

**Real Time Water Quality Monthly Report
for Voisey's Bay Nickel Company Ltd.
September - November 2007**

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Voisey's Bay Nickel Company Ltd. will continue to be informed of any significant water quality events in the future in the form of a monthly report.

Maintenance and Calibration of Instrumentation

- VBNC staff removed instruments from Camp Pond Brook, Tributary to Lower Reid Brook, Lower Reid Brook and Upper Reid Brook for cleaning and calibration on August 20th. VBNC staff cleaned and calibrated the instruments and returned them to all four stations on September 1st.
- Upon redeployment on September 1st, Minisonde readings were taken for QA/QC purposes. The results from comparing the Minisonde values to the Datasonde values can be seen in **Table 1**.

Table 1: QA/QC Data Comparison Rankings upon reinstallation on September 1st, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Upper Reid Brook	Sept. 1 st , 2007	Installation	Excellent	Poor	NA*	Excellent
Lower Reid Brook	Sept. 1 st , 2007	Installation	Excellent	Excellent	NA*	Good
Tributary to Lower Reid Bk	Sept. 1 st , 2007	Installation	Excellent	Excellent	NA*	Excellent
Camp Pond Brook	Sept. 1 st , 2007	Installation	Good	Excellent	NA*	Fair

*Conductivity probe on Minisonde was not working properly.

- VBNC staff removed instruments from Camp Pond Brook, Tributary to Lower Reid Brook, Lower Reid Brook and Upper Reid Brook on November 3rd for the winter months. Instruments will be reinstalled in the spring when ice conditions allow.
- Upon removal Minisonde readings were not taken for QA/QC purposes due to cold and ice conditions.

Data Interpretation

REID BROOK AT OUTLET OF REID POND (UPPER REID BROOK)

- The water temperature (**Figure 1**) showed an decreasing pattern throughout the deployment period. Corresponding, dissolved oxygen (**Figure 2**) showed an increase throughout the deployment. This pattern is expected during the fall.

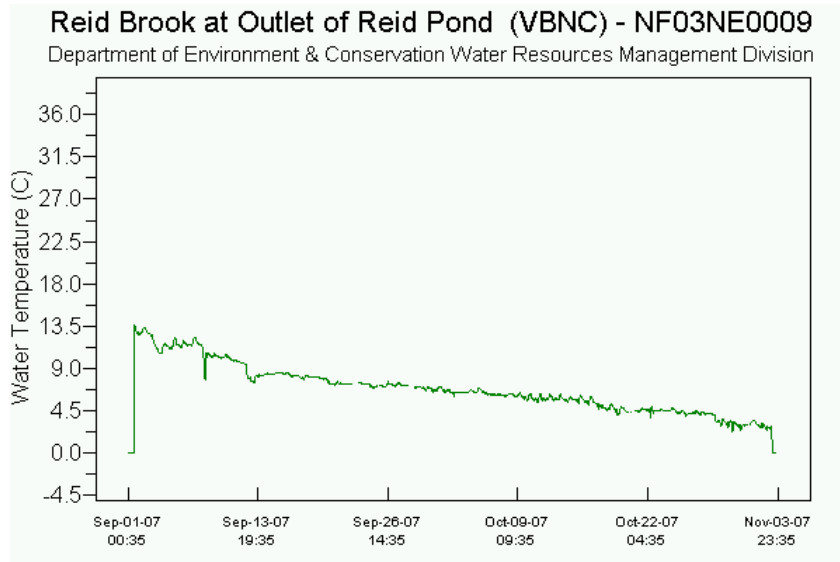


Figure 1

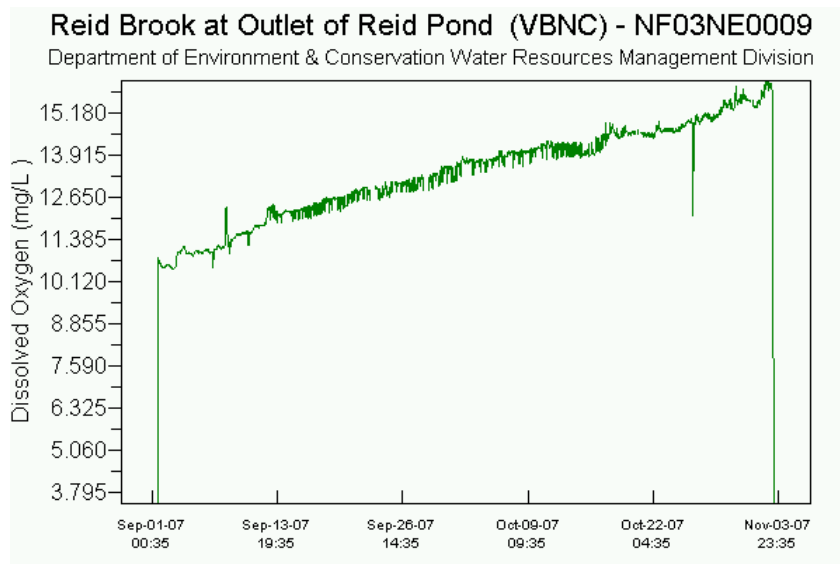
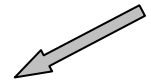
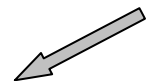


Figure 2



- The conductivity (**Figure 3**) remained very consistent throughout the deployment period.

