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Peace River Water Use Plan

Peace River Baseline TDGP/Temperature

GMSWORKS-2

Year 8 Monitoring Program - Annual Report

January 2016 to December 2016

**Diversified Environmental Services
Box 6263,
Fort St. John, B.C.
V1J 4H7 May 2016**

April 2017

PEACE RIVER WATER USE PLAN
IMPLEMENTATION PROGRAM

PEACE RIVER BASELINE TDGP/TEMPERATURE
GMSWORKS-2
YEAR 8 MONITORING PROGRAM - ANNUAL REPORT
January 2016 to December 2016

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EXECUTIVE SUMMARY

Long-term monitoring of baseline water temperature and total dissolved gas pressure (TDGP) in the vicinity of the WAC Bennett and Peace Canyon dams is an essential component of the Peace Spill Protocol and the Peace River Flood Pulse Plan as set out by the Peace Water Use Plan Committee and the Peace Water Use Plan (WUP; BC Hydro 2010). Data collected through the monitoring of these parameters will be used to help assess and quantify the environmental effects of spills, as well as to provide information on the temperature regime of the Peace River under normal operating conditions and the influence of reservoir operations on downstream temperature. Long-term baseline temperature data will also be available for use in other projects and monitoring programs within and outside of the Peace WUP. This report summarizes data collection and maintenance activities conducted at 18 monitoring sites located between the WAC Bennett Dam forebay (Williston Reservoir) and a point approximately 6.5 km downstream of the confluence of the Pine and Peace rivers during Year 8 (Jan 01, 2016 to Dec 31, 2016).

In situ reference temperatures were recorded at the time of each field download event using a certified laboratory-grade mercury thermometer calibrated in increments of 0.1°C, for comparison to the corresponding hourly logger readings. Mean calibration errors for all temperature loggers were $\leq 0.3^\circ\text{C}$.

Results of Year 8 water temperature monitoring over the 132 km length of the study area indicate a moderating effect of hypolimnetic withdrawal from Williston Reservoir and seasonal effects associated with ambient air temperature. Minimum winter temperatures decrease and maximum summer temperatures increase with distance downstream from the facilities.

Some logistical problems were encountered in Year 8, primarily associated with floating debris resulting from floods events in late June and late August. Short-term data gaps were observed at some stations immediately downstream of tributary mouths due to loggers becoming temporarily stranded near the waterline due to out-flowing ice, large woody debris, and tampering by curious persons. Data gaps were generally covered by functioning back-up loggers at these locations. Loggers located in the GMS forebay (gmsUP1 and gmsUP2) and downstream of the Moberly River (mobDN1 and mobDN1BU) were lost or destroyed prior to the January 2016 download event. One of the loggers located downstream of the Pine River confluence (pineDN1) and one logger upstream of the Moberly River confluence (mobUP2) were lost during the late June flood event. All six loggers were replaced. Finally, corrupted data files were recovered from the logger upstream of the Peace Canyon Dam

(pcnUP1) and two loggers upstream of the Halfway River (halfUP1 and halfUP2) during the January 2017 download session due to a faulty download shuttle device; the shuttle was subsequently replaced.

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1.0 INTRODUCTION

Long-term monitoring of baseline water temperature and total dissolved gas pressure (TDGP) in the vicinity of the WAC Bennett and Peace Canyon dams has been identified as an essential component of the Peace Spill Protocol (PSP) and the Peace River Flood Pulse Plan as set out by the Peace Water Use Plan Committee and the Peace Water Use Plan (WUP; BC Hydro 2010). Data collected through the monitoring of these parameters will be used to help assess and quantify the environmental effects of spills, as well as to provide information on the temperature regime of the Peace River under normal operating conditions and the influence of reservoir operations on downstream temperature. Long-term baseline temperature data will also be available for use by other projects and monitoring programs within and outside the Peace WUP.

The objectives of this program are to collect data on spatial and temporal variations in water temperature between the WAC Bennett Dam forebay (Williston Reservoir) and a point 6.5 km downstream of the Pine River confluence for up to 10 years, and to maintain TDGP data loggers and related equipment for immediate deployment in the event of a spill at either the Gordon M. Shrum (GMS) or Peace Canyon (PCN) generating stations that is likely to meet the PSP criteria (2 days at 1,500cms or 500cms for 7+ days at PCN; 205cms for 2 days or more at GMS). This report summarizes data collection activities completed during Year 8 of the monitoring program.

2.0 METHODS

Temperature data presented in this summary were recorded between January 01, 2016 and December 31, 2016.

2.1 Temperature Monitoring

Upon commencement of the Peace River baseline temperature monitoring program in September 2008 (Year 1), 20 Tidbit v2 Model #UTBI-001 temperature sensor/logger units (0.2°C accuracy over 0°C to 50°C; 0.02°C resolution @ 25°C; Onset Corp., Bourne, MA) were deployed at 18 locations between the WAC Bennett Dam forebay and a site approximately 6.5 km downstream of the confluence of the Pine and Peace rivers (Fig. 1). During Years 2 and 3, revisions were made to monitoring site positioning and configuration to account for changes in bank conditions, to reduce the potential for logger stranding due to debris and flow level extremes, to increase redundancy in case of logger failure or loss, and to improve accessibility during high flow stage.

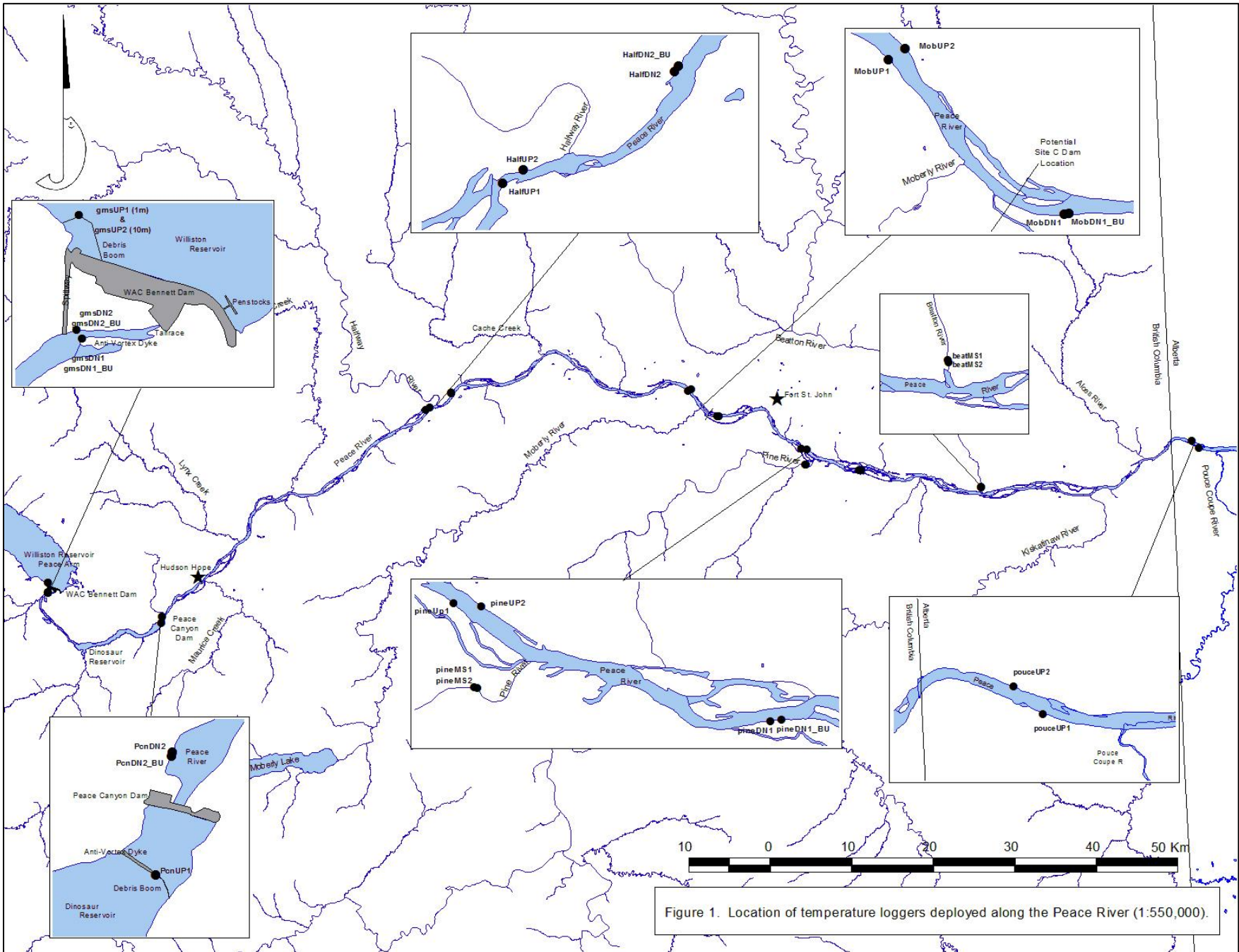


Figure 1. Location of temperature loggers deployed along the Peace River (1:550,000).

Monitoring stations are typically maintained in pairs at each general location in order to minimize the risk of data gaps in the event of logger stranding, failure, or loss. At Peace River locations upstream of major tributaries (Halfway, Moberly, and Pine rivers), monitoring stations are maintained on opposing banks of the river in order to provide redundancy and confirm temperature consistency across the channel. At Peace River locations downstream of major tributaries, paired station configuration was revised in 2011 (Year 3) from opposing banks to common banks in order to provide better redundancy in tributary outflow paths prone to stranding by passing ice and debris.

By late in Year 3, monitoring site configuration had been revised to include 21 data loggers at 18 monitoring sites. This configuration was maintained throughout Years 4 to 8. A summary of temperature monitoring station location information as of the end of Year 8 appears in Appendix I. A description of site configuration changes prior to Year 3 can be found in DES 2013.

In April 2016, six additional temperature loggers were added to three monitoring sites in the project area at the request of BC Hydro's Site C project (Fig. 1). These included 2 loggers on the left downstream bank of the lower Pine River mainstem (pineUP1 and pineUP2), 2 loggers on the left downstream bank of the lower Beatton River mainstem (beatUP1 and beatUP2), and 2 loggers on the left and right downstream banks of the Peace River, approximately 3 km upstream of the confluence with the Pouce Coupe River (pouceUP1 and pouceUP2). Although these additional sites are maintained and downloaded in conjunction with the Peace WUP monitoring program, results are reported in a separate summary report submitted to the Site C project. For information purposes, monitoring site details appear in Figure 1 and Appendices I, III and V.

Temperature loggers were programmed to record water temperature (°C) at 1 hour intervals throughout Year 8. Loggers continued to be housed in 38 mm x 100 mm steel nipples with threaded steel end caps, weighted with 5 kg steel anchors, and tethered to rooted trees or large bedrock fragments using 3.18 mm stainless steel cable.

Temperature data recorded and stored on each logger during 2016 were downloaded at approximately 3 month intervals by field transfer to a Model U-DTW-1 Hobo® waterproof shuttle (Onset Corp., Bourne, MA). Data from the shuttle were then downloaded to a desktop computer after each field session. Logger sites at the WAC Bennett Dam and Peace Canyon Dam forebay and tailrace locations were accessed by vehicle, while all Peace River mainstem sites were accessed by riverboat. Conditions and observations at the time of each download event were documented in the field on

hardcopy Download Information Forms and subsequently entered into digital format. *In situ* reference temperatures were recorded at the time of each field download event using a YSI® Professional Plus handheld multi-parameter instrument (Model No. E-528-ProPlus) or certified laboratory-grade mercury thermometer calibrated in increments of 0.1°C for comparison to the corresponding hourly logger readings (within 30 minutes of reference temperature).

In addition to scheduled download events, temperature loggers at some Peace River mainstem locations were visually checked and re-positioned by DES staff during the course of activities unrelated to the temperature monitoring program.

Data files were exported as MS Office Excel and Access compatible text files using Onset® Hoboware Pro software (Ver. 2.3.0), amalgamated into single Excel worksheets for each data logger, and plotted relative to time. Readings representing air temperature during period of logger stranding above the waterline have been removed from data displayed graphically in this summary report.

2.1.1 Year 8 Site Logistics

Few logistical problems were encountered during Year 8, partially due to refinements in station location and configuration made in Years 2 and 3. Occasional stranding of loggers above the waterline during Year 8 was largely associated the accumulation of debris on tether cables during tributary freshet and flood events in late June and August 2016. Loggers located downstream of the Pine and Moberly river confluences were stranded in late June to early July by debris originating from upstream. The loggers located upstream of the Halfway River (halfUP2) and Moberly River (mobUP2) were pulled ashore and left near or above the high water mark by persons unknown.

During the October 2016 and January 2017 download sessions, 3 data files were corrupted during the download and transfer process. The problem was attributed to an intermittent glitch in Hobo optical shuttle and the unit was replaced.

During the January 2016 download, both loggers suspended from the debris boom buoy in the WAC Bennett Dam forebay were discovered missing. It was believed the tether cable had been pinched and parted by a shifting boom line clevis and the arrangement was modified to prevent similar loss of the replacement loggers. One logger located upstream of the Moberly River (mobUP2) and one located downstream of the Pine River (pineDN1-BU) could not be recovered during the July 2016 download session, which occurred immediately after the major flood event in late June 2016. All 4 loggers were replaced during the July download.

