Government of
Newfoundland
and Labrador

# Real Time Water Quality Monthly Report
# Leary's Brook
# May 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 May.

| Date Installed | Date Removed |
|---|---|
| April 27, 2005 | May 05, 2005 |
| May 05, 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 May 05, 2005 for laboratory analysis as part of QA/QC procedures.

## Data Interpretation

- In general, water quality parameters were stable during the month of May 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 57.4 mm of precipitation fell on May 20$^{th}$ 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 in response to an increase 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 May 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 | 14.6 | 3.4 | 9.0 | 9.0 | 0.0 | T | 0.0 | T | 0 | | |
| 02 | 15.5 | 4.7 | 10.1 | 7.9 | 0.0 | 4.2 | 0.0 | 4.2 | 0 | | |
| 03 | 8.4 | 1.2 | 4.8 | 13.2 | 0.0 | 4.0 | 0.0 | 4.0 | 0 | | |
| 04 | 17.6 | 1.8 | 9.7 | 8.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 05 | 13.9 | 3.0 | 8.5 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 06 | 12.9 | 0.1 | 6.5 | 11.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 07 | 13.2 | -0.5 | 6.4 | 11.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 08 | 5.2 | 0.5 | 2.9 | 15.1 | 0.0 | 1.0 | 0.0 | 1.0 | 0 | | |
| 09 | 6.2 | 2.2 | 4.2 | 13.8 | 0.0 | T | 0.0 | T | 0 | | |
| 10 | 5.8 | 2.5 | 4.2 | 13.8 | 0.0 | 0.6 | 0.0 | 0.6 | 0 | | |
| 11 | 7.7 | 3.3 | 5.5 | 12.5 | 0.0 | 4.0 | 0.0 | 4.0 | 0 | | |
| 12 | 13.8 | 5.1 | 9.5 | 8.5 | 0.0 | 1.0 | 0.0 | 1.0 | 0 | | |
| 13 | 7.7 | 0.3 | 4.0 | 14.0 | 0.0 | 5.0 | T | 5.0 | 0 | | |
| 14 | 5.4 | -4.1 | 0.7 | 17.3 | 0.0 | 1.2 | 0.2 | 1.2 | T | | |
| 15 | 4.8 | -4.7 | 0.1 | 17.9 | 0.0 | 1.8 | 0.0 | 1.8 | 0 | | |
| 16 | 10.5 | 3.1 | 6.8 | 11.2 | 0.0 | 0.4 | 0.0 | 0.4 | 0 | | |
| 17 | 7.0 | 3.3 | 5.2 | 12.8 | 0.0 | 0.2 | 0.0 | 0.2 | 0 | | |
| 18 | 8.5 | 0.6 | 4.6 | 13.4 | 0.0 | 0.2 | 0.0 | 0.2 | 0 | | |
| 19 | 6.4 | 2.0 | 4.2 | 13.8 | 0.0 | 0.4 | 0.0 | 0.4 | 0 | | |
| 20 | 5.2 | 4.0 | 4.6 | 13.4 | 0.0 | 57.4 | 0.0 | 57.4 | 0 | | |
| 21 | 6.1 | 2.1 | 4.1 | 13.9 | 0.0 | 3.6 | 0.0 | 3.6 | 0 | | |
| 22 | 6.6 | -0.2 | 3.2 | 14.8 | 0.0 | T | 0.0 | T | 0 | | |
| 23 | 6.3 | 0.1 | 3.2 | 14.8 | 0.0 | T | 0.0 | T | 0 | | |
| 24 | 8.8 | -0.9 | 4.0 | 14.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 25 | 14.6 | -0.5 | 7.1 | 10.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 26 | 20.5 | 3.4 | 12.0 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 27 | 13.4 | 5.6 | 9.5 | 8.5 | 0.0 | 11.6 | 0.0 | 11.6 | 0 | | |
| 28 | 6.5 | 4.2 | 5.4 | 12.6 | 0.0 | 36.8 | 0.0 | 36.8 | 0 | | |
| 29 | 9.2 | 4.8 | 7.0 | 11.0 | 0.0 | 0.4 | 0.0 | 0.4 | 0 | | |
| 30 | 10.9 | 2.7 | 6.8 | 11.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | | |
| 31 | 10.3 | 2.7 | 6.5 | 11.5 | 0.0 | T | 0.0 | T | 0 | | |

