

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

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Voisey's Bay Nickel Company Ltd. will continue to be informed of any significant water quality events in the future in the form of a monthly report.

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 September 18th (after 40 day deployment period). DOEC & VBNC staff cleaned and calibrated the instruments and returned them to Camp Pond Brook on September 19th and Upper Reid Brook, Lower Reid Brook and Tributary to Lower Reid Brook on September 20th.
- As of September 20th, 2006 all four surface water stations were successfully deployed.
- 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 1**. The conductivity probe was not functioning properly and hence field readings for conductivity are not available for QA/QC. The Minisonde will be sent away for servicing throughout the winter months when the instruments are not in the water. Upon reinstallation, it appears as though the majority of the comparisons remained in the "Excellent" and "Good" categories. Servicing will be carried out on all the instruments during the winter months and each sensor will be put through a series of evaluation and proficiency testing to ensure its reading accurately.

Table 1: QA/QC Data Comparison Rankings upon removal and reinstallation in September, 2006

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Upper Reid Brook	Sept. 18, 2006	Removal	Excellent	Marginal	NA*	Marginal
	Sept. 20, 2006	Installation	Good	Good	NA*	Excellent
Lower Reid Brook	Sept. 18, 2006	Removal	** Comparisons not available due to transmission problems encountered from this station**			
	Sept. 20, 2006	Installation	Excellent	Good	NA*	Fair
Tributary to Lower Reid Bk	Sept. 18, 2006	Removal	Good	Good	NA*	Poor
	Sept. 20, 2006	Installation	Excellent	Excellent	NA*	Excellent
Camp Pond Brook	Sept. 18, 2006	Removal	Excellent	Excellent	NA*	Good
	Sept. 19, 2006	Installation	Good	Fair	NA*	Excellent

* Problems with conductivity probe on the Minisonde. Field reading could not be taken.

- All surface water stations were deployed from September 19th/20th – November 4th/7th, 2006 (39-40 days). At this time in November due to ice conditions, all instruments were removed for the winter months. There were no QA/QC field readings available due to problems with the Minisonde. The Minisonde will be serviced during the winter months.
- The groundwater station was removed (by DOEC staff and VBNC staff) from the well on September 19th, 2006 for maintenance/calibration and was reinstalled on September 20th. Additionally, the instrument was removed for the winter months on Nov. 7th. Groundwater quality results and QA/QC results will be summarized in the Annual Report.

Data Interpretation

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

- The water temperature and conductivity (Figures 1 & 2 respectively) remained very 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. There was a slight increase in conductivity towards the end of the deployment period which dropped to background levels in a short time period.

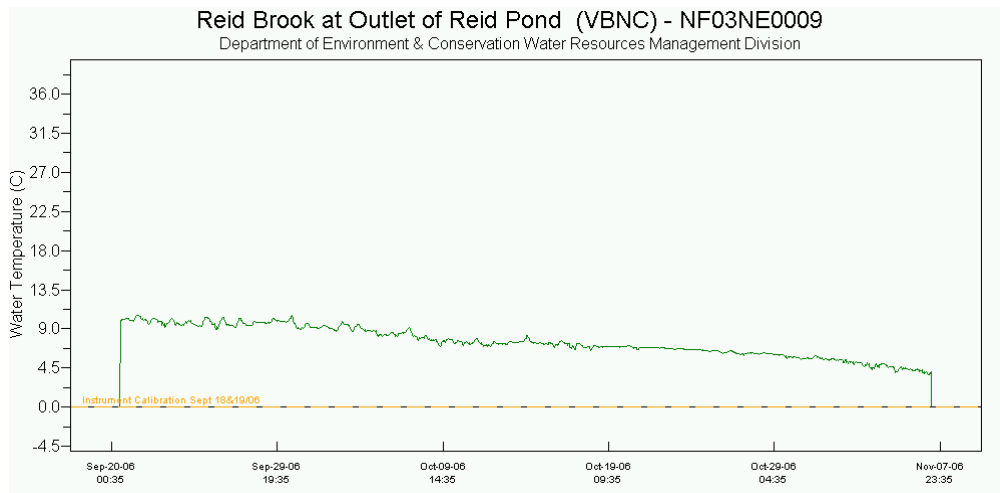


Figure 1

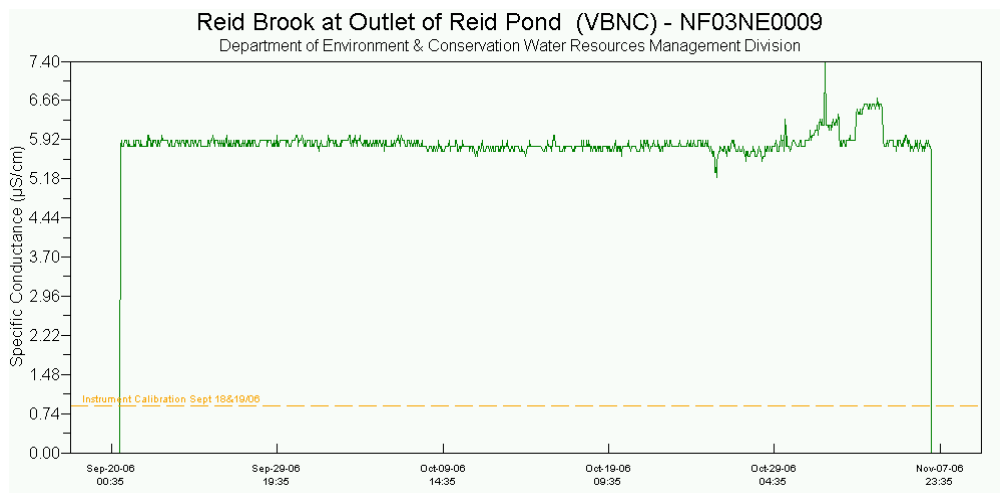
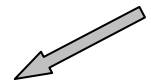
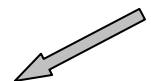


Figure 2



- The dissolved oxygen, pH and turbidity (Figures 3, 4 & 5 respectively) remained consistent throughout the deployment until October 25th. The drop in dissolved oxygen and pH and increase in turbidity is consistent with a significant increase in stage (Figure 6) that peaked on October 23rd with a maximum value of 3.84m. It appears as though the increase in stage caused turbidity issues that in turn affected the other sensors such as pH and dissolved oxygen until the removal date. In most cases, if parameters are affected by stage fluctuations, the readings generally return to normal background concentrations after a short period of time. This was not the case at Upper Reid Brook whereby the readings did not return to normal background levels.

