ND		0.04	ND		0.24	ND		0.039	ND		0.043	ND		0.043			
Chlorodibromomethane	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloroethane	µg/kg	5580	--	--	5580	--	5700000	1400000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloroform	µg/kg	1	--	--	311	1	1400	320	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloromethane	µg/kg	39	--	--	39	10400	46000	11000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chromium	mg/kg	0.3	52.3	160.4	19	26	6.3	0.3	370	1.200	200	25.7		0.607	27.8		0.686	16.7		0.699	11.6		0.551	22.3		0.646	14.1		0.589	6.47		0.577	13.9		0.675			
Chromium, Hexavalent	mg/kg	--	--	--	--	--	--	--	--	--	--	0.3		0.25	1.58		0.28	0.74		0.28	0.23		0.23	2.24		0.26	0.39		0.25	ND		0.24	ND		0.28			
Chrysene	µg/kg	107.8	107.8	846	64400	1100	290000	16000	2800	210000	9000	1.7	J	1.3	ND		1.3	11		1.3	ND		1.3	ND		1.3	1.4	J	1.3	ND		1.3	ND		1.3			
Cis-1,3-Dichloropropene	µg/kg	1.66	--	--	1.66	398	8200	1800	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA			
Cobalt	mg/kg	0.21	--	--	0.21	13	35	2.3	--	300	--	9.18		0.243	9.06		0.085	5.54		0.28	9.88		0.22	7.57		0.258	4.67		0.236	2		0.231	4.3		0.083			

Table 1
HRBT Expansion
Summary of Analytical Results
Sediment - Standard Chemistry

Parameter	Unit	Most Stringent	TEL*	PEL*	GW SSL*	ESSL*	ISSL***	RSSL***	ERMs****	Weanack Exclusion Criteria	Weanack Clean Fill Criteria	HRCP-L-ENV-024 19D1291 4/25/2019 1:30:00 PM			HRCP-L-ENV-025 19E0632 5/9/2019 5:15:00 PM			HRCP-L-ENV-026 19D1291 4/26/2019 12:10:00 PM			HRCP-L-ENV-027 19D1291 4/27/2019 12:40:00 PM			HRCP-L-ENV-082 19D1291 4/24/2019 4:00:00 PM			HRCP-L-ENV-083 19D1291 4/28/2019 9:30:00 PM			HRCP-L-ENV-084 19D1291 4/28/2019 9:30:00 PM			HRCP-L-ENV-085 19E0632 5/13/2019 9:30:00 AM		
												Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL
Conductivity (Saturated Paste)	dS/m	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Copper	mg/kg	19	18.7	108	5570	28	4700	310	270	4,300	1,500	5.59		0.607	3.38	J	0.0686	3.95		0.699	2.89		0.551	4.09		0.646	1.97	J	0.589	1.24	J	0.577	1.33	J	0.675
Cyanide	mg/kg	0	--	--	20	0.005	--	--	--	20,000	1,100	ND		1.07	ND		1.42	ND		1.37	ND		1.02	ND		1.31	ND		1.1	ND		1.01	ND		1.42
Dcpa	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.17	ND		0.19	ND		0.19	ND		0.032	ND		0.19	ND		0.032	ND		0.035	ND		0.035
Delta-Bhc	µg/kg	1.51	--	--	1.51	9940	360	86	--	--	--	ND		0.17	ND		0.19	ND		0.18	ND		0.032	ND		0.19	ND		0.032	ND		0.035	ND		0.035
Dibenzo(A,H)Anthracene	µg/kg	6.2	6.2	134.6	427	1100	290	16	260	660	210	ND		1.5	ND		1.5	3.2	J	1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
Dibenzofuran	µg/kg	391	--	--	391	--	100000	7300	--	--	--	5.5	J	1.4	ND		1.5	2.6	J	1.5	ND		1.4	8.9	J	1.5	ND		1.4	ND		1.5	ND		1.5
Dichlorobromomethane	µg/kg	2050	--	--	--	2050	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dichlorodifluoromethane	µg/kg	595	--	--	595	39500	37000	8700	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dieldrin	µg/kg	0.715	0.715	4.3	0.434	4.9	140	34	8	110	42	ND		0.13	ND		0.15	0.32	J p	0.15	ND		0.025	ND	*	0.15	ND		0.025	ND		0.027	ND		0.027
Diethyl Phthalate	µg/kg	18800	--	--	18800	24800	66000000	5100000	--	490,000,000	10,000,000	ND		11	ND		12	ND		12	ND		11	ND		12	ND		11	ND		12	ND		12
Dimethyl Phthalate	µg/kg	200000	--	--	--	200000	--	--	--	10,000,000	10,000,000	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2
Di-N-Butyl Phthalate	µg/kg	150	--	--	176000	150	8200000	630000	--	5,700,000	5,700,000	ND		14	ND		15	ND		15	ND		14	ND		15	ND		14	ND		15	ND		15
Di-N-Octyl Phthalate	µg/kg	70900	--	--	--	70900	--	--	--	--	--	ND		19	ND		19	ND		19	ND		19	ND		19	ND		19	ND		19	ND		19
Endosulfan I	µg/kg	100	--	--	1730	100	700000	47000	--	3,700,000	--	ND		0.14	ND		0.16	ND		0.16	ND		0.027	ND		0.16	ND		0.027	ND		0.03	ND		0.03
Endosulfan Ii	µg/kg	100	--	--	1730	100	700000	47000	--	3,700,000	--	ND		0.12	ND		0.13	0.35	J	0.13	ND		0.022	ND	*	0.13	ND		0.022	ND		0.024	ND		0.024
Endosulfan Sulfate	µg/kg	35.8	--	--	1270	35.8	700000	47000	--	3,700,000	--	ND		0.14	ND		0.15	ND		0.15	ND		0.026	ND	*	0.16	ND		0.026	ND		0.028	ND		0.028
Endrin	µg/kg	1	--	--	589	1	25000	1900	--	180000	17000	ND		0.21	ND		0.23	ND		0.23	ND		0.039	ND	*	0.24	ND		0.039	ND		0.043	ND		0.043
Endrin Aldehyde	µg/kg	10.5	--	--	231	10.5	25000	1900	--	--	--	ND		0.19	ND		0.21	ND		0.21	ND		0.036	ND	*	0.22	ND		0.036	ND		0.039	ND		0.039
Ethylbenzene	µg/kg	50	--	--	16800	50	25000	5800	--	--	--	ND		6.24	ND		7.12	ND		7.2	ND		5.84	ND		6.71	ND		6.17	ND		5.95	ND		6.98
Extractable Organic Halides (Eox)	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10
Extractable Organic Halogens	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Fizz Rating	--	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Flash Point	--	--	--	--	--	--	--	--	--	--	--	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20
Fluoranthene	µg/kg	112.8	112.8	1493.5	278000	1100	3000000	240000	5100	22,000,000	2,300,000	8.6		1.7	2.3	J	1.7	26		1.8	ND		1.7	4.6	J	1.7	2.3	J	1.7	ND		1.7	2.1	J	1.7
Fluorene	µg/kg	21.2	21.2	144.4	17000	29000	3000000	240000	--	22,000,000	2,300,000	5.9	J	1.3	ND		1.3	3.4	J	1.3	ND		1.3	8.6		1.3	ND		1.3	ND		1.3	ND		1.3
Gamma-Bhc (Lindane)	µg/kg	0.05	0.32	0.99	11	0.05	2500	570	--	520	520	ND		0.18	ND		0.2	ND		0.2	ND		0.034	ND		0.21	ND		0.034	ND		0.037	ND		0.037
Heptachlor	µg/kg	5.96	--	--	425	5.96	630	130	--	380	150	ND		0.17	ND		0.19	ND		0.18	ND		0.031	ND		0.19	ND		0.031	ND		0.034	ND		0.034
Heptachlor Epoxide	µg/kg	70	--	--	2440	100	330	70	--	190		ND		0.14	ND		0.15	ND		0.15	ND		0.026	ND		0.15	ND		0.026	ND		0.028	ND		0.028
Hexachlorobenzene	µg/kg	2.5	--	--	9960	2.5	960	210	--	1100	660	ND		2.3	ND		2.4	ND		2.4	ND		2.3	ND		2.4	ND		2.3	ND		2.4	ND		2.4
Hexachlorobutadiene	µg/kg	39.8	--	--	781	39.8	5300	1200	--	22000	1000	ND		1.9	ND		1.9	ND		2	ND		1.9	ND		1.9	ND		1.9	ND		1.9	ND		1.9
Hexachlorocyclopentadiene	µg/kg	400000	--	--	--	--	--	--	--	3,700,000	400000	ND		3.3	ND		3.4	ND		3.4	ND		3.3	ND		3.4	ND		3.3	ND		3.4	ND		3.4
Hexachloroethane	µg/kg	347	--	--	347	596	8000	1800	--	120000	6000	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7
Ignitability	None	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Indeno(1,2,3-Cd)Pyrene	µg/kg	1100	--	--	5160	1100	3000000	240000	--	2100	900	ND		1.3	ND		1.3	9.6		1.4	ND		1.3	ND		1.3	ND		1.3	ND		1.3	ND		1.3
Iron	mg/kg	276	--	--	276	--	82000	5500	--	150,000	150,000	26700		60.7	28600		68.6	16100		69.9	10300		55.1	21900		64.6	12900		58.9	4620		57.7	11400		67.5
Isophorone	µg/kg	243	--	--	243	139000	2400000	570000	--	1,800,000	1,100,000	ND		1.7	ND	F2	1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7
Lead	mg/kg	11	30.24	112	135	11	800	400	218	800	300	8.21		0.607	8.04		0.686	5.19		0.699	6.93		0.551	6.22		0.646	4.14		0.589	2.21		0.577	4.12		0.675
M+P-Xylenes	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		6.24	ND		5.95	ND		7.2	ND		5.84	ND		6.61	ND		6.17	ND		5.95	ND		5.95
Magnesium	mg/kg	4400	--	--	--	4400	--	--	--	--	--	5550		60.7	5600		68.6	3970		69.9	2710		55.1	5620		64.6	3620		58.9	1370		57.7	3080		67.5
Manganese	mg/kg	20.8	--	--	20.8	220	2600	180	--	--	--	221		0.607	211		0.686	215		0.699	142		0.551	233		0.646	160		0.589	58		0.577	124		0.675
Mercury	mg/kg	0.06	0.1	1	1.04	0.06	4.6	1.1	710	100	14	0.022		0.01	ND		0.011	ND		0.012	ND		0.009	ND		0.01	ND		0.01	ND		0.009	ND		0.011
Methoxychlor	µg/kg	19.9	--	--	134000	19.9	410000	32000	--	3,100,000	280000	ND		0.21	ND		0.23	ND		0.23	ND		0.039	ND	*	0.24	ND		0.039	ND		0.043	ND		0.043
Methylene Chloride	µg/kg	9.36	--	--	9.36	300	1000000	57000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Methylphenol, 3 & 4	µg/kg	100	--	--	437	100	8200000	630000	--	2,800,000	2,800,000	ND		9.6	ND	F2	9.7	ND		9.8	ND		9.5	ND		9.7	ND		9.6	ND		9.7	ND		9.7
Mirex	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.099	ND		0.11	ND		0.11	ND		0.019	ND	*	0.11	ND		0.019	ND		0.02	ND		0.02
Naphthalene	µg/kg	14.9	34.6	390.6	14.9	29000	17000	3800	2100	230000	20000	4.7	J	1.3	ND	F2	1.3	3.2	J	1.3	ND		1.3	6.4	J	1.3	ND		1.3	ND		1.3	2.5	J	1.3
Nickel	mg/kg	15.9	15.9	42.8	19.5	38	2200	150	51.6	1,000	250	16.8		0.607	14.7		0.686	9.87		0.699	6.51		0.551	13.6		0.646	7.81		0.589	3.23		0.577	6.44		0.675
Nitrate As N	mg/kg	--	--	--	--	--	--	--	--	--	--	ND		1.26	ND		1.43	ND		1.47	ND		1.17	ND		1.34	ND		1.25	ND		1.2	ND		1.4
Nitrate Nitrite As N	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Nitrite As N	mg/kg	--	--	--	--	--	--	--	--	--	--	ND		1.3	ND		1.4	ND		1.5	ND		1.2	ND		1.3	ND		1.2	ND		1.2	ND		1.4
Nitrobenzene	µg/kg	0.595	--	--	0.595	1310	22000	5100	--	280000	28000	ND		12	ND	F2	12	ND		12	ND		12	ND		12	ND		12	ND		12	ND		12
N-Nitrosodimethylamine	µg/kg	140000	--	--	--	--	--	--	--	350000	140000	ND		3.2	ND	1,F2	3.3	ND		3.3	ND		3.2	ND		3.3	ND		3.2	ND		3.3	ND		3.3
N-Nitrosodi-N-Propylamine	µg/kg	0.0214	--	--	0.0214	544	330	78	--	660	250	ND		2.2	ND	F2	2.2	ND		2.3	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2
N-Nitrosodiphenylamine	µg/kg	727	--	--	727	545	470000	110000	--	--	--	ND		11	ND		11	ND		11	ND		11	ND		11	ND		11	ND		11	ND		11
O-Xylene	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		6.24	ND		7.12	ND		7.2	ND		5.84	ND		6.71	ND		6.17	ND		5.95	ND		6.98
Paint Filter Test	--	--	--	--	--	--	--	--	--	--	--	NA		NA	ND	NFL	1	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	ND	NFL	1
Pcb As Aroclor 1016	µg/kg	410	--	--	9600	--	27000	410	--	21000	--	ND		55	ND		71	ND		68	ND		58	ND	*	67	ND		57	ND		56	ND		69
Pcb As Aroclor 1221	µg/kg	200	--	--	1250	--	830	200	--	620	--	ND		55	ND		71	ND		68	ND		58	ND		67	ND		57	ND		56	ND		69
Pcb As Aroclor 1232	µg/kg	170	--	--	3100	--	720	170	--	620	--	ND		55	ND		71	ND		68	ND		58	ND		67	ND		57	ND		56	ND		69
Pcb As Aroclor 1242	µg/kg	230	--	--	9600	--	950	230	--	620	--	ND		55	ND		71	ND		68	ND		58	ND		67	ND		57	ND		56	ND		69
Pcb As Aroclor 1248	µg/kg	230	--	--	37300	--	950	230	--	620	--	ND		55	ND		71	ND		68	ND		58	ND		67	ND		57	ND		56	ND		69
Pcb As Aroclor 1254	µg/kg	240	--	--	73600	--	970	240	--	620	--	ND		55	ND		71	ND		68	ND		58	ND		67	ND		57	ND		56	ND		69
Pcb As Aroclor 1260	µg/kg	240	--	--	145000	--	990	240	--	620	--	ND		55	ND		71	ND		68	ND		58	ND		67	ND		57	ND		56	ND		69
PCB 101 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.27	ND		0.27	1.7		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27
PCB 105 (BZ)	µg/kg	0.48	0.48	--	--	--	490	120	--	--	--	ND		0.27	ND		0.27	ND		0.28	ND		0.27	ND		0.27	ND		0.28	ND		0.27	ND		0.27
PCB 118 (BZ)	µg/kg	0.48	0.48	--	--	--	490	120	--	--	--	ND		0.29	ND		0.29	0.69	J p	0.29	ND		0.29	ND		0.29	ND		0.29	ND		0.29	ND		0.29
PCB 126 (BZ)	µg/kg	0.036	0.48	--	--	--	0.15	0.036	--	--	--	ND		0.62	ND		0.62	ND		0.63	ND		0.62	ND		0.62	ND		0.63	ND		0.62	ND		0.62
PCB 128 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.37	ND		0.37	0.37	J	0.37	ND		0.37	ND		0.37	ND		0.37	ND		0.37	ND		0.37
PCB 138 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.4	ND		0.4	0.85	J p	0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
PCB 153 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.23	ND		0.23	1.8		0.23	ND		0.23	ND		0.23	ND		0.23	ND		0.23	ND		0.23
PCB 156 (BZ)	µg/kg	0.48	0.48	--	--	--	500	120	--	--	--	ND		0.53	ND		0.53	ND		0.54	ND		0.53	ND		0.53	ND		0.54	ND		0.53	ND		0.53
PCB 169 (BZ)	µg/kg	0.051	0.48	--	--	--	0.051	0.12	--	--	--	ND		0.68	ND		0.68	ND		0.69	ND		0.68	ND		0.68	ND		0.69	ND		0.68	ND		0.68
PCB 170 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.21	ND		0.2	0.54	J	0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21	ND		0.2
PCB 18 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.61	ND		0.6	ND		0.62	ND		0.6	ND		0.6	ND		0.62	ND		0.61	ND		0.6
PCB 180 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.47	ND		0.46	0.87	J	0.47	ND		0.46	ND		0.46	ND		0.47	ND		0.47	ND		0.46
PCB 183 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.65	ND		0.64	ND		0.66	ND		0.64	ND		0.64	ND		0.64	ND		0.65	ND		0.64
PCB 184 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.23	ND		0.23	ND		0.24	ND		0.23	ND		0.23	ND		0.24	ND		0.23	ND		0.23
PCB 187 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.25	ND		0.25	0.59	J	0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
PCB 195 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.51	ND		0.51	ND		0.52	ND		0.51	ND		0.51	ND		0.52	ND		0.51	ND		0.51
PCB 28 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.45	ND		0.44	ND		0.45	ND		0.44	ND		0.44	ND		0.45	ND		0.45	ND		0.44
PCB 44 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.61	ND		0.6	ND		0.62	ND		0.6	ND		0.6	ND		0.62	ND		0.61	ND		0.6
PCB 49 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.52	ND		0.52	0.65	J	0.53	ND		0.52	ND		0.52	ND		0.53	ND		0.52	ND		0.52
PCB 52 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.39	ND		0.38	0.48	J	0.39	ND		0.38	ND		0.38	ND		0.39	ND		0.39	ND		0.38
PCB 66 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.43	ND		0.43	0.81	J	0.43	ND		0.43	ND		0.43	ND		0.43	ND		0.43	ND		0.43
PCB 77 (BZ)	µg/kg	0.48	0.48	--	--	--	160	38	--	--	--	ND		0.4	ND		0.39	0.76	J	0.4	ND		0.39	ND		0.39	ND		0.4	ND		0.4	ND		0.39
PCB 8 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	1.9		0.35	ND		0.34	0.58	J p	0.35	ND		0.34	ND		0.34	ND		0.35	ND		0.35	ND		0.34
PCB 87 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.38	ND		0.37	ND		0.38	ND		0.37	ND		0.37	ND		0.38	ND		0.38	ND		0.37
PCB-206 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.87	ND		0.86	1.3		0.88	ND		0.86	ND		0.86	ND		0.88	ND		0.87	ND		0.86
PCB-209 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
TOTAL PCBs	µg/kg	21.6	--	21.6	188.8	0.332	740	220	--	--	--	1.9		0.23	ND		0.2	11.99		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21	ND		0.2
Pentachlorophenol	µg/kg	36.5	--	--	36.5	2100	4000	1000	--	9000	6000	ND		53	ND		53	ND		54	ND		52	ND		53	ND		53	ND		53	ND		53
Percent Solids	µg/kg	--	--	--	--	--	--	--	--	--	--	79.3		0.1	70		0.1	68.8		0.1	85.5		0.1	74.4		0.1	80.2		0.1	83.5		0.1	71.3		0.1
Ph	µg/kg	--	--	--	--	--	--	--	--	--	--	8.06	H	0	8.13	H	0	8.32	H	0	8.24	H	0	7.81	H	0	8.37	H	0	8.51	H	0	8.57		0
Ph (Saturated Paste)	s.u.	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Phenanthrene	µg/kg	86.7	86.7	543.5	160000	29000	2300000	180000	--	--	--	17		1.8	3.5	J	1.8	13		1.8	2.6	J	1.7	20		1.8	ND		1.8	4	J	1.8	2.7	J	1.8
Phenol	µg/kg	50	--	--	--	50	25000000	1900000	--	180,000,000	10,000	ND		9.9	ND	F2	10	ND		10	ND		9.8	ND		10	ND		9.9	ND		10	ND		10
Phosphorus, Total	mg/kg	--	--	--	--	--	--	--	--	--	--	2.7		1.2	1.4	J	1.4	4.3		1.4	18.6		1.1	5.4		1.3	2	J	1.2	14.5		1.2	4.7		1.4

Table 1
HRBT Expansion
Summary of Analytical Results
Sediment - Standard Chemistry

Parameter	Unit	Most Stringent	TEL*	PEL*	GW SSL*	ESSL*	ISSL***	RSSL***	ERMs****	Weanack Exclusion Criteria	Weanack Clean Fill Criteria	HRCP-L-ENV-024			HRCP-L-ENV-025			HRCP-L-ENV-026			HRCP-L-ENV-027			HRCP-L-ENV-082			HRCP-L-ENV-083			HRCP-L-ENV-084			HRCP-L-ENV-085		
												19D1291			19E0632			19D1291			19D1291			19D1291			19D1291			19D1291			19E0632		
												4/25/2019			5/9/2019			4/26/2019			4/27/2019			4/24/2019			4/28/2019			4/28/2019			5/13/2019		
												1:30:00 PM			5:15:00 PM			12:10:00 PM			12:40:00 PM			4:00:00 PM			9:30:00 PM			9:30:00 PM			9:30:00 AM		
												Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL
Potassium	mg/kg	--	--	--	--	--	--	--	--	--	--	3050		30.4	2950		34.3	1940		34.9	1300		27.5	2800	J	32.3	1710		29.5	647		28.9	1450		33.7
Pyrene	µg/kg	152.7	152.7	1397.6	32700	1100	2300000	180000	2600	17,000,000	1,700,000	4.4	J	1.5	ND		1.6	25		1.6	ND		1.5	2.5	J	1.6	1.9	J	1.5	ND		1.6	1.7	J	1.6
Pyritic Sulfur	%	< 0.25	--	--	--	--	--	--	--	2	< 0.25	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Selenium	mg/kg	2.55	--	--	2.55	0.52	580	39	--	5,100	63	ND		3.04	ND		3.43	ND		3.49	ND		2.75	ND		3.23	ND		2.95	ND		2.89	ND		3.37
Silver	mg/kg	0.596	0.73	1.77	0.596	4.2	580	39	--	5,100	110	ND		0.607	ND		0.686	ND		0.699	ND		0.551	ND		0.646	ND		0.589	ND		0.577	ND		0.675
Sodium	mg/kg	--	--	--	--	--	--	--	--	--	--	3060		30.4	3570		34.3	2000		34.9	1880		27.5	2670		32.3	2210		29.5	1510		28.9	1300		33.7
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	1850		427	2830		566	3650		548	2300		407	3830		522	2500		441	2430		405	1910		552
Tetrachloroethene	µg/kg	10	--	--	189	10	100000	24000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Thallium	mg/kg	0.001	--	--	1	0.001	1.2	0.078	--	5	1	ND		3.04	ND		0.966	ND		3.49	ND		2.75	ND		3.23	ND		2.95	ND		2.89	ND		0.95
Tin		--	--	--	--	--	--	--	--	--	--	ND		1.23	ND		1.37	ND		1.39	ND		1.15	ND		1.29	ND		1.15	ND		1.12	ND		1.35
Tkn As N	mg/kg	--	--	--	--	--	--	--	--	--	--	198		25.2	836		28.5	550		29.1	209		23.4	974		26.9	172		24.9	111		24	356		28
Toluene	µg/kg	50	--	--	11900	50	4700000	490000	--	--	--	ND		6.24	ND		7.12	ND		7.2	ND		5.84	ND		6.71	ND		6.17	ND		5.95	ND		6.98
Total Organic Carbon	%	< 5%	--	--	--	--	--	--	--	--	< 5%	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Petroleum Hydrocarbons (As Diesel)	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Petroleum Hydrocarbons (As Gasoline)	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Solids (Ts)	µg/kg	--	--	--	--	--	--	--	--	--	--	1000000		252	1020000		286	1180000		291	1000000		234	1000000		269	977000		249	1000000		240	948000		280
Total Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Toxaphene	µg/kg	100	--	--	9860	119	2100	490	--	1600	100	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Tph-Semi-Volatiles (Dro)	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		12.2	ND		14.1	ND		14.5	ND		11.2	ND		13.4	ND		11.9	ND		11.4	ND		13.9
Tph-Volatiles (Gro)	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.13	ND		0.14	ND		0.15	ND		0.12	ND		0.13	ND		0.12	ND		0.12	ND		0.63
Trans-1,2-Dichloroethene	µg/kg	300	--	--	498	300	2300000	160000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Trans-1,3-Dichloropropene	µg/kg	1.6	--	--	1.6	398	8200	1800	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Trichloroethene	µg/kg	1	--	--	39	1	6000	940	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Trichlorofluoromethane	µg/kg	1740	--	--	1740	16400	35000000	2300000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Tributyltin	mg/kg	1.8	--	--	--	--	25	1.8	--	--	--	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Vanadium	mg/kg	7.8	--	--	78	7.8	580	39	--	5,200	370	30.4		0.607	33.5		0.686	19.4		0.699	15.7		0.551	25.9		0.646	16.3		0.589	6.94		0.577	16.1		0.675
Vinyl Chloride	µg/kg	7.92	--	--	7.92	10	1700	59	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Xylenes, Total		--	--	--	--	--	--	--	--	--	--	ND		18.7	ND		21.4	ND		21.6	ND		17.5	ND		20.1	ND		18.5	ND		17.9	ND		20.9
Zinc	mg/kg	46	124	271	292	46	35000	2300	410	7,500	1,500	52.4		0.607	47.8		0.686	32.6		0.699	30.3		0.551	44.5		0.646	29.1		0.589	12.8		0.577	23.4		0.675

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed
*Source: MacDonald et al. 1996. Ecotoxicology 5: 253-278.
** Source: Virgina Department of Environmental Quality Solid Waste Guidance Memorandum. July 2012.
*** Source: Virgina Department of Environmental Quality Solid Waste Guidance Memorandum. July 2012 or USEPA Regional Screening Levels, USEPA, May 2016. For non-carcinogens, value shown is equal to 1/10 the residential or industrial soil value.
**** Source: National Oceanic and Atmospheric Administration's Screening Quick Reference Tables

Table 2
HRBT Expansion
Summary of Analytical Results
Fill Samples - Standard Chemistry

