Appendix V4-1A

Back River Project: 2011-2013 Air Quality Baseline Report

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
2011-2013 Air Quality Baseline Report







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February 2014

BACK RIVER PROJECT
2011-2013 AIR QUALITY BASELINE REPORT

February 2014
Project #0194096-0008

Citation:
Rescan. 2014. *Back River Project: 2011-2013 Air Quality Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company.

Prepared for:

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Executive Summary

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Executive Summary

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut. This report presents the results of the air quality monitoring program developed to support the air quality portions of the draft Environmental Impact Statement (DEIS; Volume 4, Atmospheric Environment; Rescan 2013).

The overall objective of the air quality monitoring program was to provide required baseline information for the DEIS and to provide information for the air quality portions of the DEIS. The monitoring results were also used as a baseline for the air quality model used in the DEIS (Volume 4, Appendix V4-1B; Rescan 2013). In addition to presenting results from the 2013 air quality and dust baseline program, results from the 2011 and 2012 air quality baseline programs are also included in this report (Rescan 2012a, 2012b).

The 2013 air quality baseline program included dustfall monitoring at three locations within the Goose Property, one location within the George Property, one location in the MLA and two locations along the route of the proposed winter road, from May 29 to September 13. Also included in the 2013 program were passive air sampling stations (PASS) to measure nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and ozone (O_3), with stations within the George Property, the Goose Property, the MLA and along the route of the proposed winter road. The 2013 baseline program was expanded to include particulate monitoring, with stations located at the George Property, Goose Property, MLA and along the route of the proposed winter road.

The 2012 air quality baseline program included the Goose Property, the George Property and MLA. Dustfall levels were measured at four locations within the Goose Property, one location within the George Property and one location in the MLA from June 17 to September 17. Also included in the 2012 program was the measurement of NO_2, SO_2, and O_3, with one station within each of the three geographical areas (George Property, Goose Property and MLA) of the Project. The 2011 air quality baseline program focused on the Goose Property only, and included five dustfall stations and one PASS. The 2011 dustfall and PASS stations were installed on May 24 and monitored monthly until September 18.

Dustfall analyses included particulates (total, soluble and insoluble), anions (sulphate, nitrate, chloride and ammonia), total metals and various cations. In 2013, the maximum dustfall deposition rate of 1.67 mg/dm^2/day was observed in August within the George Property. In 2012 and 2011, the maximum dustfall deposition rates of 0.57 and 1.13 mg/dm^2/day, respectively were observed. Both values occurred in July within the Goose Property. All dustfall results measured were below the most stringent objective of 1.7 mg/dm^2/day.

Anions of nitrate and sulphate were analyzed from the dustfall samples in order to calculate acid deposition. The highest mean acid deposition rate observed in 2013 was 85 eq/hq/yr located within the Goose Property. The highest mean acid deposition rate observed in 2012 was 45 eq/ha/yr located within the George Property, while the highest mean acid deposition rate observed in 2011 was 291 eq/ha/yr. The average acid deposition results in 2013 were all below the WHO guideline value of 250 eq/hq/yr. The average results were also well below the objective in 2012, however, in 2011 the average results from one site at Goose exceeded the objective.

Dustfall samples were also analyzed for metals. Since the Project area has limited anthropogenic emission sources, most of the metal deposition levels analyzed were below detection limits. The reported metal deposition rates are predominantly the result of natural sources in the area.

The passive sampling of NO_2, SO_2, and O_3 was conducted monthly from June to September 2013. The 2013 maximum average 30-day O_3 concentration was 60.7 µg/m^3, measured within the George Property. In 2011 and 2012, the highest O_3 concentrations were 54.6 µg/m^3 and 55.1 µg/m^3, measured within the Goose Property and MLA, respectively. These values are all within the Health Canada range (49 to 78 µg/m^3); however, they are above the national annual objective (30 µg/m^3). This reflects natural levels in remote locations, which are expected to be higher than the national objective. All ambient concentrations of NO_2 and SO_2 were found to be a small percentage of the corresponding federal and territorial air quality objectives.

Twenty four hour particulate monitoring of TSP, PM_{10} and $PM_{2.5}$ was conducted in May and June 2013. At the George Property Area the PM_{10} results were below the detection limit (2.1 µg/m^3) during both monitoring periods (May and June). The $PM_{2.5}$ results were below the detection limit (2.1 µg/m^3) on May 27 and 2.9 µg/m^3 on May 28. At the Goose Property Area the TSP and $PM_{2.5}$ results were both below the detection limit (2.1 µg/m^3). The results are all well below the objectives.

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Acronyms and Abbreviations

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Acronyms 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.

AENV	Alberta Environment
BDL	Below Detection Limit
CCME	Canadian Council of Ministers of the Environment
Critical acid load	Amount of acid deposition a particular region can receive without being adversely affected
EC	Environment Canada
eq/ha/yr	Total acidity equivalency per hectare per year
kg/ha/yr	Kilograms per hectare per year
mg/dm^2/day	Milligrams per square decimetre per day
MLA	Marine Laydown Area
O_3	Ozone
NO_X	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
PASS	Passive Air Sampling System
$PM_{2.5}$	Particulate Matter 2.5 micrometers in diameter or smaller
PM_{10}	Particulate Matter 10 micrometers in diameter or smaller
ppb	Parts per billion
SO_2	Sulphur Dioxide
TSP	Total Suspended Particulate
µg/m^3	Microgram per cubic metre

1. Introduction

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut (Figure 1-1). This report presents the results of the air quality monitoring program developed to support the air quality portions of the draft Environmental Impact Statement (DEIS; Volume 4, Atmospheric Environment; Rescan 2013).

The overall objective of the air quality monitoring program was to provide required baseline information for the DEIS and to provide information for the air quality portions of the DEIS. The monitoring results were used as a baseline for the air quality model used in the DEIS (Volume 4, Appendix V4-1B; Rescan 2013). In addition to presenting results from the 2013 air quality and dust baseline program, results from the 2011 and 2012 air quality baseline programs are also included in this report (Rescan 2012a, 2012b).

The 2013 program was conducted from May to September of 2013 and included dustfall, Passive Air Sampling System (PASS) and particulate monitoring.

This report details the methodology used in the development of the air quality monitoring program and a comparison of the results to relevant legislation and guidelines. Chapter 2 of this report presents the relevant legislation, Chapter 3 provides information on the study area, Chapter 4 presents the methods, Chapter 5 presents the results, and Chapter 6 provides a summary. All raw data obtained from the laboratories are included as appendices to this report.

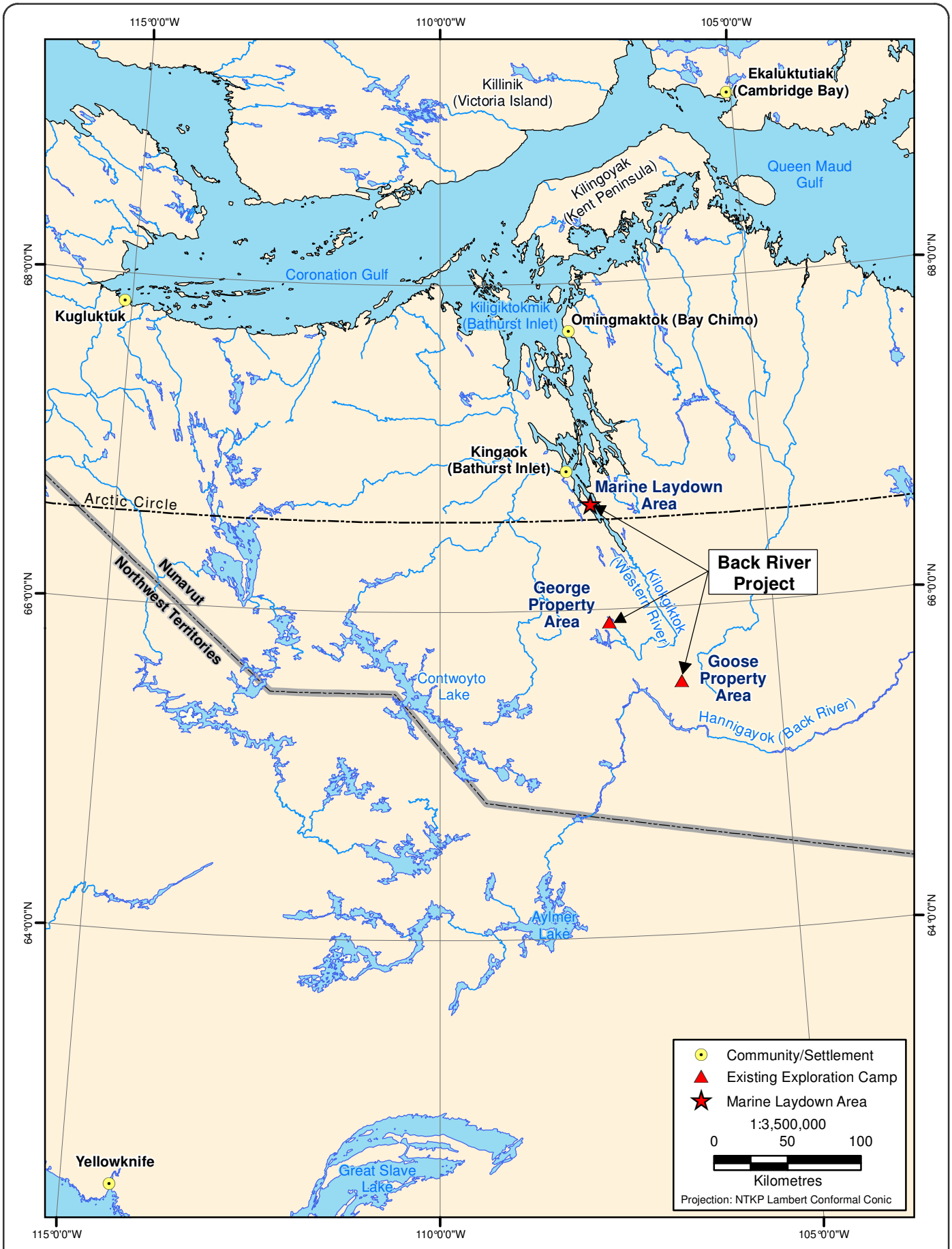


Figure 1-1

Back River Project Location

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2. Air Quality Standards, Objectives, and Guidelines

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2. Air Quality Standards, Objectives, and Guidelines

The following section describes the legislation associated with the dustfall, ambient air quality and particulate monitoring.

2.1 DUSTFALL

2.1.1 Total Dustfall

There are no air quality standards for dustfall in Nunavut, however, there are objectives and guidelines for dustfall in other jurisdictions. Table 2.1-1 shows the dustfall criteria in these jurisdictions to provide context for dustfall results. The most stringent dustfall criterion is the acceptable limit in BC which ranges from 1.7 to 2.9 mg/dm^2/day (BC MOE 1979).

Table 2.1-1. Existing Dustfall Criteria

Jurisdiction	Criteria (mg/dm^2/day)	Notes
Alberta	1.75	Residential and recreation areas
	2.25	Commercial and industrial areas
British Columbia	1.7 to 2.9	-
Ontario	2.3	-
Saskatchewan	6.67	-

2.1.2 Acid Deposition

Acid deposition is the end product of the reaction between sulphur oxides (SO_X), nitrogen oxides (NO_X) and water in the atmosphere. These compounds can be converted to sulphuric acid and nitric acid by reacting with oxygen and water in the air. Acid deposition occurs when these acid-forming pollutants are deposited on the earth's surface. Acid deposition critical load is a quantitative estimate of an exposure to one or more acid generating pollutants below which significant harmful effects on specific sensitive elements of the environment do not occur according to present knowledge.

There are also no air quality standards for acid deposition in Nunavut; however critical loads of acid deposition proposed by the World Health Organization (WHO; 2000) range from less than 250 eq/ha/year to more than 1,500 eq/ha/year, dependent on soil type. The Goose and George properties are dominated by shallow, acidic morainal and glaciofluvial deposits, characterized by variable, but predominantly coarse to medium textures. Since coarse deposits are more susceptible to acidification, a more conservative critical load value associated with this texture was chosen for the assessment of the effects of acidic deposition on local soils. The critical load guideline for acidic deposition recommended by the WHO for acidic, coarse parent materials is below 250 eq/ha/year (WHO 2000).

2.1.3 Metals

There are currently no specific criteria for total metals in environmental dustfall. The atmospheric metal levels are generally low; however, they tend to contribute to the deposition in soils. Heavy metals are persistent in the environment and are subject to bioaccumulation in food-chains. Therefore, metal deposition results are often analyzed further for wildlife, country foods and human health assessments.

2.2 PASS — NO_2, SO_2, AND O_3

Territorial and federal objectives and standards for ambient concentrations of NO_2, SO_2, and O_3, summarized in Table 2.2-1. Time averaging periods associated with these objectives and standards range from hourly to annual. Since the sampling methods used for PASS and dustfall require collection over 30 days, criteria with 30-day averaging period will allow direct comparison of the baseline condition to regulatory criteria. There are, however, currently no 30-day criteria for NO_2, SO_2, and O_3; however, Alberta Environment (AENV) has recently published a 30-day average objective of 30 µg/m^3 for SO_2 (Government of Alberta 2011). This objective was established for monitoring purposes, specifically for passive monitoring, allowing direct comparison of the results obtained from PASS to the objective. The 30-day average SO_2 objective was not established based on values for human health or ecosystems.

Table 2.2-1. Federal, Provincial, and Territorial Ambient Air Quality Standards and Objectives

Parameter	Averaging Period	Nunavut Ambient Air Quality Standards[a]	National Ambient Air Quality Objectives[b]	
			Maximum Desirable	Maximum Acceptable
Sulphur dioxide (SO_2) (µg/m^3)	1-hour	450	450	900
	24-hour	150	150	300
	annual	30	30	60
Nitrogen dioxide (NO_2) (µg/m^3)	1-hour	400	-	400
	24-hour	200	-	200
	Annual	60	60	100
Ozone (O_3) (µg/m^3)	1-hour	-	100	160
	8-hour	-	-	130 (65 ppb)
	24-hour	-	30	50
	Annual	-	-	30

Note: dash (-) indicates standards/objective not available.
[a] *Government of Nunavut (2011)*
[b] *Environment Canada (1999)*

Ozone is a secondary pollutant that is produced by nitrogen oxides (NO_X) and volatile organic compounds reacting in sunlight and stagnant air. Since it is a secondary pollutant, it is difficult to identify the source of emission and ozone standards across the world are fairly inconsistent. The purpose of ozone monitoring is typically not to be compared to the standard, but to obtain background ozone concentrations for estimation of NO_2 ambient concentrations from NO_X if the ozone limiting method is required. Health Canada states the monthly 1-hour O_3 averages between May to September should be in the range of 49 to 78 µg/m^3 (25 to 40 ppb) when the source is away from anthropogenic influence (Health Canada 1999).

2.3 PARTICULATE — TSP, PM_{10}, AND $PM_{2.5}$

Territorial and federal objectives and standards for ambient concentrations of TSP, PM_{10} and $PM_{2.5}$, are summarized in Table 2.3-1. Time averaging periods associated with these objective and standards range from hourly to annual.

Table 2.3-1. Federal, Provincial, and Territorial Ambient Air Quality Standards and Objectives

Parameter	Averaging Period	Nunavut Ambient Air Quality Standards[a]	Air Quality Criteria from Other Jurisdictions	National Ambient Air Quality Objectives[b]	
				Maximum Desirable	Maximum Acceptable
Total suspended particulate (TSP) ($\mu g/m^3$)	24-hour	120	-	-	120
	Annual[c]	60	-	60	70
PM_{10} ($\mu g/m^3$)	24-hour	-	50[d]	-	-
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	30[e]	-	28[e,f]	
	Annual	-	-	10[f,g]	

Note: Dash (-) indicates standards/objective not available.
[a] *Government of Nunavut (2011).*
[b] *Environment Canada (1999).*
[c] *Geometric mean: the average of the logarithmic values of a data set converted back to a base 10 number.*
[d] *BC MOE (2009).*
[e] *The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.*
[f] *Canada Ambient Air Quality Standard which will be in effect in 2015.*
[g] *The 3-year average of the annual average concentrations.*

3. Methodology

3. Methodology

The following section describes the methodology associated with the dustfall, PASS and particulate monitoring. The locations of the dustfall, PASS and particulate monitoring stations are presented in Table 3-1 and shown in Figure 3-1.

Table 3-1. Summary of Air Quality Monitoring Stations (2011–2013)

Name	Location	Monitoring Period[a]	UTM Easting (m)	UTM Northing (m)	Elevation (masl)
DF1/PASS	Goose	Jun - Sep 2011	430,196	7,269,720	331
DF2	Goose	Jun - Sep 2011	427,102	7,274,061	328
DF3	Goose	Jun - Sep 2011	425,746	7,270,497	331
DF4	Goose	Jun - Sep 2011	433,520	7,267,493	332
DF5	Goose	Jun - Sep 2011	434,978	7,265,614	330
DF6	Goose	Jun - Aug 2012	422,556	7,267,276	329
DF7	Goose	Jun - Aug 2012	431,148	7,264,126	338
DF8	Goose	Jun - Aug 2012	429,317	7,272,209	338
DF8 (2013)[b]	Goose	Jun - Sep 2013	428,881	7,273,107	318
DF9/PASS1[c]/Particulate1[d]	Goose	Jun - Aug 2012 Jun - Sep 2013	442,827	7,259,270	322
DF10/PASS2/Particulate3[d]	George	Jun - Aug 2012 Jun - Sep 2013	388,217	7,313,131	337
DF11/PASS3/Particulate4[d]	MLA	Jun - Aug 2012 Jul - Sep 2013	381,087	7,393,661	51
DF11/PASS3 (June 2013)[e]	MLA	Jun 2013	388,579	7,382,197	51
DF12/Particulate2	Winter Road	Jun - Sep 2013	400,530	7,299,923	327
DF13	Winter Road	Jun - Sep 2013	415,069	7,280,000	323

Note: Geodetic network used is North American Datum developed in 1983 (NAD 83) Zone 13.
[a] The 2011 sampling period ran from May 24 to September 18; the 2012 sampling period ran from June 17 to September 17; the 2013 sampling period ran from May 29 to September 13.
[b] DF8 was relocated 1.5 km northwest in 2013.
[c] PASS1 was not installed until July 7, 2012.
[d] Particulate sampling was monitored in May and June 2013 only.
[e] The location of the proposed MLA was revised in June 2013 and therefore the site was relocated. The site returned to the original location in July.

3.1 STUDY AREA

Air quality monitoring was carried out within two air quality study areas, a Local Study Area (LSA) and a Regional Study Area (RSA; Figure 3-1). The boundaries of the LSA were set to encompass the area around each of the Goose and George Potential Development Areas (PDAs), with boundaries of approximately 10 km in all directions from infrastructure, and also a smaller LSA around the MLA.

Comprehensive baseline field programs began in 2011 and initially focused on the Goose Property Area. In 2012 they were expanded to include the George Property Area and the MLA. For 2013, the baseline program was designed around potential infrastructure and known deposits at the Goose Property, the George Property, and the MLA.

3.2 DUSTFALL

As part of the 2013 ambient air quality baseline program, monthly dustfall measurements were collected at three locations within the Goose Property, one location within the George Property, one location in the MLA and two sites along the routes of the proposed winter roads. Monitoring was carried out from May to September.

The 2012 monitoring program included monthly dustfall measurements collected at four locations within the Goose Property, one location within the George Property and one location in the MLA, from June to September. The 2011 monitoring included monthly dustfall measurements collected at five locations within the Goose Property from May to September.

3.2.1 Dustfall Study Area and Site Selection

The 2013 baseline dustfall monitoring network, shown in Figure 3-1, was developed based on the potential infrastructure. Monitoring stations were located at the George Property and Goose Property in close proximity to proposed open pits, the proposed MLA and two sites along the proposed winter roads.

The 2012 baseline air quality monitoring network was developed based on the potential infrastructure locations available in early 2012, which included the George Property and Goose Property deposits, the proposed tailings impoundment area, proposed site infrastructure and the proposed MLA. The currently proposed route of the TCWR Winter Road Connector crosses the 2012 DF6 dustfall site.

The 2011 air quality monitoring network was developed based on the location of the deposits at the Goose Property. The predominant wind direction in the Project area is from the north to northwest sector (Rescan 2011). The dustfall station locations, shown in Figure 3-1, were selected to be located upwind (DF2), in close proximity of (DF1), and downwind (DF4 and DF5) of the deposits. One station was located off the upwind-downwind axis and could act as a potential baseline (DF3) station.

Current exploration activities were considered during the site selection process. There are no local sources of air pollutants within the immediate vicinities of the stations. The dustfall monitoring stations were in open areas that are free of structures higher than 1 m within a 20 m radius of the collection container.

3.2.2 Monitoring Method

The dustfall monitoring program was developed in accordance with sampling method ASTM D1739-98 (ASTM Standard D1739-98 Reapproved 2010). The dustfall monitoring stations collect particles small enough to pass through a 1 mm stainless steel sieve and large enough to settle by virtue of weight. The containers used are open-topped cylinders not less than 150 mm in diameter placed at the top of the stands at a height of 2 m above ground. The containers are partially filled with deionized water and algaecide to prevent re-suspension of dust and growth of algae in the containers.

The containers were installed on 2 m poles, surrounded by a windscreen and bird spikes. The wind screen improves the dustfall collection efficiency, and bird spikes are used to minimize contaminants from bird faeces. Sample containers were exposed to the atmosphere for approximately 30 days, after which they were sent to the laboratory for analysis. Each dustfall station was comprised of two sample containers with separate mounts (Plate 3.1-1). One of the containers was analyzed for particulates (total, soluble and insoluble) and anions (sulphate, nitrate, chloride and ammonia), while the other was analyzed for total metals and various cations. The dustfall stations were serviced on a monthly basis and the samples were sent to the Burnaby ALS Laboratory for analysis following each sampling period.

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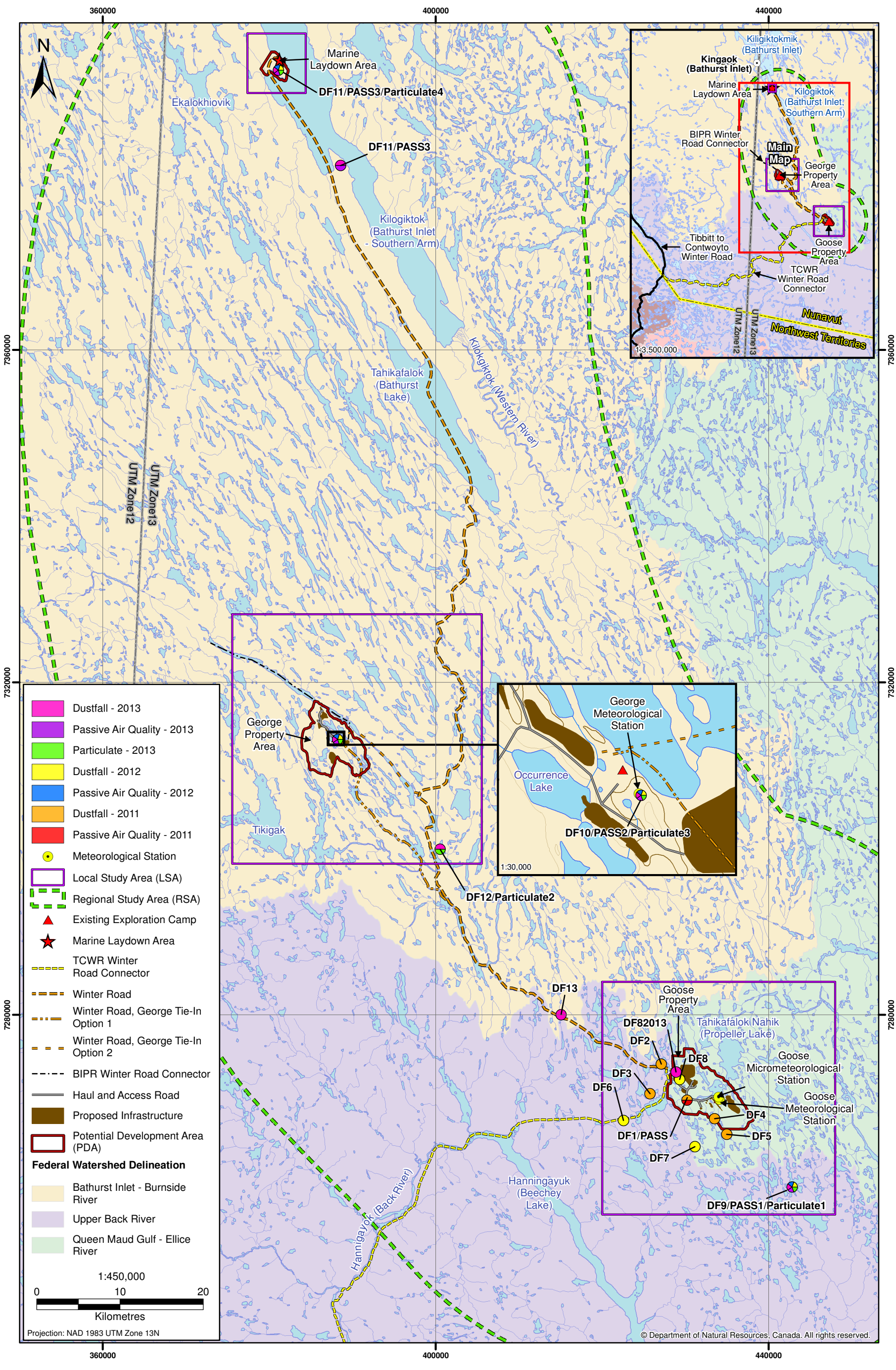


Figure 3-1

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Locations of Dustfall, Particulate, and Passive Air Quality (SO_2, NO_2 and O_3) Stations, 2011 to 2013

Figure 3-1

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Plate 3.1-1. Dustfall station, DF11, located at the MLA. The passive air sampling system shelter, for PASS3, can be seen on the left stand (June 2013).

3.3 PASS

3.3.1 Site Selection

In 2012 and 2013, PASS stations were installed at three dustfall monitoring stations in the three geographical areas of the Project (Table 3-1; Figure 3-1). DF9/PASS1 was located within the Goose Property area approximately 13 km to the southwest of the existing Goose exploration camp. DF10/PASS2 was located within the George Property next to the George Meteorological Station. DF11/PASS3 was installed within the proposed MLA along the southeast shoreline of Bathurst Inlet (Figure 3-1). The location of the proposed MLA was revised in June 2013 and therefore DF11/PASS3 was relocated for the July sampling period. In 2011, two PASS stations were installed at the dustfall monitoring station (DF1) located central to the known deposits within the Goose Property (Figure 3-1).

3.3.2 Monitoring Method

PASS is a diffusive method which monitors gas or vapour pollutants in the atmosphere at a rate controlled by a physical process such as diffusion through a static air layer or permeation through a membrane, which does not involve the active movement of air through the sampler (Tang 2001). The number of days of contact between the ambient air and the permeation membrane is important and local meteorological conditions are also used in the calculations. The meteorological parameters that are used in the PASS calculations are temperature, wind speed and relative humidity. Meteorological conditions from the regional Yellowknife Airport station operated by EC were used by the laboratory for all years.

The PASS filters were protected from rain by small enclosures. Plate 3.2-1 provides a close-up view of one of the samplers. The three PASS samples were serviced on a monthly basis from June to September and the samples were sent to Maxxam Analytical Laboratory for analysis following each sampling period.



Plate 3.2-1. Close-up view of PASS3 (May 2013).

3.4 PARTICULATE

3.4.1 Site Selection

The particulate samplers were installed at four dustfall monitoring stations (Table 3-1; Figure 3-1). DF9/PASS1/Particulate1 was located within the Goose Property area approximately 13 km to the southwest of the existing Goose exploration camp. DF12/Particulate2 was located adjacent to the proposed winter road location in the George LSA. DF10/PASS2/Particulate3 was located within the George Property next to the George Meteorological Station. DF11/PASS3/Particulate4 was installed within the proposed MLA along the southeast shoreline of Bathurst Inlet.

3.4.2 Monitoring Method

Particulate sampling was carried out using a BGI PQ100-FRM sampler (Plate 3.4-1). Particulate2 and Particulate3 were sampled over a 24-hour period on May 27 and 28, and each location was sampled for PM_{10} and $PM_{2.5}$. Particulate1 and Particulate4 were sampled over a 24-hour period on June 24 and 25 and each location was sampled for $PM_{2.5}$ and TSP.

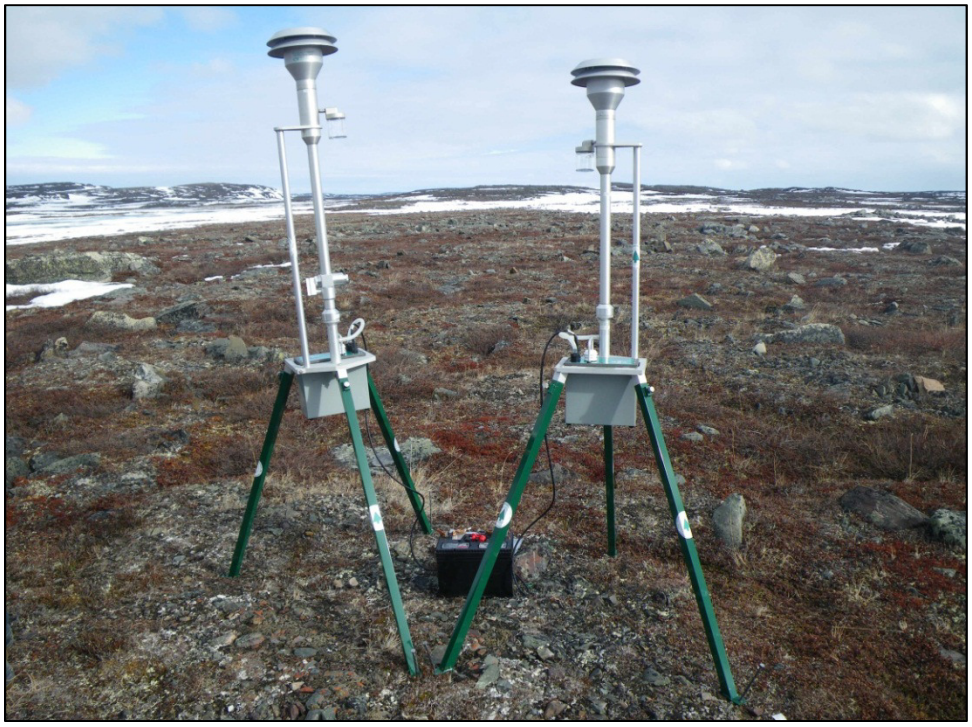


Plate 3.3-1. Particulate monitor, Particulate2, located along the proposed winter road route (May 2013).

4. Results

4. Results

The following section presents results from the 2013 air quality baseline program for dustfall and ambient air quality, along with the results from the 2012 and 2011 programs. 2012 data have been previously reported in *Back River Project: 2011-2012 Air Quality Baseline Report* (Rescan 2012b). 2011 data have been previously reported in *Back River Project: 2011 Air Quality Baseline Report* (Rescan 2012a).

4.1 DUSTFALL

4.1.1 Total Dustfall

Dustfall results for 2011 to 2013 are summarized in Table 4.1-1 and Figure 4.1-1. The monthly dustfall results in 2013 ranged from less than 0.14 to 1.67 mg/dm^2/day. In 2012, the monthly values ranged from less than 0.10 to 0.57 mg/dm^2/day and in 2011 the results ranged from ranged from less than 0.10 to 1.13 mg/dm^2/day. The highest monthly dustfall level in 2013 occurred in August at DF10 in the George Property. In 2012 and 2011 the highest dustfall result occurred in July at in the Goose Property, at DF7 and DF3 respectively (Rescan 2012b). All the dustfall results measured were below the most stringent objective of 1.7 mg/dm^2/day.

4.1.2 Acid Deposition

Sulphur oxides (SO_x) and nitrogen oxides (NO_x) can be converted to sulphuric acid and nitric acid by reacting with oxygen and water in the air. Acid deposition occurs when these acid-forming pollutants are deposited on the earth's surface.

Anions of nitrate and sulphate were analyzed from the dustfall samples and presented in Tables 4.1-2 and 4.1-3. The unit conversion factors used to calculate charge equivalency were obtained from the 2004 Canadian Acid Deposition Science Assessment (EC 2004).

The acid deposition rates are presented in Table 4.1-4 and Figure 4.1-2. The monthly acid deposition results in 2013 ranged from 49 to 85 eq/hq/yr. In 2012, the average values ranged from 36 to 45 eq/hq/yr and in 2011 the results ranged from ranged from 76 to 291 eq/hq/yr. The highest monthly acid deposition in 2013 occurred in August at DF8 in the Goose Property (110 eq/hq/yr). In 2012 the highest dustfall result occurred in August at the George Property (58 eq/hq/yr), and in 2011 the highest dustfall result occurred in July at the Goose Property (698 eq/hq/yr; Rescan 2012b). The average acid deposition results in 2013 were all below the WHO guideline value of 250 eq/hq/yr. The average results were also well below the objective in 2012, however, in 2011 the average results from one site at Goose (DF1), exceeded the objective. This was due to one unexpectedly large value which occurred in July (698 eq/hq/yr). It is unclear why this value is significantly higher than all other values.

4.1.3 Metal Deposition

Heavy metals such as cadmium, lead and mercury are common air pollutants typically emitted from industrial activities, traffic and energy production. Although the atmospheric levels are low, they tend to contribute to the deposition in soils. Heavy metals are persistent in the environment and are subject to bioaccumulation in food-chains. Since there are currently no significant anthropogenic sources in The Project area, the metal deposition results are predominantly from natural emissions and most results were below the detection limits.

Table 4.1-1. Total Dustfall Results, 2011-2013 (mg/dm^2/day)

	DF1 (Goose)	DF2 (Goose)	DF3 (Goose)	DF4 (Goose)	DF5 (Goose)	DF6 (Goose)	DF7 (Goose)	DF8 (Goose)[a]	DF9 (Goose)	DF10 (George)	DF11 (MLA)[b]	DF12 (Winter Road)	DF13 (Winter Road)
2011													
Jun-11	0.33	0.42[c]	0.45	0.25	0.44	-	-	-	-	-	-	-	-
Jul-11	0.27	0.42[c]	1.13	< 0.10	< 0.10	-	-	-	-	-	-	-	-
Aug-11	0.5	0.37	0.29	0.46	0.4	-	-	-	-	-	-	-	-
Sep-11	0.55	< 0.10	0.23	0.26	0.28	-	-	-	-	-	-	-	-
Average	**0.41**	**0.21**	**0.53**	**0.26**	**0.29**	-	-	-	-	-	-	-	-
2012													
Jun-12	-	-	-	-	-	0.25	0.33	0.39	0.26	0.46	0.38	-	-
Jul-12	-	-	-	-	-	0.39	0.57	0.25	< 0.10	0.54	-[d]	-	-
Aug-12	-	-	-	-	-	< 0.10	< 0.10	< 0.10	0.18	0.19	0.25	-	-
Average	-	-	-	-	-	**0.23**	**0.32**	**0.23**	**0.16**	**0.40**	-	-	-
2013													
Jun-13	-	-	-	-	-	-	-	0.61	0.65	0.68	0.60	0.44	0.28
Jul-13	-	-	-	-	-	-	-	-[e]	0.23	0.17	0.13	0.42	0.13
Aug-13	-	-	-	-	-	-	-	0.69	0.62	1.67	-[e]	-[e]	0.83
Sep-13	-	-	-	-	-	-	-	0.76	<0.16	<0.14	<0.16	0.58	0.50
Average	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.69**	**0.40**	**0.65**	**0.27**	**0.48**	**0.44**

Note: The values below detection limits were assumed to be half of the detection limit in the calculation of averages.

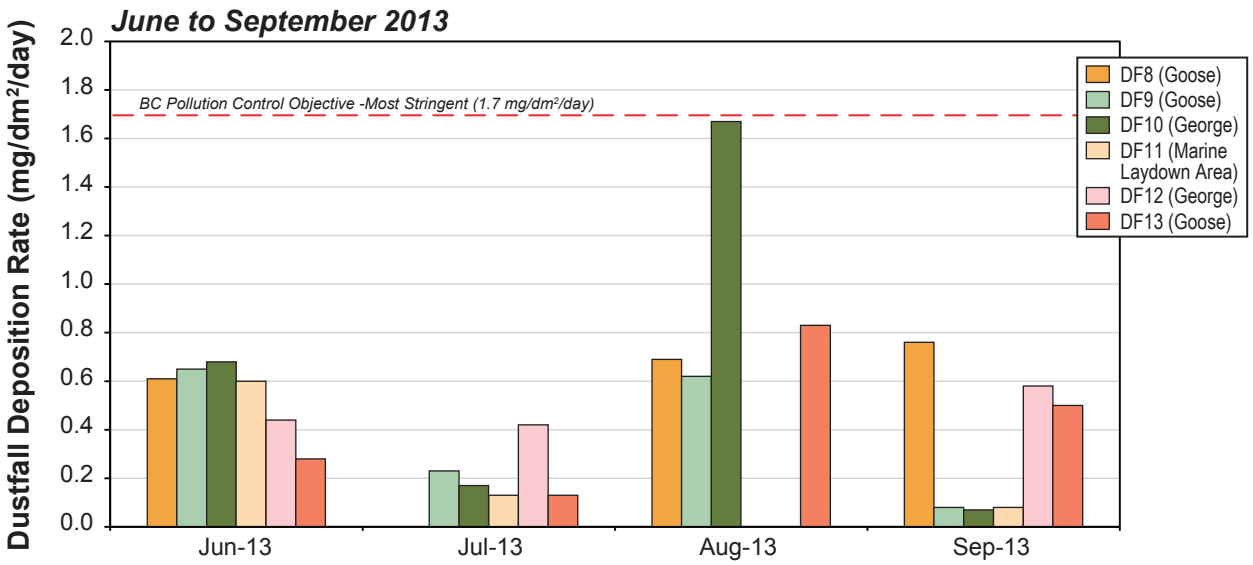
[a] *DF8 was relocated 1.5 km northwest in 2013.*

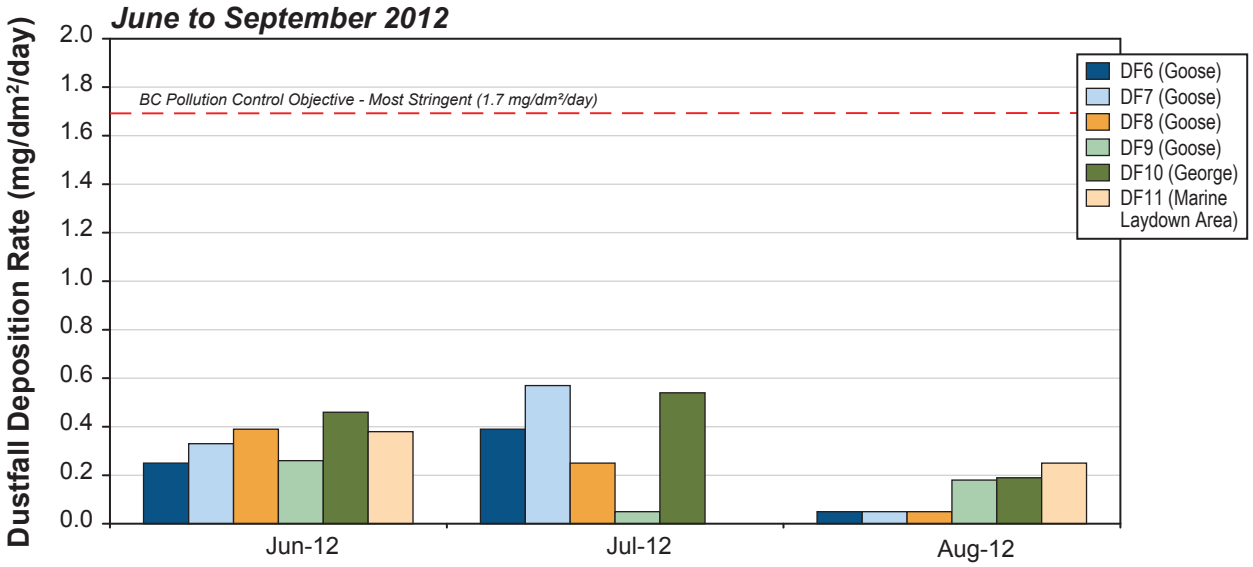
[b] *The location of the proposed MLA was revised in June 2013 and therefore the site was relocated 15km southeast. The site returned to the original location in July.*

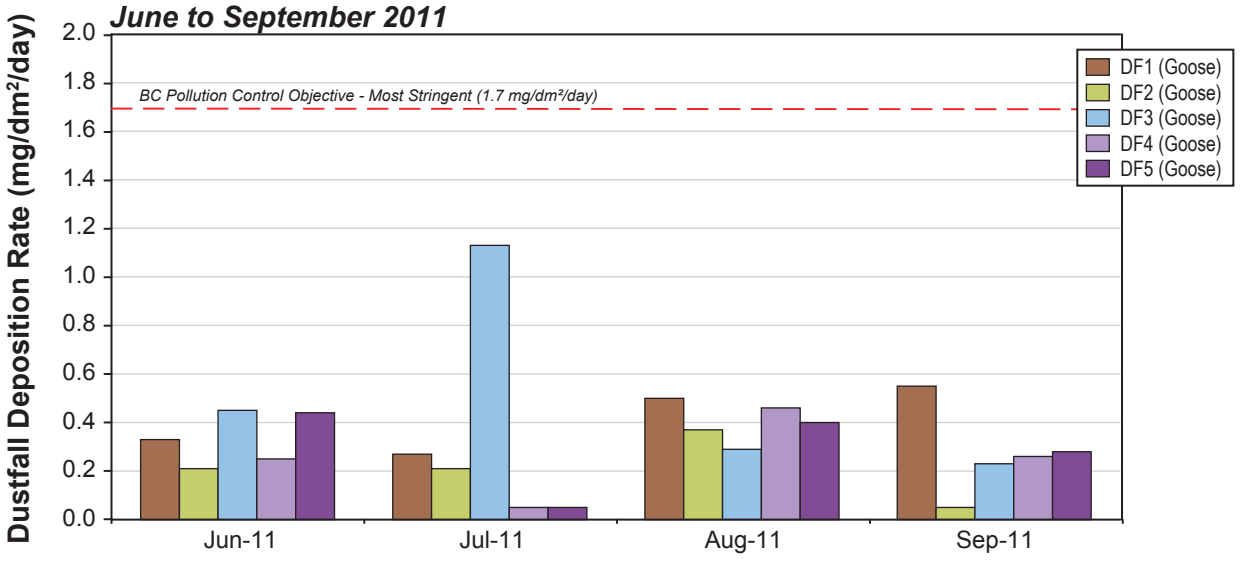
[c] *2011 - There is only one sample at DF2 from June to July.*

[d] *2012 - During the July sampling period the dustfall stand was disturbed by wildlife, and both the sample bottles were void.*

[e] *2013 - During the sampling periods the dustfall stands were disturbed by wildlife, and the sample bottles were void.*







Note: The location of the proposed MLA was revised in June 2013 and therefore the site was relocated. The site returned to the original location in July.

Figure 4.1-1

Dustfall Results, 2011, 2012, and 2013

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Table 4.1-2. Nitrate Deposition Analysis Results from Dustfall, Goose Property Area, 2011-2013 (mg/dm^2/day)

	DF1 (Goose)	DF2 (Goose)	DF3 (Goose)	DF4 (Goose)	DF5 (Goose)	DF6 (Goose)	DF7 (Goose)	DF8 (Goose)[a]	DF9 (Goose)	DF10 (George)	DF11 (MLA)[b]	DF12 (Winter Road)	DF13 (Winter Road)
2011													
Jun-11	0.00038	0.00341	0.00064	0.00040	0.00039	-	-	-	-	-	-	-	-
Jul-11	0.02520	0.00341	0.00266	0.00402	0.00207	-	-	-	-	-	-	-	-
Aug-11	0.01060	0.00118	0.00483	0.00115	0.00156	-	-	-	-	-	-	-	-
Sep-11	0.00276	0.00205	0.00124	0.00174	0.00129	-	-	-	-	-	-	-	-
Average	**0.0097**	**0.0017**	**0.0021**	**0.0018**	**0.0013**	-	-	-	-	-	-	-	-
2012[c]													
Jun-12	-	-	-	-	-	-	-	-	-	-	-	-	-
Jul-12	-	-	-	-	-	0.000925	0.00126	0.000914	0.000311	0.000273	-[d]	-	-
Aug-12	-	-	-	-	-	0.000603	0.000488	0.000555	0.000624	0.00062	0.000495	-	-
Average	-	-	-	-	-	**0.00076**	**0.00087**	**0.00073**	**0.00047**	**0.00045**	**0.00050**	-	-
2013[e]													
Jun-13	-	-	-	-	-	-	-	0.0014	0.0012	0.0017	0.0011	0.0009	0.0005
Jul-13	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug-13	-	-	-	-	-	-	-	0.0027	0.0015	0.0015	-[f]	0.0003	0.0018
Sep-13	-	-	-	-	-	-	-	0.0008	0.0008	0.0008	0.0007	0.0007	0.0007
Average	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.0017**	**0.0012**	**0.0013**	**0.009**	**0.0006**	**0.0010**

Note: The values below detection limits were assumed to be half of the detection limit values in the calculation of averages.

[a] *DF8 was relocated 1.5 km northwest in 2013.*

[b] *The location of the proposed MLA was revised in June 2013 and therefore the site was relocated 15 km southeast. The site returned to the original location in July.*

[c] *2012 - Sulphates and nitrates were not analyzed by the laboratory in June.*

[d] *During the July sampling period, at DF11, the dustfall stand was disturbed by wildlife, and both the sample bottles were void.*

[e] *2013 - Sulphates and nitrates were not analyzed by the laboratory in July.*

[f] *2013 - During the sampling periods the dustfall stands were disturbed by wildlife, and the sample bottles were void.*

Table 4.1-3. Sulphate Deposition Analysis Results from Dustfall, Goose Property Area, 2011-2013 (mg/dm^2/day)

	DF1 (Goose)	DF2 (Goose)	DF3 (Goose)	DF4 (Goose)	DF5 (Goose)	DF6 (Goose)	DF7 (Goose)	DF8 (Goose)[a]	DF9 (Goose)	DF10 (George)	DF11 (MLA)[b]	DF12 (Winter Road)	DF13 (Winter Road)
2011													
Jun-11	< 0.003	< 0.011	< 0.007	< 0.003	< 0.003	-	-	-	-	-	-	-	-
Jul-11	< 0.011	< 0.011	0.033	< 0.011	< 0.011	-	-	-	-	-	-	-	-
Aug-11	< 0.007	< 0.012	< 0.013	< 0.008	< 0.010	-	-	-	-	-	-	-	-
Sep-11	< 0.019	< 0.017	< 0.023	< 0.021	< 0.020	-	-	-	-	-	-	-	-
Average	**0.005**	**0.005**	**0.014**	**0.005**	**0.006**	-	-	-	-	-	-	-	-
2012[c]													
Jun-12	-	-	-	-	-	-	-	-	-	-	-	-	-
Jul-12	-	-	-	-	-	<0.006	<0.006	<0.005	<0.006	<0.007	-[d]	-	-
Aug-12	-	-	-	-	-	<0.006	<0.006	<0.006	<0.007	<0.011	<0.007	-	-
Average	-	-	-	-	-	**0.003**	**0.003**	**0.003**	**0.003**	**0.004**	**0.004**	-	-
2013[e]													
Jun-13	-	-	-	-	-	-	-	<0.006	<0.006	0.01	<0.006	<0.006	<0.005
Jul-13	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug-13	-	-	-	-	-	-	-	0.01	0.00	<0.005	-[f]	<0.004	0.01
Sep-13	-	-	-	-	-	-	-	<0.017	<0.019	<0.016	<0.017	<0.016	<0.016
Average	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.006**	**0.005**	**0.006**	**0.006**	**0.004**	**0.005**

Note: The values below detection limits were assumed to be half of the detection limit values in the calculation of averages.

[a] *DF8 was relocated 1.5 km northwest in 2013.*

[b] *The location of the proposed MLA was revised in June 2013 and therefore the site was relocated 15 km southeast. The site returned to the original location in July.*

[c] *2012 - Sulphates and nitrates were not analyzed by the laboratory in June.*

[d] *During the July sampling period, at DF11, the dustfall stand was disturbed by wildlife, and both the sample bottles were void.*

[e] *2013 - Sulphates and nitrates were not analyzed by the laboratory in July.*

[f] *2013 - During the sampling periods the dustfall stands were disturbed by wildlife, and the sample bottles were void.*

Table 4.1-4. Calculated Acid Deposition Rates, Goose Property, George Property and the MLA, 2011-2013 (eq/ha/yr)

	DF1 (Goose)	DF2 (Goose)	DF3 (Goose)	DF4 (Goose)	DF5 (Goose)	DF6 (Goose)	DF7 (Goose)	DF8 (Goose)[a]	DF9 (Goose)	DF10 (George)	DF11 (MLA)[b]	DF12 (Winter Road)	DF13 (Winter Road)
2011													
Jun-11	20	65	43	20	20	-	-	-	-	-	-	-	-
Jul-11	698	65	320	147	96	-	-	-	-	-	-	-	-
Aug-11	302	76	175	61	79	-	-	-	-	-	-	-	-
Sep-11	144	118	93	125	110	-	-	-	-	-	-	-	-
Average	**291**	**81**	**158**	**88**	**76**	-	-	-	-	-	-	-	-
2012[c]													
Jun-12	-	-	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	-	-
Jul-12	-	-	-	-	-	45	54	44	29	32	-[d]	-	-
Aug-12	-	-	-	-	-	37	34	36	42	58	39	-	-
Average	-	-	-	-	-	**41**	**44**	**40**	**36**	**45**	**-**	-	-
2013[e]													
Jun-13	-	-	-	-	-	-	-	59	54	93	49	47	34
Jul-13	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug-13	-	-	-	-	-	-	-	110	68	59	-[f]	21	85
Sep-13	-	-	-	-	-	-	-	86	93	82	81	79	79
Average	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**85**	**72**	**78**	**65**	**49**	**66**

Note: Due to the sulphate concentration being below detectable limit, it should be noted that there is some uncertainty of the actual value calculated for acid deposition rates.

[a] *DF8 was relocated 1.5 km northwest in 2013.*

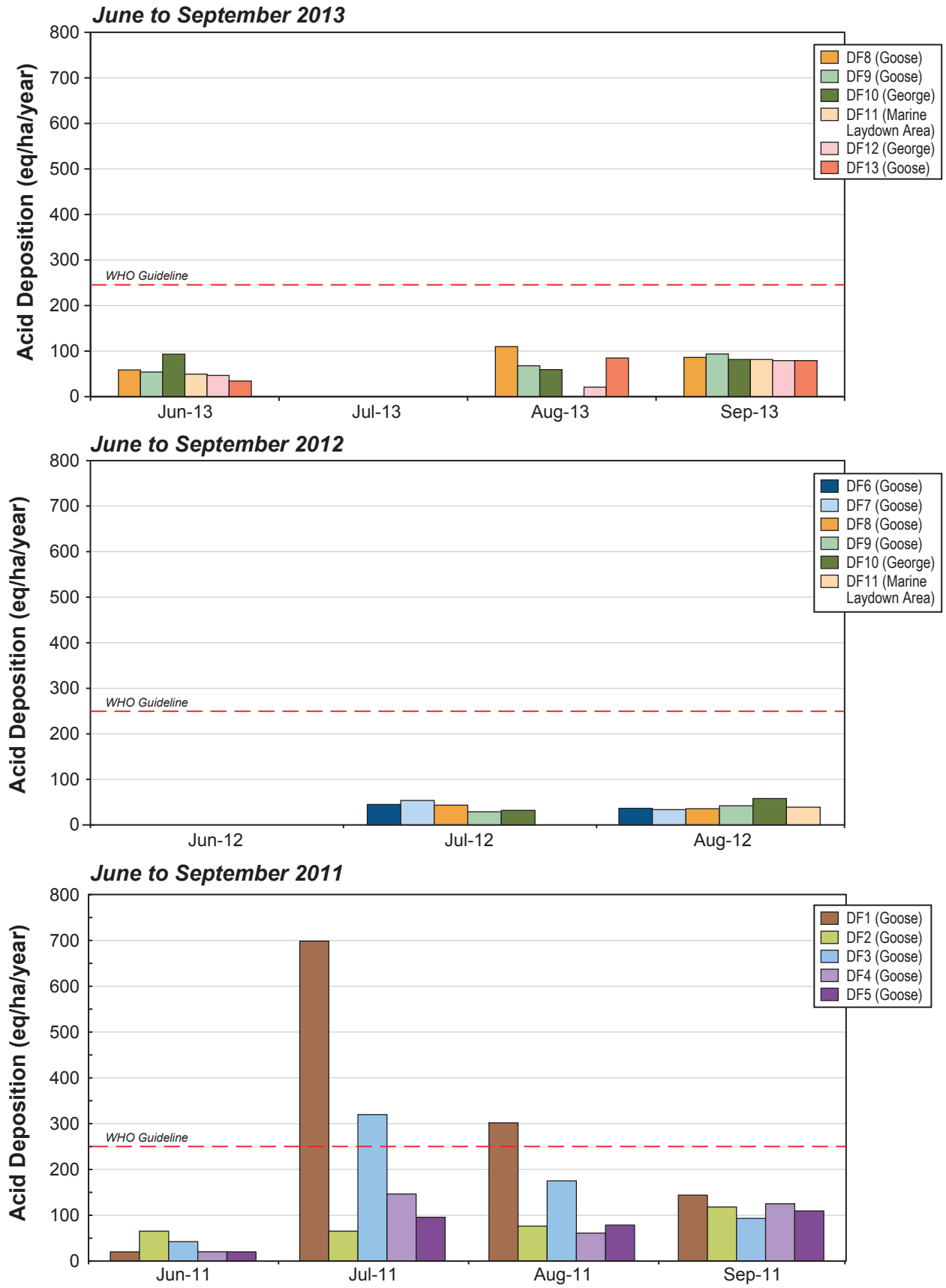
[b] *The location of the proposed MLA was revised in June 2013 and therefore the site was relocated 15 km southeast. The site returned to the original location in July.*

[c] *2012 - Sulphates and nitrates were not analyzed by the laboratory in June, and therefore the June acid deposition rate could not be calculated.*

[d] *During the July sampling period, at DF11, the dustfall stand was disturbed by wildlife, and both the sample bottles were void.*

[e] *2013 - Sulphates and nitrates were not analyzed by the laboratory in June, and therefore the June acid deposition rate could not be calculated.*

[f] *2013 - During the sampling periods the dustfall stand was disturbed by wildlife, and the sample bottles were void.*



Note: Nitrate and sulphates were not available for the June monitoring period.
The location of the proposed MLA was revised in June 2013 and therefore the site was relocated. The site returned to the original location in July.

Figure 4.1-2

Acid Deposition Results, 2011, 2012, and 2013

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Table 4.1-5 shows the maximum metal deposition averaged over the 30-day collection period. All analytical results are presented in Appendix 1. In 2013, 13 of the 33 metals that were analyzed were always below the detection limits. In 2012, 13 were also always below the detection limit and in 2011, 14 were always below the detection limits. All other metals had at least one reading that was above the detection limits, but generally with very low metal deposition rates.

Table 4.1-5. Maximum Metal Deposition from all Dustfall Stations, 2011-2013

	Maximum Deposition Rate ($mg/dm^2/day$)				Maximum Deposition Rate ($mg/dm^2/day$)		
Metal	**2011**	**2012**	**2013**	**Metal**	**2011**	**2012**	**2013**
Aluminum (Al)-Total	6.98E-04	1.66E-03	1.12E-03	Mercury (Hg)-Total	BDL	BDL	BDL
Antimony (Sb)-Total	4.30E-06	BDL	2.80E-06	Molybdenum (Mo)-Total	5.90E-06	BDL	1.50E-06
Arsenic (As)-Total	4.30E-06	1.31E-05	1.20E-05	Nickel (Ni)-Total	4.20E-05	1.10E-04	6.80E-06
Barium (Ba)-Total	3.87E-05	2.28E-05	2.42E-05	Phosphorus (P)-Total	2.16E-02	3.35E-02	1.77E-02
Beryllium (Be)-Total	BDL	BDL	BDL	Potassium (K)-Total	8.60E-02	3.80E-02	2.90E-02
Bismuth (Bi)-Total	BDL	BDL	BDL	Selenium (Se)-Total	BDL	BDL	BDL
Boron (B)-Total	BDL	BDL	BDL	Silicon (Si)-Total	BDL	2.25E-03	1.57E-03
Cadmium (Cd)-Total	3.50E-06	5.17E-06	2.83E-06	Silver (Ag)-Total	5.10E-07	2.90E-07	4.10E-07
Calcium (Ca)-Total	3.20E-03	4.63E-03	5.17E-03	Sodium (Na)-Total	BDL	BDL	BDL
Chromium (Cr)-Total	BDL	9.10E-06	8.00E-06	Strontium (Sr)-Total	1.83E-05	1.97E-05	2.00E-05
Cobalt (Co)-Total	BDL	5.00E-06	3.10E-06	Thallium (Tl)-Total	BDL	BDL	BDL
Copper (Cu)-Total	7.71E-04	7.67E-04	8.33E-04	Tin (Sn)-Total	4.30E-06	1.80E-06	BDL
Iron (Fe)-Total	1.80E-03	2.81E-03	BDL	Titanium (Ti)-Total	BDL	BDL	BDL
Lead (Pb)-Total	8.91E-05	5.90E-05	1.83E-03	Uranium (U)-Total	BDL	BDL	BDL
Lithium (Li)-Total	BDL	BDL	4.15E-05	Vanadium (V)-Total	BDL	BDL	BDL
Magnesium (Mg)-Total	4.30E-03	6.50E-03	BDL	Zinc (Zn)-Total	8.08E-04	1.59E-04	2.86E-04
Manganese (Mn)-Total	7.90E-05	1.03E-04	3.40E-03				

Note:
BDL = Below Detection Limit

4.2 PASS

Table 4.2-1 and Figure 4.2-1 summarize the ambient concentrations of NO_2, SO_2 and O_3 for 2011 to 2013. Results are expressed as 30-day averages. The ambient air quality standards provided by the Government of Nunavut (Government of Nunavut 2011) shown in Table 2.2-1 utilize ambient concentrations with other averaging periods. Since there are no 30-day objectives in Nunavut, 30-day averages of NO_2 and SO_2 are conservatively compared to annual average standards. The 2011 and 2012 monthly concentrations of SO_2 and NO_2 were all well below the relevant annual standards.

In 2013 the highest average 30-day NO_2 concentration was 1.4 $\mu g/m^3$, measured at DF11/PASS3 within the MLA. In 2011 and 2012, the highest NO_2 concentrations were 0.6 $\mu g/m^3$ measured at the Goose Property and 1.1 $\mu g/m^3$ measured at the George Property, respectively. These values are all below the annual Nunavut Standard (60 $\mu g/m^3$).

Table 4.2-1. Ambient Concentrations of NO_2, SO_2, and O_3 Collected by PASS, Goose Property, George Property and MLA, 2011-2013 (µg/m^3)

	NO_2				O_3				SO_2			
	PASS (Goose)	PASS1 (Goose)	PASS2 (George)	PASS3 (MLA)[a]	PASS (Goose)	PASS1 (Goose)	PASS2 (George)	PASS3 (MLA)[a]	PASS (Goose)	PASS1 (Goose)	PASS2 (George)	PASS3 (MLA)[a]
2011												
Jun-11	0.1	-	-	-	54.6	-	-	-	0.2	-	-	-
Jul-11	0.2	-	-	-	49.4	-	-	-	0.1	-	-	-
Aug-11	0.1	-	-	-	38.4	-	-	-	1.0	-	-	-
Sep-11	0.6	-	-	-	42.3	-	-	-	0.6	-	-	-
2012												
Jun-12[b]	-	0.1	1.1	-	-	50.2	50.4	55.1	-	1.3	0.1	0.1
Jul-12[c]	-	0.1	0.1	-	-	40.4	41.9	42.3	-	0.1	0.3	0.1
Aug-12	-	0.1	0.8	0.1	-	34.1	33.5	36.1	-	0.1	0.1	0.1
2013												
Jun-13	-	0.6	0.4	0.4	-	53.0	60.7	58.3	-	0.1	0.1	0.1
Jul-13	-	0.1	-[d]	1.4	-	44.8	48.2	47.6	-	0.1	0.1	0.1
Aug-13	-	0.2	0.4	0.1	-	46.5	42.2	-[e]	-	0.4	0.2	-[e]
Sep-13	-	0.1	0.1	0.1	-	34.4	43.5	35.2	-	0.4	0.8	0.2

Note: The values below detection limits were assumed to be half of the detection limit.

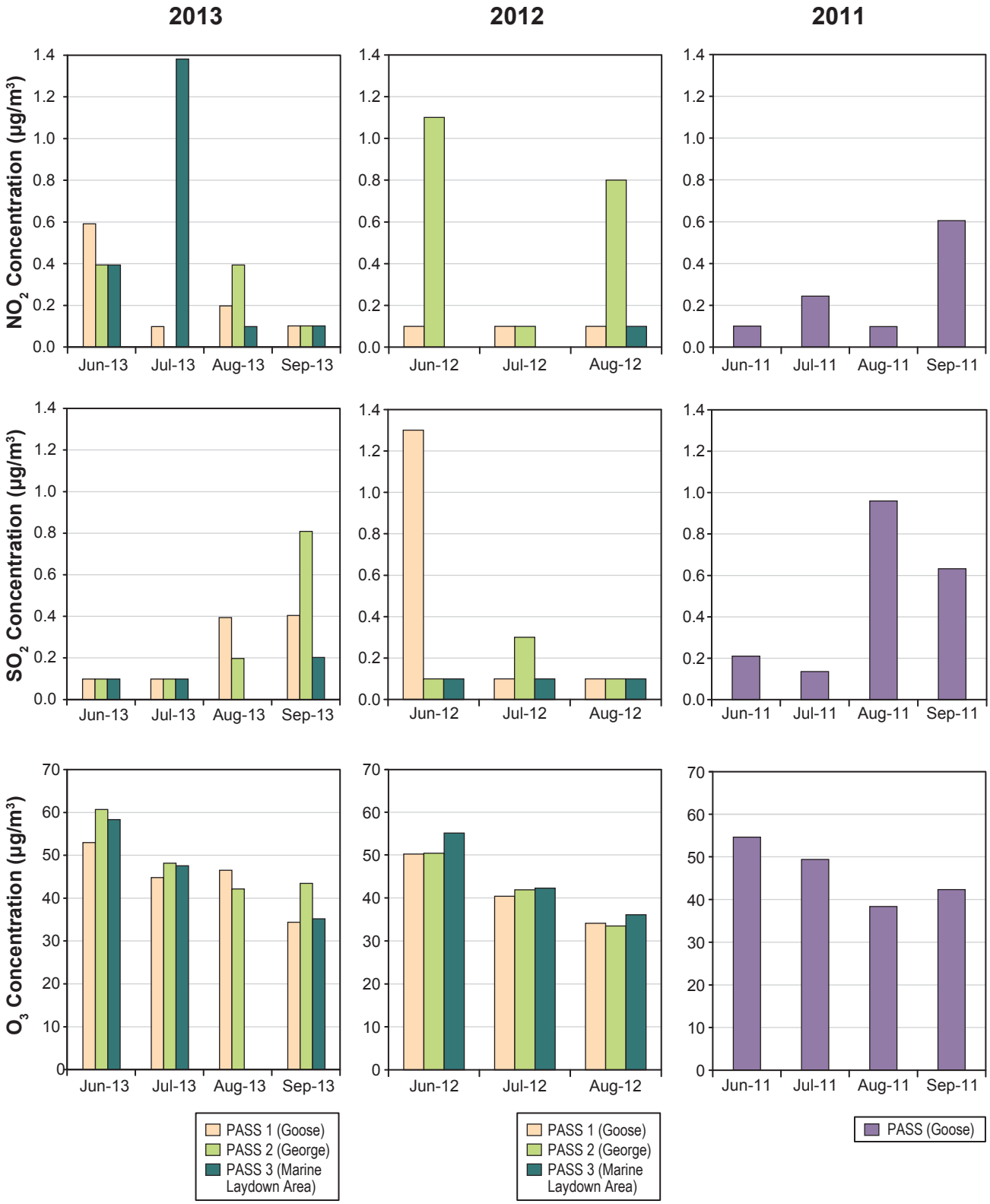
[a] *The location of the proposed MLA was revised in June 2013 and therefore the site was relocated 15 km southeast. The site returned to the original location in July.*

[b] *The NO_2 filter was missing from the canister, due to suspected high winds.*

[c] *During the animal disturbance of the dustfall stands in July, it is suspected that the NO_2 canister and filter was disturbed, as the filter was missing.*

[d] *NO_2 cartridge was damaged during swap.*

[e] *O_3 and SO_2 samples were disturbed by wildlife.*



Note: The location of the proposed MLA was revised in June 2013 and therefore the site was relocated. The site returned to the original location in July.

Figure 4.2-1

Monthly Ambient Concentrations of NO_2, SO_2, and O_3 Collected by PASS, 2011, 2012, and 2013

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In 2013 the highest average 30-day SO_2 concentration was 0.8 µg/m^3, measured at DF10/PASS2 within the George Property. In 2011 and 2012, the highest SO_2 concentrations were 1.0 µg/m^3 and 1.3 µg/m^3 respectively, both measured within the Goose Property. These values are all below the annual Nunavut Standard (30 µg/m^3).

In 2013 the highest average 30-day O_3 concentration was 60.7 µg/m^3, measured at DF10/PASS2 within the George Property. In 2011 and 2012, the highest O_3 concentrations were 54.6 µg/m^3 and 55.1µg/m^3, measured within the Goose Property and MLA, respectively. These values are all within the Health Canada range (49 to 78 µg/m^3), however they above the national annual objective (30 µg/m^3). This reflects natural levels in remote locations, which are expected to be higher than the national objective.

4.3 PARTICULATE

Particulate results for 2013 are summarized in Table 4.3-1. At the George Property Area the PM_{10} results were below the detection limit (2.1 µg/m^3) during both monitoring periods (May and June), the $PM_{2.5}$ results were below the detection limit (2.1 µg/m^3) on May 27 and 2.9 µg/m^3 on May 28. At the Goose Property Area the TSP and $PM_{2.5}$ results were both below the detection limit (2.1 µg/m^3). The results are all well below the objectives.

Table 4.3-1. Particulate Results, Goose Property, George Property and MLA, 2013 (µg/m^3)

	Particulate1 (Goose)	Particulate2 (George)	Particulate3 (George)	Particulate4 (MLA)
	$PM_{2.5}$			
May-13	-	2.9	< 2.1	-
June-13	< 2.1	-	-	3.3
	PM_{10}			
May-13	-	< 2.1	< 2.1	-
June-13	-	-	-	-
	TSP			
May-13	-	-	-	-
June-13	< 2.1	-	-	3.6

5. Summary

5. Summary

The 2013 air quality baseline program included dustfall, PASS and particulate monitoring at the Goose Property, George Property, the MLA and along the proposed winter roads. In 2012 dustfall and PASS monitoring was carried out at the Goose Property, George Property and the MLA, and the 2011 baseline program included dustfall monitoring within the Goose Property.

Dustfall analyses included particulates (total, soluble and insoluble), anions (sulphate, nitrate, chloride and ammonia), total metals and various cations. In 2013, the maximum dustfall deposition rate of 1.67 mg/dm^2/day was observed in August within the George Property. In 2012 and 2011, the maximum dustfall deposition rate of 0.57 and 1.13 mg/dm^2/day, respectively were observed. Both values occurred in July within the Goose Property. All dustfall results measured were below the most stringent objective of 1.7 mg/dm^2/day.

Anions of nitrate and sulphate were analyzed from the dustfall samples in order to calculate acid deposition. The highest mean acid deposition rate observed in 2013 was 85 eq/hq/yr located within the Goose Property. The highest mean acid deposition rate observed in 2012 was 45 eq/ha/yr located within the George Property, while the highest mean acid deposition rate observed in 2011 was 291 eq/ha/yr. The average acid deposition results in 2013 were all below the WHO guideline value of 250 eq/hq/yr. The average results were also well below the objective in 2012, however, in 2011 the average results from one site at Goose, exceeded the objective.

Dustfall samples were also analyzed for metals. Since the Project area has limited anthropogenic emission sources, most of the metal deposition levels analyzed were below detection limits. The reported metal deposition rates are predominantly the result of natural sources in the area.

The passive sampling of NO_2, SO_2, and O_3 was conducted monthly from June to September 2013. The 2013 maximum average 30-day O_3 concentration was 60.7 µg/m^3, measured within the George Property. In 2011 and 2012, the highest O_3 concentrations were 54.6 µg/m^3 and 55.1 µg/m^3, measured within the Goose Property and MLA, respectively. These values are all within the Health Canada range (49 to 78 µg/m^3), however they above the national annual objective (30 µg/m^3). All ambient concentrations of NO_2 and SO_2 were found to be a small percentage of the corresponding federal and territorial air quality objectives.

Particulate monitoring of TSP, PM_{10}, and $PM_{2.5}$ was conducted in May and June 2013. At the George Property Area the PM_{10} results were below the detection limit (2.1 µg/m^3) during both monitoring periods (May and June). The $PM_{2.5}$ results were below the detection limit (2.1 µg/m^3) on May 27 and 2.9 µg/m^3 on May 28. At the Goose Property Area the TSP and $PM_{2.5}$ results were both below the detection limit (2.1 µg/m^3). The results are all well below the objectives.

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Appendix 1

2011 Back River Dustfall Results

Rescan™
an ERM company

RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 07-JUL-11
Report Date: 18-JUL-11 17:22 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1028446
Project P.O. #: NOT SUBMITTED
Job Reference: 0833-002-09
Legal Site Desc:
C of C Numbers: 10-178474

Amber Springer
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1028446-1	L1028446-2	L1028446-3	L1028446-4	
Description	DUSTFALL	DUSTFALL	DUSTFALL	DUSTFALL	
Sampled Date	02-JUL-11	02-JUL-11	02-JUL-11	02-JUL-11	
Sampled Time	17:43	18:00	17:34	17:24	
Client ID	DF1 (MAY 23 - JULY 2)	DF3 (MAY 23 - JULY 2)	DF4 (MAY 23 - JULY 2)	DF5 (MAY 23 - JULY 2)	
Grouping	**Analyte**				
DUSTFALL					
Particulates	Total Dustfall (mg/dm2.day)	0.33	0.45	0.25	0.44
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.30	0.36	0.20	0.36
Anions and Nutrients	Ammonia (as N) (mg/dm2.day)	0.000208	0.000406	0.000435	0.000625
	Chloride (Cl) (mg/dm2.day)	0.0253	0.0320	0.0283	0.0256
	Nitrate (as N) (mg/dm2.day)	0.000376	0.000641	0.000399	0.000391
	Sulfate (SO4) (mg/dm2.day)	<0.0027	<0.0068	<0.0026	<0.0026
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000176	0.000171	0.000143	0.000138
	Antimony (Sb)-Total (mg/dm2.day)	0.00000128	0.0000018	<0.0000010	0.00000096
	Arsenic (As)-Total (mg/dm2.day)	0.00000070	<0.0000014	<0.0000010	<0.00000085
	Barium (Ba)-Total (mg/dm2.day)	0.00000858	0.0000225	0.00000810	0.0000118
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000033	<0.0000068	<0.0000051	<0.0000042
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000033	<0.0000068	<0.0000051	<0.0000042
	Boron (B)-Total (mg/dm2.day)	<0.000067	<0.00014	<0.00010	<0.000085
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000063	0.00000101	<0.00000051	0.00000054
	Calcium (Ca)-Total (mg/dm2.day)	0.00129	0.00227	0.00087	0.00102
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000033	<0.0000068	<0.0000051	<0.0000042
	Cobalt (Co)-Total (mg/dm2.day)	<0.00000067	<0.0000014	<0.0000010	<0.00000085
	Copper (Cu)-Total (mg/dm2.day)	0.0000981	0.000103	0.0000357	0.0000482
	Iron (Fe)-Total (mg/dm2.day)	<0.00020	<0.00041	<0.00031	<0.00025
	Lead (Pb)-Total (mg/dm2.day)	0.00000814	0.00000431	0.00000371	0.00000502
	Lithium (Li)-Total (mg/dm2.day)	<0.000033	<0.000068	<0.000051	<0.000042
	Magnesium (Mg)-Total (mg/dm2.day)	<0.00067	<0.0014	<0.0010	<0.00085
	Manganese (Mn)-Total (mg/dm2.day)	0.0000293	0.0000312	0.0000265	0.0000260
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000033	<0.00000068	<0.00000051	<0.00000042
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000033	<0.00000068	<0.00000051	0.00000049
	Nickel (Ni)-Total (mg/dm2.day)	0.0000034	<0.0000068	0.0000117	0.0000212
	Phosphorus (P)-Total (mg/dm2.day)	0.0024	<0.0041	<0.0031	0.0028
	Potassium (K)-Total (mg/dm2.day)	<0.013	<0.027	<0.021	<0.017
	Selenium (Se)-Total (mg/dm2.day)	<0.0000067	<0.000014	<0.000010	<0.0000085
	Silicon (Si)-Total (mg/dm2.day)	<0.00033	<0.00068	<0.00051	<0.00042
	Silver (Ag)-Total (mg/dm2.day)	<0.000000067	0.00000024	<0.00000010	<0.000000085
	Sodium (Na)-Total (mg/dm2.day)	<0.013	<0.027	<0.021	<0.017
	Strontium (Sr)-Total (mg/dm2.day)	0.00000527	0.0000183	0.0000048	0.00000489
	Thallium (Tl)-Total (mg/dm2.day)	<0.00000067	<0.0000014	<0.0000010	<0.00000085
	Tin (Sn)-Total (mg/dm2.day)	0.00000071	<0.0000014	<0.0000010	0.00000150
	Titanium (Ti)-Total (mg/dm2.day)	<0.000067	<0.00014	<0.00010	<0.000085

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1028446-1	L1028446-2	L1028446-3	L1028446-4	
	Description	DUSTFALL	DUSTFALL	DUSTFALL	DUSTFALL	
	Sampled Date	02-JUL-11	02-JUL-11	02-JUL-11	02-JUL-11	
	Sampled Time	17:43	18:00	17:34	17:24	
	Client ID	DF1 (MAY 23 - JULY 2)	DF3 (MAY 23 - JULY 2)	DF4 (MAY 23 - JULY 2)	DF5 (MAY 23 - JULY 2)	
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.000000067	<0.00000014	<0.00000010	<0.000000085	
	Vanadium (V)-Total (mg/dm2.day)	<0.0000067	<0.000014	<0.000010	<0.0000085	
	Zinc (Zn)-Total (mg/dm2.day)	0.0000820	0.000167	0.000099	0.000808	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-178474

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10-178474

ALS Environmental

L1028446-COFC

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page ____ of ____

Report To		Report Format / Distribution		Service Request (Rush subject to availability - Contact ALS to confirm TAT)
Company:	Rescan Environmental Services Ltd.	Standard:	Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact:	Tolga Olkay	Select: PDF ✓	Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	1111 West Hastings St (6th Floor)	Email 1:	tolkay@rescan.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
	Vancouver, BC V6E 2J3	Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	604-689-9460 Fax:			**Analysis Request**
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		(Indicate Filtered or Preserved, F/P)
	Copy of Invoice with Report? (circle) Yes or No	Job #:	0833-002-09	
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)	L1028446	ALS Contact:	Amber Springer	Sampler:

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
1	DF1	July 2/11	542 pm	dustfall	
2	DF1	"	543 pm	"	
3	DF3	"	600 pm	"	
4	DF4	"	533pm	"	
5	DF4	"	534 pm	"	
6	DF5	"	521 pm	"	
7	DF5	"	524pm	"	

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

DF2 canisters ~~(x2)~~ (x2) and DF3 canister (x1) damaged by wildlife - not being sent to lab

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			RC	7-7-11	12:00	19.9°C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

Sample Receipt Confirmation

Report Distribution:

Company Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Tolga Olcay
Address: Sixth Floor, 1111 West Hastings Street Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: 604-687-4277
Email: tolcay@rescan.com
Report Name: CROSSTAB_ALS
Digital Type: --
Digital Email: --
Distribution: Hard Copy: Y Email: Y Fax: N

Invoice Distribution:

Acct Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Accounts Payable
Address: Sixth Floor, 1111 West Hastings Street Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: --
Invoice Email: --
Project #: N/A
Account #: RES100

Client Information:

Job Reference #: 0833-002-09
Project PO #:
Legal Site Description: N/A
Quote #: N/A
Date Sampled: 02-JUL-11
Date Received: 07-JUL-11
Sampled By:
Chain Of Custody: 10-178474

Workorder Summary:

Lab Work Order #: **L1028446**
Estimated completion date: 18-JUL-11
4 Samples received at ALS in **VANCOUVER**
Client Job #: 0833-002-09
Account Manager: Amber Springer
Estimated sample disposal date: 17-AUG-11

Lab Sample ID	Client Sample ID	Date Sampled	Date Received	Sample Due Date	Priority Flag	Sample Type
L1028446-1	DF1 (MAY 23 - JULY 2)	02-JUL-11 17:43	07-JUL-11 12:00	18-JUL-11		DUSTFALL
L1028446-2	DF3 (MAY 23 - JULY 2)	02-JUL-11 18:00	07-JUL-11 12:00	18-JUL-11		DUSTFALL
L1028446-3	DF4 (MAY 23 - JULY 2)	02-JUL-11 17:34	07-JUL-11 12:00	18-JUL-11		DUSTFALL
L1028446-4	DF5 (MAY 23 - JULY 2)	02-JUL-11 17:24	07-JUL-11 12:00	18-JUL-11		DUSTFALL

Analysis Requested:

	Sample Handling and Disposal Fee	Dustfall Chloride by Ion Chromatography	Combined Dustfalls-Total, soluble, insol	Dustfall Ammonia by Fluorescence	Dustfall Nitrate by Ion Chromatography	Total Mercury in Dustfalls by CVAFS	Total Metals in Dustfalls by ICPOES	Total Metals in Dustfalls by ICPMS	Dustfall Sample Preparation	Dustfall Sulphate by Ion Chromatography
DF1 (MAY 23 - JULY 2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF3 (MAY 23 - JULY 2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF4 (MAY 23 - JULY 2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF5 (MAY 23 - JULY 2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Sample Integrity Observations:

No observations were identified for this work order submission.

ALS Group strives to deliver on-time results to our clients at all times. However, there are times when due to capacity issues or other unforeseen circumstances we are unable to meet our expected turnaround times. The information above is related to a recent workorder you have submitted to our laboratory. In the event that you have an inquiry, please refer to the Lab Work Order # when calling your Account Manager.

RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 05-AUG-11
Report Date: 16-AUG-11 10:23 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1041149

Project P.O. #: NOT SUBMITTED
Job Reference: BACK RIVER 0833-002-09
C of C Numbers:
Legal Site Desc:

STEFANIE TEO
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1041149-1	L1041149-2	L1041149-3	L1041149-4	L1041149-5
Description	WATER	WATER	WATER	WATER	WATER
Sampled Date	31-JUL-11	31-JUL-11	31-JUL-11	31-JUL-11	31-JUL-11
Sampled Time					
Client ID	DF-1 (JULY 2 - JULY 31)	DF-2 (JULY 2 - JULY 31) & (JUL10 - JUL31)	DF-3 (JULY 2 - JULY 31)	DF-4 (JULY 2 - JULY 31)	DF-5 (JULY 2 - JULY 31)
Grouping / **Analyte**					
DUSTFALL					
Particulates					
Total Dustfall (mg/dm2.day)	0.27	0.42	1.13	<0.10	<0.10
Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	0.17	<0.10	<0.10
Total Soluble Dustfall (mg/dm2.day)	0.24	0.39	0.96	<0.10	<0.10
Anions and Nutrients					
Ammonia (as N) (mg/dm2.day)	0.00021	0.00024	0.00438	0.00024	0.00013
Chloride (Cl) (mg/dm2.day)	0.030	0.031	0.051	0.019	0.024
Nitrate (as N) (mg/dm2.day)	0.0252	0.00341	0.00266	0.00402	0.00207
Sulfate (SO4) (mg/dm2.day)	<0.011	<0.011	0.033	<0.011	<0.011
Metals					
Aluminum (Al)-Total (mg/dm2.day)	0.000324	<0.00020 DLB	<0.00022 DLB	0.000179	0.000210
Antimony (Sb)-Total (mg/dm2.day)	<0.0000014	<0.0000020	<0.0000020	<0.0000014	<0.0000014
Arsenic (As)-Total (mg/dm2.day)	<0.0000014	<0.0000020	<0.0000020	<0.0000014	<0.0000014
Barium (Ba)-Total (mg/dm2.day)	0.00000816	0.0000070	0.0000049	0.00000494	0.0000128
Beryllium (Be)-Total (mg/dm2.day)	<0.0000068	<0.000010	<0.000010	<0.0000070	<0.0000070
Bismuth (Bi)-Total (mg/dm2.day)	<0.0000068	<0.000010	<0.000010	<0.0000070	<0.0000070
Boron (B)-Total (mg/dm2.day)	<0.00014	<0.00020	<0.00020	<0.00014	<0.00014
Cadmium (Cd)-Total (mg/dm2.day)	<0.00000068	<0.0000010	<0.0000010	<0.00000070	<0.00000070
Calcium (Ca)-Total (mg/dm2.day)	<0.00068	0.0012	<0.0010	0.00095	0.00191
Chromium (Cr)-Total (mg/dm2.day)	<0.0000068	<0.000010	<0.000010	<0.0000070	<0.0000070
Cobalt (Co)-Total (mg/dm2.day)	<0.0000014	<0.0000020	<0.0000020	<0.0000014	<0.0000014
Copper (Cu)-Total (mg/dm2.day)	0.000107	0.000135	0.0000581	0.000192	0.000250
Iron (Fe)-Total (mg/dm2.day)	<0.00041	<0.00061	<0.00061	<0.00042	0.00080
Lead (Pb)-Total (mg/dm2.day)	0.00000318	0.0000038	0.0000028	0.00000202	0.00000323
Lithium (Li)-Total (mg/dm2.day)	<0.000068	<0.00010	<0.00010	<0.000070	<0.000070
Magnesium (Mg)-Total (mg/dm2.day)	<0.0014	<0.0020	<0.0020	<0.0014	0.0033
Manganese (Mn)-Total (mg/dm2.day)	0.00000888	0.0000112	0.0000148	0.0000117	0.0000700
Mercury (Hg)-Total (mg/dm2.day)	<0.00000068	<0.0000010	<0.0000010	<0.00000070	<0.00000070
Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000068	<0.0000010	<0.0000010	<0.00000070	<0.00000070
Nickel (Ni)-Total (mg/dm2.day)	<0.0000068	0.000010	<0.000010	<0.0000070	<0.0000070
Phosphorus (P)-Total (mg/dm2.day)	<0.0041	<0.0061	<0.0061	0.0044	0.0216
Potassium (K)-Total (mg/dm2.day)	<0.027	<0.040	<0.040	<0.028	0.035
Selenium (Se)-Total (mg/dm2.day)	<0.000014	<0.000020	<0.000020	<0.000014	<0.000014
Silicon (Si)-Total (mg/dm2.day)	<0.00068	<0.0010	<0.0010	<0.00070	<0.00070
Silver (Ag)-Total (mg/dm2.day)	0.00000051	<0.00000020	<0.00000020	<0.00000014	<0.00000014
Sodium (Na)-Total (mg/dm2.day)	<0.027	<0.040	<0.040	<0.028	<0.028
Strontium (Sr)-Total (mg/dm2.day)	0.0000028	0.0000055	0.0000044	0.0000036	0.0000129
Thallium (Tl)-Total (mg/dm2.day)	<0.0000014	<0.0000020	<0.0000020	<0.0000014	<0.0000014
Tin (Sn)-Total (mg/dm2.day)	<0.0000014	<0.0000020	<0.0000020	<0.0000014	<0.0000014
Titanium (Ti)-Total (mg/dm2.day)	<0.00014	<0.00020	<0.00020	<0.00014	<0.00014

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1041149-1	L1041149-2	L1041149-3	L1041149-4	L1041149-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	31-JUL-11	31-JUL-11	31-JUL-11	31-JUL-11	31-JUL-11
	Sampled Time					
	Client ID	DF-1 (JULY 2 - JULY 31)	DF-2 (JULY 2 - JULY 31) & (JUL10 - JUL31)	DF-3 (JULY 2 - JULY 31)	DF-4 (JULY 2 - JULY 31)	DF-5 (JULY 2 - JULY 31)
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000014	<0.00000020	<0.00000020	<0.00000014	<0.00000014
	Vanadium (V)-Total (mg/dm2.day)	<0.000014	<0.000020	<0.000020	<0.000014	<0.000014
	Zinc (Zn)-Total (mg/dm2.day)	0.000098	0.000211	0.000298	0.000107	0.000292

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

AL ANALY *L1041149-COFC*

Environmental Division (ALS)

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM COC # L1041149

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE:	604-689-9460 604-689-4277			ANALYSIS REQUEST	
INVOICE TO:	SAME AS REPORT ? YES / NO			Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)		ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM	31-JUL-11		Water			X	
	DF-1-TP	31-JUL-11		Water	X	X		
	DF-2-TM	31-JUL-11		Water			X	
	DF-2-TP	31-JUL-11		Water	X	X		
	DF-3-TM	31-JUL-11		Water			X	
	DF-3-TP	31-JUL-11		Water	X	X		
	DF-4-TM	31-JUL-11		Water			X	
	DF-4-TP	31-JUL-11		Water	X	X		
	DF-5-TM	31-JUL-11		Water			X	
	DF-5-TP	31-JUL-11		Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
		Ryan	Aug 5/11
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
			11:35

SAMPLE CONDITION (lab use only)	
TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
20.0	
	If NO, Explain

Sample Receipt Confirmation

Report Distribution:

Company Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Tolga Olcay
Address: Sixth Floor, 1111 West Hastings Street
Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: 604-687-4277
Email: tolcay@rescan.com
fhodge@rescan.com
Report Name: CROSSTAB_ALS
Digital Type: --
Digital Email: --
Distribution: Hard Copy: Y Email: Y Fax: N

Invoice Distribution:

Acct Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Accounts Payable
Address: Sixth Floor, 1111 West Hastings Street
Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: --
Invoice Email: --
Project #: N/A
Account #: RES100

Client Information:

Job Reference #: BACK RIVER 0833-002-09
Project PO #:
Legal Site Description: N/A
Quote #: N/A
Date Sampled: 31-JUL-11
Date Received: 05-AUG-11
Sampled By:
Chain Of Custody: --

Workorder Summary:

Lab Work Order #: **L1041149**
Estimated completion date: 16-AUG-11
5 Samples received at ALS in **VANCOUVER**
Client Job #: BACK RIVER 0833-002-09
Account Manager: Amber Springer
Estimated sample disposal date: 15-SEP-11

Lab Sample ID	Client Sample ID	Date Sampled	Date Received	Sample Due Date	Priority Flag	Sample Type
L1041149-1	DF-1 (JULY 2 - JULY 31)	31-JUL-11 00:00	05-AUG-11 11:35	16-AUG-11		WATER
L1041149-2	DF-2 (JULY 2 - JULY 31) & (JUL10 - JUL31)	31-JUL-11 00:00	05-AUG-11 11:35	16-AUG-11		WATER
L1041149-3	DF-3 (JULY 2 - JULY 31)	31-JUL-11 00:00	05-AUG-11 11:35	16-AUG-11		WATER
L1041149-4	DF-4 (JULY 2 - JULY 31)	31-JUL-11 00:00	05-AUG-11 11:35	16-AUG-11		WATER
L1041149-5	DF-5 (JULY 2 - JULY 31)	31-JUL-11 00:00	05-AUG-11 11:35	16-AUG-11		WATER

Analysis Requested:

	Sample Handling and Disposal Fee	Dustfall Chloride by Ion Chromatography	Combined Dustfalls-Total, soluble, insol	Dustfall Ammonia by Fluorescence	Dustfall Nitrate by Ion Chromatography	Total Mercury in Dustfalls by CVAFS	Total Metals in Dustfalls by ICPOES	Total Metals in Dustfalls by ICPMS	Dustfall Sample Preparation	Dustfall Sulphate by Ion Chromatography
DF-1 (JULY 2 - JULY 31)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-2 (JULY 2 - JULY 31) & (JUL10 - JUL31)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-3 (JULY 2 - JULY 31)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-4 (JULY 2 - JULY 31)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Analysis Requested:

	Sample Handling and Disposal Fee	Dustfall Chloride by Ion Chromatography	Combined Dustfalls-Total, soluble, insol	Dustfall Ammonia by Fluorescence	Dustfall Nitrate by Ion Chromatography	Total Mercury in Dustfalls by CVAFS	Total Metals in Dustfalls by ICPOES	Total Metals in Dustfalls by ICPMS	Dustfall Sample Preparation	Dustfall Sulphate by Ion Chromatography
DF-5 (JULY 2 - JULY 31)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Sample Integrity Observations:

No observations were identified for this work order submission.