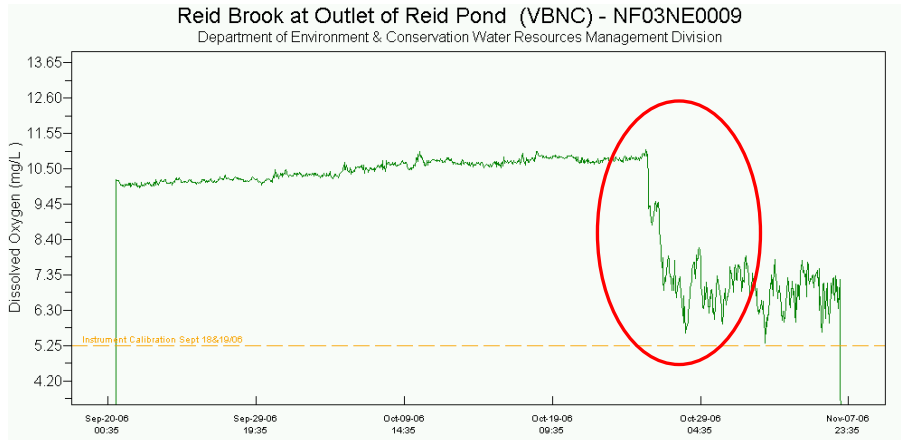


Figure 3

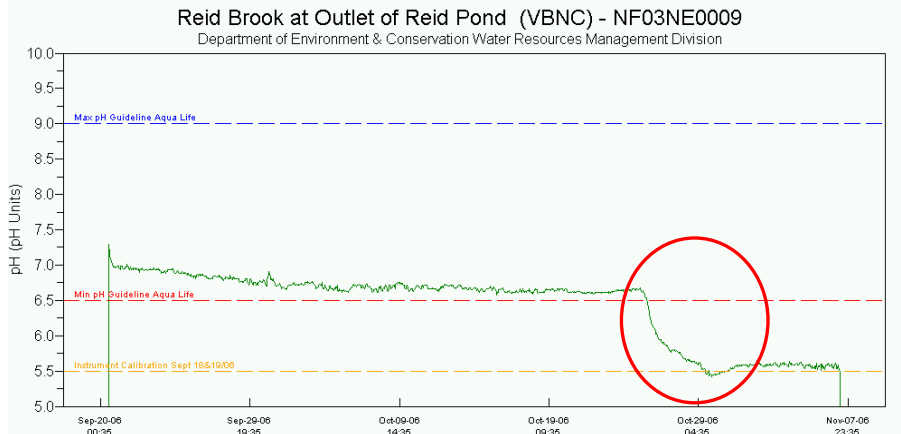
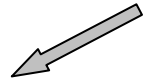


Figure 4

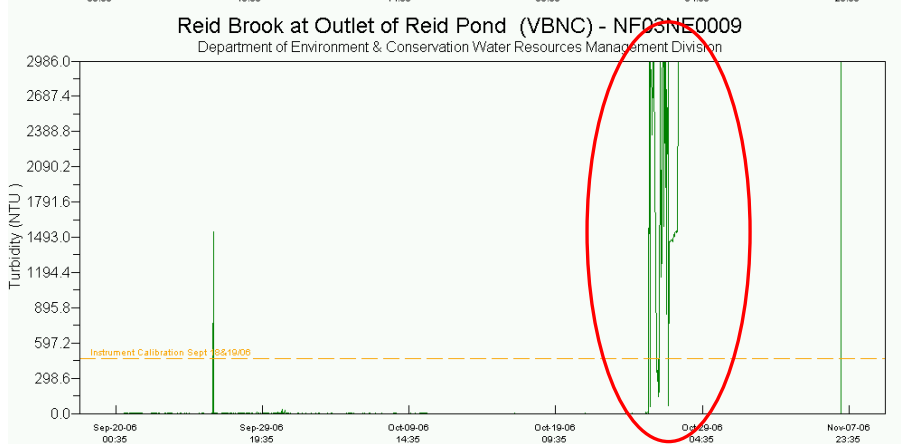
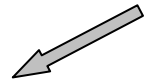


Figure 5

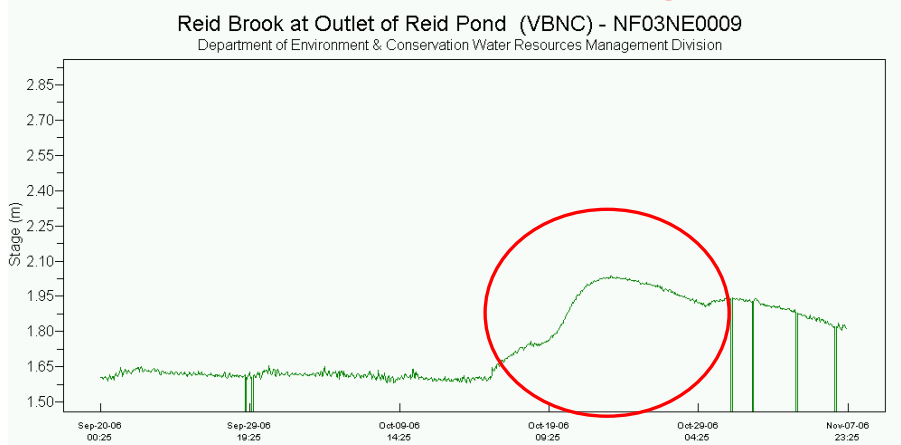
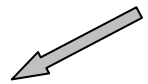
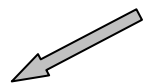


Figure 6



CAMP POND BROOK BELOW CAMP POND

- The majority of water quality parameters including water temperature, dissolved oxygen and pH (Figures 7, 8, & 9 respectively) remained very 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 temperature and corresponding increase in dissolved oxygen over the deployment period.