2.2 Total Dissolved Gas Pressure (TDGP)

Six Model TBO-DL6(F) TDGP monitors (Common Sensing Inc., Clark Fork, ID) were purchased by BC Hydro in Year 1, and stored at the office of Diversified Environmental Services (DES) in Fort St. John, BC. Appendix II contains an inventory of dissolved gas pressure meters and probes. Meters and probes were checked for functionality on a quarterly basis when not in use and battery charge was maintained. Initialization check routines were repeated and the condition of each probe oxygen sensor membrane was examined for evidence of ZnO precipitate build-up. In addition to routine quarterly maintenance records, calibration statements were obtained for meters that were returned to the manufacturer for repair or factory re-calibration.

On April 12, 2016, BC Hydro conducted a short-term, low volume test spill at the WAC Bennett Dam facility. At the request of BC Hydro, paired TDGP monitors were deployed in the WAC Bennett Dam forebay and on the left and right banks of the tailrace, approximately 650 m downstream of the spillway (LDB 10.548261.6207267, RDB 10.548163.6207390) in order to determine the magnitude of dissolved gas changes created by the spill event. Two meters were deployed at each site for redundancy and to confirm that each meter was functional after their extended storage period. Tailrace TDGP loggers were programmed to log data at five minute intervals. The left and right bank monitors were deployed on April 11, 2016 at 13:16 and 13:30, respectively and recovered on April 12, 2016 at 17:00 and 16:45 respectively. Raw data logged by the monitors was downloaded and provided to BC Hydro for subsequent analysis. The test spill did not meet the rate and duration thresholds for mandatory TDGP monitoring. Data was collected for BC Hydro in-house experimental use and is not presented in this report.

3.0 RESULTS AND DISCUSSION

Figures 2 to 12 are presented following Section 4.0.

3.1 Temperature Monitoring

Reference temperatures recorded during download events are presented in Appendix III along with corresponding logger temperatures and indicated error values. None of the loggers in use in 2016 exhibited a correctable zero error greater than 0.3°C; most calibration errors are typically within the range of 0.2°C.

Several loggers were replaced in Year 8, as they were approaching the end of their predicted lifespan of six years or were recording low voltage readings. Logger serial numbers listed in Appendix I correspond to the units presently in use following the January 2017 data downloads.

A summary of temperature data collection results and related conditions and limitations are discussed in the following 6 sections, which correspond to the 6 major generating station and tributary features. Download Information Forms completed during each download are provided in Appendix IV.

3.1.1 WAC Bennett Dam Forebay and Tailrace

The WAC Bennett Dam forebay temperature monitoring station is located at the GMS spillway log boom and consists of a vertical cable suspended from the northernmost log boom steel buoy. Temperature is recorded with 2 loggers, the first located at 1 m depth (gmsUP1) and the second suspended at a depth of 10 m (gmsUP2). Neither logger could be recovered during the January 2016 download session due to a parted cable which occurred sometime following the October 2015 download. As a result, only temperature data spanning January 28 to December 31, 2016 could be retrieved (Figure 2). Although seasonal thermal stratification of Williston Reservoir is evident, the relatively small temperature differential between the 2 loggers (mean=0.4°C) suggests the primary thermocline may lie deeper than 10 m. Maximum temperature differentials up to 6.5°C were recorded during a period of significant daytime surface warming during the last two weeks of July and first two weeks of August, when annual ambient temperatures peaked. Temperature profiles recorded further up the Peace Reach during unrelated work in August 2012 indicated a thermocline at approximately 26 m depth (B. Culling, pers. obs.).

The GMS tailrace monitoring sites are located on opposite banks, approximately 700 m downstream of the outflow manifolds. Logger gmsDN1 records the temperature of water flowing from the south tailrace manifold, which originates from the shallowest penstock depth. Logger gmsDN2 samples water from the north tailrace manifold, which originates from a deeper withdrawal point. The tethered steel capsule at both stations contains a back-up logger in addition to the primary unit (gmsDN1BU and gmsDN2BU). All 4 loggers collected seamless data through Year 8.

As in previous years, water temperatures at gmsDN2 showed the lowest annual variation and are consistently cooler in the summer and warmer in the winter than gmsDN1 flow, which originates closer to the surface of Williston Reservoir. Temperatures recorded at gmsUP1 (forebay surface) exhibit greater annual variation than tailrace values (Fig. 3). Temperatures recorded at gmsDN1 and gmsDN2 exhibit a

wide range of hourly and daily fluctuations during the summer period compared to gmsUP1, due to operational changes in water intake for power generation and maintenance activities.

3.1.2 Peace Canyon Dam Forebay and Tailrace

The data logger recording temperature at the Peace Canyon Dam forebay (pcnUP1) is attached to the anti-vortex dam log boom, located approximately 450 m upstream of the dam face. The pcnUP1 data file for the period between November 1 and December 31, 2016 was corrupted by a faulty optical shuttle during the January 4, 2017 download and could not be recovered. Temperature data is available for the remainder of the year (January 1 to October 31).

Both Peace Canyon Tailrace loggers (pcnDN2 and pcnDN2BU) recorded continuous data throughout Year 8. A comparison of PCN tailrace temperature (pcnDN2) and GMS tailrace temperature (mean of gmsDN1 and gmsDN2) indicates a relatively small temperature change through Dinosaur Reservoir during all seasons (Fig. 4). For example, mean differentials of 0.02°C were recorded in winter (December through February) and 0.5°C in summer (June through August). Figure 4 also illustrates slight thermal stratification of the Peace Canyon forebay associated with peak ambient temperatures during the last week of June and first week of July and again during the first week of August 2016. For example, PCN forebay temperatures at 1 m depth (pcnUP1) were as much as 5.5 °C warmer than water exiting the PCN powerhouse (pcnDN2) from August 1 to 7, 2016).

3.1.3 Halfway River Confluence

Peace River water temperature was monitored at points approximately 1 km upstream and 2.5 km downstream of the Halfway River confluence. Halfway upstream stations were maintained on opposing banks throughout Year 8 (halfUP1 and halfUP2). Data sets from both upstream loggers for the period between October 10 and December 31 were corrupted by a faulty optical shuttle during the January 4, 2017 download and could not be recovered. Logger halfUP1 recorded continuous data for the remainder of the year (January 1 to October 10), however, logger halfUP2 became intermittently stranded during periods of low water between April and October after being pulled partially to shore by curious persons prior to both the July 7 and October 10 download sessions. No cross-channel differential was recorded between the opposing upstream stations.

Both Halfway downstream loggers (halfDN2 and halfDN2BU) were located on the left downstream bank within the influence of Halfway River inputs. Both were intermittently exposed during Year 8, resulting in sporadic gaps in water temperature readings. Logger halfDN2BU was

swung into shallow water by debris from the Halfway River sometime between July 15 and October 5, 2016 and recorded air temperature during periods of low flow. Logger halfDN2 appeared to have been pulled to shore by persons unknown sometime after the October 10, 2016 download. Data presented in Figure 5 are a composite of data logged by halfDN2 and halfDN2BU (halfDN_COMP) and excludes periods of exposure.

As in previous years, Peace River temperature values recorded at stations upstream and downstream of the Halfway River confluence differed markedly. Temperatures collected downstream of the confluence exhibited a greater degree of daily and annual variability (Fig. 5). Halfway River inputs typically have a cooling effect during the winter period (October through April) and a warming effect during the summer (May through September). Temperatures within the Halfway River mainstem upstream of its confluence with the Peace are not recorded as part of this project.

3.1.4 Moberly River Confluence

Peace River water temperature was monitored at points approximately 2.6 km upstream and 2.5 km downstream of the Moberly River confluence. Upstream stations were maintained on opposing banks throughout Year 8 (mobUP1 and mobUP2). Logger mobUP1 recorded continuous water temperature data throughout Year 8. Logger mobUP2 was lost between April and July 2016, due to a parted cable, and could not be recovered during the July 7 download attempt. A slight cross-channel differential averaging 0.5°C was recorded between July 7 and August 31, 2016.

The Moberly downstream logger and downstream back-up logger are both located on the south bank of the Peace River, within the influence of outfall from the Moberly River. Both loggers also lie immediately downstream of the footprint of the proposed Site C dam. No water temperature data is available from either logger between January 1 and 27, 2016 as both units were destroyed by Site C construction preparation activities in December 2015; both were replaced on January 27, 2016. Between February and April 2016 both mobDN1 and mobDN1BU were swung to shore by ice and debris and became exposed frequently during low water levels. Seamless data was collected after the April 15, 2016 download.

As in previous years, Peace River water temperatures recorded within the influence of the Moberly River were cooler than the Moberly upstream stations from January through March and warmer than the upstream stations from May through July (Fig. 6). The influence of the Moberly River is

significantly less than that of the Halfway River and appears to correspond to the difference in relative contributed volumes. Temperatures within the Moberly River upstream of its confluence with the Peace River are not recorded as part of this project.

3.1.5 Pine River Confluence

Peace River water temperature was monitored at points approximately 2.0 km upstream and 6.5 km downstream of the Pine River confluence. During Year 8, upstream stations were maintained on opposing banks (pineUP1 and pineUP2) and both downstream loggers (pineDN1 and pineDN1BU) were located on the south river bank, within the influence of inputs from the Pine River. Both pineUP1 and pineUP2 loggers recorded continuous hourly data throughout Year 8. No cross-channel differential was noted.

Both Pine downstream loggers (pineDN1 and pineDN1BU) exhibited periodic data gaps as a result of unusually high debris flow from the Pine River during 2016. Logger pineDN1 was partially swung to shore by debris prior to the April 2016 download and was re-tethered in a new location in an attempt to minimize the frequency of debris accumulation on the tether cable. Despite this revision, the logger was dislodged by debris and swung to shallow water again prior to the July and October 2016 and January 2017 downloads. As a result, air temperatures were recorded during sporadic periods of low water. Logger pineDN1BU was lost to large debris during a flood event in late June 2016 and was replaced on July 13, 2016. Pine downstream temperature data in Figure 7 are presented as a composite of both pineDN1 and pineDN1BU (pineDN_COMP).

Temperature values recorded within the downstream influence of the Pine River were typically cooler than the Pine River upstream stations from late September through December and slightly warmer from July through mid-September (Fig. 7). A temperature monitoring station was established and maintained in the lower Pine River mainstem during Year 8 at the request of the BC Hydro Site C project. Results are discussed in a separate Site C project summary report.

Figure 8 presents comparative seasonal temperature changes over the 132 km length of the study area between the WAC Bennett Dam tailrace (gmsDN2) and the Pine River confluence (pineUP1) during 2016 and Figure 9 compares daily mean ambient air temperature at the Fort St. John airport with daily mean Peace River water temperature at the Pine river confluence (pineUP1). Data appearing in these figures include Halfway and Pine confluence stations not directly influenced by their respective tributary inputs. The graphs illustrate the moderating effect of hypolimnetic

withdrawal from Williston Reservoir on downstream temperatures in the Peace River and the seasonal impact of ambient air temperature on downstream water temperatures, i.e., winter temperatures decrease and summer temperatures increase with distance downstream. Brief periods of homogeneity occurred in early April and mid-October, with gradients inverting on either side of these dates to form the typical annual pattern.

Figures 10 and 11 represent temporal comparisons of daily mean water temperature during Year 8 (2016) against the average of 2009 to 2015 daily mean temperatures for WAC Bennett Dam tailrace (gmsDN2) and Pine River confluence (pineUP1) sites, respectively. Water temperatures recorded in the WAC Bennett Dam tailrace (north manifold) show some deviation from the 2009-2015 average. Variability in tailrace temperature is largely due to operational factors at the GMS generating station and may include variations in reservoir elevation and changes in volume contribution from hypolimnetic and epilimnetic withdrawal at various generating outputs. An analysis of these influences is beyond the scope of this summary report. Downstream Peace River water temperatures recorded immediately above the Pine River confluence (pineUP1) during Year 8 generally track the 2009-2015 average, with occasional variation due to weather events including above and below normal periods in ambient temperature and increased tributary contributions during precipitation events.

4.0 RECOMMENDATIONS

The 6.35 mm galvanized cable used during the initial years of the program has proven to have low resistance to corrosion. With the exception of a few locations where segments of galvanized cable remain above the waterline, all the tether cables have been replaced with stainless steel cable. The remaining galvanized cable sections should be monitored for corrosion.

The battery life of the Tidbit v2 Model #UTBI-001 temperature sensors is estimated at approximately 5-6 years and a number of loggers were replaced in 2015 and 2016. Scheduled replacement of units should continue in 2017 as per the table presented in Appendix V.

During 2015, aluminum information tags reading “DATA RECORDER, PLEASE DO NOT DISTURB” were attached to the tether cables of loggers previously subject to tampering or potentially accessible to the public. These tags should be monitored and maintained through Year 9.

