REPORT ON SEDIMENT SAMPLING IN THE HUDSON RIVER FOR THE CHAMPLAIN HUDSON POWER EXPRESS PROJECT

EXECUTIVE SUMMARY

CHPE LLC ("CHPE") and the Hudson River Drinking Water Intermunicipal Council ("Hudson 7") developed a set of studies, above and beyond those required by our permits, to determine the potential impact of the Champlain Hudson Power Express project's jet plow installation on the public water systems located within the Hudson River.

One of these studies involved the collection of sediment data in the vicinity of the five intakes, to understand the potential contaminants that might be mobilized by the jet plow and reach the intakes. Five sediment samples were collected along the proposed route for all of the intakes except for Esopus. Laboratory analysis was collected on the upper (A-series) and lower (B-series) portions of the cores collected.

Laboratory analysis found that there were no detectable concentrations of pesticides or volatiles (i.e., benzene, ethylbenzene, toluene, and xylenes) in the samples collected from the upper portion of the cores. There were no exceedances of the New York State reference values for metals, mercury, or semi-volatiles. The Hyde Park sample 1A showed an exceedance of the reference values for dioxin and PCBs which would not impact drinking water, but rather the sludge material that results from water purification and would thus require a different method of disposal. In addition, the Hyde Park water intake is a significant distance from the proposed route (approximately 1,100 feet) and the results of the pump study, which are discussed in a separate report, suggest that construction activities will not result in elevated values at the intake.

INTRODUCTION

In September of 2022, Normandeau Associates, Inc. ("Normandeau") completed sediment sampling near five municipal drinking water intakes in the Hudson River. The protocol for this work was developed to better understand the likely impacts, if any, associated with the installation of the Champlain Hudson Power Express ("CHPE") project and in direct consultation with the Hudson River Drinking Water Intermunicipal Council ("the Hudson 7"). This document summarizes the field sampling activities completed and provide a brief review of laboratory results for the sediment core sampling conducted.

FIELD SUMMARY

Normandeau performed sediment core sampling near the five drinking water intakes in the Hudson River (Highland, Poughkeepsie, Hyde Park, Port Ewen, and Rhineback) from September 20th through September 28, 2022. Normandeau deployed a 21-foot coring barge vessel with a Rossfelder P-3 submersible vibracore unit and 3- inch clear, semi-rigid, cellulose acetate butyrate ("CAB") tubes to conduct the sediment core sampling.

At each intake site, five sediment cores were collected at the closest point along the proposed CHPE transmission route to each drinking water intake, and ⅛ mile and ¼ mile both upriver and downriver of the intake, as possible. The only exception to this sample design was the Port Ewen site, which did not include a sediment core from the Port Ewen intake due to uncertainty as to the exact location of the Port Ewen water pipe (as the route currently crosses between the intake and the shoreline). The sample collected closest to the intakes was designated sample 1 (e.g., Rhinebeck 1). The samples then were labelled from north to south, wherein sample 2 was ¼ mile to the north and sample 5 was ¼ mile to the south of the intake. This nomenclature pattern is illustrated in Figure 1 below. Table 1 summarizes the sample collection locations and associated data.

Figure 1: Sample Nomenclature Pattern.

