



Surveillance Network Program Report Hay River Harbour Remediation Project August 2024

Date: September 23, 2024
To: MVLWB
From: Jamie Young, Outcome Consultants Inc,
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This Surveillance Network Program (SNP) Report for August 2024 is being submitted in accordance with the requirements of the Type B Water Licence MV2023L8-0005 issued to the Government of the Northwest Territories – Department of Infrastructure for the Hay River Harbour Remediation Project.

Summary of Activities in August 2024

Dredging activities were conducted from August 1st through August 10th. Over that period, sediment was dredged from the fingers of Hay River (Area B/ Area C) and was placed in the Sediment Deposit Areas 1, 3 and 6. The dredgate from Area B and Area C was found to be a mixture of fine and coarse-grained material ranging from sandy loam to loam. Area B dredgate was found to be highly saturated and required containment. Stacking of Area B and Area C dredgate was not possible.

Activities completed in Sediment Deposit Areas were as follows:

Sediment Deposit Area 1 was used to stockpile Area B Dredgate. An approximately 5m wide sliver was left unfilled from previous dredgate stockpiling activities. The area was pumped of any water and filled with dredgate from Area B/ Area C.

Sediment Deposit Area 3 has five monitoring wells. Area B/ Area C dredgate was stored in the northern and southern extents of the site. The entirety of the stockpile was levelled following the completion of dredgate offloading.

Sediment Deposit Area 6 was used to stockpile Area B/ Area C Dredgate. No pumping or levelling was required in this area following completing the placement of dredgate.

Due to the fine-grained nature of dredgate material from Area B/ Area C, the material remained highly saturated following the completion of stockpiling activities. Generally speaking, the material was not free draining, shaping sumps was either difficult or not possible, and minimal free-standing water was observed.

The following information is provided as required in Schedule 1 of the Water Licence.

A Tabular Summaries of all data and information generated under the SNP for the month being reported

The results of water samples from dredgate from Areas A and B have been compared to the CCME Water Quality Guideline Protection Freshwater Aquatic Life (short and long-term exposure criteria), and are attached in Appendix A.

Water samples were collected in the Sediment Deposit Areas on the dates indicated in the table below. If no sample was collected on a given date, there was no water available to sample.

Date	Sediment Deposit Area						
	1	2	3	4	5	6	7
August 7	✓	✓					

A summary of the interpretation of water analytical results in Sediment Deposit Area is as follows:

Sediment Deposit Area 1 had the following exceedances:

2024/08/07

- Total Manganese (concentration 0.54 mg/L compared to 0.26 mg/L for short-term exposure)
- Total Arsenic (concentration 0.0087 mg/L compared to 0.005 mg/L for long-term exposure)
- Total Iron (concentration 7.2 mg/L compared to 0.3 mg/L for long-term exposure)

- Total Manganese (concentration 0.72 mg/L compared to 0.26 mg/L for short-term exposure)
- Total Selenium (concentration 0.0012 compared to 0.001 for long-term exposure)

Sediment Deposit Area 2 had the following exceedances:

2024/08/07

- Total Iron (concentration 0.76 mg/L compared to 0.3 mg/L for long-term exposure)

The coordinates of all SNP sites

Sump location in Sediment Deposit Area 2

- 568780.49m E
- 6747431.30m N

Sump location in Sediment Deposit Area 3

- 568633.987m E
- 6747424.537m N

Sump location in Sediment Deposit Area 4

- 568802.965m E
- 6746846.413m N

Sump location in Sediment Deposit Area 5

- 568810.002m E
- 6747306.394m N

Sump location in Sediment Deposit Area 7

- 568263.20m E
- 6747670.84m N

Water samples from the remaining areas was collected from the point it naturally accumulated due to lack of ability to form sumps.

D A tabular summary of cumulative water use

There was no water used.

E Tabular summaries of all data and information generated under the Supplementary Measurement Requirements referred to in Part C

There were no supplementary measurements referred to in Part C of the Water Licence.

