# Real Time Water Quality Deployment Report
# Come by Chance River
# September – October 2008

## General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Newfoundland and Labrador Refining Company will be informed of any significant water quality events in the form of a monthly report.
- This monthly report interprets the data from the Come by Chance River RTWQ station for the period of September 15th to October 14th, 2008.

## Maintenance and Calibration of Instrumentation

- The Come by Chance River instrument was deployed on September 15th, 2008. A second set of data readings were collected at the time of installation, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings upon comparing water quality data from both instruments for the removal before the start of the deployment period and the installation at the start of the deployment period are indicated in **Table 1.** Rankings of "excellent" were achieved on installation for all parameters except pH which ranked "fair" while an "excellent" ranking on the following removal indicates that the ph sensor of the QA instrument at the time of installation may not have calibrated properly.

**Table 1: QA/QC Data Comparison Rankings upon removal on September 11th, 2008 and installation on September 15th, 2008**

| Station | Date | Action | Instrument Comparison Ranking | | | |
|---|---|---|---|---|---|---|
| | | | Temperature | pH | Conductivity | Dissolved Oxygen |
| Come by Chance River | Sept. 11, 2008 | Removal | Excellent | Marginal | Excellent | Excellent |
| | Sept. 15, 2008 | Installation | Excellent | Fair | Excellent | Excellent |

- The Come by Chance River instrument was removed October 14th, after a period of 29 days for regular maintenance and calibration activities. A second set of data readings were collected at the time of removal, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings upon comparing water quality data from both instruments on removal is indicated in **Table 2.** As the instrument was not reinstalled there were no subsequent installation rankings. Rankings of "excellent" and "good" were achieved for all parameters minus conductivity which ranked "poor" after an "excellent" ranking on installation, considering the conductivity values of each instrument, it is more probable that the QA sensor may not have calibrated properly.

**Table 2: QA/QC Data Comparison Rankings upon removal on October 14th, 2008**

| Station | Date | Action | Instrument Comparison Ranking | | | |
|---|---|---|---|---|---|---|
| | | | Temperature | pH | Conductivity | Dissolved Oxygen |
| Come by Chance River | Oct. 14, 2008 | Removal | Good | Excellent | Poor | Good |

## Data Interpretation

- Water temperature values **(Figure 1)** for the deployment period displayed diurnal fluctuations and a general decrease over the period, which is consistent with the fall season. Water temperature ranged between 5.74 and 18.6°C.

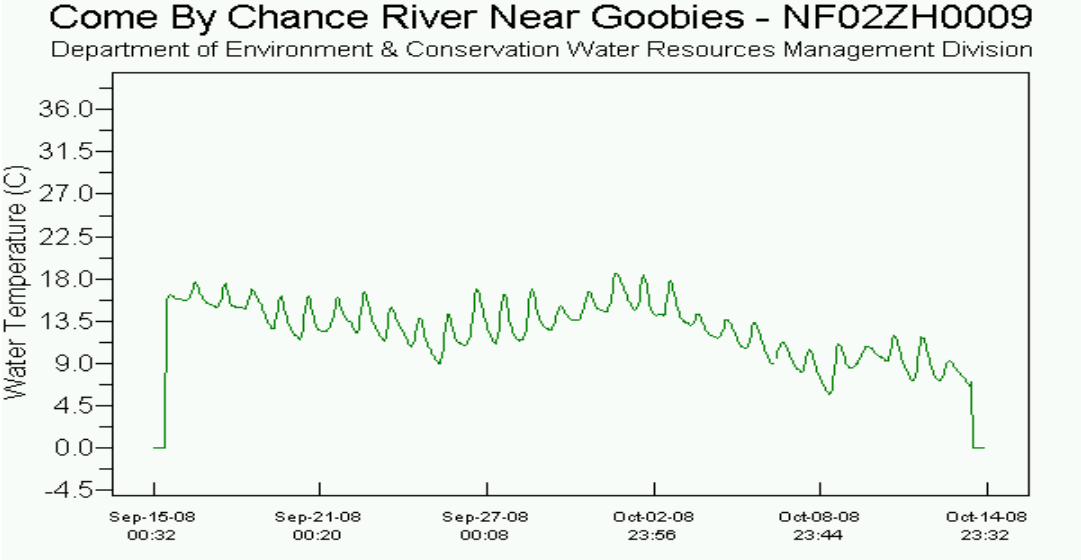


**Figure 1**

- Dissolved oxygen (DO) values (**Figure 2**) for the deployment period generally increased which is consistent with the decrease in temperature. DO values ranged from 8.55 to 11.91 mg/L, most below the most conservative recommended DO concentration of 9.5 mg/L by the Canadian Council of Ministers of the Environment (CCME) Protection of Freshwater Aquatic Life Guidelines (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 – above 9.5 mg/L).