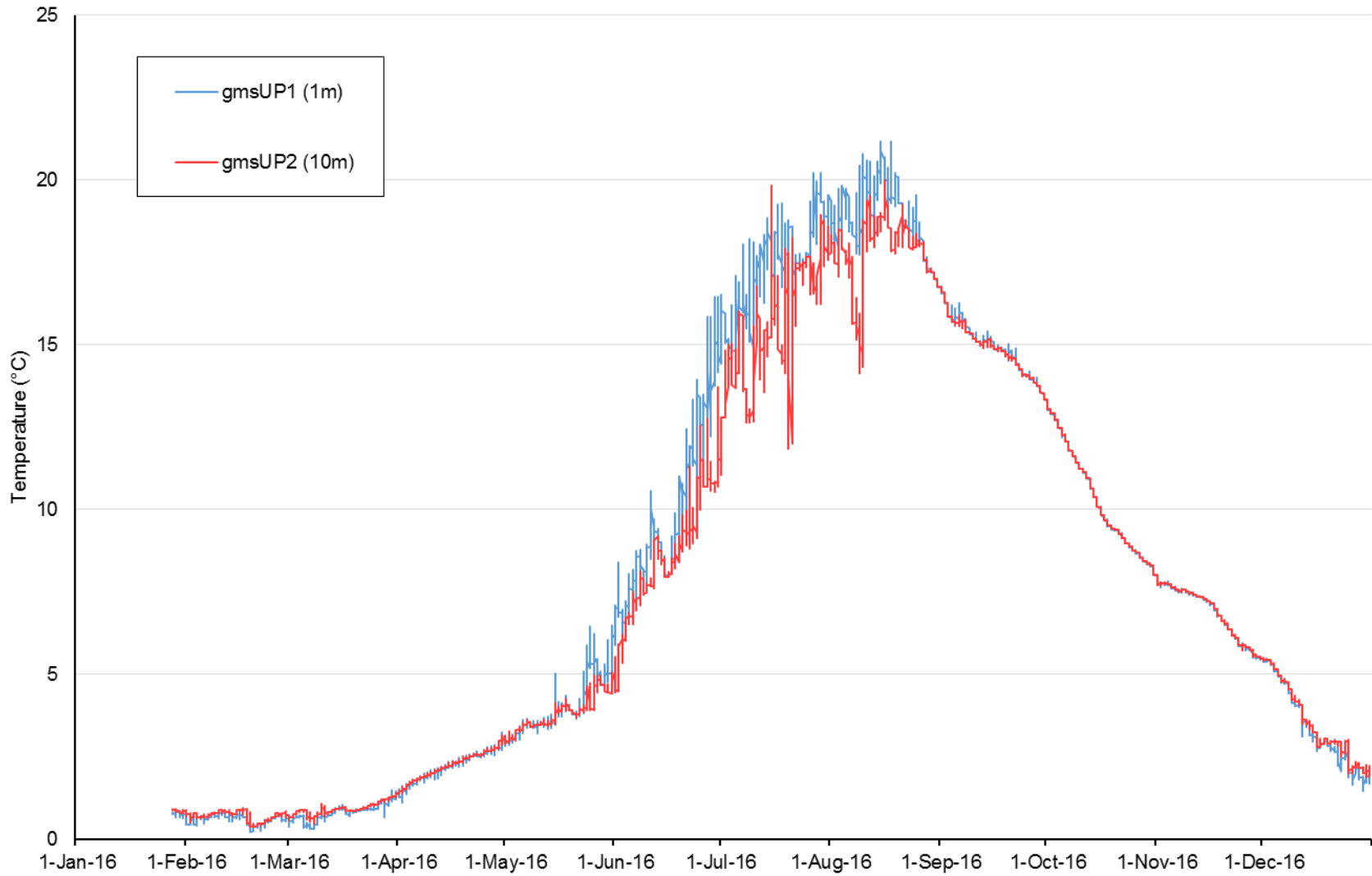


Figure 2. Comparison of hourly water temperature at WAC Bennett Dam forebay station from 1 m depth (gmsUP1) and 10 m depth (gmsUP2) during Year 8, January 01, 2016 – December 31, 2016.

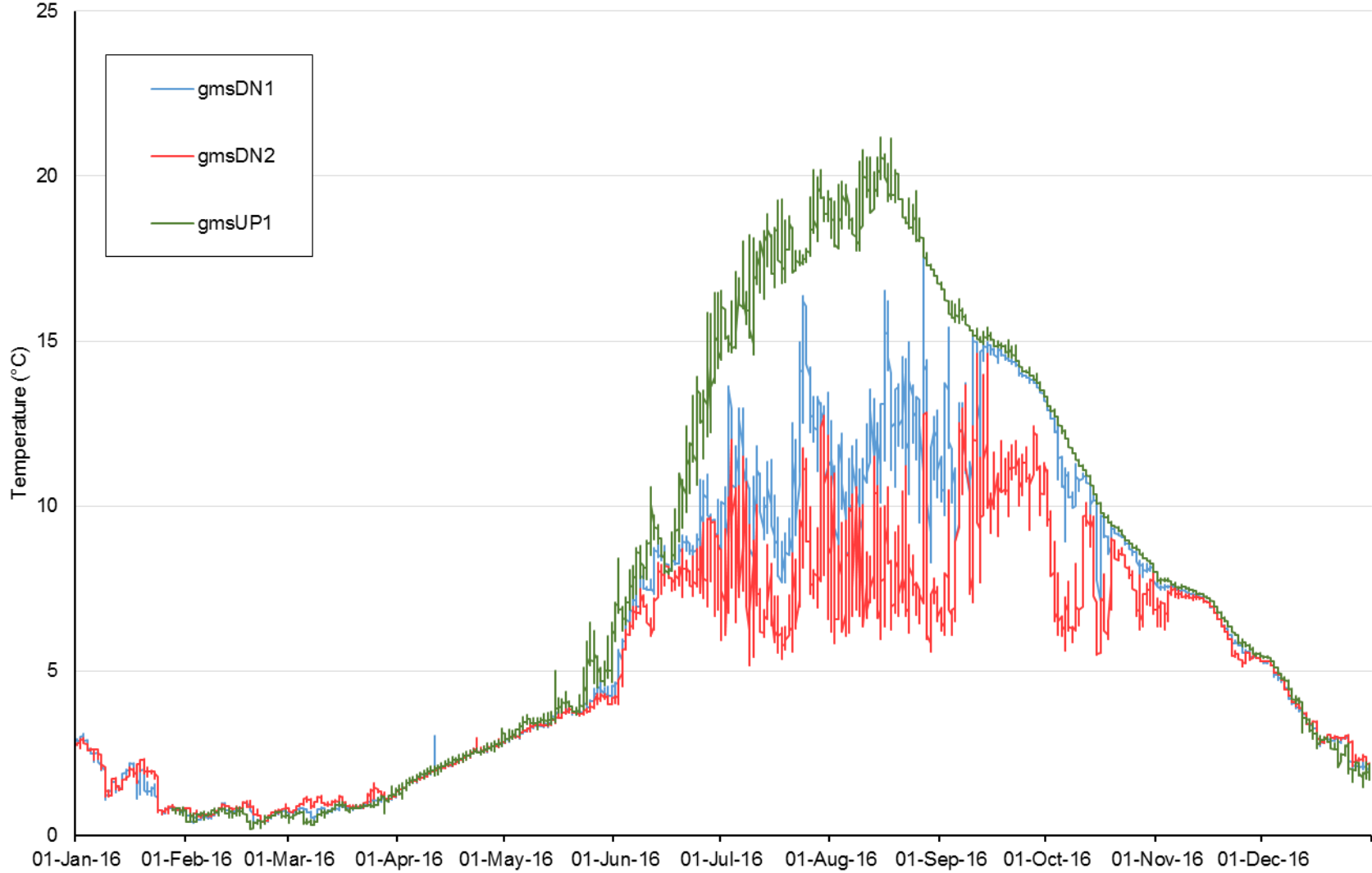


Figure 3. Comparison of hourly water temperature at WAC Bennett Dam forebay surface (gmsUP1), and WAC Bennett Dam tailrace (gmsDN1 and gmsDN2) during Year 8, January 01, 2016 – December 31, 2016.

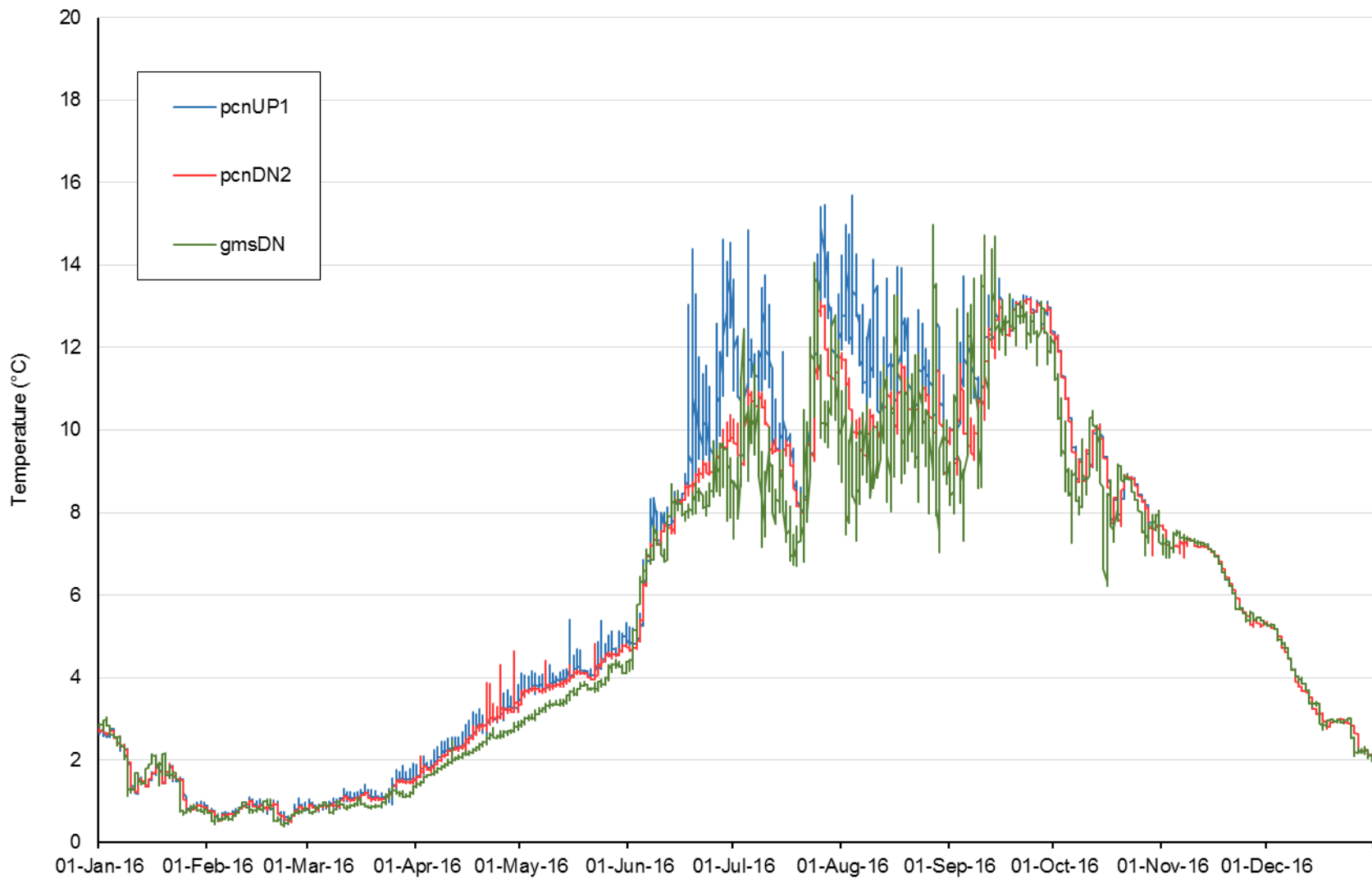


Figure 4. Comparison of hourly water temperature at Peace Canyon forebay surface (pcnUP1), Peace Canyon tailrace (pcnDN2), and WAC Bennett Dam tailrace (gmsDN) during Year 8, January 01, 2016 – December 31, 2016.

