

Real Time Water Quality Deployment Report
NF02ZK0023 - Rattling Brook below Bridge (Vale Inco)
May – June 2008

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Vale Inco will be informed of any significant water quality events in the form of a monthly report.
- This monthly report interprets the data from the Rattling Brook River RTWQ station for the period of May 14 to June 11, 2008.

Maintenance and Calibration of Instrumentation

- The Rattling Brook instrument was deployed on May 14, 2008. A second set of data readings were collected at the time of installation, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings upon comparing water quality data from both instruments for the removal before the start of the deployment period and the installation at the start of the deployment period are both indicated in **Table 1**. Rankings of “good” and “excellent” were achieved on installation for all parameters.

Table 1: QA/QC Data Comparison Rankings upon removal on April 24th, 2008 and installation on May 14th, 2008

Station	Date	Action	Instrument Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Rattling Brook (Long Harbour)	Apr. 24, 2008	Removal	Good	Excellent	Good	Excellent
	May. 14, 2008	Installation	Excellent	Good	Good	Excellent

- Due to problems with site transmission, data was not available on-line past mid-April. The Rattling Brook instrument was removed June 11th after a period of 28 days for regular maintenance and calibration activities. A second set of data readings were collected at the time of removal, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings upon comparing water quality data from both instruments for the removal at the end of the deployment period and the installation after the deployment period are both indicated in **Table 2**. Rankings of “excellent” and “good” on removal were achieved for all parameters, except dissolved oxygen which ranked “poor” indicating fouling or loss of calibration. The “excellent” and “good” rankings on removal indicate a high degree of accuracy in the data obtained for all other parameters. Conductivity and dissolved oxygen sensors were not giving stable readings on the QA sonde, as a result they were not included for rankings on June 13th installation.

Table 2: QA/QC Data Comparison Rankings upon removal on June 11th, 2008 and installation on June 13th, 2008

Station	Date	Action	Instrument Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Rattling Brook (Long Harbour)	Jun. 11, 2008	Removal	Good	Excellent	Excellent	Poor
	Jun. 13, 2008	Installation	Good	Excellent	NA	NA

Data Interpretation

- Water temperature values (**Figure 1**) for the deployment period displayed diurnal fluctuations and generally increased, typical for the spring season. Water temperature ranged between 5.25 and 15.79°C.