Parameter	Unit	Most Stringent	TEL*	PEL*	GW SSL*	ESSL*	ISSL***	RSSL***	ERMs****	Weanack Exclusion Criteria	Weanack Clean Fill Criteria	HRCP-L-ENV-024-Fill			HRCP-L-ENV-025-Fill			HRCP-L-ENV-026-Fill			HRCP-L-ENV-027-Fill			HRCP-L-ENV-082-Fill			HRCP-L-ENV-083-Fill			HRCP-L-ENV-084-Fill			HRCP-L-ENV-085-Fill		
												19D1288			19E0632			19D1288			19D1288			19D1288			19D1288			19D1288			19E0632		
												4/25/2019			5/9/2019			4/26/2019			4/28/2019			4/24/2019			4/28/2019			4/27/2019			5/13/2019		
												1:05:00 PM			5:00:00 AM			10:15:00 AM			12:00:00 PM			2:50:00 AM			9:15:00 AM			12:30:00 PM			9:15:00 AM		
												Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL
1,1,1-Trichloroethane	µg/kg	1810	--	--	1810	--	3600000	810000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1,2,2-Tetrachloroethane	µg/kg	0.44	--	--	0.44	127	2700	600	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1,2-Trichloroethane	µg/kg	29	--	--	29	300	5000	1100	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1-Dichloroethane	µg/kg	8	--	--	8	300	16000	3600	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,1-Dichloroethene	µg/kg	11	--	--	11	8280	100000	23000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2,4-Trichlorobenzene	µg/kg	10	--	--	7210	10	110000	24000	--	400000	68000	ND		1.5	ND		1.5	ND		1.5	ND		1.6	ND		1.5	ND		1.5	ND		1.5	ND		15
1,2,4-Trichlorobenzene	µg/kg	10	--	--	7210	10	110000	24000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Dichlorobenzene	µg/kg	10	--	--	21200	10	930000	180000	--	10,000,000	5,100,000	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		10
1,2-Dichlorobenzene	µg/kg	10	--	--	21200	10	930000	180000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Dichloroethane	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Dichloropropane	µg/kg	300	--	--	--	300	4400	1000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,2-Diphenylhydrazine	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.2	ND		2.3	ND		23
1,3-Dichlorobenzene	µg/kg	20	--	--	225	10	930000	180000	--	5,100,000	5,100,000	ND		1.2	ND		1.2	ND		1.2	ND		1.3	ND		1.2	ND		1.2	ND		1.2	ND		12
1,3-Dichlorobenzene	µg/kg	10	--	--	225	10	930000	180000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,4-Dichlorobenzene	µg/kg	10	--	--	3390	10	11000	2600	--	570,000	13,000	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		17
1,4-Dichlorobenzene	µg/kg	10	--	--	3390	10	11000	2600	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1-Methylnaphthalene	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		1.5	ND		1.5	2.1	J	1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		15
2,2'-Oxybis[1-Chloropropane]	µg/kg	5.41	--	--	5.41	--	4700000	310000	--	2,300,000	2,300,000	ND		2.4	ND		2.5	ND		2.4	ND		2.5	ND		2.5	ND		2.4	ND		2.4	ND		25
2,3,7,8-Tcdd	pg/g	0.199	--	--	6060	0.199	22	4.8	--	18000000	4300000	ND		0.013	ND		0.05	0.029	J q	0.015	ND		0.0088	ND		0.009	ND		0.011	0.035	J q	0.01	ND		0.038
2,3,7,8-Tcdf	pg/g	38.5	--	--	--	38.5	--	--	--	--	--	ND		0.015	ND		0.032	0.1	J	0.011	ND		0.017	0.03	J	0.01	ND		0.01	0.051	J q	0.012	ND		0.025
2,4,6-Trichlorophenol	µg/kg	100	--	--	--	100	210000	49000	--	160000	62000	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		1.8	ND		18
2,4'-Ddd	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.016	ND		0.018	ND		0.078	ND		0.015	ND		0.015	ND		0.015	ND		0.016	ND		0.33
2,4'-Dde	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.023	ND		0.026	ND		0.11	ND		0.022	ND		0.022	ND		0.022	ND		0.023	ND		0.48
2,4'-Ddt	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.035	ND		0.039	ND		0.17	0.082	J	0.033	ND		0.034	ND		0.034	ND		0.035	ND		0.73
2,4-Dichlorophenol	µg/kg	3	--	--	3.45	3	250000	19000	--	12,000,000	1,100,000	ND		2.5	ND		2.6	ND		2.5	ND		2.6	ND		2.6	ND		2.5	ND		2.5	ND		26
2,4-Dimethylphenol	µg/kg	10	--	--	323	10	1600000	130000	--	1,800,000	170000	ND		2	ND		2.1	ND		2	ND		2.1	ND		2.1	ND		2	ND		2	ND		21
2,4-Dinitrophenol	µg/kg	3	--	--	3	60.9	160000	13000	--	1,200,000	110000	ND		89	ND		89	ND		88	ND		90	ND		89	ND		87	ND		88	ND		890
2,4-Dinitrotoluene	µg/kg	1.39	--	--	1.39	1280	7400	1700	--	1,200,000	--	ND		1.6	ND		1.6	ND		1.6	ND		1.7	ND		1.6	ND		1.6	ND		1.6	ND		16
2,6-Dinitrotoluene	µg/kg	5.92	--	--	5.92	32.8	1500	360	--	620000	61000	ND		2	ND		2	ND		2	ND		2.1	ND		2	ND		2	ND		2	ND		20
2-Butanone (Mek)	µg/kg	552	--	--	552	--	19000000	2700000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2-Chloroethyl Vinyl Ether	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2-Chloronaphthalene	µg/kg	12.2	--	--	7000	12.2	6000000	480000	--	--	--	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		15
2-Chlorophenol	µg/kg	10	--	--	173	10	580000	39000	--	5,100,000	280000	ND		1.5	ND		1.5	ND		1.5	ND		1.6	ND		1.5	ND		1.5	ND		1.5	ND		15
2-Methylnaphthalene	µg/kg	20.2	20.2	201.3	1010	29000	300000	24000	670	4,100,000	--	ND		1.6	ND		1.6	3.5	J	1.6	1.9	J	1.6	2	J	1.6	ND		1.5	ND		1.6	ND		16
2-Methylphenol	µg/kg	100	--	--	429	100	4100000	320000	--	2,800,000	2,800,000	ND		9.4	ND		9.5	ND		9.4	ND		9.6	ND		9.5	ND		9.3	ND		9.4	ND		95
2-Nitrophenol	µg/kg	1600	--	--	--	1600	--	--	--	--	--	ND		5.2	ND		5.3	ND		5.2	ND		5.3	ND		5.3	ND		5.1	ND		5.2	ND		53
3,3'-Dichlorobenzidine	µg/kg	18.7	--	--	18.7	646	5100	1200	--	490,000,000	10,000,000	ND		31	ND		31	ND		30	ND		31	ND		31	ND		30	ND		30	ND		310
4,4'-Ddd	µg/kg	1.22	1.22	7.81	13900	21	9600	2300	20	--	--	ND		0.039	ND		0.043	ND		0.19	ND		0.036	ND		0.037	ND		0.037	ND		0.038	ND		0.8
4,4'-Dde	µg/kg	2.07	2.07	374	4710	21	9300	2000	27	7200	3000	ND		0.018	ND		0.02	ND		0.089	ND		0.017	ND		0.018	ND		0.017	ND		0.018	ND		0.38
4,4'-Ddt	µg/kg	1.19	1.19	4.77	21400	21	8500	1900	7	5100	2000	ND		0.036	ND		0.039	ND		0.17	ND		0.033	ND		0.034	ND		0.034	ND		0.035	ND		0.73
4,6-Dinitro-2-Methylphenol	µg/kg	0.136	--	--	0.136	144	6600	510	--	--	--	ND		57	ND		57	ND		56	ND		58	ND		57	ND		56	ND		56	ND		570
4-Bromophenyl Phenyl Ether	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		2.3	ND		23
4-Chloro-3-Methylphenol	µg/kg	7470	--	--	7470	7950	8200000	630000	--	10,000,000	10,000,000	ND		1.5	ND		1.6	ND		1.5	ND		1.6	ND		1.6	ND		1.5	ND		1.5	ND		16
4-Chlorophenyl Phenyl Ether	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		1.5	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		20
4-Nitrophenol	µg/kg	100	--	--	--	100	--	--	--	--	--	ND		23	ND		23	ND		23	ND		23	ND		23	ND		23	ND		23	ND		230
Acenaphthene	µg/kg	6.7	6.7	88.9	17200	29000	4500000	360000	500	33,000,000	3,400,000	ND		1.9	ND		1.9	4.5	J	1.9	5.4	J	1.9	5.6	J	1.9	ND		1.9	ND		1.9	ND		19
Acenaphthylene	µg/kg	5.9	5.9	127.9	66300	29000	4500000	360000	640	--	--	ND		1.4	ND		1.5	ND		1.4	ND		1.5	ND		1.5	ND		1.4	ND		1.4	ND		15
Acrolein	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Acrylonitrile	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Aldrin	µg/kg	2.5	--	--	3.36	2.5	180	39	--	110	40	ND		0.028	ND		0.031	ND		0.14	ND		0.026	ND		0.027	ND		0.027	ND		0.028	ND		0.58
Alpha-Bhc	µg/kg	0.461	--	--	0.461	2.5	360	86	--	--	--	ND		0.022	ND		0.025	ND		0.11	ND		0.021	ND		0.021	ND		0.021	ND		0.022	ND		0.46
Aluminum	mg/kg	7700	--	--	24000	--	110000	7700	--	--	--	586		2.67	421		2.67	959		246	271		2.57	560		2.62	563		2.54	604		2.65	463		2.47
Ammonia As N	mg/kg	--	--	--	--	--	--	--	--	--	--	ND		10.6	ND		10.9	ND		10.2	ND		10.5	ND		10.6	ND		10.5	ND		10.3	ND		10.4
Anthracene	µg/kg	46.9	46.9	245	185000	29000	23000000	1800000	1100	170,000,000	10,000,000	2	J	1.7	ND		1.7	ND		1.7	1.9	J	1.7	4.6	J	1.7	ND		1.7	ND		1.7	ND		17
Antimony	mg/kg	0.3	--	--	2.7	0.3	47	3.1	--	410	14	ND		5.34	ND		5.35	ND		5	ND		5.14	ND		5.25	ND		5.09	ND		5.3	ND		5
Arsenic	mg/kg	0.68	7.24	41.6	2.9	18	3	0.68	70	41	20	ND		1.07	ND		1.07	ND		1	ND		1.03	ND		1.05	ND		1.02	ND		1.06	ND		1
Barium	mg/kg	330	--	--	822	330	22000	1500	--	19,000	700	1.75		0.534	1.59		0.535	4.8		0.5	1.13		0.514	1.93		0.525	2.72		0.509	2.01		0.53	1.88		0.5
Benzene	µg/kg	24.6	--	--	24.6	50	5100	1200	--	--	--	ND		24	ND		27.6	ND		24.4	ND		23	ND		26.7	ND		26.1	ND		23.5	ND		26.2
Benzidine	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		250	ND		250	ND		250	ND		250	ND		250	ND		240	ND		250	ND		2500
Benzo(A)Anthracene	µg/kg	74.8	74.8	692.5	644	1100	2900	160	1600	2100	900	2.6	J	1.2	ND		1.3	1.4	J	1.2	5.9	J	1.3	ND		1.3	ND		1.2	2	J	1.2	ND		13
Benzo(A)Pyrene	µg/kg	88.8	88.8	763.2	8870	1100	290	160	1600	660	210	ND		1.4	ND		1.4	ND		1.4	6.4	J	1.5	ND		1.4	ND		1.4	2.3	J	1.4	ND		14
Benzo(B)Fluoranthene	µg/kg	160	--	--	1820	1100	2900	160	--	2100	900	1.6	J	1.6	ND		1.6	ND		1.6	9		1.6	ND		1.6	ND		1.6	3	J	1.6	ND		16
Benzo(Ghi)Perylene	µg/kg	1100	--	--	19400000	1100	2300000	180000	--	--	--	ND		1.4	ND		1.4	1.4	J	1.4	4.7	J	1.4	ND		1.4	ND		1.4	2.9	J	1.4	ND		14
Benzo(K)Fluoranthene	µg/kg	1100	--	--	18200	1100	29000	1600	--	21000	900	ND		2	ND		2	ND		2	2.6	J	2	ND		2	ND		1.9	ND		2	ND		20
Benzoic Acid	µg/kg	6000	--	--	6000	--	330000000	25000000	--	--	--	ND		36	ND		36	ND		35	ND		36	ND		36	ND		35	ND		35	ND		360
Benzyl Alcohol	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		2.2	ND		2.2	ND		2.2	ND		2.3	ND		2.2	ND		2.2	ND		2.2	ND		22
Beryllium	mg/kg	16	--	--	31.6	21	230	16	--	2,000	160	ND		0.214	ND		0.214	ND		0.2	ND		0.205	ND		0.21	ND		0.203	ND		0.212	ND		0.2
Beta-Bhc	µg/kg	1	--	--	1.58	1	1300	300	--	--	--	ND		0.025	ND		0.027	ND		0.12	ND		0.023	ND		0.024	ND		0.024	ND		0.025	ND		0.51
Bis(2-Chloroethoxy)Methane	µg/kg	6.24	--	--	6.24	--	250000	19000	--	1,800,000	--	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.6	ND		1.5	ND		1.6	ND		16
Bis(2-Chloroethyl)Ether	µg/kg	0.254	--	--	0.254	23700	1000	230	--	900	660	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		12
Bis(2-Ethylhexyl) Phthalate	µg/kg	182	182	2647	38000	925	160000	39000	--	120000	49000	ND		35	ND		35	ND		35	ND		36	ND		35	ND		34	ND		35	ND		350
Bromoform	µg/kg	516	--	--	516	15900	86000	19000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Bromomethane	µg/kg	1.48	--	--	1.48	235	3000	680	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Butyl Benzyl Phthalate	µg/kg	239	--	--	56400	239	1200000	290000	--	1,100,000	910000	30	J	23	ND		23	27	J	22	28	J	23	29	J	23	28	J	22	30	J	22	ND		230
Cadmium	mg/kg	0.36	0.676	4.21	3.76	0.36	98	7.1	--	810	39	ND		0.214	ND		0.214	ND		0.2	ND		0.205	ND		0.21	ND		0.203	ND		0.212	ND		0.2
Calcium Carbonate Equivalance	mg/kg	--	--	--	--	--	--	--	--	--	--	33000		1000	ND		1000	29000		1000	38000		1000	29000		1000	30000		1000	39000		1000	24000		1000
Calcium	mg/kg	9.6	--	--	--	--	--	--	9.6	--	--	260		5.34	396		5.35	772		5	535		2.57	382		5.25	4120		254	3760		265	666		5
Carbon Tetrachloride	µg/kg	79.4	--	--	79.4	300	2900	650	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chlordane	µg/kg	6	--	--	14500	--	7700	1700	6	--	--	ND		0.39	ND		0.43	ND		1.9	ND		0.36	ND		0.37	ND		0.37	ND		0.38	ND		8
Chlorobenside	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.036	ND		0.039	ND		0.17	ND		0.033	ND		0.034	ND		0.034	ND		0.035	ND		0.73
Chlorodibromomethane	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloroethane	µg/kg	5580	--	--	5580	--	5700000	1400000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloroform	µg/kg	1	--	--	311	1	1400	320	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloromethane	µg/kg	39	--	--	39	10400	46000	11000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chromium	mg/kg	0.3	52.3	160.4	19	26	6.3	0.3	370	1,200	200	1.49		0.534	1.42		0.535	6.42		0.5	1.13		0.514	1.9		0.525	2.18		0.509	1.8		0.53	3.17		0.5
Chromium, Hexavalent	--	--	--	--	--	--	--	--	--	--	--	ND		0.21	ND		0.22	ND		0.2	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Chrysene	µg/kg	107.8	107.8	846	64400	1100	290000	16000	2800	210000	9000	2.2	J	1.3	ND		1.3	2.4	J	1.3	7.3		1.3	ND		1.3	ND		1.3	3.6	J	1.3	ND		13
Cis-1,3-Dichloropropene	µg/kg	1.66	--	--	1.66	398	8200	1800	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Cobalt	mg/kg	0.21	--	--	0.21	13	35	2.3	--	300	--	0.512		0.214	0.396		0.214	0.704		0.2	0.319		0.205	0.623		0.21	0.442		0.203	0.561		0.212	0.504		0.2
Conductivity (Saturated Paste)	dS/m	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Copper	mg/kg	19	18.7	108	5570	28	4700	310	270	4,300	1,500	ND		2.67	ND		2.67	1.23	J	2.5	ND		0.514	ND		2.62	0.576	J	0.509	ND		0.53	ND		2.5
Cyanide	mg/kg	0	--	--	20	0.005	--	--	--	20,000	1,100	ND		1.07	ND		1.1	ND		1.02	ND		1.04	ND		1.05	ND		1.05	ND		0.92	ND		1.05
Dcpa	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.029	ND		0.032	ND		0.14	ND		0.027	ND		0.028	ND		0.027	ND		0.029	ND		0.59

Table 2
HRBT Expansion
Summary of Analytical Results
Fill Samples - Standard Chemistry

Parameter	Unit	Most Stringent	TEL*	PEL*	GW SSL*	ESSL*	ISSL***	RSSL***	ERMs****	Weanack Exclusion Criteria	Weanack Clean Fill Criteria	HRCP-L-ENV-024-Fill			HRCP-L-ENV-025-Fill			HRCP-L-ENV-026-Fill			HRCP-L-ENV-027-Fill			HRCP-L-ENV-082-Fill			HRCP-L-ENV-083-Fill			HRCP-L-ENV-084-Fill			HRCP-L-ENV-085-Fill		
												19D1288			19E0632			19D1288			19D1288			19D1288			19D1288			19D1288			19E0632		
												4/25/2019			5/9/2019			4/26/2019			4/28/2019			4/24/2019			4/28/2019			4/27/2019			5/13/2019		
												1:05:00 PM			5:00:00 AM			10:15:00 AM			12:00:00 PM			2:50:00 AM			9:15:00 AM			12:30:00 PM			9:15:00 AM		
												Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL
Delta-Bhc	µg/kg	1.51	--	--	1.51	9940	360	86	--	--	--	ND		0.029	ND		0.032	ND		0.14	ND		0.026	ND		0.027	ND		0.027	ND		0.028	ND		0.59
Dibenzo(A,H)Anthracene	µg/kg	6.2	6.2	134.6	427	1100	290	16	260	660	210	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.4	ND		1.5	ND		15
Dibenzofuran	µg/kg	391	--	--	391	--	100000	7300	--	--	--	ND		1.4	ND		1.5	3.9	J	1.4	6.4	J	1.5	9.7	J	1.5	ND		1.4	ND		1.4	ND		15
Dichlorobromomethane	µg/kg	2050	--	--	--	2050	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dichlorodifluoromethane	µg/kg	595	--	--	595	39500	37000	8700	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dieldrin	µg/kg	0.715	0.715	4.3	0.434	4.9	140	34	8	110	42	ND		0.023	ND		0.025	ND		0.11	ND		0.021	ND		0.022	ND		0.021	ND		0.022	ND		0.47
Diethyl Phthalate	µg/kg	18800	--	--	18800	24800	66000000	5100000	--	490,000,000	10,000,000	ND		12	ND		12	ND		11	ND		12	ND		12	ND		11	ND		11	ND		120
Dimethyl Phthalate	µg/kg	200000	--	--	--	200000	--	--	--	10,000,000	10,000,000	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		1.2	ND		12
Di-N-Butyl Phthalate	µg/kg	150	--	--	176000	150	8200000	630000	--	5,700,000	5,700,000	ND		14	ND		15	ND		14	ND		15	ND		15	ND		14	ND		14	ND		150
Di-N-Octyl Phthalate	µg/kg	70900	--	--	--	70900	--	--	--	--	--	ND		19	ND		19	ND		19	ND		19	ND		19	ND		19	ND		19	ND		190
Endosulfan I	µg/kg	100	--	--	1730	100	700000	47000	--	3,700,000	--	ND		0.025	ND		0.027	ND		0.12	ND		0.023	ND		0.023	ND		0.023	ND		0.024	ND		0.5
Endosulfan Ii	µg/kg	100	--	--	1730	100	700000	47000	--	3,700,000	--	ND		0.02	ND		0.022	ND		0.096	ND		0.018	ND		0.019	ND		0.019	ND		0.02	ND		0.41
Endosulfan Sulfate	µg/kg	35.8	--	--	1270	35.8	700000	47000	--	3,700,000	--	ND		0.024	ND		0.026	ND		0.11	ND		0.022	ND		0.023	ND		0.022	ND		0.023	ND		0.48
Endrin	µg/kg	1	--	--	589	1	25000	1900	--	180000	17000	ND		0.035	ND		0.039	ND		0.17	ND		0.033	ND		0.034	ND		0.033	ND		0.035	ND		0.72
Endrin Aldehyde	µg/kg	10.5	--	--	231	10.5	25000	1900	--	--	--	ND		0.032	ND		0.036	ND		0.16	ND		0.03	ND		0.032	ND		0.031	ND		0.032	ND		0.66
Ethylbenzene	µg/kg	50	--	--	16800	50	25000	5800	--	--	--	ND		24	ND		27.6	ND		24.4	ND		23	ND		26.7	ND		26.1	ND		23.5	ND		26.2
Extractable Organic Halides (Eox)	--	--	--	--	--	--	--	--	--	--	--	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10
Extractable Organic Halogens	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Fizz Rating	--	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Flash Point	--	--	--	--	--	--	--	--	--	--	--	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20	> 65		20
Fluoranthene	µg/kg	112.8	112.8	1493.5	278000	1100	3000000	240000	5100	22,000,000	2,300,000	12		1.7	ND		1.7	2	J	1.7	23		1.8	7.6		1.7	ND		1.7	5	J	1.7	ND		17
Fluorene	µg/kg	21.2	21.2	144.4	17000	29000	3000000	240000	--	22,000,000	2,300,000	ND		1.3	ND		1.3	2.7	J	1.3	5	J	1.3	8.7		1.3	ND		1.3	ND		1.3	ND		13
Gamma-Bhc (Lindane)	µg/kg	0.05	0.32	0.99	11	0.05	2500	570	--	520	520	ND		0.031	ND		0.034	ND		0.15	ND		0.029	ND		0.03	0.11		0.029	ND		0.031	ND		0.63
Heptachlor	µg/kg	5.96	--	--	425	5.96	630	130	--	380	150	ND		0.028	ND		0.031	ND		0.14	ND		0.026	ND		0.027	ND		0.027	ND		0.028	ND		0.58
Heptachlor Epoxide	µg/kg	70	--	--	2440	100	330	70	--	190		ND		0.023	ND		0.026	ND		0.11	ND		0.021	ND		0.022	ND		0.022	ND		0.023	ND		0.47
Hexachlorobenzene	µg/kg	2.5	--	--	9960	2.5	960	210	--	1100	660	ND		2.4	ND		2.4	ND		2.3	ND		2.4	ND		2.4	ND		2.3	ND		2.3	ND		24
Hexachlorobutadiene	µg/kg	39.8	--	--	781	39.8	5300	1200	--	22000	1000	ND		1.9	ND		1.9	ND		1.9	ND		2	ND		1.9	ND		1.9	ND		1.9	ND		19
Hexachlorocyclopentadiene	µg/kg	400000	--	--	--	--	--	--	--	3,700,000	400000	ND		3.4	ND		3.4	ND		3.3	ND		3.4	ND		3.4	ND		3.3	ND		3.3	ND		34
Hexachloroethane	µg/kg	347	--	--	347	596	8000	1800	--	120000	6000	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		17
Ignitability	None	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Indeno(1,2,3-Cd)Pyrene	µg/kg	1100	--	--	5160	1100	3000000	240000	--	2100	900	ND		1.3	ND		1.3	ND		1.3	4.5	J	1.4	ND		1.3	ND		1.3	2.3	J	1.3	ND		13
Iron	mg/kg	276	--	--	276	--	82000	5500	--	150,000	150,000	1030		267	711		2.67	1910		246	503		0.514	1130		262	1130		50.9	952		0.53	1200		247
Isophorone	µg/kg	243	--	--	243	139000	2400000	570000	--	1,800,000	1,100,000	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.6	ND		1.7	ND		17
Lead	mg/kg	11	30.24	112	135	11	800	400	218	800	300	1.18		0.534	0.955		0.535	3.52		0.5	0.958		0.514	2.02		0.525	1.51		0.509	1.1		0.53	1.46		0.5
M+P-Xylenes	--	--	--	--	--	--	--	--	--	--	--	ND		24	ND		27.6	ND		24.4	ND		23	ND		26.7	ND		26.1	ND		23.5	ND		26.2
Magnesium	mg/kg	4400	--	--	--	4400	--	--	--	--	--	136		2.67	90.7		0.535	208		2.5	61.4		0.514	180		2.62	133		0.509	153		0.53	109		2.5
Manganese	mg/kg	20.8	--	--	20.8	220	2600	180	--	--	--	12.6		0.534	12.8		0.535	22.8		0.5	8.19		0.514	16.5		0.525	16.8		0.509	27.2		0.53	14.5		0.5
Mercury	mg/kg	0.06	0.1	1	1.04	0.06	4.6	1.1	710	100	14	ND		0.008	ND		0.009	ND		0.008	ND		0.008	ND		0.009	ND		0.008	ND		0.008	0.013		0.008
Methoxychlor	µg/kg	19.9	--	--	134000	19.9	410000	32000	--	3,100,000	280000	ND		0.035	ND		0.039	ND		0.17	ND		0.033	ND		0.034	ND		0.033	ND		0.035	ND		0.72
Methylene Chloride	µg/kg	9.36	--	--	9.36	300	1000000	57000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Methylphenol, 3 & 4	µg/kg	100	--	--	437	100	8200000	630000	--	2,800,000	2,800,000	ND		9.7	ND		9.7	ND		9.6	ND		9.8	ND		9.7	ND		9.5	ND		9.6	ND		97
Mirex	µg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.017	ND		0.019	ND		0.082	ND		0.016	ND		0.016	ND		0.016	ND		0.017	ND		0.35
Naphthalene	µg/kg	14.9	34.6	390.6	14.9	29000	17000	3800	2100	230000	20000	ND		1.3	ND		1.3	9.6		1.3	3.2	J	1.3	4.3	J	1.3	ND		1.3	ND		1.3	ND		13
Nickel	mg/kg	15.9	15.9	42.8	19.5	38	2200	150	51.6	1,000	250	0.632		0.534	ND		0.535	0.968		0.5	ND		0.514	0.672		0.525	0.524		0.509	0.703		0.53	0.551		0.5
Nitrate As N	--	--	--	--	--	--	--	--	--	--	--	2.57		2.15	8.19		1.1	ND		2.07	ND		1.06	ND		2.14	2.65		1.07	1.2	J	1.06	1.28		2.1
Nitrate Nitrite As N	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Nitrite As N	--	--	--	--	--	--	--	--	--	--	--	ND		2.1	ND		1.1	ND		2.1	ND		1.1	ND		2.1	ND		1.1	ND		1.1	ND		2.1
Nitrobenzene	µg/kg	0.595	--	--	0.595	1310	22000	5100	--	280000	28000	ND		12	ND		12	ND		12	ND		12	ND		12	ND		12	ND		12	ND		120
N-Nitrosodimethylamine	µg/kg	140000	--	--	--	--	--	--	--	350000	140000	ND		3.3	ND		3.3	ND		3.2	ND		3.3	ND		3.3	ND		3.2	ND		3.2	ND		33
N-Nitrosodi-N-Propylamine	µg/kg	0.0214	--	--	0.0214	544	330	78	--	660	250	ND		2.2	ND		2.2	ND		2.2	ND		2.3	ND		2.2	ND		2.2	ND		2.2	ND		22
N-Nitrosodiphenylamine	µg/kg	727	--	--	727	545	470000	110000	--	--	--	ND		11	ND		11	ND		11	ND		11	ND		11	ND		11	ND		11	ND		110
O-Xylene	--	--	--	--	--	--	--	--	--	--	--	ND		24	ND		27.6	ND		24.4	ND		23	ND		26.7	ND		26.1	ND		23.5	ND		26.2
Paint Filter	--	--	--	--	--	--	--	--	--	--	--	ND	NFL	1	ND	NFL	1	ND	NFL	1	ND	NFL	1	ND	NFL	1	ND	NFL	1	ND	NFL	1	ND	NFL	1
Pcb As Aroclor 1016	µg/kg	410	--	--	9600	--	27000	410	--	21000	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
Pcb As Aroclor 1221	µg/kg	200	--	--	1250	--	830	200	--	620	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
Pcb As Aroclor 1232	µg/kg	170	--	--	3100	--	720	170	--	620	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
Pcb As Aroclor 1242	µg/kg	230	--	--	9600	--	950	230	--	620	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
Pcb As Aroclor 1248	µg/kg	230	--	--	37300	--	950	230	--	620	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
Pcb As Aroclor 1254	µg/kg	240	--	--	73600	--	970	240	--	620	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
Pcb As Aroclor 1260	µg/kg	240	--	--	145000	--	990	240	--	620	--	ND		106	ND		110	ND		103	ND		49	ND		102	ND		51	ND		49	ND		103
PCB 101 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27
PCB 105 (BZ)	µg/kg	0.48	0.48	--	--	--	490	120	--	--	--	ND		0.27	ND		0.28	ND		0.27	ND		0.27	ND		0.28	ND		0.27	ND		0.27	ND		0.28
PCB 118 (BZ)	µg/kg	0.48	0.48	--	--	--	490	120	--	--	--	ND		0.29	ND		0.29	ND		0.29	ND		0.29	ND		0.29	ND		0.29	ND		0.28	ND		0.29
PCB 126 (BZ)	µg/kg	0.036	0.48	--	--	--	0.15	0.036	--	--	--	ND		0.62	ND		0.63	ND		0.62	ND		0.62	ND		0.63	ND		0.62	ND		0.61	ND		0.63
PCB 128 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.37	ND		0.37	ND		0.37	ND		0.37	ND		0.37	ND		0.37	ND		0.36	ND		0.37
PCB 138 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.39	ND		0.4
PCB 153 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.23	ND		0.23	ND		0.23	ND		0.23	ND		0.23	ND		0.23	0.25	J	0.23	ND		0.23
PCB 156 (BZ)	µg/kg	0.48	0.48	--	--	--	500	120	--	--	--	ND		0.53	ND		0.54	ND		0.53	ND		0.53	ND		0.54	ND		0.53	ND		0.52	ND		0.54
PCB 169 (BZ)	µg/kg	0.051	0.48	--	--	--	0.051	0.12	--	--	--	ND		0.68	ND		0.69	ND		0.68	ND		0.68	ND		0.69	ND		0.68	ND		0.67	ND		0.69
PCB 170 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21	ND		0.2	ND		0.21
PCB 18 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.61	ND		0.62	ND		0.6	ND		0.6	ND		0.62	ND		0.61	ND		0.6	ND		0.62
PCB 180 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.47	ND		0.47	ND		0.46	ND		0.46	ND		0.47	ND		0.47	ND		0.46	ND		0.47
PCB 183 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.65	ND		0.66	ND		0.64	ND		0.64	ND		0.66	ND		0.65	ND		0.64	ND		0.66
PCB 184 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.23	ND		0.24	ND		0.23	ND		0.23	ND		0.24	ND		0.23	ND		0.23	ND		0.24
PCB 187 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
PCB 195 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.51	ND		0.52	ND		0.51	ND		0.51	ND		0.52	ND		0.51	ND		0.5	ND		0.52
PCB 28 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.45	ND		0.45	ND		0.44	ND		0.44	ND		0.45	ND		0.45	ND		0.44	ND		0.45
PCB 44 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.61	ND		0.62	ND		0.6	ND		0.6	ND		0.62	ND		0.61	ND		0.6	ND		0.62
PCB 49 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.52	ND		0.53	ND		0.52	ND		0.52	ND		0.53	ND		0.52	ND		0.51	ND		0.53
PCB 52 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.39	ND		0.39	ND		0.38	ND		0.38	ND		0.39	ND		0.39	ND		0.38	ND		0.39
PCB 66 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.43	ND		0.43	ND		0.43	ND		0.43	ND		0.43	ND		0.43	ND		0.42	ND		0.43
PCB 77 (BZ)	µg/kg	0.48	0.48	--	--	--	160	38	--	--	--	ND		0.4	ND		0.4	ND		0.39	ND		0.39	ND		0.4	ND		0.4	ND		0.39	ND		0.4
PCB 8 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.35	ND		0.35	ND		0.34	ND		0.34	ND		0.35	ND		0.35	ND		0.34	ND		0.35
PCB 87 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.38	ND		0.38	ND		0.37	ND		0.37	ND		0.38	ND		0.38	ND		0.37	ND		0.38
PCB-206 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.87	ND		0.88	ND		0.86	ND		0.86	ND		0.88	ND		0.87	ND		0.85	ND		0.88
PCB-209 (BZ)	µg/kg	0.48	0.48	--	--	--	--	--	--	--	--	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.24	ND		0.25
TOTAL PCBs	µg/kg	21.6	--	21.6	188.8	0.332	740	220	--	--	--	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.2	ND		0.23	0.25	J	0.23	ND		0.21
Pentachlorophenol	µg/kg	36.5	--	--	36.5	2100	4000	1000	--	9000	6000	ND		53	ND		53	ND		54	ND		54	ND		53	ND		52	ND		53	ND		530
Percent Solids	--	--	--	--	--	--	--	--	--	--	--	93.1		0.1	90.7		0.1	96.6		0.1	94.7		0.1	93.7		0.1	93.9		0.1	94.2		0.1	95.3		0.1
Ph	µg/kg	--	--	--	--	--	--	--	--	--	--	6.97	H	0	7.31	H	0	7.11	H	0	6.92	H	0	6.93	H	0	6.86	H	0	7.22	H	0	8.51	H	0
Ph (Saturated Paste)	s.u.	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Phenanthrene	µg/kg	86.7	86.7	543.5	160000	29000	2300000	180000	--	--	--	8.8		1.8	ND		1.8	4.3	J	1.8	27		1.8	26		1.8	ND		1.7	5.7	J	1.8	ND		18
Phenol	µg/kg	50	--	--	--	50	25000000	1900000	--	180,000,000	10,000	ND		10	ND		10	ND		9.9	ND		10	ND		10	ND		9.8	ND		9.9	ND		100
Phosphorus, Total	mg/kg	--	--	--	--	--	--	--	--	--	--	17.3		2.1	5.3		1.1	67.9		2	39.6		1.1	49.7		2.1	19.5		1.1	45.9		1	2.1		2.1
Potassium	mg/kg	--	--	--	--	--	--	--	--	--	--	112		26.7	82.9		26.7	204		25	52.9		25.7	114		26.2	122		25.4	117		26.5	104		25
Pyrene	µg/kg	152.7	152.7	1397.6	32700	1100	2300000	180000	2600	17,000,000	1,700,000	6.9		1.6	ND		1.6	2	J	1.5	15		1.6	3.8	J	1.6	ND		1.5	3.9	J	1.5	ND		16

Table 2
HRBT Expansion
Summary of Analytical Results
Fill Samples - Standard Chemistry

Parameter	Unit	Most Stringent	TEL*	PEL*	GW SSL*	ESSL*	ISSL***	RSSL***	ERMs****	Weanack Exclusion Criteria	Weanack Clean Fill Criteria	HRCP-L-ENV-024-Fill			HRCP-L-ENV-025-Fill			HRCP-L-ENV-026-Fill			HRCP-L-ENV-027-Fill			HRCP-L-ENV-082-Fill			HRCP-L-ENV-083-Fill			HRCP-L-ENV-084-Fill			HRCP-L-ENV-085-Fill		
												19D1288			19E0632			19D1288			19D1288			19D1288			19D1288			19D1288			19E0632		
												4/25/2019			5/9/2019			4/26/2019			4/28/2019			4/24/2019			4/28/2019			4/27/2019			5/13/2019		
												1:05:00 PM			5:00:00 AM			10:15:00 AM			12:00:00 PM			2:50:00 AM			9:15:00 AM			12:30:00 PM			9:15:00 AM		
												Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL	Result	Q	DL
Pyritic Sulfur	%	< 0.25	--	--	--	--	--	--	--	2	< 0.25	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Selenium	mg/kg	2.55	--	--	2.55	0.52	580	39	--	5,100	63	ND		2.67	ND		2.67	ND		2.5	ND		2.57	ND		2.62	ND		2.54	ND		2.65	ND		2.5
Silver	mg/kg	0.596	0.73	1.77	0.596	4.2	580	39	--	5,100	110	ND		0.534	ND		0.535	ND		0.5	ND		0.514	ND		0.525	ND		0.509	ND		0.53	ND		0.5
Sodium	mg/kg	--	--	--	--	--	--	--	--	--	--	ND		26.7	33.2		26.7	31.1		25	ND		25.7	94.9		26.2	64.7		25.4	42.6		26.5	ND		25
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	1430		429	1680		436	2450		408	1950		418	1810		418	2100		421	2820		423	1830		415
Tetrachloroethene	µg/kg	10	--	--	189	10	100000	24000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Thallium	mg/kg	0.001	--	--	1	0.001	1.2	0.078	--	5	1	ND		2.67	ND		2.67	ND		2.5	ND		2.57	ND		2.62	ND		2.54	ND		2.65	ND		2.5
Tin	--	--	--	--	--	--	--	--	--	--	--	ND		5.22	ND		5.35	ND		5.05	ND		1.01	ND		5.31	ND		1.03	ND		1.01	ND		5
Tkn As N	mg/kg	--	--	--	--	--	--	--	--	--	--	27		53.7	ND		55.1	63.4		52.8	81.7		21.1	88.8		53.4	37.9	J	21.3	ND		21.2	35.3	J	52.3
Toluene	µg/kg	50	--	--	11900	50	4700000	490000	--	--	--	ND		24	ND		27.6	ND		24.4	ND		23	ND		26.7	ND		26.1	ND		23.5	ND		26.2
Total Organic Carbon	%	< 5%	--	--	--	--	--	--	--	--	< 5%	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Petroleum Hydrocarbons (As Diesel)	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Petroleum Hydrocarbons (As Gasoline)	µg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Solids (Ts)	--	--	--	--	--	--	--	--	--	--	--	997000		215	1000000		221	978000		207	990000		211	972000		214	1000000		213	996000		212	987000		210
Total Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Toxaphene	µg/kg	100	--	--	9860	119	2100	490	--	1600	100	ND		2.4	ND		2.7	ND		12	ND		2.3	ND		2.3	ND		2.3	ND		2.4	ND		50
Tph-Semi-Volatiles (Dro)	mg/kg	--	--	--	--	--	--	--	--	--	--	ND		10.4	ND		11	ND		10.1	ND		10.3	ND		10.6	ND		10.5	ND		10.4	ND		10.3
Tph-Volatiles (Gro)	mg/kg	--	--	--	--	--	--	--	--	--	--	ND		0.11	ND		0.11	ND		0.1	ND		0.1	ND		0.11	ND		0.11	ND		0.11	ND		0.1
Trans-1,2-Dichloroethene	µg/kg	300	--	--	498	300	2300000	160000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Trans-1,3-Dichloropropene	µg/kg	1.6	--	--	1.6	398	8200	1800	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Tributyltin	mg/kg	1.8	--	--	--	--	25	1.8	--	--	--	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Trichloroethene	µg/kg	1	--	--	39	1	6000	940	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Trichlorofluoromethane	µg/kg	1740	--	--	1740	16400	35000000	2300000	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Vanadium	mg/kg	7.8	--	--	78	7.8	580	39	--	5,200	370	1.78		0.534	1.5		0.535	2.79		0.5	1.13		0.514	1.99		0.525	1.81		0.509	1.72		0.53	1.85		0.5
Vinyl Chloride	µg/kg	7.92	--	--	7.92	10	1700	59	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Xylenes, Total	--	--	--	--	--	--	--	--	--	--	--	ND		72	ND		82.7	ND		73.3	ND		68.9	ND		80.1	ND		78.3	ND		70.4	ND		78.7
Zinc	mg/kg	46	124	271	292	46	35000	2300	410	7,500	1,500	2.62		0.534	2		0.535	5.27		0.5	1.49		0.514	3.15		0.525	3.35		0.509	2.63		0.53	2.23		0.5

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed
*Source: MacDonald et al. 1996. Ecotoxicology 5: 253-278.
** Source: Virgina Department of Environmental Quality Solid Waste Guidance Memorandum. July 2012.
*** Source: Virgina Department of Environmental Quality Solid Waste Guidance Memorandum. July 2012 or USEPA Regional Screening Levels, USEPA, May 2016. For non-carcinogens, value shown is equal to 1/10 the residential or industrial soil value.
**** Source: National Oceanic and Atmospheric Administration's Screening Quick Reference Tables