ALS Group strives to deliver on-time results to our clients at all times. However, there are times when due to capacity issues or other unforeseen circumstances we are unable to meet our expected turnaround times. The information above is related to a recent workorder you have submitted to our laboratory. In the event that you have an inquiry, please refer to the Lab Work Order # when calling your Account Manager.

AL ANALY *L1041149-COFC*

Environmental Division (ALS)

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM COC # L1041149

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE:	604-689-9460 604-689-4277			ANALYSIS REQUEST	
INVOICE TO:	SAME AS REPORT ? YES / NO			Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)		ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM	31-JUL-11		Water			X	
	DF-1-TP	31-JUL-11		Water	X	X		
	DF-2-TM	31-JUL-11		Water			X	
	DF-2-TP	31-JUL-11		Water	X	X		
	DF-3-TM	31-JUL-11		Water			X	
	DF-3-TP	31-JUL-11		Water	X	X		
	DF-4-TM	31-JUL-11		Water			X	
	DF-4-TP	31-JUL-11		Water	X	X		
	DF-5-TM	31-JUL-11		Water			X	
	DF-5-TP	31-JUL-11		Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
		Ryan	Aug 5/11
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
			11:35

SAMPLE CONDITION (lab use only)	
TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
20.0	
	If NO, Explain

RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 01-SEP-11
Report Date: 13-SEP-11 11:48 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1053220

Project P.O. #: NOT SUBMITTED
Job Reference: BACK RIVER 0833-002-09
C of C Numbers:
Legal Site Desc:

Amber Springer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1053220-1 WATER 26-AUG-11 09:55 DF-1 (JUL31-AUG26)	L1053220-2 WATER 26-AUG-11 11:35 DF-2 (JUL31-AUG26)	L1053220-3 WATER 26-AUG-11 10:10 DF-3 (JUL31-AUG26)	L1053220-4 WATER 26-AUG-11 10:16 DF-4 (JUL31-AUG26)	L1053220-5 WATER 26-AUG-11 10:23 DF-5 (JUL31-AUG26)
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.50	0.37	0.29	0.46	0.40
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.50	0.37	0.29	0.46	0.39
Anions and Nutrients	Ammonia (as N) (mg/dm2.day)	0.000206	0.00143	0.00079	0.000268	0.00045
	Chloride (Cl) (mg/dm2.day)	0.0631	0.070	0.070	0.0738	0.073
	Nitrate (as N) (mg/dm2.day)	0.0106	0.00118	0.00483	0.00115	0.00156
	Sulfate (SO4) (mg/dm2.day)	<0.0067	<0.012	<0.013	<0.0082	<0.010
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000195	<0.000094 DLB	0.000112	0.000163	0.000108
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000015	<0.0000024	<0.0000021	<0.0000018	<0.0000019
	Arsenic (As)-Total (mg/dm2.day)	<0.0000015	<0.0000024	<0.0000021	<0.0000018	<0.0000019
	Barium (Ba)-Total (mg/dm2.day)	0.0000145	0.0000059	0.0000112	0.00000622	0.0000108
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000073	<0.000012	<0.000011	<0.0000091	<0.0000094
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000073	<0.000012	<0.000011	<0.0000091	<0.0000094
	Boron (B)-Total (mg/dm2.day)	<0.00015	<0.00024	<0.00021	<0.00018	<0.00019
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000073	<0.0000012	<0.0000011	<0.00000091	<0.00000094
	Calcium (Ca)-Total (mg/dm2.day)	<0.00073	<0.0012	<0.0011	<0.00091	<0.00094
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000073	<0.000012	<0.000011	<0.0000091	<0.0000094
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000015	<0.0000024	<0.0000021	<0.0000018	<0.0000019
	Copper (Cu)-Total (mg/dm2.day)	0.0000837	0.0000320	0.0000352	0.0000231	0.0000264
	Iron (Fe)-Total (mg/dm2.day)	<0.00044	<0.00071	<0.00063	<0.00054	<0.00056
	Lead (Pb)-Total (mg/dm2.day)	0.00000399	<0.0000012	0.0000019	0.00000132	0.00000513
	Lithium (Li)-Total (mg/dm2.day)	<0.000073	<0.00012	<0.00011	<0.000091	<0.000094
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0015	<0.0024	<0.0021	<0.0018	<0.0019
	Manganese (Mn)-Total (mg/dm2.day)	0.0000107	0.0000110	0.0000199	0.00000958	0.00000845
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000073	<0.0000012	<0.0000011	<0.00000091	<0.00000094
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000073	<0.0000012	<0.0000011	<0.00000091	<0.00000094
	Nickel (Ni)-Total (mg/dm2.day)	0.0000074	<0.000012	<0.000011	<0.0000091	<0.0000094
	Phosphorus (P)-Total (mg/dm2.day)	<0.0044	<0.0071	<0.0063	<0.0054	<0.0056
	Potassium (K)-Total (mg/dm2.day)	<0.029	<0.047	<0.042	<0.036	<0.037
	Selenium (Se)-Total (mg/dm2.day)	<0.000015	<0.000024	<0.000021	<0.000018	<0.000019
	Silicon (Si)-Total (mg/dm2.day)	<0.00073	<0.0012	<0.0011	<0.00091	<0.00094
	Silver (Ag)-Total (mg/dm2.day)	<0.00000015	<0.00000024	<0.00000021	<0.00000018	<0.00000019
	Sodium (Na)-Total (mg/dm2.day)	<0.029	<0.047	<0.042	<0.036	<0.037
	Strontium (Sr)-Total (mg/dm2.day)	0.0000041	0.0000047	0.0000061	0.0000029	0.0000030
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000015	<0.0000024	<0.0000021	<0.0000018	<0.0000019
	Tin (Sn)-Total (mg/dm2.day)	<0.0000015	<0.0000024	<0.0000021	<0.0000018	<0.0000019
	Titanium (Ti)-Total (mg/dm2.day)	<0.00015	<0.00024	<0.00021	<0.00018	<0.00019

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1053220-1	L1053220-2	L1053220-3	L1053220-4	L1053220-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	26-AUG-11	26-AUG-11	26-AUG-11	26-AUG-11	26-AUG-11
	Sampled Time	09:55	11:35	10:10	10:16	10:23
	Client ID	DF-1 (JUL31-AUG26)	DF-2 (JUL31-AUG26)	DF-3 (JUL31-AUG26)	DF-4 (JUL31-AUG26)	DF-5 (JUL31-AUG26)
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000015	<0.00000024	<0.00000021	<0.00000018	<0.00000019
	Vanadium (V)-Total (mg/dm2.day)	<0.000015	<0.000024	<0.000021	<0.000018	<0.000019
	Zinc (Zn)-Total (mg/dm2.day)	0.000050	0.000051	0.000053	0.000035	0.000061

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

L1053220-COFC

ALS ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

COC #

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	
INVOICE TO: SAME AS REPORT ? YES / NO				Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)	L1053220	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM	26-08-11	9:55	Water			X	
	DF-1-TP	26-08-11	9.55	Water	X	X		
	DF-2-TM	26-08-11	11:35	Water			X	
	~~DF-2-TP~~			~~Water~~	X	X		
	DF-3-TM	26-08-11	10:10	Water			X	
	DF-3-TP	26-08-11	10:10	Water	X	X		
	DF-4-TM	26-08-11	10.116	Water			X	
	DF-4-TP	26-08-11	10:16	Water	X	X		
	DF-5-TM	26-08-11	10:23	Water			X	
	DF-5-TP	26-08-11	10:23	Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	All samples were installed on July 31, 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	SAMPLE CONDITION (lab use only)	
	Aug29 10:00			TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY: RYAN SEPT 1st	DATE & TIME: 12:30	10°C	
					If NO, Explain

GENF 18.01 Front

Sample Receipt Confirmation

Report Distribution:

Company Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Tolga Olcay
Address: Sixth Floor, 1111 West Hastings Street
Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: 604-687-4277
Email: tolcay@rescan.com
fhodge@rescan.com
Report Name: CROSSTAB_ALS
Digital Type: --
Digital Email: --
Distribution: Hard Copy: Y Email: Y Fax: N

Invoice Distribution:

Acct Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Accounts Payable
Address: Sixth Floor, 1111 West Hastings Street
Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: --
Invoice Email: --
Project #: N/A
Account #: RES100

Client Information:

Job Reference #: BACK RIVER 0833-002-09
Project PO #:
Legal Site Description: N/A
Quote #: N/A
Date Sampled: 26-AUG-11
Date Received: 01-SEP-11
Sampled By:
Chain Of Custody: --

Workorder Summary:

Lab Work Order #: **L1053220**
Estimated completion date: 13-SEP-11
5 Samples received at ALS in **VANCOUVER**
Client Job #: BACK RIVER 0833-002-09
Account Manager: Amber Springer
Estimated sample disposal date: 13-OCT-11

Lab Sample ID	Client Sample ID	Date Sampled	Date Received	Sample Due Date	Priority Flag	Sample Type
L1053220-1	DF-1 (JUL31-AUG26)	26-AUG-11 09:55	01-SEP-11 12:20	13-SEP-11		WATER
L1053220-2	DF-2 (JUL31-AUG26)	26-AUG-11 11:35	01-SEP-11 12:20	13-SEP-11		WATER
L1053220-3	DF-3 (JUL31-AUG26)	26-AUG-11 10:10	01-SEP-11 12:20	13-SEP-11		WATER
L1053220-4	DF-4 (JUL31-AUG26)	26-AUG-11 10:16	01-SEP-11 12:20	13-SEP-11		WATER
L1053220-5	DF-5 (JUL31-AUG26)	26-AUG-11 10:23	01-SEP-11 12:20	13-SEP-11		WATER

Analysis Requested:

	Sample Handling and Disposal Fee	Dustfall Chloride by Ion Chromatography	Combined Dustfalls-Total, soluble, insol	Dustfall Ammonia by Fluorescence	Dustfall Nitrate by Ion Chromatography	Total Mercury in Dustfalls by CVAFS	Total Metals in Dustfalls by ICPOES	Total Metals in Dustfalls by ICPMS	Dustfall Sample Preparation	Dustfall Sulphate by Ion Chromatography
DF-1 (JUL31-AUG26)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-2 (JUL31-AUG26)	✓					✓	✓	✓	✓	
DF-3 (JUL31-AUG26)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-4 (JUL31-AUG26)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-5 (JUL31-AUG26)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Sample Integrity Observations: No observations were identified for this work order submission.

ALS Group strives to deliver on-time results to our clients at all times. However, there are times when due to capacity issues or other unforeseen circumstances we are unable to meet our expected turnaround times. The information above is related to a recent workorder you have submitted to our laboratory. In the event that you have an inquiry, please refer to the Lab Work Order # when calling your Account Manager.

L1053220-COFC

ALS ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

COC #

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	
INVOICE TO: SAME AS REPORT ? YES / NO				Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)	L1053220	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM	26-08-11	9:55	Water			X	
	DF-1-TP	26-08-11	9.55	Water	X	X		
	DF-2-TM	26-08-11	11:35	Water			X	
	~~DF-2-TP~~			~~Water~~	X	X		
	DF-3-TM	26-08-11	10:10	Water			X	
	DF-3-TP	26-08-11	10:10	Water	X	X		
	DF-4-TM	26-08-11	10.116	Water			X	
	DF-4-TP	26-08-11	10:16	Water	X	X		
	DF-5-TM	26-08-11	10:23	Water			X	
	DF-5-TP	26-08-11	10:23	Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	All samples were installed on July 31, 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	SAMPLE CONDITION (lab use only)	
	Aug29 10:00			TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY: RYAN SEPT 1st	DATE & TIME: 12:30	10°C	
					If NO, Explain

GENF 18.01 Front

RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 21-SEP-11
Report Date: 03-OCT-11 11:49 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1061660

Project P.O. #: NOT SUBMITTED
Job Reference: BACK RIVER-0833-002-09
C of C Numbers: 1, 2
Legal Site Desc:

Amber Springer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1061660-1	L1061660-2	L1061660-3	L1061660-4	L1061660-5
Description	WATER	WATER	WATER	WATER	WATER
Sampled Date					
Sampled Time					
Client ID	DF-1 (AUG26-SEP18)	DF-2 (AUG26-SEP18)	DF-3 (AUG26-SEP18)	DF-4 (AUG26-SEP18)	DF-5 (AUG26-SEP18)
Grouping / **Analyte**					
DUSTFALL					
Particulates					
Total Dustfall (mg/dm2.day)	0.55	<0.10	0.23	0.26	0.28
Total Insoluble Dustfall (mg/dm2.day)	0.23	<0.10	<0.10	<0.10	<0.10
Total Soluble Dustfall (mg/dm2.day)	0.32	<0.10	0.21	0.24	0.22
Anions and Nutrients					
Ammonia (as N) (mg/dm2.day)	0.00240	0.00019	<0.00023	0.00022	0.00028
Chloride (Cl) (mg/dm2.day)	0.053	0.048	0.087	0.055	0.053
Nitrate (as N) (mg/dm2.day)	0.00276	0.00205	0.00124	0.00174	0.00129
Sulfate (SO4) (mg/dm2.day)	<0.019	<0.017	<0.023	<0.021	<0.020
Metals					
Aluminum (Al)-Total (mg/dm2.day)	0.000353	0.000255	0.000369	0.000698	0.000368
Antimony (Sb)-Total (mg/dm2.day)	<0.0000039	<0.0000035	<0.0000040	<0.0000043	<0.0000039
Arsenic (As)-Total (mg/dm2.day)	<0.0000039	<0.0000035	<0.0000040	<0.0000043	<0.0000039
Barium (Ba)-Total (mg/dm2.day)	0.0000129	0.0000113	0.0000268	0.0000387	0.0000149
Beryllium (Be)-Total (mg/dm2.day)	<0.000020	<0.000018	<0.000020	<0.000021	<0.000020
Bismuth (Bi)-Total (mg/dm2.day)	<0.000020	<0.000018	<0.000020	<0.000021	<0.000020
Boron (B)-Total (mg/dm2.day)	<0.00039	<0.00035	<0.00040	<0.00043	<0.00039
Cadmium (Cd)-Total (mg/dm2.day)	<0.0000020	<0.0000018	<0.0000020	<0.0000021	0.0000035
Calcium (Ca)-Total (mg/dm2.day)	<0.0020	<0.0018	0.0024	0.0032	0.0022
Chromium (Cr)-Total (mg/dm2.day)	<0.000020	<0.000018	<0.000020	<0.000021	<0.000020
Cobalt (Co)-Total (mg/dm2.day)	<0.0000039	<0.0000035	<0.0000040	<0.0000043	<0.0000039
Copper (Cu)-Total (mg/dm2.day)	0.000248	0.000103	0.000323	0.000771	0.000415
Iron (Fe)-Total (mg/dm2.day)	<0.0012	<0.0011	<0.0012	0.0018	<0.0012
Lead (Pb)-Total (mg/dm2.day)	0.0000067	0.0000088	0.0000329	0.0000107	0.0000891
Lithium (Li)-Total (mg/dm2.day)	<0.00020	<0.00018	<0.00020	<0.00021	<0.00020
Magnesium (Mg)-Total (mg/dm2.day)	<0.0039	<0.0035	<0.0040	<0.0043	<0.0039
Manganese (Mn)-Total (mg/dm2.day)	0.0000165	0.0000220	0.0000246	0.0000507	0.0000790
Mercury (Hg)-Total (mg/dm2.day)	<0.0000020	<0.0000018	<0.0000020	<0.0000021	<0.0000020
Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000020	<0.0000018	<0.0000020	0.0000059	<0.0000020
Nickel (Ni)-Total (mg/dm2.day)	<0.000020	<0.000018	0.000042	<0.000021	<0.000020
Phosphorus (P)-Total (mg/dm2.day)	<0.012	<0.011	<0.012	<0.013	<0.012
Potassium (K)-Total (mg/dm2.day)	<0.079	<0.070	<0.080	<0.086	<0.079
Selenium (Se)-Total (mg/dm2.day)	<0.000039	<0.000035	<0.000040	<0.000043	<0.000039
Silicon (Si)-Total (mg/dm2.day)	<0.0020	<0.0018	<0.0020	<0.0021	<0.0020
Silver (Ag)-Total (mg/dm2.day)	<0.00000039	<0.00000035	<0.00000040	<0.00000043	<0.00000039
Sodium (Na)-Total (mg/dm2.day)	<0.079	<0.070	<0.080	<0.086	<0.079
Strontium (Sr)-Total (mg/dm2.day)	0.0000046	0.0000049	0.0000074	0.0000105	0.0000064
Thallium (Tl)-Total (mg/dm2.day)	<0.0000039	<0.0000035	<0.0000040	<0.0000043	<0.0000039
Tin (Sn)-Total (mg/dm2.day)	<0.0000039	<0.0000035	<0.0000040	<0.0000043	<0.0000039
Titanium (Ti)-Total (mg/dm2.day)	<0.00039	<0.00035	<0.00040	<0.00043	<0.00039

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID Description Sampled Date Sampled Time Client ID	L1061660-1 WATER DF-1 (AUG26-SEP18)	L1061660-2 WATER DF-2 (AUG26-SEP18)	L1061660-3 WATER DF-3 (AUG26-SEP18)	L1061660-4 WATER DF-4 (AUG26-SEP18)	L1061660-5 WATER DF-5 (AUG26-SEP18)
DUSTFALL							
Metals	Uranium (U)-Total (mg/dm2.day)		<0.00000039	<0.00000035	<0.00000040	<0.00000043	<0.00000039
	Vanadium (V)-Total (mg/dm2.day)		<0.000039	<0.000035	<0.000040	<0.000043	<0.000039
	Zinc (Zn)-Total (mg/dm2.day)		0.000112	0.000158	0.000193	0.000336	0.000149

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

1 2

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

L1061660-COFC

T FORM COC #

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	
INVOICE TO: SAME AS REPORT ? YES / NO				Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River - 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)	L1061660	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM ✓			Water			X	
	DF-1-TP ✓			Water	X	X		
	DF-2-TM ✓			Water			X	
	DF-2-TP ✓			Water	X	X		
	DF-3-TM ✓			Water			X	
	DF-3-TP ✓			Water	X	X		
	DF-4-TM			Water			X	
	DF-4-TP			Water	X	X		
	DF-5-TM			Water			X	
	DF-5-TP			Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	All samples were installed on August 26, 2011 : All samples collected Sept 18, 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	SAMPLE CONDITION (lab use only)	
				TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	15.6	
					If NO, Explain

ALS Laboratory Group

Environmental Division

CHAIN OF CUSTOD

CANADA TOL

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	
INVOICE TO: SAME AS REPORT ? YES / NO				Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River - 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)	L1061660	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM			Water			X	
	DF-1-TP			Water	X	X		
	DF-2-TM			Water			X	
	DF-2-TP			Water	X	X		
	DF-3-TM			Water			X	
	DF-3-TP			Water	X	X		
	DF-4-TM ✓			Water			X	
	DF-4-TP ✓			Water	X	X		
	DF-5-TM ✓			Water			X	
	DF-5-TP ✓			Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	All samples were installed on August 26, 2011 : All samples collected Sept 18, 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
		DCM	12/9/11 12:16

SAMPLE CONDITION (lab use only)	
TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
13.2°C	
	If NO, Explain

Sample Receipt Confirmation

Report Distribution:

Company Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Tolga Olcay
Address: Sixth Floor, 1111 West Hastings Street Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: 604-687-4277
Email: tolcay@rescan.com fhodge@rescan.com
Report Name: CROSSTAB_ALS
Digital Type: --
Digital Email: --
Distribution: Hard Copy: Y Email: Y Fax: N

Invoice Distribution:

Acct Name: RESCAN ENVIRONMENTAL SERVICES
Contact: Accounts Payable
Address: Sixth Floor, 1111 West Hastings Street Vancouver, BC, V6E 2J3
Phone: 604-689-9460
Fax: --
Invoice Email: --
Project #: N/A
Account #: RES100

Client Information:

Job Reference #: BACK RIVER-0833-002-09
Project PO #:
Legal Site Description: N/A
Quote #: N/A
Date Sampled:
Date Received: 21-SEP-11
Sampled By:
Chain Of Custody: 1, 2

Workorder Summary:

Lab Work Order #: **L1061660**
Estimated completion date: 30-SEP-11
5 Samples received at ALS in **VANCOUVER**
Client Job #: BACK RIVER-0833-002-09
Account Manager: Amber Springer
Estimated sample disposal date: 30-OCT-11

Lab Sample ID	Client Sample ID	Date Sampled	Date Received	Sample Due Date	Priority Flag	Sample Type
L1061660-1	DF-1 (AUG26-SEP18)		21-SEP-11 12:16	30-SEP-11		WATER
L1061660-2	DF-2 (AUG26-SEP18)		21-SEP-11 12:16	30-SEP-11		WATER
L1061660-3	DF-3 (AUG26-SEP18)		21-SEP-11 12:16	30-SEP-11		WATER
L1061660-4	DF-4 (AUG26-SEP18)		21-SEP-11 12:16	30-SEP-11		WATER
L1061660-5	DF-5 (AUG26-SEP18)		21-SEP-11 12:16	30-SEP-11		WATER

Analysis Requested:

	Sample Handling and Disposal Fee	Dustfall Chloride by Ion Chromatography	Combined Dustfalls-Total, soluble, insol	Dustfall Ammonia by Fluorescence	Dustfall Nitrate by Ion Chromatography	Total Mercury in Dustfalls by CVAFS	Total Metals in Dustfalls by ICPOES	Total Metals in Dustfalls by ICPMS	Dustfall Sample Preparation	Dustfall Sulphate by Ion Chromatography
DF-1 (AUG26-SEP18)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-2 (AUG26-SEP18)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-3 (AUG26-SEP18)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-4 (AUG26-SEP18)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DF-5 (AUG26-SEP18)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Sample Integrity Observations: No observations were identified for this work order submission.

ALS Group strives to deliver on-time results to our clients at all times. However, there are times when due to capacity issues or other unforeseen circumstances we are unable to meet our expected turnaround times. The information above is related to a recent workorder you have submitted to our laboratory. In the event that you have an inquiry, please refer to the Lab Work Order # when calling your Account Manager.

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

L1061660-COFC

T FORM COC #

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	
INVOICE TO: SAME AS REPORT ? YES / NO				Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River - 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)	L1061660	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM ✓			Water			X	
	DF-1-TP ✓			Water	X	X		
	DF-2-TM ✓			Water			X	
	DF-2-TP ✓			Water	X	X		
	DF-3-TM ✓			Water			X	
	DF-3-TP ✓			Water	X	X		
	DF-4-TM			Water			X	
	DF-4-TP			Water	X	X		
	DF-5-TM			Water			X	
	DF-5-TP			Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	All samples were installed on August 26, 2011 : All samples collected Sept 18, 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	SAMPLE CONDITION (lab use only)	
				TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	15.6	
					If NO, Explain

ALS Laboratory Group

Environmental Division

CHAIN OF CUSTOD

CANADA TOL

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REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	fhodge@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	
INVOICE TO: SAME AS REPORT ? YES / NO				Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:		JOB #:	Back River - 0833-002-09		
ADDRESS:		PO /AFE:			
CITY/ PROV		Legal Site Description:			
PHONE:	FAX	QUOTE #:			
Lab Work Order # (lab use only)	L1061660	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
	DF-1-TM			Water			X	
	DF-1-TP			Water	X	X		
	DF-2-TM			Water			X	
	DF-2-TP			Water	X	X		
	DF-3-TM			Water			X	
	DF-3-TP			Water	X	X		
	DF-4-TM ✓			Water			X	
	DF-4-TP ✓			Water	X	X		
	DF-5-TM ✓			Water			X	
	DF-5-TP ✓			Water	X	X		

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	All samples were installed on August 26, 2011 : All samples collected Sept 18, 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
		DCM	12/9/11 12:16

SAMPLE CONDITION (lab use only)	
TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
13.2°C	
	If NO, Explain

Appendix 2

2011 Passive Air Contaminant Sampling Results

Rescan™
an ERM company

Maxxam

Your Project #: 0833-002-09
Site: BACK RIVER, NT

Attention: Tolga Olcay
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/07/12

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B159231
Received: 2011/07/06, 09:40

Sample Matrix: Air
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	2	2011/07/08	2011/07/12	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	2	2011/07/11	2011/07/12	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	2	2011/07/08	2011/07/12	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Levi Manchak
12 Jul 2011 13:13:25 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B159231
Report Date: 2011/07/12

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Reference: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		AX6541	AX6612		
Sampling Date		2011/05/24 11:00	2011/05/24 11:00		
	Units	**2011-01**	**2011-01 DUP**	**RDL**	**QC Batch**
Passive Monitoring					
Calculated NO2	ppb	<0.1	<0.1	0.1	4989996
Calculated O3	ppb	26.4	25.6	0.1	4994697
Calculated SO2	ppb	0.1	<0.1	0.1	4990001

RDL = Reportable Detection Limit

Maxxam

Maxxam Job #: B159231
Report Date: 2011/07/12

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Reference: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	Units	% Recovery	QC Limits
4989996	Calculated NO2	2011/07/08	100	N/A	<0.1	ppb	100	76 - 118
4990001	Calculated SO2	2011/07/08	96	N/A	<0.1	ppb	100	95 - 105
4994697	Calculated O3	2011/07/11	100	N/A	<0.1	ppb	100	91 - 107

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B159231

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Page: 1 of 1

Invoice To:	Require Report? Yes ☑ No ☐
Company Name:	Rescan Environmental Services Ltd.
Contact Name:	Tolga Olkay
Address:	1111 West Hastings St. (6th Floor)
Prov: BC	PC: V6E 2J3
Contact #s:	Ph: 604-689-9460 Fax: 604-687-4277

Report To:	
	same as invoice
Prov:	PC:
Ph:	Fax:

PO# / AFE#:	
Quotation #:	
Project #:	0833-002-09
Proj. Name:	Back River
Location:	Nunavut
Sampler's Initials:	JS

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use

- ☐ AT1 _____
- ☐ CCME _____
- ☐ OTHER _____

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):

tolkay@rescan.com

SERVICE REQUESTED:

- ☐ **RUSH** (Please ensure you contact the lab to reserve)
  - **Date Required:** _____
- ☑ REGULAR Turnaround (5 to 7 Days)

	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	SOILS: BTEX F1-F4	Sieve (75 micron)	Salinity 4	Regulated Metals (CCME / AT1)1	Assessment ICP Metals2	Paint Filter ☐ Flashpoint ☐ pH (1:1)	TCLP ☐ BTEX ☐ Metals ☐	WATERS: ☐ VOCs ☐ BTEX F1 ☐ BTEX F1-F2	☐ BTEX F1-F4	Routine Water Package ☐ Turb ☐ F-	REGULATED METALS (CCME / AT1)3 Total ☐ Preserved ☐ Not Preserved	Dissolved ☐ Preserved ☐ Not Preserved ☐ Filtered ☐ Not Filtered	Mercury ☐ Total ☐ Dissolved	☐ Ammonia ☐ TKN ☐ COD	☐ TOC ☐ DOC	OTHER TEST(S)	*HOLD for 60 Days	# of Containers Submitted
1	2011-N02-01		2011/07/02 1747																		
2	2011-03-01		" 1748																		
3	2011-S02-01		" 1746																		
4	2011-N02-01dup		" 1750																		
5	2011-03-01dup		" 1749																		
6	2011-S02-01dup		" 1751																		
7	Travel Blank S02		"																		
8	Travel Blank N02		"																		
9	Travel Blank 03		"																		
10																					
11																					
12																					

Maxxam Job #:

All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.

Relinquished By: Julia Shewan **Date/Time:** July 4/11-0900

Sign and Print: Julia Shewan

COMMENTS/SPECIAL INSTRUCTIONS:

Contact Tolga for analysis instructions

Maxxam Contact. Levi Manchak.

# JARS USED & NOT SUBMITTED	Received By	Temperature	Ice
	CUSTODY SEAL YES / NO		

Maxxam

Your Project #: 0833-002-09
Site Location: BACK RIVER, NT

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/08/15

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B170872
Received: 2011/08/04, 12:26

Sample Matrix: Air
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	2	2011/08/08	2011/08/15	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	2	2011/08/15	2011/08/15	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	2	2011/08/08	2011/08/15	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Levi Manchak
15 Aug 2011 14:07:26 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B170872
Report Date: 2011/08/15

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		BE0645	BE0646		
Sampling Date		2011/07/02	2011/07/02		
	Units	**2011-01**	**2011-01 DUP**	**RDL**	**QC Batch**
Passive Monitoring					
Calculated NO2	ppb	<0.1	0.2	0.1	5070048
Calculated O3	ppb	24.3	24.3	0.1	5090676
Calculated SO2	ppb	<0.1	<0.1	0.1	5070055

RDL = Reportable Detection Limit

Maxxam Job #: B170872
Report Date: 2011/08/15

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	Units	% Recovery	QC Limits
5070048	Calculated NO2	2011/08/08	101	N/A	<0.1	ppb	100	76 - 118
5070055	Calculated SO2	2011/08/08	103	N/A	<0.1	ppb	104	95 - 105
5090676	Calculated O3	2011/08/15	101	N/A	<0.1	ppb	102	91 - 107

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B170872

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

B170872

SAMPLE ANALYSIS REQUEST FORM

Maxxam 0833-002-09
Back River Project

9331 - 48 Street, Edmonton AB T6B 2R4
tel: 780-577-7100 fax: 780-466-3332

INVOICE TO: Rescan Environmental
~~Hope Bay Project - Atmospheric 1009-002-02~~
6 floor, 1111 W Hastings Street
V6E2J3 Vancouver, BC

REPORT TO: Rescan Environmental Services
6th floor, 1111 W Hasting Street
V6E 2J3 Vancouver, BC
tolcay@rescan.com

Company Name: Rescan Environmental Back River Project | **Phone:** 604-689-9460 | **Area:** Sabina Gold - Back River Project

Requestor: | **Additional contact:** Fiona Hodge

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone customer service rep. Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Analysis completion requirement (surcharge may apply for priority analysis)
PRIORITY 1 (same day turnaround)
PRIORITY 2 (2 days turnaround)
turnaround)
specify DUE ON DATE
STANDARD 5 days or

Sample identification or location (LSD)	Sample Point	Sampling Start Date	Sampling End Date	Priority	SO2	H2S	NO2	O3	NOx	PM 10	PM 2.5	Dustfall	TSP						
SO2	Back River DF1		31-JUL-11	Standard	x														
SO2 duplicate	Back River DF1		31-JUL-11	Standard	x														
NO2	Back River DF1		31-JUL-11	Standard			x												
NO2 duplicate	Back River DF1		31-JUL-11	Standard			x												
O3	Back River DF1		31-JUL-11	Standard				x											
O3 duplicate	Back River DF1		31-JUL-11	Standard				x											
SO2 blank	Back River DF2			Standard	x														
NO2 blank	Back River DF3			Standard			x												
O3 blank	Back River DF4			Standard				x											

Other analysis:

Results to be reported to:

Name: Tolca Olcay
Fax: (604) 689-4277
e-mail: tolcay@rescan.com
Do you require a confirmation of receipt of samples? Yes

Email/Fax #/Phone #: _____

Maxxam to complete *Date received:* _____ *Received By:* _____

Maxxam

Your Project #: 0833-002-09
Site Location: BACK RIVER, NT

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/09/08

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B181359
Received: 2011/08/31, 12:30

Sample Matrix: Air
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	2	2011/09/07	2011/09/08	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	2	2011/09/06	2011/09/08	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	2	2011/09/08	2011/09/08	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Levi Manchak
08 Sep 2011 15:10:42 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B181359
Report Date: 2011/09/08

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		BK1753	BK1754		
Sampling Date		2011/07/31	2011/07/31		
	Units	**2011-02**	**2011-02 DUP**	**RDL**	**QC Batch**
Passive Monitoring					
Calculated NO2	ppb	<0.1	<0.1	0.1	5153638
Calculated O3	ppb	18.0	19.3	0.1	5150727
Calculated SO2	ppb	0.3	0.4	0.1	5158488

RDL = Reportable Detection Limit

Maxxam Job #: B181359
Report Date: 2011/09/08

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

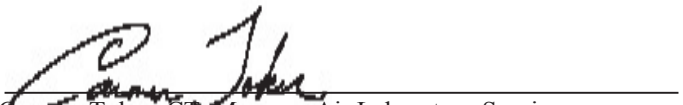
			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	Units	% Recovery	QC Limits
5150727	Calculated O3	2011/09/06	98	N/A	<0.1	ppb	100	91 - 107
5153638	Calculated NO2	2011/09/07	100	N/A	<0.1	ppb	99	76 - 118
5158488	Calculated SO2	2011/09/08	101	N/A	<0.1	ppb	99	95 - 105

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B181359

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Carmen Toker, CT, Manager Air Laboratory Services

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics Inc

9331 - 48 Street, Edmonton AB T6B 2R4
tel: 780-577-7100 fax: 780-466-3332

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO: Rescan Environmental
Back River Project - 0833-002-09
6 floor, 1111 W Hastings Street
V6E2J3 Vancouver, BC

REPORT TO: Rescan Environmental Services
6th floor, 1111 W Hasting Street
V6E 2J3 Vancouver, BC
tolcay@rescan.com

Company Name: Rescan Environmental Back River Projec	**Phone: 604-689-9460**	**Area:** Sabina Gold - Back River Project
Requestor: Tolga Olcay		**Additional contact: Fiona Hodge**

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone customer service rep. Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Analysis completion requirement (surcharge may apply for priority analysis)
PRIORITY 1 (same day turnaround)
PRIORITY 2 (2 days turnaround)
STANDARD (5 days turnaround)
or specify DUE ON DATE

Sample identification or location (LSD)	Sample Point	Sampling Start Date	Sampling End Date	Priority	SO2	H2S	NO2	O3	NOx	PM 10	PM 2.5	Dustfall	TSP						
SO2	Back River DF1	31/Jul/2011	26/Aug/2011	Standard	x														
SO2 duplicate	Back River DF1	31/Jul/2011	26/Aug/2011	Standard	x														
NO2	Back River DF1	31/Jul/2011	26/Aug/2011	Standard			x												
NO2 duplicate	Back River DF1	31/Jul/2011	26/Aug/2011	Standard			x												
O3	Back River DF1	31/Jul/2011	26/Aug/2011	Standard				x											
O3 duplicate	Back River DF1	31/Jul/2011	26/Aug/2011	Standard				x											
SO2 blank	kept in Goose Lake			Standard	x														
NO2 blank	kept in Goose Lake			Standard			x												
O3 blank	kept in Goose Lake			Standard				x											

Other analysis:

Results to be reported to:

Name: Tolga Olcay
Fax: 604-689-4277
e-mail: tolcay@rescan.com
Do you require a confirmation of receipt of samples? Yes

Email/Fax #/Phone #: _____

Maxxam to complete *Date received:* _____ *Received By:* _____

Maxxam

Your Project #: 0833-002-09
Site Location: BACK RIVER, NT

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/09/27

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B188922
Received: 2011/09/20, 14:34

Sample Matrix: Air
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	2	2011/09/26	2011/09/27	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	2	2011/09/21	2011/09/27	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	2	2011/09/26	2011/09/27	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Levi Manchak
27 Sep 2011 11:36:19 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B188922
Report Date: 2011/09/27

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		BO7732	BO7733		
Sampling Date		2011/08/26	2011/08/26		
	Units	**1**	**2 (DUP)**	**RDL**	**QC Batch**
Passive Monitoring					
Calculated NO2	ppb	0.3	0.3	0.1	5208733
Calculated O3	ppb	20.6	19.6	0.1	5200625
Calculated SO2	ppb	<0.1	0.4	0.1	5208777

RDL = Reportable Detection Limit

General Comments

Sample exposure dates: 2011/08/26 - 2011/09/18

Maxxam Job #: B188922
Report Date: 2011/09/27

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-09
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	Units	% Recovery	QC Limits
5200625	Calculated O3	2011/09/22	100	N/A	<0.1	ppb	100	91 - 107
5208733	Calculated NO2	2011/09/26	98	N/A	<0.1	ppb	101	76 - 118
5208777	Calculated SO2	2011/09/26	101	N/A	<0.1	ppb	101	95 - 105

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B188922

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics Inc

9331 - 48 Street, Edmonton AB T6B 2R4
tel: 780-577-7100 fax: 780-466-3332

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO: Rescan Environmental
Back River Project - 0833-002-09
6 floor, 1111 W Hastings Street
V6E2J3 Vancouver, BC

REPORT TO: Rescan Environmental Services
6th floor, 1111 W Hasting Street
V6E 2J3 Vancouver, BC
tolcay@rescan.com

Company Name: Rescan Environmental Back River Projec | **Phone: 604-689-9460** | **Area:** Sabina Gold - Back River Project

Requestor: | **Additional contact: Fiona Hodge**

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone customer service rep. Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Analysis completion requirement (surcharge may apply for priority analysis)
PRIORITY 1 (same day turnaround)
PRIORITY 2 (2 days turnaround)
STANDARD (5 days turnaround)
or specify DUE ON DATE

Sample identification or location (LSD)	Sample Point	Sampling Start Date	Sampling End Date	Priority	SO2	H2S	NO2	O3	NOx	PM 10	PM 2.5	Dustfall	TSP						
SO2	Back River DF1	26/Aug/2011	Sept, 18, 2011	Standard	x														
SO2 duplicate	Back River DF1	26/Aug/2011	Sept 18, 2011	Standard	x														
NO2	Back River DF1	26/Aug/2011	Sept 18 2011	Standard			x												
NO2 duplicate	Back River DF1	26/Aug/2011	Sept 18 2011	Standard			x												
O3	Back River DF1	26/Aug/2011	Sept 18 2011	Standard				x											
O3 duplicate	Back River DF1	26/Aug/2011	Sept 18 2011	Standard				x											
SO2 blank	kept in Goose Lake			Standard	x														
NO2 blank	kept in Goose Lake			Standard			x												
O3 blank	kept in Goose Lake			Standard				x											

Other analysis:

Results to be reported to:

Name:

Fax:

e-mail:

Do you require a confirmation of receipt of samples? Yes

Email/Fax #/Phone #:

Maxxam to complete *Date received:* *Received By:*

Appendix 3

2012 Back River Dustfall Results

Rescan™
an ERM company

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 30-JUL-12
Report Date: 09-AUG-12 14:54 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1186348

Project P.O. #:	NOT SUBMITTED
Job Reference:	0833-002-08
C of C Numbers:	10-253966
Legal Site Desc:	BACK RIVER

Amber Springer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1186348-1 WATER 18-JUL-12 BRDF 6 (JUNE 17-JULY 18)	L1186348-2 WATER 18-JUL-12 BRDF 7 (JUNE 17-JULY 18)	L1186348-3 WATER 18-JUL-12 BRDF 8 (JUNE 17-JULY 18)	L1186348-4 WATER 18-JUL-12 BRDF 9 (JUNE 17-JULY 18)	L1186348-5 WATER 17-JUL-12 BRDF 10 (JUNE 17-JULY 17)
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.25	0.33	0.39	0.26	0.46
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.24	0.30	0.36	0.23	0.43
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000056	0.000280	0.000082	0.000177	0.000320
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000074	<0.00000074	<0.00000098	<0.00000086	<0.00000074
	Arsenic (As)-Total (mg/dm2.day)	0.00000089	0.00000098	0.00000128	<0.00000086	0.00000309
	Barium (Ba)-Total (mg/dm2.day)	0.00000862	0.0000106	0.0000216	0.0000225	0.0000195
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000037	<0.0000037	<0.0000049	<0.0000043	<0.0000037
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000037	<0.0000037	<0.0000049	<0.0000043	<0.0000037
	Boron (B)-Total (mg/dm2.day)	<0.000074	<0.000074	<0.000098	<0.000086	<0.000074
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000037	0.00000047	0.00000050	<0.00000043	0.00000163
	Calcium (Ca)-Total (mg/dm2.day)	0.00147	0.00180	0.00177	0.00222	0.00218
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000037	0.0000046	<0.0000049	<0.0000043	<0.0000037
	Cobalt (Co)-Total (mg/dm2.day)	<0.00000074	<0.00000074	<0.00000098	<0.00000086	0.00000125
	Copper (Cu)-Total (mg/dm2.day)	<0.00018 DLB	<0.00026 DLB	<0.00020 DLB	<0.00034 DLB	<0.00018 DLB
	Iron (Fe)-Total (mg/dm2.day)	<0.00022	0.00091	<0.00029	<0.00026	0.00049
	Lead (Pb)-Total (mg/dm2.day)	<0.000052 DLB	<0.000059 DLB	<0.000034 DLB	<0.000039 DLB	<0.000022 DLB
	Lithium (Li)-Total (mg/dm2.day)	<0.000037	<0.000037	<0.000049	<0.000043	<0.000037
	Magnesium (Mg)-Total (mg/dm2.day)	0.00120	0.00141	0.00148	0.00086	0.00170
	Manganese (Mn)-Total (mg/dm2.day)	0.0000261	0.0000376	0.0000348	0.0000779	0.0000452
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000037	<0.00000037	<0.00000049	<0.00000043	<0.00000037
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000037	<0.00000037	<0.00000049	<0.00000043	<0.00000037
	Nickel (Ni)-Total (mg/dm2.day)	<0.000055 DLB	<0.000033 DLB	<0.000059 DLB	<0.000026 DLB	<0.000011 DLB
	Phosphorus (P)-Total (mg/dm2.day)	0.0052	0.0063	0.0090	0.0032	0.0077
	Potassium (K)-Total (mg/dm2.day)	<0.015	<0.015	<0.020	<0.017	0.015
	Selenium (Se)-Total (mg/dm2.day)	<0.0000074	<0.0000074	<0.0000098	<0.0000086	<0.0000074
	Silicon (Si)-Total (mg/dm2.day)	<0.00037	0.00053	<0.00049	<0.00043	0.00053
	Silver (Ag)-Total (mg/dm2.day)	<0.00000015 DLB	<0.00000029 DLB	<0.00000020 DLB	<0.00000026 DLB	<0.00000015 DLB
	Sodium (Na)-Total (mg/dm2.day)	<0.015	<0.015	<0.020	<0.017	<0.015
	Strontium (Sr)-Total (mg/dm2.day)	0.00000456	0.00000642	0.00000665	0.0000197	0.0000102
	Thallium (Tl)-Total (mg/dm2.day)	<0.00000074	<0.00000074	<0.00000098	<0.00000086	<0.00000074
	Tin (Sn)-Total (mg/dm2.day)	<0.00000074	<0.00000074	<0.00000098	<0.00000086	0.00000093
	Titanium (Ti)-Total (mg/dm2.day)	<0.000074	<0.000074	<0.000098	<0.000086	<0.000074
	Uranium (U)-Total (mg/dm2.day)	<0.000000074	<0.000000074	<0.000000098	<0.000000086	<0.000000074
	Vanadium (V)-Total (mg/dm2.day)	<0.0000074	<0.0000074	<0.0000098	<0.0000086	<0.0000074
	Zinc (Zn)-Total (mg/dm2.day)	<0.00011 DLB	<0.00011 DLB	<0.000088 DLB	<0.00010 DLB	<0.00011 DLB

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1186348-6				
	Description	WATER				
	Sampled Date	17-JUL-12				
	Sampled Time					
	Client ID	BRDF 11 (JUNE 17-JULY 17)				
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.38				
	Total Insoluble Dustfall (mg/dm2.day)	0.16				
	Total Soluble Dustfall (mg/dm2.day)	0.21				
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000128				
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000074				
	Arsenic (As)-Total (mg/dm2.day)	<0.00000074				
	Barium (Ba)-Total (mg/dm2.day)	0.0000228				
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000037				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000037				
	Boron (B)-Total (mg/dm2.day)	<0.000074				
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000046				
	Calcium (Ca)-Total (mg/dm2.day)	0.00154				
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000037				
	Cobalt (Co)-Total (mg/dm2.day)	<0.00000074				
	Copper (Cu)-Total (mg/dm2.day)	<0.00015 DLB				
	Iron (Fe)-Total (mg/dm2.day)	<0.00022				
	Lead (Pb)-Total (mg/dm2.day)	<0.000015 DLB				
	Lithium (Li)-Total (mg/dm2.day)	<0.000037				
	Magnesium (Mg)-Total (mg/dm2.day)	<0.00074				
	Manganese (Mn)-Total (mg/dm2.day)	0.0000181				
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000037				
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000037				
	Nickel (Ni)-Total (mg/dm2.day)	<0.00011 DLB				
	Phosphorus (P)-Total (mg/dm2.day)	<0.0022				
	Potassium (K)-Total (mg/dm2.day)	<0.015				
	Selenium (Se)-Total (mg/dm2.day)	<0.0000074				
	Silicon (Si)-Total (mg/dm2.day)	<0.00037				
	Silver (Ag)-Total (mg/dm2.day)	<0.00000015 DLB				
	Sodium (Na)-Total (mg/dm2.day)	<0.015				
	Strontium (Sr)-Total (mg/dm2.day)	0.0000102				
	Thallium (Tl)-Total (mg/dm2.day)	<0.00000074				
	Tin (Sn)-Total (mg/dm2.day)	<0.00000074				
	Titanium (Ti)-Total (mg/dm2.day)	<0.000074				
	Uranium (U)-Total (mg/dm2.day)	<0.000000074				
	Vanadium (V)-Total (mg/dm2.day)	<0.0000074				
	Zinc (Zn)-Total (mg/dm2.day)	<0.000088 DLB				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-253966

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10-253966

ALS Enviro

L1186348-COFC

Chain of Custody / Analytical Request Form
~~Canada Toll Free: 1 800 668 9878~~
www.alsglobal.com

Page 2 of 2

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)	
Company:	RESCAN ENV. SERVICES	Standard:	Other (specify):		Regular (Standard Turnaround Times - Business Days)
Contact:	1111 West Hastings (JEM MORRISON)	Select: PDF ✓	Excel ✓ Digital Fax		Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	Vancouver BC V6E 2J3	Email 1:	jmorrison@rescan.com		Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
		Email 2:	dcasanova@rescan.com		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	604-689-9460 Fax: 604-687-4277				Analysis Request
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		(Indicate Filtered or Preserved, F/P)	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	0833-002-08		
Company:	Daniela Shciopu	PO / AFE:			
Contact:	accountspayable@rescan.com	LSD:	Back River		
Address:					
Phone:	Fax:	Quote #:			
Lab Work Order # (lab use only)	L1186348	ALS Contact:	Amber Springer	Sampler:	SM

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Particulate	Total Metals	Number of Containers
1	BROF 6	17/JUN/12		Water	X		
	BROF 6					X	
2	BROF 7				X		
	" 7					X	
3	" 8				X		
	" 8					X	
4	" 9				X		
	" 9					X	
5	" 10				X		
	" 10					X	
6	" 11				X		
	" 11					X	

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Jem Morrison	July 19/2012	9AM		July 30	13:15	19.7 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 22-AUG-12
Report Date: 05-SEP-12 16:42 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1198177

Project P.O. #: NOT SUBMITTED
Job Reference: 0833-002-09
C of C Numbers: 10-253969
Legal Site Desc:

Amber Springer
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1198177-1	L1198177-2	L1198177-3	L1198177-4	L1198177-5
Description	dustfall	dustfall	dustfall	dustfall	dustfall
Sampled Date	18-AUG-12	18-AUG-12	18-AUG-12	18-AUG-12	17-AUG-12
Sampled Time	14:00	14:30	15:00	15:30	16:00
Client ID	BRDF6 (18-JUL-12~18-AUG-12)	BRDF7 (18-JUL-12~18-AUG-12)	BRDF8 (18-JUL-12~18-AUG-12)	BRDF9 (18-JUL-12~18-AUG-12)	BRDF10 (18-JUL-12~18-AUG-12)
Grouping / **Analyte**					
DUSTFALL					
Particulates					
Total Dustfall (mg/dm2.day)	0.39	0.57	0.25	<0.10	0.54
Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	0.40
Total Soluble Dustfall (mg/dm2.day)	0.38	0.56	0.25	<0.10	0.14
Anions and Nutrients					
Ammonia, Total (as N) (mg/dm2.day)	<0.00027	<0.00027	<0.00026	<0.00027	0.00304
Chloride (Cl) (mg/dm2.day)	0.0371	0.0396	0.0305	0.0080	0.0148
Nitrate (as N) (mg/dm2.day)	0.000925	0.00126	0.000914	0.000311	0.000273
Sulfate (SO4) (mg/dm2.day)	<0.0055	<0.0055	<0.0052	<0.0055	<0.0066
Metals					
Aluminum (Al)-Total (mg/dm2.day)	0.000388	0.000062	0.000086	0.000082	0.00166
Antimony (Sb)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000011	<0.0000011	<0.0000011
Arsenic (As)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000011	<0.0000011	0.0000131
Barium (Ba)-Total (mg/dm2.day)	0.0000208	0.00000614	0.00000632	0.00000666	0.0000131
Beryllium (Be)-Total (mg/dm2.day)	<0.0000056	<0.0000056	<0.0000056	<0.0000056	<0.0000056
Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056	<0.0000056	<0.0000056	<0.0000056	<0.0000056
Boron (B)-Total (mg/dm2.day)	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056	<0.00000056	<0.00000056	0.00000076	0.00000517
Calcium (Ca)-Total (mg/dm2.day)	0.00131	0.00096	0.00128	0.00199	0.00463
Chromium (Cr)-Total (mg/dm2.day)	<0.0000056	<0.0000056	<0.0000056	<0.0000056	0.0000087
Cobalt (Co)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000011	<0.0000011	0.0000050
Copper (Cu)-Total (mg/dm2.day)	0.000238	0.000234	0.000218	0.000227	0.000222
Iron (Fe)-Total (mg/dm2.day)	0.00064	<0.00033	<0.00033	<0.00033	0.00281
Lead (Pb)-Total (mg/dm2.day)	0.0000169	<0.0000045 DLB	0.0000333	<0.0000045 DLB	0.00000842
Lithium (Li)-Total (mg/dm2.day)	<0.000056	<0.000056	<0.000056	<0.000056	<0.000056
Magnesium (Mg)-Total (mg/dm2.day)	<0.0011	<0.0011	<0.0011	<0.0011	0.0065
Manganese (Mn)-Total (mg/dm2.day)	0.0000300	0.0000106	0.0000188	0.0000163	0.000103
Mercury (Hg)-Total (mg/dm2.day)	<0.00000056	<0.00000056	<0.00000056	<0.00000056	<0.00000056
Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000056	<0.00000056	<0.00000056	<0.00000056	<0.00000056
Nickel (Ni)-Total (mg/dm2.day)	0.0000339	0.0000108	0.0000060	<0.0000056	0.0000074
Phosphorus (P)-Total (mg/dm2.day)	<0.0033	<0.0033	<0.0033	0.0040	0.0335
Potassium (K)-Total (mg/dm2.day)	<0.022	<0.022	<0.022	<0.022	0.038
Selenium (Se)-Total (mg/dm2.day)	<0.000011	<0.000011	<0.000011	<0.000011	<0.000011
Silicon (Si)-Total (mg/dm2.day)	0.00098	<0.00056	<0.00056	<0.00056	0.00225
Silver (Ag)-Total (mg/dm2.day)	0.00000012	<0.00000011	<0.00000011	<0.00000011	<0.00000011
Sodium (Na)-Total (mg/dm2.day)	<0.022	<0.022	<0.022	<0.022	<0.022
Strontium (Sr)-Total (mg/dm2.day)	<0.0000078 DLB	<0.0000045 DLB	<0.0000056 DLB	<0.0000078 DLB	0.0000157
Thallium (Tl)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000011	<0.0000011	<0.0000011
Tin (Sn)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000011	<0.0000011	<0.0000011
Titanium (Ti)-Total (mg/dm2.day)	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1198177-1	L1198177-2	L1198177-3	L1198177-4	L1198177-5
	Description	dustfall	dustfall	dustfall	dustfall	dustfall
	Sampled Date	18-AUG-12	18-AUG-12	18-AUG-12	18-AUG-12	17-AUG-12
	Sampled Time	14:00	14:30	15:00	15:30	16:00
	Client ID	BRDF6 (18-JUL-12~18-AUG-12)	BRDF7 (18-JUL-12~18-AUG-12)	BRDF8 (18-JUL-12~18-AUG-12)	BRDF9 (18-JUL-12~18-AUG-12)	BRDF10 (18-JUL-12~18-AUG-12)
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000011	<0.00000011	<0.00000011	<0.00000011	<0.00000011
	Vanadium (V)-Total (mg/dm2.day)	<0.000011	<0.000011	<0.000011	<0.000011	<0.000011
	Zinc (Zn)-Total (mg/dm2.day)	0.000104	0.000046	0.000067	0.000065	0.000159

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate."
Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-253969

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10-253969

ALS Environmental

Chain of Custody / Analytical Request Form

~~Canada Toll Free: 1 800 668 9878~~

www.alsglobal.com

Page 1 of 1

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company:	Rescan	Standard: ✓	Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact:	~~HH West Hastings~~ Sam Morrison	Select: PDF ✓	Excel ✓ Digital Fax	Priority (2-4 Business Days) - 50% surcharge - Contact ALS to confirm TAT
Address:	111 West Hastings, Vancouver V6E 2J3	Email 1:		Emergency (1-2 Business Days) - 100% Surcharge - Contact ALS to confirm TAT
		Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	604-689-9460 Fax:			Analysis Request
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		(Indicate Filtered or Preserved, F/P)
	Copy of Invoice with Report? (circle) Yes or No	Job #: 0883-002-09		
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: A. Springer	Sampler: C. Pin	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	BRDF6	18 Aug 2012	2:00 PM	2600 mL Plastic	2
	BRDF7	↓	2:30 PM	↓	2
	BRDF8		3:00 PM		2
	BRDF9		3:30 PM		2
	BRDF10	17 Aug 2012	4:00 PM		2

L1198177-COFC

Special Instructions / Regulation with water or land use (CCME-Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
C. Pin	20 Aug 12'	12:00 PM	Brittany	Aug. 22	12:25	17.0 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 20-SEP-12
Report Date: 12-OCT-12 16:00 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1212095

Project P.O. #: NOT SUBMITTED
Job Reference: 0833-002-09
C of C Numbers: 1
Legal Site Desc:

Amber Springer
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1212095-1	L1212095-2	L1212095-3	L1212095-4	L1212095-5
	Description	Dustfall	Dustfall	Dustfall	Dustfall	Dustfall
	Sampled Date	17-SEP-12	17-SEP-12	17-SEP-12	17-SEP-12	17-SEP-12
	Sampled Time					
	Client ID	BRDF6 (AUG 18 TO SEP 17)	BRDF7 (AUG 18 TO SEP 17)	BRDF8 (AUG 18 TO SEP 17)	BRDF9 (AUG 18 TO SEP 17)	BRDF10 (AUG 18 TO SEP 17)
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	0.18	0.19
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	<0.11
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	0.18	0.17
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.000226	0.000120	0.000523	0.000597	0.00049
	Chloride (Cl) (mg/dm2.day)	0.0164	<0.0055	0.0285	0.0390	0.051
	Nitrate (as N) (mg/dm2.day)	0.000603	0.000488	0.000555	0.000624	0.00062
	Sulfate (SO4) (mg/dm2.day)	<0.0055	<0.0055	<0.0056	<0.0068	<0.011
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000089	0.000043	0.000126	0.000063	0.000446
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000012	<0.0000012	<0.0000018
	Arsenic (As)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000012	<0.0000012	0.0000025
	Barium (Ba)-Total (mg/dm2.day)	0.00000690	0.00000586	0.00000777	0.00000666	0.0000103
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000058	<0.0000058	<0.0000091
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000058	<0.0000058	<0.0000091
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00012	<0.00012	<0.00018
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058	<0.00000058	<0.00000058	<0.00000058	<0.00000091
	Calcium (Ca)-Total (mg/dm2.day)	0.00116	0.00152	0.00092	0.00115	0.00240
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000058	<0.0000058	<0.0000091
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000012	<0.0000012	<0.0000018
	Copper (Cu)-Total (mg/dm2.day)	0.000767	0.000281	0.000270	0.000173	0.000145
	Iron (Fe)-Total (mg/dm2.day)	<0.00035	<0.00035	<0.00035	<0.00035	<0.00054
	Lead (Pb)-Total (mg/dm2.day)	0.0000148	0.00000819	0.0000174	<0.0000046 DLB	<0.0000045 DLB
	Lithium (Li)-Total (mg/dm2.day)	<0.000058	<0.000058	<0.000058	<0.000058	<0.000091
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0012	<0.0012	<0.0012	<0.0012	<0.0018
	Manganese (Mn)-Total (mg/dm2.day)	0.0000140	0.0000143	0.0000160	0.0000150	0.0000227
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058	<0.00000058	<0.00000058	<0.00000058	<0.00000091
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000058	<0.00000058	<0.00000058	<0.00000058	<0.00000091
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000058	<0.0000058	0.0000065	0.0000115	<0.0000091
	Phosphorus (P)-Total (mg/dm2.day)	<0.0035	<0.0035	<0.0035	<0.0035	<0.0054
	Potassium (K)-Total (mg/dm2.day)	<0.023	<0.023	<0.023	<0.023	<0.036
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000012	<0.000012	<0.000018
	Silicon (Si)-Total (mg/dm2.day)	<0.00058	<0.00058	<0.00058	<0.00058	<0.00091
	Silver (Ag)-Total (mg/dm2.day)	0.00000018	<0.00000012	<0.00000012	<0.00000012	<0.00000018
	Sodium (Na)-Total (mg/dm2.day)	<0.023	<0.023	<0.023	<0.023	<0.036
	Strontium (Sr)-Total (mg/dm2.day)	<0.0000043 DLB	<0.0000043 DLB	<0.0000035 DLB	<0.0000039 DLB	<0.0000060 DLB
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000012	<0.0000012	<0.0000018
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000012	<0.0000012	<0.0000018
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00012	<0.00012	<0.00018

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1212095-6				
	Description	Dustfall				
	Sampled Date	17-SEP-12				
	Sampled Time					
	Client ID	BRDF11 (AUG 18 TO SEP 17)				
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.25				
	Total Insoluble Dustfall (mg/dm2.day)	<0.12				
	Total Soluble Dustfall (mg/dm2.day)	0.25				
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.000309				
	Chloride (Cl) (mg/dm2.day)	0.0505				
	Nitrate (as N) (mg/dm2.day)	0.000495				
	Sulfate (SO4) (mg/dm2.day)	<0.0069				
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000071				
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000014				
	Arsenic (As)-Total (mg/dm2.day)	<0.0000014				
	Barium (Ba)-Total (mg/dm2.day)	<0.0000048 DLB				
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000069				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000069				
	Boron (B)-Total (mg/dm2.day)	<0.00014				
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000069				
	Calcium (Ca)-Total (mg/dm2.day)	0.00129				
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000069				
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000014				
	Copper (Cu)-Total (mg/dm2.day)	0.000327				
	Iron (Fe)-Total (mg/dm2.day)	<0.00041				
	Lead (Pb)-Total (mg/dm2.day)	0.00000860				
	Lithium (Li)-Total (mg/dm2.day)	<0.000069				
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0014				
	Manganese (Mn)-Total (mg/dm2.day)	0.00000971				
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000069				
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000069				
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000069				
	Phosphorus (P)-Total (mg/dm2.day)	<0.0041				
	Potassium (K)-Total (mg/dm2.day)	<0.028				
	Selenium (Se)-Total (mg/dm2.day)	<0.000014				
	Silicon (Si)-Total (mg/dm2.day)	<0.00069				
	Silver (Ag)-Total (mg/dm2.day)	<0.00000014				
	Sodium (Na)-Total (mg/dm2.day)	<0.028				
	Strontium (Sr)-Total (mg/dm2.day)	<0.0000083 DLB				
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000014				
	Tin (Sn)-Total (mg/dm2.day)	<0.0000014				
	Titanium (Ti)-Total (mg/dm2.day)	<0.00014				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1212095-1	L1212095-2	L1212095-3	L1212095-4	L1212095-5
	Description	Dustfall	Dustfall	Dustfall	Dustfall	Dustfall
	Sampled Date	17-SEP-12	17-SEP-12	17-SEP-12	17-SEP-12	17-SEP-12
	Sampled Time					
	Client ID	BRDF6 (AUG 18 TO SEP 17)	BRDF7 (AUG 18 TO SEP 17)	BRDF8 (AUG 18 TO SEP 17)	BRDF9 (AUG 18 TO SEP 17)	BRDF10 (AUG 18 TO SEP 17)
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000012	<0.00000012	<0.00000012	<0.00000012	<0.00000018
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000012	<0.000012	<0.000018
	Zinc (Zn)-Total (mg/dm2.day)	0.000091	0.000048	0.000069	0.000082	0.000099

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1212095-6				
	Description	Dustfall				
	Sampled Date	17-SEP-12				
	Sampled Time					
	Client ID	BRDF11 (AUG 18 TO SEP 17)				
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000014				
	Vanadium (V)-Total (mg/dm2.day)	<0.000014				
	Zinc (Zn)-Total (mg/dm2.day)	0.000068				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate."
Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

L1212095-COFC

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Rescan Environmental Services	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Jem Morrison	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1111 West Hastings Street, Vancouver, B.C. V6E 2J3	Email 1: cho@rescan.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
		Email 2: dshaw@rescan.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	6046899430 Fax: 6046874277	Email 3:	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 0833-002-09	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Rescan Environmental Services	PO / AFE:	
Contact:	Accounts Payable	LSD:	
Address:	1111 West Hastings Street, Vancouver, B.C. V6E 2J3		
Phone:	(604) 689-9560 Fax: (604) 689-9460	Quote #:	
Lab Work Order # (lab use only)	L1212095 ☑ No	ALS Contact: Amber Springer	Sampler: Chris Ho

Sample #	Sample Identification (This description will appear on the report)	Date (Install) (dd-mmm-yy)	Date (Retrieval) (dd-mmm-yy)	Sample Type	Total Particulate	Soluble particulate	Insoluble particulate	Sulphate	Nitrate	NH3, NH4	Cl	Total Metals	Mg+	Ca+	K+		Number of Containers
	BRDF6-Rep1-Y	18-Aug-12	17-Sep-12	Water	X	X	X	X	X	X	X						1
	BRDF6-Rep2-Y	18-Aug-12	17-Sep-12	Water								X	X	X	X		1
	BRDF7-Rep1-Y { ON THEIR SIDE IN ORIGINAL	18-Aug-12	17-Sep-12	Water	X	X	X	X	X	X	X						1
	BRDF7-Rep2-Y } PACKING. REPACKED IN YW.	18-Aug-12	17-Sep-12	Water								X	X	X	X		1
	BRDF8-Rep1-Y	18-Aug-12	17-Sep-12	Water	X	X	X	X	X	X	X						1
	BRDF8-Rep2-Y	18-Aug-12	17-Sep-12	Water								X	X	X	X		1
	BRDF9-Rep1-Y	18-Aug-12	17-Sep-12	Water	X	X	X	X	X	X	X						1
	BRDF9-Rep2-Y	18-Aug-12	17-Sep-12	Water								X	X	X	X		1
	BRDF10-Rep1-Y	17-Aug-12	12-Sep-12	Water	X	X	X	X	X	X	X						1
	BRDF10-Rep2-Y	17-Aug-12	12-Sep-12	Water								X	X	X	X		1
	BRDF11-Rep1-Y (to be split in two for Total Metals/Mg+/Ca+/K+?)	17-Aug-12	11-Sep-12	Water	X	X	X	X	X	X	X						1
	BRDF11-Rep2-Y (Gone missing)	17-Aug-12	Missing	Water								X	X	X	X		1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Plus 2X unused DF bottles

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Chris Ho	19-Sep-12			9/19/12	15:00	19 °C				

GENF 18.01 Front

Appendix 4

2012 Passive Air Contaminant Sampling Results

Rescan™
an ERM company

Maxxam

Your Project #: 0833-002-08
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2012/08/22

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B263292
Received: 2012/07/20, 10:41

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	3	2012/07/25	2012/08/22	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2012/07/25	2012/08/22	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2012/07/25	2012/08/22	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key Levi Manchak
Levi Manchak
22 Aug 2012 14:44:03 -06:00
Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B263292
Report Date: 2012/08/22

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-08
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		DZ2636	DZ2703	DZ2704		
Sampling Date		2012/07/07	2012/06/17	2012/06/17		
	UNITS	**BRDF9**	**BRDF10**	**BRDF11**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	<0.1	0.6	DAMAGED	0.1	6033396
Calculated O3	ppb	25.6	25.7	28.1	0.1	6034609
Calculated SO2	ppb	0.5	<0.1	<0.1	0.1	6033553

RDL = Reportable Detection Limit

General Comments

Sample DZ2704-01: NO2 sample from station BRDF11 (DZ2704) received to the lab damaged (no NO2 powder in the body, and no barrier). SS

Maxxam Job #: B263292
Report Date: 2012/08/22

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-08
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
6033396	Calculated NO2	2012/07/25	96	N/A	<0.1	ppb	101	76 - 118
6033553	Calculated SO2	2012/07/25	100	N/A	<0.1	ppb	101	95 - 105
6034609	Calculated O3	2012/07/25	103	N/A	<0.1	ppb	99	91 - 107

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B263292

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam

6744 - 50 St. Edmonton AB
tel: 780-378-8500 fax: 780-378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO:
Attn: Accounts Payable
Rescan Environmental Services Ltd.
1111 W. Hastings St.
Vancouver BC V6E 2J3

REPORT TO:
Jeremy Morrison - jmorrison@rescan.com

ADDITIONAL REPORT(S) TO:

Rescan - Sabina Back River

Company Name:	Rescan	**Phone:**	(604) 689-9460	**Site/Area Name & LSD:**	Back River ~~Hay River~~
Requestor:	Jeremy Morrison	**Additional Contact:**		**Project Name/Number:**	~~Pine Point 1078-002-02~~ 0853-002-08

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5	PM10	TSP	Metal Scan	Dustfall	VOC	
~~BRDF9~~	~~16/06/12~~	~~18~~	~~18/07~~													
BRDF9	07/07/12		18/07/12		✓											
BRDF9	07/07/12		18/07/12			✓										
BRDF9	07/07/12		18/07/12				✓									
BRDF10	17/06/12		17/07/12		✓											
BRDF10	17/06/12		17/07/12			✓	✓									
BRDF10	17/06/12		17/07/12				✓									
BRDF11	17/06/12		17/07/12		✓											
BRDF11	17/06/12		17/07/12			✓										
BRDF11	17/06/12		17/07/12				✓									
Feild Blanks,																

Analysis

Extra Notes/Instructions:

Additional Information (Project #, PO#, etc.)

Maxxam to complete *Date received:* *Received By:*

Maxxam

Your Project #: 0833-002-08
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2012/08/29

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B274523
Received: 2012/08/22, 12:41

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	2	2012/08/24	2012/08/24	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2012/08/28	2012/08/29	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2012/08/24	2012/08/24	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Levi Manchak
29 Aug 2012 15:31:56 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B274523
Report Date: 2012/08/29

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-08
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		EG5456	EG5457	EG5458		
Sampling Date		2012/07/17	2012/07/17	2012/07/17		
	UNITS	**BRDF9**	**BRDF10**	**BRDF11**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	<0.1	<0.1		0.1	6112588
Calculated O3	ppb	20.6	21.4	21.6	0.1	6122728
Calculated SO2	ppb	<0.1	0.1	<0.1	0.1	6112645

RDL = Reportable Detection Limit

Maxxam

Maxxam Job #: B274523
Report Date: 2012/08/29

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-08
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
6112588	Calculated NO2	2012/08/24	96	N/A	<0.1	ppb	98	76 - 118
6112645	Calculated SO2	2012/08/24	99	N/A	<0.1	ppb	101	95 - 105
6122728	Calculated O3	2012/08/28	100	N/A	<0.1	ppb	100	91 - 107

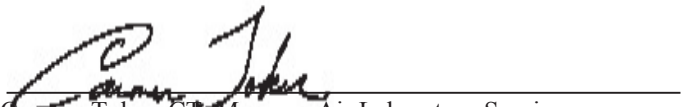
N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Maxxam

Validation Signature Page

Maxxam Job #: B274523

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Carmen Toker, CT, Manager Air Laboratory Services

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam

6744 - 50 St. Edmonton AB
tel: 780-378-8500 fax: 780-378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO:
Attn: Accounts Payable
Rescan Environmental Services Ltd.
1111 W. Hastings St.
Vancouver BC V6E 2J3

REPORT TO:
Jeremy Morrison - jmorrison@rescan.com

ADDITIONAL REPORT(S) TO:

Rescan - Sabina Back River

Company Name:	Rescan	Phone:	(604) 689-9460	Site/Area Name & LSD:	Hay River
Requestor:	Jeremy Morrison	Additional Contact:		Project Name/Number:	0833-002-09

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5	PM10	TSP	Metal Scan	Dustfall	VOC		
BRDF10	July 17, 2012	2:00 PM	Aug 17, 2012	4:00 PM	X		X	X									
BRDF9	July 17, 2012	3:00 PM	Aug 18 2012	3:00 PM	X		X	X									
BRDF11	July 17, 2012	2:30 PM	Aug 17, 2012	4:30 PM	X			X									

Analysis

Extra Notes/Instructions:
BRDF11 is missing NO2

Additional Information (Project #, PO#, etc.)

Maxxam to complete *Date received:* *Received By:*

Maxxam

Your Project #: 0833-002-08
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2012/10/03

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B286766
Received: 2012/09/27, 10:41

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	3	2012/10/03	2012/10/03	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2012/10/03	2012/10/03	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2012/10/03	2012/10/03	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Levi Manchak
03 Oct 2012 15:26:55 -06:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

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Total cover pages: 1

Maxxam Job #: B286766
Report Date: 2012/10/03

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-08
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		EO6437	EO6438	EO6439		
Sampling Date		2012/08/18	2012/08/17	2012/08/17		
	UNITS	**BRDF9**	**BRDF10**	**BRDF11**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	<0.1	0.4	<0.1	0.1	6223069
Calculated O3	ppb	17.4	17.1	18.4	0.1	6225146
Calculated SO2	ppb	<0.1	<0.1	<0.1	0.1	6223081

RDL = Reportable Detection Limit

Maxxam Job #: B286766
Report Date: 2012/10/03

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 0833-002-08
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
6223069	Calculated NO2	2012/10/03	97	N/A	<0.1	ppb	99	76 - 118
6223081	Calculated SO2	2012/10/03	100	N/A	<0.1	ppb	100	95 - 105
6225146	Calculated O3	2012/10/03	100	N/A	<0.1	ppb	98	91 - 107

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B286766

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

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Maxxam Analytics Inc

6744 - 50 St. Edmonton AB
tel: 780-378-8500 fax: 780-378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO: Rescan Environmental Services
Accounts Payable
1111 West Hastings Street
Vancouver, B.C. V6E 2J3
Phone: (604) 689-9460

REPORT TO: Rescan Environmental Services
Jem Morrison

ADDITIONAL REPORT(S) TO:
Chris Ho - cho@rescan.com
Derek Shaw - dshaw@rescan.com
Jem Morrison - jmorrison@rescan.com

Company Name: Rescan Environmental Services		**Phone:**	6046899460	**Site/Area Name & LSD:**	Melville and Young
Requestor: Chris Ho		**Additional Contact:**		**Project Name/Number:**	BackRiver 833-002-09

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Regular (non-priority) turn-around time (2-3 weeks)

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5	PM10	TSP	Metal Scan	Dustfall	VOC	
BRDF9	18/08/2012		17/09/2012		x		x	x								
BRDF11	17/08/2012		11/9/2012		x		x	x								
BRDF10	17/08/2012		12/9/2012		x		x	x								

Analysis

Extra Notes/Instructions:

Additional Information (Project #, PO#, etc.)

Maxxam to complete — *Date received:* 2012/09/24 10:44 — *Received By:* ASAD BHATTI

18/11/16 ic
no ice

no custody seal

Appendix 5

2013 Back River Dustfall Results

Rescan™
an ERM company

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 02-JUL-13
Report Date: 15-JUL-13 17:28 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1325417

Project P.O. #: 0194096-0009
Job Reference: BACK RIVER
C of C Numbers: 10-295106
Legal Site Desc:



Amber Springer
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1325417-1 water 25-JUN-13 DF8 (MAY 29 - JUNE 25)	L1325417-2 water 25-JUN-13 DF9 (MAY 29 - JUNE 25)	L1325417-3 water 25-JUN-13 DF10 (MAY 30 - JUNE 25)	L1325417-4 water 24-JUN-13 DF11 (MAY 28 - JUNE 24)	L1325417-5 water 25-JUN-13 DF12 (MAY 29 - JUNE 25)
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.61	0.65	0.68	0.60	0.44
	Total Insoluble Dustfall (mg/dm2.day)	<0.11	<0.11	0.24	<0.11	<0.11
	Total Soluble Dustfall (mg/dm2.day)	0.57	0.59	0.44	0.51	0.38
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.000701	0.000901	0.000642	0.00132	0.000304
	Chloride (Cl) (mg/dm2.day)	0.0408	0.0399	0.0345	0.0350	0.0270
	Nitrate (as N) (mg/dm2.day)	0.00140	0.00123	0.00171	0.00105	0.000944
	Sulfate (SO4) (mg/dm2.day)	<0.0058	<0.0058	0.0064	<0.0058	<0.0058
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000314	0.000297	0.00112	0.000442	0.000158
	Antimony (Sb)-Total (mg/dm2.day)	0.0000022	<0.0000013	<0.0000013	0.0000021	0.0000028
	Arsenic (As)-Total (mg/dm2.day)	0.0000013	<0.0000013	0.0000120	0.0000016	0.0000014
	Barium (Ba)-Total (mg/dm2.day)	0.0000118	0.00000936	0.00000976	0.00000937	0.00000512
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000062	<0.0000065	<0.0000067	<0.0000064	<0.0000064
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000062	<0.0000065	<0.0000067	<0.0000064	<0.0000064
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00013	<0.00013	<0.00013	<0.00013
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000062	<0.00000065	<0.00000067	<0.00000064	<0.00000064
	Calcium (Ca)-Total (mg/dm2.day)	0.00240	0.00178	0.00176	0.00326	0.00127
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000062	<0.0000065	0.0000080	<0.0000064	<0.0000064
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000012	<0.0000013	0.0000020	<0.0000013	<0.0000013
	Copper (Cu)-Total (mg/dm2.day)	0.000169	0.0000474	0.0000677	0.0000819	0.0000336
	Iron (Fe)-Total (mg/dm2.day)	0.00044	0.00047	0.00183	0.00063	<0.00038
	Lead (Pb)-Total (mg/dm2.day)	0.0000168	0.0000202	0.0000187	<0.0000058 DLB	<0.0000051 DLB
	Lithium (Li)-Total (mg/dm2.day)	<0.000062	<0.000065	<0.000067	<0.000064	<0.000064
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0012	<0.0013	<0.0013	0.0024	<0.0013
	Manganese (Mn)-Total (mg/dm2.day)	0.0000590	0.0000339	0.0000402	0.0000350	0.0000184
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000062	<0.00000065	<0.00000067	<0.00000064	<0.00000064
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000062	<0.00000065	<0.00000067	<0.00000064	<0.00000064
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000062	<0.0000065	<0.0000067	<0.0000064	<0.0000064
	Phosphorus (P)-Total (mg/dm2.day)	<0.0037	<0.0039	<0.0040	0.0148	<0.0038
	Potassium (K)-Total (mg/dm2.day)	<0.025	<0.026	<0.027	0.029	<0.026
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000013	<0.000013	<0.000013	<0.000013
	Silicon (Si)-Total (mg/dm2.day)	<0.00062	<0.00065	0.00144	0.00157	<0.00064
	Silver (Ag)-Total (mg/dm2.day)	0.00000013	0.00000015	0.00000018	<0.00000013	0.00000013
	Sodium (Na)-Total (mg/dm2.day)	<0.025	<0.026	<0.027	<0.026	<0.026
	Strontium (Sr)-Total (mg/dm2.day)	0.0000056	0.0000057	0.0000059	0.0000094	0.0000046
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000013	<0.0000013	<0.0000013	<0.0000013
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000013	<0.0000013	<0.0000013	<0.0000013
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00013	<0.00013	<0.00013	<0.00013

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1325417-6				
	Description	water				
	Sampled Date	27-JUN-13				
	Sampled Time					
	Client ID	DF13 (MAY 29 - JUNE 27)				
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.28				
	Total Insoluble Dustfall (mg/dm2.day)	<0.10				
	Total Soluble Dustfall (mg/dm2.day)	0.22				
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.000230				
	Chloride (Cl) (mg/dm2.day)	0.0182				
	Nitrate (as N) (mg/dm2.day)	0.000532				
	Sulfate (SO4) (mg/dm2.day)	<0.0054				
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000096				
	Antimony (Sb)-Total (mg/dm2.day)	0.0000012				
	Arsenic (As)-Total (mg/dm2.day)	0.0000013				
	Barium (Ba)-Total (mg/dm2.day)	0.00000210				
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000060				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000060				
	Boron (B)-Total (mg/dm2.day)	<0.00012				
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000060				
	Calcium (Ca)-Total (mg/dm2.day)	0.00065				
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000060				
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000012				
	Copper (Cu)-Total (mg/dm2.day)	0.0000330				
	Iron (Fe)-Total (mg/dm2.day)	<0.00036				
	Lead (Pb)-Total (mg/dm2.day)	<0.0000042 DLB				
	Lithium (Li)-Total (mg/dm2.day)	<0.000060				
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0012				
	Manganese (Mn)-Total (mg/dm2.day)	<0.0000083 DLB				
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000060				
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000060				
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000060				
	Phosphorus (P)-Total (mg/dm2.day)	<0.0036				
	Potassium (K)-Total (mg/dm2.day)	<0.024				
	Selenium (Se)-Total (mg/dm2.day)	<0.000012				
	Silicon (Si)-Total (mg/dm2.day)	<0.00060				
	Silver (Ag)-Total (mg/dm2.day)	<0.00000012				
	Sodium (Na)-Total (mg/dm2.day)	<0.024				
	Strontium (Sr)-Total (mg/dm2.day)	0.0000017				
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012				
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012				
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1325417-1	L1325417-2	L1325417-3	L1325417-4	L1325417-5
	Description	water	water	water	water	water
	Sampled Date	25-JUN-13	25-JUN-13	25-JUN-13	24-JUN-13	25-JUN-13
	Sampled Time					
	Client ID	DF8 (MAY 29 - JUNE 25)	DF9 (MAY 29 - JUNE 25)	DF10 (MAY 30 - JUNE 25)	DF11 (MAY 28 - JUNE 24)	DF12 (MAY 29 - JUNE 25)
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000012	<0.00000013	<0.00000013	<0.00000013	<0.00000013
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000013	<0.000013	<0.000013	<0.000013
	Zinc (Zn)-Total (mg/dm2.day)	0.000117	0.000078	0.000094	0.000050	0.000047

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1325417-6				
	Description	water				
	Sampled Date	27-JUN-13				
	Sampled Time					
	Client ID	DF13 (MAY 29 - JUNE 27)				
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000012				
	Vanadium (V)-Total (mg/dm2.day)	<0.000012				
	Zinc (Zn)-Total (mg/dm2.day)	<0.000036				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate."
Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-295106

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

L1325417-COFC

Request Form
368 9878

10- 295106

Page 1 of 1

Report To Team	**Report Format / Distribution**	**Service Request:** (Rush subject to availability - Contact ALS to confirm TAT)
Company: Rescan Env Services	Standard: ✓ Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact: 604-689-9460	Select: (PDF) Excel Digital Fax	Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: 1111 West Hastings Street	Email 1: jen.morrison@erm.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Vancouver BC V6E2J3	Email 2: derek.shaw@erm.com	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: Fax:		**Analysis Request**
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: Back River	
Company: payables@erm.com	PO / AFE: 0194096-0009	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only): L1325417	ALS Contact: Amber Springer	Sampler: J. Morrison

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Particulate	Soluble Particulate	Insoluble	Sulphate	NO_3^-	HNO_3, NH_4	Cl	Total Metals	Mg^{2+}	Ca^{2+}	K^+		Number of Containers
	DF8-TP	May29	June 25	Water	x	x	x	x	x	x	x						
	DF8-TM	"	"									x	x	x	x		
	DF9-TP	May29	June25		x	x	x	x	x	x	x						
	DF9-TM	"	"									x	x	x	x		
	DF10-TP	May30	June25		x	x	x	x	x	x	x						
	DF10-TM	"	"									x	x	x	x		
	DF11-TP	May28	June24		x	x	x	x	x	x	x						
	DF11-TM	"	"									x	x	x	x		
	DF12-TP	May29	June25		x	x	x	x	x	x	x						
	DF12-TM	"	"									x	x	x	x		
	DF13-TP	May29	June27	✓	x	x	x	x	x	x	x						
	DF13-TM	"	"									x	x	x	x		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Outfall

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
J. Morrison	June27	10:00AM	TN	June 27	17:25	21 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 31-JUL-13
Report Date: 13-AUG-13 17:48 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1341123

Project P.O. #: NOT SUBMITTED
Job Reference: 0194096-0009
C of C Numbers: 10-295108
Legal Site Desc:



Amber Springer
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1341123-1 Dustfall 22-JUL-13 DF13 (JUN25 - JUL22)	L1341123-2 Dustfall 22-JUL-13 DF12 (JUN25 - JUL22)	L1341123-3 Dustfall 22-JUL-13 DF10 (JUN25 - JUL22)	L1341123-4 Dustfall 22-JUL-13 DF9 (JUN25 - JUL22)	L1341123-5 Dustfall 23-JUL-13 DF11 (JUN24 - JUL23)
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.13	0.42	0.17	0.23	0.13
	Total Insoluble Dustfall (mg/dm2.day)	<0.11	0.12	0.17	0.22	0.10
	Total Soluble Dustfall (mg/dm2.day)	<0.11	0.30	<0.11	<0.11	<0.10
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000071	0.000061	0.000353	0.000113	0.000098
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000014	<0.0000013	<0.0000013	<0.0000013	<0.0000012
	Arsenic (As)-Total (mg/dm2.day)	<0.0000014	<0.0000013	0.0000021	<0.0000013	<0.0000012
	Barium (Ba)-Total (mg/dm2.day)	<0.0000041 DLB	<0.0000038 DLB	0.00000588	0.00000720	<0.0000024 DLB
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000069	<0.0000064	<0.0000064	<0.0000064	<0.0000060
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000069	<0.0000064	<0.0000064	<0.0000064	<0.0000060
	Boron (B)-Total (mg/dm2.day)	<0.00014	<0.00013	<0.00013	<0.00013	<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000069	<0.00000064	0.00000154	<0.00000064	<0.00000060
	Calcium (Ca)-Total (mg/dm2.day)	<0.00069	<0.00064	0.00222	0.00088	0.00095
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000069	<0.0000064	<0.0000064	<0.0000064	<0.0000060
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000014	<0.0000013	<0.0000013	<0.0000013	<0.0000012
	Copper (Cu)-Total (mg/dm2.day)	<0.00011 DLB	<0.00010 DLB	0.000162	<0.00012 DLB	<0.000060 DLB
	Iron (Fe)-Total (mg/dm2.day)	<0.00041	<0.00038	0.00082	<0.00038	<0.00036
	Lead (Pb)-Total (mg/dm2.day)	<0.000041 DLB	<0.000038 DLB	0.0000391	<0.000038 DLB	<0.000024 DLB
	Lithium (Li)-Total (mg/dm2.day)	<0.000069	<0.000064	<0.000064	<0.000064	<0.000060
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0014	<0.0013	0.0015	<0.0013	<0.0012
	Manganese (Mn)-Total (mg/dm2.day)	<0.000014 DLB	0.0000184	0.0000365	<0.000026 DLB	0.0000211
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000069	<0.00000064	<0.00000064	<0.00000064	<0.00000060
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000069	<0.00000064	<0.00000064	<0.00000064	<0.00000060
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000069	<0.0000064	<0.0000064	<0.0000064	<0.0000060
	Phosphorus (P)-Total (mg/dm2.day)	0.0044	<0.0038	0.0048	<0.0038	0.0053
	Potassium (K)-Total (mg/dm2.day)	<0.028	<0.026	<0.026	<0.026	<0.024
	Selenium (Se)-Total (mg/dm2.day)	<0.000014	<0.000013	<0.000013	<0.000013	<0.000012
	Silicon (Si)-Total (mg/dm2.day)	<0.00069	<0.00064	<0.00064	<0.00064	<0.00060
	Silver (Ag)-Total (mg/dm2.day)	<0.00000014	<0.00000013	<0.00000013	<0.00000013	0.00000015
	Sodium (Na)-Total (mg/dm2.day)	<0.028	<0.026	<0.026	<0.026	<0.024
	Strontium (Sr)-Total (mg/dm2.day)	0.0000028	0.0000021	0.0000064	0.0000034	0.0000029
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000014	<0.0000013	<0.0000013	<0.0000013	<0.0000012
	Tin (Sn)-Total (mg/dm2.day)	<0.0000014	<0.0000013	<0.0000013	<0.0000013	<0.0000012
	Titanium (Ti)-Total (mg/dm2.day)	<0.00014	<0.00013	<0.00013	<0.00013	<0.00012
	Uranium (U)-Total (mg/dm2.day)	<0.00000014	<0.00000013	<0.00000013	<0.00000013	<0.00000012
	Vanadium (V)-Total (mg/dm2.day)	<0.000014	<0.000013	<0.000013	<0.000013	<0.000012
	Zinc (Zn)-Total (mg/dm2.day)	0.000063	0.000044	0.000198	0.000077	0.000055

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1341123-6				
	Description	Dustfall				
	Sampled Date	22-JUL-13				
	Sampled Time					
	Client ID	DF8 (JUN25 - JUL22)				
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.30				
	Total Insoluble Dustfall (mg/dm2.day)	<0.11				
	Total Soluble Dustfall (mg/dm2.day)	0.24				
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000119				
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000013				
	Arsenic (As)-Total (mg/dm2.day)	0.0000013				
	Barium (Ba)-Total (mg/dm2.day)	0.00000560				
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000064				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000064				
	Boron (B)-Total (mg/dm2.day)	<0.00013				
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000064				
	Calcium (Ca)-Total (mg/dm2.day)	0.00115				
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000064				
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000013				
	Copper (Cu)-Total (mg/dm2.day)	0.000131				
	Iron (Fe)-Total (mg/dm2.day)	<0.00038				
	Lead (Pb)-Total (mg/dm2.day)	<0.000026 DLB				
	Lithium (Li)-Total (mg/dm2.day)	<0.000064				
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0013				
	Manganese (Mn)-Total (mg/dm2.day)	0.0000307				
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000064				
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000064				
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000064				
	Phosphorus (P)-Total (mg/dm2.day)	<0.0038				
	Potassium (K)-Total (mg/dm2.day)	<0.026				
	Selenium (Se)-Total (mg/dm2.day)	<0.000013				
	Silicon (Si)-Total (mg/dm2.day)	<0.00064				
	Silver (Ag)-Total (mg/dm2.day)	<0.00000013				
	Sodium (Na)-Total (mg/dm2.day)	<0.026				
	Strontium (Sr)-Total (mg/dm2.day)	0.0000082				
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000013				
	Tin (Sn)-Total (mg/dm2.day)	<0.0000013				
	Titanium (Ti)-Total (mg/dm2.day)	<0.00013				
	Uranium (U)-Total (mg/dm2.day)	<0.00000013				
	Vanadium (V)-Total (mg/dm2.day)	<0.000013				
	Zinc (Zn)-Total (mg/dm2.day)	0.000067				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-295108

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10- 295108

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page 1 of 1

Report To	Report Format / Distribution	Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company: Rescan	Standard: ✓ Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact: Jem Morrison	Select: PDF ✓ Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: 111 W Hastings St Vancouver	Email 1: jem.morrison@erm.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
	Email 2: Fiona.hodge@erm.com	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: 604 687 4277 Fax: —		**Analysis Request**
Invoice To Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) (Yes) or No	Job #: 0194096-0009	
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #: 0194096-0009	
Lab Work Order # (lab use only) L1341123	**ALS Contact:** A Springer **Sampler:** F Hodge E Boyle	

Sample #	Sample Identification (This description will appear on the report)	Date Installed (dd-mmm-yy)	Time Date retrieved (hh:mm)	Sample Type	Total Metals	Total Particulates	Number of Containers
	~~DF8~~	~~25-Jun-13~~	~~28-Jul-13~~		✓	✓	~~2~~
	DF13	25-Jun-13	22-Jul-13		✓	✓	2
	DF12	25-Jun-13	22-Jul-13	Dustfall Samplers	✓	✓	2
	DF10	25-Jun-13	22-Jul-13		✓	✓	2
	DF9	25-Jun-13	22-Jul-13		✓	✓	2
	DF11	24-Jun-13	23-Jul-13		✓	✓	2

L1341123-COFC

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Contact Jem Morrison if you have questions. Please do not analyze DF8, please dispose.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			B. H	July 31	10:05	22.3 / 22.6°C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 03-SEP-13
Report Date: 12-SEP-13 15:30 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1356835

Project P.O. #: NOT SUBMITTED
Job Reference: 0194096-0009
C of C Numbers:
Legal Site Desc:

Comments: The dustfall canister submitted for L1356835-5 arrived damaged, and it's possible that some of the sample may have been lost in transport. This should be considered when reviewing the data.

