

# Real-Time Water Quality Deployment Report

## Paddy's Pond at Outlet

September 8, 2021 to November 3, 2021



Government of Newfoundland & Labrador  
Department of Environment and Climate Change  
Water Resources Management Division  
St. John's, NL, A1B 4J6 Canada

## CONTENTS

<b>GENERAL .....</b>	<b>3</b>
<b>MAINTENANCE AND CALIBRATION OF INSTRUMENT .....</b>	<b>3</b>
<b>DATA INTERPRETATION.....</b>	<b>6</b>
WATER TEMPERATURE.....	6
PH .....	8
SPECIFIC CONDUCTIVITY .....	9
DISSOLVED OXYGEN .....	11
TURBIDITY .....	13
<b>APPENDIX A : MEAN DAILY TEMPERATURE AND TOTAL PRECIPITATION .....</b>	<b>15</b>
<b>APPENDIX B : QA/QC GRAB SAMPLE FIELD RESULTS .....</b>	<b>17</b>

## General

The Department of Environment and Climate Change, Water Resources Management Division's staff currently monitor water quality in real-time at a station on Paddy's Pond near the outlet to Three Arm Pond (47.488129N, 52.893809W – Figure 1) .



Figure 1: Paddy's Pond at Outlet Real-Time Water Quality Station location

## Maintenance and Calibration of Instrument

As part of the Quality Assurance and Quality Control protocol (QAQC), an assessment of the reliability of data recorded by an instrument is made at the beginning and end of the deployment period. The procedure is based on the approach used by the United States Geological Survey.

Upon deployment, a QA/QC Sonde is temporarily deployed *in situ*, adjacent to the Field Sonde. Depending on the degree of difference between each parameter from the Field and QAQC sondes a qualitative rank is assigned (See Table 1). The possible ranks, from most to least desirable, are: Excellent, Good, Fair, Marginal, and Poor. A grab sample is also taken for additional confirmation of conditions at deployment and to allow for future modelling studies.

**Table 1: Ranking classifications for deployment and removal**

Parameter	Rank				
	Excellent	Good	Fair	Marginal	Poor
Temperature (°C)	<=+/-0.2	>+/-0.2 to 0.5	>+/-0.5 to 0.8	>+/-0.8 to 1	<+/-1
pH (unit)	<=+/-0.2	>+/-0.2 to 0.5	>+/-0.5 to 0.8	>+/-0.8 to 1	>+/-1
Sp. Conductance (µS/cm)	<=+/-3	>+/-3 to 10	>+/-10 to 15	>+/-15 to 20	>+/-20
Sp. Conductance > 35 µS/cm (%)	<=+/-3	>+/-3 to 10	>+/-10 to 15	>+/-15 to 20	>+/-20
Dissolved Oxygen (mg/L) (% Sat)	<=+/-0.3	>+/-0.3 to 0.5	>+/-0.5 to 0.8	>+/-0.8 to 1	>+/-1
Turbidity <40 NTU (NTU)	<=+/-2	>+/-2 to 5	>+/-5 to 8	>+/-8 to 10	>+/-10
Turbidity > 40 NTU (%)	<=+/-5	>+/-5 to 10	>+/-10 to 15	>+/-15 to 20	>+/-20

At the end of a deployment period, a freshly cleaned and calibrated QA/QC Sonde is again placed *in situ*, adjacent to the Field Sonde and values are again compared to determine how well the instrument performed during deployment and whether there is any indication of sensor drift or fouling.

Deployment and removal comparison rankings for the station at Paddy's Pond deployed between Sept. 8, 2021 and Nov. 3, 2021 are summarized in Table 2.

**Table 2: Qualitative QA/QC comparison rankings for Paddy's Pond at outlet station Sept. 8, 2021 through Nov. 3, 2021.**

Station	Date	Action	Comparison Ranking				
			Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Paddy's Pond at Outlet	2021-09-08	Deployment	Excellent	Good	Excellent	Excellent	Excellent
	2021-11-03	Removal	Fair	Fair	Poor	Excellent	Excellent
	2021-09-08	Grab Sample #1841	N/A	Fair	Good	N/A	Good

- On September 8, 2021, a real-time water quality monitoring instrument was deployed at the station Paddy's Pond at Outlet. The instrument was deployed for a period of 57 days and was removed on November 3, 2021.
- Upon deployment, all sensors ranked 'Excellent' and 'Good'.
- At removal of the instrument, parameter rankings were 'Excellent' and 'Fair', with the exception of conductivity which ranked 'Poor' against the QA/QC sonde after the deployment period. The measured water temperature value for the QA/QC sonde was higher (8.11°C) than that of the field sonde (7.55°C) at the time of removal. As specific conductivity is influenced by temperature, this is most likely the cause for the lower ranking and could be the result of insufficient time given for the QA/QC sonde to acclimate to water conditions.

- Other potential causes for less than desirable QA/QC rankings to be obtained include: the placement of the QA/QC sonde in relation to the field sonde and deteriorating performance of one of the sensors.