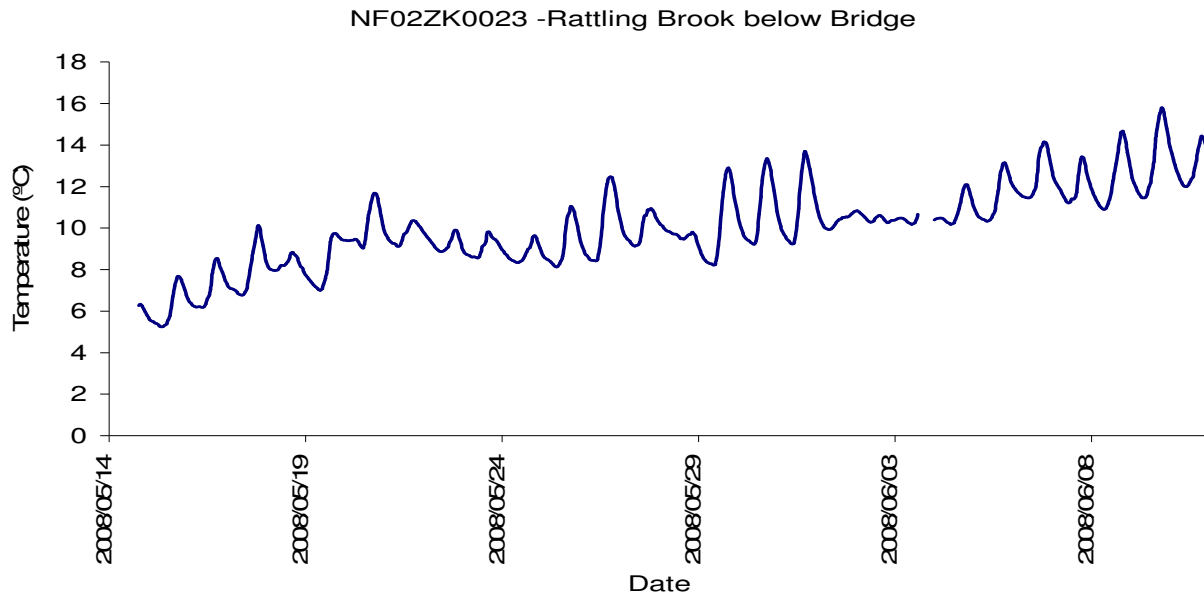


Figure 1

- Dissolved oxygen (DO) values (**Figure 2**) for the deployment period generally decreased, corresponding with the increase in water temperature. DO values ranged from 7.84 to 12.43 mg/L, it is suspected around the middle of the deployment period the sensor readings began to lose their initial “excellent” ranking, resulting in a “poor” ranking on removal. The minimum DO concentrations recommended by the Canadian Council of Ministers of the Environment (CCME) Protection of Freshwater Aquatic Life Guidelines are cold water/other life stages – above 6.5; warm water/other life stages – above 5.5; warm water/early life stages – above 6; cold water/early life stages – above 9.5 mg/L.

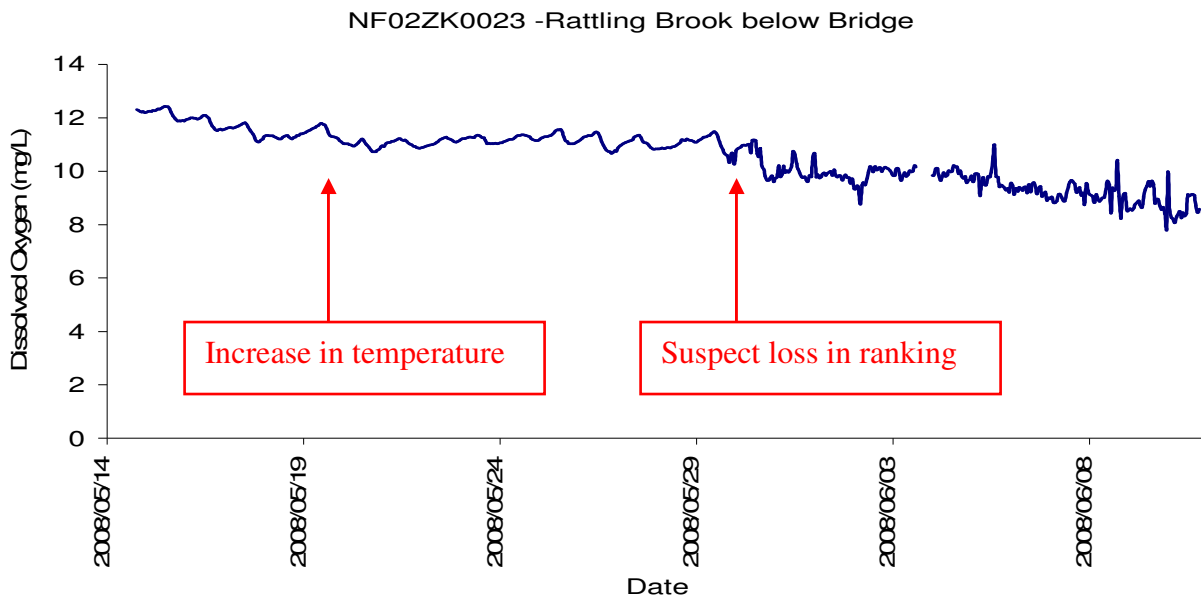


Figure 2

- pH values (**Figure 3**) were consistent over the deployment period. pH values ranged between 5.80 and 6.26, all values below the minimum pH level of 6.5 recommended by the CCME Guidelines for the Protection of Freshwater Aquatic Life (due to the naturally acidic nature of NL waters).

