

**Real Time Water Quality Monthly Report  
Come by Chance River  
December 2007-January 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.

**Maintenance and Calibration of Instrumentation**

- The datasonde was deployed on December 13, 2007. A second set of data readings was 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 when comparing water quality data from both instruments at the time of installation are indicated in **Table 1**, below. All parameters ranked as “excellent” which meets the Department’s protocol for QA/QC comparisons and indicates a high degree of confidence in the accuracy of data collected during this deployment period.

**Table 1: QA/QC Data Comparison Rankings upon reinstallation on December 13th, 2007**

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Come by Chance River	December 13	Installation	Excellent	Excellent	Excellent	Excellent

- The Come by Chance instrument was deployed until January 18th, 2008 at which point it was removed for routine maintenance and calibration. A second set of data readings was 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.

**Table 2: QA/QC Data Comparison Rankings upon removal on January 18th, 2008**

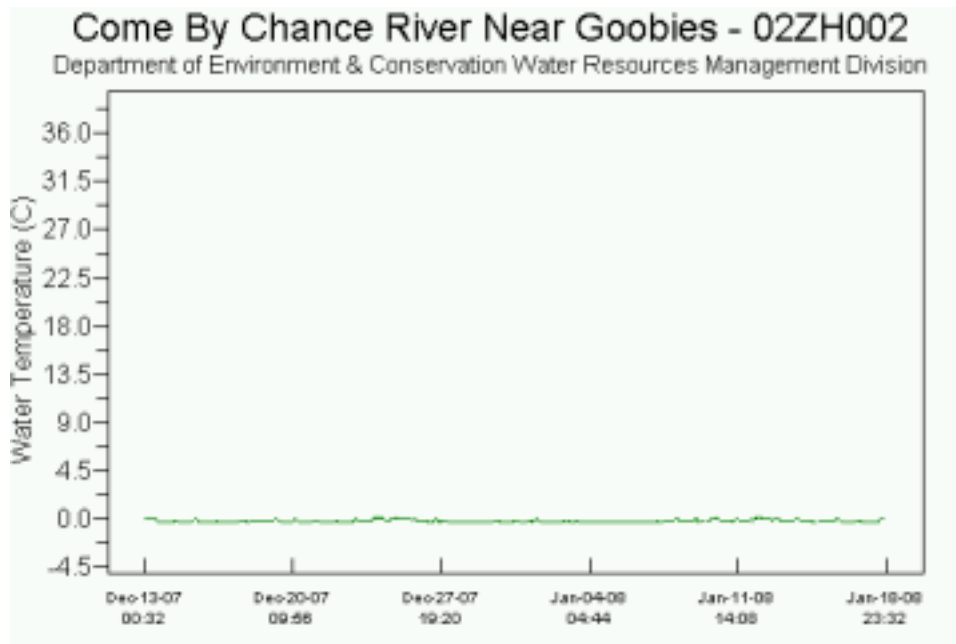
Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Come by Chance River	January 18	Removal	Excellent	Excellent	Fair	Good

- Rankings of “excellent” were achieved when comparing water temperature and pH readings from the instrument that had been deployed for 25 days with a clean freshly calibrated instrument, thus indicating very little fouling or drift had occurred with both of these sensors during the deployment period, and a high level of accuracy in data recorded by sensors for the entire deployment. A ranking of “good” was achieved when comparing the dissolved oxygen readings between the two instruments, indicating little fouling and drift had occurred with this sensor, and all data falls within the acceptable QAQC range for dissolved oxygen throughout the entire deployment period. A ranking of “fair” was achieved when comparing conductivity readings between the two instruments,

indicating that data collected towards the end of the deployment period may have been affected by fouling and drift of this sensor.

### Data Interpretation

- This monthly report interprets the data from the Come by Chance River RTWQ station for the period of December 13<sup>th</sup>, 2007 – January 18<sup>th</sup>, 2008.
- Data gaps did not appear to be a factor during this deployment period.
- Water temperature data for this deployment period was very stable, ranging between -0.36 and 0.16°C (see **Figure 1**, below).



