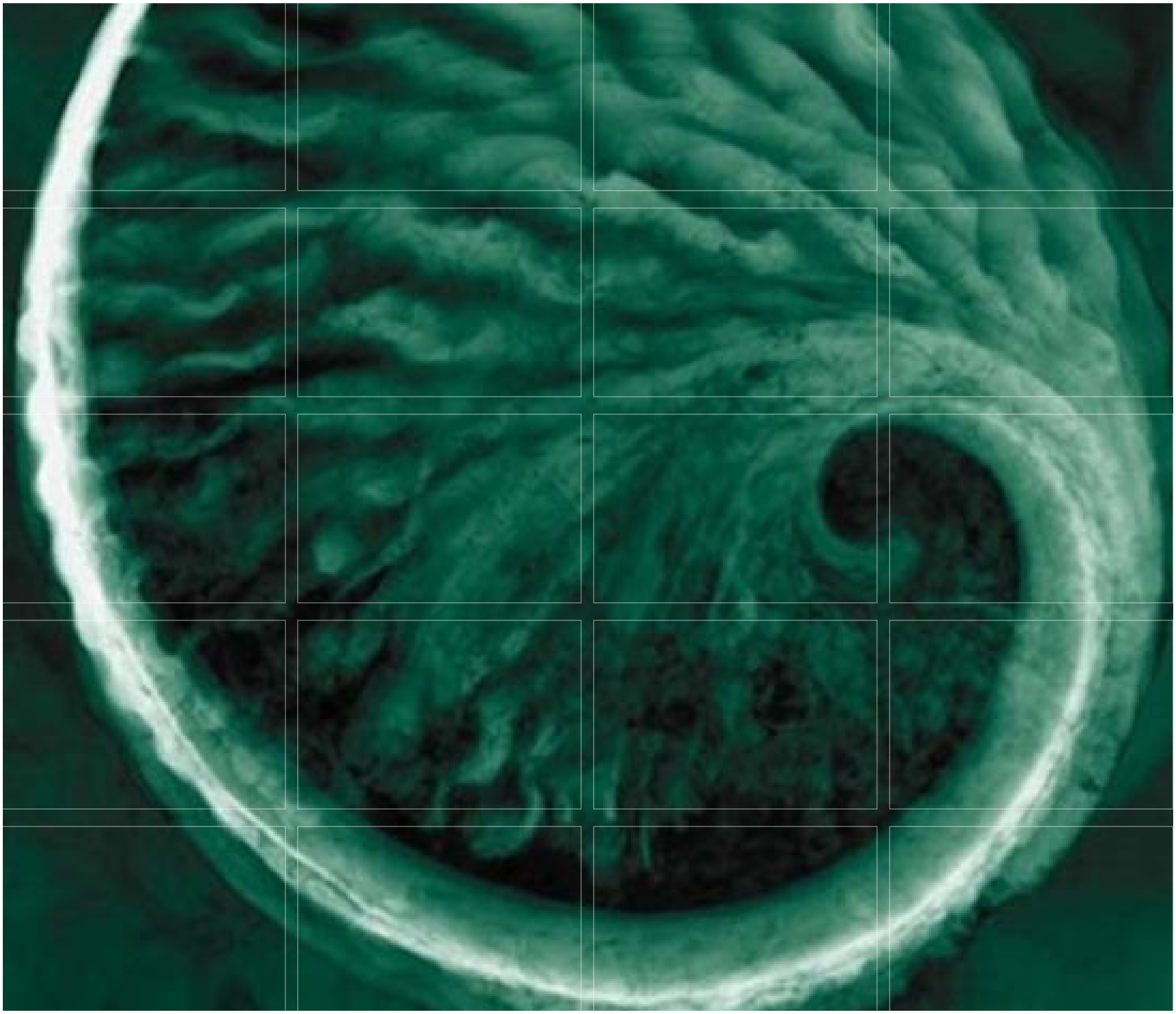
Appendix 9-B

Meteorological Baseline Report

HARPER CREEK PROJECT

Application for an Environmental Assessment Certificate / Environmental Impact Statement



Prepared for:

HARPER CREEK
MINING CORP.

HARPER CREEK PROJECT

Meteorological Baseline Report

June 2014

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ERM

Harper Creek Mining Corporation

HARPER CREEK PROJECT
Meteorological Baseline Report

June 2014

Project #0230881-0003

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EXECUTIVE SUMMARY

The Harper Creek Project (the Project) is a proposed open pit copper mine located in south-central British Columbia (BC), approximately 150 km northeast by road from Kamloops. The Project has an estimated 28-year mine life based on a process plant throughput of 70,000 tonnes per day. The Proponent, Harper Creek Mining Corporation, is a wholly owned subsidiary of Yellowhead Mining Inc., which is a public BC junior mineral development company trading on the Toronto Stock Exchange.

Meteorological data has been collected at the Project Site since late 2007. This data is presented and discussed in this report and long-term values of various meteorological parameters are estimated based on the available site and regional data.

Meteorological data is currently being collected at the Project by two meteorological stations. The first was installed by Dillon Consulting Limited (DCL) in December 2007 within the location of the proposed open pit at an elevation of 1,680 metres above sea level (masl). This station was decommissioned in April 2011 and a second station was installed by Knight Piésold Limited (KPL) in August 2011 close to the proposed plant site at an elevation of 1,837 masl. Data from both stations was combined with historical data from the Meteorological Services of Canada (MSC) branch of Environment Canada to develop long-term meteorological estimates for the Project Site. There are five MSC stations currently operating in the region, and many deactivated historical stations.

Mean monthly temperature values were estimated based on a long-term synthetic record developed for the Project Site. The available site data were correlated to the concurrent monthly temperature data at the Criss Creek MSC station using a simple linear regression analysis. The resulting synthetic temperature record has a mean annual temperature of 0.7ºC at the DCL station and 0.2ºC at the KPL station. Long-term monthly mean temperatures ranged from 10.9ºC in July to -9.8ºC in January. From the available Project station data, the lowest hourly temperature was -35.2ºC in January 2012 and the highest was 27.4ºC in July 2009.

The mean annual relative humidity is approximately 75% at both Project stations. Summer months are less humid (mean monthly value of 50-80%) and winter months are more humid (mean monthly value of 70-90%).

Regional wind speed and relative humidity data are not available near the Project Site, so the mean monthly values for these parameters were derived using measured data from both Project stations. Winds predominantly blow from the southeast and south-southeast during all seasons. Mean annual wind speeds were 1.6 m/s at the DCL station (3 m anemometer height), and 2.3 m/s at the KPL station (10 m anemometer height). Wind speeds are generally faster and have greater deviation during the winter than during the summer.

Evaporation data was not recorded at either Project station, or at any of the regional Meteorological Service of Canada stations, and therefore lake evaporation for the site was estimated according to common empirical equations for potential evapotranspiration as they are generally representative of lake evaporation. The empirical Thornthwaite equation was used with the measured site temperature record and the long-term synthetic temperature record to estimate a mean annual lake evaporation value (potential evapotranspiration) of 466 mm at the DCL station and 430 mm at the KPL station.

The mean annual precipitation for the site is estimated to be 852 mm at an elevation of 1,837 masl, with about 40% falling as snow and 60% falling as rain. The maximum daily precipitation recorded from either station was 34 mm in both June 2012 and 2013. Using adjusted historical precipitation data from regional stations, the Project Site 24-hour precipitation for 10, 50, and 200 year return periods were estimated to be 53 mm, 69 mm, and 82 mm, respectively. The 24-hour probable maximum precipitation value was estimated to be 300 mm.

From the available data, snow generally starts to accumulate in late October and peaks in April. In 2012, 2013 and 2014, snow depth peaked at approximately 1.7 m. On average, rapid melting begins in late April or early May, and the snowpack is fully melted by early June.

ACKNOWLEDGEMENTS

This report was prepared for Harper Creek Mining Corporation by ERM Consultants Canada Ltd (ERM Rescan). Field work was completed by Dillon Consulting Ltd. and Knight Piésold Ltd. Data analysis was performed by Knight Piésold and Daniel Casanova (B.Sc.; ERM Rescan). This report was written by Daniel Casanova, directly incorporating previous work from Knight Piésold (2013). This report was reviewed by Derek Shaw (M.A.Sc., P.Eng.), Mark Branson (M.Sc. (Hons)), and Mellissa Winfield (M.Sc. (Hons)).

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GLOSSARY AND ABBREVIATIONS

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

AIR	Application Information Requirements
BC	British Columbia
BC EAA	British Columbia *Environmental Assessment Act*
BC EAO	British Columbia Environmental Assessment Office
BC MOE	British Columbia Ministry of Environment
CEA Agency	Canadian Environmental Assessment Agency
CEAA	*Canadian Environmental Assessment Act*
CEARIS	CEA Agency's Registry Internet Site
DCL	Dillon Consulting Limited
EA	Environmental Assessment
EC	Environment Canada
EIS	Environmental Impact Statement
HCMC	Harper Creek Mining Corporation
km	Kilometres
KPL	Knight Piésold Limited
M	Million or Mega
MAP	Mean Annual Precipitation
masl	Metres above sea level
MSC	Meteorological Service of Canada
Mt	Million tonnes
MW	Mega Watts
PET	Potential Evapotranspiration
PMP	Probable Maximum Precipitation

Project, the	The Harper Creek Project
Proponent, the	Harper Creek Mining Corporation
RDPA	Regulations Designating Physical Activities
t/d	Tonne per day
t/y	Tonne per year
TMF	Tailings Management Facility
TSX	Toronto Stock Exchange
US EPA	United States Environmental Protection Agency
YMI	Yellowhead Mining Inc.

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

Harper Creek Mining Corporation (HCMC) proposes to construct and operate the Harper Creek Project (the Project), an open pit copper mine near Vavenby, British Columbia (BC). The Project has an estimated 28-year mine life based on a process plant throughput of 70,000 tonnes per day (25 million tonnes per year). Ore will be processed on site through a conventional crushing, grinding and flotation process to produce a copper concentrate, with gold and silver by-products, which will be trucked from the Project Site along approximately 24km of existing access roads to a rail load-out facility located at Vavenby. The concentrate will be transported via the existing Canadian National Railway network to the existing Vancouver Wharves storage, handling and loading facilities located at the Port of Vancouver for shipment to overseas smelters.

The Project consists of an open pit mine, on-site processing facility, tailings management facility (TMF; for tailings solids, subaqueous storage of PAG waste rock, and recycling of water for processing), waste rock stockpiles, low grade and overburden stockpiles, a temporary construction camp, ancillary facilities, mine haul roads, sewage and waste management facilities, a 24km access road between the Project Site and a rail load-out facility located on private land owned by HCMC in Vavenby, and a 12km power line connecting the Project Site to the BC Hydro transmission line corridor in Vavenby. The Project location and infrastructure is shown in Figure 1.1-1.

This report describes the meteorological baseline conditions for the purposes of the Application (Application) for an Environmental Assessment (EA) Certificate under the British Columbia *Environmental Assessment Act* (BC EAA) in accordance with the Application Information Requirements (AIR) for the Project approved on October 21, 2011. This report also meets the purposes of the Environmental Impact Statement (EIS) in accordance with the "Background Information for the Initial Federal Public Comment Period on the Comprehensive Study pursuant to the *Canadian Environmental Assessment Act* of the Harper Creek Mine Project near Kamloops British Columbia."

1.2 PROJECT LOCATION

The Project is located in the Thompson-Nicola area of BC, approximately 150 km north-east of Kamloops along Yellowhead Highway #5, approximately 10 km southwest of the unincorporated municipality of Vavenby, British Columbia. The Project is located within National Topographic System (NTS) map sheets 82M/5 and 82M/12, is geographically centred at 51°30'N latitude and 119°48'W longitude, and is situated at approximately 1,800 metres above sea level (masl). The mineral claims comprising the Project cover an area of 42,636.48 hectares. The Project location is shown in Figure 1.2-1.

