

## Real Time Water Quality Monthly Report Waterford River - St. John's NL July-August 2009

### 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.

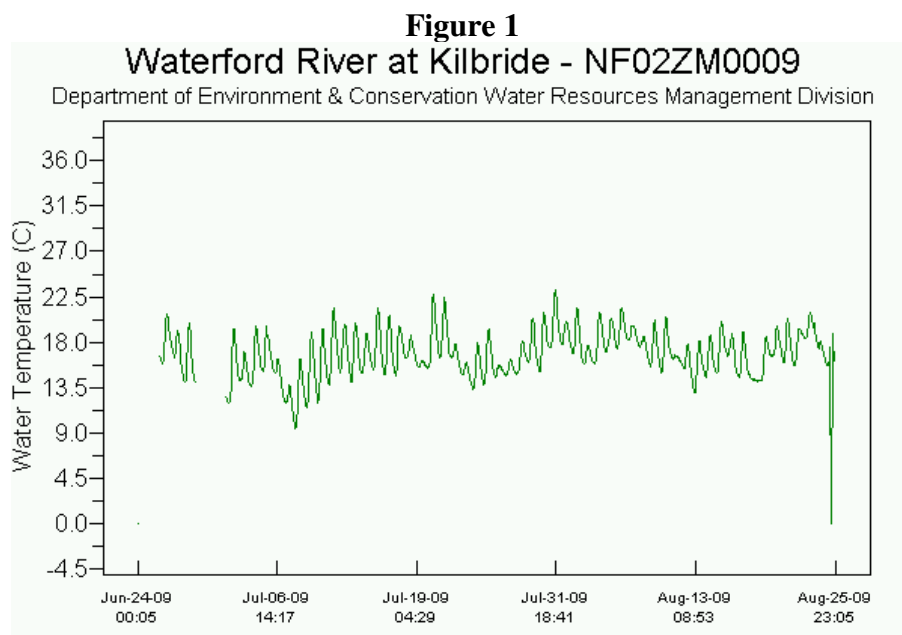
**Table 1:** Table of Water Quality Probe installation and removal:

Date Installed	Date Removed
June 24, 2009	August 23, 2009

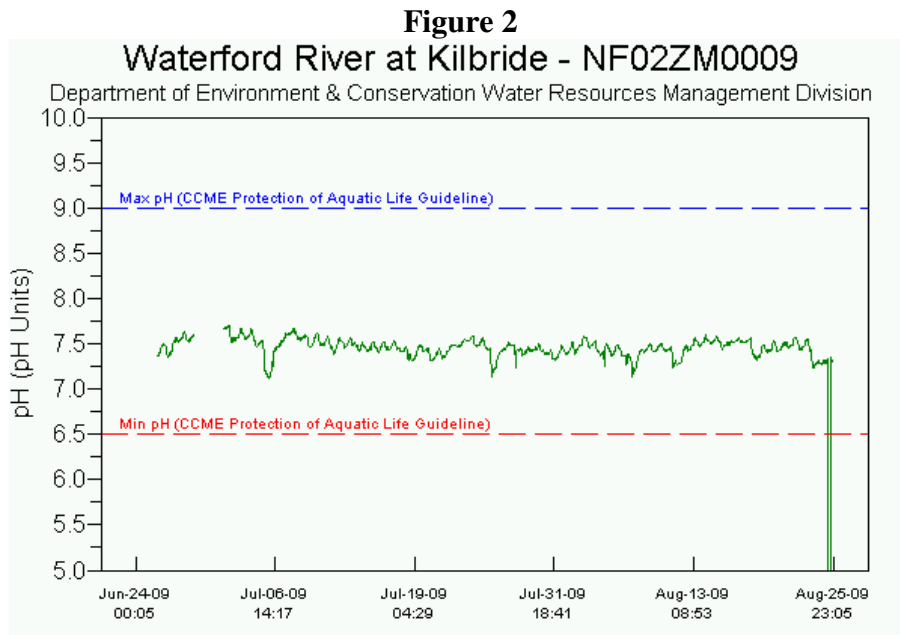
- Water quality readings were taken with a second water quality instrument at the time of installation and removal for QAQC comparison. The QAQC instrument was calibrated prior to each use.