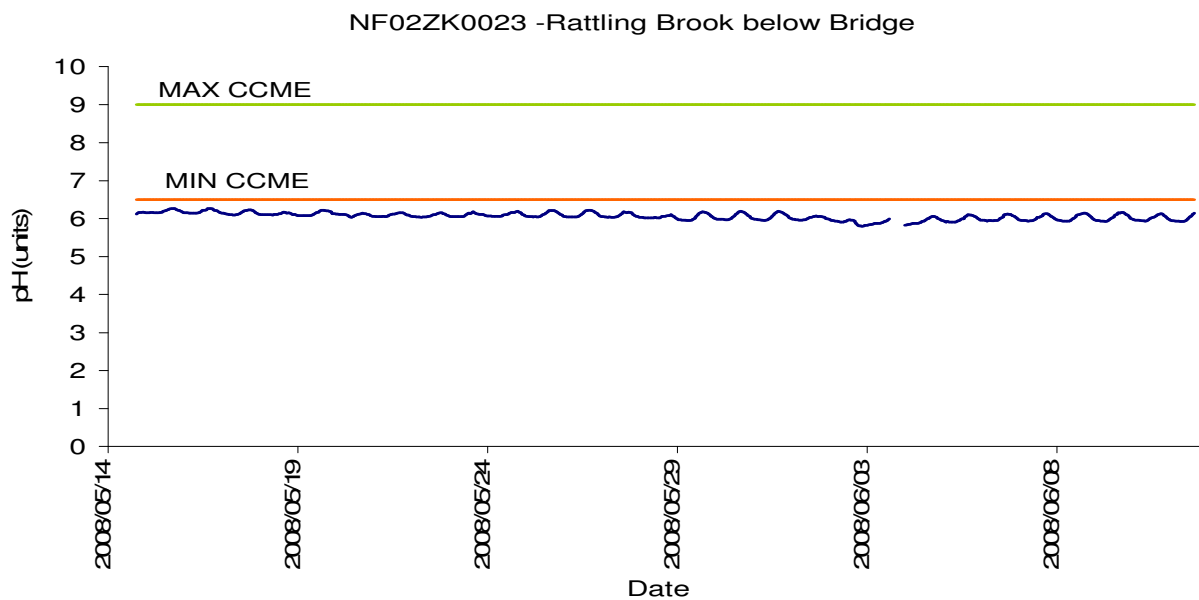


Figure 3

- Specific conductance values (**Figure 4**) were consistent for most of the deployment period, an increase at the end of deployment corresponds to a drop in stage. Specific conductance ranged from 28.3 to 30.1 $\mu\text{S}/\text{cm}$.

