

Real Time Water Quality Monthly Report for Voisey's Bay Nickel Company Ltd. June 2007

General

- The four Datasondes and one Quanta were taken out of winter storage in mid-May. Department of Environment and Conservation staff cleaned/calibrated all instruments and set the parameter display order to ensure the data would read properly when the instruments were deployed. The instruments were sent to Voisey's Bay in mid-May, 2007.
- By early June, the ice in the rivers was breaking up and the conditions were suitable for deployment of the four Datasondes.
- On June 7th, the VBNC staff was equipped with a helicopter and installed the four Datasondes. It was noticed by VBNC staff that the cap that screwed on over the air-tight connection at Lower Reid Brook below the Tributary was missing. A new communication cable will be required for this station.
- The groundwater station at the Tailing Dam could not be installed due to snow conditions around the hut. The only portion of the hut that was visible was the roof which made installation impossible. VBNC staff noted however that there was damage to the solar panel and satellite antennae which was likely due to the weight of the snow over the winter months.
- The data and real-time water quality graphs were logging and transmitting the data successfully for the four stations.
- Environment Canada staff and Department of Environment and Conservation staff were on-site July 3-4, 2007 to visit the real-time water quality/quantity stations.

Maintenance and Calibration of Instrumentation

- DOEC & 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 July 2nd (after 27 day deployment period). DOEC & VBNC staff cleaned and calibrated the instruments and returned them to all four stations on July 4th.
- Snow conditions around the Tailing Dam station hut still did not allow for installation of the groundwater station.
- Upon redeployment on June 7th, 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 June 7th, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Upper Reid Brook	June 7 th , 2007	Installation	Excellent	Fair	NA*	Good
Lower Reid Brook	June 7 th , 2007	Installation	Excellent	Poor	NA*	Marginal
Tributary to Lower Reid Bk	June 7 th , 2007	Installation	Excellent	Fair	NA*	Poor
Camp Pond Brook	June 7 th , 2007	Installation	Excellent	Fair	NA*	Marginal

* Conductivity probe on Minisonde was not working properly.

- Upon removal and redeployment, Minisonde readings were taken for QA/QC purposes. The results from comparing the Minisonde values to the Datasonde values can be seen in **Table 2**.

Table 2: QA/QC Data Comparison Rankings upon removal and reinstallation in July, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Upper Reid Brook	July 2 nd , 2007	Removal	Good	Good	NA*	Poor
	July 4 th , 2007	Installation	NA**	NA**	NA**	NA**
Lower Reid Brook	July 2 nd , 2007	Removal	Good	Fair	NA*	Poor
	July 4 th , 2007	Installation	Good	Poor	NA*	Marginal
Tributary to Lower Reid Bk	July 2 nd , 2007	Removal	Fair	Good	NA*	Good
	July 4 th , 2007	Installation	Fair	Good	NA*	Excellent
Camp Pond Brook	July 2 nd , 2007	Removal	Excellent	Good	NA*	Fair
	July 4 th , 2007	Installation	Excellent	Good	NA*	Good

* Conductivity probe on Minisonde was not working properly.

** No Minisonde readings available.

Data Interpretation

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

- The water temperature and conductivity (**Figures 1 & 2** respectively) remained consistent throughout the deployment period without any significant water quality events captured. As expected for this time of the year there was a decrease in water temperature.