Table 3
HRBT Expansion
Summary of Analytical Results
Sediment - TCLP

Parameter	Units	TCLP Criteria	HRCP-L-ENV-024			HRCP-L-ENV-025			HRCP-L-ENV-026			HRCP-L-ENV-027			HRCP-L-ENV-082			HRCP-L-ENV-083			HRCP-L-ENV-084			HRCP-L-ENV-085		
			19D1291			19E0632			19D1291			19D1291			19D1291			19D1291			19D1291			19E0632		
			4/25/2019			5/9/2019			4/26/2019			4/27/2019			4/24/2019			4/28/2019			4/28/2019			5/13/2019		
			1:30:00 PM			5:15:00 PM			12:10:00 PM			12:40:00 PM			4:00:00 PM			9:30:00 AM			12:15:00 AM			9:30:00 AM		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
1,1-Dichloroethylene	mg/L	0.7	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
1,2-Dichloroethane	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
1,4-Dichlorobenzene	mg/L	7.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2-(2,4,5-Trichlorophenoxy) Propionic acid (Silvex)	mg/L	1	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005
2,4,5-Trichlorophenol	mg/L	400	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2,4,6-Trichlorophenol	mg/L	2	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2,4-Dichlorophenoxy Acetic Acid (2,4-D)	mg/L	10	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005
2,4-Dinitrotoluene	mg/L	0.13	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2-Butanone (MEK)	mg/L	200	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2
Arsenic	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Barium	mg/L	100	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
Benzene	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Cadmium	mg/L	1	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Carbon tetrachloride	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Chlordane	mg/L	0.03	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002
Chlorobenzene	mg/L	100	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Chloroform	mg/L	6	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Chromium	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Endrin	mg/L	0.02	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Extraction Fluid, Metals	#		1		0	1		0	1		0	1		0	1		0	1		0	1		0	1		0
Extraction Fluid, ZHE	#		1		0	1		0	1		0	1		0	1		0	1		0	1		0	1		0
gamma-BHC (Lindane, Hexachlorocyclhexane)	mg/L	0.4	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Heptachlor	mg/L	0.008	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Heptachlor Epoxide	mg/L		ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Hexachlorobenzene	mg/L	0.13	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Hexachlorobutadiene	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Hexachloroethane	mg/L	3	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Lead	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
m+p-Cresols	mg/L	200	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Mercury	mg/L	0.2	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008
Methoxychlor	mg/L	10	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Nitrobenzene	mg/L	2	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
o+m+p-Cresols	mg/L	200	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
o-Cresol	mg/L	200	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Pentachlorophenol	mg/L	100	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Pyridine	mg/L	5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Selenium	mg/L	1	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
Silver	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Tetrachloroethylene (PCE)	mg/L	0.7	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Toxaphene	mg/L	0.5	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002
Trichloroethylene	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Vinyl chloride	mg/L	0.2	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed

Table 4
HRBT Expansion
Summary of Analytical Results
Fill Samples - TCLP

Parameter	Units	TCLP Criteria	HRCP-L-ENV-024-FILL			HRCP-L-ENV-025-FILL			HRCP-L-ENV-026-FILL			HRCP-L-ENV-027-FILL			HRCP-L-ENV-082-FILL			HRCP-L-ENV-083-FILL			HRCP-L-ENV-084-FILL			HRCP-L-ENV-085-FILL		
			19D1288			19E0632			19D1288			19D1288			19D1288			19D1288			19D1288			19E0632		
			4/25/2019			5/9/2019			4/26/2019			4/27/2019			4/24/2019			4/24/2019			4/28/2019			5/13/2019		
			1:05:00 PM			5:00:00 PM			10:15:00 PM			12:30:00 PM			2:50:00 PM			2:50:00 PM			12:00:00 PM			9:15:00 PM		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
1,1-Dichloroethylene	mg/L	0.7	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
1,2-Dichloroethane	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
1,4-Dichlorobenzene	mg/L	7.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2-(2,4,5-Trichlorophenoxy) Propionic acid (Silvex)	mg/L	1	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005
2,4,5-Trichlorophenol	mg/L	400	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2,4,6-Trichlorophenol	mg/L	2	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2,4-Dichlorophenoxy Acetic Acid (2,4-D)	mg/L	10	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005	ND		0.0005
2,4-Dinitrotoluene	mg/L	0.13	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
2-Butanone (MEK)	mg/L	200	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2
Arsenic	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Barium	mg/L	100	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
Benzene	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Cadmium	mg/L	1	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Carbon tetrachloride	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Chlordane	mg/L	0.03	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002
Chlorobenzene	mg/L	100	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Chloroform	mg/L	6	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Chromium	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Endrin	mg/L	0.02	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Extraction Fluid, Metals	#		1		0	1		0	1		0	1		0	1		0	1		0	1		0	1		0
Extraction Fluid, ZHE	#		1		0	1		0	1		0	1		0	1		0	1		0	1		0	1		0
gamma-BHC (Lindane, Hexachlorocyclhexane)	mg/L	0.4	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Heptachlor	mg/L	0.008	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Heptachlor Epoxide	mg/L		ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Hexachlorobenzene	mg/L	0.13	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Hexachlorobutadiene	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Hexachloroethane	mg/L	3	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Lead	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
m+p-Cresols	mg/L	200	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Mercury	mg/L	0.2	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008	ND		0.008
Methoxychlor	mg/L	10	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005	ND		0.00005
Nitrobenzene	mg/L	2	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
o+m+p-Cresols	mg/L	200	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
o-Cresol	mg/L	200	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Pentachlorophenol	mg/L	100	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Pyridine	mg/L	5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Selenium	mg/L	1	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
Silver	mg/L	5	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1	ND		0.1
Tetrachloroethylene (PCE)	mg/L	0.7	ND		0.05	ND		0.02	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.02
Toxaphene	mg/L	0.5	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002	ND		0.002
Trichloroethylene	mg/L	0.5	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02
Vinyl chloride	mg/L	0.2	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02	ND		0.02

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed

Table 5
HRBT Expansion
Summary of Analytical Results
Elutriate Sediment - Standard Chemistry

Parameter	Units	Most Stringent Criteria	USEPA Acute Ecological Criteria	VA Acute Ecological Criteria	Public Water Supply	VA Surface Water	Weanack Clean Fill Criteria	HRCP-L-ENV-024 Elutriate			HRCP-L-ENV-025 Elutriate			HRCP-L-ENV-026 Elutriate			HRCP-L-ENV-027 Elutriate			HRCP-L-ENV-082 Elutriate			HRCP-L-ENV-083 Elutriate			HRCP-L-ENV-084 Elutriate			HRCP-L-ENV-085 Elutriate		
								19E0014			19E0634			19E0014			19E0014			19E0014			19E0014			19E0014			19E0634		
								5/2/2019			5/15/2019			5/2/2019			5/2/2019			5/1/2019			5/2/2019			5/2/2019			5/16/2019		
								11:28:00 AM			3:55:00 PM			12:05:00 AM			1:05:00 PM			4:15:00 PM			1:05:00 PM			1:05:00 PM			2:32:00 PM		
								Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,1,1-Trichloroethane	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,1,2,2-Tetrachloroethane	µg/L	1.7	--	--	1.7	40	1.7	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
1,1,2-Trichloroethane	µg/L	5.9	--	--	5.9	160	5.9	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,1-Dichloroethane	µg/L	3.8	--	--	3.8	370	3.8	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,1-Dichloroethylene	µg/L	330	--	--	320	7100	320	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
1,1-Dichloropropene	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
1,2,3-Trichloropropane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2,4-Trichlorobenzene	µg/L	35	--	--	35	70	35	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,2,4-Trichlorobenzene	µg/L	35	--	--	35	70	35	ND		4.12	ND		4.17	ND		4.12	ND		4.12	ND		4.17	ND		4.21	ND		4.17	ND		4.17
1,2,4-Trimethylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,2-Dibromoethane (EDB)	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Dichlorobenzene	µg/L	420	--	--	420	1300	420	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Dichloroethane	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
1,2-Dichloropropane	µg/L	5	--	--	5	150	5	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Diphenylhydrazine	µg/L	0.36	--	--	0.36	2	0.36	ND		8.25	ND		8.33	ND		8.25	ND		8.25	ND		8.33	ND		8.42	ND		8.33	ND		8.33
1,3,5-Trimethylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,3-Dichlorobenzene	µg/L	320	--	--	320	960	320	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
1,3-Dichloropropane	µg/L	3.4	--	--	3.4	210	3.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,4'-DDT	µg/L	0.13	0.13	0.13	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,4-Dichlorobenzene	µg/L	63	--	--	63	190	63	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1-Methylnaphthalene	µg/L	--	--	--	--	--	--	ND		8.25	ND		8.33	ND		8.25	ND		8.25	ND		8.33	ND		8.42	ND		8.33	ND		8.33
2-(2,4,5-Trichlorophenoxy) Propionic acid (Silvex)	µg/L	10	--	--	50	--	10	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2,2-Dichloropropane	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
2,2'-Oxybis (1-chloropropane)	µg/L	1400	--	--	--	--	1400	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
2,3,7,8-TCDD	pg/L	0.05	--	--	--	--	0.05	ND		0.24	nd		0.55	ND		0.15	ND		0.18	ND		0.23	ND		0.19	ND		0.29	ND		0.43
2,4,6-Trichlorophenol	µg/L	14	--	--	14	24	14	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
2,4-Dichlorophenol	µg/L	77	--	--	77	290	77	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2,4-Dichlorophenoxy Acetic Acid (2,4-D)	µg/L	100	--	--	100	--	100	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2,4-Dimethylphenol	µg/L	380	--	--	380	850	380	ND		0.52	ND	C	0.52	ND		0.52	ND		0.52	ND		0.52	ND		0.53	ND		0.52	ND		0.52
2,4-Dinitrophenol	µg/L	69	--	--	69	5300	69	ND		8.25	ND		8.33	ND		8.25	ND		8.25	ND		8.33	ND		8.42	ND		8.33	ND		8.33
2,4-Dinitrotoluene	µg/L	1.1	--	--	1.1	34	1.1	ND		2.58	ND		2.6	ND		2.58	ND		2.58	ND		2.6	ND		2.63	ND		2.6	ND		2.6
2,6-Dichlorophenol	µg/L	--	--	--	--	--	--	ND		1.03	ND		1.04	ND		1.03	ND		1.03	ND		1.04	ND		1.05	ND		1.04	ND		1.04
2,6-Dinitrotoluene	µg/L	--	--	--	--	--	--	ND		4.12	ND		4.17	ND		4.12	ND		4.12	ND		4.17	ND		4.21	ND		4.17	ND		4.17
2-Butanone (MEK)	µg/L	--	--	--	--	--	--	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3
2-Chloronaphthalene	µg/L	1000	--	--	1000	1600	1000	ND		4.64	ND		4.69	ND		4.64	ND		4.64	ND		4.69	ND		4.74	ND		4.69	ND		4.69
2-Chlorophenol	µg/L	81	--	--	81	150	81	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
2-Chlorotoluene	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
2-Hexanone (MBK)	µg/L	--	--	--	--	--	--	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2
2-Methylnaphthalene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
2-Methylphenol	µg/L	--	--	--	--	--	--	NA		8.25	ND		8.33	ND		8.25	ND		8.25	ND		8.33	ND		8.42	ND		8.33	ND		8.33
2-Nitrophenol	µg/L	--	--	--	--	--	--	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
3,3'-Dichlorobenzidine	µg/L	0.21	--	--	0.21	0.28	0.21	NA		NA	NA		4.17	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		4.17
3,3'-Dichlorobenzidine	µg/L	--	--	--	--	--	--	ND		4.12	NA		NA	ND		4.12	ND		4.12	ND		4.17	ND		4.21	NA		4.17	NA		NA
4,4'-DDD	µg/L	0.0031	--	--	0.0031	0.0031	0.0031	ND		0.00054	ND		0.00054	ND		0.00054	ND		0.00054	ND		0.00054	ND		0.00054	ND		0.00054	ND		0.00054
4,4'-DDE	µg/L	0.0022	--	--	0.0022	0.0022	0.0022	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003
4,4'-DDT	µg/L	0.001	--	--	0.0022	0.0022	0.001	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003
4,6-Dinitro-2-methylphenol	µg/L	13	--	--	--	--	13	ND		8.25	ND		8.33	ND		8.25	ND		8.25	ND		8.33	ND		8.42	ND		8.33	ND		8.33
4-Bromophenyl phenyl ether	µg/L	--	--	--	--	--	--	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
4-Chloro-3-methylphenol	µg/L	--	--	--	--	--	--	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
4-Chlorophenyl phenyl ether	µg/L	--	--	--	--	--	--	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
4-Chlorotoluene	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
4-Isopropyltoluene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
4-Methyl-2-pentanone (MIBK)	µg/L	--	--	--	--	--	--	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
4-Methylphenol	µg/L	--	--	--	--	--	--	ND		1.03	44.1		1.04	ND		1.03	ND		1.03	ND		1.04	ND		1.05	ND		1.04	ND		1.04
4-Nitrophenol	µg/L	--	--	--	--	--	--	ND		2.06	ND	C	2.08	ND		2.06	ND		2.06	ND		2.08	ND		2.11	ND		2.08	ND		2.08
Acenaphthene	µg/L	670	--	--	670	990	670	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Acenaphthylene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Acetone	µg/L	--	--	--	--	--	--	9.35	J	7	14.9		7	10.3		7	ND		7	10.7		7	ND		7	8.31	J	7	9.89	J	7
Acrolein	µg/L	6.1	--	--	6.1	9.3	6.1	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Acrylonitrile	µg/L	0.51	--	--	0.51	235	0.51	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Aldrin	µg/L	1.3	1.3	1.3	0.00049	0.0005	0.00049	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036
alpha-BHC (Hexachlorocyclhexane)	µg/L	0.026	--	--	0.026	0.049	0.026	ND		0.00012	0.0011	J p	0.00012	ND		0.00012	ND		0.00012	ND		0.00012	ND		0.00012	ND		0.00012	0.0011	J p	0.00012
alpha-Endosulfan	µg/L	0.034	0.034	0.034	62	89	0.22	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007
Aluminum	µg/L	--	--	--	--	--	--	826		19	2500		19	1620		19	2420		19	1620		19	1560		19	2510		19	1030		19
Ammonia as N	mg/L	14.3	14.3	14.3	--	--	25	1.94		0.1	2.86		0.1	2.4		0.1	0.79		0.1	3.15		0.1	0.89		0.1	0.63		0.1	0.86		0.1
Anthracene	µg/L	8300	--	--	8300	40000	8300	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Antimony	µg/L	5.6	--	--	5.6	640	5.6	ND		30	ND		30	ND		30	ND		30	ND		30	ND		30	ND		30	ND		30
Arsenic	µg/L	10	69	69	10	--	10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10
Barium	µg/L	1000	--	--	2000	--	1000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Benzene	µg/L	22	--	--	22	510	22	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Benzidine	µg/L	0.00086	--	--	0.00086	0.002	0.00086	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Benzo (a) anthracene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Benzo (a) pyrene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Benzo (b) fluoranthene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Benzo (g,h,i) perylene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Benzo (k) fluoranthene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Benzoic acid	µg/L	--	--	--	--	--	--	ND		10.3	ND	C	10.4	ND		10.3	ND		10.3	ND		10.4	ND		10.5	ND		10.4	ND		10.4
Benzyl alcohol	µg/L	--	--	--	--	--	--	ND		1.03	ND		1.04	ND		1.03	ND		1.03	ND		1.04	ND		1.05	ND		1.04	ND		1.04

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Summary of Analytical Results
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Parameter	Units	Most Stringent Criteria	USEPA Acute Ecological Criteria	VA Acute Ecological Criteria	Public Water Supply	VA Surface Water	Weanack Clean Fill Criteria	HRCP-L-ENV-024 Elutriate			HRCP-L-ENV-025 Elutriate			HRCP-L-ENV-026 Elutriate			HRCP-L-ENV-027 Elutriate			HRCP-L-ENV-082 Elutriate			HRCP-L-ENV-083 Elutriate			HRCP-L-ENV-084 Elutriate			HRCP-L-ENV-085 Elutriate		
								19E0014			19E0634			19E0014			19E0014			19E0014			19E0014			19E0014			19E0634		
								5/2/2019			5/15/2019			5/2/2019			5/2/2019			5/1/2019			5/2/2019			5/2/2019			5/16/2019		
								11:28:00 AM			3:55:00 PM			12:05:00 AM			1:05:00 PM			4:15:00 PM			1:05:00 PM			1:05:00 PM			2:32:00 PM		
								Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Beryllium	µg/L	--	--	--	--	--	--	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
beta-BHC (Hexachlorocyclhexane)	µg/L	0.091	--	--	0.091	0.017	0.091	ND		0.00037	ND		0.00037	ND		0.00037	ND		0.00037	ND		0.00037	ND		0.00037	ND		0.00037	ND		0.00037
beta-Endosulfan	µg/L	0.034	0.034	0.034	62	89	0.22	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032
bis (2-Chloroethoxy) methane	µg/L	--	--	--	--	--	--	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
bis (2-Chloroethyl) ether	µg/L	0.3	--	--	0.3	5.3	0.3	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
bis (2-Ethylhexyl) phthalate	µg/L	12	--	--	12	22	12	ND		6.19	ND		6.25	ND		6.19	ND		6.19	ND		6.25	ND		6.32	ND		6.25	ND		6.25
Bromobenzene	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Bromochloromethane	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Bromodichloromethane	µg/L	5.5	--	--	--	--	5.5	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Bromoform	µg/L	43	--	--	43	1400	43	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Bromomethane	µg/L	47	--	--	--	--	47	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8
Butyl benzyl phthalate	µg/L	1500	--	--	1500	1900	1500	ND		7.22	ND	C	7.29	ND		7.22	ND		7.22	ND		7.29	ND		7.37	ND		7.29	ND		7.29
Cadmium	µg/L	0.4	40	40	43	1400	0.4	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
Carbon disulfide	µg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
Carbon tetrachloride	µg/L	2.3	--	--	--	--	2.3	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Chlordane	µg/L	0.008	0.9	--	0.008	0.0081	0.008	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074
Chloride	µg/L	50000	--	--	--	--	50000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chlorobenzene	µg/L	130	--	--	130	1600	130	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Chloroethane	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
Chloroform	µg/L	340	--	--	340	11000	340	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Chloromethane	µg/L	--	--	--	--	--	--	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95
Chloropyrifos	µg/L	0.1	--	--	--	--	0.083	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chromium	µg/L	50	1100	1100	--	--	50	6.2	J	4	ND		4	8.5	J	4	10.9		4	8.4	J	4	8.3	J	4	11.6		4	ND		4
Chromium III, Dissolved	µg/L	180	--	--	180		180	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chromium VI, Dissolved	µg/L	16	--	--	--	--	16	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chrysene	µg/L	0.0038	--	--	0.0038	0.018	0.0038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
cis-1,2-Dichloroethylene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
cis-1,3-Dichloropropene	µg/L	--	--	--	--	--	--	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
Cobalt	µg/L	--	--	--	--	--	--	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
Copper	µg/L	3.6	4.8	4.8	1300	--	3.6	5	J	3	ND		3	5.5	J	3	5.1	J	3	5.3	J	3	5.8	J	3	6	J	3	ND		3
Cyanide	µg/L	1.3	1.3	1.3	140	16000	5	ND	CI	10	ND		10	ND	CI	10	ND	CI	10	ND	CI	10	ND	CI	10	ND		10	ND		10
Cyanide, Free	µg/L	22	--	--	140	16000	22	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Diazinon	µg/L	0.2	--	--	--	--	0.17	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dibenz (a,h) anthracene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Dibenzofuran	µg/L	--	--	--	--	--	--	ND		2.06	ND		2.08	ND		2.06	ND		2.06	ND		2.08	ND		2.11	ND		2.08	ND		2.08
Dibromochloromethane	µg/L	4	--	--	--	--	4	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35
Dibromomethane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Dichlorodifluoromethane	µg/L	--	--	--	--	--	--	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95
Dieldrin	µg/L	0.00052	0.7	0.71	0.00052	0.00054	0.00052	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028
Diethyl phthalate	µg/L	17000	--	--	17000	44000	17000	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
Di-isopropyl ether (DIPE)	µg/L	--	--	--	--	--	--	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3
Dimethyl phthalate	µg/L	270000	--	--	270000	1100000	270000	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
Di-n-butyl phthalate	µg/L	2000	--	--	2000	4500	2000	ND		4.12	ND		4.17	ND		4.12	ND		4.12	ND		4.17	ND		4.21	ND		4.17	ND		4.17
Di-n-octyl phthalate	µg/L	--	--	--	--	--	--	ND		8.25	ND		8.33	ND		8.25	ND		8.25	ND		8.33	ND		8.42	ND		8.33	ND	C	8.33
Endosulfan	µg/L	0.034	0.034	0.034	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Endosulfan sulfate	µg/L	0.034	0.034	0.034	62	89	62	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065
Endrin	µg/L	0.004	0.037	0.037	0.059	0.06	0.004	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023
Endrin aldehyde	µg/L	0.037	0.037	0.037	0.29	0.3	0.29	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053
Ethylbenzene	µg/L	530	--	--	530	2100	530	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Fluoranthene	µg/L	130	--	--	130	140	130	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Fluorene	µg/L	1100	--	--	1100	5300	1100	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Fluoride	µg/L	1400	--	--	1100	5300	1400	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
gamma-BHC (Lindane, Hexachlorocyclhexane)	µg/L	0.01	0.16	0.16	0.98	1.8	0.01	ND		0.0003	ND	F2	0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003
Heptachlor	µg/L	0.00079	0.053	0.053	0.00079	0.00079	0.00079	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046
Heptachlor epoxide	µg/L	0.00039	0.053	0.053	0.00039	0.00039	0.00039	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035	0.00067	J	0.00035	ND		0.00035	ND		0.00035
Hexachlorobenzene	µg/L	0.0028	--	--	0.0028	0.0029	0.0028	ND		1.03	ND		1.04	ND		1.03	ND		1.03	ND		1.04	ND		1.05	ND		1.04	ND		1.04
Hexachlorobutadiene	µg/L	4.4	--	--	4.4	180	4.4	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
Hexachlorocyclopentadiene	µg/L	40	--	--	40	1100	40	ND		1.03	ND	C	1.04	ND		1.03	ND		1.03	ND		1.04	ND		1.05	ND		1.04	ND		1.04
Hexachloroethane	µg/L	14	--	--	14	33	14	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
Indeno (1,2,3-cd) pyrene	µg/L	0.0038	--	--	0.038	0.18	0.0038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
Iodomethane	µg/L	--	--	--	--	--	--	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7
Iron	µg/L	300	--	--	300	--	300	1180		5	3960		5	2340		5	3970		5	2410		5	2270		5	4450		5	1950		5
Isophorone	µg/L	--	--	--	350	9600	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Isopropylbenzene	µg/L	--	--	--	--		--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Lead	µg/L	15	210	210	15		15	ND		6	ND		30	ND		6	ND		6	ND		6	ND		6	ND		6	ND		6
m+p-Xylenes	µg/L				--	--		ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
Manganese	µg/L	50	--	--	--	--	50	47.1		2	143		2	134		2	67.1		2	130		2	45.7		2	86.8		2	67.1		2
Mercury	µg/L	0.5	1.8	1.8	--	--	0.5	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2
Methoxychlor	µg/L	0.03	--	--	100		0.03	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079
Methylene chloride	µg/L	46	--	--	46	5900	46	2.23	J	1	1.62	J	1	2.81	J	1	1.18	J	1	1.34	J	1	1.16	J	1	1.66	J	1	1.46	J	1
Methyl-t-butyl ether (MTBE)	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
Naphthalene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
n-Butylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Nickel	µg/L	56	74	74	610	4600	56	ND		2	4.3	J	2	ND		2	ND		2	ND		2	ND		2	3.3	J	2	ND		2
Nitrate as N	mg/L	5000	--	--	10000	--	5000	ND		0.11	ND		0.11	ND		0.11	ND		0.11	ND		0.11	ND		0.11	ND		0.11	0.152		0.11
Nitrate+Nitrite as N	mg/L	--	--	--	--	--	--	0.1		0.1	0.15		0.1	0.1		0.1	0.12		0.1	0.13		0.1	ND		0.1	0.11		0.1	0.15		0.1
Nitrite as N	mg/L	25	--	--	--	--	25	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01
Nitrobenzene	µg/L	17	--	--	17	690	17	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
n-Nitrosodimethylamine	µg/L	0	--	--	0.0069	30	0	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12
n-Nitrosodi-n-propylamine	µg/L	0.05	--	--	0.05	5.1	0.05	ND		3.61	ND		3.65	ND		3.61	ND		3.61	ND		3.65	ND		3.68	ND		3.65	ND		3.65
n-Nitrosodiphenylamine	µg/L	33	--	--	33	60	33	ND		3.09	ND		3.12	ND		3.09	ND		3.09	ND		3.12	ND		3.16	ND		3.12	ND		3.12

Table 5
HRBT Expansion
Summary of Analytical Results
Elutriate Sediment - Standard Chemistry

Parameter	Units	Most Stringent Criteria	USEPA Acute Ecological Criteria	VA Acute Ecological Criteria	Public Water Supply	VA Surface Water	Weanack Clean Fill Criteria	HRCP-L-ENV-024 Elutriate			HRCP-L-ENV-025 Elutriate			HRCP-L-ENV-026 Elutriate			HRCP-L-ENV-027 Elutriate			HRCP-L-ENV-082 Elutriate			HRCP-L-ENV-083 Elutriate			HRCP-L-ENV-084 Elutriate			HRCP-L-ENV-085 Elutriate		
								19E0014			19E0634			19E0014			19E0014			19E0014			19E0014			19E0014			19E0634		
								5/2/2019			5/15/2019			5/2/2019			5/2/2019			5/1/2019			5/2/2019			5/2/2019			5/16/2019		
								11:28:00 AM			3:55:00 PM			12:05:00 AM			1:05:00 PM			4:15:00 PM			1:05:00 PM			1:05:00 PM			2:32:00 PM		
								Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Nonylphenol	µg/L	28	--	--	--	--	28	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
n-Propylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
o-Xylene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Parathion	µg/L	0.065	--	--	--	--	0.065	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Pentachlorophenol	µg/L	2.7	--	--	2.7	30	2.7	ND		6.19	ND	C	6.25	ND		6.19	ND		6.19	ND		6.25	ND		6.32	ND		6.25	ND		6.25
Phenanthrene	µg/L	--	--	--	--	--	--	0.23	B	0.21	ND		0.21	0.25	B	0.21	0.26	B	0.21	0.22	B	0.21	0.29	B	0.21	0.28	B	0.21	0.27		0.21
Phenol	µg/L	10000	--	--	10000	860000	10000	ND		2.58	ND		2.6	ND		2.58	ND		2.58	ND		2.6	ND		2.63	ND		2.6	ND		2.6
Phosphorus, Total	mg/L	--	--	--	--	--	--	0.052		0.01	ND		0.01	ND		0.01	ND		0.01	0.017	J	0.01	0.09		0.01	0.071		0.01	ND		0.01
Pyrene	µg/L	830	--	--	--	--	830	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.21
sec-Butylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Selenium	µg/L	10	290	290	170	4200	10	ND		40	ND		40	ND		40	ND		40	ND		40	ND		40	ND		40	ND		40
Silver	µg/L	1.9	1.9	1.9	--	--	--	ND		5	ND		5	ND		5	ND		5	ND		5	ND		5	ND		5	ND		5
Styrene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Sulfate	µg/L	50000	--	--	250000	--	50000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Sulfide	mg/L	--	--	--	--	--	--	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8
tert-Butylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Tetrachloroethylene (PCE)	µg/L	6.9	--	--	6.9	33	6.9	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Thallium	µg/L	--	--	--	--	--	--	ND		9	ND		9	ND		9	ND		9	ND		9	ND		9	ND		9	ND		9
Tin	µg/L	--	--	--	--	--	--	ND		20	ND		20	ND		20	ND		20	ND		20	ND		20	ND		20	ND		20
TKN as N	mg/L	--	--	--	--	--	--	2.86		0.2	4.17		0.2	3.29		0.2	1.43		0.2	4.49		0.2	1.53		0.2	1.33		0.2	1.53		0.2
TOC (Max)	mg/L	--	--	--	--	--	--	1		1	ND		1	ND		1	ND		1	1.2		1	1.9		1	1.8		1	ND		1
TOC (Mean)	mg/L	--	--	--	--	--	--	1		1	ND		1	ND		1	ND		1	ND		1	1.8		1	1.8		1	ND		1
TOC (Min)	mg/L	--	--	--	--	--	--	1		1	ND		1	ND		1	ND		1	ND		1	1.7		1	1.8		1	ND		1
Toluene	µg/L	510	--	--	510	6000	510	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
PCB-101	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28
PCB-105	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.51	ND		0.51	ND		0.51	ND		0.51	ND		0.51	ND		0.51	ND		0.5	ND		0.51
PCB-118	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.75	ND		0.75	ND		0.75	ND		0.75	ND		0.75	ND		0.75	ND		0.74	ND		0.75
PCB-126	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.74	ND		0.74	ND		0.74	ND		0.74	ND		0.74	ND		0.74	ND		0.73	ND		0.74
PCB-128	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
PCB-138	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.51	ND		0.51	ND		0.51	ND		0.51	ND		0.51	ND		0.51	ND		0.5	ND		0.51
PCB-153	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.54	ND		0.54	ND		0.54	ND		0.54	ND		0.54	ND		0.54	ND		0.53	ND		0.54
PCB-156	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.67	ND		0.67	ND		0.67	ND		0.67	1		0.67	ND		0.67	ND		0.67	ND		0.67
PCB-169	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.71	ND		0.71	ND		0.71	ND		0.71	ND		0.71	ND		0.71	ND		0.7	ND		0.71
PCB-170	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34
PCB-18	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.26	2.5		0.26	ND		0.26	2.1		0.26	1.5		0.26	2		0.26	1.1		0.26	ND		0.26
PCB-180	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
PCB-183	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.65	ND		0.65	ND		0.65	ND		0.65	2.5		0.65	ND		0.65	ND		0.65	ND		0.65
PCB-184	ng/L	0.64	--	--	0.64	0.64	0.64	0.62	J	0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26
PCB-187	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.65	ND		0.65	0.9	J	0.65	2		0.65	ND		0.65	ND		0.65	1		0.64	ND		0.65
PCB-195	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36
PCB-206	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.89	ND		0.89	ND		0.89	ND		0.89	ND		0.89	ND		0.89	ND		0.88	ND		0.89
PCB-209	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.84	ND		0.84	ND		0.84	ND		0.84	ND		0.84	ND		0.84	ND		0.83	ND		0.84
PCB-28	ng/L	0.64	--	--	0.64	0.64	0.64	1.2	p	0.5	ND	F1	0.5	ND		0.5	2.9	p	0.5	ND		0.5	ND		0.5	1.9	p	0.5	ND		0.5
PCB-44	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.28	ND		0.28	ND		0.28	1.2		0.28	1.3		0.28	ND		0.28	0.96	J	0.27	ND		0.28
PCB-49	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.34	ND	F1	0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34
PCB-52	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.48	ND		0.48	ND		0.48	ND		0.48	ND		0.48	ND		0.48	ND		0.47	ND		0.48
PCB-66	ng/L	0.64	--	--	0.64	0.64	0.64	1.8		0.61	1.5	p	0.61	ND		0.61	ND		0.61	ND		0.61	1.2		0.61	ND		0.6	ND		0.61
PCB-77	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.72	ND		0.72	ND		0.72	ND		0.72	ND		0.72	ND		0.72	ND		0.71	ND		0.72
PCB-8	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41
PCB-87	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
Total PCBs, all cogeners	ng/L	0.64	--	--	0.64	0.64	0.64	3.62		0.25	4		0.25	0.9		0.25	8.2		0.25	6.3		0.25	3.2		0.25	4.96		0.25	ND		0.25
Total petroleum hydrocarbons (TPH)	mg/kg	10000	--	--	--	--	10000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total phenols (phenolic compounds)	µg/L	1	--	--	--	--	1	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Toxaphene	µg/L	0.21	0.21	0.21	--	--	--	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05
trans-1,2-Dichloroethylene	µg/L	140	--	--	--	--	140	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
trans-1,3-Dichloropropene	µg/L	--	--	--	--	--	--	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
Trichloroethylene	µg/L	25	--	--	25	300	25	NA		NA	ND		0.03	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	ND		0.03
Trichlorofluoromethane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Tributyltin	µg/L	0.46	0.46	--	--	--	0.46	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8
Vinyl acetate	µg/L	0.46	0.46	--	--	--	0.46	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
Vinyl chloride	µg/L	0.46	0.46	--	0.25	24	0.46	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Xylenes, Total	µg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
Zinc	µg/L	36	90	90	7400	26000	36	ND		10	10.3		10	ND		10	12.1		10	ND		10	ND		10	11.5		10	ND		10

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed

Table 6
HRBT Expansion
Summary of Analytical Results
Elutriate Fill Sediment - Standard Chemistry