Figure 1.1-1
Project Location and Infrastructure

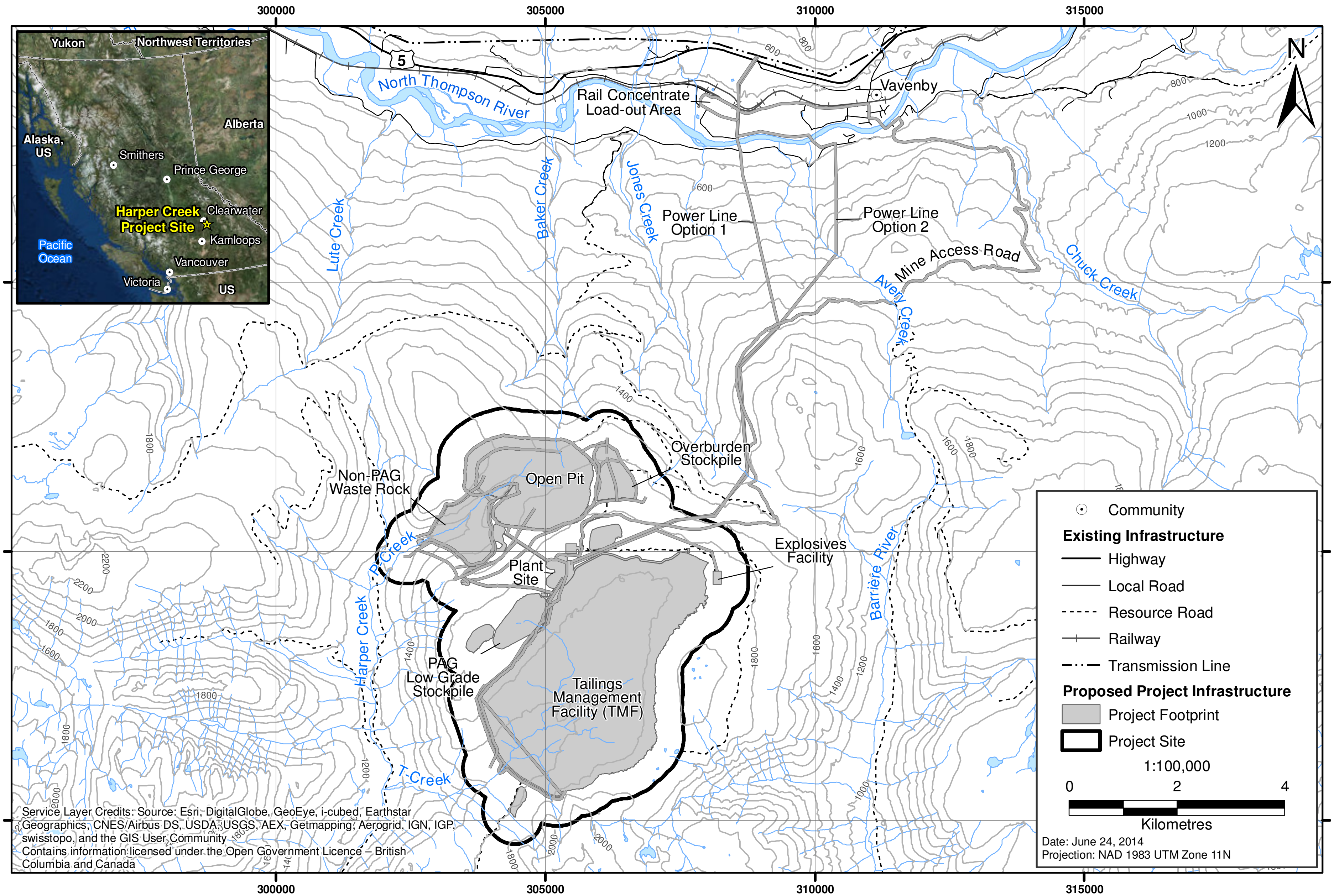
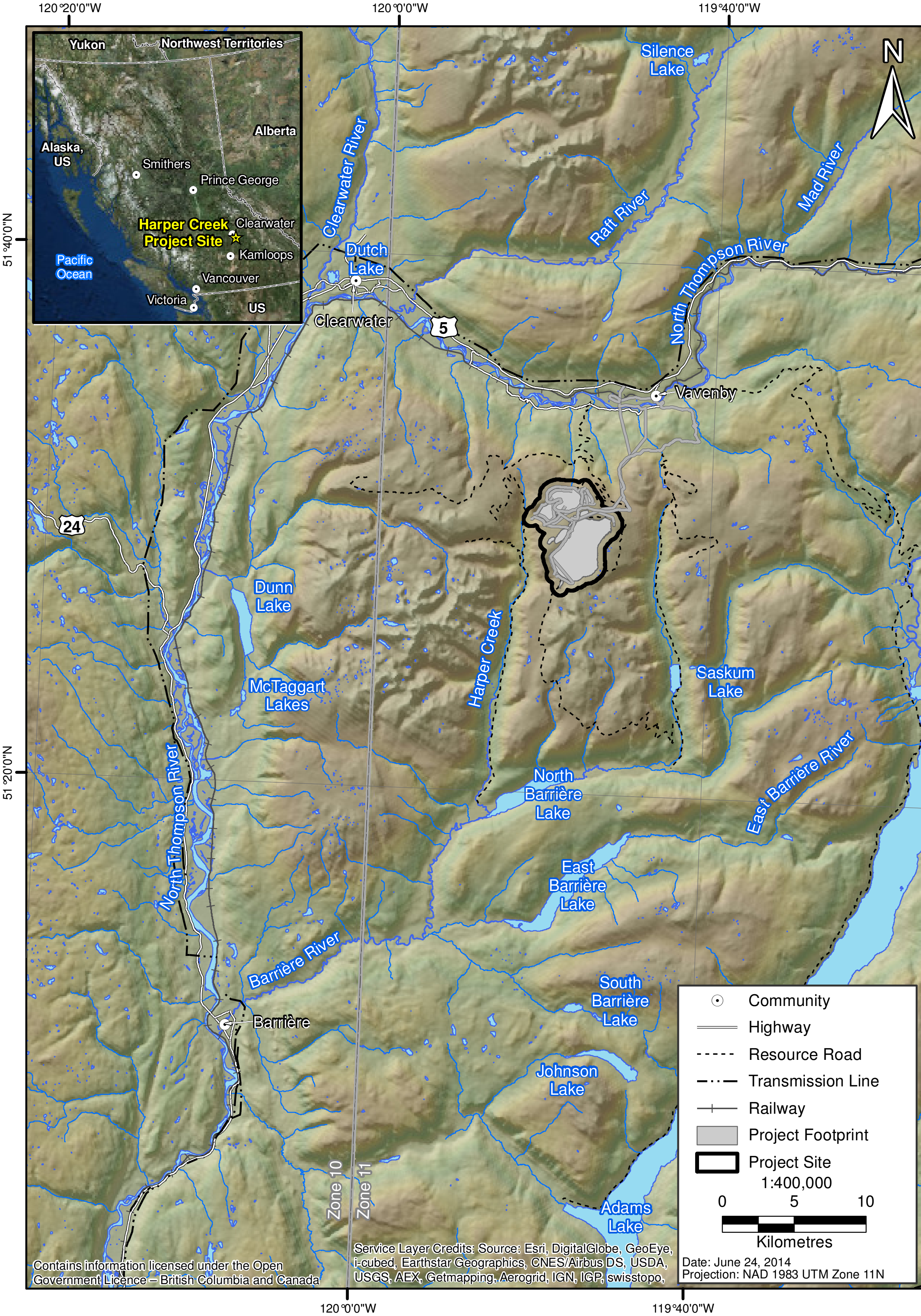


Figure 1.2-1

Project Location



1.3 PROJECT PROPONENT

The Proponent of the Project is Harper Creek Mining Corporation (HCMC), a wholly owned subsidiary of Yellowhead Mining Inc. (YMI). YMI was formed in 2005 as a private British Columbia company specifically to acquire, explore and, if feasible, develop the Project. YMI is now a publicly owned BC based mineral development company trading on the Toronto Stock Exchange (TSX) in Canada. HCMC's strategy is to engineer, permit, finance, construct, and operate the Project.

1.4 PROJECT SETTING

The Project is located in the interior of BC, just west of the Columbia Mountains. The proposed plant site is approximately 8 km south of Vavenby at an elevation of 1,400 m above the North Thompson Valley floor. The Yellowhead #5 Highway runs along the North Thompson River and, at its closest point, is approximately 7 km to the north of the Project Site. Meteorological and long term climate conditions at the Project are heavily influenced by continental air masses and the local and regional complex terrain.

1.5 STUDY OBJECTIVES

The objective of the meteorological baseline study is to monitor and report on meteorological conditions in the baseline study area observed since December 2007, and to estimate the long term climate conditions of the mine site area.

This report details the methodology used in the meteorological monitoring program. Chapter 2 of this report presents the relevant legislation, Chapter 3 provides details of the methodology, Chapter 4 presents the results and discussion, and Chapter 5 provides a summary of the key findings.

1.6 BASELINE STUDY AREA

The meteorological baseline study area encompasses the Project Site (Figure 1.1-1) with elevations roughly between 1,600 and 1,900 metres above sea level (masl). This area was chosen as the study area in order to accurately characterize meteorological conditions for the majority of Project components without requiring the installation of multiple meteorological stations.

2. BACKGROUND REVIEW

2.1 LEGISLATION, REGULATIONS, AND GUIDELINES

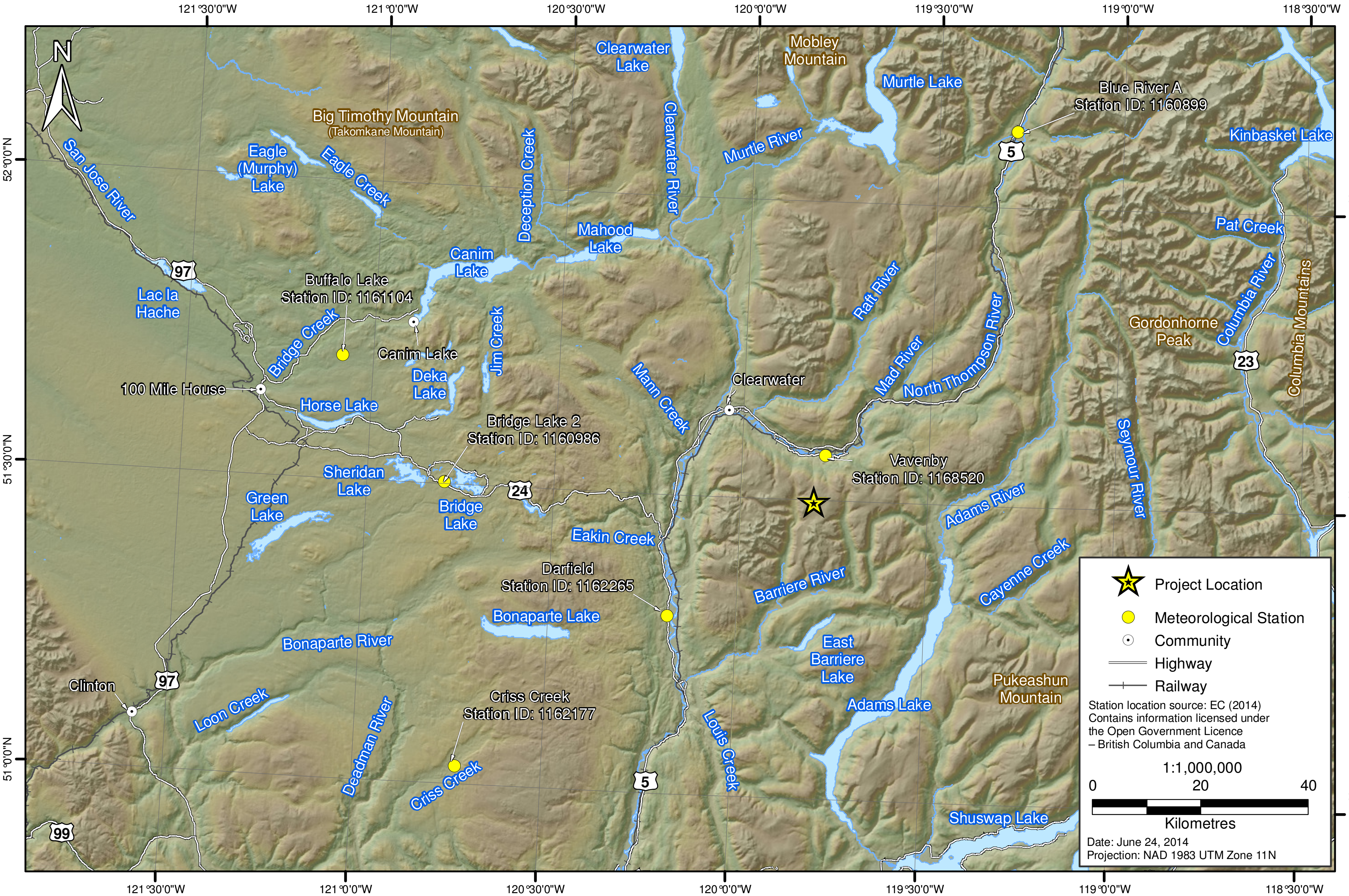
The Project is subject to both provincial and federal environmental assessment (EA) requirements under the BC *Environmental Assessment Act* (2002) and *Canadian Environmental Assessment Act* (CEAA; 1992). The EA will undergo a coordinated review by the BC Environmental Assessment Office (EAO) and the Canadian Environmental Assessment Agency (CEA Agency) in accordance with the 2004 Canada-BC Agreement for Environmental Assessment Cooperation. The requirements for the provincial EA are defined in the AIR for the Project, approved by the BC Environmental Assessment Office (EAO) on October 21, 2011. Requirements of the federal EA are outlined in the "Background Information for the Initial Federal Public Comment Period on the Comprehensive Study pursuant to the *Canadian Environmental Assessment Act* of the Harper Creek Mine Project near Kamloops British Columbia" as issued in April 2011 on the CEA Agency's Registry Internet Site (CEARIS).