Amber Springer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1356835-1	L1356835-2	L1356835-3	L1356835-4	L1356835-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	25-AUG-13	25-AUG-13	23-AUG-13	26-AUG-13	24-AUG-13
	Sampled Time	20:00	21:00	13:00	18:00	17:00
	Client ID	DF8	DF9	DF10	DF11	DF12
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.69	0.62	1.67	<0.10	<0.10
	Total Insoluble Dustfall (mg/dm2.day)	0.13	<0.10	0.59	<0.10	<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.56	0.58	1.08	<0.10	<0.10
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	<0.0022	0.00054	<0.0026	0.000034	0.000259
	Chloride (Cl) (mg/dm2.day)	0.0496	0.0468	0.0540	0.0043	0.0073
	Nitrate (as N) (mg/dm2.day)	0.00273	0.00147	0.00152	0.000408	0.000264
	Sulfate (SO4) (mg/dm2.day)	0.0051	0.0039	<0.0052	<0.0021	<0.0037
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000095	0.000247	0.000294	0.000093	0.000350
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000010	<0.0000010	<0.0000011	<0.0000010	0.0000012
	Arsenic (As)-Total (mg/dm2.day)	<0.0000010	<0.0000010	0.0000040	<0.0000010	0.0000017
	Barium (Ba)-Total (mg/dm2.day)	0.0000168	0.0000162	0.0000157	0.0000115	0.0000204
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000051	<0.0000051	<0.0000054	<0.0000051	<0.0000052
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000051	<0.0000051	<0.0000054	<0.0000051	<0.0000052
	Boron (B)-Total (mg/dm2.day)	<0.00010	<0.00010	<0.00011	<0.00010	<0.00010
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000051	<0.00000051	0.00000283	<0.00000051	0.00000102
	Calcium (Ca)-Total (mg/dm2.day)	0.00515	0.00250	0.00445	0.00104	0.00312
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000051	<0.0000051	<0.0000054	<0.0000051	<0.0000052
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000010	<0.0000010	0.0000031	<0.0000010	<0.0000010
	Copper (Cu)-Total (mg/dm2.day)	0.000174	0.000288	0.000266	<0.000081 DLB	0.000283
	Iron (Fe)-Total (mg/dm2.day)	<0.00031	0.00039	0.00045	<0.00031	0.00046
	Lead (Pb)-Total (mg/dm2.day)	<0.000020 DLB	0.0000415	<0.0000097 DLB	<0.0000061 DLB	<0.000021 DLB
	Lithium (Li)-Total (mg/dm2.day)	<0.000051	<0.000051	<0.000054	<0.000051	<0.000052
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0010	0.0014	0.0034	<0.0010	0.0013
	Manganese (Mn)-Total (mg/dm2.day)	0.0000493	0.0000471	0.0000787	0.0000237	0.0000418
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000051	<0.00000051	<0.00000054	<0.00000051	<0.00000052
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000051	<0.00000051	<0.00000054	<0.00000051	0.00000071
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000051	<0.0000051	<0.0000054	<0.0000051	0.0000068
	Phosphorus (P)-Total (mg/dm2.day)	<0.0031	0.0062	0.0177	<0.0031	0.0052
	Potassium (K)-Total (mg/dm2.day)	<0.020	<0.020	0.027	<0.020	<0.021
	Selenium (Se)-Total (mg/dm2.day)	<0.000010	<0.000010	<0.000011	<0.000010	<0.000010
	Silicon (Si)-Total (mg/dm2.day)	0.00103	<0.00051	<0.00054	<0.00051	0.00097
	Silver (Ag)-Total (mg/dm2.day)	<0.00000010	0.00000014	<0.00000011	<0.00000010	0.00000041
	Sodium (Na)-Total (mg/dm2.day)	<0.020	<0.020	<0.022	<0.020	<0.021
	Strontium (Sr)-Total (mg/dm2.day)	0.0000200	0.0000089	0.0000092	0.0000056	0.0000116
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000010	<0.0000010	<0.0000011	<0.0000010	<0.0000010
	Tin (Sn)-Total (mg/dm2.day)	<0.0000010	<0.0000010	<0.0000011	<0.0000010	<0.0000010
	Titanium (Ti)-Total (mg/dm2.day)	<0.00010	<0.00010	<0.00011	<0.00010	<0.00010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1356835-6				
	Description	Water				
	Sampled Date	24-AUG-13				
	Sampled Time	16:00				
	Client ID	DF13				
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.83				
	Total Insoluble Dustfall (mg/dm2.day)	0.11				
	Total Soluble Dustfall (mg/dm2.day)	0.72				
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	<0.0023				
	Chloride (Cl) (mg/dm2.day)	0.0496				
	Nitrate (as N) (mg/dm2.day)	0.00177				
	Sulfate (SO4) (mg/dm2.day)	0.0051				
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000361				
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000010				
	Arsenic (As)-Total (mg/dm2.day)	0.0000014				
	Barium (Ba)-Total (mg/dm2.day)	0.0000242				
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000052				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000052				
	Boron (B)-Total (mg/dm2.day)	<0.00010				
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000058				
	Calcium (Ca)-Total (mg/dm2.day)	0.00517				
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000052				
	Cobalt (Co)-Total (mg/dm2.day)	0.0000012				
	Copper (Cu)-Total (mg/dm2.day)	0.000349				
	Iron (Fe)-Total (mg/dm2.day)	0.00075				
	Lead (Pb)-Total (mg/dm2.day)	0.00000383				
	Lithium (Li)-Total (mg/dm2.day)	<0.000052				
	Magnesium (Mg)-Total (mg/dm2.day)	0.0027				
	Manganese (Mn)-Total (mg/dm2.day)	0.000103				
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000052				
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000150				
	Nickel (Ni)-Total (mg/dm2.day)	0.0000059				
	Phosphorus (P)-Total (mg/dm2.day)	0.0154				
	Potassium (K)-Total (mg/dm2.day)	0.022				
	Selenium (Se)-Total (mg/dm2.day)	<0.000010				
	Silicon (Si)-Total (mg/dm2.day)	0.00110				
	Silver (Ag)-Total (mg/dm2.day)	0.00000015				
	Sodium (Na)-Total (mg/dm2.day)	<0.021				
	Strontium (Sr)-Total (mg/dm2.day)	0.0000196				
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000010				
	Tin (Sn)-Total (mg/dm2.day)	<0.0000010				
	Titanium (Ti)-Total (mg/dm2.day)	<0.00010				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1356835-1	L1356835-2	L1356835-3	L1356835-4	L1356835-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	25-AUG-13	25-AUG-13	23-AUG-13	26-AUG-13	24-AUG-13
	Sampled Time	20:00	21:00	13:00	18:00	17:00
	Client ID	DF8	DF9	DF10	DF11	DF12
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000010	<0.00000010	<0.00000011	<0.00000010	<0.00000010
	Vanadium (V)-Total (mg/dm2.day)	<0.000010 DLB	<0.000010 DLB	<0.000011	<0.000010 DLB	<0.000010
	Zinc (Zn)-Total (mg/dm2.day)	<0.000092	<0.00012	0.000286	<0.000061	0.000280

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1356835-6				
	Description	Water				
	Sampled Date	24-AUG-13				
	Sampled Time	16:00				
	Client ID	DF13				
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000010				
	Vanadium (V)-Total (mg/dm2.day)	<0.000010				
	Zinc (Zn)-Total (mg/dm2.day)	0.000109				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate."
Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory
ANALYTICAL CHEMISTRY & TE
Environmental Divi

L1356835-COFC

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

Page 1 of 1

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Rescan Environmental Services	☑ Standard ☐ Other	◉ Regular (Default)
Contact:	Jem Morrison	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (Specify Date Required →) Surcharges apply
Address:	1111 West Hastings Street	Email 1: jem.morrison@erm.com	○ Emergency (1 Business Day) - 100% Surcharge
	Vancouver, B.C. V6E 2J3	Email 2: derek.shaw@erm.com	○ For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	(604)689-9560 Fax:		**Analysis Request**
Invoice To	Same as Report ? ☐ Yes ☑ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Rescan Environmental Services	Job #: 0194096-0009	
Contact:	Accounts Payable (ermcanada.payables@erm.com)	PO / AFE:	
Address:	1111 West Hastings Street	LSD:	
	Vancouver, B.C. V6E 2J3		
Phone:	(604)689-9560 Fax:	Quote #:	
Lab Work Order # (lab use only)	☑ No L1356835	**ALS Contact:** Amber Springer	**Sampler:** Christine Rock

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Particulate	Soluble particulate	Insoluble particulate	Sulphate	Nitrate	NH3, NH4	Cl	Total Metals	Mg+	Ca+	K+		Number of Containers
	DF8-TP	25-Aug-13	20:00	Water	X	X	X	X	X	X	X						1
	DF8-TM	25-Aug-13	20:00	Water								X	X	X	X		1
	DF9-TP	25-Aug-13	21:00	Water	X	X	X	X	X	X	X						1
	DF9-TM	25-Aug-13	21:00	Water								X	X	X	X		1
	DF10-TP	23-Aug-13	13:00	Water	X	X	X	X	X	X	X						1
	DF10-TM	23-Aug-13	13:00	Water								X	X	X	X		1
	DF11-TP	26-Aug-13	18:00	Water	X	X	X	X	X	X	X						1
	DF11-TM	26-Aug-13	18:00	Water								X	X	X	X		1
	DF12-TP	24-Aug-13	17:00	Water	X	X	X	X	X	X	X						1
	DF12-TM	24-Aug-13	17:00	Water								X	X	X	X		1
	DF13-TP	24-Aug-13	16:00	Water	X	X	X	X	X	X	X						1
	DF13-TM	24-Aug-13	16:00	Water								X	X	X	X		1

Short Holding Time

Rush Processing

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Christine Rock	28-Aug-13	15:00	P.R.	3 SEPT	12:30	14.4 14.3 °C				

GENF 18.02 Front

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 18-SEP-13
Report Date: 27-SEP-13 16:01 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1364961

Project P.O. #: NOT SUBMITTED
Job Reference: 0194096-0009
C of C Numbers:
Legal Site Desc:

Amber Springer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1364961-1	L1364961-2	L1364961-3	L1364961-4	L1364961-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	13-SEP-13	13-SEP-13	14-SEP-13	14-SEP-13	13-SEP-13
	Sampled Time					
	Client ID	DF8 (AUG25 - SEP13/13)	DF9 (AUG25 - SEPT13/13)	DF10 (AUG23 - SEPT14/13)	DF11 (AUG26 - SEPT14/13)	DF12 (AUG24 - SEPT13/13)
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.76	<0.16	<0.14	<0.16	0.58
	Total Insoluble Dustfall (mg/dm2.day)	<0.16	<0.16	<0.14	<0.16	<0.15
	Total Soluble Dustfall (mg/dm2.day)	0.74	<0.16	<0.14	<0.16	0.53
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.00028	0.00020	0.00026	0.00022	0.00032
	Chloride (Cl) (mg/dm2.day)	0.042	0.043	0.037	0.047	0.082
	Nitrate (as N) (mg/dm2.day)	0.00083	0.00082	0.00080	0.00065	0.00070
	Sulfate (SO4) (mg/dm2.day)	<0.017	<0.019	<0.016	<0.017	<0.016
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000181	0.00018	0.00022	0.00025	0.00015
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000028	<0.0000042	<0.0000034	<0.0000035	<0.0000037
	Arsenic (As)-Total (mg/dm2.day)	<0.0000028	<0.0000042	<0.0000034	<0.0000035	<0.0000037
	Barium (Ba)-Total (mg/dm2.day)	0.0000055	0.0000193	0.0000039	0.0000084	0.0000044
	Beryllium (Be)-Total (mg/dm2.day)	<0.000014	<0.000021	<0.000017	<0.000017	<0.000018
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000014	<0.000021	<0.000017	<0.000017	<0.000018
	Boron (B)-Total (mg/dm2.day)	<0.00028	<0.00042	<0.00034	<0.00035	<0.00037
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000014	<0.0000021	<0.0000017	<0.0000017	<0.0000018
	Calcium (Ca)-Total (mg/dm2.day)	<0.0014	<0.0021	<0.0017	0.0030	<0.0018
	Chromium (Cr)-Total (mg/dm2.day)	<0.000014	<0.000021	<0.000017	<0.000017	<0.000018
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000028	<0.0000042	<0.0000034	<0.0000035	<0.0000037
	Copper (Cu)-Total (mg/dm2.day)	0.000632	0.000484	<0.00015 DLB	0.000833	0.000473
	Iron (Fe)-Total (mg/dm2.day)	<0.00084	<0.0013	<0.0010	<0.0010	<0.0011
	Lead (Pb)-Total (mg/dm2.day)	0.0000026	0.0000045	0.0000261	0.0000058	0.0000024
	Lithium (Li)-Total (mg/dm2.day)	<0.00014	<0.00021	<0.00017	<0.00017	<0.00018
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0028	<0.0042	<0.0034	<0.0035	<0.0037
	Manganese (Mn)-Total (mg/dm2.day)	0.0000291	0.0000235	0.0000108	0.0000258	0.0000096
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000014	<0.0000021	<0.0000017	<0.0000017	<0.0000018
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000014	<0.0000021	<0.0000017	<0.0000017	<0.0000018
	Nickel (Ni)-Total (mg/dm2.day)	<0.000014	<0.000021	<0.000017	<0.000017	<0.000018
	Phosphorus (P)-Total (mg/dm2.day)	<0.0084	<0.013	<0.010	<0.010	<0.011
	Potassium (K)-Total (mg/dm2.day)	<0.056	<0.084	<0.069	<0.069	<0.074
	Selenium (Se)-Total (mg/dm2.day)	<0.000028	<0.000042	<0.000034	<0.000035	<0.000037
	Silicon (Si)-Total (mg/dm2.day)	<0.0014	<0.0021	<0.0017	<0.0017	<0.0018
	Silver (Ag)-Total (mg/dm2.day)	<0.00000028	<0.00000042	<0.00000034	<0.00000035	<0.00000037
	Sodium (Na)-Total (mg/dm2.day)	<0.056	<0.084	<0.069	<0.069	<0.074
	Strontium (Sr)-Total (mg/dm2.day)	0.0000060	0.0000062	0.0000047	0.0000151	<0.0000037
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000028	<0.0000042	<0.0000034	<0.0000035	<0.0000037
	Tin (Sn)-Total (mg/dm2.day)	<0.0000028	<0.0000042	<0.0000034	<0.0000035	<0.0000037
	Titanium (Ti)-Total (mg/dm2.day)	<0.00028	<0.00042	<0.00034	<0.00035	<0.00037

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1364961-6				
	Description	Water				
	Sampled Date	13-SEP-13				
	Sampled Time					
	Client ID	DF13 (AUG24 - SEPT13/13)				
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.50				
	Total Insoluble Dustfall (mg/dm2.day)	<0.15				
	Total Soluble Dustfall (mg/dm2.day)	0.46				
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.00027				
	Chloride (Cl) (mg/dm2.day)	0.082				
	Nitrate (as N) (mg/dm2.day)	0.00071				
	Sulfate (SO4) (mg/dm2.day)	<0.016				
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00012				
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000035				
	Arsenic (As)-Total (mg/dm2.day)	<0.0000035				
	Barium (Ba)-Total (mg/dm2.day)	0.0000044				
	Beryllium (Be)-Total (mg/dm2.day)	<0.000018				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000018				
	Boron (B)-Total (mg/dm2.day)	<0.00035				
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000018				
	Calcium (Ca)-Total (mg/dm2.day)	<0.0018				
	Chromium (Cr)-Total (mg/dm2.day)	<0.000018				
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000035				
	Copper (Cu)-Total (mg/dm2.day)	<0.00014 DLB				
	Iron (Fe)-Total (mg/dm2.day)	<0.0011				
	Lead (Pb)-Total (mg/dm2.day)	0.0000032				
	Lithium (Li)-Total (mg/dm2.day)	<0.00018				
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0035				
	Manganese (Mn)-Total (mg/dm2.day)	0.0000085				
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000018				
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000018				
	Nickel (Ni)-Total (mg/dm2.day)	<0.000018				
	Phosphorus (P)-Total (mg/dm2.day)	<0.011				
	Potassium (K)-Total (mg/dm2.day)	<0.071				
	Selenium (Se)-Total (mg/dm2.day)	<0.000035				
	Silicon (Si)-Total (mg/dm2.day)	<0.0018				
	Silver (Ag)-Total (mg/dm2.day)	<0.00000035				
	Sodium (Na)-Total (mg/dm2.day)	<0.071				
	Strontium (Sr)-Total (mg/dm2.day)	0.0000039				
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000035				
	Tin (Sn)-Total (mg/dm2.day)	<0.0000035				
	Titanium (Ti)-Total (mg/dm2.day)	<0.00035				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1364961-1	L1364961-2	L1364961-3	L1364961-4	L1364961-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	13-SEP-13	13-SEP-13	14-SEP-13	14-SEP-13	13-SEP-13
	Sampled Time					
	Client ID	DF8 (AUG25 - SEP13/13)	DF9 (AUG25 - SEPT13/13)	DF10 (AUG23 - SEPT14/13)	DF11 (AUG26 - SEPT14/13)	DF12 (AUG24 - SEPT13/13)
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000028	<0.00000042	<0.00000034	<0.00000035	<0.00000037
	Vanadium (V)-Total (mg/dm2.day)	<0.000028	<0.000042	<0.000034	<0.000035	<0.000037
	Zinc (Zn)-Total (mg/dm2.day)	0.000141	0.00022	0.00015	0.00023	0.00015

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1364961-6				
	Description	Water				
	Sampled Date	13-SEP-13				
	Sampled Time					
	Client ID	DF13 (AUG24 - SEPT13/13)				
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000035				
	Vanadium (V)-Total (mg/dm2.day)	<0.000035				
	Zinc (Zn)-Total (mg/dm2.day)	0.00011				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE

This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate."
Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

AI
ANA
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L1364961-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Rescan Environmental Services	☑ Standard ☐ Other		◉ Regular (Default)
Contact:	Jem Morrison	☑ PDF ☑ Excel ☐ Digital ☐ Fax		○ Priority (Specify Date Required → →) Surcharges apply
Address:	1111 West Hastings Street	Email 1: jem.morrison@erm.com		○ Emergency (1 Business Day) - 100% Surcharge
	Vancouver, B.C. V6E 2J3	Email 2: derek.shaw@erm.com		○ For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	(604)689-9560 Fax:			
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information		Analysis Request
Company:	Rescan Environmental Services	Job #: 0194096-0009		Please indicate below Filtered, Preserved or both (F, P, F/P)
Contact:	Accounts Payable (ermcanada.payables@erm.com)	PO / AFE:		
Address:	1111 West Hastings Street	LSD:		
	Vancouver, B.C. V6E 2J3			
Phone:	(604)689-9560 Fax:	Quote #:		
Lab Work Order # (lab use only)	☑ No L1364961	ALS Contact: Amber Springer	Sampler: Christine Rock	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Particulate	Soluble particulate	Insoluble particulate	Sulphate	Nitrate	NH3, NH4	Cl	Total Metals	Mg+	Ca+	K+		Number of Containers
	DF8-TP	25-Aug-13	Sept 13	Water	X	X	X	X	X	X	X						1
	DF8-TM	25-Aug-13	Sept 13	Water								X	X	X	X		1
	DF9-TP	25-Aug-13	Sept 13	Water	X	X	X	X	X	X	X						1
	DF9-TM	25-Aug-13	Sept 13	Water								X	X	X	X		1
	DF10-TP	23-Aug-13	Sept 14	Water	X	X	X	X	X	X	X						1
	DF10-TM	23-Aug-13	Sept 14	Water								X	X	X	X		1
	DF11-TP	26-Aug-13	Sept 14	Water	X	X	X	X	X	X	X						1
	DF11-TM	26-Aug-13	Sept 14	Water								X	X	X	X		1
	DF12-TP	24-Aug-13	Sept 13	Water	X	X	X	X	X	X	X						1
	DF12-TM	24-Aug-13	Sept 13	Water								X	X	X	X		1
	DF13-TP	24-Aug-13	Sept 13	Water	X	X	X	X	X	X	X						1
	DF13-TM	24-Aug-13	Sept 13	Water								X	X	X	X		1

Short Holding Time

Rush Processing

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Christine Rock			Joyce	Sept 18	14:30	15.6 °C Cooled				

Cooler #2 16.6 Temp

GENF 18.02 Front

Appendix 6

2013 Passive Air Contaminant Sampling Results

Rescan™
an ERM company

Your Project #: 01940960009
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2013/07/25

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B358723
Received: 2013/07/05, 15:35

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	3	2013/07/12	2013/07/25	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2013/07/11	2013/07/25	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2013/07/12	2013/07/25	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key Levi Manchak
Levi Manchak
26 Jul 2013 08:46:35 -06:00
Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B358723
Report Date: 2013/07/25

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		GW5245	GW5246	GW5247		
Sampling Date		2013/05/29	2013/05/30	2013/05/28		
	UNITS	**1**	**2**	**3**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	0.3	0.2	0.2	0.1	6965242
Calculated O3	ppb	26.9	30.8	29.6	0.1	6961554
Calculated SO2	ppb	<0.1	<0.1	<0.1	0.1	6979213

RDL = Reportable Detection Limit

Maxxam

Maxxam Job #: B358723
Report Date: 2013/07/25

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
6961554	Calculated O3	2013/07/08	100	N/A	<0.1	ppb	98	91 - 107
6965242	Calculated NO2	2013/07/09	99	N/A	<0.1	ppb	101	76 - 118
6979213	Calculated SO2	2013/07/12	100	N/A	<0.1	ppb	102	95 - 105

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B358723

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

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REC: July 3

Maxxam

6744 - 50 St. Edmonton AB T5H 0B4
tel: 780-378-8500 fax: (780) 378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO: **REPORT TO:** **ADDITIONAL REPORT(S) TO:**

Company Name: RESCAN		Phone:	604-689-9400	Site/Area Name & LSD:	
Requestor: J Morrison		Project Name/Number:	Back River → 0194086-0009	Additional contact:	jem.morrison@erm.com

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5/10	Metal Scan	Dustfall	VOC				Analysis
Pass 1	May 29		June 25		✓												
" "	"		"				✓										
" "	"		"					✓									
Pass 2	May 30		June 25		✓												
" "	"		" "				✓										
" "	"		" "					✓									
PASS 3	May 28		June 24		✓												
" "	"		"				✓										
" "	"		"					✓									

Extra Instructions: Attn: Levi Manchak

Additional Information (Project #, PO#, etc.)

PO#

Maxxam to complete *Date received.* *Received By:*

Maxxam

Your Project #: 01940960009
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2013/08/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B365476
Received: 2013/07/30, 12:29

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	3	2013/07/31	2013/08/06	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2013/08/02	2013/08/06	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2013/07/31	2013/08/06	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key Levi Manchak
Levi Manchak
06 Aug 2013 13:02:10 -06:00
Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

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Total cover pages: 1

Maxxam Job #: B365476
Report Date: 2013/08/06

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		HB0147	HB0148	HB0149		
Sampling Date		2013/06/25	2013/06/25	2013/06/25		
	UNITS	**1**	**2**	**3**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	<0.1	DAMAGED	0.7	0.1	7039448
Calculated O3	ppb	22.7	24.4	24.1	0.1	7045842
Calculated SO2	ppb	<0.1	<0.1	<0.1	0.1	7039450

RDL = Reportable Detection Limit

General Comments

Sample: HB0148 (#2) for NO2 parameter was returned to the lab damaged. No powder in sampler, it was all on bottom of bag. - DF

Maxxam

Maxxam Job #: B365476
Report Date: 2013/08/06

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
7039448	Calculated NO2	2013/07/31	97	N/A	<0.1	ppb	98	76 - 118
7039450	Calculated SO2	2013/07/31	102	N/A	<0.1	ppb	102	95 - 105
7045842	Calculated O3	2013/08/02	99	N/A	<0.1	ppb	99	91 - 107

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B365476

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Linda Lin, Supervisor, Centre for Passive Sampling Technology

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Maxxam

6744 - 50 St. Edmonton AB T5H 0B4
tel: 780-378-8500 fax: (780) 378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO:

REPORT TO:

ADDITIONAL REPORT(S) TO:

Company Name:		Phone:		Site/Area Name & LSD:	
Requestor:		Project Name/Number:		Additional contact:	

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Analysis

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5/10	Metal Scan	Dustfall	VOC				
PASS1	25-Jun-2013		22-Jul-2013		✓		✓	✓									
PASS2	25-Jun-2013		22-Jul-2013		✓		✓	✓									
Blank	25-Jun-2013		22-Jul-2013		✓		✓	✓									
PASS3	24-Jun-2013		23-Jul-2013		✓		✓	✓									

Extra Instructions:

Additional Information (Project #, PO#, etc.)

PO#

PASS 2 filter all opened accidentally in field. Some particles flew away.

Maxxam to complete *Date received:* *Received By:*

Your Project #: 01940960009
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2013/09/11

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B377748
Received: 2013/08/30, 12:45

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	3	2013/09/06	2013/09/09	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2013/09/09	2013/09/10	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2013/09/05	2013/09/09	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key Levi Manchak
Levi Manchak
11 Sep 2013 11:36:30 -06:00
Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

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Total cover pages: 1

Maxxam Job #: B377748
Report Date: 2013/09/11

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		HJ2001	HJ2002	HJ2003		
Sampling Date		2013/07/22	2013/07/22	2013/07/23		
	UNITS	**1**	**2**	**3**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	0.1	0.2	<0.1	0.1	7151004
Calculated O3	ppb	23.6	21.4	DAMAGED	0.1	7153844
Calculated SO2	ppb	0.2	0.1	<0.1	0.1	7147637

RDL = Reportable Detection Limit

General Comments

No blanks returned. Default lab blanks used. - DF

Sample HJ2003 (#3): O3 parameter was returned to the lab damaged. - OZ

Maxxam Job #: B377748
Report Date: 2013/09/11

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
7147637	Calculated SO2	2013/09/05	101	90 - 110	<0.1	ppb	102	95 - 105
7151004	Calculated NO2	2013/09/06	101	93 - 105	<0.1	ppb	100	76 - 118
7153844	Calculated O3	2013/09/09	99	96 - 103	<0.1	ppb	98	91 - 107

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B377748

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

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Maxxam Analytics Inc

6744 - 50 St. Edmonton AB
tel: 780-378-8500 fax: 780-378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO:
ermcanada.payables@erm.com

REPORT TO:
Rescan Env. Services
1111 West Hastings Street
Vancouver BC, V6E 2J3
attn: Jem Morrison

ADDITIONAL REPORT(S) TO:
jem.morrison@erm.com
derek.shaw@erm.com

Company Name: Back River		**Phone:**	604-689-9406	**Site/Area Name & LSD:**	Back River
Requestor: Christine Rock		**Additional Contact:**	Jem Morrison	**Project Name/Number:**	0194096-0009 Back River

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3536 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5	PM10	TSP	Metal Scan	Dustfall	VOC	
PASS 1	22/07/2013		25/08/2013	21:00	x											
PASS 1	22/07/2013		25/08/2013	21:00			x									
PASS 1	22/07/2013		25/08/2013	21:00				x								
PASS 2	22/07/2013		23/08/2013	13:00	x											
PASS 2	22/07/2013		23/08/2013	13:00			x									
PASS 2	22/07/2013		23/08/2013	13:00				x								
PASS 3	23/07/2013		26/08/2013	18:00	x											
PASS 3	23/07/2013		26/08/2013	18:00			x									
PASS 3	23/07/2013		26/08/2013	18:00				x								

Analysis

Extra Notes/Instructions:

Additional Information (Project #, PO#, etc.)
Back River 0194096-009

Maxxam to complete *Date received:* *Received By:*

Your Project #: 01940960009
Site Location: BACK RIVER, NT

Attention: JEM MORRISON
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2013/09/24

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B383871
Received: 2013/09/17, 10:51

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis (1)	3	2013/09/24	2013/09/24	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2013/09/23	2013/09/24	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2013/09/24	2013/09/24	EINDSOP-00149	Tang Passive SO2 in

* Results relate only to the items tested.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key Levi Manchak
Levi Manchak
25 Sep 2013 08:47:25 -06:00
Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

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Total cover pages: 1

Maxxam Job #: B383871
Report Date: 2013/09/24

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		HN5840	HN5841	HN5842		
Sampling Date		2013/08/25	2013/08/23	2013/08/26		
	UNITS	**1**	**2**	**3**	**RDL**	**QC Batch**
Passive Monitoring						
Calculated NO2	ppb	<0.1	<0.1	<0.1	0.1	7188129
Calculated O3	ppb	17.0	21.5	17.4	0.1	7185712
Calculated SO2	ppb	0.2	0.4	0.1	0.1	7188138

RDL = Reportable Detection Limit

Maxxam Job #: B383871
Report Date: 2013/09/24

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 01940960009
Site Location: BACK RIVER, NT

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		Calibration Check	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	% Recovery	QC Limits
7185712	Calculated O3	2013/09/23	99	96 - 103	<0.1	ppb	101	91 - 107
7188129	Calculated NO2	2013/09/24	101	93 - 105	<0.1	ppb	104	76 - 118
7188138	Calculated SO2	2013/09/24	100	90 - 110	<0.1	ppb	101	95 - 105

N/A = Not Applicable
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B383871

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

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Maxxam

6744 - 50 St. Edmonton AB T5H 0B4
tel: 780-378-8500 fax: (780) 378-8699

SAMPLE ANALYSIS REQUEST FORM

INVOICE TO:

REPORT TO:

ADDITIONAL REPORT(S) TO:

Company Name:	Rescan/ERM	**Phone:**	604-689-9460	**Site/Area Name & LSD:**	BACK RIVER
Requestor:	Jem Morrison	**Project Name/Number:**	0194096-0009	**Additional contact:**	

Please check applicable boxes for routine analysis; for specialty work, provide a detailed description of parameters required or phone Project Manager: Levi Manchak @ (780) 468-3826 to discuss testing procedures.

Please indicate analysis completion requirement date (surcharge may apply for priority analysis)

Sample identification or location (LSD)	Sampling Start Date (DD/MM/YYYY)	Time (HH:MM)	Sampling End Date (DD/MM/YYYY)	Time (HH:MM)	SO2	H2S	NO2	O3	NOx	PM 2.5/10	Metal Scan	Dustfall	VOC	Analysis
PASS 2	Aug 23/2013		Sept 14/2013		✓		✓	✓						
PASS 1	Aug 25/2013		Sept 14/2013		✓		✓	✓						
PASS 3	Aug 26/2013		Sept 14/2013		✓		✓	✓						

Extra Instructions: Email results to jem.morrison@erm.com
Derek.Shaw@erm.com

Additional Information (Project #, PO#, etc.)
PO# Back River 0194096-0009

Maxxam to complete *Date received:* _____ *Received By:* _____

Appendix 7

2013 Particulate Sampling Results

Rescan™
an ERM company

RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 06-JUN-13
Report Date: 14-JUN-13 14:34 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1312931

Project P.O. #: NOT SUBMITTED
Job Reference: 0194096-0009
C of C Numbers: 10-298238
Legal Site Desc:

Amber Springer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1312931-1	L1312931-2	L1312931-3	L1312931-4	
	Description	filter	filter	filter	filter	
	Sampled Date	28-MAY-13	28-MAY-13	29-MAY-13	29-MAY-13	
	Sampled Time					
	Client ID	PR027324 PM2.5 PART3	PR093446 PM10 PART 3	27800 PM2.5 PART2	24928 PM10 PART2	
Grouping	**Analyte**					
FILTER						
Particulates	Particulate - PM2.5 (ug)	<50		70		
	Particulate - PM2.5 (ug/m3)	<2.1		2.9		
	Particulate - PM10 (ug)		<50		<50	
	Particulate - PM10 (ug/m3)		<2.1		<2.1	

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1312931-1	L1312931-2	L1312931-3	L1312931-4	
	Description	filter	filter	filter	filter	
	Sampled Date	28-MAY-13	28-MAY-13	29-MAY-13	29-MAY-13	
	Sampled Time					
	Client ID	PR027324 PM2.5 PART3	PR093446 PM10 PART 3	27800 PM2.5 PART2	24928 PM10 PART2	
Grouping	**Analyte**					
MISC.						
Field Tests	Air Volume, Client Supplied (L)	24050	24050	24050	24060	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AIR VOLUME-VA	Misc.	Air volume (L)	HYGIENE METHOD
PART-PM10-VA	Filter	Total Particulate (PM10) by Gravimetric	BCMOE METHOD

Total Particulate Matter (PM10) Method analysis is carried out in accordance with the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a PM10 inlet. The particulate matter is determined gravimetrically.

PART-PM2.5-VA	Filter	Total Particulate (PM2.5) by Gravimetric	BCMOE METHOD

Total Particulate Matter (PM2.5) Method analysis is carried out in accordance with the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a PM2.5 inlet. The particulate matter is determined gravimetrically.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-298238

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10- 298238

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page ____ of ____

Report To	Report Format / Distribution	Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company: BESCAN	Standard: Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact: Jem Morrison	Select: PDF ✓ Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: 1111 West Hastings Street (6th Floor)	Email 1: jem.morrison@erm.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Vancouver BC V6E 2J3	Email 2: derek.shaw@erm.com	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: 604-689-4460 Fax:		
Invoice To Same as Report ? (circle) Yes or No (If No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) Yes or No	Job #:	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:	Project # 0194096-0009	
Phone:	Quote #:	
Lab Work Order #: L1312931-COFC	**ALS Contact:**	**Sampler:**

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	PM 2.5	PM10	Number of Containers
	RP027324 PM2.5 ~~Pooled~~ Part 3	24 hours May 27-May28		PM2.5	X		
	RP 093446 ~~PM2.5~~ PM10 Part 3	24 hours May 27-May 28		~~PM2.5~~ PM10		X	
	27800 PM2.5 Part 2	24 hours May 28-May 29		PM2.5	X		
	24928 ~~PM2.5~~ PM10 Part 2	24 hours May 28-May 29		~~PM2.5~~ PM10		X	
	Please See Attached Sheet						
	for Volumes						

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RESCAN ENVIRONMENTAL SERVICES
ATTN: Jem Morrison
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 02-JUL-13
Report Date: 12-JUL-13 17:41 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1326166

Project P.O. #: 0194046-0009
Job Reference:
C of C Numbers: 10-295107
Legal Site Desc: Back River

Amber Springer
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1326166-1	L1326166-2	L1326166-3	L1326166-4	
	Description	filter	filter	filter	filter	
	Sampled Date	25-JUN-13	25-JUN-13	26-JUN-13	26-JUN-13	
	Sampled Time	16:20	16:20	18:15	18:15	
	Client ID	PART 1 PM2.5	PART 1 TSP	PART4 PM2.5	PART4 TSP	
Grouping	**Analyte**					
FILTER						
Particulates	Particulate - PM2.5 (ug)	<50		80		
	Particulate - PM2.5 (ug/m3)	<2.1		3.3		
	Total Suspended Particulate (ug)		<50		87	
	Total Suspended Particulate (ug/m3)		<2.1		3.6	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1326166-1	L1326166-2	L1326166-3	L1326166-4	
	Description	filter	filter	filter	filter	
	Sampled Date	25-JUN-13	25-JUN-13	26-JUN-13	26-JUN-13	
	Sampled Time	16:20	16:20	18:15	18:15	
	Client ID	PART 1 PM2.5	PART 1 TSP	PART4 PM2.5	PART4 TSP	
Grouping	**Analyte**					
MISC.						
Field Tests	Air Volume, Client Supplied (L)	24050	24050	24050	24050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SR:COC	Sample Received, Not Listed on Submitted Chain of Custody / Analytical Request Form - samples # 25052 and RP090549 - extra not on CoC

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AIR VOLUME-VA	Misc.	Air volume (L)	HYGIENE METHOD
PART-PM2.5-VA	Filter	Total Particulate (PM2.5) by Gravimetric	BCMOE METHOD

Total Particulate Matter (PM2.5) Method analysis is carried out in accordance with the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a PM2.5 inlet. The particulate matter is determined gravimetrically.

PART-TSP-VA	Filter	Total Particulate (TSP) by Gravimetric	BCMOE METHOD

Total Suspended Particulate Matter (TSP) Method of analysis is modified from the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a TSP inlet. The particulate matter is determined gravimetrically.

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Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-295107

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

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Address: 2111 West Hastings St. Vancouver BC V6E 2J3	Email 1: jem.morrison@erm.com
Phone: 604-689-9460 Fax:	Email 2: derek.shaw@erm.com
Invoice To Same as Report ? (circle) Yes or (No) If No, provide details	**Client / Project Information**
Copy of Invoice with Report? (circle) Yes or No	Job #:
Company:	PO / AFE: 0194096-0009
Contact: ermCanada.Payables@erm.com	LSD: Back River
Address:	Quote #:
Phone:	ALS Contact: Amber Springer Sampler: J. Morrison

Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
- ✓ Regular (Standard Turnaround Times - Business Days)
- Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
- Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
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Analysis Request
(Indicate Filtered or Preserved, F/P)

Lab Work Order # (lab u) L1326166-COFC

Sample #	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSP	PM2.5	Number of Containers
Part1 PM2.5	See attached		PM2.5 Filter		X	
Part1 TSP	Data Sheet		"	X		
Part4 PM2.5			"		X	
Part4 TSP			"	X		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

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Appendix V4-1B

Air Quality Modelling Assessment: Goose Property

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GOLD & SILVER CORP.

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Back River Project

Final Report

Air Quality Modelling Assessment: Goose Property

RWDI # 1502212
September 9, 2015

SUBMITTED TO

Max Brownhill, R.P.Bio
Manager, Environment
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EXECUTIVE SUMMARY

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of Nunavut. The Project is composed of two main areas: the Goose Property and a Marine Laydown Area (MLA) situated along the western shore of southern Bathurst Inlet.

This air quality modelling assessment will focus on the effects of the Goose Property on its surrounding area. The scope of this study is itemized below:

- Outline relevant thresholds to evaluate air quality effects against;
- Outline the background air quality conditions;
- Identify the Project's sources of emissions and develop an emissions inventory; and
- Evaluate the air quality effects of the Project's sources of emissions on the surrounding areas.

Year 3 is selected to represent the year when the Goose Property will have the highest emissions for criteria air contaminants (CACs) and dust emissions as it was the highest year for fuel consumption and waste rock production and a year of high ore production levels.

Dispersion modelling was conducted using the CALPUFF dispersion model v5.8.4, approved by the U.S. EPA and widely used in Canada and elsewhere. CALPUFF model runs were completed to obtain the maximum (or first highest) predicted concentrations for 1-hour, 8-hour, 24-hour and annual averaging periods.

The following emissions sources were included in the air dispersion model:

- CAC emissions from generators, heaters, kiln and incinerator stacks;
- Dust emissions from dust collectors stacks;
- CAC and dust emissions from underground mine operations stacks;
- Fugitive dust emissions from surface mining equipment/vehicles and winter road vehicles travelling on unpaved roads;
- Tailpipe exhaust emissions from mining equipment/vehicles and winter road vehicles;
- CAC and dust emissions from blasting;
- Fugitive dust emissions from mining activities, including material handling, bulldozing, grading, drilling; and
- CAC emissions from aircrafts.

Predicted concentrations of all contaminants are within the relevant thresholds outside the Potential Development Area (PDA) for all relevant averaging times, except for 1-hour levels of SO_2, NO_2 and CO, 8-hour concentrations of CO and 24-hour concentrations of TSP, PM_{10} and $PM_{2.5}$, which exceed the applicable thresholds at some locations, a small percentage of the time.

The elevated short-term exposure levels for SO_2, NO_2, CO, TSP, PM_{10} and $PM_{2.5}$ outside the PDA are heavily influenced by blasting in the Llama open pit. Blasting has less of an effect on the long-term exposure levels as it only occurs during a short time period (i.e. 1 hour per day). In addition to blasting, the fugitive dust emissions from unpaved roads also have a significant effect on the TSP, PM_{10} and $PM_{2.5}$ exposure levels.

Predicted dust deposition and acid deposition rates are within the thresholds at locations outside the PDA.

Selected results of the air dispersion modelling assessment were used to support the assessment of various valued ecosystem components (VECs) and other subjects, as part of the final environmental impact statement (FEIS). Results from the air quality modelling assessment were used in the following chapter of the FEIS: Air Quality (Volume 4, Chapter 1), Country Foods (Volume 8, Chapter 5), Vegetation (Volume 5, Chapter 5), Freshwater Water Quality (Volume 6, Chapter 4) and the Human Health and Environmental Risk Assessments (Volume 8, Chapter 6).

CONSULTING ENGINEERS & SCIENTISTS

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1. INTRODUCTION

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of Nunavut, shown in Figure 1.0-1. The Project is composed of two main areas: the Goose Property and a Marine Laydown Area (MLA) situated along the western shore of southern Bathurst Inlet.

The mine plan reflects an estimated ten year operating mine life based on currently known resources, with a total ore feed of 19.8 million tonnes sent to a single processing plant at the Goose Property. The Project includes several mineral targets: Umwelt, Llama, Echo, and Goose Main at the Goose Property. Annual re-supply will be completed using the MLA, located in Bathurst Inlet, and winter ice roads will be utilized to interconnect these sites.

This air quality modelling assessment focuses on the effects of the Goose Property on its surrounding area. The scope of this study is itemized below:

- Outline relevant thresholds to evaluate air quality effects against;
- Outline the background air quality conditions;
- Identify the Project's sources of emissions and develop an emissions inventory; and
- Evaluate the air quality effects of the Project's sources of emissions on the surrounding areas.

Chapter 2 of this report outlines the scope of the air quality assessment. Chapter 3 summarizes the air quality standards, objectives and guidelines used as relevant air quality thresholds. Chapter 4 summarizes the background air quality conditions included to determine cumulative air quality effects. Chapter 5 details the development of the emissions inventory. Chapter 6 describes the methodology followed to complete the air quality dispersion modelling. Chapter 7 presents the air quality effects. The conclusions of the air quality modelling assessment are presented in Chapter 8.

Selected results of the air quality modelling assessment were used to support the assessment of various valued ecosystem components (VECs) and other subjects, as part of the final environmental impact statement (FEIS). Results from the air quality modelling assessment were used in the following chapter of the FEIS: Air Quality (Volume 4, Chapter 1), Country Foods (Volume 8, Chapter 5), Vegetation (Volume 5, Chapter 5), Freshwater Water Quality (Volume 6, Chapter 4) and the Human Health and Environmental Risk Assessments (Volume 8, Chapter 6).

2. SCOPE OF THE ASSESSMENT

The air quality modelling assessment was prepared in accordance with the final NIRB Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River (NIRB File No. 12MN036), NIRB 2013.

2.1 Spatial Boundaries

The spatial boundaries of the air quality modelling assessment are delineated by the Local Study Area (LSA), presented in Figure 2.1-1. The boundaries of the Goose Property LSA are used as the CALPUFF computational grid receptor domain, which is set at 28 km by 28 km. This LSA is delineated to encompass the "zone of influence" where noticeable air quality effects from the Goose Property operations can occur. The expected zone of influence was previously determined as part of the DEIS.

Shown in Figure 2.1-1 is another LSA for the Marine Laydown Area. The Regional Study Area (RSA) encompasses both LSAs and matches the RSA boundary used for terrestrial wildlife.

2.2 Temporal Boundaries

The temporal boundaries are chosen to capture the year with highest emissions for criteria air contaminants (CACs) and dust emitted from the Project's operations and therefore, the highest air quality effects of the Project throughout its life. By using the year with highest emissions, the upper bound of air quality effects is predicted. It can be assumed that if the upper bound air quality effects are found to be "Not Significant", the potential effects for the entirety of the Project should also be "Not Significant".

The determination of the worst-case year to model is based on information from the ''Final Environmental Impact Statement (EIS) Supporting Volume 2: Project Description and Alternatives'' (Sabina, 2015), the ''Logistics and Transportation Report'' (JDS, 2015), as well as consultations with Sabina.

The EIS Project Description document provides ore production and waste rock production data and the Logistics and Transportation Report provides fuel consumption data for the different years of the mine's life. The total ore production, extracted from underground mines and open pits is highest in Year 4 at 2,644 kilotonnes, closely followed by Year 3 at 2,478 kilotonnes. The total waste rock production is highest in Year 3 at 12,031 kilotonnes, 462 kilotonnes more than any other year of construction or production. The total fuel consumption for the Goose Property is estimated to be highest in Year 3 at 52,835,967 litres, closely followed by the fuel consumption in Year 4 at 52,034, 546 litres.

Based on the above information, Year 3 is selected to represent the year where the Goose Property will emit the highest emissions as it was the year with the highest fuel consumption and waste rock production and a year of high ore production levels.

2.3 Air Contaminants

The list of air contaminants assessed is consistent with that of the DEIS. The following air contaminants are assessed in this air quality dispersion modelling assessment:

- nitrogen oxide (NO_X as NO_2),
- sulphur dioxide (SO_2),
- carbon monoxide (CO),
- total suspended particulates (TSP) matter;
- particulate matter (PM_{10})
- respirable particulate matter ($PM_{2.5}$)
- dust deposition; and
- acid deposition.

3. AIR QUALITY STANDARDS, OBJECTIVES AND GUIDELINES

The ambient air quality standards, objective and guidelines applicable to the Project, are summarized in Table 3-1. The standards, objectives and guidelines presented in Table 3-1, are consistent with those used in the DEIS.

Air quality standards are applicable in areas accessible to the general public or areas beyond the project's property line. Typically, air quality effects at or beyond a producer's property line are compared to standards, objectives and guidelines. For this assessment, the Potential Development Area (PDA) is used as the property line for the Goose Property.

Table 3-1: Ambient Air Quality Standards, Objectives and Guidelines

Parameter	Averaging Period	Units	Nunavut Ambient Air Quality Standards [1]	Dust and Acid Deposition Provincial Guideline Values	Canadian Ambient Air Quality Standards [2] (2020)	National Ambient Air Quality Objectives [3]	
						Maximum Desirable	Maximum Acceptable
Sulphur dioxide (SO_2)	1-hour	$\mu g/m^3$	450	-	-	450	900
	24-hour	$\mu g/m^3$	150	-	-	150	300
	annual	$\mu g/m^3$	30	-	-	30	60
Nitrogen dioxide (NO_2)	1-hour	$\mu g/m^3$	400	-	-	-	400
	24-hour	$\mu g/m^3$	200	-	-	-	200
	annual	$\mu g/m^3$	60	-	-	60	100
Carbon monoxide (CO)	1-hour	$\mu g/m^3$	-	-	-	15,000	35,000
	8-hour	$\mu g/m^3$	-	-	-	6,000	15,000
Total suspended particulate (TSP)	24-hour	$\mu g/m^3$	120	-	-	-	120
	annual [4]	$\mu g/m^3$	60	-	-	60	70
PM_{10}	24-hour	$\mu g/m^3$	-	50 [5]	-	-	-
$PM_{2.5}$	24-hour	$\mu g/m^3$	30	-	27 [6]	-	-
	annual	$\mu g/m^3$	-	-	8.8	-	-
Dust Deposition	30-day	$mg/dm^2/day$	-	1.7 [7]	-	-	-
Acid Deposition	annual	keq H+/ha/year	-	0.25 [8]	-	-	-

Notes:
[1] Government of Nunavut (2011)
[2] CCME (2012)
[3] Environment Canada (1999)
[4] Geometric mean: the average of the logarithmic values of a data set converted back to a base 10 number.
[5] BC MOE (2009)
[6] The 3-year average of the annual 98th percentile of the daily 24-hour concentrations.
[7] Most stringent provincial guideline, BC MOE (1979)
[8] The critical deposition load for sensitive receptor, AENV (1999)

4. BACKGROUND AIR QUALITY

Monitoring of dustfall, acid deposition, NO_2, SO_2, TSP, PM_{10}, $PM_{2.5}$ was previously completed for the DEIS, to determine site specific background concentrations for the Goose Property. Details on the monitoring program and assumptions on background concentrations can be found in the DEIS.

The background concentrations used in this air quality modelling assessment, as well as the DEIS, are summarized in Table 4-1.

Table 4-1: Background Air Contaminant Concentrations

Pollutant	Averaging Period	Background Concentrations	Units
SO_2	1-hour	16.25	$\mu g/m^3$
	24-hour	6.5	$\mu g/m^3$
	Annual	1.3	$\mu g/m^3$
NO_2	1-hour	7.5	$\mu g/m^3$
	24-hour	3	$\mu g/m^3$
	Annual	0.6	$\mu g/m^3$
CO	1-hour	1250	$\mu g/m^3$
	8-hour	875	$\mu g/m^3$
TSP	24-hour	7	$\mu g/m^3$
	Annual	1.4	$\mu g/m^3$
PM_{10}	24-hour	3.8	$\mu g/m^3$
$PM_{2.5}$	24-hour	3.8	$\mu g/m^3$
	Annual	0.76	$\mu g/m^3$
Dust Deposition	30-day	1.13	$mg/dm^2/day$
Acid Deposition	Annual	0.104	keq H+/ha/year

5. EMISSIONS INVENTORY

As previously mentioned in Section 2.2, Year 3 of operations is chosen as the modelling scenario for the Goose Property. Listed below are facilities/areas that are operational during Year 3:

- Umwelt Pit (underground mine);
- Llama Pit (underground mine);
- Goose Main Pit (open pit);
- Llama Pit (open pit);
- Tailings Storage Facility (TSF) Waste Rock Storage Area (WRSA);
- Llama WRSA;
- Run-of-mill storage pile;
- Crushing, Mill and Refinery Plant;
- Power Plant;
- Airstrip;
- Accommodation camp;
- Winter Roads.

Figure 5.0-1 shows the potential development area and layout of the Goose Property.

5.1 Emissions Sources

An emission inventory was developed to capture the operations associated with the facilities/areas listed above and to serve as reasonably conservative inputs into the air quality dispersion model.

The following emissions sources are included in the air dispersion model:

- CAC emissions from generators, heaters, kiln and incinerator stacks;
- Dust emissions from dust collectors stacks;
- CAC and dust emissions from underground mine operations stacks;
- Fugitive dust emissions from mining equipment/vehicles and winter road vehicles travelling on unpaved roads;
- Tailpipe exhaust emissions from mining equipment/vehicles and winter road vehicles;
- CAC and dust emissions from blasting;
- Fugitive dust emissions from mining activities, including material handling, bulldozing, grading, drilling; and
- CAC emissions from aircrafts.

Combustion by-product emissions from generators, heaters, kiln and incinerator

Emissions for each of these point sources are included in Section 1.1 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 2 of Appendix A.

5.1.1 Dust emissions from dust collectors

Emissions for each of these point sources are included in Section 1.1 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 2 of Appendix A.

5.1.2 Combustion by-product and dust emissions from underground mine operations

Emissions for each of these point sources are included in Section 1.1 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 3 of Appendix A.

5.1.3 Fugitive dust emissions vehicles travelling on unpaved roads

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 4 of Appendix A.

5.1.4 Tailpipe exhaust emissions from vehicles

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 5 of Appendix A.

5.1.5 Fugitive dust emissions from material handling

Emissions for each of these volume sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 6 of Appendix A.

5.1.6 Combustion by-products and dust emissions from blasting

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 7 of Appendix A.

5.1.7 Fugitive dust emissions from bulldozing

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 8 of Appendix A.

5.1.8 Fugitive dust emissions from grading

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 9 of Appendix A.

5.1.9 Fugitive dust emissions from drilling

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 10 of Appendix A.

5.1.10 Combustion by-products from aircraft

Emissions for this area source are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 11 of Appendix A.

5.2 Insignificant Emission Sources

For the purposes of this assessment, several small sources of emissions are deemed insignificant; therefore, they are not included in the dispersion model. This section identifies the insignificant sources and the rationale.

Small combustion equipment, including diesel lake dewatering pumps, diesel pit dewatering pumps, emergency diesel fire pumps, portable diesel light plants, accommodation camp diesel generator, electro-winning furnace, glycol boiler, are deemed insignificant as they represent a small fraction of the total combustion by-product emissions from the Goose Property. The largest contributor to CACs emissions are the blasting activities at the open pits and the power plant run by 24.99 MW generators.

The fleet of surface support equipment is classified as general light duty vehicles and will be used infrequently; therefore, the fleet of surface support equipment is deemed insignificant as it represents a small fraction of CAC and fugitive dust emissions. The contribution of fugitive dust from the surface support equipment would be dwarfed by that of the high tonnage haul trucks.

Backfilling requirements are calculated to be insignificant in Year 3, in comparison to the quantity of ore and waste rock removed from the active underground mines; therefore, activities associated with backfilling including material handling and crushing, are deemed insignificant.

Wind erosion of the run-of-mill (ROM) stockpile and waste rock storage areas (WRSAs) is deemed insignificant. The particles in the ROM and waste rock material (stored at the ROM stockpile and WRSAs) are expected to be of a large size fraction; therefore, the material has low potential of wind entrainment (i.e. becoming a source of wind erosion). The Tailing Storage Facility (TSF) pond is also expected to have low potential of wind entrainment, as the tailings are expected to be kept under water through effective management of the tailings disposal area.

5.3 Emission Summary

A summary of total emissions by type of source is presented in Table 5.2-1. A more detailed breakdown of the emissions is provided in Section 1 of Appendix A.

Table 5.2-1 Emission Summary

Sources	Emission Rates (g/s)					
	NO_X	SO_X	CO	TSP	PM_{10}	$PM_{2.5}$
Stacks	60	2.2	36	6.6	2.1	1.3
Unpaved Road Dust	0	0	0	42	12	1.2
Vehicle Tailpipe	0.90	0	0.17	0.02	0.02	0.02
Blasting	91	11	389	225	117	6.7
Material Handling	0	0	0	0.41	0.19	0.03
Bulldozing	0	0	0	1.4	0.27	0.15
Grading	0	0	0	0.88	0.28	0.03
Drilling	0	0	0	2.1	1.1	0.53
Aircraft	1.8	0.25	3.6	0.03	0.03	0.03

In the worst-case hour of effects, the largest contributor to NO_X, SO_X, CO, TSP, PM_{10} and $PM_{2.5}$ is blasting; however, blasting only occurs during one hour per day. The second largest NO_X, SO_X, CO contributors are the stacks (which includes generators, heaters, kiln and incinerator). The second largest TSP, PM_{10} and $PM_{2.5}$ contributor is the fugitive dust from the unpaved roads.

Vehicle tailpipe, underground mining activities and aircraft emissions are small contributors to the overall emissions.

6. MODELLING METHODOLOGY

6.1 Model Selection

The CALPUFF dispersion model is used with 1 year of hourly, three-dimensional meteorological data to predict the maximum expected pollutant concentrations due to emissions from Goose Property operations. CALPUFF (Scire et al., 2000) is a multi-layer, multi-species, non-steady-state puff dispersion model that can simulate the effects of time and space-varying meteorological conditions on pollutant transport, transformation, and deposition. Version 5.8.4 of CALPUFF, approved by the U.S. EPA and widely used in Canada and elsewhere, is used in this air quality modelling assessment. The hourly, 3-dimensional meteorological data were previously developed for the DEIS, using the CALMET meteorological model, which is a companion model of CALPUFF. CALMET modelling was previously performed by ERM-RESCAN, who provided the output data to RWDI. The CALMET modelling was described in the DEIS.

The CALPUFF dispersion modelling followed detailed guidance for this type of modelling that is available for Canadian jurisdictions. Specifically, it followed the Guideline for Air Quality Dispersion modelling in British Columbia (BC MOE, 2008) as well as the Guideline for Plume Dispersion Modelling in Newfoundland and Labrador (Government of Newfoundland and Labrador, 2012). Aspects of the model set-up that were not previously or clearly defined in the DEIS, such as the particle density, receptor grid and various other model assumptions, were established using the aforementioned guidance documents.

6.2 Model Inputs

6.2.1 Model Switches

All model options were set as recommended in the Guideline for Air Quality Dispersion modelling in British Columbia (BC MOE, 2008).

6.2.2 Model Domains and Receptors

As previously described in section 2.1, the boundaries of the Goose Property LSA are used as the CALPUFF computational grid receptor domain, which is set at 28 km by 28 km.

The following receptor spacing was used in accordance with the Guideline for Air Quality Dispersion modelling in British Columbia (April 2008):

- 50 m spacing within 500 m of source;
- 250 m spacing within 2 km of source;
- 500 m spacing within 5 km of source; and
- 1000 m spacing beyond 5 km of source.

To reduce model computational run time, the receptors within 200 m of the sources (generally corresponding to locations well inside the PDA) were removed.

In addition to the regular grid of receptors, as described above, eighty-seven discrete receptors were included in the model run to represent the accommodation camp, as well as sensitive receptors related to country food and water quality.

6.2.3 Terrain

Terrain information for the area surrounding the Goose Property was obtained from Natural Resources Canada's Canadian Digital Elevation Model (CDEM) which has a resolution of 15 m. The elevation data were applied in the estimation of base elevations for sources and receptors to help the CALPUFF dispersion model account for changes in elevations of the surrounding terrain.

6.2.4 Buildings

The Building Profile Input Program (BPIP) was used to calculate the aerodynamic effects of buildings on emissions from point sources, such as stacks. The crushing plant building, the accommodation camp, the truck shop/admin building, the waste management and incinerator building, the power plant enclosure and the processing plant building were included in the modelling as these structures have the potential to

affect emissions from the generators, dust collectors, kiln and incinerator. Building elevations were provided by Sabina. The BPIP model was executed prior to running the CALPUFF dispersion model to incorporate the potential building aerodynamic effects.

6.2.5 Emission Source Parameters

Emission sources were modelled as point sources, area sources or volume sources, as alluded to in Section 5.1.

Point source parameters, including source location, stack height above ground, stack inner diameter, stack exit velocity and exhaust temperature, are provided in Section 1.1 of Appendix A.

Vehicle tailpipe emissions, fugitive dust from unpaved road, emissions from underground mining activities, and aircrafts emissions were modelled as area sources. Area source parameters, including source location, source height and initial dispersion parameter (sigma z) are provided in Section 1.2 of Appendix A. In that same section, the emission rates are listed in g/s, as well as the area of the modelled source. To calculate the emission flux rate in $g/s/m^2$, the emission rate is divided by the area of the modelled source; the emission flux rate is the input into the CALPUFF dispersion model.

Material handling sources were modelled as volume sources. Volume source parameters, including source height, source location and initial dispersion parameters (sigma z and sigma y), are provided in Section 1.2 of Appendix A. Sigma z and y source parameters for the area and volume sources were calculated in accordance to the document ''Modeling Fugitive Dust Sources'' (NSSGA, 2004).

The modelled point source locations are shown in Figure 6.2.5-1, area source locations are shown in Figure 6.2.5-2 and volume source locations are shown in Figure 6.2.5-3.

6.2.6 Dust Deposition Parameters

To properly model dust deposition, the size of the airborne dust particles and its density must be considered. The methodology outlined in the Guideline for Plume Dispersion Modelling in Newfoundland and Labrador (September 2012) was used. The particle density was assumed to be 2 g/cm^3 [1].

6.2.7 Acid Deposition Parameters

To obtain acid deposition rates, CALPUFF modeling must account for the chemical transformation of SO_2 and NO_X (using the MESOPUFF II chemistry scheme) as well as the wet and dry deposition of SO_2, SO_4, NO (or NO_X in this instance), NO_3^- and HNO_3. To properly model wet and dry deposition of sulphate and nitrate, the following parameters were required by the CALPUFF model:

- Diffusivity;
- Alpha Star;
- Reactivity;
- Mesophyll resistance;
- Henry's Law coefficient;

[1] Information was provided by Max Brownhill from Sabina Gold in an e-mail dated June 16, 2015.

- Scavenging coefficient for liquid precipitation; and
- Scavenging coefficient for frozen precipitation.

The parameters for the wet and dry deposition modelling were taken from the document "NO_X Dispersion and Chemistry Assumptions in the CALPUFF Model" (RWDI, 2005).

6.3 Model Run Parameters

CALPUFF model runs were completed to obtain the maximum (or first highest) predicted concentrations for a 1- hour, 8-hour, 24-hour and annual averaging periods.

Other results were also calculated for the human health and environmental risk assessment study. These results included:

- Second highest predicted concentrations;
- 98th percentile (9th highest) of the 24-hour $PM_{2.5}$ concentrations;
- 99th percentile (5th highest) of the daily max 1-hour SO_2 concentration in the year; and
- 98th percentile (9th highest) of the daily max 1-hour NO_2 concentration in the year.

6.4 Model Run Post Processing

To obtain parameters to compare to relevant thresholds outlined in Section 3, some post processing was required using tools such as POSTUTIL and CALPOST.

6.4.1 Nitrogen Dioxide

Included in the CALPUFF model were NO_X emission rates for combustion sources. NO_X emissions are comprised on nitric oxide (NO) and nitrogen dioxide (NO_2). Typically, the primary emissions are predominantly in the form of NO with reaction in the atmosphere resulting in the conversion of NO to NO_2. The ozone limiting method (OLM) was used, which assumes that the conversion of NO to NO_2 is mainly driven by reaction with tropospheric ozone, O_3 (BC MOE 2008).

6.4.2 Acid Deposition

The CALPUFF model was used to predict wet and dry deposition for all sulphur species (SO_2, SO_4) and nitrogen species (NO_X, NO_3^- and HNO_3). The resulting mass deposition for each species was divided by its molecular weight to convert it to a molar quantity. It was then factored to represent the corresponding number of hydrogen ions that would occur in a water solution with that species The resulting values for all species, for both wet and dry deposition, were then summed to determine the total potential acid input (PAI), expressed in terms of k_{eq}/ha/yr where k_{eq} refers to the number of equivalent hydrogen ions (1 k_{eq} = 1 kmol H+).

6.4.3 Dust Deposition

To obtain deposition results of dust, post-processing of the CALPUFF model run output was required to extract maximum 30-day average total deposition rates (sum of all PM size fractions included in the model) and convert them to units of mg/dm^2/day for a 30-day averaging period for comparison against relevant threshold, as outlined in Section 3.

7. MODELLING RESULTS

The predicted maximum concentrations for all contaminants as a result of Year 3 operations at the Goose Property are presented in Table 7.1. Concentrations isopleths for all contaminants and relevant averaging periods are included in Appendix B.

Long-term exposure to SO_2, NO_2 and CO levels (i.e. annual average concentrations, 24-hour and 8-hour concentrations) remain within the applicable thresholds. Maximum short-term exposure SO_2, NO_2 and CO levels (i.e. 1-hour concentrations) exceed their applicable thresholds under worst-case meteorological conditions outside the PDA.

Long-term exposure TSP and $PM_{2.5}$ levels (i.e. annual average concentrations) remain within the applicable thresholds. Maximum short-term exposure TSP, PM_{10} and $PM_{2.5}$ levels (i.e. 24-hour concentrations) exceed their applicable thresholds under worst-case meteorological conditions outside of the PDA and TSP and $PM_{2.5}$ levels exceed their applicable thresholds at the on-site accommodation camp. The maximum concentrations occur to the west of the PDA, as the Llama open pit (and associated mining activities) is within approximately 500 m of the PDA.

The short-term exposure level exceedances for SO_2, NO_2, CO, TSP, PM_{10} and $PM_{2.5}$ are heavily influenced by the blasting in the Llama open pit. Blasting has less of an effect on the long-term exposure levels as it only occurs during a short time period (i.e. 1 hour per day). In addition to blasting, the fugitive dust emissions from unpaved roads also have a significant effect on the TSP, PM_{10} and $PM_{2.5}$ exposure levels.

The frequency at which the concentrations exceeded their applicable thresholds was calculated and shown in Table 7.1. At the locations outside of the PDA, exceedances of the 1-hour for SO_2, NO_2, CO were predicted to occur 0.03% (2.6 hours), 0.03% (2.6 hours) and 0.05% (4.4 hours) of the time, respectively. At the locations outside of the PDA, exceedances of the 24-hour TSP, PM_{10}, and $PM_{2.5}$ were predicted to occur 1.92% (7 days), 3.84% (14 days) and 1.37% (5 days) of the time, respectively. At the on-site camp accommodation location, exceedances of the 24-hour TSP, PM_{10} were predicted to occur 0.55% (2 days) and 2.47% (9 days) of the time, respectively.

Dust deposition rates and acid deposition rates remain within the applicable threshold at locations outside the PDA.

8. CONCLUSIONS

The air quality modelling assessment for the Goose Property operations and its associated emissions sources in Year 3 were included in the dispersion model. The dispersion model's predicted effects were compared against applicable thresholds and evaluated.

Predicted concentrations of all contaminants are within the thresholds outside the Potential Development Area (PDA) for all relevant averaging times, except for 1-hour levels of SO_2, NO_2 and CO, 8-hour concentrations of CO and 24-hour concentrations of TSP, PM_{10} and $PM_{2.5}$, which exceed the threshold at some locations, a small percentage of the time.

The elevated short-term exposure levels for SO_2, NO_2, CO, TSP, PM_{10} and $PM_{2.5}$ outside the PDA are heavily influenced by blasting in the Llama open pit. Blasting has less of an effect on the longer-term exposure levels as it only occurs during a short time period (i.e. 1 hour per day). In addition to blasting, the fugitive dust emissions from unpaved roads also have a significant effect on the TSP, PM_{10} and $PM_{2.5}$ exposure levels.

The estimated frequency at which the concentrations exceed their applicable thresholds was calculated. At locations outside of the PDA, 1-hour SO_2, NO_2, and CO levels exceed their thresholds less than 0.05% of the time (or 4.4 hours per year), and 24-hour TSP, PM_{10}, and $PM_{2.5}$ levels exceed their thresholds less than 3.8% of the time (or 14 days per year). At the on-site camp accommodation location, levels of 24-hour TSP and PM_{10} exceed the thresholds less than 2.5% of the time (or 9 days per year), and levels for all other contaminants and averaging times were within the thresholds.

Dust deposition rates and acid deposition rates are within the thresholds at all locations outside the PDA.

Table 7.1 Predicted Maximum Concentrations for air contaminants assessed

Pollutant	Averaging Period	Concentrations (µg/m^3), Dust Deposition Rate (mg/dm^2/day) and Acid Deposition Rate (eq/ha/year)							
				Outside of PDA			Camp Location		
		Objective	Background	Maximum Predicted Concentration (Project)	Maximum Predicted Concentration (Project + Background)	Maximum Frequency of Exceedance per Year	Maximum Predicted Concentration (Project)	Maximum Predicted Concentration (Project + Background)	Maximum Frequency of Exceedance per Year
SO_2	1-hour	450	16.25	**981**	**997**	0.03%	38.2	54.4	-
	24-hour	150	6.5	44	51	-	3.32	9.8	-
	Annual	30	1.3	0.61	1.9	-	0.58	1.9	-
NO_2	1-hour	400	7.5	**842**	**849**	0.03%	385	393	-
	24-hour	200	3	72.1	75.1	-	151	154	-
	Annual	60	0.6	7.7	8.3	-	16	16	-
CO	1-hour	15,000	1250	**43,395**	**44,645**	0.05%	1,884	3,134	-
	8-hour	6,000	875	**5,912**	**6,787**	0.09%	915.4	1,790	-
TSP	24-hour	120	7	**566**	**573**	1.92%	**118**	**125**	0.55%
	Annual	60	1.4	10	12	-	19	20	-
PM_{10}	24-hour	50	3.8	**387**	**390**	3.84%	**65**	**69**	2.47%
$PM_{2.5}$	24-hour	27	3.8	**52**	**56**	1.37%	15	19	-
	Annual	8.8	0.76	2.1	2.8	-	2.4	3.1	-
Dustfall (mg/dm^2/day)	30-day	1.7	1.13	0.46	1.6	-	n/a	n/a	-
Acid Deposition (k_{eq} H+/ha/year)	Annual	0.25	0.104	0.09	0.20	-	n/a	n/a	-

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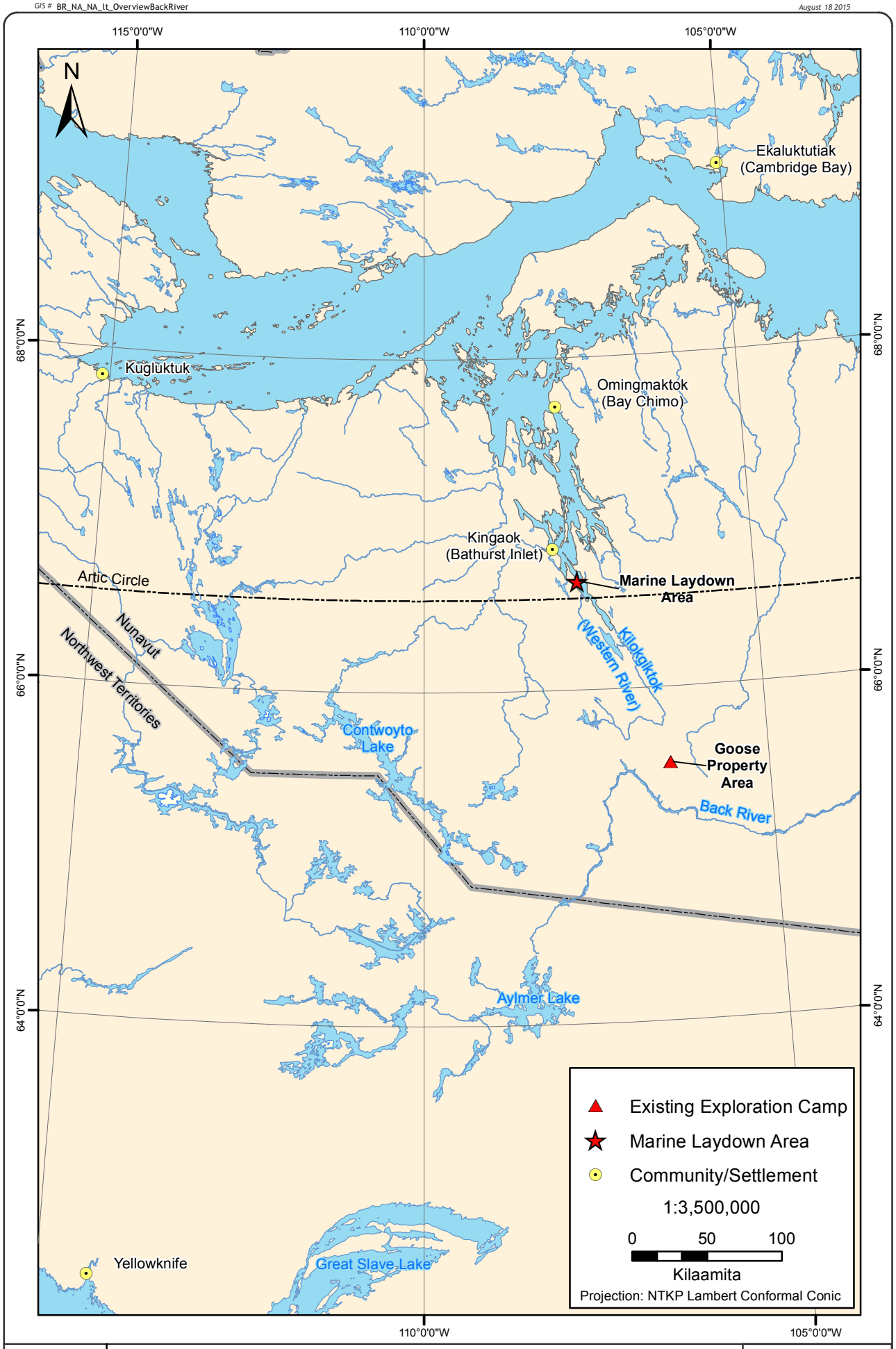
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FIGURES



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Project Overview

Figure 1.0-1

PROJECT # 0194096-0040 GIS # BAC-12-022 August 25 2015

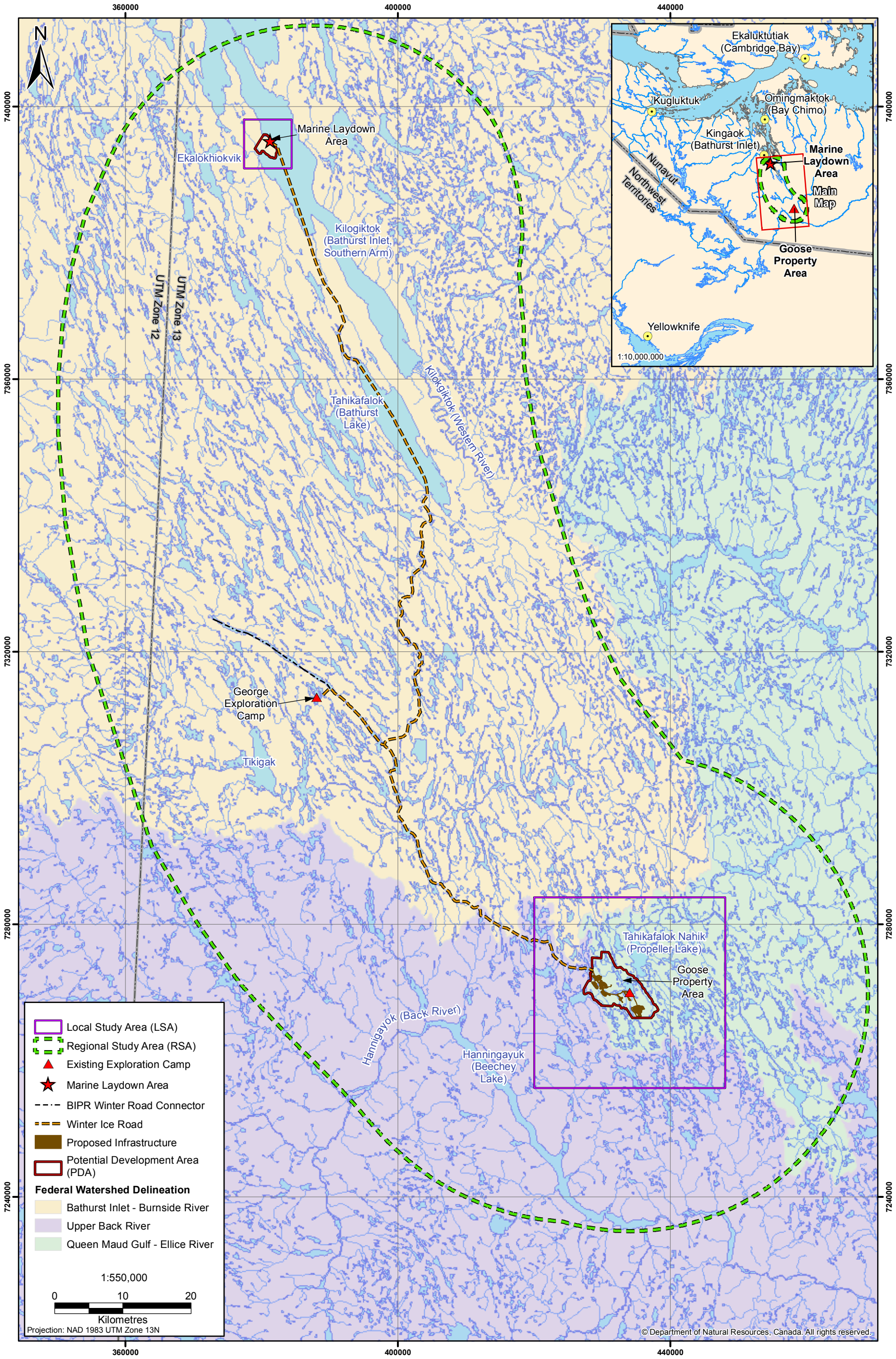
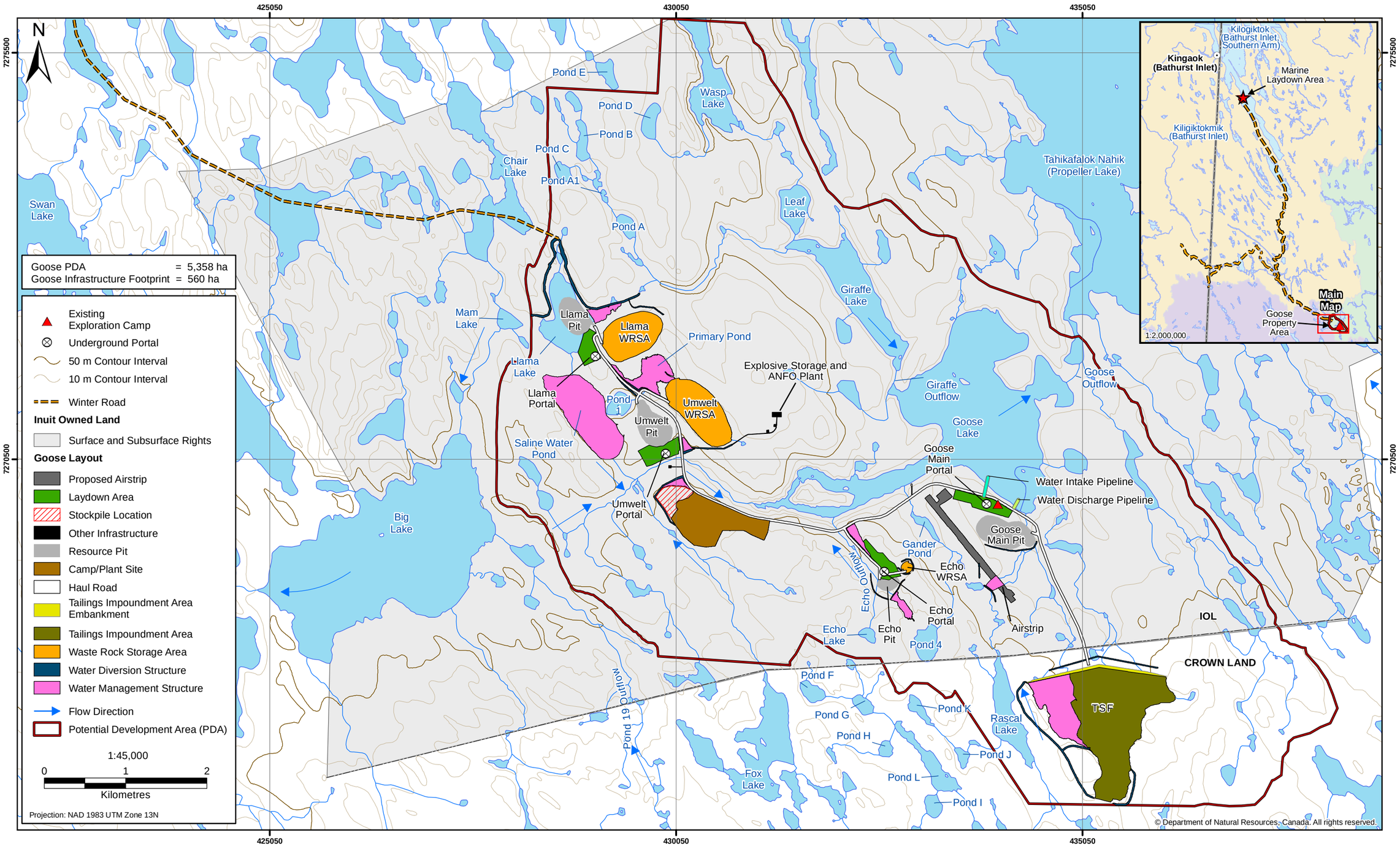


Figure 2.2-1

Local Study Area and Regional Study Area for Air Quality

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Potential Development Area and Layout
Goose Property Area