**Figure 1**

- Dissolved oxygen (DO) values (**Figure 2** below) were mostly stable during this deployment period, which corresponds with the stable water temperatures recorded, with the exception of a sudden drop in DO that occurred on December 25. This decrease may have been influenced by milder temperatures experienced on December 24 and 25 (see **Appendix A** at end of report), which may have disrupted the ice cover and caused a build up of ice in the area of the probe. DO values ranged from 12.57 to 13.83 mg/L and all values were above the minimum DO concentrations recommended 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).

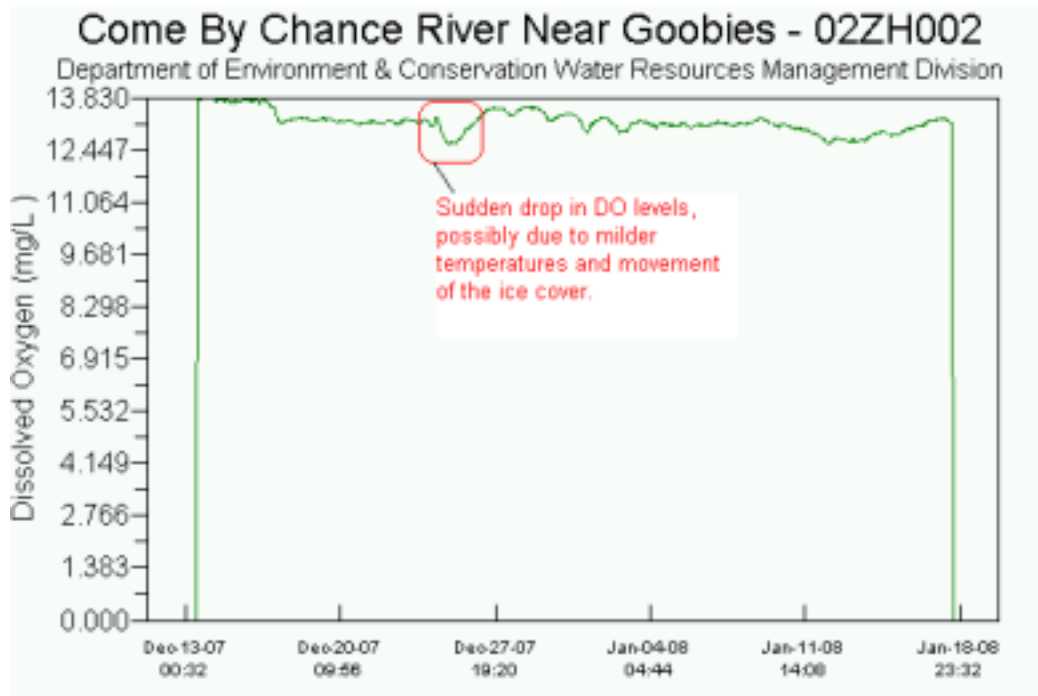


Figure 2

- All pH values (**Figure 3**, below) for Come by Chance River fell below the minimum pH level of 6.5 recommended by the CCME Guidelines for the Protection of Freshwater Aquatic Life. pH levels ranged between 5.72 and 6.38 during this deployment period. Fresh water bodies in NL frequently have pH values below the CCME recommended range, resulting from the typically acidic nature of the surrounding terrain. The sudden drop in pH seen on December 25 in **Figure 3** corresponds with milder temperatures and rainfall experienced in that area on December 24 and 25 (see **Appendix A**).