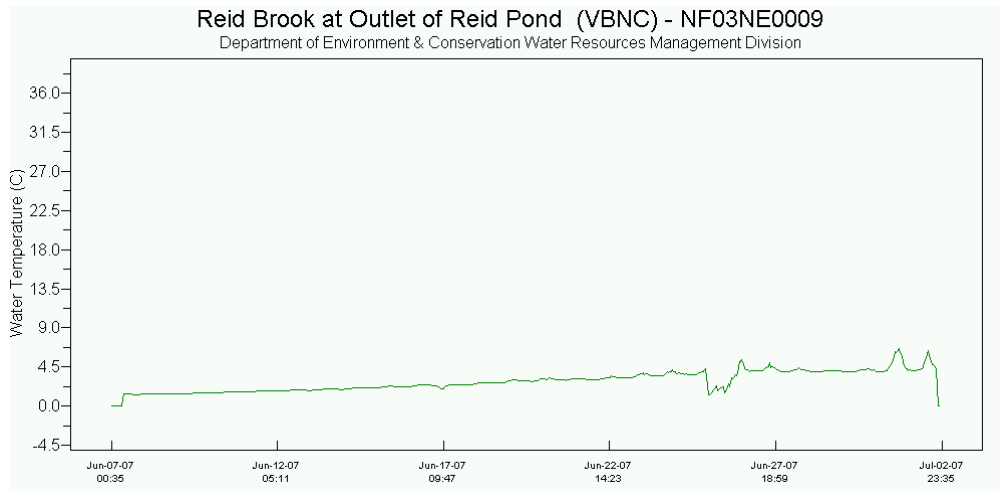


Figure 1

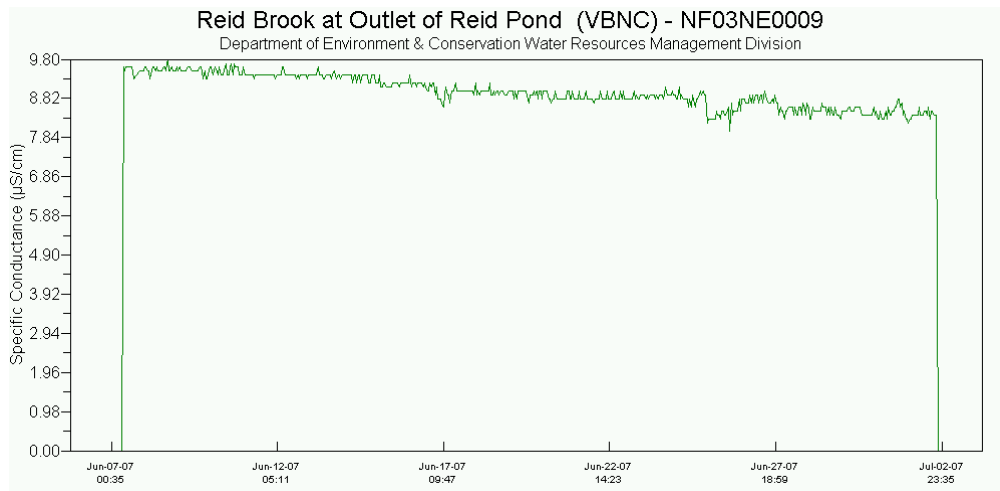
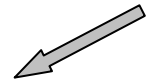
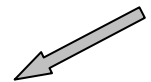


Figure 2



- The dissolved oxygen (**Figure 3**) showed a slight decrease consistent with the increase seen in temperature readings until June 27th. At that time, there was a significant drop in DO that remained lower until removal of the instrument. The minimum DO value (10.31mg/L) is above the minimum CCME Water Quality Guideline for the Protection of Aquatic Life. This station is a control site and not influenced by activities at Voisey's Bay Nickel Company Limited.

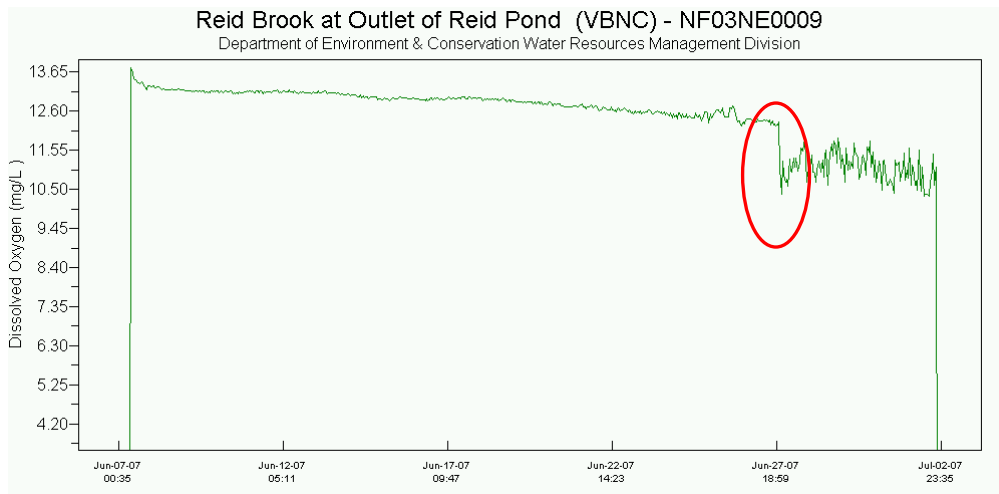


Figure 3

- The pH (Figure 4) values decreased throughout the deployment period and remained below CCME Water Quality for Aquatic Life after June 12th. These values are not typical for this station and will be examined closely throughout the remainder of 2007 to determine if this was equipment error or something has changed in the natural environment. As mentioned previously, this station is a control site and not influenced by activities at Voisey's Bay Nickel Company Limited.

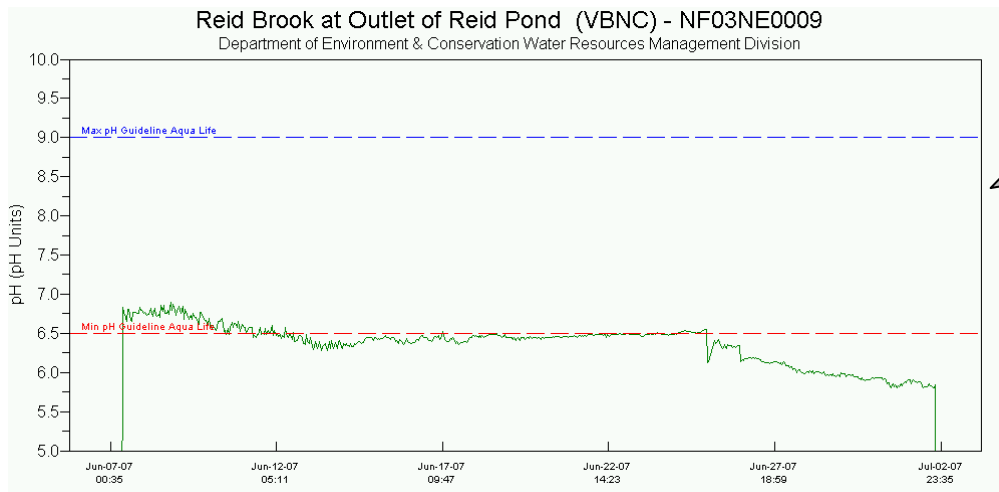


Figure 4

- Turbidity values (Figure 5) consistently remained at 0 NTU throughout the deployment period.