This baseline report has been prepared to support the submission of the Application/EIS. Air quality modelling is a component of the EA and meteorological baseline data is required to support air quality modelling for the Project Application/EIS (BC MOE 2008, 2012). Guidelines for the installation of operation of meteorological stations, can be found in the document *MSC Guidelines for Co-operative Climatological Autostations* (EC 2004).

2.2 PREVIOUS ENVIRONMENTAL STUDIES

Dillon Consulting Ltd. installed a climate station in December 2007 near the proposed tailings storage facility. Data from regional meteorological stations operated by the Meteorological Service of Canada (MSC; Figure 2.2-1) were also used in this baseline study. Data from these stations are discussed further in Section 4 as well as in previous baseline reports (Knight Piésold 2013).

Figure 2.2-1
Regional Meteorological Stations



3. METHODOLOGY

3.1 Sampling Methods

3.1.1 Project Meteorological Stations

In December 2007, an automated meteorological station was installed at the Project by DCL at the proposed open pit location, at an elevation of 1,680 masl (Plate 3.1-1). This station was decommissioned in April 2011 and replaced by a new automated meteorological station installed by KPL in September 2011 close to the proposed mine plant site, at an elevation of 1,837 masl (Plate 3.1-2). Tables 3.1-1 and Figure 3.1-1 summarize the locations of these stations. Table 3.1-2 summarizes the meteorological parameters monitored by each station.

Climate and meteorological analyses conducted in this report are based on data collected by both Project stations, as well as regional data.

Plate 3.1-1. DCL Climate Station behind helicopter tail boom. Photo provided by KPL.

Table 3.1-1. Project Meteorological Stations

Station Name	Starting Month	Ending Month	UTM Coordinates[a]		Elevation (masl)
			Northing (m)	Easting (m)	
DCL Climate Station	Dec. 2007	Apr. 2011	5,711,302	305,107	1,680
KPL Climate Station	Sep. 2011	Still Active	5,710,037	305,831	1,837

[a] *NAD83 Zone 11U.*

Plate 3.1-2. KPL Climate Station. Photo provided by KPL.

Table 3.1-2. Meteorological Parameters Measured by Project Stations

Station Name	Air Temperature	Relative Humidity	Wind Speed/ Direction	Solar Radiation	Net Radiation	Barometric Pressure	Precipitation	Snow Depth
DCL Climate Station	✓	✓	✓	✓	-	✓	✓ (rainfall only)	-
KPL Climate Station	✓	✓	✓	✓	✓	✓	✓ (rainfall and snowfall)	✓

3.1.2 Regional Meteorological Stations

Many active and decommissioned regional meteorological stations operated by the Meteorological Service of Canada (MSC) are located in the region surrounding the Project. Stations that were used to characterize the climate of the Project region are presented in Figure 2.2-1 and Table 3.1-3. These stations were chosen as they are still active or have been recently deactivated, they all have the most recent 1981 to 2010 climate normals (EC 2014a), and they are close to the Project Site or relatively close to the Project elevation.

3.2 Data Analysis

All Project meteorological data were reviewed after collection in order to filter out or correct any erroneous values. The screening process used by ERM Rescan draws on screening criteria used by the United States Environmental Protection Agency (US EPA 2000) and Environment Canada (EC 2004), as well as professional judgement. After data were screened, the recorded hourly and daily values were analysed and processed into daily and monthly summaries. Specific analytical methods for various meteorological parameters are discussed in the following subsections.

Figure 3.1-1
Project Meteorological Stations

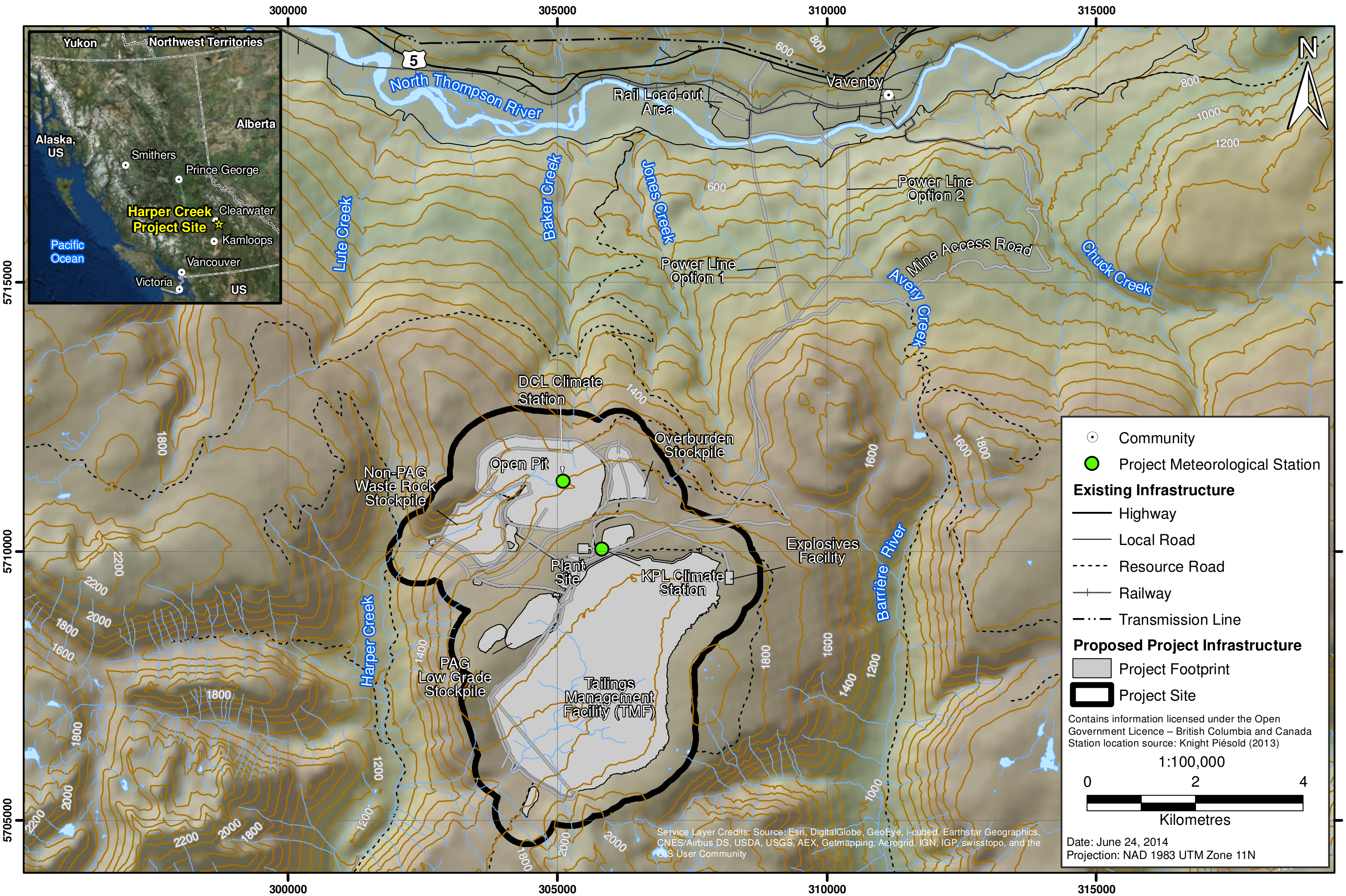


Table 3.1-3. Regional Meteorological Stations

Station Name	Climate ID	Start Year	End Year	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)	Elevation (masl)	Distance from Proposed Plant Site (km)
Blue River A	1160899	1969	Still Active	5,777,862	343,285[a]	690	78
Bridge Lake 2	1160986	1980	2010	5,708,164	653,138[b]	1,155	69
Buffalo Lake	1161104	1962	Still Active	5,730,246	632,465[b]	1,003	91
Criss Creek	1162177	1988	Still Active	5,655,586	659,291[b]	1,122	83
Darfield	1162265	1956	Still Active	5,686,660	696,408[b]	412	35
Vavenby	1168520	1913	Still Active	5,717,551	307,506[a]	445	8

Source: EC (2014c).
[a] *NAD83 Zone 11U.*
[b] *NAD83 Zone 10U.*

3.2.1 Temperature

The available site data were compared with concurrent monthly temperature data from three MSC stations (Vavenby, Criss Creek, and Buffalo Lake). A linear regression analysis was performed for each paired MSC and Project station. A synthetic long-term temperature record for each Project station was then generated by applying the linear regression equation to the most recent 1981-2010 climate normal temperature values for the MSC station with the highest linear coefficient of determination (Criss Creek; R^2=0.98 for the DCL station and R^2=0.97 for the KPL station).

3.2.2 Evapotranspiration

Potential evapotranspiration (PET) is defined as the amount of evapotranspiration that would occur given an infinite supply of water from a crop surface (Ponce 1989). There is inherent uncertainty with any PET estimate when reliable site specific data are not available for calibration. Since lake evaporation values are difficult to measure and due to the lack of measured data available for the Project (both site-specific and regional) the PET for the Project Site was estimated based on the Thornthwaite equation (Thornthwaite 1948). This equation requires input of monthly temperature, number of days in a month and the mean day length of the month. Monthly temperature data collected at the site, as well as the synthetic long-term temperature values, were used as temperature inputs to the equation. The mean day length for each month at the Project Site was calculated using a US Naval Observatory daylight table (US Naval Observatory 2014).

3.2.3 Precipitation

During months with snowfall, the snow depth data at the KPL Climate Station was used to verify precipitation events. If snow depth increased but the precipitation gauge did not record any precipitation during the same time period, it was likely that there was snow cap blocking the gauge orifice and the resulting precipitation data were marked as missing. Large precipitation events recorded by the KPL station were also verified by comparing the event with the snow depth change over the same period. Daily precipitation from the KPL station were also verified against the Criss Creek and Vavenby station precipitation.

Total precipitation recorded by the KPL station precipitation gauge were then separated into daily rainfall and snowfall based on daily air temperature data and followed the methodology provided in Chapter 8: The UBC Watershed Model, Computer Models of Watershed Hydrology (Quick 1995). The algorithm is as follows:

If T > 2 Then
R = P
SWE = 0

If T < 0 Then
R = 0
SWE = P

If 0 < T < 2 Then
*R = P * T/2*
*SWE = P * (1 - (T/2))*

where
T = Mean Daily Air Temperature (°C)
P = Daily Precipitation (mm)
R = Daily Rainfall (mm)
SWE = Daily Snowfall (Snow-water equivalent; mm)

In order to estimate the long-term mean annual precipitation for the site, the concurrent daily precipitation records at the KPL climate station and the Criss Creek station were compared for the available November 2012 to December 2013 period. A double mass curve analysis was performed which compares the concurrent cumulative precipitation at the regional station with the site station. The Criss Creek station was chosen as it had the highest linear coefficient of determination ($R^2 = 0.99$). A linear regression equation was generated from this double mass curve and was used to calculate the synthetic long-term precipitation record for the KPL station.

Extreme rainfall values for the Project Site were estimated using the 91-year daily precipitation record at the Vavenby station. The annual maximum daily precipitation data recorded at the Vavenby station were converted to 24-hour values using a conversion factor of 1.13, and were then scaled to the DCL station elevation of 1,680 masl using a 4% per 100 m scaling factor (Knight Piésold 2013). The return period 24-hour precipitation events are mostly likely occurring in the summer months due to convective storms. The mean and standard deviation of the scaled 24-hour record was then applied to a Gumbel distribution to determine 24-hour precipitation values for various return periods.

3.3 LIMITATIONS AND ASSUMPTIONS

DCL and KPL stations, operated by Dillon Consulting Ltd. and Knight Piésold Ltd., respectively, were operated in accordance with EC guidelines (EC 2004), sensors were installed according to manufacturer manuals. All meteorological results are presented for the location of the DCL and KPL stations. Adjustments may be required to apply them to other locations within the Project Site. Synthetic long-term meteorological estimates at both Project stations are calculated using data published by the MSC which is assumed to be accurate.

4. RESULTS AND DISCUSSION

4.1 TEMPERATURE

Mean monthly temperature data from the DCL and KPL stations are summarized in Tables 4.1-1 and 4.1-2, respectively. Daily mean, maximum and minimum temperatures for both stations are presented in Figures 4.1-1 to 4.1-3.