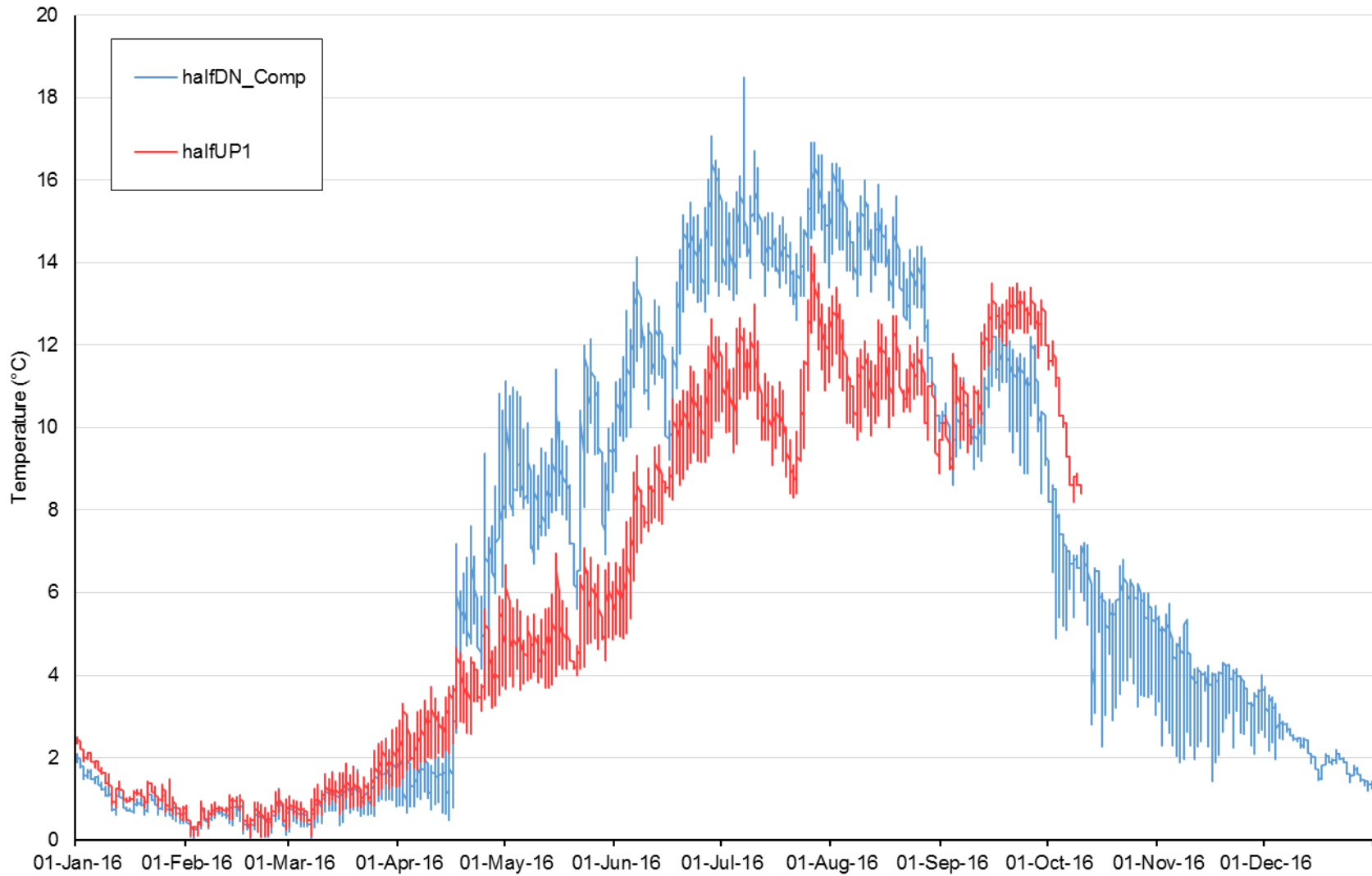


Figure 5. Comparison of hourly Peace River water temperature upstream of Halfway River confluence (halfUP1) and downstream of Halfway River confluence (halfDN_COMP) during Year 8, January 01, 2016 – December 31, 2016.

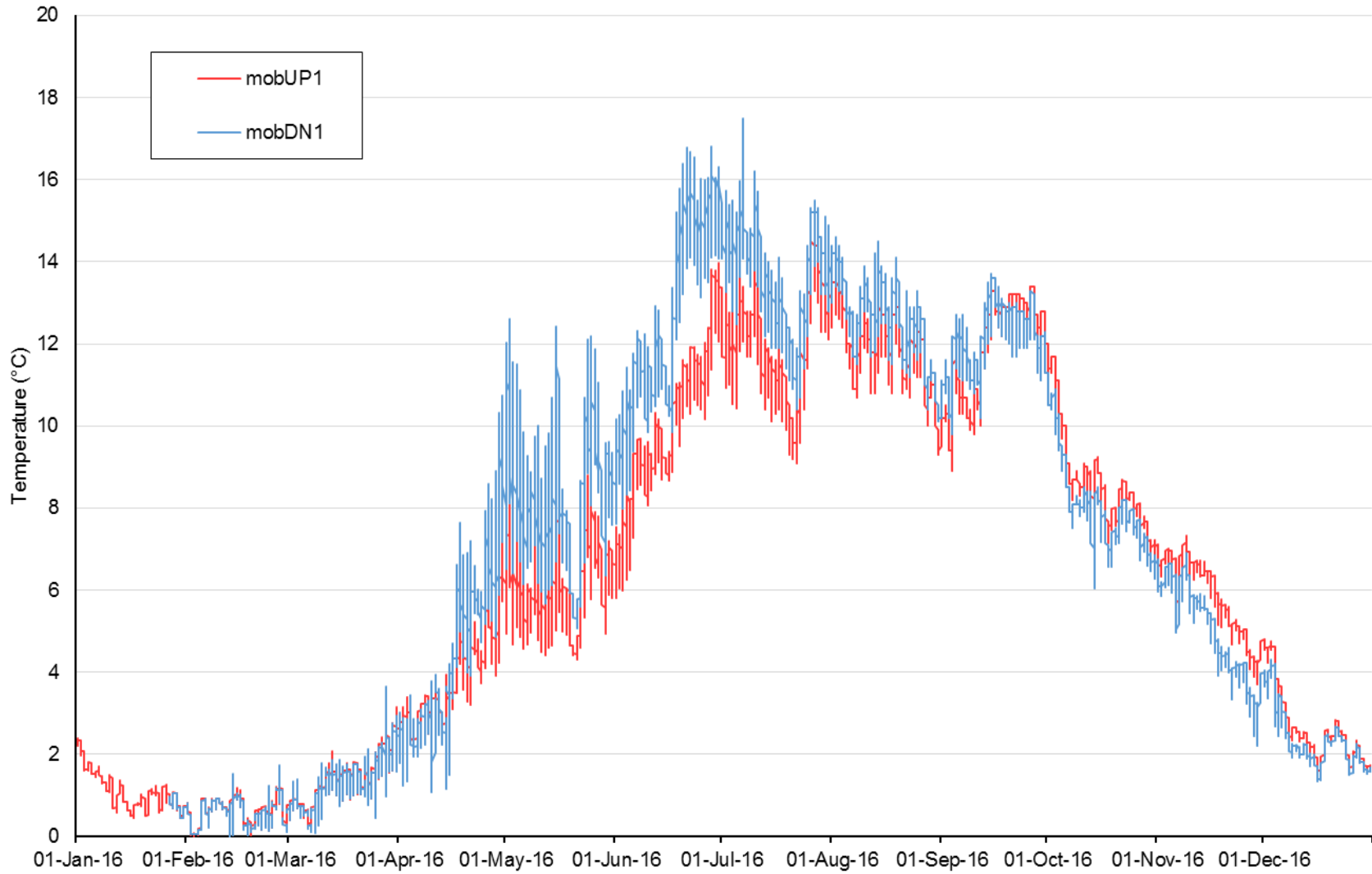


Figure 6. Comparison of hourly Peace River water temperature upstream of Moberly River confluence (mobUP1) and downstream of Moberly River confluence (mobDN1) during Year 8, January 01, 2016 – December 31, 2016.

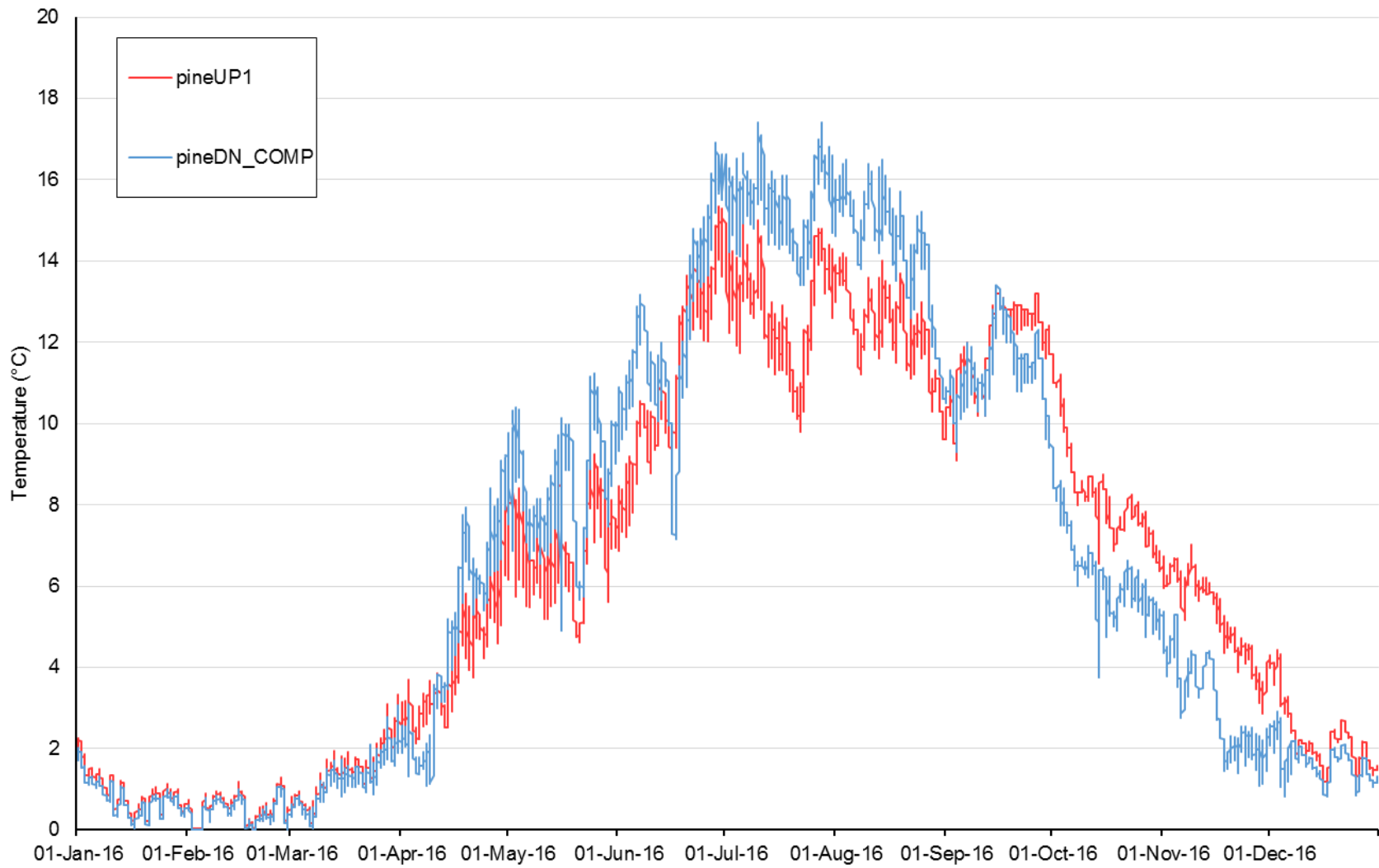


Figure 7. Comparison of hourly Peace River water temperature upstream of Pine River confluence (pineUP1) and downstream of Pine River confluence (pineDN_COMP) during Year 8, January 01, 2016 – December 31, 2016.

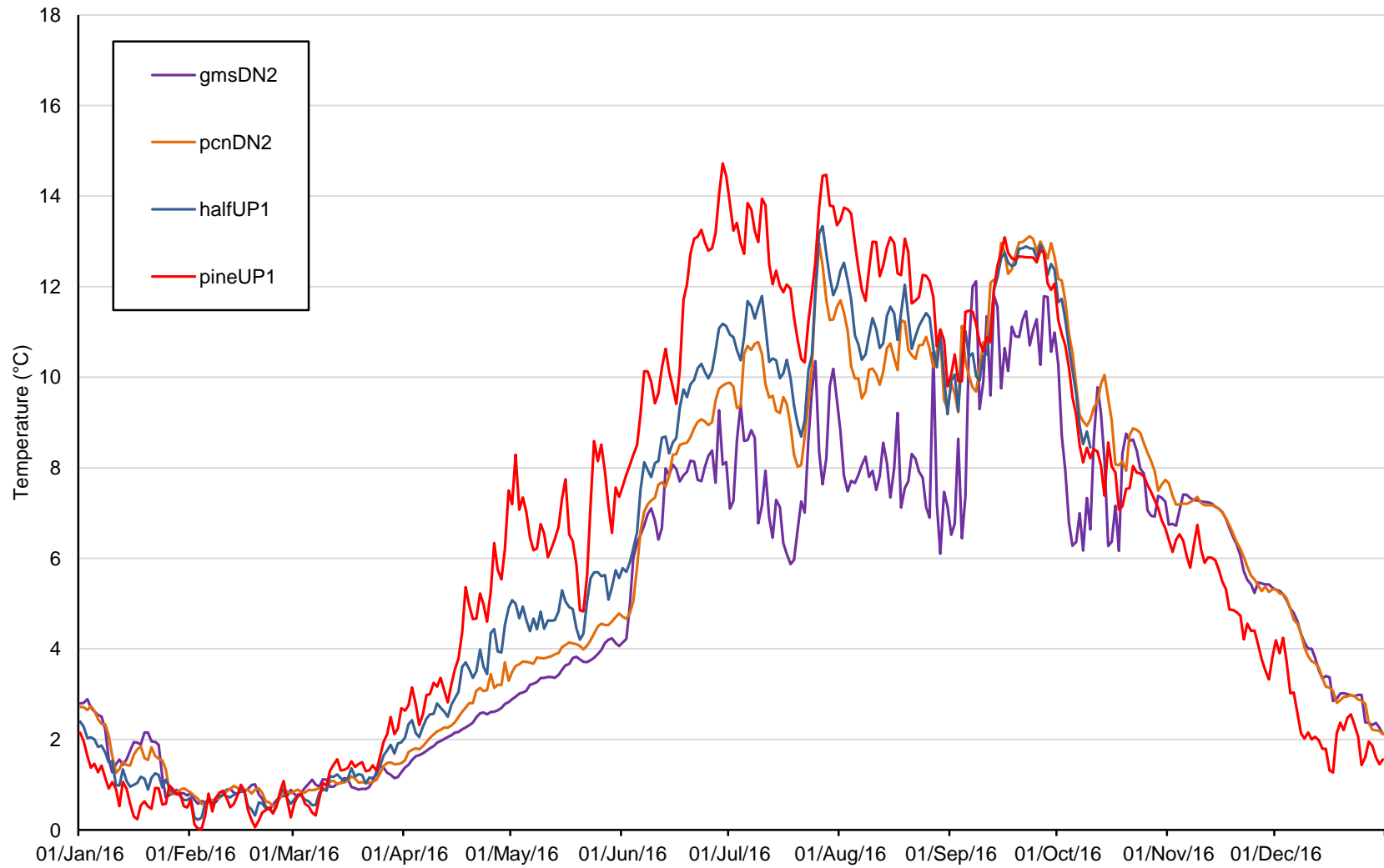


Figure 8. Daily mean Peace River water temperature gradient from WAC Bennett Dam tailrace, downstream to Pine River confluence, during Year 8, January 01, 2016 – December 31, 2016.