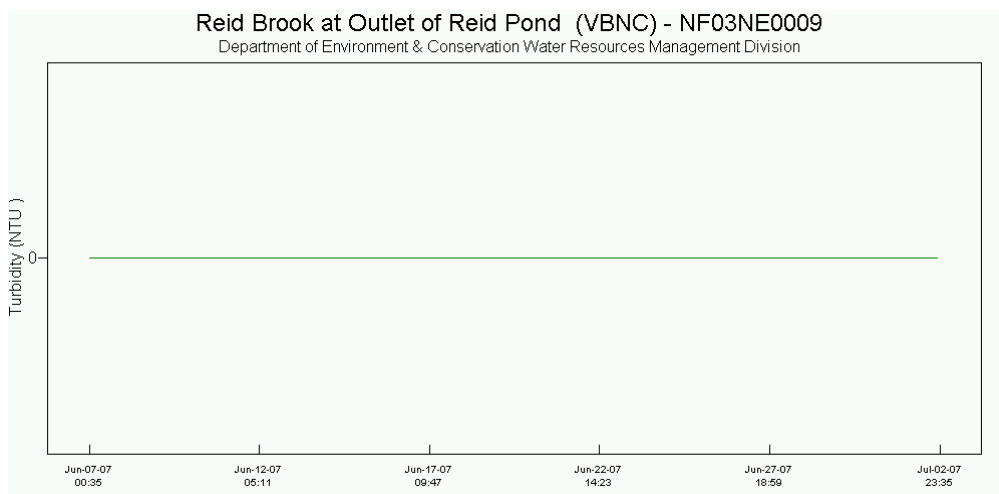


Figure 5

CAMP POND BROOK BELOW CAMP POND

- Water temperature (**Figure 6**) showed an increasing pattern during the first half of the deployment period and then decreased and remained fairly consistent during the second half of the deployment period. This was likely due to temperature conditions in the area. The DO (**Figure 7**) showed a decrease in concentrations and then an increase which stabilized which is consistent with the patterns seen for water temperature.