Parameter	Units	Most Stringent Criteria	USEPA Acute Criteria	VA Acute Criteria	Public Water Supply	VA Surface Water	Weanack Clean Fill	HRCP-L-ENV-024-FILL			HRCP-L-ENV-025-FILL			HRCP-L-ENV-026-FILL			HRCP-L-ENV-027-FILL			HRCP-L-ENV-082-FILL			HRCP-L-ENV-083-FILL			HRCP-L-ENV-084-FILL			HRCP-L-ENV-085-FILL		
								19E0463			19E0634			19E0463			19E0463			19E0463			19E0463			19E0463			19E0634		
								5/13/2019			5/15/2019			5/13/2019			5/13/2019			5/13/2019			5/13/2019			5/14/2019			5/16/2019		
								3:45:00 PM			3:17:00 PM			1:35:00 PM			1:47:00 PM			1:35:00 PM			11:32:00 PM			11:47:00 PM			12:17:00 PM		
								Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,1,1-Trichloroethane	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,1,2,2-Tetrachloroethane	µg/L	1.7	--	--	1.7	40	1.7	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
1,1,2-Trichloroethane	µg/L	5.9	--	--	5.9	160	5.9	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,1-Dichloroethane	µg/L	3.8	--	--	3.8	370	3.8	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,1-Dichloroethylene	µg/L	330	--	--	320	7100	320	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
1,1-Dichloropropene	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
1,2,3-Trichloropropane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2,4-Trichlorobenzene	µg/L	35	--	--	35	70	35	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,2,4-Trichlorobenzene	µg/L	35	--	--	35	70	35	ND		4.17	ND		4.17	ND		4.21	ND		4.21	ND		4.04	ND		4.04	ND		4.17	ND		4.17
1,2,4-Trimethylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
1,2-Dibromoethane (EDB)	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Dichlorobenzene	µg/L	420	--	--	420	1300	420	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Dichloroethane	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
1,2-Dichloropropane	µg/L	5	--	--	5	150	5	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,2-Diphenylhydrazine	µg/L	0.36	--	--	0.36	2	0.36	ND		8.33	ND		8.33	ND		8.42	ND		8.42	ND		8.08	ND		8.08	ND		8.33	ND		8.33
1,3,5-Trimethylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,3-Dichlorobenzene	µg/L	320	--	--	320	960	320	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
1,3-Dichloropropane	µg/L	3.4	--	--	3.4	210	3.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1,4'-DDT	µg/L	0.13	0.13	0.13	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
1,4-Dichlorobenzene	µg/L	63	--	--	63	190	63	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
1-Methylnaphthalene	µg/L	--	--	--	--	--	--	ND		8.33	ND		8.33	ND		8.42	ND		8.42	ND		8.08	ND		8.08	ND		8.33	ND		8.33
2-(2,4,5-Trichlorophenoxy) Propionic acid (Silvex)	µg/L	10	--	--	50	--	10	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2,2-Dichloropropane	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
2,2'-Oxybis (1-chloropropane)	µg/L	1400	--	--	--	--	1400	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
2,3,7,8-TCDD	pg/L	0.05	--	--	--	--	0.05	ND		0.66	ND		0.48	ND		0.64	ND		0.64	ND		0.77	ND		0.52	ND		0.65	ND		0.77
2,4,6-Trichlorophenol	µg/L	14	--	--	14	24	14	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
2,4-Dichlorophenol	µg/L	77	--	--	77	290	77	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2,4-Dichlorophenoxy Acetic Acid (2,4-D)	µg/L	100	--	--	100	--	100	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2,4-Dimethylphenol	µg/L	380	--	--	380	850	380	ND		0.52	ND		0.52	ND		0.53	ND		0.53	ND	C	0.51	ND	C	0.51	ND		0.52	ND		0.52
2,4-Dinitrophenol	µg/L	69	--	--	69	5300	69	ND		8.33	ND		8.33	ND		8.42	ND		8.42	ND		8.08	ND		8.08	ND		8.33	ND		8.33
2,4-Dinitrotoluene	µg/L	1.1	--	--	1.1	34	1.1	ND		2.6	ND		2.6	ND		2.63	ND		2.63	ND		2.53	ND		2.53	ND		2.6	ND		2.6
2,6-Dichlorophenol	µg/L	--	--	--	--	--	--	ND		1.04	ND		1.04	ND		1.05	ND		1.05	ND		1.01	ND		1.01	ND		1.04	ND		1.04
2,6-Dinitrotoluene	µg/L	--	--	--	--	--	--	ND		4.17	ND		4.17	ND		4.21	ND		4.21	ND		4.04	ND		4.04	ND		4.17	ND		4.17
2-Butanone (MEK)	µg/L	--	--	--	--	--	--	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3
2-Chloronaphthalene	µg/L	1000	--	--	1000	1600	1000	ND		4.69	ND		4.69	ND		4.74	ND		4.74	ND		4.55	ND		4.55	ND		4.69	ND		4.69
2-Chlorophenol	µg/L	81	--	--	81	150	81	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
2-Chlorotoluene	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
2-Hexanone (MBK)	µg/L	--	--	--	--	--	--	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2	ND		2.2
2-Methylnaphthalene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
2-Methylphenol	µg/L	--	--	--	--	--	--	ND		8.33	ND		8.33	ND		8.42	ND		8.42	ND		8.08	ND		8.08	ND		8.33	ND		8.33
2-Nitrophenol	µg/L	--	--	--	--	--	--	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
3,3'-Dichlorobenzidine	µg/L	0.21	--	--	0.21	0.28	0.21	ND		4.17	ND		4.17	ND		4.21	ND		4.21	ND		4.04	ND		4.04	ND		4.17	ND		4.17
3,3'-Dichlorobenzidine	µg/L	--	--	--	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
4,4'-DDD	µg/L	0.0031	--	--	0.0031	0.0031	0.0031	0.00066	J p	0.00054	ND		0.00054	0.00092	J p	0.00054	ND		0.00054	ND		0.00054	0.00071	J p	0.00054	ND		0.00054	ND		0.00054
4,4'-DDE	µg/L	0.0022	--	--	0.0022	0.0022	0.0022	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003
4,4'-DDT	µg/L	0.001	--	--	0.0022	0.0022	0.001	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003
4,6-Dinitro-2-methylphenol	µg/L	13	--	--	--	--	13	ND		8.33	ND		8.33	ND		8.42	ND		8.42	ND		8.08	ND		8.08	ND		8.33	ND		8.33
4-Bromophenyl phenyl ether	µg/L	--	--	--	--	--	--	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
4-Chloro-3-methylphenol	µg/L	--	--	--	--	--	--	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.16	ND		3.16	ND		3.12	ND		3.12
4-Chlorophenyl phenyl ether	µg/L	--	--	--	--	--	--	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.03	ND		3.54	ND		3.65	ND		3.65
4-Chlorotoluene	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
4-Isopropyltoluene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
4-Methyl-2-pentanone (MIBK)	µg/L	--	--	--	--	--	--	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5	ND		1.5
4-Methylphenol	µg/L	--	--	--	--	--	--	NA		1.04	ND		1.04	ND		1.05	ND		1.05	ND		1.01	ND		1.01	ND		1.04	ND		1.04
4-Nitrophenol	µg/L	--	--	--	--	--	--	ND		2.08	ND		2.08	ND		2.11	ND		2.11	ND		2.02	ND		2.02	ND		2.08	ND		2.08
Acenaphthene	µg/L	670	--	--	670	990	670	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Acenaphthylene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Acetone	µg/L	--	--	--	--	--	--	7.12	J	7	8.05	J	7	ND		7	ND		7	ND		7	7.07	J	7	33		7	20.5		7
Acrolein	µg/L	6.1	--	--	6.1	9.3	6.1	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Acrylonitrile	µg/L	0.51	--	--	0.51	235	0.51	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Aldrin	µg/L	1.3	1.3	1.3	0.00049	0.0005	0.00049	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036	ND		0.00036
alpha-BHC (Hexachlorocyclhexane)	µg/L	0.026	--	--	0.026	0.049	0.026	ND		0.00012	0.00081	J p	0.00012	ND		0.00012	ND		0.00012	ND		0.00012	ND		0.00012	ND		0.00012	0.0009	J p	0.00012
alpha-Endosulfan	µg/L	0.034	0.034	0.034	62	89	0.22	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007	ND		0.0007
Aluminum	µg/L	--	--	--	--	--	--	1110		95	4410		19	1640		95	701		95	1290		95	799		95	2260		95	1820		19
Ammonia as N	mg/L	14.3	14.3	14.3	--	--	25	0.12		0.1	ND		0.1	0.16		0.1	0.11		0.1	0.12		0.1	0.12		0.1	0.14		0.1	0.11		0.1
Anthracene	µg/L	8300	--	--	8300	40000	8300	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Antimony	µg/L	5.6	--	--	5.6	640	5.6	ND		150	ND		30	ND		150	ND		150	ND		150	ND		150	ND		150	ND		30
Arsenic	µg/L	10	69	69	10	--	10	ND		50	ND		10	ND		50	ND		50	ND		50	ND		50	ND		50	ND		10
Barium	µg/L	1000	--	--	2000	--	1000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Benzene	µg/L	22	--	--	22	510	22	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Benzidine	µg/L	0.00086	--	--	0.00086	0.002	0.00086	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Benzo (a) anthracene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Benzo (a) pyrene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Benzo (b) fluoranthene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Benzo (g,h,i) perylene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND	C	0.2	ND	C	0.2	ND		0.21	ND		0.21
Benzo (k) fluoranthene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Benzoic acid	µg/L	--	--	--	--	--	--	ND	C	10.4	ND		10.4	ND	C	10.5	ND	C	10.5	ND		10.1	ND		10.1	ND	C	10.4	ND		10.4
Benzyl alcohol	µg/L	--	--	--	--	--	--	ND		1.04	ND		1.04	ND		1.05	ND		1.05	ND		1.01	ND		1.01	ND		1.04	ND		1.04
Beryllium	µg/L	--	--	--	--	--	--	ND		10	ND		2	ND		10	ND		10	ND		10	ND		10	ND		10	ND		2
beta-BHC (Hexachlorocyclhexane)	µg/L	0.091	--	--	0.091	0.017	0.091	NA		0.00037	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
beta-Endosulfan	µg/L	0.034	0.034	0.034	62	89	0.22	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032	ND		0.00032
bis (2-Chloroethoxy) methane	µg/L	--	--	--	--	--	--	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
bis (2-Chloroethyl) ether	µg/L	0.3	--	--	0.3	5.3	0.3	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
bis (2-Ethylhexyl) phthalate	µg/L	12	--	--	12	22	12	ND		6.25	ND		6.25	ND		6.32	ND		6.32	ND		6.06	ND		6.06	ND		6.25	ND		6.25
Bromobenzene	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Bromochloromethane	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Bromodichloromethane	µg/L	5.5	--	--	--	--	5.5	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Bromoform	µg/L	43	--	--	43	1400	43	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Bromomethane	µg/L	47	--	--	--	--	47	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8
Butyl benzyl phthalate	µg/L	1500	--	--	1500	1900	1500	ND	C	7.29	ND		7.29	ND	C	7.37	ND	C	7.37	ND		7.07	ND		7.07	ND	C	7.29	ND		7.29
Cadmium	µg/L	0.4	40	40	43	1400	0.4	ND		10	ND		2	ND		10	ND		10	ND		10	ND		10	ND		10	ND		2
Carbon disulfide	µg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
Carbon tetrachloride	µg/L	2.3	--	--	--	--	2.3	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Chlordane	µg/L	0.008	0.9	--	0.008	0.0081	0.008	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074	ND		0.0074

Table 6
HRBT Expansion
Summary of Analytical Results
Elutriate Fill Sediment - Standard Chemistry

Parameter	Units	Most Stringent Criteria	USEPA Acute Criteria	VA Acute Criteria	Public Water Supply	VA Surface Water	Weanack Clean Fill	HRCP-L-ENV-024-FILL			HRCP-L-ENV-025-FILL			HRCP-L-ENV-026-FILL			HRCP-L-ENV-027-FILL			HRCP-L-ENV-082-FILL			HRCP-L-ENV-083-FILL			HRCP-L-ENV-084-FILL			HRCP-L-ENV-085-FILL		
								19E0463			19E0634			19E0463			19E0463			19E0463			19E0463			19E0463			19E0634		
								5/13/2019			5/15/2019			5/13/2019			5/13/2019			5/13/2019			5/13/2019			5/14/2019			5/16/2019		
								3:45:00 PM			3:17:00 PM			1:35:00 PM			1:47:00 PM			1:35:00 PM			11:32:00 PM			11:47:00 PM			12:17:00 PM		
								Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Chloride	µg/L	50000	--	--	--	--	50000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chlorobenzene	µg/L	130	--	--	130	1600	130	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Chloroethane	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
Chloroform	µg/L	340	--	--	340	11000	340	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Chloromethane	µg/L	--	--	--	--	--	--	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95
Chloropyrifos	µg/L	0.1	--	--	--	--	0.083	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chromium	µg/L	50	1100	1100	--	--	50	ND		20	11.6		4	ND		20	ND		20	ND		20	ND		20	ND		20	18.7		4
Chromium III, Dissolved	µg/L	180	--	--	180		180	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chromium VI, Dissolved	µg/L	16	--	--	--	--	16	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chrysene	µg/L	0.0038	--	--	0.0038	0.018	0.0038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
cis-1,2-Dichloroethylene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
cis-1,3-Dichloropropene	µg/L	--	--	--	--	--	--	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
Cobalt	µg/L	--	--	--	--	--	--	ND		10	3.6	J	2	ND		10	ND		10	ND		10	ND		10	ND		10	2.6	J	2
Copper	µg/L	3.6	4.8	4.8	1300	--	3.6	ND		15	4.8	J	3	ND		15	ND		15	ND		15	ND		15	ND		15	6.6	J	3
Cyanide	µg/L	1.3	1.3	1.3	140	16000	5	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10	ND		10
Cyanide, Free	µg/L	22	--	--	140	16000	22	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Diazinon	µg/L	0.2	--	--	--	--	0.17	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dibenz (a,h) anthracene	µg/L	0.038	--	--	0.038	0.18	0.038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Dibenzofuran	µg/L	--	--	--	--	--	--	ND		2.08	ND		2.08	ND		2.11	ND		2.11	ND		2.02	ND		2.02	ND		2.08	ND		2.08
Dibromochloromethane	µg/L	4	--	--	--	--	4	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35	ND		0.35
Dibromomethane	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Dichlorodifluoromethane	µg/L	--	--	--	--	--	--	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95	ND		0.95
Dieldrin	µg/L	0.00052	0.7	0.71	0.00052	0.00054	0.00052	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028	ND		0.00028
Diethyl phthalate	µg/L	17000	--	--	17000	44000	17000	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
Di-isopropyl ether (DIPE)	µg/L	--	--	--	--	--	--	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3	ND		3
Dimethyl phthalate	µg/L	270000	--	--	270000	1100000	270000	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
Di-n-butyl phthalate	µg/L	2000	--	--	2000	4500	2000	ND		4.17	ND		4.17	ND		4.21	ND		4.21	ND		4.04	ND		4.04	ND		4.17	ND		4.17
Di-n-octyl phthalate	µg/L	--	--	--	--	--	--	ND		8.33	ND	C	8.33	ND		8.42	ND		8.42	ND		8.08	ND		8.08	ND		8.33	ND	C	8.33
Endosulfan	µg/L	0.034	0.034	0.034	--	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Endosulfan sulfate	µg/L	0.034	0.034	0.034	62	89	62	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065	ND		0.00065
Endrin	µg/L	0.004	0.037	0.037	0.059	0.06	0.004	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023	ND		0.00023
Endrin aldehyde	µg/L	0.037	0.037	0.037	0.29	0.3	0.29	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053	ND		0.00053
Ethylbenzene	µg/L	530	--	--	530	2100	530	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Fluoranthene	µg/L	130	--	--	130	140	130	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Fluorene	µg/L	1100	--	--	1100	5300	1100	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Fluoride	µg/L	1400	--	--	1100	5300	1400	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
gamma-BHC (Lindane, Hexachlorocyclhexane)	µg/L	0.01	0.16	0.16	0.98	1.8	0.01	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003	ND		0.0003
Heptachlor	µg/L	0.00079	0.053	0.053	0.00079	0.00079	0.00079	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046	ND		0.00046
Heptachlor epoxide	µg/L	0.00039	0.053	0.053	0.00039	0.00039	0.00039	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035	ND		0.00035
Hexachlorobenzene	µg/L	0.0028	--	--	0.0028	0.0029	0.0028	ND		1.04	ND		1.04	ND		1.05	ND		1.05	ND		1.01	ND		1.01	ND		1.04	ND		1.04
Hexachlorobutadiene	µg/L	4.4	--	--	4.4	180	4.4	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
Hexachlorocyclopentadiene	µg/L	40	--	--	40	1100	40	ND		1.04	ND		1.04	ND		1.05	ND		1.05	ND	C	1.01	ND	C	1.01	ND		1.04	ND		1.04
Hexachloroethane	µg/L	14	--	--	14	33	14	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
Indeno (1,2,3-cd) pyrene	µg/L	0.0038	--	--	0.038	0.18	0.0038	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Iodomethane	µg/L	--	--	--	--	--	--	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7	ND		1.7
Iron	µg/L	300	--	--	300	--	300	4550		25	9520		5	4370		25	4340		25	4790		25	3780		25	4030		25	7080		5
Isophorone	µg/L	--	--	--	350	9600	--	ND		2.6	ND		2.6	ND		2.63	ND		2.63	ND		2.53	ND		2.53	ND		2.6	ND		2.6
Isopropylbenzene	µg/L	--	--	--	--		--	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Lead	µg/L	15	210	210	15		15	ND		30	ND		30	ND		30	ND		30	ND		30	ND		30	ND		30	ND		6
m+p-Xylenes	µg/L				--	--		ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
Manganese	µg/L	50	--	--	--	--	50	143		10	154		2	166		10	85.6		10	129		10	69		10	69.6		10	175		2
Mercury	µg/L	0.5	1.8	1.8	--	--	0.5	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2	ND		0.2
Methoxychlor	µg/L	0.03	--	--	100		0.03	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079	ND		0.00079
Methylene chloride	µg/L	46	--	--	46	5900	46	ND		1	1.56	J	1	ND		1	ND		1	1.09	J	1	1.04	J	1	1.43	J	1	1.49	J	1
Methyl-t-butyl ether (MTBE)	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	0.93	J	0.6	ND		0.6
Naphthalene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
n-Butylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Nickel	µg/L	56	74	74	610	4600	56	ND		10	5.5	J	2	ND		10	ND		10	ND		10	ND		10	ND		10	3.5	J	2
Nitrate as N	mg/L	5000	--	--	10000	--	5000	0.313		0.11	0.526		0.11	0.4		0.11	0.45		0.11	0.336		0.11	0.459		0.11	0.39		0.11	0.241		0.11
Nitrate+Nitrite as N	mg/L	--	--	--	--	--	--	0.31		0.1	0.53		0.1	0.4		0.1	0.45		0.1	0.34		0.1	0.46		0.1	ND		0.1	0.24		0.1
Nitrite as N	mg/L	25	--	--	--	--	25	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01	ND		0.01
Nitrobenzene	µg/L	17	--	--	17	690	17	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
n-Nitrosodimethylamine	µg/L	0	--	--	0.0069	30	0	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
n-Nitrosodi-n-propylamine	µg/L	0.05	--	--	0.05	5.1	0.05	ND		3.65	ND		3.65	ND		3.68	ND		3.68	ND		3.54	ND		3.54	ND		3.65	ND		3.65
n-Nitrosodiphenylamine	µg/L	33	--	--	33	60	33	ND		3.12	ND		3.12	ND		3.16	ND		3.16	ND		3.03	ND		3.03	ND		3.12	ND		3.12
Nonylphenol	µg/L	28	--	--	--	--	28	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
n-Propylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
o-Xylene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Parathion	µg/L	0.065	--	--	--	--	0.065	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Pentachlorophenol	µg/L	2.7	--	--	2.7	30	2.7	ND		6.25	ND		6.25	ND		6.32	ND		6.32	ND		6.06	ND		6.06	ND		6.25	ND		6.25
Phenanthrene	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
Phenol	µg/L	10000	--	--	10000	860000	10000	ND		2.6	ND		2.6	ND		2.63	ND		2.63	ND		2.53	ND		2.53	ND		2.6	ND		2.6
Phosphorus, Total	mg/L	--	--	--	--	--	--	0.231		0.01	ND		0.01	0.214		0.01	0.214		0.01	0.856		0.01	0.292		0.01	0.123		0.01	0.097		0.01
Pyrene	µg/L	830	--	--	--	--	830	ND		0.21	ND		0.21	ND		0.21	ND		0.21	ND		0.2	ND		0.2	ND		0.21	ND		0.21
sec-Butylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Selenium	µg/L	10	290	290	170	4200	10	ND		200	ND		40	ND		200	ND		200	ND		200	ND		200	ND		200	ND		40
Silver	µg/L	1.9	1.9	1.9	--	--	--	ND		25	ND		5	ND		25	ND		25	ND		25	ND		25	ND		25	ND		5
Styrene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Sulfate	µg/L	50000	--	--	250000	--	50000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Sulfide	mg/L	--	--	--	--	--	--	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8
tert-Butylbenzene	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Tetrachloroethylene (PCE)	µg/L	6.9	--	--	6.9	33	6.9	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Thallium	µg/L	--	--	--	--	--	--	ND		45	ND		9	ND		45	ND		45	ND		45	ND		45	ND		45	ND		9
Tin	µg/L	--	--	--	--	--	--	ND		100	ND		20	ND		100	ND		100	ND		100	ND		100	ND		100	ND		20
TKN as N	mg/L	--	--	--	--	--	--	0.82		0.2	0.71		0.2	1.18		0.2	0.71		0.2	0.99		0.2	0.72		0.2	0.64		0.2	0.67		0.2
TOC (Max)	mg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	1.8		1	ND		1	ND		1
TOC (Mean)	mg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	1.8		1	ND		1	ND		1
TOC (Min)	mg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	1.7		1	ND		1	ND		1
Toluene	µg/L	510	--	--	510	6000	510	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
PCB-101	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28	ND		0.28
PCB-105	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.5	ND		0.51	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.51
PCB-118	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.74	ND		0.75	ND		0.74	ND		0.74	ND		0.74	ND		0.74	ND		0.74	ND		0.75
PCB-126	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.73	ND		0.74	ND		0.73	ND		0.73	ND		0.73	ND		0.73	ND		0.73	ND		0.74
PCB-128	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
PCB-138	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.5	ND		0.51	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.51
PCB-153	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.53	ND		0.54	ND		0.53	ND		0.53	ND		0.53	ND		0.53	ND		0.53	ND		0.54
PCB-156	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.67	ND		0.67	ND		0.67	ND		0.67	ND		0.67	ND		0.67	ND		0.67	ND		0.67
PCB-169	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.7	ND		0.71	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.71

Table 6
HRBT Expansion
Summary of Analytical Results
Elutriate Fill Sediment - Standard Chemistry

Parameter	Units	Most Stringent Criteria	USEPA Acute Criteria	VA Acute Criteria	Public Water Supply	VA Surface Water	Weanack Clean Fill	HRCP-L-ENV-024-FILL			HRCP-L-ENV-025-FILL			HRCP-L-ENV-026-FILL			HRCP-L-ENV-027-FILL			HRCP-L-ENV-082-FILL			HRCP-L-ENV-083-FILL			HRCP-L-ENV-084-FILL			HRCP-L-ENV-085-FILL		
								19E0463			19E0634			19E0463			19E0463			19E0463			19E0463			19E0463			19E0634		
								5/13/2019			5/15/2019			5/13/2019			5/13/2019			5/13/2019			5/13/2019			5/14/2019			5/16/2019		
								3:45:00 PM			3:17:00 PM			1:35:00 PM			1:47:00 PM			1:35:00 PM			11:32:00 PM			11:47:00 PM			12:17:00 PM		
								Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
PCB-170	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34
PCB-18	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.26	4		0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26
PCB-180	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7	ND		0.7
PCB-183	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.65	ND		0.65	ND		0.65	ND		0.65	ND		0.65	ND		0.65	ND		0.65	ND		0.65
PCB-184	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.26	0.81	J	0.26	0.34	J p	0.26	ND		0.26	ND		0.26	ND		0.26	ND		0.26	1.6		0.26
PCB-187	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.64	ND		0.65	ND		0.64	ND		0.64	ND		0.64	ND		0.64	ND		0.64	ND		0.65
PCB-195	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36	ND		0.36
PCB-206	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.88	ND		0.89	ND		0.88	ND		0.88	ND		0.88	ND		0.88	ND		0.88	ND		0.89
PCB-209	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.83	ND		0.84	ND		0.83	ND		0.83	ND		0.83	ND		0.83	ND		0.83	ND		0.84
PCB-28	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
PCB-44	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.27	ND		0.28	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.27	ND		0.28
PCB-49	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34	ND		0.34
PCB-52	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.47	ND		0.48	ND		0.47	ND		0.47	ND		0.47	ND		0.47	ND		0.47	ND		0.48
PCB-66	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.6	ND		0.61	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.61
PCB-77	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.71	ND		0.72	ND		0.71	ND		0.71	ND		0.71	ND		0.71	ND		0.71	ND		0.72
PCB-8	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41	ND		0.41
PCB-87	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25
Total PCBs, all cogeners	ng/L	0.64	--	--	0.64	0.64	0.64	ND		0.25	4.81		0.25	0.34		0.25	ND		0.25	ND		0.25	ND		0.25	ND		0.25	1.6		0.25
Total petroleum hydrocarbons (TPH)	mg/kg	10000	--	--	--	--	10000	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total phenols (phenolic compounds)	µg/L	1	--	--	--	--	1	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Toxaphene	µg/L	0.21	0.21	0.21	--	--	--	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05	ND		0.05
trans-1,2-Dichloroethylene	µg/L	140	--	--	--	--	140	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6	ND		0.6
trans-1,3-Dichloropropene	µg/L	--	--	--	--	--	--	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3	ND		0.3
Trichloroethylene	µg/L	25	--	--	25	300	25	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4	ND		0.4
Trichlorofluoromethane	µg/L	--	--	--	--	--	--	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8	ND		0.8
Tributyltin	µg/L	0.46	0.46	--	--	--	0.46	ND		0.03	ND		0.03	ND		0.03	ND		0.03	ND		0.03	ND		0.03	ND		0.03	ND		0.03
Vinyl acetate	µg/L	0.46	0.46	--	--	--	0.46	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2	ND		2
Vinyl chloride	µg/L	0.46	0.46	--	0.25	24	0.46	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5	ND		0.5
Xylenes, Total	µg/L	--	--	--	--	--	--	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1	ND		1
Zinc	µg/L	36	90	90	7400	26000	36	58.9		50	25.7		10	55.3		10	ND		50	ND		50	ND		50	ND		50	13.9		10

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed

Table 7
HRBT Expansion
Summary of Analytical Results
River Water - Standard Chemistry

Parameter	Unit	Most Stringent	Saltwater Aquatic Life		Human Health		HRCP-L-ENV-RW			HRCP-L-ENV-RW		
							19E0007			19E0462		
							4/30/2019			5/9/2019		
			Acute	Chronic	Public Water Supply	All Other Surface Waters	Conc	Q	DL	Conc	Q	DL
1,1 Dichloroethylene	µg/L	330	--	--	330	7100	NA			ND		0.7
1,1,2,2-Tetrachloroethane	µg/L	1.7	--	--	1.7	40	NA			ND		0.3
1,1,2-Trichloroethane	µg/L	5.9	--	--	5.9	160	NA			ND		0.5
1,2 Dichloroethane	µg/L	3.8	--	--	3.8	370	NA			ND		0.7
1,2,4-Trichlorobenzene	µg/L	35	--	--	35	70	ND		4.30	ND		0.5
1,2-Dichlorobenzene	µg/L	420	--	--	420	1300	NA			ND		0.4
1,2-Dichloropropane	µg/L	5	--	--	5	150	NA			ND		0.4
1,2-Diphenylhydrazine	µg/L	0.36	--	--	0.36	2	ND		8.60			
1,2-trans-dichloroethylene	µg/L	140	--	--	140	10000	NA			ND		0.6
1,3-Dichlorobenzene	µg/L	96	--	--	320	96	NA			ND		0.3
1,3-Dichloropropene	µg/L	3.4	--	--	3.4	210	NA			ND		0.4
1,4 Dichlorobenzene	µg/L	63	--	--	63	190	NA			ND		0.4
13C-2,3,7,8-TCDD	pg/L	--	--	--	--	--	740		3.1	NA		
13C-2,3,7,8-TCDF	pg/L	--	--	--	--	--	770		5.4	NA		
2-(2, 4, 5-Trichlorophenoxy) propionic acid (	µg/L	50	--	--	50	--	NA			NA		
2, 4, 6-Trichlorophenol	µg/L	14	--	--	14	24	ND		3.23	NA		
2,3,7,8-TCDF	pg/L	--	--	--	--	--	ND		0.15	NA		
2,4 Dichlorophenol	µg/L	77	--	--	77	290	NA			NA		
2,4 Dichlorophenoxy acetic acid(2,4-D)	µg/L	100	--	--	100	--	NA			NA		
2,4 Dimethylphenol	µg/L	380	--	--	380	850	ND		0.54	NA		
2,4 Dinitrophenol	µg/L	69	--	--	69	5300	ND		8.60	NA		
2,4 Dinitrotoluene	µg/L	1.1	--	--	1.1	34	ND		2.69	NA		
2,4'-DDD	ug/L	--	--	--	--	--	ND		0.00084	NA		
2,4'-DDE	ug/L	--	--	--	--	--	ND		0.00055	NA		
2,4'-DDT	ug/L	--	--	--	--	--	ND		0.00055	NA		
2-Chloronaphthalene	µg/L	1000	--	--	1000	1600	ND		4.84	NA		
2-Chlorophenol	µg/L	81	--	--	81	150	ND		3.76	NA		
2-Methyl-4,6-Dinitrophenol	µg/L	13	--	--	13	280	ND		8.6	NA		
3,3 Dichlorobenzidine	µg/L	0.21	--	--	0.21	0.28	ND		4.30	NA		
37Cl4-2,3,7,8-TCDD	pg/L	--	--	--	--	--	170		0.41	NA		
Acenapthene	µg/L	670	--	--	670	990	ND		0.22	NA		
Acrolein	µg/L	6.1	--	--	6.1	9.3	NA			NA		
Acrylonitrile	µg/L	0.51	--	--	0.51	2.5	NA			NA		
Aldrin	µg/L	0.00049	1.3		0.00049	0.0005	ND		0.00036	NA		
Alpha-Endosulfan	µg/L	0.0087	0.034	0.0087	62	89	ND		0.0007	NA		
Anthracene	µg/L	8300	--	--	8300	40000	ND		0.22	NA		
Antimony	µg/L	5.6	--	--	5.6	640	ND		30.0	NA		
Arsenic	µg/L	10	69	36	10	--	ND		10.0	NA		
Barium	µg/L	2000	--	--	2000	--	NA			NA		
Benzene	µg/L	22	--	--	22	510	NA			ND		0.4
Benzidine	µg/L	0.00086	--	--	0.00086	0.002	NA			NA		
Benzo (a) anthracene	µg/L	0.038	--	--	0.038	0.18	ND		0.22	NA		
Benzo (a) pyrene	µg/L	0.038	--	--	0.038	0.18	ND		0.22	NA		
Benzo (b) fuoranthene	µg/L	0.038	--	--	0.038	0.18	ND		0.22	NA		
Benzo (k) fuoranthene	µg/L	0.038	--	--	0.038	0.18	ND		0.22	NA		
Beta-Endosulfan	µg/L	0.0087	0.034	0.0087	62	89	ND		0.00032	NA		
Bis2-Chloroethyl Ether	µg/L	0.3	--	--	0.3	5.3	ND		3.76	NA		
Bis2-Chloroisopropyl Ether	µg/L	1400	--	--	1400	65000	NA			NA		
Bis2-Ethylhexyl Phthalate	µg/L	12	--	--	12	22	ND		6.45	NA		
Bromoform	µg/L	43	--	--	43	1400	NA			ND		0.4
Butyl benzyl phthalate	µg/L	1500	--	--	1500	1900	ND		7.53	ND		0.4
Cadmium	µg/L	8.8	40	8.8	43	1400	ND		2.0	NA		
Carbaryl	µg/L	1.6	1.6		--	--	NA			NA		
Chlordane	µg/L	0.004	0.09	0.004	0.008	0.0081	NA			NA		
Chlordane (technical)	ug/L	--	--	--	--	--	ND		0.0074	NA		
Chlorine Produced Oxidant	µg/L	7.5	13	7.5	--	--	NA			NA		
Chlorobenside	ug/L	--	--	--	--	--	ND		0.0018	NA		
Chlorobenzene	µg/L	130	--	--	130	1600	NA			ND		0.4
Chlorodibromomethane	µg/L	4	--	--	4	130	NA			ND		0.35
Chloroform	µg/L	340	--	--	340	11000	NA			ND		0.5
Chlorpyrifos	µg/L	0.0056	0.011	0.0056	--	--	NA			NA		
Chromium III	µg/L	100	--	--	100	--	NA			NA		
Chromium VI	µg/L	50	1100	50	--	--	NA			NA		
Chrysene	µg/L	0.018	--	--	0.038	0.018	ND		0.22	NA		
Copper	µg/L	6	9.3	6	1300	--	4.6		3	NA		
Cyanide, Free	µg/L	1	1	1	140	16000	ND		10	NA		
DCB Decachlorobiphenyl (Surr)	ug/L	--	--	--	--	--	0.015			NA		
DCB Decachlorobiphenyl (Surr)	ug/L	--	--	--	--	--	0.016			NA		
DCPA	ug/L	--	--	--	--	--	ND		0.0002	NA		
DDD	µg/L	0.0031	--	--	0.0031	0.0031	ND		0.00054	NA		
DDE	µg/L	0.0022	--	--	0.0022	0.0022	ND		0.0003	NA		
DDT	µg/L	0.001	0.13	0.001	0.0022	0.0022	ND		0.0003	NA		
delta-BHC	ug/L	--	--	--	--	--	ND		0.00066	NA		
Demeton	µg/L	0.1		0.1	--	--	NA			NA		
Diazinon	µg/L	0.82	0.82	0.82	--	--	ND		0.22	NA		
Dibenz (a, h) anthracene	µg/L	0.038	--	--	0.038	0.18	NA			NA		
Dichlorobromomethane	µg/L	5.5	--	--	5.5	170	NA			ND		0.35
Dieldrin	µg/L	0.00052	0.71	0.0019	0.00052	0.00054	ND		0.00028	NA		
Diethyl Phthalate	µg/L	17000	--	--	17000	44000	ND		3.23	NA		
Dimethyl Phthalate	µg/L	270000	--	--	270000	1100000	ND		3.76	NA		
Di-n-Butyl Phthalate	µg/L	2000	--	--	2000	4500	ND		4.3	NA		
Dioxin 2, 3, 7, 8- tetrachlorodibenzo-p-dioxin	µg/L	5.0 E-8	--	--	5.0 E-8	5.1 E-8	ND		2.40E-07	NA		
Endosulfan Sulfate	µg/L	62	--	--	62	89	ND		0.00065	NA		
Endrin Aldehyde	µg/L	0.29	--	--	0.29	0.3	ND		0.00053	NA		
Endrin	µg/L	0.0023	0.037	0.0023	0.059	0.06	ND		0.00023	NA		
Ethylbenzene	µg/L	530	--	--	530	2100	NA			ND		0.4
Fluoranthene	µg/L	130	--	--	130	140	ND		0.22	NA		

