Government of Newfoundland and Labrador

Real Time Water Quality Monthly Report for Voisey's Bay Nickel Company Ltd. June 2006

General

- By late-May, the ice in the rivers was breaking up and the conditions were suitable for deployment of the three Datasondes.
- The three Datasondes were taken out of winter storage on May 22nd. 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 on May 23rd, 2006.
- On May 26th, the Environment Canada staff was on-site at Voisey's Bay equipped with a helicopter. The plan was to install all three instruments, however, only two instruments (Lower Reid Brook and Camp Pond Brook) were successfully deployed. The instrument for the Upper Reid Brook station could not be deployed because wildlife had chewed off the main communication cable (see Figure 1) that runs underground and into the water. It will be necessary to replace the communication cable at the Upper Reid Brook station; VBNC has a new cable on order from Campbell Scientific Canada Corporation as a replacement.
- The Minisonde readings were not taken because the battery for the surveyor was not charged prior to fieldwork.
- The data and real-time water quality graphs were logging and transmitting the data successfully for the two stations that were deployed.
- Environment Canada staff and Department of Environment and Conservation staff will tentatively be on-site in early July to visit the real-time water quality/quantity stations.

Figure 1

Data Interpretation

- As mentioned previously, the instrument for Upper Reid Brook was unable to be deployed therefore there is no data to report for this station.
- The temperature at both the Lower Reid Brook (Figure 2) and Camp Pond Brook (Figure 3) stations showed an increase as expected for this time of the year with minor fluctuations.

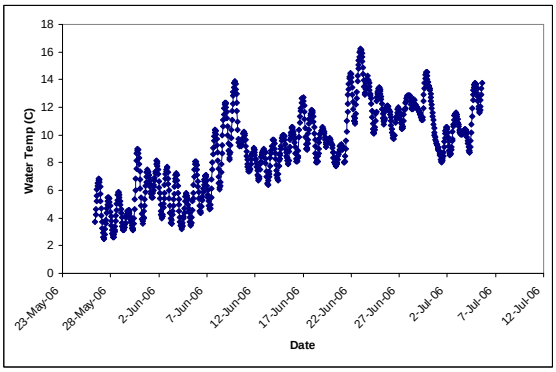

Figure 2

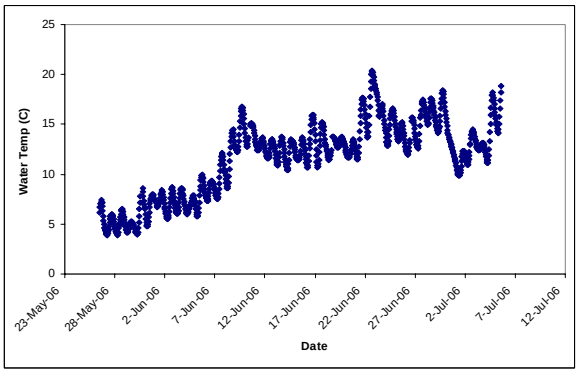

Figure 3

- Due to the relationship between temperature and dissolved oxygen, as expected, the dissolved oxygen values for both Lower Reid Brook (Figure 4) and Camp Pond Brook (Figure 5) stations decreased as the temperature increased over the deployment period. Even with warm water temperatures, the dissolved oxygen levels remained well within the acceptable limits to support aquatic life. However, it is important to note that some instrumentation drift occurred over the deployment period at Lower Reid Brook (for dissolved oxygen) because after the instrument was cleaned/calibrated in early July there was a noticeable increase in the dissolved oxygen levels when the instrument was redeployed. Additionally, the comparison of the Minisonde and Datasonde values at the time of removal ranked "Poor" indicating drift had occurred. This was not the case with the instrument at Camp Pond Brook.