### Data Interpretation

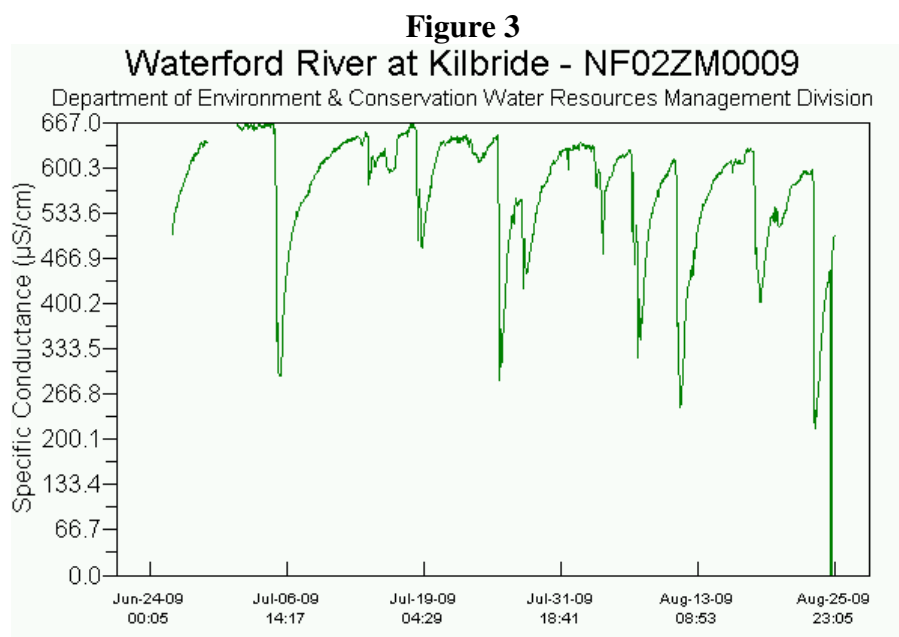
- Water temperatures** fluctuated in response to daily maximum and minimum air temperatures during this deployment. This is seen by comparing the graph in **Figure 1** below, to the air temperature data in **Appendix 1** at the end of this report. Water temperatures ranged between 9.4 and 23.1 °C during this period.



- pH** ranged from 7.12 to 7.70 units, as seen in **Figure 2**. All recorded pH measurements were within the range recommended by the Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9 pH units (**Figure 2**).

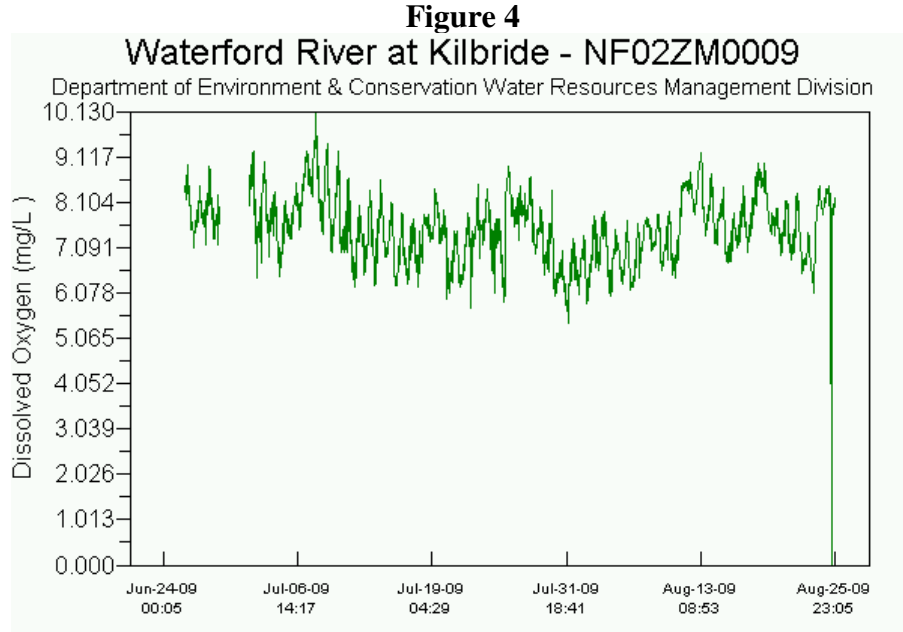


- Specific conductivity levels were variable during this deployment, ranging from 217 to 667 $\mu$ S/cm, as seen in **Figure 3**. Sudden drops in conductivity levels correspond with rainfall events, shown in **Appendix 1** below, which often have a dilution effect on conductivity. Overall, conductivity was lower than the range recorded in the previous deployment period, which was 498 to 701 $\mu$ S.

