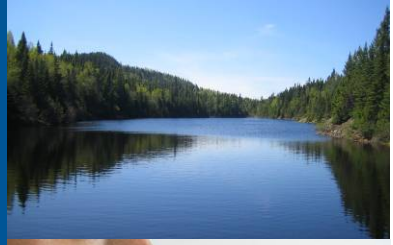
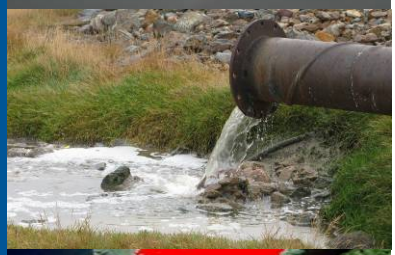
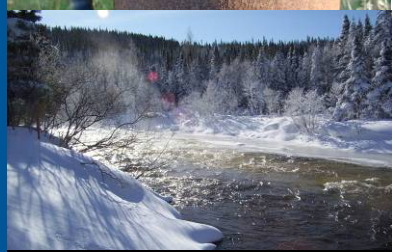




# Waterford River @ Kilbride

# NF02ZM0009

**July 2010**


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

**Real Time Water Quality Monthly Report**
**Waterford River - St. John's NL**
**July 2010**

## General

- Data from the Waterford River monitoring station is monitored by the Water Resources Management Division staff.

## Maintenance and Calibration of Instrumentation

- The following table displays the dates when the Waterford River water quality probe was installed and removed during this deployment period for routine cleaning, maintenance and calibration.
- There is a technical problem with transmitting dissolved oxygen data to the data logger at Waterford River. A new transmission cable will be installed when weather conditions permit, thus dissolved oxygen data will not be reported in the interim.

**Table 1**: Table of Water Quality Probe Installation and Removal

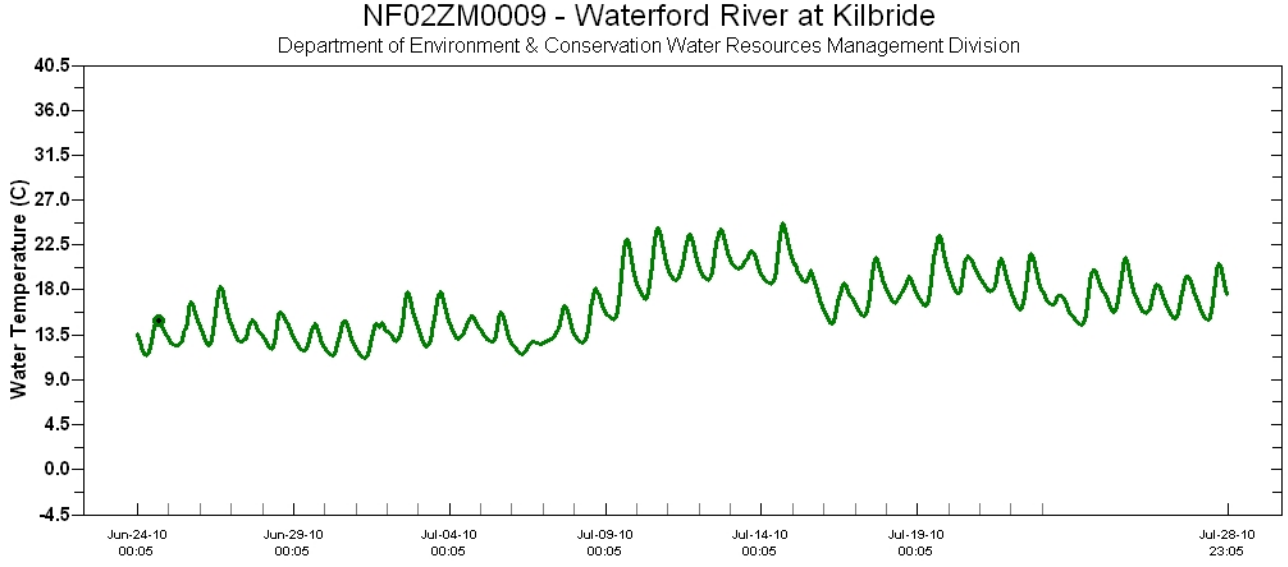
| Date Installed | Date Removed |
|---|---|
| June 24, 2010 | July 28, 2010 |

- Water quality readings were taken with a second water quality instrument at the time of installation and removal for QAQC comparison. The QAQC instrument was calibrated prior to each use.