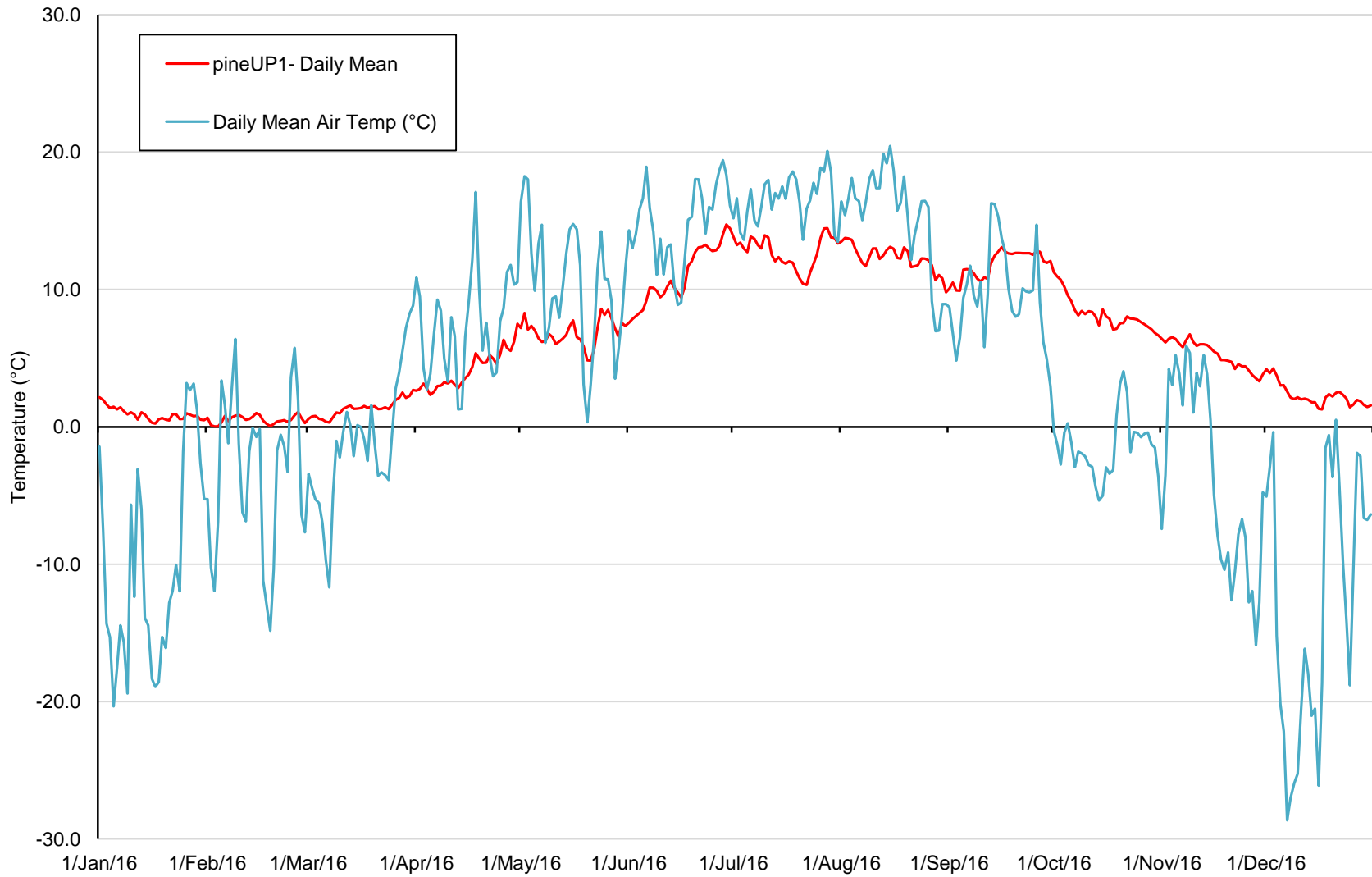


Figure 9. Comparison of Peace River daily mean water temperature upstream of the Pine River confluence (pineUP1) with daily mean ambient air temperature at the Fort St. John airport during Year 8, January 01, 2016 to December 31, 2016.

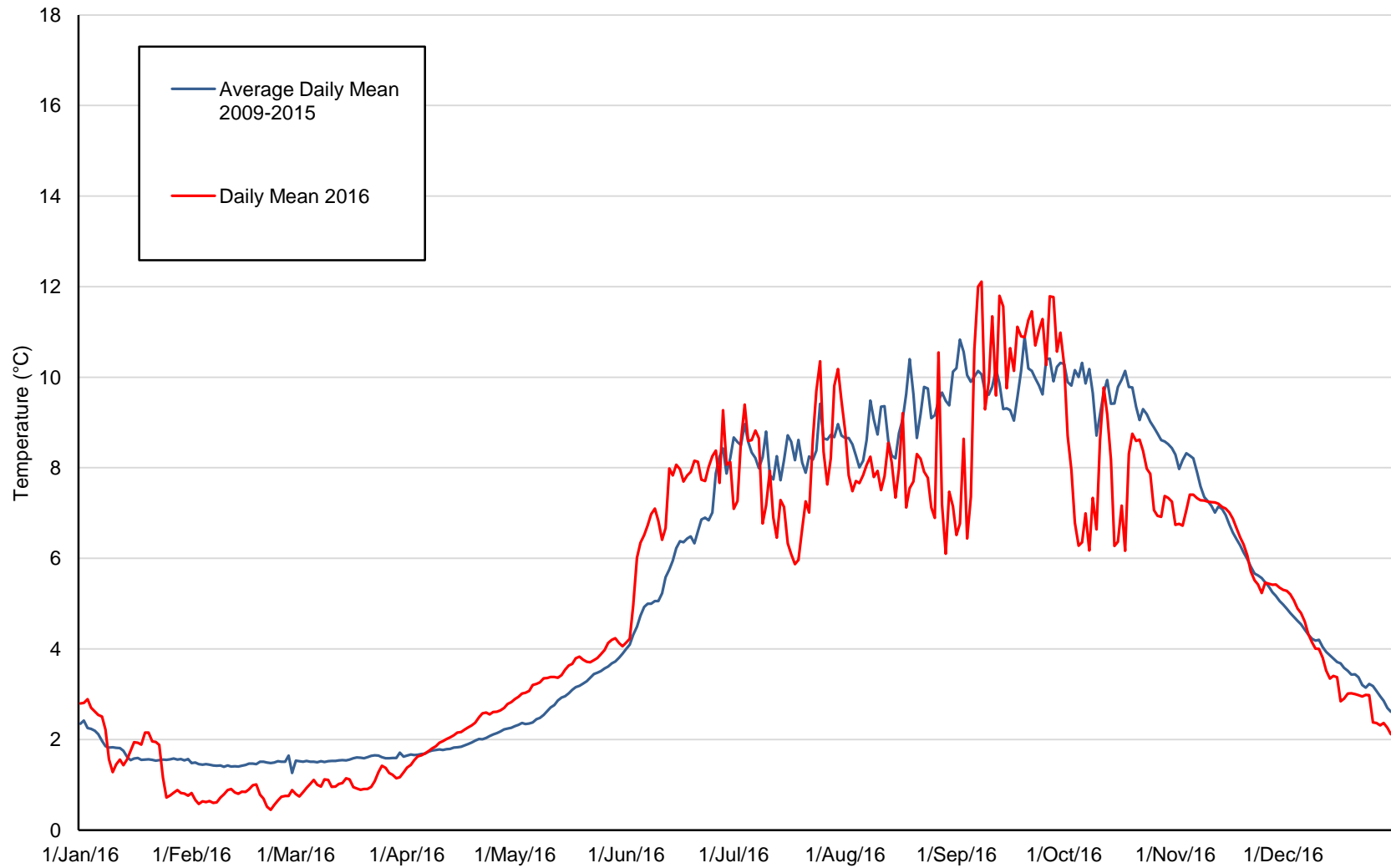


Figure 10. Comparison of Year 8 daily mean water temperature at WAC Bennett Dam tailrace north manifold (gmsDN2) with average of 2009 to 2015 daily mean water temperature at gmsDN2.

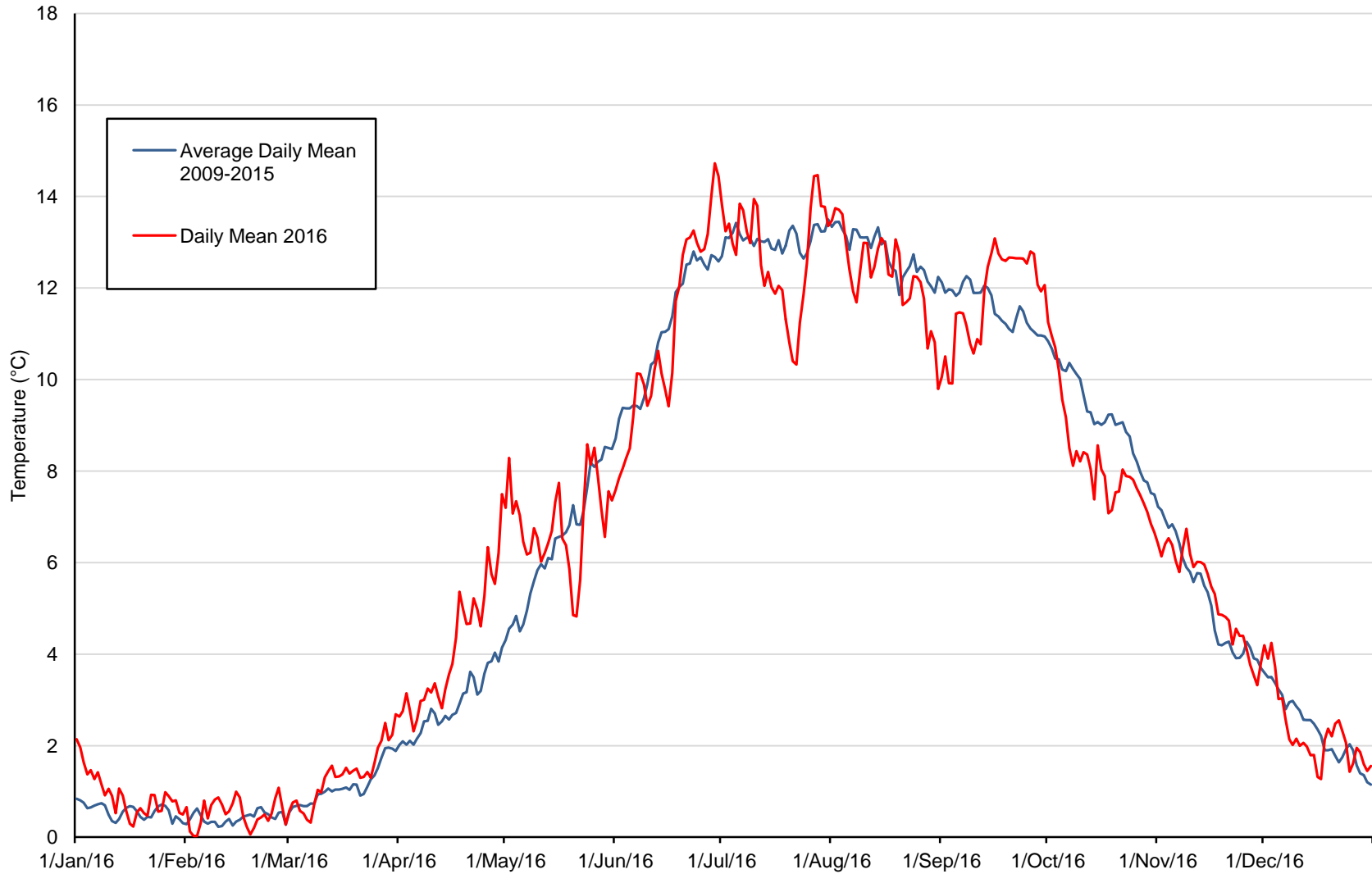


Figure 11. Comparison of Year 8 daily mean water temperature upstream of the Pine River confluence (pineUP1) with average of 2009 to 2015 daily mean water temperature at pineUP1.