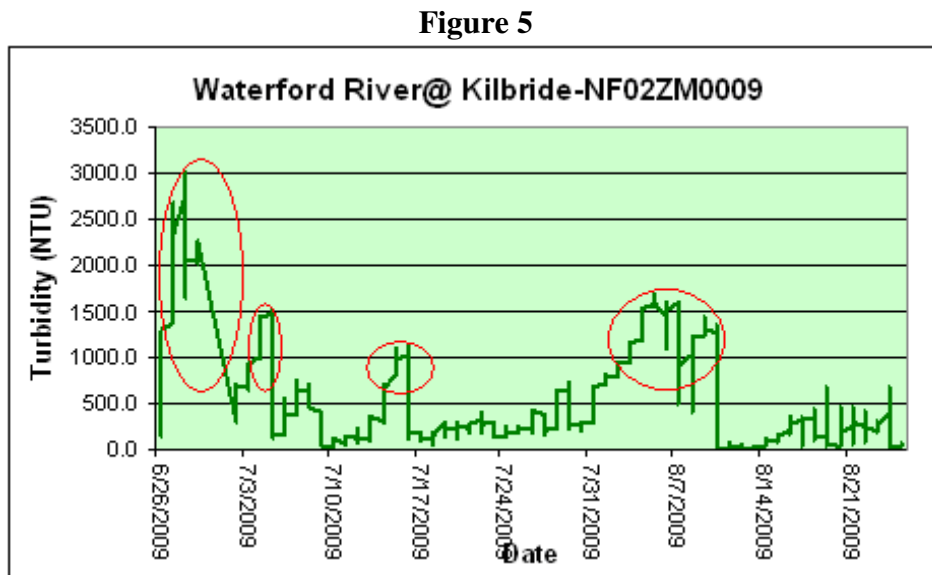


- Dissolved oxygen (DO)** values recorded during this deployment ranged between 5.39 and 10.13mg/L, as seen in **Figure 4** below. The low value is below the minimum DO level recommended by the Canadian Water Quality Guidelines for the Protection of Aquatic

Life of 5.5mg/L. Only two DO values recorded over this 60-day period fell below the recommended minimum, and these occurred within a 1-hour period on July 31, 2009. Waterford River is the catchment for many storm sewer drainage outfalls in this urban watershed and is impacted by land use activities. DO levels are typically lowest during this time of year when water temperatures reach annual maximums.



- Turbidity values fluctuated above background levels during four periods throughout this deployment, as seen in **Figure 5** below. These fluctuations don't appear to be solely related to rainfall.



**APPENDIX 1:** Weather information for St. John's, NL provided by Environment Canada for July and August 2009:

**Daily Data Report for July 2009**

<b>D a y</b>	<b>Max Temp °C</b> 	<b>Min Temp °C</b> 	<b>Mean Temp °C</b> 	<b>Heat Deg Days °C</b> 	<b>Cool Deg Days °C</b> 	<b>Total Rain mm</b> 	<b>Total Snow cm</b> 	<b>Total Precip mm</b> 	<b>Snow on Grnd cm</b>	<b>Dir of Max Gust 10's Deg</b>	<b>Spd of Max Gust km/h</b> 
<a href="#">01</a> †	12.8	7.4	10.1	7.9	0.0	0.8	0.0	0.8			<31
<a href="#">02</a> †	16.7	7.8	12.3	5.7	0.0	T	0.0	T			<31
<a href="#">03</a> †	16.0	10.5	13.3	4.7	0.0	T	0.0	T			<31
<a href="#">04</a> †	20.4	10.7	15.6	2.4	0.0	T	0.0	T			<31
<a href="#">05</a> †	23.1	12.5	17.8	0.2	0.0	6.2	0.0	6.2	25		44
<a href="#">06</a> †	16.3	6.7	11.5	6.5	0.0	0.4	0.0	0.4	26		39
<a href="#">07</a> †	9.1	3.5	6.3	11.7	0.0	3.0	0.0	3.0			<31
<a href="#">08</a> †	18.6	2.6	10.6	7.4	0.0	0.0	0.0	0.0	28		35
<a href="#">09</a> †	20.6	7.8	14.2	3.8	0.0	0.0	0.0	0.0			<31
<a href="#">10</a> †	23.8	7.3	15.6	2.4	0.0	0.0	0.0	0.0	25		52
<a href="#">11</a> †	26.3	13.3	19.8	0.0	1.8	0.0	0.0	0.0			<31
<a href="#">12</a> †	23.6	12.5	18.1	0.0	0.1	0.0	0.0	0.0	27		33
<a href="#">13</a> †	22.5	10.9	16.7	1.3	0.0	3.4	0.0	3.4	16		56
<a href="#">14</a> †	22.9	12.3	17.6	0.4	0.0	T	0.0	T	15		44
<a href="#">15</a> †	23.6	12.4	18.0	0.0	0.0	0.0	0.0	0.0	28		33
<a href="#">16</a> †	22.9	11.6	17.3	0.7	0.0	0.0	0.0	0.0	25		39
<a href="#">17</a> †	24.0	12.5	18.3	0.0	0.3	0.4	0.0	0.4	25		41
<a href="#">18</a> †	20.1	12.5	16.3	1.7	0.0	3.2	0.0	3.2	19		32
<a href="#">19</a> †	17.6	12.2	14.9	3.1	0.0	2.2	0.0	2.2	27		44
<a href="#">20</a> †	26.1	15.9	21.0	0.0	3.0	T	0.0	T	27		39
<a href="#">21</a> †	21.8	14.2	18.0	0.0	0.0	0.0	0.0	0.0			<31
<a href="#">22</a> †	15.9	11.5	13.7	4.3	0.0	3.2	0.0	3.2			<31
<a href="#">23</a> †	13.5	9.9	11.7	6.3	0.0	2.2	0.0	2.2			<31
<a href="#">24</a> †	16.3	9.8	13.1	4.9	0.0	0.0	0.0	0.0			<31
<a href="#">25</a> †	21.1	12.2	16.7	1.3	0.0	14.6	0.0	14.6	16		41
<a href="#">26</a> †	15.7	12.2	14.0	4.0	0.0	6.8	0.0	6.8			<31
<a href="#">27</a> †	15.0	13.3	14.2	3.8	0.0	2.4	0.0	2.4			<31
<a href="#">28</a> †	22.8	13.7	18.3	0.0	0.3	6.2	0.0	6.2	25		48
<a href="#">29</a> †	21.3	10.4	15.9	2.1	0.0	T	0.0	T			<31
<a href="#">30</a> †	23.7	10.4	17.1	0.9	0.0	0.4	0.0	0.4	20		37
<a href="#">31</a> †	25.5	16.8	21.2	0.0	3.2	T	0.0	T	27		59