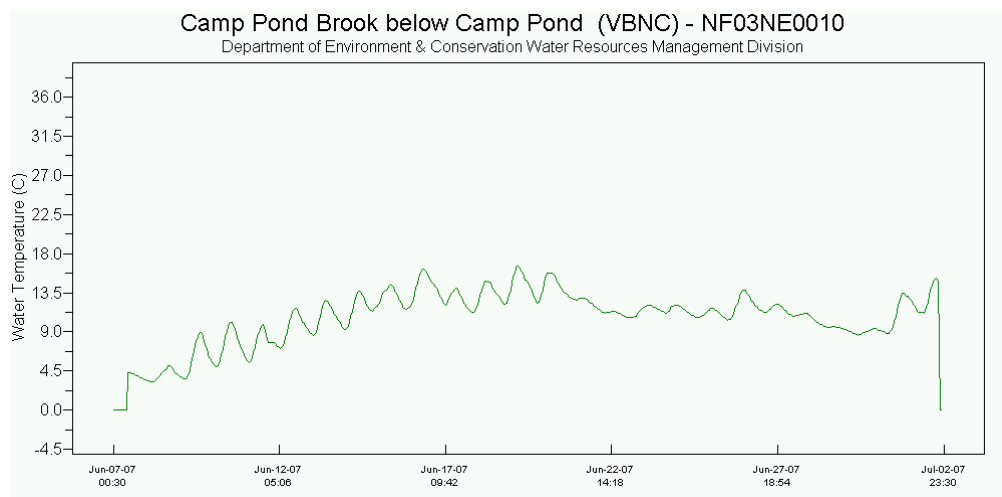


Figure 6

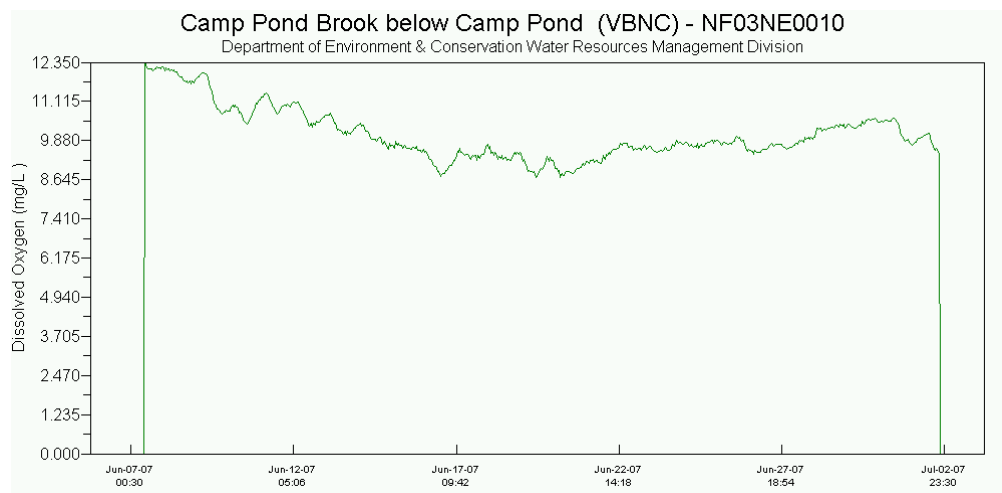


Figure 7

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

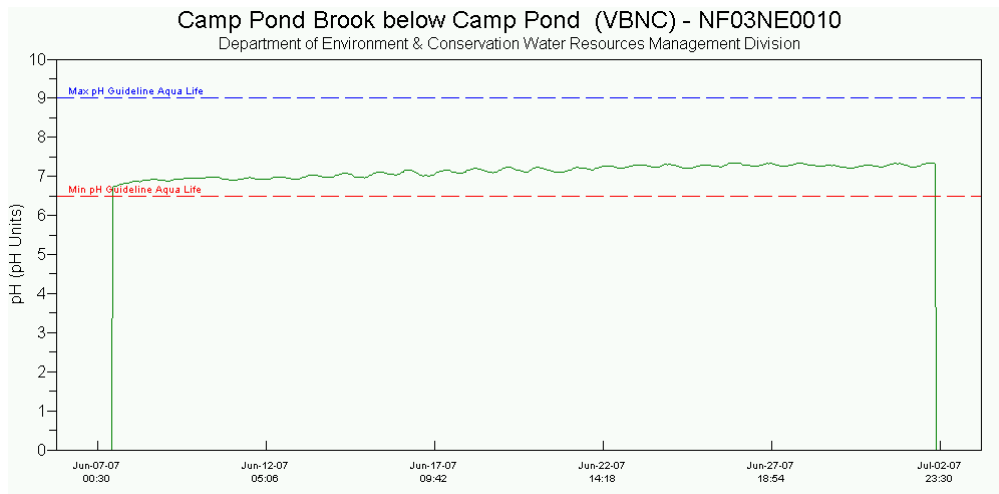
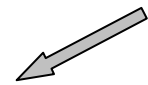


Figure 8



- The specific conductivity values (**Figure 9**) fluctuated throughout the deployment period but remained within normal background levels for this station. The maximum for conductivity was 26.7 $\mu\text{S}/\text{cm}$ which is similar to previous years.

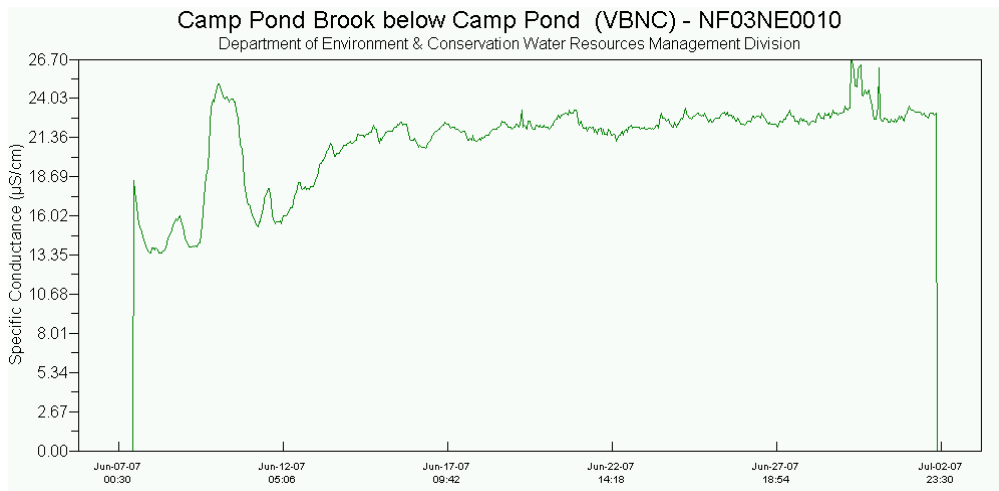
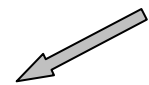


Figure 9



- The turbidity values (**Figure 10**) remained at fairly constant background levels for this station over the deployment period with the exception of a couple of incidences where turbidity values increased for intervals of a couple of hours. All spikes however, remained below 26 NTU and are likely due to spring conditions caused by snow melt.

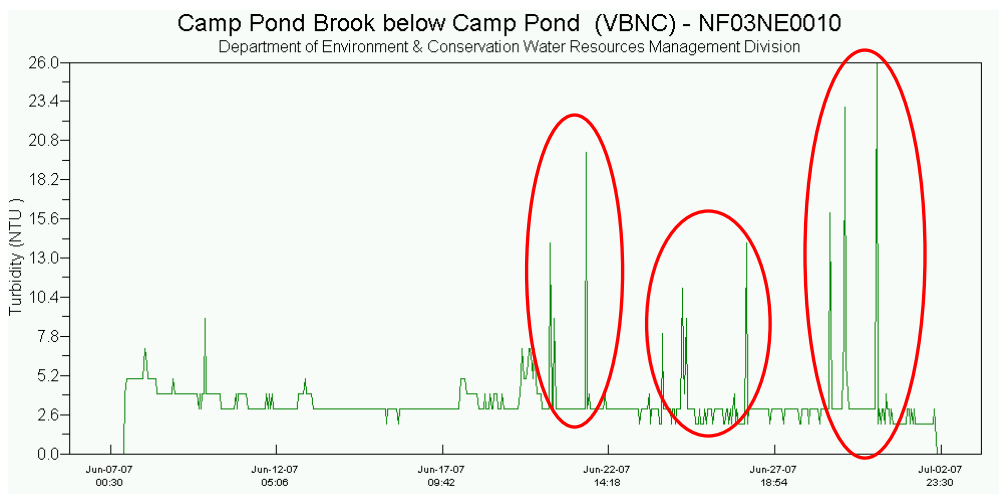
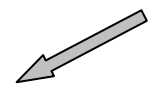