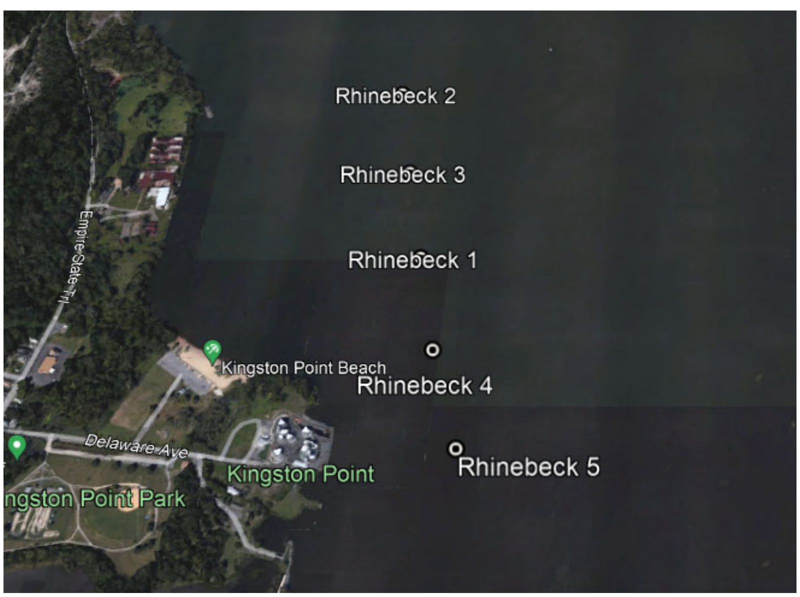

TABLE 1. SEDIMENT CORE SAMPLE COLLECTION SUMMARY.

Station Name	Planned GPS		Actual GPS		Date	Time (EDT)	Water Depth at time of collection
	Longitude	Latitude	Longitude	Latitude			
Rhinebeck 1	-73.960536590	41.931922330	-73.960536230	41.931916590	09/28/2022	943	31'
Rhinebeck 2	-73.961472920	41.935475680	-73.961484000	41.935475520	09/28/2022	1043	33'
Rhinebeck 3	-73.961031540	41.933694660	-73.961039800	41.933694810	09/28/2022	1010	32'
Rhinebeck 4	-73.960041660	41.930150010	-73.960031740	41.930149290	09/28/2022	903	32'
Rhinebeck 5	-73.959332640	41.928413780	-73.959331250	41.928407720	09/28/2022	834	33'
Port Ewen 1[i]	-73.956724080	41.888052158	N/A[i]				
Port Ewen 2	-73.959404030	41.891070111	-73.959407010	41.891077058	09/26/2022	1111	37'
Port Ewen 3	-73.958164390	41.889508379	-73.958164080	41.889514289	09/26/2022	1030	35'
Port Ewen 4	-73.955283830	41.886595911	-73.955284660	41.886589951	09/26/2022	1000	33'
Port Ewen 5	-73.953843490	41.885139500	-73.953844630	41.885147350	09/26/2022	935	31'
Hyde Park 1	-73.952609910	41.775038941	-73.952608940	41.775045918	09/24/2022	952	56'
Hyde Park 2	-73.952905130	41.778653765	-73.952895860	41.778652965	09/24/2022	1057	49'
Hyde Park 3	-73.952757550	41.776846674	-73.952746170	41.776846127	09/24/2022	1025	52'
Hyde Park 4	-73.952462280	41.773231209	-73.952457220	41.773231329	09/24/2022	921	61'
Hyde Park 5	-73.952311700	41.771423783	-73.952313670	41.771409136	09/24/2022	853	70'
Poughkeepsie 1	-73.942433350	41.723147379	-73.942442390	41.723145845	09/22/2022	1323	53'
Poughkeepsie 2	-73.941762011	41.726734336	-73.941750820	41.726733669	09/22/2022	1422	51'
Poughkeepsie 3	-73.942097761	41.724940464	-73.942095409	41.724932087	09/22/2022	1349	52'
Poughkeepsie 4	-73.942764269	41.721353761	-73.942754479	41.721353788	09/22/2022	1255	54'
Poughkeepsie 5	-73.942789839	41.719535277	-73.942781020	41.719534636	09/22/2022	1225	58'
Highland 1[ii]	-73.944316050	41.712147947	-73.944114181	41.712846294	09/20/2022	1106	58'
Highland 2	-73.943211730	41.715674099	-73.943217540	41.715666215	09/20/2022	1237	54'
Highland 3	-73.943764060	41.713910509	-73.943775051	41.713910402	09/20/2022	1203	55'
Highland 4	-73.944868019	41.710385398	-73.944871469	41.710378434	09/20/2022	1020	56'
Highland 5[iii]	-73.945342899	41.708608948	-73.945625210	41.707614916	09/20/2022	922	55'

[i]Station was not sampled following TDI request due to unknown location of Port Ewen intake.

[ii]Station was moved slightly north due to gas line crossing (per signs posted on riverbank).