**Daily Data Report for August 2009**

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<a href="#">01</a> †	24.0	16.4	20.2	0.0	2.2	1.0	0.0	1.0	24		48
<a href="#">02</a> †	21.0	10.9	16.0	2.0	0.0	0.0	0.0	0.0			<31
<a href="#">03</a> †	17.9	11.6	14.8	3.2	0.0	6.0	0.0	6.0	15		41
<a href="#">04</a> †	25.9	15.3	20.6	0.0	2.6	0.2	0.0	0.2	28		35

<a href="#">05</a> †	25.8	14.9	20.4	0.0	2.4	T	0.0	T	26	37
<a href="#">06</a> †	23.3	16.1	19.7	0.0	1.7	0.0	0.0	0.0	26	50
<a href="#">07</a> †	22.5	15.9	19.2	0.0	1.2	23.2	0.0	23.2	23	32
<a href="#">08</a> †	20.4	13.5	17.0	1.0	0.0	0.4	0.0	0.4	25	33
<a href="#">09</a> †	20.9	12.1	16.5	1.5	0.0	T	0.0	T	28	37
<a href="#">10</a> †	23.6	12.1	17.9	0.1	0.0	T	0.0	T	25	33
<a href="#">11</a> †	17.5	14.5	16.0	2.0	0.0	36.4	0.0	36.4	18	56
<a href="#">12</a> †	17.5	8.4	13.0	5.0	0.0	T	0.0	T	1	33
<a href="#">13</a> †	23.2	9.1	16.2	1.8	0.0	0.0	0.0	0.0	25	39
<a href="#">14</a> †	21.6	13.7	17.7	0.3	0.0	0.0	0.0	0.0	26	44
<a href="#">15</a> †	25.3	14.3	19.8	0.0	1.8	0.0	0.0	0.0	25	37
<a href="#">16</a> †	21.2	11.4	16.3	1.7	0.0	1.6	0.0	1.6	25	48
<a href="#">17</a> †	20.9	10.8	15.9	2.1	0.0	0.0	0.0	0.0	2	37
<a href="#">18</a> †	13.5	10.5	12.0	6.0	0.0	26.4	0.0	26.4	11	44
<a href="#">19</a> †	23.0	13.1	18.1	0.0	0.1	0.2	0.0	0.2	26	44
<a href="#">20</a> †	24.0	16.2	20.1	0.0	2.1	2.8	0.0	2.8	26	37
<a href="#">21</a> †	22.7	13.9	18.3	0.0	0.3	0.0	0.0	0.0		<31
<a href="#">22</a> †	25.7	14.4	20.1	0.0	2.1	T	0.0	T	25	56
<a href="#">23</a> †	25.8	18.4	22.1	0.0	4.1	38.2	0.0	38.2	16	80

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