Figure 10



LOWER REID BROOK BELOW TRIBUTARY

- Water temperature and dissolved oxygen (**Figures 11 & 12** respectively) remained fairly consistent throughout the deployment period without any significant water quality events captured. As expected for this time of the year there was an increase in temperature and corresponding decrease in dissolved oxygen over the deployment period.

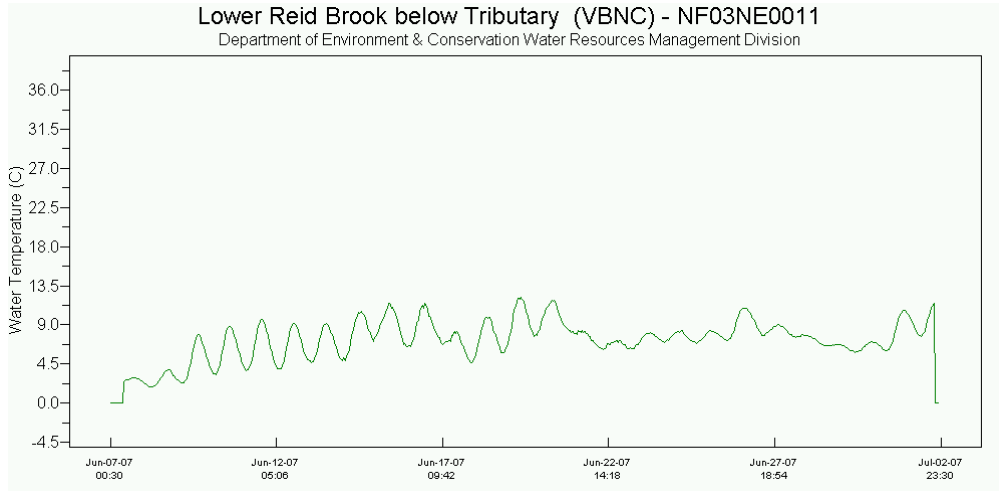


Figure 11

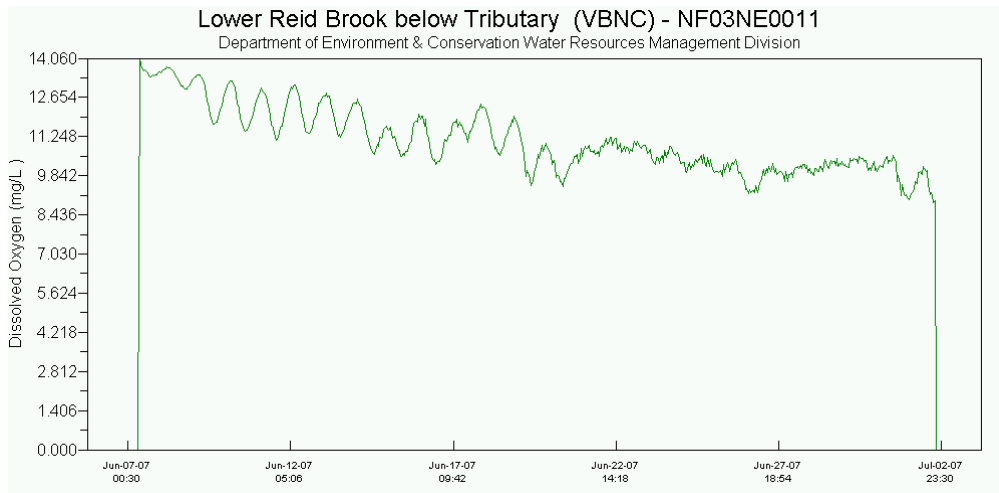
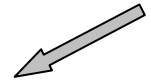
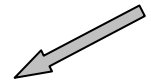


Figure 12



- The pH and specific conductivity (**Figures 13 & 14** respectively) remained at fairly constant background levels for this station over the deployment period. pH values also remained within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0).