Figure **5.0-1**

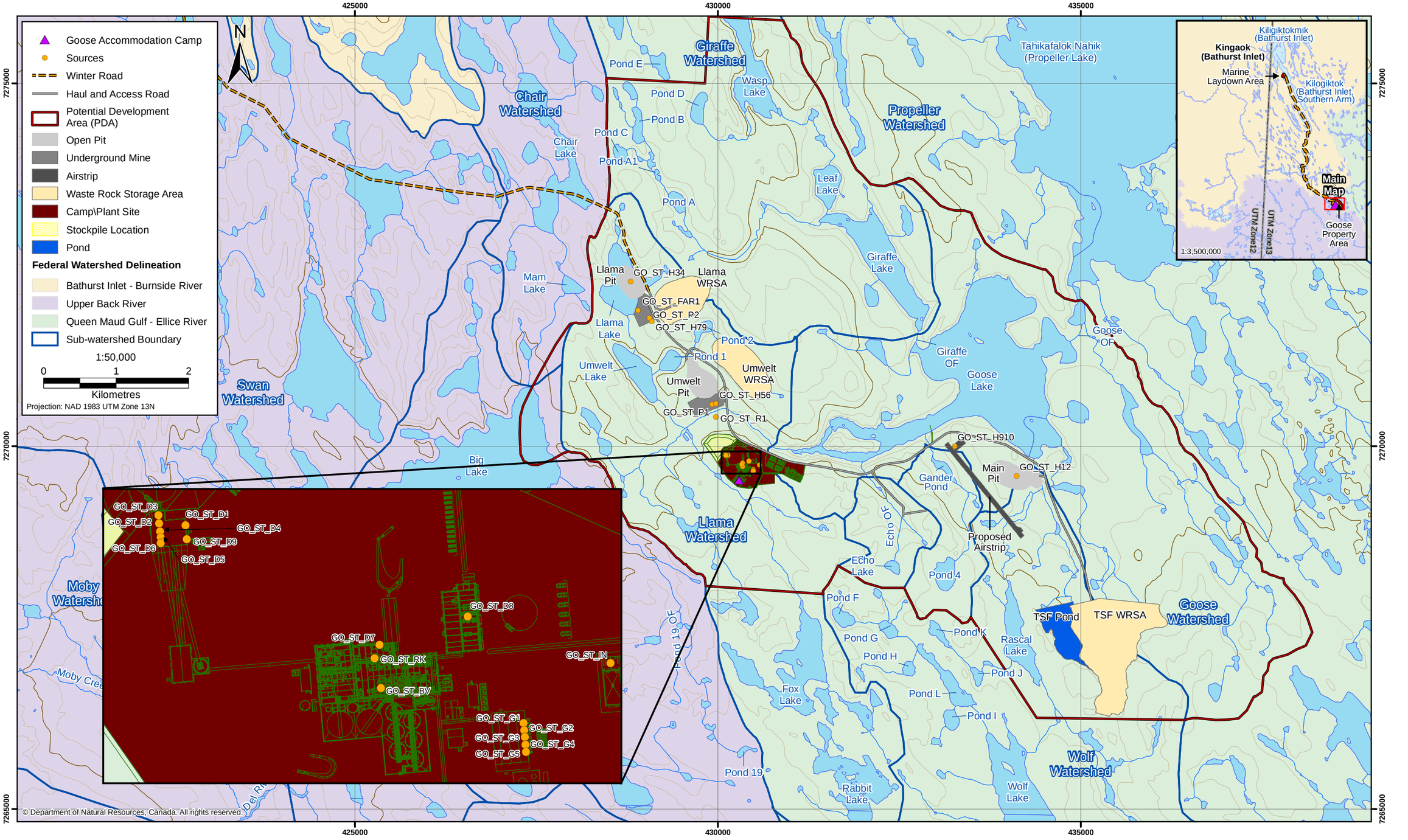
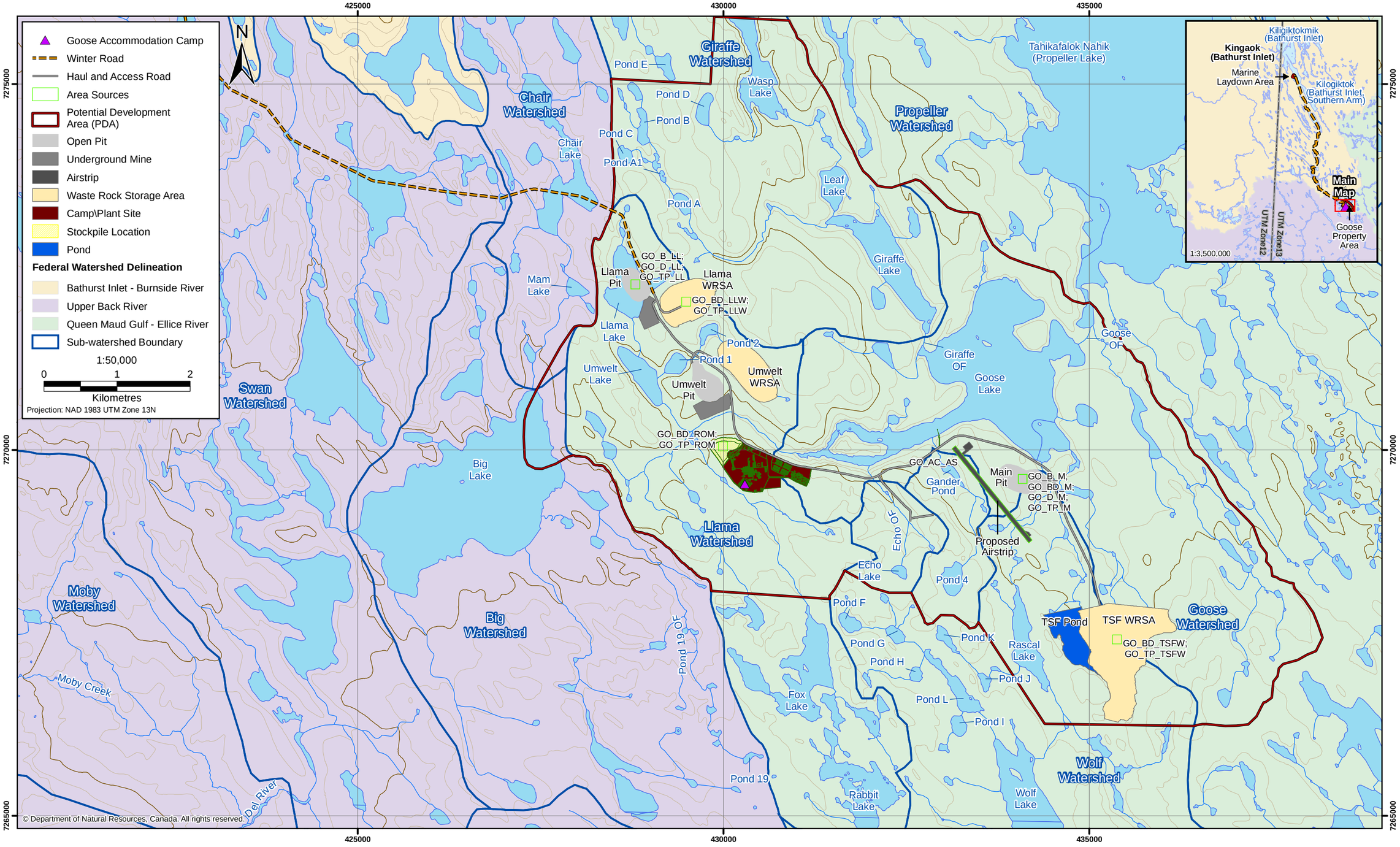


Figure 6.2.5-1

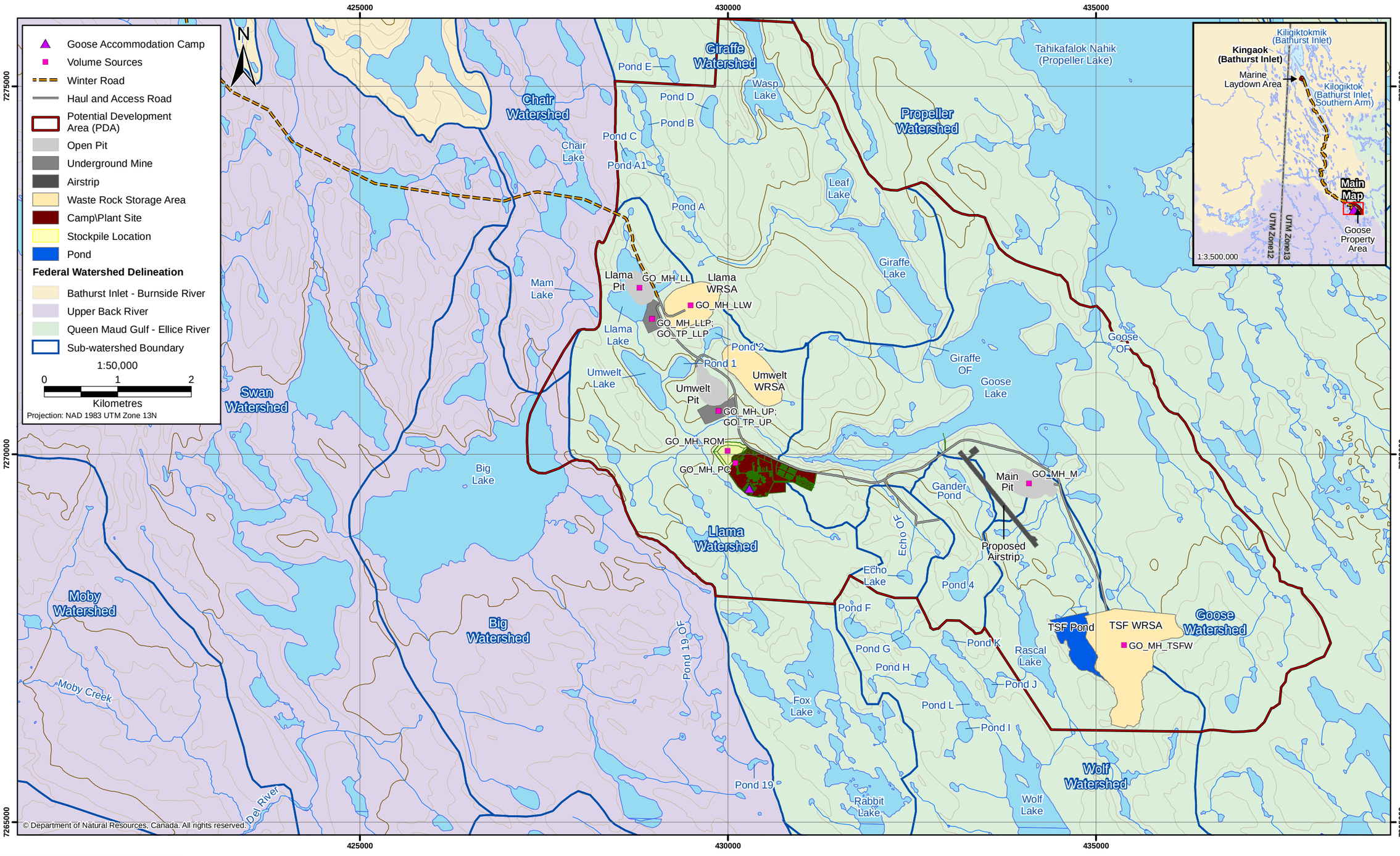
Emission Point Sources Layout
- Goose Property



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Figure 6.2.5-2

Emission Area Sources Layout
- Goose Property



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Figure 6.2.5-3

Emission Volume Sources Layout
- Goose Property

APPENDIX A

APPENDIX A: EMISSION SOURCES

Section 1: Source Summary Tables

Section 1.1: Goose Property - Point Source Summary Table

Source Type	Source ID	Emission Source	Location	UTM Coordinates		Stack Height	Stack Inner Diameter	Exit Velocity	Exhaust Temperature	Emission Rates (g/s)						Details in Section:
				(mE)	(mN)	(m above ground)	(m)	(m/s)	(°C)	NO_x	SO_x	CO	TSP	PM_{10}	$PM_{2.5}$	
Point	GO_ST_R1	Exhaust Air Raise (EAR)	Umwelt Underground Mine	429973	7270406	0.1	4	9.9	25	4.59E+00	6.45E-01	3.60E+00	1.24E+00	2.48E-01	1.86E-01	3
Point	GO_ST_P1	Mine Portal Decline (Decline)	Umwelt Underground Mine	429920	7270574	0.1	5.35	5.5	25	4.59E+00	6.45E-01	3.60E+00	1.24E+00	2.48E-01	1.86E-01	3
Point	GO_ST_FAR1	Fresh Air Intake (FAR) Heater	Llama Underground Mine	428899	7271877	2	0.6	10	104	3.47E-01	3.08E-03	7.23E-02	2.89E-02	1.45E-02	7.23E-03	3
Point	GO_ST_P2	Mine Portal Decline (Decline)	Llama Underground Mine	429054	7271770	0.4	5.35	6.6	25	5.51E+00	7.75E-01	4.32E+00	1.49E+00	2.98E-01	2.24E-01	3
Point	GO_ST_G1	Diesel fired generator	Power plant	430988	7271854	15	1.1	11.8	173	1.18E+01	1.36E-02	6.45E+00	3.69E-01	1.84E-01	9.22E-02	2
Point	GO_ST_G2	Diesel fired generator	Power plant	430984	7271843	15	1.1	11.8	173	1.18E+01	1.36E-02	6.45E+00	3.69E-01	1.84E-01	9.22E-02	2
Point	GO_ST_G3	Diesel fired generator	Power plant	430980	7271831	15	1.1	11.8	173	1.18E+01	1.36E-02	6.45E+00	3.69E-01	1.84E-01	9.22E-02	2
Point	GO_ST_G4	Diesel fired generator	Power plant	430975	7271820	15	1.1	11.8	173	9.03E+00	1.04E-02	4.94E+00	2.82E-01	1.41E-01	7.06E-02	2
Point	GO_ST_G5	Diesel fired generator	Power plant	430971	7271808	15	1.1	11.8	173	n/a	n/a	n/a	n/a	n/a	n/a	2
Point	GO_ST_D1	Primary Crusher Dust Collector	Crushing Plant	430116	7269866	18.3	1.2	15	10	n/a	n/a	n/a	3.39E-01	1.70E-01	8.48E-02	2
Point	GO_ST_D9	Secondary Crusher Dust Collector	Crushing Plant	430139	7269726	18.3	1	16	10	n/a	n/a	n/a	2.51E-01	1.26E-01	6.28E-02	2
Point	GO_ST_D2	Crushing Conveyor Transfer Dust collector #1	Crushing Plant	430962	7271706	12.2	0.43	16.1	10	n/a	n/a	n/a	4.68E-02	2.34E-02	1.17E-02	2
Point	GO_ST_D3	Crushing Conveyor Transfer Dust collector #2	Crushing Plant	430966	7271718	12.2	0.43	16.1	10	n/a	n/a	n/a	4.68E-02	2.34E-02	1.17E-02	2
Point	GO_ST_D4	Crushing & Screening Dust Collector	Crushing Plant	430939	7271744	15.2	1.12	15.5	10	n/a	n/a	n/a	3.05E-01	1.53E-01	7.64E-02	2
Point	GO_ST_D5	Ball mill Surge Bin Dust Collector	Ball mill surge bin	431003	7271721	18.3	0.38	14.9	10	n/a	n/a	n/a	3.38E-02	1.69E-02	8.45E-03	2
Point	GO_ST_D6	Ball mill Surge Bin Reclaim Dust Collector	Ball mill surge bin	431013	7271700	15.2	0.51	15.1	10	n/a	n/a	n/a	6.17E-02	3.08E-02	1.54E-02	2
Point	GO_ST_D7	Smelting Furnace Dust Collector	Refinery	430336	7269768	21	0.3	15	15	n/a	n/a	n/a	2.12E-02	1.06E-02	5.30E-03	2
Point	GO_ST_BV	Lime Silo Bin Vent Dust Collector	Process plant	431037	7271896	21.3	0.18	15.2	10	n/a	n/a	n/a	7.74E-03	3.87E-03	1.93E-03	2
Point	GO_ST_D8	Lab Dry Dust Collector	Truck shop	431106	7271746	15.2	0.53	14.8	10	n/a	n/a	n/a	6.53E-02	3.27E-02	1.63E-02	2
Point	GO_ST_RK	Regeneration Kiln	Process plant	430331	7269752	32	0.3	15	74	2.57E-02	2.74E-04	6.43E-03	4.24E-03	2.57E-03	1.67E-03	2
Point	GO_ST_H12	Frost Fighter Portable Diesel Heater	Goose Main Pit	434116	7269590	1.3	0.41	0.62	93	1.29E-02	1.37E-04	3.21E-03	2.12E-03	1.29E-03	8.35E-04	2
Point	GO_ST_H34	Frost Fighter Portable Diesel Heater	Llama Open Pit	428798	7272269	1.3	0.41	0.62	93	1.29E-02	1.37E-04	3.21E-03	2.12E-03	1.29E-03	8.35E-04	2
Point	GO_ST_H56	Frost Fighter Portable Diesel Heater	Umwelt Underground Portal	429975	7270588	1.3	0.41	0.62	93	1.29E-02	1.37E-04	3.21E-03	2.12E-03	1.29E-03	8.35E-04	2
Point	GO_ST_H78	Frost Fighter Portable Diesel Heater	Llama Underground Portal	433263	7270000	1.3	0.41	0.62	93	1.29E-02	1.37E-04	3.21E-03	2.12E-03	1.29E-03	8.35E-04	2
Point	GO_ST_H910	Frost Fighter Portable Diesel Heater	Airstrip	429089	7271720	1.3	0.41	0.62	93	1.29E-02	1.37E-04	3.21E-03	2.12E-03	1.29E-03	8.35E-04	2
Point	GO_ST_IN	Incinerator	Camp	430575	7269747	11.1	0.813	2.23	1000	9.66E-02	5.16E-02	2.82E-02	1.48E-02	7.40E-03	3.70E-03	2

APPENDIX A: EMISSION SOURCES (cont'd)

Section 1.2: Area and Volume Source Summary Table

Source Type	Source ID	Emission Source	Location	UTM Coordinates (mE)	UTM Coordinates (mN)	Area (m^2)	Source Ht (m)	Sigma z (m)	Sigma y (m)	Emission Rates (g/s) NOx	SOx	CO	TSP	PM_{10}	$PM_{2.5}$	Details in Section:
Volume	GO_MH_LLP	Loading Vehicle Tailpipe	Llama Portal	428968	7271837	n/a	1.3	2.7	0.6	8.84E-03	1.18E-04	4.42E-03	5.58E-04	5.58E-04	5.41E-04	5
Volume	GO_MH_UP	Loading Vehicle Tailpipe	Umwelt Portal	429871	7270593	n/a	1.3	2.7	0.6	8.84E-03	1.18E-04	4.42E-03	5.58E-04	5.58E-04	5.41E-04	5
Area	GO_TP_LL	Vehicle Tailpipe	Llama Open Pit Active Face	428795	7272264	15,000	3.6	1.7	n/a	3.89E-02	5.14E-04	2.52E-02	2.35E-03	2.35E-03	2.28E-03	5
Area	GO_TP_M	Vehicle Tailpipe	Goose Open Pit Active Face	434089	7269605	15,000	3.6	1.7	n/a	7.24E-01	1.49E-03	5.04E-02	1.40E-02	1.40E-02	1.36E-02	5
Area	GO_TP_LLW	Vehicle Tailpipe	Llama WRSA Pile	429489	7272025	15,000	3.6	1.7	n/a	5.82E-03	7.77E-05	2.91E-03	3.67E-04	3.67E-04	3.56E-04	5
Area	GO_TP_TSFW	Vehicle Tailpipe	TSF WRSA Pile	435379	7267410	15,000	3.6	1.7	n/a	1.27E-02	1.55E-04	5.80E-03	8.75E-04	8.75E-04	8.48E-04	5
Area	GO_TP_ROM	Vehicle Tailpipe	ROM pile	429993	7270049	15,000	3.6	1.7	n/a	6.41E-03	8.56E-05	3.59E-03	4.04E-04	4.04E-04	3.92E-04	5
Area	UR1	Vehicle Tailpipe	Internal Haul Road	429071	7272089	2,136	4.5	2.1	n/a	4.28E-04	5.71E-06	3.58E-04	2.68E-05	2.68E-05	2.60E-05	5
Area	UR2	Vehicle Tailpipe	Internal Haul Road	429230	7271928	8,946	4.5	2.1	n/a	1.28E-03	1.71E-05	1.07E-03	8.09E-05	8.09E-05	7.85E-05	5
Area	UR3	Vehicle Tailpipe	Internal Haul Road	429071	7271923	6,016	4.5	2.1	n/a	6.06E-04	8.09E-06	4.78E-04	3.77E-05	3.77E-05	3.66E-05	5
Area	UR4	Vehicle Tailpipe	Internal Haul Road	429105	7271778	985	4.5	2.1	n/a	9.53E-05	1.27E-06	6.03E-05	6.01E-06	6.01E-06	5.83E-06	5
Area	UR5	Vehicle Tailpipe	Internal Haul Road	429346	7271530	13,689	4.5	2.1	n/a	2.12E-03	2.83E-05	1.50E-03	1.33E-04	1.33E-04	1.29E-04	5
Area	UR6	Vehicle Tailpipe	Internal Haul Road	429573	7271247	2,645	4.5	2.1	n/a	1.14E-04	1.52E-06	8.24E-05	7.18E-06	7.18E-06	6.97E-06	5
Area	UR7	Vehicle Tailpipe	Internal Haul Road	429778	7271289	8,437	4.5	2.1	n/a	3.64E-04	4.85E-06	2.63E-04	2.29E-05	2.29E-05	2.22E-05	5
Area	UR8	Vehicle Tailpipe	Internal Haul Road	429933	7271019	18,192	4.5	2.1	n/a	2.82E-03	3.76E-05	2.00E-03	1.76E-04	1.76E-04	1.71E-04	5
Area	UR9	Vehicle Tailpipe	Internal Haul Road	430026	7270614	3,672	4.5	2.1	n/a	4.57E-04	6.10E-06	2.82E-04	2.88E-05	2.88E-05	2.80E-05	5
Area	UR10	Vehicle Tailpipe	Internal Haul Road	430164	7270351	11,655	4.5	2.1	n/a	2.75E-03	3.68E-05	1.81E-03	1.73E-04	1.73E-04	1.67E-04	5
Area	UR11	Vehicle Tailpipe	Internal Haul Road	430215	7270021	4,299	4.5	2.1	n/a	1.67E-03	2.23E-05	1.25E-03	1.05E-04	1.05E-04	1.02E-04	5
Area	UR12	Vehicle Tailpipe	Internal Haul Road	432060	7269883	75,838	4.5	2.1	n/a	1.60E-02	2.13E-04	1.32E-02	1.00E-03	1.00E-03	9.72E-04	5
Area	UR13	Vehicle Tailpipe	Internal Haul Road	434200	7269864	17,282	4.5	2.1	n/a	3.51E-03	4.69E-05	2.94E-03	2.22E-04	2.22E-04	2.15E-04	5
Area	UR14	Vehicle Tailpipe	Internal Haul Road	434467	7269588	1,601	4.5	2.1	n/a	2.07E-03	2.77E-05	1.83E-03	1.31E-04	1.31E-04	1.27E-04	5
Area	UR15	Vehicle Tailpipe	Internal Haul Road	434839	7268734	36,759	4.5	2.1	n/a	5.35E-02	7.13E-04	4.70E-02	3.37E-03	3.37E-03	3.27E-03	5
Area	WR1	Vehicle Tailpipe	Winter Road	various		516	4.5	2.1	n/a	1.21E-05	1.62E-07	6.26E-06	6.20E-07	6.20E-07	6.02E-07	5
Area	WR2	Vehicle Tailpipe	Winter Road	various		1,039	4.5	2.1	n/a	2.29E-05	3.06E-07	1.19E-05	1.17E-06	1.17E-06	1.14E-06	5
Area	WR3	Vehicle Tailpipe	Winter Road	various		10,255	4.5	2.1	n/a	2.43E-05	3.25E-07	1.26E-05	1.25E-06	1.25E-06	1.21E-06	5
Area	WR4	Vehicle Tailpipe	Winter Road	various		3,560	4.5	2.1	n/a	2.40E-04	3.21E-06	1.24E-04	1.23E-05	1.23E-05	1.20E-05	5
Area	WR5	Vehicle Tailpipe	Winter Road	various		7,746	4.5	2.1	n/a	1.66E-04	2.23E-06	8.64E-05	8.55E-06	8.55E-06	8.30E-06	5
Area	WR6	Vehicle Tailpipe	Winter Road	various		5,026	4.5	2.1	n/a	1.81E-04	2.43E-06	9.39E-05	9.31E-06	9.31E-06	9.03E-06	5
Area	WR7	Vehicle Tailpipe	Winter Road	various		1,175	4.5	2.1	n/a	1.17E-04	1.57E-06	6.10E-05	6.04E-06	6.04E-06	5.86E-06	5
Area	WR8	Vehicle Tailpipe	Winter Road	various		6,551	4.5	2.1	n/a	2.75E-05	3.68E-07	1.43E-05	1.41E-06	1.41E-06	1.37E-06	5
Area	WR9	Vehicle Tailpipe	Winter Road	various		978	4.5	2.1	n/a	1.53E-04	2.05E-06	7.95E-05	7.87E-06	7.87E-06	7.63E-06	5
Area	WR10	Vehicle Tailpipe	Winter Road	various		5,791	4.5	2.1	n/a	1.35E-04	1.81E-06	7.02E-05	6.96E-06	6.96E-06	6.75E-06	5
Area	WR11	Vehicle Tailpipe	Winter Road	various		7,907	4.5	2.1	n/a	1.85E-04	2.48E-06	9.59E-05	9.50E-06	9.50E-06	9.21E-06	5
Area	WR12	Vehicle Tailpipe	Winter Road	various		7,879	4.5	2.1	n/a	1.84E-04	2.47E-06	9.56E-05	9.47E-06	9.47E-06	9.18E-06	5
Area	WR13	Vehicle Tailpipe	Winter Road	various		2,139	4.5	2.1	n/a	5.00E-05	6.70E-07	2.59E-05	2.57E-06	2.57E-06	2.49E-06	5
Area	WR14	Vehicle Tailpipe	Winter Road	various		11,096	4.5	2.1	n/a	2.59E-04	3.48E-06	1.35E-04	1.33E-05	1.33E-05	1.29E-05	5
Area	WR15	Vehicle Tailpipe	Winter Road	various		13,326	4.5	2.1	n/a	3.11E-04	4.18E-06	1.62E-04	1.60E-05	1.60E-05	1.55E-05	5
Area	WR16	Vehicle Tailpipe	Winter Road	various		2,429	4.5	2.1	n/a	5.68E-05	7.61E-07	2.95E-05	2.92E-06	2.92E-06	2.83E-06	5
Area	WR17	Vehicle Tailpipe	Winter Road	various		12,936	4.5	2.1	n/a	3.02E-04	4.05E-06	1.57E-04	1.55E-05	1.55E-05	1.51E-05	5
Area	WR18	Vehicle Tailpipe	Winter Road	various		3,958	4.5	2.1	n/a	9.25E-05	1.24E-06	4.80E-05	4.75E-06	4.75E-06	4.61E-06	5
Area	WR19	Vehicle Tailpipe	Winter Road	various		5,163	4.5	2.1	n/a	1.21E-04	1.62E-06	6.26E-05	6.20E-06	6.20E-06	6.02E-06	5
Area	WR20	Vehicle Tailpipe	Winter Road	various		6,765	4.5	2.1	n/a	1.58E-04	2.12E-06	8.21E-05	8.13E-06	8.13E-06	7.88E-06	5
Area	WR21	Vehicle Tailpipe	Winter Road	various		3,750	4.5	2.1	n/a	8.77E-05	1.18E-06	4.55E-05	4.51E-06	4.51E-06	4.37E-06	5
Area	UR1	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429071	7272089	2,136	4.5	2.1	n/a	n/a	n/a	n/a	2.15E-01	6.12E-02	6.12E-03	4
Area	UR2	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429230	7271928	8,946	4.5	2.1	n/a	n/a	n/a	n/a	5.74E-01	1.64E-01	1.64E-02	4
Area	UR3	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429071	7271923	6,016	4.5	2.1	n/a	n/a	n/a	n/a	3.36E-01	9.58E-02	9.58E-03	4
Area	UR4	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429105	7271778	985	4.5	2.1	n/a	n/a	n/a	n/a	4.97E-02	1.42E-02	1.42E-03	4
Area	UR5	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429346	7271530	13,689	4.5	2.1	n/a	n/a	n/a	n/a	1.22E+00	3.47E-01	3.47E-02	4
Area	UR6	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429573	7271247	2,645	4.5	2.1	n/a	n/a	n/a	n/a	4.46E-02	1.27E-02	1.27E-03	4
Area	UR7	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429778	7271289	8,437	4.5	2.1	n/a	n/a	n/a	n/a	1.42E-01	4.06E-02	4.06E-03	4
Area	UR8	Unpaved Road Fugitive Dust [1]	Internal Haul Road	429933	7271019	18,192	4.5	2.1	n/a	n/a	n/a	n/a	1.62E+00	4.61E-01	4.61E-02	4
Area	UR9	Unpaved Road Fugitive Dust [1]	Internal Haul Road	430026	7270614	3,672	4.5	2.1	n/a	n/a	n/a	n/a	2.48E-01	7.06E-02	7.06E-03	4
Area	UR10	Unpaved Road Fugitive Dust [1]	Internal Haul Road	430164	7270351	11,655	4.5	2.1	n/a	n/a	n/a	n/a	1.61E+00	4.59E-01	4.59E-02	4
Area	UR11	Unpaved Road Fugitive Dust [1]	Internal Haul Road	430215	7270021	4,299	4.5	2.1	n/a	n/a	n/a	n/a	8.63E-01	2.46E-01	2.46E-02	4
Area	UR12	Unpaved Road Fugitive Dust [1]	Internal Haul Road	432060	7269883	75,838	4.5	2.1	n/a	n/a	n/a	n/a	8.31E+00	2.37E+00	2.37E-01	4
Area	UR13	Unpaved Road Fugitive Dust [1]	Internal Haul Road	434200	7269864	17,282	4.5	2.1	n/a	n/a	n/a	n/a	1.65E+00	4.69E-01	4.69E-02	4
Area	UR14	Unpaved Road Fugitive Dust [1]	Internal Haul Road	434467	7269588	1,601	4.5	2.1	n/a	n/a	n/a	n/a	1.03E+00	2.95E-01	2.95E-02	4
Area	UR15	Unpaved Road Fugitive Dust [1]	Internal Haul Road	434839	7268734	36,759	4.5	2.1	n/a	n/a	n/a	n/a	2.10E+01	5.98E+00	5.98E-01	4
Area	WR1	Unpaved Road Fugitive Dust [1]	Winter Road	various		516	4.5	2.1	n/a	n/a	n/a	n/a	1.49E-02	4.24E-03	4.24E-04	4
Area	WR2	Unpaved Road Fugitive Dust [1]	Winter Road	various		1,039	4.5	2.1	n/a	n/a	n/a	n/a	2.99E-02	8.53E-03	8.53E-04	4
Area	WR3	Unpaved Road Fugitive Dust [1]	Winter Road	various		10,255	4.5	2.1	n/a	n/a	n/a	n/a	2.95E-01	8.42E-02	8.42E-03	4
Area	WR4	Unpaved Road Fugitive Dust [1]	Winter Road	various		3,560	4.5	2.1	n/a	n/a	n/a	n/a	1.03E-01	2.92E-02	2.92E-03	4

APPENDIX A: EMISSION SOURCES (cont'd)

Section 1.2: Area and Volume Source Summary Table (cont'd)

Source Type	Source ID	Emission Source	Location	UTM Coordinates (mE)	UTM Coordinates (mN)	Area (m^2)	Source Ht (m)	Sigma z (m)	Sigma y (m)	Emission Rates (g/s) NOx	SOx	CO	TSP	PM_{10}	$PM_{2.5}$	Details in Section:
Area	WR5	Unpaved Road Fugitive Dust [1]	Winter Road	various		7,746	4.5	2.1	n/a	n/a	n/a	n/a	2.23E-01	6.36E-02	6.36E-03	4
Area	WR6	Unpaved Road Fugitive Dust [1]	Winter Road	various		5,026	4.5	2.1	n/a	n/a	n/a	n/a	1.45E-01	4.13E-02	4.13E-03	4
Area	WR7	Unpaved Road Fugitive Dust [1]	Winter Road	various		1,175	4.5	2.1	n/a	n/a	n/a	n/a	3.39E-02	9.65E-03	9.65E-04	4
Area	WR8	Unpaved Road Fugitive Dust [1]	Winter Road	various		6,551	4.5	2.1	n/a	n/a	n/a	n/a	1.89E-01	5.38E-02	5.38E-03	4
Area	WR9	Unpaved Road Fugitive Dust [1]	Winter Road	various		978	4.5	2.1	n/a	n/a	n/a	n/a	2.82E-02	8.03E-03	8.03E-04	4
Area	WR10	Unpaved Road Fugitive Dust [1]	Winter Road	various		5,791	4.5	2.1	n/a	n/a	n/a	n/a	1.67E-01	4.75E-02	4.75E-03	4
Area	WR11	Unpaved Road Fugitive Dust [1]	Winter Road	various		7,907	4.5	2.1	n/a	n/a	n/a	n/a	2.28E-01	6.49E-02	6.49E-03	4
Area	WR12	Unpaved Road Fugitive Dust [1]	Winter Road	various		7,879	4.5	2.1	n/a	n/a	n/a	n/a	2.27E-01	6.47E-02	6.47E-03	4
Area	WR13	Unpaved Road Fugitive Dust [1]	Winter Road	various		2,139	4.5	2.1	n/a	n/a	n/a	n/a	6.16E-02	1.76E-02	1.76E-03	4
Area	WR14	Unpaved Road Fugitive Dust [1]	Winter Road	various		11,096	4.5	2.1	n/a	n/a	n/a	n/a	3.20E-01	9.11E-02	9.11E-03	4
Area	WR15	Unpaved Road Fugitive Dust [1]	Winter Road	various		13,326	4.5	2.1	n/a	n/a	n/a	n/a	3.84E-01	1.09E-01	1.09E-02	4
Area	WR16	Unpaved Road Fugitive Dust [1]	Winter Road	various		2,429	4.5	2.1	n/a	n/a	n/a	n/a	7.00E-02	1.99E-02	1.99E-03	4
Area	WR17	Unpaved Road Fugitive Dust [1]	Winter Road	various		12,936	4.5	2.1	n/a	n/a	n/a	n/a	3.73E-01	1.06E-01	1.06E-02	4
Area	WR18	Unpaved Road Fugitive Dust [1]	Winter Road	various		3,958	4.5	2.1	n/a	n/a	n/a	n/a	1.14E-01	3.25E-02	3.25E-03	4
Area	WR19	Unpaved Road Fugitive Dust [1]	Winter Road	various		5,163	4.5	2.1	n/a	n/a	n/a	n/a	1.49E-01	4.24E-02	4.24E-03	4
Area	WR20	Unpaved Road Fugitive Dust [1]	Winter Road	various		6,765	4.5	2.1	n/a	n/a	n/a	n/a	1.95E-01	5.55E-02	5.55E-03	4
Area	WR21	Unpaved Road Fugitive Dust [1]	Winter Road	various		3,750	4.5	2.1	n/a	n/a	n/a	n/a	1.08E-01	3.08E-02	3.08E-03	4
Area	GO_AC_AS	Aircraft Landing/Takeoff and Ground Equipment	Airstrip	433670	7269393	99,533	0	0	n/a	1.84E+00	2.49E-01	3.55E+00	2.50E-02	2.50E-02	2.50E-02	11
Area	GO_B_LL	Blasting at Llama Open Pit	Llama Open Pit Active Face	428795	7272264	15,000	0	0	n/a	4.60E+01	5.75E+00	1.96E+02	1.12E+02	5.84E+01	3.37E+00	7
Area	GO_B_M	Blasting at Goose Main Open Pit	Goose Open Pit Active Face	434089	7269605	15,000	0	0	n/a	4.54E+01	5.68E+00	1.93E+02	1.12E+02	5.84E+01	3.37E+00	7
Area	GO_BD_LLW	Dozers at Llama WRSA	Llama WRSA Pile	429489	7272025	15,000	0	0	n/a	n/a	n/a	n/a	2.90E-01	5.46E-02	3.04E-02	8
Area	GO_BD_M	Dozers at Goose Main Pit	Goose Open Pit Active Face	434089	7269605	15,000	0	0	n/a	n/a	n/a	n/a	2.90E-01	5.46E-02	3.04E-02	8
Area	GO_BD_TSFW	Dozers at TSF WRSA	TSF WRSA Pile	435379	7267410	15,000	0	0	n/a	n/a	n/a	n/a	5.79E-01	1.09E-01	6.08E-02	8
Area	GP_BD_ROM	Dozers at ROM pile	ROM pile	429993	7270049	15,000	0	0	n/a	n/a	n/a	n/a	2.90E-01	5.46E-02	3.04E-02	8
Area	UR1-UR15	Grading [1]	Internal Haul Road	various		15,000	0	0	n/a	n/a	n/a	n/a	8.82E-01	2.76E-01	2.73E-02	9
Area	GO_D_LL	Drilling at Llama	Llama Open Pit Active Face	428795	7272264	15,000	0	0	n/a	n/a	n/a	n/a	3.51E-01	1.76E-01	8.78E-02	10
Area	GO_D_M	Drilling at Goose Main	Goose Open Pit Active Face	434089	7269605	15,000	0	0	n/a	n/a	n/a	n/a	1.75E+00	8.76E-01	4.38E-01	10
Volume	GO_MH_LL	Loading Waste Rock and Ore at Llama Open Pit[2]	Llama Open Pit	428795	7272264	n/a	2.3	0.9	0.4	n/a	n/a	n/a	1.58E-02	7.46E-03	1.13E-03	6
Volume	GO_MH_M	Loading Waste Rock and Ore at Goose Main Open	Goose Open Pit	434089	7269605	n/a	2.3	0.9	0.4	n/a	n/a	n/a	1.67E-01	7.88E-02	1.19E-02	6
Volume	GO_MH_UP	Loading and Unloading Waste Rock[2]	Umwelt Mine Portal	429871	7270593	n/a	1.3	2.7	0.6	n/a	n/a	n/a	1.40E-03	6.63E-04	1.00E-04	6
Volume	GO_MH_LLP	Loading and Unloading Waste Rock[2]	Llama Mine Portal	428968	7271837	n/a	1.3	2.7	0.6	n/a	n/a	n/a	1.61E-03	7.60E-04	1.15E-04	6
Volume	GO_MH_LLW	Unloading Waste Rock[2]	Llama WRSA Pile	429489	7272025	n/a	2	4.3	0.9	n/a	n/a	n/a	9.70E-03	4.59E-03	6.95E-04	6
Volume	GO_MH_TSF	Unloading Waste Rock[2]	TSF WRSA Pile	435379	726741	n/a	2	4.3	0.9	n/a	n/a	n/a	1.52E-01	7.17E-02	1.09E-02	6
Volume	GO_MH_ROM	Unloading Ore at ROM[2]	ROM pile	429993	7270049	n/a	2	4.3	0.9	n/a	n/a	n/a	3.32E-02	1.57E-02	2.38E-03	6
Volume	GO_MH_PC	Loading Ore into the Primary Crusher[2]	Crushing Plant	430100	7269881	n/a	2.0	1.3	1.1	n/a	n/a	n/a	2.85E-02	1.35E-02	2.04E-03	6

Notes:

[1] The fugitive dust emission rates shown in this table are based on a roadway control efficiency of 84% (winter control of 90% and summer control of 77%).

[2] The material handling emissions vary with hourly wind speeds; therefore, the emission rates shown in this table are based on a wind speed of 3.7 m/s.

APPENDIX A: EMISSION SOURCES (cont'd)

Section 2: Combustion Sources and Dust Collector Sources

- The peak gross power is 24.99 MW (4 operating @ 100%; 3 x 6.6 MW & 1 x 5 MW & 1 spare generator).
- It is assumed that the diesel lake dewatering pumps, diesel pit dewatering pumps and portable diesel heaters have a total of less than 1 MW power rating.
- Regeneration Kiln emissions will be based on the 1.4 million BTU/hr input capacity and diesel combustion AP-42 emission factors (as no exhaust emissions data is provided).
- Based on RWDI experience, 50% of TSP is PM_{10} and 50% of PM_{10} is $PM_{2.5}$.

Source ID	Emission Source	Power Rating or BTU Input Rating	Load Factor	Operating Hours	Control Device	Emission Calculation Reference
GO_ST_G1	Diesel fired generator	6.635 MW	1.00	8760	-	NONROAD EPA Tier 2 (NO_X, CO, TSP) and AP42 CH3.4 for SO_2
GO_ST_G2	Diesel fired generator	6.635 MW	1.00	8760	-	NONROAD EPA Tier 2 (NO_X, CO, TSP) and AP42 CH3.4 for SO_2
GO_ST_G3	Diesel fired generator	6.635 MW	1.00	8760	-	NONROAD EPA Tier 2 (NO_X, CO, TSP) and AP42 CH3.4 for SO_2
GO_ST_G4	Diesel fired generator	5.080 MW	1.00	8760	-	NONROAD EPA Tier 2 (NO_X, CO, TSP) and AP42 CH3.4 for SO_2
GO_ST_RK	Regeneration Kiln	1.4 million	-	7884	-	U.S. EPA Chapter 1.3 External Combustion Sources
GO_ST_H12	Frost Fighter Portable Diesel Heater	2 x 350,000	-	8760	-	U.S. EPA Chapter 1.3 External Combustion Sources
GO_ST_H34	Frost Fighter Portable Diesel Heater	2 x 350,000	-	8760	-	U.S. EPA Chapter 1.3 External Combustion Sources
GO_ST_H56	Frost Fighter Portable Diesel Heater	2 x 350,000	-	8760	-	U.S. EPA Chapter 1.3 External Combustion Sources
GO_ST_H78	Frost Fighter Portable Diesel Heater	2 x 350,000	-	8760	-	U.S. EPA Chapter 1.3 External Combustion Sources
GO_ST_H910	Frost Fighter Portable Diesel Heater	2 x 350,000	-	8760	-	U.S. EPA Chapter 1.3 External Combustion Sources
GO_ST_IN	Incinerator	-	-	8059	-	Hatch Technical Datasheet
GO_ST_D1	Primary Crusher Dust Collector	-	-	8059	Baghouse, fan, rotary valve	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D9	Secondary Crusher Dust Collector		-	8059	Bin Vent with exhaust fan	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D2	Crushing Conveyor Transfer Dust collector #1	-	-	8760	Bin Vent with exhaust fan	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D3	Crushing Conveyor Transfer Dust collector #2	-	-	8760	Bin Vent with exhaust fan	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D4	Crushing & Screening Dust Collector	-	-	8760	Baghouse, fan, rotary valve	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D5	Ball mill Surge Bin Dust Collector	-	-	8760	Bin Vent with exhaust fan	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D6	Ball mill Surge Bin Reclaim Dust Collector	-	-	8760	Baghouse, fan, rotary valve	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D7	Smelting Furnace Dust Collector	-	-	8059	Baghouse, fan, rotary valve	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_BV	Lime Silo Bin Vent Dust Collector	-	-	8760	Bin Vent with exhaust fan	MOECC Guideline A-10 (Appendix C), 2009
GO_ST_D8	Lab Dry Dust Collector	-	-	8760	Baghouse	MOECC Guideline A-10 (Appendix C), 2009

Section 3: Underground Mine Sources

- Information on underground mining description sent on June 3, 2015 by JDS Mining.
- Stack parameters for the fresh air intake mine heater remain unchanged from the DEIS. These are reasonable parameters.
- Emission rates for Exhaust Air Raise and declines are based on upper bound concentrations to meet the BC MOE - Health, Safety and Reclamation Code for Mines in British Columbia, 2008 Threshold Limit Values Table 2-1
- Emission rates for Fresh Air Intake (FAR) Indirect-Fired Heaters are based on the annual consumption of diesel for mine air heating (p. R-7-25 of draft FEIS project description) and AP-42 Chapter 1.3 "Fuel Oil Combustion" emission factors
- Other inputs required to calculate the emission rates for the FAR Heaters are:

Annual consumption of diesel:	2,260,000	L
Hours of Operation:	5,208	hours (only running during winter, October to May)
Sulphur Weight Content:	0.0015	% - from diesel MSDS provided by JDS

APPENDIX A: EMISSION SOURCES (cont'd)

Section 4: Unpaved Road Sources

- Unpaved road fugitive dust emissions are calculated based on the following information:

Route ID	Route	Hourly Traffic Passes (#/h)	Segment Length (m)	Average Vehicle Weight [a] (tonnes)	Surface Silt Content [b] (%)	Emission Calculation Reference
UR1	Road Segment 1	11	107	61	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR2	Road Segment 2	7	124	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR3	Road Segment 3	7	301	47	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR4	Road Segment 4	7	49	33	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR5	Road Segment 5	11	684	46	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR6	Road Segment 6	3	132	19	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR7	Road Segment 7	3	421	19	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR8	Road Segment 8	11	909	46	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR9	Road Segment 9	9	184	35	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR10	Road Segment 10	17	582	45	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR11	Road Segment 11	22	215	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR12	Road Segment 12	12	3,790	60	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR13	Road Segment 13	10	864	60	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR14	Road Segment 14	60	80	79	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
UR15	Road Segment 15	53	1,838	79	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR1	Winter Road Segment	1.6	52	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR2	Winter Road Segment	1.6	104	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR3	Winter Road Segment	1.6	1,025	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR4	Winter Road Segment	1.6	356	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR5	Winter Road Segment	1.6	775	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR6	Winter Road Segment	1.6	503	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR7	Winter Road Segment	1.6	118	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR8	Winter Road Segment	1.6	655	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR9	Winter Road Segment	1.6	98	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR10	Winter Road Segment	1.6	579	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR11	Winter Road Segment	1.6	791	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR12	Winter Road Segment	1.6	788	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR13	Winter Road Segment	1.6	214	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR14	Winter Road Segment	1.6	1,110	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR15	Winter Road Segment	1.6	1,333	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR16	Winter Road Segment	1.6	243	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR17	Winter Road Segment	1.6	1,294	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR18	Winter Road Segment	1.6	396	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR19	Winter Road Segment	1.6	516	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR20	Winter Road Segment	1.6	676	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
WR21	Winter Road Segment	1.6	375	55	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)

Note:

[a] The following table lists the vehicle types and information to calculate the mean vehicle weight. Please note that the average vehicle weight is calculated as a combination of vehicles travelling on a particular road segment.

Listing of On-Site Vehicle Mix	Empty Weight (tonnes)	Payload (tonnes)	Loaded Weight (tonnes)	Mean Weight (tonnes)
Haulage Truck (30t)	29	30	59	44
Haul Truck-Cat 775G	51	64	115	83
Loader-Cat 988	51	-	51	51

Listing of On-Site Vehicle Mix	Empty Weight (tonnes)	Payload (tonnes)	Loaded Weight (tonnes)	Mean Weight (tonnes)
Grader	19	-	19	19
25 tonnes truck	25	50	75	50
B-Train	25	68	93	59

[b] Silt content from AP 42 Table 13.2.2-1 - Mean silt content for Western Surface Coal Mining haul road to/from pit.

APPENDIX A: EMISSION SOURCES (cont'd)

Section 4: Unpaved Road Sources (cont'd)

- Number of haul truck trips are based on waste rock (12,031,000 t) and ore production (2,477,000 t) rates in Rear 3 as well as payload of CAT 775G (64 t) used in open pits and Haulage Trucks (30 t) used in underground mines.
- Trucks are driven around site 355 days per year, 20 hours per day.
- Number of winter road trucks trips (25 tonnes trucks) are based on the total freight tonnage (22,800 t) to be delivered to the Goose Property in Year 3 as well as it's payload (25t).
- Number of winter road trucks trips (B-train Tanker) are based on the total fuel (52,823 m^3) to be delivered to the Goose Property in Year 3 as well as it's payload (50 m^3).
- Winter road trucks drive between MLA and Goose Property for 104 days of the year and for 16 hours per day.
- A control efficiency of fugitive dusts on unpaved roads due to winter conditions is 90% based on a study from "Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada", Golder Associates, 2012
- A control efficiency of fugitive dusts on unpaved roads due to waterting was calculated to be 77% using the approach outlined in U.S. EPA Control of Open Fugitive Dust Sources, September 1988. The control efficiency was calculated based on the water truck capacity of 30 m2, completing two passes per 10 hour shift.

Section 5: Vehicular Tailpipe Sources

- Tailpipe emissions are calculated based on the following information:

Equipment	Number of Units in Year 3	Rated Max HP	Load Factor Used [a]	Activity Hrs/Yr/Unit	Travel Speed [b] km/hr	Emission Calculation Reference
Haulage Truck (30t)	n/a [a]	393	58%	7100	50	NONROAD 2008, Tier 4 emissions
Haul Truck - CAT 775G	n/a [a]	725	58%	7100	50	NONROAD 2008, Tier 4 emissions
Excavators - CAT 390	2	523	53%	7100	n/a	NONROAD 2008, Tier 4 emissions
Grader - CAT 14m	1	297	58%	4188	n/a	NONROAD 2008, Tier 4 emissions
Loader - CAT 988	1	430	48%	5804	n/a	NONROAD 2008, Tier 4 emissions
Loader - CAT 966K	2	258	48%	8520	n/a	NONROAD 2008, Tier 4 emissions
Production Drill - MD 6240	2	800	100%	5609	n/a	NONROAD 2008, Tier 4 emissions
Small Drill - MD 5125	1	325	100%	2565	n/a	NONROAD 2008, Tier 4 emissions
Track Dozers - D9	1	289	58%	4188	n/a	NONROAD 2008, Tier 4 emissions
Track Dozers - D8	3	285	58%	4188	n/a	NONROAD 2008, Tier 4 emissions
Water truck - CAT 775	1	725	58%	7100	n/a	NONROAD 2008, Tier 4 emissions
Wheel Dozer - CAT 824	1	325	58%	4188	n/a	NONROAD 2008, Tier 4 emissions
Hydraulic Shovel - CAT 6015	2	665	48%	5644	n/a	NONROAD 2008, Tier 4 emissions
25 tonnes/trucks	n/a [a]	600	58%	1621	32.5	NONROAD 2008, Tier 4 emissions
B-train tankers	n/a [a]	600	58%	1691	32.5	NONROAD 2008, Tier 4 emissions

Note:
[a] Load factors are from the document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition" published by the US EPA, 2010.
[b] The trucks are travelling; therefore, emissions are not based on the number of units but rather the number of passes per hour and travelling speed. Refer to Section 4 for information on number of passes per hour.

Section 6: Material Sources

- Material handling emissions are calculated based on the following information:

Source ID	Description	Processing Rate			Moisture Content [a] (%)	Emission Calculation Reference
		Hourly (Mg/h)	Daily (Mg/d)	Annual (Mg/y)		
GO_MH_LL	Loading Waste Rock and Ore at Llama Open Pit	138	3,315	1,177,000	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_M	Loading Waste Rock and Ore at Goose Main Open Pit	1,460	35,034	12,437,000	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_UP	Loading and Unloading Waste Rock at Umwelt Mine Portal	12	295	104,609	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_LLP	Loading and Unloading Waste Rock at Llama Mine Portal	14	338	119,958	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_LLW	Unloading Waste Rock at Llama WRSA	85	2,039	724,000	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_TSFW	Unloading Waste Rock at TSF WRSA	1,327	31,851	11,307,000	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_ROM	Unloading Ore at ROM	291	6,977	2,477,000	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"
GO_MH_PC	Loading Ore into the Primary Crusher	250	6,000	2,130,000	6.9%	U.S. EPA AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles"

Note:

[a] In addition to the moisture content, the wind speed is required to calculate the emission factor. The same hourly wind speeds from the dispersion modelling meteorological data set were used, and emissions vary by hour.

APPENDIX A: EMISSION SOURCES (cont'd)

Section 7: Blasting Sources

- Blasting emissions are calculated based on the following information:

Source ID	Source Description	Total Blast Area (m^2)	Shot Size [a] (Charge) (Mg)	Explosive Type	Number of Blasts			Emission Calculation Reference
					Hourly [b] (#/hour)	Daily (#/day)	Annual (#/year)	
GO_B_LL	Blasting at Llama Open Pit	15,000	21	ANFO	1	1	28	U.S. EPA AP-42 Chapter 13.3 "Explosives Detonation" and U.S. EPA AP-42 Section 11.9 "Western Surface Coal Mining"
GO_B_M	Blasting at Goose Main Open Pit	15,000	20	ANFO	1	1	300	

Notes:

[a] Shot size is calculated based on the quantity of bulk explosives used at the Llama Pit (580,000 kg) and th Goose Main Pit (6,134,000 kg) as well as the number of blasts per year.

[b] A maximum of one blast can occur per hour (and per day). It was assumed that the blast occurs mid-day.

Section 8: Bulldozing Sources

- Equipment activity (bulldozing) emissions are calculated based on the following information:

Source ID	Source Description	Number of Units in Year 3	Annual operating hrs per unit	Silt content	Moisture content	Dozer Load Factor	Emission Calculation Reference
GO_BD_LLW	Dozers at Llama WRSA	1	4188	6.90%	7.9%	58%	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining"
GO_BD_M	Dozers at Goose Main Pit	1	4188	6.90%	7.9%	58%	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining"
GO_BD_TSFW	Dozers at TSF WRSA	2	4188	6.90%	7.9%	58%	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining"
GP_BD_ROM	Dozers at ROM pile	1	4188	6.90%	7.9%	58%	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining"

Section 9: Grading Sources

- Equipment activity (grading) emissions are calculated based on the following information:

Source ID	Source Description	Number of Units in Year 3	Annual operating hrs per unit	Vehicle Mean Speed (km/hr)	Control Efficiency	Grader Load Factor	Emission Calculation Reference
UR1 - UR15	Grading on all Internal Haul Routes	3	4188	10	77% (winter) 90% (summer)	58%	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining"

Section 10: Drilling Sources

- Equipment activity (drilling) emissions are calculated based on the following information:

Source ID	Source Description	Number of Units in Year 3	Annual operating hrs per unit	# of holes drilled per year	Emission Calculation Reference
GO_D_LL	Drilling at Llama	1	2565	5,500	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining", Appendix B, Table 10
GO_D_M	Drilling at Goose Main	2	5609	60,000	U.S. EPA AP-42 Chapter 11.9 "Western Surface Coal Mining", Appendix B, Table 10

APPENDIX A: EMISSION SOURCES (cont'd)

RWDI Project #1502212

Section 11: Aircraft Sources

- Aircraft emissions are calculated based on the following information:

Source ID	Source Description	Aircraft Type [a]	Number of landings/takeoffs [b]			Emission Calculation Reference
			Max Hourly (#/hour)	Max Daily (#/day)	Annual (#/day)	
GO_AC_AS	Aircraft Landing/Takeoff and Ground Equipment Support	AVRO RJ85	1	2	50	FAA EDMS v5.1.4.1

Notes:

[a] There are also Buffalo DHC5A aircrafts usef to carry freight; however, the AVRO RJ85 emit higher quantities of emissions and to conservatively quantify emissions, it was assumed that two AVRO RJ85 aircrafts are landing and taking off in one day.

[b] It was assumed that the landing/takeoff of an aircraft occur in the same hour. It was also assumed that two landings/takeoffs occur per day, one in the morning and one in the evening.