[iii]Station was moved slightly south to avoid submerged cable crossing (per signs posted on riverbank).

Sediment cores were sampled to a depth of up to nine feet. Onboard the sampling vessel, each sediment core collected was capped and taped on both ends and stored for transportation. During sediment sample processing, the uppermost 4 feet of the core was subsampled as the "upper" core sample (denoted sample "A" from each station), and the lower section of the sediment core from 4 feet down to 9 feet was subsampled as the "lower" core sample (denoted sample "B" from each station). After subsampling the cores, each sediment sample was placed into sample jars and shipped to analytical chemistry laboratories for chemical analyses. The chain of custody paperwork is provided in Appendix 1. Each sample was analyzed for the chemical parameters summarized in Table 2.

TABLE 2. ANALYTICAL METHODS FOR SEDIMENT CORE ANALYSES.

Parameter	SW-846 Analysis Method[1]
Dioxins / Furans	1613B
Petroleum Compounds (i.e., Volatiles)	8260C
Polycyclic Aromatic Hydrocarbons (PAHs) - Benz(a)anthracene - Pyrene - Phenanthrene - Naphthalene	8270D
Pesticides (4, 4 DDE)	8081B
Polychlorinated Biphenyls (PCBs)	8270E-SIM/680(M) (NOAA 22 Congeners)
Metals (As, Cd, Cu, Pb)	6010D
Mercury	7471B

[1]United States Environmental Protection Agency ("USEPA") Hazard Waste Test Methods (USEPA 2015).

FINDINGS

PDF copies of the laboratory results, field data sheets, soil boring logs, and sediment core photos are provided as follows:

- Attachment A – Highland
- Attachment B – Poughkeepsie
- Attachment C – Hyde Park
- Attachment D – Port Ewen
- Attachment E – Rhinebeck

Table 3 provides a summary of the 1A samples for four of the sites (Highland, Poughkeepsie, Hyde Park and Rhinebeck), which represent the upper portion of the sample collected closest to the intake and therefore those sediments most likely to be disturbed by the jet plow operation. For Port Ewen, where a sample was not collected along the route near the intake, the results from sample 3A are presented. Sample 3A is the upper portion of the sample collected ¼ of a mile upriver from the intake. For each result, the Reporting Detection Limit (RDL) or, in the case of dioxins, the Method Reporting Limit (MRL) is provided.[1]

One of the selection criteria for where the pilot study was completed was the existence of historic soil sampling

[1] Certain results, indicated with a "J" are below the RDL and MDL. These represent estimates between the Method Detection Limit and the Practical Quantification Limit for the testing method.

data that was considered "representative" of sediments along the route within the vicinity of the five intakes. The intent was to compare sediment conditions at the pilot study with those at the actual intakes in order to allow for an extrapolation of the results of the simulated intake study. The laboratory results from the sediment sample collected in 2010 where the pilot study was completed (HR 93) are also provided in Table 3 as available.

In order to provide context for the laboratory values, three New York State standards were applied. First, the Hudson 7 indicated that a primary concern for sediment was the potential for contamination of the water treatment plant sludge so that it could no longer be used for composting. The 6 NYCRR 361-3.9 standards[2] were applied to metals and mercury.

There are no compost standards for pesticides, semi-volatiles, volatiles, and PCB so the 6 NYCRR 375-6.8[3] Unrestricted Use standard was applied for these parameters. The Unrestricted Use standards are primarily concerned with dermal exposure or vapor intrusion with sensitive receptors (e.g., kindergarten, playground) so they should be considered extremely conservative. However, in the absence of another standard, the Hudson 7 recommended this standard be applied. Finally, there is no Unrestricted Use standard for dioxin so the Class A threshold for toxic equivalency (TEQ) from the New York State's Technical & Operational Guidance Series (TOGS) 5.1.9[4] was applied. Again, this standard is designed to applied to situations where there would be no restrictions where materials are disposed.