Table 4.1-1. Mean Air Temperature at the DCL Station

Year	Mean Air Temperature (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	-	-	-	-	-	-	-	-	-	-	-	-9.6[a]	-
2008	-9.5	-5.9	-5.6	-3.4	5.2	6.3[a]	-	-	-	-	-2.7[a]	-13.5	-
2009	-7.7	-7.5	-7.4	-0.9	4.4	8.7	14.1	12.6	9.2	-1.7	-4.1	-11.4	0.7
2010	-4.8	-4.0	-2.3	0.0	3.0	7.3	12.1	10.5	5.4	3.2	-7.3	-7.5	1.3
2011	-8.0	-11.0	-4.6	-4.5[b]	-	-	-	-	-	-	-	-	-
Mean	-7.5	-7.1	-5.0	-1.4	4.2	7.4	13.1	11.6	7.3	0.7	-4.7	-10.5	0.7
Long-term	-9.5	-7.3	-3.7	1.2	5.1	8.3	10.9	10.4	6.7	1.0	-5.2	-9.2	0.7

Note: Station elevation: 1,680 masl.
[a] *Missing under six days of data.*
[b] *Missing 24 days of data. Not included in mean calculation.*

Table 4.1-2. Mean Air Temperature at the KPL Station

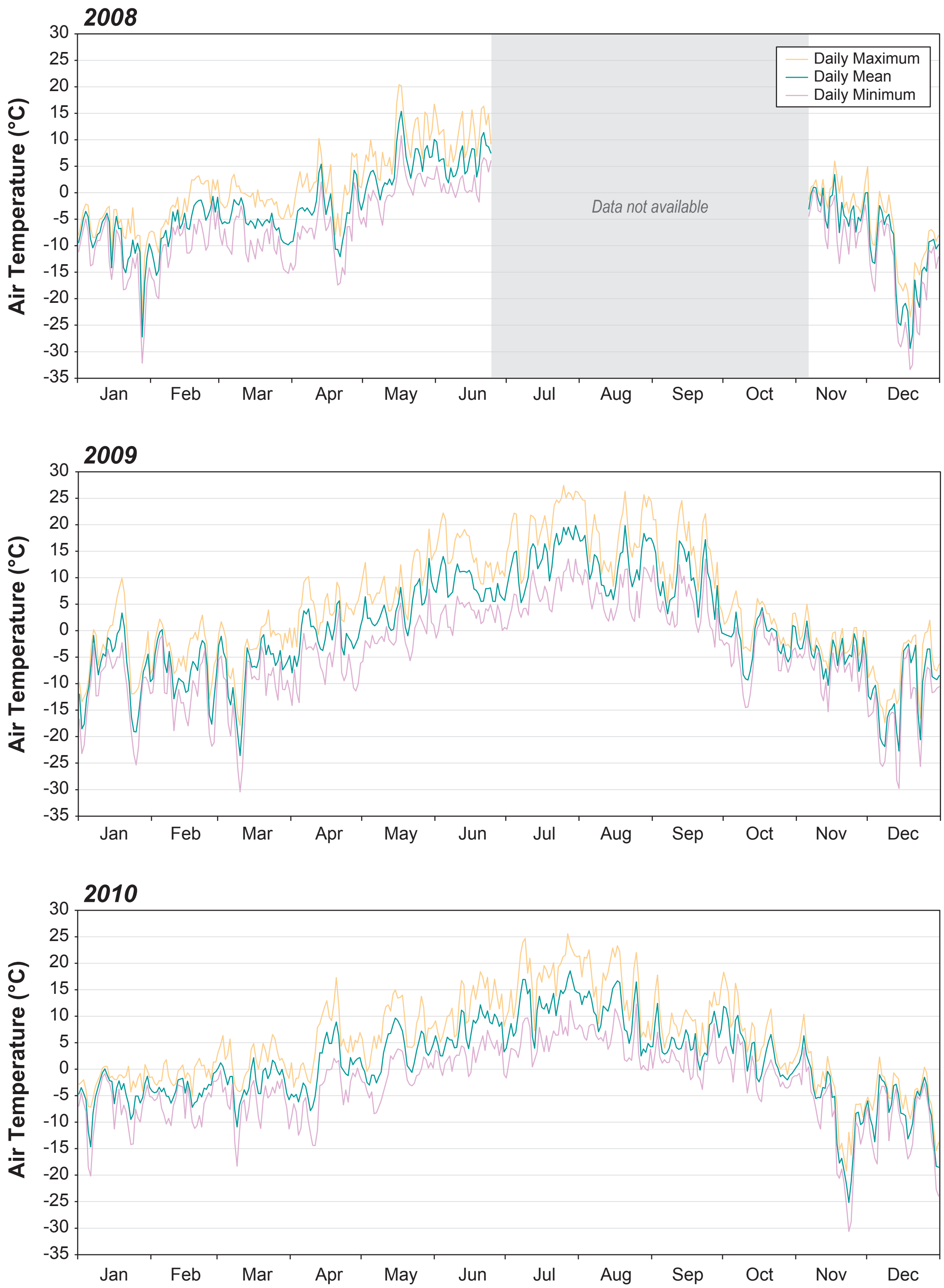
Year	Mean Air Temperature (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2011	-	-	-	-	-	-	-	-	8.8[a]	-0.7	-8.1	-7.3	-
2012	-10.0	-7.3	-6.2	-0.8	2.9	5.3	12.4	11.9	8.7	-0.6	-5.1	-8.8	0.2
2013	-7.0	-6.4	-5.0	-2.1	5.1	7.3	12.1	11.6	8.0	0.7	-5.8	-9.8	0.7
2014	-5.9	-12.4	-6.3	-1.5	1.9[b]	-	-	-	-	-	-	-	-
Mean	-7.7	-8.7	-5.9	-1.5	4.0	6.3	12.3	11.7	8.5	-0.2	-6.4	-8.6	0.3
Long-term	-9.8	-7.6	-4.1	0.8	4.5	7.6	10.3	9.7	6.1	0.5	-5.6	-9.5	0.2

Note: Station elevation: 1,837 masl.
[a] *Missing one day of data.*
[b] *Missing 23 days of data. Not included in mean calculation.*

The mean annual temperatures from the available DCL and KPL station data are 0.7ºC and 0.3ºC, respectively. The KPL station is 157 m higher in elevation than the DCL station and it is therefore expected that the KPL station will record slightly lower temperatures than the DCL station, on average. From the available data, the lowest hourly temperature was -35.2ºC in January 2012 and the highest was 27.4ºC in July 2009.

Figure 4.1-1

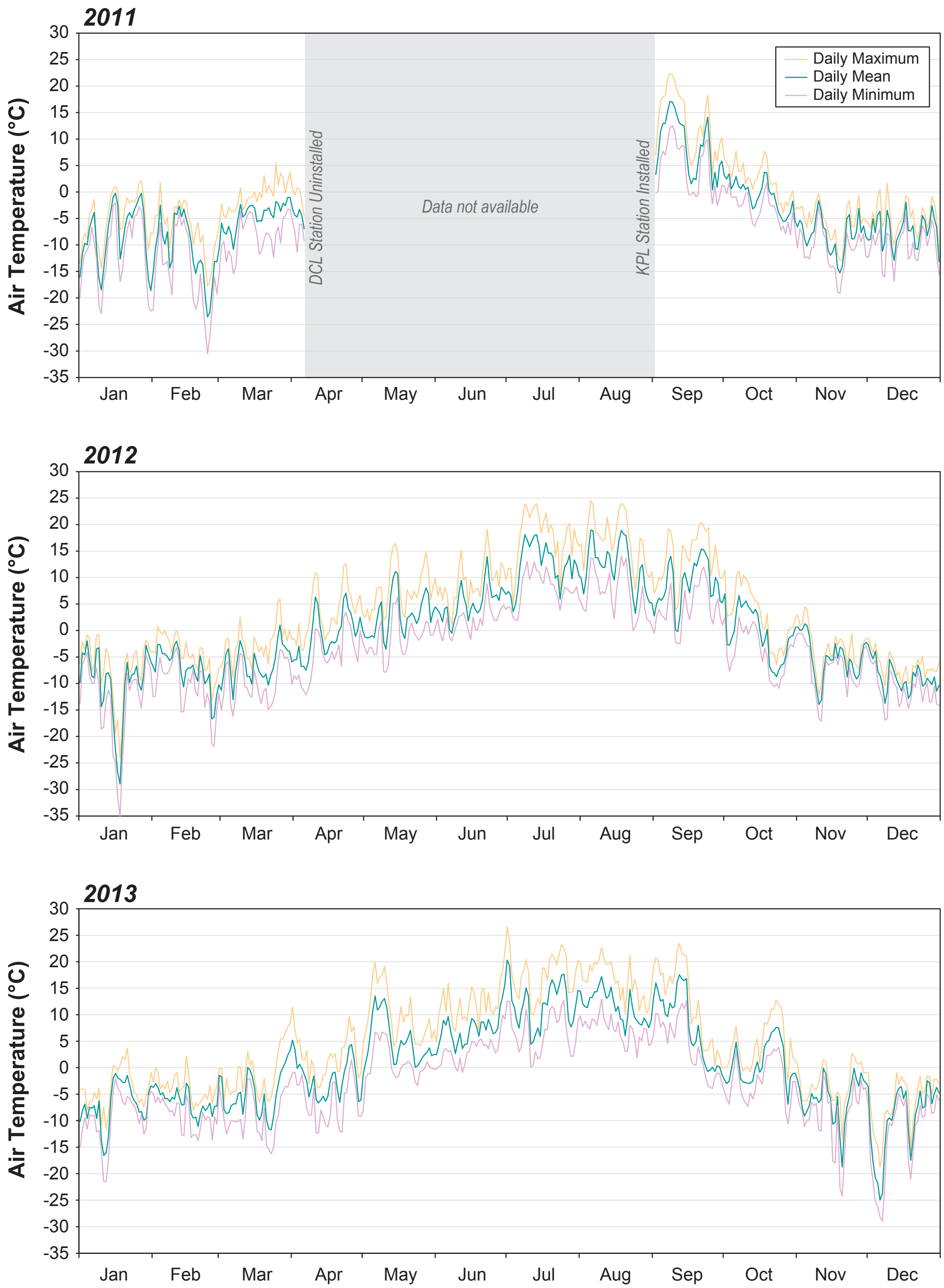
Daily Air Temperature, 2008 to 2010



Notes: Data up to April 6, 2011 from DCL Station.
Data after Sept 1, 2011 from KPL Station.
DCL Station Data Source: Knight Piésold (2013).

Figure 4.1-2

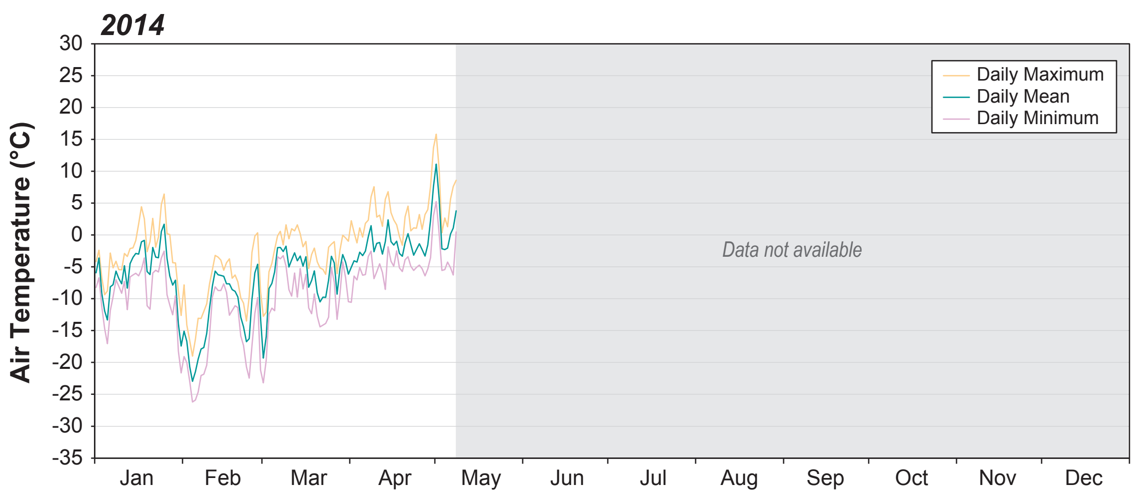
Daily Air Temperature, 2011 to 2013



Notes: Data up to April 6, 2011 from DCL Station.
Data after Sept 1, 2011 from KPL Station.
DCL Station Data Source: Knight Piésold (2013).

Figure 4.1-3

Daily Air Temperature, 2014



Notes: Data up to April 6, 2011 from DCL Station.
Data after Sept 1, 2011 from KPL Station.
DCL Station Data Source: Knight Piésold (2013).