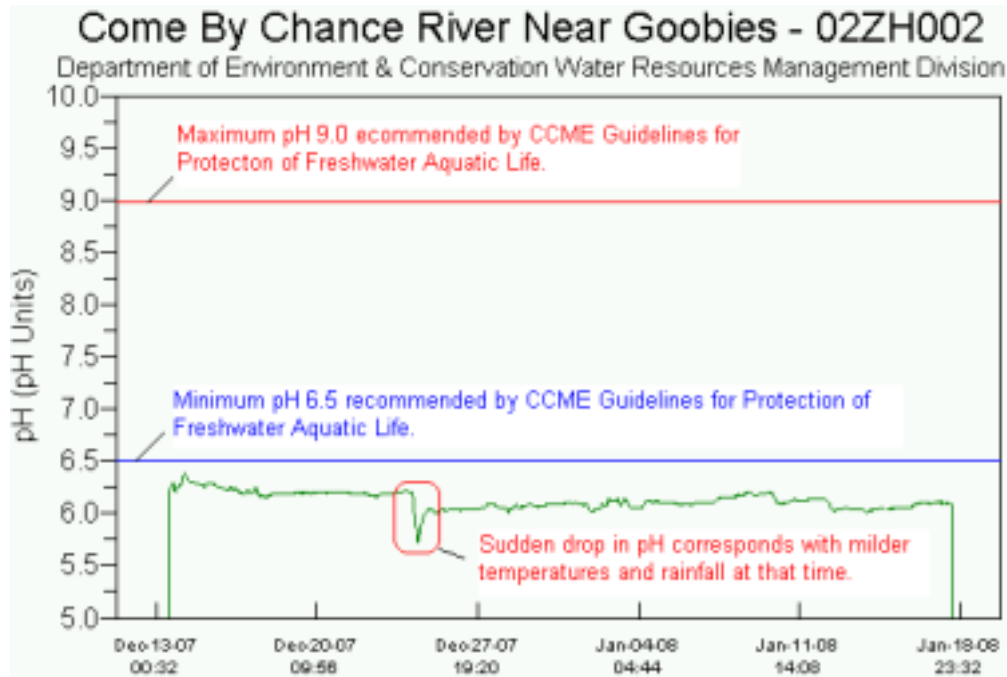
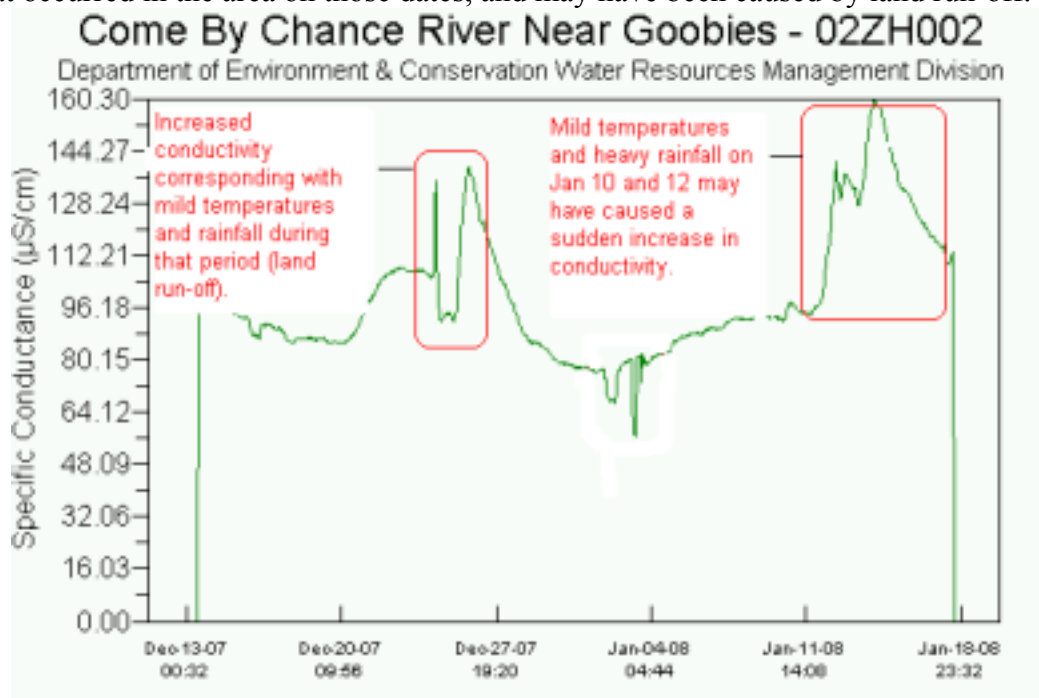