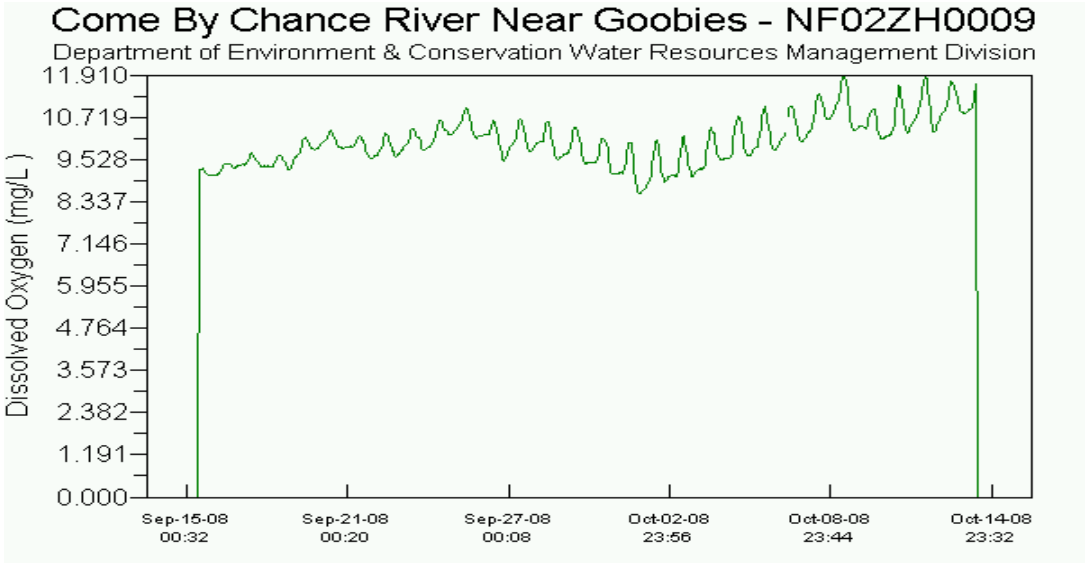


**Figure 2**

- pH values **(Figure 3)** ranged between 5.99 and 6.48, showing a decreasing trend over the period. All pH values were below the minimum pH level of 6.5 recommended by the CCME Guidelines for the Protection of Freshwater Aquatic Life (due to the naturally acidic nature of NL waters).

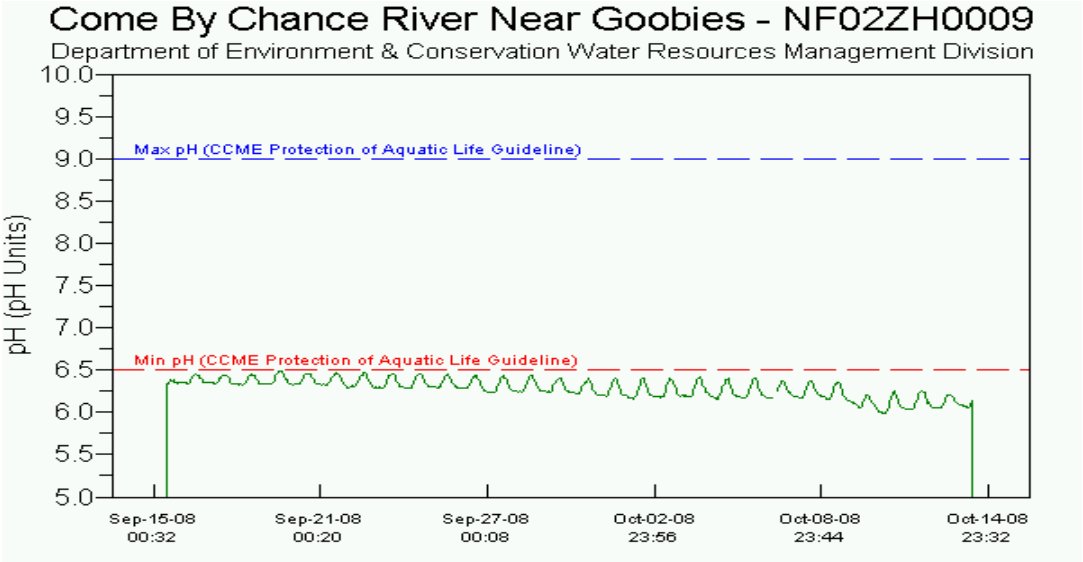


**Figure 3**

- Specific conductance values (**Figure 4**) ranged between 49.3 and 56.5 µS/cm, showing an increasing trend over the period which corresponds to a drop in stage.