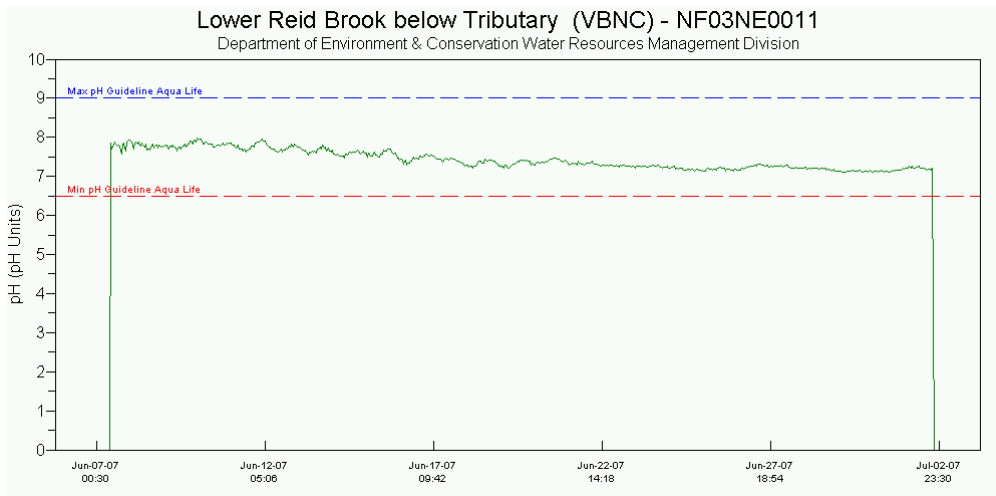


Figure 13

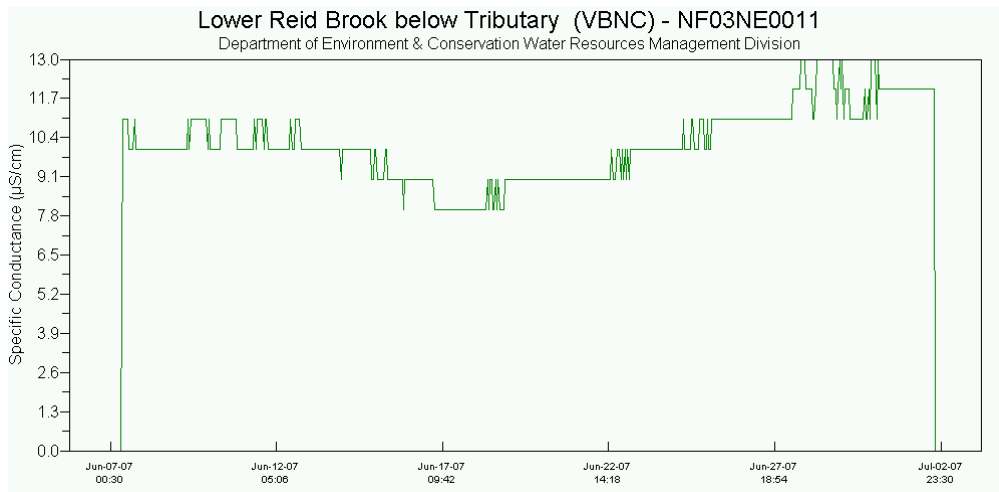
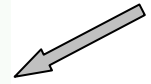
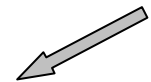


Figure 14



- Turbidity values (**Figure 15**) fluctuated throughout the first half of the deployment period, however, concentration remained below 30 NTU. Due to the low values on the turbidity spikes, they are likely due to movement of the sandy sediment or caused by spring snow melt.

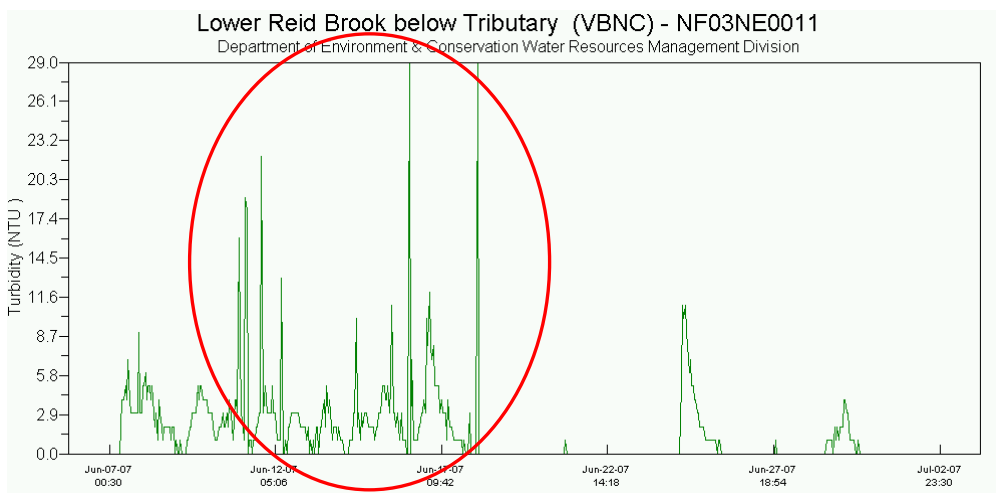
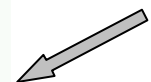


Figure 15



TRIBUTARY TO REID BROOK

- Water temperature (**Figure 16**) showed an increasing pattern during the first half of the deployment period and then decreased and remained fairly consistent during the second half of the deployment period. This was likely due to temperature conditions in the area and similar patterns were seen at Camp Pond Brook. The DO (**Figure 17**) showed a decrease in concentrations and then an increase which stabilized which is consistent with the patterns seen for water temperature.