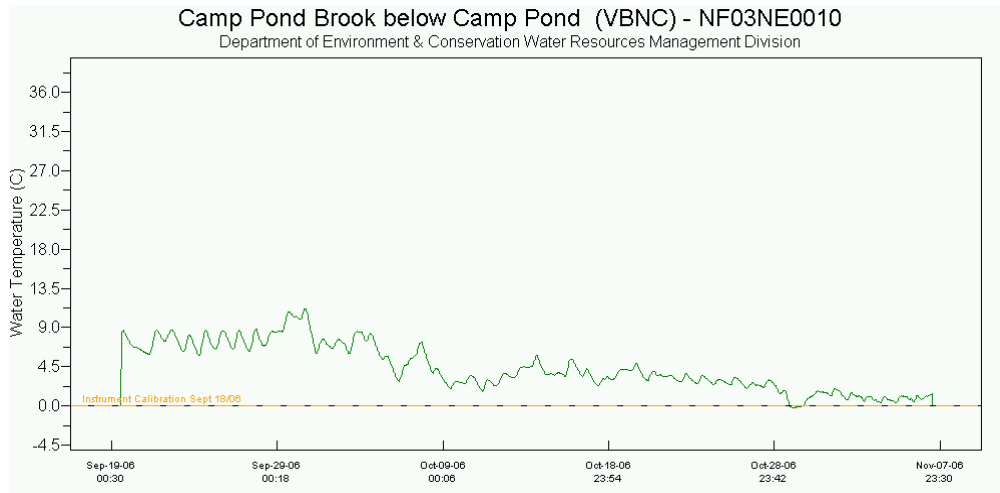


Figure 7

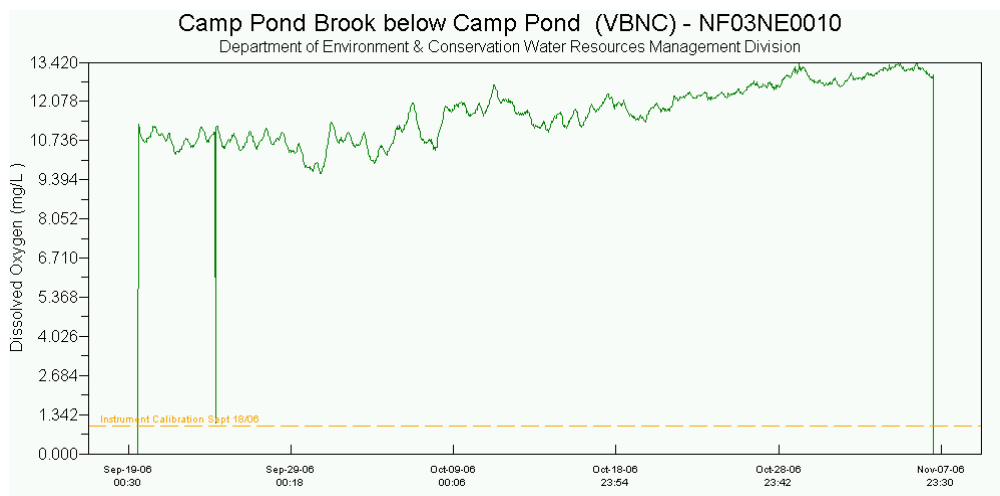
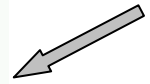


Figure 8

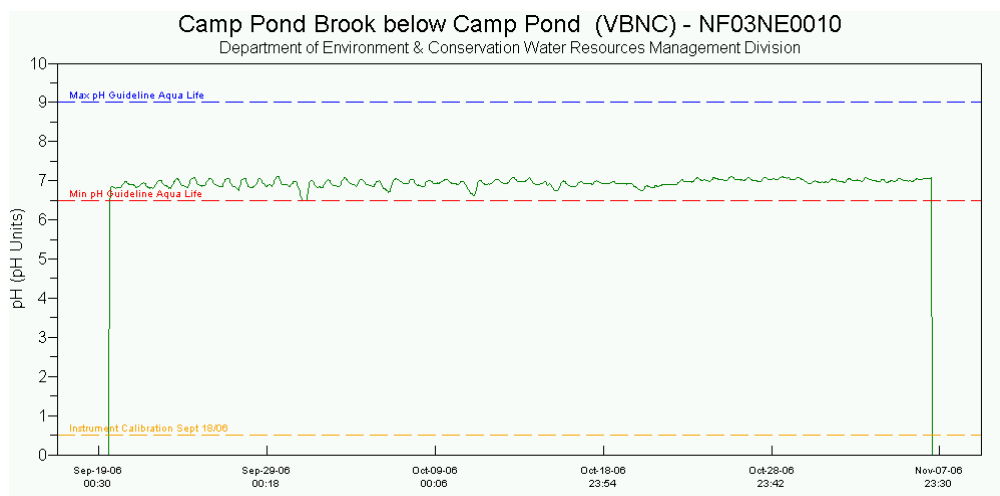
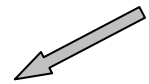
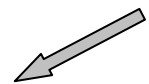


Figure 9



- The turbidity values (**Figure 10**) and specific conductivity values (**Figure 11**) remained at fairly constant background levels for this station over the deployment period with the exception of four water quality events which resulted in increases in these parameters. The increases in turbidity and specific conductivity can be attributed to the increases in stage (**Figure 12**) due to heavy rainfall events at the time (**Appendix A**).