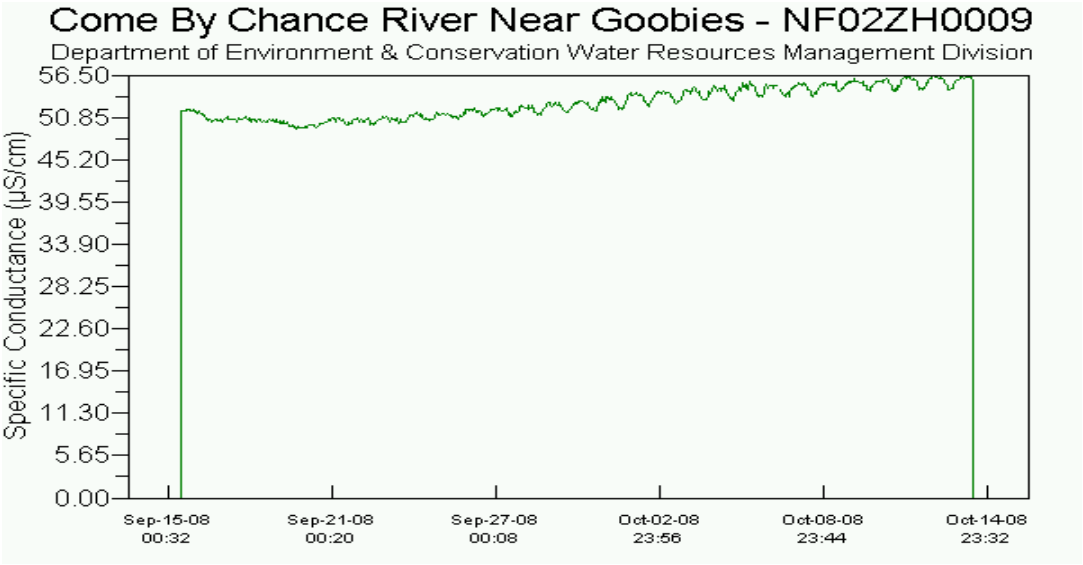


**Figure 4**

- Turbidity values (**Figure 5**) were at zero NTU for the first half of the deployment period. A steady rise in turbidity is seen in the second half, reaching a maximum value of 7.40 NTU. This may be indicative of some sensor fouling and the steady drop in stage.