Table 7
HRBT Expansion
Summary of Analytical Results
River Water - Standard Chemistry

Parameter	Unit	Most Stringent	Saltwater Aquatic Life		Human Health		HRCP-L-ENV-RW 19E0007 4/30/2019			HRCP-L-ENV-RW 19E0462 5/9/2019		
			Acute	Chronic	Public Water Supply	All Other Surface Waters	Conc	Q	DL	Conc	Q	DL
Fluorene	µg/L	1100	--	--	1100	5300	ND		0.22	NA		
Foaming Agents	µg/L	500	--	--	500	--	NA			NA		
Guthion	µg/L	0.1	--	0.01	--	--	NA			NA		
Heptachlor	µg/L	0.00079	0.053	0.0036	0.00079	0.00079	ND		0.00046	NA		
Heptachlor Epoxide	µg/L	0.00039	0.053	0.0036	0.00039	0.00039	ND		0.00035	NA		
Hexachlorobenzene	µg/L	0.0028	--	--	0.0028	0.0029	ND		1.08	NA		
Hexachlorobutadiene	µg/L	4.4	--	--	4.4	180	ND		4.84	NA		
Hexachlorocyclohexane (Lindane)	µg/L	0.16	0.16	--	0.98	1.8	ND		0.0003	NA		
Hexachlorocyclohexane Alpha- BHC	µg/L	0.026	--	--	0.026	0.049	ND		0.00012	NA		
Hexachlorocyclohexane Beta- BHC	µg/L	0.091	--	--	0.091	0.17	ND		0.00037	NA		
Hexachlorocyclopentadiene	µg/L	40	--	--	40	1100	ND		1.08	NA		
Hexachloroethane	µg/L	14	--	--	14	33	ND		3.76	NA		
Hydrogen sulfide	µg/L	2	--	2	--	--	NA			NA		
Indeno (1,2,3,-cd) pyrene	µg/L	0.038	--	--	0.038	0.18	ND		0.22	NA		
Iron	µg/L	300	--	--	300	--	579		5.0	NA		
Isophorone	µg/L	350	--	--	350	9600	ND		2.69	NA		
Lead	µg/L	8.8	20	8.8	15	--	ND		6.0	NA		
Malathion	µg/L	0.1	--	--	0.1	--	NA			NA		
Mercury	µg/L	1.8	1.8	9.4	--	--	ND		0.2	NA		
Methoxychlor	µg/L	0.3		0.3	100		ND		0.00079	NA		
Methyl Bromide	µg/L	47	--	--	47	1500	NA			ND		0.8
Methyl Mercury	µg/L	0.3	--	--	0.3	0.3	NA			NA		
Methylene Chloride	µg/L	46	--	--	46	5900	NA			ND		1
Mirex	ug/L	--	--	--	--	--	ND		0.00021	NA		
Nickel	µg/L	8.2	74	8.2	610	4600	ND		2	NA		
Nitrate as N	µg/L	1000	--	--	10000	--	ND		110	NA		
Nitrobenzene	µg/L	17	--	--	17	690	ND		3.23	NA		
N-Nitrosodimethylamine	µg/L	0.069	--	--	0.0069	30	ND		3.23	NA		
N-Nitrosodi-n-propylamine	µg/L	0.05	--	--	0.05	5.1	ND		3.76	NA		
N-Nitrosodiphenylamine	µg/L	33	--	--	33	60	ND		3.23	NA		
Nonylphenol	µg/L	7	7	1.7	--	--	NA			NA		
PCB Total	ng/L	0.64	--	30	0.64	0.64	**2.2**		0.26	NA		
PCB-101	ng/L	0.64	--	30	0.64	0.64	ND		0.28	NA		
PCB-105	ng/L	0.64	--	30	0.64	0.64	ND		0.51	NA		
PCB-118	ng/L	0.64	--	30	0.64	0.64	ND		0.76	NA		
PCB-126	ng/L	0.64	--	30	0.64	0.64	ND		0.74	NA		
PCB-128	ng/L	0.64	--	30	0.64	0.64	ND		0.25	NA		
PCB-138	ng/L	0.64	--	30	0.64	0.64	ND		0.51	NA		
PCB-153	ng/L	0.64	--	30	0.64	0.64	ND		0.54	NA		
PCB-156	ng/L	0.64	--	30	0.64	0.64	ND		0.68	NA		
PCB-169	ng/L	0.64	--	30	0.64	0.64	ND		0.71	NA		
PCB-170	ng/L	0.64	--	30	0.64	0.64	ND		0.35	NA		
PCB-18	ng/L	0.64	--	30	0.64	0.64	**2.2**		0.26	NA		
PCB-180	ng/L	0.64	--	30	0.64	0.64	ND		0.71	NA		
PCB-183	ng/L	0.64	--	30	0.64	0.64	ND		0.66	NA		
PCB-184	ng/L	0.64	--	30	0.64	0.64	ND		0.26	NA		
PCB-187	ng/L	0.64	--	30	0.64	0.64	ND		0.66	NA		
PCB-195	ng/L	0.64	--	30	0.64	0.64	ND		0.37	NA		
PCB-206	ng/L	0.64	--	30	0.64	0.64	ND		0.9	NA		
PCB-209	ng/L	0.64	--	30	0.64	0.64	ND		0.85	NA		
PCB-28	ng/L	0.64	--	30	0.64	0.64	ND		0.51	NA		
PCB-44	ng/L	0.64	--	30	0.64	0.64	ND		0.28	NA		
PCB-49	ng/L	0.64	--	30	0.64	0.64	ND		0.35	NA		
PCB-52	ng/L	0.64	--	30	0.64	0.64	ND		0.48	NA		
PCB-66	ng/L	0.64	--	30	0.64	0.64	ND		0.62	NA		
PCB-77	ng/L	0.64	--	30	0.64	0.64	ND		0.72	NA		
PCB-8	ng/L	0.64	--	30	0.64	0.64	ND		0.42	NA		
PCB-87	ng/L	0.64	--	30	0.64	0.64	ND		0.26	NA		
Pentachlorophenol	µg/L	2.7	13	7.9	2.7	30	ND		6.54	NA		
Phenol	µg/L	10000	--	--	10000	860000	ND		2.69	NA		
Phosphorus Elemental	µg/L	0.1	--	0.1	--	--	ND		10	NA		
Selenium	µg/L	71	290	71	170	4200	ND		40	NA		
Silver	µg/L	1.9	1.9	--	--	--	ND		5	NA		
Sulfate	µg/L	250000	--	--	250000	--	NA			NA		
Tetrachloroethylene	µg/L	6.9	--	--	6.9	33	NA			ND		0.4
Tetrachloro-m-xylene	ug/L	--	--	--	--	--	0.017			NA		
Tetrachloro-m-xylene	ug/L	--	--	--	--	--	0.016			NA		
Tetrachloro-m-xylene (Surr)	ng/L	--	--	--	--	--	16			NA		
Tetrachloro-m-xylene (Surr)	ng/L	--	--	--	--	--	13			NA		
Tetrachloro-m-xylene (Surr)	ng/L	--	--	--	--	--	11			NA		
Tetrachloro-m-xylene (Surr)	ng/L	--	--	--	--	--	12			NA		
Thallium	µg/L	0.24	--	--	0.24	0.47	ND		9	NA		
Toluene	µg/L	510	--	--	510	6000	NA			ND		0.5
Total Chromium	?	--	--	--	--	--	6J		4	NA		
Total Dissolved Solids	µg/L	500000	--	--	--	500000	NA			NA		
Toxaphene	µg/L	0.0002	0.21	0.0002	0.0028	0.0028	ND		0.05	NA		
Tributyltin	µg/L	0.0074	0.42	0.0074	--	--	ND		0.03	NA		
Trichloroethylene	µg/L	25	--	--	25	300	NA			ND		0.4
Vinyl Chloride	µg/L	0.25	--	--	0.25	24	NA			ND		0.5
Zinc	µg/L	81	90	81	7400	26000	ND		10	NA		

ND: Not Detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed

Table 8
HRBT Expansion
Summary of Analytical Results
Groundwater - Standard Chemistry

Parameter	Type	Units	Most Stringent	Groundwater Standard	Saltwater Aquatic Life		Human Health		ENV-081-GW (30') 5/10/2019			ENV-081-GW (127') 5/10/2019		
					Acute	Chronic	Public Water Supply	All Other Surface Water	Result	Q	DL	Result	Q	DL
1,1,1-Trichloroethane	Total	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6
1,1,2,2-Tetrachloroethane	Total	µg/L	1.7	--	--	--	1.7	40	ND		0.3	ND		0.3
1,1,2-Trichloro-1,2,2-trifluoroethane	Total	µg/L	--	--	--	--	--	--	ND		5	ND		5
1,1,2-Trichloroethane	Total	µg/L	5.9	--	--	--	5.9	160	ND		0.5	ND		0.5
1,1-Biphenyl	Total	µg/L	--	--	--	--	--	--	ND		8.42	ND		8.7
1,1-Dichloroethane	Total	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6
1,1-Dichloroethylene	Total	µg/L	330	--	--	--	330	7100	ND		0.7	ND		0.7
1,2,3-Trichlorobenzene	Total	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7
1,2,4-Trichlorobenzene	Total	µg/L	35	--	--	--	35	70	ND		0.5	ND		0.5
1,2,4-Trimethylbenzene	Total	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4
1,2-Dibromo-3-chloropropane (DBCP)	Total	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6
1,2-Dibromoethane (EDB)	Total	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4
1,2-Dichlorobenzene	Total	µg/L	420	--	--	--	420	1300	ND		0.4	ND		0.4
1,2-Dichloroethane	Total	µg/L	3.8	--	--	--	3.8	370	ND		0.7	ND		0.7
1,2-Dichloropropane	Total	µg/L	5	--	--	--	5	150	ND		0.4	ND		0.4
1,2-Diphenylhydrazine		µg/L	0.36	--	--	--	0.36	2	NA		NA	NA		NA
1,3-Dichlorobenzene	Total	µg/L	320	--	--	--	320	960	ND		0.3	ND		0.3
1,3-Dichloropropene		µg/L	3.4	--	--	--	3.4	210	NA		NA	NA		NA
1,4-Dichlorobenzene	Total	µg/L	63	--	--	--	63	190	ND		0.4	ND		0.4
2-(2, 4, 5-Trichlorophenoxy) propionic acid (Silvex)		µg/L	50	--	--	--	50	--	NA		NA	NA		NA
2,3,4,6-Tetrachlorophenol	Total	µg/L	--	--	--	--	--	--	ND		1.05	ND		1.09
2,4 Dichlorophenoxy acetic acid(2,4-D)		µg/L	100	--	--	--	100	--	NA		NA	NA		NA
2,4,5-Trichlorophenol	Total	µg/L	--	--	--	--	--	--	ND		1.05	ND		1.09
2,4,6-Trichlorophenol	Total	µg/L	14	--	--	--	14	24	ND		3.16	ND		3.26
2,4-Dichlorophenol	Total	µg/L	77	--	--	--	77	290	ND		3.16	ND		3.26
2,4-Dimethylphenol	Total	µg/L	380	--	--	--	380	850	ND		0.53	ND		0.54
2,4-Dinitrophenol	Total	µg/L	69	--	--	--	69	5300	ND		8.42	ND		8.7
2,4-Dinitrotoluene	Total	µg/L	1.1	--	--	--	1.1	34	ND		2.63	ND		2.72
2,6-Dinitrotoluene	Total	µg/L	--	--	--	--	--	--	ND		4.21	ND		4.35
2-Butanone (MEK)	Total	µg/L	--	--	--	--	--	--	ND		3	ND		3
2-Chloronaphthalene	Total	µg/L	1000	--	--	--	1000	1600	ND		4.74	ND		4.89
2-Chlorophenol	Total	µg/L	81	--	--	--	81	150	ND		3.68	ND		3.8
2-Hexanone (MBK)	Total	µg/L	--	--	--	--	--	--	ND		2.2	ND		2.2
2-Methylnaphthalene	Total	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.22
2-Methylphenol	Total	µg/L	--	--	--	--	--	--	ND		8.42	ND		8.7
2-Nitroaniline	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
2-Nitrophenol	Total	µg/L	--	--	--	--	--	--	ND		3.16	ND		3.26
3,3'-Dichlorobenzidine	Total	µg/L	0.21	--	--	--	0.21	0.28	ND		4.21	ND		4.35
3-Nitroaniline	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
4,4'-DDD	Total	µg/L	0.0031	--	--	--	0.0031	0.0031	ND		0.005	ND		0.006
4,4'-DDE	Total	µg/L	0.0022	--	--	--	0.0022	0.0022	ND		0.005	ND		0.006
4,4'-DDT	Total	µg/L	0.001	0.001	0.13	0.001	0.0022	0.0022	ND		0.005	ND		0.006
4,6-Dinitro-2-methylphenol	Total	µg/L	--	--	--	--	13	280	ND		8.42	ND		8.7
4-Bromophenyl phenyl ether	Total	µg/L	--	--	--	--	--	--	ND		3.68	ND		3.8
4-Chloro-3-methylphenol	Total	µg/L	--	--	--	--	--	--	ND		3.16	ND		3.26
4-Chloroaniline	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
4-Chlorophenyl phenyl ether	Total	µg/L	--	--	--	--	--	--	ND		3.68	ND		3.8
4-Methyl-2-pentanone (MIBK)	Total	µg/L	--	--	--	--	--	--	ND		1.5	ND		1.5
4-Methylphenol	Total	µg/L	--	--	--	--	--	--	ND		1.05	ND		1.09
4-Nitroaniline	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
4-Nitrophenol	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
Acenaphthene	Total	µg/L	670	--	--	--	670	990	ND		0.21	ND		0.22
Acenaphthylene	Total	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.22
Acetone	Total	µg/L	--	--	--	--	--	--	24.6		7	167		7
Acetophenone	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
Acrolein		µg/L	6.1	--	--	--	6.1	9.3	NA		NA	NA		NA
Acrylonitrile		µg/L	0.51	--	--	--	0.51	2.5	NA		NA	NA		NA
Aldrin	Total	µg/L	0.00049	0.003	1.3		0.00049	0.0005	ND		0.005	ND		0.006
alpha-BHC	Total	µg/L	0.026	--	--	--	0.026	0.049	ND		0.005	ND		0.006
Aluminum	Total	mg/L	--	--	--	--	--	--	1.18		0.095	6.85		0.095
Aluminum, Dissolved	Dissolved	mg/L	--	--	--	--	--	--	ND		0.019	ND		0.019
Anthracene	Total	µg/L	8300	--	--	--	8300	40000	ND		0.21	ND		0.22
Antimony	Total	µg/L	5.6	--	--	--	5.6	640	1.21		1	ND		1
Antimony, Dissolved	Dissolved	µg/L	5.6	--	--	--	5.6	640	1.86		1	ND		1
Arsenic	Total	µg/L	10	50	69	36	10	--	2.3		0.5	23		0.5
Arsenic, Dissolved	Dissolved	µg/L	10	50	69	36	10	--	1.09		0.5	0.726	J	0.5
Atrazine	Total	µg/L	--	--	--	--	--	--	ND		2.63	ND		2.72
Barium	Total	µg/L	1000	1000	--	--	2000	--	23.1		1	980		1
Barium, Dissolved	Dissolved	µg/L	2000	--	--	--	2000	--	13.9		1	526		10
Benzaldehyde	Total	µg/L	--	--	--	--	--	--	ND		2.63	ND		2.72
Benzene	Total	µg/L	22	--	--	--	22	510	ND		0.4	ND		0.4
Benzidine		µg/L	0.00086	--	--	--	0.00086	0.002	NA		NA	NA		NA
Benzo (a) anthracene	Total	µg/L	0.038	--	--	--	0.038	0.18	ND		0.21	ND		0.22
Benzo (a) pyrene	Total	µg/L	0.038	--	--	--	0.038	0.18	ND		0.21	ND		0.22
Benzo (b) fluoranthene	Total	µg/L	0.038	--	--	--	0.038	0.18	ND		0.21	ND		0.22
Benzo (g,h,i) perylene	Total	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.22
Benzo (k) fluoranthene	Total	µg/L	0.038	--	--	--	0.038	0.18	ND		0.21	ND		0.22
Beryllium	Total	mg/L	--	--	--	--	--	--	ND		0.01	ND		0.01
Beryllium, Dissolved	Dissolved	µg/L	--	--	--	--	--	--	ND		0.2	ND		0.2
beta-BHC	Total	µg/L	0.091	--	--	--	0.091	0.17	ND		0.005	ND		0.006
bis (2-Chloroethoxy) methane	Total	µg/L	--	--	--	--	--	--	ND		3.68	ND		3.8
bis (2-Chloroethyl) ether	Total	µg/L	0.3	--	--	--	0.3	5.3	ND		3.68	ND		3.8
bis (2-chloroisopropyl) ether	Total	µg/L	1400	--	--	--	1400	65000	ND		3.16	ND		3.26
bis (2-Ethylhexyl) phthalate	Total	µg/L	12	--	--	--	12	22	ND		6.32	ND		6.52
Bromochloromethane	Total	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5
Bromodichloromethane	Total	µg/L	5.5	--	--	--	5.5	170	7.72		0.4	1.44		0.4
Bromoform	Total	µg/L	43	--	--	--	43	1400	ND		0.4	ND		0.4
Bromomethane	Total	µg/L	47	--	--	--	47	1500	ND		0.8	ND		0.8
Butyl benzyl phthalate	Total	µg/L	1500	--	--	--	1500	1900	ND	C	7.37	ND	C	7.61
Cadmium	Total	µg/L	0.4	0.4	40	8.8	43	1400	ND		0.1	1.89		0.1
Cadmium, Dissolved	Dissolved	µg/L	8.8	--	40	8.8	43	1400	ND		0.1	ND		0.1
Calcium	Total	mg/L	--	--	--	--	--	--	23.2		0.2	712		2
Calcium, Dissolved	Dissolved	mg/L	--	--	--	--	--	--	20.1		0.4	273		4
Caprolactam	Total	µg/L	--	--	--	--	--	--	ND		2.63	ND		2.72
Carbaryl		µg/L	1.6	--	1.6		--	--	NA		NA	NA		NA
Carbazole	Total	µg/L	--	--	--	--	--	--	ND		2.63	ND		2.72
Carbon disulfide	Total	µg/L	--	--	--	--	--	--	ND		1	ND		1
Carbon tetrachloride	Total	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5
Chlordane	Total	µg/L	0.004	0.01	0.09	0.004	0.008	0.0081	ND		0.208	ND		0.222
Chlorine Produced Oxidant		µg/L	7.5	--	13	7.5	--	--	NA		NA	NA		NA
Chlorobenzene	Total	µg/L	130	--	--	--	130	1600	ND		0.4	ND		0.4
Chlorodibromomethane	Total	µg/L	4	--	--	--	4	130	1.24		0.35	ND		0.35
Chloroethane	Total	µg/L	--	--	--	--	--	--	ND		0.7	ND		0.7
Chloroform	Total	µg/L	340	--	--	--	340	11000	33.2		0.5	14		0.5
Chloromethane	Total	µg/L	--	--	--	--	--	--	ND		0.95	ND		0.95
Chlorpyrifos		µg/L	0.0056	--	0.011	0.0056	--	--	NA		NA	NA		NA
Chromium	Total	µg/L	--	--	--	--	--	--	6.72		0.4	83.6		0.4
Chromium III (Trivalent)		µg/L	100	--	--	--	100	--	NA		NA	NA		NA
Chromium, Dissolved	Dissolved	µg/L	50	50	--	--	--	--	ND		0.4	ND		0.4
Chromium, Hexavalent	Total	mg/L	50000	--	1100000	50000	--	--	ND		0.005	0.007		0.005
Chrysene	Total	µg/L	0.018	--	--	--	0.038	0.018	ND		0.21	ND		0.22
cis-1,2-Dichloroethylene	Total	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4
cis-1,3-Dichloropropene	Total	µg/L	--	--	--	--	--	--	ND		0.3	ND		0.3
Cobalt	Total	µg/L	--	--	--	--	--	--	2		0.2	14.2		0.2
Cobalt, Dissolved	Dissolved	µg/L	--	--	--	--	--	--	0.286	J	0.2	3.24	J	0.2
Copper	Total	µg/L	6	1000	9.3	6	1300	--	15.3		0.3	7.76		0.3
Copper, Dissolved	Dissolved	µg/L	6	1000	9.3	6	1300	--	ND		0.3	ND		0.3

Table 8
HRBT Expansion
Summary of Analytical Results
Groundwater - Standard Chemistry

Parameter	Type	Units	Most Stringent	Groundwater Standard	Saltwater Aquatic Life		Human Health		ENV-081-GW (30') 5/10/2019			ENV-081-GW (127') 5/10/2019		
					Acute	Chronic	Public Water Supply	All Other Surface Water	Result	Q	DL	Result	Q	DL
Cyanide	Total	µg/L	1000	5	1000	1000	140000	16000000	ND		0.01	ND		0.01
Cyclohexane	Total	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5
delta-BHC	Total	µg/L	--	--	--	--	--	--	ND		0.005	ND		0.006
Demeton		µg/L	0.1	--		0.1	--	--	NA		NA	NA		NA
Diazinon		µg/L	0.82	--	0.82	0.82	--	--	NA		NA	NA		NA
Dibenz (a,h) anthracene	Total	µg/L	0.038	--	--	--	0.038	0.18	ND		0.21	ND		0.22
Dibenzofuran	Total	µg/L	--	--	--	--	--	--	ND		2.11	ND		2.17
Dichlorodifluoromethane	Total	µg/L	--	--	--	--	--	--	ND		0.95	ND		0.95
Dieldrin	Total	µg/L	0.00052	--	0.71	0.0019	0.00052	0.00054	ND		0.005	ND		0.006
Diethyl phthalate	Total	µg/L	17000	--	--	--	17000	44000	ND		3.16	ND		3.26
Dimethyl phthalate	Total	µg/L	270000	--	--	--	270000	1100000	ND		3.68	ND		3.8
Di-n-butyl phthalate	Total	µg/L	2000	--	--	--	2000	4500	ND		4.21	ND		4.35
Di-n-octyl phthalate	Total	µg/L	--	--	--	--	--	--	ND		8.42	ND		8.7
Dioxin 2, 3, 7, 8- tetrachlorodibenzo-p-dioxin		µg/L	0.00000005	--	--	--	0.00000005	0.00000051	NA		NA	NA		NA
Endosulfan I	Total	µg/L	0.0087	--	0.034	0.0087	62	89	ND		0.005	0.156		0.006
Endosulfan II	Total	µg/L	0.0087	--	0.034	0.0087	62	89	ND		0.005	ND		0.006
Endosulfan sulfate	Total	µg/L	62	--	--	--	62	89	ND		0.005	ND		0.006
Endrin	Total	µg/L	0.0023	0.004	0.037	0.0023	0.059	0.06	ND		0.005	ND		0.006
Endrin aldehyde	Total	µg/L	0.29	--	--	--	0.29	0.3	ND		0.005	ND		0.006
Endrin ketone	Total	µg/L	--	--	--	--	--	--	ND		0.005	ND		0.006
Ethylbenzene	Total	µg/L	530	--	--	--	530	2100	ND		0.4	ND		0.4
Fluoranthene	Total	µg/L	130	--	--	--	130	140	ND		0.21	ND		0.22
Fluorene	Total	µg/L	1100	--	--	--	1100	5300	ND		0.21	ND		0.22
Foaming Agents		µg/L	500	--	--	--	500	--	NA		NA	NA		NA
gamma-BHC (Lindane)	Total	µg/L	0.01	0.01	0.16	--	0.98	1.8	ND		0.005	ND		0.006
Guthion		µg/L	0.1	--	--	0.01	--	--	NA		NA	NA		NA
Heptachlor	Total	µg/L	0.00079	0.001	0.053	0.0036	0.00079	0.00079	ND		0.005	ND		0.006
Heptachlor epoxide	Total	µg/L	0.00039	0.001	0.053	0.0036	0.00039	0.00039	ND		0.005	ND		0.006
Hexachlorobenzene	Total	µg/L	0.0028	--	--	--	0.0028	0.0029	ND		1.05	ND		1.09
Hexachlorobutadiene	Total	µg/L	4.4	--	--	--	4.4	180	ND		4.74	ND		4.89
Hexachlorocyclopentadiene	Total	µg/L	40	--	--	--	40	1100	ND		1.05	ND		1.09
Hexachloroethane	Total	µg/L	14	--	--	--	14	33	ND		3.68	ND		3.8
Hexanal	Total	µg/L	--	--	--	--	--	--	NA		NA	9.74		
Hydrogen sulfide		µg/L	2	--	--	2	--	--	NA		NA	NA		NA
Indeno (1,2,3-cd) pyrene	Total	µg/L	0.038	--	--	--	0.038	0.18	ND		0.21	ND		0.22
Iron	Total	mg/L	300000	--	--	--	300000	--	4.25		0.025	143		0.25
Iron, Dissolved	Dissolved	mg/L	300000	--	--	--	300000	--	ND		0.005	0.223		0.005
Isophorone	Total	µg/L	350	--	--	--	350	9600	ND		2.63	ND		2.72
Isopropylbenzene	Total	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5
Lead	Total	µg/L	8.8	50	20	8.8	15	--	8.3		1	12.4		1
Lead, Dissolved	Dissolved	µg/L	8.8	50	20	8.8	15	--	ND		1	ND		1
m+p-Xylenes	Total	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6
Magnesium	Total	mg/L	--	--	--	--	--	--	21.2		0.05	227		0.5
Magnesium, Dissolved	Dissolved	mg/L	--	--	--	--	--	--	17.1		0.1	117		0.1
Malathion		µg/L	0.1	--	--	--	0.1	--	NA		NA	NA		NA
Manganese	Total	µg/L	--	--	--	--	--	--	213		15	2810		150
Manganese, Dissolved	Dissolved	µg/L	--	--	--	--	--	--	91.4		1.5	845		15
Mercury	Total	µg/L	0.5	0.5	1800	9400	--	--	ND		0.2	0.25		0.2
Mercury, Dissolved	Dissolved	µg/L	0.5	0.5	1800	9400	--	--	ND		0.2	ND		0.2
Methoxychlor	Total	µg/L	0.03	0.03	--	0.3	100		ND		0.005	ND		0.006
Methyl acetate	Total	µg/L	--	--	--	--	--	--	ND		1	ND		1
Methyl cyclohexane	Total	µg/L	--	--	--	--	--	--	ND		0.5	ND		0.5
Methyl Mercury (fish tissue criterion)		µg/L	0.3	--	--	--	0.3	0.3	NA		NA	NA		NA
Methylene chloride	Total	µg/L	46	--	--	--	46	5900	ND		1	ND		1
Methyl-t-butyl ether (MTBE)	Total	µg/L	--	--	--	--	--	--	ND		0.6	ND		0.6
Naphthalene	Total	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.22
Nickel	Total	µg/L	8.2	--	74	8.2	610	4600	4.023		1	78.01		1
Nickel, Dissolved	Dissolved	µg/L	8.2	--	74	8.2	610	4600	1.164		0.3	17.47		0.3
Nitrate as N		µg/L	1000	5000	--	--	10000	--	NA		NA	NA		NA
Nitrobenzene	Total	µg/L	17	--	--	--	17	690	ND		3.16	ND		3.26
n-Nitrosodimethylamine	Total	µg/L	0.069	--	--	--	0.0069	30	ND		3.16	ND		3.26
n-Nitrosodi-n-propylamine	Total	µg/L	0.05	--	--	--	0.05	5.1	ND		3.68	ND		3.8
n-Nitrosodiphenylamine	Total	µg/L	33	--	--	--	33	60	ND		3.16	ND		3.26
Nonanal	Total	µg/L	--	--	--	--	--	--	NA		NA	8.69		
Nonylphenol		µg/L	7	--	7	1.7	--	--	NA		NA	NA		NA
Oxacyclotetradecan-2-one, 13-methyl-	Total	µg/L	--	--	--	--	--	--	6.23			NA		NA
o-Xylene	Total	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4
PCB as Aroclor 1016	Total	µg/L	--	--	--	--	--	--	ND		0.005	ND		0.006
PCB as Aroclor 1221	Total	µg/L	--	--	--	--	--	--	ND		0.04	ND		0.04
PCB as Aroclor 1232	Total	µg/L	--	--	--	--	--	--	ND		0.003	ND		0.003
PCB as Aroclor 1242	Total	µg/L	--	--	--	--	--	--	ND		0.009	ND		0.009
PCB as Aroclor 1248	Total	µg/L	--	--	--	--	--	--	ND		0.01	ND		0.01
PCB as Aroclor 1254	Total	µg/L	--	--	--	--	--	--	ND		0.007	ND		0.008
PCB as Aroclor 1260	Total	µg/L	--	--	--	--	--	--	ND		0.007	ND		0.008
PCB as Aroclor 1262	Total	µg/L	--	--	--	--	--	--	ND		0.006	ND		0.006
PCB as Aroclor 1268	Total	µg/L	--	--	--	--	--	--	ND		0.005	ND		0.006
PCB Total		µg/L	0.0064	--		0.03	0.00064	0.00064	NA		NA	NA		NA
Pentachlorophenol	Total	µg/L	2.7	--	13	7.9	2.7	30	ND		6.32	ND		6.52
Phenanthrene	Total	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.22
Phenol	Total	µg/L	1	1	--	--	10000	860000	ND		2.63	ND		2.72
Phosphorus Elemental		µg/L	0.1	--	--	0.1	--	--	NA		NA	NA		NA
Potassium	Total	mg/L	--	--	--	--	--	--	11		2.5	37.5		2.5
Potassium, Dissolved	Dissolved	mg/L	--	--	--	--	--	--	11.1		0.5	44.5		0.5
Pyrene	Total	µg/L	--	--	--	--	--	--	ND		0.21	ND		0.22
Selenium	Total	µg/L	10	10	290	71	170	4200	ND		0.85	17.2		0.85
Selenium, Dissolved	Dissolved	µg/L	10	10	290	71	170	4200	ND		0.85	ND		0.85
Silver	Total	µg/L	1.9	--	1.9	--	--	--	ND		0.06	ND		0.06
Silver, Dissolved	Dissolved	µg/L	1.9	--	1.9	--	--	--	ND		0.06	ND		0.06
Sodium	Total	mg/L	--	--	--	--	--	--	173		2.5	991		25
Sodium, Dissolved	Dissolved	mg/L	--	--	--	--	--	--	172		0.5	1060		5
Styrene	Total	µg/L	--	--	--	--	--	--	ND		0.4	ND		0.4
Sulfate		µg/L	250000	--	--	--	250000	--	NA		NA	NA		NA
Tentatively Identified Compounds	Total	µg/L	--	--	--	--	--	--	10.9		0	16.5		0
Tertiary Butyl Alcohol	Total	µg/L	--	--	--	--	--	--	ND		50	ND		50
Tetrachloroethylene (PCE)	Total	µg/L	6.9	--	--	--	6.9	33	ND		0.4	ND		0.4
Thallium	Total	µg/L	0.24	--	--	--	0.24	0.47	ND		1	ND		1
Thallium, Dissolved	Dissolved	µg/L	0.24	--	--	--	0.24	0.47	ND		1	ND		1
Toluene	Total	µg/L	510	--	--	--	510	6000	ND		0.5	ND		0.5
Total Dissolved Solids		µg/L	500000	--	--	--	--	500000	NA		NA	NA		NA
Toxaphene	Total	µg/L	0.0002	--	0.21	0.0002	0.0028	0.0028	ND		0.208	ND		0.222
trans-1,2-Dichloroethylene	Total	µg/L	140	--	--	--	140	10000	ND		0.6	ND		0.6
trans-1,3-Dichloropropene	Total	µg/L	--	--	--	--	--	--	ND		0.3	ND		0.3
Tributyltin		µg/L	0.0074	--	0.42	0.0074	--	--	NA		NA	NA		NA
Trichloroethylene	Total	µg/L	25	--	--	--	25	300	ND		0.4	ND		0.4
Trichlorofluoromethane	Total	µg/L	--	--	--	--	--	--	ND		0.8	ND		0.8
Vanadium	Total	µg/L	--	--	--	--	--	--	10.3		2.5	74.8		2.5
Vanadium, Dissolved	Dissolved	µg/L	--	--	--	--	--	--	ND		2.5	ND		2.5
Vinyl chloride	Total	µg/L	0.25	--	--	--	0.25	24	ND		0.5	ND		0.5
Xylenes, Total	Total	µg/L	--	--	--	--	--	--	ND		1	ND		1
Zinc	Total	µg/L	50	50	90	81	7400	26000	334		25	15100		250
Zinc, Dissolved	Dissolved	µg/L	50	50	90	81	7400	26000	19.7		2.5	4760		250

ND: Not detected at Method Detection Limit
DL: Lower Detection Limit
NA: Not Analyzed

ATTACHMENT L-8: SAMPLING AND ANALYSIS PLAN

Project	I-64 Hampton Roads Bridge-Tunnel
To	Hampton Roads Connector Partners (HRCP)
From	Mott MacDonald
Subject	Baseline Characterization Environmental Sampling and Analysis Plan- Phase I - On Island Source Materials for On-site Reuse and/or Off-site Disposal and Phase II – Marine Source Materials for Beneficial Reuse and/or Offsite Disposal
Date	August 15, 2019 (revised)
Attachments	Table 1 – Analytical Parameters Figure 1 – Sample Location Plan- North Island Figure 2 – Sample Location Plan- South Island Figure 3 – Bored Tunnel South Island Plan and Profile Figure 4 – Marine Environmental Boring Locations – Overview Index Map Figure 5 – Marine Environmental Boring Locations – North Trestle Area Figure 6 – Marine Environmental Boring Locations – North Island Area Figure 7 – Marine Environmental Boring Locations – Channel Area Figure 8 – Marine Environmental Boring Locations – South Island Area Figure 9 – Marine Environmental Boring Locations – South Trestle Area Attachment 1 – Proposed Environmental Boreholes Cross Section – Phase I Attachment 2 – Addendum to the Baseline Characterization Environmental Sampling and Analysis Plan – Phase I On Island Source Materials for On-Site Reuse and/or Off-site Disposal – Upland Characterization

1. PROJECT SCOPE OF WORK – BASELINE CHARACTERIZATION

The scope of work addressed in this Baseline Characterization Environmental Sampling and Analysis Plan (Phase I and Phase II sampling plan) consists of the sampling and analysis of materials expected to be encountered during the I-64 Hampton Roads Bridge Tunnel Project (HRBT). On-island construction activities will generate materials (approximately 860,000 cubic yards) which will require management through disposal or reuse. On-site beneficial reuse is being considered for 206,000 cubic yards of clean sand excavated from the South Island Entrance portal. On-island activities include the excavation of the entry portal and tunnel and portal approach on the South Island and the jet grouting of material to stabilize said entry portal. Dredging activities will generate additional materials (between approximately 480,000 to 648,000 cubic yards, and up to 718,000 cubic yards with the addition of armor stone) which will also require management through disposal or reuse. This sampling plan has been generated and updated to outline the sampling strategy and analytical parameters proposed for a baseline characterization and evaluation of the following:

- On-island source materials for re-use for the North Island Expansion or for disposal at an off-site upland location(s).
- Dredge materials for reuse as beach nourishment, and/or disposal at an off-site upland source or recycling facility;
- Tunnel boring machine (TBM) additive testing to determine appropriate means of disposal (off-site upland disposal or recycling).
- Jet grout residuals (not in this document).
- Upland soil characterization related to road construction (appended to this document).