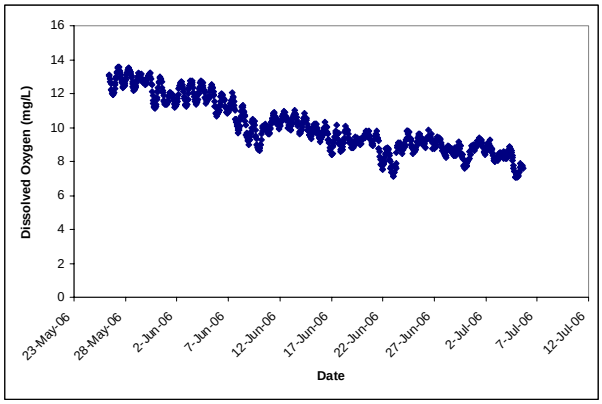

Figure 4

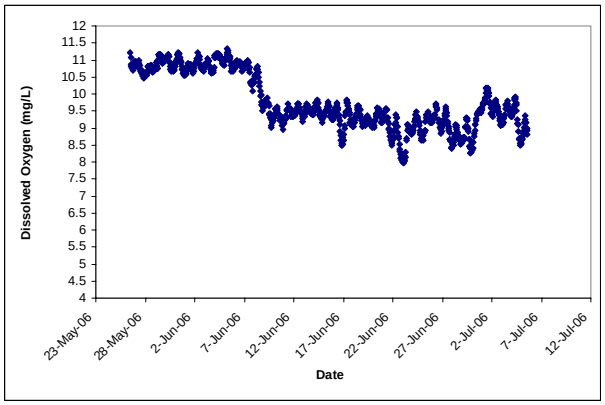

Figure 5

- The pH levels for both Lower Reid Brook (Figure 6) and Camp Pond Brook (Figure 7) remained fairly consistent over the deployment period. There was a slight increase in the pH at the Camp Pond Brook station at the beginning of the deployment period but it levelled off over the one-month period. These pH values are very similar to that of the pH values recorded the same time last year (2005).

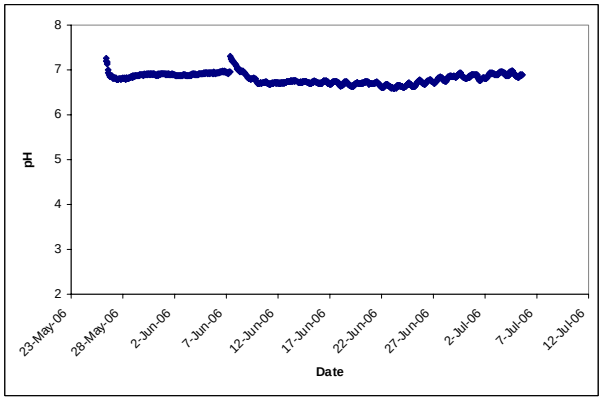

Figure 6

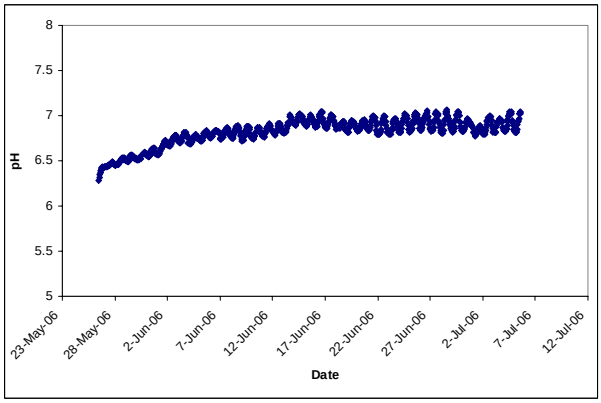

Figure 7

- The conductivity and total dissolved solids values for Lower Reid Brook (Figure 8a & 8b) increased over the deployment period. It is likely that this increase can be attributed to the drop in stage over the deployment period thus concentrating the ions in the water body as well as a drift associated with the specific conductance probe over the deployment period. After the instrument was cleaned/calibrated in July, the conductivity values dropped. It is important to note that there is only a difference of approximately 15 uS/cm over the deployment period which is not significant.