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2 https://govt.westlaw.com/nycrr/Document/Id4d62f37dfe911e7aa6b9b71698a280b?viewType=Fu&transitionType=Default&contextData=%28sc.Default%29

3 https://govt.westlaw.com/nycrr/Document/I4eadfca8cd1711dda432a117e6e0f345?contextData=%28sc.Default%29&bhcp=1&transitionType=Default

4 https://www.dec.ny.gov/docs/water_pdf/togs519.pdf

TABLE 3. SUMMARY TABLE OF LABORATORY RESULTS														
		Highland 1A		**Poughkeepsie 1A**		**Hyde Park 1A**		**Port Ewen 3A**		**Rhinebeck 1A**			**HR 93**	**NY**
		Result	**RDL**	**Result**	**RDL**	**Result**	**RDL**	**Result**	**RDL**	**Result**	**RDL**		**Results**	**Standards**
METALS / MERCURY[1]														
Arsenic, Total	mg/kg	5.5	*3.3*	6	*3.3*	13.4	*3.6*	9.8	*3.1*	3.2	*2.5*		5.3	41
Cadmium, Total	mg/kg	ND	*0.82*	0.28J	*0.82*	1.5	*0.89*	0.31J	*0.78*	ND	*0.63*		0.367	10
Copper, Total	mg/kg	11.7	*3.3*	14.9	*3.3*	64.5	*3.6*	19.5	*3.1*	7.6	*2.5*		15.6	1,500
Lead, Total	mg/kg	9.1	*3.3*	14.4	*3.3*	83.6	*3.6*	27.9	*2.1*	6.4	*2.5*		13.5	300
Mercury, Total	mg/kg	ND	*0.081*	0.064J	*0.092*	0.68	*0.08*	0.24	*0.73*	0.031J	*0.059*		0.077	10
PESTICIDES [2]														
4,4'-DDD	ug/kg	ND	*13.8*	ND	*15.7*	ND	*15.1*	ND	*13.5*	ND	*11.6*		ND	3.3
4,4'-DDE	ug/kg	ND	*13.8*	ND	*15.7*	ND	*15.1*	ND	*13.5*	ND	*11.6*		ND	3.3
4,4'-DDT	ug/kg	ND	*13.8*	ND	*15.7*	ND	*15.1*	ND	*13.5*	ND	*11.6*		ND	3.3
Chlordane	ug/kg	ND	*284*	ND	*322*	ND	*311*	ND	*278*	ND	*239*		N/A	N/A
Dieldrin	ug/kg	ND	*13.8*	ND	*15.7*	ND	*15.1*	ND	*13.5*	ND	*11.6*		ND	5
Mirex	ug/kg	ND	*13.8*	ND	*15.7*	ND	*15.1*	ND	*13.5*	ND	*11.6*		N/A	N/A
SEMI-VOLATILES [2]														
Acenaphthene	ug/kg	ND	*69.1*	ND	*84.4*	ND	*88.3*	ND	*27.9*	ND	*20.7*		ND	20000
Acenaphthylene	ug/kg	ND	*69.1*	ND	*84.4*	62.7J	*88.3*	ND	*27.9*	ND	*20.7*		ND	100000
Anthracene	ug/kg	ND	*69.1*	ND	*84.4*	79.0J	*88.3*	ND	*27.9*	ND	*20.7*		ND	100000
Benzo(a)anthracene	ug/kg	ND	*69.1*	45.8J	*84.4*	187	*88.3*	59.1J	*27.9*	71.4	*20.7*		0	1000
Benzo(a)pyrene	ug/kg	411	*69.1*	54.7J	*84.4*	271	*88.3*	65.9J	*27.9*	97.2	*20.7*		0	1000
Benzo(b)fluoranthene	ug/kg	ND	*69.1*	35.3J	*84.4*	157	*88.3*	36.5J	*27.9*	107	*20.7*		N/A	1000
Benzo(g,h,i)perylene	ug/kg	ND	*69.1*	41.0J	*84.4*	148	*88.3*	45.2J	*27.9*	54.5J	*20.7*		N/A	100000
Benzo(k)fluoranthene	ug/kg	ND	*69.1*	40.4J	*84.4*	173	*88.3*	43.8J	*27.9*	41.0J	*20.7*		N/A	800
Chrysene	ug/kg	ND	*69.1*	31.1J	*84.4*	223	*88.3*	56.8J	*27.9*	72.6	*20.7*		0	1000
Dibenzo(a,h)anthracene	ug/kg	ND	*69.1*	ND	*84.4*	39.2J	*88.3*	ND	*27.9*	ND	*20.7*		ND	330
Fluoranthene	ug/kg	ND	*69.1*	47.9J	*84.4*	205	*88.3*	87.4	*27.9*	151	*20.7*		0	10000
Fluorene	ug/kg	ND	*69.1*	ND	*84.4*	36.4J	*88.3*	ND	*27.9*	ND	*20.7*		ND	30000
Indeno(1,2,3-cd)pyrene	ug/kg	ND	*69.1*	ND	*84.4*	161	*88.3*	40.7J	*27.9*	75.5	*20.7*		N/A	500
Naphthalene	ug/kg	ND	*69.1*	ND	*84.4*	55.4J	*88.3*	ND	*27.9*	42.6J	*20.7*		ND	12000
Phenanthrene	ug/kg	ND	*69.1*	34.8J	*84.4*	165	*88.3*	60.1J	*27.9*	85.7	*20.7*		0	100000
Pyrene	ug/kg	ND	*69.1*	68.3J	*84.4*	290	*88.3*	101	*27.9*	91.9	*20.7*		0	100000