It should be noted that this Phase I sampling plan is being generated to provide a baseline characterization of the materials and based on the results of this effort, recommendations for the end use of the materials will be developed. A Material Management Plan (MMP) will be generated which will outline additional sampling requirements required prior to movement of materials. This materials management plan will be implemented at the initiation of physical excavation activities, prior to management and placement of the material and will be developed and updated (as necessary) with the input and guidance of all relevant regulatory agencies to ensure that an appropriate sampling frequency is implemented.

Please note: This sampling plan addresses the on-island, dredging, upland soil characterization related to road construction activities (appended) and TBM characterization of the I-64 Hampton Roads Bridge Tunnel Project related to identifying the potential options for re-use or disposal. Additional components of the sampling plan will be generated at a later date to address jet grout residuals. Additional sampling of this material will be included in the materials management plan.

Preliminary characterization of upland soils, expected to be excavated during roadway expansion, will be performed in conjunction with geotechnical borings. Samples will be collected from geotechnical borings where areas of proposed excavation are located in or adjacent to areas of Potential Environmental Concern (PEC) as identified in the Hazardous Materials Technical Memorandum (July, 2016), Updated Hazardous Materials Technical Memorandum (June, 2018), and Phase II Environmental Site Assessment (ESA) for the Willoughby Spit Property - Norfolk, Virginia (July, 2018). The preliminary characterization of upland soils was addressed in a separate submission, which has been appended to this SAP.

Geotechnical investigation activities are not included in this Environmental Sampling and Analysis Plan, however, this report is to augment the March 2019 HRBT Geotechnical Exploration Plan.

Beneficial Reuse Baseline Characterization Sampling

Soil and sediment baseline characterization sampling will be conducted in order to identify if select soils and sediment have the potential to be utilized for tunnel construction (as ballast) and/or island expansion, inclusive of in-water placement of said materials.

Material Disposal Sampling

Soil, sediment and water sampling will be conducted in order to identify the appropriate end use method(s) of disposal that could be implemented for excess material generated during construction activities (inclusive of dredging and jet grout residuals), and for water generated from dewatering activities.

Tunnel Boring Machine Additive Sampling

Soil and sediment sampling will be conducted to determine the appropriate course of action (disposal or reuse) of the Tunnel Boring Machine (TBM) materials generated during construction activities.

Beach Nourishment Sampling

The Commonwealth of Virginia requires that beach nourishment be given priority consideration for the disposal of dredged material determined to be suitable as beach fill material. If interest in utilizing dredged material for beach nourishment is expressed by a local municipality, Hampton Roads Connector Partners will coordinate with the Virginia Marine Resources Commission to determine the appropriate sampling procedures for the dredged material. The City of Virginia Beach has declined interest in accepting dredged material from the project as beach nourishment material. HRCP will inquire with the Cities of Hampton and Norfolk regarding the utilization the dredged material for beach nourishment.

2. PROJECT QUALITY OBJECTIVES – SCREENING CRITERIA

Data Quality Objectives

Data Quality Objectives (DQOs) are part of a systematic process that establishes the quantity and quality of the data needed to define the nature and extent of environmental problems. DQOs confirm the collection of the appropriate quantity of samples and the need to develop a reasonable baseline conceptual model. DQOs were developed utilizing the seven-step process outlined in the United States Environmental Protection Agency's (USEPA) *Guidance on Systematic Planning Using the Data Quality Objective Process* Document, dated February 2006. The seven step DQO process is as follows:

Step 1- State the Problem

Materials generated during construction activities for the HRBT project need to be characterized in order to generate recommendations for the end use of the materials.

Step 2- Goal of the Study

The goal of the study is to characterize materials expected to be generated during construction activities in order to determine reuse and disposal options for material, and to gather information to develop a material management plan.

Step 3- Information Inputs

Soil/sediment samples will be collected from soil borings and analysed for disposal and reuse parameters identified by USEPA, VA DEQ, and potential disposal facilities. Soil/sediment sample locations and depths will be selected to be representative of the materials expected to be generated during construction. The sample collection plan is discussed in **Section 3**.

Step 4- Define Boundaries of Study

Sampling is being conducted for baseline materials characterization purposes only. The data generated will be utilized to identify potential end uses for the material. Additional sampling may be required to fulfil regulatory and facility requirements for materials at the time of reuse and/or disposal.

Step 5- Develop Analytic Approach

Soil/sediment, elutriate, and water samples will be collected from soil borings in order to characterize the material expected to be generated during construction activities. Samples will be analysed for the parameters identified on **Table 1**, based on potential end use.

Additional Tunnel boring material (TBM) additive testing will be performed in order to simulate the anticipated material generation streams from the tunnel boring procedure. Analytical results from the TBM additive testing will be compared to parameters identified on **Table 1**, based on potential end use.

The analytical approach is discussed in detail in **Section 3**.

Step 6- Specify Performance Criteria

All samples will be analysed by a VDEQ certified laboratory. All analytical reporting limits from the material characterization analytical reports will be at or below the applicable screening criteria, as feasible. The raw QA/QC data, case narratives, and non-conformance summaries for the analytical data will be reviewed to ensure all analytical data generated is valid and does not need to be qualified. A third-party data validation will be performed in accordance with contract documents. The applicable screening criteria is as follows:

On-Site Reuse

Soil and sediment analytical data collected to determine if the materials are suitable for reuse as part of the North Island Expansion will be compared to the marine sediment quality guidelines (specifically Threshold Effect Levels (TELs) and Probable Effect Levels (PELs) (MacDonald et al. 1996), and the Estuarine NOAA-based Effects Range-Median (ER-M) Sediment Screening Values (Buchanan, M.F. 1999)). Elutriate analytical data will be compared to USEPA and Commonwealth of Virginia saltwater acute water quality criteria (WQC).

Off-site Upland Disposal

Materials that will be evaluated to determine the potential suitability for placement or disposal at offsite upland locations will be compared to the following criteria:

- The Virginia Department of Environmental Quality (VDEQ) state-wide variance criteria (VDEQ 2012);
- U.S. Environmental Protection Agency (USEPA) residential and industrial soil Regional Screening Levels (RSL) (USEPA 2016);
- The Exclusion Criteria for placement at Weanack (VDEQ 2014), the Toxicity Characteristic Leaching Procedure (TCLP) regulatory criteria (40 Code of Federal Regulations [CFR] 261.24); and
- The Commonwealth of Virginia disposal criteria for soil contaminated with petroleum products (9 Virginia Administrative Code [VAC] 20-81-660).

Beach Nourishment

The Commonwealth of Virginia "Criteria for the Placement of Sandy Dredged Material along Beaches in the Commonwealth" (4 VAC 20-400-10) requires that grain size analysis be conducted to determine if dredged material is suitable for beach nourishment.

If interest in utilizing the dredged material for beach nourishment is expressed by a local municipality, Hampton Roads Connector Partners will coordinate with the Virginia Marine Resources Commission to determine the specific additional sampling requirements for the dredged material.

Step 7- Develop a Plan for Obtaining Data

The plan for obtaining data is outlined in Section 3.

Data Management

Analytical data will be compiled and maintained by Mott MacDonald.

3. SAMPLE COLLECTION PLAN

Sonic drilling (vibracoring) will be utilized to install a total of 65 borings from on-island and marine locations to collect samples for environmental testing. Approximately 15 borings (eight of which will be installed within the entry portal/excavation area on the North Island) will be installed on the North and South Islands to depths ranging from 45 feet below surface grade to 185 feet below surface grade. These depths correspond to the maximum depth of excavation within the entry portal area and/or to the deepest depth of the proposed tunnel invert. The maximum boring depths are included below:

Location	Boring ID	Maximum Depth (Feet)	Lexan Liner Interval (depth bgs)	Purpose
South Island	HRCP-L-ENV-023	100	Bagged	Reuse & Disposal Testing
South Island	HRCP-L-ENV-024	90	Bagged	Reuse & Disposal Testing
South Island	HRCP-L-ENV-025	90	Bagged	Reuse & Disposal Testing
South Island	HRCP-L-ENV-026	70	Bagged	Reuse & Disposal Testing
South Island	HRCP-L-ENV-027	55	Bagged	Reuse & Disposal Testing
South Island	HRCP-L-ENV-078	200	25-200	TBM Additive Testing
South Island	HRCP-L-ENV-079	200	25-200	TBM Additive Testing
South Island	HRCP-L-ENV-081	200	25-200	TBM Additive Testing
South Island	HRCP-L-ENV-082	200	25-200	TBM Additive Testing
South Island	HRCP-L-ENV-083	60	Bagged	Reuse & Disposal Testing
South Island	HRCP-L-ENV-084	45	Bagged	Reuse & Disposal Testing
South Island	HRCP-L–ENV-085	45	Bagged	Reuse & Disposal Testing
North Island	HRCP-M-ENV-013	100	25-100	TBM Additive Testing
North Island	HRCP-M-ENV-072	75	0-75	TBM Additive Testing
North Island	HRCP-M-ENV-077	200	25-200	TBM Additive Testing

Bgs = below grade surface

Please Note: Boring locations and designations are also subject to change based on site/field conditions.

Approximately 45 marine borings will be installed along the project route. Marine borings will be installed to depths ranging from 20 feet to 110 feet below the river bottom. The boring depths are included below:

Location	Boring ID	Depth	Lexan Liner Interval	Purpose
Marine	HRCP-M-ENV-008	50		Shallow (N. Trestle)
Marine	HRCP-M-ENV-011	45		Shallow (N. Trestle)
Marine	HRCP-M-ENV-012	45		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-014	20		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-015	110		Bench Scale Testing
Marine	HRCP-M-ENV-016	115		Bench Scale Testing
Marine	HRCP-M-ENV-017	125		Bench Scale Testing
Marine	HRCP-M-ENV-018	130		Bench Scale Testing
Marine	HRCP-M-ENV-019	125		Bench Scale Testing
Marine	HRCP-M-ENV-020	120		Bench Scale Testing
Marine	HRCP-M-ENV-022	115		Bench Scale Testing
Marine	HRCP-M-ENV-038	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-039	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-040	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-041	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-042	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-043	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-044	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-045	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-046	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-047	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-048	20		Testing (S. Trestle)
Marine	HRCP-M-ENV-058	45		Shallow (N. Trestle)
Marine	HRCP-M-ENV-059	45		Shallow (N. Trestle)
Marine	HRCP-M-ENV-060	45		Shallow (N. Trestle)
Marine	HRCP-M-ENV-063	20		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-064	25		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-065	20		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-066	20		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-067	20		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-068	45		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-070	110		Bench Scale Testing
Marine	HRCP-M-ENV-071	45		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-073	40		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-074	35		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-075	20		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-076	35		Spoils Disposal/Reuse
Marine	HRCP-M-ENV-131	20		Dredging
Marine	HRCP-M-ENV-132	20		Dredging
Marine	HRCP-M-ENV-133	20		Dredging
Marine	HRCP-M-ENV-134	20		Dredging
Marine	HRCP-M-ENV-135	20		Dredging
Marine	HRCP-M-ENV-136	20		Dredging
Marine	HRCP-M-ENV-137	20		Dredging
Marine	HRCP-M-ENV-138	20		Dredging

All borings will be advanced in 5-foot intervals. Soil/sediment cores will be field screened with a photoionization detector (PID) and logged by I-64 Design Joint Venture personnel (as appropriate, based on coring procedure). The boring locations are depicted on **Figures 1 through 9.**

On-site Beneficial Reuse and Off-site Upland Disposal Sampling

Soil and sediment samples from borings HRCP-L-ENV-023 through HRCP-L-ENV-027, and borings HRCP-L-ENV-083 through HRCP-L-ENV-085, located on the South Island, will be collected and analysed in order to assess if those materials have the potential to be utilized for tunnel construction and/or island expansion. Based on proposed construction, materials encountered from depths of surface grade to -125 bgs (or approximately 110 feet below grade) will be characterized and evaluated to determine potential end-uses including onsite reuse, off-site upland placement or disposal. No materials from the North Island or from beneath the river are proposed to be utilized for onsite reuse/in-water placement.

Recent discussions with the regulatory agencies have noted that although there are specific sampling frequencies for the management of soil and hazardous waste for upland areas, there is no set frequency for materials proposed for beneficial reuse for in-water placement. As the sampling proposed herein is to generate baseline characterization data to evaluate proposed end use options, a custom sampling regime has been developed. Based on the selection of an end use, a pre-construction sampling plan will be developed to meet regulatory requirements which will be implemented during excavation or tunnel boring activities and prior to exporting materials for placement/disposal. The following sampling frequencies and associated end use analysis are proposed:

- Fill Material – Fill material is defined as the top 25 feet of soils at the South Island location, which were imported as part of island development, and would also be most susceptible to contamination due to being located at or near the surface. It is proposed to collect a total 8 composite samples, one from each applicable boring (specifically soil borings HRCP-L-ENV-023 through HRCP-L-ENV-027, and HRCP-L-ENV-083 through HRCP-L-ENV-085). Composites will consist of soils from surface grade to 25 feet bgs. Fill material samples will be analysed for the parameters listed in **Table 1** for on or off-site reuse in addition to disposal characterization.
- Soils/sediment located at depths from 25 feet bgs to 115 feet bgs at the South Island location that are not anticipated to be impacted (considered “native” to the area). - It is proposed to collect one composite sample from each of the eight borings located within the area of proposed excavation (specifically soil borings HRCP-L-ENV-023 through HRCP-L-ENV-027, and HRCP-L-ENV-083 through HRCP-L-ENV-085) for this baseline characterization, which will assist in identifying potential end uses of the excavated material. (reuse, offsite upland placement or disposal). Currently, it is estimated that 206,000 CY of material will be needed for fill at the North Island expansion. Composite samples will consist of a whole core composite of the entire boring, which will be representative of the materials encountered during excavation activities. Samples will be analysed for the parameters in **Table 1** for on or off-site reuse.
- Sediment located at depths up to 20 feet below the river bottom will be collected from proposed dredging areas. - It is proposed to collect one composite sample from depths corresponding with proposed dredging or temporary works activities from designated marine borings for the baseline characterization of sediment, which will assist in identifying potential end uses of the material (reuse, offsite upland placement or disposal). Samples will be analysed for the parameters in **Table 1** for disposal characterization. If interest in

utilizing the dredged material for beach nourishment is expressed by a local municipality, HRCP will coordinate with the Virginia Marine Resources Commission to determine the specific additional sampling requirements for the dredged material.

- Elutriate preparation water will be collected from one location within the James River at the North Island; sampling of the elutriate preparation water and standard elutriates will also be performed.

- TBM additive testing (bench scale testing) will be performed in order to simulate the anticipated material generation streams from the tunnel boring procedure. A total of 15 borings, collected from the land and marine boring installations, will be utilized to produce samples for the TBM bench scale testing program. Of those 15 borings, 8 will be installed during the upcoming marine boring mobilization within the tunnel alignment from which soils will be utilized to prepare samples for the TBM bench scale testing program. The total number of samples that will be analyzed will be dependent on the number of selected additives. Please note, the TBM additives have not been selected at this time. At a minimum, one sample per additive will be collected and submitted for analysis (resulting in the testing of four waste streams per additive). Samples will be composited from materials at elevations corresponding to the anticipated elevation of the tunnel boring activities. The composites will be representative of the various strata encountered during tunnel boring activities.

Samples will be analysed for the parameters on **Table 1** for placement at Port Tobacco at Weanack, Dominion Recycling, or at other upland placement/regional landfill sites. Elutriate analysis will also be performed on the soil/sediment samples. TBM additive water samples will be analysed for the reuse parameters on **Table 1**, in order to characterize decant water created by the tunnel boring process. Toxicity testing will also be performed on the soil/sediment and water samples. An additional sample may be collected from each soil/sediment strata to be utilized as a control (non-TBM additive) sample.

Samples will be transported to a VDEQ certified laboratory for analysis. Samples will be analysed for the parameters in **Table 1**.

Soil/Sediment Sample Collection – On-site Reuse, Off-site Upland Placement or Disposal

Soil/sediment will be retrieved from the ground through the use of vibracoring. Samples will be collected with pre-dedicated stainless-steel trowels and transferred to clean, decontaminated containers/drums for mixing of the composite samples.

Samples will be cut open and field screened for lithology, and evidence of contamination. Multi-point composite samples will be collected from each soil/sediment strata encountered to generate a representative sample. All samples will be collected in accordance with the applicable VDEQ and USEPA regulations. Elutriate samples will be prepared by a VDEQ certified laboratory under the direction of the I-64 Design Joint Venture.

Elutriate Preparation Water Sample Collection

A surface water sample will be collected from the James River utilizing a Teflon bailer, in compliance with the VDEQ's June 2017 Standard Operating Procedure Manual for the Department of Environmental Quality Water Quality Monitoring document. The following water quality measurements will be obtained for the in-situ elutriate preparation water:

- Elutriate water collection depth (in feet);
- pH;
- Dissolved oxygen (mg/L);
- Water temperature (°C);
- Salinity (ppt); and
- Turbidity (NTU).

Tunnel Boring Machine (TBM) Additive Testing

Soil/sediment borings will be obtained from the North and South Islands and the marine boring program at the depth of the tunnel horizon for TBM additive testing. Soil/sediment cores will be collected from the borings utilizing Lexan liners. The Lexan liners will then be capped, labelled, and transported to refrigerated storage for subsequent TBM additive testing. A total of 15 soil/sediment borings will be utilized for the preparation of TBM additive samples.

The Lexan liners will be opened and screened for lithology. The encountered lithology will be documented. Soil/sediment samples will then be collected from each strata of soil/sediment expected to be encountered during tunnel construction activities. It is anticipated that one composite sample will be generated for each TBM additive selected and based on the maximum amounts of additives required to effectively operate the TBM through the various strata encountered within the tunnel horizon; resulting in the highest potential for contaminant loading. The composite sample will yield a total of four waste stream samples to be analysed. An additional sample may be collected from each soil/sediment strata to be utilized as a control (non-TBM additive) sample. Please note, an explanation of the strata abbreviations is included in the geotechnical report.

A slurry consisting of water, bentonite, and the TBM additive will be generated to simulate the slurry utilized by the TBM. The slurry will then be added to each soil/sediment sample at a volumetric ratio of X gallons of slurry per Y gallons of soil/sediment, as recommended by the manufacturer of each additive. The slurry/sample mixture will then be agitated until the mixture forms a homogeneous puree. The mixture will then be screened on site or transported to a VDEQ certified laboratory for further processing and analysis under the direction of the I-64 Design Joint Venture.

Bench-Scale Testing

The mixture will be processed in a manner that replicates the TBM sequence at bench scale.

1. The mixture will be screened through a 6 millimeter screen in order to separate coarse sand, pebbles, and shell fragments, as this represents a separate material generation stream from the TMB. The separated coarse sand, pebbles, and shell fragments will be assessed for

placement at Port Tobacco at Weanack or at other upland placement/regional landfill sites. Toxicity testing will also be conducted on these samples.

2. The mixture will then be centrifuged (or screened) in order to separate fine sands and fine silts greater than 70-80 micrometers, as this represents a separate material generation stream from the TMB. The separated fine sands and fine silts will be analysed for placement at Port Tobacco at Weanack or at other upland placement/regional landfill sites. Elutriate analysis and toxicity testing will also be conducted on these samples.
3. The TBM slurry and the remaining soil/sediment will then be run through a filter press to remove water from the soil/sediment. The water will be analysed in order to characterize decant water created by the tunnel boring process. Decant water from the tunnel boring process will be treated on-site prior to discharge. The simulated decant water from the TBM additive testing will inform the design of the on-Site treatment system and associated VPDES permitting. Whole effluent toxicity testing will also be conducted on the decant (simulated effluent) water.
4. The remaining soil/sediment (filter cake) will then be analysed for placement at Port Tobacco at Weanack, Dominion Recycling or at other upland placement/regional landfill sites. Elutriate analysis and toxicity testing will also be conducted on these samples.

The sample collection plan is summarized in the following table.

Test Material		Source	Disposal/reuse	Analysis Preparation	Analysis
Dredged Material		Top 5-20 feet	Disposal		Standard Chemistry
Jet Grout Material	High pH Water	Not in this plan	Water Treatment/VPDES	N/A	Not included in this plan
	Solids	Not in this plan	Disposal	N/A	Not included in this plan
TBM Material	Screened	Coarse Sand >6mm	Disposal/reuse	Bench Scale Test	Standard Chemistry, + Toxicity
	Hydrocyclone (fines)	>70 µm	Disposal		Standard Chemistry, Toxicity, + Elutriate
	Filter cake	<70 µm	Disposal		Standard Chemistry, Toxicity, + Elutriate
	Filtrate (water)		Water Treatment/VPDES		Standard chemistry
Excavated Sand					Standard chemistry

		Portal Entry/Approach Excavation	Disposal/Reuse/ North Island Expansion		Elutriate TCLP
Excavated Fill/Soil		Roadway/Utility Excavation	Disposal/Upland Reuse		Standard chemistry

Analytical Parameters

Table 1 identifies the required sampling parameters for each end use (onsite reuse, placement at Port Tobacco at Weanack, Dominion Recycling or at other upland placement/regional landfill sites). Soil/sediment and water samples will be analysed for the parameters outlined in **Table 1**. Toxicity testing of the simulated effluent (decant) water from the TBM bench-scale test will be conducted in accordance with the USEPA EPA-821-R-02-012 method for acute whole effluent toxicity. Toxicity testing of the simulated sediment waste streams from the TBM bench-scale test will be conducted in accordance with an USEPA approved bulk sediment toxicity testing method. Toxicity testing of the simulated effluent (decant) water will provide a basis of design for the water treatment system. Toxicity testing of the simulated sediment waste streams will inform the management and disposal of the sediment waste streams. Toxicity testing will also provide information for emergency response and clean-up activities in the event of an inadvertent discharge. If additional compounds not listed in the SAP are identified during the toxicity testing, or any other phase of sampling, the additional compounds will be identified and analyzed for.

Quality Control Samples and Blanks

Quality control samples will be collected and analysed as presented in the following table.

QC Sample	**Frequency**
Method Blanks (Field/Trip)	1 per every 20 samples analysed
Laboratory Control Sample (LCS)	1 per every 20 samples analysed
Surrogates	Spiked into all field and QC samples (organic analyses)
Sample Duplicates	1 per every 20 samples analysed (inorganic analyses)
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	1 per every 20 samples analysed

Field and trip blanks must travel with sample containers and arrive on site within one day of their preparation in the laboratory.

Laboratory control samples is a fortified method blank consisting of reagent water or solid fortified with the analyses of interest for single-analyte methods and selected analytes for multi-analyte methods according to the appropriate analytical method. LCS will be prepared and analysed with each analytical batch, with analyte recoveries utilized to monitor the analytical accuracy and precision of the instrument.

Collection of duplicate samples provides for the evaluation of the laboratory's and sampler's performance by comparing the analytical results of two samples from the same location. The

sample name must not indicate which sample has been duplicated. Duplicate requirements may be waived or expanded depending on the particular regulatory program.

A matrix spike/matrix spike duplicate is an aliquot of a field sample that is fortified with the analyte(s) of interest and analysed to monitor matrix effects associated with a particular sample. Samples to be spiked will be determined in advance to allow for collection and submittal of additional volume samples.

3.2. Sampling Equipment Decontamination

Sample collection and compositing equipment must be decontaminated if it will be reused to maintain the integrity of the sample and avoid cross-contamination between samples. In the majority of the instances, stainless-steel trowels and mixing bowls will be dedicated per sample. Larger mixing devices will be decontaminated as follows:

- Rinse with deionized (DI) water
- Rinse with 10 percent nitric acid (HNO_3)
- Rinse with distilled or DI water
- Rinse with methanol followed by hexane
- Rinse with DI water
- Air dry (area away from decontamination area)

All sample collection devices/storage containers will be laboratory cleaned, packaged, and dedicated for exclusive use at one sampling location for that day.

Decontamination will occur between marine borings on the vessels and will consist of a steam cleaning procedure. Materials not sampled will be returned to the bore-hole or disposed of as investigation derived waste.

3.3. Documentation

Field notebooks will be bound with numbered pages. Any pertinent information regarding the site and the sampling procedures will be documented. Entries made in these notebooks must note the date and time. Information recorded in these notebooks will include:

- Name of the individual making the entry;
- Date and time of arrival and departure at the site;
- Location of the samples taken;
- The method of collection;
- Numbers of samples taken;
- Date and time of collection;
- Sample identification number(s);
- Any field instrument calibration performed and/or instrument readings; and,
- Weather conditions on the day of sampling and any field observations.

For soil sampling, the following additional information will be entered into the field book:

- Boring ID number;

- Soil Recovery;
- Photo-ionization detector (PID) readings for volatile organic compounds; and,
- Description of lithology.

Photo documentation will be made of all core bags/liners with description, time and date photo was taken, specific location, and direction (as applicable. All photo information will be recorded in the field notebook.

3.4. Field Instrumentation

Field instrumentation will be operated in accordance with Mott MacDonald's January 2013 field sampling Standard Operating Procedures. Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications. The calibration and internal standards shall meet all criteria specified in the referenced instrumentation specifications.

Calibration of field instruments and equipment will be performed as specified by the manufacturer or more frequently as conditions dictate. The minimum calibration of field instrumentation is once at the beginning of each day, as necessary.

Records of calibration, repair or replacement will be filed and maintained by the designated field personnel. Calibration procedures, calibration check procedures, proper usage, data recording, preventative maintenance are provided in the specified manufacturer's operation manual.

Instrument	Activity	Frequency	Accuracy	Corrective Action
RAE Systems MiniRAE 3000 Photo Ionization Detector (PID)	Calibration on-site	Beginning and end of day, and as needed.	±3%	Re-calibrate using manufacturer's instructions and recheck with isobutylene gas; replace if faulty

Instrument	Activity	Frequency	Accuracy	Corrective Action
Horiba U-52 Water Quality Meter or Yellow-Springs Instrument Water Quality Probe	Auto-calibrate on-site with manufacturer specific calibration solutions	Beginning and end of each day, and as needed.	•pH: ±0.1 pH •water temperature •dissolved oxygen: ±0.2 mg/L •salinity •Turbidity: ±5%	Re-calibrate using manufacturer's instructions; replace if faulty

Field sampling data will be evaluated by the Field Team Leader and or the Project Manager Coordinator, based on their judgment for the determination and verification of the representativeness of sample, maintenance and cleanliness of the sampling equipment and adherence to the approved collection procedure.

3.5. Sample Quality Assurance

The purpose of sample quality assurance is to verify and document quality aspects for the sampling process where the identity of the sample and its handling from collection to delivery at the laboratory meets specific sample collecting process criteria. Upon arrival at the laboratory under chain of custody, the laboratory's internal quality assurance procedures are then implemented. All materials such as field and laboratory notebooks and logbooks, field and laboratory data records, correspondence, reports, chain of custody records and instrument printouts will be clearly labelled and filed in accordance with Mott MacDonald's standard operating procedures.

Sample Identification

Each sample will be identified using a sample label marked on the container in permanent marker containing the following information:

- Project name and number;
- Sample number;
- Sample depth;
- Analysis;
- Preservative;
- Date;
- Time; and,
- Sampler's name / initials.

Prior to going into the field, this sample identification procedure will be further refined (if needed), so that a sample is accurately and easily identified.

The sample label contains the authoritative information for the sample. Inconsistencies with other documents will be settled in favor of the vial or container label unless otherwise corrected in writing by the person who collected the samples.

Sample Handling

Sample containers or capped Lexan liners will be placed in a secured refrigerated truck (cooled to 4°C) immediately following collection and labelling. Samples will then be transferred to a refrigerated storage until processing for the bench scale testing samples occurs. Samples, upon shipment to the laboratory, will be packed to prevent containers and liners from breaking. Blanks and their associated samples may be held on-site for no longer than two calendar days and must arrive back in the laboratory within on day of shipment from the field unless the specific analytical holding times are less. This constitutes a 4-day maximum handling time.

Chain-of-Custody

The objective of the chain-of-custody procedure is to document the history of each sample and its handling. Custody records trace a sample from its collection through all transfers of custody until it is transferred to the laboratory. Samples are considered to be in custody if they are within sight of the individual responsible for their security or locked in a secure location. Each person who takes possession of the samples is responsible for sample integrity and safekeeping.

Chain-of-custody procedures are provided below:

- The chain-of-custody form is completed at the time of sample collection. The sample identification number, sampling location, depth, date, time and analysis requested are recorded on the form;
- The sampling team will check the sample numbers on the individual jars against the chain of custody form; and,
- Field samplers are responsible for the care and custody of the samples collected until the samples are transferred to another party.

Samples are packaged for shipment and delivered to the VADEQ-certified laboratory within two days of sampling. A copy of the chain-of-custody form is retained by the sampling team for the project file and the original is sent with the samples. Internal laboratory records then document the custody of the sample through its final deposition.

Sample Storage

Standard procedures are employed both in the field and in the laboratory to maintain the integrity of the sample custody. Such procedures include the tagging of all sample containers, the use of custody seals where applicable, the use of chain of custody forms and standard schedule, and control and security procedures within the laboratory.

4. LABORATORY OPERATIONS AND DATA DELIVERABLES

Soil/sediment, standard elutriate and elutriate preparation water samples will be analysed by a VDEQ certified laboratory (Air, Water & Soil Laboratories and Central Soil and Water Lab, Virginia Tech). The VDEQ certified laboratory that will perform the toxicity testing has not been identified at this time.