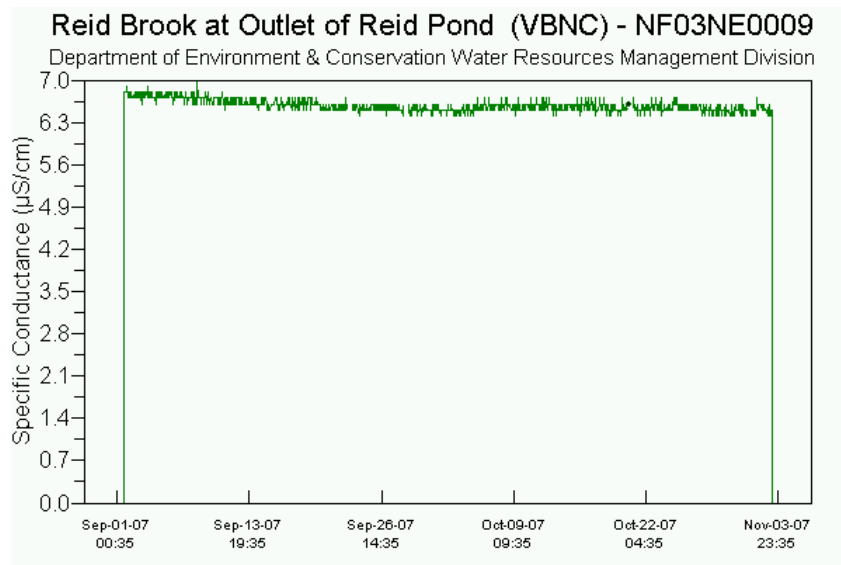
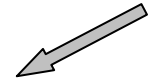


Figure 3



- The pH (**Figure 4**) values fluctuated slightly throughout the deployment period but remained within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0). The first reading after installation was likely due to an erroneous value that was recorded before the pH sensor had time to adjust to the river conditions. This type of occurrence happens occasionally when the instrument is installed close to the same time as a reading is taken by the datalogger.

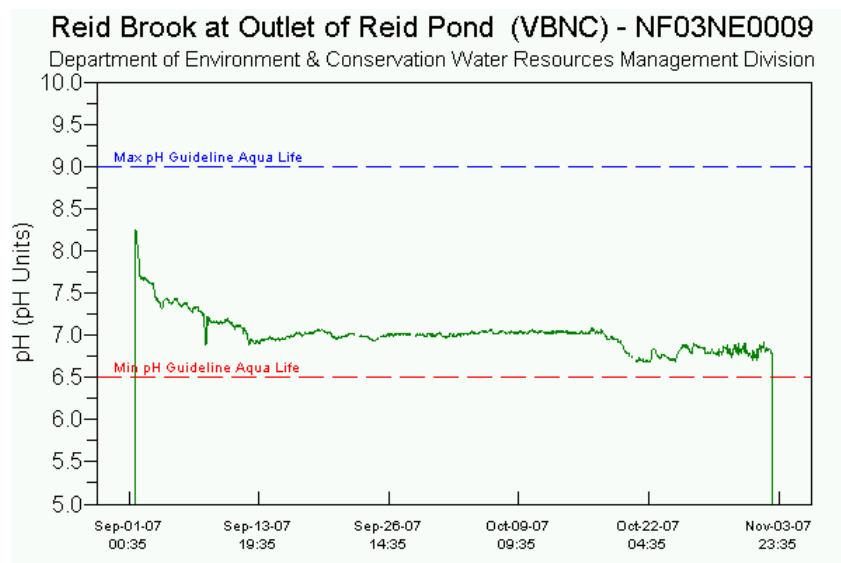
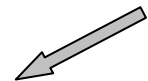


Figure 4



- Turbidity values (**Figure 5**) remained relatively consistently throughout the deployment period with the exception of the first half of October. Looking at the scale of this turbidity spike reveals that the maximum concentration remained below 18 NTU. This station is above all VBNC activities and therefore is likely due to natural events.