The available on-site data records from both stations were not long enough to provide long-term mean temperatures. Therefore, these data were compared with concurrent monthly temperature data from Vavenby, Criss Creek, and Buffalo Lake stations, operated by the MSC. Linear regression analyses indicated that the regional dataset that most strongly correlated to both Project stations' data is that from Criss Creek. A synthetic long-term temperature record for Harper Creek was then generated by applying the linear regression equation to the long-term temperature values for the Criss Creek station. The resulting long-term synthetic temperature series has a mean annual value of 0.7ºC for DCL station and 0.2ºC for KPL station.

4.2 WIND SPEED AND DIRECTION

Mean monthly wind speed data from the DCL and KPL stations are summarized in Tables 4.2-1 and 4.2-2, respectively. Annual and seasonal wind roses for both stations are presented in Figures 4.2-1 and 4.2-2. Box plots of mean hourly wind speed in each month are presented in Figure 4.2-3.

Table 4.2-1. Mean Wind Speed at the DCL Station

Year	Mean Wind Speed (m/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	-	-	-	-	-	-	-	-	-	-	-	1.9[a]	-
2008	2.2	1.7	1.7	1.4	1.3	1.2[a]	-	-	-	-	2.3[a]	1.2	-
2009	1.4	1.7[a]	2.1	1.8	1.6	1.2	1.2	1.3	1.9	1.5[a]	2.8	1.3[a]	1.6
2010	2.1[a]	1.5	2.3	1.7	1.2	1.2	1.2	1.0	1.5	1.9	1.8[a]	2.2[a]	1.6
2011	1.6	1.7	2.0	1.9[b]	-	-	-	-	-	-	-	-	-
Mean	1.8	1.7	2.0	1.6	1.3	1.2	1.2	1.1	1.7	1.7	2.3	1.7	1.6

Notes:
Station elevation: 1,680 masl.
Station anemometer located approximately 3 m above ground.
[a] *Missing under six days of data.*
[b] *Missing 24 days of data. Not included in mean calculation.*

Table 4.2-2. Mean Wind Speed at the KPL Station

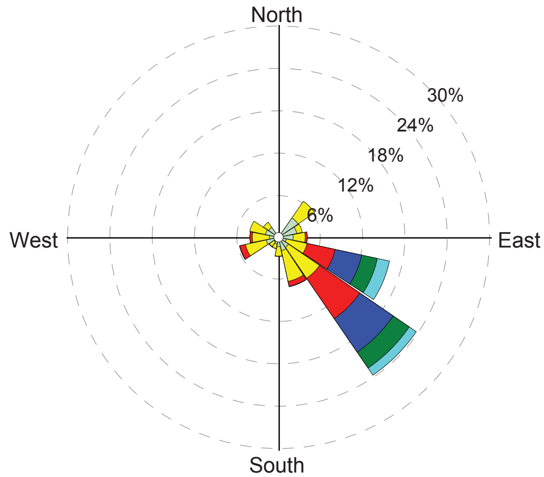
Year	Mean Wind Speed (m/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2011	-	-	-	-	-	-	-	-	2.5[a]	2.6	3.0	3.1	-
2012	3.3	2.6	3.0	2.4	2.0	2.2	1.7	1.7	1.8	2.4	3.2	2.6	2.4
2013	2.4	2.6	2.3	2.4	1.9	1.6	1.6	1.7	2.1	1.8	2.3	2.2	2.1
2014	2.4	2.2	2.5	2.3	1.6[b]	-	-	-	-	-	-	-	-
Mean	2.7	2.5	2.6	2.4	2.0	1.9	1.7	1.7	2.1	2.3	2.8	2.6	2.3

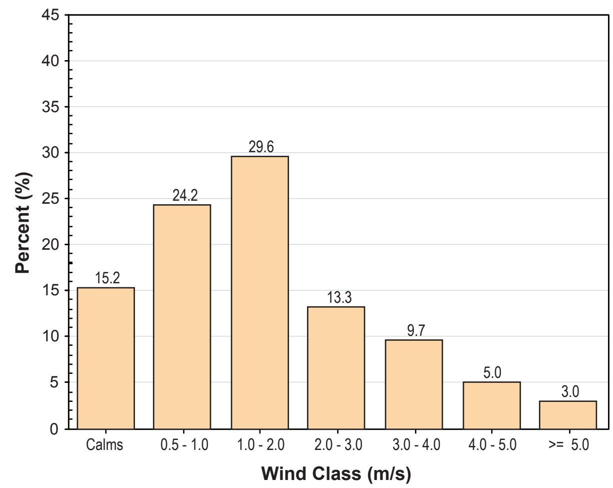
Notes:
Station elevation: 1,837 masl.
Station anemometer located approximately 10 m above ground.
[a] *Missing one day of data.*
[b] *Missing 23 days of data. Not included in mean calculation.*

Figure 4.2-1

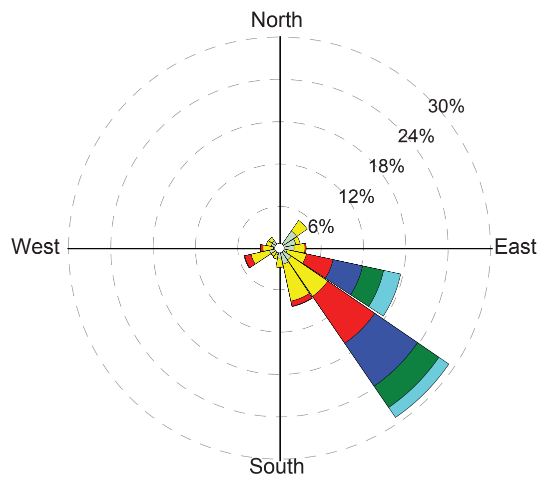
Wind Rose and Wind Speed Frequency Distribution, December 6, 2007 to April 6, 2011, DCL Station

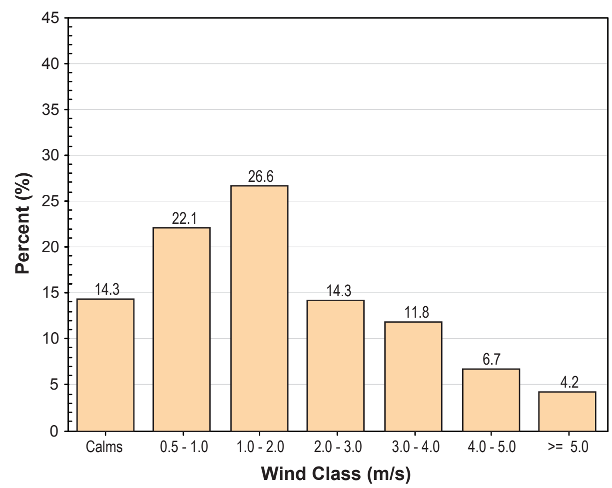
Annual



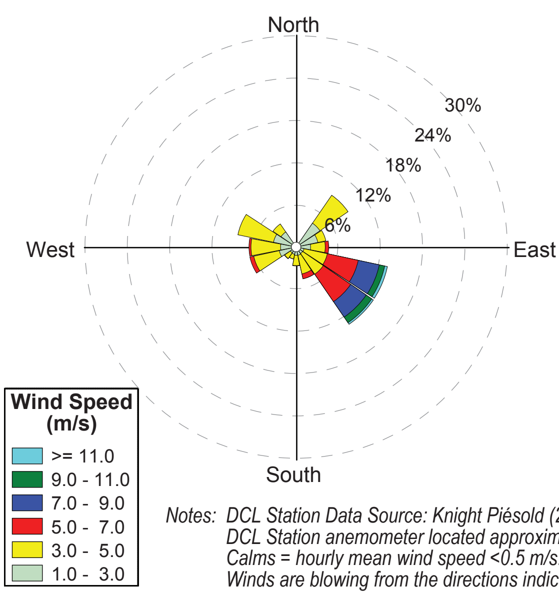


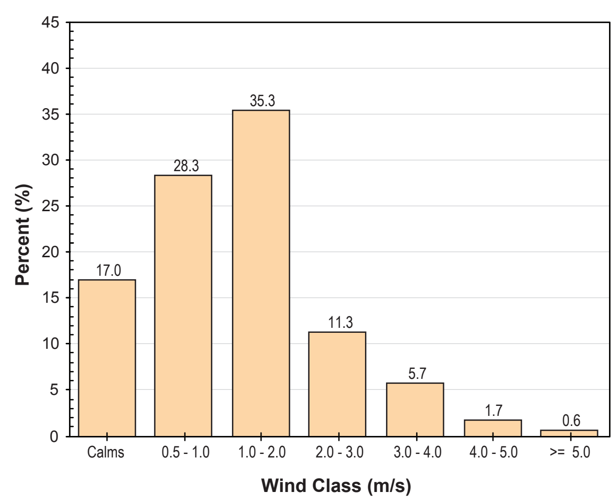
October to April





May to September



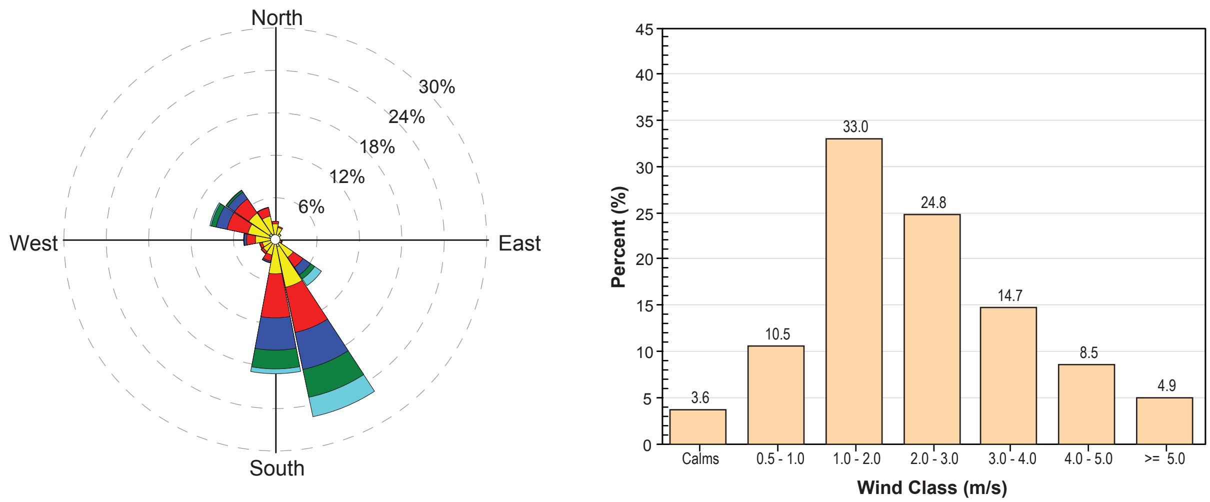


Notes: DCL Station Data Source: Knight Piésold (2013).
DCL Station anemometer located approximately 3 m above ground.
Calms = hourly mean wind speed <0.5 m/s.
Winds are blowing from the directions indicated.

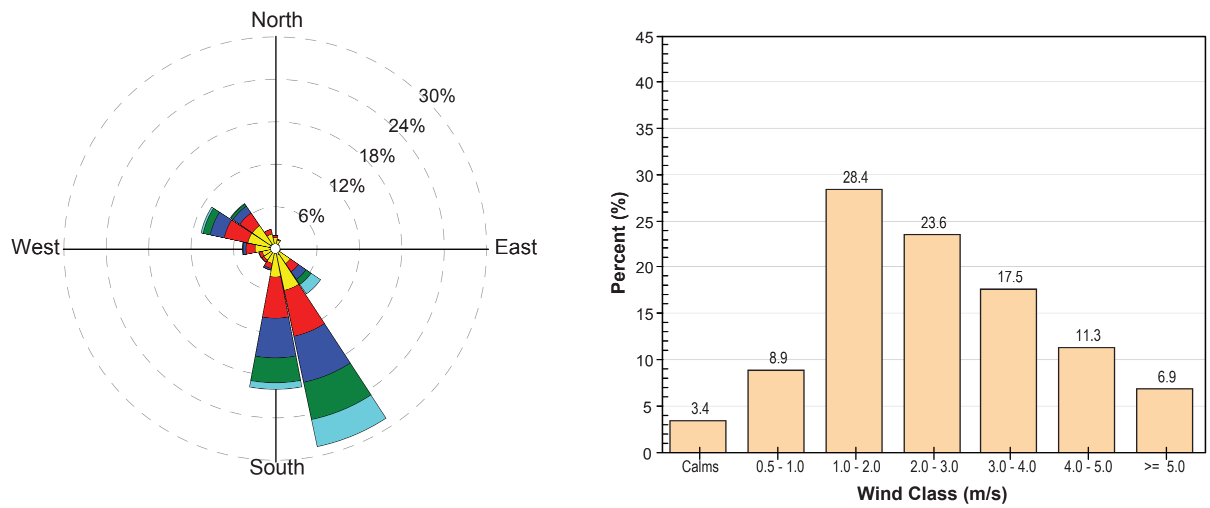
Figure 4.2-2

Wind Rose and Wind Speed Frequency Distribution, September 2, 2011 to May 8, 2014, KPL Station