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BC Hydro. 2010. Peace River Water Use Plan; monitoring program terms of reference – Peace River Baseline TGP/Temp. BC Hydro, Vancouver, BC. 7pp.

DES (Diversified Environmental Services). 2013. Peace River Water Use Plan Peace River Baseline TDGP/Temperature GMSWorks-2 - Year 4 Monitoring Program - Interim Report January 2012 to December 2012. Prepare for BC Hydro, Vancouver, BC. 24pp + appendices.

Appendix I. Temperature monitoring station location information for Year 8, January 01, 2016 to December 31, 2016.

Site ID	Serial #	Location	UTM (Zone 10)		Comment
			East	North	
gmsUP1	10676155	WAC Bennett Forebay	548841	6209022	steel buoy; 1 m depth
gmsUP2	10676160	WAC Bennett Forebay	548841	6209022	steel buoy; 10 m depth
gmsDN1	10635063	GMS Tailrace	548881	6207761	southbank; deflection wier riprap
gmsDN1BU	2038613	GMS Tailrace	548881	6207761	southbank; deflection wier riprap
gmsDN2	10669739	GMS Tailrace	548828	6207836	north bank; riprap below Tunnel portal #3
gmsDN2BU	2038614	GMS Tailrace	548828	6207836	north bank; riprap below Tunnel portal #3
pcnUP1	10635067	Peace Canyon Forebay	562710	6204068	anti-vortex log boom; 1 m depth
pcnDN2	10156317	Peace Canyon Tailrace	562803	6204854	north bank; rock slab
pcnDN2BU	10635061	Peace Canyon Tailrace	562803	6204854	north bank; rock slab
HalfUP1	9767573	Halfway Confluence - upstream	595165	6230094	south bank; spruce tree
HalfUP2	10156319	Halfway Confluence - upstream	595569	6230541	north bank; spruce tree
HalfDN2	10669748	Halfway Confluence - downstream	598198	6232169	north bank; balsam poplar
HalfDN2BU	10156314	Halfway Confluence - downstream	598179	6232144	north bank; balsam poplar
MobUP1	10887852	Moberly Confluence - upstream	627158	6232349	south bank; alder
MobUP2	10669754	Moberly Confluence - upstream	627501	6232563	north bank; spruce tree
MobDN1	10676146	Moberly Confluence - downstream	630776	6229287	south bank; alder
MobDN1BU	10676147	Moberly Confluence - downstream	630875	6229303	south bank; alder
PineUP1	10669747	Pine Confluence - upstream	641034	6225375	south bank; alder
PineUP2	10635062	Pine Confluence - upstream	641653	6225304	north bank; balsam poplar
PineDN1	2225322	Pine Confluence - downstream	648101	6222802	south bank; alder
PineDN1BU	10893055	Pine Confluence - downstream	648362	6222823	south bank; alder
PineMS1	10893069	Pine Mainstem - upstream of Peace	641762	6223599	north bank; steel piling
PineMS2	10887856	Pine Mainstem - upstream of Peace	641677	6223590	north bank; balsam poplar
BeatMS1	10930732	Beatton Mainstem - upstream of Peace	663101	6220759	east bank; spruce
BeatMS2	10930793	Beatton Mainstem - upstream of Peace	663098	6220723	east bank; birch
PouceUP1	10893059	Pouce Coupe confluence - upstream	*316873	6225211	south bank; birch; *UTM Zone 11
PouceUP2	10893068	Pouce Coupe confluence - upstream	*316146	6226036	south bank; spruce; *UTM Zone 11

Appendix II. Inventory of dissolved gas pressure meters and probes.

Meter Number	Serial Number	Probe Number	Cable Length (ft)
1	231	1	50
2	228	2	100
3	230	3	100
4	227	4	100
5	226	5	100
6	229	6	100

Appendix III. Reference temperature values and corresponding logger fix values recorded during download events in Year 8, January 01, 2016 to December 31, 2016.

Logger ID	Date	Fix Temp	Ref Temp	Error
gmsUP1 (SN 10676155)	11-Apr-16	2.1	1.9	0.2
	15-Jul-16	17.8	17.8	0.0
	31-Oct-16	8.1	8.0	0.1
	4-Jan-17	1.7	1.6	0.1
gmsUP2 (SN 10666160)	11-Apr-16	2.1	1.9	0.2
	15-Jul-16	17.6	17.5	0.1
	31-Oct-16	8.1	8.0	0.1
	4-Jan-17	1.7	1.6	0.1
gmsDN1 (SN 10635063)	11-Apr-16	2.0	1.9	0.1
	15-Jul-16	10.8	10.9	-0.1
	31-Oct-16	8.0	8.1	-0.1
	4-Jan-17	1.8	1.9	-0.1
gmsDN1_BU (SN 2038613)	11-Apr-16	2.1	1.9	0.2
	15-Jul-16	10.9	10.9	0.0
	31-Oct-16	8.1	8.1	0.0
	4-Jan-17	1.9	1.9	0.0
gmsDN2 (SN 10669739)	11-Apr-16	1.9	1.9	0.0
	15-Jul-16	6.5	6.7	-0.2
	31-Oct-16	7.1	7.0	0.1
	4-Jan-17	1.8	1.9	-0.1
gmsDN2_BU (SN 2038614)	11-Apr-16	2.1	1.9	0.2
	15-Jul-16	6.7	6.9	-0.2
	31-Oct-16	7.3	7.0	0.3
	4-Jan-17	2.0	1.9	0.1
pcnUP1 (SN 10635067)	11-Apr-16	2.3	2.1	0.2
	15-Jul-16	9.2	9.5	-0.3
	31-Oct-16	7.7	7.9	-0.2
pcnDN2 (SN 10156317)	11-Apr-16	2.2	2.1	0.1
	15-Jul-16	9.0	9.0	0.0
	31-Oct-16	7.8	7.7	0.1
	4-Jan-17	2.0	2.0	0.0
pcnDN2_BU (SN 10635061)	11-Apr-16	2.2	2.1	0.1
	15-Jul-16	9.0	9.0	0.0
	31-Oct-16	7.8	7.7	0.1
	4-Jan-17	2.0	2.0	0.0
halfUP1 (SN 9767573)	21-Apr-16	2.6	2.5	0.1
	7-Jul-16	12.3	12.4	-0.1
	10-Oct-16	8.5	8.5	0.0

Appendix III. Reference temperature values and corresponding logger fix values recorded during download events in Year 8, January 01, 2016 to December 31, 2016, cont.

Logger ID	Date	Logger Temp	Reference Temp	Error
halfUP2 (SN 10156319)	21-Apr-16	2.7	2.7	0.0
	7-Jul-16	12.5	12.4	0.1
	10-Oct-16	8.5	8.5	0.0
halfDN2 (SN 10669748)	21-Apr-16	5.8	5.6	0.2
	7-Jul-16	15.2	15.2	0.0
	10-Oct-16	6.5	6.4	0.2
	5-Jan-17	1.3	1.3	0.0
halfDN2_BU (SN 10156314)	21-Apr-16	5.7	5.6	0.1
	7-Jul-16	15.2	15.2	0.0
	10-Oct-16	6.5	6.4	0.2
	5-Jan-17	1.3	1.3	0.0
mobUP1 (SN 10339754)	15-Apr-16	2.8	2.7	0.1
mobUP1 (SN 10887852)	7-Jul-16	12.1	12.1	0.0
	13-Oct-16	8.5	8.2	0.3
	17-Jan-17	1.9	1.8	0.1
mobUP2 (SN 10669741)	15-Apr-16	2.6	2.6	0.0
mobUP2 (SN 10669754)	13-Oct-16	8.0	7.8	0.2
	17-Jan-17	1.8	1.8	0.0
mobDN1 (SN 10676146)	7-Jul-16	14.1	13.9	0.2
	13-Oct-16	7.6	7.5	0.1
	17-Jan-17	1.9	1.8	0.1
mobDN1_BU (SN 10676147)	7-Jul-16	14.1	14.0	0.1
	13-Oct-16	7.6	7.5	0.1
	17-Jan-17	1.8	1.8	0.0
pineUP1 (SN10669747)	15-Apr-16	3.1	3.3	-0.2
	7-Jul-16	13.5	13.7	-0.2
	13-Oct-16	7.9	7.6	0.3
	17-Jan-17	1.8	1.8	0.0
pineUP2 (SN10635062)	15-Apr-16	3.0	3.0	0.0
	7-Jul-16	13.2	13.1	0.1
	13-Oct-16	8.1	8.0	0.1
	17-Jan-17	1.9	1.8	0.1

Appendix III. Reference temperature values and corresponding logger fix values recorded during download events in Year 8, January 01, 2016 to December 31, 2016, cont.

Logger ID	Date	Logger Temp	Reference Temp	Error
pineDN1 (SN 2225322)	15-Apr-16	4.2	4.2	0.0
	7-Jul-16	15.3	15.1	0.2
pineDN1_BU (SN 9762095)	15-Apr-16	4.3	4.2	0.1
pineDN1_BU (SN 10930722)	13-Oct-16	5.6	5.4	0.2
	17-Jan-17	1.6	1.5	0.1
pineMS1 (SN 10893069)	13-Oct-16	1.9	1.6	0.3
	17-Jan-17			
pineMS2 (SN 10887856)	13-Jul-16	17.9	18.0	-0.1
	13-Oct-16	1.9	1.6	0.3
	17-Jan-17			
beatMS1 (SN 10930732)	Unable to establish reference data due to beaching in July 2016 and logger loss in August 2016, not downloaded in Jan 2017.			
beatMS2 (SN 10893055)	7-Jul-16	20.0	19.9	0.1
pouceUP1 (SN 10893059)	6-Jul-16	15.0	15.1	-0.1
	12-Oct-16	7.8	7.8	0.0
	18-Jan-17	1.9	1.8	0.1
pouceUP2 (SN 10893068)	6-Jul-16	14.7	14.9	-0.2
	12-Oct-16	7.7	7.7	0.0
	18-Jan-17	1.9	1.9	0.0

Appendix IV. Year 8 download information forms, January 01, 2016 to December 31, 2016.