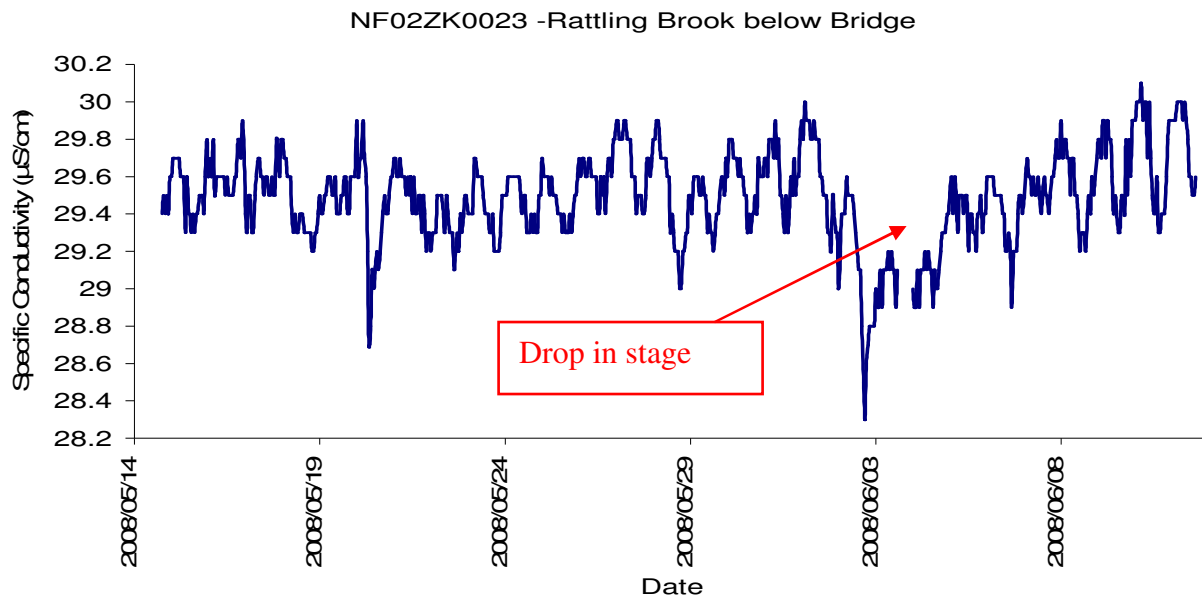


Figure 4

- Generally, turbidity values (**Figure 5**) were at zero NTU for the deployment period, yet spikes in turbidity can be seen over the period. Turbidity spikes may be explained by precipitation events at the same time or sensor interference, such as debris on the turbidity sensor window at the time of measurement. The maximum turbidity value recorded for the deployment period was 31.8 NTU.

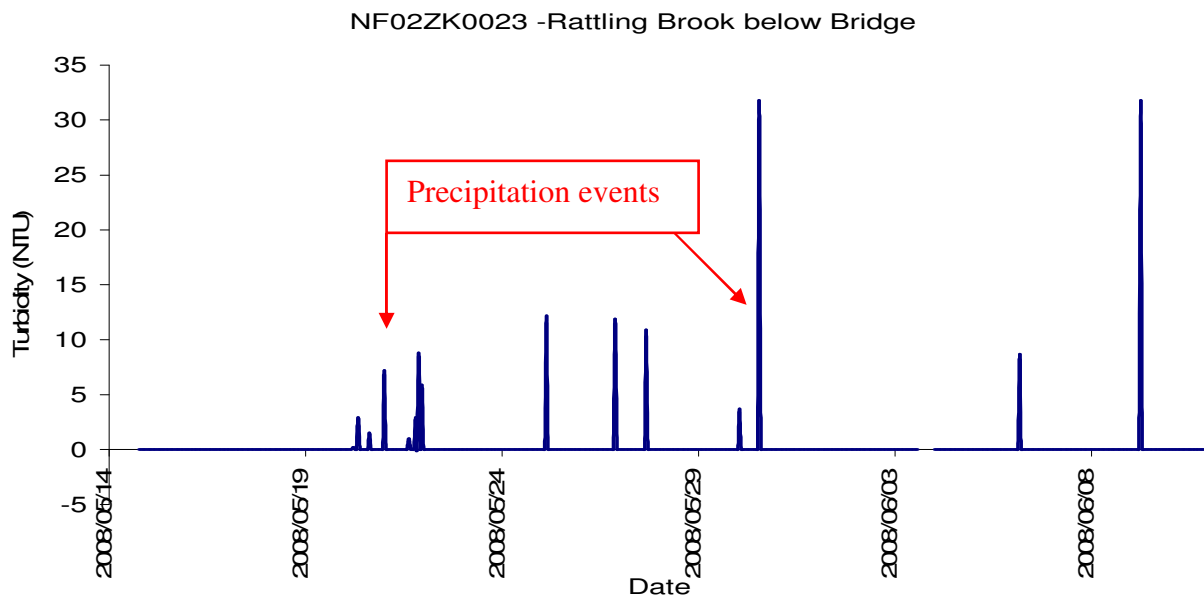


Figure 5

- Stage values (**Figure 6**) were consistent with precipitation events (**Appendix A**). Two significant rises in stage can be seen in Figure 6, the first during the start of the deployment period and the second towards the end. Stage values ranged between 1.551 and 1.758 meters.