APPENDIX B

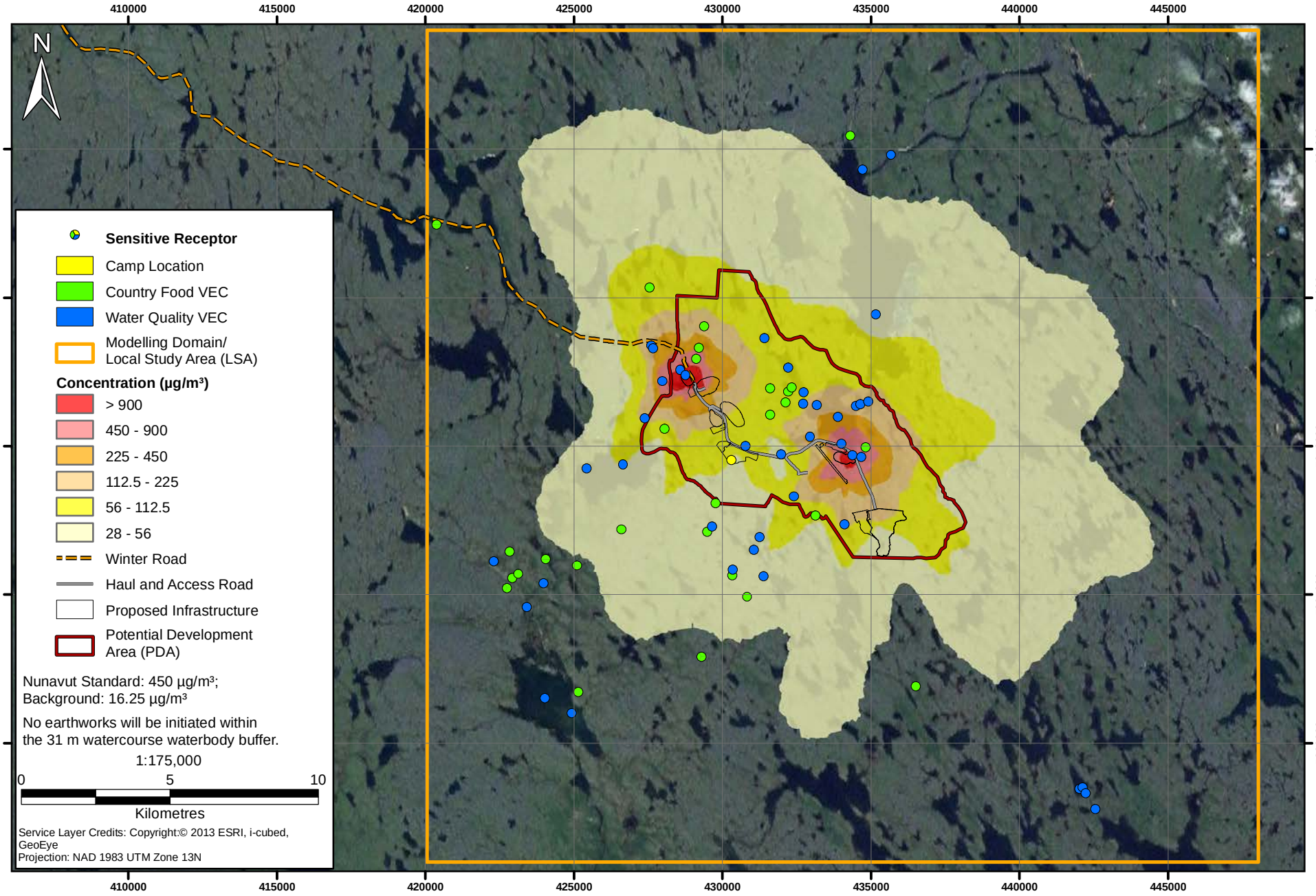


Figure B-1

Sabina GOLD & SILVER CORP

Maximum 1-hour SO_2 Concentration, Goose Property Area

Figure B-1

RWDI

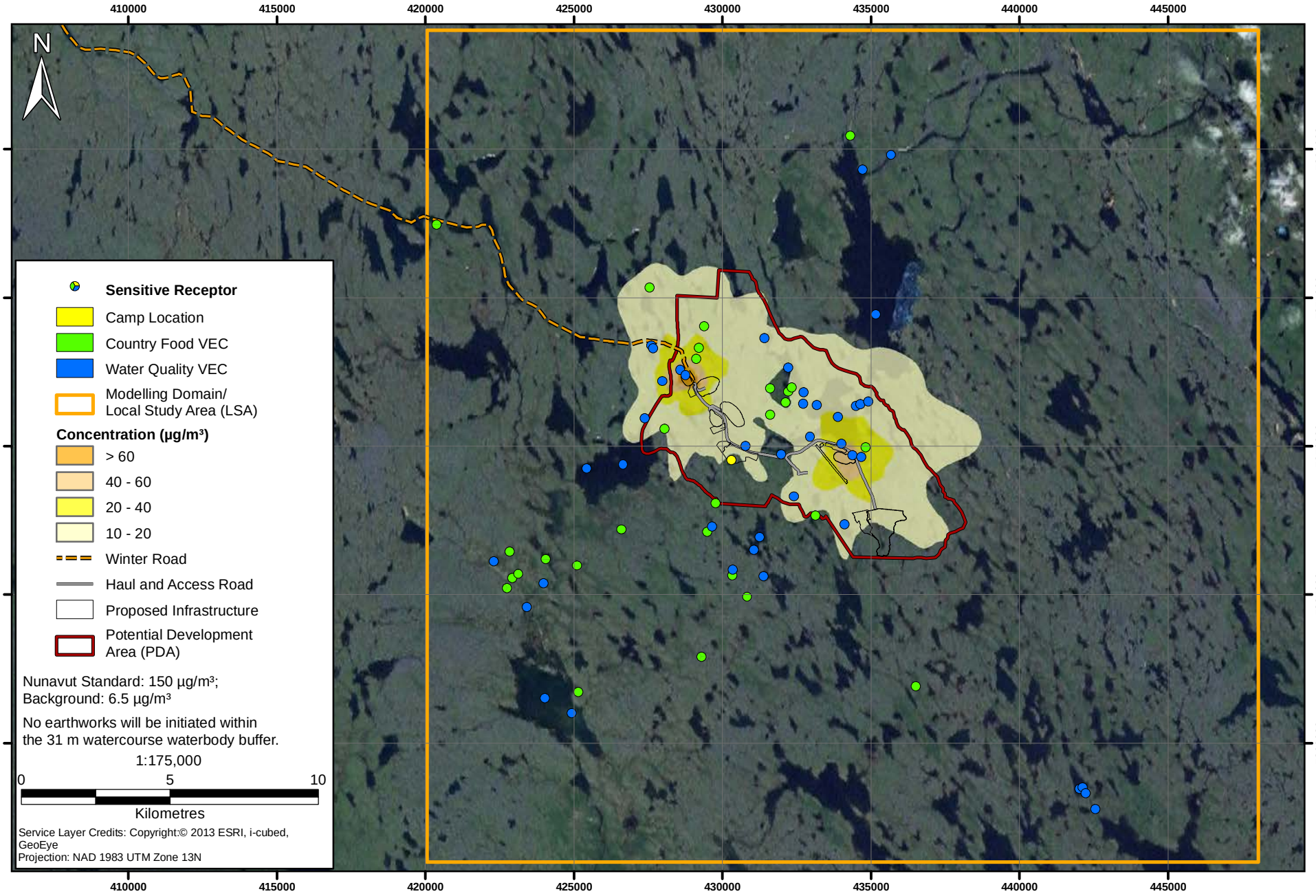


Figure B-2

Sabina GOLD & SILVER CORP

Maximum 24-hour SO_2 Concentration, Goose Property Area

Figure B-2

RWDI

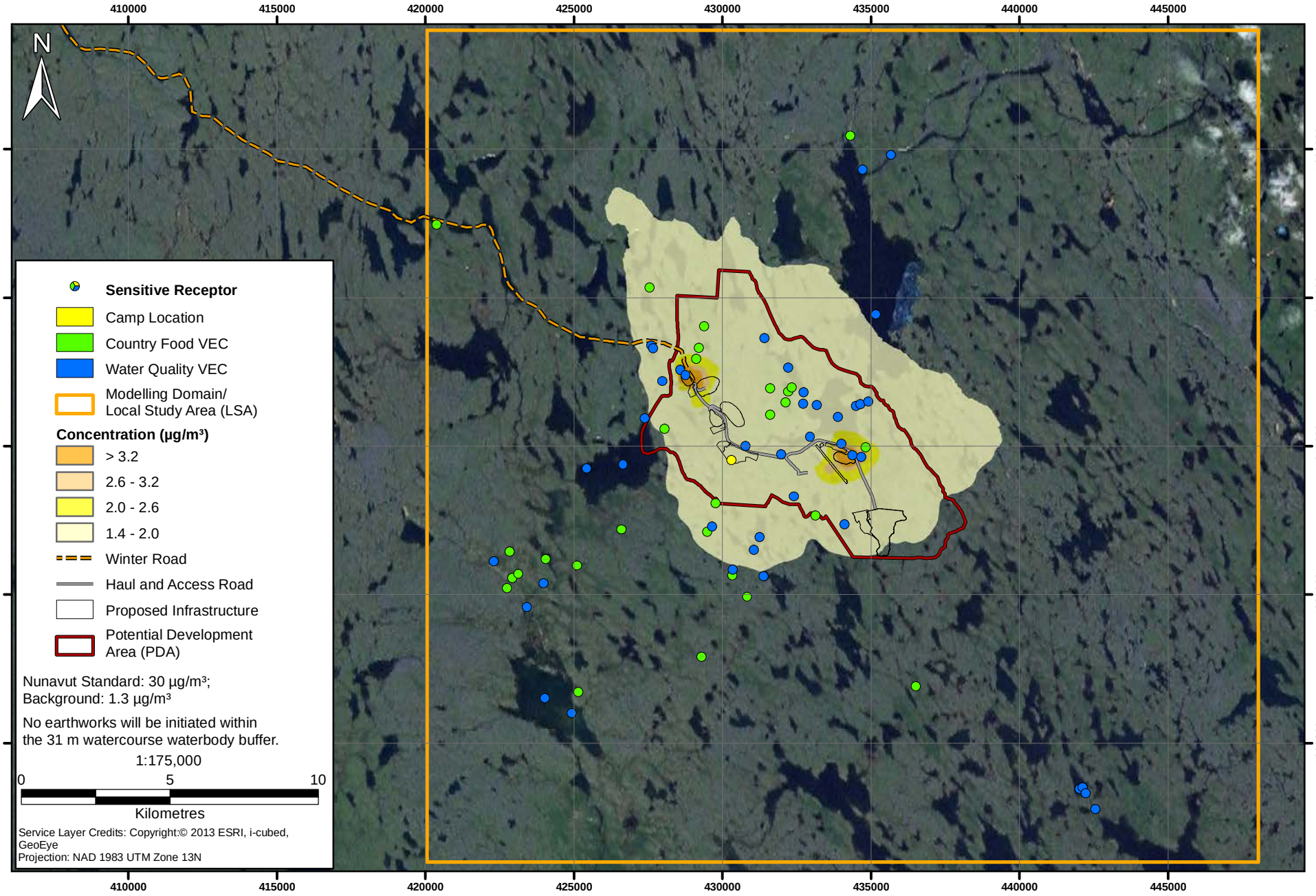


Figure B-3

Sabina GOLD & SILVER CORP

Annual SO_2 Concentration, Goose Property Area

Figure B-3

RWDI

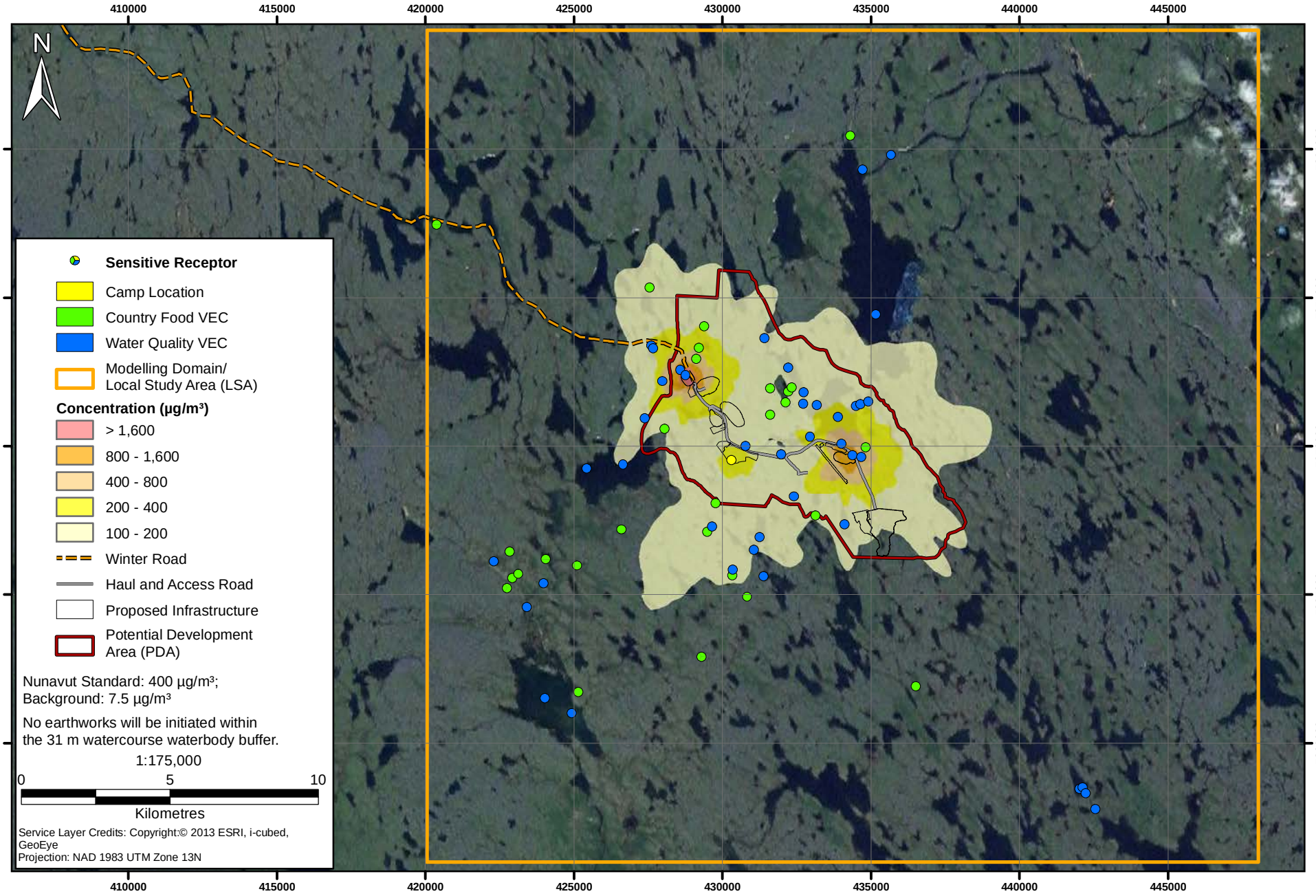


Figure B-4

Sabina GOLD & SILVER CORP

Maximum 1-hour NO_2 Concentration, Goose Property Area

Figure B-4

RWDI

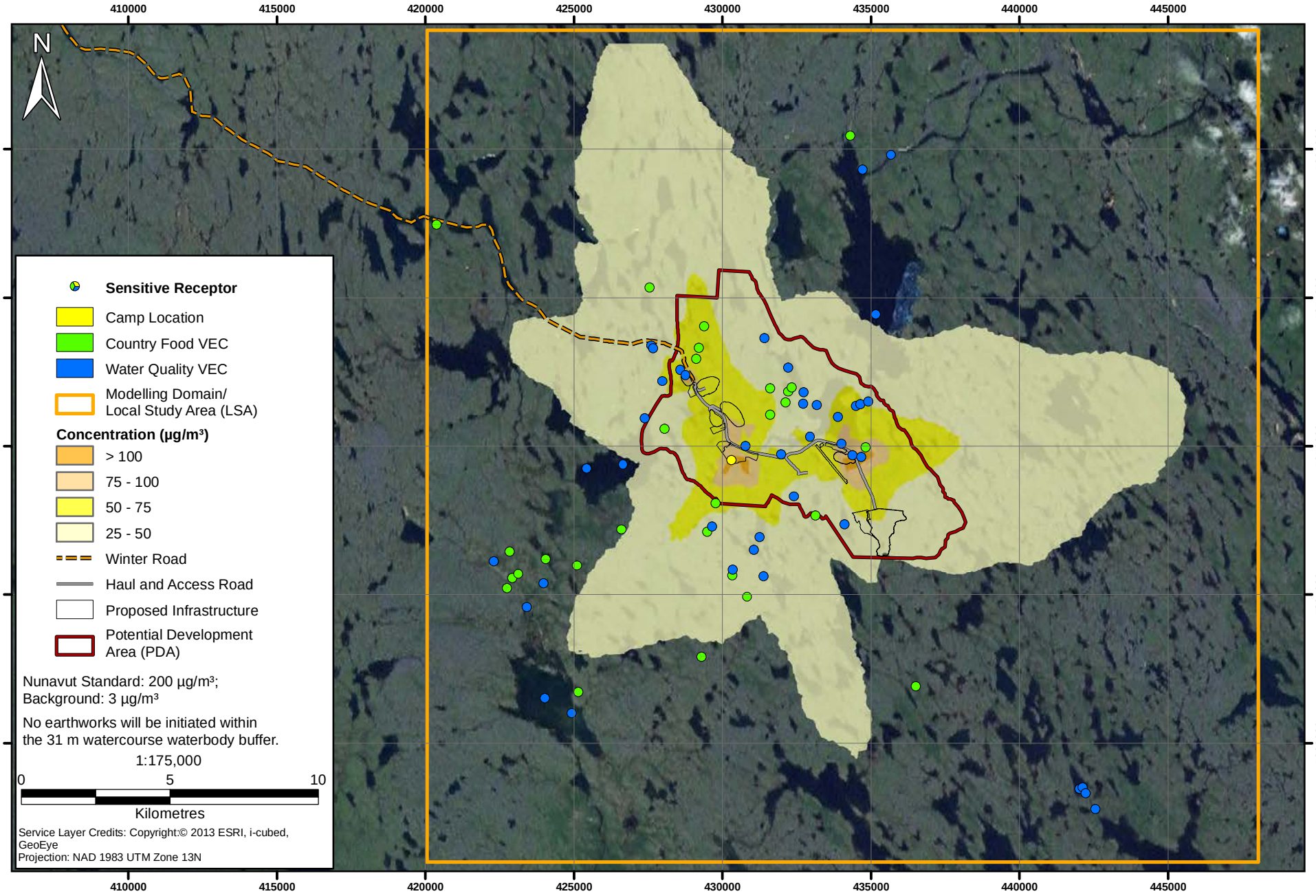


Figure B-5

Sabina GOLD & SILVER CORP

Maximum 24-hour NO_2 Concentration, Goose Property Area

Figure B-5

RWDI

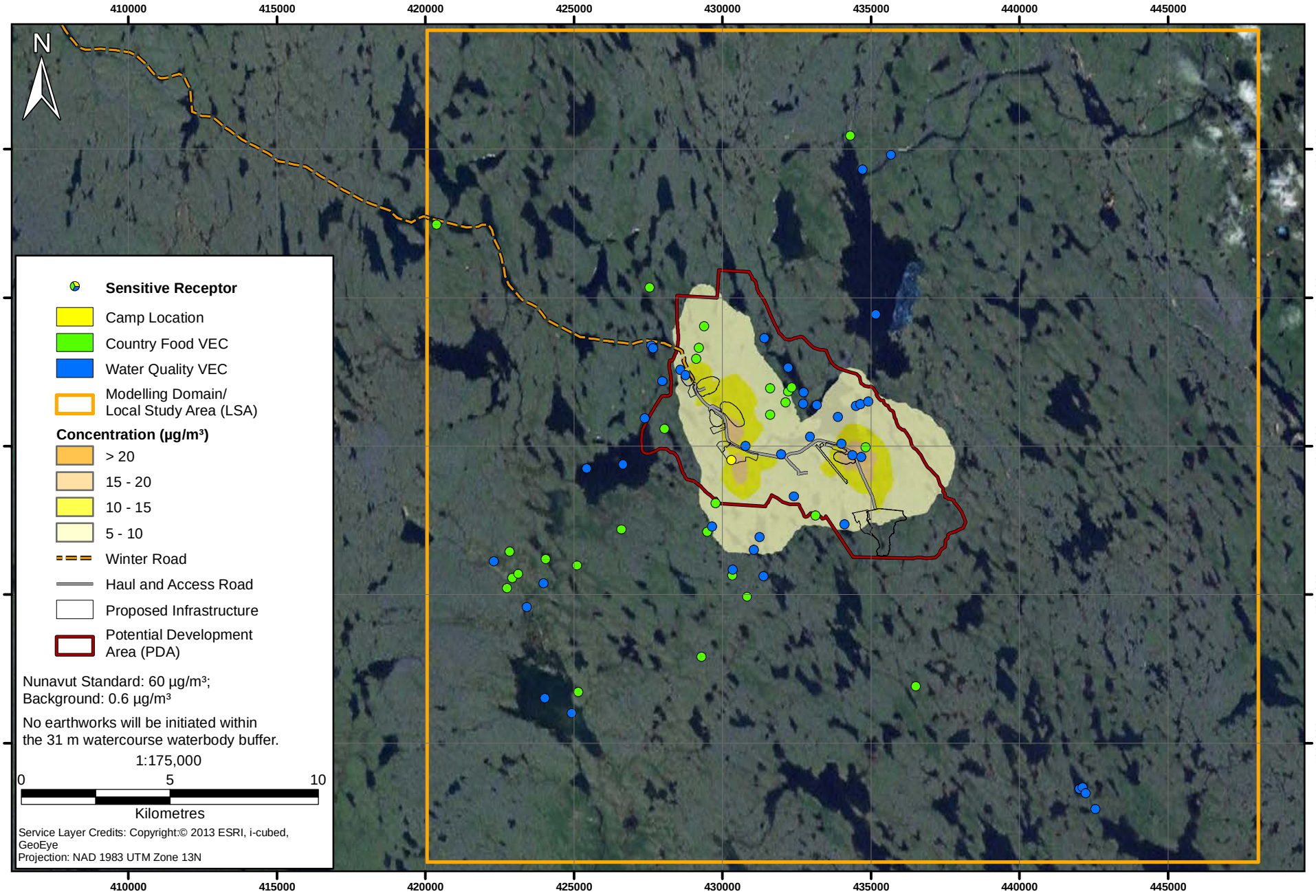


Figure B-6

Sabina GOLD & SILVER CORP

Annual NO_2 Concentration, Goose Property Area

Figure B-6

RWDI

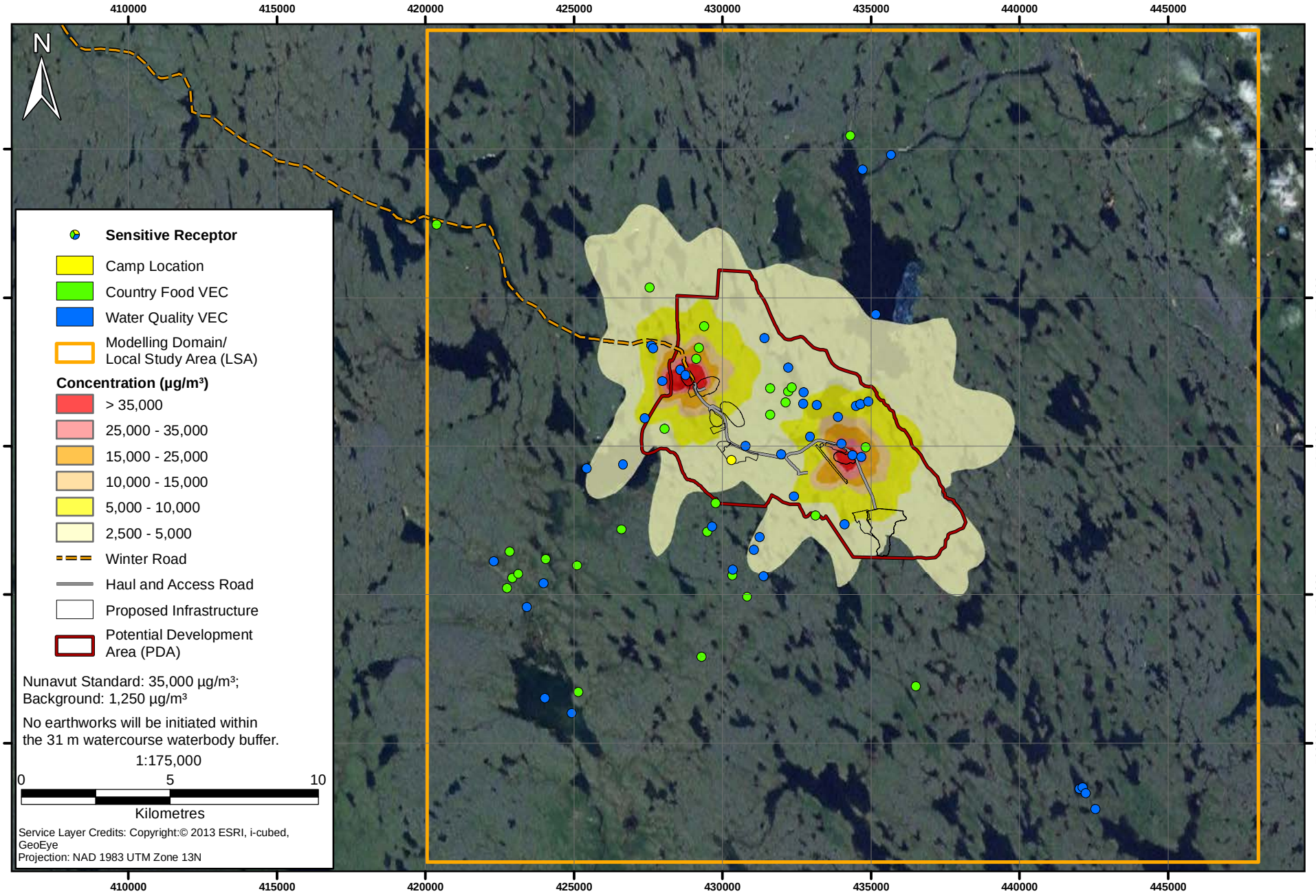


Figure B-7

Sabina GOLD & SILVER CORP

Maximum 1-hour CO Concentration, Goose Property Area

RWDI

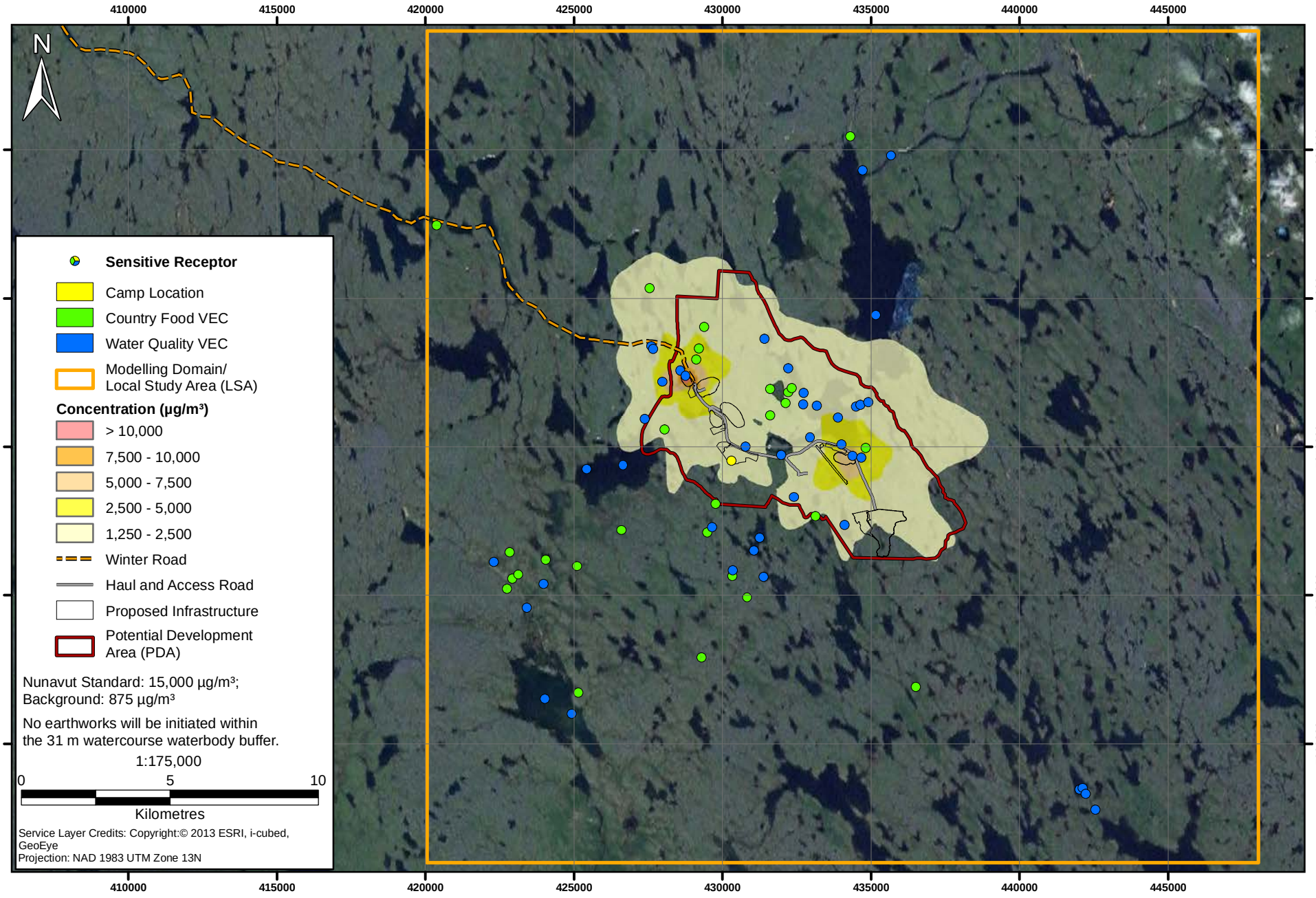


Figure B-8

Sabina GOLD & SILVER CORP

Maximum 8-hour CO Concentration, Goose Property Area

Figure B-8

RWDI

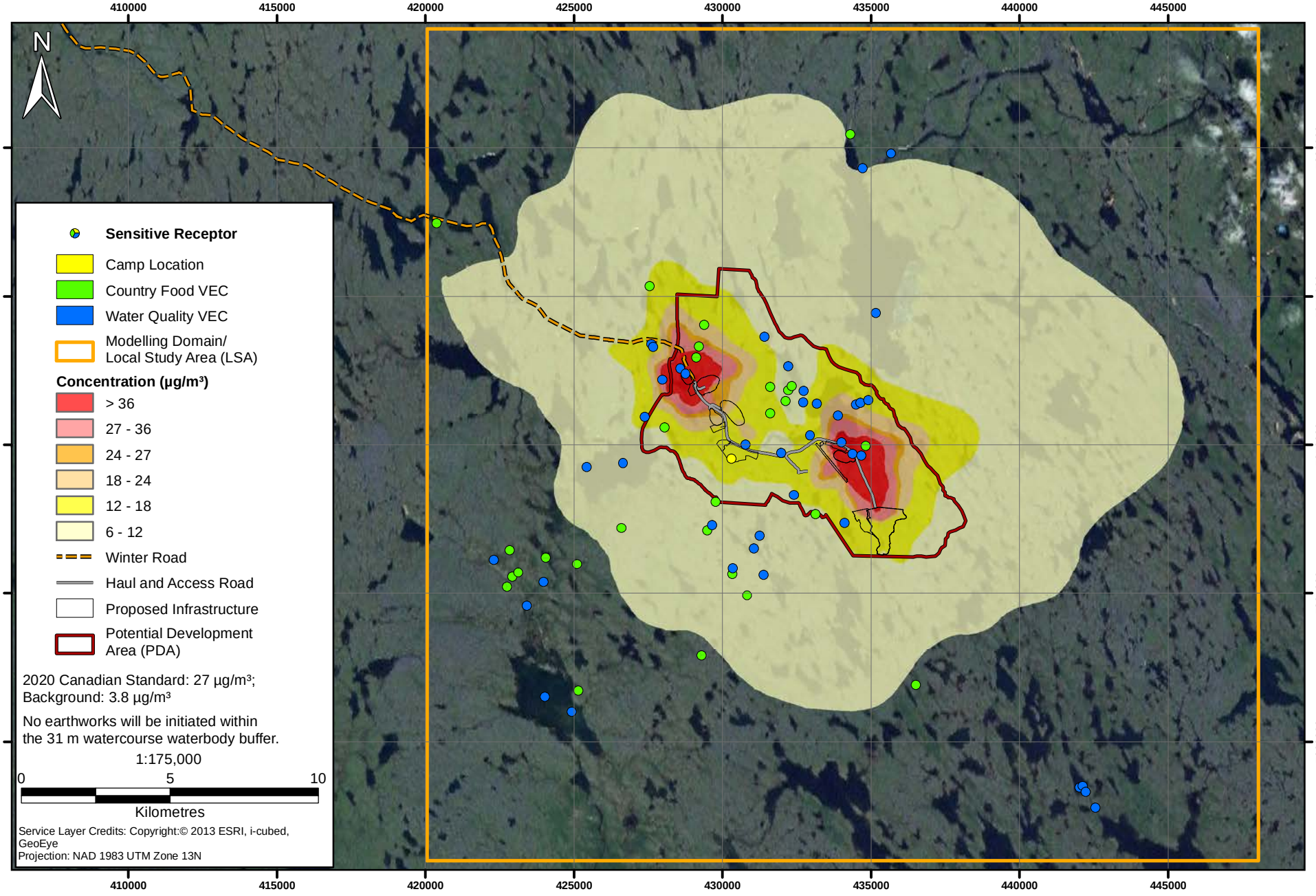


Figure 7.1-3

Sabina GOLD & SILVER CORP

Maximum Total 24-hour $PM_{2.5}$ Concentration, Goose Property Area

Figure **B-9**

RWDI

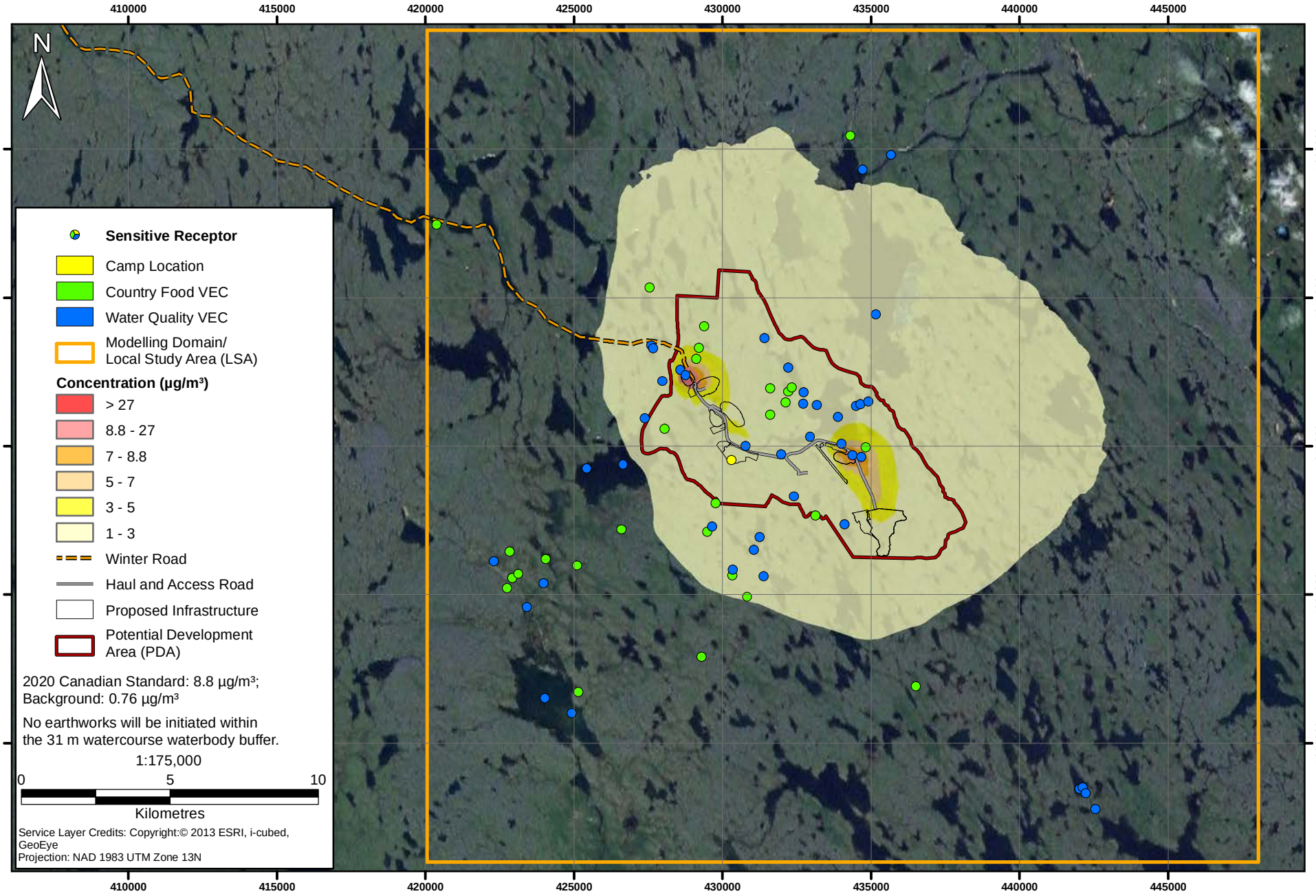


Figure B-10

Sabina GOLD & SILVER CORP

Annual Total $PM_{2.5}$ Concentration, Goose Property Area

RWDI

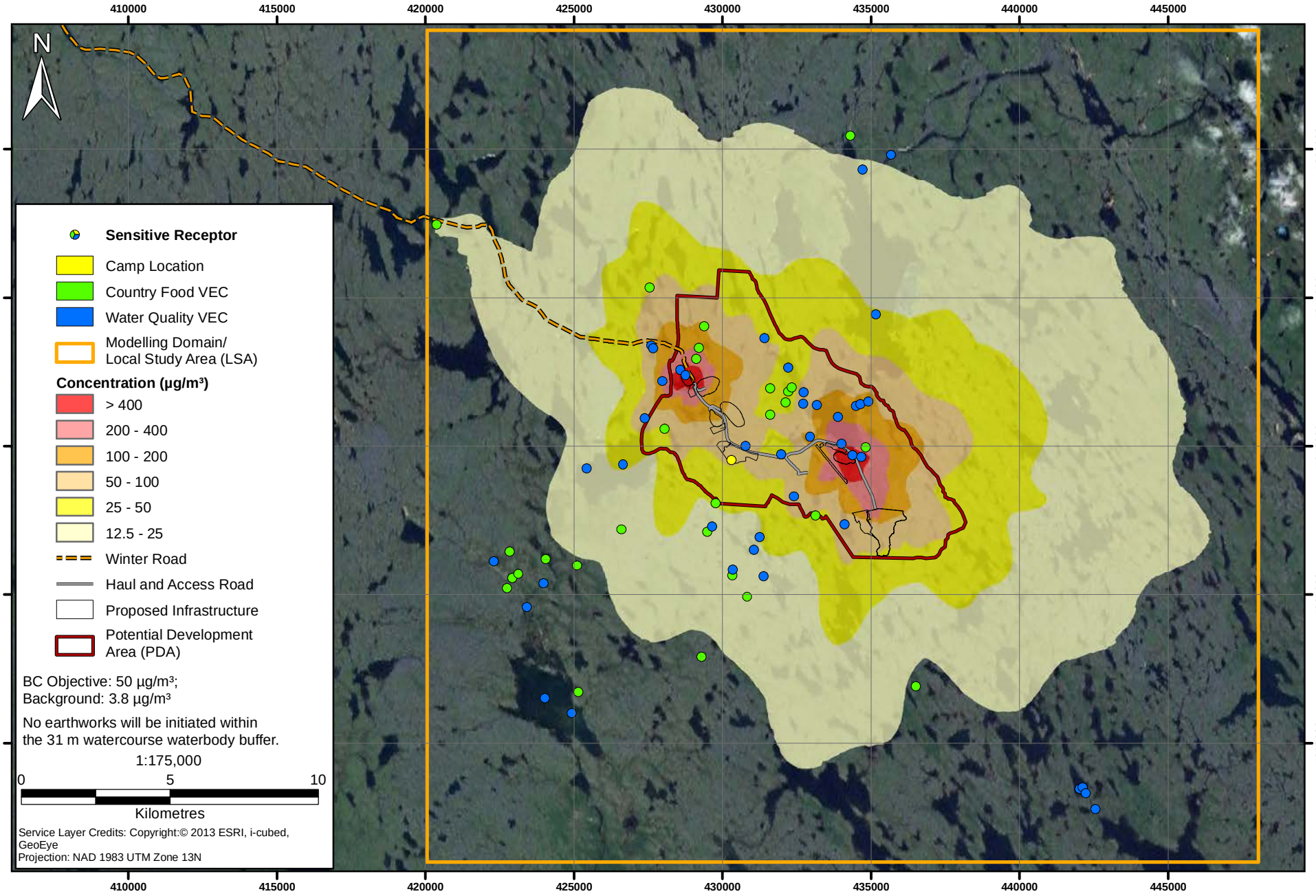


Figure 7.1-2

Sabina GOLD & SILVER CORP

Maximum Total 24-hour PM_{10} Concentration, Goose Property Area

Figure **B-11**

RWDI

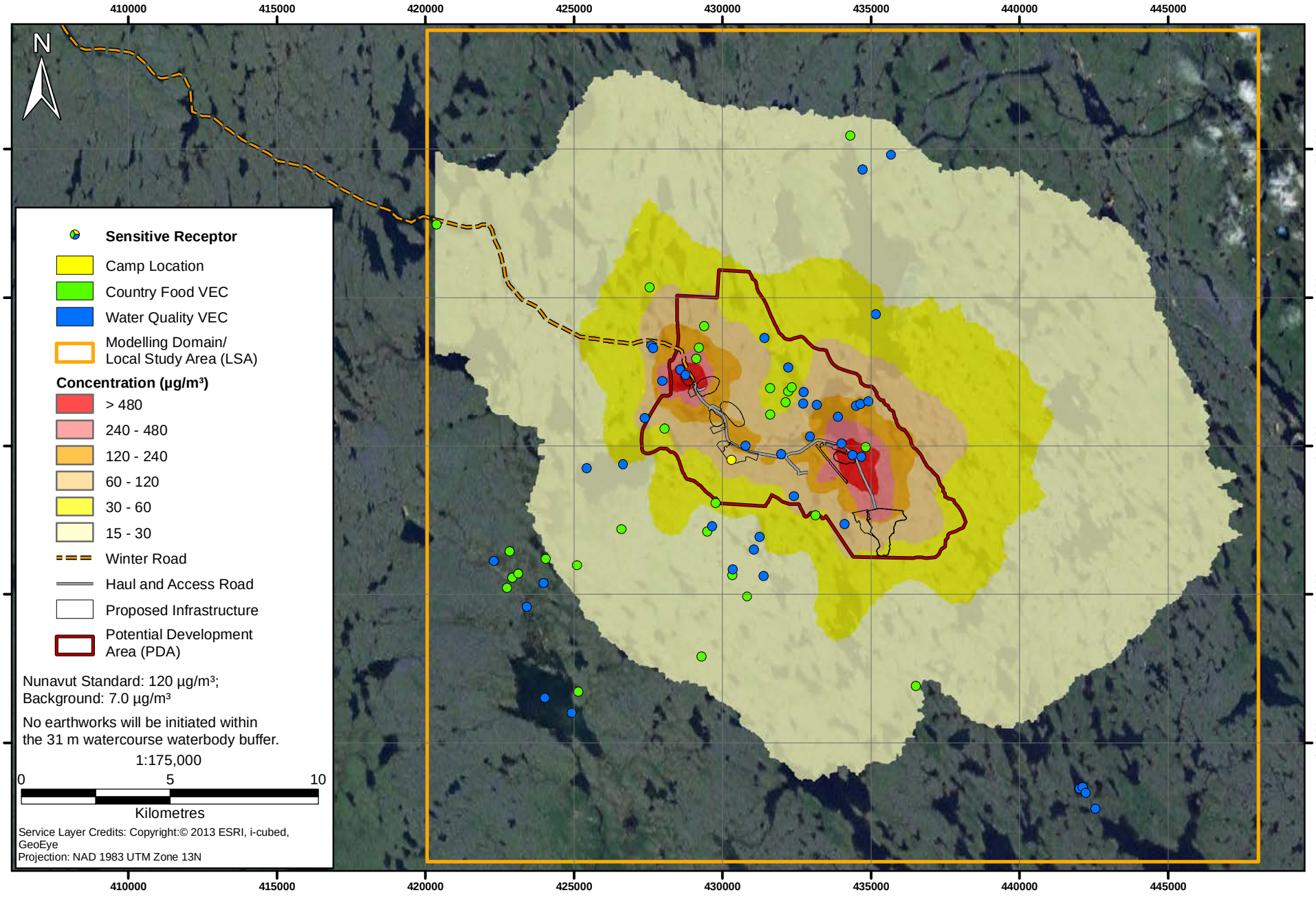


Figure 7.1-1

Sabina GOLD & SILVER CORP

Maximum Total 24-hour TSP Concentration, Goose Property Area

Figure **B-12**

RWDI

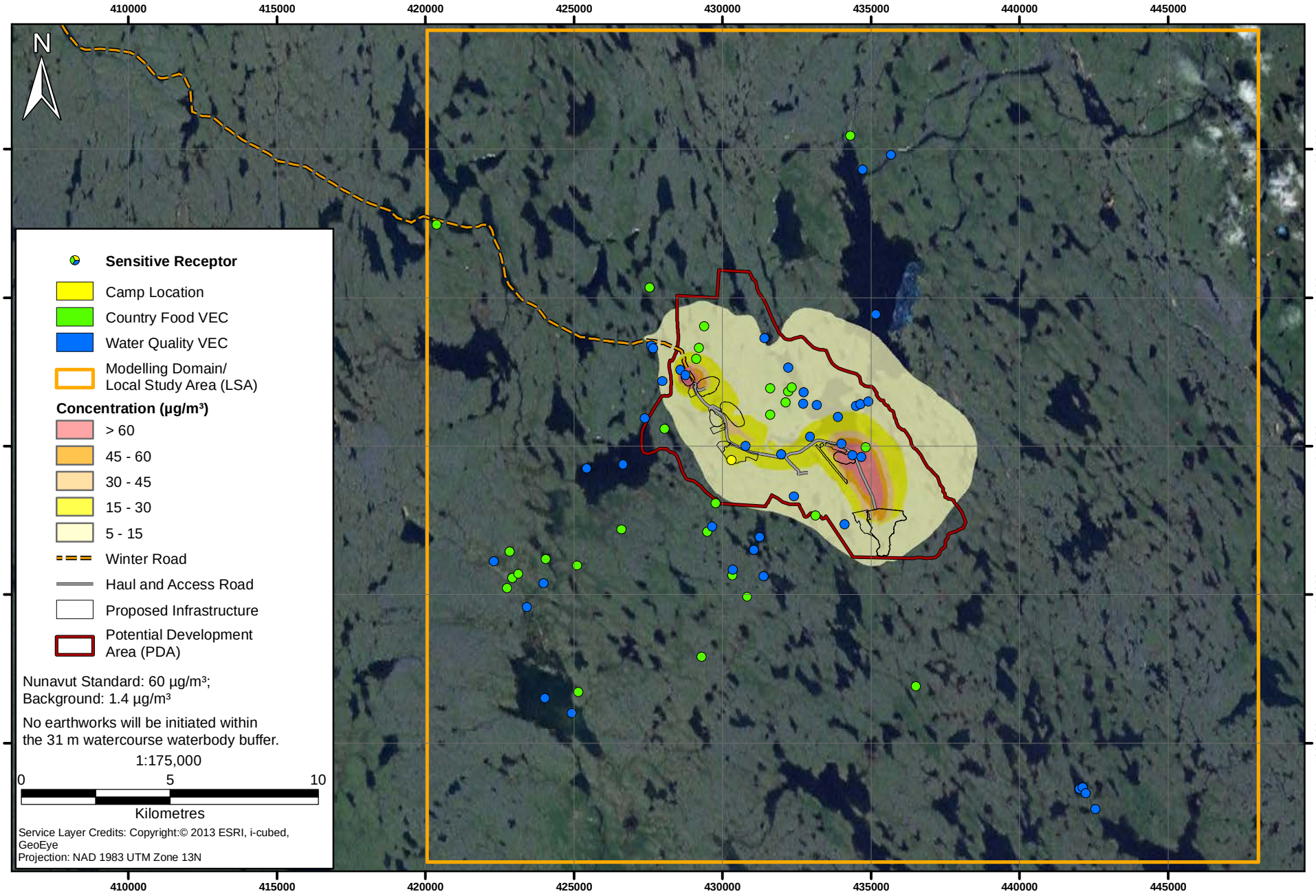


Figure B-9

Sabina GOLD & SILVER CORP

Annual Total TSP Concentration, Goose Property Area

Figure B-**13**

RWDI

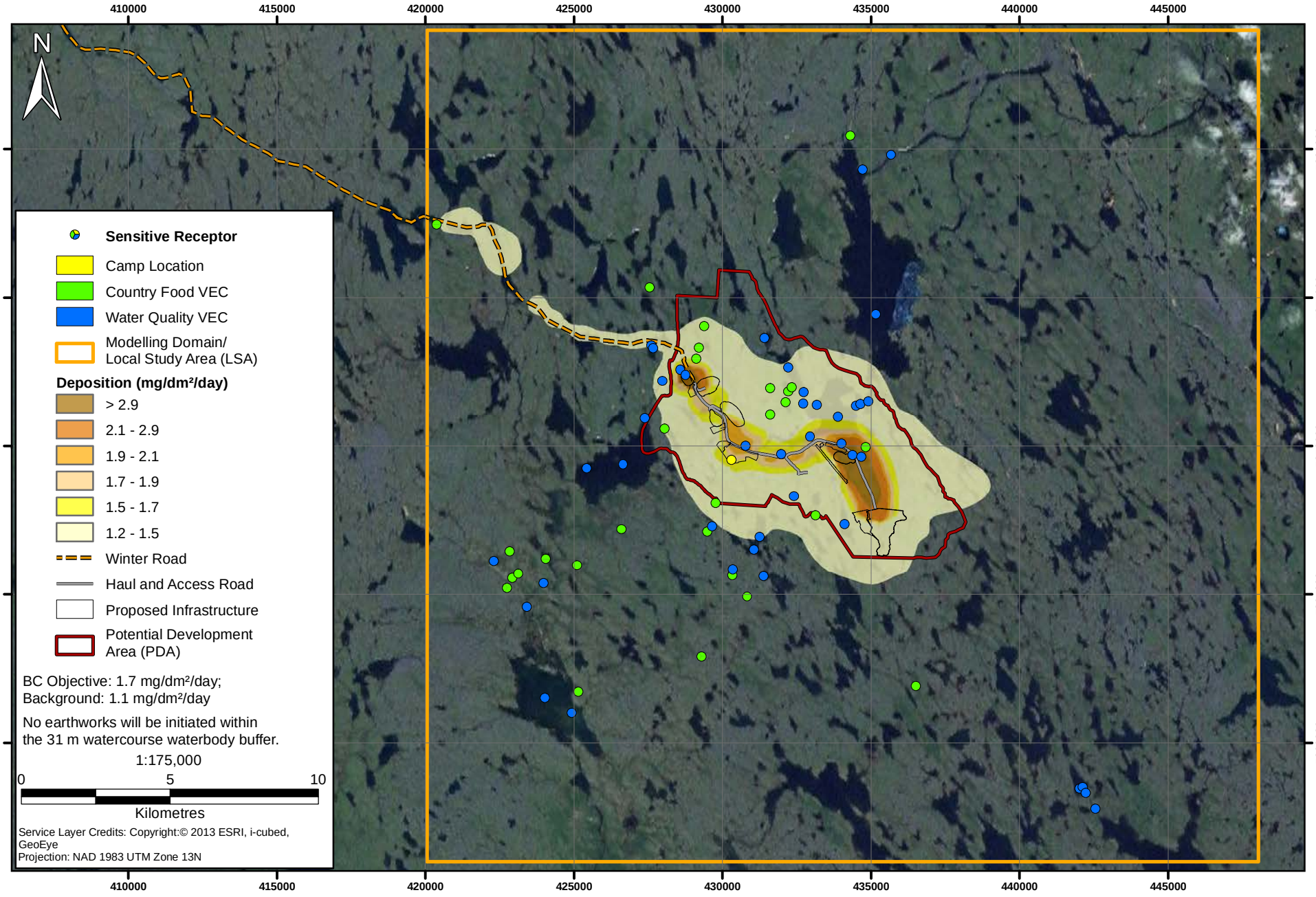


Figure 7.1-4

Sabina GOLD & SILVER CORP

Maximum 30-day Dust Deposition, Goose Property Area

Figure **B-14**

RWDI

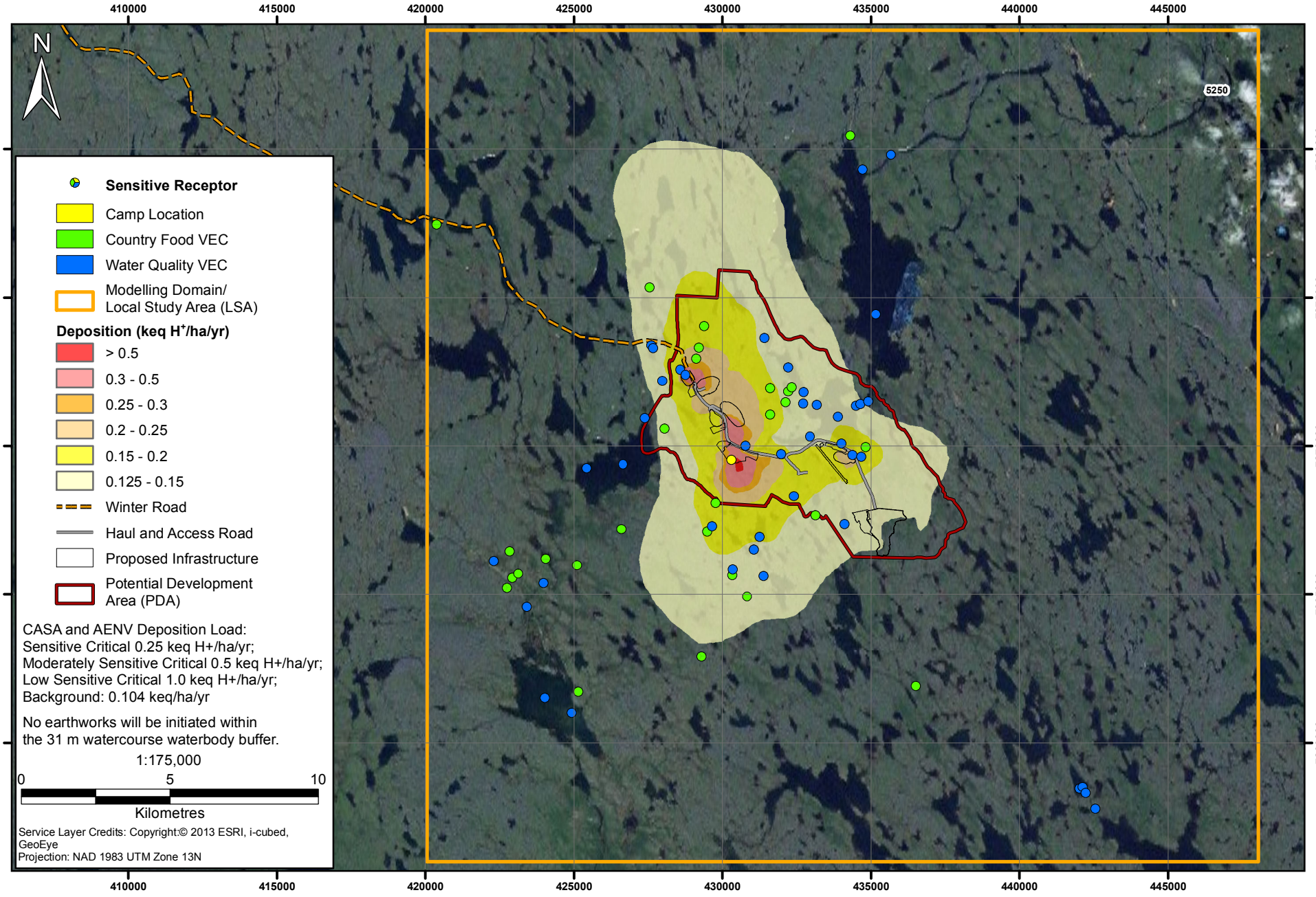


Figure B-15

Sabina GOLD & SILVER CORP.

Annual Acid Deposition, Goose Property Area

Figure B-15

RWDI

Appendix V4-1C

Air Quality Modelling Assessment: Marine Laydown Area

Sabina
GOLD & SILVER CORP.

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Back River Project

Final Report

Air Quality Modelling Assessment
Marine Laydown Area

RWDI # 1502212
September 9, 2015

SUBMITTED TO

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EXECUTIVE SUMMARY

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of Nunavut. The Project is composed of two main areas: the Goose Property and a Marine Laydown Area (MLA) situated along the western shore of southern Bathurst Inlet.

This air quality modelling assessment will focus on the effects of the MLA on its surrounding area. The scope of this study is itemized below:

- Outline relevant thresholds to evaluate air quality effects against;
- Outline the background air quality conditions;
- Identify sources of emissions to reflect the activities at the MLA in its current design;
- Develop an emission inventory to reflect sources of emissions; and
- Evaluate the air quality effects of the MLA's sources of emissions on the surrounding areas.

Year 3 is selected to represent the operation year where the MLA will emit the highest emissions as it is the year with the highest fuel delivery and a year of high freight delivery. It is anticipated that the highest emissions will be generated by ships hoteling in the Bathurst Inlet (during the shipping season) and support equipment is being used to unload freight and fuel, in comparison, to emissions generated by winter road traffic.

Dispersion modelling was conducted using the CALPUFF dispersion model v5.8.4, approved by the U.S. EPA and widely used in Canada and elsewhere. CALPUFF model runs were completed to obtain the maximum (or first highest) predicted concentrations for 1-hour, 8-hour, 24-hour and annual averaging periods.

The following emissions sources were included in the air dispersion model:

- CAC emissions from generators, portable diesel heaters, waste oil boilers and incinerator stacks;
- CAC emissions from cargo ship, fuel tanker ship exhausts while hoteling;
- CAC emissions from the tugboat maneuvering to unload cargo ship freight;
- CAC emissions from aircraft;
- Tailpipe exhaust emissions from haul trucks and container handlers; and
- Fugitive dust emissions from haul trucks travelling on unpaved roads.

Predicted levels of SO_2, NO_2, CO, TSP, PM_{10} and $PM_{2.5}$ are within the relevant thresholds at all locations outside of the PDA and at the on-site accommodation camp, with the exception of 24-hour TSP levels. At the on-site camp accommodation location, exceedances of the limit for 24-hour TSP are predicted to occur 0.27% of the time (1 day per year).

Predicted dust deposition rates and acid deposition rates are within the applicable standard at all locations outside the PDA.

Selected results of the air dispersion modelling assessment were used to support the assessment of various valued ecosystem components (VECs) and other subjects, as part of the final environmental impact statement (FEIS). Results from the air quality modelling assessment were used in the following chapter of the FEIS: Air Quality (Volume 4, Chapter 1), Country Foods (Volume 8, Chapter 5), Vegetation (Volume 5, Chapter 5), Freshwater Water Quality (Volume 6, Chapter 4) and the Human Health and Environmental Risk Assessments (Volume 8, Chapter 6).

CONSULTING ENGINEERS & SCIENTISTS

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1. INTRODUCTION

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of Nunavut, shown in Figure 1.0-1. The Project is composed of two main areas: the Goose Property and a Marine Laydown Area (MLA) situated along the western shore of southern Bathurst Inlet.

The mine plan reflects an estimated ten year operating mine life based on currently known resources, with a total ore feed of 19.8 million tonnes sent to a single processing plant at the Goose Property. The Project includes several mineral targets: Umwelt, Llama, Echo, and Goose Main at the Goose Property. Annual re-supply will be completed using the MLA, located in Bathurst Inlet, and winter ice roads will be utilized to interconnect these sites.

This air quality modelling assessment focuses on the effects of the MLA on its surrounding area. The scope of this study is itemized below:

- Outline relevant thresholds to evaluate air quality effects against;
- Outline the background air quality conditions;
- Identify sources of emissions to reflect the activities at the MLA in its current design;
- Develop an emission inventory to reflect sources of emissions; and
- Evaluate the air quality effects of the MLA's sources of emissions on the surrounding areas.

Chapter 2 of this report outlines the scope of the air quality assessment. Chapter 3 summarizes the air quality standards, objectives and guidelines used as relevant air quality thresholds. Chapter 4 summarizes the background air quality conditions included to determine cumulative air quality effects. Chapter 5 details the development of the emissions inventory. Chapter 6 describes the methodology followed to complete the air quality dispersion modelling. Chapter 7 presents the air quality effects. The conclusions of the air quality modelling assessment are presented in Chapter 8.

Selected results of the air quality modelling assessment were used to support the assessment of various valued ecosystem components (VECs) and other subjects, as part of the final environmental impact statement (FEIS). Results from the air quality modelling assessment were used in the following chapter of the FEIS: Air Quality (Volume 4, Chapter 1), Country Foods (Volume 8, Chapter 5), Vegetation (Volume 5, Chapter 5), Freshwater Water Quality (Volume 6, Chapter 4) and the Human Health and Environmental Risk Assessments (Volume 8, Chapter 6).

2. SCOPE OF THE ASSESSMENT

The air quality modelling assessment was prepared in accordance with the final NIRB Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River (NIRB File No. 12MN036), NIRB 2013.

2.1 Spatial Boundaries

The spatial boundaries of the air quality modelling assessment are delineated by the Local Study Area (LSA), presented in Figure 2.1-1. The boundaries of the MLA LSA are used as the CALPUFF computational grid receptor domain, which is set at 7 km by 7 km. This LSA is delineated to encompass the "zone of influence" where noticeable air quality effects from the MLA operations can occur. The expected zone of influence was previously determined as part of the DEIS.

Also shown in Figure 2.1-1 is another LSA for the Goose Property. The Regional Study Area (RSA) encompasses both LSAs and matches the RSA boundary used for terrestrial wildlife.

2.2 Temporal Boundaries

The temporal boundaries are chosen to capture the year with highest emissions for criteria air contaminants (CACs) and dust emitted from the Project's operations and therefore, the highest air quality effects of the Project throughout its life. By using the year with highest emissions, the upper bound of air quality effects is predicted. It can be assumed that if the upper bound air quality effects are found to be "Not Significant", the potential effects for the entirety of the Project should also be "Not Significant".

The determination of the worst-case year to model is based on information from the ''Final Environmental Impact Statement (EIS) Supporting Volume 2: Project Description and Alternatives'' (Sabina, 2015), as well as consultations with Sabina.

The EIS Project Description document provides data on operations freight and fuel delivery as well as expected number of vessels and aircraft. The operations freight delivered is highest in Year 1 at 23,268 tonnes, closely followed by Year 2 and Year 3 at 22,899 and 22,285 tonnes, respectively. The fuel delivered is highest in Year 3 at 55,269,127 litres. The anticipated upper bound number of vessels, including cargo ships and fuel tanker ships, does not vary from operational year to year. The anticipated upper bound number and frequency of aircraft do not vary from operational year to year.

Based on the above information, Year 3 is selected to represent the year where the MLA will emit the highest emissions as it is the year with the highest fuel delivery and a year of high freight delivery.

Peaks of activity at the MLA occur during either the open water season or the winter ice road season.

Vessels only have access to the Bathurst Inlet between end of August and mid-October, known as the open water season. Vessels will not overwinter.

Haul trucks delivering freight and fuel to the Goose Property can only travel on the winter roads between mid-January and the end of April, known as the winter ice road season.

Aircraft access to the MLA can be via an ice airstrip, during the winter or via open water, during the summer.

It is anticipated that the highest emissions will be generated, not by the traffic during the winter ice road season, but rather by the open water season activities. To predict upper bound levels of air contaminants, the air quality assessment focused on operations during the open water season.

The worst case scenario assessed includes the following:

- a fuel tanker ship is hoteling in the Bathurst Inlet while fuel is unloaded to storage tanks via pipelines.
- a cargo ship is hoteling in the Bathurst Inlet while freight is being unloaded;
- a tugboat is maneuvering between the cargo ship and shore to unload freight;
- support equipment (i.e. container handlers and haul trucks) are unloading freight from the lightering barge to the storage areas;
- a total of three aircraft landing and taking off per day;
- on-site generators, portable diesel heaters, waste oil boilers and incinerator stacks.

2.3 Air Contaminants

The following air contaminants are assessed in this air quality dispersion modelling assessment:

- nitrogen oxide (NO_X as NO_2),
- sulphur dioxide (SO_2),
- carbon monoxide (CO),
- total suspended particulates (TSP) matter;
- particulate matter (PM_{10})
- respirable particulate matter ($PM_{2.5}$)
- dust deposition; and
- acid deposition.

3. AIR QUALITY STANDARDS, OBJECTIVES AND GUIDELINES

The ambient air quality standards, objective and guidelines applicable to the Project, are summarized in Table 3-1. The standards, objectives and guidelines presented in Table 3-1, are consistent with those used in the DEIS.

Air quality standards are applicable in areas accessible to the general public or areas beyond a project's property line. Typically, air quality effects at or beyond a producer's property line are compared to standards, objectives and guidelines. For this assessment, the Potential Development Area (PDA) is used as the property line for the MLA.

Table 3-1: Ambient Air Quality Standards, Objectives and Guidelines

Parameter	Averaging Period	Units	Nunavut Ambient Air Quality Standards [1]	Dust and Acid Deposition Provincial Guideline Values	Canadian Ambient Air Quality Standards [2] (2020)	National Ambient Air Quality Objectives [3]	
						Maximum Desirable	Maximum Acceptable
Sulphur dioxide (SO_2)	1-hour	$\mu g/m^3$	450	-	-	450	900
	24-hour	$\mu g/m^3$	150	-	-	150	300
	annual	$\mu g/m^3$	30	-	-	30	60
Nitrogen dioxide (NO_2)	1-hour	$\mu g/m^3$	400	-	-	-	400
	24-hour	$\mu g/m^3$	200	-	-	-	200
	annual	$\mu g/m^3$	60	-	-	60	100
Carbon monoxide (CO)	1-hour	$\mu g/m^3$	-	-	-	15,000	35,000
	8-hour	$\mu g/m^3$	-	-	-	6,000	15,000
Total suspended particulate (TSP)	24-hour	$\mu g/m^3$	120	-	-	-	120
	annual [4]	$\mu g/m^3$	60	-	-	60	70
PM_{10}	24-hour	$\mu g/m^3$	-	50 [5]	-	-	-
$PM_{2.5}$	24-hour	$\mu g/m^3$	30	-	27 [6]	-	-
	annual	$\mu g/m^3$	-	-	8.8	-	-
Dust Deposition	30-day	$mg/dm^2/day$	-	1.7 [7]	-	-	-
Acid Deposition	annual	k_{eq} H+/ha/year	-	0.25 [8]	-	-	-

Notes:
[1] Government of Nunavut (2011)
[2] CCME (2012)
[3] Environment Canada (1999)
[4] Geometric mean: the average of the logarithmic values of a data set converted back to a base 10 number.
[5] BC MOE (2009)
[6] The 3-year average of the annual 98th percentile of the daily 24-hour concentrations.
[7] Most stringent provincial guideline, BC MOE (1979)
[8] The critical deposition load for sensitive receptor, AENV (1999)

4. BACKGROUND AIR QUALITY

Monitoring of dustfall, acid deposition, NO_2, SO_2 was previously completed to determine site specific background concentrations for the MLA. Details on the monitoring program and assumptions on background concentrations can be found in the DEIS.

The background concentrations used in this air quality modelling assessment, as well as the DEIS, are summarized in Table 4-1.

Table 4-1: Background Air Contaminant Concentrations

Pollutant	Averaging Period	Background Concentrations	Units
SO_2	1-hour	16.25	µg/m^3
	24-hour	6.5	µg/m^3
	Annual	1.3	µg/m^3
NO_2	1-hour	7.5	µg/m^3
	24-hour	3	µg/m^3
	Annual	0.6	µg/m^3
CO	1-hour	1250	µg/m^3
	8-hour	875	µg/m^3
TSP	24-hour	7	µg/m^3
	Annual	1.4	µg/m^3
PM_{10}	24-hour	3.8	µg/m^3
$PM_{2.5}$	24-hour	3.8	µg/m^3
	Annual	0.76	µg/m^3
Dust Deposition	30-day	1.13	mg/dm^2/day
Acid Deposition	Annual	0.104	k_{eq} H+/ha/year

5. EMISSIONS INVENTORY

As previously mentioned in Section 2.2, Year 3 of operations is chosen as the modelling scenario for the MLA. Listed below are facilities/areas that are operational during Year 3:

- Lightering Barge Terminal;
- Fuel Ship Terminal;
- Airstrip (open water);
- Temporary freight storage area;
- Freight storage and camp area;
- Support buildings;
- Incinerator.

Figure 5.0-1 shows the potential development area and layout of the MLA.

5.1 Emissions Sources

An emission inventory was developed to capture the operations associated with the facilities/areas listed above and to serve as reasonably conservative inputs into the air quality dispersion model.

The following emissions sources are included in the air dispersion model:

- CAC emissions from generators, portable diesel heaters, waste oil boilers and incinerator stacks;
- CAC emissions from vessel (cargo ship, fuel tanker ship) exhausts while hoteling;
- CAC emissions from the tugboat maneuvering to unload cargo ship freight;
- CAC emissions from aircraft;
- Tailpipe exhaust emissions from haul trucks and container handlers; and
- Fugitive dust emissions from haul trucks travelling on unpaved roads.

5.1.1 Combustion By-Product Emissions from Generators, Heaters, Boilers and Incinerator

Emissions for each of these point sources are included in Section 1.1 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 2 of Appendix A.

5.1.2 Combustion By-Product Emissions from Vessel (Cargo Ship, Fuel Tanker Ship and Tugboat) Exhausts

Emissions for each of these point sources are included in Section 1.1 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 3 of Appendix A.

5.1.3 Combustion By-Products from Aircraft

Emissions for this area source are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 4 of Appendix A.

5.1.4 Tailpipe Exhaust Emissions from Vehicles

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 5 of Appendix A.

5.1.5 Fugitive Dust Emissions Vehicles Travelling on Unpaved Roads

Emissions for each of these area sources are included in Section 1.2 of Appendix A. Details on assumptions, inputs, and source of emission factors are provided in Section 6 of Appendix A.

5.2 Insignificant Emission Sources

For the purposes of this assessment, several small sources of emissions are deemed insignificant; therefore, they are not included in the dispersion model. This section identifies the insignificant sources and the rationale.

Small combustion equipment, including portable diesel-fired light plants and supplemental heating boiler are deemed insignificant as they represent a small fraction of the total combustion by-product emissions from the MLA. The largest contributor to CACs emissions are the ship exhausts.

The fleet of surface support equipment is classified as general light duty vehicles and will be used infrequently; therefore, the fleet of surface support equipment is deemed insignificant as it represents a small fraction of CAC and fugitive dust emissions. The contribution of fugitive dust from the surface support equipment would be dwarfed by that of the high tonnage haul trucks.

5.3 Emission Summary

A summary of total emissions by type of source is presented in Table 5.2-1. A more detailed breakdown of the emissions is provided in Section 1 of Appendix A.

Table 5.2-1 Emission Summary

Sources	Emission Rates (g/s)					
	NO_X	SO_X	CO	TSP	PM_{10}	$PM_{2.5}$
Stacks	1.9	0.02	0.99	0.07	0.04	0.02
Ships	27	6.8	4.1	0.67	0.67	0.67
Aircraft	0.07	0.02	0.59	0.001	0.001	0.001
Unpaved Road Dust	0	0	0	0.79	0.22	0.02
Vehicle Tailpipe	0.03	0.0004	0.01	0.001	0.001	0.001

The largest contributor to NO_X, SO_X, CO emissions is the hoteling ship exhausts. Contributors such as stacks and aircraft have a small impact (less than 20%) on the CO emissions. The largest contributor to TSP, PM_{10} and $PM_{2.5}$ emissions is the hoteling ship exhausts and dust from unpaved roads.

Vehicle tailpipe and aircraft emissions are small contributors to the overall emissions.

6. MODELLING METHODOLOGY

6.1 Model Selection

The CALPUFF dispersion model is used with 1 year of hourly three-dimensional meteorological data to predict the maximum expected pollutant concentrations due to emissions from MLA operations. CALPUFF (Scire et al., 2000) is a multi-layer, multi-species, non-steady-state puff dispersion model that can simulate the effects of time and space-varying meteorological conditions on pollutant transport, transformation, and deposition. Version 5.8.4 of CALPUFF, approved by the U.S. EPA and widely used in Canada and elsewhere, is used in this air quality modelling assessment. The hourly, 3-dimensional meteorological data were previously developed for the DEIS, using the CALMET meteorological model, which is a companion model of CALPUFF. CALMET modelling was previously performed by ERM-RESCAN, who provided the output data to RWDI. The CALMET modelling was described in the DEIS.

The CALPUFF dispersion modelling followed detailed guidance for this type of modelling that is available for Canadian jurisdictions. Specifically, it followed the Guideline for Air Quality Dispersion modelling in British Columbia (BC MOE, 2008) as well as the Guideline for Plume Dispersion Modelling in Newfoundland and Labrador (Government of Newfoundland and Labrador, 2012). Aspects of the model set-up that were not previously or clearly defined in the DEIS, such as the particle density, receptor grid and various other model assumptions, were established using the aforementioned guidance documents.

6.2 Model Inputs

6.2.1 Model Switches

All model options were set as recommended in the Guideline for Air Quality Dispersion modelling in British Columbia (BC MOE, 2008).

6.2.2 Model Domains and Receptors

As previously described in section 2.1, the boundaries of the MLA LSA are used as the CALPUFF computational grid receptor domain, which is set at 7 km by 7 km.

The following receptor spacing was used in accordance with the Guideline for Air Quality Dispersion modelling in British Columbia (BC MOE, 2008):

- 50 m spacing within 500 m of source;
- 250 m spacing within 2 km of source;
- 500 m spacing within 5 km of source; and
- 1000 m spacing beyond 5 km of source.

For consistency with the Goose Property assessment, the receptors within 200 m of the sources (generally corresponding to locations well inside the PDA) were removed.

In addition to the regular grid of receptors, as described above, one discrete receptor was included in the model run to represent the accommodation camp. No sensitive receptors related to country food and water quality were identified for the human health and environmental risk assessment study.

6.2.3 Terrain

Terrain information for the area surrounding the MLA was obtained from Natural Resources Canada's Canadian Digital Elevation Model (CDEM) which has a resolution of 15 m. The elevation data were applied in the estimation of base elevations for sources and receptors to help the CALPUFF dispersion model account for changes in elevations of the surrounding terrain.

6.2.4 Buildings

The Building Profile Input Program (BPIP) was used to calculate the aerodynamic effects of structures/buildings on the emission from point sources, such as stacks. Vessels, the generator building, the accommodation camp, the fire water skid, the kitchen/admin building, the fuel storage tanks, the maintenance shop, the warehouse and storage building and the incinerator building were included in the modelling as these structures have the potential to affect emissions from the ship exhausts, generators, portable diesel heaters, waste oil burners and incinerator. The cargo ship and tug boat dimensions were provided in specification documents, whereas the fuel tanker ship dimensions were assumed to be similar to that of the cargo ship. Most building elevations were provided by Sabina, and if they were not provided it was assumed that it was a one storey building. The BPIP model was executed prior to running the CALPUFF dispersion model to incorporate the potential building aerodynamic effects.

6.2.5 Emission Source Parameters

Emission sources were modelled as point sources or area sources, as alluded to in Section 5.1.

Point source parameters, including stack height above ground, stack inner diameter, stack exit velocity and exhaust temperature, are provided in Section 1.1 of Appendix A.

Vehicle tailpipe emissions, fugitive dust from unpaved road and aircraft emissions were modelled as area sources. Area source parameters, including source location, source height and initial dispersion parameter (sigma z) are provided in Section 1.2 of Appendix A. In that same section, the emission rates are listed in g/s, as well as the area of the modelled source. To calculate the emission flux rate in $g/s/m^2$, the emission rate is divided by the area of the modelled source; the emission flux rate is the input into the CALPUFF dispersion model.

The modelled point source and area source locations are shown in Figure 6.2.5.

6.2.6 Dust Deposition Parameters

To properly model dust deposition, the size of the airborne dust particles and its density must be considered. The methodology outlined in the Guideline for Plume Dispersion Modelling in Newfoundland and Labrador (September 2012) was used. The size parameterization was adjusted for a particle density of 2 g/cm^3 [1].

6.2.7 Acid Deposition Parameters

To obtain acid deposition rates, CALPUFF modeling must account for the chemical transformation of SO_2 and NO_X (using the MESOPUFF II chemistry scheme) as well as the wet and dry deposition of SO_2, SO_4, NO (or NO_X in this instance), NO_3^- and HNO_3. To properly model wet and dry deposition of sulphate and nitrate, the following parameters were required by the CALPUFF model:

- Diffusivity;
- Alpha Star;
- Reactivity;
- Mesophyll resistance;
- Henry's Law coefficient;
- Scavenging coefficient for liquid precipitation; and
- Scavenging coefficient for frozen precipitation.

The parameters for the wet and dry deposition modelling were taken from the document "NO_X Dispersion and Chemistry Assumptions in the CALPUFF Model" (RWDI, 2005).

6.3 Model Run Parameters

CALPUFF model runs were completed to obtain the maximum (or first highest) predicted concentrations for a 1- hour, 8-hour, 24-hour and annual averaging periods.

[1] Information was provided by Max Brownhill from Sabina Gold in an e-mail dated June 16, 2015.

Other results were also calculated for the human health and environmental risk assessment study. These results included:

- Second highest predicted concentrations;
- 98th percentile (9th highest) of the 24-hour $PM_{2.5}$ concentrations;
- 99th percentile (5th highest) of the daily max 1-hour SO_2 concentration in the year; and
- 98th percentile (9th highest) of the daily max 1-hour NO_2 concentration in the year.

6.4 Model Run Post Processing

To obtain parameters to compare to relevant thresholds outlined in Section 3, some post processing was required using tools such as POSTUTIL and CALPOST.

6.4.1 Nitrogen Dioxide

Included in the CALPUFF model were NO_X emission rates for combustion sources. NO_X emissions are comprised of nitric oxide (NO) and nitrogen dioxide (NO_2). Typically, the primary emissions are predominantly in the form of NO with reaction in the atmosphere resulting in the conversion of NO to NO_2. The ozone limiting method (OLM) was used, which assumes that the conversion of NO to NO_2 is mainly driven by the reaction with the tropospheric ozone, O_3 (BC MOE 2008).

6.4.2 Acid Deposition

The CALPUFF model was used to predict wet and dry deposition for all sulphur species (SO_2, SO_4) and nitrogen species (NO_X, NO_3^- and HNO_3). The resulting mass deposition for each species was divided by its molecular weight to convert it to a molar quantity. It was then factored to represent the corresponding number of hydrogen ions that would occur in a water solution with that species The resulting values for all species, for both wet and dry deposition, were then summed to determine the total potential acid input (PAI), expressed in terms of k_{eq}/ha/yr where k_{eq} refers to the number of equivalent hydrogen ions (1 k_{eq} = 1 kmol H+).

6.4.3 Dust Deposition

To obtain deposition results of dust, post-processing of the CALPUFF model run output was required to extract maximum 30-day average total deposition rates (sum of all PM size fractions included in the model) and convert them to units of mg/dm^2/day for a 30-day averaging period for comparison against relevant standard, as outlined in Section 3.

7. MODELLING RESULTS

The predicted maximum concentrations for all contaminants as a result of Year 3 operations at the Marine Laydown Area (MLA), under peak operations during the shipping season, are presented in Table 7.1. Concentrations isopleths for all contaminants and relevant averaging periods are included in Appendix B.

Predicted levels of TSP, PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO levels are within the applicable thresholds at all locations outside of the PDA. The predicted levels of these contaminants are also within the thresholds at the on-site accommodation camp, with the exception of TSP.

The predicted maximum 24-hour TSP level at the accommodation camp exceeds its applicable threshold, but the predicted frequency of exceedance is only 0.27% of the time (about 1 day per year).

Predicted dust deposition rates and acid deposition rates are within the applicable standard at all locations outside the PDA.

8. CONCLUSION

The air quality modelling assessment for the MLA operations and its associated emissions sources in Year 3 were included in the dispersion model. The dispersion model's predicted effects were compared against applicable thresholds and evaluated. The model results indicate that the applicable air quality thresholds are met, with the exception of the standard for maximum 24-hour Total Suspended Particulate Matter (TSP) at the on-site accommodations area. However, as the model accounts for proposed dust suppression on the haul routes at the MLA, the predicted frequency of exceeding the standard at the accommodations area is low.

Table 7.1 Predicted Maximum Concentrations for Air Contaminants Assessed

Pollutant	Averaging Period	Concentrations (µg/m^3), Dust Deposition Rate (mg/dm^2/day) and Acid Deposition Rate (eq/ha/year)							
				Outside of PDA			Camp Location		
		Objective	Background	Maximum Predicted Concentration (Project)	Maximum Predicted Concentration (Project + Background)	Maximum Frequency of Exceedance per Year	Maximum Predicted Concentration (Project)	Maximum Predicted Concentration (Project + Background)	Maximum Frequency of Exceedance per Year
SO_2	1-hour	450	1.25	75	76	-	67.1	68.3	-
	24-hour	150	0.5	30	30	-	20.65	21.1	-
	Annual	30	0.1	0.72	0.8	-	1.87	2.0	-
NO_2	1-hour	400	1.25	85	87	-	131	132	-
	24-hour	200	0.5	64.3	64.8	-	80	80	-
	Annual	60	0.1	2.9	3.0	-	20	20	-
CO	1-hour	15,000	1250	251	1501	-	402	1652	-
	8-hour	6,000	875	42	917	-	180	1055	-
TSP	24-hour	120	7	14	21	-	**121**	**128**	0.27%
	Annual	60	1.4	1	3	-	22	24	-
PM_{10}	24-hour	50	3.8	6	10	-	39	42	-
$PM_{2.5}$	24-hour	27	3.8	3	7	-	5	9	-
	Annual	8.8	0.76	0.1	0.9	-	1.4	2.2	-
Dustfall (mg/dm^2/day)	30-day	1.7	0.38	0.06	0.4	-	n/a	n/a	-
Acid Deposition (k_{eq} H+/ha/year)	Annual	0.25	0.039	0.09	0.13	-	n/a	n/a	-

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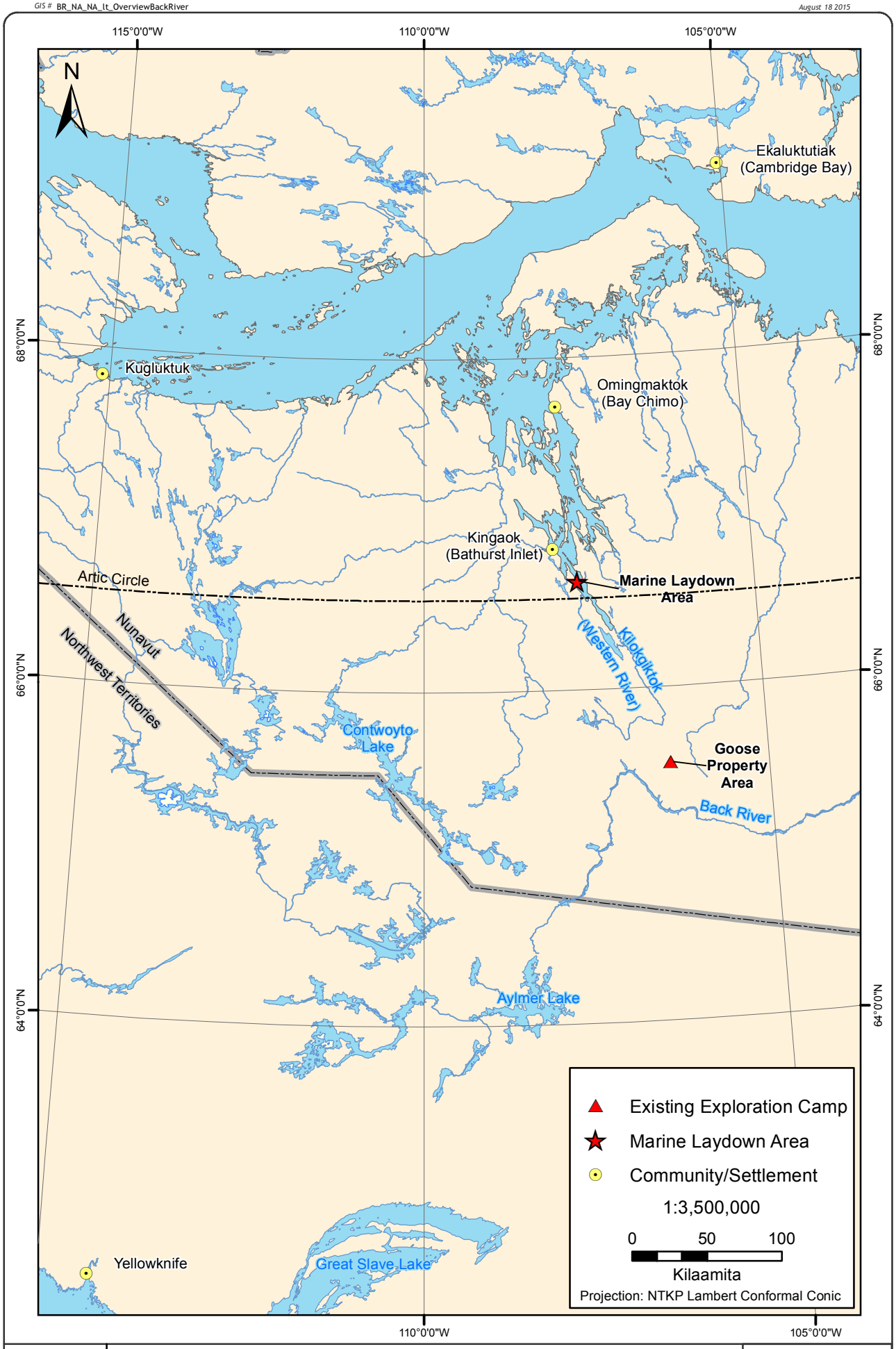
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FIGURES



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Project Overview

Figure 1.0-1

PROJECT # 0194096-0040 GIS # BAC-12-022 August 25 2015

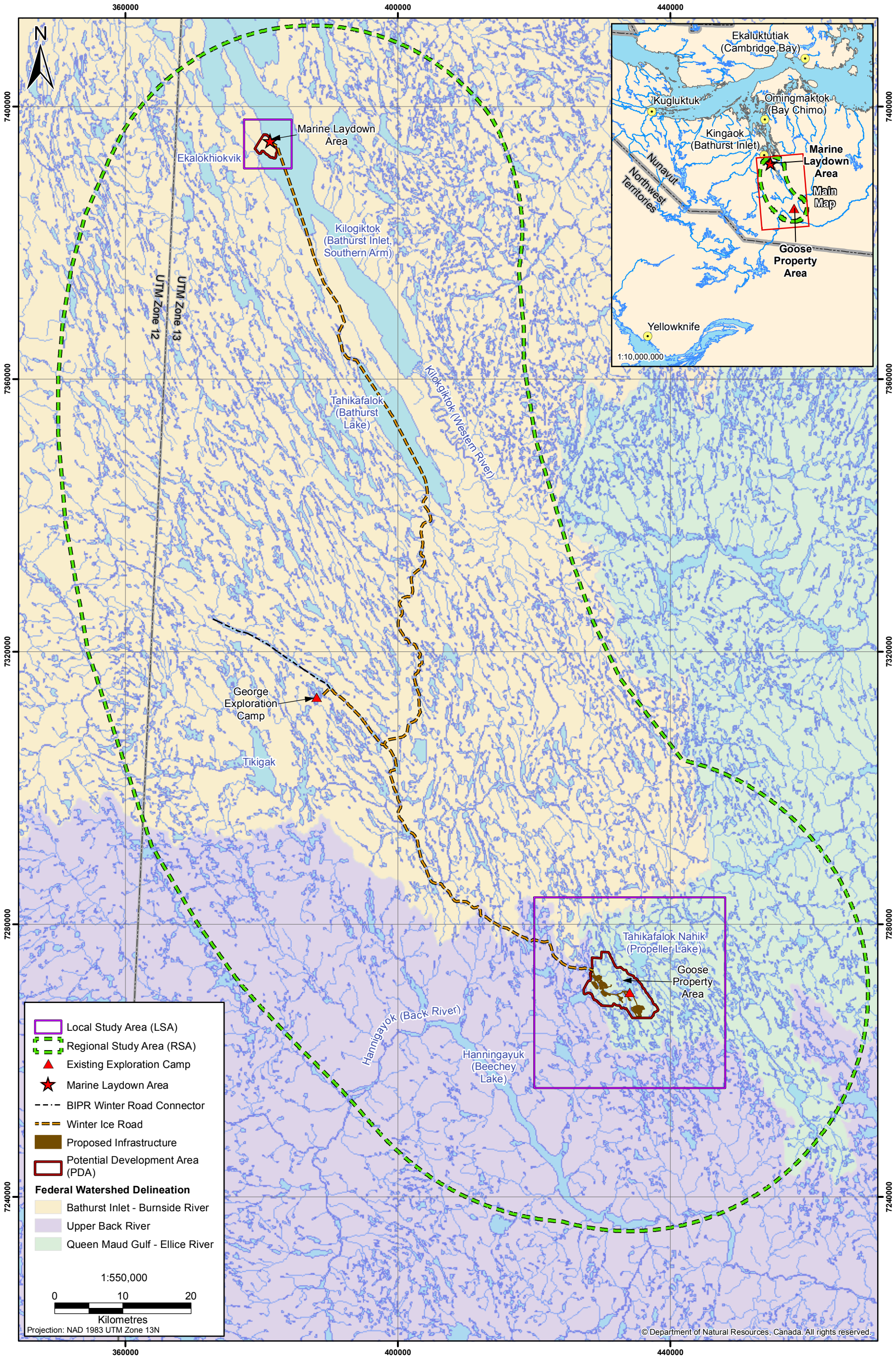


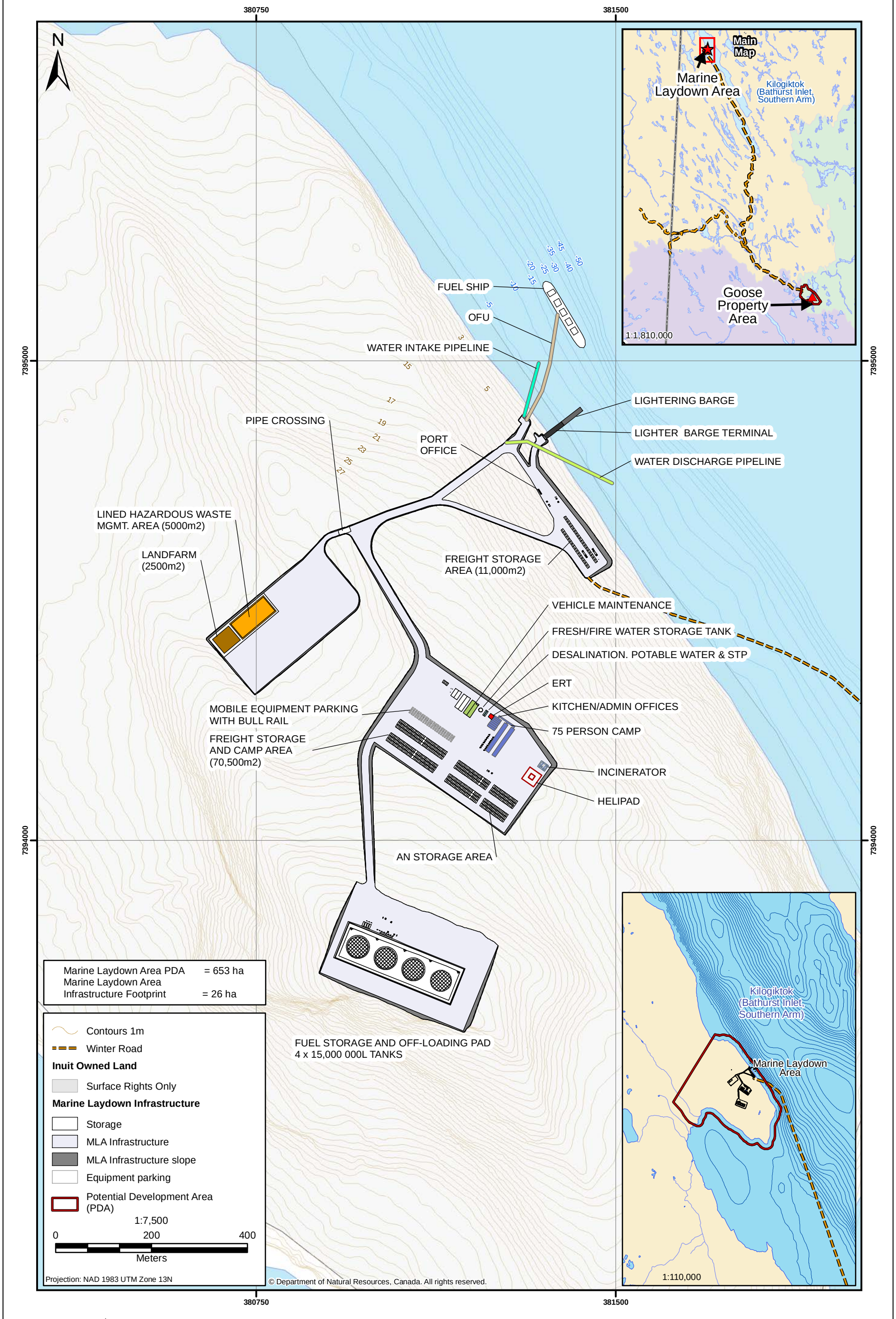
Figure 2.2-1

Local Study Area and Regional Study Area for Air Quality

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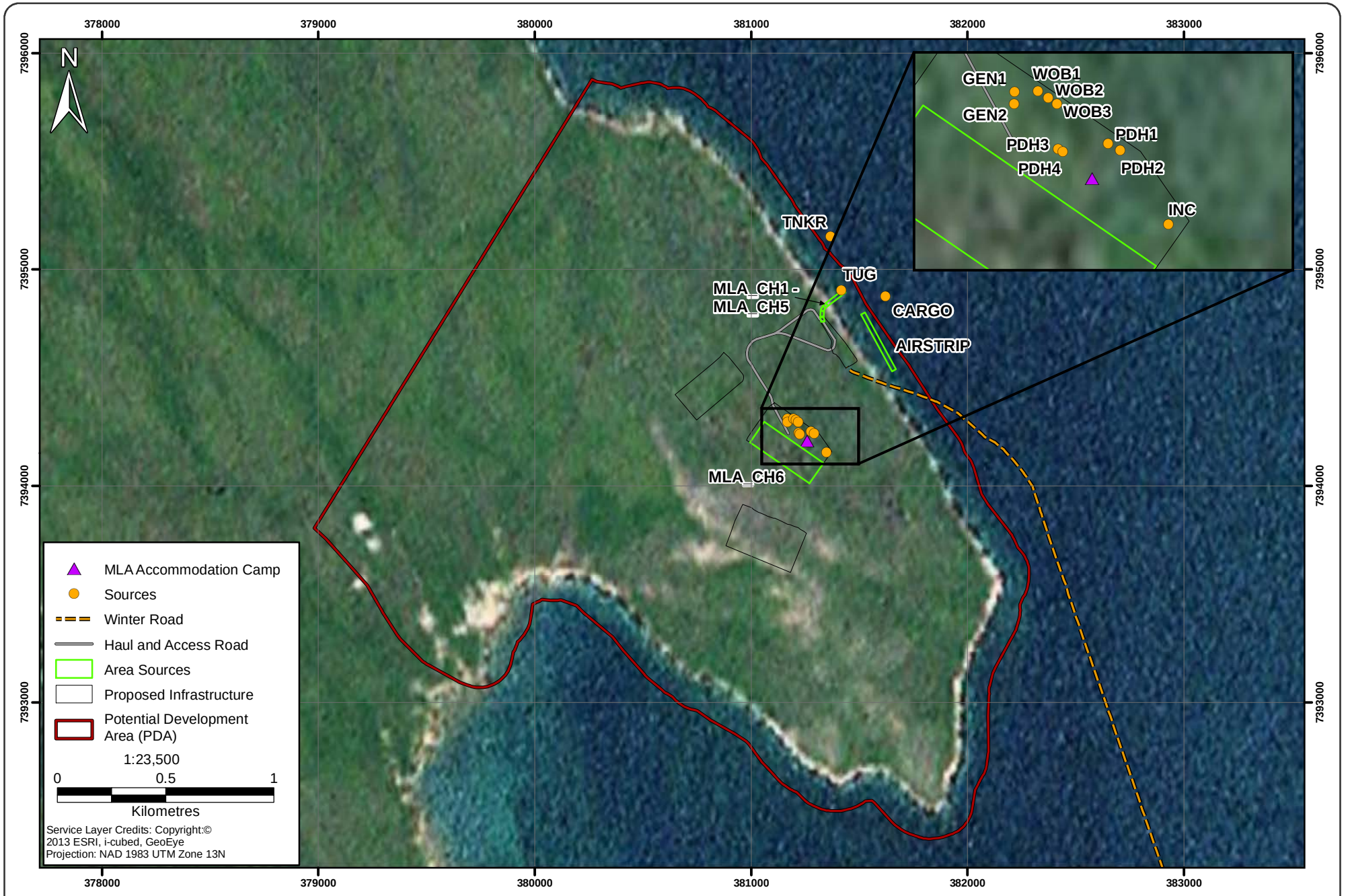
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Figure **5.0-1**

Potential Development Area and Layout
Marine Laydown Area



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Figure 6.2-5

Emission Source Layout - MLA Property

APPENDIX A

APPENDIX A: EMISSION SOURCES

RWDI Project # 1502212

Section 1: Source Summary Tables

Section 1.1: MLA - Point Source Summary Table

Source Type	Source ID	Emission Source	Location	UTM Coordinates (mE)	UTM Coordinates (mN)	Stack Height (m above ground)	Stack Inner Diameter (m)	Velocity (m/s)	Exhaust Temperature (°C)	Emission Rates (g/s) NO_x	SO_x	CO	TSP	PM_{10}	$PM_{2.5}$	Details in Section:
Point	MLA_INC	Incinerator	Freight Storage and Camp Area	381349	7394155	10	0.45	2.1	1000	4.16E-02	2.18E-02	1.20E-02	6.24E-03	3.12E-03	1.56E-03	2
Point	MLA_GEN1	Diesel-Fired Generator	Freight Storage and Camp Area	381168	7394312	3.0	0.13	147	550	8.89E-01	1.02E-03	4.86E-01	2.78E-02	1.39E-02	6.94E-03	2
Point	MLA_GEN2	Diesel-Fired Generator	Freight Storage and Camp Area	381167	7394298	3.0	0.13	147	550	8.89E-01	1.02E-03	4.86E-01	2.78E-02	1.39E-02	6.94E-03	2
Point	MLA_WOB1	Waste Oil Burners Warehouse Storage Heating	Freight Storage and Camp Area	381195	7394313	3.0	0.41	0.62	93	5.54E-03	5.90E-05	1.39E-03	9.15E-04	5.54E-04	3.60E-04	2
Point	MLA_WOB2	Waste Oil Burners for Vehicle Maintenance Heating	Freight Storage and Camp Area	381207	7394305	3.0	0.41	0.62	93	5.54E-03	5.90E-05	1.39E-03	9.15E-04	5.54E-04	3.60E-04	2
Point	MLA_WOB3	Waste Oil Furnace/Boiler for Power Supply	Freight Storage and Camp Area	381217	7394297	3.0	0.41	0.62	93	5.54E-03	5.90E-05	1.39E-03	9.15E-04	5.54E-04	3.60E-04	2
Point	MLA_PDH1	Frost Fighter Portable Diesel Heater	Freight Storage and Camp Area	381278	7394251	1.3	0.41	0.62	93	6.55E-03	6.98E-05	1.64E-03	1.08E-03	6.55E-04	4.26E-04	2
Point	MLA_PDH2	Frost Fighter Portable Diesel Heater	Freight Storage and Camp Area	381292	7394242	1.3	0.41	0.62	93	6.55E-03	6.98E-05	1.64E-03	1.08E-03	6.55E-04	4.26E-04	2
Point	MLA_PDH3	Frost Fighter Portable Diesel Heater	Freight Storage and Camp Area	381219	7394245	1.3	0.41	0.62	93	6.55E-03	6.98E-05	1.64E-03	1.08E-03	6.55E-04	4.26E-04	2
Point	MLA_PDH4	Frost Fighter Portable Diesel Heater	Freight Storage and Camp Area	381225	7394241	1.3	0.41	0.62	93	6.55E-03	6.98E-05	1.64E-03	1.08E-03	6.55E-04	4.26E-04	2
Point	MLA_TNKR	Fuel Tanker (hoteling)	Fuel Ship Dock	381366	7395152	22	0.65	30	482	6.61E+00	1.70E+00	1.02E+00	1.66E-01	1.66E-01	1.66E-01	3
Point	MLA_CARGO	Cargo ship (hoteling)	Lightering Barge Parking	381621	7394878	22	0.65	30	482	1.07E+01	2.74E+00	1.65E+00	2.68E-01	2.68E-01	2.68E-01	3
Point	MLA_TUG	Tug Boat shuffling	Lightering Barge Parking	381416	7394905	9.5	0.79	30	379	9.37E+00	2.41E+00	1.45E+00	2.36E-01	2.36E-01	2.36E-01	3

Section 1.2: Area Source Summary Table

Source Type	Source ID	Emission Source	Location	UTM Coordinates (mE)	UTM Coordinates (mN)	Area (m^2)	Source Ht (m)	Sigma z (m)	Emission Rates (g/s) NO_x	SO_x	CO	TSP	PM_{10}	$PM_{2.5}$	Details in Section:
Area	MLA_AIR	Aircraft Landing/Takeoff	Sea "Airstrip"	381588	7394665	5,989	5.9	2.8	7.19E-02	2.11E-02	5.91E-01	1.11E-03	1.11E-03	1.11E-03	4
Area	MLA_CH1	Vehicle Tailpipe - Unloading cargo from barge to Western Star trailer	Lightering Barge	381391	7394870	1,593	0	0	6.47E-03	8.70E-05	3.21E-03	2.92E-04	2.92E-04	2.83E-04	5
Area	MLA_CH2	Vehicle Tailpipe - Unloading cargo from barge to Western Star trailer	Lightering Barge	381344	7394834	270	0	0	1.09E-03	1.47E-05	5.44E-04	4.94E-05	4.94E-05	4.79E-05	5
Area	MLA_CH3	Vehicle Tailpipe - Unloading cargo from barge to Western Star trailer	Lightering Barge	381332	7394819	331	0	0	1.34E-03	1.81E-05	6.68E-04	6.07E-05	6.07E-05	5.88E-05	5
Area	MLA_CH4	Vehicle Tailpipe - Unloading cargo from barge to Western Star trailer	Lightering Barge	381328	7394795	440	0	0	1.78E-03	2.40E-05	8.87E-04	8.06E-05	8.06E-05	7.82E-05	5
Area	MLA_CH5	Vehicle Tailpipe - Unloading cargo from barge to Western Star trailer	Lightering Barge	381329	7394771	367	0	0	1.49E-03	2.00E-05	7.40E-04	6.72E-05	6.72E-05	6.52E-05	5
Area	MLA_CH6	Vehicle Tailpipe - Unloading cargo Western Star to storage area	Freight Storage and Camp Area	381164	7394153	38,670	0	0	1.22E-02	1.64E-04	6.05E-03	5.50E-04	5.50E-04	5.33E-04	5
Area	MLA_UR3	Vehicle Tailpipe	Internal Haul Road	381362	7394720	1,001	4.5	2.1	2.91E-04	3.92E-06	1.45E-04	1.33E-05	1.33E-05	1.29E-05	5
Area	MLA_UR5	Vehicle Tailpipe	Internal Haul Road	381391	7394676	2,857	4.5	2.1	9.47E-04	1.28E-05	4.72E-04	4.32E-05	4.32E-05	4.19E-05	5
Area	MLA_UR6	Vehicle Tailpipe	Internal Haul Road	381334	7394763	2,814	4.5	2.1	8.18E-04	1.10E-05	4.08E-04	3.73E-05	3.73E-05	3.61E-05	5
Area	MLA_UR7	Vehicle Tailpipe	Internal Haul Road	381111	7394700	1,098	4.5	2.1	6.38E-04	8.60E-06	3.18E-04	2.91E-05	2.91E-05	2.82E-05	5
Area	MLA_UR9	Vehicle Tailpipe	Internal Haul Road	381010	7394667	2,963	4.5	2.1	1.92E-03	2.58E-05	9.57E-04	8.74E-05	8.74E-05	8.48E-05	5
Area	MLA_UR10	Vehicle Tailpipe	Internal Haul Road	381121	7394346	1,530	4.5	2.1	8.89E-04	1.20E-05	4.43E-04	4.05E-05	4.05E-05	3.93E-05	5
Area	MLA_UR3	Unpaved Road Fugitive Dust	Internal Haul Road	381362	7394720	1,001	4.5	2.1	n/a	n/a	n/a	2.57E-02	7.33E-03	7.33E-04	6
Area	MLA_UR5	Unpaved Road Fugitive Dust	Internal Haul Road	381391	7394676	2,857	4.5	2.1	n/a	n/a	n/a	1.01E-01	2.89E-02	2.89E-03	6
Area	MLA_UR6	Unpaved Road Fugitive Dust	Internal Haul Road	381334	7394763	2,814	4.5	2.1	n/a	n/a	n/a	5.16E-02	1.47E-02	1.47E-03	6
Area	MLA_UR7	Unpaved Road Fugitive Dust	Internal Haul Road	381111	7394700	1,098	4.5	2.1	n/a	n/a	n/a	1.13E-01	3.22E-02	3.22E-03	6
Area	MLA_UR9	Unpaved Road Fugitive Dust	Internal Haul Road	381010	7394667	2,963	4.5	2.1	n/a	n/a	n/a	3.39E-01	9.68E-02	9.68E-03	6
Area	MLA_UR10	Unpaved Road Fugitive Dust	Internal Haul Road	381121	7394346	1,530	4.5	2.1	n/a	n/a	n/a	1.57E-01	4.48E-02	4.48E-03	6

APPENDIX A: EMISSION SOURCES (cont'd)

Section 2: Combustion Sources

- two (2) generators are operating at 500 kW. One (1) 500 kW generator is not included in this assessment, as it used as a spare.
- Make and model have not been chosen for the generators. Exhaust parameters were taken from a surrogate unit: Generac Model# SD500.
- Exhaust parameters were not provided for the waste boilers. It was assumed that these pieces of combustion equipment have similar exhaust parameters to the frost figher portable diesel heaters.
- RWDI was instructed by Sabina and supporting teams that the Incinerator emissions would increase to waste treatment reactor process. Sabina instructed that the emissions from the incinerator specification be scaled up by 30%.

Source ID	Emission Source	Power Rating	Load Factor	Operating Hours per year	Emission Calculation Reference
MLA_INC	Incinerator	6500 BTU/lb		4	Hatch Technical Datasheet and 1.3 scaling factor
MLA_GEN1	Diesel-Fired Generator	500 KW	1.00	24	NONROAD EPA Tier 2 (NO_X, CO, TSP) and U.S. EPA AP-42 CH3.4 for SO_2
MLA_GEN2	Diesel-Fired Generator	500KW	1.00	24	NONROAD EPA Tier 2 (NO_X, CO, TSP) and U.S. EPA AP-42 CH3.4 for SO_2
MLA_WOB1	Waste Oil Burners Warehouse Storage Heating	300,000 BTU/hr		24	U.S. EPA Chapter 1.3 External Combustion Sources
MLA_WOB2	Waste Oil Burners for Vehicle Maintenance Heating	300,000 BTU/hr		24	U.S. EPA Chapter 1.3 External Combustion Sources
MLA_WOB3	Waste Oil Furnace/Boiler for Power Supply	300,000 BTU/hr		24	U.S. EPA Chapter 1.3 External Combustion Sources
MLA_PDH1	Frost Fighter Portable Diesel Heater	350,000 BTU/hr		4	U.S. EPA Chapter 1.3 External Combustion Sources
MLA_PDH2	Frost Fighter Portable Diesel Heater	350,000 BTU/hr		4	U.S. EPA Chapter 1.3 External Combustion Sources
MLA_PDH3	Frost Fighter Portable Diesel Heater	350,000 BTU/hr		4	U.S. EPA Chapter 1.3 External Combustion Sources
MLA_PDH4	Frost Fighter Portable Diesel Heater	350,000 BTU/hr		4	U.S. EPA Chapter 1.3 External Combustion Sources

Section 3: Ship Exhaust Sources

- Information used to determine exhaust parameters for the ships exhaust sources are found in table below:

Source ID	Emission Source	Information Source
MLA_TNKR	Fuel Tanker (hoteling)	- no information provided for fuel tanker exhaust; therefore, the cargo ship exhaust parameters were used.
MLA_CARGO	Cargo ship (hoteling)	- The Donaldson Engine Horsepower and Exhaust Flow Guide was used to determine exhaust flow rate. - It was assumed that the cargo ship exhaust is similar to that of the YANMAR engine with the closest hp (885 hp).
MLA_TUG	Tug Boat (shuffling)	- the exhaust flow rate is from the EMD 8-645 E7 specification sheet.

- the exhaust stack diameters were chosen to result in an exit velocity of 30 m/s (typical)

- information used to calculated emissions for ships activity can be found in table below:

Source ID	Ship Type	Engine	Power Rating (kW)	Engine Load (%)	Classification	Emission Calculation Reference
MLA_TNKR	Dry Cargo Ship	Auxillary engine (3)	1185	50	GL + 100 A5 ICE E3 G + MC E3 AUT	U.S. EPA Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data
MLA_CARGO	Fuel Tanker	Auxillary engine	2202	50	LR1	U.S. EPA Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data
MLA_TUG	Tug	Main Engine Auxillary engine (2)	2243 440	50 50	Lloyds + 100 A1 TUG ICE CLASS I	U.S. EPA Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data

- assumed 0.5% sulphur limit to be enforced after 2020 (from New Regulations for Vessel Air Emissions: Compliance with Air Emission Standards - SSB No. 05/2013)
- Tug Dimensions: 32.31 x 10.36 x 3.5 m (From specs, scaled off height)
- Cargo Ship Dimensions: 143.14 x 22.8 x 16.5 m (From specs, scaled off height)
- Tanker Dimensions: 143.14 x 22.8 x 16.5 m (the assumption is that the dimensions are the same as the cargo ship, as no details are provided)
- PM_{10} and $PM_{2.5}$ are assumed to be equivalent to TSP to be conservative

Section 4: Aircraft Sources

- There is no permanent airstrip structure. The water "airstrip" was assumed to be 300 m long.
- Aircraft emissions are calculated based on the following information:

Source ID	Emission Source [a]	Aircraft Type	Number of landings/takeoffs [b]			Emission Calculation Reference
			Max Hourly (#/hour)	Max Daily (#/day)	Max Weekly (#/week)	
MLA_AIR	Aircraft Landing/Takeoff	de Havilland DHC-6 Twin Otter	1	3	6	FAA EDMS v5.1.4.1

Notes:

[a] As aircraft land on water, it was assumed there would be no ground support equipment.

[b] It was assumed that the landing/takeoff of aircraft occur in the same hour. It was also assumed that three landings/takeoffs occur per day; one in the morning, one mid-day and one in the evening.

APPENDIX A: EMISSION SOURCES (cont'd)

Section 5: Vehicle Tailpipe Sources

- Total Loads: 550
- Days required to unload cargo: 10
- Hours of Operation per day: 12
- One (1) container handler unloading cargo from Barge to Western Star trailer
- One (1) container handler unloading cargo from Western Star trailer to storage area
- vehicle tailpipe emissions are calculated based on the following information:

Source ID	Emission Source	Type of Truck	Power (hp)	Load Factor Used [a]	Truck passes per	Segment Length	Travel Speed [b]	Emission Calculation Reference
MLA_UR3	Haul trucks travelling on Internal Haul Road	Western Star 4900	600	58%	4.6	100	40	NONROAD 2008, Tier 4 emissions
MLA_UR5	Haul trucks travelling on Internal Haul Road	Western Star 4901	600	58%	4.6	389	40	NONROAD 2008, Tier 4 emissions
MLA_UR6	Haul trucks travelling on Internal Haul Road	Western Star 4902	600	58%	4.6	326	40	NONROAD 2008, Tier 4 emissions
MLA_UR7	Haul trucks travelling on Internal Haul Road	Western Star 4903	600	58%	9.2	281	40	NONROAD 2008, Tier 4 emissions
MLA_UR9	Haul trucks travelling on Internal Haul Road	Western Star 4904	600	58%	9.2	110	40	NONROAD 2008, Tier 4 emissions
MLA_UR10	Haul trucks travelling on Internal Haul Road	Western Star 4905	600	58%	9.2	278	40	NONROAD 2008, Tier 4 emissions
MLA_CH1	Unloading cargo from barge to Western Star trailer	Taylor TXLC975	348	48%	n/a	n/a	n/a	NONROAD 2008, Tier 4 emissions
MLA_CH2	Unloading cargo from barge to Western Star trailer	Taylor TXLC975	348	48%	n/a	n/a	n/a	NONROAD 2008, Tier 4 emissions
MLA_CH3	Unloading cargo from barge to Western Star trailer	Taylor TXLC975	348	48%	n/a	n/a	n/a	NONROAD 2008, Tier 4 emissions
MLA_CH4	Unloading cargo from barge to Western Star trailer	Taylor TXLC975	348	48%	n/a	n/a	n/a	NONROAD 2008, Tier 4 emissions
MLA_CH5	Unloading cargo from barge to Western Star trailer	Taylor TXLC975	348	48%	n/a	n/a	n/a	NONROAD 2008, Tier 4 emissions
MLA_CH6	Unloading cargo from Western Star trailer to storage area	Taylor TXLC975	348	48%	n/a	n/a	n/a	NONROAD 2008, Tier 4 emissions

Note:

[a] Load factors are from the document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition" published by the US EPA, 2010.

[b] The haul trucks are travelling; therefore, emissions are not based on the number of units but rather the number of passes per hour and travelling speed. The container handlers' emissions are based on one (1) container handler unloading cargo from the barge and one (1) container handler unloading cargo to the storage area.

Section 6: Unpaved Road Sources

- unpaved road emissions are calculated based on the following information, as well as the truck passes per hour and segment length listed in Section 5:

Route ID	Route	Empty Weight (tonnes)	Payload (tonnes)	Loaded Weight (tonnes)	Mean Weight (tonnes) [a]	Surface Silt Content [b] (%)	Emission Calculation Reference
MLA_UR3	Haul trucks travelling on Internal Haul Road	25	56	81	53	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
MLA_UR5	Haul trucks travelling on Internal Haul Road	25	56	81	81	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
MLA_UR6	Haul trucks travelling on Internal Haul Road	25	56	81	25	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
MLA_UR7	Haul trucks travelling on Internal Haul Road	25	56	81	53	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
MLA_UR9	Haul trucks travelling on Internal Haul Road	25	56	81	53	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)
MLA_UR10	Haul trucks travelling on Internal Haul Road	25	56	81	53	8.4%	U.S. EPA AP-42 Chapter 13.2.2 Unpaved Road (Industrial)

Note:

[a] Average of empty vehicle and fully loaded vehicle weight, with the exceptions of trucks travelling on MLA_UR5 which are only loaded trucks and trucks travelling on MLA_UR6 which are only empty trucks, as they travel in a loop from the barge to the storage area, then back to the barge.

[b] Silt content from AP 42 Table 13.2.2-1 - Mean silt content for Western Surface Coal Mining haul road to/from pit.

- A control efficiency of fugitive dust on unpaved roads due to watering was calculated to be an average of 92% using the approach outlined in U.S. EPA Control of Open Fugitive Dust Sources, September 1988. The control efficiency was calculated based on the water truck capacity of 25 m^2, completing one (1) pass per 12 hour shift.