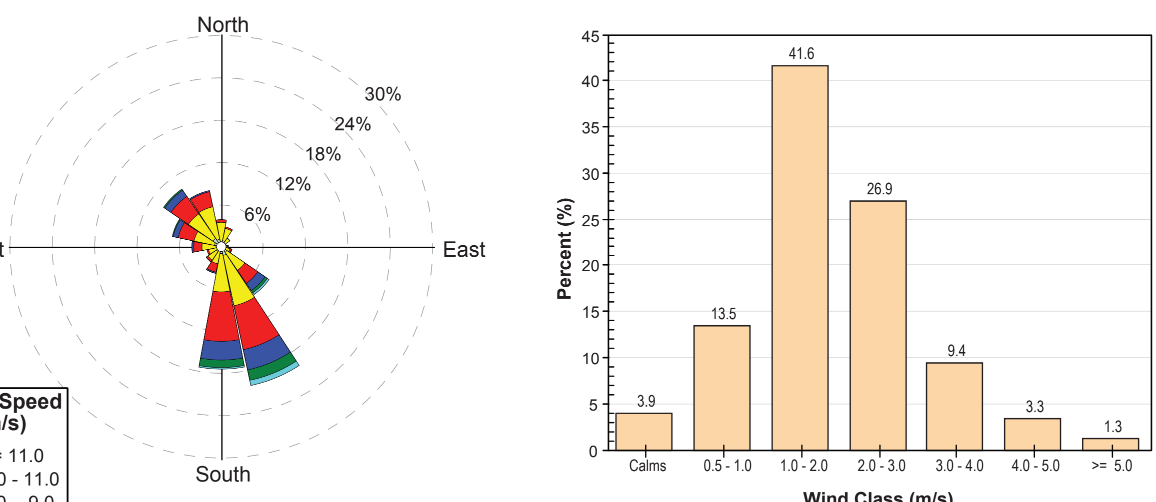
Annual

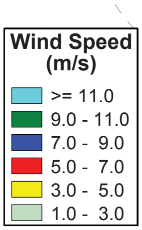


Winter

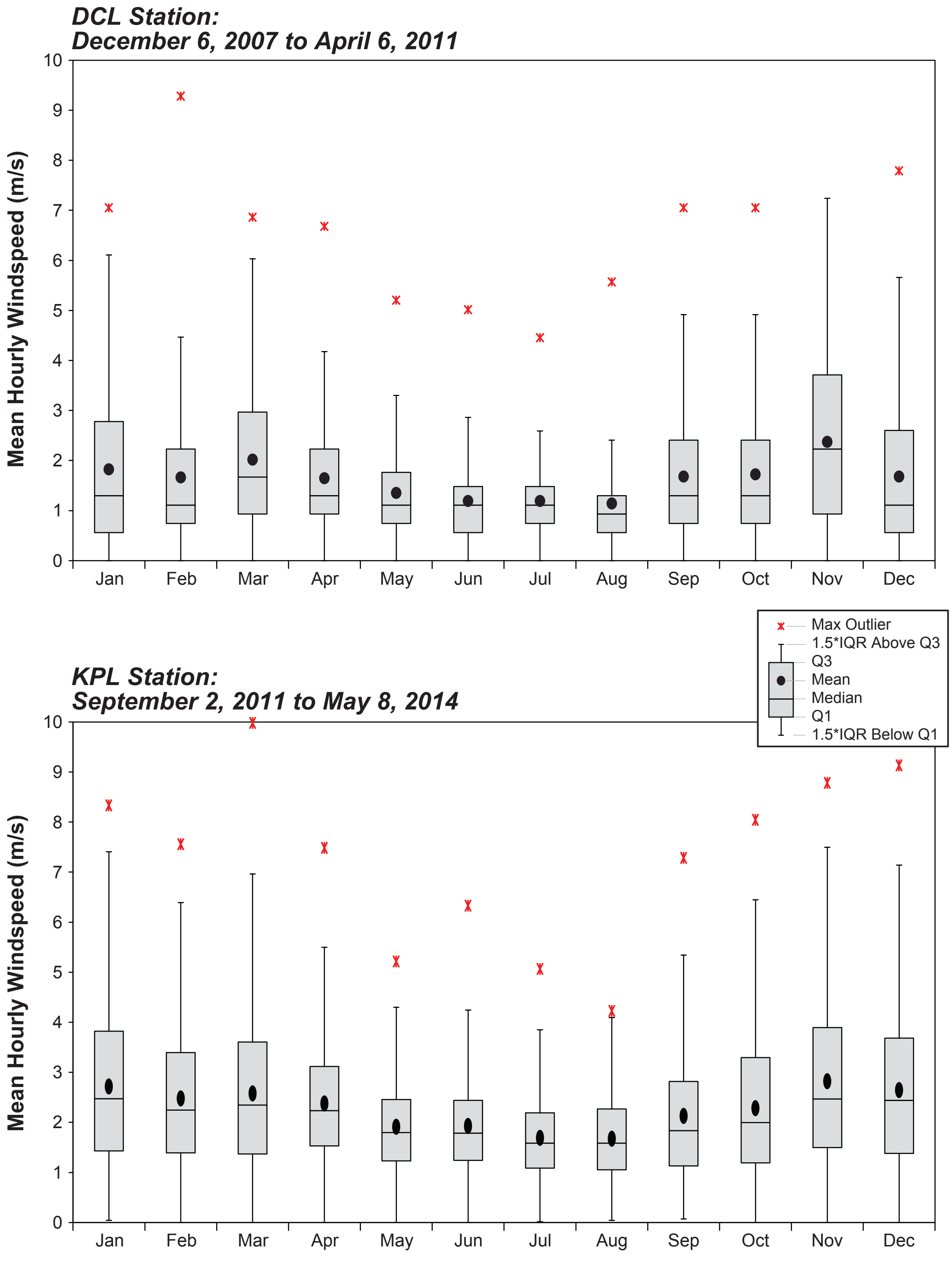


Summer





Notes: KPL Station anemometer located approximately 10 m above ground.
Calms = hourly mean wind speed <0.5 m/s.
Winds are blowing from the directions indicated.



Notes: DCL Station Data Source: Knight Piésold (2013).
DCL Station anemometer located approximately 3 m above ground.
KPL Station anemometer located approximately 10 m above ground.

Winds recorded at both stations primarily came from the southeast and south-southeast in all seasons. Wind speeds were typically higher during the winter (October to April) than the summer (May to September). Winds recorded at the KPL station were also higher than at the DCL station. This was to be expected as the KPL station was located a higher elevation and the anemometer was located approximately 10 m above the surface compared to the 3 m anemometer height at the DCL station.

4.3 RELATIVE HUMIDITY

Mean monthly relative humidity is summarized in Tables 4.3-1 and 4.3-2 for the DCL and KPL stations, respectively. Relative humidity is generally lower during the summer months and higher during the winter months.

Table 4.3-1. Mean Relative Humidity at the DCL Station

Year	Mean Relative Humidity (%)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	-	-	-	-	-	-	-	-	-	-	-	87[a]	-
2008	85	82	77	75	72	76[a]	-	-	-	-	83[a]	87	-
2009	81	79	79	64	63	63	58	61	65	84	87	86	72
2010	89	90	75	69	72	77	61	71	84	77	86	88	78
2011	89	84	86	86[b]	-	-	-	-	-	-	-	-	-
Mean	86	84	79	69	69	72	59	66	74	80	85	87	76

Note: Station elevation: 1,680 masl.
[a] *Missing under six days of data.*
[b] *Missing 24 days of data. Not included in mean calculation.*

Table 4.3-2. Mean Relative Humidity at the KPL Station

Year	Mean Relative Humidity (%)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2011	-	-	-	-	-	-	-	-	60[a]	83	87	85	-
2012	84	79	78	75	61	80	64	59	57	79	91	89	75
2013	79	86	78	70	66	77	56	67	72	76	86	88	75
2014	81	72	82	72	65[b]	-	-	-	-	-	-	-	-
Mean	81	79	79	72	63	79	60	63	63	79	88	87	75

Note: Station elevation: 1,837 masl.
[a] *Missing one day of data.*
[b] *Missing 23 days of data. Not included in mean calculation.*

4.4 EVAPOTRANSPIRATION

The estimated monthly PET values for the DCL and KPL stations are summarized in Tables 4.4-1 and 4.4-2, respectively. The calculation methodology is described in Section 3.2.2. The estimated long-term annual PET value is 466 mm at the DCL station and 430 mm at the KPL station. These values are generally consistent with the approximate 500 mm to 600 mm value indicated in the *Manual of*

Operational Hydrology in British Columbia (Coulson 1991), recognizing that this manual reports lake evaporation for valley locations and that evaporation is generally higher in valleys than in mountains.

Table 4.4-1. Estimated Potential Evapotranspiration at the DCL Station

Year	Estimated Potential Evapotranspiration (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	-	-	-	-	-	-	-	-	-	-	-	0	-
2008	0	0	0	0	55	64	-	-	-	-	0	0	-
2009	0	0	0	0	48	81	116	98	65	0	0	0	409
2010	0	0	0	0	43	79	112	93	50	30	0	0	407
2011	0	0	0	0	-	-	-	-	-	-	-	-	-
Mean	0	0	0	0	49	75	114	96	57	15	0	0	406
Long-term	0	0	0	18	54	78	104	107	81	23	0	0	466

Notes:
Station elevation: 1,680 masl.
Long-term PET values were based on the long-term synthetic temperature values.

Table 4.4-2. Estimated Potential Evapotranspiration at the KPL Station

Year	Estimated Potential Evapotranspiration (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2011	-	-	-	-	-	-	-	-	68	0	0	0	-
2012	0	0	0	0	40	62	112	100	67	0	0	0	381
2013	0	0	0	0	58	76	108	96	62	10	0	0	411
2014	0	0	0	0	29[a]	-	-	-	-	-	-	-	-
Mean	0	0	0	0	49	69	110	98	66	3	0	0	395
Long-term	0	0	0	13	50	74	100	102	76	14	0	0	430

Notes:
Station elevation: 1,837 masl.
Long-term PET values were based on the long-term synthetic temperature values.
[a] *Missing 23 days of data. Not included in mean calculation.*

These values are believed to reasonably represent lake evaporation conditions (Ponce 1989; Maidment 1993), since water is abundantly available at the site, and therefore, PET is largely independent of soil conditions.

4.5 PRECIPITATION

4.5.1 Regional Data

Mean monthly and annual rainfall, snowfall and precipitation values for the most relevant MSC regional climate stations are summarised in Table 4.5-1. These values were taken from each station's most recent (1981 – 2010) climate normal dataset (EC 2014a).

Table 4.5-1. Summary of Regional Total Precipitation Distributions, 1981 to 2010 Climate Normals

Station	Distance from Proposed Plant Site (km)	Elevation (masl)	Type	Mean Total Precipitation												
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Buffalo Lake ID 1161104	91	1,003	Rainfall (mm)	8.1	2.5	4.6	17.6	44.1	74.7	68.1	51.8	34.6	31.7	13.9	3.0	354.5
			% Annual Precip.	1%	0%	1%	3%	8%	14%	13%	10%	6%	6%	3%	1%	65%
			Snowfall (mm)	39.1	16.2	21.0	13.9	6.5	0.0	0.0	0.0	0.4	11.4	36.3	44.6	189.5
			% Annual Precip.	7%	3%	4%	3%	1%	0%	0%	0%	0%	2%	7%	8%	35%
			Precip. (mm)	47.2	18.7	25.6	31.6	50.6	74.7	68.1	51.8	34.9	43.0	50.2	47.6	544.0
			% Annual Precip.	9%	3%	5%	6%	9%	14%	13%	10%	6%	8%	9%	9%	100%
Bridge Lake 2 ID 1160986	69	1,155	Rainfall (mm)	4.1	2.2	6.8	19.5	52.6	77.8	73.4	52.1	47.4	29.9	12.5	1.2	379.6
			% Annual Precip.	1%	0%	1%	3%	9%	13%	12%	9%	8%	5%	2%	0%	64%
			Snowfall (mm)	41.0	22.3	23.1	16.6	8.6	0.7	0.0	0.0	0.6	12.9	40.0	50.2	215.9
			% Annual Precip.	7%	4%	4%	3%	1%	0%	0%	0%	0%	2%	7%	8%	36%
			Precip. (mm)	45.2	24.5	29.9	36.2	61.2	78.4	73.4	52.1	48.0	42.8	52.6	51.4	595.5
			% Annual Precip.	8%	4%	5%	6%	10%	13%	12%	9%	8%	7%	9%	9%	100%
Criss Creek ID 1162177	83	1,122	Rainfall (mm)	1.9	1.0	3.4	16.5	43.4	67.7	52.0	46.2	34.0	23.5	6.4	1.0	296.9
			% Annual Precip.	0%	0%	1%	4%	9%	14%	11%	10%	7%	5%	1%	0%	63%
			Snowfall (mm)	28.9	16.6	23.4	15.2	6.8	0.9	0.0	0.0	0.7	10.7	32.7	37.6	173.3
			% Annual Precip.	6%	4%	5%	3%	1%	0%	0%	0%	0%	2%	7%	8%	37%
			Precip. (mm)	30.8	17.7	26.7	31.7	50.2	68.5	52.0	46.2	34.7	34.1	39.0	38.6	470.2
			% Annual Precip.	7%	4%	6%	7%	11%	15%	11%	10%	7%	7%	8%	8%	100%
Darfield ID 1162265	35	412	Rainfall (mm)	10.3	9.7	19.7	28.0	45.5	54.1	52.1	41.8	35.2	38.7	29.1	8.4	372.5
			% Annual Precip.	2%	2%	4%	6%	9%	11%	11%	9%	7%	8%	6%	2%	77%
			Snowfall (mm)	32.4	13.1	5.3	0.6	0.0	0.0	0.0	0.0	0.0	1.3	22.4	37.5	112.6
			% Annual Precip.	7%	3%	1%	0%	0%	0%	0%	0%	0%	0%	5%	8%	23%
			Precip. (mm)	42.8	22.8	25.0	28.6	45.6	54.1	52.1	41.8	35.2	40.0	51.4	45.9	485.1
			% Annual Precip.	9%	5%	5%	6%	9%	11%	11%	9%	7%	8%	11%	9%	100%