The laboratory will report all non-conformance results and the reason for the non-conformance so that a determination may be made as to the reliability of the data. Mott MacDonald will confirm that deliverables from the laboratory will be sufficient for data validation at another date, if needed. The data packages will be reviewed for completeness.

Validation may be performed on the data but will be limited to holding times and QC results, as summarized on the forms from the laboratory. If required, validation actions will be in accordance with the EPA Region III data validation protocol.

The results of the data usability assessment will be discussed in Mott MacDonald's project report. This discussion will include an assessment of measurement error with respect to either field sampling or analytical testing activities. This will be accomplished by performing a cursory scan of critical data quality parameters such as cooler temperatures, sample holding times, surrogate recovery, etc. An opinion statement will be included describing whether identified problems have a major or minor impact on data usability and whether or not DQOs were achieved. A discussion will be included in the final report that will assess precision, accuracy and completeness, as well as how this parameter affects the usability of the data.

5. KEY STAFF

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As previously noted throughout this document, sampling proposed in this sampling plan is being performed to obtain baseline characterization data from material that will be excavated or generated as part of the construction of the entry portals on the North and South Islands, as well as dredging and TBM activities. The data will be utilized to identify potential end uses for the material which could include, but may not be limited to, onsite beneficial reuse (in-water placement), offsite upland placement or disposal at a landfill. This plan is solely meant to assist in future planning and based on the results, may require additional sampling to fulfil regulatory requirements. Upon the receipt of the data, and once an end use is selected, a meeting with the regulatory agencies will be held to provide the background data generated and to obtain guidance from those agencies for the need for additional sampling, associated sample frequency and required analyses.

Table 1- Analytical Parameters

Parameters	Method	On or Off-site Reuse	Port Tobacco at Weanack (c)	Other Upland Placement and/or Regional Landfills (b) (c)
Metals (ITM List)	SW846 6020	S(a), W, E	S	
Mercury	SW846 7471A	S(a), W, E	S	
Butyltins	Unger Method / Rice 1987	S, W, E	S	
PCB Congeners	SW846 8082	S, W, E	S	
PCB Aroclors	SW846 8082A	S(a), W, E	S	
Semi volatile Organic Compounds	SW846 8270C	S(a), W, E	S	
Polynuclear Aromatic Hydrocarbons (PAHs)		S(a), W, E	S	
Cyanide	SW846 9012A	S, W, E	S	
pH	EPA 9054D	W,E	S	S
Nitrate/Nitrite	EPA 353.2	S, W, E		
Chlorinated Pesticides	SW846 8081A	S(a), W, E	S	
Herbicides	SW846 8151A	S(a), W, E		
Volatile Organic Compounds	SW846 8260C	S(a), W, E		
Dioxins/Furans (2,3,7,8-TCDD and 2,3,7,8-TCDF only)	EPA 1613B	S(a), W, E	S	
Extractrable Organic Halides (EOX)	SW846 9023	S	S	S
TPH - DRO/ORO (C10 to C34)	SW846 8015 D	S	S	S
TPH - GRO (C6 to C10)		S	S	S
Ammonia (as N)	EPA 350.1	S, W, E		
Total Kjedahl Nitrogen (TKN)	SM 4500 Norg_C	S, W, E		
Total Phosphorus	SM4500_P_E	S, W, E		
Sulfide	EPA 9030B/9034	S, W, E	S	
Potential Acidity	VA Tech method		S	
Neutralization Potential	Neutralization Potential		S	
Acid Base Accounting	Calculation		S	
Calcium Carbonate Equivalence	AOAC 955.01		S	
Pyritic Sulfur (Fizz Rating)	Calculation		S	
Saturated Paste pH & Conductivity	Saturated paste extract		S	
Flashpoint	7.1.2		S	S
Paint Filter Test	SW846 9095A			S*
Total Organic Carbon	Lloyd Kahn	S, W, E	S	
Total Solids	SM 2540G	S	S	S
Atterberg Limits	ASTM D4381	S	S	S
Specific Gravity	ASTM D854	S	S	S
Grain Size(Sieve and Hydrometer)	ASTM D422	S	S	S
TCLP Analysis (Includes Volatiles, Semi volatiles, Pesticides, Herbicides, Metals, Mercury, and TCLP	SW846,8260B,8270C,8081A,8151A, 6010B, 7470A, 1311			S

Notes: S = Soil/Sediment; E = Elutriate, W = Site Water (elutriate preparation water)

(a) Required for off-site placement as specified in VDEQ 2012.
(b) Regional landfills may have additional site-specific testing requirements.
(c) Not required for landfill disposal. Only required for Weanack "Clean Fill" designation or in-water placement.

***Only run on fill material (0-20' below grade) samples**

FIGURES

Scale: 1" = 100'

ENV_BORING_PLAN_SOUTHISLAND

FINAL PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH.	DESCRIPTION	NO.	DATE	AUTH.	DESCRIPTION

Hampton Roads Connector Partners | VDOT | M M Mott MacDonald

Designed: ELS
Drawn: CEM
Checked: EKM

STRUCTURE AND BRIDGE DIVISION
DATE: March 15, 2019

TWIN BORED TUNNEL
NORTH ISLAND
ENVIRONMENTAL BORING LOCATION PLAN

FIGURE 1

Sheet No. ENV(001)

Scale: 1" = 100'

ENV_BORING_PLAN_SOUTHISLAND

FINAL PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH.	DESCRIPTION	NO.	DATE	AUTH.	DESCRIPTION

Hampton Roads Connector Partners

VDOT

M M MOTT MACDONALD

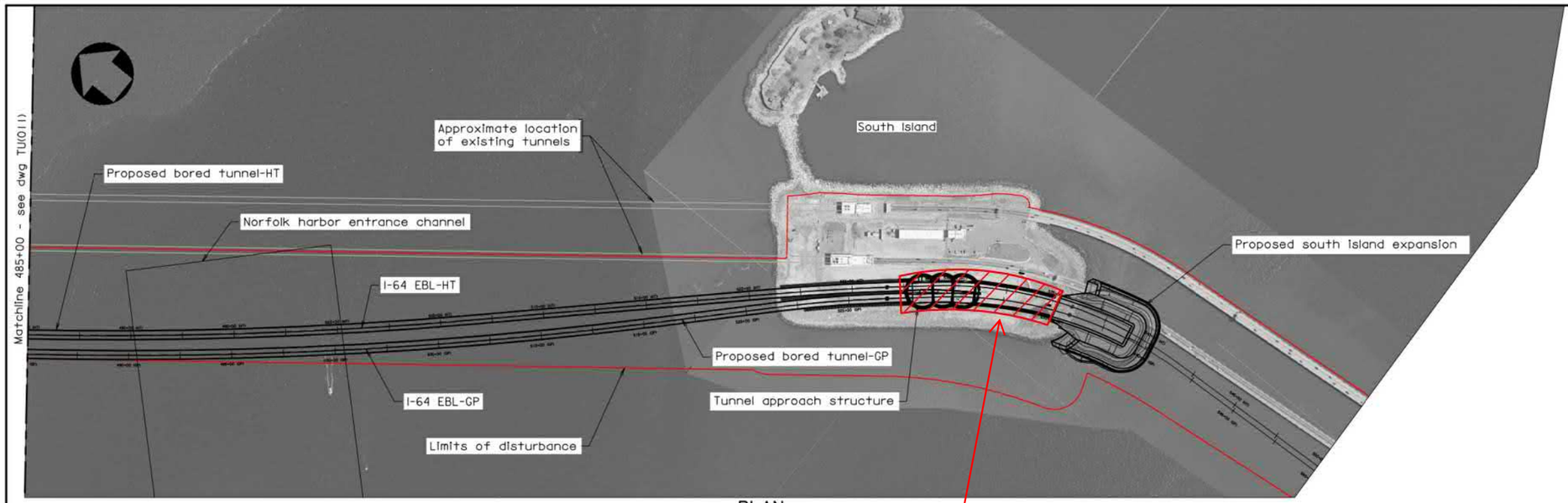
Designed: ..ELS.
Drawn: .....CEM.
Checked: ...EKM

STRUCTURE AND BRIDGE DIVISION
DATE: March 15, 2019

TWIN BORED TUNNEL SOUTH ISLAND ENVIRONMENTAL BORING LOCATION PLAN

FIGURE 2

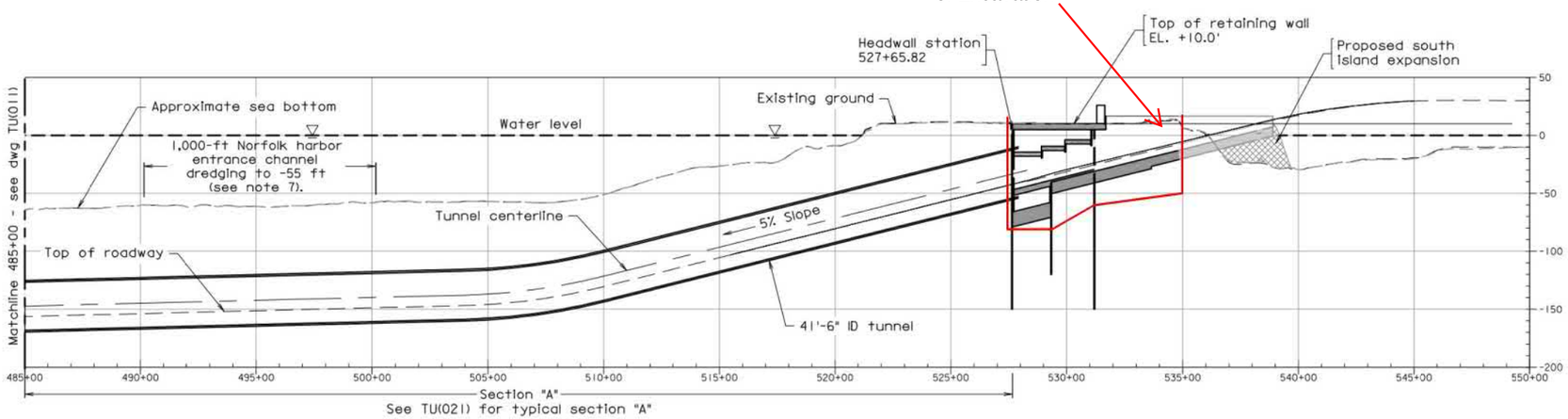
Sheet No. ENV(002)



PLAN

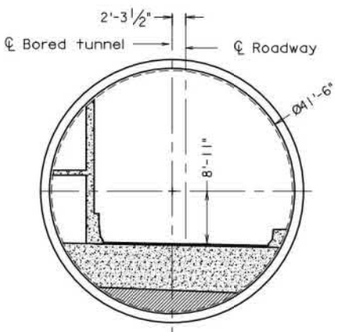
Scale: 1" = 300'

Approximate Limits of Excavation



PROFILE

Scale: 1" = 300' Horizontal 1" = 60' Vertical



TYPICAL SECTION "A"
- TUNNEL ALIGNMENT OFFSETS

Not to scale

NOTES:

1. Stations per roadway geometric design.
2. Bored tunnel alignment defined by roadway alignment and geometry combined with the offsets presented on this drawing. Applicability of sections is approximately as follows: Section "A" STA:483+30 to south approach structure.
3. Tunnel profile is cut along the centerline of the east roadway lane (I-64 EBL-HT). The profile of west roadway lanes (I-64 EBL-GP) to be similar.
4. Proposed bored tunnel-GP to be driven first (SI to NI) followed by proposed bored tunnel-HT (NI to SI).
5. Refer to AL and PL drawings for precise highway geometry.
6. Refer to TS drawing subset for details related to tunnel approach structure.
7. Recommended Norfolk harbor entrance channel depth is -55 ft and minimum width is 1000-ft per Table 5-1 of Norfolk harbor navigational improvements - General Reevaluation Report and Environmental Assessment.

RFP PART 1 REQUIREMENTS:

This drawing has been provided to meet the following RFP Part 1 Requirements:
- 4.7.1.2.a(i)
- 4.7.1.2.a(ii)
- 4.7.1.2.a(iii)
- 4.7.1.2.a(iv)
- 4.7.1.2.a(v)
- 4.7.1.2.a(vi)
- 4.7.1.2.a(viii)
- 4.7.1.2.a(ix)
- 4.7.1.2.a(x)
- 4.7.1.2.a(xi)
- 4.7.1.2.a(xii)

*Please note, the final footprint, geometry, and extents are represented in this drawing at the conceptual level from the proposal, and are subject to change as part of the I-64 DJV's design development process,which may impact final quantities.

PURSUIT PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

-- RESTRICTED --
CRITICAL INFRASTRUCTURE INFORMATION
Sensitive Security Information

TN110577_TU012-MM

Scale: As noted

FINAL PLAN REVISIONS SUBMITTAL DATE:							
NO.	DATE	AUTH.	DESCRIPTION	NO.	DATE	AUTH.	DESCRIPTION

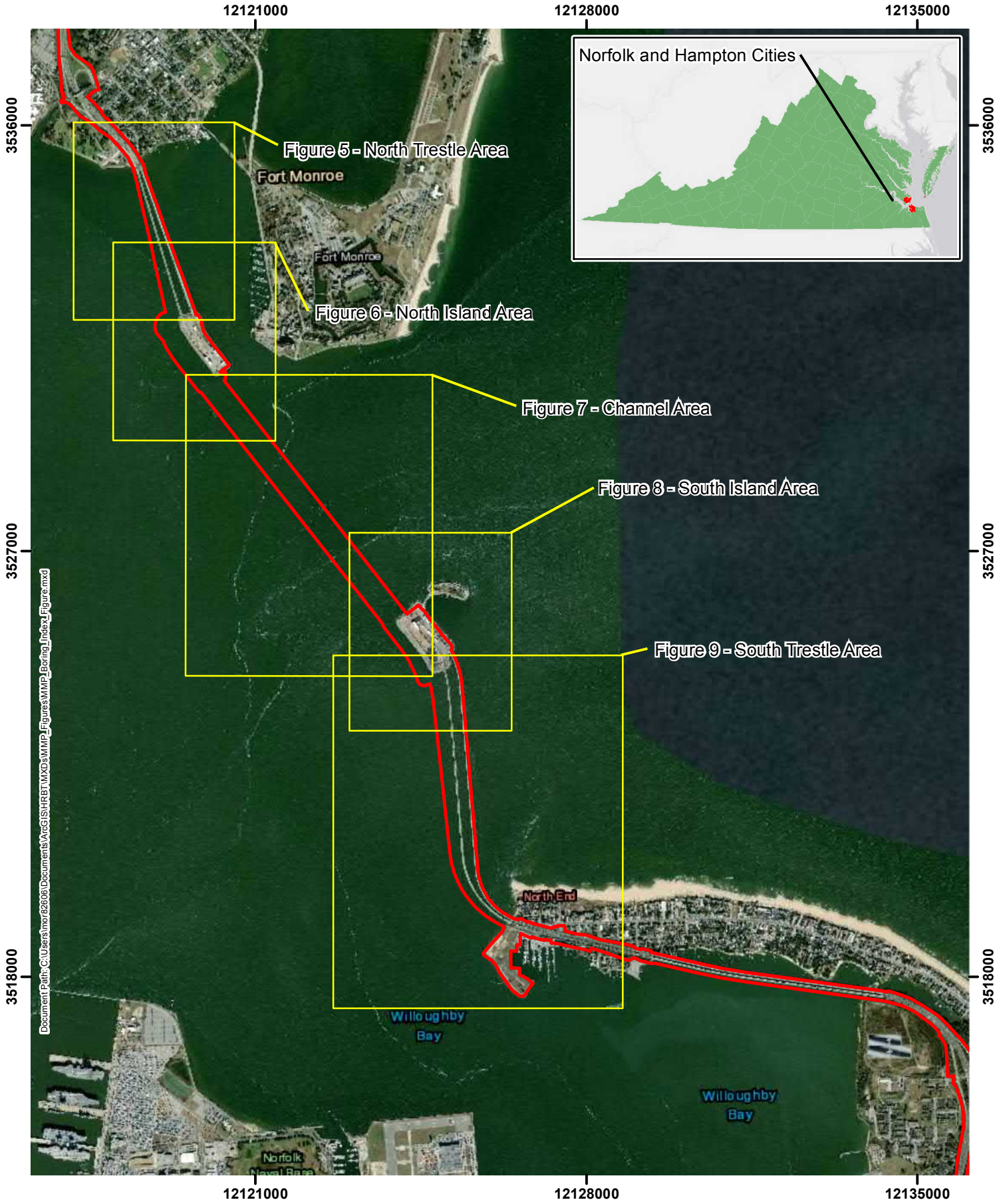
Hampton Roads Connector Partners | VDOT | MOTT MACDONALD

Designed: AN
Drawn: RGR
Checked: BB

STRUCTURE AND BRIDGE DIVISION
DATE: January 15, 2019

BORED TUNNEL
SOUTH ISLAND
PLAN AND PROFILE

FIGURE 3 | Sheet No. TU(012)



Legend

- Marine Boring Figure Extents
- Limits Of Disturbance

0 1,375 2,750 5,500 Feet

This map was developed using publicly-available digital data, but his secondary product has not been verified by regulatory authorities and is not state-authorized.

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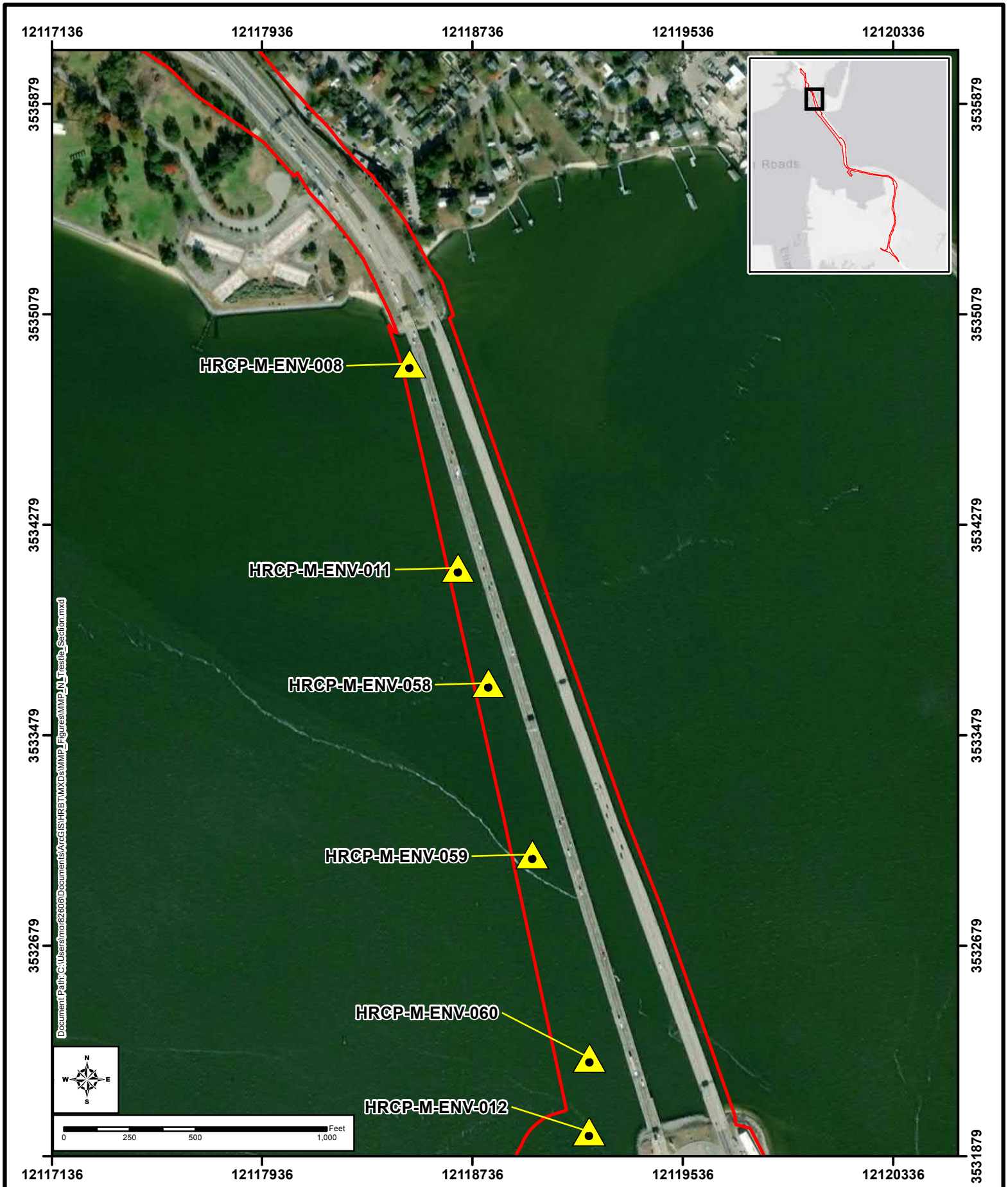
I-64 HRBT EXPANSION
NORFOLK & HAMPTON CITIES, VIRGINIA
MARINE ENVIRONMENTAL BORING LOCATIONS
FIGURE 4 OVERVIEW INDEX MAP

Designed	Drawn	Checked	Approved	Date
XXX				7/23/2019



Legend

Marine Borings

Limit Of Disturbance

This map was developed using publicly-available digital data, but his secondary product has not been verified by regulatory authorities and is not state-authorized.

Hampton Roads Bridge-Tunnel VDOT

Hampton Roads Connector Partners

HDR | MOTT MACDONALD Design Joint Venture

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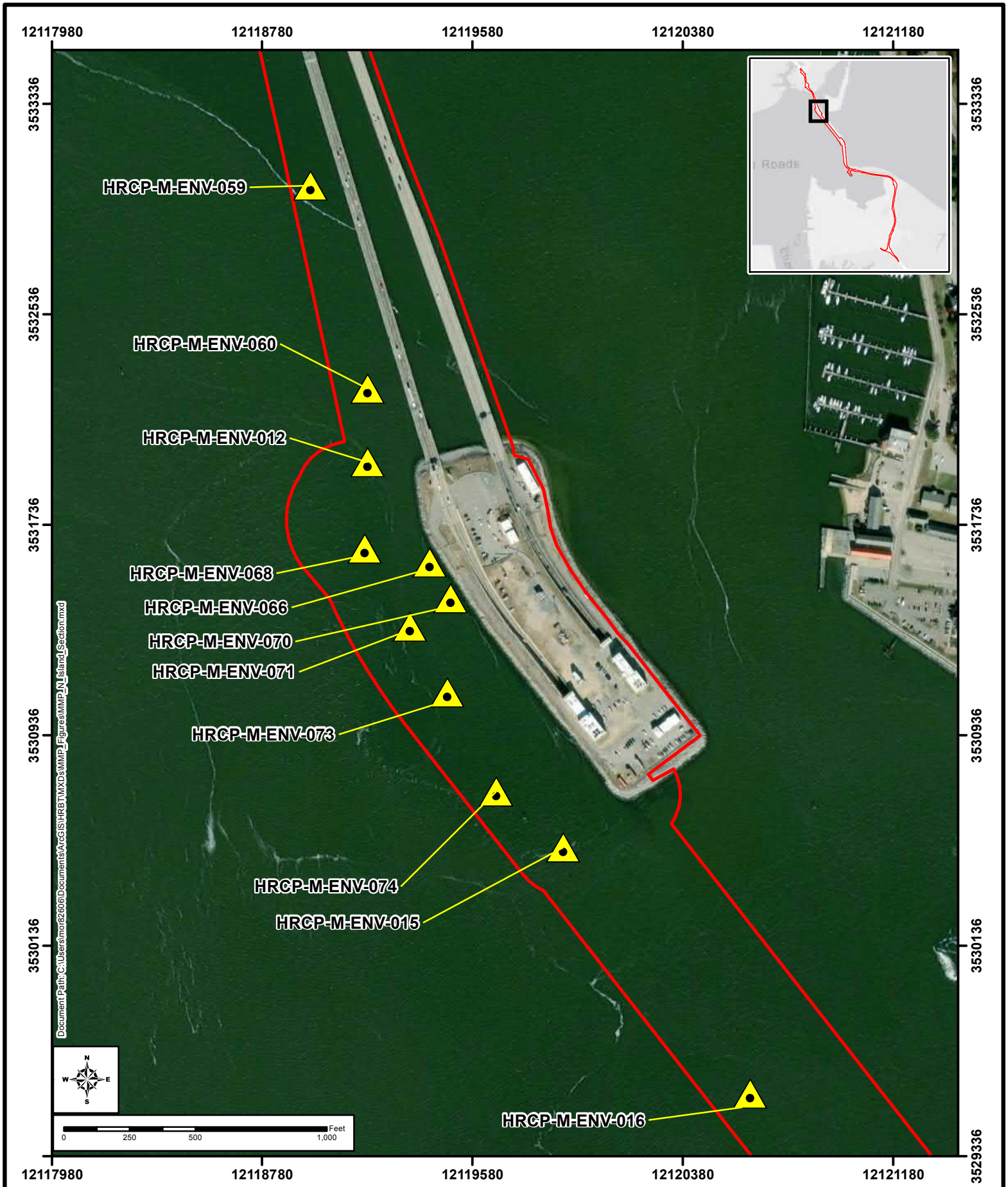
I-64 HRBT EXPANSION

NORFOLK & HAMPTON CITIES, VIRGINIA

MARINE ENVIRONMENTAL BORING LOCATIONS

FIGURE 5 NORTH TRESTLE AREA

Designed	Drawn	Checked	Approved	Date
XXX				7/23/2019



Legend

Marine Borings

Limit Of Disturbance

This map was developed using publicly-available digital data, but his secondary product has not been verified by regulatory authorities and is not state-authorized.

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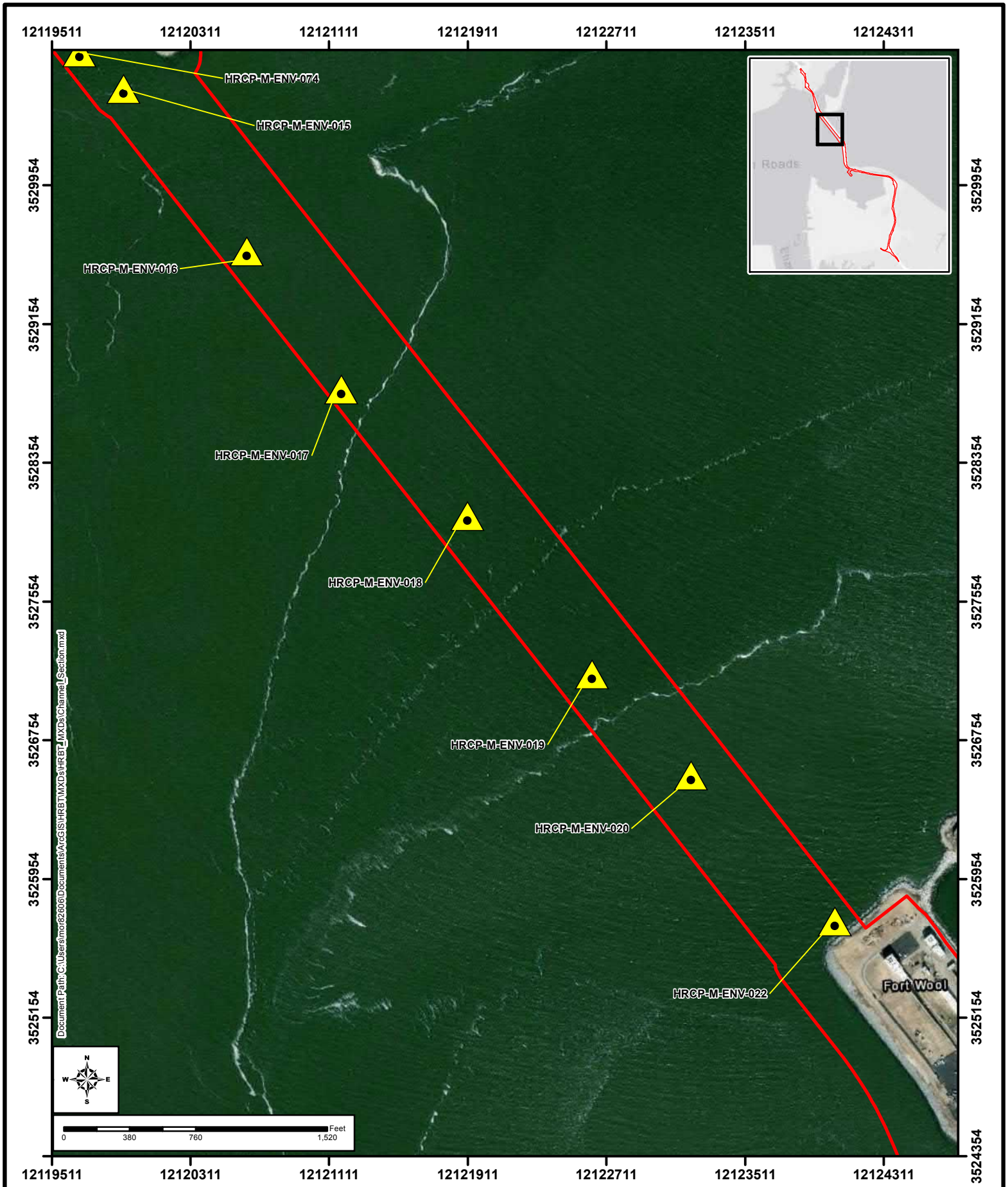
I-64 HRBT EXPANSION
NORFOLK & HAMPTON CITIES, VIRGINIA
MARINE ENVIRONMENTAL BORING LOCATIONS
FIGURE 6 NORTH ISLAND AREA

Designed	Drawn	Checked	Approved	Date
XXX				7/23/2019



Legend

Marine Borings

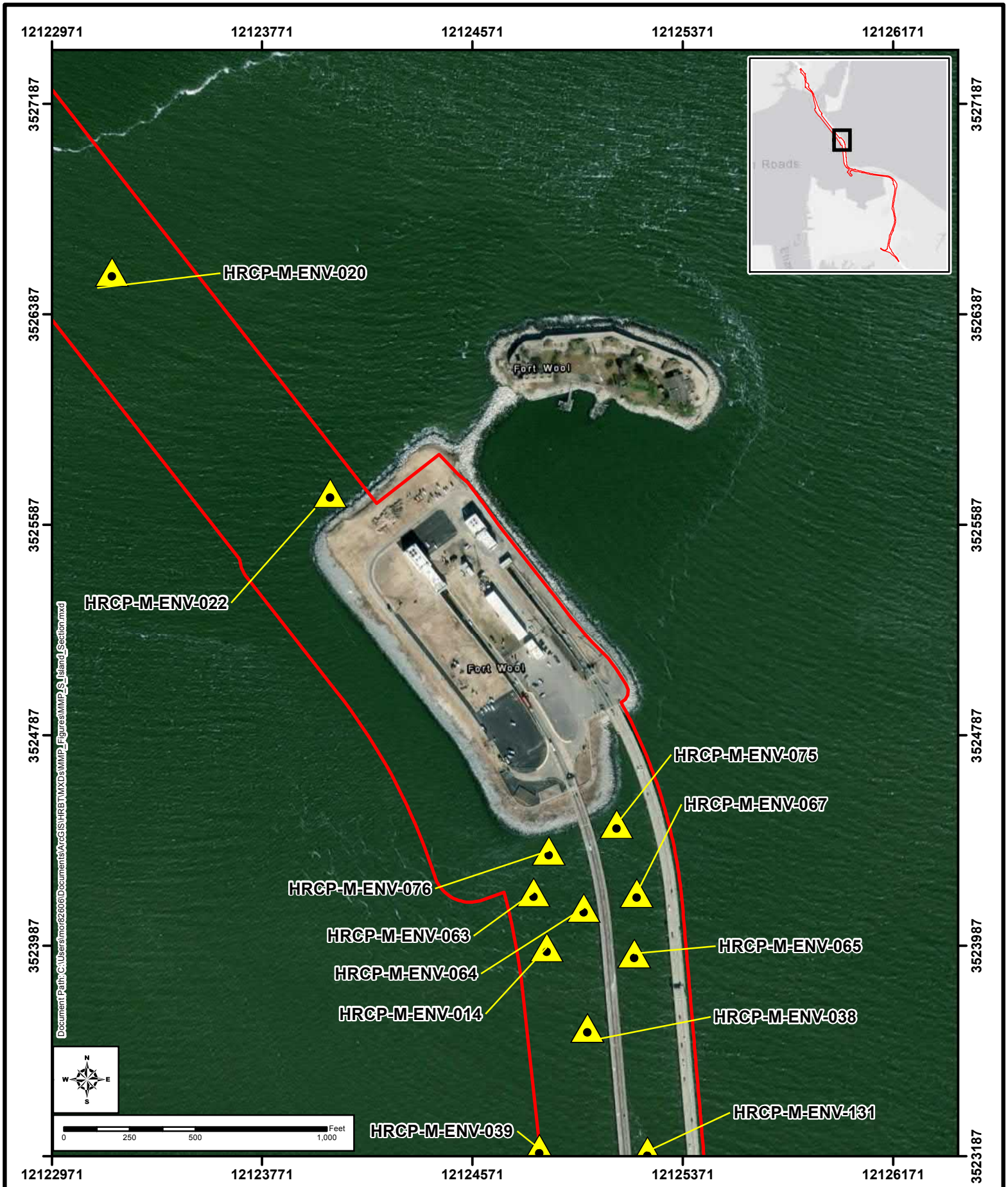
Limit Of Disturbance

This map was developed using publicly-available digital data, but his secondary product has not been verified by regulatory authorities and is not state-authorized.