APPENDIX B

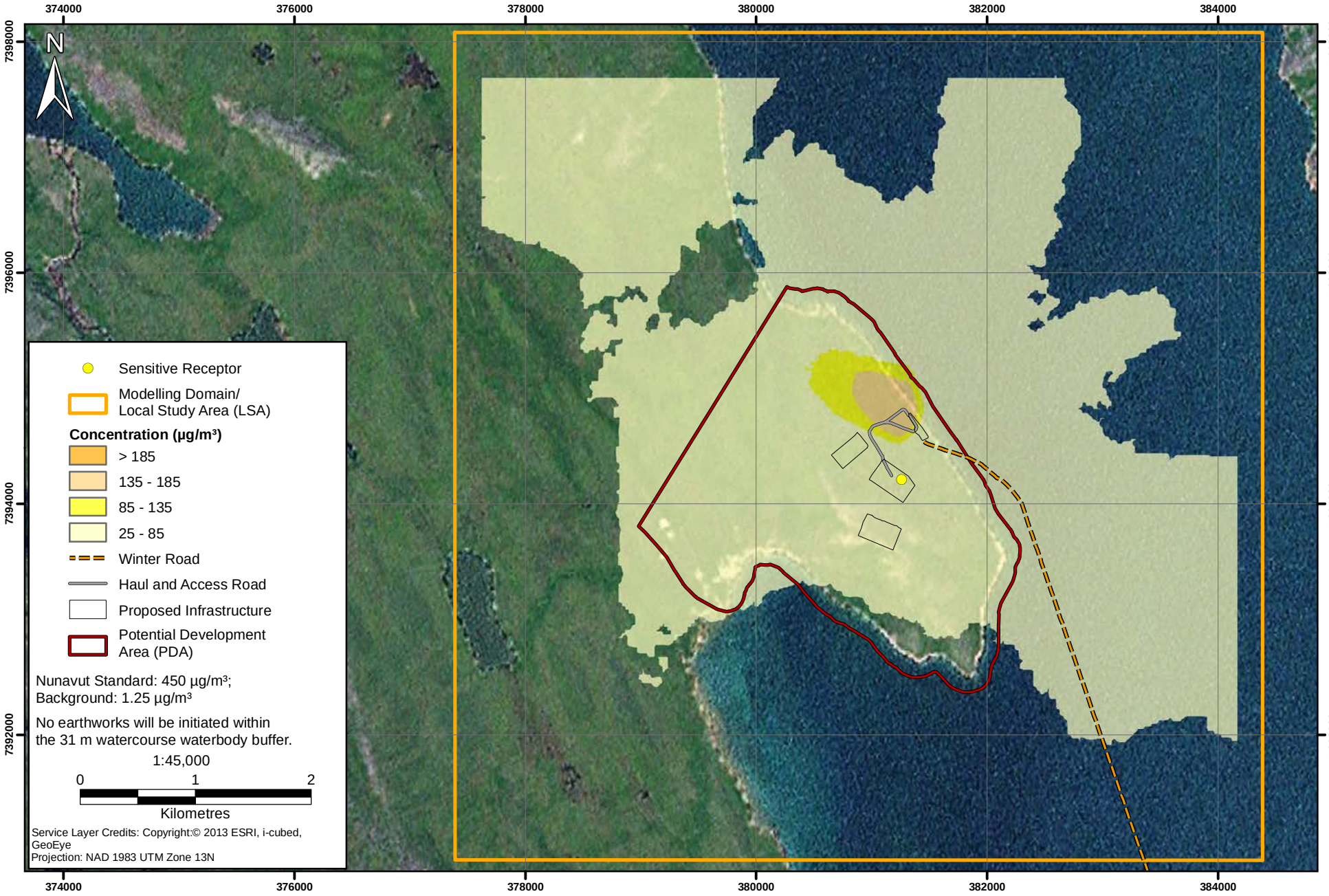


Figure B-1

Sabina GOLD & SILVER CORP

Maximum 1-hour SO_2 Concentration, Marine Laydown Area

Figure B-1

RWDI

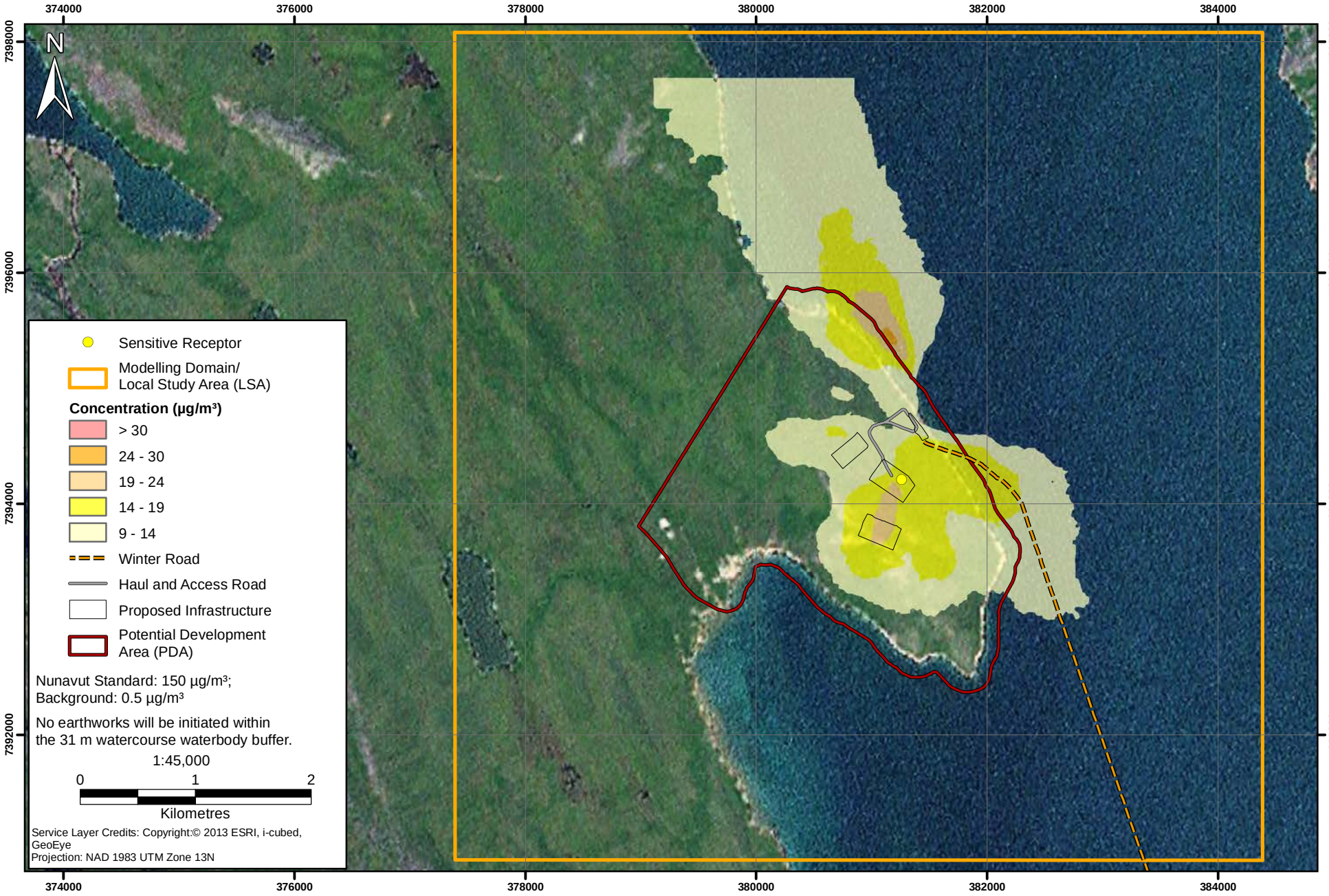


Figure B-2

Sabina GOLD & SILVER CORP

Maximum 24-hour SO_2 Concentration, Marine Laydown Area

Figure B-2

RWDI

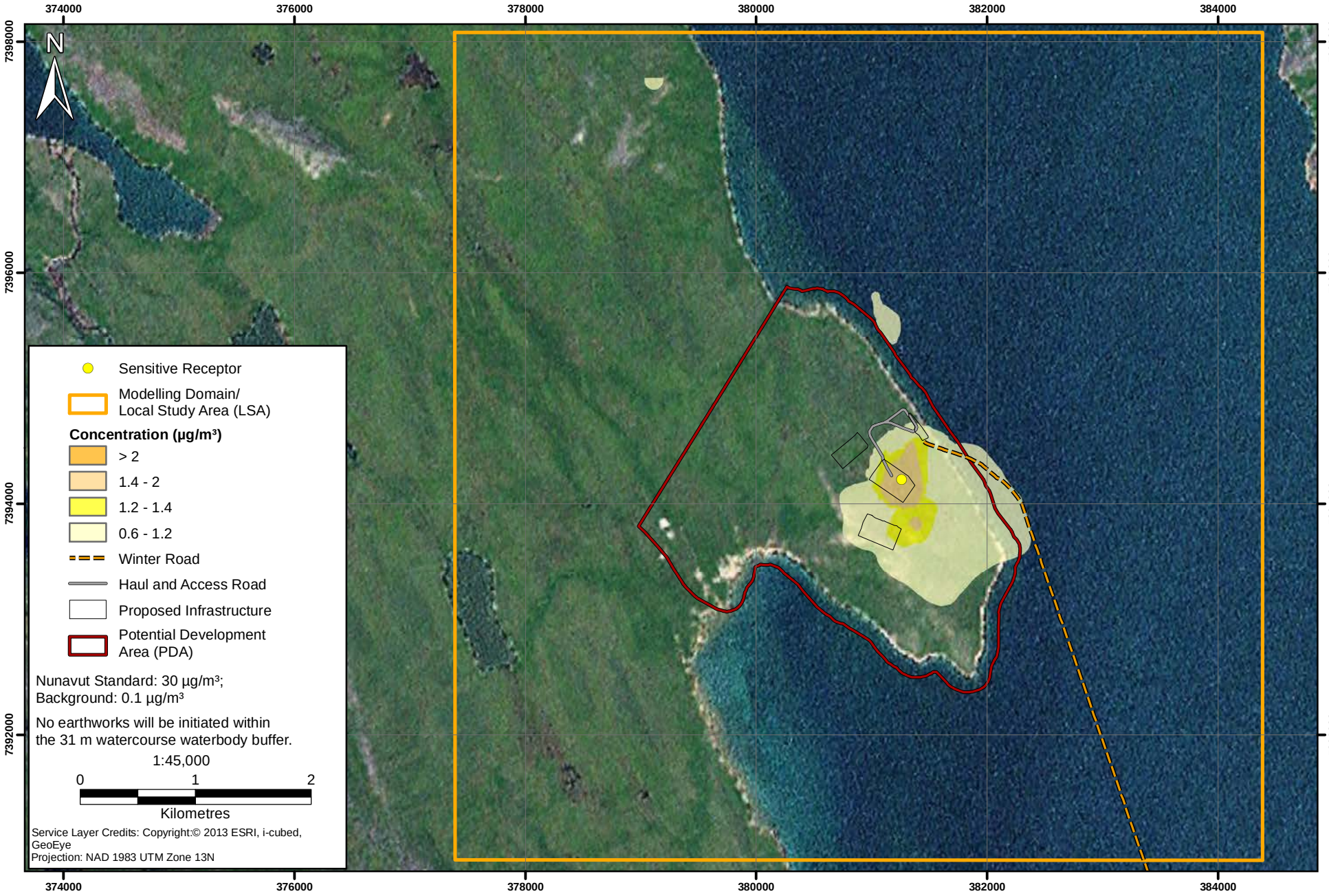


Figure B-3

Sabina GOLD & SILVER CORP

Annual SO_2 Concentration, Marine Laydown Area

Figure B-3

RWDI

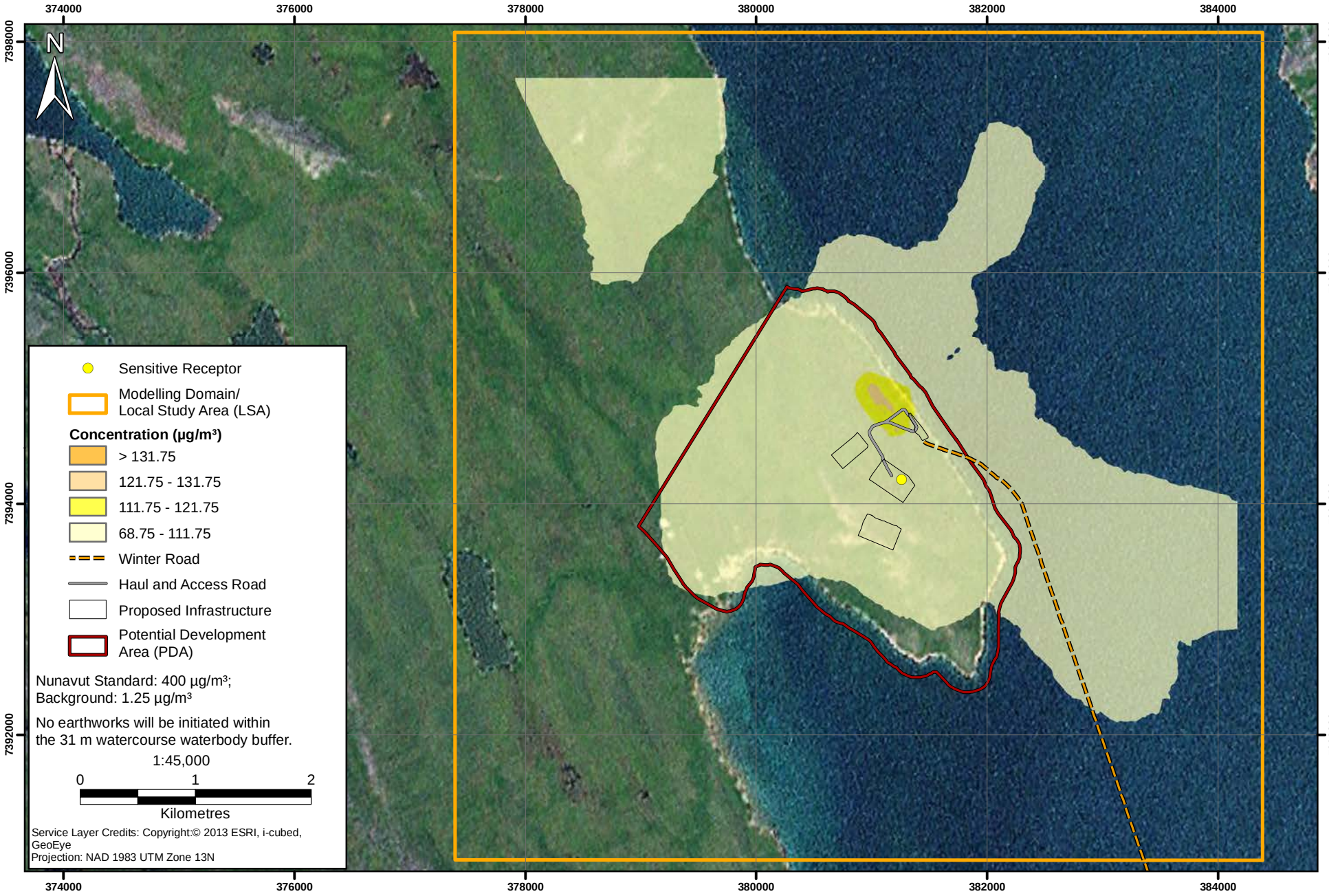


Figure B-4

Sabina GOLD & SILVER CORP

Maximum 1-hour NO_2 Concentration, Marine Laydown Area

Figure B-4

RWDI

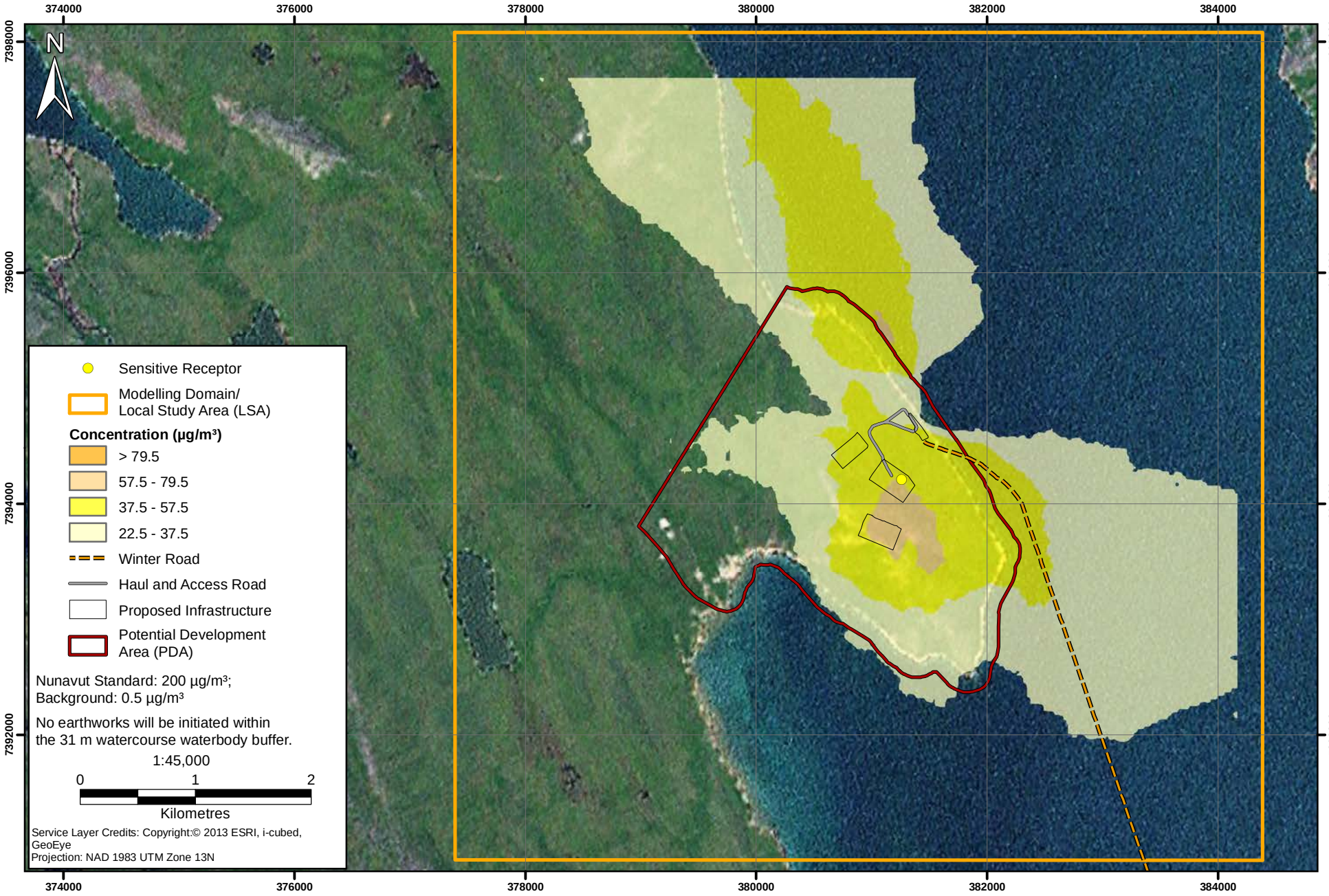


Figure B-5

Sabina GOLD & SILVER CORP

Maximum 24-hour NO_2 Concentration, Marine Laydown Area

Figure B-5

RWDI

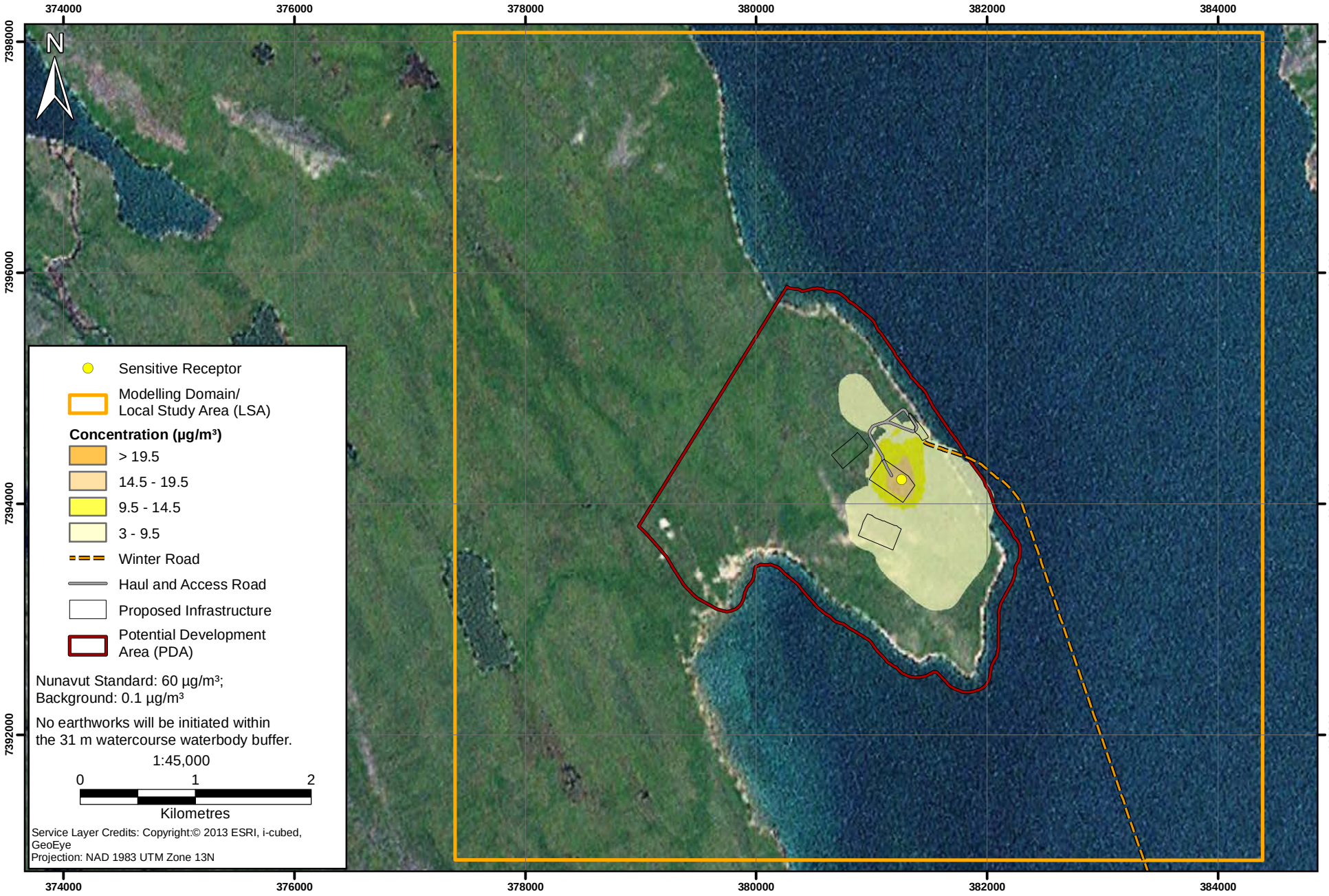


Figure B-6

Sabina GOLD & SILVER CORP

Annual NO_2 Concentration, Marine Laydown Area

Figure B-6

RWDI

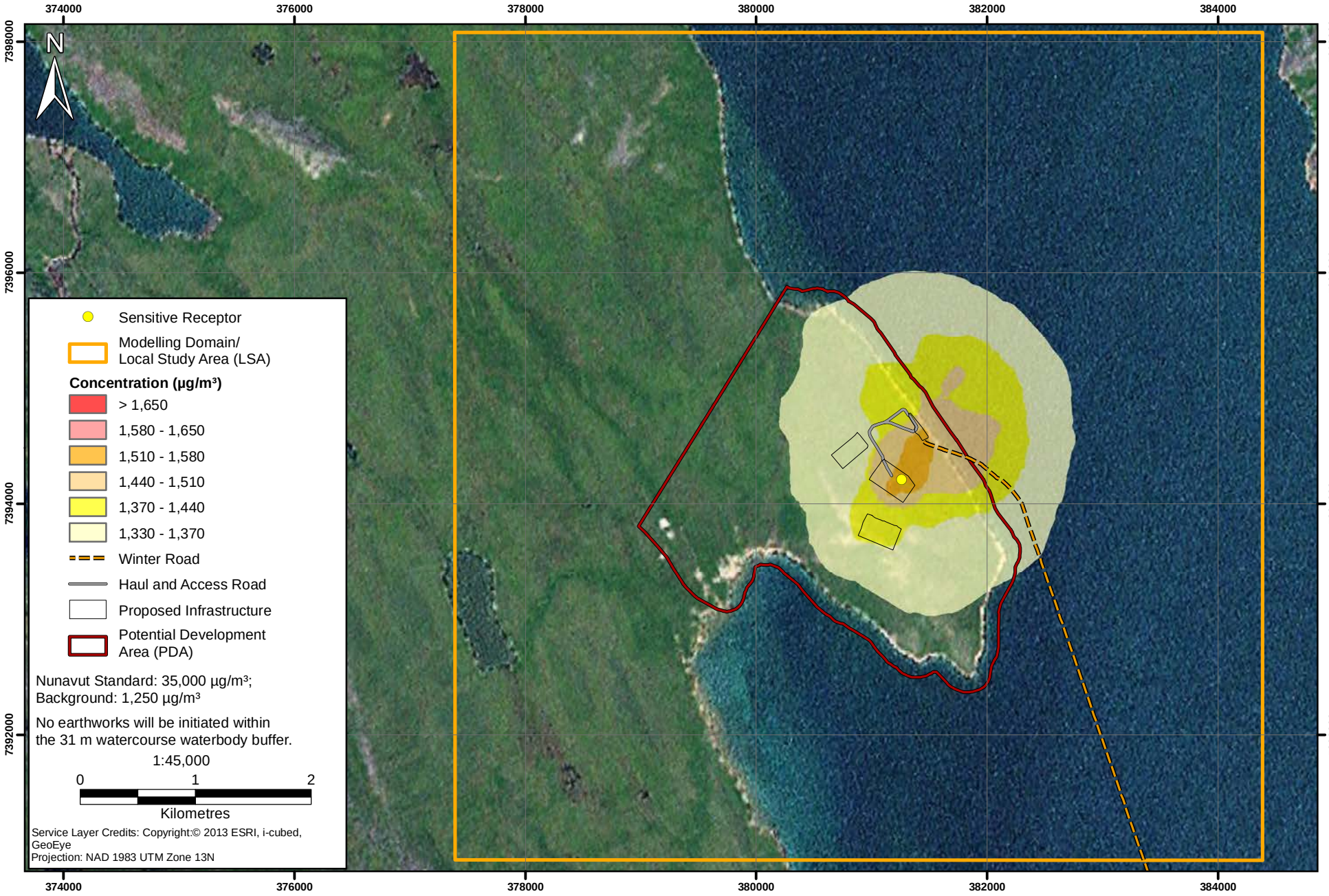


Figure B-7

Sabina GOLD & SILVER CORP

Maximum 1-hour CO Concentration, Marine Laydown Area

Figure B-7

RWDI

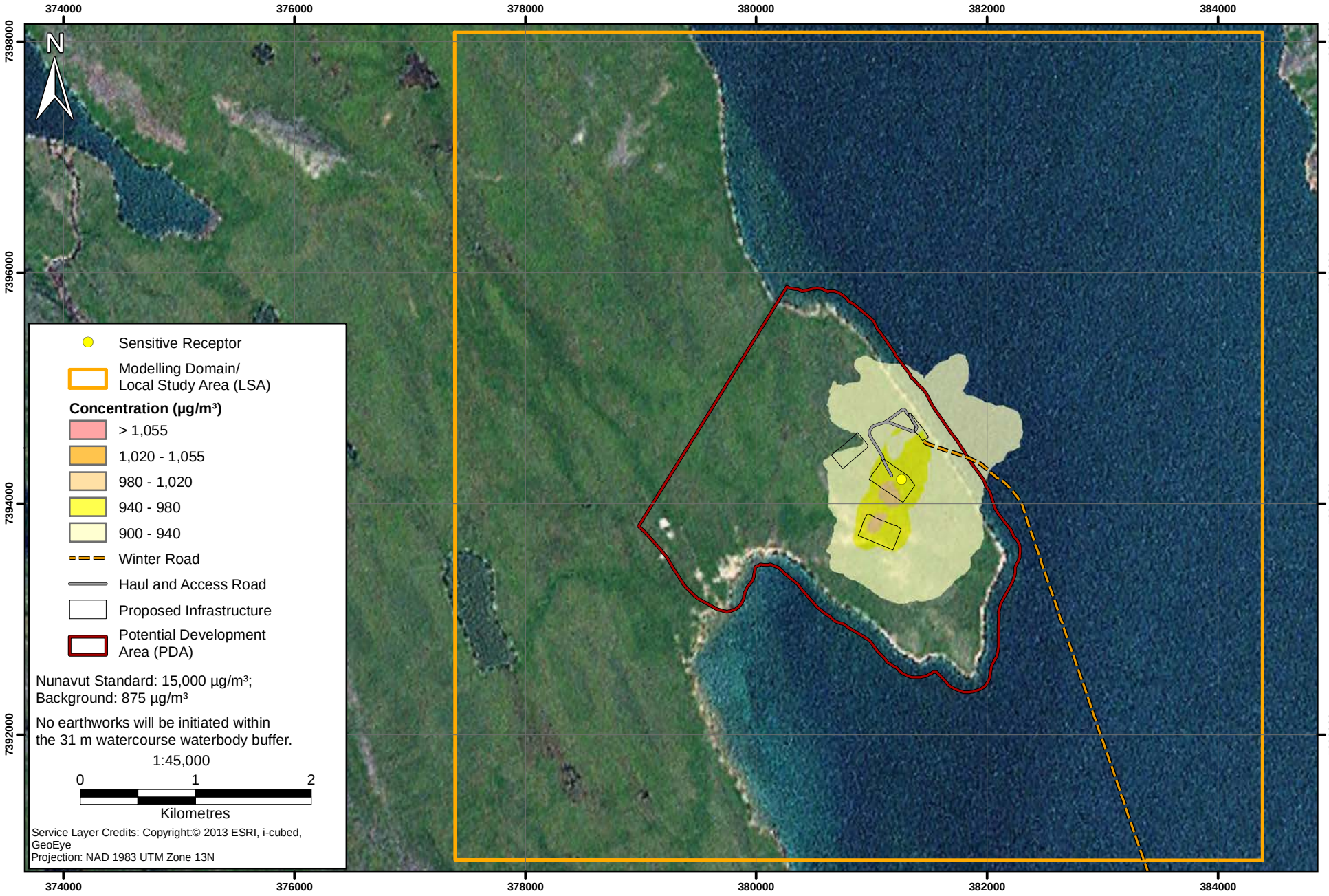


Figure B-8

Sabina GOLD & SILVER CORP

Maximum 8-hour CO Concentration, Marine Laydown Area

Figure B-8

RWDI

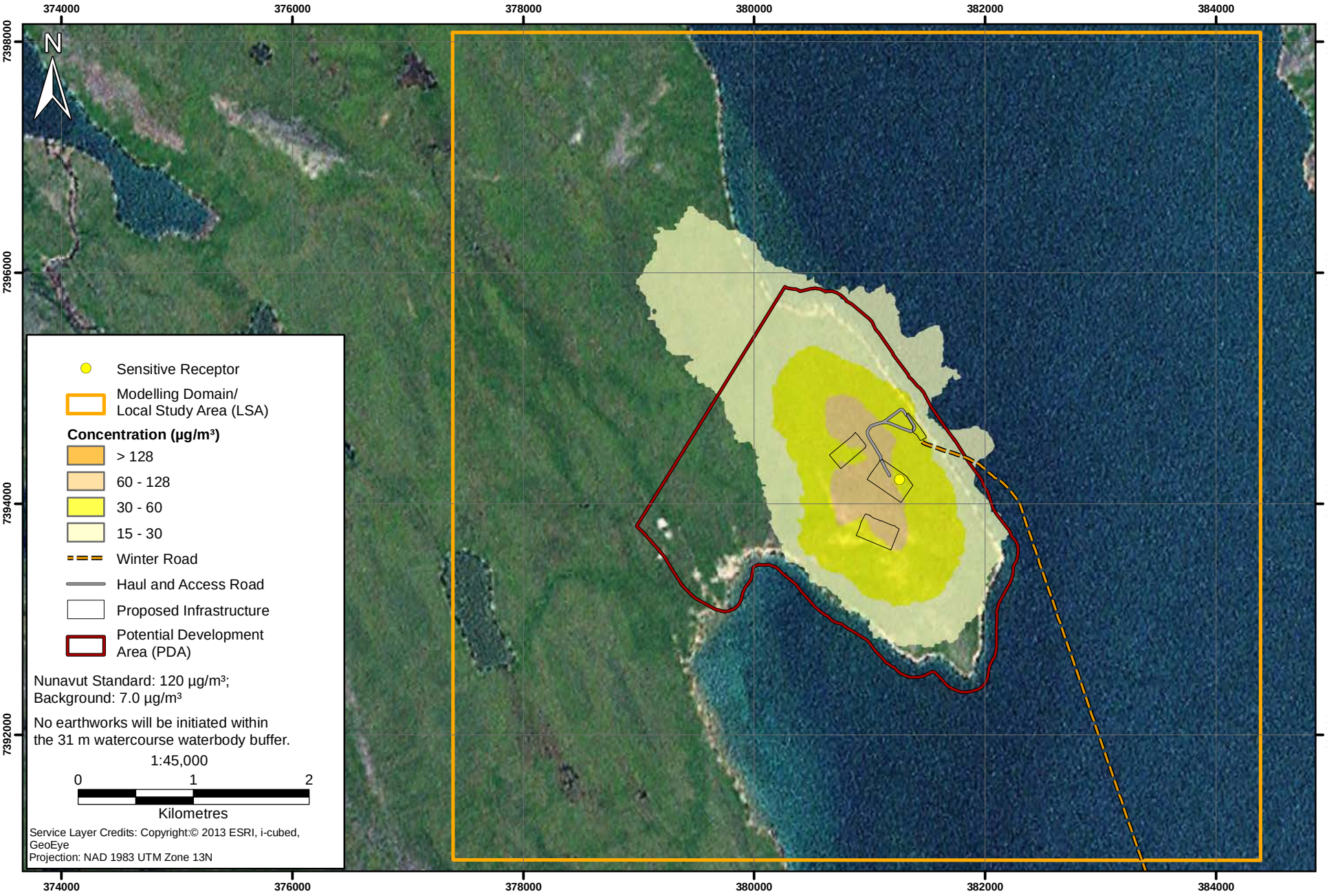


Figure 7.1-1

Sabina GOLD & SILVER CORP

Maximum Total 24-hour TSP Concentration, Marine Laydown Area

Figure **B-9**

RWDI

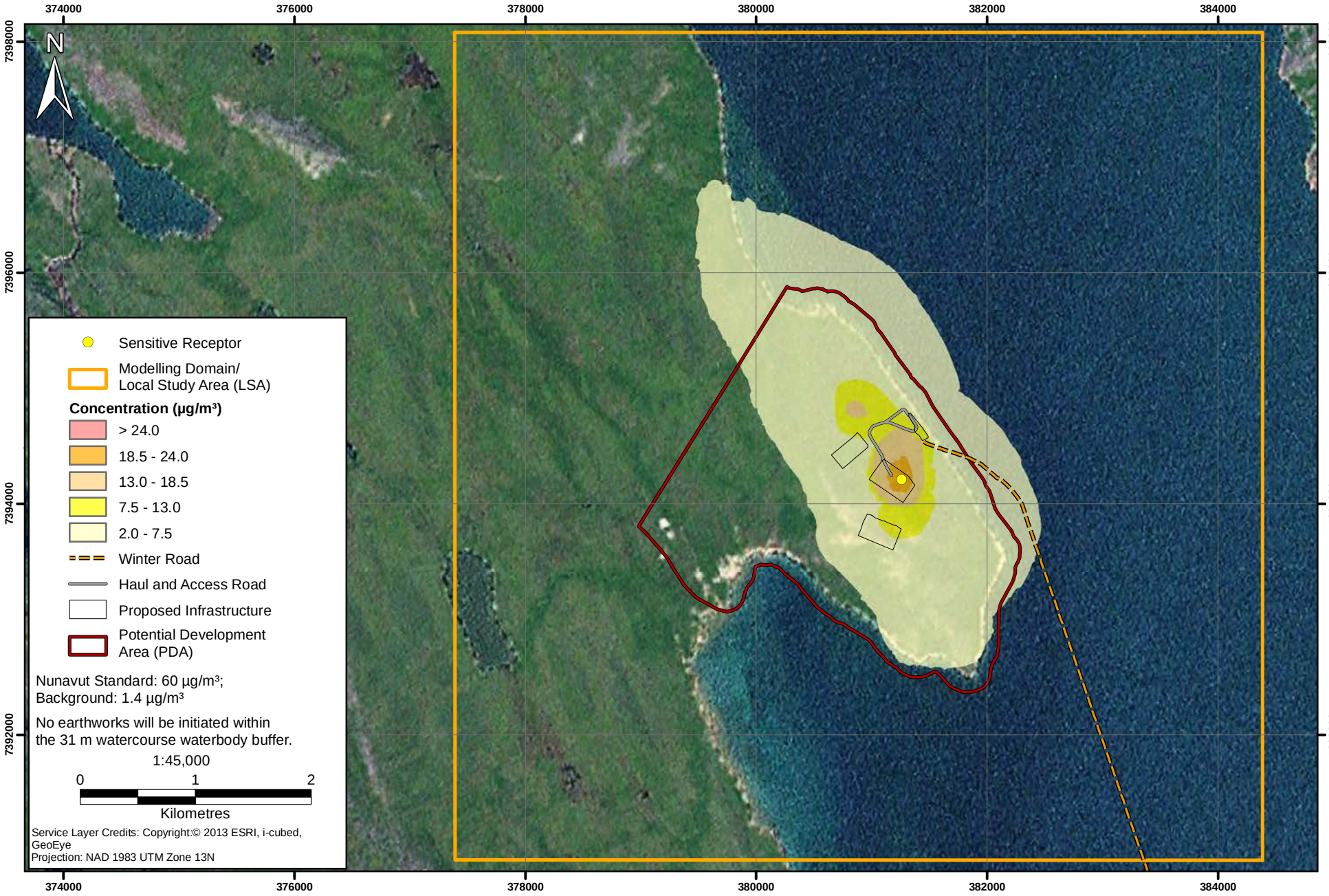


Figure B-9

Sabina GOLD & SILVER CORP

Annual Total TSP Concentration, Marine Laydown Area

Figure B-**10**

RWDI

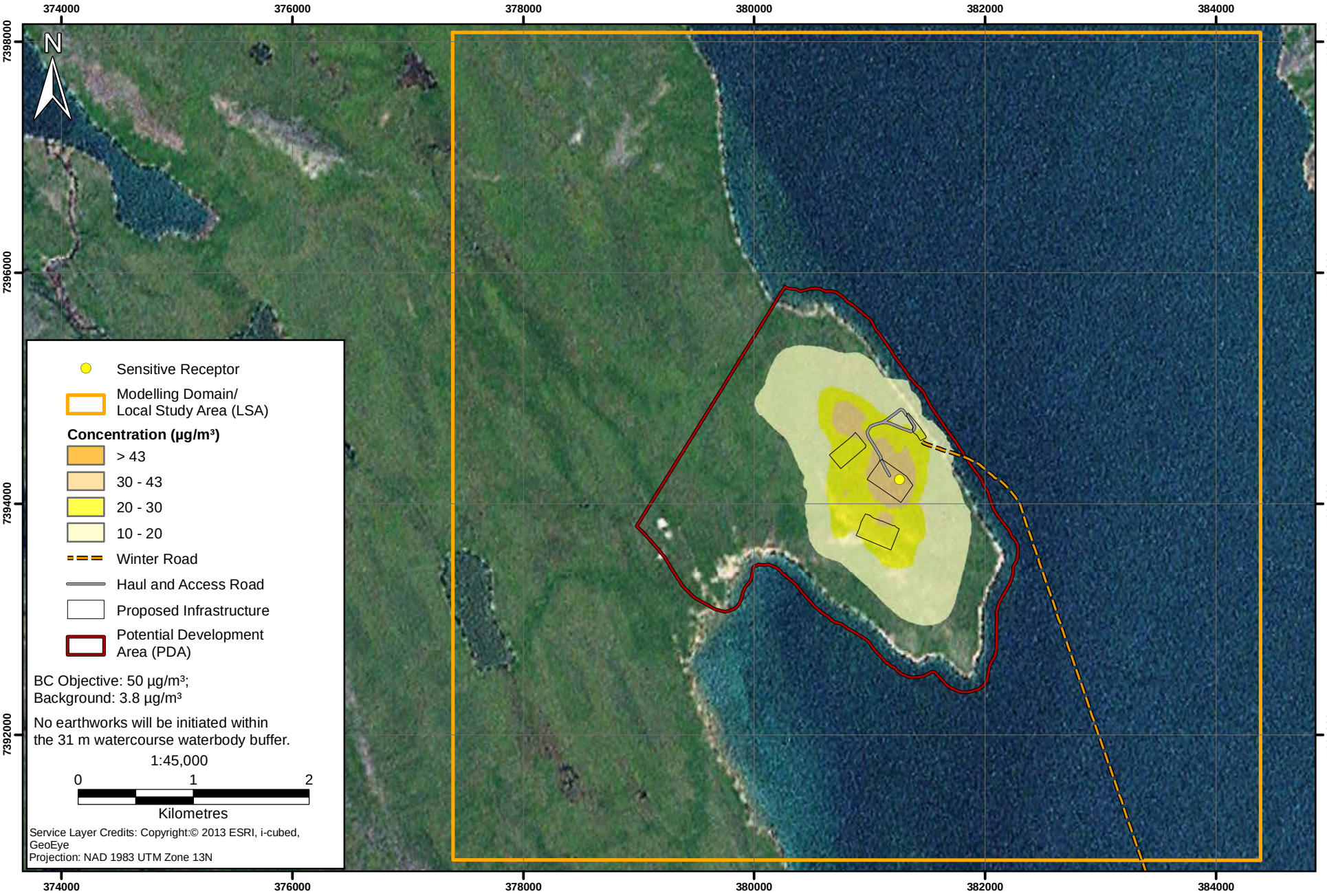


Figure B-10

Sabina GOLD & SILVER CORP

Maximum Total 24-hour PM_{10} Concentration, Marine Laydown Area

Figure B-**11**

RWDI

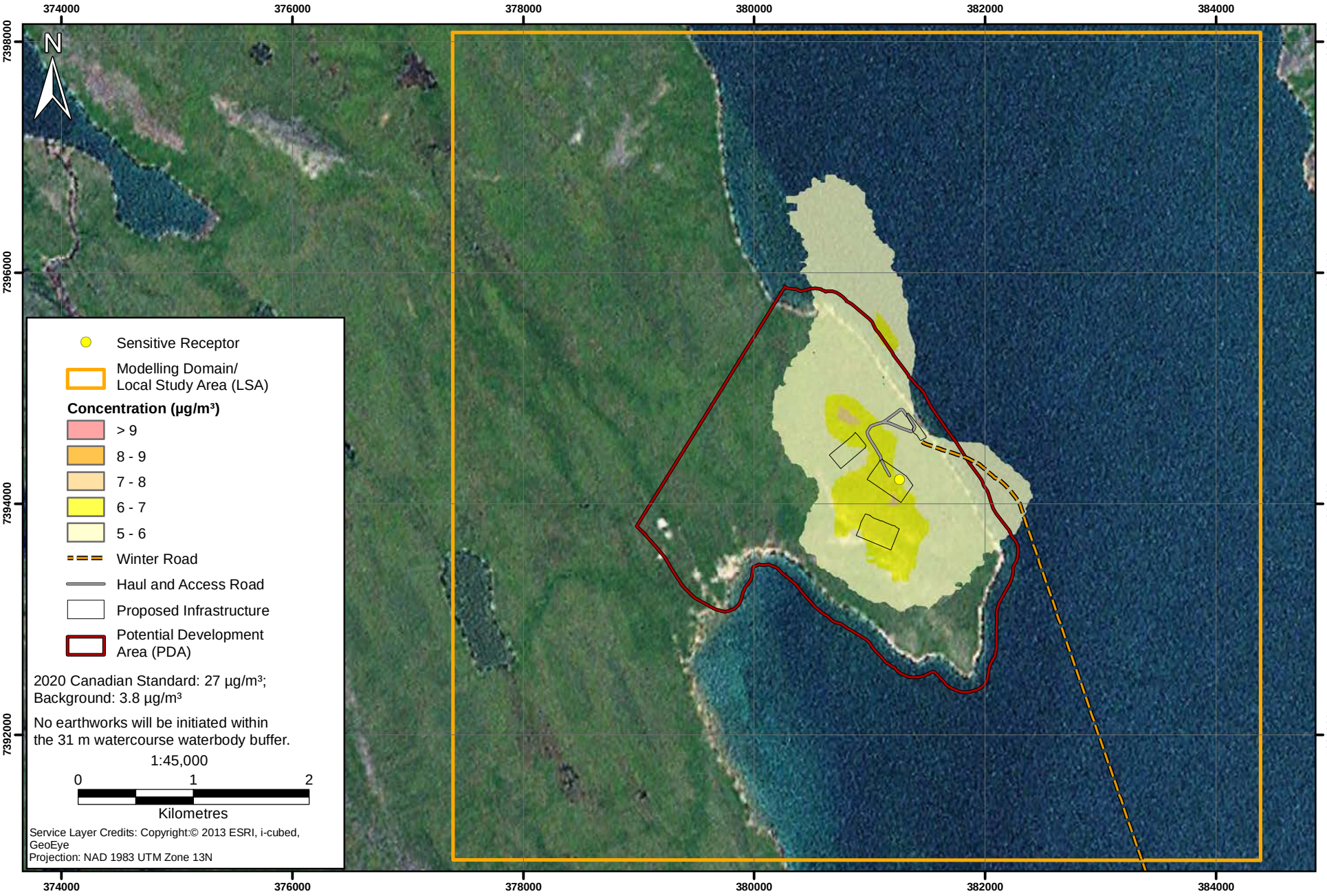


Figure B-11

Sabina GOLD & SILVER CORP

Maximum Total 24-hour $PM_{2.5}$ Concentration, Marine Laydown Area

Figure B-12

RWDI

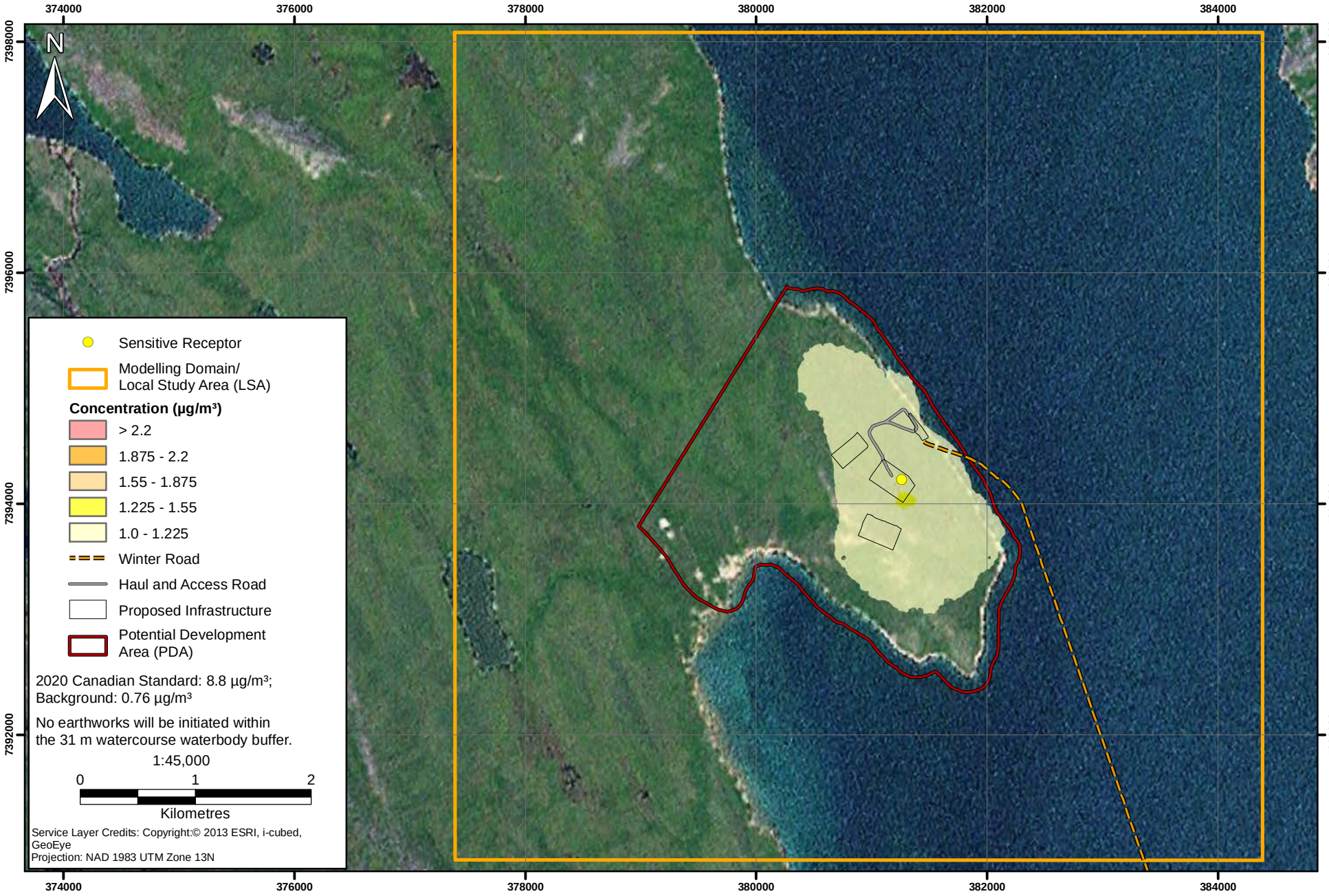


Figure B-12

Sabina GOLD & SILVER CORP

Annual Total $PM_{2.5}$ Concentration, Marine Laydown Area

Figure B-13

RWDI

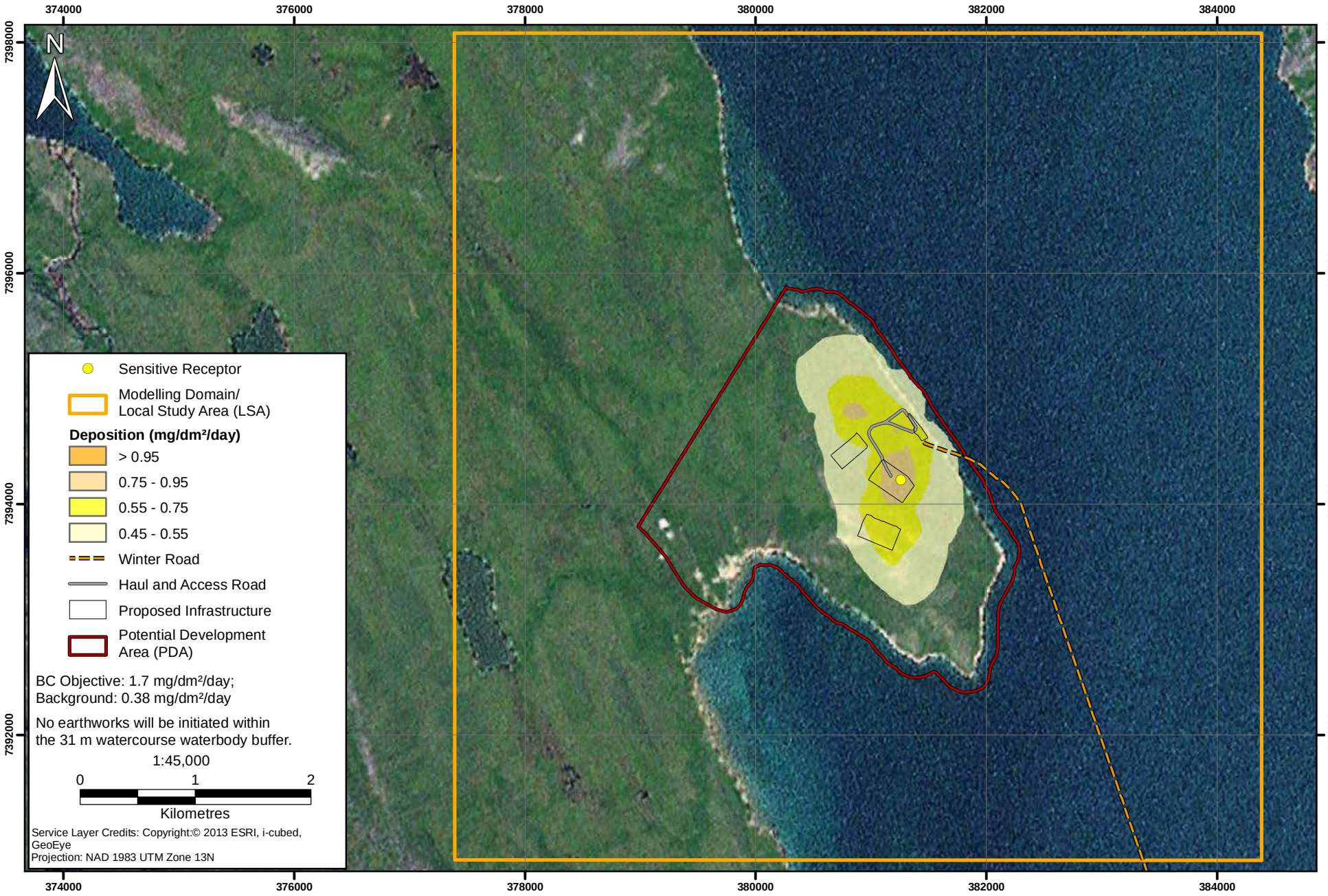


Figure B-13

Sabina GOLD & SILVER CORP

Maximum 30-day Dust Deposition, Marine Laydown Area

Figure B-**14**

RWDI

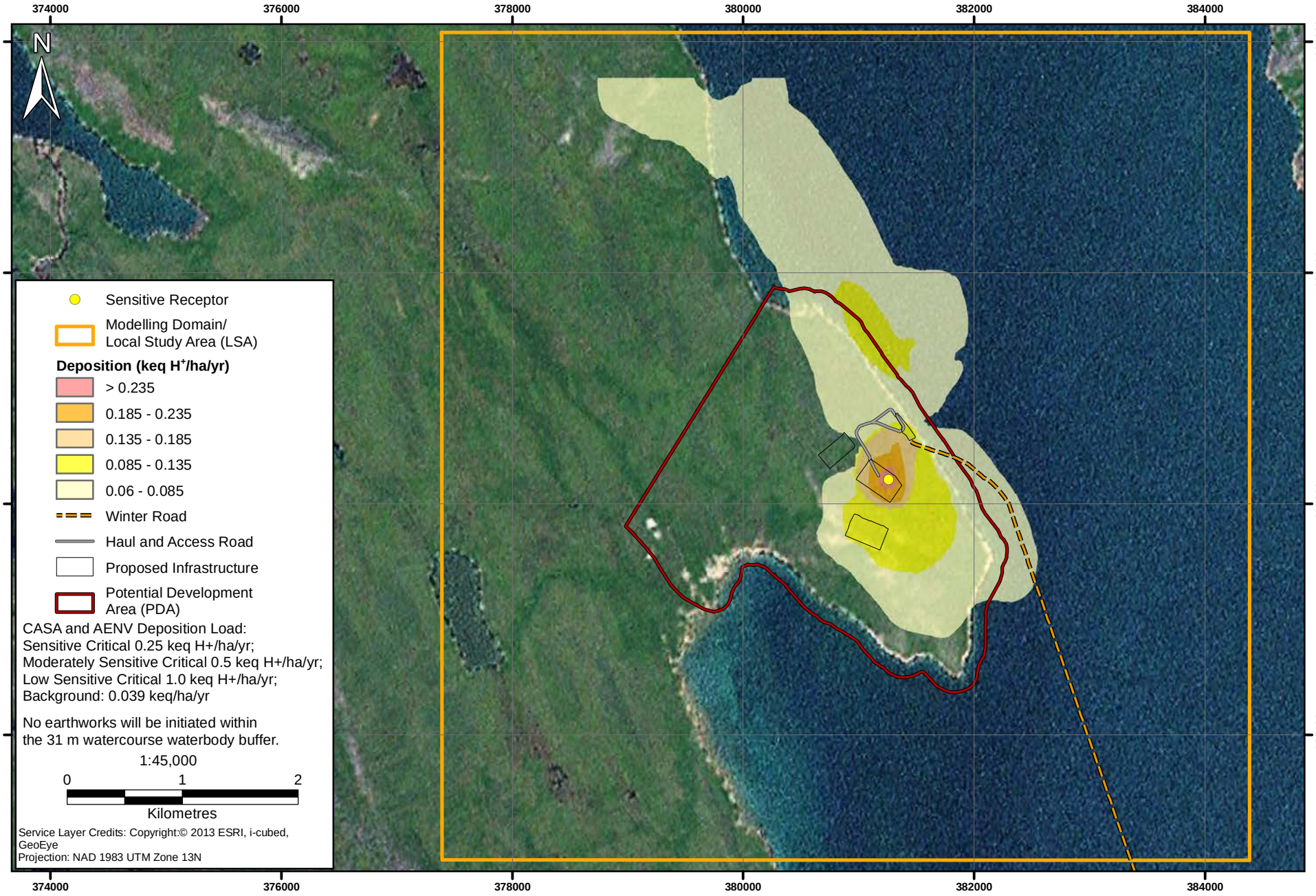


Figure B-15

Sabina GOLD & SILVER CORP

Annual Acid Deposition, Marine Laydown Area

Figure B-15

RWDI

Appendix V4-2A

Back River Project: 2012 Noise Baseline Report

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
2012 Noise Baseline Report







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October 2012

BACK RIVER PROJECT
2012 NOISE BASELINE REPORT

October 2012
Project #0833-002-16

Citation:
Rescan. 2012. *Back River Project: 2012 Noise Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

Rescan™
Engineers and Scientists

Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold and Silver Corporation (Sabina) located in the West Kitikmeot region of Nunavut. Exploration programs were run out of both the Goose and George properties in 2012.

For 2012, Sabina contracted Rescan Environmental Services (Rescan) to conduct a comprehensive baseline program that covered the geographical area of the Goose Property, the George Property, and a Marine Laydown Area located on the southern part of Bathurst Inlet. This report presents the results from the 2012 noise baseline program.

Ten noise monitoring stations were set up at varying distances from Goose Camp, George Camp, and the Marine Laydown Area in 2012. Noise levels were recorded over a 24 hour period in March and June. The locations were selected to characterize the range of baseline conditions in the region, based on their proximity of known deposits and sensitive wildlife receptors. Results from the noise monitoring program captured background noise levels from stations that were located approximately 3 to 70 km away from the camps. Noise levels were also recorded at both exploration camps.

The highest logarithmic averages were measured at stations S01 and S10, which were situated at Goose and George exploration camps, which is to be expected due to the noise generated by anthropogenic sources during exploration. The next highest logarithmic averages were measured at stations S05, S06 and S03 (high to low). High winds, and increased bird calls recorded during the June sampling period could explain the high noise levels at all three of these sites. Station S03 was located approximately 3 km from Goose Camp and S05 and S06 were located along the flight path between George and Goose Camps. In comparison the two monitoring stations with the lowest logarithmic averages, S07 and S08, were the furthest away from existing infrastructure (~70 km).

Noise data collected in 2012 was reflective of pristine background noise conditions as well as exploration camp noise conditions. 2012 data compares well with background studies done in other pristine areas, where L_{eq} values can range from 9 to 22 dbA, depending on proximity to noise sources, wind speed and snow cover (Menge, Ross, and Ernenwein 2002).

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Rescan™
Engineers and Scientists

BACK RIVER PROJECT
2012 NOISE BASELINE REPORT

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Glossary and Abbreviations

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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.

Absolute L_{min}	Minimum sound value recorded during a 24-hour monitoring period
dBA	Sound levels measured with an A-weighted filter, which is within a response frequency range for humans and animals, between 1 kHz to 4 kHz (1,000 to 4,000 vibrations per second)
FAT	Felsic Ash Tuff
GPS	Global Positioning System
ha	Hectares
L_{eq}	Continuous equivalent sound level over a time period
L_{90}	Ninetieth percentile level (the A-weighted sound pressure level that is exceeded 90 percent of the time during the measurement period)
L_{max}	Maximum recorded sound level during an hourly period
QA	Quality Assurance
QC	Quality Control

1. Introduction

Rescan™
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1. Introduction

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold and Silver Corporation (Sabina) located in the West Kitikmeot region of Nunavut. Exploration programs were run out of both the Goose and George properties in 2012 (Figure 1-1).

For 2012, Sabina contracted Rescan Environmental Services (Rescan) to conduct a comprehensive baseline program that covered the geographical area of the Goose Property, the George Property, and a Marine Laydown Area located on the southern part of Bathurst Inlet. The following components were included in the 2012 baseline program:

- Meteorology
- Air Quality and Dust
- Noise
- Hydrology and Bathymetry
- Freshwater Water Quality, Sediment Quality, Aquatic Biology
- Freshwater Fish and Fish Habitat
- Marine Water Quality, Sediment Quality, Aquatic Biology
- Marine Fish and Fish Habitat
- Wildlife (Terrestrial and Marine)
- Wildlife DNA Study (Grizzly Bear and Wolverine)
- Ecosystem Mapping
- Vegetation and Wetlands (including Rare Plants)
- Soils and Terrain
- Country Foods
- Archaeology
- Socio-economics
- Land Use
- Metal Leaching/Acid Rock Drainage (ML/ARD)

The 2012 baseline program was designed around potential infrastructure and known deposits at the Goose Property, the George Property, and the Marine Laydown Area. It was assumed that access from the Marine Laydown Area to George and Goose properties would be by winter road, and that access between the George and Goose properties would also be by winter road.

This report presents the results from the noise portion of the 2012 baseline program, which was undertaken in March and June of 2012. Chapter 2 of this report presents the methods, Chapter 3 presents the results, and Chapter 4 presents a summary of the 2012 data. All raw data collected are included as appendices to this report.



Figure 1-1

Back River Project Location

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2. Methodology

2. Methodology

Noise may affect wildlife populations by causing them to avoid important habitats and/or take time away from other key behaviors such as feeding, breeding, or watching for predators, which can ultimately lead to reduced reproductive productivity and/or increased mortality. To quantify baseline noise conditions, monitoring was conducted at ten locations around the Project area during March and June (Figure 2-1).

Table 2-1 provides the UTM locations of the sampling sites. The locations were selected to characterize the range of baseline conditions in the region, based on their proximity to known deposits and sensitive wildlife receptors. The time periods were chosen to encompass winter and summer conditions, and to include the critical bird nesting period and a portion of the caribou migration in June.

Table 2-1. UTM Coordinates of Noise Monitoring Stations

Location	Easting	Northing
S01	434023	7269878
S02	444229	7281281
S03	436819	7269564
S04	442052	7271258
S05	393767	7306118
S06	406727	7289932
S07	373761	7382904
S08	388656	7382021
S09	388255	7328466
S10	388124	7313269

Note: UTM references are from Zone 13 NAD 83

Noise is typically monitored as sound pressure level, in A-weighted decibels (dBA). The A-weighting is designed to match the average frequency response of the human ear. Some typical noise levels are as follows:

- rustling leaves: 20;
- humming of refrigerator: 40;
- normal conversation: 60;
- business office: 65;
- average city traffic: 80 to 85;
- jackhammer:100;
- jet take-off at 100 m distance: 130; and
- motorcycles, firecrackers, small arms fire: up to 140.

Baseline noise levels were measured using a Brüel & Kjaer Model 2250 sound level meter capable of logging data and sound files (Plate 2-1). The microphone was protected by a wind screen/weather shield and bird spikes. A weather resistant case protected the meter and battery pack, and provided a stable base for the kit. Both the average and maximum peak sound levels were measured using a sound level meter with “A” standardized frequency rating (dBA), designed to match the frequency response of the human ear. The sound level meters were calibrated prior to sampling. Noise measurements were made once every five seconds, 1.5 m above ground for a minimum of 24 consecutive hours. The Brüel & Kjaer Model 2250 sound level meter has an operating range that captures low sound levels, which are typical for undisturbed wilderness areas.

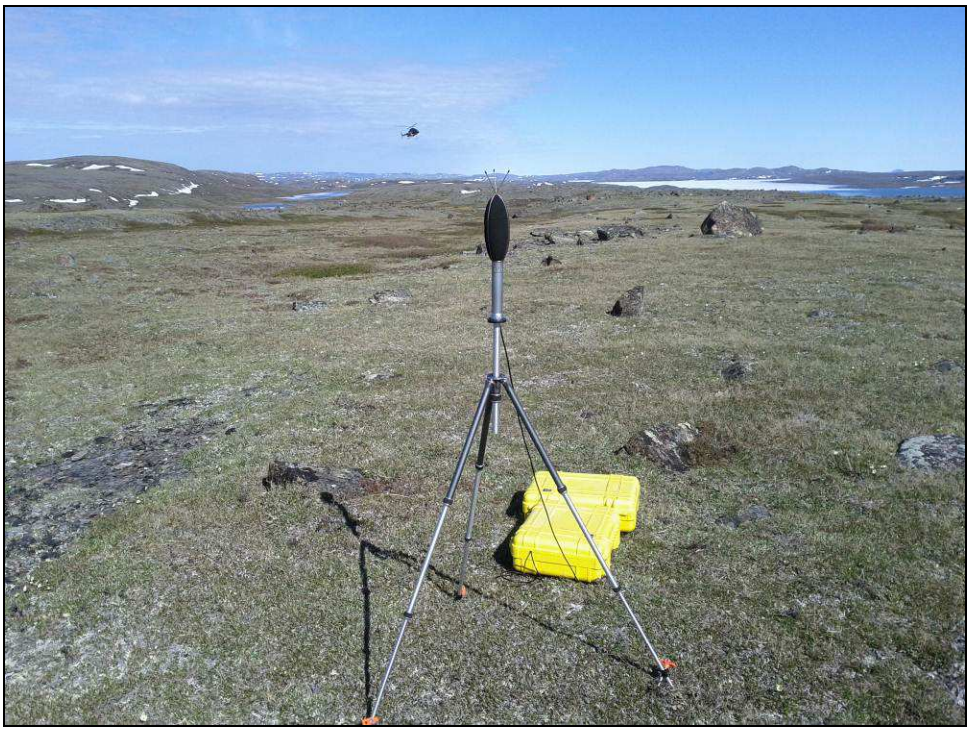


Plate 2-1. A typical sound level meter and associated environmental enclosure kits.

The first survey was conducted from March 20 – 29, 2012, and the second survey took place from June 14 - 20, 2012. These two monitoring periods had a wide range of environmental variation, such as changing wind speeds, and varying levels of noise from birds, mammals, and anthropogenic activity.

Data parameters logged during these survey periods included L_{eq}, L_{90}, L_{max}, and absolute L_{min}.

- L_{eq} is the continuous equivalent sound level over a time period.
- L_{90} is the ninetieth percentile level (the A-weighted sound pressure level that is exceeded 90 percent of the time during the measurement period). For example, L_{90} = 80 dBA means that the sound pressure level exceeded 80 dBA during 90% of the measurement period. L_{90} is usually regarded as the residual level or the background noise level without discrete events (e.g., helicopters, fixed wing aircraft).
- L_{max} is the maximum value recorded during an hourly period.
- Absolute L_{min} is the minimum value recorded during the monitoring period (24 hours).

L_{eq} values include noise from anthropogenic sources such as helicopters and aircraft movement, therefore not typically reflecting the natural noise level conditions in the area. Background noise studies done in other pristine areas, have found that L_{90} values can range from 9 to 22 dbA, depending on proximity to noise sources, wind speed and snow cover (Menge, Ross, and Ernenwein 2002). L_{90} values provide a better indication of the natural noise levels since discrete events that occur from anthropogenic sources will not be part of 90% of the measurement time period. Additionally, the sound level meters recorded audible sound files, which were used for the analysis of the baseline data to identify the peak events and the associated noise sources.

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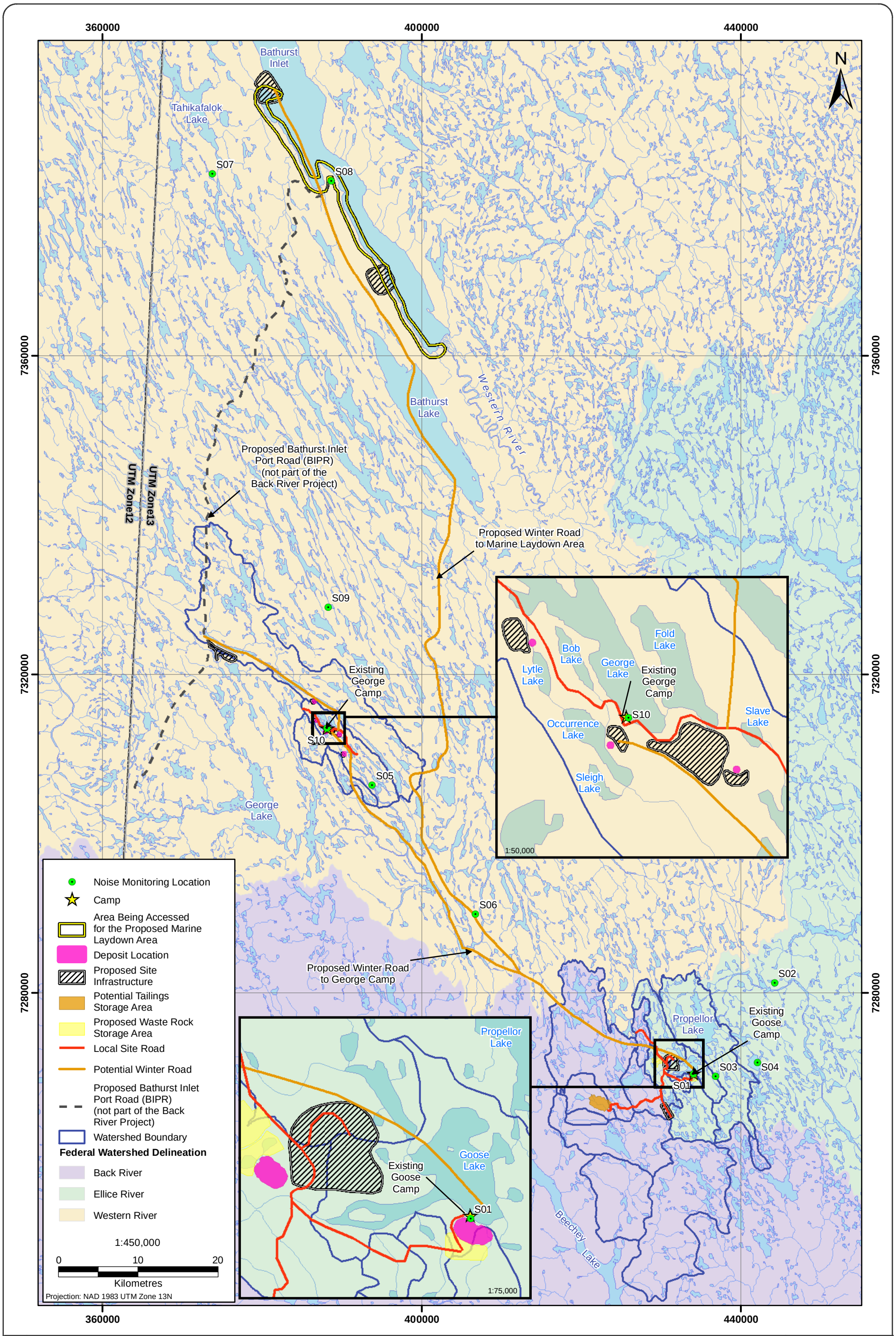


Figure 2-1

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2012 Noise Baseline Monitoring Locations, Back River Project

Figure 2-1

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The following weather parameters were recorded by the George Camp automated meteorology station during each noise measurement time period:

- relative humidity (%);
- wind speed (km/h or m/s);
- wind direction (degrees from true north);
- precipitation (mm); and
- temperature (°C).

The acceptable weather conditions for noise monitoring are:

- relative humidity of less than 90%;
- wind speeds of less than 20 km/h;
- no active precipitation (rain or snow); and
- temperatures that allow the meter body to be maintained within manufacturer's specifications.

The following information was recorded in the field during the noise monitoring program:

- descriptions of the monitoring site using sketches and pictures;
- time of set up and tear down;
- time of calibration;
- type of surface the meter is placed on;
- observed audible noise sources;
- distance from all obstacles in the area (cannot be closer than 3 m to any surface except the ground);
- global position system (GPS) location;
- serial number of the meter being used; and
- weather conditions at each site at the time of set up and tear down, including precipitation and cloud cover.

The noise meters were set up and operated to obtain reliable data given the on-site conditions. The noise meters cannot operate reliably at air temperatures below -20°C. Typical battery power for these instruments does not last long (usually less than 24 hours) in extreme cold, so a spare battery was taken into the field to be certain that the sound level meters were fully operational during the monitoring period. A housing or protection mechanism for the cable wire was used, and the tripod was secured to the ground to prevent tampering by wildlife.

Recorded sound level and audio sound were downloaded to a computer for analysis with the Brüel and Kjaer 7820 Evaluator® software program. The sound recordings were reviewed to identify noise sources, such as technician activities, wind, rain, construction and helicopter noise. Hourly values were then calculated for the 24-hour measurements from the 1-minute data. Other indicators used to identify sources of noise were time of day and field observations.

Quality Assurance (QA) and Quality Control (QC) checks were conducted on the downloaded data. Field QA/QC of equipment was not always practical as the climate and terrain were not always conducive to frequent checks. Weather data were verified in the field with a pocket weather meter. Equipment was calibrated before and after each 24-hour survey to ensure that the noise meter and microphone were operating properly. All information was recorded by the field technician.

Detailed field notes were recorded during the monitoring period to record the state of the equipment and any audible noises. The site visits were conducted by experienced technicians to ensure proper documentation and field observations.

3. Results

3. Results

This section presents the results from the baseline noise measurements in March and June of 2012. Ten locations were chosen to conduct noise monitoring. Results from each station are provided individually, and a summary of all results is provided in chapter 4.

3.1 S01

Station S01 was positioned close to the Goose exploration camp (plates 3.1-1 and 3.1-2). The sound monitor was surrounded by gently undulating hills with exposed bedrock typical of Arctic terrain. There was a layer of snow present during the March 2012 sampling period.



Plate 3.1-1. S01 Noise Monitoring Station, March 2012.

One-minute noise levels recorded during March and June 2012 are shown in Figure 3.1-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March and June 2012 sampling periods are shown in Tables 3.1-1a and 3.1-1b, respectively.

General sources of noise observed at this location were aircraft, wind noise, and heavy machinery. Sounds from birds were also detected during the summer (June) monitoring period. Precipitation was recorded during monitoring of S01 in the 2012 sampling period at 5:00 PM on June 14, 2012 and at 11:00 AM on June 15, 2012.

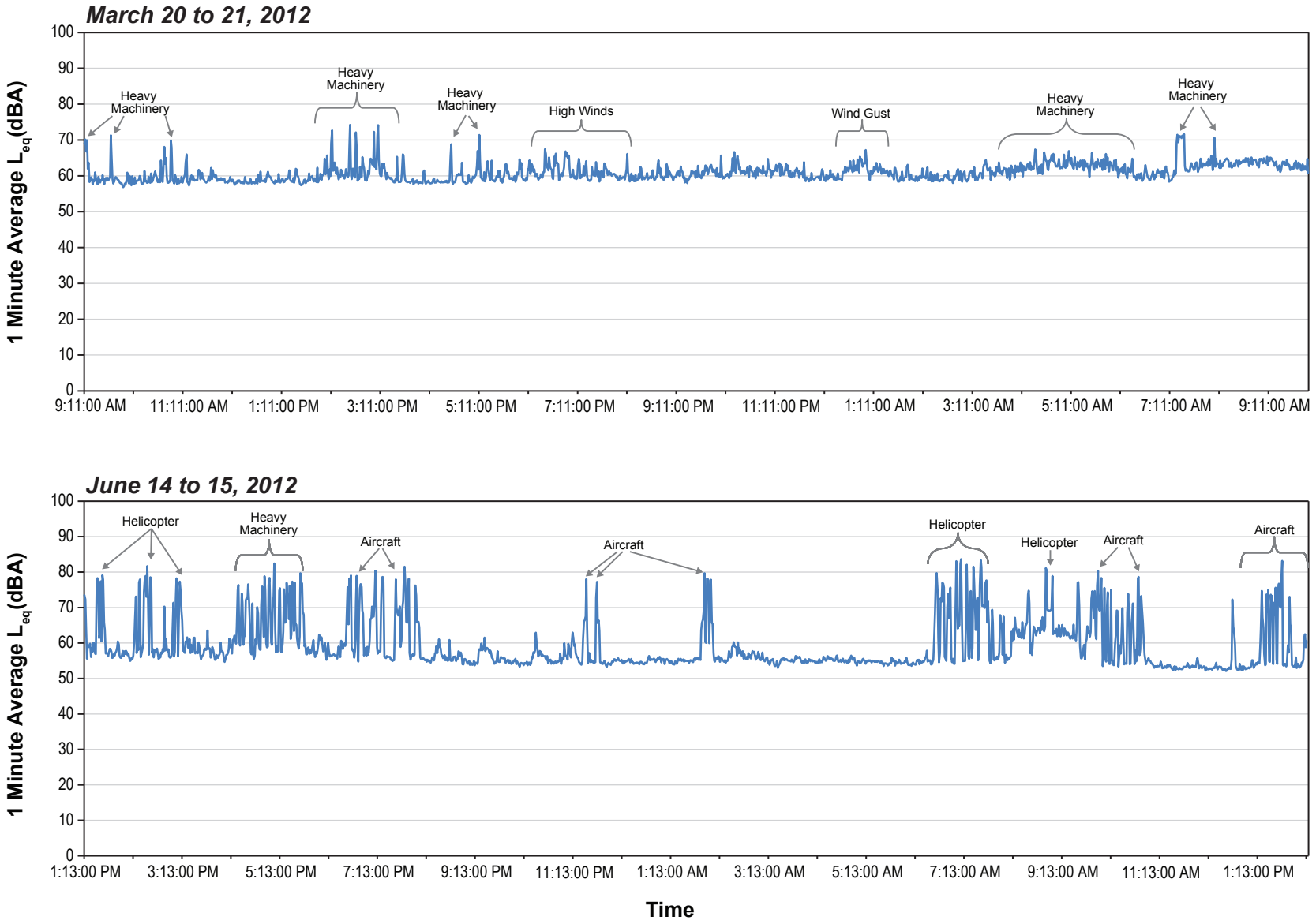


Figure 3.1-1

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Back River Noise Monitoring Station S01, March and June 2012

Figure 3.1-1

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Plate 3.1-2. S01 Noise Monitoring Station, June 2012.

Table 3.1-1a. Hourly Sound Levels, Station S01, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/20/2012	9:11:00 AM	10:11:00 AM	11.5	80	60	55	75
3/20/2012	10:11:00 AM	11:11:00 AM	13.9	68	61	56	75
3/20/2012	11:11:00 AM	12:11:00 PM	13.4	69	60	55	73
3/20/2012	12:11:00 PM	1:11:00 PM	15.4	67	59	55	69
3/20/2012	1:11:00 PM	2:11:00 PM	14.4	53	60	55	75
3/20/2012	2:11:00 PM	3:11:00 PM	15.6	53	65	55	81
3/20/2012	3:11:00 PM	4:11:00 PM	16.7	53	62	55	79
3/20/2012	4:11:00 PM	5:11:00 PM	20.2	52	60	55	73
3/20/2012	5:11:00 PM	6:11:00 PM	17.5	42	62	56	76
3/20/2012	6:11:00 PM	7:11:00 PM	16.5	41	63	56	80
3/20/2012	7:11:00 PM	8:11:00 PM	17.8	45	61	56	73
3/20/2012	8:11:00 PM	9:11:00 PM	19.7	45	60	56	74
3/20/2012	9:11:00 PM	10:11:00 PM	21.7	49	61	56	76
3/20/2012	10:11:00 PM	11:11:00 PM	20.8	45	62	57	77
3/20/2012	11:11:00 PM	12:11:00 AM	20.3	39	61	56	74
3/21/2012	12:11:00 AM	1:11:00 AM	18.2	19	62	58	79
3/21/2012	1:11:00 AM	2:11:00 AM	19.2	27	61	56	72
3/21/2012	2:11:00 AM	3:11:00 AM	20.4	24	60	56	72
3/21/2012	3:11:00 AM	4:11:00 AM	20.7	23	61	56	74

(continued)

Table 3.1-1a. Hourly Sound Levels, Station S01, March 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/21/2012	4:11:00 AM	5:11:00 AM	20.6	24	63	56	74
3/21/2012	5:11:00 AM	6:11:00 AM	21.2	24	64	57	74
3/21/2012	6:11:00 AM	7:11:00 AM	18.6	21	61	56	72
3/21/2012	7:11:00 AM	8:11:00 AM	20.0	23	66	57	79
3/21/2012	8:11:00 AM	9:11:00 AM	18.7	18	64	60	72
Maximum			*21.7*	*n/a*	*66*	*58*	*81*
Minimum			*11.5*	*n/a*	*59*	*55*	*69*
Logarithmic average[1]			*18.0*	*n/a*	*62*	*56*	*76*

[1] *Wind speed and wind direction are arithmetic averages.*

Table 3.1-1b. Hourly Sound Levels, Station S01, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/14/2012	1:13:00 PM	2:13:00 PM	14.5	320	71	55	92
6/14/2012	2:13:00 PM	3:13:00 PM	15.5	330	72	55	91
6/14/2012	3:13:00 PM	4:13:00 PM	15.0	326	68	55	89
6/14/2012	4:13:00 PM	5:13:00 PM	14.0	319	72	56	91
6/14/2012	5:13:00 PM	6:13:00 PM	15.7	325	73	56	91
6/14/2012	6:13:00 PM	7:13:00 PM	15.8	322	72	55	93
6/14/2012	7:13:00 PM	8:13:00 PM	16.0	320	74	55	89
6/14/2012	8:13:00 PM	9:13:00 PM	15.6	323	59	54	80
6/14/2012	9:13:00 PM	10:13:00 PM	15.6	319	59	53	74
6/14/2012	10:13:00 PM	11:13:00 PM	15.3	325	58	53	75
6/14/2012	11:13:00 PM	12:13:00 AM	13.7	319	67	53	86
6/15/2012	12:13:00 AM	1:13:00 AM	10.6	1	56	53	61
6/15/2012	1:13:00 AM	2:13:00 AM	12.5	312	70	54	87
6/15/2012	2:13:00 AM	3:13:00 AM	12.8	321	59	54	71
6/15/2012	3:13:00 AM	4:13:00 AM	11.9	329	56	53	63
6/15/2012	4:13:00 AM	5:13:00 AM	12.7	323	57	53	66
6/15/2012	5:13:00 AM	6:13:00 AM	10.8	325	56	53	62
6/15/2012	6:13:00 AM	7:13:00 AM	10.6	329	72	53	92
6/15/2012	7:13:00 AM	8:13:00 AM	10.9	330	76	54	90
6/15/2012	8:13:00 AM	9:13:00 AM	11.2	325	71	57	92
6/15/2012	9:13:00 AM	10:13:00 AM	11.0	325	71	56	88
6/15/2012	10:13:00 AM	11:13:00 AM	11.2	317	70	53	87
6/15/2012	11:13:00 AM	12:13:00 PM	11.7	318	54	52	66
6/15/2012	12:13:00 PM	1:13:00 PM	11.5	325	59	52	79
Maximum			*16.0*	*n/a*	*76*	*57*	*93*
Minimum			*10.6*	*n/a*	*54*	*52*	*61*
Logarithmic average[1]			*13.2*	*n/a*	*70*	*54*	*88*

[1] *Wind speed and wind direction are arithmetic averages.*

The L_{eq} ranges ($L_{eq}[max]$ - $L_{eq}[min]$) of 7 and 22 dBA and the L_{90} ranges ($L_{90}[max]$ - $L_{90}[min]$) of 3 and 5 dBA during March 2012, and June 2012, respectively, represent minor noise fluctuations in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 52 dBA was recorded at 11:00 AM on June 15, 2012. The L_{eq} logarithmic averages were 62 and 70 dBA and the L_{90} logarithmic averages were 56 and 54 dBA during March 2012 and June 2012, respectively. Due to heavy equipment and frequent helicopter noise in the sampling area, noise levels are reflective of exploration camp conditions.

3.2 S02

The set up for Station S02 is shown in plates 3.2-1 and 3.2-2 for the March and June 2012 monitoring periods, respectively. The device was placed on a small hill surrounded by undulating terrain typical of the Arctic, located approximately 15 km northeast of Goose exploration camp. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.2-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.2-1a, and 3.2-1b, respectively.



Plate 3.2-1. S02 Noise Monitoring Station, March 2012.

General noise sources observed at this location included aircraft and wind. No precipitation was observed during monitoring of S02 during the 2012 monitoring periods.

The L_{eq} ranges ($L_{eq}[max]$ - $L_{eq}[min]$) of 13 and 17 dBA and the L_{90} ranges ($L_{90}[max]$ - $L_{90}[min]$) of 4 and 13 dBA during March 2012, and June 2012, respectively, represent minor noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 18 dBA was recorded at 12:00 AM on June 15, 2012. The L_{eq} logarithmic averages were 22 and 39 dBA and the L_{90} logarithmic averages were 17 and 25 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low one value representations of baseline environmental noise in this area.