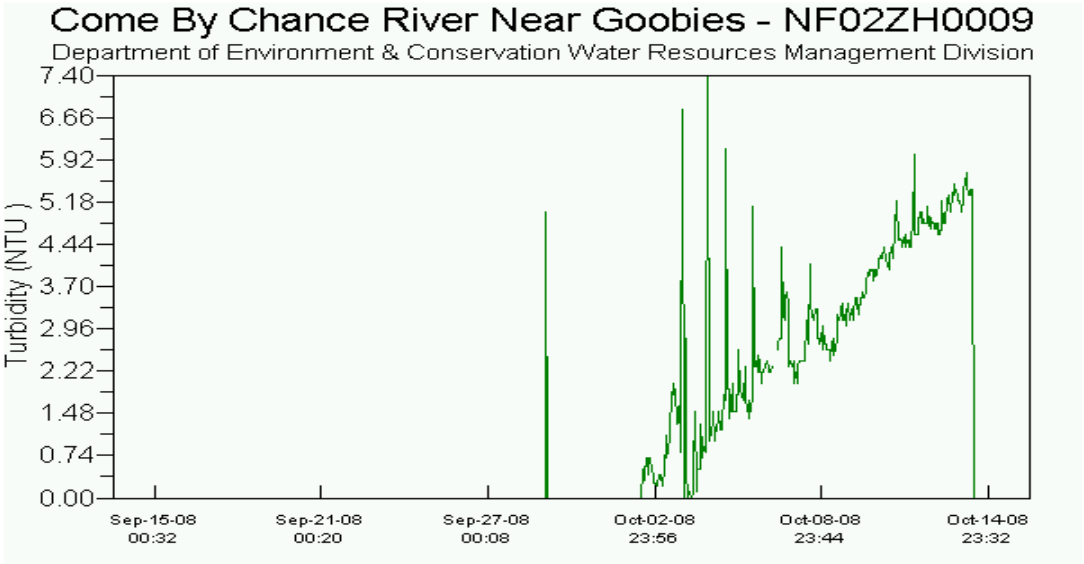


**Figure 5**

- Stage values (**Figure 6**) dropped over the deployment period from 0.860 to 0.633 meters, which corresponds to very little precipitation (**Appendix A**) over the period.

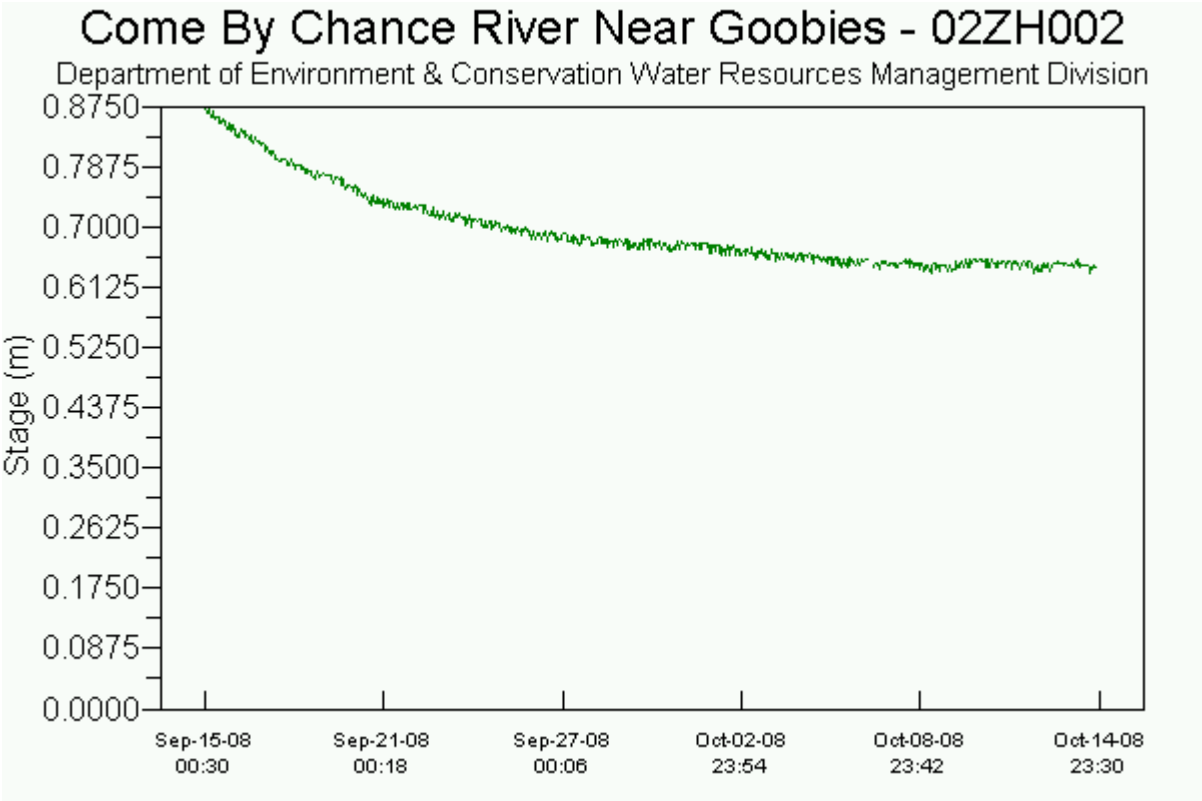


**Figure 6**

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## Appendix A – Climate Data for Argentia, NL (September 15 to October 14, 2008)