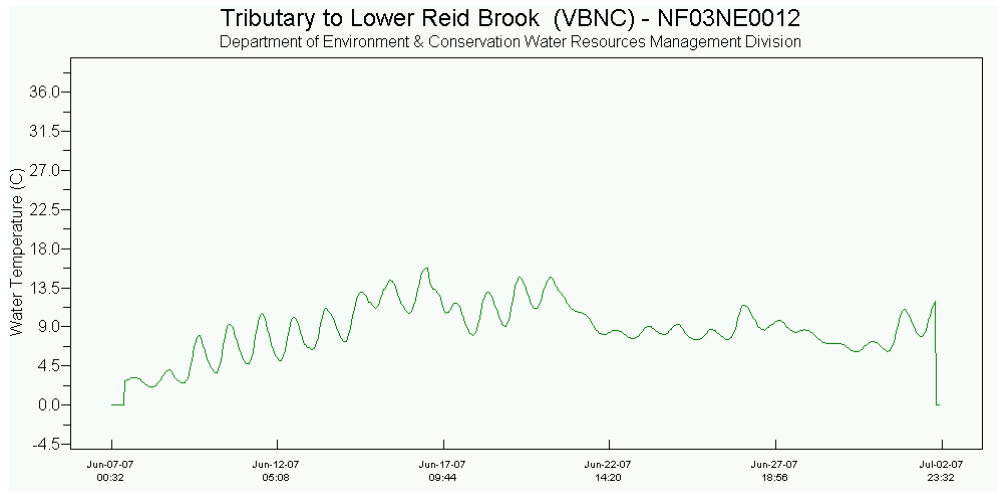


Figure 16

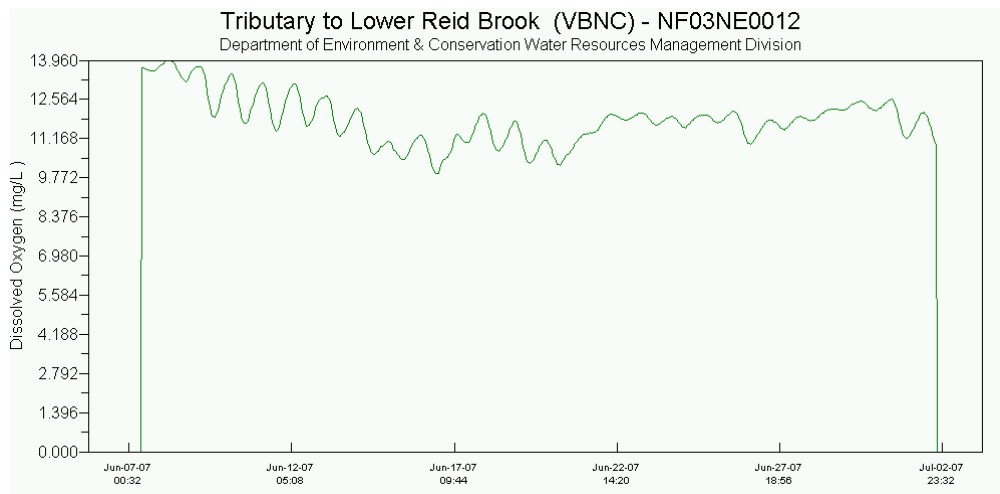
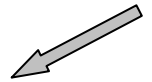
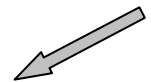


Figure 17



- The pH (**Figure 18**) remained at fairly constant background levels and within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0) over the deployment period.

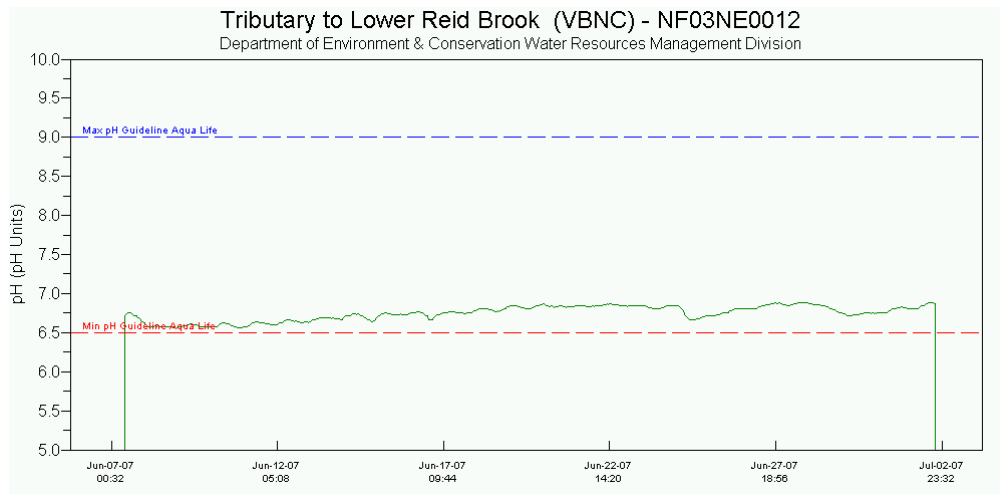


Figure 18

- Turbidity values (**Figure 19**) fluctuated throughout the deployment period, however, concentration remained below 45 NTU. Due to the low values on the turbidity spikes, they are likely due to movement of the sandy sediment or caused by spring snow melt.