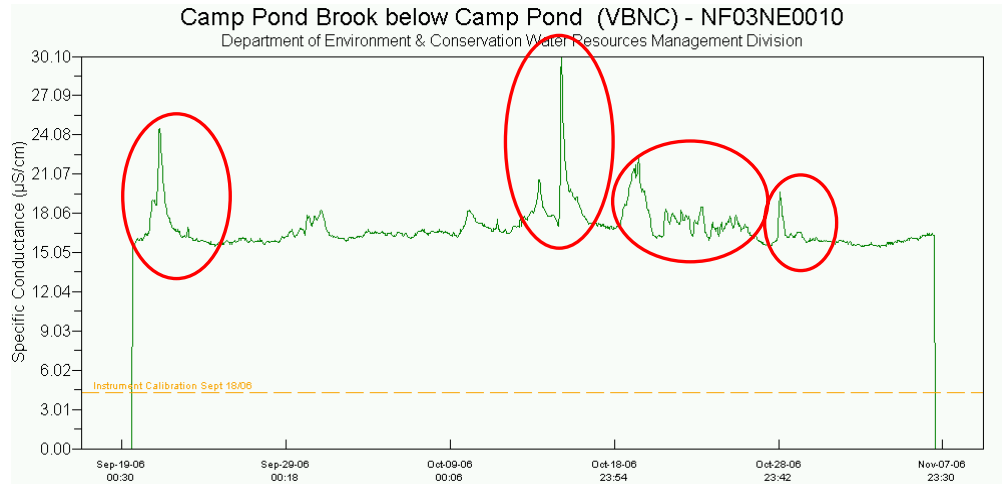


Figure 10

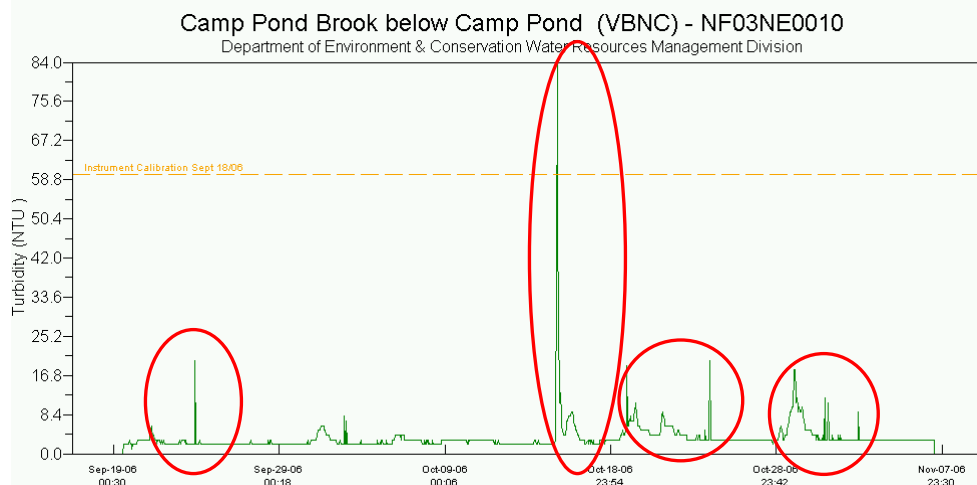
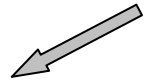


Figure 11

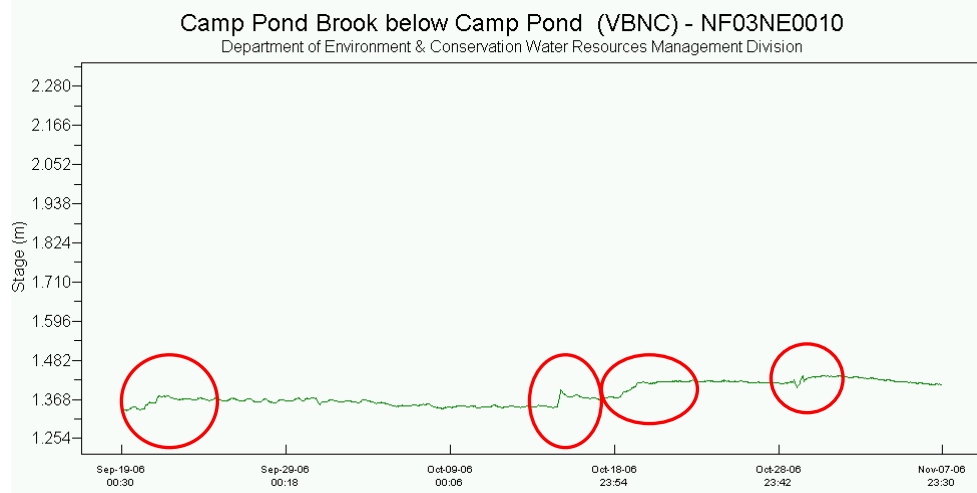
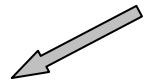
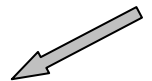


Figure 12



LOWER REID BROOK BELOW TRIBUTARY

- Water temperature and dissolved oxygen (**Figures 13 & 14** respectively) remained very 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 temperature and corresponding increase in dissolved oxygen over the deployment period.