## Data Interpretation

- **Water temperatures** were fairly constant during this deployment showing an increasing trend in response to seasonally warmer air temperatures, as seen in **Figure 1** below. Water temperatures ranged between 10.64 and 24.15$^{o}$C during this deployment.

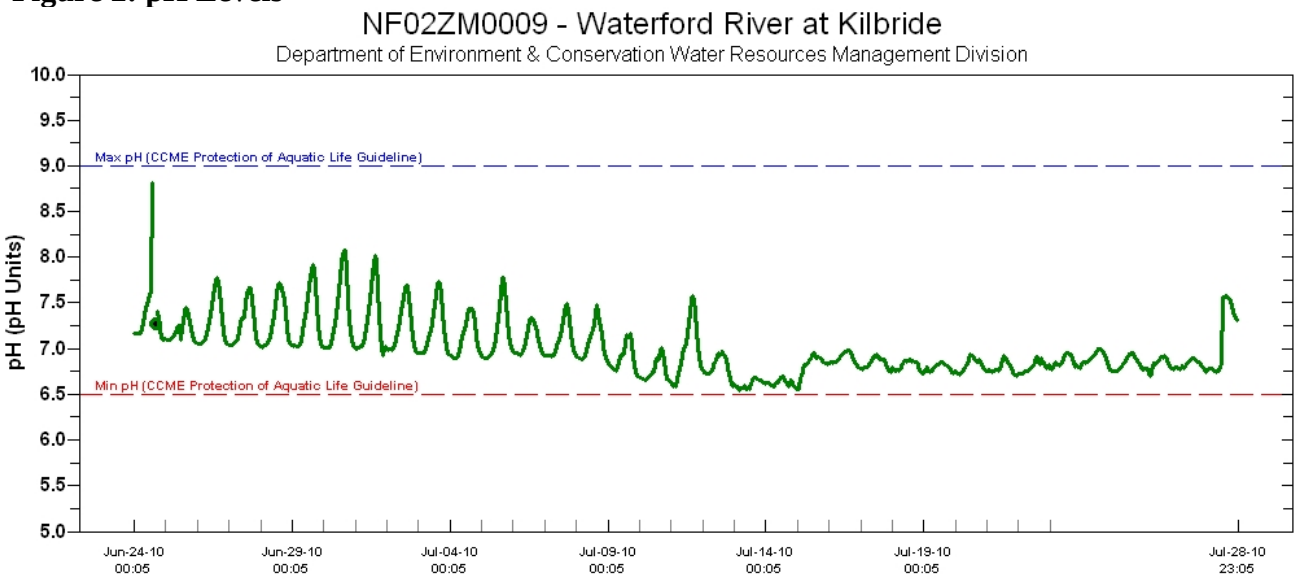
**Figure 1: Water Temperature**




- **pH** levels were fairly constant and within the expected range for this station throughout the deployment, ranging from 6.54 to 8.08 units, as seen in **Figure 2** below. All pH values were within the range recommended by the Canadian Water

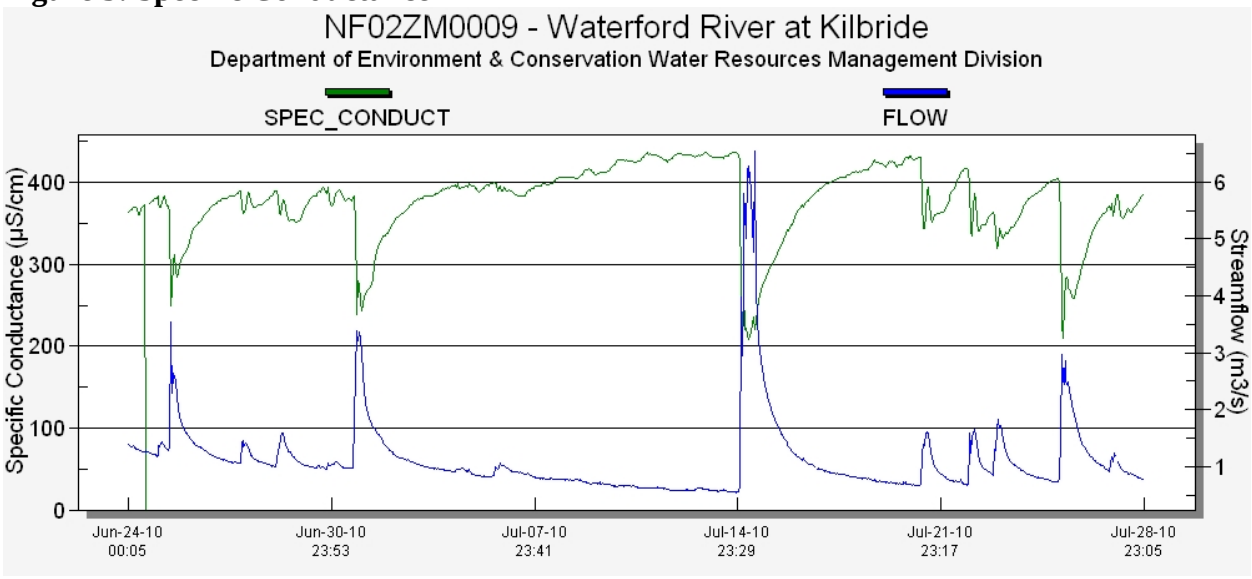
Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9.0 pH units. The pH spikes at the beginning and end of the graph indicate false data, and were caused by removing and deploying the probe.