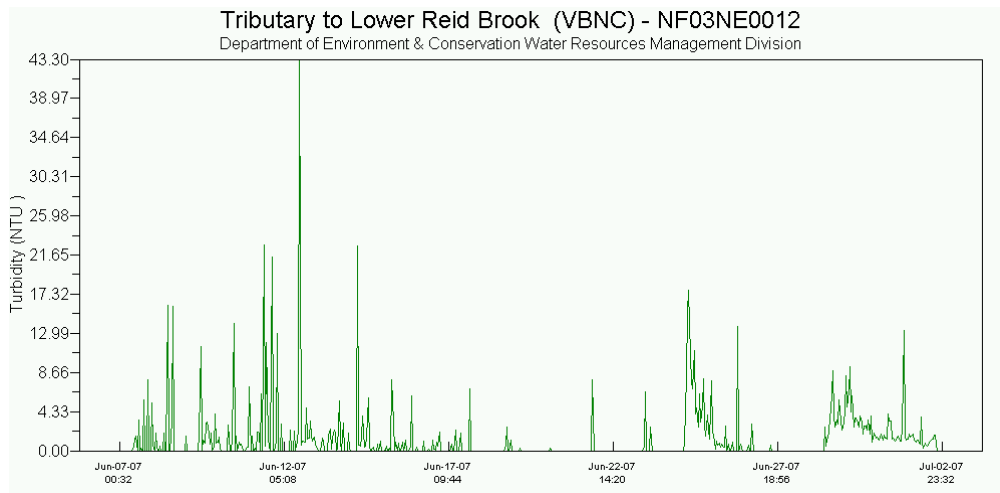


Figure 19

- The specific conductivity (**Figure 20**) showed a general increase in values throughout the deployment period. This is consistent with a general decrease in stage seen throughout the deployment period. As the stage (**Figure 21**) decreased until June 22nd there was a corresponding increase in conductivity. After June 22nd there were two incidences where as stage increased/decreased the conductivity decreased/increased. This pattern is commonly seen in water quality for as stage decreases, the ions in the water column become more concentrated and increase the specific conductivity of the water body.

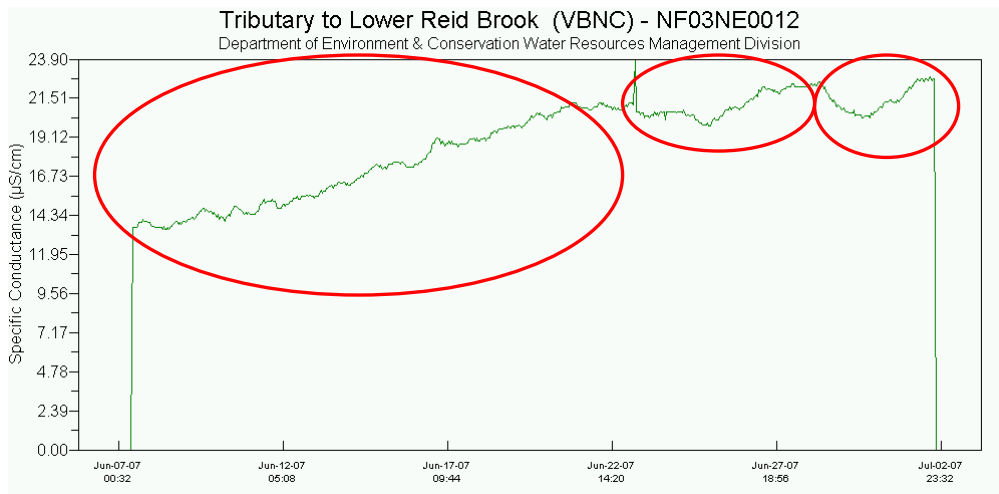


Figure 20

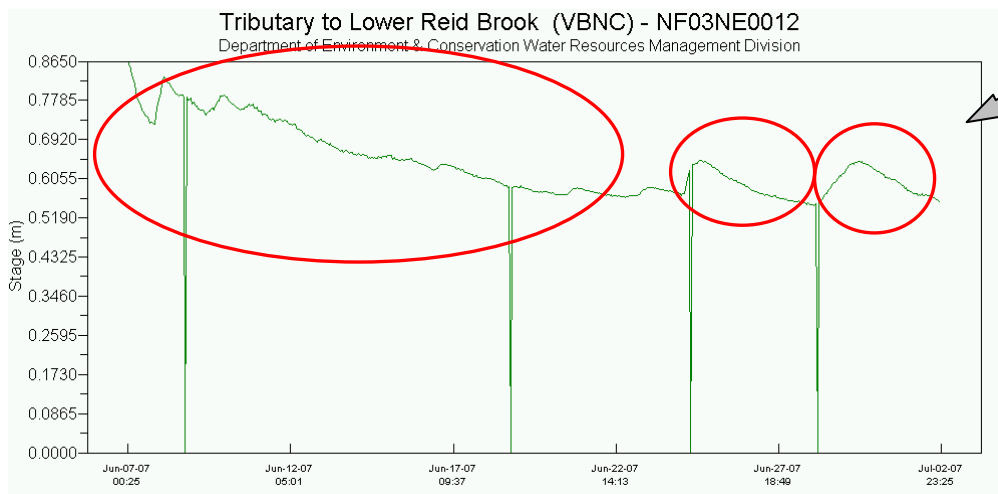
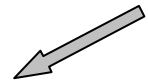
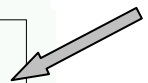


Figure 21



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