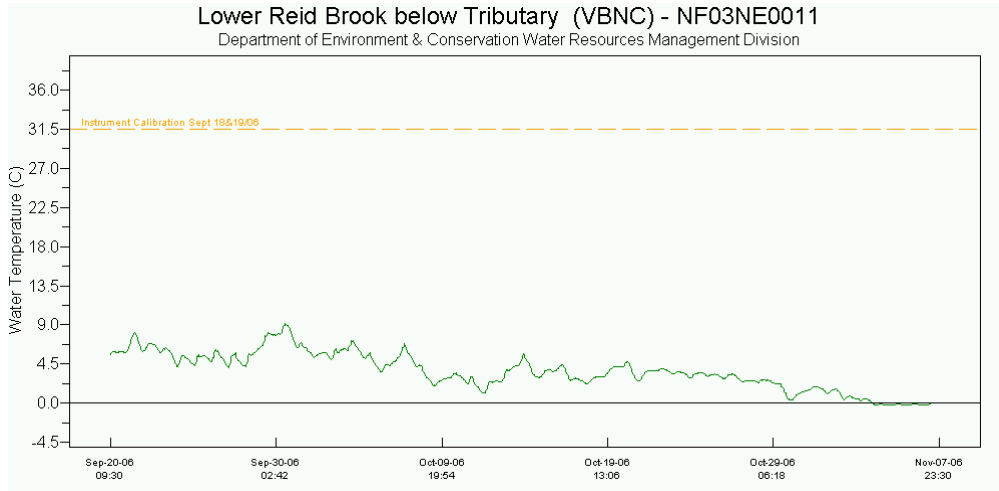


Figure 13

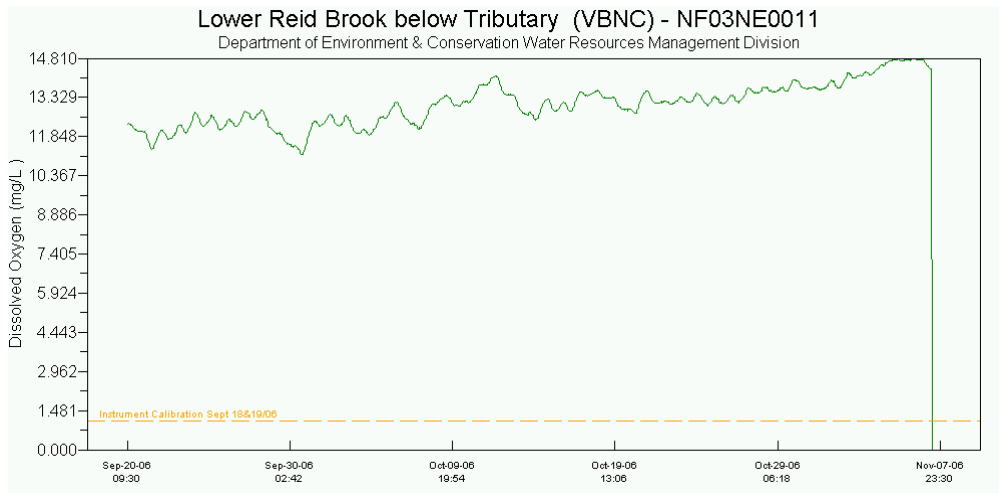
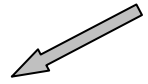
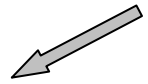


Figure 14



- The pH, turbidity and specific conductivity (**Figures 15, 16 & 17** respectively) remained at fairly constant background levels for this station over the deployment period with the exception of 2 (pH & turbidity) or 3 (conductivity) water quality events. The two incidences of decreases/increases in pH and turbidity and the three incidences of decreases/increases in conductivity can be attributed to the increase in stage (**Figure 18**) due to heavy rainfall events at the time (**Appendix A**).

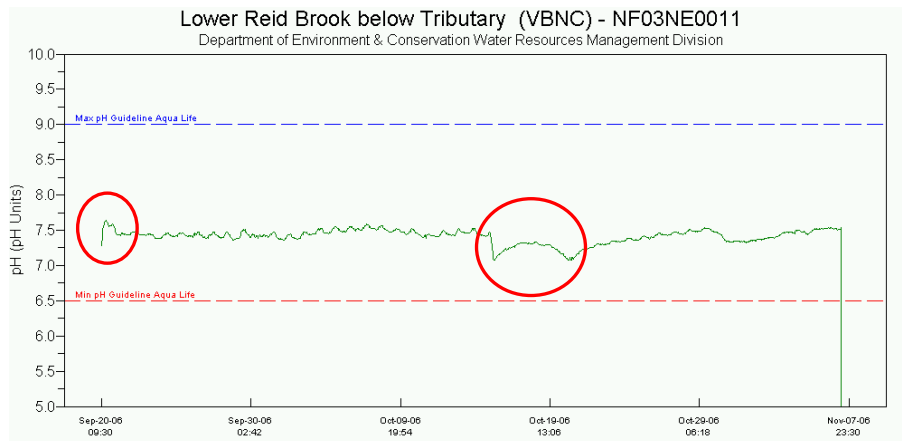


Figure 15

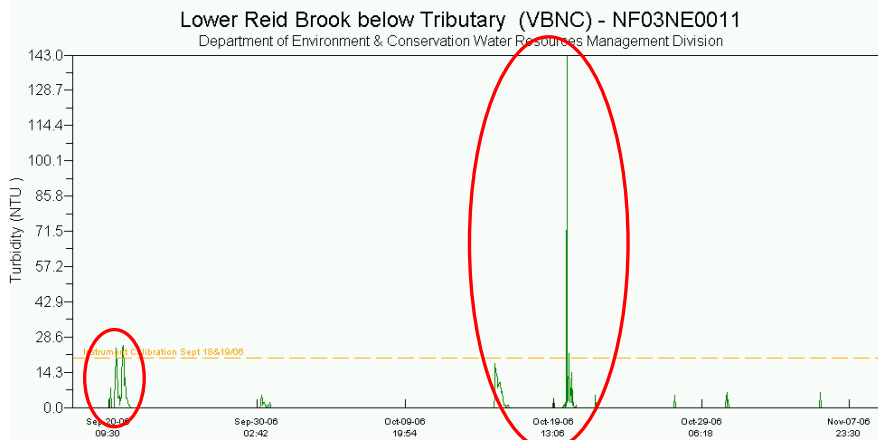
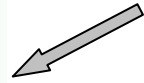


Figure 16

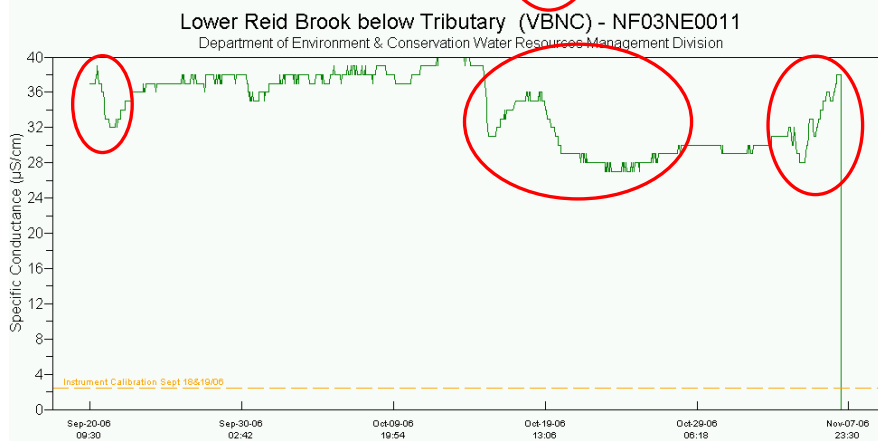
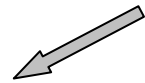