## **DATA INTERPRETATION**

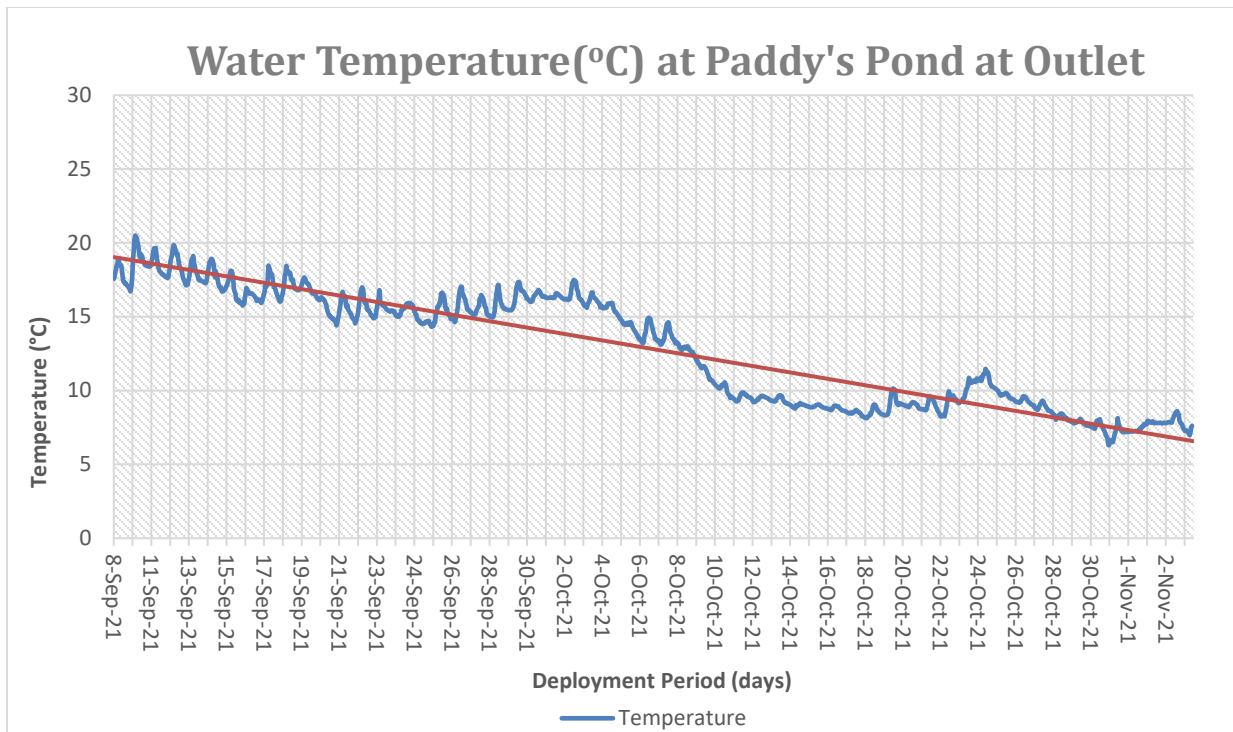
The following graphs and discussion illustrate water quality data obtained hourly from September 9, 2021 through November 3, 2021 at Paddy's Pond at outlet to Three Arm Pond, St. John's, NL.

Stage is not monitored at this station and as such cannot be discussed with respect to other monitored water quality parameters. All data used in the preparation of the graphs and subsequent discussion adhere to WRMD QA/QC protocol.

Mean daily temperature and total precipitation data were obtained from the St. John's West ECCC historical weather data at [https://climate.weather.gc.ca/historical\\_data/search\\_historic\\_data\\_e.html](https://climate.weather.gc.ca/historical_data/search_historic_data_e.html) and can be found illustrated in Appendix A. Gaps in available daily data were removed for graphing purposes.

### Water Temperature

- Water Temperature is a major factor used to describe water quality. Temperature has major implications on both the ecology and chemistry of a water body, governing processes such as the metabolic rate of aquatic plants and animals and the degree of dissolved oxygen saturation.
- It should be noted that the temperature sensor on any sonde is the most important. All other parameters can be broken down into three groups: temperature dependent, temperature compensated and temperature independent. Because the temperature sensor is not isolated from the rest of the sonde the entire sonde must be at the same temperature before the sensor will stabilize. The values may take some time to climb to the appropriate reading; if a reading is taken too soon it may not accurately portray the water body.