(continued)

Table 4.5-1. Summary of Regional Total Precipitation Distributions, 1981 to 2010 Climate Normals (completed)

Station	Distance from Proposed Plant Site (km)	Elevation (masl)	Type	Mean Total Precipitation												
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Vavenby ID 1168520	8	445	Rainfall (mm)	12.3	10.7	20.0	29.0	43.6	56.5	58.2	43.1	37.2	41.0	26.8	10.9	389.3
			% Annual Precip.	3%	2%	4%	6%	9%	12%	12%	9%	8%	8%	6%	2%	80%
			Snowfall (mm)	27.2	11.7	5.0	0.9	0.1	0.0	0.0	0.0	0.0	2.2	17.3	30.4	94.8
			% Annual Precip.	6%	2%	1%	0%	0%	0%	0%	0%	0%	0%	4%	6%	20%
			Precip. (mm)	39.5	22.4	25.0	29.8	43.8	56.5	58.2	43.1	37.2	43.2	44.1	41.4	484.1
			% Annual Precip.	8%	5%	5%	6%	9%	12%	12%	9%	8%	9%	9%	9%	100%

Source: EC (2014a).

Precipitation is typically highest during the months of June and July and lowest during the late winter months of February and March. At the higher elevation stations, precipitation falls almost exclusively as snow from November through March, and as rain from June through August, while during the shoulder months of April, May, September and October there are often mixed rain and snow conditions.

4.5.2 Project Data

Monthly precipitation data collected at the DCL and KPL stations are summarized in Tables 4.5-2 and 4.5-3, respectively. Figures 4.5-1 to 4.5-3 present the daily precipitation recorded by each station.

Table 4.5-2. Rainfall at the DCL Station

Year	Rainfall (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	-	-	-	-	-	-	-	-	-	-	-	*0.0*[a]	-
2008	*0.2*	*16.2*	*21.0*	*43.2*	41.6	76.0[a]	-	-	-	-	*39.2*[a]	*0.8*	-
2009	*20.4*	*6.0*	*20.8*	*27.2*	42.6	47.8	27.6	16.0	67.0	*68.4*	*4.0*	*2.6*	350.4
2010	*9.4*	*34.8*	*30.4*	*25.4*	85.8	87.0	25.2	55.6	86.0	*32.2*	*18.2*	*0.2*	490.2
2011	*7.8*	*7.6*	*36.6*	*19.6*[b]	-	-	-	-	-	-	-	-	-
Mean	*9.5*	*16.2*	*27.2*	*31.9*	56.7	70.3	26.4	35.8	76.5	*50.3*	*20.5*	*0.9*	422.0

Notes:
Station elevation: 1,680 masl.
Data from October to April, italicized above, are not fully representative of rainfall or total precipitation due to inadequate snowfall measurement techniques. Snowfall would accumulate, partially melt and be falsely recorded as rainfall.
[a] *Missing under six days of data.*
[b] *Missing 24 days of data. Not included in mean calculation.*

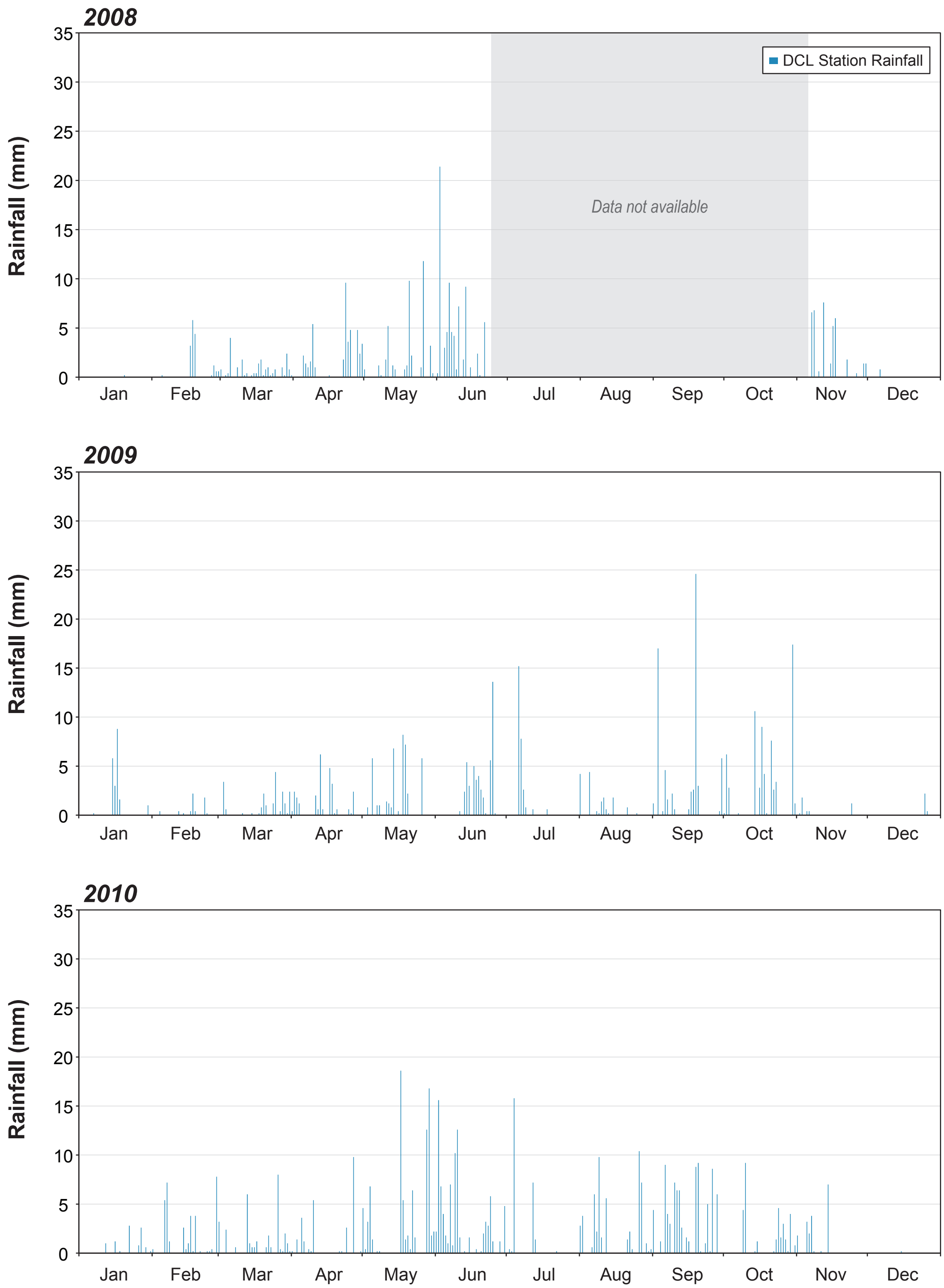
The DCL station precipitation data collected during freezing months (October through April) are not considered representative of Project Site conditions as this station was equipped with a rainfall gauge which prevented the accurate collection and measurement of snowfall. As a result, the calculated mean annual precipitation of 422 mm greatly under-represents the actual station and Project Site precipitation.

The KPL climate station used a total precipitation gauge able to measure both snowfall and rainfall; however, there were significant data gaps at different periods between October 2011 and March 2012, December 2012 to March 2013, and December 2013 to March 2014. Some of these gaps were likely due to a snow cap forming and blocking the gauge orifice and others due to freezing of the gauge which produced erroneous results. From the available 2012 and 2013 data, the total annual precipitation was over 941 and 837 mm, respectively. The maximum daily precipitation recorded from either station was 34 mm in both June 2012 and June 2013. It is estimated that approximately 40% of the annual precipitation fell as rain and the remaining 60% fell as snow.

The 2012 and 2013 month-by-month precipitation recorded at the KPL station were highly variable compared to the normal seasonal precipitation trends for the Project region, as discussed in Section 4.5.1. The EC *Climate Trends and Variations Bulletin* (EC 2014b) reported that in 2013 the regional area of southeast BC experienced a wetter than usual fall and spring, a drier summer and an average 2012/2013 winter season.

Figure 4.5-1

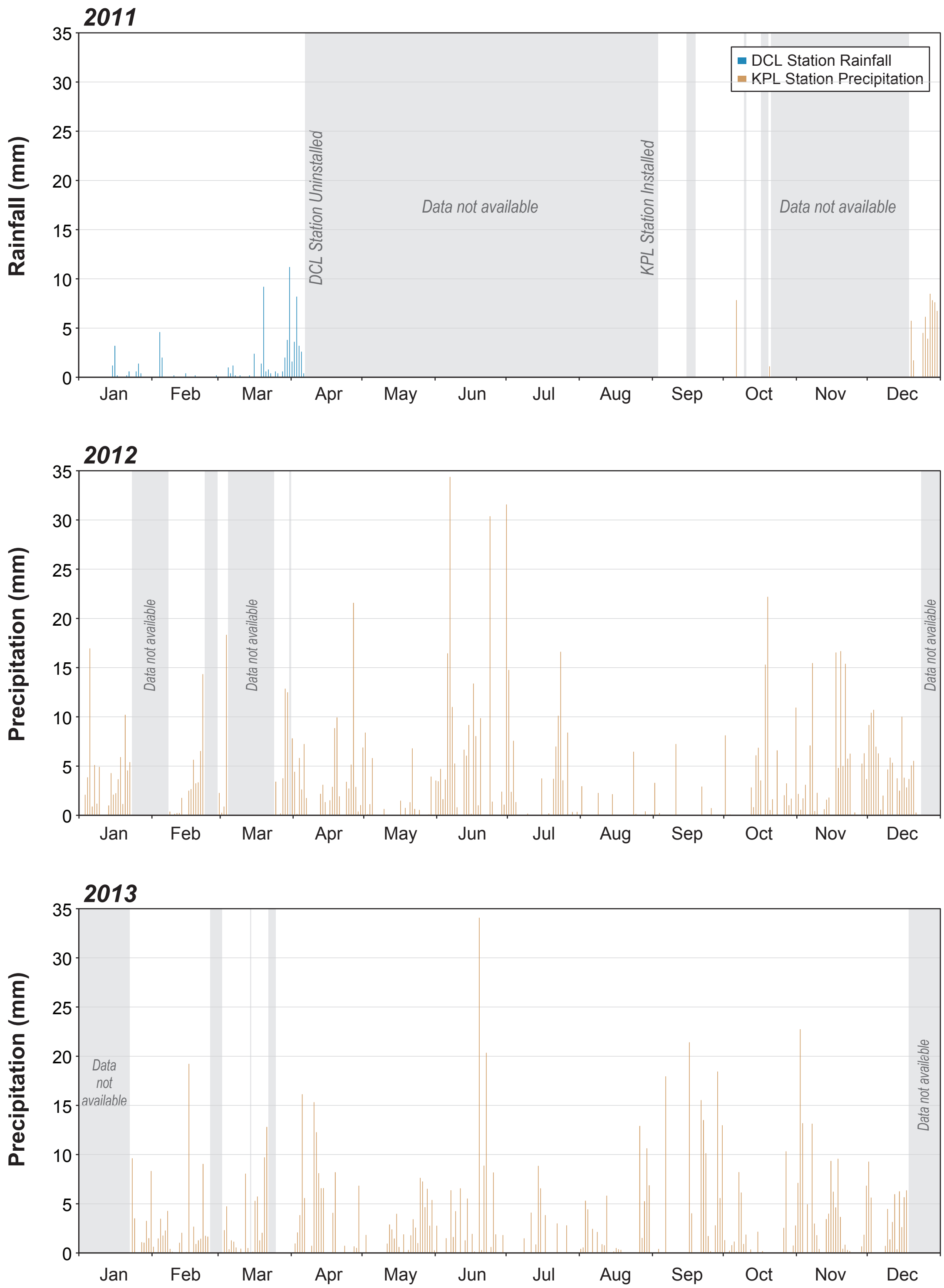
Daily Rainfall, 2008 to 2010



Notes: Data up to April 6, 2011 from DCL Station.
Data after Sept 1, 2011 from KPL Station.
DCL Station Data Source: Knight Piésold (2013).
Grey areas indicate periods of missing data.