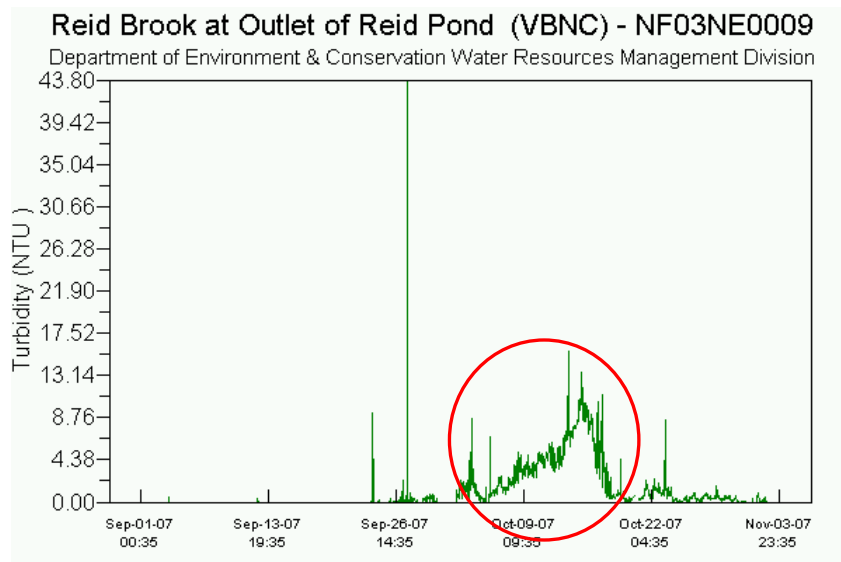
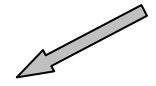


Figure 5



CAMP POND BROOK BELOW CAMP POND

- The water temperature (**Figure 6**) showed an decreasing pattern throughout the deployment period. Corresponding, dissolved oxygen (**Figure 7**) showed an increase throughout the deployment. This pattern is expected during the fall.

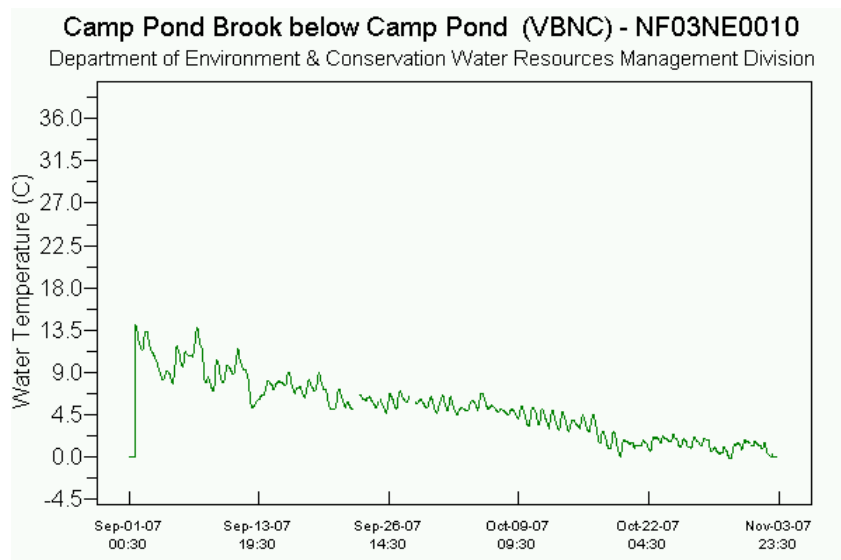
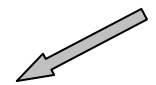


Figure 6



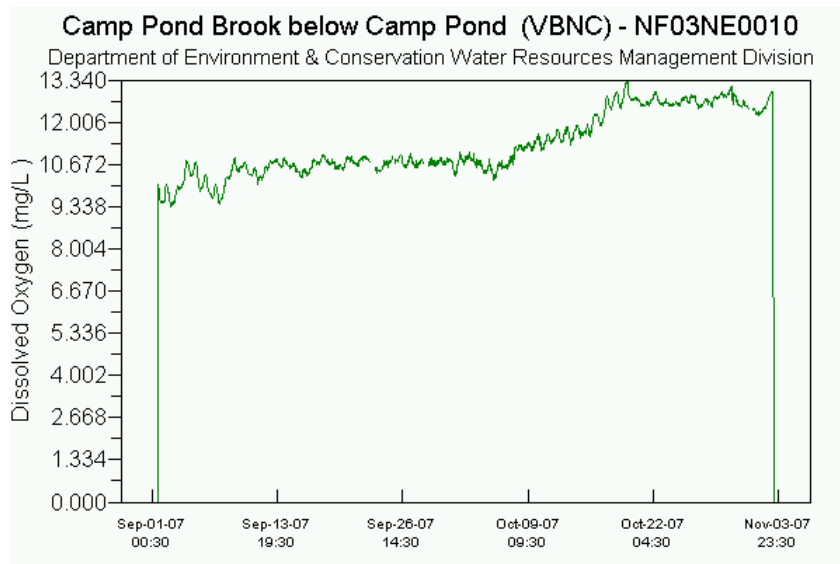
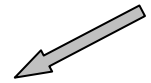


Figure 7



- pH (**Figure 8**) remained very consistent throughout the deployment period and within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0).