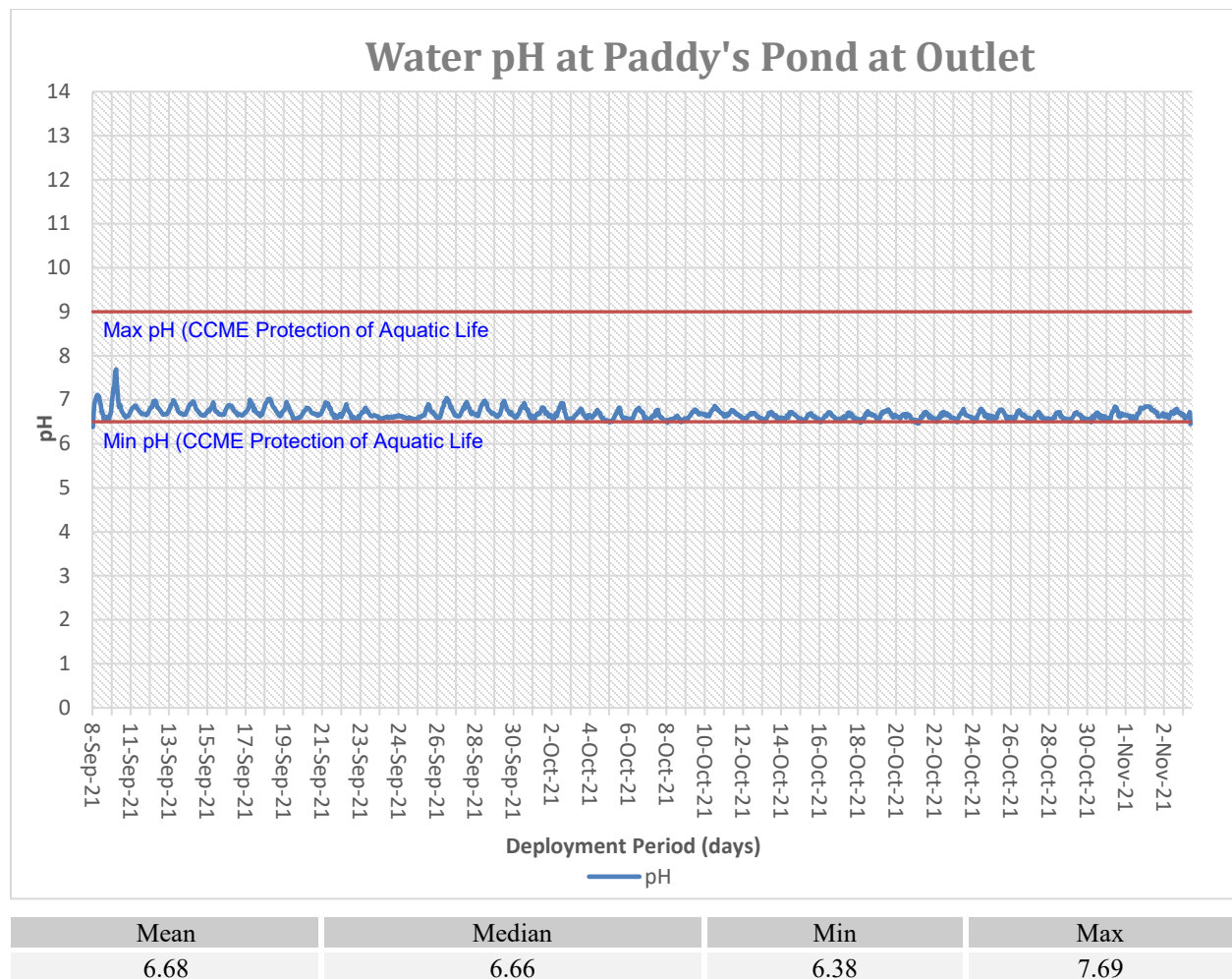
Mean	Median	Min	Max
12.81	13.78	6.30	20.50

**Figure 2: Water temperature (°C) values at Paddy's Pond at Outlet**

- Over the 57-day deployment period, water temperature decreased in correlation with natural seasonal air temperatures (Figure 2). Water temperature trended downward continuously over the deployment period. Maximum water temperature of 20.5 °C decreased to a minimum temperature of 6.30°C observed in late October.
- The mean temperature was 12.81°C with a median temperature of 13.78°C.
- A slight increase in water temperature is observed in late October, which correlates to an increase in air temperature from mid to late October (See Figure 6 in Appendix 1). The water temperature trend then continued to decrease naturally into the fall season.
- A natural diurnal temperature pattern with temperatures increasing during the day and decreasing overnight was observed.

pH

- pH is used to give an indication of the acidity or basicity of a solution. A pH of seven (7) denotes a neutral solution while lower values are acidic and higher values are basic. Technically, the pH of a solution indicates the availability of protons to react with molecules dissolved in water. Such reactions can affect how molecules function chemically and metabolically.



**Figure 3: pH (pH units) at Paddy's Pond at outlet from June 9, 2021 through July 6, 2021.**

- Throughout the deployment period, pH values ranged from 6.38 to 7.69 pH units, with a mean unit value of 6.68 and median of 6.66 units (Figure 3).
- The CCME guideline for the protection of aquatic life states the requirement of a minimum pH value of 6.5 and max value of 9.0. This guideline provides a basis for the overall health of the waterbody. Paddy's Pond at Outlet pH values remained within the guidelines with a few exceptions over the deployment where values decreased slightly below from 6.38 to 6.49

