



Real Time Water Quality Monthly Report Leary's Brook April 2005

General

- The Water Resources Management Division staff monitor the data from the Leary's Brook monitoring station on a monthly basis.

Maintenance and Calibration of Instrumentation

- The following table displays the dates when the Datasonde was removed for routine cleaning, maintenance and calibration and when it was redeployed during the month of April.

Date Installed	Date Removed
	April 11, 2005
April 16, 2005	April 26, 2005
April 27, 2005	

- Water quality readings were taken with a Minisonde at the time of removal for comparison purposes. The Minisonde was calibrated prior to use.
- Water samples were taken on April 26, 2005 for laboratory analysis as part of QA/QC procedures.

Data Interpretation

- In general, water quality parameters were stable during the month of April with expected daily/nightly (diurnal) and seasonal changes occurring.
- **Stage height** (water level) rose and fell in response to daily precipitation as seen in **Figure 1**. The response to heavy precipitation where 46.2 mm of precipitation fell on April 11th and 22.6 mm of precipitation fell on April 12 can be observed in Figure 1.
- **Water temperature** fluctuated in response to daily maximum and minimum air temperature. This is demonstrated by comparing the graph in **Figure 2** to the air temperature data in **Table 1**. An increase in water temperature is observed from April 16th to the 18th in response to an increase in daily mean temperatures. Another increase in water temperature is observed from April 22nd to the 24th in response to increases in daily mean temperatures. A warming trend in water temperature continued to the end of the month.

Table 1: Weather information for St. John's, NL provided by Environment Canada

Daily Data Report for April 2005											
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days C	Cool Deg Days C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
01†	-0.9	-3.2	-2.1	20.1	0.0	0.0	0.0	0.0	38	5E	37E
02†	1.8	-4.8	-1.5	19.5	0.0	0.0	0.0	0.0	38		<31
03†	6.1	-4.6	0.8	17.2	0.0	0.0	0.0	0.0	36		<31
04†	7.0	1.6	4.3	13.7	0.0	0.4	0.0	0.4	29	16	39
05†	5.2	2.8	4.0	14.0	0.0	7.8	0.0	7.8	22	17	44
06†	8.0	0.3	4.2	13.8	0.0	T	0.0	T	13		<31
07†	9.6	-1.0	4.3	13.7	0.0	T	0.0	T	6	22	33
08†	10.6	0.3	5.5	12.5	0.0	6.2	T	6.2	5	24	70
09†	4.5	0.0	2.3	15.7	0.0	0.4	T	0.4	4	26	33
10†	8.2	-1.9	3.2	14.8	0.0	0.0	T	T	3		<31
11†	4.6	-1.4	1.6	16.4	0.0	46.2	1.2	47.4	3	9	41
12†	6.0	2.0	4.0	14.0	0.0	22.6	0.0	22.6	T	16	37
13†	7.1	0.4	3.8	14.2	0.0	2.4	0.0	2.4	T	23	83
14†	2.0	-6.2	-2.1	20.1	0.0	4.8	0.0	4.8	T	24	48
15†	0.0	-7.8	-3.9	21.9	0.0	0.0	T	T	2		<31
16†	6.7	-8.0	-0.7	18.7	0.0	0.0	0.0	0.0	2	27	65
17†	16.5	-0.3	8.1	9.9	0.0	0.0	0.0	0.0	T	25	41
18†	15.4	-2.2	6.6	11.4	0.0	0.0	0.4	0.2	T	1	37
19†	2.3	-2.4	-0.1	18.1	0.0	0.0	0.2	0.2	T	31	52
20†	6.7	0.7	3.7	14.3	0.0	0.0	T	T	T	30	52
21†	2.8	-0.8	1.0	17.0	0.0	0.0	5.6	5.6	T		<31
22†	5.4	-3.7	0.9	17.1	0.0	0.0	0.0	0.0	2	26	57
23†	10.5	-0.3	5.1	12.9	0.0	0.0	0.0	0.0	T	28	74
24†	12.0	1.1	6.6	11.4	0.0	0.0	0.0	0.0	T		<31
25†	5.6	-1.3	2.2	15.8	0.0	0.0	0.0	0.0	T		<31
26†	2.8	-1.1	0.9	17.1	0.0	T	0.0	T	T	8	37
27†	1.9	-1.7	0.1	17.9	0.0	T	0.0	T	T	36	32
28†	3.4	-1.7	0.9	17.1	0.0	0.0	2.2	2.2	T		<31
29†	3.9	-2.1	0.9	17.1	0.0	0.0	0.2	0.2	1		<31
30†	7.8	-0.6	3.6	14.4	0.0	0.0	T	T	T		<31