**Figure 1**

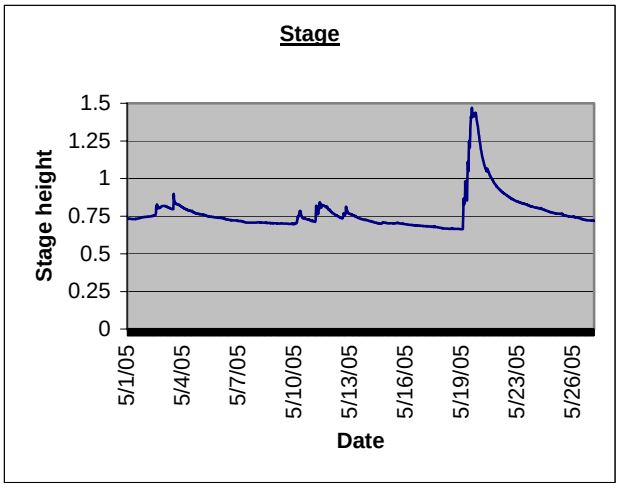
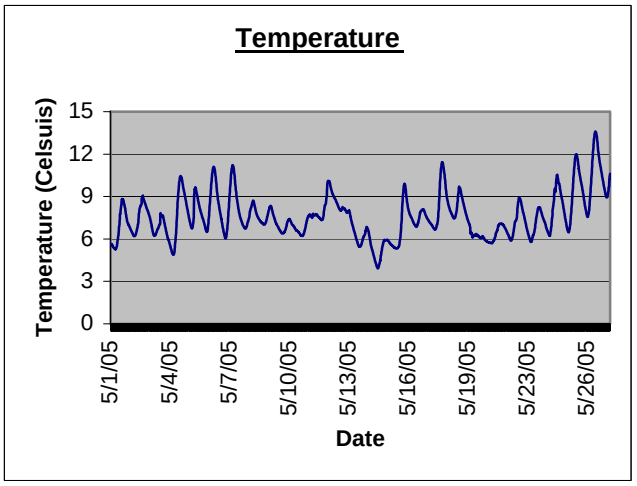



**Figure 2**




- **Conductivity** levels fluctuated throughout the month as seen in **Figure 3** usually in response to precipitation events. A notable change in conductivity occurred on May 20th. This is related to a significant rainfall event that occurred on May 20th (**Table 1)**. 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**

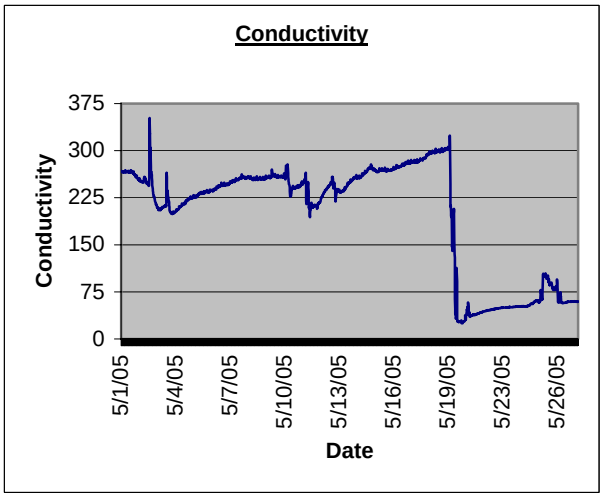
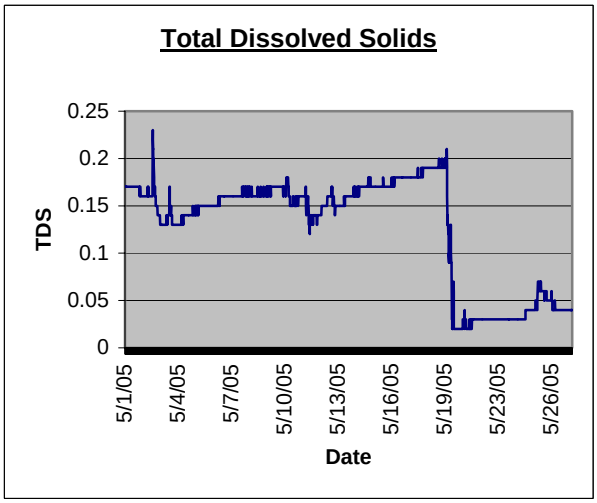



**Figure 4**




- **pH** levels ranged between 5.85 to 6.92. 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 deployment of the datasonde instrument during the month of May was 6.54. (see **Table 2**).
- **Dissolved oxygen (DO)** levels ranged between 3.4 mg/L to 11.7 mg/L during the period of measurement (see **Figure 6).** During the month of May, dissolved oxygen measurements were, at times, above the CCME recommended maximum guideline of 9.5 mg/L. The average DO level for the period of measure was 9.3 mg/L. After the significant rainfall event that occurred on May 20th, the dissolved oxygen sensor was fouled and the readings were not as accurate as they normally are.