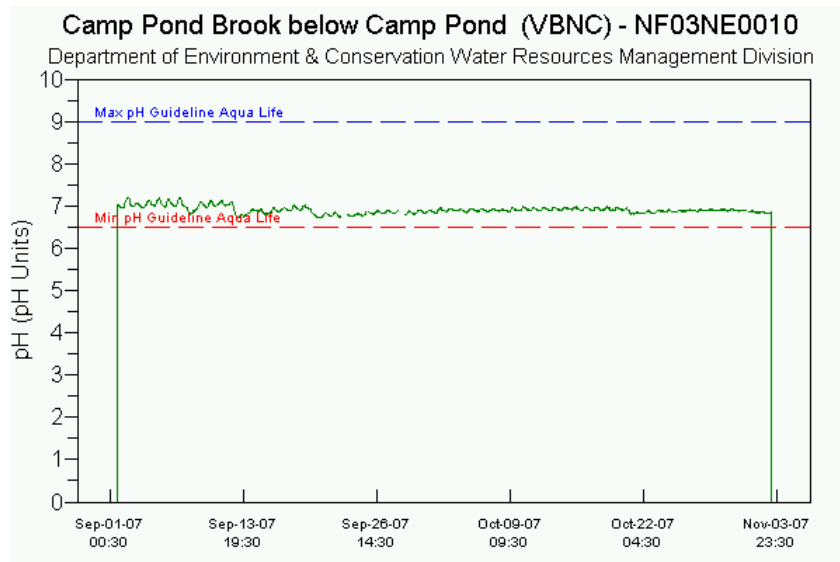
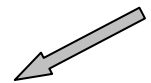


Figure 8



- The specific conductivity values (**Figure 9**) showed fluctuations throughout the month of September and then remained constant throughout the remainder of the deployment period. Conductivity for September however generally remained below 40 $\mu\text{S}/\text{cm}$ which is slightly higher than normal background levels.

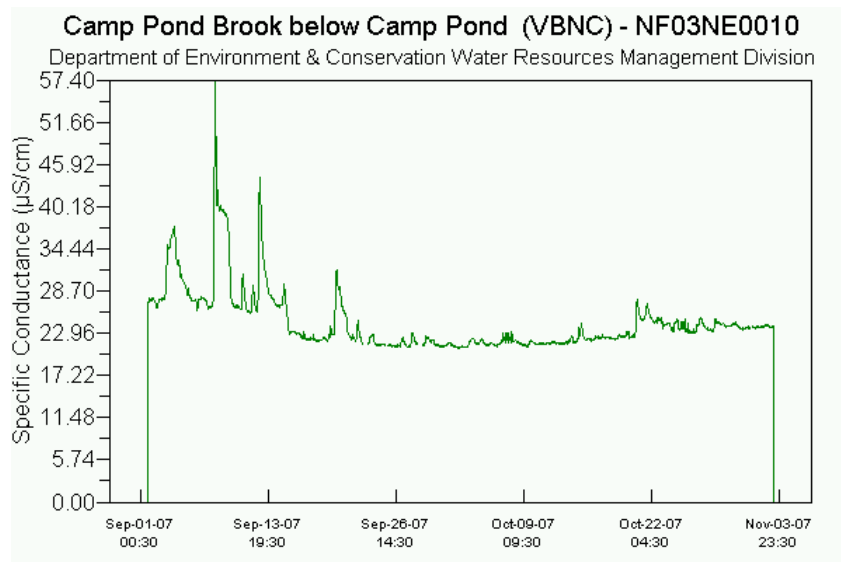
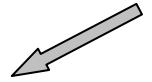


Figure 9



- The turbidity values (**Figure 10**) remained at fairly constant background levels for this station over the deployment period with the exception of few incidents where turbidity values spiked for a short period of time. There is not explanation for these spikes at this time.

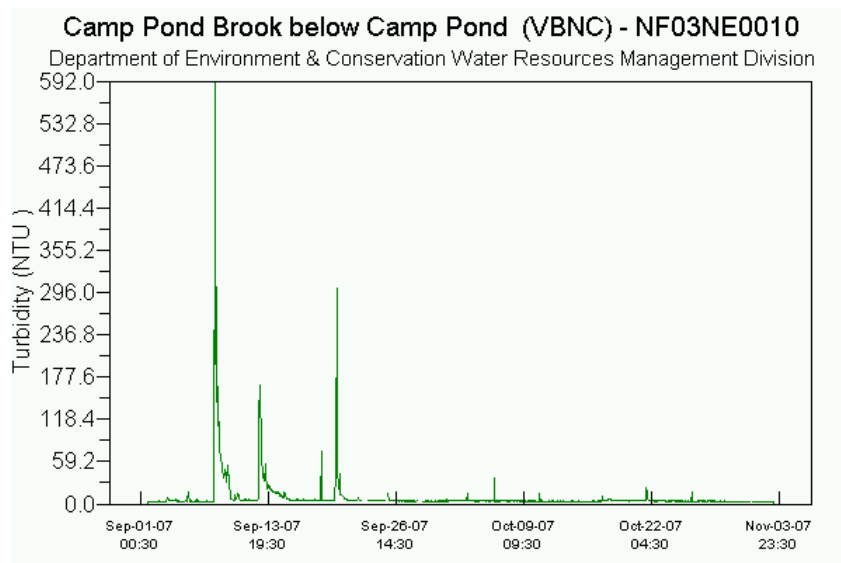
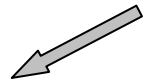


Figure 10



LOWER REID BROOK BELOW TRIBUTARY

- The water temperature (**Figure 11**) showed a decreasing pattern throughout the deployment period. Corresponding, dissolved oxygen (**Figure 12**) showed an increase throughout the deployment. This pattern is expected during the fall.