Figure 17

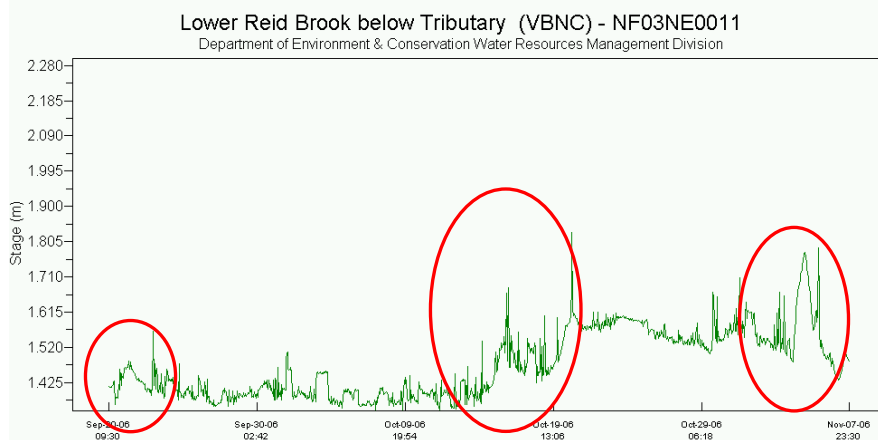
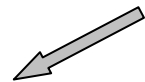
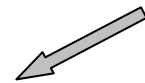


Figure 18



TRIBUTARY TO REID BROOK

- The water temperature and dissolved oxygen (**Figures 19 & 20** respectively) remained very 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 temperature and corresponding increase in dissolved oxygen over the deployment period.

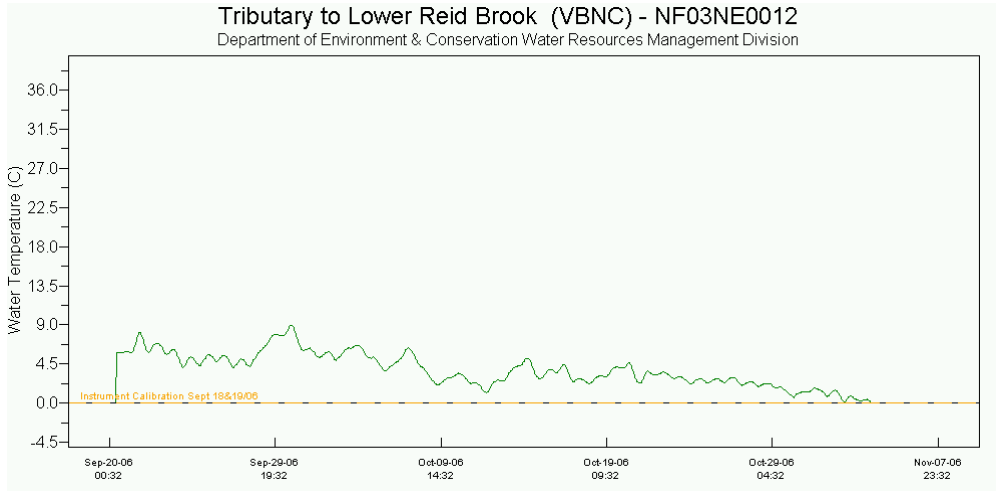


Figure 19

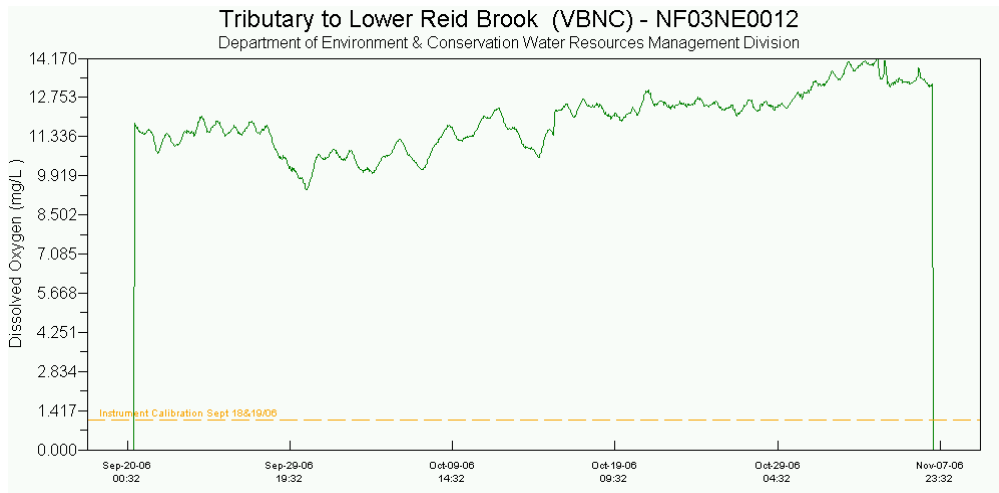
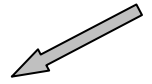
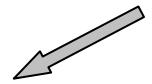


Figure 20



- The pH, turbidity and specific conductivity (**Figures 21, 22 & 23** respectively) remained at fairly constant background levels for this station over the deployment period with the exception of 4 (pH & turbidity) or 5 (conductivity) water quality events. The four incidences of decreases/increases in pH and turbidity and the five incidences of decreases/increases in conductivity can be attributed to the increase in stage (**Figure 24**) due to rainfall events at the time (**Appendix A**).