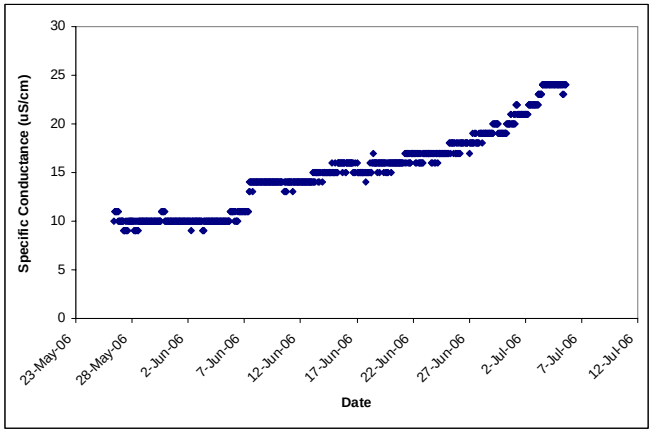

Figure 8a

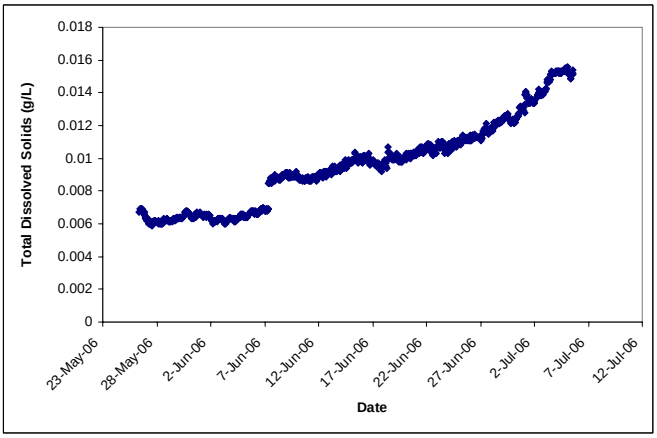

Figure 8b

- The conductivity and total dissolved solids values for Camp Pond Brook (Figures 9a & 9b) only showed a slight increase over the deployment period. Drift was not a factor in this case.

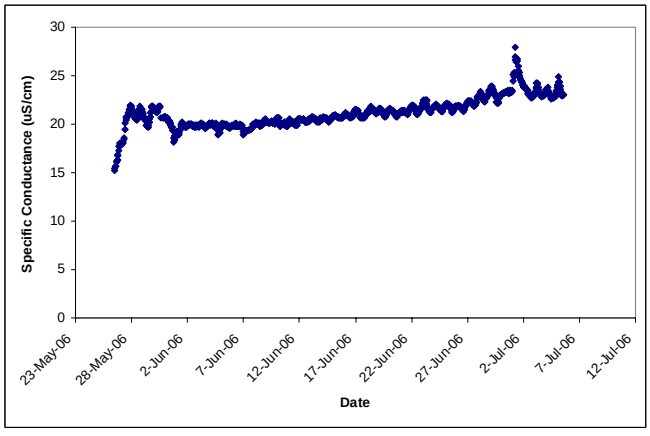

Figure 9a

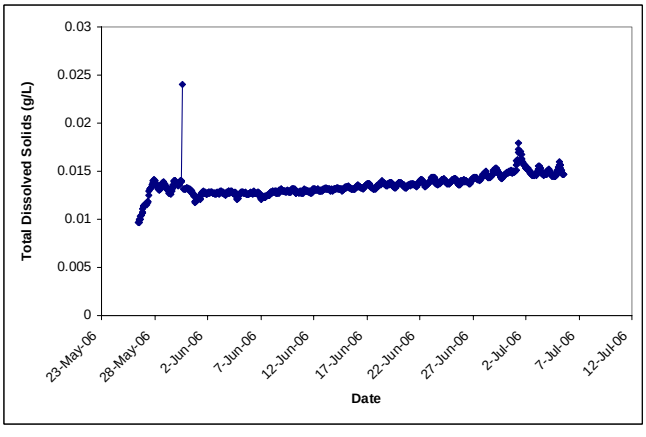

Figure 9b

- The station at Lower Reid Brook (Figure 10a, 10b & 10c) only showed a few spikes in turbidity values over the deployment period. The largest spike occurred on July 1st, 2006 where the maximum turbidity value recorded was 25 NTU. By comparing the turbidity graph to the stage and flow graphs, it is evident that the increases in turbidity are most likely a result of rainfall events.