[1] 6 NYCRR 361-3.9

[2] 6 NYCRR 375-6.8

[3] Technical Operational Guidance Series 5.1.9

		Highland 1A		Poughkeepsie 1A		Hyde Park 1A		Port Ewen 3A		Rhinebeck 1A			HR 93	NY
		Result	**RDL**	**Result**	**RDL**	**Result**	**RDL**	**Result**	**RDL**	**Result**	**RDL**		**Results**	**Standards**
VOLATILES [2]														
Benzene	ug/kg	ND	*4.6*	ND	*3.8*	ND	*3.2*	ND	*2.6*	ND	*2.9*		N/A	60
Ethylbenzene	ug/kg	ND	*4.6*	ND	*3.8*	ND	*3.2*	ND	*2.6*	ND	*2.9*		N/A	1000
Toluene	ug/kg	ND	*4.6*	ND	*3.8*	ND	*3.2*	ND	*2.6*	ND	*2.9*		N/A	700
Total Xylenes	ug/kg	ND	*13.7*	ND	*11.3*	ND	*9.7*	ND	*7.8*	ND	*8.6*		N/A	260
PCBS [2]														
Cl2-BZ#8	ug/kg	ND	*0.677*	0.712J	*0.756*	21.2	*0.655*	ND	0.596	2.33	*0.545*		0	N/A
Cl3-BZ#18	ug/kg	ND	*0.677*	1.35	*0.756*	74.1	*0.655*	ND	0.596	1.85	*0.545*		0	N/A
Cl3-BZ#28	ug/kg	ND	*0.677*	1.67	*0.756*	82.6	*0.655*	ND	0.596	1.49	*0.545*		0	N/A
Cl4-BZ#44	ug/kg	ND	*0.677*	0.906	*0.756*	31.1	*0.655*	ND	0.596	0.456J	*0.545*		0	N/A
Cl4-BZ#49	ug/kg	ND	*0.677*	1.11	*0.756*	57.2	*0.655*	ND	0.596	1.04	*0.545*		0	N/A
Cl4-BZ#52	ug/kg	ND	*0.677*	1.74	*0.756*	67.7	*0.655*	ND	0.596	1.21	*0.545*		0	N/A
Cl4-BZ#66	ug/kg	ND	*0.677*	0.723J	*0.756*	39.6	*0.655*	ND	0.596	0.504J	*0.545*		0	N/A
Cl5-BZ#87	ug/kg	ND	*0.677*	ND	*0.756*	7.79	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl5-BZ#101	ug/kg	ND	*0.677*	1.29	*0.756*	35.9	*0.655*	ND	0.596	0.273J	*0.545*		0	N/A
Cl5-BZ#105	ug/kg	ND	*0.677*	ND	*0.756*	7.51	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl5-BZ#118	ug/kg	ND	*0.677*	0.412J	*0.756*	23.9	*0.655*	ND	0.596	ND	*0.545*		0	N/A
Cl6-BZ#128	ug/kg	ND	*0.677*	0.555J	*0.756*	6.48	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl6-BZ#138	ug/kg	ND	*0.677*	0.503J	*0.756*	24.6	*0.655*	ND	0.596	ND	*0.545*		0	N/A
Cl6-BZ#153	ug/kg	ND	*0.677*	ND	*0.756*	19.4	*0.655*	ND	0.596	ND	*0.545*		0	N/A
Cl7-BZ#170	ug/kg	ND	*0.677*	ND	*0.756*	4.79	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl7-BZ#180	ug/kg	ND	*0.677*	ND	*0.756*	6.24	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl7-BZ#183	ug/kg	ND	*0.677*	ND	*0.756*	1.85	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl7-BZ#184	ug/kg	ND	*0.677*	ND	*0.756*	ND	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl7-BZ#187	ug/kg	ND	*0.677*	ND	*0.756*	4.3	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl8-BZ#195	ug/kg	ND	*0.677*	ND	*0.756*	0.789	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl9-BZ#206	ug/kg	ND	*0.677*	0.413J	*0.756*	1.62	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Cl10-BZ#209	ug/kg	ND	*0.677*	0.572J	*0.756*	1.36	*0.655*	ND	0.596	ND	*0.545*		ND	N/A
Total	ug/kg	0	*0.677*	11.956	*0.756*	520.029	*0.655*	0	0.596	0	*0.545*		0	100
DIOXINS [3]														
Total TEQ	ng/kg	0.286		1.5		24.6		0.548		0.0329			N/A	4.5