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	gmsUP1		LOCATION			GMS Forebay			BANK	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10676155			UTM	548841 6209022
DOWNLOAD DATE	11	Apr	2016	DOWNLOAD TIME			CREW		BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.9	AIR TEMP	10	ICE CONDITIONS		none	
LOGGER CONDITIONS										
WATER DEPTH	100	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	steel buoy
COMMENTS										
Dow nload OK Stainless steel cable OK RPL#19										
SITE ID	gmsUP2		LOCATION			GMS Forebay			BANK	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10676160			UTM	548841 6209022
DOWNLOAD DATE	11	Apr	2016	DOWNLOAD TIME			15:13		CREW BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.9	AIR TEMP	10	ICE CONDITIONS		none	
LOGGER CONDITIONS										
WATER DEPTH	10 m	DISLODGED		no	REASON					
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	steel buoy
COMMENTS										
Dow nload OK Stainless steel cable OK RPL#20										
SITE ID	gmsDN2		LOCATION			GMS Tailrace RDB			BANK	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10669739			UTM	548828 6207836
DOWNLOAD DATE	11	Apr	2016	DOWNLOAD TIME			CREW		BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.9	AIR TEMP	6	ICE CONDITIONS		none	
LOGGER CONDITIONS										
WATER DEPTH	160	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock
COMMENTS										
Back-up logger gmsDN2-BU 2038614 in same capsule 12:40 both dow nloads OK cable ok (stainless steel cable section attached to galvanized cable around rock) Primary Logger-Rpl #11, SN 10669739										
SITE ID	gmsDN1		LOCATION			GMS Tailrace LDB			BANK	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635063			UTM	548881 6207761
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME			12:00		CREW BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.9	AIR TEMP	6	ICE CONDITIONS		none	
LOGGER CONDITIONS										
WATER DEPTH	250	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock
COMMENTS										
Back-up logger gmsDN1-BU 2038613 in same capsule 12:00 both dow nloads OK cable ok (stainless steel cable section attached to galvanized cable around rock) GMSDN1-RPL#17										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pcnUP1		LOCATION	PCN Forebay			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635067			UTM	562684		6204075	
DOWNLOAD DATE	11	Apr	2016	DOWNLOAD TIME	11:52			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	6.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	log boom		
COMMENTS											
download OK											
all stainless steel cable ok											
Rpl #10, SN 10635067											
SITE ID	pcnDN2		LOCATION	PCN Tailrace			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156317			UTM	562803		6204854	
DOWNLOAD DATE	11	Apr	2016	DOWNLOAD TIME	10:41			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	6.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock		
COMMENTS											
download OK											
all stainless steel cable ok											
SITE ID	pcnDN2_BU		LOCATION	PCN Tailrace			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635061			UTM	562803		6204854	
DOWNLOAD DATE	11	Apr	2016	DOWNLOAD TIME	10:42			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	6.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock		
COMMENTS											
download OK											
all stainless steel cable ok											
Anchored to same rock as pcnDN2											
Rpl #9, SN10635061											
SITE ID			LOCATION				BANK				
LOGGER TYPE			LOGGER SERIAL #				UTM				
DOWNLOAD DATE				DOWNLOAD TIME				CREW			
TEST RECORDER TYPE			WATER TEMP		AIR TEMP			ICE CONDITIONS			
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED			REASON					
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE			
COMMENTS											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	halfUP2	LOCATION	u/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156319			UTM	595569	6230541			
DOWNLOAD DATE	21	Apr	2016	DOWNLOAD TIME	9:05	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	2.7	AIR TEMP	5	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	spruce			
COMMENTS											
download OK (initially would not download but did a few minutes later, redeployed)											
cable OK											
SITE ID	halfUP1	LOCATION	u/s of Halfway River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9767573			UTM	595165	6230094			
DOWNLOAD DATE	21	Apr	2016	DOWNLOAD TIME	9:15	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	2.5	AIR TEMP	5	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	spruce tree			
COMMENTS											
download OK											
cable OK											
SITE ID	halfDN2	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598198	6232169			
DOWNLOAD DATE	21	Apr	2016	DOWNLOAD TIME	9:33	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	5.6	AIR TEMP	5	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	30	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	balsam pop			
COMMENTS											
download OK											
stainless steel cable OK											
Rpl #15, SN 10669748											
SITE ID	halfDN2_BU	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598179	6263144			
DOWNLOAD DATE	21	Apr	2016	DOWNLOAD TIME	9:28	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	5.6	AIR TEMP	5	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	60-80	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	balsam pop			
COMMENTS											
download OK											
stainless steel cable OK											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	mobUP2		LOCATION	u/s of Moberly River			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669741			UTM	627501	6232563		
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	9:34			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.6	AIR TEMP	4.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	300	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	spruce			
COMMENTS											
dow nload Ok											
stainless steel cable OK											
Rpl #12, SN 10669741											
SITE ID	mobUP1		LOCATION	u/s of Moberly River			BANK	south			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	1006975			UTM	627158	6232349		
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	9:45			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.7	AIR TEMP	4.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	60	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder			
COMMENTS											
RPL#16-1006975 failed to dow nload in field but dow nloaded fine in office later											
replaced w ith RPL#21-10887852											
SITE ID	mobDN1_BU		LOCATION	d/s of Moberly River			BANK	south			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676147			UTM	630875	6229275		
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	10:21			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.4	AIR TEMP	5.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED	yes	REASON		ice	debris			
BURIED	no	FUNCTIONAL		dry	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder		
COMMENTS											
dow nload OK											
sw ung to shore by ice and debris											
RPL#18											
SITE ID	mobDN1		LOCATION	d/s of Moberly River			BANK	south			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669746			UTM	630776	6229287		
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	10:10			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	2.4	AIR TEMP	5.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED	yes	REASON		ice	debris			
BURIED	no	FUNCTIONAL		dry	IF DRY, HEIGHT ABOVE WATER	60	cm	TETHER TYPE	spruce		
COMMENTS											
pulled to shore by ice and debris											
dow nload OK											
Rpl # 17, SN 10669746											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pineUP2	LOCATION	u/s of Pine River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10635062			UTM	641653	6225304			
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	11:00		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	3.0	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	balsam pop			
COMMENTS											
down load OK											
Stainless steel cable OK											
RPL#6											
SITE ID	pineUP1	LOCATION	u/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669747			UTM	641034	6225372			
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	10:50		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	3.5	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder			
COMMENTS											
down load OK											
Rpl # 14, SN 10669747											
Stainless steel cable OK											
SITE ID	pineDN1_BU	LOCATION	d/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9762095			UTM	648362	6222823			
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	12:05		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	4.2	AIR TEMP	6.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder			
COMMENTS											
down load OK											
Stainless steel cable OK											
SITE ID	pineDN1	LOCATION	d/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	2226322			UTM	648101	6222802			
DOWNLOAD DATE	15	Apr	2016	DOWNLOAD TIME	11:55		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	4.2	AIR TEMP	6.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	40	cm	DISLODGED	yes	REASON	ice	debris				
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder			
COMMENTS											
down load OK											
partially sw ung to shore but submerged											
Stainless steel cable OK											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	gmsUP1		LOCATION	GMS Forebay			BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676155			UTM	548841	6209022		
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	10:58			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	17.8	AIR TEMP	23	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy	
COMMENTS											
Download OK											
Stainless steel cable OK											
RPL#19											
SITE ID	gmsUP2		LOCATION	GMS Forebay			BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676160			UTM	548841	6209022		
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	10:56			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	17.5	AIR TEMP	23	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	10	m	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy	
COMMENTS											
Download OK											
Stainless steel cable OK											
RPL#20											
SITE ID	gmsDN2		LOCATION	GMS Tailrace RDB			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669739			UTM	548828	6207836		
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	11:52			CREW	BC TE		
TEST RECORDER TYPE	merc		WATER TEMP	6.9	AIR TEMP	18	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock	
COMMENTS											
Back-up logger gmsDN2-BU 2038614 in same capsule 11:52											
both downloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											
Primary Logger-Rpl #11, SN 10669739											
SITE ID	gmsDN1		LOCATION	GMS Tailrace LDB			BANK		south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635063			UTM	548881	6207761		
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	12:00			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	10.9	AIR TEMP	20	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock	
COMMENTS											
Back-up logger gmsDN1-BU 2038613 in same capsule 12:12											
both downloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											
GMSDN1-RPL#7											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pcnUP1		LOCATION	PCN Forebay			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635067			UTM	562684		6204075	
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	9:26			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	9.8	AIR TEMP	18.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	log boom
COMMENTS											
down load OK											
all stainless steel cable ok											
Rpl #10, SN 10635067											
SITE ID	pcnDN2		LOCATION	PCN Tailrace			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156317			UTM	562803		6204854	
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	9:43			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	9.0	AIR TEMP	18.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	150+	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock
COMMENTS											
down load OK											
all stainless steel cable ok											
RPL#2											
SITE ID	pcnDN2_BU		LOCATION	PCN Tailrace			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635061			UTM	562803		6204854	
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	9:49			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	9.0	AIR TEMP	18.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock
COMMENTS											
down load OK											
all stainless steel cable ok											
Anchored to same rock as pcnDN2											
Rpl #9, SN10635061											
SITE ID			LOCATION				BANK				
LOGGER TYPE			LOGGER SERIAL #				UTM				
DOWNLOAD DATE				DOWNLOAD TIME				CREW			
TEST RECORDER TYPE			WATER TEMP		AIR TEMP			ICE CONDITIONS			
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED			REASON					
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	
COMMENTS											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	halfUP2	LOCATION	u/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156319			UTM	595569	6230541			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	17:19	CREW	BC DC				
TEST RECORDER TYPE	YSI	WATER TEMP	12.4	AIR TEMP	15	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	30	cm	DISLODGED	yes	REASON	tampered					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce				
COMMENTS											
download OK											
cable OK											
RPL#1											
pulled to shore and coiled in a pile											
SITE ID	halfUP1	LOCATION	u/s of Halfway River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9767573			UTM	595165	6230094			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	17:32	CREW	BC DC				
TEST RECORDER TYPE	YSI	WATER TEMP	17.4	AIR TEMP	15	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce tree				
COMMENTS											
download OK											
cable OK											
SITE ID	halfDN2	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669748			UTM	598198	6232169			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	18:00	CREW	BC DC				
TEST RECORDER TYPE	YSI	WATER TEMP	15.9	AIR TEMP	15	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download failed on Jul 7, 2016, redeployed and successfully downloaded on July 9, 2016 at 16:53, 15.3C H2O											
stainless steel cable OK											
Rpl #15, SN 10669748											
SITE ID	halfDN2_BU	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598179	6263144			
DOWNLOAD DATE	7	July	2016	DOWNLOAD TIME	17:50	CREW	BC Dc				
TEST RECORDER TYPE	YSI	WATER TEMP	15.9	AIR TEMP	15	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download failed on Jul 7, 2016, redeployed and successfully downloaded on July 9, 2016 at 16:51, 15.3C H2O											
stainless steel cable OK											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	mobUP2		LOCATION	u/s of Moberly River			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669741			UTM	627501	6232563	
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	9:20			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	12.8	AIR TEMP	15.0	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH			cm	DISLODGED	yes		REASON	unk		
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce	
COMMENTS										
logger gone from cable - no sign of debris, maybe failed clamp										
new logger RPL#16 SN 10669754 deployed										
SITE ID	mobUP1		LOCATION	u/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10887852			UTM	627158	6232349	
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	9:36			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	12.1	AIR TEMP	15.0	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder		
COMMENTS										
RPL#21-10887852 (replaced RPL#16 April 2016)										
SITE ID	mobDN1_BU		LOCATION	d/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676147			UTM	630875	6229275	
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	8:48			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	14.0	AIR TEMP	15.0	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	30	cm	DISLODGED	yes		REASON	debris			
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder		
COMMENTS										
download OK										
partially submerged to shore by debris										
RPL#18										
SITE ID	mobDN1		LOCATION	d/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669746			UTM	630776	6229287	
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	10:10			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	13.9	AIR TEMP	15.0	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce		
COMMENTS										
download OK										
Rpl # 17, SN 10669746										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pineUP2	LOCATION	u/s of Pine River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10635062			UTM	641653	6225304			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	10:15			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	13.1	AIR TEMP	15.0			ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download OK											
Stainless steel cable OK											
RPL#6											
SITE ID	pineUP1	LOCATION	u/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669747			UTM	641034	6225372			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	10:15			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	13.9	AIR TEMP	15.0			ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
download OK											
Rpl # 14, SN 10669747											
Stainless steel cable OK											
SITE ID	pineDN1_BU	LOCATION	d/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10930722			UTM	648362	6222823			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	11:30			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	14.8	AIR TEMP	20.0			ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	120	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
logger lost in June 2016 flood, replaced with RPL#29											
new stainless steel cable											
SITE ID	pineDN1	LOCATION	d/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	2226322			UTM	648101	6222802			
DOWNLOAD DATE	7	Jul	2016	DOWNLOAD TIME	12:33			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	15.1	AIR TEMP				ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	50	cm	DISLODGED	yes	REASON	debris					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
download OK											
partially swung to shore but submerged											
Stainless steel cable OK											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM												
SITE ID	gmsUP1		LOCATION	GMS Forebay				BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676155				UTM	548841	6209022		
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	10:58				CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	17.8	AIR TEMP	23		ICE CONDITIONS	none			
LOGGER CONDITIONS												
WATER DEPTH	100	cm	DISLODGED	no		REASON						
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy		
COMMENTS												
Download OK												
Stainless steel cable OK												
RPL#19												
SITE ID	gmsUP2		LOCATION	GMS Forebay				BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676160				UTM	548841	6209022		
DOWNLOAD DATE	15	Jul	2016	DOWNLOAD TIME	10:56				CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	17.5	AIR TEMP	23		ICE CONDITIONS	none			
LOGGER CONDITIONS												
WATER DEPTH	10	m	DISLODGED	no		REASON						
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy		
COMMENTS												
Download OK												
Stainless steel cable OK												
RPL#20												
SITE ID	gmsDN2		LOCATION	GMS Tailrace RDB				BANK		north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669739				UTM	548828	6207836		
DOWNLOAD DATE	31	Oct	2016	DOWNLOAD TIME	11:32				CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	7	AIR TEMP	-3		ICE CONDITIONS	none			
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED	no		REASON						
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock		
COMMENTS												
Back-up logger gmsDN2-BU 2038614 in same capsule 11:33												
both downloads OK												
cable ok (stainless steel cable section attached to galvanized cable around rock)												
Primary Logger-Rpl #11, SN 10669739												
SITE ID	gmsDN1		LOCATION	GMS Tailrace LDB				BANK	south			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635063				UTM	548881	6207761		
DOWNLOAD DATE	31	Oct	2016	DOWNLOAD TIME	11:45				CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	8.1	AIR TEMP	-3		ICE CONDITIONS	none			
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED	no		REASON						
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock		
COMMENTS												
Back-up logger gmsDN1-BU 2038613 in same capsule 11:46												
both downloads OK												
cable ok (stainless steel cable section attached to galvanized cable around rock)												
GMSDN1-RPL#7												