Appendix A

Interpreted Analytica Data from Sumps

Emergency Dredging Project, Hay River, NT
Water Quality Monitoring



Bureau Veritas Job Number: C458310
Report Date: 2024/08/12

OUTCOME CONSULTANTS INC.
Client Project #: 2024 HREDP

				CCME Water Quality Guideline Protection Freshwater Aquatic Life	
				Short-Term Exposure	Long-Term Exposure
Bureau Veritas ID		CSX124	CSX125		
Sampling Date		2024/08/07 07:45	2024/08/07 07:51		
COC Number		1/1	1/1		
	UNITS	HR24-SP03-(08-07)-SV01	HR24-SP02-(08-07)-SV02		
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10		
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	0.11		
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	<0.20		
Volatiles					
Benzene	ug/L	<0.40	<0.40		370
Toluene	ug/L	<0.40	<0.40		2
Ethylbenzene	ug/L	<0.40	<0.40		90
m & p-Xylene	ug/L	<0.80	<0.80		
o-Xylene	ug/L	<0.40	<0.40		
Xylenes (Total)	ug/L	<0.89	<0.89		
F1 (C6-C10) - BTEX	ug/L	<100	<100		
F1 (C6-C10)	ug/L	<100	<100		
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	106	108		
4-Bromofluorobenzene (sur.)	%	104	104		
D4-1,2-Dichloroethane (sur.)	%	102	102		
O-TERPHENYL (sur.)	%	96	94		
Calculated Parameters					
Anion Sum	meq/L	15	7.8		
Cation Sum	meq/L	15	8.5		
Hardness (CaCO3)	mg/L	680	360		
Ion Balance (% Difference)	%	2.3	3.9		
Nitrate (N)	mg/L	0.88	0.95	550	13
Nitrate (NO3)	mg/L	3.9	4.2		
Nitrite (NO2)	mg/L	0.22	1.7		
Elements					
Dissolved Cadmium (Cd)	ug/L	0.025	<0.020		
Misc. Inorganics					
Conductivity	uS/cm	1300	790		
pH	pH	8.37	7.61		6.5 to 9.0
Anions					
Alkalinity (PP as CaCO3)	mg/L	21	<1.0		
Alkalinity (Total as CaCO3)	mg/L	550	89		
Bicarbonate (HCO3)	mg/L	620	110		
Carbonate (CO3)	mg/L	25	<1.0		
Hydroxide (OH)	mg/L	<1.0	<1.0		
Chloride (Cl)	mg/L	20	45	640	120
Sulphate (SO4)	mg/L	160	230		
Nutrients					
Nitrite (N)	mg/L	0.068	0.52		
Nitrate plus Nitrite (N)	mg/L	0.95	1.5		
Dissolved Metals (Lab Filtered Elements)					
Dissolved Aluminum (Al)	mg/L	0.0056	0.015		5
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060		