[1] 6 NYCRR 361-3.9

[2] 6 NYCRR 375-6.8

[3] Technical Operational Guidance Series 5.1.9

DISCUSSION

There were no detectable concentrations of pesticides or volatiles (i.e., benzene, ethylbenzene, toluene, and xylenes) in the samples collected from the upper portion of the cores. There were no exceedances of the New York State reference values for metals, mercury, or semi-volatiles.

For the Hyde Park sample 1A, there was an exceedance of the reference value for two constituents:

- Total PCBs: 520 ug/kg compared to standard of 100 ug/kg.
- Toxic Equivalency (TEQ): 24.6 ng/kg compared to standard of 4.5 ng/kg.

While dioxin and PCBs have low toxicity standards, they are both hydrophobic and rarely dissolve into surface water. Therefore, the risk would not be to drinking water but rather elevated levels in sludge material. In addition, this water intake is a significant distance from the route (approximately 1,100 feet). The results of the pilot study, where a simulated intake was placed 160 feet from the jet plow trial, suggest that if elevated levels of total suspended solids occur it will be when the jet plow is operating in close proximity to the intake. CHPE LLC believes that they can work with Hyde Park to develop appropriate precautionary measures to ensure that the plant's sludge can be disposed of with no additional cost to the residents.

The sediment quality results for the sample along the pilot study route (HR 93) are largely comparable to those collected at the intake locations. It has been suggested that a soil sample should be collected at this same location and the upper four feet of the core be subjected to the same laboratory sampling. However, the laboratory results for HR 93 are based on the analysis of the four (4) to five (5) foot section of the core, as shown on the core log (see Appendix 2). Moreover, the laboratory results at the intakes suggest that the sediment quality is generally within regulatory standards, so any disturbance would not trigger any non-compliance issues.

A core sample was not obtained in the direct vicinity of the Port Ewan intake because the protocols called for collection along the route and the route as of the time of the study crossed the intake pipe. However, as shown in Table 4, the laboratory results for the Port Ewan 2A, 3A, 4A and 5A samples show similar values and there are no exceedances of the New York standards recommended by the Hudson 7. Therefore, there is no reason to assume that a core sample collected directly in the vicinity of the Port Ewan intake would produce different results.