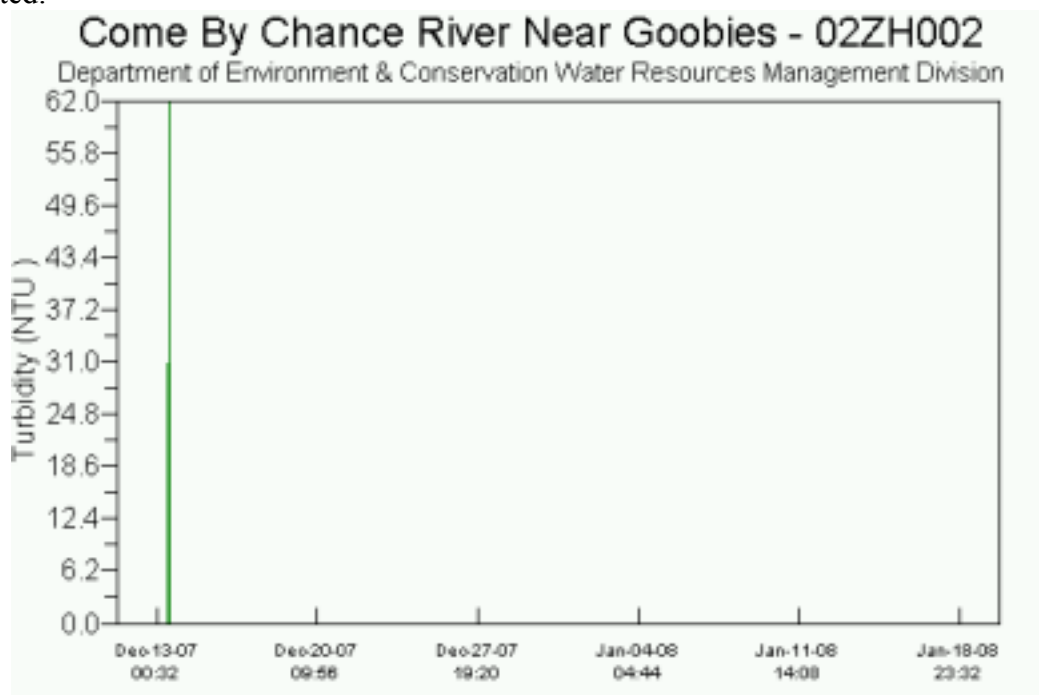
Figure 3

- Specific conductivity values (**Figure 4**), ranged from 56.7 to 160.3 $\mu$ S/cm throughout the reported period. Two conductivity spikes that occurred near December 25 and January 10-12 correspond to precipitation events that occurred in the area on those dates, and may have been caused by land run-off.