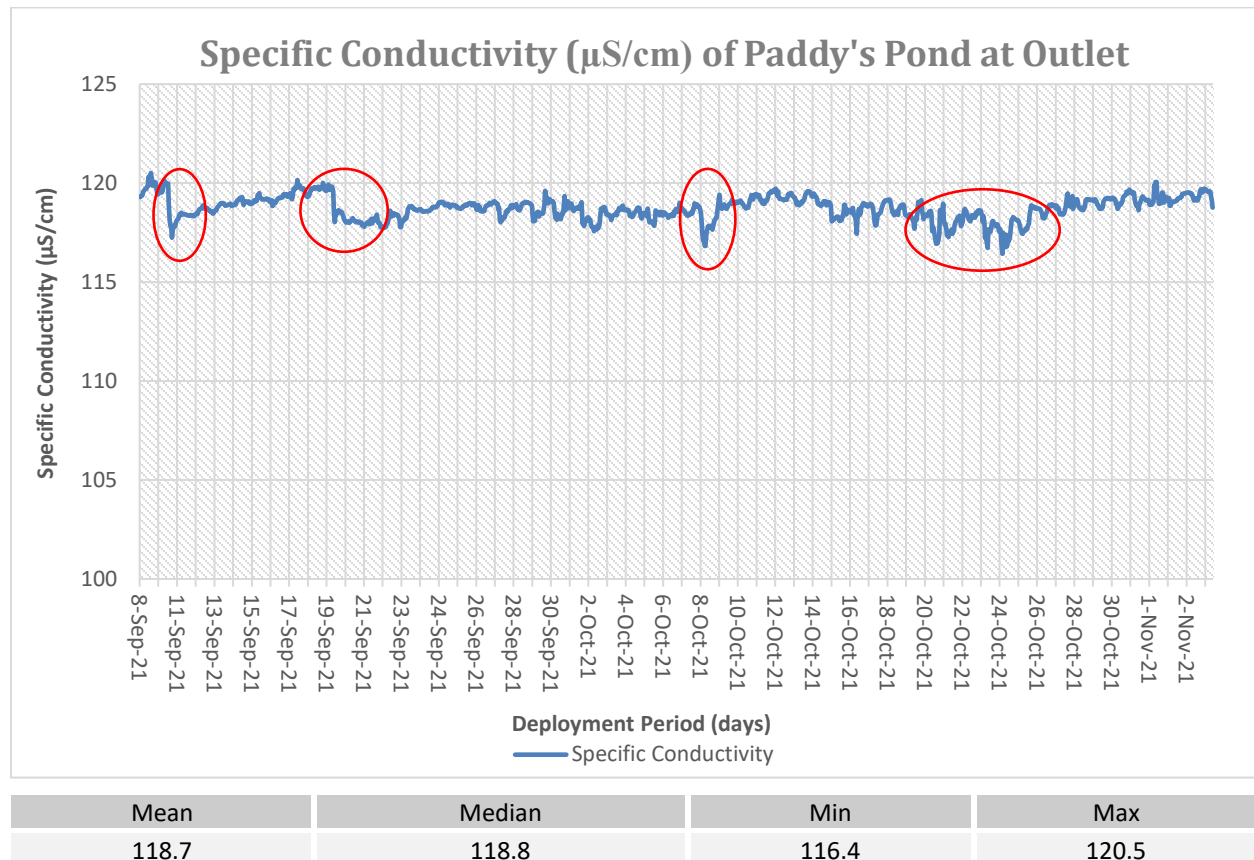


units. This may be the result of a decrease in temperature and precipitation events the days before.

- pH values are temperature dependant as well as influenced by photosynthesis and respiration by aquatic organisms. The concentration of dissolved carbon dioxide in the water throughout the day, especially overnight when oxygen production is reduced relative to carbon dioxide levels. Carbon dioxide dissolved in water yields a slightly acidic solution.
- Diurnal variation was most visible from September though the beginning of October. The magnitude of variation from the beginning of October throughout the remainder of the deployment period decreased in correlation to the lowering water/air temperatures and the length of days.

### Specific Conductivity

- Conductivity relates to the ease of passing an electric charge – or resistance – through a solution. Conductivity is highly influenced by the concentration of dissolved ions in solution: distilled water has zero conductivity (infinite resistance) while salty solutions have high conductivity (low resistance). Specific Conductivity is corrected to 25°C to allow comparison across variable temperatures.