| Daily Data Report for September 2008 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Max Temp °C | Min Temp °C | Mean Temp °C | Heat Deg Days °C | Cool Deg Days °C | Total Rain mm | Total Snow cm | Total Precip mm | Snow on Grnd cm | Dir of Max Gust 10's Deg | Spd of Max Gust km/h |
| 15† | 20.1 | 14.0 | 17.1 | 0.9 | 0.0 | M | M | 0.0 | | 22 | 50 |
| 16† | 18.7 | 10.3 | 14.5 | 3.5 | 0.0 | M | M | 0.0 | | 21 | 54 |
| 17† | 13.8 | 10.2 | 12.0 | 6.0 | 0.0 | M | M | 0.0 | | 22 | 33 |
| 18† | 15.2 | 9.7 | 12.5 | 5.5 | 0.0 | M | M | 0.0 | | 34 | 54 |
| 19† | 14.1 | 8.4 | 11.3 | 6.7 | 0.0 | M | M | 0.0 | | 33 | 56 |
| 20† | 14.2 | 7.3 | 10.8 | 7.2 | 0.0 | M | M | 0.0 | | 22 | 50 |
| 21† | 17.9 | 12.9 | 15.4 | 2.6 | 0.0 | M | M | 0.0 | | 20 | 35 |
| 22† | 14.8 | 8.2 | 11.5 | 6.5 | 0.0 | M | M | 1.0 | | 35 | 46 |
| 23† | 12.5 | 5.4 | 9.0 | 9.0 | 0.0 | M | M | 2.6 | | 31 | 50 |
| 24† | 11.5 | 4.3 | 7.9 | 10.1 | 0.0 | M | M | 0.7 | | 36 | 50 |
| 25† | 11.4 | 4.5 | 8.0 | 10.0 | 0.0 | M | M | 0.0 | | 24 | 50 |
| 26† | 14.9 | 11.3 | 13.1 | 4.9 | 0.0 | M | M | 0.0 | | 24 | 52 |
| 27† | 14.1 | 11.2 | 12.7 | 5.3 | 0.0 | M | M | 0.0 | | 22 | 33 |
| 28† | 13.6 | 9.0 | 11.3 | 6.7 | 0.0 | M | M | 0.0 | | | <31 |
| 29† | 16.2 | 9.6 | 12.9 | 5.1 | 0.0 | M | M | 0.0 | | 13 | 41 |
| 30† | 23.6 | 14.5 | 19.1 | 0.0 | 1.1 | M | M | 0.0 | | | <31 |

| Daily Data Report for October 2008 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Max Temp °C | Min Temp °C | Mean Temp °C | Heat Deg Days °C | Cool Deg Days °C | Total Rain mm | Total Snow cm | Total Precip mm | Snow on Grnd cm | Dir of Max Gust 10's Deg | Spd of Max Gust km/h |
| 01† | 16.4 | 11.9 | 14.2 | 3.8 | 0.0 | M | M | 0.0 | | 26 | 41 |
| 02† | 16.1 | 10.1 | 13.1 | 4.9 | 0.0 | M | M | 0.0 | | 20 | 37 |
| 03† | 16.0 | 12.5 | 14.3 | 3.7 | 0.0 | M | M | 0.0 | | 19 | 48 |
| 04† | 14.6 | 10.3 | 12.5 | 5.5 | 0.0 | M | M | 0.8 | | 25 | 80 |
| 05† | 13.2 | 9.5 | 11.4 | 6.6 | 0.0 | M | M | 0.0 | | 27 | 57 |
| 06† | 12.5 | 8.9 | 10.7 | 7.3 | 0.0 | M | M | 0.0 | | 27 | 56 |
| 07† | 11.1 | 5.9 | 8.5 | 9.5 | 0.0 | M | M | 0.6 | | 31 | 41 |
| 08† | 8.7 | 5.3 | 7.0 | 11.0 | 0.0 | M | M | 0.7 | | 25 | 56 |
| 09† | 12.4 | 5.8 | 9.1 | 8.9 | 0.0 | M | M | 4.8 | | 26 | 56 |
| 10† | 13.5 | 10.1 | 11.8 | 6.2 | 0.0 | M | M | 2.3 | | 26 | 57 |
| 11† | 10.3 | 4.0 | 7.2 | 10.8 | 0.0 | M | M | 0.7 | | 2 | 33 |
| 12† | 9.6 | 3.5 | 6.6 | 11.4 | 0.0 | M | M | 0.0 | | | <31 |
| 13† | 12.0 | 5.1 | 8.6 | 9.4 | 0.0 | M | M | 0.0 | 2 | 4 | 46 |
| 14† | 9.4 | 3.7 | 6.6 | 11.4 | 0.0 | M | M | 0.0 | | 22 | 41 |