**Figure 5**

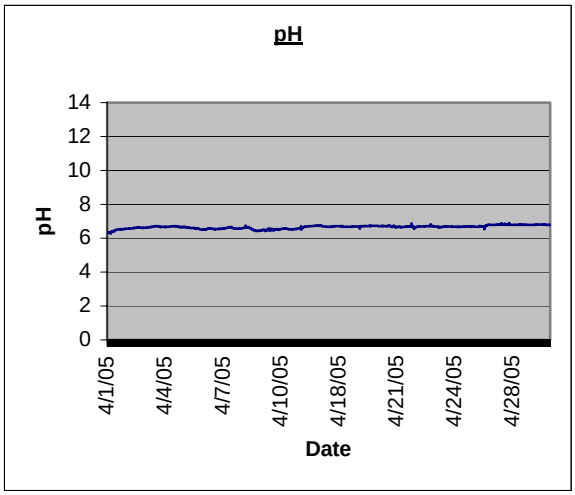
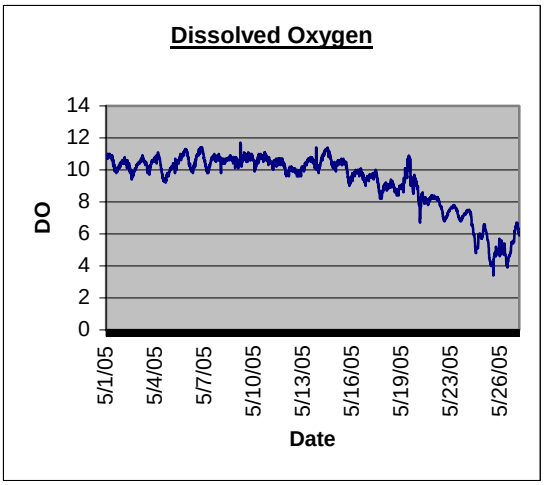
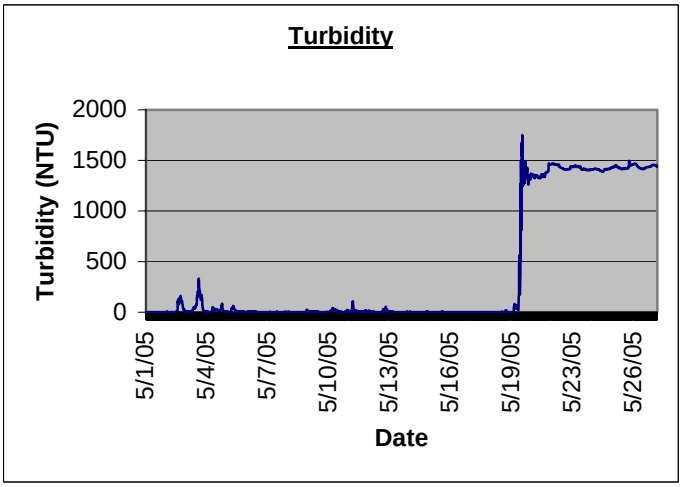



**Figure 6**




- **Turbidity** levels fluctuated and had several minor spikes noted throughout the month. The turbidity spikes (see **Figure 7**) are normally in response to precipitation. A large notable turbidity spike occurred on May 20th. This is likely in response to the heavy precipitation event on that date. 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 May 2005.

Table 2: Summary statistics for May 2005.

| | Temp-Water | pH | Conductance | Diss-Solids | Percent-Satur | Diss-Oxy | Turbidity |
|---|---|---|---|---|---|---|---|
| Max | 13.6 | 6.92 | 352 | 0.23 | 98.1 | 11.7 | 1751 |
| Min | 3.91 | 5.85 | 24.8 | 0.02 | 30.6 | 3.4 | 0 |
| Average | 7.598763419 | 6.54394 | 198.187396 | 0.12700596 | 77.66139165 | 9.317416 | 386.2419 |
| Standard Deviation | 1.587212932 | 0.24688 | 90.4079337 | 0.05789999 | 14.21405796 | 1.795752 | 622.0675 |

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