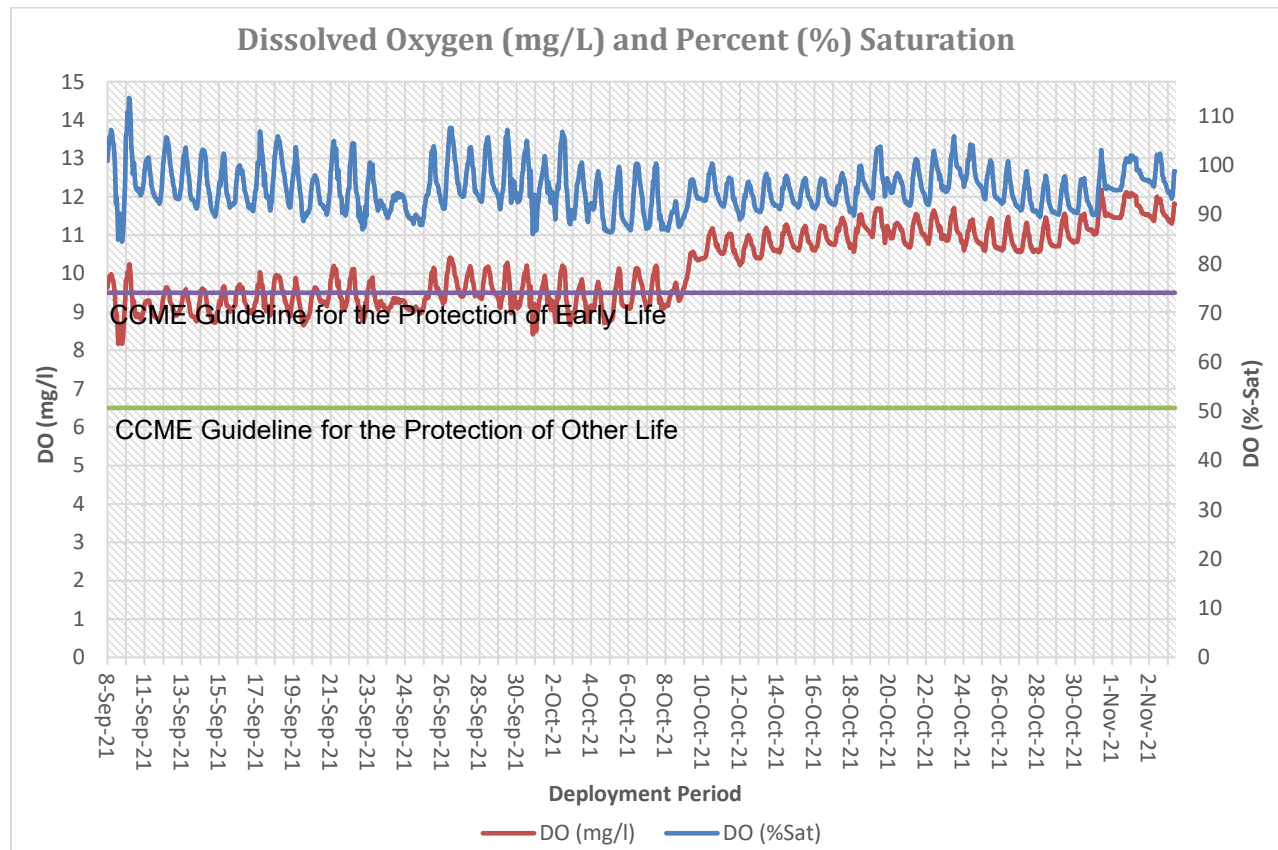


**Figure 4: Specific conductivity (µS/cm) values at Paddy's Pond at Outlet.**

- Specific Conductivity levels were stable throughout the deployment period and within 116.4 µS/cm and 120.5 µS/cm (Figure 4). Mean conductivity was 118.7 µS/cm with a median conductivity value of 118.8 µS/cm. Given the isolated station location, sources of disturbances that may affect conductivity are considered minimal.
- Slight decreases in specific conductivity (identified in red in Figure 4) throughout the deployment period are likely the result of precipitation events (Figure 6 – Appendix 1). This can be expected after rainfall: as the amount of water increases, solids concentration is reduced, decreasing conductivity.

### Dissolved Oxygen

- Dissolved oxygen is a metabolic requirement of aquatic plants and animals. The concentration of oxygen in water depends on many factors, especially temperature – the saturation of oxygen in water is inversely proportional to water temperature. Oxygen concentrations also tend to be higher in flowing water compared to still, lake environments. Low oxygen concentrations can give an indication of excessive decomposition of organic matter or the presence of oxidizing materials.



Parameter	Mean	Median	Min	Max
DO (mg/L)	10.14	10.02	8.17	12.18
DO ( % Sat)	95.3	94.8	84.5	113.7

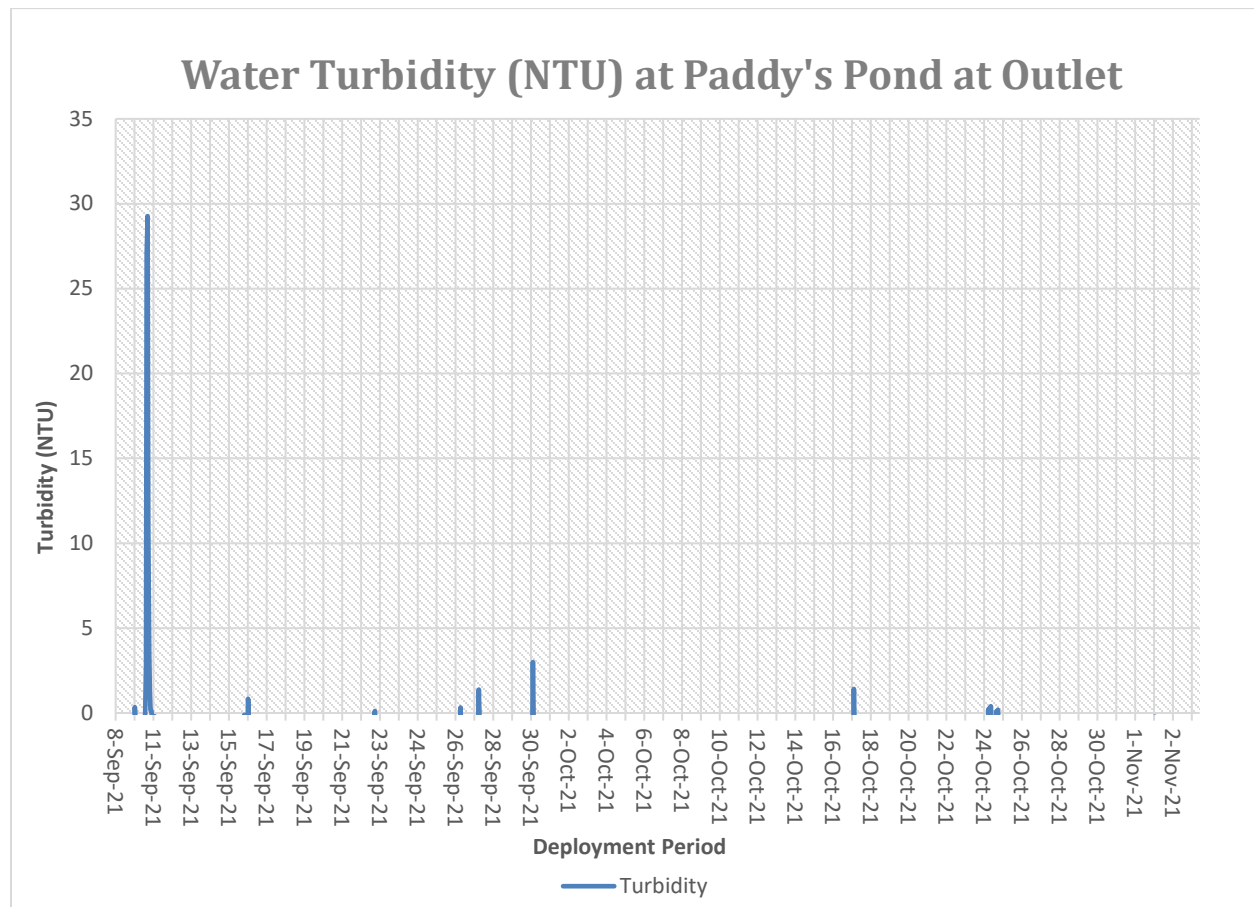
Figure 5: Dissolved Oxygen (mg/L & Percent (%) Saturation) values at Paddy's Pond at Outlet.