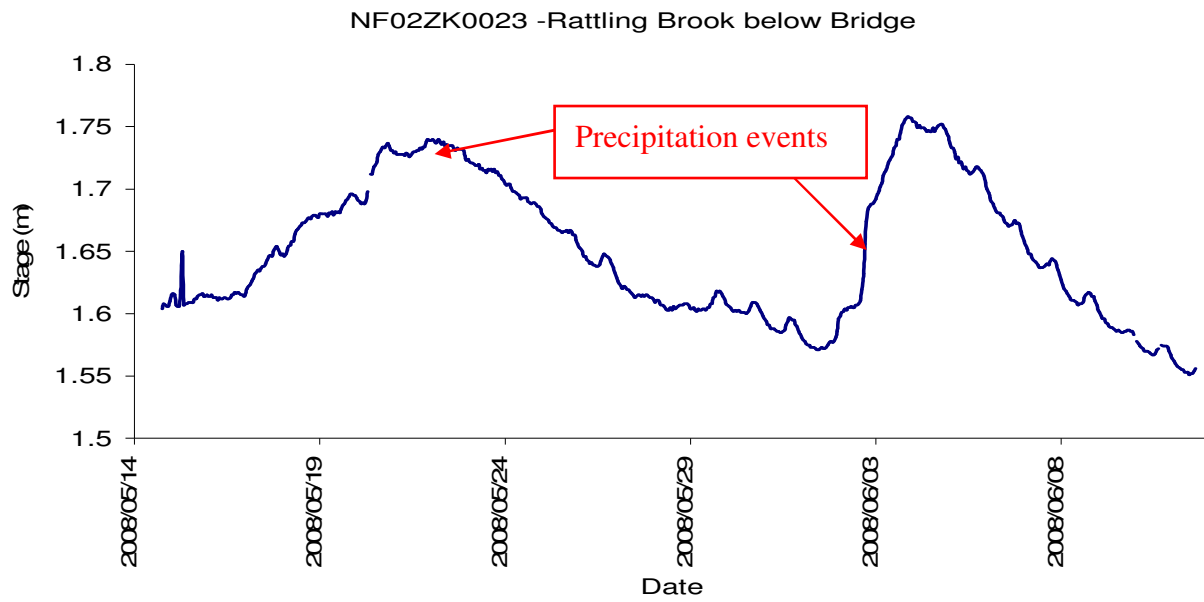


Figure 6

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Appendix A – Climate Data for Argentia, NL (May 14 to June 11, 2008)

Daily Data Report for May 2008											
D a y	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
14†	4.2	0.9	2.6	15.4	0.0	M	M	0.0		4	57
15†	9.8	1.8	5.8	12.2	0.0	M	M	3.3		5	48
16†	9.2	3.1	6.2	11.8	0.0	M	M	1.9			<31
17†	9.9	2.9	6.4	11.6	0.0	M	M	7.9		12	59
18†	11.9	2.0	7.0	11.0	0.0	M	M	3.0		15	74
19†	14.8	1.6	8.2	9.8	0.0	M	M	3.6		13	56
20†	11.3	3.5	7.4	10.6	0.0	M	M	8.1		16	48
21†	12.1	4.2	8.2	9.8	0.0	M	M	13.5		13	82
22†	6.7	3.0	4.9	13.1	0.0	M	M	0.0		20	67
23†	13.2	3.1	8.2	9.8	0.0	M	M	3.8		10	44
24†	5.1	2.2	3.7	14.3	0.0	M	M	2.0		21	44
25†	5.9	1.3	3.6	14.4	0.0	M	M	0.0		20	39
26†	9.2	2.7	6.0	12.0	0.0	M	M	0.0		20	52
27†	11.4	5.5	8.5	9.5	0.0	M	M	2.8		21	87
28†	7.3	2.7	5.0	13.0	0.0	M	M	6.4		21	63
29†	9.4	3.1	6.3	11.7	0.0	M	M	0.0		19	61
30†	7.9	4.2	6.1	11.9	0.0	M	M	0.0		21	63
31†	9.3	4.0	6.7	11.3	0.0	M	M	0.0		21	41

Daily Data Report for June 2008											
D a y	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†	12.5	5.2	8.9	9.1	0.0	M	M	6.8		15	67
02†	10.2	5.3	7.8	10.2	0.0	M	M	5.5		20	44
03†	8.8	4.9	6.9	11.1	0.0	M	M	0.0		20	33
04†	8.8	4.9	6.9	11.1	0.0	M	M	0.0		19	35
05†	10.7	5.4	8.1	9.9	0.0	M	M	1.2			<31
06†	17.4	4.3	10.9	7.1	0.0	M	M	0.0		1	39
07†	10.1	4.0	7.1	10.9	0.0	M	M	0.0			<31
08†	12.4	3.5	8.0	10.0	0.0	M	M	0.0		14	52
09†	13.1	4.6	8.9	9.1	0.0	M	M	0.0		13	54
10†	14.9	5.0	10.0	8.0	0.0	M	M	0.0		3	43
11†	15.7	6.3	11.0	7.0	0.0	M	M	0.0		3	35