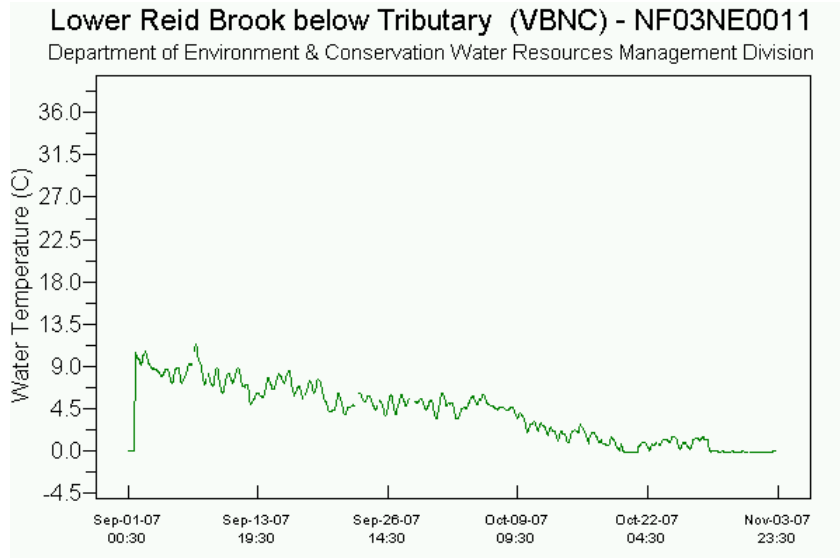


Figure 11

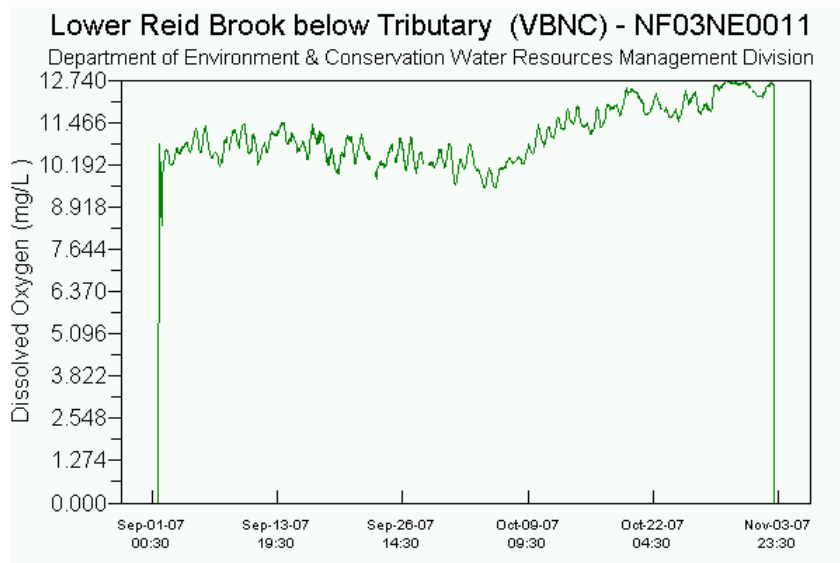
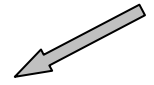
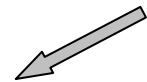


Figure 12



- pH (**Figure 13**) remained fairly consistent throughout the deployment period. The majority of the pH values remained within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0).

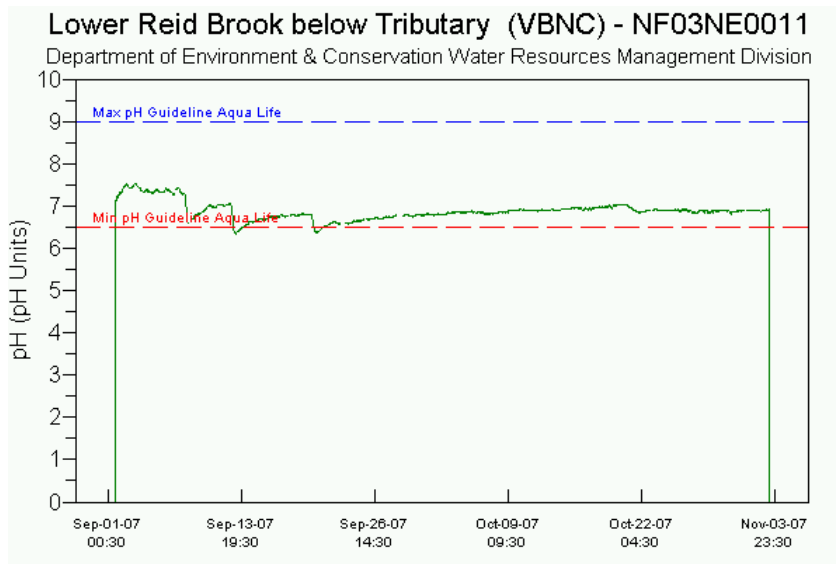
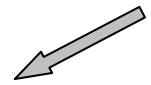


Figure 13



- Turbidity values (**Figure 16**) fluctuated throughout the deployment period. This seems to be fairly consistent with previous deployment period. This site has a very sandy bottom and a new deployment technique may have to be considered at this site.