- With less variable water temperatures, dissolved oxygen concentrations remained stable from September 8, 2021 through the beginning of October. The saturation of dissolved oxygen (%DO) ranged from 84.5 mg/L to 113.7 mg/L, with a mean %DO of 95.3. A range of 8.17 mg/L to 12.18 mg/L was observed for the concentration of dissolved oxygen with a mean of 10.14 mg/L and median of 10.02 mg/L.

- A considerable increase in dissolved oxygen was observed after October 9, 2021 and is correlated with a significant decrease in water temperature at this time (Figure 2). This is considered a natural occurrence as the transition into late fall/winter season begin.
- DO concentrations were predominantly near and above the 9.5 mg/l guideline for the protection of early life stage cold water biota (indicated in purple in Figure 5).
- All values were above the minimum CCME Guideline for the Protection of Other Life Stages of 6.5 mg/l (indicated in green in Figure 5).
- Diurnal variation was most visible from September through the beginning of October. The magnitude of variation from the beginning of October throughout the remainder of the deployment period decreased in correlation to the lowering water/air temperatures and the length of days.

### Turbidity

- Turbidity is typically caused by fine suspended solids such as silt, clay, or organic material. Consistently high levels of turbidity tend to block sunlight penetration into a waterbody, discouraging plant growth. High turbidity can also damage the delicate respiratory organs of aquatic animals and cover spawning areas.



Mean	Median	Min	Max
-1.5	-1.6	-3.7	29.3

**Figure 6: Water turbidity (NTU) values at Paddy's Pond at Outlet during deployment period Sept. 8, 2021 through Nov. 3, 2021.**

- Turbidity values range from -3.7 NTU to 29.3 NTU, with a mean of -1.5 and a median value of -1.6 NTU as seen above. Turbidity measurements over the majority of the deployment period indicated negative turbidity values. This situation is most likely to happen when measuring low-level turbidity. Natural variations in all measurements, instrument and non-instrument related, can lead to a negative result. Some other turbidimeters are designed to round up a negative number to 0.00 NTU, since a result of less than 0.00 NTU is theoretically impossible. However, in practice, these results are actually quite meaningful. The problem could be operator technique

or sonde error. It could also indicate a problem with the low turbidity/turbidity-free water used for a blank or a problem with the calibration. If the meter rounds the negative result to 0.00 NTU, the user will not be alerted to a potential problem.

- Turbidity levels were generally low during this deployment period, however events above baseline level as seen on September 11<sup>th</sup> and 30<sup>th</sup> correlated with precipitation at that time, which likely suspended sediments into the water column. Other events may be influenced by debris, suspended algae and siltation due to wave action.