Figure 1

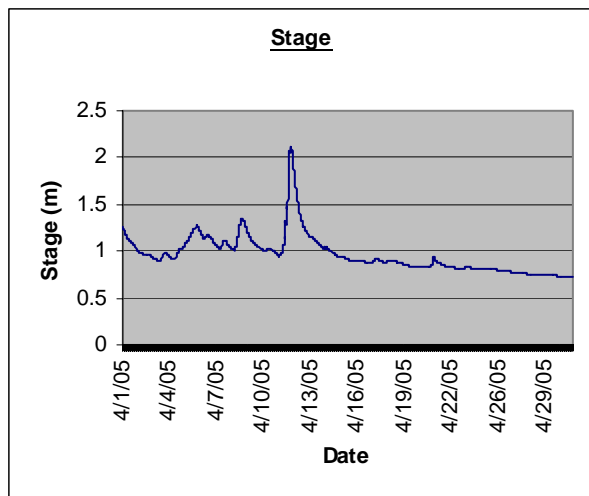
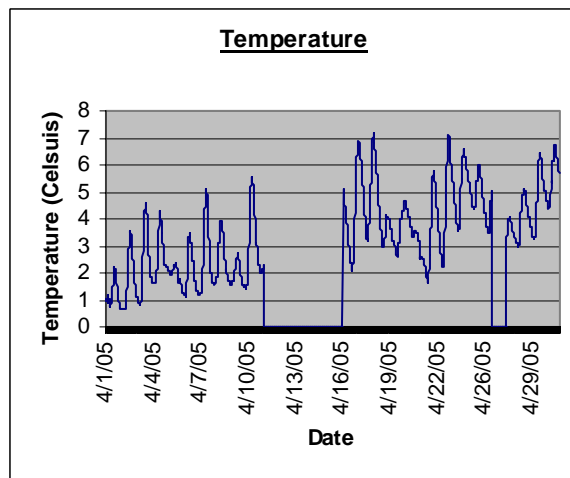


Figure 2



- **Conductivity** levels fluctuated throughout the month as seen in **Figure 3** with a notable spike occurring on April 21st. This is related to a snowfall of 5.6 cm that occurred on April 21st (**Table 1**) and a subsequent melting event. Other less pronounced spikes occurred throughout the month, which are related to precipitation events.
- **Total dissolved solids (Figure 4)** levels reflected the changes in conductivity. Conductivity measurements are a good indication of total dissolved solids and total dissolved ion concentrations, although this is not an exact linear relationship.

Figure 3

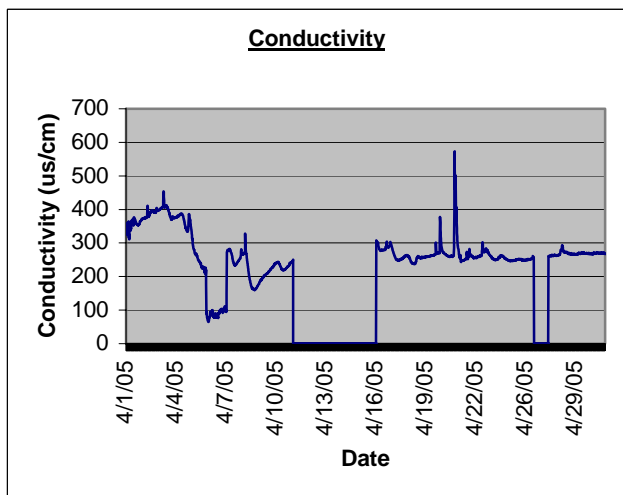
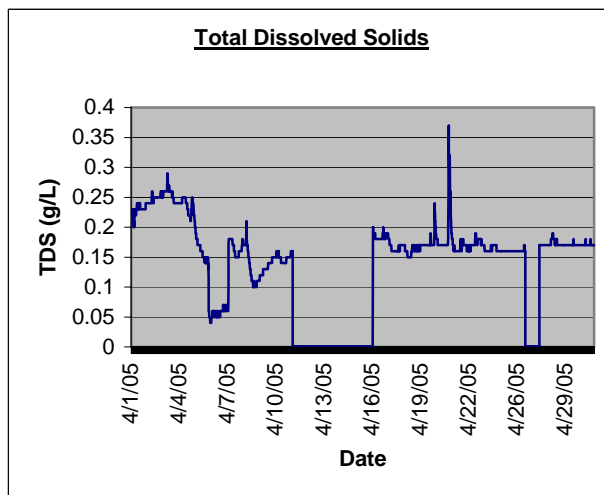


Figure 4



- **pH** levels ranged between 6.28 to 6.89. There were some exceedances above the CCME recommended Guideline for Freshwater Aquatic Life of 6.5 (see **Figure 5**). The average pH level for the three deployments of the datasonde instrument during the month of April was 6.65. (see **Table 2**).
- **Dissolved oxygen (DO)** levels ranged between 10.2 mg/L to 13.10 mg/L during the periods of measurement (see **Figure 6**). All dissolved oxygen measurements were above the CCME recommended maximum guideline of 9.5. The average DO level for the periods of measure was 11.71 mg/L.