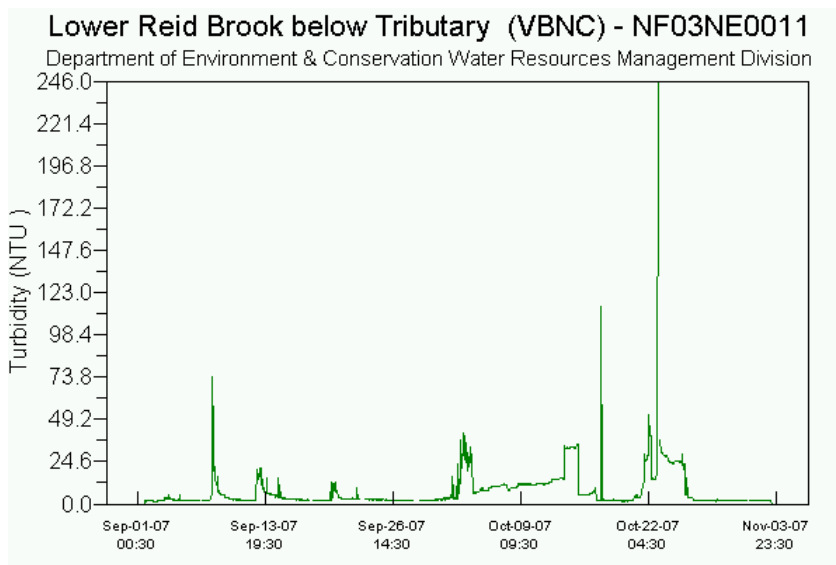
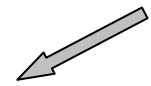


Figure 16



- The specific conductivity values (**Figure 14**) showed a decrease and then increase throughout the deployment period. This is consistent with the increase and then decrease seen in the stage (**Figure 15** graph for September to November. It is typical for conductivity to increase when stage decreases due to ions becoming more concentrated and increasing the conductivity values.

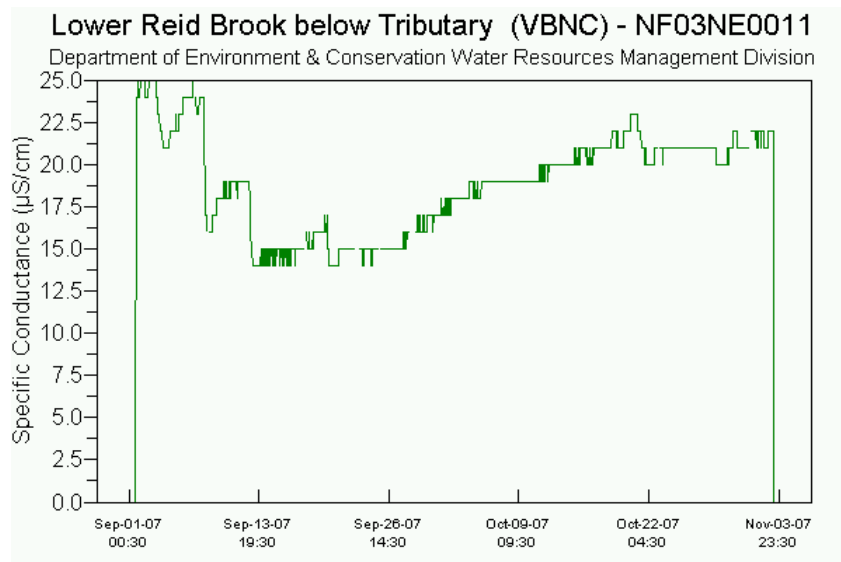


Figure 14

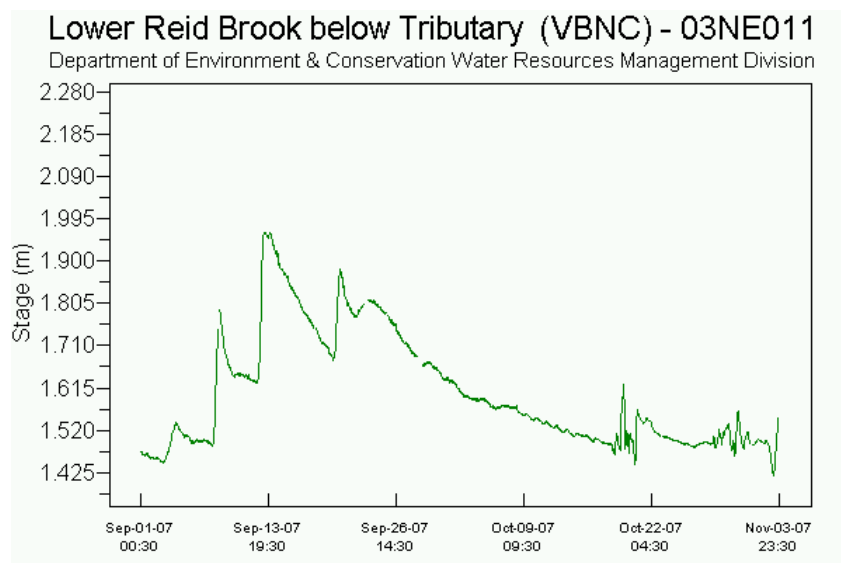
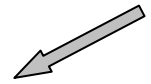
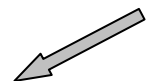