**APPENDIX A : MEAN DAILY TEMPERATURE AND TOTAL PRECIPITATION**

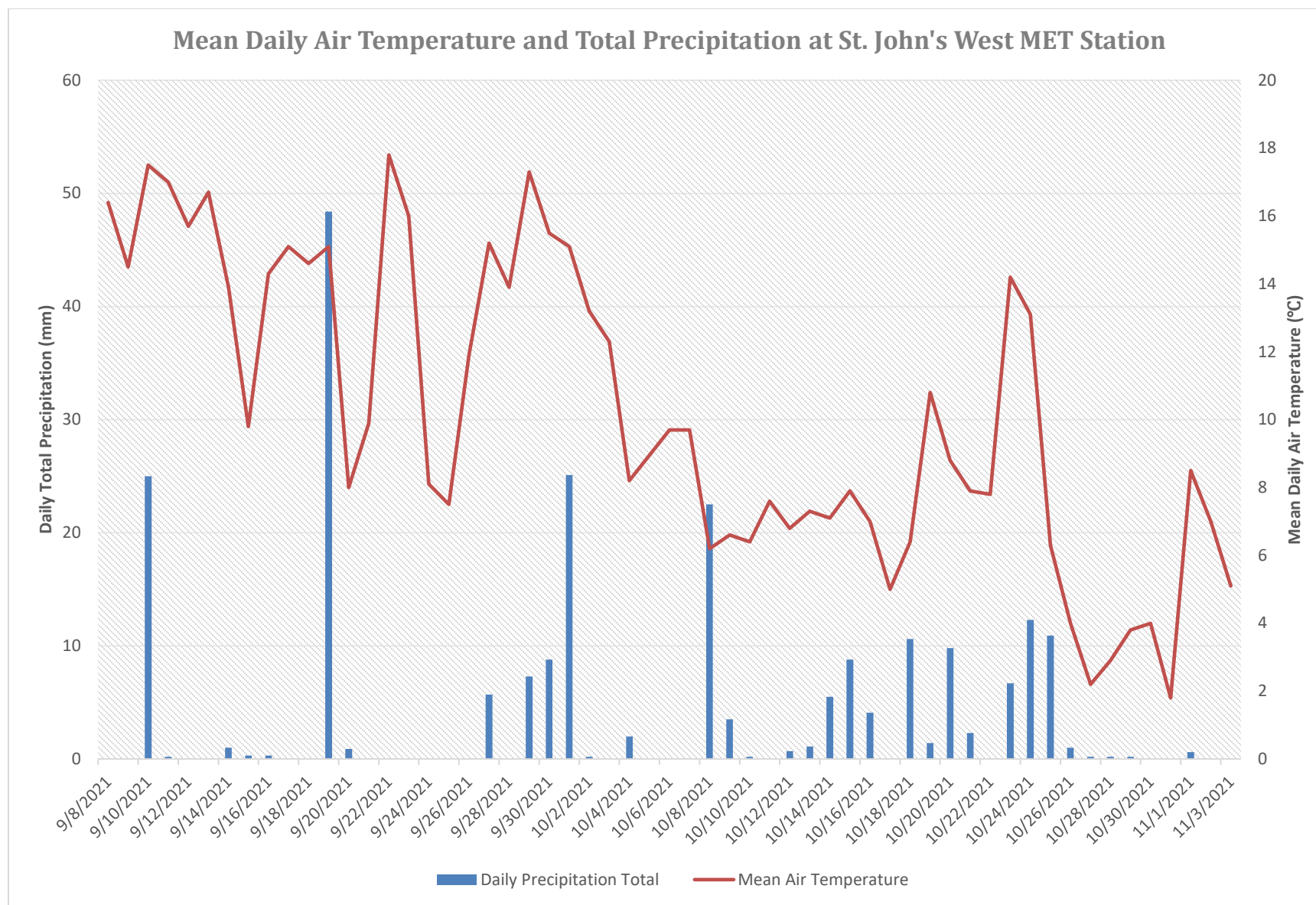


Figure 6: Mean daily air temperature and total precipitation at St. John's West near Paddy's Pond between Sept. 8, 2021 and Nov. 3, 2021



**APPENDIX B : QA/QC GRAB SAMPLE FIELD RESULTS**



Your P.O. #: 220028978-5  
 Your C.O.C. #: 2021-1841-00-SI-SP

**Attention: Robert Richard Harvey**

NL Department of Environment, Climate Change and Municipalities  
 Water Resources  
 PO Box 8700  
 St. John's, NL  
 CANADA A1B 4J6

**Report Date: 2021/11/17**  
 Report #: R6905252  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C1W7271**

**Received: 2021/11/05, 09:33**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	1	N/A	2021/11/10	ATL SOP 00013	EPA 310.2 R1974 m
Anions (1)	1	N/A	2021/11/11	CAM SOP-00435	SM 23 4110 B m
Colour	1	N/A	2021/11/10	ATL SOP 00020	SM 23 2120C m
Organic carbon - Diss (DOC) (2)	1	N/A	2021/11/10	ATL SOP 00203	SM 23 5310B m
Conductance - water	1	N/A	2021/11/09	ATL SOP 00004	SM 23 2510B m
Fluoride	1	N/A	2021/11/09	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	1	N/A	2021/11/09	ATL SOP 00048	Auto Calc
Mercury - Total (CVAA,LL)	1	2021/11/15	2021/11/15	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	1	2021/11/08	2021/11/08	ATL SOP 00058	EPA 6020B R2 m
Nitrogen Ammonia - water	1	N/A	2021/11/09	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	1	N/A	2021/11/17	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	1	N/A	2021/11/16	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	1	N/A	2021/11/17	ATL SOP 00018	ASTM D3867-16
pH (3)	1	N/A	2021/11/09	ATL SOP 00003	SM 23 4500-H+ B m
Calculated TDS (DW Pkg)	1	N/A	2021/11/09	N/A	Auto Calc
Total Kjeldahl Nitrogen in Water (1)	1	2021/11/10	2021/11/15	CAM SOP-00938	OMOE E3516 m
Organic carbon - Total (TOC) (2)	1	N/A	2021/11/09	ATL SOP 00203	SM 23 5310B m
Total Phosphorus (Colourimetric) (1)	1	2021/11/11	2021/11/11	CAM SOP-00407	SM 23 4500 P B H m
Total Suspended Solids	1	2021/11/10	2021/11/15	ATL SOP 00007	SM 23 2540D m
Turbidity	1	N/A	2021/11/09	ATL SOP 00011	EPA 180.1 R2 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8

(2) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

(3) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.



Your P.O. #: 220028978-5  
Your C.O.C. #: 2021-1841-00-SI-SP

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Water Resources  
PO Box 8700  
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Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

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Report Date: 2021/11/17

NL Department of Environment, Climate Change and  
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Your P.O. #: 220028978-5