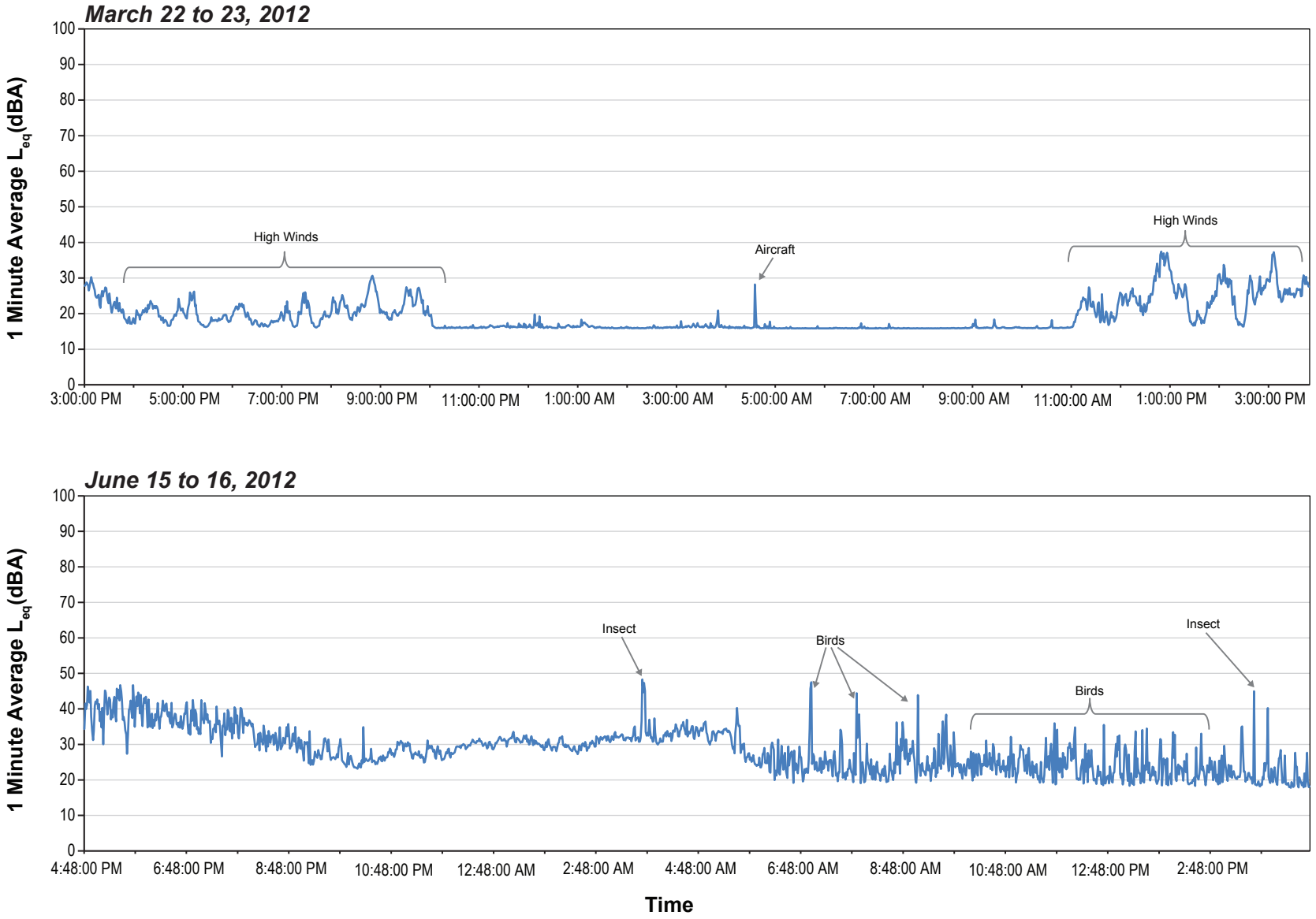


Figure 3.2-1

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Back River Noise Monitoring Station S02, March and June 2012

Figure 3.2-1

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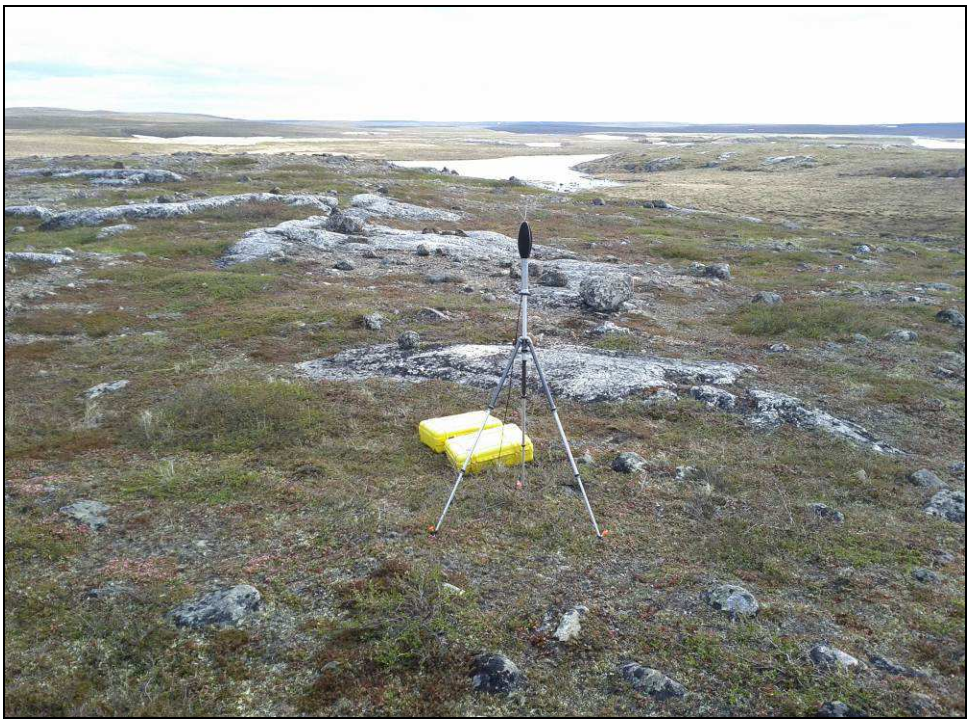


Plate 3.2-2. S02 Noise Monitoring Station, June 2012.

Table 3.2-1a. Hourly Sound Levels, Station S02, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/22/2012	3:00:00 PM	4:00:00 PM	5.7	283	25	20	36
3/22/2012	4:00:00 PM	5:00:00 PM	5.4	284	20	17	39
3/22/2012	5:00:00 PM	6:00:00 PM	4.6	287	21	17	35
3/22/2012	6:00:00 PM	7:00:00 PM	6.1	301	19	16	36
3/22/2012	7:00:00 PM	8:00:00 PM	4.8	307	20	16	42
3/22/2012	8:00:00 PM	9:00:00 PM	4.7	320	24	19	37
3/22/2012	9:00:00 PM	10:00:00 PM	4.2	330	24	19	36
3/22/2012	10:00:00 PM	11:00:00 PM	2.9	10	17	16	34
3/22/2012	11:00:00 PM	12:00:00 AM	2.2	291	16	16	36
3/23/2012	12:00:00 AM	1:00:00 AM	2.7	252	17	16	44
3/23/2012	1:00:00 AM	2:00:00 AM	3.1	317	16	16	40
3/23/2012	2:00:00 AM	3:00:00 AM	2.5	329	16	16	35
3/23/2012	3:00:00 AM	4:00:00 AM	2.3	320	17	16	39
3/23/2012	4:00:00 AM	5:00:00 AM	2.2	236	17	16	39
3/23/2012	5:00:00 AM	6:00:00 AM	3.2	296	16	16	39
3/23/2012	6:00:00 AM	7:00:00 AM	1.8	352	16	16	38
3/23/2012	7:00:00 AM	8:00:00 AM	1.4	29	16	16	38
3/23/2012	8:00:00 AM	9:00:00 AM	2.3	291	16	16	24
3/23/2012	9:00:00 AM	10:00:00 AM	1.9	342	16	16	29
3/23/2012	10:00:00 AM	11:00:00 AM	2.3	304	16	16	25

(continued)

Table 3.2-1a. Hourly Sound Levels, Station S02, March 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/23/2012	11:00:00 AM	12:00:00 PM	1.8	222	21	16	38
3/23/2012	12:00:00 PM	1:00:00 PM	2.4	246	28	19	46
3/23/2012	1:00:00 PM	2:00:00 PM	1.0	216	29	17	46
3/23/2012	2:00:00 PM	3:00:00 PM	1.7	188	27	17	42
Maximum			*6.1*	*n/a*	*29*	*20*	*46*
Minimum			*1.0*	*n/a*	*16*	*16*	*24*
Logarithmic average[1]			*3.1*	*n/a*	*22*	*17*	*40*

[1] *Wind speed and wind direction are arithmetic averages.*
[2] *Not used in calculating logarithmic average or maximum sound level, as measurement contained noise from helicopter takeoff or landing.*

Table 3.2-1b. Hourly Sound Levels, Station S02, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/15/2012	4:48:00 PM	5:48:00 PM	8.0	3	46	28	57
6/15/2012	5:48:00 PM	6:48:00 PM	8.9	28	46	28	61
6/15/2012	6:48:00 PM	7:48:00 PM	8.6	27	43	27	56
6/15/2012	7:48:00 PM	8:48:00 PM	9.3	27	41	25	53
6/15/2012	8:48:00 PM	9:48:00 PM	8.4	27	37	24	52
6/15/2012	9:48:00 PM	10:48:00 PM	7.4	25	35	24	60
6/15/2012	10:48:00 PM	11:48:00 PM	5.7	14	32	24	53
6/15/2012	11:48:00 PM	12:48:00 AM	3.3	4	29	26	36
6/16/2012	12:48:00 AM	1:48:00 AM	6.2	350	31	18	35
6/16/2012	1:48:00 AM	2:48:00 AM	0.9	32	32	29	35
6/16/2012	2:48:00 AM	3:48:00 AM	1.5	81	31	28	45
6/16/2012	3:48:00 AM	4:48:00 AM	1.7	140	40	30	60
6/16/2012	4:48:00 AM	5:48:00 AM	1.0	176	36	31	57
6/16/2012	5:48:00 AM	6:48:00 AM	1.2	147	36	25	56
6/16/2012	6:48:00 AM	7:48:00 AM	2.0	131	33	19	53
6/16/2012	7:48:00 AM	8:48:00 AM	3.3	155	42	19	65
6/16/2012	8:48:00 AM	9:48:00 AM	4.1	186	35	19	58
6/16/2012	9:48:00 AM	10:48:00 AM	5.2	164	38	19	63
6/16/2012	10:48:00 AM	11:48:00 AM	5.3	205	32	19	58
6/16/2012	11:48:00 AM	12:48:00 PM	3.2	191	33	19	57
6/16/2012	12:48:00 PM	1:48:00 PM	4.0	56	35	19	62
6/16/2012	1:48:00 PM	2:48:00 PM	3.5	37	31	18	53
6/16/2012	2:48:00 PM	3:48:00 PM	3.5	3	29	18	53
6/16/2012	3:48:00 PM	4:48:00 PM	5.1	12	35	18	62
Maximum			*9.3*	*n/a*	*46*	*31*	*65*
Minimum			*0.9*	*n/a*	*29*	*18*	*35*
Logarithmic average[1]			*4.6*	*n/a*	*39*	*25*	*58*

[1] *Wind speed and wind direction are arithmetic averages.*

3.3 S03

The set up for Station S03 is shown in plates 3.3-1 and 3.3-2 for the March and June 2012 monitoring periods, respectively. The device was placed on the top of an esker, located approximately 3 km east of Goose exploration camp, surrounded by terrain consisting of gentle hills typical of the Arctic. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.3-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.3-1a and 3.3-1b, respectively. General noise sources observed at this location included drilling from exploration, aircraft, and wind. Precipitation was recorded during the monitoring of S03 at 5:00 PM on June 14, 2012 and at 11:00 AM on June 15, 2012.



Plate 3.3-1. S03 Noise Monitoring Station, March 2012.



Plate 3.3-2. S03 Noise Monitoring Station, June 2012.

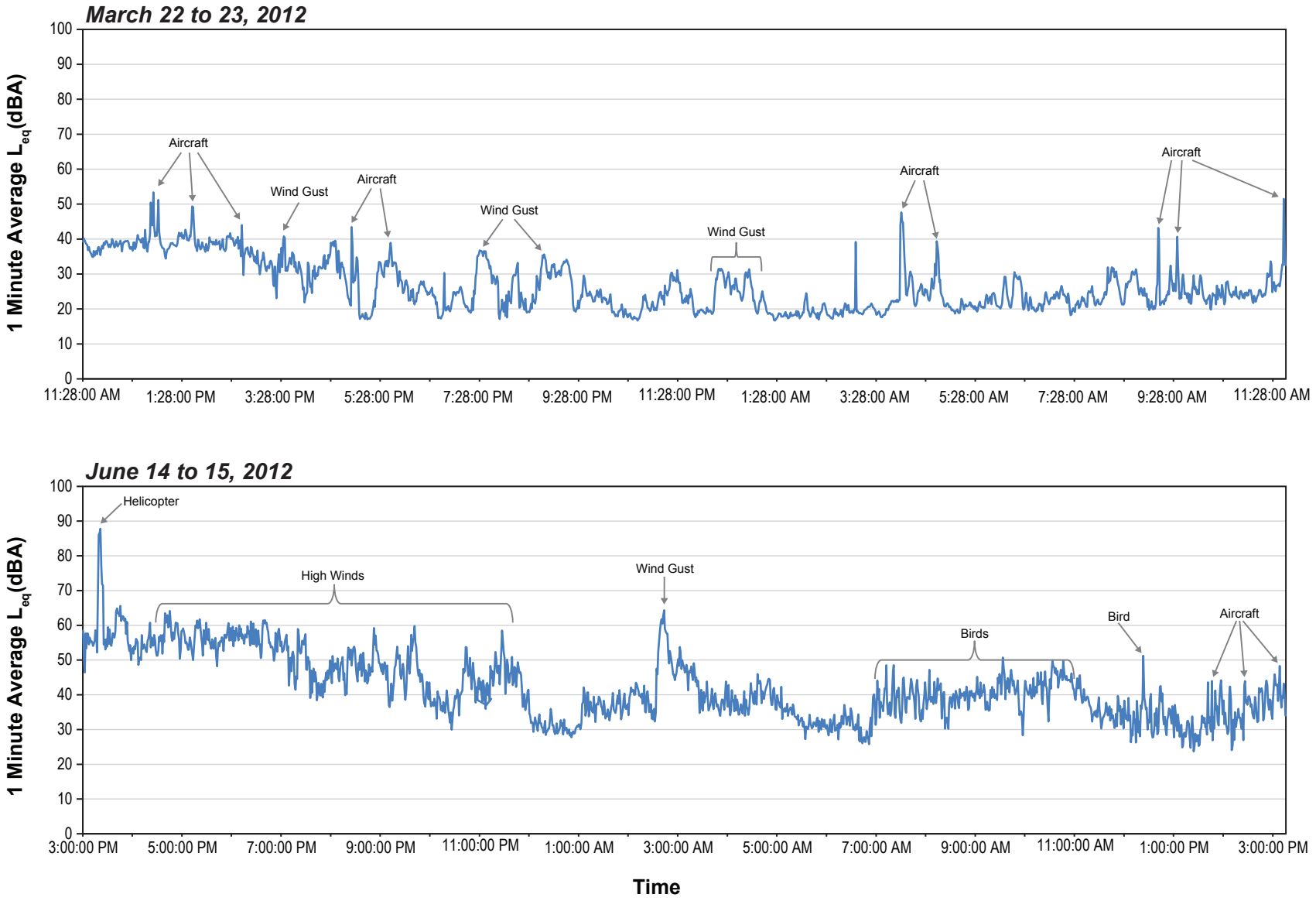


Figure 3.3-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S03, March and June 2012

Figure 3.3-1

Rescan™ Engineers & Scientists

Table 3.3-1a. Hourly Sound Levels, Station S03, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/22/2012	11:28:00 AM	12:28:00 PM	4.7	303	38	30	47
3/22/2012	12:28:00 PM	1:28:00 PM	5.0	308	42	34	59
3/22/2012	1:28:00 PM	2:28:00 PM	4.7	291	41	33	57
3/22/2012	2:28:00 PM	3:28:00 PM	5.0	273	39	30	53
3/22/2012	3:28:00 PM	4:28:00 PM	5.7	283	33	21	50
3/22/2012	4:28:00 PM	5:28:00 PM	5.4	284	34	21	50
3/22/2012	5:28:00 PM	6:28:00 PM	4.6	287	31	17	41
3/22/2012	6:28:00 PM	7:28:00 PM	6.1	301	24	17	42
3/22/2012	7:28:00 PM	8:28:00 PM	4.8	307	31	17	41
3/22/2012	8:28:00 PM	9:28:00 PM	4.7	320	29	18	40
3/22/2012	9:28:00 PM	10:28:00 PM	4.2	330	28	20	37
3/22/2012	10:28:00 PM	11:28:00 PM	2.9	10	20	17	28
3/22/2012	11:28:00 PM	12:28:00 AM	2.2	291	25	19	35
3/23/2012	12:28:00 AM	1:28:00 AM	1.8	222	28	22	34
3/23/2012	1:28:00 AM	2:28:00 AM	3.1	317	20	17	28
3/23/2012	2:28:00 AM	3:28:00 AM	2.5	329	20	17	29
3/23/2012	3:28:00 AM	4:28:00 AM	2.3	320	33	18	57
3/23/2012	4:28:00 AM	5:28:00 AM	2.2	236	31	20	50
3/23/2012	5:28:00 AM	6:28:00 AM	3.2	296	21	19	29
3/23/2012	6:28:00 AM	7:28:00 AM	1.8	352	25	19	33
3/23/2012	7:28:00 AM	8:28:00 AM	1.4	29	23	19	29
3/23/2012	8:28:00 AM	9:28:00 AM	2.3	291	27	21	36
3/23/2012	9:28:00 AM	10:28:00 AM	1.9	342	30	20	49
3/23/2012	10:28:00 AM	11:28:00 AM	2.3	304	25	20	34
Maximum			*6.1*	*n/a*	*42*	*34*	*59*
Minimum			*1.4*	*n/a*	*20*	*17*	*28*
Logarithmic average[1]			*3.6*	*n/a*	*33*	*26*	*50*

[1] *Wind speed and wind direction are arithmetic averages.*

Table 3.3-1b. Hourly Sound Levels, Station S03, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/14/2012	3:00:00 PM	4:00:00 PM	15.0	326	62	45	74
6/14/2012	4:00:00 PM	5:00:00 PM	14.0	319	62	45	74
6/14/2012	5:00:00 PM	6:00:00 PM	15.7	325	61	46	72
6/14/2012	6:00:00 PM	7:00:00 PM	15.8	322	60	42	75
6/14/2012	7:00:00 PM	8:00:00 PM	16.0	320	54	37	69
6/14/2012	8:00:00 PM	9:00:00 PM	15.6	323	55	38	69
6/14/2012	9:00:00 PM	10:00:00 PM	15.6	319	53	33	71
6/14/2012	10:00:00 PM	11:00:00 PM	15.3	325	50	33	65

(continued)

Table 3.3-1b. Hourly Sound Levels, Station S03, June 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/14/2012	11:00:00 PM	12:00:00 AM	13.7	319	51	28	71
6/15/2012	12:00:00 AM	1:00:00 AM	11.9	311	38	27	52
6/15/2012	1:00:00 AM	2:00:00 AM	12.5	312	42	31	52
6/15/2012	2:00:00 AM	3:00:00 AM	12.8	321	58	34	76
6/15/2012	3:00:00 AM	4:00:00 AM	11.9	329	43	31	59
6/15/2012	4:00:00 AM	5:00:00 AM	12.7	323	44	32	59
6/15/2012	5:00:00 AM	6:00:00 AM	10.8	325	37	26	54
6/15/2012	6:00:00 AM	7:00:00 AM	10.6	329	40	26	56
6/15/2012	7:00:00 AM	8:00:00 AM	10.9	330	44	31	59
6/15/2012	8:00:00 AM	9:00:00 AM	11.2	325	42	32	54
6/15/2012	9:00:00 AM	10:00:00 AM	11.0	325	47	34	63
6/15/2012	10:00:00 AM	11:00:00 AM	11.2	317	48	34	62
6/15/2012	11:00:00 AM	12:00:00 PM	11.7	318	39	27	50
6/15/2012	12:00:00 PM	1:00:00 PM	11.5	325	44	24	69
6/15/2012	1:00:00 PM	2:00:00 PM	11.4	336	39	24	55
6/15/2012	2:00:00 PM	3:00:00 PM	10.6	1	46	29	64
Maximum			*16.0*	*n/a*	*62*	*46*	*76*
Minimum			*10.6*	*n/a*	*37*	*24*	*50*
Logarithmic average[1]			*13.0*	*n/a*	*55*	*38*	*69*

[1] *Wind speed and wind direction are arithmetic averages.*

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 23 and 25 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 17 and 22 dBA during March 2012 and June 2012, respectively, represent moderate noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 24 dBA was recorded at 12:00 PM on June 15, 2012. The L_{eq} logarithmic averages were 34 and 55 dBA and the L_{90} logarithmic averages were 26 and 38 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low one value representations of baseline environmental noise in this area.

3.4 S04

The set up for Station S04 is shown in plates 3.4-1 and 3.4-2 for the March and June 2012 monitoring periods, respectively. The device was placed approximately 8 km east of Goose exploration camp on bedrock with a slight incline surrounded by terrain consisting of gentle hills typical of the Arctic. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.4-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.4-1a and 3.4-1b, respectively. General noise sources observed at this location included aircraft and wind. No precipitation was observed during monitoring of S04 in the 2012 period.

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 22 and 21 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 14 and 13 dBA during March 2012 and June 2012, respectively, represent minor noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 17dBA was recorded at 3:05 AM on March 24, 2012. The L_{eq} logarithmic averages were 31 and

39 dBA and the L_{90} logarithmic averages were 22 and 25 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low one value representations of baseline environmental noise in this area.

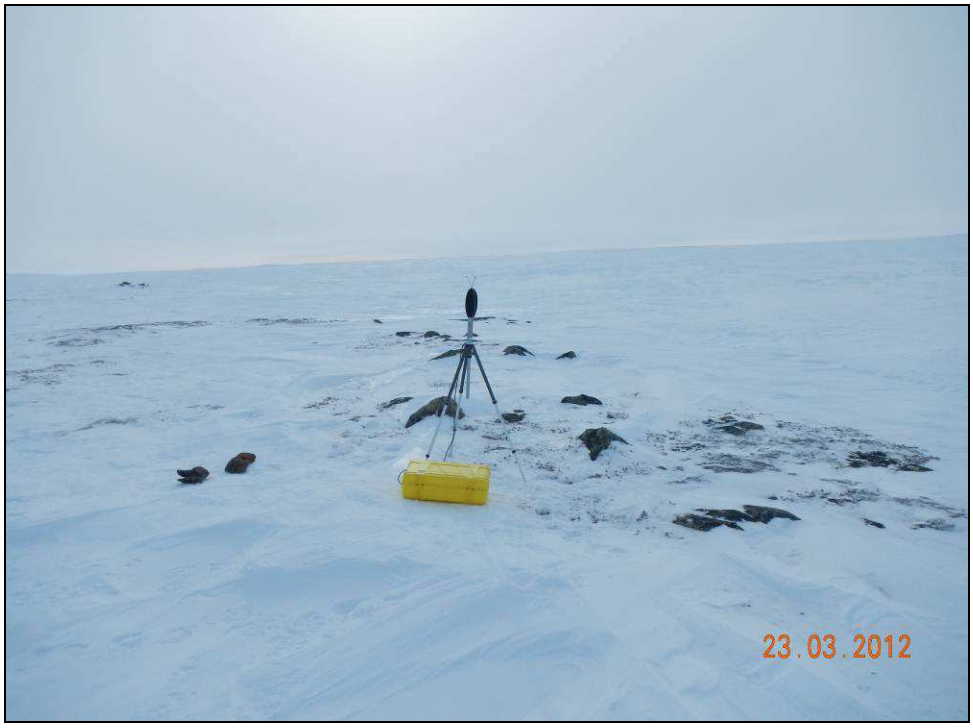


Plate 3.4-1. S04 Noise Monitoring Station, March 2012.



Plate 3.4-2. S04 Noise Monitoring Station, June 2012.

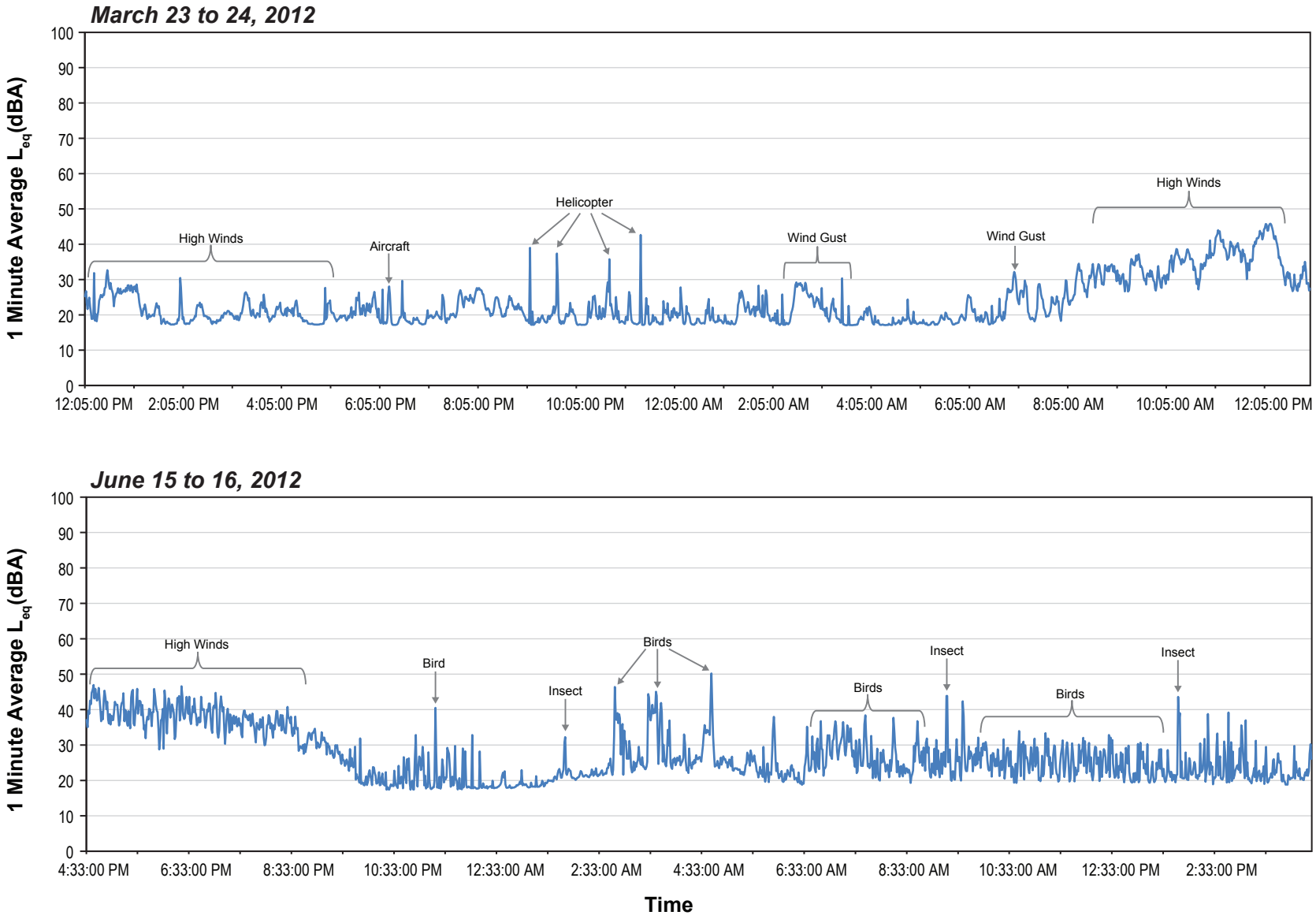


Figure 3.4-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S04, March and June 2012

Figure 3.4-1

Rescan™ Engineers & Scientists

Table 3.4-1a. Hourly Sound Levels, Station S04, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/23/2012	12:05:00 PM	1:05:00 PM	7.2	180	40	25	50
3/23/2012	1:05:00 PM	2:05:00 PM	5.9	255	23	17	33
3/23/2012	2:05:00 PM	3:05:00 PM	3.3	225	21	17	34
3/23/2012	3:05:00 PM	4:05:00 PM	4.0	219	22	18	29
3/23/2012	4:05:00 PM	5:05:00 PM	4.2	225	20	17	38
3/23/2012	5:05:00 PM	6:05:00 PM	4.0	230	22	18	31
3/23/2012	6:05:00 PM	7:05:00 PM	5.5	229	21	17	40
3/23/2012	7:05:00 PM	8:05:00 PM	5.9	242	22	18	30
3/23/2012	8:05:00 PM	9:05:00 PM	5.5	245	24	19	30
3/23/2012	9:05:00 PM	10:05:00 PM	5.9	250	25	17	50
3/23/2012	10:05:00 PM	11:05:00 PM	6.7	229	23	17	44
3/23/2012	11:05:00 PM	12:05:00 AM	6.5	224	26	17	54
3/24/2012	12:05:00 AM	1:05:00 AM	6.8	235	20	17	40
3/24/2012	1:05:00 AM	2:05:00 AM	6.7	216	22	17	40
3/24/2012	2:05:00 AM	3:05:00 AM	4.9	208	25	17	38
3/24/2012	3:05:00 AM	4:05:00 AM	5.6	209	21	17	42
3/24/2012	4:05:00 AM	5:05:00 AM	5.2	202	19	17	35
3/24/2012	5:05:00 AM	6:05:00 AM	5.9	202	18	17	24
3/24/2012	6:05:00 AM	7:05:00 AM	5.7	200	23	18	38
3/24/2012	7:05:00 AM	8:05:00 AM	6.3	200	25	18	35
3/24/2012	8:05:00 AM	9:05:00 AM	6.2	193	31	22	40
3/24/2012	9:05:00 AM	10:05:00 AM	5.0	186	32	25	41
3/24/2012	10:05:00 AM	11:05:00 AM	5.3	188	35	27	50
3/24/2012	11:05:00 AM	12:05:00 PM	4.0	192	40	31	48
Maximum			*7.2*	*n/a*	*40*	*31*	*54*
Minimum			*3.3*	*n/a*	*18*	*17*	*24*
Logarithmic average[1]			*5.5*	*n/a*	*31*	*22*	*45*

[1] *Wind speed and wind direction are arithmetic averages.*

Table 3.4-1b. Hourly Sound Levels, Station S04, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/15/2012	4:33:00 PM	5:33:00 PM	8.0	3	47	34	57
6/15/2012	5:33:00 PM	6:33:00 PM	8.9	28	44	31	60
6/15/2012	6:33:00 PM	7:33:00 PM	8.6	27	44	31	58
6/15/2012	7:33:00 PM	8:33:00 PM	9.3	27	42	30	53
6/15/2012	8:33:00 PM	9:33:00 PM	8.4	27	39	27	52
6/15/2012	9:33:00 PM	10:33:00 PM	7.4	25	32	19	47

(continued)

Table 3.4-1b. Hourly Sound Levels, Station S04, June 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/15/2012	10:33:00 PM	11:33:00 PM	5.7	14	28	17	45
6/15/2012	11:33:00 PM	12:33:00 AM	3.3	4	35	17	61
6/16/2012	12:33:00 AM	1:33:00 AM	6.2	350	25	19	54
6/16/2012	1:33:00 AM	2:33:00 AM	0.9	32	23	18	41
6/16/2012	2:33:00 AM	3:33:00 AM	1.5	81	39	21	58
6/16/2012	3:33:00 AM	4:33:00 AM	1.7	140	44	21	59
6/16/2012	4:33:00 AM	5:33:00 AM	1.0	176	42	21	60
6/16/2012	5:33:00 AM	6:33:00 AM	1.2	147	34	20	54
6/16/2012	6:33:00 AM	7:33:00 AM	2.0	131	33	19	60
6/16/2012	7:33:00 AM	8:33:00 AM	3.3	155	34	22	54
6/16/2012	8:33:00 AM	9:33:00 AM	4.1	186	30	20	47
6/16/2012	9:33:00 AM	10:33:00 AM	5.2	164	36	20	59
6/16/2012	10:33:00 AM	11:33:00 AM	5.3	205	31	20	52
6/16/2012	11:33:00 AM	12:33:00 PM	3.2	191	30	19	48
6/16/2012	12:33:00 PM	1:33:00 PM	4.0	56	30	19	45
6/16/2012	1:33:00 PM	2:33:00 PM	3.5	37	33	19	59
6/16/2012	2:33:00 PM	3:33:00 PM	3.5	3	33	19	59
6/16/2012	3:33:00 PM	4:33:00 PM	5.1	12	30	19	57
Maximum			*9.3*	*n/a*	*44*	*34*	*61*
Minimum			*0.9*	*n/a*	*23*	*17*	*41*
Logarithmic average[1]			*4.6*	*n/a*	*39*	*25*	*57*

[1] *Wind speed and wind direction are arithmetic averages.*

3.5 S05

The set up for Station S05 is shown in plates 3.5-1 and 3.5-2 for the March and June 2012 monitoring periods, respectively. The device was placed approximately 10 km southeast of George exploration camp on the top of a rocky outcrop surrounded by flat, gently rolling terrain typical of the Arctic.

One-minute noise levels recorded during March and June 2012 are shown in Figure 3.5-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.5-1a and 3.5-1b, respectively. General noise sources observed at this location included aircraft and wind. Precipitation was observed during monitoring of S05 at 2:00 PM to 6:00 PM on June 19, 2012.

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 31 and 45 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 14 and 3 dBA during March 2012 and June 2012, respectively, represent minor noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 15 dBA was recorded at 8:00 AM on March 25, 2012. The L_{eq} logarithmic averages were 36 and 58 dBA and the L_{90} logarithmic averages were 23 and 44 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low/moderate one value representations of baseline environmental noise in this area.

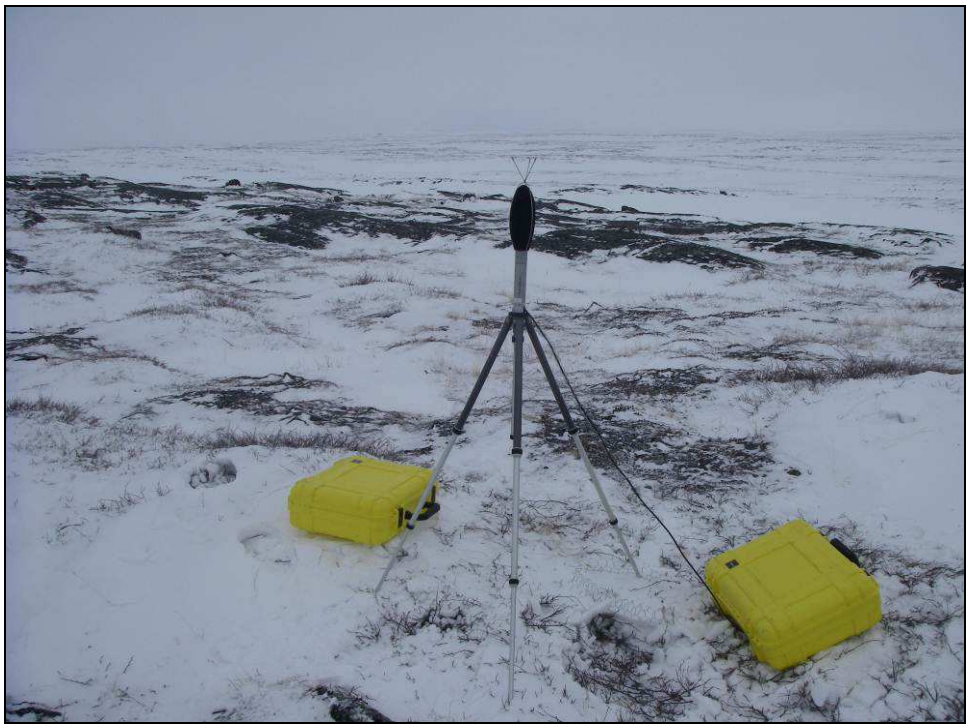


Plate 3.5-1. S05 Noise Monitoring Station, March 2012.

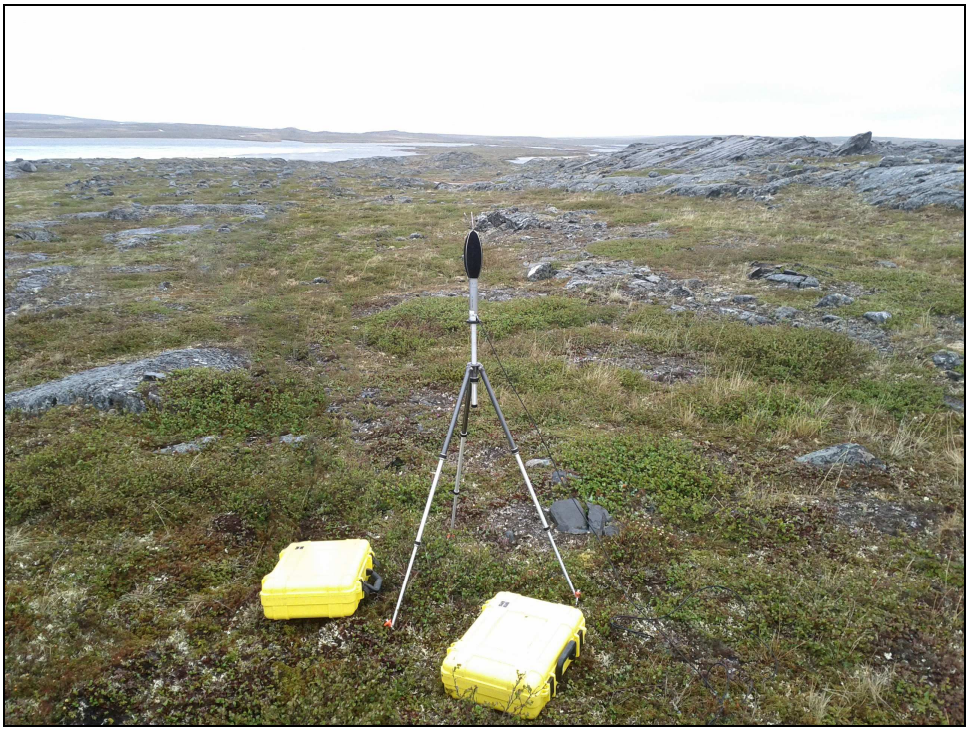


Plate 3.5-2. S05 Noise Monitoring Station, June 2012.

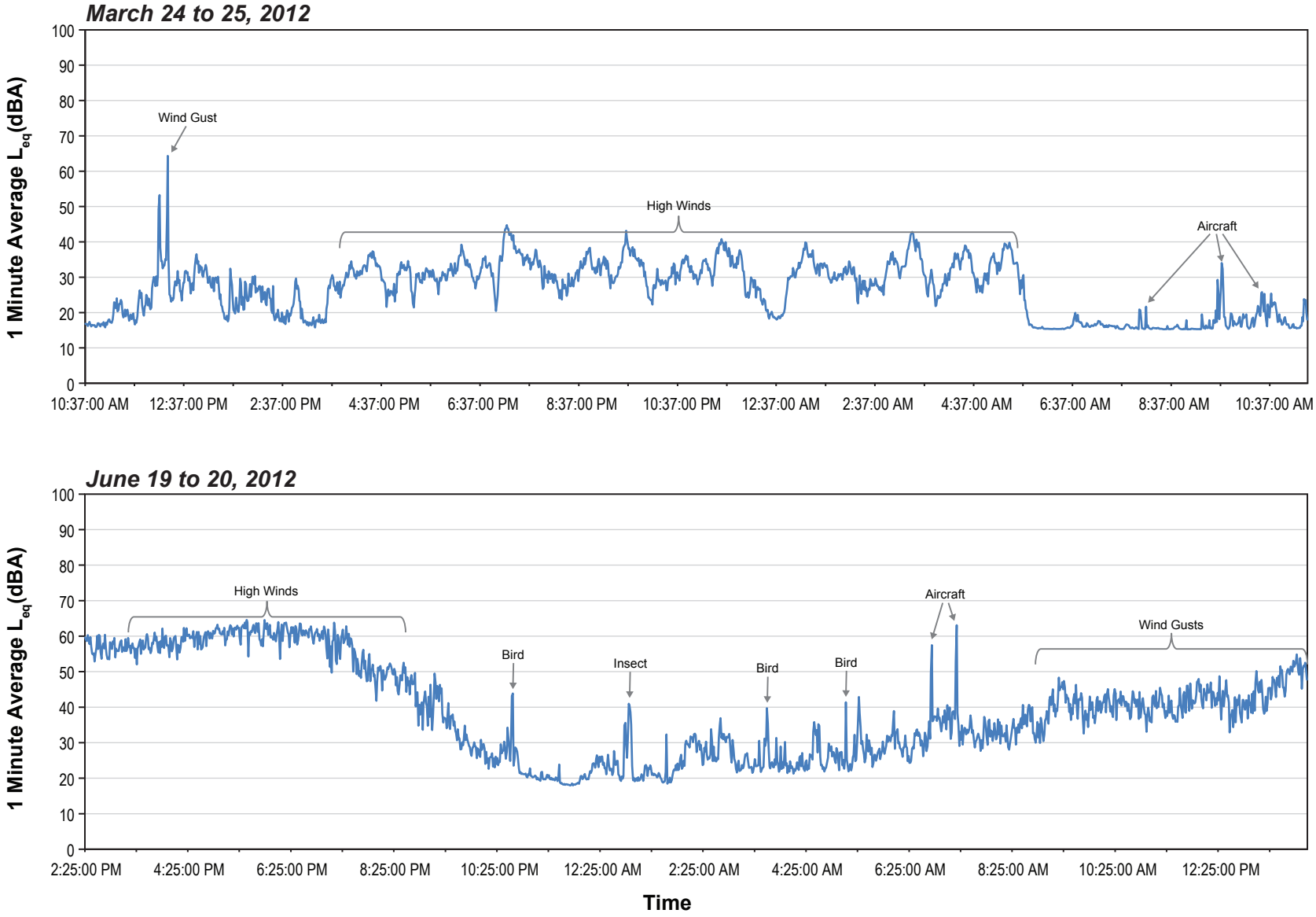


Figure 3.5-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S05, March and June 2012

Figure 3.5-1

Rescan™ Engineers & Scientists

Table 3.5-1a. Hourly Sound Levels, Station S05, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/24/2012	10:37:00 AM	11:37:00 AM	5.3	188	17	16	28
3/24/2012	11:37:00 AM	12:37:00 PM	4.0	191	22	16	35
3/24/2012	12:37:00 PM	1:37:00 PM	7.2	180	47	23	75
3/24/2012	1:37:00 PM	2:37:00 PM	7.2	193	27	18	40
3/24/2012	2:37:00 PM	3:37:00 PM	6.2	189	25	17	53
3/24/2012	3:37:00 PM	4:37:00 PM	8.6	195	26	16	39
3/24/2012	4:37:00 PM	5:37:00 PM	8.9	193	32	23	43
3/24/2012	5:37:00 PM	6:37:00 PM	7.5	175	31	24	40
3/24/2012	6:37:00 PM	7:37:00 PM	11.5	181	33	25	46
3/24/2012	7:37:00 PM	8:37:00 PM	11.0	188	38	29	50
3/24/2012	8:37:00 PM	9:37:00 PM	9.8	184	32	23	45
3/24/2012	9:37:00 PM	10:37:00 PM	8.5	183	35	27	55
3/24/2012	10:37:00 PM	11:37:00 PM	9.6	180	31	24	43
3/24/2012	11:37:00 PM	12:37:00 AM	9.2	183	36	28	49
3/25/2012	12:37:00 AM	1:37:00 AM	8.7	185	26	18	48
3/25/2012	1:37:00 AM	2:37:00 AM	8.0	183	34	27	48
3/25/2012	2:37:00 AM	3:37:00 AM	7.8	183	31	23	45
3/25/2012	3:37:00 AM	4:37:00 AM	8.0	183	36	23	51
3/25/2012	4:37:00 AM	5:37:00 AM	8.4	186	34	25	46
3/25/2012	5:37:00 AM	6:37:00 AM	8.6	188	34	16	47
3/25/2012	6:37:00 AM	7:37:00 AM	7.3	189	16	15	27
3/25/2012	7:37:00 AM	8:37:00 AM	5.8	192	16	15	31
3/25/2012	8:37:00 AM	9:37:00 AM	5.8	208	16	15	46
3/25/2012	9:37:00 AM	10:37:00 AM	6.2	224	22	15	42
Maximum			*11.5*	*n/a*	*47*	*29*	*75*
Minimum			*4.0*	*n/a*	*16*	*15*	*27*
Logarithmic average[1]			*7.9*	*n/a*	*36*	*23*	*61*

[1] *Wind speed and wind direction are arithmetic averages.*

Table 3.5-1b. Hourly Sound Levels, Station S05, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					Leq	L90	Lmax
6/19/2012	2:25:00 PM	3:25:00 PM	12.7	16	61	50	71
6/19/2012	3:25:00 PM	4:25:00 PM	13.7	22	62	50	71
6/19/2012	4:25:00 PM	5:25:00 PM	13.9	21	63	51	73
6/19/2012	5:25:00 PM	6:25:00 PM	14.1	22	66	52	72
6/19/2012	6:25:00 PM	7:25:00 PM	13.2	27	66	52	72
6/19/2012	7:25:00 PM	8:25:00 PM	12.1	20	63	43	75

(continued)

Table 3.5-1b. Hourly Sound Levels, Station S05, June 2012 (completed)

					Sound Level (dBA)		
Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Leq	L90	Lmax
6/19/2012	8:25:00 PM	9:25:00 PM	12.0	22	54	36	65
6/19/2012	9:25:00 PM	10:25:00 PM	9.7	22	46	27	59
6/19/2012	10:25:00 PM	11:25:00 PM	5.9	3	39	21	60
6/19/2012	11:25:00 PM	12:25:00 AM	4.5	336	21	18	35
6/20/2012	12:25:00 AM	1:25:00 AM	14.8	254	31	39	48
6/20/2012	1:25:00 AM	2:25:00 AM	5.9	318	32	19	50
6/20/2012	2:25:00 AM	3:25:00 AM	6.4	298	34	23	46
6/20/2012	3:25:00 AM	4:25:00 AM	7.4	297	34	21	56
6/20/2012	4:25:00 AM	5:25:00 AM	7.8	286	34	21	54
6/20/2012	5:25:00 AM	6:25:00 AM	6.6	276	38	22	59
6/20/2012	6:25:00 AM	7:25:00 AM	8.0	277	45	24	71
6/20/2012	7:25:00 AM	8:25:00 AM	8.8	260	48	28	73
6/20/2012	8:25:00 AM	9:25:00 AM	9.0	249	39	27	58
6/20/2012	9:25:00 AM	10:25:00 AM	9.5	246	46	32	61
6/20/2012	10:25:00 AM	11:25:00 AM	11.7	251	46	33	57
6/20/2012	11:25:00 AM	12:25:00 PM	12.2	246	46	32	61
6/20/2012	12:25:00 PM	1:25:00 PM	12.6	250	48	33	62
6/20/2012	1:25:00 PM	2:25:00 PM	12.1	246	53	36	64
Maximum			*14.8*	*n/a*	*66*	*52*	*75*
Minimum			*4.5*	*n/a*	*21*	*18*	*35*
Logarithmic average[1]			*10.1*	*n/a*	*58*	*44*	*68*

[1] *Wind speed and wind direction are arithmetic averages.*

3.6 S06

The set up for Station S06 is shown in plates 3.6-1 and 3.6-2 for the March and June 2012 monitoring periods, respectively. The device was placed approximately half way between George and Goose exploration camps long the potential access corridor on flat terrain typical of the Arctic. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.6-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.6-1a, 3.6-1b, respectively. General noise sources observed at this location included aircraft and wind. Precipitation was observed during monitoring of S06 at 2:00 PM to 6:00 PM on June 19, 2012.

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 56 and 34 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 16 and 21 dBA during March 2012, and June 2012, respectively, represent moderate noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 16 dBA was recorded at 3:00 PM on March 25, 2012. The L_{eq} logarithmic averages were 36 and 51 dBA and the L_{90} logarithmic averages were 25 and 32 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low one value representations of baseline environmental noise in this area.



Plate 3.6-1. S06 Noise Monitoring Station, March 2012.

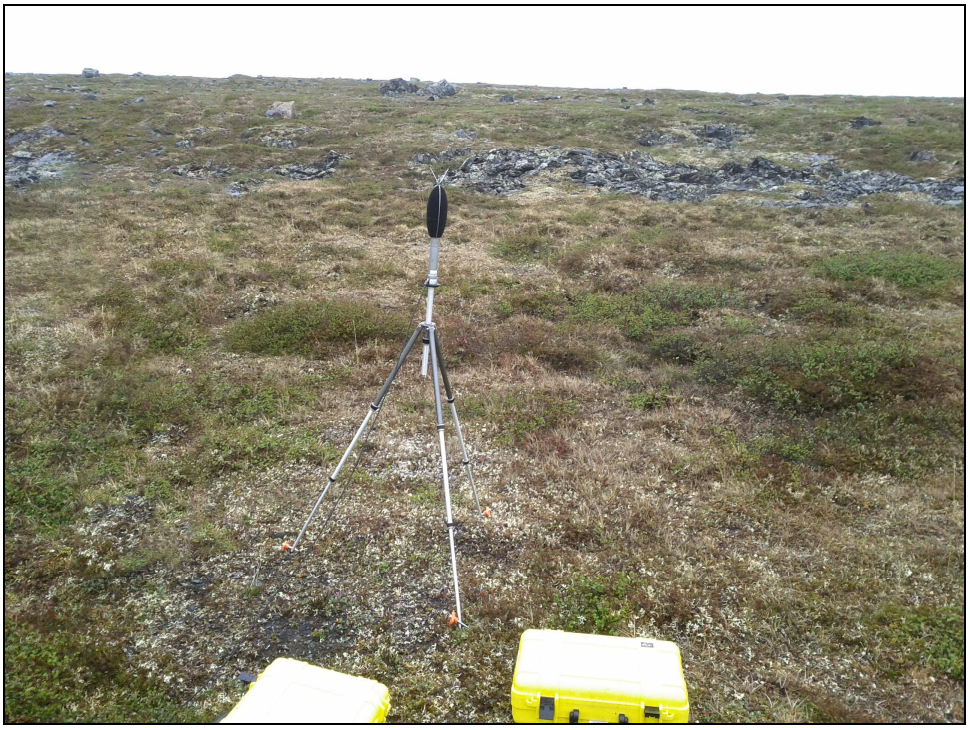


Plate 3.6-2. S06 Noise Monitoring Station, June 2012.

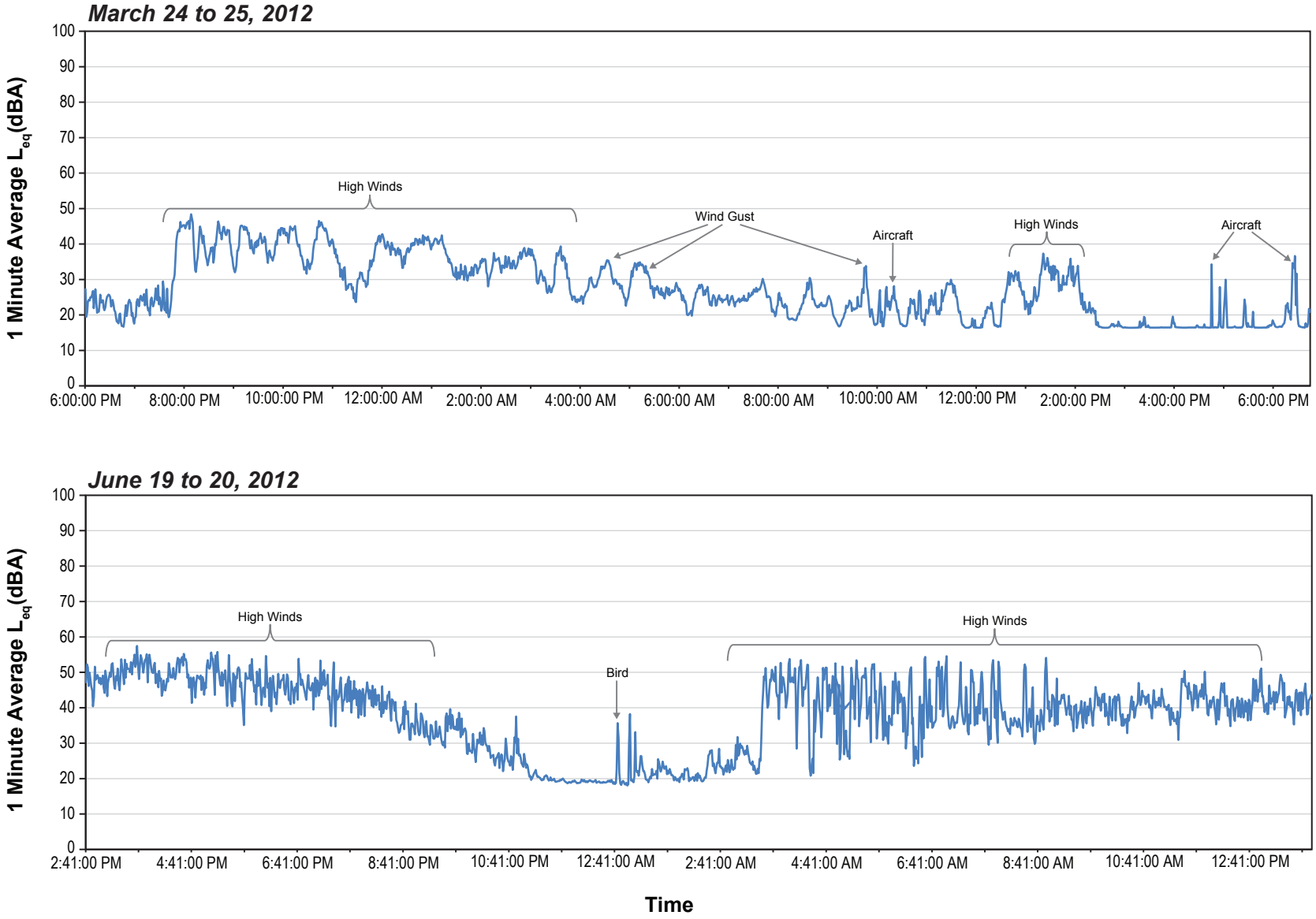


Figure 3.6-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S06, March and June 2012

Figure 3.6-1

Rescan™ Engineers & Scientists

Table 3.6-1a. Hourly Sound Levels, Station S06, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/24/2012	6:00:00 PM	7:00:00 PM	5.8	277	21	19	24
3/24/2012	7:00:00 PM	8:00:00 PM	11.0	189	37	18	50
3/24/2012	8:00:00 PM	9:00:00 PM	9.8	185	43	31	54
3/24/2012	9:00:00 PM	10:00:00 PM	8.5	183	42	32	52
3/24/2012	10:00:00 PM	11:00:00 PM	9.6	180	42	31	52
3/24/2012	11:00:00 PM	12:00:00 AM	9.2	183	36	23	46
3/24/2012	12:00:00 AM	1:00:00 AM	5.8	277	40	17	48
3/25/2012	1:00:00 AM	2:00:00 AM	8.0	184	37	27	46
3/25/2012	2:00:00 AM	3:00:00 AM	7.8	183	36	28	44
3/25/2012	3:00:00 AM	4:00:00 AM	8.0	183	33	22	45
3/25/2012	4:00:00 AM	5:00:00 AM	8.4	187	30	23	41
3/25/2012	5:00:00 AM	6:00:00 AM	8.6	189	31	23	39
3/25/2012	6:00:00 AM	7:00:00 AM	7.3	190	25	19	33
3/25/2012	7:00:00 AM	8:00:00 AM	5.8	192	26	20	35
3/25/2012	8:00:00 AM	9:00:00 AM	5.8	209	24	18	36
3/25/2012	9:00:00 AM	10:00:00 AM	6.2	224	24	17	40
3/25/2012	10:00:00 AM	11:00:00 AM	6.8	232	23	17	35
3/25/2012	11:00:00 AM	12:00:00 PM	7.2	252	24	16	36
3/25/2012	12:00:00 PM	1:00:00 PM	7.8	268	27	17	37
3/25/2012	1:00:00 PM	2:00:00 PM	7.8	269	31	20	43
3/25/2012	2:00:00 PM	3:00:00 PM	8.4	285	23	16	40
3/25/2012	3:00:00 PM	4:00:00 PM	6.0	291	17	16	29
3/25/2012	4:00:00 PM	5:00:00 PM	6.2	280	20	16	45
3/25/2012	5:00:00 PM	6:00:00 PM	5.8	287	19	16	39
Maximum			*11.0*	*n/a*	*43*	*32*	*54*
Minimum			*5.8*	*n/a*	*17*	*16*	*24*
Logarithmic average[1]			*7.6*	*n/a*	*36*	*25*	*46*

[1] Wind speed and wind direction are arithmetic averages.

Table 3.6-1b. Hourly Sound Levels, Station S06, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/19/2012	2:41:00 PM	3:41:00 PM	12.7	16	53	38	65
6/19/2012	3:41:00 PM	4:41:00 PM	13.7	22	56	40	70
6/19/2012	4:41:00 PM	5:41:00 PM	13.9	21	54	38	68
6/19/2012	5:41:00 PM	6:41:00 PM	14.1	22	54	35	66
6/19/2012	6:41:00 PM	7:41:00 PM	13.2	27	52	34	66
6/19/2012	7:41:00 PM	8:41:00 PM	12.1	20	51	32	66

(continued)

Table 3.6-1b. Hourly Sound Levels, Station S06, June 2012 (continued)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/19/2012	8:41:00 PM	9:41:00 PM	12.0	22	46	29	62
6/19/2012	9:41:00 PM	10:41:00 PM	9.7	22	39	26	57
6/19/2012	10:41:00 PM	11:41:00 PM	5.9	3	33	22	47
6/19/2012	11:41:00 PM	12:41:00 AM	4.5	336	22	19	39
6/20/2012	12:41:00 AM	1:41:00 AM	14.8	254	28	37	55
6/20/2012	1:41:00 AM	2:41:00 AM	5.9	318	26	19	51
6/20/2012	2:41:00 AM	3:41:00 AM	6.4	298	27	19	42
6/20/2012	3:41:00 AM	4:41:00 AM	7.4	297	53	20	67
6/20/2012	4:41:00 AM	5:41:00 AM	7.8	286	56	19	68
6/20/2012	5:41:00 AM	6:41:00 AM	6.6	276	55	21	67
6/20/2012	6:41:00 AM	7:41:00 AM	8.0	277	55	23	68
6/20/2012	7:41:00 AM	8:41:00 AM	8.8	260	53	26	67
6/20/2012	8:41:00 AM	9:41:00 AM	9.0	249	51	27	67
6/20/2012	9:41:00 AM	10:41:00 AM	9.5	246	46	30	64
6/20/2012	10:41:00 AM	11:41:00 AM	11.7	251	45	31	56
6/20/2012	11:41:00 AM	12:41:00 PM	12.2	246	48	32	64
6/20/2012	12:41:00 PM	1:41:00 PM	12.6	250	48	31	64
6/20/2012	1:41:00 PM	2:41:00 PM	12.1	246	48	32	62
Maximum			*14.8*	*n/a*	*56*	*40*	*70*
Minimum			*4.5*	*n/a*	*22*	*19*	*39*
Logarithmic average[1]			*10.1*	*n/a*	*51*	*32*	*65*

[1] *Wind speed and wind direction are arithmetic averages.*

3.7 S07

The set up for Station S07 is shown in plates 3.7-1 and 3.7-2 for the March and June 2012 monitoring periods, respectively. The device was placed approximately 10 km southwest of marine laydown option 6 on Bathurst Inlet on terrain consisting of gentle hills typical of the Arctic. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.7-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.7-1a and 3.7-1b, respectively.

General noise sources observed at this location included aircraft and wind. Precipitation was observed during monitoring of S07 at 6:00 PM on March 26, 2012.

The L_{eq} ranges ($L_{eq}[max]$ - $L_{eq}[min]$) of 7 and 15 dBA and the L_{90} ranges ($L_{90}[max]$ - $L_{90}[min]$) of 1 and 16 dBA during March 2012, and June 2012, respectively, represent minor noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed. A minimum L_{90} value of 16 dBA was recorded at 10:00 AM on March 26, 2012. The L_{eq} logarithmic averages were 18 and 36 dBA and the L_{90} logarithmic averages were 16 and 28 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low one value representations of baseline environmental noise in this area.

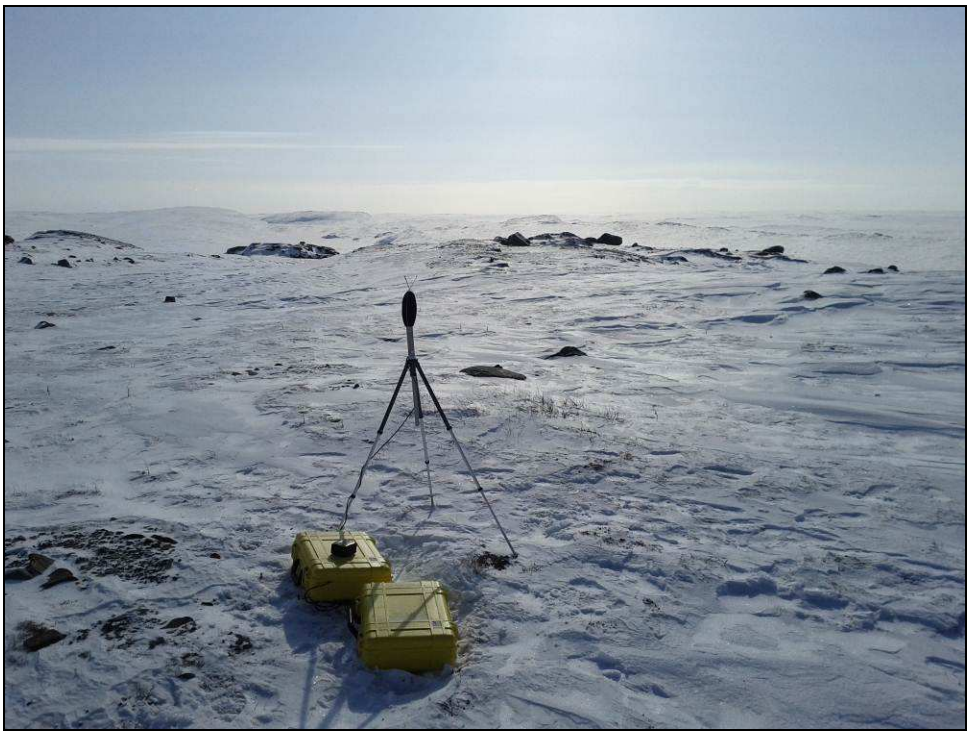


Plate 3.7-1. S07 Noise Monitoring Station, March 2012.



Plate 3.7-2. S07 Noise Monitoring Station, June 2012.

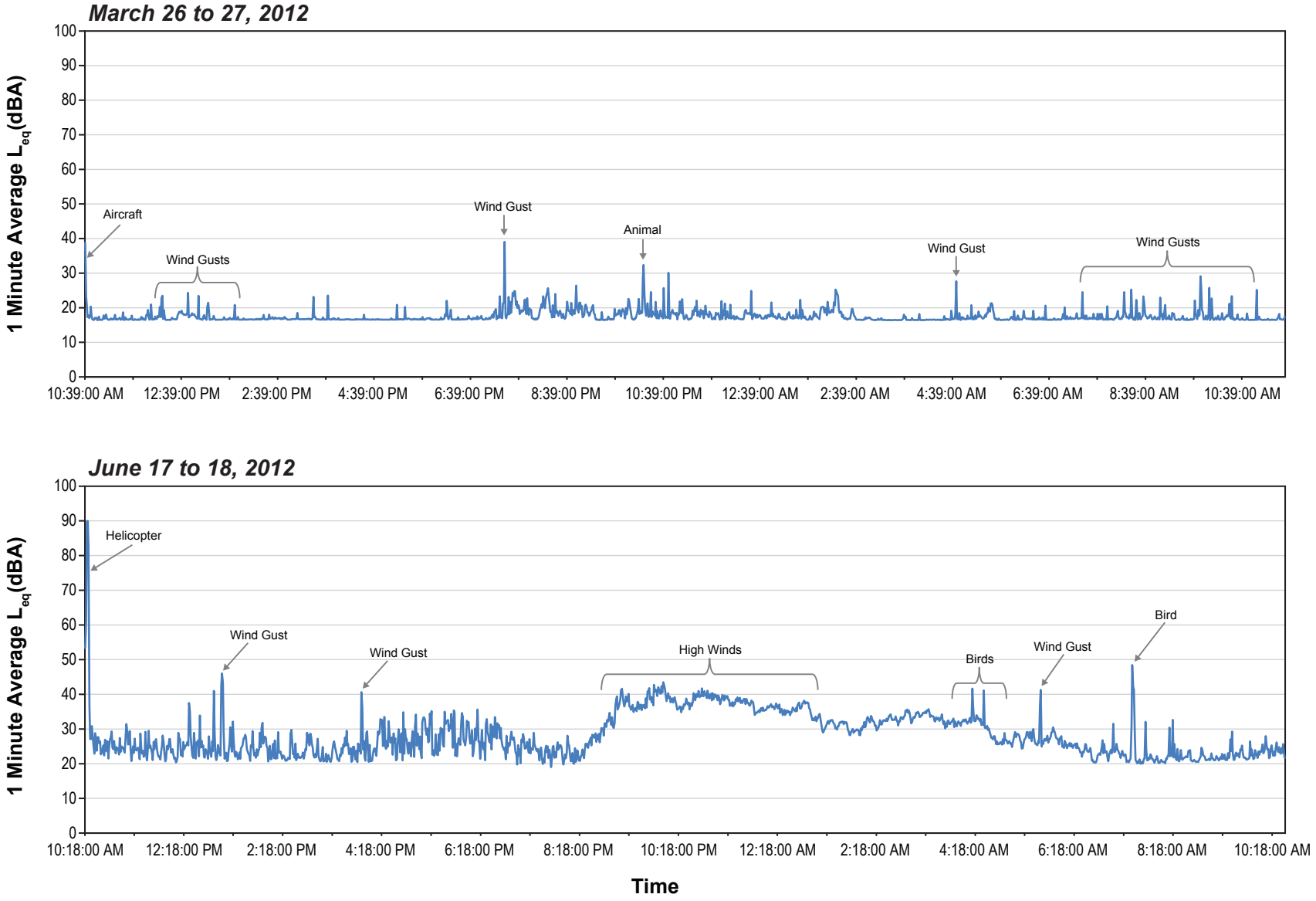


Figure 3.7-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S07, March and June 2012

Figure 3.7-1

Rescan™ Engineers & Scientists

Table 3.7-1a. Hourly Sound Levels, Station S07, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/26/2012	10:39:00 AM	11:39:00 AM	1.1	9	17	16	29
3/26/2012	11:39:00 AM	12:39:00 PM	1.3	36	17	16	31
3/26/2012	12:39:00 PM	1:39:00 PM	1.3	139	18	17	34
3/26/2012	1:39:00 PM	2:39:00 PM	1.5	203	17	16	31
3/26/2012	2:39:00 PM	3:39:00 PM	1.9	207	17	16	25
3/26/2012	3:39:00 PM	4:39:00 PM	1.3	190	17	16	34
3/26/2012	4:39:00 PM	5:39:00 PM	1.3	174	17	16	23
3/26/2012	5:39:00 PM	6:39:00 PM	1.0	187	17	16	31
3/26/2012	6:39:00 PM	7:39:00 PM	0.3	307	17	16	30
3/26/2012	7:39:00 PM	8:39:00 PM	1.2	218	24	17	50
3/26/2012	8:39:00 PM	9:39:00 PM	1.0	219	20	17	37
3/26/2012	9:39:00 PM	10:39:00 PM	1.1	123	18	16	30
3/26/2012	10:39:00 PM	11:39:00 PM	1.7	158	21	16	41
3/26/2012	11:39:00 PM	12:39:00 AM	2.1	140	18	16	32
3/27/2012	12:39:00 AM	1:39:00 AM	2.8	148	18	17	35
3/27/2012	1:39:00 AM	2:39:00 AM	2.4	151	18	16	31
3/27/2012	2:39:00 AM	3:39:00 AM	1.7	133	19	16	30
3/27/2012	3:39:00 AM	4:39:00 AM	2.3	150	17	16	26
3/27/2012	4:39:00 AM	5:39:00 AM	2.4	131	18	16	37
3/27/2012	5:39:00 AM	6:39:00 AM	2.9	134	18	16	27
3/27/2012	6:39:00 AM	7:39:00 AM	2.7	139	17	16	30
3/27/2012	7:39:00 AM	8:39:00 AM	2.3	124	17	16	35
3/27/2012	8:39:00 AM	9:39:00 AM	1.4	93	19	16	36
3/27/2012	9:39:00 AM	10:39:00 AM	1.8	178	19	16	40
Maximum			*2.9*	*n/a*	*24*	*17*	*50*
Minimum			*0.3*	*n/a*	*17*	*16*	*23*
Logarithmic average[1]			*1.7*	*n/a*	*18*	*16*	*38*

[1] *Wind speed and wind direction are arithmetic averages.*

Table 3.7-1b. Hourly Sound Levels, Station S07, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/17/2012	10:18:00 AM	11:18:00 AM	4.5	36	30	21	51
6/17/2012	11:18:00 AM	12:18:00 PM	3.8	23	31	21	55
6/17/2012	12:18:00 PM	1:18:00 PM	4.9	39	40	21	63
6/17/2012	1:18:00 PM	2:18:00 PM	5.5	36	29	21	45
6/17/2012	2:18:00 PM	3:18:00 PM	5.6	35	27	21	43
6/17/2012	3:18:00 PM	4:18:00 PM	6.2	24	32	20	57

(continued)

Table 3.7-1b. Hourly Sound Levels, Station S07, June 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/17/2012	4:18:00 PM	5:18:00 PM	5.9	18	31	21	51
6/17/2012	5:18:00 PM	6:18:00 PM	5.9	359	35	21	59
6/17/2012	6:18:00 PM	7:18:00 PM	7.1	356	32	21	46
6/17/2012	7:18:00 PM	8:18:00 PM	7.7	18	28	20	49
6/17/2012	8:18:00 PM	9:18:00 PM	6.3	55	33	20	47
6/17/2012	9:18:00 PM	10:18:00 PM	4.4	77	42	34	55
6/17/2012	10:18:00 PM	11:18:00 PM	6.5	98	41	35	49
6/17/2012	11:18:00 PM	12:18:00 AM	7.1	107	39	34	59
6/18/2012	12:18:00 AM	1:18:00 AM	4.2	152	37	21	45
6/18/2012	1:18:00 AM	2:18:00 AM	8.0	103	32	29	39
6/18/2012	2:18:00 AM	3:18:00 AM	7.4	118	34	31	41
6/18/2012	3:18:00 AM	4:18:00 AM	4.9	134	35	30	44
6/18/2012	4:18:00 AM	5:18:00 AM	2.5	120	38	25	67
6/18/2012	5:18:00 AM	6:18:00 AM	2.0	117	34	24	55
6/18/2012	6:18:00 AM	7:18:00 AM	1.8	191	27	21	50
6/18/2012	7:18:00 AM	8:18:00 AM	3.8	146	40	20	62
6/18/2012	8:18:00 AM	9:18:00 AM	4.2	144	28	20	52
6/18/2012	9:18:00 AM	10:18:00 AM	5.1	134	28	20	20
Maximum			*8.0*	*n/a*	*42*	*35*	*67*
Minimum			*1.8*	*n/a*	*27*	*20*	*39*
Logarithmic average[1]			*5.2*	*n/a*	*36*	*28*	*57*

[1] *Wind speed and wind direction are arithmetic averages.*

3.8 S08

The set up for Station S08 is shown in plates 3.8-1 and 3.8-2 for the March and June 2012 monitoring periods, respectively. The device was placed in between marine laydown area options 4 and 6 on Bathurst Inlet on a peninsula. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.8-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.8-1a and 3.8-1b, respectively.

General noise sources observed at this location included aircraft, wind, and birds in the summer (June). Precipitation was observed during monitoring of S08 at 6:00 PM on March 26, 2012.

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 11 and 22 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 8 and 13 dBA during March 2012, and June 2012, respectively, represent minor noise fluctuation in the environment. The majority of these fluctuations were caused by wildlife consisting primarily of birds, as well as changes in wind speed. A minimum L_{90} value of 15 dBA was recorded at 10:00 AM on March 27, 2012. The L_{eq} logarithmic averages were 23 and 37 dBA and the L_{90} logarithmic averages were 19 and 25 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low one value representations of baseline environmental noise in this area.



Plate 3.8-1. S08 Noise Monitoring Station, March 2012.



Plate 3.8-2. S08 Noise Monitoring Station, June 2012.

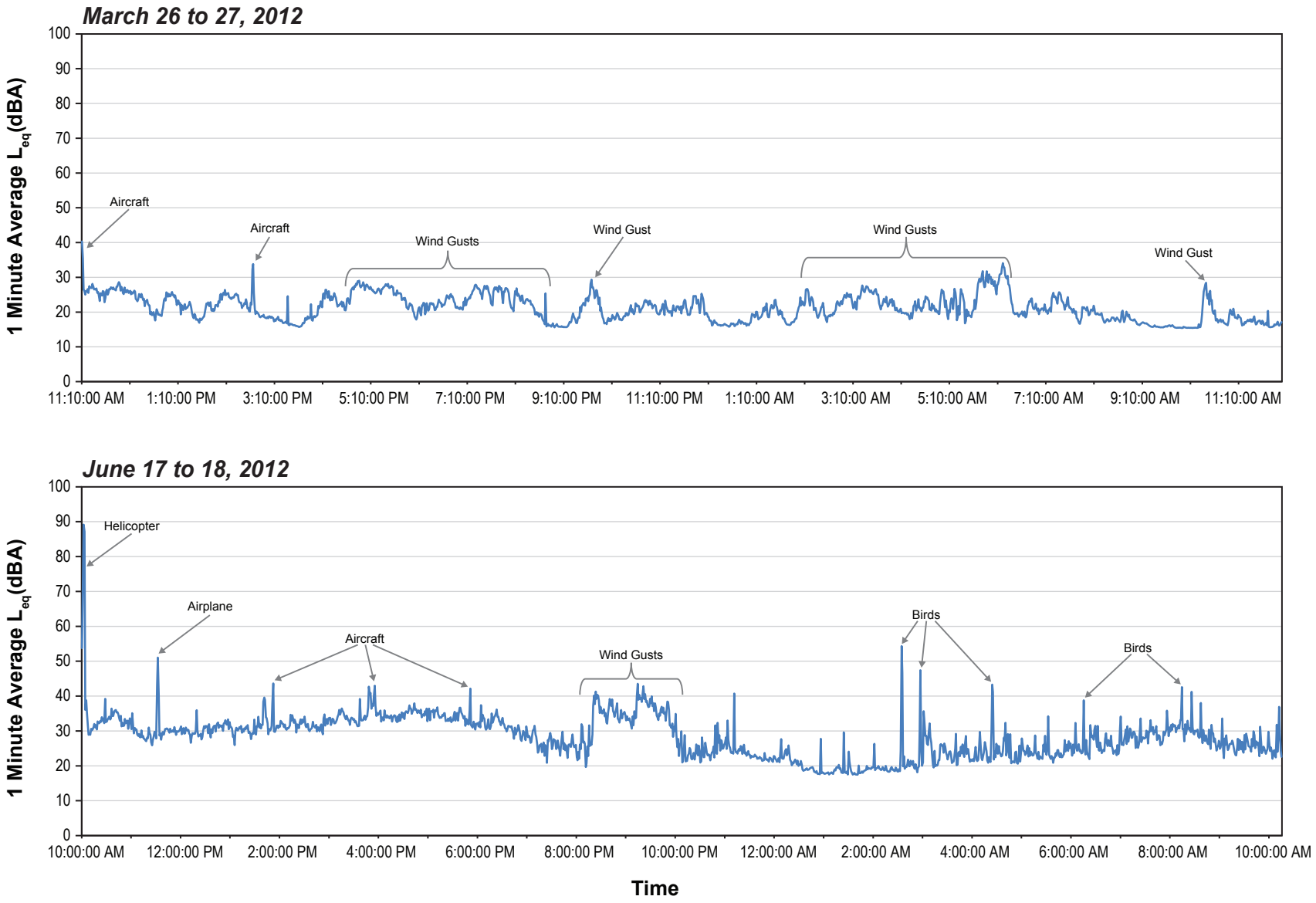


Figure 3.8-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S08, March and June 2012

Figure 3.8-1

Rescan™ Engineers & Scientists

Table 3.8-1a. Hourly Sound Levels, Station S08, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/26/2012	11:10:00 AM	12:10:00 PM	1.3	36	27	23	42
3/26/2012	12:10:00 PM	1:10:00 PM	1.3	139	24	18	35
3/26/2012	1:10:00 PM	2:10:00 PM	1.5	203	22	18	32
3/26/2012	2:10:00 PM	3:10:00 PM	1.9	207	24	18	44
3/26/2012	3:10:00 PM	4:10:00 PM	1.3	190	18	16	50
3/26/2012	4:10:00 PM	5:10:00 PM	1.3	174	25	20	35
3/26/2012	5:10:00 PM	6:10:00 PM	1.0	187	26	22	37
3/26/2012	6:10:00 PM	7:10:00 PM	0.3	307	22	19	30
3/26/2012	7:10:00 PM	8:10:00 PM	1.2	218	26	21	34
3/26/2012	8:10:00 PM	9:10:00 PM	1.0	219	22	16	51
3/26/2012	9:10:00 PM	10:10:00 PM	1.1	123	22	16	34
3/26/2012	10:10:00 PM	11:10:00 PM	1.7	158	20	17	29
3/26/2012	11:10:00 PM	12:10:00 AM	2.1	140	22	19	32
3/27/2012	12:10:00 AM	1:10:00 AM	2.8	148	18	16	35
3/27/2012	1:10:00 AM	2:10:00 AM	2.4	151	20	17	29
3/27/2012	2:10:00 AM	3:10:00 AM	1.7	133	22	18	31
3/27/2012	3:10:00 AM	4:10:00 AM	2.3	150	25	21	33
3/27/2012	4:10:00 AM	5:10:00 AM	2.4	131	21	18	34
3/27/2012	5:10:00 AM	6:10:00 AM	2.9	134	26	18	43
3/27/2012	6:10:00 AM	7:10:00 AM	2.7	139	27	19	42
3/27/2012	7:10:00 AM	8:10:00 AM	2.3	124	22	18	33
3/27/2012	8:10:00 AM	9:10:00 AM	1.4	93	19	17	28
3/27/2012	9:10:00 AM	10:10:00 AM	1.8	178	16	16	24
3/27/2012	10:10:00 AM	11:10:00 AM	2.7	135	21	15	35
Maximum			*2.9*	*n/a*	*27*	*23*	*51*
Minimum			*0.3*	*n/a*	*16*	*15*	*24*
Logarithmic average[1]			*1.8*	*n/a*	*23*	*19*	*41*

[1] Wind speed and wind direction are arithmetic averages.

Table 3.8-1b. Hourly Sound Levels, Station S08, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/17/2012	10:00:00 AM	11:00:00 AM	4.5	36	38	28	60
6/17/2012	11:00:00 AM	12:00:00 PM	3.8	23	37	25	58
6/17/2012	12:00:00 PM	1:00:00 PM	4.9	39	34	26	43
6/17/2012	1:00:00 PM	2:00:00 PM	5.5	36	40	27	57
6/17/2012	2:00:00 PM	3:00:00 PM	5.6	35	35	27	48
6/17/2012	3:00:00 PM	4:00:00 PM	6.2	24	39	30	57

(continued)

Table 3.8-1b. Hourly Sound Levels, Station S08, June 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/17/2012	4:00:00 PM	5:00:00 PM	5.9	18	38	30	47
6/17/2012	5:00:00 PM	6:00:00 PM	5.9	359	38	29	57
6/17/2012	6:00:00 PM	7:00:00 PM	7.1	356	35	26	43
6/17/2012	7:00:00 PM	8:00:00 PM	7.7	18	30	21	45
6/17/2012	8:00:00 PM	9:00:00 PM	6.3	55	39	23	57
6/17/2012	9:00:00 PM	10:00:00 PM	4.4	77	42	26	65
6/17/2012	10:00:00 PM	11:00:00 PM	6.5	98	30	20	45
6/17/2012	11:00:00 PM	12:00:00 AM	7.1	107	31	21	61
6/18/2012	12:00:00 AM	1:00:00 AM	4.2	152	27	21	54
6/18/2012	1:00:00 AM	2:00:00 AM	8.0	103	22	18	47
6/18/2012	2:00:00 AM	3:00:00 AM	7.4	118	44	18	65
6/18/2012	3:00:00 AM	4:00:00 AM	4.9	134	31	20	48
6/18/2012	4:00:00 AM	5:00:00 AM	2.5	120	39	21	62
6/18/2012	5:00:00 AM	6:00:00 AM	2.0	117	31	21	51
6/18/2012	6:00:00 AM	7:00:00 AM	1.8	191	34	22	54
6/18/2012	7:00:00 AM	8:00:00 AM	3.8	146	34	24	51
6/18/2012	8:00:00 AM	9:00:00 AM	4.2	144	37	23	59
6/18/2012	9:00:00 AM	10:00:00 AM	5.1	134	32	21	50
Maximum			*8.0*	*n/a*	*44*	*30*	*65*
Minimum			*1.8*	*n/a*	*22*	*18*	*43*
Logarithmic average[1]			*5.2*	*n/a*	*37*	*25*	*58*

[1] *Wind speed and wind direction are arithmetic averages.*

3.9 S09

The set up for Station S09 is shown in plates 3.9-1 and 3.9-2 for the March and June 2012 monitoring periods, respectively. The device was placed approximately 14 km north of George exploration camp on a hill surrounded by flat terrain typical of the Arctic. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.9-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.9-1a and 3.9-1b, respectively.

General noise sources observed at this location included aircraft and wind. During the June monitoring period, insects and birds were also common sources. Precipitation was observed during monitoring of S09 at 1:00 PM to 5:00 PM on March 27, 2012 and at 5:00 AM on June 19, 2012.

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 44 and 25 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 40 and 20 dBA during March 2012, and June 2012, respectively, represent moderate to high noise fluctuation in the environment. The majority of these fluctuations were caused by changes in wind speed and aircraft operating in the vicinity. A minimum L_{90} value of 16 dBA was recorded at 8:00 AM on March 27, 2012. The L_{eq} logarithmic averages were 52 and 39 dBA and the L_{90} logarithmic averages were 47 and 26 dBA during March 2012 and June 2012, respectively. The L_{90} values provide realistic, low/moderate one value representations of baseline environmental noise in this area.

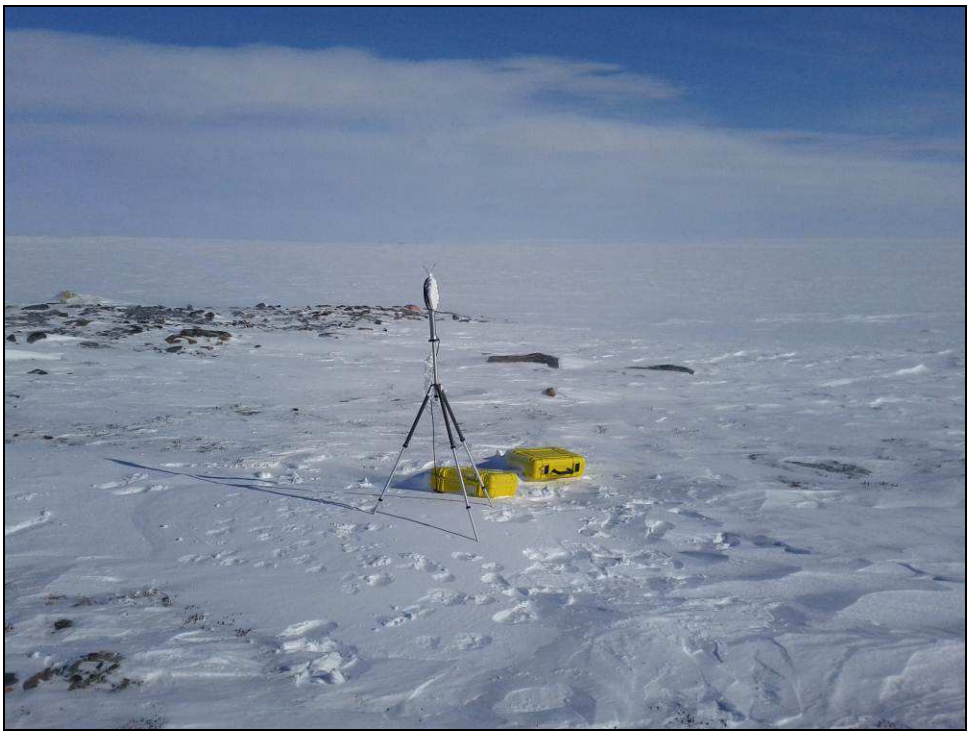


Plate 3.9-1. S09 Noise Monitoring Station, March 2012.



Plate 3.9-2. S09 Noise Monitoring Station, June 2012.