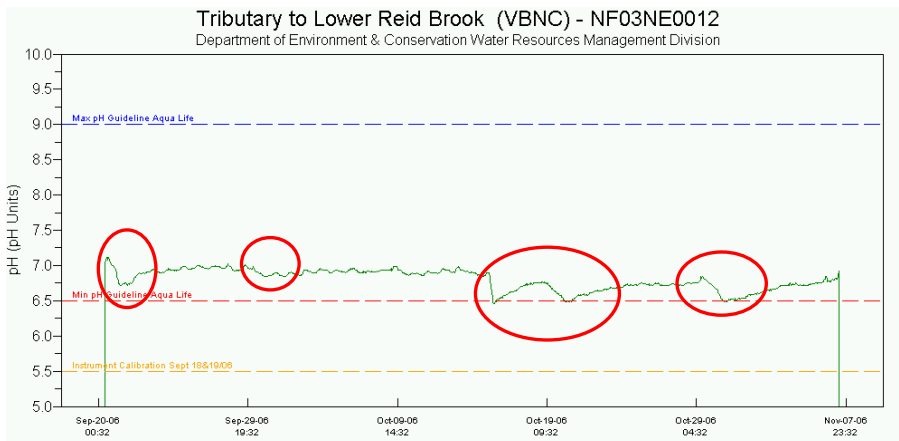


Figure 21

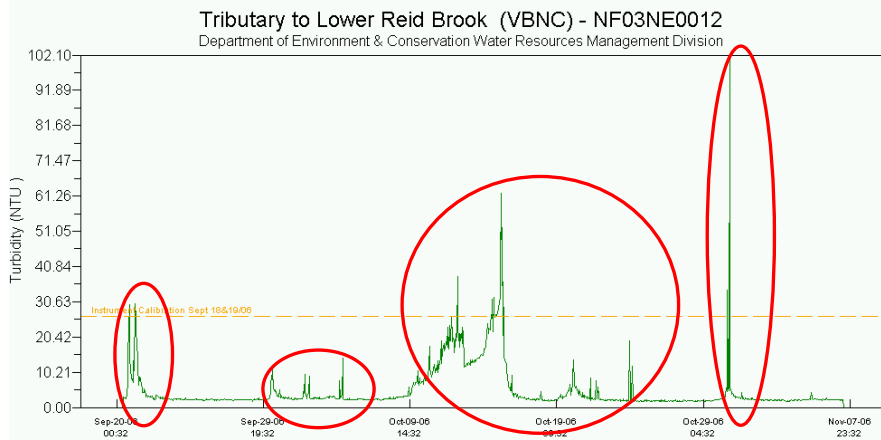
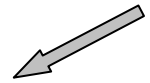


Figure 22

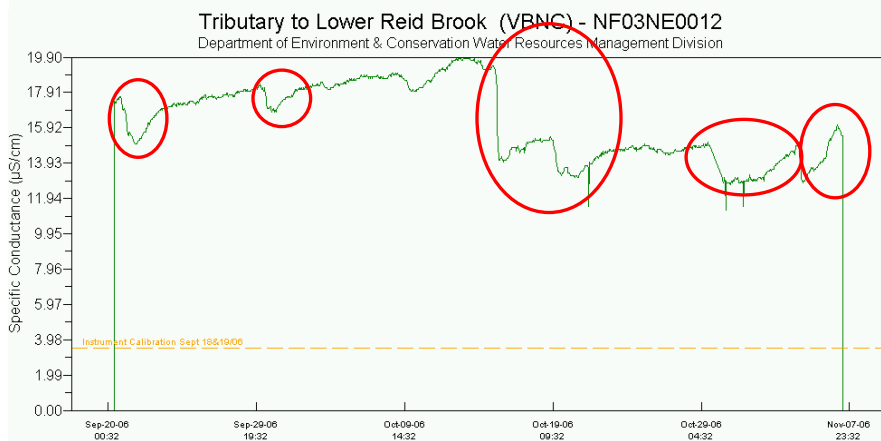
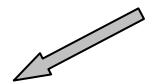


Figure 23

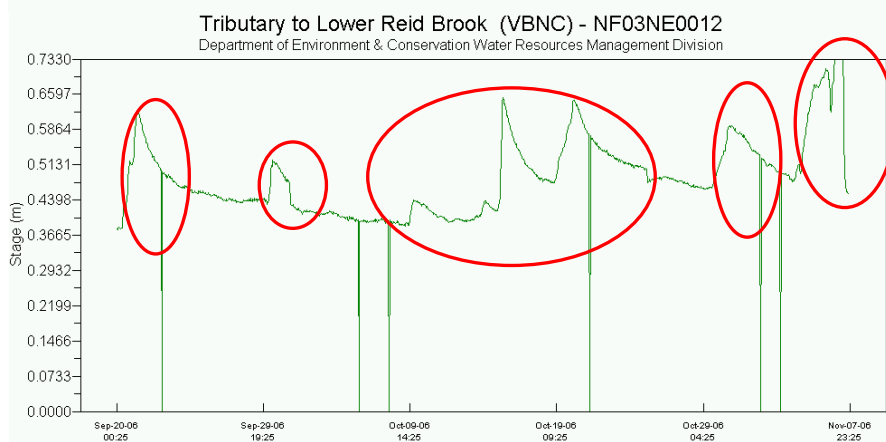
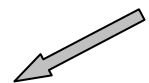
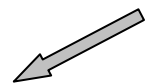


Figure 24



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Appendix A – Climate Data for Nain, Labrador (September, October & November 2006)

Daily Data Report for September 2006											
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	14.8	5.9	10.4	7.6	0.0			0.0	0		
02	24.7	7.8	16.3	1.7	0.0			0.0	0		
03	22.4	13.6	18.0	0.0	0.0			0.0	0		
04	19.1	13.9	16.5	1.5	0.0			0.0	0		
05	13.2	5.5	9.4	8.6	0.0			0.0	0		
06	13.6	3.0	8.3	9.7	0.0			0.0	0		
07	13.1	6.8	10.0	8.0	0.0			0.0	0		
08	8.4	5.8	7.1	10.9	0.0			5.5	0		
09	9.8	4.6	7.2	10.8	0.0			0.0	3		
10	12.2	2.7	7.5	10.5	0.0			0.0	1		
11	15.3	5.1	10.2	7.8	0.0			0.0	0		
12	21.5	12.4	17.0	1.0	0.0			0.0	0		
13	20.5	10.8	15.7	2.3	0.0			0.0	0		
14	17.2	8.3	12.8	5.2	0.0			0.0	0		
15	8.2	5.6	6.9	11.1	0.0			0.0	0		
16	8.4	3.5	6.0	12.0	0.0			1.5	0		
17	7.7	2.7	5.2	12.8	0.0			0.6	8		
18	8.1	0.7	4.4	13.6	0.0			0.0	8		
19	7.4	-0.7	3.4	14.6	0.0			0.0	1		
20	6.1	3.8	5.0	13.0	0.0			26.0	0		
21	14.6	4.5	9.6	8.4	0.0			0.0	0		
22	10.3	4.4	7.4	10.6	0.0			0.0	0		
23	10.9	3.1	7.0	11.0	0.0			0.0	0		
24	10.9	0.9	5.9	12.1	0.0			0.0	0		
25	11.1	1.1	6.1	11.9	0.0			0.0	0		
26	11.8	5.1	8.5	9.5	0.0			0.0	0		
27	12.7	1.8	7.3	10.7	0.0			0.0	0		
28	14.4	1.3	7.9	10.1	0.0			0.0	0		
29	17.1	9.4	13.3	4.7	0.0			7.2	0		
30	15.2	6.1	10.7	7.3	0.0			0.7	0		
Sum				259.0	0.0			41.5			
Avg	13.4	5.3	9.4								
Xtrm	24.7	-0.7									