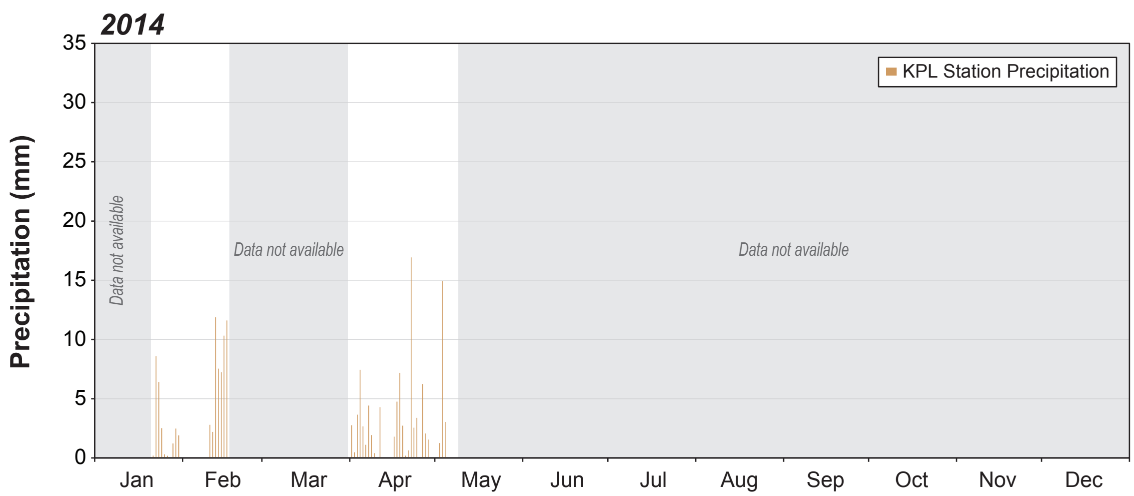
Figure 4.5-2

Daily Precipitation, 2011 to 2013



Notes: Data up to April 6, 2011 from DCL Station.
Data after Sept 1, 2011 from KPL Station.
DCL Station Data Source: Knight Piésold (2013).
Grey areas indicate periods of missing data.

Figure 4.5-3
Daily Precipitation, 2014



Notes: Data up to April 6, 2011 from DCL Station.
Data after Sept 1, 2011 from KPL Station.
DCL Station Data Source: Knight Piésold (2013).
Grey areas indicate periods of missing data.

Table 4.5-3. Precipitation at the KPL Station

Year	Type	Precipitation (mm)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2011	Rainfall	-	-	-	-	-	-	-	-	0.0[a]	7.9[c]	- [f]	0.0	-
	Snowfall	-	-	-	-	-	-	-	-	0.0[a]	1.0[c]	- [f]	52.7[d]	-
	Precip.	-	-	-	-	-	-	-	-	0.0[a]	9.0[c]	- [f]	52.7[d]	-
2012	Rainfall	0.0	0.0	0.1[e]	30.0	17.4	158.6	80.4	14.6	7.6	30.7	2.9	0.0	342.2[g]
	Snowfall	75.6[b]	43.4[c]	60.0[e]	68.0	17.9	44.1	0.0	0.0	7.0	63.1	120.0	99.6[b]	598.6[g]
	Precip.	75.6[b]	43.4[c]	60.1[e]	97.9	35.3	202.7	80.4	14.6	14.6	93.8	122.9	99.6[b]	940.8[g]
2013	Rainfall	0.0	0.0	0.0[b]	2.9	47.7	108.4	31.6	61.5	77.1	10.8	0.0	0.0	340.1
	Snowfall	28.5[e]	55.8[a]	56.5[b]	96.5	11.9	0.0	0.0	0.0	47.6	29.3	118.6	51.9[c]	496.5[g]
	Precip.	28.5[e]	55.8[a]	56.5[b]	99.3	59.7	108.4	31.6	61.5	124.8	40.0	118.6	51.9[c]	836.6[g]
2014	Rainfall	0.9[d]	0.0	- [f]	1.5	1.3	-	-	-	-	-	-	-	-
	Snowfall	22.9[d]	53.6[c]	- [f]	77.8	18.0	-	-	-	-	-	-	-	-
	Precip.	23.8[d]	53.6[c]	- [f]	79.3	19.2	-	-	-	-	-	-	-	-
Mean	Rainfall	0.0	0.0	0.0	11.4	32.6	133.5	56.0	38.1	28.2	20.7	1.5	0.0	322.0
	Snowfall	-	55.8	56.5	80.7	14.9	22.1	0.0	0.0	18.2	46.2	119.3	-	-
	Precip.	-	55.8	56.5	92.2	47.5	155.6	56.0	38.1	46.5	66.9	120.7	-	-
Long-term	Rainfall	3.4	1.8	6.2	29.9	78.6	122.6	94.2	83.7	61.6	42.6	11.6	1.8	538.0
	Snowfall	52.4	30.1	42.4	27.5	12.3	1.6	0.0	0.0	1.3	19.4	59.2	68.1	314.3
	Precip.	55.8	32.1	48.4	57.4	90.9	124.1	94.2	83.7	62.9	61.8	70.7	69.9	851.8

Notes:
Station elevation: 1,837 masl.
See Section 3.2.3 for calculation methodology.
[a] *Missing 1 to 5 days of data.*
[b] *Missing 6 to 10 days of data. May not have been included in mean calculations.*
[c] *Missing 11 to 15 days of data. Not included in mean calculations.*
[d] *Missing 16 to 20 days of data. Not included in mean calculations.*
[e] *Missing 21 to 25 days of data. Not included in mean calculations.*
[f] *Missing 26 to 31 days of data. Not included in mean calculations.*
[g] *Annual totals based on incomplete data. Actual totals are higher than reported.*

The long-term monthly precipitation for the KPL station was calculated using the methodology discussed in Section 3.2.3. On average, it is estimated that this station will experience 852 mm per year, with the wettest months being June (124 mm) and July (94 mm), and the driest months being February (32 mm) and March (48 mm). Contrary to the recorded 2012 and 2013 precipitation, long-term rainfall was estimated to make up 63% of the annual average precipitation, with snowfall contributing 37%. This difference can be partially attributed to the wetter than usual spring and fall in 2012 and 2013.

The estimates of mean annual rainfall, snowfall and precipitation are believed to reasonably represent actual conditions at the Project Site. However, their derivation involved some extrapolation and approximation because the Project Site is at a much higher elevation than any of the regional climate stations.

4.5.3 Extreme Precipitation

Table 4.5-4 summarizes the estimated 24-hour extreme precipitation values for various return periods at an elevation near 1,680 masl on the Project Site. The maximum 24-hour precipitation for 10, 50, and 200 year return periods were estimated to be 53 mm, 69 mm, and 82 mm, respectively. Based on information in the *Rainfall Frequency Atlas for Canada* (Hogg and Carr 1985), an SCS Type 1 rainfall distribution is appropriate for modelling the 24-hour distribution of these extreme events.

Table 4.5-4. Estimated Project Site 24-Hour Extreme Rainfall Return Period Values

Return Period (years)	Gumbel Distribution Frequency Factor	24-Hour Extreme Event (mm)
2	-0.164	35
5	0.719	46
10	1.305	53
15	1.635	57
20	1.866	60
25	2.044	62
50	2.592	69
100	3.137	75
200	3.679	82
500	4.395	91
1,000	4.936	97
PMP	-	300

Notes:
Mean = 37 mm.
Standard Deviation = 12 mm.
See Section 3.2.3 for calculation methodology.
Source: Knight Piésold (2013).

The 24-hour probable maximum precipitation (PMP) value is given as 300 mm. There is considerable uncertainty associated with this value, which was initially calculated to be 250 mm using the standard Hershfield equation, as outlined in the *Rainfall Frequency Atlas for Canada*. However, it was increased to 300 mm to be more consistent with values published in a study conducted for BC Hydro on PMP values for British Columbia, which utilized the well-known PRISM climatic modelling software developed by Oregon State University (Taylor and Daly 2004). It should be noted that this is a 24-hour value and that longer duration values, such as a 72-hour PMP, may be more appropriate for design purposes, depending on the design details. Very little information is available for long duration events, but reasonable approximations can be obtained using a duration scaling exponent of 0.5, which is based on a global maximum observed rainfall value (Linsely, Kohler and Paulhus 1982). To translate 24 hour extremes to 72 hour extremes this scaling exponent indicates a multiplication factor of approximately 1.7. Applying this factor to the 24 hour PMP value of 300 mm results in an associated 72 hour PMP value of 510 mm.

4.6 SNOW DEPTH

Automated snow depth measurements began with the installation of the KPL station in September 2011. Mean monthly snow depths are summarized in Table 4.6-1 and mean daily snow depths for the available 2011 to 2014 record are presented in Figure 4.6-1.

Table 4.6-1. Mean Snow Depth at the KPL Station

Year	Mean Snow Depth (m)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	-	-	-	-	-	-	-	-	0.00[a]	0.03	0.44	0.67
2012	1.00	1.18	1.45	1.44	0.89	0.09	0.00	0.00	0.00	0.07	0.31	0.85
2013	1.05	1.25	1.47	1.47	0.73	0.01	0.00	0.00	0.00	0.02	0.45	0.68
2014	1.00	1.16	1.43	1.53	1.36[b]							
Mean	1.01	1.20	1.45	1.48	0.81	0.05	0.00	0.00	0.00	0.04	0.40	0.73

Notes:
Station elevation: 1,837 masl.
[a] *Missing one day of data.*
[b] *Missing 23 days of data. Not included in mean calculation.*

From the available data, snow generally starts to accumulate in late October and peaks in April. In 2012, 2013 and 2014, the snow depth peaked at approximately 1.7 m in April. On average, rapid melting begins in late April or early May, and the snowpack is fully melted by early June.

Figure 4.6-1
Mean Daily Snow Depth, 2011 to 2014

ERM

Note: Data from KPL Station.

5. CONCLUSIONS

This report presents all meteorological results for the locations of the DCL and KPL stations in the baseline meteorological study area. The key findings of this study are:

- The long-term mean annual temperature is estimated to be 0.7ºC at the DCL station (1,680 masl), and 0.2ºC at the KPL station (1,837 masl). Long-term monthly mean temperatures range from 10.3ºC in July to -9.8ºC in January.
- From the available Project station data, the lowest hourly temperature was -35.2ºC in January 2012 and the highest was 27.4ºC in July 2009.
- Winds predominantly blow from the southeast and south-southeast during all seasons.
- Mean annual wind speeds were 1.6 m/s at the DCL station (3 m anemometer height), and 2.3 m/s at the KPL station (10 m anemometer height). Wind speeds are generally faster and have greater deviation during the winter than during the summer.
- The mean annual relative humidity is approximately 75% at both stations. Summer months are less humid (mean monthly value of 50-80%) and winter months are more humid (mean monthly value of 70-90%).
- The long-term mean annual potential evapotranspiration is estimated to be 466 mm at the DCL station and 430 mm at the KPL station.
- The available 2012 precipitation totalled 941 mm (missing 52 days of data throughout the year), and the available 2013 precipitation totalled 837 mm (missing 47 days of data throughout the year).
- The long-term mean annual precipitation is estimated to be 852 mm, with approximately 40% falling as snow and 60% falling as rain.
- The maximum daily precipitation recorded from either station was 34 mm in June 2012 and 2013. The 24-hour precipitation for 10, 50, and 200 year return periods were estimated to be 53 mm, 69 mm, and 82 mm, respectively. The 24-hour PMP value was estimated to be 300 mm.
- Snow generally starts to accumulate in late October, peaking in April, rapidly melting in late April or early May and fully melting by early June. In 2012, 2013 and 2014, snow depth peaked at approximately 1.7 m in April.

Adjustments may be required to apply these findings to locations outside the study area due to differences in elevation and topographic features which greatly influence local meteorology.

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Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

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