Figure 5

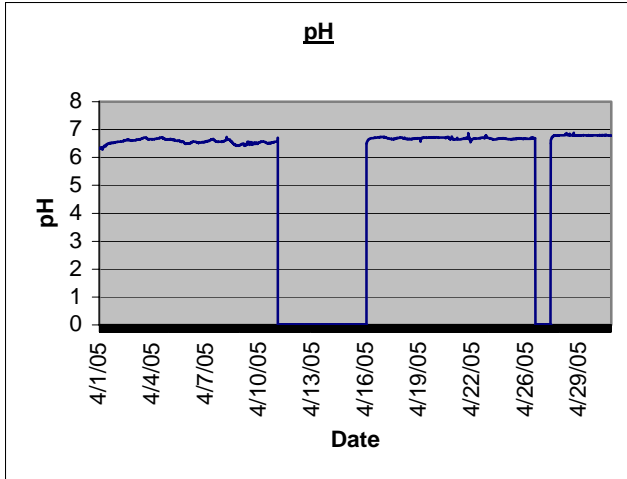
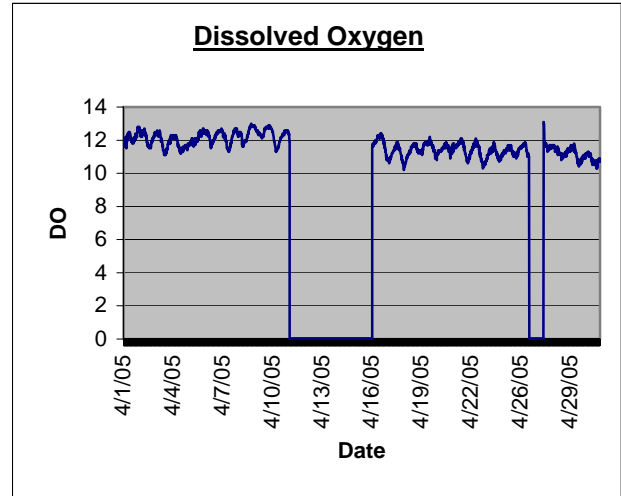
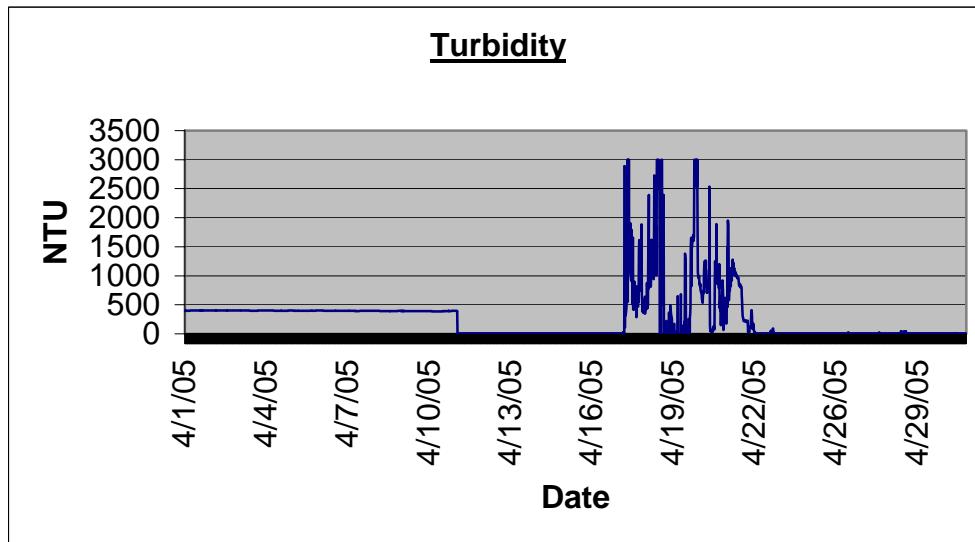


Figure 6



- Turbidity** levels fluctuated and had several spikes noted throughout the month. The turbidity spikes (see **Figure 7**) are probably in response to precipitation. Several large turbidity spikes occurred on April 17th, 18th, and 20th. Since little precipitation fell on these dates, these turbidity spikes are probably due to turbid water entering Leary's Brook that is draining from a construction area in the Kenmount Road area. Many turbidity spikes exceeded the CCME recommended maximum of 8 NTU above background levels.

Figure 7



Additional Information

- Table 2 provides summary statistics on water quality parameters for Leary's Brook during the month of April 2005.

Table 2: Summary statistics for April 2005.

	Temp-Water	pH	Conductance	Diss-Solids	Percent-Satur	Diss-Oxy	Turbidity
Max	7.20	6.89	573.00	0.3700	98.30	13.10	3000.00
Min	0.65	6.28	65.00	0.0400	81.30	10.20	0.00
Average	3.44	6.65	268.09	0.1719	87.92	11.71	337.97
Standard Deviation	1.58	0.10	69.07	0.0445	1.89	0.58	456.07

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