Daily Data Report for October 2006											
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	9.7	2.6	6.2	11.8	0.0			0.0	0		
02	8.9	5.0	7.0	11.0	0.0			0.0	0		
03	12.5	1.1	6.8	11.2	0.0			0.0	0		
04	11.8	3.2	7.5	10.5	0.0			0.0	0		
05	6.7	2.8	4.8	13.2	0.0			0.6	0		
06	10.3	2.6	6.5	11.5	0.0			0.0	0		
07	11.8	5.5	8.7	9.3	0.0			0.0	0		
08	5.9	1.8	3.9	14.1	0.0			0.7	0		
09	4.7	-1.0	1.9	16.1	0.0			9.8	0		
10	4.4	1.9	3.2	14.8	0.0			1.4	0		
11	5.0	0.9	3.0	15.0	0.0			0.0	0		
12	5.5	0.9	3.2	14.8	0.0			0.0	0		
13	7.0	3.6	5.3	12.7	0.0			1.5	0		
14	9.5	4.5	7.0	11.0	0.0			2.2	0		
15	8.6	0.9	4.8	13.2	0.0			17.1	0		
16	9.2	2.8	6.0	12.0	0.0			6.0	0		
17	6.3	2.2	4.3	13.7	0.0			0.0	0		
18	6.5	2.3	4.4	13.6	0.0			3.9	0		
19	5.7	2.3	4.0	14.0	0.0			6.9	0		
20	5.0	3.9	4.5	13.5	0.0			1.7	0		
21	5.0	0.5	2.8	15.2	0.0			1.4	0		
22	4.4	2.5	3.5	14.5	0.0			0.0	0		
23	3.6	1.4	2.5	15.5	0.0			0.0	0		
24	3.8	0.3	2.1	15.9	0.0			0.6	0		
25	3.5	1.2	2.4	15.6	0.0			0.0	0		
26	3.5	1.9	2.7	15.3	0.0			0.6	0		
27	3.6	0.2	1.9	16.1	0.0			0.0	0		
28	4.5	-1.9	1.3	16.7	0.0			0.0	0		
29	2.7	0.3	1.5	16.5	0.0			26.6	0		
30	3.1	0.6	1.9	16.1	0.0			9.7	0		
31	4.6	1.1	2.9	15.1	0.0			0.6	1		
Sum				429.5	0.0			85.3			
Avg	6.4	1.9	4.1								
Xtrm	12.5	-1.9									

Daily Data Report for November 2006											
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	3.6	-0.7	1.5	16.5	0.0			0.0	0		
02	2.2	-3.6	-0.7	18.7	0.0			0.0	0		
03	1.4	-2.2	-0.4	18.4	0.0			0.0	0		
04	-0.7	-3.7	-2.2	20.2	0.0			0.0	0		
05	0.1	-7.4	-3.7	21.7	0.0			0.0	0		
06	-0.4	-4.2	-2.3	20.3	0.0			0.0	0		
07	4.2	-6.6	-1.2	19.2	0.0			1.4	0		
08	-2.2	-4.2	-3.2	21.2	0.0			0.0	0		
09	1.0	-10.0	-4.5	22.5	0.0			6.1	0		
10	2.6	-3.7	-0.6	18.6	0.0			19.0	3		
11	0.7	-1.3	-0.3	18.3	0.0			3.6	0		
12	-3.5	-8.2	-5.9	23.9	0.0			0.0	4		
13	-2.2	-7.3	-4.8	22.8	0.0			0.0	4		
14	4.8	-7.7	-1.5	19.5	0.0			1.9	3		
15	1.8	0.4	1.1	16.9	0.0			0.0	5		
16	1.3	-0.6	0.4	17.6	0.0			0.7	5		
17	1.5	-0.1	0.7	17.3	0.0			14.6	4		
18	1.9	0.2	1.1	16.9	0.0			1.4	11		
19	0.3	-2.1	-0.9	18.9	0.0			0.0	8		
20	-0.9	-5.5	-3.2	21.2	0.0			2.5	9		
21	-3.9	-5.2	-4.6	22.6	0.0			0.0	10		
22	-4.0	-9.5	-6.8	24.8	0.0			0.0	10		
23	3.9	-10.0	-3.1	21.1	0.0			0.0	10		
24	-0.9	-3.5	-2.2	20.2	0.0			0.0	10		
25	-3.2	-9.8	-6.5	24.5	0.0			0.0	10		
26	0.1	-9.7	-4.8	22.8	0.0			2.0	10		
27	-3.5	-8.7	-6.1	24.1	0.0			0.6	12		
28	-5.9	-9.1	-7.5	25.5	0.0			0.0	12		
29	-8.4	-11.2	-9.8	27.8	0.0			0.7	12		
30	-5.9	-14.3	-10.1	28.1	0.0			2.1	12		
Sum				632.1	0.0			56.6			
Avg	-0.5	-5.7	-3.1								
Xtrm	4.8	-14.3									

Days when heavy precipitation was recorded during the deployment period are highlighted in red