**Figure 2: pH Levels**




- **Specific conductivity** levels typically share an inverse relationship with water flow, showing decreasing levels as flow increases due to precipitation. This is caused by the dilution effect precipitation has on conductivity during the warmer months, when road salting operations are not in effect. Conversely, specific conductivity levels typically increase as flow decreases. Specific conductivity values are shown in green and flow is shown in blue in **Figure 3** below. Specific conductivity values ranged between 208-437 µS/cm during this deployment.

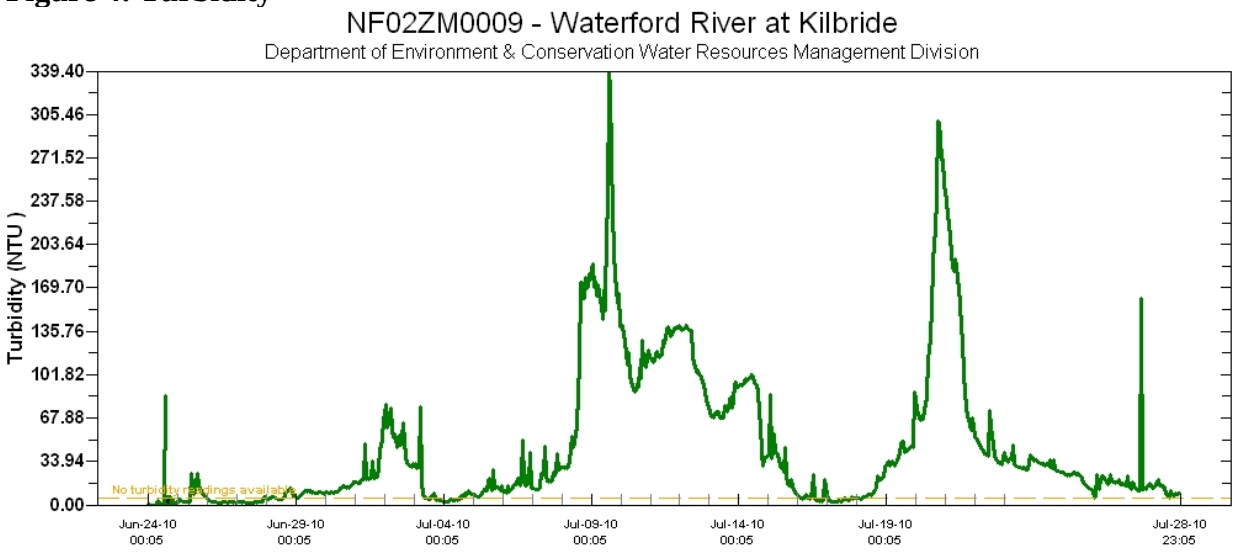
**Figure 3: Specific Conductance**




**Turbidity** values ranged between 1.4 and 339.4 NTUs during this deployment period, with spikes occurring on July 8th -14th and July 19th - 22nd as shown in **Figure 4** below. Climate data on these dates, shown below in **Appendix 1,** indicate that these spikes don't appear to be the result of significant precipitation or excessively high

winds. The heaviest rain for this deployment period fell on July 14th and 15th, causing little change in turbidity. These spikes may have been the result of water quality events upstream from the sampling station.