Sample Details/Parameters	A	Result	RDL	UNITS	Extracted	Analyzed	By	Batch
<b>RDZ173 PADDYS POND</b>								
Sampling Date		2021/11/03						
Matrix		W						
Sample #		2021-1841-00-SI-SP						
Registration #		WS-S-0000						
<b>RESULTS OF ANALYSES OF WATER</b>								
<b>Calculated Parameters</b>								
Hardness (CaCO3)	-	9.8	1.0	mg/L	N/A	2021/11/09		7686253
Nitrate (N)	-	ND	0.050	mg/L	N/A	2021/11/17		7703504
Total dissolved solids (calc., EC)	-	63	1.0	mg/L	N/A	2021/11/09		7686273
<b>Inorganics</b>								
Conductivity	-	110	1.0	uS/cm	N/A	2021/11/09	SHW	7688555
Chloride (Cl-)	-	30	1.0	mg/L	N/A	2021/11/11	FD	7691631
Bromide (Br-)	-	ND	1.0	mg/L	N/A	2021/11/11	FD	7691631
Sulphate (SO4)	-	3.6	1.0	mg/L	N/A	2021/11/11	FD	7691631
Total Alkalinity (Total as CaCO3)	-	75	5.0	mg/L	N/A	2021/11/10	EMT	7689035
Colour	-	11	5.0	TCU	N/A	2021/11/10	EMT	7691525
Dissolved Fluoride (F-)	-	ND	0.10	mg/L	N/A	2021/11/09	SHW	7688558
Total Kjeldahl Nitrogen (TKN)	-	0.16	0.10	mg/L	2021/11/10	2021/11/15	MJ1	7693210
Nitrate + Nitrite (N)	-	0.061	0.050	mg/L	N/A	2021/11/17	EMT	7702420
Nitrite (N)	-	0.024	0.010	mg/L	N/A	2021/11/16	EMT	7700513
Nitrogen (Ammonia Nitrogen)	-	ND	0.050	mg/L	N/A	2021/11/09	MKY	7688801
Dissolved Organic Carbon (C)	-	3.6	0.50	mg/L	N/A	2021/11/10	NGI	7688649
Total Organic Carbon (C)	-	3.5	0.50	mg/L	N/A	2021/11/09	NGI	7688633
pH	-	6.77		pH	N/A	2021/11/09	SHW	7688557
Total Phosphorus	-	0.010	0.004	mg/L	2021/11/11	2021/11/11	SSV	7694343
Total Suspended Solids	-	1.0	1.0	mg/L	2021/11/10	2021/11/15	MKX	7691785
Turbidity	-	0.79	0.10	NTU	N/A	2021/11/09	SHW	7688650
<b>MERCURY BY COLD VAPOUR AA (WATER)</b>								
<b>Metals</b>								
Total Mercury (Hg)	-	ND	0.000013	mg/L	2021/11/15	2021/11/15	NHU	7691845
<b>ELEMENTS BY ICP/MS (WATER)</b>								
<b>Metals</b>								
Total Aluminum (Al)	-	0.038	0.0050	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Antimony (Sb)	-	ND	0.0010	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Arsenic (As)	-	ND	0.0010	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Barium (Ba)	-	0.0025	0.0010	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Boron (B)	-	ND	0.050	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Cadmium (Cd)	-	ND	0.000010	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Calcium (Ca)	-	2.7	0.10	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Chromium (Cr)	-	ND	0.0010	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Copper (Cu)	-	ND	0.00050	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Iron (Fe)	-	0.11	0.050	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Lead (Pb)	-	ND	0.00050	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Magnesium (Mg)	-	0.73	0.10	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Manganese (Mn)	-	0.021	0.0020	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Nickel (Ni)	-	ND	0.0020	mg/L	2021/11/08	2021/11/08	SJO	7686521



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Report Date: 2021/11/17

NL Department of Environment, Climate Change and  
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Your P.O. #: 220028978-5

Sample Details/Parameters	A	Result	RDL	UNITS	Extracted	Analyzed	By	Batch
RDZ173 PADDYS POND								
Sampling Date		2021/11/03						
Matrix		W						
Sample #		2021-1841-00-SI-SP						
Registration #		WS-S-0000						
<b>ELEMENTS BY ICP/MS (WATER)</b>								
<b>Metals</b>								
Total Phosphorus (P)	-	ND	0.10	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Potassium (K)	-	0.59	0.10	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Selenium (Se)	-	ND	0.00050	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Sodium (Na)	-	17	0.10	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Strontium (Sr)	-	0.0083	0.0020	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Uranium (U)	-	ND	0.00010	mg/L	2021/11/08	2021/11/08	SJO	7686521
Total Zinc (Zn)	-	ND	0.0050	mg/L	2021/11/08	2021/11/08	SJO	7686521



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### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	14.7°C
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Sample RDZ173 [PADDYS POND] : NOX < NO2 : Both values fall within the method uncertainty for duplicates and are likely equivalent.

**Results relate only to the items tested.**



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### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

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Anastassia Hamanov, Scientific Specialist

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Colleen Acker, B.Sc, Scientific Service Specialist

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Mike MacGillivray, Scientific Specialist (Inorganics)

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 Tel: 902-567-1255 Fax: 902-539-6504 Toll Free: 1-888-535-7770

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Page 1 of 1

Invoice Information		Report Information (if differs from invoice)				Project Information (where applicable)				Turnaround Time (TAT) Required			
Company Name: Environment, Climate Change and Municipalities		Company Name:				Quotation #: INORGANICS & TSS				<input checked="" type="checkbox"/> Regular TAT (5 business days) Most analyses PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS IF RUSH please specify date (Surcharges will be applied) <b>DATE REQUIRED:</b> <h2>Early Results</h2>			
Contact Name: Robert Richard Harvey		Contact Name:				Purchase Order#: 220028978-5							
Address: PO Box 8700 St. John's NL A1B 4J6 PC:		Address:				Project #:							
Phone: (709) 729-7634		Phone:				Site Location:							
Email: rharvey@gov.nl.ca		Email:				Site Province: NL							
Report Copies: rharvey@gov.nl.ca		Report Copies:				Site #: _____							
Report Copies:		Report Copies:				Sampled By:							
Laboratory Use Only				Analysis Requested									
CUSTODY SEAL		COOLER TEMPERATURES		COOLER TEMPERATURES		# OF CONTAINERS SUBMITTED	FIELD FILTERED & PRESERVED	LAB FILTRATION REQUIRED	Inorganics Package	TSS	HOLD - DO NOT ANALYZE	Regulatory Requirements (Specify)	
Present	Intact	12/16/16											
COOLING MEDIA PRESENT Y / N													
SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS													
SAMPLE IDENTIFICATION		DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED & PRESERVED	LAB FILTRATION REQUIRED	Inorganics Package	TSS	HOLD - DO NOT ANALYZE	COMMENTS	Site Name	
1	2021-1841-00-SI-SP	2021/11/03		water	00			x	x			Paddys Pond	
2				water	00								
3				water	00								
4				water	00								
5				water	00								
6				water	00								
7				water	00								
8				water	00								
9				water	00								
10				water	00								
RELINQUISHED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	BV LABS JOB #						
Leona Hyde		2021/11/03			NOV 03 2021	11:30	UIN 7271						
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to BV Labs standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.bvlabs.com													