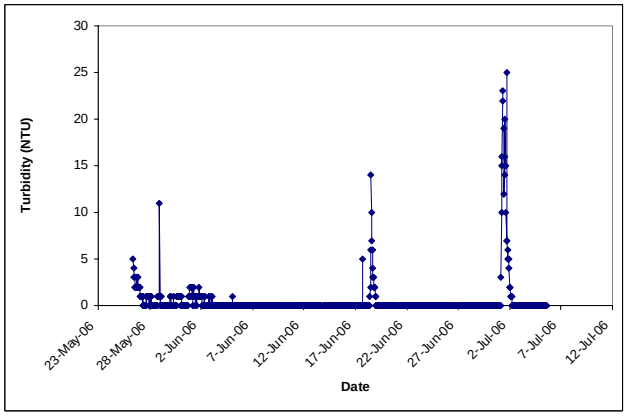

Figure 10a

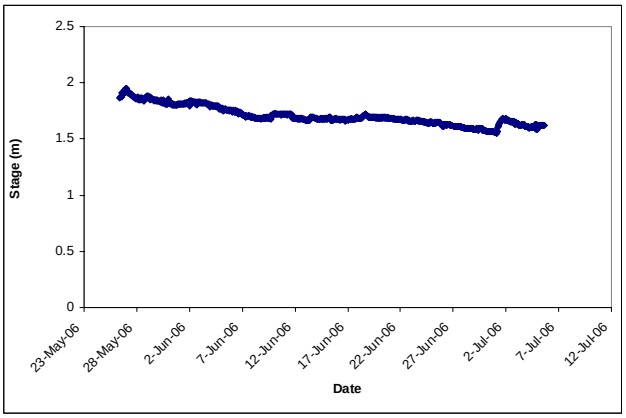

Figure 10b

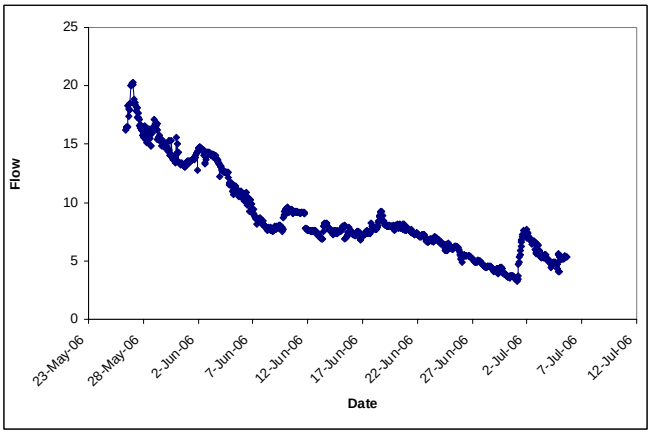

Figure 10c

- The station at Camp Pond Brook (Figure 11a, 11b & 11c) showed numerous spikes in turbidity values in early June. This corresponds with a time of increased stage height and flow. The turbidity values spiked to above 100 NTU on two occasions. The largest spike occurred on June 9th, 2006 where the maximum turbidity value recorded was 146 NTU.

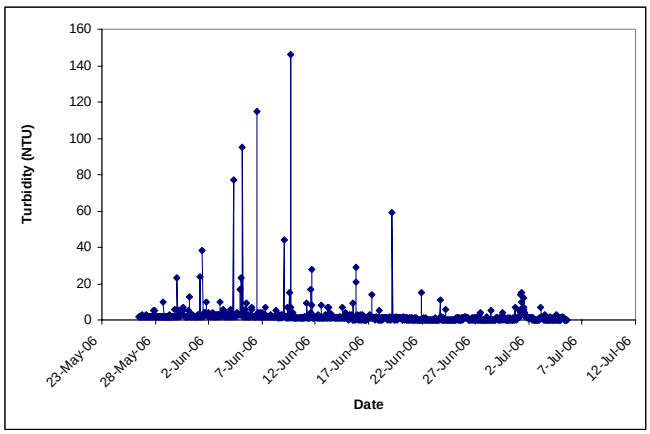

Figure 11a

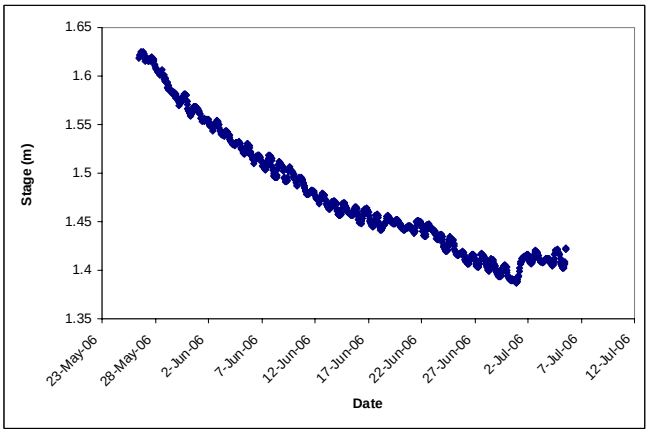

Figure 11b

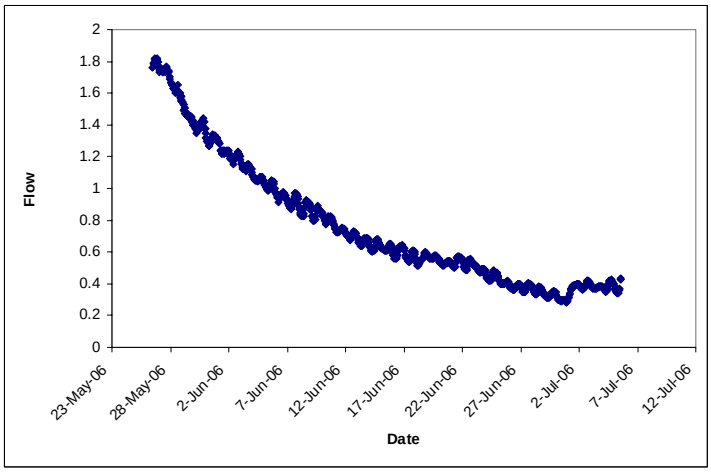

Figure 11c

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