CONCLUSION

A sediment sampling study was completed near five municipal drinking water intakes in the Hudson River, based on a protocol developed in consultation with the Hudson 7. The laboratory results from this sampling were compared with certain New York State standards, even if those standards should be considered conservative. The results showed that, with the exception of two constituents at one intake, there were no exceedances of these metrics. The nature of the two exceptions, as well as the current distance between the installation route and the associated intake, suggest that there will be no compliance issues.

TABLE 4. COMPARISONS OF PORT EWAN LABORATORY RESULTS												
		Port Ewan 2A		Port Ewan 3A		Port Ewan 4A		Port Ewen 5A			HR 93	NY
		Result	RDL	Result	RDL	Result	RDL	Result	RDL		Results	Standards
METALS / MERCURY[1]												
Arsenic, Total	mg/kg	6.7	2.9	9.8	3.1	13	3.3	15.7	3.0		5.3	41
Cadmium, Total	mg/kg	0.30J	0.72	0.31J	0.78	0.36J	0.82	0.58J	0.76		0.367	10
Copper, Total	mg/kg	18.8	2.9	19.5	3.1	24.7	3.3	40.2	3.0		15.6	1,500
Lead, Total	mg/kg	24	2.9	27.9	2.1	35.9	3.3	57.1	3.0		13.5	300
Mercury, Total	mg/kg	0.096	0.77	0.24	0.73	0.036	0.084	0.42	0.074		0.077	10
PESTICIDES [2]												
4,4'-DDD	ug/kg	ND	13.1	ND	13.5	ND	13.4	ND	14.3		ND	3.3
4,4'-DDE	ug/kg	ND	13.1	ND	13.5	ND	13.4	ND	14.3		ND	3.3
4,4'-DDT	ug/kg	ND	13.1	ND	13.5	ND	13.4	ND	14.3		ND	3.3
Chlordane	ug/kg	ND	270	ND	278	ND	276	ND	295		N/A	N/A
Dieldrin	ug/kg	ND	13.1	ND	13.5	ND	13.4	ND	14.3		ND	5
Mirex	ug/kg	ND	13.1	ND	13.5	ND	13.4	ND	14.3		N/A	N/A
SEMI-VOLATILES [2]												
Acenaphthene	ug/kg	ND	79.1	ND	27.9	ND	75.0	ND	78.1		ND	20000
Acenaphthylene	ug/kg	ND	79.1	ND	27.9	26.2J	75.0	53.3J	78.1		ND	100000
Anthracene	ug/kg	ND	79.1	ND	27.9	44.9J	75.0	99.3	78.1		ND	100000
Benzo(a)anthracene	ug/kg	30.8J	79.1	59.1J	27.9	154	75.0	205	78.1		0	1000
Benzo(a)pyrene	ug/kg	ND	79.1	65.9J	27.9	203	75.0	302	78.1		0	1000
Benzo(b)fluoranthene	ug/kg	ND	79.1	36.5J	27.9	136	75.0	170	78.1		N/A	1000
Benzo(g,h,i)perylene	ug/kg	ND	79.1	45.2J	27.9	123	75.0	187	78.1		N/A	100000
Benzo(k)fluoranthene	ug/kg	ND	79.1	43.8J	27.9	101	75.0	166	78.1		N/A	800
Chrysene	ug/kg	ND	79.1	56.8J	27.9	155	75.0	243	78.1		0	1000
Dibenzo(a,h)anthracene	ug/kg	ND	79.1	ND	27.9	26.1J	75.0	49.3J	78.1		ND	330
Fluoranthene	ug/kg	40.9J	79.1	87.4	27.9	192	75.0	244	78.1		0	10000
Fluorene	ug/kg	ND	79.1	ND	27.9	ND	75.0	44.9J	78.1		ND	30000
Indeno(1,2,3-cd)pyrene	ug/kg	ND	79.1	40.7J	27.9	124	75.0	173	78.1		N/A	500
Naphthalene	ug/kg	ND	79.1	ND	27.9	ND	75.0	54.1J	78.1		ND	12000
Phenanthrene	ug/kg	ND	79.1	60.1J	27.9	ND	75.0	216	78.1		0	100000
Pyrene	ug/kg	44.9J	79.1	101	27.9	249	75.0	325	78.1		0	100000

