

Real Time Water Quality Deployment Report Main River June - October 2008

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.

Maintenance and Calibration of Instrumentation

- The instrument at Main River was initially installed for the 2008 field season on June 25th, 2008.
- The results from comparing the Minisonde values to the Datasonde values during the installation can be seen in **Table 1**. This involves a second set of data readings being collected at the time of installation, using a similar, freshly calibrated instrument. The readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The comparison between the Minisonde and Datasonde ranged from fair to excellent, which indicates that they were reasonably close for all four parameters.

Table 1: QA/QC Data Comparison Rankings -Installation Jun. 25th, 2008, Removal Oct. 2nd, 2008

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Main River	June 25 th , 2008	Installation	Good	Fair	Good	Fair
	Oct. 2 nd 2008	Removal	Excellent	Good	Excellent	Good

- The instrument at Main River was initially installed for the 2008 field season on June 25th and removed for calibration on October 2nd, 2008. At 98 days this deployment period was longer than normal due to the fact that poor weather conditions delayed helicopter access on several occasions. It is important to note that even with an extended deployment period, the QA/QC rankings as seen in Table 1 (upon removal) all fall within the "Good" and "Excellent" range. It is obvious that the pristine nature of this water body allows for slightly longer deployment periods without extensive fouling to the instrumentation.

Data Interpretation

- The water temperature (**Figure 1**) showed normal day to day fluctuations during the entire deployment period with a decreasing trend as temperatures dropped gradually into the early fall. A diurnal pattern can be seen in the data throughout the deployment, and it is most pronounced during July.
- The dissolved oxygen (**Figure 2**) shows a slight rising trend during the cooling of early fall. There are 4 different guidelines for DO depending on the life cycle stage and water temperature (cold

water/other life stages – above 6.5 mg/L; warm water/other life stages – above 5.5 mg/L; warm water/early life stages – above 6 mg/L; cold water/early life stages – 9.5 mg/L). This deployment is a warm water period and DO is above 6.5 mg/L meeting the CCME guidelines. The DO readings show a diurnal pattern, which is directly related to the diurnal temperature cycle.

- The pH values (**Figure 3**) for Main River station remained fairly consistent throughout the deployment period. All pH values were slightly lower than the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life Guidelines. Due to the pristine condition of the area upstream of this station it is likely that the low pH values are due to natural causes and they are typical of much of Newfoundland waters.

