

Real Time Water Quality Monthly Report Rattling Brook below Bridge (VBNC) December 2006-January 2007

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Voisey's Bay Nickel Company (VBNC). will be informed of any significant water quality events in the future in the form of a monthly report.
- The initial installation of the RTWQ instrumentation at Rattling Brook below Bridge occurred on December 12th, 2006. Pictures of the installation site are in Appendix A.

Maintenance and Calibration of Instrumentation

- The instrument at Rattling Brook was initially installed on December 12th, 2006. The comparison of Minisonde values to the Datasonde values as is regularly completed for QA/QC data comparison ranking is not available. No Minisonde readings were taken at the time of installation because the battery in the data collector died due to cold weather.
- The Rattling Brook instrument was deployed until January 23rd, 2007 (42-day deployment period) at which point it was removed for maintenance and calibration. The results from comparing the Minisonde values to the Datasonde values during removal on January 23rd can be seen in **Table 1**.

	^	Action	Minisonde vs. Datasonde Comparison Ranking					
Station	Date		Temperature	рН	Conductivity	Dissolved Oxygen		
Rattling Brook (Long Harbour)	January 23 rd , 2006	Removal	Excellent	Marginal	Excellent	Excellent		

Table 1: QA/QC Data Comparison Rankings upon removal on January 23rd, 2006

• The removal of the instrument at Rattling Brook on January 23rd, 2006 showed the temperature, conductivity and dissolved oxygen probes still showing excellent QA/QC rankings. The pH probe however, showed a marginal QA/QC rating. This could have been caused by the loss of calibration over the deployment period.

Data Interpretation

- This monthly report interprets the data from the Rattling Brook RTWQ station in Long Harbour for the period of December 12th, 2006 – January 23rd, 2007.
- The water temperature (Figure 1) readings for Rattling Brook remained fairly consistent over the deployment period with a slight decrease in temperatures. This is expected at this time of the year with a temperature range of -0.28 3.02 °C.



The dissolved oxygen values (Figure 2) remained fairly consistent over the deployment period with a slight increase in values. This is consistent with the slight decrease in temperature seen in Figure 1. The dissolved oxygen values ranged from 13.12 mg/L to 15.19 mg/L. These values fall within the recommended CCME Protection of Aquatic Life guidelines for dissolved oxygen (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 – 9.5 mg/L).



Figure 2

The pH values (Figure 3) for Rattling Brook station remained consistent throughout the deployment period. The pH values ranged from 6.13 – 6.31 with all values falling outside the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life guidelines due to the naturally acidic nature of NL waters.



• The specific conductivity values (**Figure 4**) remained consistent throughout the deployment period with values ranged from $32.4 - 34.4 \,\mu$ S/cm.



Figure 4

• The turbidity values (**Figure 5**) remained near 0 NTU until January 15th, 2007. The turbidity values after that date reached the maximum measurable values for the instrument of 3000 NTU. This was likely due to the alga/plant material that was found intertwined on the turbidity sensor when the instrument was removed on January 23rd, 2007 (see Picture 3 in Appendix A). The casing was removed and taken to a machine shop for retrofit of stainless steel screen to ensure that this does not occur again.



Prepared by: Renée Paterson & Annette Tobin Environmental Scientists Department of Environment and Conservation PH: (709) 729-1159 / (709) 637-2431 FX: (709) 729-0320 / (709) 637-2541

Appendix A – Pictures of Rattling Brook RTWQ Station



Picture 1: Rattling Brook below Bridge RTWQ Station Location



Picture 2: Hydrometric Hut at Rattling Brook below Bridge



Picture 3: Alga/plant material that was found intertwined on the Datasonde when instrument was removed on January 23rd, 2007

Appendix B – Climate Data for Argentia, NL (December 2006 & January 2007)