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	pcnUP1		LOCATION	PCN Forebay			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635067			UTM	562684	6204075	
DOWNLOAD DATE	31	Oct	2016	DOWNLOAD TIME	10:39			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	8.1	AIR TEMP	-2.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	100	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	log boom	
COMMENTS										
download OK										
all stainless steel cable ok										
Rpl #10, SN 10635067										
SITE ID	pcnDN2		LOCATION	PCN Tailrace			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156317			UTM	562803	6204854	
DOWNLOAD DATE	31	Oct	2016	DOWNLOAD TIME	10:16			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	7.7	AIR TEMP	-2.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock	
COMMENTS										
download OK										
all stainless steel cable ok										
RPL#2										
SITE ID	pcnDN2_BU		LOCATION	PCN Tailrace			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635061			UTM	562803	6204854	
DOWNLOAD DATE	31	Oct	2016	DOWNLOAD TIME	10:21			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	7.7	AIR TEMP	-2.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock	
COMMENTS										
download OK										
all stainless steel cable ok										
Anchored to same rock as pcnDN2										
Rpl #9, SN10635061										
SITE ID			LOCATION				BANK			
LOGGER TYPE			LOGGER SERIAL #				UTM			
DOWNLOAD DATE				DOWNLOAD TIME				CREW		
TEST RECORDER TYPE			WATER TEMP		AIR TEMP			ICE CONDITIONS		
LOGGER CONDITIONS										
WATER DEPTH		cm	DISLODGED			REASON				
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE		
COMMENTS										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	halfUP2	LOCATION	u/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156319			UTM	595569	6230541			
DOWNLOAD DATE	10	Oct	2016	DOWNLOAD TIME	12:35	CREW	BC SC				
TEST RECORDER TYPE	YSI	WATER TEMP	8.5	AIR TEMP	0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	20	cm	DISLODGED	yes	REASON	tampered					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce				
COMMENTS											
download OK											
cable OK											
RPL#1											
pulled to shore, wet at high flows											
SITE ID	halfUP1	LOCATION	u/s of Halfway River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9767573			UTM	595165	6230094			
DOWNLOAD DATE	10	Oct	2016	DOWNLOAD TIME	12:50	CREW	BC SC				
TEST RECORDER TYPE	YSI	WATER TEMP	8.5	AIR TEMP	0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	300	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce tree				
COMMENTS											
download OK											
cable OK											
halfup1R											
SITE ID	halfDN2	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669748			UTM	598198	6232169			
DOWNLOAD DATE	10	Oct	2016	DOWNLOAD TIME	12:09	CREW	BC SC				
TEST RECORDER TYPE	YSI	WATER TEMP	6.4	AIR TEMP	0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
stainless steel cable OK											
Rpl #15, SN 10669748											
SITE ID	halfDN2_BU	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598179	6263144			
DOWNLOAD DATE	10	Oct	2016	DOWNLOAD TIME	12:20	CREW	BC SC				
TEST RECORDER TYPE	YSI	WATER TEMP	6.4	AIR TEMP	0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	60	cm	DISLODGED	yes	REASON	debris					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download ok											
stainless steel cable OK											
partially swung to shore by debris, wet at high flows											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	mobUP2		LOCATION			u/s of Moberly River			BANK	north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10669754			UTM	627501	6232563
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME			12:29			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	7.8	AIR TEMP	-3.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no		REASON			unk		
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	spruce
COMMENTS											
logger RPL#16 SN 10669754 deployed in July											
down load ok											
anchor needs upgrade											
SITE ID	mobUP1		LOCATION			u/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10887852			UTM	627158	6232349
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME			12:43			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	8.2	AIR TEMP	-3.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	alder
COMMENTS											
RPL#21-10887852 (replaced RPL#16 April 2016)											
down load ok											
anchor needs upgrade											
SITE ID	mobDN1_BU		LOCATION			d/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10676147			UTM	630875	6229275
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME			13:02			CREW	BC TE
TEST RECORDER TYPE	Merc		WATER TEMP	7.6	AIR TEMP	-3.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	alder
COMMENTS											
down load OK											
RPL#18											
SITE ID	mobDN1		LOCATION			d/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10669746			UTM	630776	6229287
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME			12:56			CREW	BC TE
TEST RECORDER TYPE	Merc		WATER TEMP	7.5	AIR TEMP	-3.0		ICE CONDITIONS	none		
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	spruce
COMMENTS											
down load OK											
Rpl # 17, SN 10669746											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	pineUP2	LOCATION	u/s of Pine River			BANK		north		
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10635062			UTM	641653	6225304		
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME	13:25	CREW	BC TE			
TEST RECORDER TYPE	Merc	WATER TEMP	8.0	AIR TEMP	-3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	300	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop			
COMMENTS										
down load OK										
Stainless steel cable OK										
RPL#6										
SITE ID	pineUP1	LOCATION	u/s of Pine River			BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669747			UTM	641034	6225372		
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME	13:25	CREW	BC TE			
TEST RECORDER TYPE	Merc	WATER TEMP	7.6	AIR TEMP	-3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	160	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
down load OK										
Rpl # 14, SN 10669747										
Stainless steel cable OK										
SITE ID	pineDN1_BU	LOCATION	d/s of Pine River			BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10930722			UTM	648362	6222823		
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME	14:22	CREW	BC TE			
TEST RECORDER TYPE	Merc	WATER TEMP	5.4	AIR TEMP	-3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	160	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
RPL#29										
down load ok										
new stainless steel cable										
needs anchor upgrade										
SITE ID	pineDN1	LOCATION	d/s of Pine River			BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	2226322			UTM	648101	6222802		
DOWNLOAD DATE	13	Oct	2016	DOWNLOAD TIME	14:08	CREW	BC TE			
TEST RECORDER TYPE	Merc	WATER TEMP	5.4	AIR TEMP	-3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH		cm	DISLODGED	yes	REASON			debris		
BURIED	no	FUNCTIONAL		dry	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder		
COMMENTS										
down load OK										
sw ung to shore and dry										
Stainless steel cable OK										
needs anchor upgrade										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	gmsUP1		LOCATION	GMS Forebay			BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676155			UTM	548841	6209022		
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	11:34			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	1.6	AIR TEMP	-3	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy	
COMMENTS											
Download OK											
Stainless steel cable OK											
RPL#19											
SITE ID	gmsUP2		LOCATION	GMS Forebay			BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676160			UTM	548841	6209022		
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	11:33			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	1.6	AIR TEMP	-3	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	10	m	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy	
COMMENTS											
Download OK											
Stainless steel cable OK											
RPL#20											
SITE ID	gmsDN2		LOCATION	GMS Tailrace RDB			BANK		north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669739			UTM	548828	6207836		
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	10:20			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	7	AIR TEMP	-3	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock	
COMMENTS											
Back-up logger gmsDN2-BU 2038614 in same capsule 11:33											
both downloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											
Primary Logger-Rpl #11, SN 10669739											
SITE ID	gmsDN1		LOCATION	GMS Tailrace LDB			BANK	south			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635063			UTM	548881	6207761		
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	10:42			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	1.9	AIR TEMP	-3	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock	
COMMENTS											
Back-up logger gmsDN1-BU 2038613 in same capsule 10:43											
both downloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											
GMSDN1-RPL#7											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	pcnUP1		LOCATION	PCN Forebay			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635067			UTM	562684	6204075	
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	15:01			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.8	AIR TEMP	-2.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	100	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	log boom	
COMMENTS										
download OK										
all stainless steel cable ok										
Rpl #10, SN 10635067										
SITE ID	pcnDN2		LOCATION	PCN Tailrace			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156317			UTM	562803	6204854	
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	14:36			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	2.0	AIR TEMP	-2.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock	
COMMENTS										
download OK										
all stainless steel cable ok										
RPL#2										
SITE ID	pcnDN2_BU		LOCATION	PCN Tailrace			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635061			UTM	562803	6204854	
DOWNLOAD DATE	4	Jan	2017	DOWNLOAD TIME	14:35			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	2.0	AIR TEMP	-2.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock	
COMMENTS										
download OK										
all stainless steel cable ok										
Anchored to same rock as pcnDN2										
Rpl #9, SN10635061										
SITE ID			LOCATION				BANK			
LOGGER TYPE			LOGGER SERIAL #				UTM			
DOWNLOAD DATE				DOWNLOAD TIME				CREW		
TEST RECORDER TYPE			WATER TEMP		AIR TEMP			ICE CONDITIONS		
LOGGER CONDITIONS										
WATER DEPTH		cm	DISLODGED			REASON				
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE		
COMMENTS										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	halfUP2	LOCATION	u/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156319			UTM	595569	6230541			
DOWNLOAD DATE	5	Jan	2017	DOWNLOAD TIME	10:22	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	1.7	AIR TEMP	-7	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce				
COMMENTS											
download OK											
cable OK											
RPL#1											
SITE ID	halfUP1	LOCATION	u/s of Halfway River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9767573			UTM	595165	6230094			
DOWNLOAD DATE	5	Jan	2017	DOWNLOAD TIME		CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	1.7	AIR TEMP	-7	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce tree				
COMMENTS											
download OK											
cable OK											
halfup1R											
SITE ID	halfDN2	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669748			UTM	598198	6232169			
DOWNLOAD DATE	5	Jan	2017	DOWNLOAD TIME	9:56	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	1.3	AIR TEMP	-7	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED	yes	REASON	tampered					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
stainless steel cable OK											
Rpl #15, SN 10669748											
pulled to shore by landowner but wet when recovered											
water very high											
SITE ID	halfDN2_BU	LOCATION	d/s of Halfway River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598179	6263144			
DOWNLOAD DATE	5	Jan	2017	DOWNLOAD TIME	10:04	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	1.3	AIR TEMP	-7	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download ok											
stainless steel cable OK											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	mobUP2		LOCATION	u/s of Moberly River			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669754			UTM	627501	6232563	
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	11:45			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.8	AIR TEMP	6.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	300	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce	
COMMENTS										
logger RPL#16 SN 10669754 deployed in July										
down load ok										
SITE ID	mobUP1		LOCATION	u/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10887852			UTM	627158	6232349	
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	11:52			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.8	AIR TEMP	6.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder	
COMMENTS										
RPL#21-10887852 (replaced RPL#16 April 2016)										
down load ok										
SITE ID	mobDN1_BU		LOCATION	d/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10676147			UTM	630875	6229275	
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	12:15			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.8	AIR TEMP	6.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	100	cm	DISLODGED	yes		REASON	debris			
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder	
COMMENTS										
down load OK										
sw ung to shore by debris (grass and debris) on cable, still w et w hen recovered										
RPL#18										
SITE ID	mobDN1		LOCATION	d/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669746			UTM	630776	6229287	
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	12:05			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	1.8	AIR TEMP	6.0		ICE CONDITIONS	none	
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no		REASON				
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce	
COMMENTS										
shuttle only blinked once, then had to repeat down load, "down load OK"										
Rpl # 17, SN 10669746										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pineUP2	LOCATION	u/s of Pine River			BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10635062			UTM	641653	6225304			
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	12:51		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	1.8	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	300	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
dow nload OK											
Stainless steel cable OK											
RPL#6											
SITE ID	pineUP1	LOCATION	u/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669747			UTM	641034	6225372			
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	12:44		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	1.8	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	250	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
dow nload OK											
Rpl # 14, SN 10669747											
Stainless steel cable OK											
SITE ID	pineDN1_BU	LOCATION	d/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10930722			UTM	648362	6222823			
DOWNLOAD DATE	17	Jan-17	2016	DOWNLOAD TIME	13:21		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	1.5	AIR TEMP	6.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
RPL#29											
dow nload failed, memory full, taken to office and dow nloaded, changed to RPL#25 SN 10893055											
new stainless steel cable											
needs anchor upgrade											
SITE ID	pineDN1	LOCATION	d/s of Pine River			BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #	2226322			UTM	648101	6222802			
DOWNLOAD DATE	17	Jan	2017	DOWNLOAD TIME	13:08		CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	1.5	AIR TEMP	6.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	yes	REASON	debris					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
not dow nloaded, "full shuttle memory"											
sw ung to shore still wet											
Stainless steel cable OK											
needs anchor upgrade											

Appendix V. Summary of temperature logger deployment dates and anticipated replacement dates.

Site ID	Serial #	Location	Date Deployed	Replace Date
gmsUP1	10676155	WAC Bennett Forebay	Jan 2016	2022
gmsUP2	10676160	WAC Bennett Forebay	Jan 2016	2022
gmsDN1	10635063	GMS Tailrace	Jan 2015	2021
gmsDN1BU	2038613	GMS Tailrace	Nov 2009	2015
gmsDN2	10669739	GMS Tailrace	Apr 2015	2021
gmsDN2BU	2038614	GMS Tailrace	Nov 2009	2015
pcnUP1	10635067	Peace Canyon Forebay	Apr 2015	2021
pcnDN2	10156317	Peace Canyon Tailrace	July 2014	2020
pcnDN2BU	10635061	Peace Canyon Tailrace	Apr 2015	2021
HalfUP1	9767573	Halfway Confluence - upstream	May 2011	2017
HalfUP2	10156319	Halfway Confluence - upstream	May 2014	2020
HalfDN2	10669748	Halfway Confluence - downstream	Apr 2015	2021
HalfDN2BU	10156314	Halfway Confluence - downstream	Jul 2013	2018
MobUP1	10887852	Moberly Confluence - upstream	Oct 2015	2021
MobUP2	10669754	Moberly Confluence - upstream	July 2016	2022
MobDN1	10676146	Moberly Confluence - downstream	Jan 2016	2021
MobDN1BU	10676147	Moberly Confluence - downstream	Jan 2016	2021
PineUP1	10669747	Pine Confluence - upstream	Apr 2015	2021
PineUP2	10635062	Pine Confluence - upstream	Jan 2015	2021
PineDN1	2225322	Pine Confluence - downstream	Sep 2008	2015
PineDN1BU	10893055	Pine Confluence - downstream	Jan 2017	2023
PineMS1	10893069	Pine Mainstem - upstream of Peace	Jul 2016	2022
PineMS2	10887856	Pine Mainstem - upstream of Peace	Apr 2016	2022
BeatMS1	10930732	Beatton Mainstem - upstream of Peace	Oct 2016	2022
BeatMS2	10930793	Beatton Mainstem - upstream of Peace	Nov 2016	2022
PouceUP1	10893059	Pouce Coupe confluence - upstream	Apr 2016	2022
PouceUP2	10893068	Pouce Coupe confluence - upstream	Apr 2016	2022