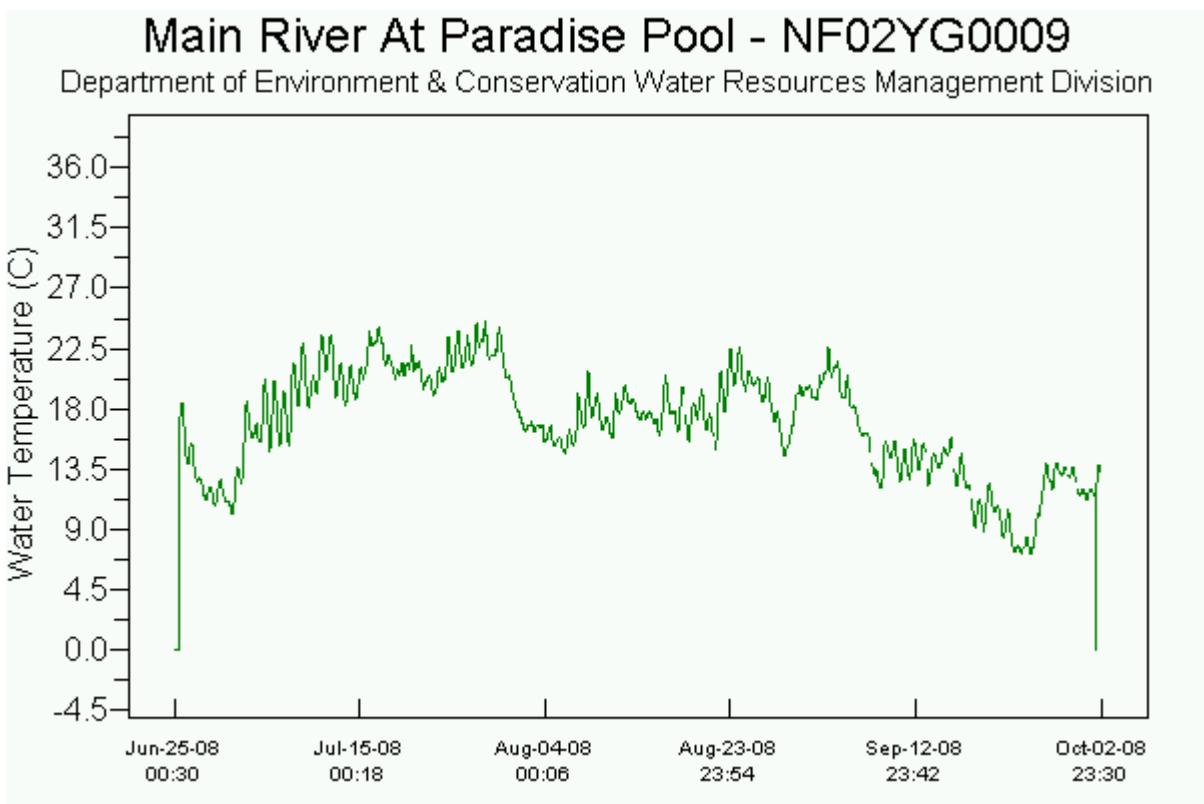


Figure 1

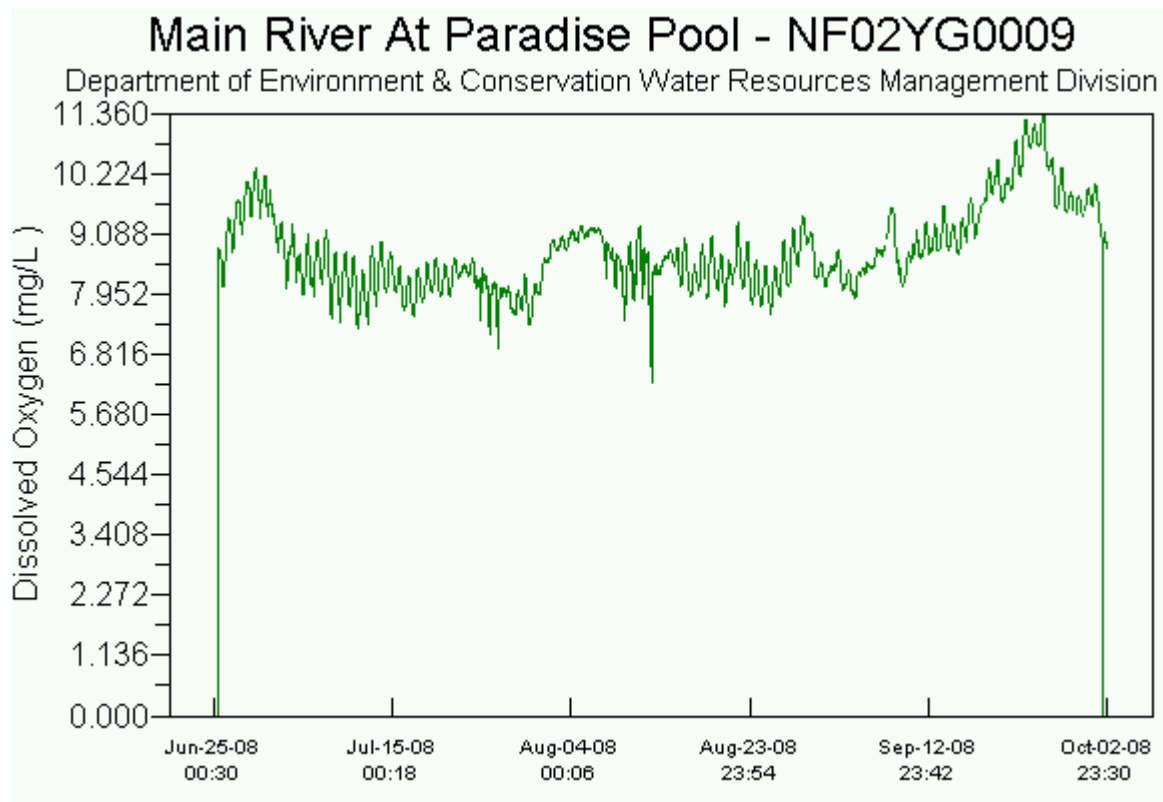


Figure 2

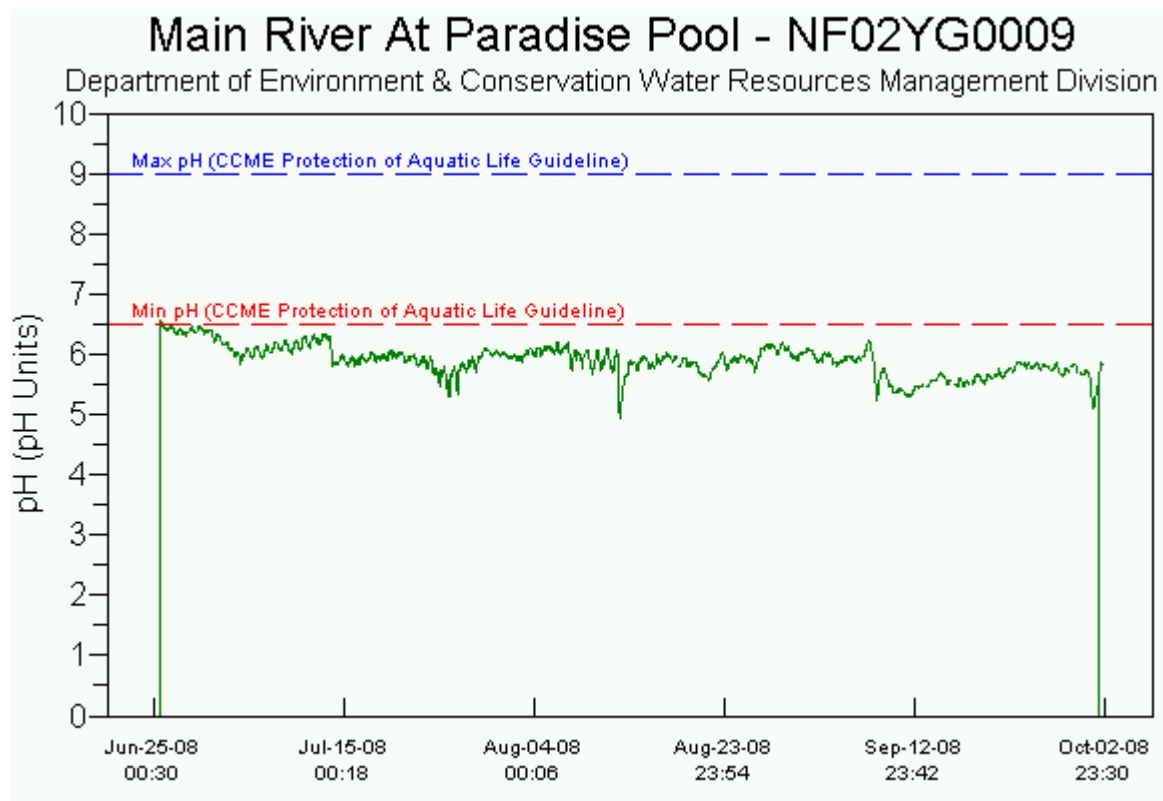


Figure 3

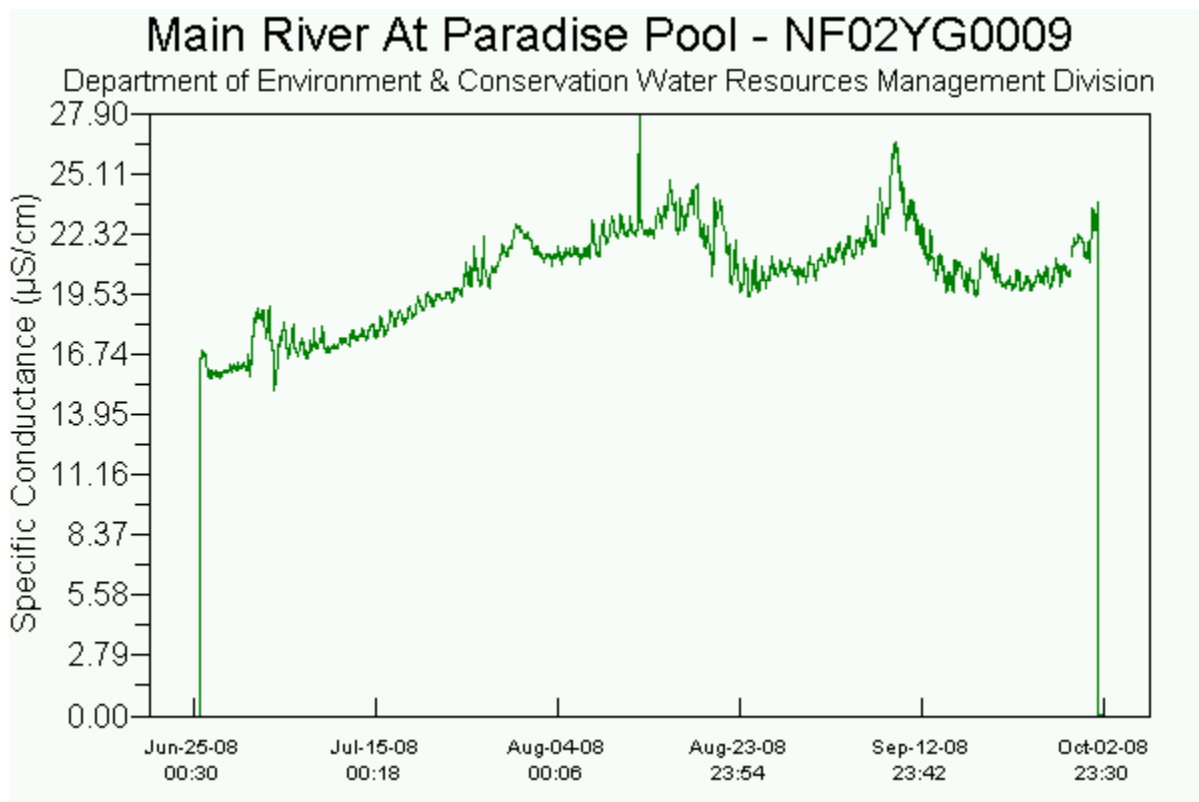


Figure 4

- The specific conductivity values (**Figure 4**) ranged from a minimum 15.1 uS/cm to a maximum of 27.9 uS/cm, which is typical of the Main River. While there is a great deal of day-to-day fluctuation there does appear to be a gently