**Figure 4: Turbidity**




**APPENDIX 1**: Weather information for St. John's, NL provided by Environment Canada for July 2010:

| 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† | 17.9 | 6.6 | 12.3 | 5.7 | 0.0 | 11.4 | 0.0 | 11.4 | | | <31 |
| 02† | 18.2 | 9.2 | 13.7 | 4.3 | 0.0 | T | 0.0 | T | | 27 | 32 |
| 03† | 20.4 | 9.6 | 15.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | <31 |
| 04† | 20.1 | 11.5 | 15.8 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | | 24 | 46 |
| 05† | 12.6 | 5.3 | 9.0 | 9.0 | 0.0 | 2.2 | 0.0 | 2.2 | | | <31 |
| 06† | 16.0 | 6.2 | 11.1 | 6.9 | 0.0 | 2.6 | 0.0 | 2.6 | | 25 | 39 |
| 07† | 16.6 | 7.2 | 11.9 | 6.1 | 0.0 | T | 0.0 | T | | | <31 |
| 08† | 21.3 | 7.7 | 14.5 | 3.5 | 0.0 | T | 0.0 | T | | 26 | 39 |
| 09† | 27.3 | 14.5 | 20.9 | 0.0 | 2.9 | 0.0 | 0.0 | 0.0 | | 27 | 61 |
| 10† | 26.6 | 16.0 | 21.3 | 0.0 | 3.3 | 0.0 | 0.0 | 0.0 | | 7 | 59 |
| 11† | 23.5 | 18.7 | 21.1 | 0.0 | 3.1 | 3.6 | 0.0 | 3.6 | | 26 | 57 |
| 12† | 27.4 | 19.1 | 23.3 | 0.0 | 5.3 | T | 0.0 | T | | 24 | 44 |
| 13† | 24.7 | 18.0 | 21.4 | 0.0 | 3.4 | 4.2 | 0.0 | 4.2 | | 24 | 52 |
| 14† | 26.0 | 17.4 | 21.7 | 0.0 | 3.7 | 10.6 | 0.0 | 10.6 | | 27 | 44 |
| 15† | 21.2 | 10.5 | 15.9 | 2.1 | 0.0 | 28.8 | 0.0 | 28.8 | | 34 | 50 |
| 16† | 23.4 | 10.7 | 17.1 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | | 26E | 52E |
| 17† | 24.9 | 13.2 | 19.1 | 0.0 | 1.1 | T | 0.0 | T | | 27 | 50 |
| 18† | 23.7 | 15.7 | 19.7 | 0.0 | 1.7 | T | 0.0 | T | | | <31 |
| 19† | 26.5 | 16.3 | 21.4 | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | | 26 | 41 |
| 20† | 25.5 | 17.4 | 21.5 | 0.0 | 3.5 | 0.2 | 0.0 | 0.2 | | 26 | 41 |
| 21† | 23.9 | 15.6 | 19.8 | 0.0 | 1.8 | 5.2 | 0.0 | 5.2 | | | <31 |
| 22† | 23.7 | 12.8 | 18.3 | 0.0 | 0.3 | 6.6 | 0.0 | 6.6 | | 21 | 37 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 23† | 15.3 | 11.1 | 13.2 | 4.8 | 0.0 | 9.2 | 0.0 | 9.2 | 1 | 48 |
| 24† | 22.8 | 11.5 | 17.2 | 0.8 | 0.0 | T | 0.0 | T | 34 | 32 |
| 25† | 22.1 | 12.4 | 17.3 | 0.7 | 0.0 | 8.2 | 0.0 | 8.2 | 16 | 56 |
| 26† | 22.2 | 13.4 | 17.8 | 0.2 | 0.0 | 7.6 | 0.0 | 7.6 | 16 | 57 |
| 27† | 20.6 | 11.6 | 16.1 | 1.9 | 0.0 | 2.2 | 0.0 | 2.2 | 24 | 52 |
| 28† | 22.3 | 11.4 | 16.9 | 1.1 | 0.0 | 0.2 | 0.0 | 0.2 | 25 | 50 |
| 29† | 24.6 | 15.3 | 20.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 24 | 59 |
| 30† | 27.3 | 17.0 | 22.2 | 0.0 | 4.2 | 1.8 | 0.0 | 1.8 | 24 | 61 |
| 31† | 23.0 | 17.3 | 20.2 | 0.0 | 2.2 | 2.4 | 0.0 | 2.4 | 22 | 33 |
| Sum | | | | **53.2** | **41.9** | **107.0** | **0.0** | **107.0** | | |
| Avg | **22.3** | **12.9** | **17.61** | | | | | | | |

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