Emergency Dredging Project, Hay River, NT
Water Quality Monitoring

					Short-Term Exposure	Long-Term Exposure
Dissolved Arsenic (As)	mg/L	0.0023	0.0012			5
Dissolved Barium (Ba)	mg/L	0.21	0.12			
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010			
Dissolved Boron (B)	mg/L	0.099	0.11		29	1.5
Dissolved Calcium (Ca)	mg/L	180	91			
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010			
Dissolved Cobalt (Co)	mg/L	0.0022	0.00064			
Dissolved Copper (Cu)	mg/L	0.0030	0.0027			2.57
Dissolved Iron (Fe)	mg/L	0.61	0.095			300
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020			0.004
Dissolved Lithium (Li)	mg/L	0.036	0.025			
Dissolved Magnesium (Mg)	mg/L	55	32			
Dissolved Manganese (Mn)	mg/L	0.54	0.0092		0.26	
Dissolved Molybdenum (Mo)	mg/L	0.015	0.0091			73
Dissolved Nickel (Ni)	mg/L	0.0076	0.0038			0.1
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10			
Dissolved Potassium (K)	mg/L	11	7.5			
Dissolved Selenium (Se)	mg/L	0.00097	0.00067			1
Dissolved Silicon (Si)	mg/L	7.5	0.66			
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010			0.25
Dissolved Sodium (Na)	mg/L	36	26			
Dissolved Strontium (Sr)	mg/L	0.54	0.32			
Dissolved Sulphur (S)	mg/L	55	80			
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020			0.8
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010			
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010			
Dissolved Uranium (U)	mg/L	0.0072	0.0034		33	15
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010			
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030		equation(1)	equation(1)
Bureau Veritas ID		CSX124	CSX125			
Sampling Date		2024/08/07 07:45	2024/08/07 07:51			
COC Number		1/1	1/1			
	UNITS	HR24-SP03-(08-07)-SV01	HR24-SP02-(08-07)-SV02			
Total Metals						
Total Cadmium (Cd)	ug/L	0.13	0.036		7.7	0.37
Total Aluminum (Al)	mg/L	0.37	0.24			5
Total Antimony (Sb)	mg/L	<0.00060	0.00072			
Total Arsenic (As)	mg/L	0.0087	0.0019			0.005
Total Barium (Ba)	mg/L	0.24	0.11			
Total Beryllium (Be)	mg/L	<0.0010	<0.0010			
Total Boron (B)	mg/L	0.10	0.10		29	1.5
Total Calcium (Ca)	mg/L	170	76			
Total Chromium (Cr)	mg/L	<0.0010	<0.0010			
Total Cobalt (Co)	mg/L	0.0034	0.0012			
Total Copper (Cu)	mg/L	0.0052	0.0053			2.57
Total Iron (Fe)	mg/L	7.2	0.76			0.3
Total Lead (Pb)	mg/L	0.0022	0.00085			0.004
Total Lithium (Li)	mg/L	0.035	0.022			
Total Magnesium (Mg)	mg/L	51	27			
Total Manganese (Mn)	mg/L	0.72	0.12		0.26	
Total Molybdenum (Mo)	mg/L	0.013	0.0098			0.073
Total Nickel (Ni)	mg/L	0.011	0.0058			0.1
Total Phosphorus (P)	mg/L	0.15	0.19			
Total Potassium (K)	mg/L	11	6.4			
Total Selenium (Se)	mg/L	0.0012	0.00072			0.001
Total Silicon (Si)	mg/L	8.9	1.4			
Total Silver (Ag)	mg/L	<0.00010	<0.00010			0.00025
Total Sodium (Na)	mg/L	33	22			
Total Strontium (Sr)	mg/L	0.53	0.28			
Total Sulphur (S)	mg/L	51	72			
Total Thallium (Tl)	mg/L	<0.00020	<0.00020			0.0008
Total Tin (Sn)	mg/L	<0.0010	<0.0010			

Emergency Dredging Project, Hay River, NT
Water Quality Monitoring

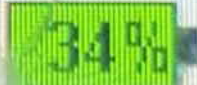
					Short-Term Exposure	Long-Term Exposure
Total Titanium (Ti)	mg/L	0.012	0.0033			
Total Uranium (U)	mg/L	0.0077	0.0039		0.033	0.015
Total Vanadium (V)	mg/L	0.0035	0.0012			
Total Zinc (Zn)	mg/L	0.037	0.089		equation(1)	equation(1)
Bureau Veritas ID		CSX124	CSX125			
Sampling Date		2024/08/07 07:45	2024/08/07 07:51			
COC Number		1/1	1/1			
	UNITS	HR24-SP03-(08-07)-SV01	HR24-SP02-(08-07)-SV02			
Misc. Inorganics						
Total Dissolved Solids	mg/L	830	530			
Total Suspended Solids	mg/L	110	29			

(1) Exceedance for CCME WQL PAL

Appendix B

Calibration Information from Field Multimeter

24/07/24 17:35:36



View Cal Record

Calibrate Turbidity

Date: [YY/MM/DD] 24/06/01

Time: 10:07:30

Sensor Type: Turbidity

Sensor: 22B101196

Sw Version: 3.0.5

Cal Value: 0.00 FNU

Pre Cal Value: 30.59 FNU

Sensor Value: 0.77 RTU

Temperature: 14.3 Ref °C

Calibrate Status: Calibration
Aborted!