rising trend in the first half of the graph. This is most likely due to declining flow levels and a corresponding increase in the significance of groundwater input into total flow.
- There was a data-logging problem with the turbidity values, which make it difficult to make meaningful comments on them, and therefore they are not discussed in this deployment report.
- Water quality is closely related to stream flow and **Figure 5** shows the stage height of the river. The peaks in flow correspond to peaks in specific conductivity of the water as there is more suspended and dissolved material in the water. There are also several noticeable dips in pH which correspond to the peaks in flow.

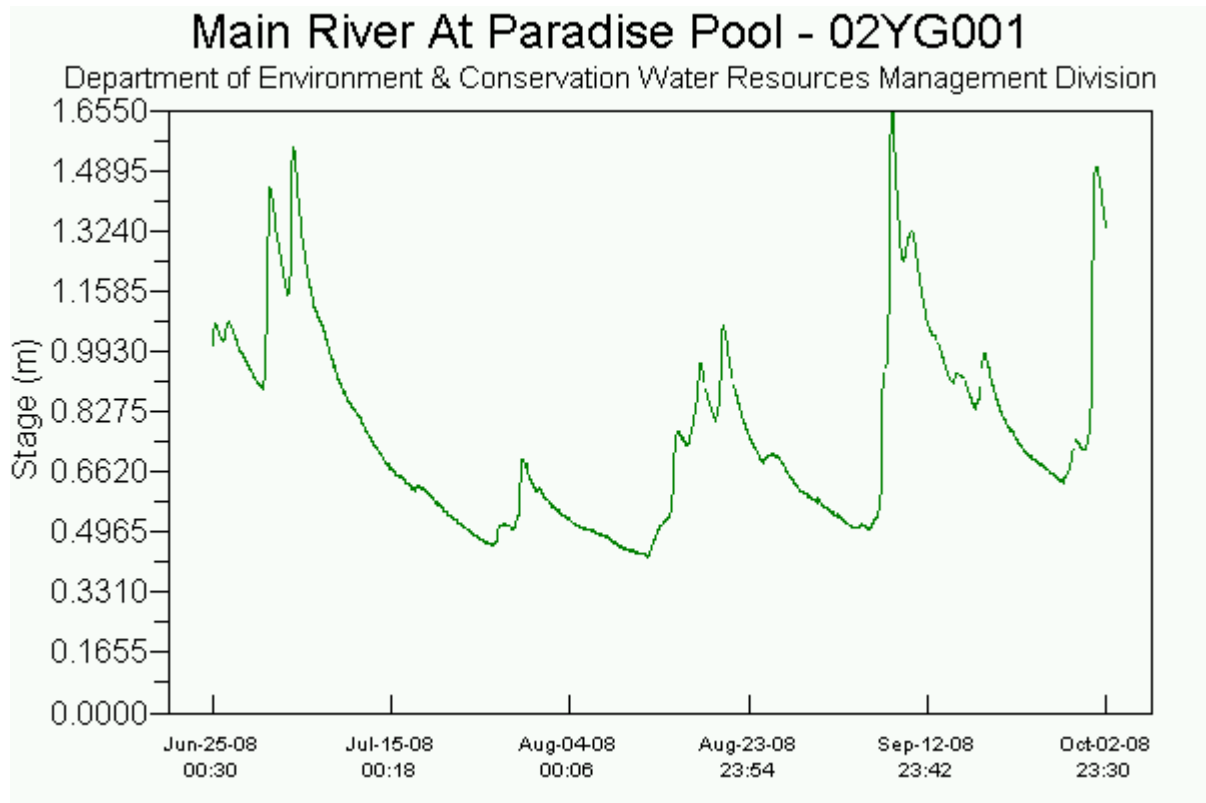


Figure 5

Prepared by: Ian Bell

Environmental Scientist

Department of Environment and Conservation

PH: (709) 637-2431

FX: (709) 637-2541

ianbell@gov.nl.ca