I-64 HRBT EXPANSION
NORFOLK & HAMPTON CITIES, VIRGINIA
MARINE ENVIRONMENTAL BORING LOCATIONS
FIGURE 7 CHANNEL AREA

249 Central Park Ave Suite 201, Virginia Beach, VA 23462

Designed	Drawn	Checked	Approved	Date
XXX				7/23/2019



This map was developed using publicly-available digital data, but his secondary product has not been verified by regulatory authorities and is not state-authorized.

Legend

Marine Borings

Limit Of Disturbance

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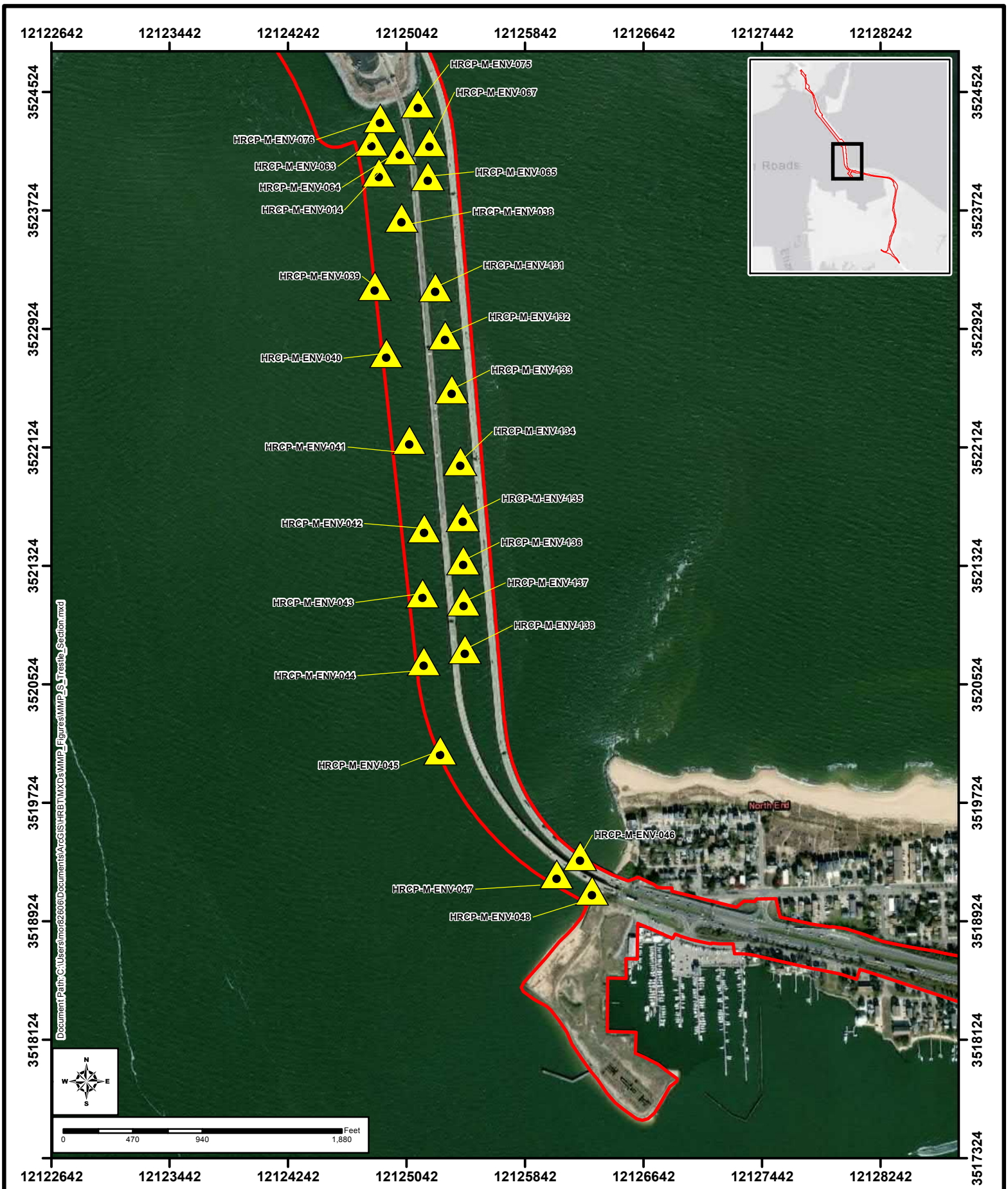
I-64 HRBT EXPANSION
NORFOLK & HAMPTON CITIES, VIRGINIA
MARINE ENVIRONMENTAL BORING LOCATIONS
FIGURE 8 SOUTH ISLAND AREA

Designed	Drawn	Checked	Approved	Date
XXX				7/23/2019



This map was developed using publicly-available digital data, but his secondary product has not been verified by regulatory authorities and is not state-authorized.

Legend

Marine Borings

Limit Of Disturbance

Hampton Roads Bridge-Tunnel VDOT

Hampton Roads Connector Partners

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I-64 HRBT EXPANSION

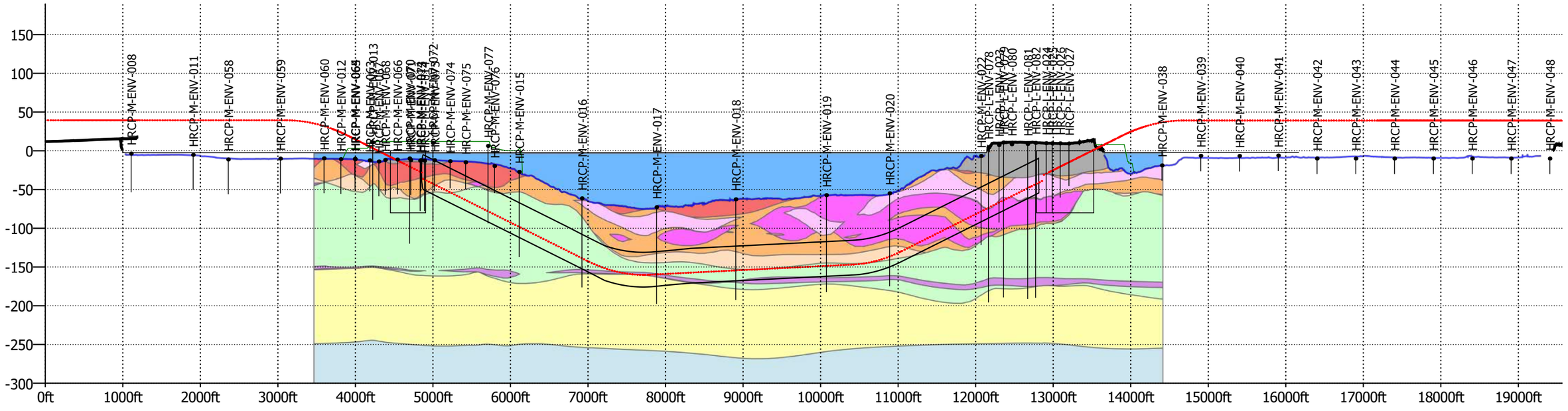
NORFOLK & HAMPTON CITIES, VIRGINIA

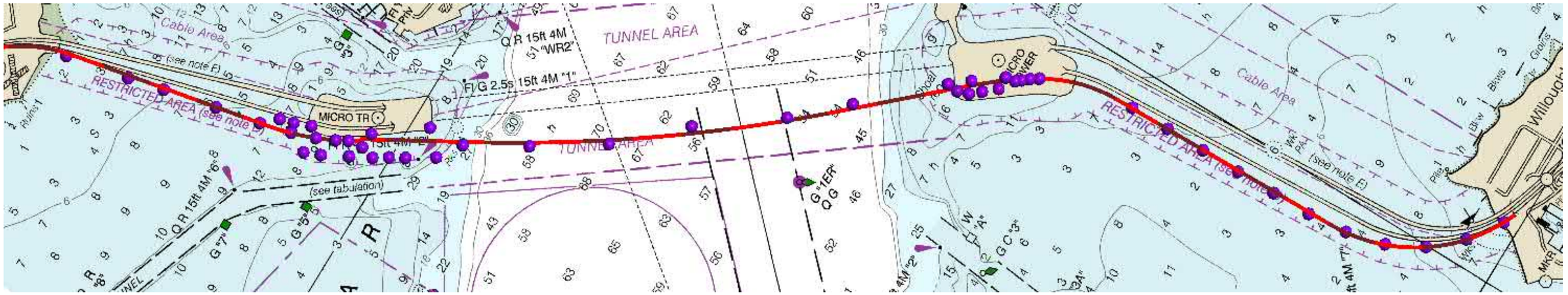
MARINE ENVIRONMENTAL BORING LOCATIONS

FIGURE 9 SOUTH TRESTLE AREA

Designed	Drawn	Checked	Approved	Date
XXX				7/23/2019

ATTACHMENT I





Responsible dept.	Technical reference	Creator DC	Approved by	
Legal owner Mott MacDonald		Document type MM Ground Model	Document status Draft for discussion	
		Title Proposed ENV BHs	Identification number 507408486	
			Rev. / Date of issue 2019/05/16	Sheet

ATTACHMENT II

Project	I-64 Hampton Roads Bridge-Tunnel, Norfolk, VA
To	Hampton Roads Connector Partners (HRCP)
From	HDR/Mott MacDonald JV
Subject	Addendum to the Baseline Characterization Environmental Sampling and Analysis Plan- Phase I - On Island Source Materials for On-site Reuse and/or Off-site Disposal – DRAFT
Date	July 29, 2019
Attachments	Figure 1- HRBT Design Segment Map, May 2019 Figure 2 through 5- Environmental Sampling Locations per segment Table 1 – Boring Designations, Depths and Quantities Attachment A – HR-SOP-HW-03, Management of Excavated and Imported Soils SOP

1. PROJECT OVERVIEW

The scope of work addressed in this plan outlines the sampling strategy and analysis of materials expected to be encountered during roadway expansion and overland bridges portion of the I-64 Hampton Roads Bridge Tunnel Project (HRBT). This scope covers preliminary characterization of upland soils that may need to be excavated during roadway expansion (cuts), and for stormwater management measures along the alignment. The preliminary soil characterization results will be used as a baseline to determine re-use or off-site disposal requirements in accordance with the Virginia Solid Waste Management Regulations (VSWMR). This plan focuses on the materials that are anticipated to be displaced and /or generated during the highway expansion and bridge construction alone and serves as an Addendum to the Baseline Characterization Environmental Sampling and Analysis Plan (Phase I sampling plan), dated May 2019.

It should be emphasized that this plan is to provide preliminary data to evaluate potential reuse of soils on-site or disposal/reuse off-site and does not cover additional analyses that disposal facilities or regulatory agencies may require for acceptance. Additional analyses, if required, will be performed on excavated soils that are in excess and cannot be reused at the site prior to removal.

2. ENVIRONMENTAL SCOPE OF WORK

Soil excavation activities are anticipated during roadway expansion and for stormwater management plans to be implemented. The purpose of this sampling plan is to characterize soils in proposed excavation areas that have the potential to be re-utilized as fill within the project limits during roadway expansion. The project limits is defined as the I-64 corridor between Settlers Landing in Hampton and I-564 in Norfolk, VA. If any of the excess soils cannot be re-used on site, the characterization testing results will be used to determine off-site disposal at an appropriate permitted facility or landfill, or re-use offsite in accordance with Virginia Department of Environmental Quality (DEQ) guidance document #LPR-SW-02-2012 and #LPR-SW-04-2012. Excavation cuts are identified in the Draft Proposed Impacts to WOUS drawings, dated July 2019.

A geotechnical exploration program will be performed by HDR's subcontracted drillers in accordance with the Geotechnical Exploration Plan (GEP), Landside Program, dated May 2019. The GEP proposes a total of 528 geotechnical boring locations along the design corridor which is divided into five (5) segments. The segments that will be covered during this investigation are highlighted in yellow in Figure 1.

The environmental scope of work includes providing field oversight and collecting environmental soil samples from select geotechnical boring locations. The geotechnical driller will be responsible for all permitting, landowner notifications, boring layout, utility coordination and clearances. The geotechnical

driller will handle any investigation derived waste, and decontamination procedures, as necessary. The geotechnical driller will work with the environmental subcontractor to collect soil samples required for environmental data.

Environmental soil samples will be screened at 71 of the geotechnical boring locations which are identified on Table 1 and located on Figure 2 through Figure 5. Soils will be sampled based on the sample collection plan described in Section 3.0.

The boring locations where environmental data will be collected were selected based on the following:

- Areas of proposed excavation that are located in or adjacent to areas of potential environmental concerns (PECs), identified in the Updated Hazardous Materials Technical Memorandum, dated June 2018.
- All borings located within stormwater management (SWM) ponds to evaluate soil conditions at pond bottom.
- Evaluate soils in significant excavation/cut areas that will generate soil for reuse or off-site disposal.

Soil Characterization Criteria

Soils that will be evaluated to determine the potential suitability for on-site reuse, and reuse or disposal at offsite upland locations will be compared to the following criteria:

- Virginia DEQ state-wide variance criteria to determine management as fill on-site and on appropriate off-site locations (LPR-SW-04-2012)

Groundwater Sampling

No groundwater borings are currently proposed in this plan. Any groundwater sampling as part of dewatering activities during excavation will be performed under an Addendum at a later time.

3. SAMPLE COLLECTION PLAN

Hollow-stem auger drilling (up to 3.25-inch inner diameter) or mud-rotary drilling (up to 4-inch inner diameter), will be utilized by the geotechnical driller. Hand auger drilling techniques may also be used for specific locations where drilling rig access is difficult and shallow explorations are specified (less than approximately five feet).

Samples will be cut open and field screened for lithology, and evidence of contamination. Multi-point composite samples will be collected from each soil strata encountered to generate a representative sample. All samples will be collected in accordance with the applicable Virginia DEQ and USEPA regulations.

All analysis, methods, sample collection and frequency, etc. shall be conducted in accordance with EPA SW-846 Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods. Soil samples will be transported to a Virginia Environmental Laboratory Accreditation Program (VELAP) certified laboratory.

The environmental subcontractor will observe drilling at 71 geotechnical boring locations (Figure 2 through 5) and field screen soils from the top of the boring to the groundwater table. Soil cores will be field screened with a photoionization detector (PID) and logged by the environmental subcontractor. Soils will be observed for visual and olfactory characteristics to determine the potential presence of contamination. Soils will be described by the environmental subcontractor and all observations of soil/fill characteristics and sample collection will be recorded in a field logbook.

Borings will be installed by the geotechnical subcontractor to depths ranging from 6 feet below surface grade to 35 feet below surface grade (bgs) (Table 1**,** attached). Groundwater is anticipated to be encountered at around 10 feet bgs. The borings will be advanced in 5-foot intervals. These depths correspond to the maximum depth of excavations for cut/fill and stormwater plans and/or based on potential impacts from environmental concerns identified adjacent to the alignment. The final locations and depths of the borings, are subject to change depending on design progress, field conditions/obstructions, and as approved by the agencies. Schedules will be coordinated with the geotechnical driller so that the environmental subcontractor is on site only for environmental sampling locations. A project contact list is provided on page 8 of this plan.

On-site/Off-site Beneficial Reuse and Off-site Upland Disposal Sampling

Disposal of excavated roadway material is expected to be minimal. Based on preliminary estimates, it is anticipated that approximately 30,000 cubic yards of soil may need to be excavated as part of roadway improvements. This preliminary sampling of soils during the geotechnical investigation is to anticipate future soil handling requirements and is by no means considered definitive. It is likely that for any petroleum contaminated soils (if encountered) or excess soils that cannot be reused at the site, disposal facilities will require additional analytical parameters not covered in this plan prior to removal from the site.

Only if visual/olfactory contamination and/or elevated PID readings (greater than 10 ppm) are observed, discrete soil samples will be collected in order to identify areas of contamination. One discrete soil sample per boring will be collected only if visual/olfactory contamination and/or elevated PID readings (greater than 10 ppm) are observed. The soil samples will be biased toward the interval displaying the highest degree of contamination based on visual and olfactory contamination and/or PID readings. Field personnel will be prepared to collect an estimated 71 discrete soil samples for TCL VOCs analysis in order to determine the presence of petroleum contamination in the vicinity of the alignment. In the absence of any indication of contamination, no discrete soil samples will be collected.

For any excess soil anticipated to be generated during construction activities from the HRBT project within Naval Station Norfolk, soils will be characterized in accordance with the August 2017 Standard Operating Procedure (SOP) for management of excavated and imported soils (HR-SOP-HW-03). As per the SOP, soils shall be analyzed as per Virginia DEQ guidance #LPR-SW-02-012.

Based on Virginia DEQ guidance document (#LPR-SW-02-2012), a minimum of one composite sample shall be analyzed for each required test for every 250 cubic yards of soil to be disposed. Additionally, for quantities of soil greater than 2,500 cubic yards the sampling rates may be adjusted with approval from Virginia DEQ. Since this investigation is meant to pre-characterize soils that may need to be excavated as part of the roadway improvement plans and does not necessarily reflect actual quantities that will need re-use or disposal, the following sampling frequency and analyses are proposed:

At a minimum, three composite samples will be collected in segment 1, seven composite samples will be collected in segment 3, three samples will be collected in segment 4, and two samples will be collected in segment 5 of the alignment. Refer Figure 1 for segments. One composite soil sample will be collected from each boring location identified in Table 1, which will assist in identifying potential end uses of the excavated material (reuse, offsite upland placement or disposal). Composite samples will consist of a whole core composite of the entire boring, which will be representative of the materials encountered during excavation activities. It is estimated that a total of 15 composite soil samples will be collected and analysed for a full list of analytical parameters to provide preliminary data. Table 1 provides the sampling quantities, and analytical groups covered in this investigation. No soil samples will be collected below the water table.

Analytical Parameters and Sample Labelling

Each sample will have a unique identification and will correspond to the geotechnical boring designation shown on Figures 2 through 5. Refer Table 1 for sample identification numbers to be used for the environmental samples.

Any discrete soil samples collected based on field screening results will be analysed for TCL VOCs. Sample depths will be provided in field notes, sample labels and on the chain of custody.

The following full list of analytical parameters were identified in accordance with Virginia DEQ guidance document (#LPR-SW-02-2012), Naval Station provided SOP (HR-SOP-HW-03) and minimum requirements by off-site disposal facilities/landfills. It should be noted that disposal facilities may require additional analytical parameters not covered by the DEQ guidance and this sampling plan prior to acceptance.

Site composite samples from boring locations identified in Table 1 will be analysed for a preliminary list of parameters including TAL metals, TCL VOCs (includes BTEX), TCL SVOCs, TCL pesticides/PCBs, dioxins/furans (2,3,7,8-TCDD and 2,3,7,8-TCDF only), TPH (DRO/GRO), and TOX. These results will be evaluated against Virginia DEQ state-wide variance criteria to determine management as fill on-site and on appropriate off-site locations (#LPR-SW-04-2012).

Since waste characterization sampling for parameters including but not limited to TCLP, and RCRA hazardous waste are driven by offsite disposal facility requirements and volume of soil that needs disposal, these analyses will be performed prior to removal of excavated soils. Any additional sampling required by regulatory agencies or offsite disposal facilities that are not covered in this plan will be provided in an Addendum and performed on excavated soils prior to removal/reuse.

Quality Control Samples and Blanks

Quality control samples will be collected and analyzed as presented in the following table:

QC Sample	Frequency	Analysis
Sample Duplicates	1 per every 20 samples analysed (total 4 duplicates estimated)	TCL VOCs (includes BTEX), TCL SVOCs, TCL pesticides/PCBs, and TAL metals
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	1 per every 20 samples analysed or 1 per sample delivery group (total 4 MS/MSDs estimated)	TAL Metals

Collection of duplicate samples provides for the evaluation of the laboratory's and sampler's performance by comparing the analytical results of two samples from the same location. The sample name must not indicate which sample has been duplicated. Duplicate requirements may be waived or expanded depending on the particular regulatory program or remedial phase involved.

A matrix spike/matrix spike duplicate is an aliquot of a field sample that is fortified with the analyte(s) of interest and analyzed to monitor matrix effects associated with a particular sample. Samples to be spiked will be determined in advance to allow for collection and submittal of additional volume samples. Note that additional volume shall be collected for MS/MSD samples and samples will be identified as such.

3.1. Sampling Equipment Decontamination

Sample collection and compositing equipment must be decontaminated if it will be reused to maintain the integrity of the sample and avoid cross-contamination between samples. In the majority of the instances, stainless-steel trowels and mixing bowls will be dedicated per sample. Larger mixing devices will be decontaminated as follows:

- Rinse with deionized (DI) water
- Rinse with 10 percent nitric acid (HNO_3)
- Rinse with distilled or DI water
- Rinse with methanol followed by hexane
- Rinse with DI water
- Air dry (area away from decontamination area)

All sample collection devices/storage containers will be laboratory cleaned, packaged, and dedicated for exclusive use at one sampling location for that day.

3.2. Documentation

Field notebooks will be bound with numbered pages. Any pertinent information regarding the site and the sampling procedures will be documented. Entries made in these notebooks must note the date and time. Information recorded in these notebooks will include:

- Name of the individual making the entry;
- Date and time of arrival and departure at the site;
- Location of the samples taken;
- The method of collection;
- Numbers of samples taken;
- Date and time of collection;
- Sample identification number(s);
- Any field instrument calibration performed and/or instrument readings; and,
- Weather conditions on the day of sampling and any field observations.

For soil sampling, the following additional information will be entered into the field book:

- Boring ID number;
- Sample depth intervals;
- Photo-ionization detector (PID) readings for volatile organic compounds; and,
- Description of lithology.

Photo documentation will be made of grossly contaminated soils and others as applicable with photo description, time and date photo was taken, photo location, and direction (as applicable) of photo all to be recorded in the field notebook.

3.3. Field Instrumentation

Field instrumentation will be operated in accordance with the manufacturer's instructions for PID. Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications. The calibration and internal standards shall meet all criteria specified in the referenced analytical method.

Calibration of field instruments and equipment will be performed as specified by the manufacturer or more frequently as conditions dictate. The minimum calibration of field instrumentation is once at the beginning of each day, as necessary.

Records of calibration, repair or replacement will be filed and maintained by the designated personnel performing quality control activities. Calibration records of the assigned laboratory will be filed and maintained at the laboratory location where the work is performed and subject to QA audit.

Calibration procedures, calibration check procedures, proper usage, data recording, preventative maintenance are provided in the specified manufacturer's operation manual.

Instrument	Activity	Frequency	Accuracy	Corrective Action
RAE Systems MiniRAE 3000 Photo Ionization Detector (PID)	Calibration on-site	Beginning and end of day, and as needed.	±3%	Re-calibrate using manufacturer's instructions and recheck with isobutylene gas; replace if faulty

Field sampling data will be evaluated by the Field Team Leader and or the Project Manager Coordinator, based on their judgment of the representativeness of sample, maintenance and cleanliness of the sampling equipment and adherence to the approved collection procedure.

3.4. Sample Quality Assurance and Deliverables

The purpose of sample quality assurance is to document the identity of the sample and its handling from collection until delivery to the laboratory, at which point the laboratory's internal quality assurance procedures are implemented. All materials such as field logbooks, boring logs with field screening results, sample locations, laboratory data records, reports, chain of custody records and instrument printouts will be clearly labelled and provided to HDR.

Sample Identification

Each sample will be identified using a sample label marked on the container in permanent marker containing the following information:

- Project name and number;
- Sample number;
- Sample depth;
- Analysis;
- Preservative;
- Date;
- Time; and,
- Sampler's name / initials.

Prior to going into the field, this sample identification procedure will be further refined (if needed), so that a sample is accurately and easily identified.

The sample label contains the authoritative information for the sample. Inconsistencies with other documents will be settled in favor of the vial or container label unless otherwise corrected in writing by the person who collected the samples.

Sample Handling

Sample containers will be placed in a secured refrigerated cooler (cooled to 4°C) immediately following collection and labelling. Samples will be packed to prevent containers from breaking.

Chain-of-Custody

The objective of the chain-of-custody procedure is to document the history of each sample and its handling. Custody records trace a sample from its collection through all transfers of custody until it is transferred to the laboratory. Samples are considered to be in custody if they are within sight of the individual responsible for their security or locked in a secure location. Each person who takes possession of the samples is responsible for sample integrity and safekeeping.

Chain-of-custody procedures are provided below:

- The chain-of-custody form is completed at the time of sample collection. The sample identification number, sampling location, depth, date, time and analysis requested are recorded on the form;
- The sampling team will check the sample numbers on the individual jars against the chain of custody form; and,
- Field samplers are responsible for the care and custody of the samples collected until the samples are transferred to another party.

Samples are packaged for shipment and delivered to the Virginia DEQ-certified laboratory within two days of sampling. A copy of the chain-of-custody form is retained by the sampling team for the project file and the original is sent with the samples. Internal laboratory records then document the custody of the sample through its final deposition.

Sample Storage

Standard procedures are employed both in the field and in the laboratory to maintain the integrity of the sample custody. Such procedures include the tagging of all sample containers, the use of custody seals where applicable, the use of chain of custody forms and standard schedule, and control and security procedures within the laboratory.

4. LABORATORY OPERATIONS AND DATA DELIVERABLES

All samples will be analysed by a Virginia Environmental Laboratory Accreditation Program (VELAP) certified laboratory.

The laboratory will report all non-conformance results and the reason for the non-conformance so that a determination may be made as to the reliability of the data. Subcontractor will confirm that deliverables from the laboratory will be sufficient for data validation at another date, if needed. The data packages will be reviewed for completeness.

Validation may be performed on the data but will be limited to holding times and QC results, as summarized on the forms from the laboratory. If required, validation actions will be in accordance with the EPA Region III data validation protocol.

5. KEY STAFF

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Waste characterization for soil sampling on the Naval Station property will be coordinated with the Waste Media Manager, Candice Sylvan (at 757-341-0659 or at candice.sylvan1@navy.mil).

As previously noted throughout this document, sampling proposed in this Addendum to the Phase I sampling plan is being performed to obtain preliminary soil characterization data from material that will be excavated as part of the construction of the roadway expansion and bridge installations. The data will be utilized to identify potential end uses for the material which could include, but may not be limited to, onsite reuse, offsite upland placement or disposal at a landfill. This plan is solely meant to assist in future planning and based on the results, may require additional sampling to fulfil regulatory requirements. The August 2017 SOP for management of excavated and imported soils (HR-SOP-HW-03) in the Commonwealth of Virginia is included in Attachment A and will be used as a reference to determine soil end-use. Upon the receipt of the data, and once an end use is selected, a meeting with the regulatory agencies will be held to provide the background data generated and to obtain guidance from those agencies for the need for additional sampling, associated sample frequency and required analyses.

Table 1
Boring Designations, Depths, and Quantities

Geotechnical Boring Information			Quantities					
Segment	**Geotech Boring ID[1, 2]**	**Boring Depth (ft bgs)**	**Discrete Soil Analyticals**	**Composite Soil Analyticals[3]**	**Composite Samples for Full list of analyticals**	**Duplicate Samples**	**MS/MSDs**	**Total Estd Samples**
1	1B-SWMMBO-001	25	One Discrete soil sample per boring will be sampled only for TCL VOCs if visual/olfactory contamination and PID readings > 10 ppm.	TAL metals, TCL VOCs (includes BTEX), TCL SVOCs, TCL Pesticides/PCBs, TPH (DRO/GRO), Dioxins/Furans (2,3,7,8-TCDD and 2,3,7,8-TCDF) and TOX	3 samples (1B-SWMWBO-002, 1B-RWWBR-010, 1B-SWWBO-024)	1 per 20 samples (1)	1 per 20 samples (1)	5
1	**1B-SWMMBO-002/CS**	25						
1	1B-RWEBR-006	25						
1	1B-WEBO-029F	10						
1	1B-RWWBR-008	25						
1	1B-WEBR-030A	6						
1	1B-WSBI-031A	6						
1	**1B-RWWBR-010/CS**	25						
1	1B-WEBR-036A	6						
1	1B-WEBR-038A	6						
1	**1B-SWWBO-024/CS**	35						
1	1B-WEBI-042C	10						
1	1B-WWBO-044F	6						
1	1B-WEBO-043C	10						
1	1B-WWBI-045C	8						
3	**3B-WEBO-049F/CS**	15	One Discrete soil sample per boring will be sampled only for TCL VOCs if visual/olfactory contamination and PID readings > 10 ppm.	TAL metals, TCL VOCs (includes BTEX), TCL SVOCs, TCL Pesticides/PCBs, TPH (DRO/GRO), Dioxins/Furans (2,3,7,8-TCDD and 2,3,7,8-TCDF) and TOX	7 samples (3B-WEBO-049F, 3B-WEBI-065F, 3B-RWEBO-027, 3B-WEBI-077A, 3B-WEBO-188A, 3B-SWMEBO-006, 3B-WEBI-104A)	1 per 20 samples (estd 1)	1 per 20 samples (estd 1)	9
3	3B-SWEBO-026	35						
3	3B-WWBI-062F	10						
3	3B-WWBI-064F	10						
3	**3B-WEBI-065F/CS**	10						
3	3B-WWBI-066F	10						
3	**3B-RWEBO-027/CS**	25						
3	3B-RWEBO-032	25						
3	3B-WEBI-072A	6						
3	3B-RWEBO-036	25						
3	3B-WWBI-073A	6						
3	3B-RWEBO-040	25						
3	3B-WEBO-076A	6						
3	**3B-WEBI-077A/CS**	6						
3	3B-WWBI-078A	6						
3	3B-WEBI-079A	6						
3	3B-WEBO-187F	6						
3	**3B-WEBO-188A/CS**	6						
3	3B-WEBO-082A	6						
3	3B-WEBI-084A	6						
3	3B-WWBI-085F	10						
3	3B-WEBI-089A	6						
3	3B-WWBI-092C	10						
3	3B-WEBI-094A	6						
3	3B-WWBI-095C	10						
3	**3B-SWMEBO-006/CS**	25						
3	3B-SWMEBO-003	25						
3	3B-WEBI-098A	6						
3	3B-WWBI-099F	10						
3	3B-WEBI-101A	6						
3	3B-WWBI-103F	10						
3	3B-WEBI-106A	6						
3	3B-WWBI-105F	10						
3	**3B-WEBI-104A/CS**	6						
3	3B-WEBI-108A	6						
3	3B-WWBI-109F	10						
3	3B-WWBI-112F	10						
3	3B-WWBI-116F	10						

Table 1
Boring Designations, Depths, and Quantities

Geotechnical Boring Information			Quantities					
Segment	**Geotech Boring ID[1, 2]**	**Boring Depth (ft bgs)**	**Discrete Soil Analyticals**	**Composite Soil Analyticals[3]**	**Composite Samples for Full list of analyticals**	**Duplicate Samples**	**MS/MSDs**	**Total Estd Samples**
Geotechnical Boring Information								
Segment	**Geotech Boring ID[1]**	**Boring Depth (ft bgs)**	**Analyte/Analytical Group**	**Full List of Analytes for Select Samples**	**Composite Samples for Full list of analyticals[5]**	**Duplicate Samples**	**MS/MSDs**	**Total Estd Samples**
4	4B-WWBI-119F	10	One Discrete soil sample per boring will be sampled only for TCL VOCs if visual/olfactory contamination and PID readings > 10 ppm.	TAL metals, TCL VOCs (includes BTEX), TCL SVOCs, TCL Pesticides/PCBs, TPH (DRO/GRO), Dioxins/Furans (2,3,7,8-TCDD and 2,3,7,8-TCDF) and TOX	3 samples (4B-WWBI-123A, 4B-WEBI-133A, 4B-WEBI-150F)	1 per 20 samples (1)	1 per 20 samples (1)	5
4	**4B-WWBI-123A/CS**	6						
4	4B-WWBI-129F	10						
4	4B-WEBI-130A/CS	6						
4	4B-WEBI-132A	6						
4	**4B-WEBI-133A/CS**	6						
4	4B-WEBI-135A	6						
4	4B-WEBI-136A	6						
4	4B-WEBI-139A	6						
4	4B-WEBI-149A	6						
4	**4B-WEBI-150F/CS**	10						
5	5B-WEBI-151A	6	One Discrete soil sample per boring will be sampled only for TCL VOCs if visual/olfactory contamination and PID readings > 10 ppm.	TAL metals, TCL VOCs (includes BTEX), TCL SVOCs, TCL Pesticides/PCBs, TPH (DRO/GRO), Dioxins/Furans (2,3,7,8-TCDD and 2,3,7,8-TCDF) and TOX	2 samples (5B-WEBO-189A, 5B-WEBR-172F)	1 per 20 samples (1)	1 per 20 samples (1)	4
5	5B-WWBO-152F	10						
5	5B-WWBI-157F	10						
5	**5B-WEBO-189A/CS**	10						
5	5B-WEBI-158F	10						
5	5B-WWB0-168F	10						
5	**5B-WEBR-172F/CS**	10						

Notes:
1. Geotechnical Boring IDs and depths referenced from May 2019 Geotechnical Exploration Plan
2. CS designations for composite soil samples. Discrete soil samples (if collected) shall be identified with boring designation and sampling depth interval.
3. Disposal facilities may require additional analyses not covered in this plan prior to off-site disposal.

Acronyms:
ID- identification
bgs- below grade surface
CS- composite soil sample

Figure 1: HRBT Design Segment Map

Reference: Geotechnical Exploration Plan, Landside Program for the Hampton Roads Bridge-Tunnel Expansion Project, May 29, 2019