Figure 15



TRIBUTARY TO REID BROOK

- The water temperature (**Figure 17**) showed a decreasing pattern throughout the deployment period. Corresponding, dissolved oxygen (**Figure 18**) showed an increase throughout the deployment. This pattern is expected during the fall.

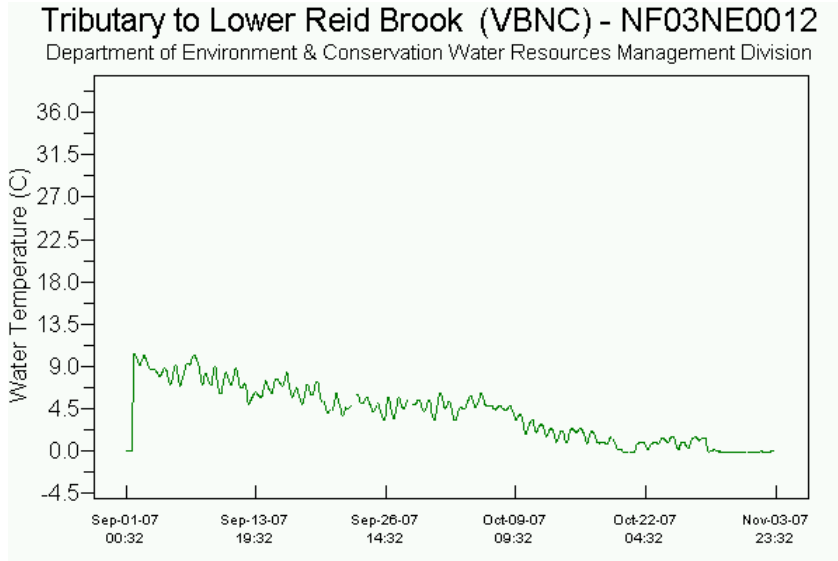


Figure 17

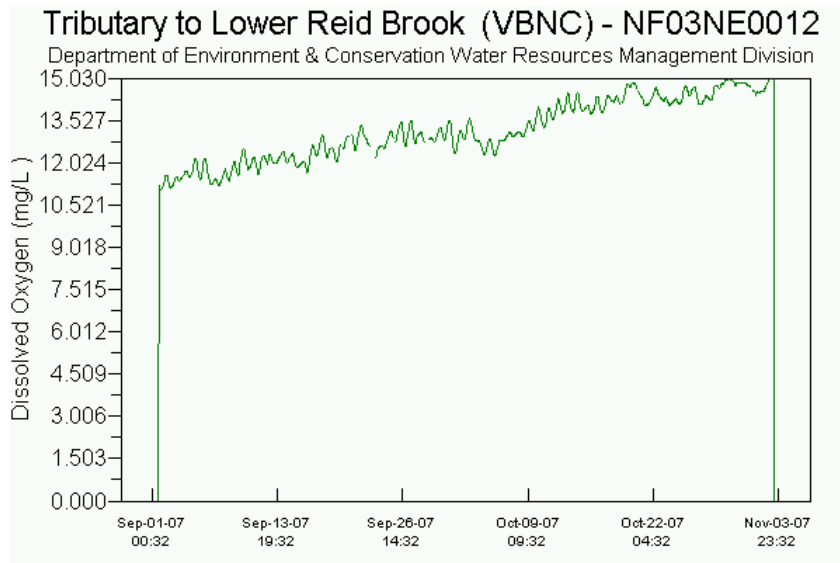
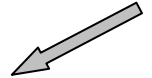
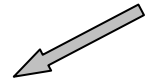


Figure 18



- The pH (**Figure 19**) fluctuated throughout the month of September and then remained fairly consistent through the remainder of the deployment. The majority of the pH values remained within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0) with the exception of three individual incidents in September.