Daily Data Report for December 2006											
D a y	<u>Max</u> Temp ℃ M	<u>Min</u> Temp ℃ ₩	Mean Temp °C M	<u>Heat</u> Deg Days C M	Cool Deq Days C M	<u>Total</u> <u>Rain</u> mm	<u>Total</u> <u>Snow</u> cm	<u>Total</u> Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	<u>Spd</u> of <u>Max</u> <u>Gust</u> km/h
<u>01</u>	8.0	2.0	5.0	13.0	0.0			4.9	0		
<u>02</u>	9.0	-0.3	4.4	13.6	0.0			8.6	0		
<u>03</u>	2.1	0.2	1.2	16.8	0.0			0.0	0		
<u>04</u>	2.1	-1.6	0.3	17.7	0.0			17.5	0		
<u>05</u>	2.2	0.3	1.3	16.7	0.0			1.6	M		
<u>06</u>	1.9	-3.9	-1.0	19.0	0.0			0.0	M		
<u>07</u>	11.8	-3.2	4.3	13.7	0.0			4.2	M		
<u>08</u>	12.9	3,5	8.2	9.8	0.0			18.4	M		
<u>09</u>	1.3	-4.0	-1.4	19.4	0.0			0.0	M		
<u>10</u>	5.5	-3,5	1.0	17.0	0.0			0.7	M		
<u>11</u>	4.2	2.7	3.5	14.5	0.0			0.0	M		
12	-0.9	-6.5	-3.7	21.7	0.0			0.0	M		
<u>13</u>	4.2	-3.4	0.4	17.6	0.0			0.0	M		
<u>14</u>	8.6	1.6	5.1	12.9	0.0			5.1	M		
<u>15</u>	5.3	3.9	4.6	13.4	0.0			11.0	M		
<u>16</u>	10.4	3.2	6.8	11.2	0.0			9.8	M		
<u>17</u>	5.0	4.0	4.5	13.5	0.0			0.0	M		
<u>18</u>	5.3	2.1	3.7	14.3	0.0			0.0	M		
<u>19</u>	-0.4	-4.7	-2.6	20.6	0.0			0.0	M		
<u>20</u>	0.6	-4.7	-2.1	20.1	0.0			0.6	M		
<u>21</u>	2.9	-2.8	0.1	17.9	0.0			1.6	M		
22	-0.6	-3,3	-2.0	20.0	0.0			0.0	M		
23	4.3	-3.9	0.2	17.8	0.0			3.3	M		
24	7.8	-0.8	3,5	14.5	0.0			3.7	M		
<u>25</u>	3.0	2.0	2,5	15.5	0.0			0.0	M		
<u>26</u>	1.9	0.0	1.0	17.0	0.0			6.8	M		
27	0.7	-0.2	0.3	17.7	0.0			0.0	M		
28	-2.2	-4.9	-3,6	21.6	0.0			0.0	M		
<u>29</u>	-5.0	-6.8	-5.9	23.9	0.0			0.0	M		
<u>30</u>	-0.5	-8.9	-4.7	22.7	0.0			0.0	M		
<u>31</u>	-0.2	-4.7	-2.5	20.5	0.0			2.0	M		
Sum				525.6	0.0			99.8			
Avg	3.6	-1.5	1.0								
Xtrm	12.9	-8.9									

Daily Data Report for January 2007											
D a y	<u>Max</u> Temp ℃ M	<u>Min</u> Temp ℃ M	Mean Temp °C M	Heat Deg Days C M	Cool Deq Days C M	<u>Total</u> <u>Rain</u> mm	<u>Total</u> <u>Snow</u> cm	<u>Total</u> <u>Precip</u> mm	<u>Snow</u> on <u>Grnd</u> cm	Dir of <u>Max</u> Gust 10's Deg	<u>Spd</u> of <u>Max</u> <u>Gust</u> km/h
<u>01</u>	0.3	-6.4	-3.1	21.1	0.0			0.0			
<u>02</u>	7.6	-3.4	2,1	15.9	0.0			12.9			
<u>03</u>	2.1	-2.1	0.0	18.0	0.0			0.0			
<u>04</u>	2.8	-2.0	0.4	17.6	0.0			0.0			
<u>05</u>	4.2	1.0	2.6	15.4	0.0			9.2			
<u>06</u>	6.6	1.8	4.2	13.8	0.0			22.7			
<u>07</u>	4.1	2.6	3.4	14.6	0.0			0.0			
<u>08</u>	9.9	1.7	5.8	12.2	0.0			11.9			
<u>09</u>	5.6	0.9	3.3	14.7	0.0			3.8			
<u>10</u>	2.5	1.9	2.2	15.8	0.0			1.3			
<u>11</u>	0.6	-1.0	-0.2	18.2	0.0			1.1			
<u>12</u>	2.5	-2.1	0.2	17.8	0.0			2.4			
<u>13</u>	2.1	0.7	1.4	16.6	0.0			3.7			
<u>14</u>	0.0	-6.4	-3.2	21.2	0.0			0.7			
<u>15</u>	-3.1	-6.1	-4.6	22.6	0.0			1.9			
<u>16</u>	-2.1	-8.4	-5.3	23.3	0.0			0.7			
<u>17</u>	-11.0	-12.5	-11.8	29.8	0.0			0.0			
<u>18</u>	-0.8	-14.2	-7.5	25.5	0.0			0.0			
<u>19</u>	4.9	-8.5	-1.8	19.8	0.0			2.9			
<u>20</u>	5.9	-0.2	2,9	15.1	0.0			10.6			
21	0.2	-0.5	-0.2	18.2	0.0			4.2			
22	-3.0	-5.3	-4.2	22.2	0.0			0.0			
23	-1.1	-6.0	-3.6	21.6	0.0			3.8			
<u>24</u>	1.2	-4.2	-1.5	19.5	0.0			7.6			
<u>25</u>	-0.3	-1.0	-0.7	18.7	0.0			0.7			
<u>26</u>	2.4	-4.4	-1.0	19.0	0.0			6.9			
27	0.8	-0.6	0.1	17.9	0.0			2.6			
<u>28</u>	-1.5	-2.6	-2,1	20.1	0.0			0.6			
<u>29</u>	-2.8	-4.4	-3.6	21.6	0.0			6.9			
<u>30</u>	-3.6	-7.3	-5.5	23.5	0.0			0.6			
<u>31</u>	-4.7	-6.6	-5.7	23.7	0.0			0.0			
Sum				595.0	0.0			119.7			
Avg	1.0	-3.4	-1.2								
Xtrm	9.9	-14.2									