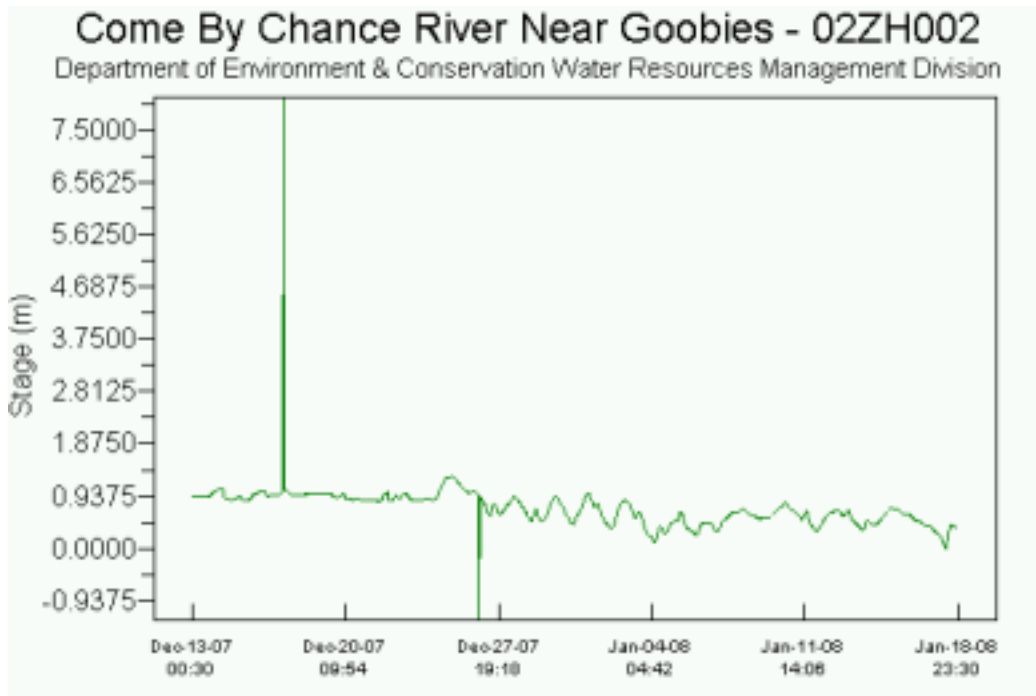
**Figure 4**

- Turbidity values remained constant at 0 NTU for this deployment period (see **Figure 5** below). One turbidity spike on December 13 is related to the redeployment of the probe, and not a water quality event. Values of 0 NTU appear to be typical for this site since the probe was installed in June 2007; however, the probe will continue to be monitored to ensure that the turbidity sensor is performing as expected.



**Figure 5**

- Stage height remained fairly constant throughout the deployment period, as shown in **Figure 6** below. The two spikes that occurred near December 17 and 25 appear to be related to data transmission errors.



**Figure 6**

**Appendix A: Climate Data for St. John's, NL**



(see below)

(December 13-31, 2007)

D a y	Mean Temp °C	Total Rain mm	Total Snow cm	Spd of Max Gust km/h
<u>13</u>	-6.4	0.0	7.2	63E
<u>14</u>	-11.7	0.0	0.0	<31
<u>15</u>	-10.4	0.0	T	<31
<u>16</u>	-11.3	0.0	T	32E
<u>17</u>	-2.4	3.6	13.8	89E
<u>18</u>	-2.3	0.0	0.6	70E
<u>19</u>	-7.0	0.0	T	52E
<u>20</u>	-10.2	0.0	0.0	<31
<u>21</u>	-5.1	0.0	T	61E
<u>22</u>	-7.7	0.0	T	<31
<u>23</u>	-2.6	0.0	0.0	57E
<u>24</u>	4.1	9.2	0.0	83E
<u>25</u>	1.1	0.0	1.0	72E
<u>26</u>	-1.5	T	T	59E
<u>27</u>	-4.0	0.0	2.0	44E
<u>28</u>	-3.2	0.0	32.0	82E
<u>29</u>	-7.2	0.0	T	56E
<u>30</u>	-2.0	0.4	12.2	M
<u>31</u> T	-1.5	T	8.0	M

(January 1-18, 2008)

Daily Data Report for January 2008				
D a y	Mean Temp °C	Total Rain mm	Total Snow cm	Spd of Max Gust km/h
<u>01</u> †	-2.5	0.0	1.8	95E
<u>02</u> †	-3.1	0.0	5.0	76E
<u>03</u> †	-5.7	0.2	T	65
<u>04</u> †	-6.8	0.0	T	37
<u>05</u> †	-7.5	0.0	2.6	50
<u>06</u> †	-6.5	0.0	6.4	<31
<u>07</u> †	-0.9	0.0	T	54
<u>08</u> †	1.3	0.6	0.0	61
<u>09</u> †	-1.0	0.8	1.8	<31
<u>10</u> †	4.8	8.2	0.0	74
<u>11</u> †	-1.3	0.0	0.0	82
<u>12</u> †	2.2	11.0	T	57
<u>13</u> †	0.4	0.4	0.0	74
<u>14</u> †	-4.0	0.0	1.0	67
<u>15</u> †	-0.9	5.5	8.6	56
<u>16</u> †	-1.0	0.0	0.8	61
<u>17</u> †	-3.2	0.0	T	67
<u>18</u> †	-5.2	0.0	0.0	59

Prepared by: Joanne Sweeney

Environmental Scientist  
 Water Resources Management Division  
 Department of Environment and Conservation  
 Ph: (709) 729-0351