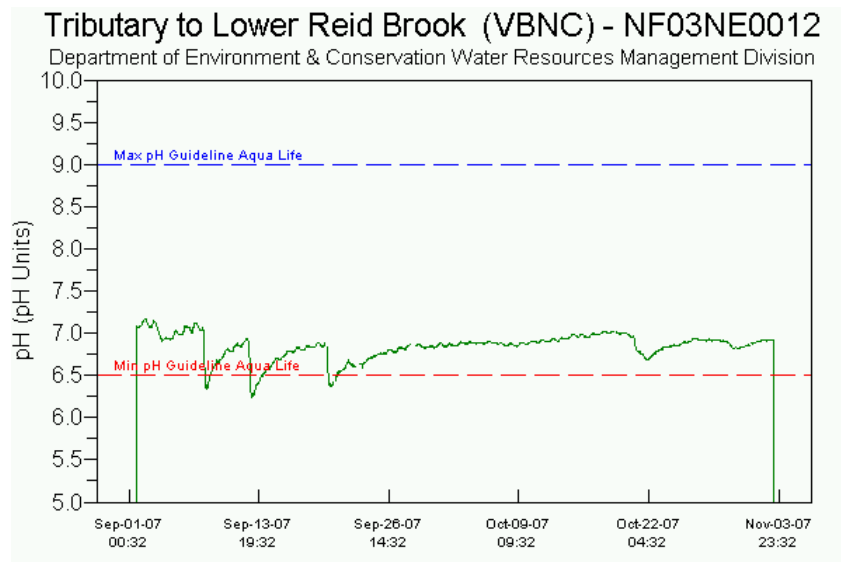
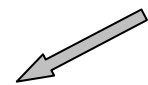


Figure 19



- The turbidity sensor was not functioning properly throughout the fall deployment.

- The specific conductivity values (**Figure 20**) fluctuated throughout the deployment period. This is consistent with fluctuations seen in the stage (**Figure 21**) graph throughout the same period of time. It is typical for conductivity to decrease when stage increases due to ions becoming more concentrated and increasing the conductivity values.

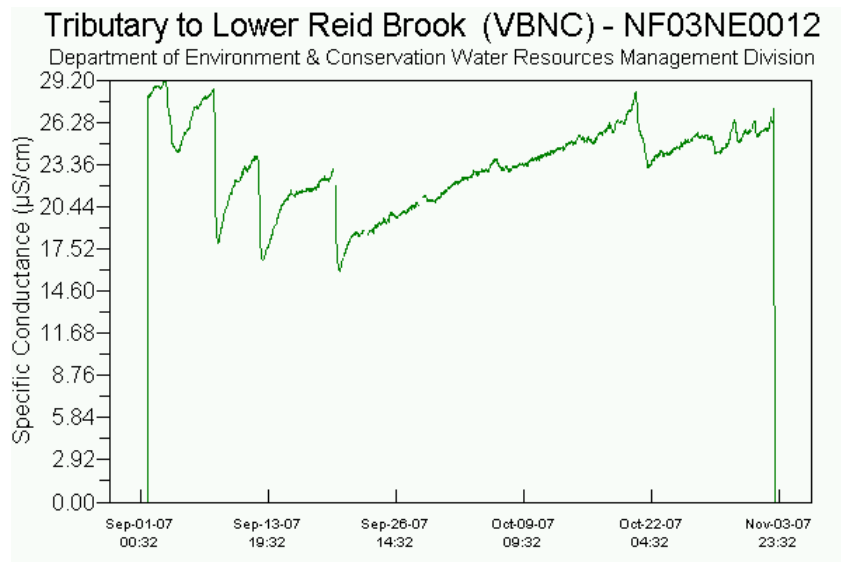


Figure 20

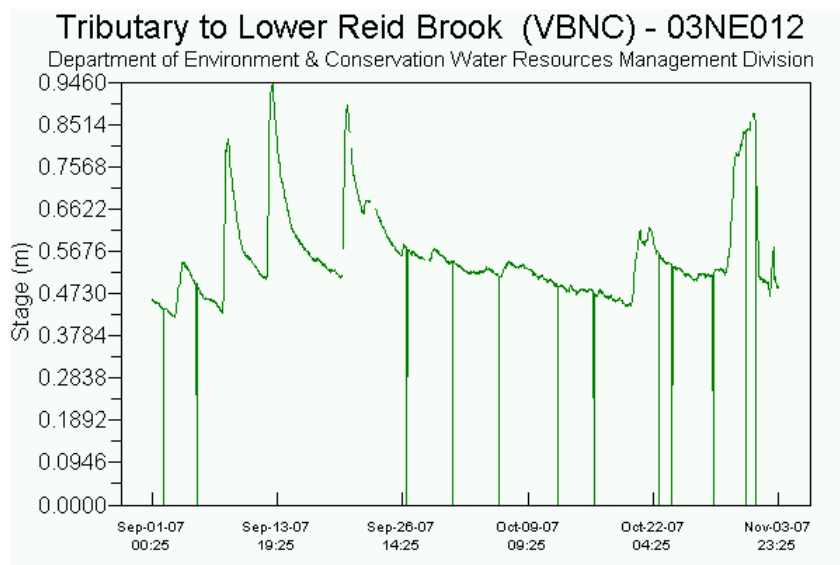
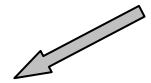
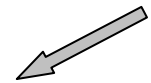


Figure 21



Prepared by: Annette Tobin
Environmental Scientist
Department of Environment and Conservation
PH: (709) 637-2431
FX: (709) 637-2541
Email: annettetobin@gov.nl.ca