[1] 6 NYCRR 361-3.9

[2] 6 NYCRR 375-6.8

[3] Technical Operational Guidance Series 5.1.9

		Port Ewan 2A		Port Ewen 3A		Port Ewen 4A		Port Ewen 5A			HR 93	NY
		Result	RDL	Result	RDL	Result	RDL	Result	RDL		Results	Standards
VOLATILES [2]												
Benzene	ug/kg	ND	2.6	ND	2.6	ND	4.2	ND	2.6		N/A	60
Ethylbenzene	ug/kg	ND	2.6	ND	2.6	ND	4.2	ND	2.6		N/A	1000
Toluene	ug/kg	ND	2.6	ND	2.6	ND	4.2	ND	2.6		N/A	700
Total Xylenes	ug/kg	ND	7.8	ND	7.8	ND	12.5	ND	7.7		N/A	260
PCBS [2]												
Cl2-BZ#8	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl3-BZ#18	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl3-BZ#28	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl4-BZ#44	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl4-BZ#49	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl4-BZ#52	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl4-BZ#66	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl5-BZ#87	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl5-BZ#101	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl5-BZ#105	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl5-BZ#118	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl6-BZ#128	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl6-BZ#138	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl6-BZ#153	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		0	N/A
Cl7-BZ#170	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl7-BZ#180	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl7-BZ#183	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl7-BZ#184	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl7-BZ#187	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl8-BZ#195	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl9-BZ#206	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Cl10-BZ#209	ug/kg	ND	0.602	ND	0.596	ND	0.627	ND	0.631		ND	N/A
Total	ug/kg	0	0.602	0	0.596	0	0.627	0	0.631		ND	100
DIOXINS [3]												
Total TEQ	ng/kg	0.336		0.548		1.06		0.695			N/A	4.5

[1] 6 NYCRR 361-3.9

[2] 6 NYCRR 375-6.8

[3] Technical Operational Guidance Series 5.1.9

APPENDIX 1

LABORATORY RESULTS

APPENDIX 2

2010 STUDY SAMPLE (HR93)
CORE LOG

DRILLING LOG	DIVISION	INSTALLATION Hudson River Section	SHEET 1 OF 1 SHEETS

1. PROJECT Champlain Hudson Power Express	10. SIZE AND TYPE OF BIT 3.5 Inch
2. LOCATION (Coordinates or Station) N 15,096,303.7 E 1,921,806.1	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*
3. DRILLING AGENCY Alpine Ocean Seismic Survey, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL Vibracore
4. HOLE NO. *(As shown on drawing title and file number)* HR-93	13. TOTAL NO. OF SAMPLES TAKEN; INTERVAL; COMPOSITE
5. NAME OF DRILLER R. Parkinson	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE STARTED 4/22/2010 COMPLETED 4/22/2010
7. PENETRATION (ft) 9.9	17. ELEVATION TOP OF HOLE
8. RECOVERY (ft) 10.2	18. TOTAL CORE RECOVERY FOR BORING 103 %
9. TOTAL CORE RECOVERY (%) 103.0	19. GEOLOGIST C. Dill

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	Sample No. Depth Interval, ft. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
	0.0 – 4.0		Dark gray to brown very soft wet Silt Torvane @ 1' 0.04 kg/cm^2 Torvane @ 2' 0.04 kg/cm^2 Torvane @ 3' 0.05 kg/cm^2 Torvane @ 3.5' 0.05 kg/cm^2			
	4.0 – 5.0		Section sent for Geotechnical lab analysis			
	5.0 – 10.2		Dark gray to brown very soft wet Silt, with a few lamina (<0.078") of very fine Sand Torvane @ 5.5' 0.08 kg/cm^2 Torvane @ 6.5' 0.07 kg/cm^2 Torvane @ 7.5' 0.06 kg/cm^2 Torvane @ 8.5' 0.06 kg/cm^2 Torvane @ 9.5' 0.08 kg/cm^2			