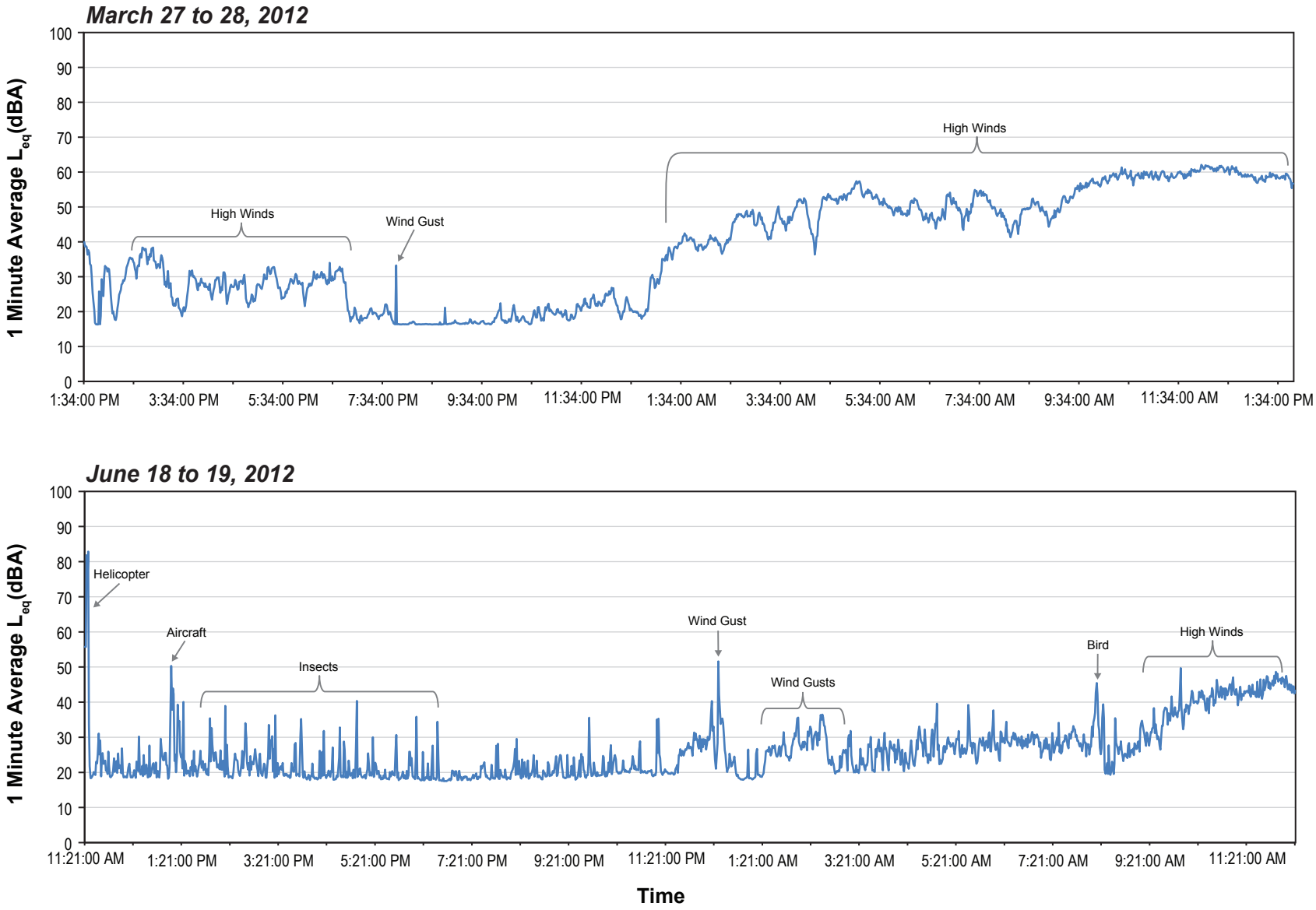


Figure 3.9-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S09, March and June 2012

Figure 3.9-1

Rescan™ Engineers & Scientists

Table 3.9-1a. Hourly Sound Levels, Station S09, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/27/2012	1:34:00 PM	2:34:00 PM	3.3	155	35	16	45
3/27/2012	2:34:00 PM	3:34:00 PM	2.6	142	33	19	41
3/27/2012	3:34:00 PM	4:34:00 PM	1.5	164	31	19	44
3/27/2012	4:34:00 PM	5:34:00 PM	1.4	169	28	20	36
3/27/2012	5:34:00 PM	6:34:00 PM	1.5	225	29	22	37
3/27/2012	6:34:00 PM	7:34:00 PM	2.1	251	29	21	43
3/27/2012	7:34:00 PM	8:34:00 PM	2.6	294	21	16	45
3/27/2012	8:34:00 PM	9:34:00 PM	3.0	315	17	16	31
3/27/2012	9:34:00 PM	10:34:00 PM	3.2	323	17	16	23
3/27/2012	10:34:00 PM	11:34:00 PM	3.0	320	19	17	32
3/27/2012	11:34:00 PM	12:34:00 AM	3.3	330	21	17	28
3/28/2012	12:34:00 AM	1:34:00 AM	1.1	359	22	18	30
3/28/2012	1:34:00 AM	2:34:00 AM	1.9	305	38	26	46
3/28/2012	2:34:00 AM	3:34:00 AM	1.7	359	44	35	52
3/28/2012	3:34:00 AM	4:34:00 AM	1.5	283	47	40	55
3/28/2012	4:34:00 AM	5:34:00 AM	1.0	178	51	40	58
3/28/2012	5:34:00 AM	6:34:00 AM	2.6	151	54	47	61
3/28/2012	6:34:00 AM	7:34:00 AM	2.9	119	49	43	57
3/28/2012	7:34:00 AM	8:34:00 AM	3.4	130	52	45	59
3/28/2012	8:34:00 AM	9:34:00 AM	4.5	141	49	42	57
3/28/2012	9:34:00 AM	10:34:00 AM	4.8	144	54	45	63
3/28/2012	10:34:00 AM	11:34:00 AM	5.3	146	59	54	65
3/28/2012	11:34:00 AM	12:34:00 PM	6.9	142	59	55	66
3/28/2012	12:34:00 PM	1:34:00 PM	6.8	140	61	56	68
Maximum			*6.9*	*n/a*	*61*	*56*	*68*
Minimum			*1.0*	*n/a*	*17*	*16*	*23*
Logarithmic average[1]			*3.0*	*n/a*	*52*	*47*	*59*

[1] Wind speed and wind direction are arithmetic averages.

Table 3.9-1b. Hourly Sound Levels, Station S09, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/18/2012	11:21:00 AM	12:21:00 PM	4.2	161	31	18	50
6/19/2012	12:21:00 PM	1:21:00 PM	10.3	7	49	37	57
6/18/2012	1:21:00 PM	2:21:00 PM	2.6	303	40	18	63
6/18/2012	2:21:00 PM	3:21:00 PM	5.3	304	31	18	59
6/18/2012	3:21:00 PM	4:21:00 PM	4.7	302	32	18	58
6/18/2012	4:21:00 PM	5:21:00 PM	5.2	344	32	18	58

(continued)

Table 3.9-1b. Hourly Sound Levels, Station S09, June 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/18/2012	5:21:00 PM	6:21:00 PM	4.2	340	25	18	48
6/18/2012	6:21:00 PM	7:21:00 PM	5.3	353	27	18	53
6/18/2012	7:21:00 PM	8:21:00 PM	2.7	2	24	18	49
6/18/2012	8:21:00 PM	9:21:00 PM	4.1	214	26	18	48
6/18/2012	9:21:00 PM	10:21:00 PM	4.1	191	34	18	62
6/18/2012	10:21:00 PM	11:21:00 PM	4.6	200	26	19	46
6/18/2012	11:21:00 PM	12:21:00 AM	3.9	180	30	19	51
6/19/2012	12:21:00 AM	1:21:00 AM	4.0	222	39	18	62
6/19/2012	1:21:00 AM	2:21:00 AM	5.5	284	30	19	44
6/19/2012	2:21:00 AM	3:21:00 AM	4.5	265	35	20	53
6/19/2012	3:21:00 AM	4:21:00 AM	7.3	13	33	19	50
6/19/2012	4:21:00 AM	5:21:00 AM	7.5	14	36	20	56
6/19/2012	5:21:00 AM	6:21:00 AM	3.9	333	36	23	55
6/19/2012	6:21:00 AM	7:21:00 AM	4.1	295	36	23	55
6/19/2012	7:21:00 AM	8:21:00 AM	5.8	340	34	23	54
6/19/2012	8:21:00 AM	9:21:00 AM	5.6	354	42	19	64
6/19/2012	9:21:00 AM	10:21:00 AM	5.8	14	41	25	59
6/19/2012	10:21:00 AM	11:21:00 AM	6.2	28	46	35	62
Maximum			*10.3*	*n/a*	*49*	*37*	*64*
Minimum			*2.6*	*n/a*	*24*	*18*	*44*
Logarithmic average[1]			*5.0*	*n/a*	*39*	*26*	*58*

[1] *Wind speed and wind direction are arithmetic averages.*

3.10 S10

The set up for Station S10 is shown in plates 3.10-1 and 3.10-2 for the March and June 2012 monitoring periods, respectively. The device was placed next to the George exploration camp, at the top of an esker. One-minute noise levels recorded during March and June 2012 are shown in Figure 3.10-1. Hourly, maximum, minimum, and logarithmic average L_{eq}, L_{90}, and L_{max} results of the 24-hour March 2012 and June 2012 surveys are shown in Tables 3.10-1a and 3.10-1b, respectively.

General noise sources observed at this location included continuous human activity, aircraft, and wind. Precipitation was observed during monitoring of S10 at 1:00 PM to 5:00 PM on March 27, 2012 and at 5:00 AM on June 19, 2012.

The L_{eq} ranges (L_{eq}*[max]* - L_{eq}*[min]*) of 31 and 19 dBA and the L_{90} ranges (L_{90}*[max]* - L_{90}*[min]*) of 14 and 3 dBA during March 2012, and June 2012, respectively, represent minor noise fluctuation in the environment. The majority of these fluctuations were caused by heavy equipment operating in the vicinity of the monitoring site. A minimum L_{90} value of 27 dBA was recorded at 11:00 AM on March 28, 2012. The L_{eq} logarithmic averages were 55 and 61 dBA and the L_{90} logarithmic averages were 37 and 47 dBA during March 2012 and June 2012, respectively. Due to heavy equipment and frequent helicopter noise in the sampling area, measured noise levels are indicative of an exploration camp.

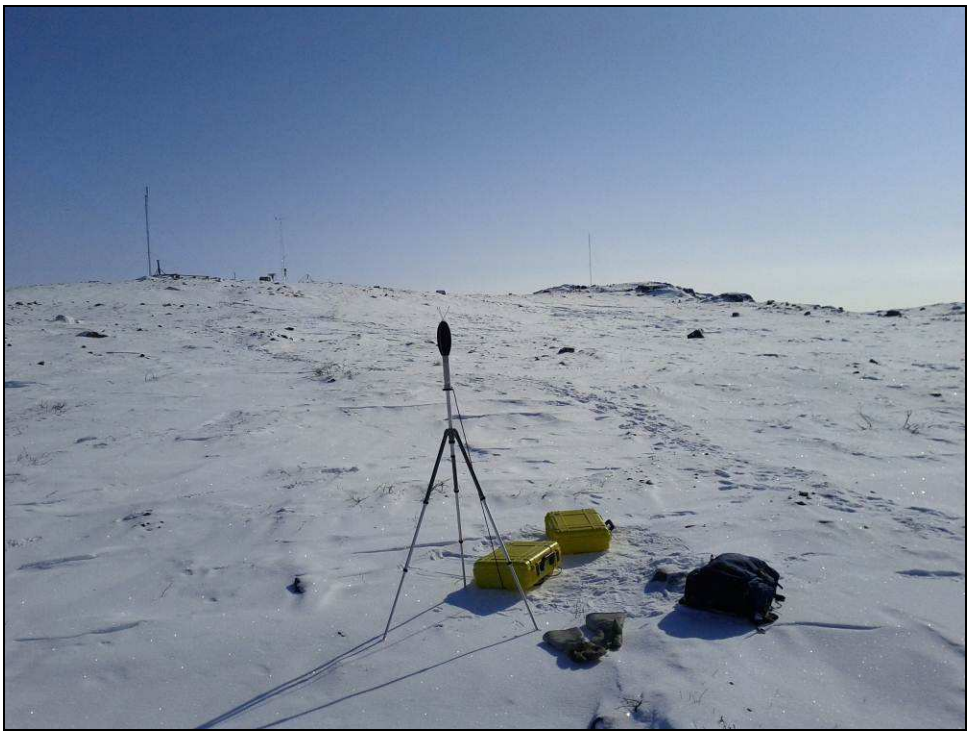


Plate 3.10-1. S10 Noise Monitoring Station, March 2012.

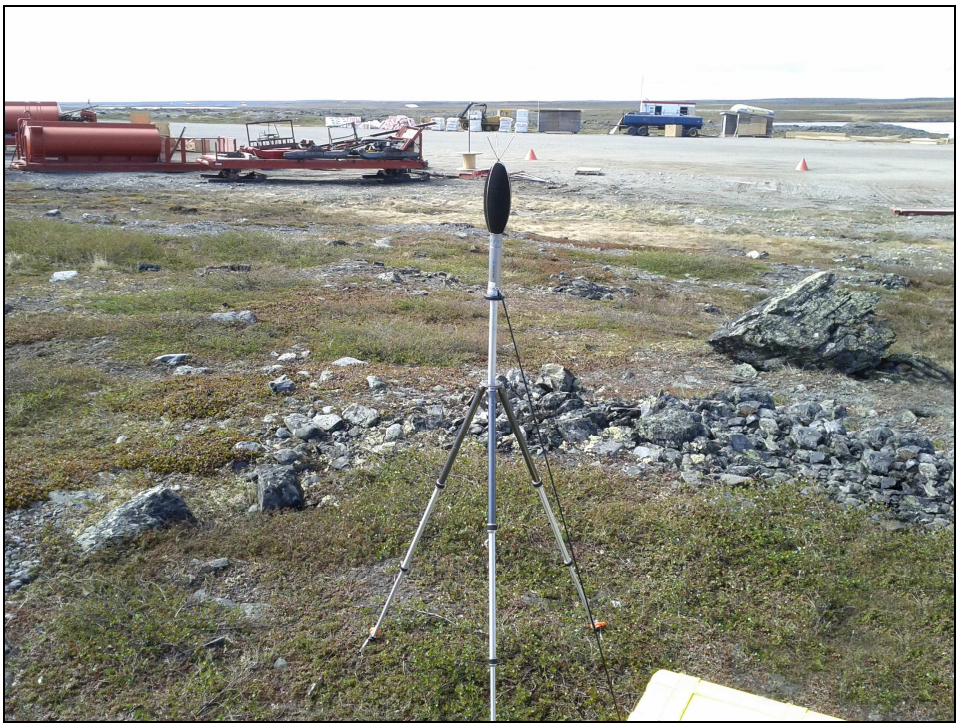


Plate 3.10-2. S10 Noise Monitoring Station, June 2012.

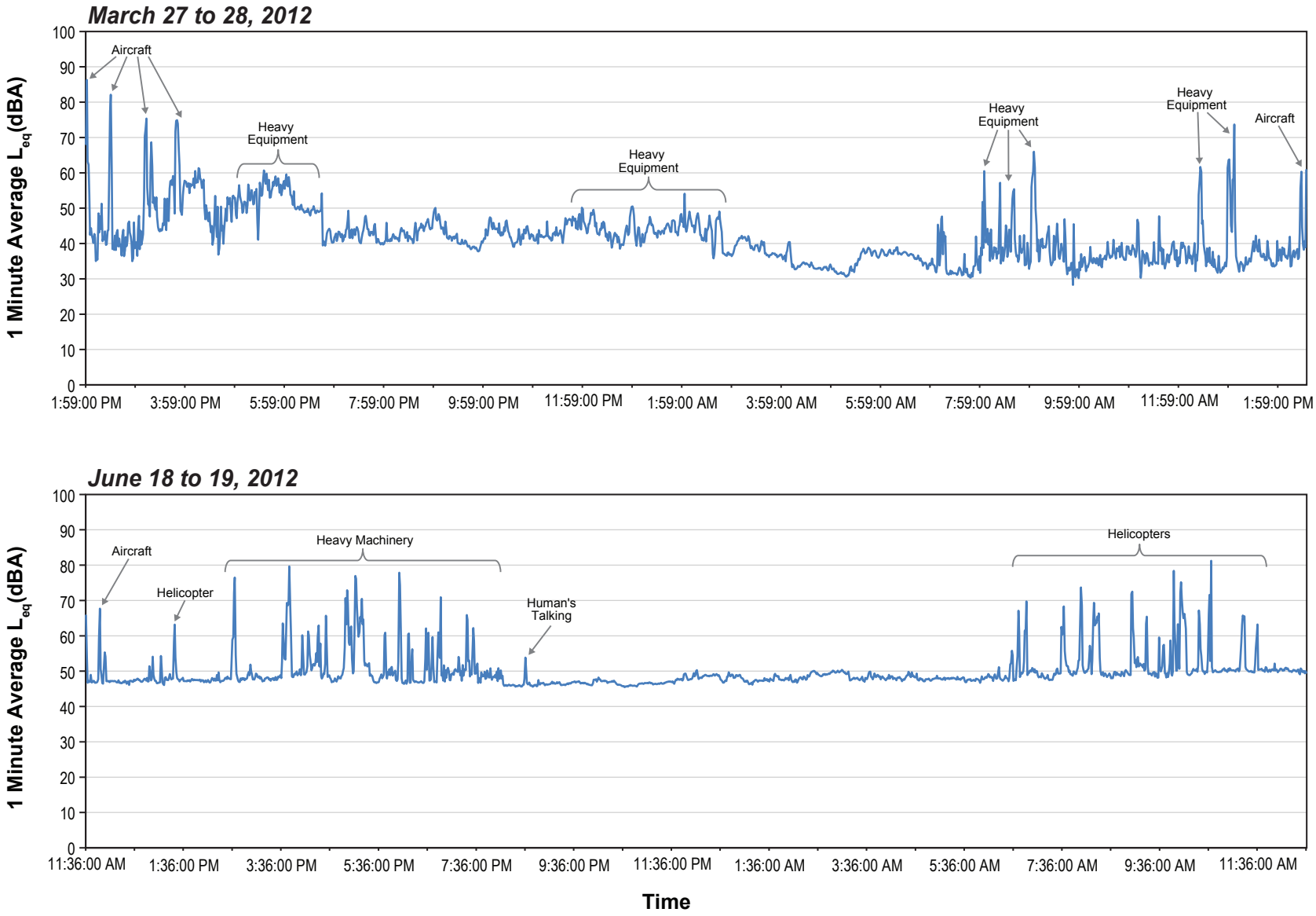


Figure 3.10-1

Sabina GOLD & SILVER CORP.

Back River Noise Monitoring Station S10, March and June 2012

Figure 3.10-1

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Table 3.10-1a. Hourly Sound Levels, Station S10, March 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
3/27/2012	1:59:00 PM	2:59:00 PM	3.3	155	43[2]	35[2]	50[2]
3/27/2012	2:59:00 PM	3:59:00 PM	2.6	142	66	32	89
3/27/2012	3:59:00 PM	4:59:00 PM	1.5	164	65	40	81
3/27/2012	4:59:00 PM	5:59:00 PM	1.4	169	54	36	69
3/27/2012	5:59:00 PM	6:59:00 PM	1.5	225	56	39	68
3/27/2012	6:59:00 PM	7:59:00 PM	2.1	251	49	39	62
3/27/2012	7:59:00 PM	8:59:00 PM	2.6	294	43	40	56
3/27/2012	8:59:00 PM	9:59:00 PM	3.0	315	44	40	53
3/27/2012	9:59:00 PM	10:59:00 PM	3.2	323	42	38	56
3/27/2012	10:59:00 PM	11:59:00 PM	3.0	320	43	40	52
3/27/2012	11:59:00 PM	12:59:00 AM	3.3	330	45	41	57
3/28/2012	12:59:00 AM	1:59:00 AM	1.1	359	45	39	54
3/28/2012	1:59:00 AM	2:59:00 AM	1.9	305.	45	41	65
3/28/2012	2:59:00 AM	3:59:00 AM	1.7	359	44	36	50
3/28/2012	3:59:00 AM	4:59:00 AM	1.5	283	39	36	50
3/28/2012	4:59:00 AM	5:59:00 AM	1.0	178	35	32	41
3/28/2012	5:59:00 AM	6:59:00 AM	2.6	151	36	30	43
3/28/2012	6:59:00 AM	7:59:00 AM	2.9	119	37	33	43
3/28/2012	7:59:00 AM	8:59:00 AM	3.4	130	44	29	70
3/28/2012	8:59:00 AM	9:59:00 AM	4.5	141	51	31	71
3/28/2012	9:59:00 AM	10:59:00 AM	4.8	144	45	27	67
3/28/2012	10:59:00 AM	11:59:00 AM	5.3	146	37	30	50
3/28/2012	11:59:00 AM	12:59:00 PM	6.9	142	39	29	56
3/28/2012	12:59:00 PM	1:59:00 PM	6.8	140	53[2]	29[2]	72[2]
Maximum			*6.9*	*n/a*	*66*	*41*	*89*
Minimum			*1.0*	*n/a*	*35*	*27*	*41*
Logarithmic average[1]			*3.0*	*n/a*	*55*	*37*	*76*

[1] Wind speed and wind direction are arithmetic averages.
[2] Not used in calculating logarithmic average or maximum sound level, as measurement contained noise from helicopter takeoff or landing.

Table 3.10-1b. Hourly Sound Levels, Station S10, June 2012

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/18/2012	11:37:00 AM	12:37:00 PM	4.2	161	57	46	77
6/18/2012	12:37:00 PM	1:37:00 PM	4.0	193	49	47	65
6/18/2012	1:37:00 PM	2:37:00 PM	2.6	303	52	47	71
6/18/2012	2:37:00 PM	3:37:00 PM	5.3	304	62	47	85
6/18/2012	3:37:00 PM	4:37:00 PM	4.7	302	66	47	89

(continued)

Table 3.10-1b. Hourly Sound Levels, Station S10, June 2012 (completed)

Date	Start Time	End Time	Wind Speed (m/s)	Wind Direction (degrees)	Sound Level (dBA)		
					L_{eq}	L_{90}	L_{max}
6/18/2012	4:37:00 PM	5:37:00 PM	5.2	344	61	47	84
6/18/2012	5:37:00 PM	6:37:00 PM	4.2	340	66	47	86
6/18/2012	6:37:00 PM	7:37:00 PM	5.3	353	65	46	87
6/18/2012	7:37:00 PM	8:37:00 PM	2.7	2	62	46	78
6/18/2012	8:37:00 PM	9:37:00 PM	4.1	214	53	45	73
6/18/2012	9:37:00 PM	10:37:00 PM	4.1	191	47	46	49
6/18/2012	10:37:00 PM	11:37:00 PM	4.6	200	47	46	50
6/18/2012	11:37:00 PM	12:37:00 AM	3.9	180	48	46	51
6/19/2012	12:37:00 AM	1:37:00 AM	10.3	7	49	49	61
6/19/2012	1:37:00 AM	2:37:00 AM	5.5	284	48	47	51
6/19/2012	2:37:00 AM	3:37:00 AM	4.5	265	50	47	60
6/19/2012	3:37:00 AM	4:37:00 AM	7.3	13	49	47	55
6/19/2012	4:37:00 AM	5:37:00 AM	7.5	14	49	47	58
6/19/2012	5:37:00 AM	6:37:00 AM	3.9	333	49	47	62
6/19/2012	6:37:00 AM	7:37:00 AM	4.1	295	58	47	78
6/19/2012	7:37:00 AM	8:37:00 AM	5.8	340	60	48	80
6/19/2012	8:37:00 AM	9:37:00 AM	5.6	354	59	48	77
6/19/2012	9:37:00 AM	10:37:00 AM	5.8	14	65	48	93
6/19/2012	10:37:00 AM	11:37:00 AM	6.2	28	69	49	99
Maximum			*10.3*	*n/a*	*66*	*49*	*93*
Minimum			*2.6*	*n/a*	*47*	*45*	*49*
Logarithmic average[1]			*5.0*	*n/a*	*61*	*47*	*87*

[1] *Wind speed and wind direction are arithmetic averages.*

4. Summary

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4. Summary

Ten noise monitoring stations were set up at varying distances from Goose Camp, George Camp, and the Marine Laydown Area in 2012. Noise levels were recorded over a 24 hour period in March and June of 2012. The locations were selected to characterize the range of baseline conditions in the region, based on their proximity to known deposits and sensitive wildlife receptors. Results from the noise monitoring program captured background noise levels from stations that were located approximately 3 to 70 km away from the camps. Noise levels were also recorded at both exploration camps.

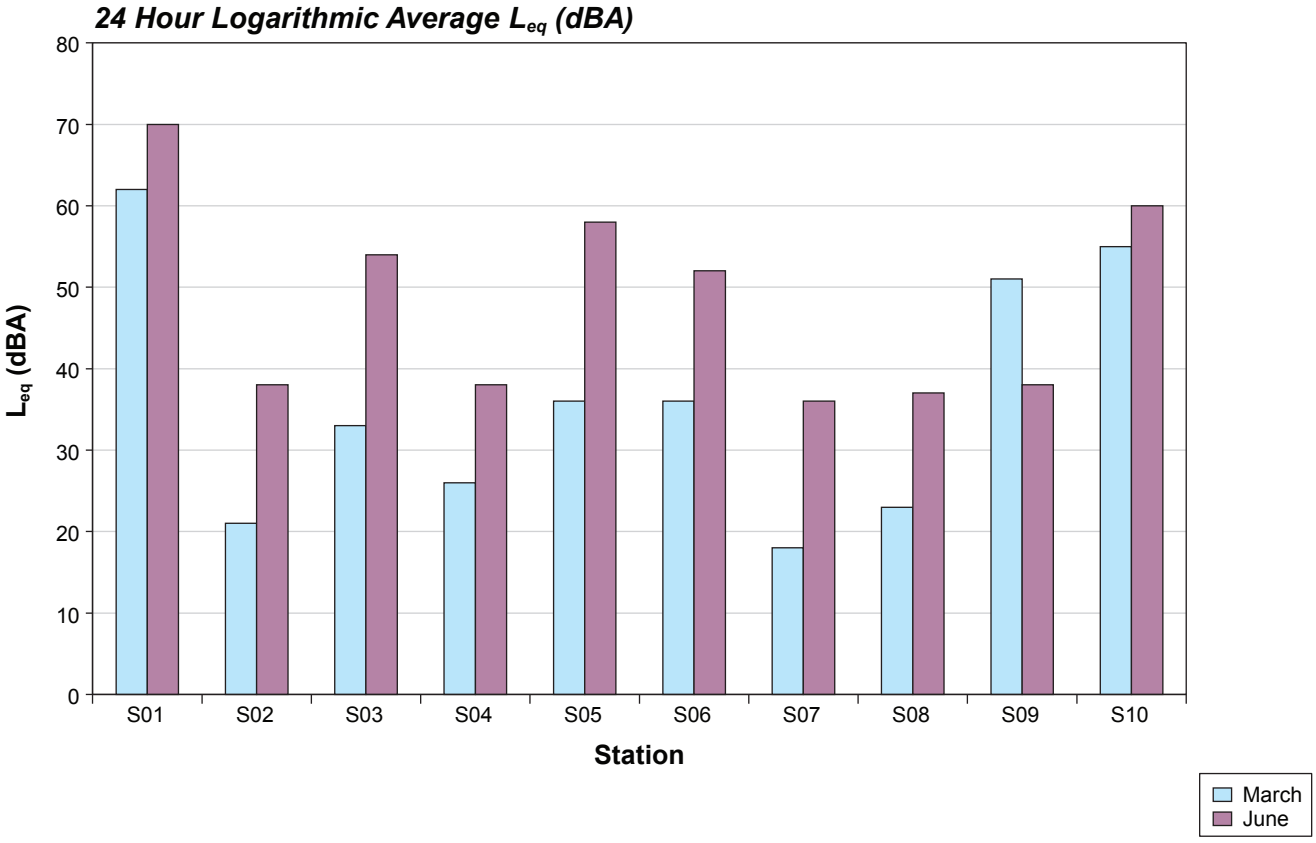
Table 4-1 and Figure 4-1 provide a summary of the measured 24 hour logarithmic average (L_{eq} and L_{90}) noise levels from 2012. The June monitoring period had higher logarithmic averages for L_{eq} and L_{90} than the March monitoring period. The exception to this was station S01 that had a slightly higher L_{90} average during March and station S09 that had higher L_{eq} and L_{90} averages in March. The higher averages for station S09 are attributed to high winds during that sampling period. During the June monitoring period more non-anthropogenic noise sources, such as birds and insects, were recorded than during the March monitoring period.

Table 4-1. Summary of 24 Hour Logarithmic Average L_{eq} and L_{90} Noise Levels

Location	Approximate Distance From Nearest Exploration Camp	24 Hour Logarithmic Average L_{eq} (dBA)		24 Hour Logarithmic Average L_{90} (dBA)	
		March	June	March	June
S01	0 km (Goose)	62	70	56	52
S02	15 km (Goose)	21	38	17	25
S03	3 km (Goose)	33	54	26	38
S04	8 km (Goose)	26	38	22	25
S05	10 km (George)	36	58	23	44
S06	28 km (George)	36	52	25	32
S07	72 km (George)	18	36	16	28
S08	70 km (George)	23	37	19	25
S09	14 km (George)	51	38	47	26
S10	0 km (George)	55	60	37	47

The highest logarithmic averages were measured at stations S01 and S10, which were situated at Goose and George exploration camps, which is to be expected due to the noise generated by anthropogenic sources during exploration. The next highest logarithmic averages were measured at stations S05, S06 and S03 (high to low). High winds, and increased bird calls recorded during the June sampling period could explain the high noise levels at all three of these sites. Station S03 is located approximately 3 km from Goose Camp and stations S05 and S06 are located along the flight path between George and Goose camps. In comparison the two monitoring stations with the lowest logarithmic averages, S07 and S08, are the furthest away from existing infrastructure (~70 km).

This data compares well with background studies done in other pristine areas, where L_{eq} values can range from 9 to 22 dbA, depending on proximity to noise sources, wind speed and snow cover (Menge, Ross, and Ernenwein 2002).



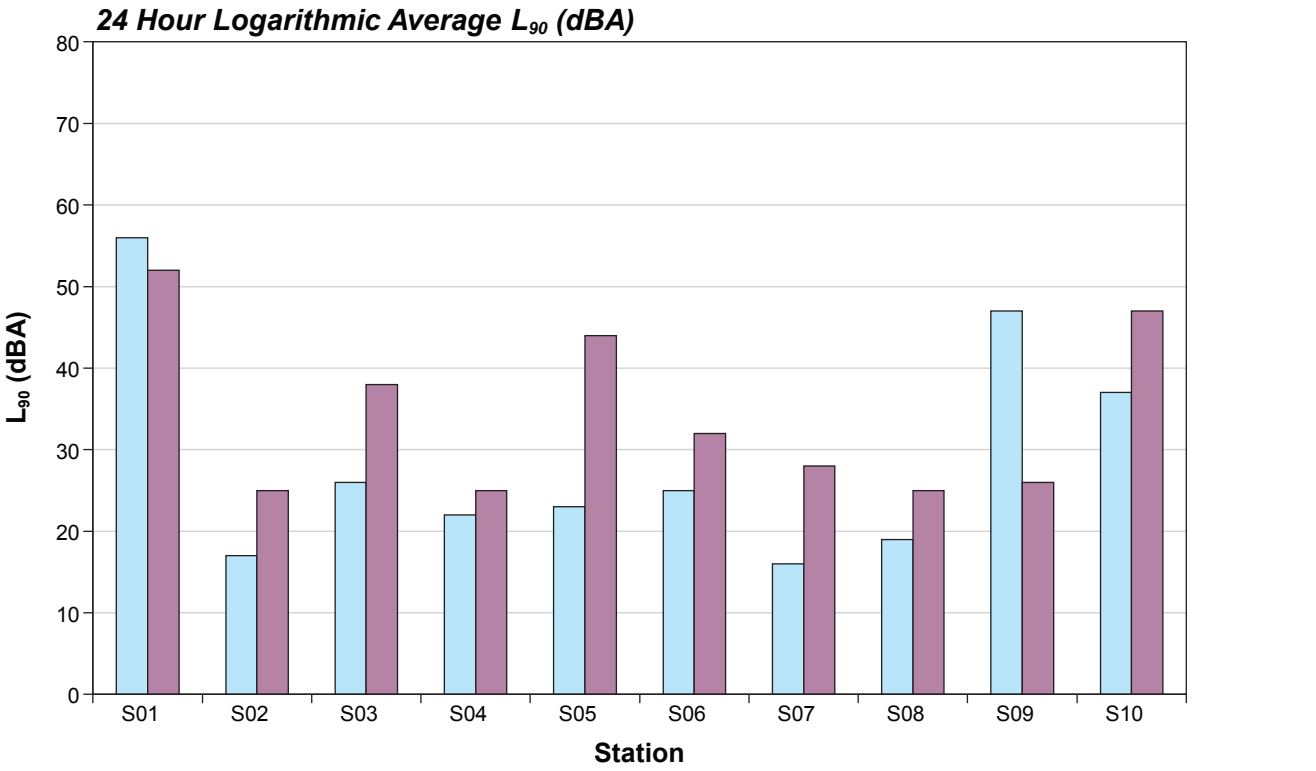


Figure 4-1

24 Hour Logarithmic Average L_{eq} and L_{90}

References

References

Menge, C. W., J. C. Ross, and R. L. Ernenwein. 2002. *Noise data from Snowmobile Pass-bys:* The Significance of Frequency Content. Society of Automotive Engineers.

Appendix 1

Noise Monitoring Field Sheets

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Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 0833-002-16

ID (*e.g.* S1): BR1

UTM Coordinates: 434023 E 7269078 N 13W — UTM Datum: NAD 83

Ground Cover (*e.g.* soil/vegetation type): Snow — Start Date/Time: 0845 Mar 20/12

Terrain (*e.g.* flat, hills, mountains): Camp (flat) — Finish Date/Time:

Weather:

Temperature (°C): -19 — Cloud Cover (%): 100

Precipitation: ☐ Heavy ☐ Moderate ☒ Mild ☐ None

☒ Snow ☐ Rain ☐ Other

Wind: Speed ☐ Strong ☒ Moderate ☐ Light ☐ None — Direction: E

Instrument:

Type: ~~2250~~ ~~3025~~ 2250 — Serial #: 5

Calibration: ☒ Before ☐ After

Method:

Weighting (*i.e.* A): — Other Settings:

Response (*i.e.* fast/slow):

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: Wind,

Potential noise sources: Snow mobiles, construction, planes, helicopters, wildlife

Obstacles (*e.g.* trees, buildings): Buildings to the east

Notes:

New Sensitivity 51.81 } Before
Deviation from last 0.34 }

Pictures taken north, east, south, west

New Sensitivity

Deviation from last

Downloaded by Dean

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: BackRiver — Project #: 833-002-16

ID (e.g. S1): BR2

UTM Coordinates: 444229 E 7281281 N — UTM Datum: NAD 83

Ground Cover (e.g. soil/vegetation type): Bedrock / Snow — Start Date/Time: 22 March / 3:05 pm

Terrain (e.g. flat, hills, mountains): Hill — Finish Date/Time: 23 March / 4 pm

Weather:

Temperature (°C): -19 — Cloud Cover (%): 35%

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☒ Light ☐ None — Direction _____

Instrument:

Type _____ — Serial #: 1

Calibration: ☒ Before ☒ After

Method _____

Weighting (i.e. A) _____ — Other Settings _____

Response (i.e. fast/slow) _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: Wind

Potential noise sources: wildlife, wind, helicopter, plane

Obstacles (e.g. trees, buildings): None

Notes:

Before: New Sensitivity 52.14 mV/Pa — Pictures taken facing north, east, south, west

Deviation from last -0.29 dB

After: New Sensitivity 50.69 mV/Pa

Deviation from last -0.25 dB

15km from camp

Please be sure to take a few photos of the instrument and the surrounding area (i.e. one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Came back to camp overnight, set out again march 24 - 8km from George Camp

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 833-002-16

ID (*e.g.* S1): BR3

UTM Coordinates: 13W 436819 E 7269564 N — UTM Datum: Nad 83

Ground Cover (*e.g.* soil/vegetation type): Snow — Start Date/Time: March 22 11:23 am

Terrain (*e.g.* flat, hills, mountains): esker/hill top — Finish Date/Time: March 23 11:40 am

Weather:

Temperature (°C): -17 C — Cloud Cover (%): 80%

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☒ Light ☐ None — Direction _____

Instrument:

Type: 2250 — Serial #: 5

Calibration: ☒ Before ☐ After

Method _____

Weighting (*i.e.* A) _____ — Other Settings _____

Response (*i.e.* fast/slow) _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: wind

Potential noise sources: wind, wildlife, planes, helicopter, construction (?) drill (?)

Obstacles (*e.g.* trees, buildings) _____

Notes:

Before - New Sensitivity 51.81 mV/Pa — Pictures taken facing: north, east, south, west

Deviation from last 0.00 dB

After - New Sensitivity Forgot to get

Deviation from last

2.5 km from Goose camp

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 833-002-16

ID (*e.g.* S1): BR4

UTM Coordinates: 442052 E 7271258 N — UTM Datum: NAD 83

Ground Cover (*e.g.* soil/vegetation type): Snow — Start Date/Time: March 23 11:59am

Terrain (*e.g.* flat, hills, mountains): slight hill, bedrocky — Finish Date/Time: March 24 3:15pm

Weather:

Temperature (°C): -19C — Cloud Cover (%): 30%

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☒ Light ☐ None — Direction _____

Instrument:

Type: 2250 — Serial #: 5

Calibration: ☐ Before ☒ After

Method _____

Weighting (*i.e.* A) _____ — Other Settings _____

Response (*i.e.* fast/slow) _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: Just a bit of wind + us

Potential noise sources: Wind, helicopter, planes

Obstacles (*e.g.* trees, buildings): None

Notes:

Before: New Sensitivity 46.51 mV/Pa — Photos: facing north, east, south + west

Deviation from last -0.94 dB

After - New sensitivity 49.75 mV/Pa

Deviation from last 0.58 dB

8km to NE of camp

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 0833-002-16

ID (e.g. S1): BR5

UTM Coordinates: 393767 E 7306118 N — UTM Datum: NAD 83

Ground Cover (e.g. soil/vegetation type): Snow, small shrubs — Start Date/Time: March 24 10:22am

Terrain (e.g. flat, hills, mountains): Small bedrock hill — Finish Date/Time: March 25 11am

Weather:

Temperature (°C): ~27 — Cloud Cover (%): 100%

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☒ Moderate ☐ Light ☐ None — Direction _____

Instrument:

Type _____ — Serial #: 1

Calibration: ☒ Before ☐ After

Method _____

Weighting (i.e. A) _____ — Other Settings _____

Response (i.e. fast/slow) _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: wind

Potential noise sources: Helicopter overhead & landing within 1.5 km for wolverine survey, planes, wind, wildlife

Obstacles (e.g. trees, buildings): Circle of bedrock on western side

Notes:

8 km from George Camp

Photos taken facing: north, east, south, west

Before: New Sensitivity 56.51 mV/Pa

Deviation from last 0.95dB

After: "Calibration failed. Deviates more than 1.5 dB from initial calibration"

* Batteries were low on calibrator on day it was set - kept turning off. I replaced batteries

Please be sure to take a few photos of the instrument and the surrounding area (i.e. one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 833-002-16

ID (e.g. S1): BR6 (5)

UTM Coordinates: 406727 E 7289932 N — UTM Datum: NAD 83

Ground Cover (e.g. soil/vegetation type): Snow — Start Date/Time: March 24 / 5:49 pm

Terrain (e.g. flat, hills, mountains): Flat — Finish Date/Time: March 25 / 6:30 pm

Weather:

Temperature (°C): _____ — Cloud Cover (%): 100%

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☐ Light ☒ None — Direction _____

Instrument:

Type: 2250 — Serial #: 5

Calibration: ☐ Before ☐ After

Method: _____

Weighting (i.e. A): _____ — Other Settings: _____

Response (i.e. fast/slow): _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: very little

Potential noise sources: planes / helicopter - it is on heli flight path between Goose + George camps, wind, wildlife

Obstacles (e.g. trees, buildings): no

Notes:

Before: New Sensitivity 50.60 mV/PA — Photos Taken Facing: North, East, South, West

Deviation from last 0.15 dB

* Batteries were low on calibrator

* Battery was charged overnight, but said "low battery" → seemed to work okay anyway

All-Weather Road. ½ way b/w Goose + George Camps

Please be sure to take a few photos of the instrument and the surrounding area (i.e. one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 0833-002-16

ID (*e.g.* S1): BR7

13W UTM Coordinates: 0373761 E 7382904 N — UTM Datum: _____

Ground Cover (*e.g.* soil/vegetation type): Snow — Start Date/Time: 1030 26-MAR-2012

Terrain (*e.g.* flat, hills, mountains): Hills — Finish Date/Time: 1300 26-MAR-2012

Weather:

Temperature (°C): -20°C — Cloud Cover (%): 100

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☐ Light ☒ None — Direction: N/A

Instrument:

Type: 2250 — Serial #: 5

Calibration: ☒ Before ☒ After

Method: _____

Weighting (*i.e.* A): _____ — Other Settings: _____

Response (*i.e.* fast/slow): _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: None

Potential noise sources: Wildlife

Obstacles (*e.g.* trees, buildings): _____

Notes:

Before New Sensitivity 50.17 mV/Pa
Deviation from Last -0.07dB

After New Sensitivity: 50.20 mV/Pa
Deviation from Last: 0.00dB

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Rock River — Project #: 0832-002-16

ID (*e.g.* S1): BR8

BW UTM Coordinates: 0388656 E 7382021 N — UTM Datum: _____

Ground Cover (*e.g.* soil/vegetation type): Snow C. — Start Date/Time: 1100 26-MAR-12

Terrain (*e.g.* flat, hills, mountains): Peninsula — Finish Date/Time: 1200 26-MAR-12

Weather:

Temperature (°C): -20°C — Cloud Cover (%): 100

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☒ Light ☐ None — Direction: S

Instrument:

Type: 2250 — Serial #:)

Calibration: ☒ Before ☒ After

Method: _____

Weighting (*i.e.* A): _____ — Other Settings: _____

Response (*i.e.* fast/slow): _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: None

Potential noise sources: Wildlife

Obstacles (*e.g.* trees, buildings): None

Notes: Before: New Sensitivity = 55.30 mV/Pa

Deviation from Last = -0.19 dB

After: New Sensitivity: 52.33 mV/Pa

Deviation from Last: -0.48 dB

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 0833-002-16

ID (*e.g.* S1): BR9

13 W UTM Coordinates: 0388255 E 7328466 N — UTM Datum: _____

Ground Cover (*e.g.* soil/vegetation type): Snow — Start Date/Time: 1330 27-MAR-12

Terrain (*e.g.* flat, hills, mountains): Flat — Finish Date/Time: 1345 28-MAR-12

Weather:

Temperature (°C): -15°C — Cloud Cover (%): 50

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☒ Moderate ☐ Light ☐ None — Direction: S

Instrument:

Type: 2250 — Serial #: 5

Calibration: ☒ Before ☒ After

Method: _____

Weighting (*i.e.* A): _____ — Other Settings: _____

Response (*i.e.* fast/slow): _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: Wind

Potential noise sources: Wildlife

Obstacles (*e.g.* trees, buildings): _____

Notes:

Before 50.96 mV/Pa

Deviation from Last 0.13 dB

After New Sensitivity = 53.86 mV/Pa

Deviation from Last = 0.48 dB

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Baseline Study - Field Data Sheet

Sampler Location:

Project Name: Back River — Project #: 0833-0020-16

ID (*e.g.* S1): BR10

13W UTM Coordinates: 0388130 E 7313257 N — UTM Datum: _____

Ground Cover (*e.g.* soil/vegetation type): Snow + bedrock — Start Date/Time: 1400 27-MAR-2012

Terrain (*e.g.* flat, hills, mountains): Hill — Finish Date/Time: 1415 28-MAR-12

Weather:

Temperature (°C): -10°C — Cloud Cover (%): 0

Precipitation: ☐ Heavy ☐ Moderate ☐ Mild ☒ None

☐ Snow ☐ Rain ☐ Other _____

Wind: Speed ☐ Strong ☐ Moderate ☒ Light ☐ None — Direction: S

Instrument:

Type: 2250 — Serial #: 1

Calibration: ☒ Before ☒ After

Method: _____

Weighting (*i.e.* A): _____ — Other Settings: _____

Response (*i.e.* fast/slow): _____

Observations: ***Include directions and estimated distances to the instrument in this section***

Audible noise observed: Construction, snow plow

Potential noise sources: Wildlife, wind, camp noise

Obstacles (*e.g.* trees, buildings): _____

Notes: Before New Sensitivity: 55.19 mV/Pa @ George Camp

Deviation from Last: 0.46 dB

After New Sensitivity = 52.33 mV/Pa

Deviation from Last = -0.46 dB

Please be sure to take a few photos of the instrument and the surrounding area (*i.e.* one in each direction) and put them in the project folder with appropriate labels upon return to the office!

Noise Data Sheet BR1 14-Jun-12

- Goose Camp
- cloudy (100%)
- high wind
- 10°C
- no precip
- located in camp

- sources:
  - → helicopters
  - → bobcats
  - → other machinery
  - → people
  - → wind
  - → weather

- dispatched @ 1300 pickup @ 1500 (15-Jun)
- Calibration beginning:
  new sensitivity = 53.03 mV/Pa
  deviation from last = -0.12 dB
- Calibration after:
  new sensitivity = 50.85 mV/Pa
  deviation from last = -0.37 dB

Unit 1

Noise Data Sheet BRN 2 15-Jun-2012

- Clouds 90%
- Wind moderate
- Temp 10°C
- Precip none

- Sources
  aircraft
  wildlife
  weather

Install time 1645
Pickup time 1700

Calibration before
new sensitivity 54.01 mV/Pa
deviation from last 0.53 dB

Calibration after
new sensitivity 52.92 mV/Pa
deviation from last -0.18 dB

Unit 1

Noise Data Sheet BRN3 14-Jun-2012

- Clouds 100%
- Wind high (10 m/s +)
- Temp 7°C
- Precip none

- Sources
  - → wind
  - → wildlife
  - → helicopters + planes

Install time: 1430
Pickup time: 1545 (15-Jun)

- Calibration before
  - new sensitivity = 48.31 mV/Pa
  - dev. from last = 0.07dB

- Calibration after
  - new sensitivity 54.01 mV/Pa
  - deviation from last 0.53dB

Unit 2

Noise Data Sheet BRN4 15-June-2012

- Clouds 100%
- Wind moderate
- Temp 10°C
- Precip none

- Sources
  - birds
  - wildlife
  - weather
  - aircraft

Install time 1600
Pickup time 1630

- Calibration before
  - new sensitivity 47.71 mV/Pa
  - deviation from last -0.11dB

- Calibration after
  - new sensitivity 47.42 mV/Pa
  - deviation from last -0.05dB

Unit 2

Noise Data Sheet BRN5 14-JUN-2012

Clouds 100%
Wind moderate-high
Temp 5°C
Precip moderate rain

Sources
rain
helicopter
weather
wildlife

Install time 1415
Pickup time 1415

Calibration before
new sensitivity 52.96
deviation from last -0.12 dB

Unit 1

Noise Data Sheet BRN6 14-JUN-2012

Clouds 100%
Wind moderate
Temp 5°C
Prelip moderate

Sources
rain
helicopter
weather
wildlife

Install time 1430
Pickup time 1430

Calibration before
new sensitivity 47.82 mV/Pa
deviation from last 0.00 dB

Unit 2

No.392

Noise Data Sheet BRN7 17-Jun-2012

Clouds 0
Wind moderate
Temp 15°
Precip none

Sources
weather
wildlife
helicopters

Install time 1015
Pickup time

Calibration before
new sensitivity 47.59 mV/Pa
deviation from last 0.03 dB

Calibration after
new sensitivity
deviation from last

Unit 2

Rite in the Rain

No.392

Noise Data Sheet BRN8 17-Jun-2012

Clouds 0%
Wind mild
Temp 15c
Precip none

Sources
wind
weather
wildlife

Install time 1000
Pickup time

Calibration before
new sensitivity 53.18 mV/Pa
deviation from last 0.04 dB

Calibration after
new sensitivity
deviation from last

Unit 1

Rite in the Rain

Noise Data Sheet BRN9 18-JUN-2012

Clouds 50%
Wind mild
Temp 15°
Precip none

Sources
- aircraft
- wildlife
- weather

Install time 1115
Pickup time

Calibration before
new sensitivity 47.79 mV/Pa
deviation from last 0.04 dB

Calibration after
new sensitivity
deviation from last

Unit 2

BRN10 Noise Data Sheet BRN10 18-JUN-2012

Clouds 50%
Wind mild
Temp 15°C
Precip none

Sources
- machines
- people
- camp noise
- people
- wildlife
- aircraft
- weather

Install time 1140
Pickup time

Calibration before
new sensitivity 53.70 mV/Pa
deviation from last 0.68 dB

Calibration after
new sensitivity
deviation from last

Unit 1

Appendix V4-2B

Back River Project: Noise and Vibration Modelling Report

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

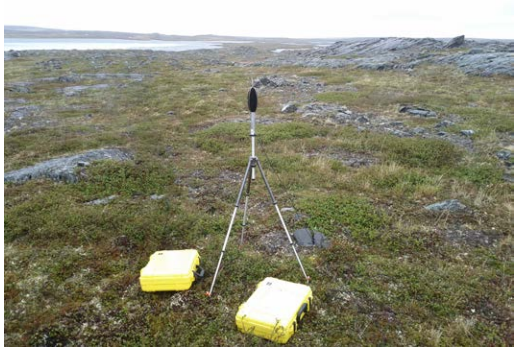
BACK RIVER PROJECT
Noise and Vibration Modelling Report

Sabina GOLD & SILVER CORP.











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November 2013

BACK RIVER PROJECT
NOISE AND VIBRATION MODELLING REPORT

November 2013
Project #0194096 0037

Citation:

Rescan. 2013. *Back River Project: Noise and Vibration Modelling Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan Environmental Services Ltd., an ERM company
Vancouver, British Columbia

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BACK RIVER PROJECT
NOISE AND VIBRATION MODELLING REPORT

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Appendix 1. Source Term Data

Glossary and Abbreviations

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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.

%HA	Percent Highly Annoyed
ANSI	American National Standards Institute
Ambient noise	The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far.
Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the LA90 descriptor.
Decibel (dB)	The unit used to describe sound levels and noise exposure. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.
dB(A)	Environmental noise levels such as noise generated by industry, construction and road traffic are commonly expressed in dB(A). The A-weighting scale follows the average human hearing response and enables comparison of the intensity of noise with different frequency characteristics. Unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear.
dB(C)	Unit used to measure 'C-weighted' sound pressure levels. C-weighting is an adjustment made to sound-level measurements which takes account of low-frequency components of noise within the audibility range of humans.
ISO	International Organization for Standardization
kg	kilogram
L_{AE}	A-weighted sound exposure level
L_{AFmax}	Maximum A-weighted, fast time constant sound level
L_{CE}	C-weighted sound exposure level
L_d	Daytime (07:00 to 22:00) equivalent sound level
L_{dn}	Day-night equivalent sound level
L_{eq} / LA_{eq}	This level represents the equivalent, or average noise energy, during a measurement period. The L_{eq}, 15min noise descriptor simply refers to the Leq noise level calculated over a 15 minute period. Indeed, any of the below noise descriptors may be defined in this way, with an accompanying time period (e.g., L_{10}, 15 minute) as required.

L_n	Nighttime (22:00 to 07:00) equivalent sound level.
L_{peak}	The maximum absolute value of the instantaneous sound pressure.
m	Metre
MLA	Marine Laydown Area
NIHL	Noise Induced Hearing Loss
Project, the	The Back River Project
Sound Power Level (Lw) -	This is a measure of the total power radiated by a source. The Sound Power of a source is a fundamental property of the source and is independent of the surrounding environment.
Tpd	Tonnes per day
TNT	Trinitrotoluene (explosive)
WHO	World Health Organization

1. Introduction

1. Introduction

This Noise and Vibration Modelling Report provides details of the modelling undertaken to assess the potential environmental effects of noise and vibration associated with the proposed Back River Project (the Project).

The Project is located in the Kitikmeot region of Nunavut. The Project includes the Goose Property Area, the George Property Area, the Marine Laydown Area (MLA) situated in the southern portion of Bathurst Inlet, and connecting winter roads.

Noise and vibration is an important environmental factor because a change in the noise or vibration levels may adversely affect wildlife, workers and local residents. Noise is defined as any undesirable sound that may irritate people, disturb rest or sleep, cause loss of hearing, or otherwise affect the quality of life of affected individuals. Noise can result in psychological and physiological effects (e.g., stress), mental health effects, and effects on residential behaviour (WHO 1999).

In addition, noise may negatively affect wildlife causing them to avoid important habitats and/or take time away from their key behaviours such as feeding, breeding or watching for predators, which can ultimately lead to reduced reproduction and increased mortality. Direct effects of high noise levels and shock waves on fish include mortality or internal injury (e.g., hearing, bleeding, ruptured swim bladder).

Vibration may be in the form of ground vibration or blasting overpressure, i.e., pressure waves in the atmosphere. These ground-borne or airborne vibrations can cause cosmetic and structural damage to buildings as well as disturbances to local residents, workers, and wildlife.

The existing noise environment is described as pristine wilderness with no noise effects relating to industrial activity. The construction and operation of the Project will introduce noise and vibration sources largely in the form of construction equipment, haul vehicles, blasting and vehicle and aircraft traffic.

The scope of the noise and vibration modelling study was identified based on regulatory considerations and guidance, professional judgement and community-based consultation and includes:

- noise and vibration from mining, processing and construction activities within the noise local study area (LSA); and
- air operations (including fixed wing aircraft at the George Property Area and Goose Property Area permanent airstrips) and helicopter operations between the two property areas.

Due to the anticipated lower levels of activity at the MLA, the potential noise and vibration effects at the MLA are expected to be less than at the George Property Area or the Goose Property Area. If the effects on noise of the Goose and George Property Areas are not predicted to be significant, then the potential effects from the entirety of the Project and the MLA should also be not significant. As such, the MLA is not included in the scope of this modelling report.

The broad objective of the noise and vibration modeling study is to quantify potential environmental noise and vibration levels associated with mining, processing, construction, and aviation aspects of the Project.

This report provides details of the modelling methodology and results. A full discussion of these results, quantification of any effects and provision of necessary mitigation are included in the Noise and Vibration chapter (Volume 4, Chapter 2), the Wildlife chapters (Volume 5, Chapter 5 – 10) and Human Health and Environmental Risk Assessment chapter (Volume 8, Chapter 6).

2. Existing Environment

2. Existing Environment

2.1 BASELINE NOISE

The Back River Project (the Project) is remote and void of significant noise from other projects or activities. Baseline noise monitoring was conducted in 2012 at ten noise monitoring locations across the Goose and George Property Areas and the MLA (Rescan 2012a). The noise monitoring locations were selected to characterise the range of baseline conditions in the noise regional study area (RSA), based on their proximity to known deposits and sensitive wildlife receptors (Figure 2.1-1).

Monitored average noise levels varied substantially depending on the proximity to existing infrastructure and 24 hour L_{eq} values ranged from 18 to 70 dBA. As expected, the highest average noise levels were recorded at the stations situated at the Goose and George exploration camps, due to nearby anthropogenic noise sources during exploration. The lowest average noise levels were monitored at locations furthest from the existing infrastructure.

Noise data collected in 2012 was reflective of pristine background noise conditions as well as exploration camp noise conditions. Overall monitored noise levels were consistent with other background studies done in pristine areas. These levels are comparable to those collected at a nearby location in the West Kitikmeot where 24 hour L_{A90} levels ranged from 17 to 49 dBA (Rescan 2012b). Monitored noise levels are also comparable to estimated baseline levels for quiet, rural areas as given in the Alberta EUB Directive 038, which considers a quiet, rural area with day-night sound levels due to human-made sounds to be below 45 dBA (Alberta EUB, 2007).

2.2 METEOROLOGICAL CONDITIONS

The Project is located in the vicinity of the Arctic Circle in the West Kitikmeot region of Nunavut. The Project area experiences relatively low amounts of precipitation. Due to sub-zero temperatures for the majority of the year the area experiences high snow accumulation. There is a relative absence of obstructions to impede the wind (e.g., trees, buildings, mountains) meaning that wind speeds are generally high. The length of the snow-free season is typically from June to September (Rescan 2012c).

The site-specific meteorological monitoring program for the Project began in 2004 with the commissioning of the George and Goose meteorological stations. The climatic variables monitored by the meteorological stations are air temperature, precipitation as rainfall, solar radiation, wind speed and wind direction (Rescan 2012c). Analysis of the meteorological data collected during 2006 to 2012 has been used to provide the following information relevant to the noise modelling.

At the George meteorological station the winds are predominately from the north, north northeast, northwest and southeast. Wind speeds were in excess of 5 m/s from all directions 43% of the time.

At the Goose meteorological station the dominant wind direction was from the west to north quadrant, blowing from this quadrant 42% of the time and also from the southerly direction for 9% of the time. Wind speeds were in excess of 5 m/s from all directions over 35% of the time.

Annual average air temperatures ranged from -11.6°C to -5.8°C at George and -11.5°C to -6.6°C at Goose. Observations recorded indicate that the climate consists of a winter period (October to May) of extremely cold mean monthly temperatures ranging from -33.0 to -1.3°C; a cool spring, summer and fall period (June to September) with mean monthly temperatures ranging from -0.3 to 14.5°C.

Precipitation in the noise RSA ranged from 249.4 to 299.2 mm per year. Site-specific meteorology station precipitation was measured as rainfall during the summer period only (June to September), when temperatures were above freezing. Summer total rainfall between June and September ranged from 4 mm to 211 mm.

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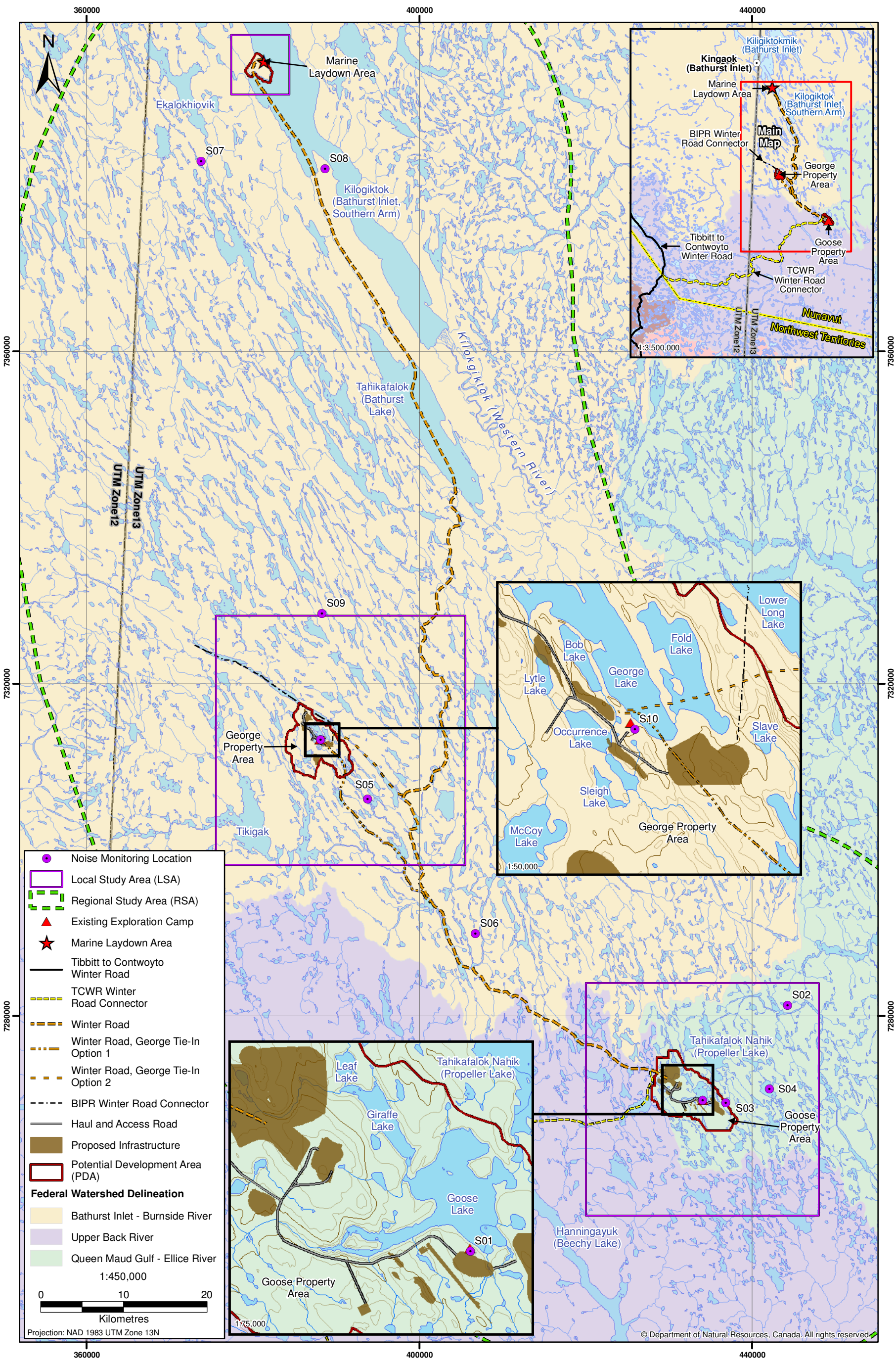


Figure 2.1-1

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2012 Noise Baseline Monitoring Locations, Back River Project

Figure 2.1-1

Rescan an ERM company

3. Methodology

3. Methodology

3.1 OVERVIEW

In order to robustly model the potential effects of the Project on noise the following tasks were completed:

- identify relevant standards and guidelines, applicable to the Project and the assessment;
- review any existing Project data and/or information relevant to the assessment, including review of project site plans and proposed operational mining, quarry and construction scenarios;
- identify the closest and/or potentially most affected noise and vibration sensitive ecological and human receptors in the vicinity to the site. These locations have been adopted as the Project-specific assessment locations (sensitive receptors);
- scope the potential effects of the Project on vibration levels;
- assume typical background noise levels at representative project-specific assessment locations (sensitive receptors) and develop the Project-specific criteria at these assessment locations;
- develop a Project-specific noise model to accurately quantify mining, processing, construction and aviation noise level contributions including fixed and mobile noise sources associated with the Project; and
- compare the resultant noise levels to the Project-specific noise criteria and determine the noise levels at the closest and/or potentially most affected noise sensitive receiver locations in the vicinity of the site.

The scope of this study is to determine noise and vibration levels at human and wildlife receptors within 10 km of the noise sources. Potential noise and vibration effects are assessed in accordance with current best practice and the following relevant guidance:

- Alberta Energy and Utility Board (2007) *Alberta Noise Directive 038*;
- Health Canada (2010) *Useful Information for Environmental Assessment (Section 6: Noise Effects)*;
- WHO (1999) *Guidelines for Community Noise*;
- US EPA (1974) Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety;
- Michaud, Bly, and Keith (2008) *Using a Change in Percent Highly Annoyed with Noise as a Potential Health Effect Measure for Projects under the* Canadian Environmental Assessment Act;
- Environment Canada (2009) *The Environmental Code of Practice for Metal Mines*;
- International Standards Organization (2003) *ISO 2631/2 Mechanical Vibration and Shock - Evaluation of human exposure to whole-body vibration Part 2*;
- German Standard Organization (1970) *Vibrations in Building Construction DIN 4150*; and
- Swiss Association of Standardization (1978) *Effects of Vibration on Construction: SN640 312*.

3.2 SPATIAL AND TEMPORAL BOUNDARIES

3.2.1 Spatial Boundaries

Study areas were established based on the "zone of influence" beyond which the residual effects of the Project are expected to diminish to a negligible state. The expected zone of influence was determined using baseline studies, consultation, and expert knowledge.

Based on professional judgement, and other assessments in northern regions such as that for the Snap Lake Project, Project-related noise may be audible under calm conditions at a distance of up to 10 km (De Beers 2002). Therefore, two LSAs were selected for the Project extending 10 km in all directions from infrastructure around the Goose and George properties (Figure 3.2-1). The LSAs include the Proposed Development Area (PDAs) which contain all existing and planned infrastructure.

3.2.1.1 Noise Sensitive Receptor Locations

A point of reception or receptor may be defined as any point occupied by persons where extraneous noise and/or vibration are received. Examples of human receptor locations may include: permanent or seasonal residences; hotels, schools and daycares; hospitals and nursing homes; places of worship; and parks and campgrounds. There are no such locations at the Project and only off duty workers at the camps are considered. Wildlife receptors may be areas where wildlife frequent or migrate between habitat areas.

Tables 3.2-1 and 3.2-2 provide the identified sensitive receptors (human and wildlife) within 10 km of the George Property Area and Goose Property Area infrastructure, respectively. These are also shown on Figures 3.2-2 and 3.2-3. These locations have been adopted as the project-specific assessment locations, or the sensitive receptors. No existing human receptors were identified within 10 km of either the George Property Area or the Goose Property Area.

Table 3.2-1. George Property Sensitive Receptors

Sensitive Receptor Number	Sensitive Receptor Description	Coordinates (UTM13N)		Approximate Distance from Closest Deposit (m)	Direction from Source
		Easting	Northing		
R1	George camp[1]	387456	7311480	400 (Locale 1)	NE
R2	Peregrine falcon nest	388723	7312293	600 (Locale 2)	SE
R3	Rough-legged hawk nest	391848	7314708	3,000 (Locale 1)	NE
R4	Waterbirds - Staging area	385600	7311500	2,500 (Locale 2)	SW
R5	Wolf/ Fox - active and productive fox den	388091	7311053	1,600 (Locale 2)	S

[1] *The future George camp was assumed to be east of McCoy Lake.*

Table 3.2-2. Goose Property Sensitive Receptors

Sensitive Receptor Number	Sensitive Receptor Description	Coordinates (UTM13N)		Approximate Distance from Closest Deposit (m)	Direction from Source
		Easting	Northing		
R6	Goose camp	431139	7272010	1400 (Umwelt)	NE
R7	Caribou camera location BR28	421107	7260616	13000 (Umwelt)	SW
R8	Gyrfalcon nest	431202	7269935	900 (Umwelt)	SE
R9	Waterbirds - Staging area	435000	7265775	3500 (Main)	S
R10	Wolverine - Active den	431012	7269955	700 (Umwelt)	S
R11	Wolverine - Active den	431145	7263746	6200 (Main)	SE

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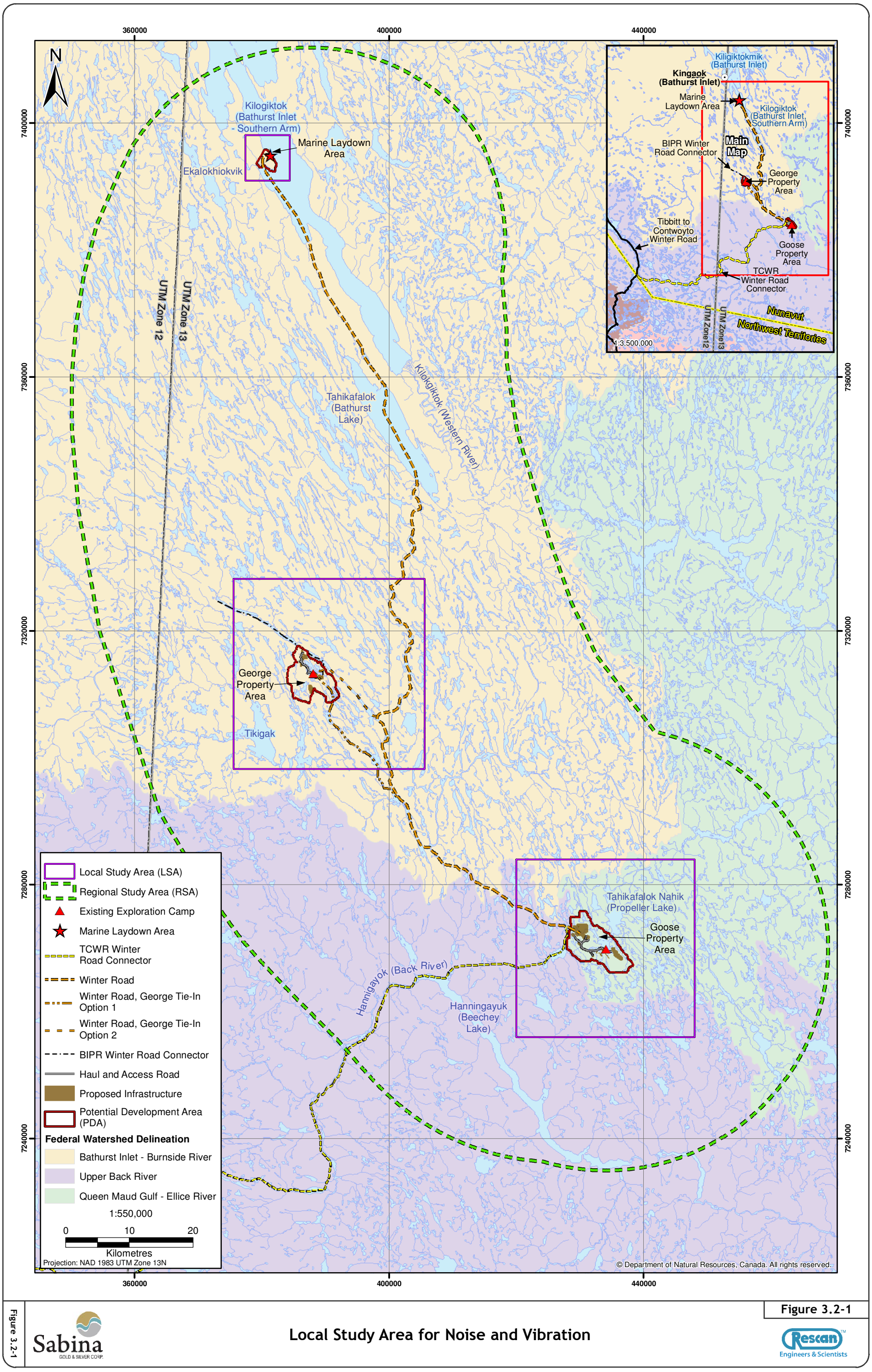


Figure 3.2-1

Sabina GOLD & SILVER CORP.

Local Study Area for Noise and Vibration

Figure 3.2-1

Rescan™ Engineers & Scientists

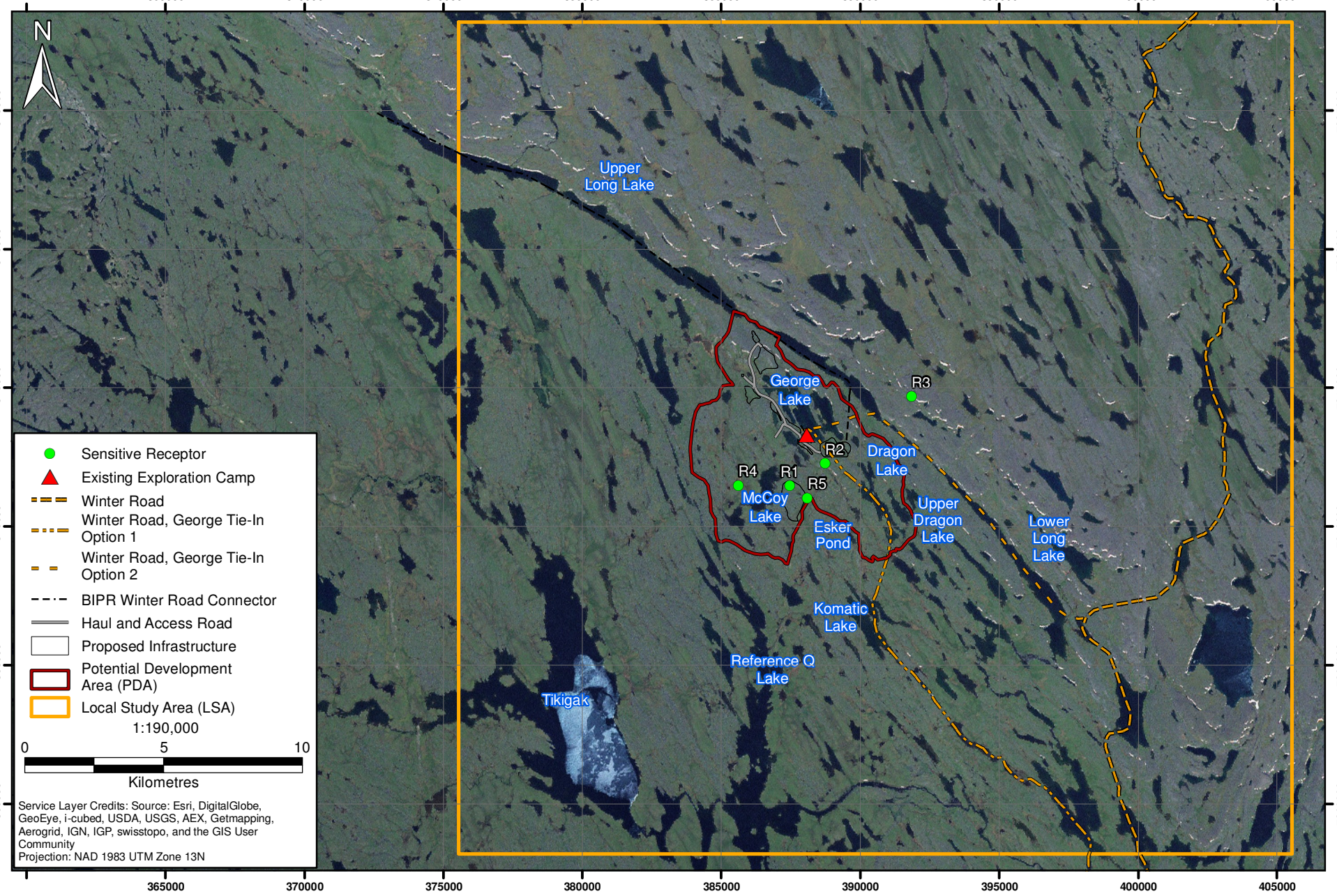


Figure 3.2-2

Sabina GOLD & SILVER CORP.

Noise Sensitive Receptors: George Property Area

Figure 3.2-2

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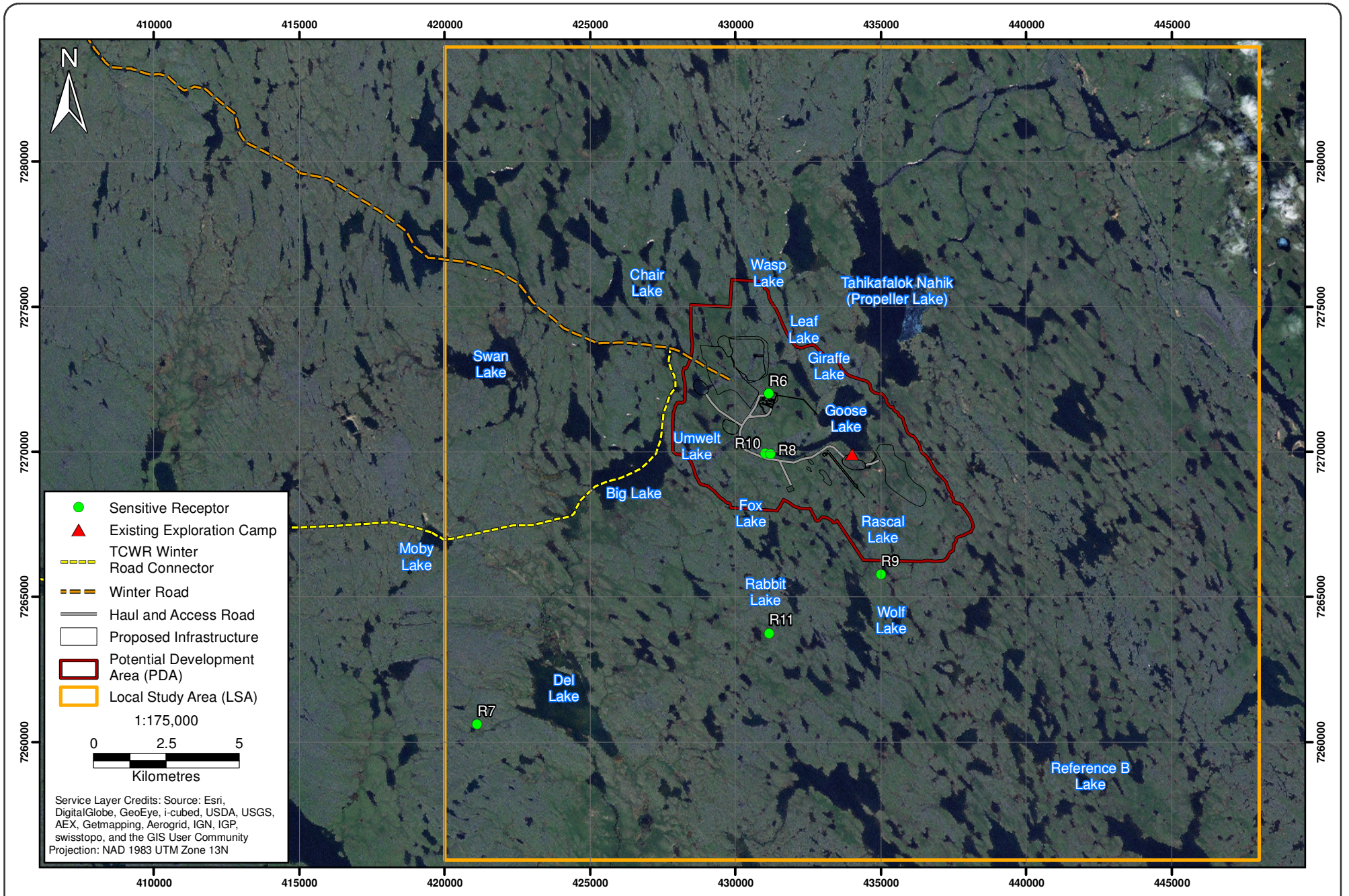


Figure 3.2-3

Sabina GOLD & SILVER CORP.

Noise Sensitive Receptors: Goose Property Area

Figure 3.2-3

Rescan an ERM company

As there are no known existing human receptors within 10 km of either the George Property Area or the Goose Property Area, the potential effects of noise on human health focuses solely on the Project workers' camps. In line with current best practice the noise assessment for the worker's camps will consider the potential effects on sleep disturbance.

In line with current best practices, other potential effects such as interference with speech communications and the potential for noise complaints will not be assessed for onsite human receptors.

3.2.2 Temporal Boundaries

All of the project phases may have interactions with noise; however, only the years with the highest predicted noise emissions were included in the noise modelling study.

The noise modelling and assessment are based on the conservative approach of using the 'worst case' year for noise emissions. Modelling years were chosen to be years in which the highest numbers of mobile and fixed equipment units are expected to be in use, as follows:

- Year 3 - Goose Property Area; and
- Year 7 – George Property Area.

If the effects of these years are predicted to be not significant then the potential effect for the entirety of the Project should also be not significant. Noise does not persist once the noise-causing activities cease.

Noise and vibration levels have also been predicted for two scenarios to represent snap shots of the fixed wing aircraft operations and the helicopter operations using the permanent airstrips at the George Property Area and the Goose Property Area.

The noise effects during the site preparation, reclamation and closure, post-closure and other potential phases are expected to be less than during the construction and operation phases and therefore these other phases are not explicitly included.

3.3 PROJECT ASSUMPTIONS USED IN NOISE MODELLING

Within the Goose Property Area and George Property Area there are several mineral targets and a combination of open pit and underground mining methods are to be used for mineral extraction. Open pit mining will be carried out by conventional truck/shovel methods at six sites (Main, Umwelt, Llama, Locale 1, Locale 2 and LCP North). Umwelt is the only deposit which will be mined using underground mining methods. For underground mining, access to mineralized zones will be by decline tunnels (See Volume 2; Project Description).

Ore will be processed at a mill located within the Goose Property Area. Ore from Goose Property Area and George Property Area will be processed at this one location while waste rock will be stored in designated storage areas on the surface or backfilled in mine workings at both properties.

Ice and open water airstrips and aprons will be used during site preparation, construction and closure. At the onset of site preparation activities, an all-weather airstrip and apron capable of servicing passenger aircraft will be constructed at the Goose Property Area and the George Property Area. During winter, larger airstrips will be constructed on an adjacent lake at George Property Area and on Bathurst Inlet at the Marine Laydown Area.

Helicopters are used, and will continue to be used, within the Project area to support exploration activities, provide linkages between the camps, and between each property and Bathurst Inlet.

3.3.1 Open Pit and Surface Equipment

The major open pit mining equipment requirements for the modelled years are indicated in Table 3.3-1. The mining fleet has an estimated maximum capacity of 50,000 tpd total material. The equipment in the fleet will vary during underground operations based on production schedule, haulage distances and mineralized zones in operation.

Table 3.3-1. Estimate of Major Open Pit Equipment Requirements Used in Noise Model

Type of Equipment	Goose Property Year 3 Umwelt, Llama, and Goose Main	George Property Year 7 L1, L2, and LCP North Pits
Haul Truck CAT-785D	5	5
Haul Truck CAT-777G	9	9
Front end loaders CAT 993K	3	3
Rubber Tyre Dozers CAT 824 H	2	2
Bulldozers CAT D-10	5	4
Motor Graders CAT 16M	3	2
Vertical Drill Rig MD 6240 (rotary)	3	2
Vertical Drill Rig MD 5125 (Track)	2	2
Mechanics Truck	1	1
School bus	1	1

Table 3.3-1 also includes details of the fleet of surface equipment required at both sites to move rock from the stockpiles to the crusher, move people and freight about the site, maintain roads and remove snow. This equipment will also be used to maintain and build access roads, and to meet various site facility requirements (including stockpile maintenance, and further exploration development).

3.3.2 Underground Mine Equipment

Table 3.3-2 lists the initial underground mobile equipment fleet selected for the current mine plan, as available at the time of undertaking the noise modelling (June 2013). As for the open pit equipment, the equipment in the fleet will vary during underground operations based on production schedule, haulage distances and mineralized zones in operation.

Table 3.3-2. Estimate of Major Underground Mobile Equipment Requirements

Drilling Equipment	Quantity	Service Vehicles	Quantity
2 Boom Jumbo	4	Grader	1
Rockbolter	4	ANFO Loader	2
Cablebolter	1	Boom Truck	1
LH Production Drill	2	Flat Deck Truck	1
Secondary Breaking System	1	Mechanics Truck	1
Exploration Drill	2	Scissor Lift	2
Loading and Hauling Equipment	**Quantity**	Personnel Carrier	3
LHD, 5.4 m^3 (10 t)	3	Supervisor/Engineering Vehicle	3
LHD, 3.5 m3 (6.7 t)	1	Electrician Vehicle - Scissor Lift	1
LHD, 2.0 m3 (3.5 t)	1	Shotcrete System	1
Haulage Truck, 40 t	5	Forklift/Tractor	2

3.3.3 Hours of Operation

The mine is designed to operate 24 hours per day, 365 days per year. The mine will operate on two 12-hour daily shifts for most of the operating activities. Construction will also be undertaken 24 hours a day, 365 days a year with two 12-hour daily shifts.

3.3.4 Road Transportation

Transportation of fuel and supplies during the winter will occur via ice roads from the MLA to both the George and Goose Property Areas.

The following traffic movements are expected for the winter road during the 75-day winter period trucking window:

- 42 trucks (95-tonne trucks), each making two trips per day, totalling 84 truck trips per day for the transportation of material, equipment etc.; and
- 80 truck trips (5,000-litre fuel tankers) per day for the transportation of fuel.

3.4 ASSESSMENT INDICATORS AND THRESHOLDS

3.4.1 Noise

The following indicators\criteria were used for the noise modelling:

- effects on humans:
  - sleep disturbance;
  - interference with speech communication;
  - complaints;
  - high annoyance;
  - noise induced rattling;
  - noise induced hearing loss (NIHL);
  - cosmetic and structural damage to buildings from vibration; and
- effects on wildlife:
  - loss of wildlife habitat; and
  - disturbance to wildlife.

Details about these indicators\criteria and how they were used in the effects assessment can be found in Volume 4, Chapter 2. Table 3.4-1 provides the thresholds for each indicator that were used to compare the noise modelling results to. These thresholds were also used to characterize potential noise effects in the Noise Chapter (Volume 4, Chapter 2). All of these indicators are for off-site receptors except for sleep disturbance, where on-site mine camps have been assessed with the assumption that windows would be closed.

3.4.2 Vibration Criteria

The sensitivity of a building or structure to vibration will depend on the building itself, for example, the age and construction materials. The German standard DIN 4150 Part 3 (German Standard Organization 1970) provides vibration velocity guidelines for use in evaluating the effect of vibration on building structure. These guidelines are considered to be safe limits up to which no damage due to vibration effects have been observed (Table 3.4-2).

Table 3.4-1. Noise Indicators and Thresholds

Indicator		Description	Threshold
Human Receptors			
Sleep disturbance	L_n	Night-time noise level for assessing sleep disturbance outside the Project boundary	45 dBA
		Night-time noise level for assessing sleep disturbance inside the Project boundary (i.e., windows closed)	60 dBA
	L_{AE}	Noise level for assessing sleep disturbance outside the Project boundary	90 dBA
		Noise levels for assessing sleep disturbance inside the Project boundary (i.e., windows closed)	120 dBA
	L_{peak}	Peak sound pressure level for assessing human sensitivity to impulsive blasting noise	120 dB
	L_{AFmax}	Sleep disturbance level (internal) not to be exceeded more than 10-15 times per night	45 dBA
Interference with speech communication	L_d	Day-time noise level for assessing speech interference	55 dBA
Complaints	L_{dn}	Assessing the likelihood of complaints	62 dBA
		Legal action / Project noise mitigation required	75 dBA
High annoyance	Δ %HA	Increase in % HA metric before and after Project initiation	6.5%
	LLF	Assessing low frequency noise annoyance: sum of low frequency energy content > 65 dB and C-weighted L_{dn} exceeds A-weighted L_{dn} by 10 dB	65 dB
Noise induced rattling	LLF	Using the sum of low frequency energy content to assess the likelihood of noise-induced rattling	70 dB
Wildlife Receptors			
Loss of wildlife habitat	L_n	Night-time noise level for assessing wildlife habitat loss	45 dBA
Disturbance to wildlife	L_{AE}	Sound exposure level for assessing wildlife sensitivity to helicopter noise (ringed seal and marine birds)	70 dBA
		Sound exposure level for assessing wildlife sensitivity to helicopter noise (all other wildlife)	80 dBA
	L_{peak}	Peak sound pressure level for assessing wildlife sensitivity to impulsive blasting noise (disturbed habitat)	108 dB
		Peak sound pressure level for assessing wildlife sensitivity to impulsive blasting noise (functional habitat loss)	120 dB

Table 3.4-2. Vibration Description and Thresholds for Building Structures

Type of Structure	Threshold Value for Velocity (mm/s)
Buildings used for commercial purposes, industrial buildings and buildings of similar design	10
Dwellings and buildings of similar design and/or occupancy	5
Structures that, because of their particular sensitivity to vibration, cannot be classified under types 1 or 2 and are of great intrinsic value, e.g., listed buildings under preservation order	2.5

3.5 MODEL ASSUMPTIONS

3.5.1 Assessment Scenarios

The following scenarios were modelled to quantify potential operational, construction and aviation noise levels across the LSA.

- **Scenario 1** - representative of operational and construction noise within the George Property Area occurring at Year 3 during the Project life;
- **Scenario 2** - representative of operational and construction noise within the Goose Property Area occurring at Year 7 during the Project life;
- **Scenario 3** - representative of combined aviation operations from fixed wing aircraft using the permanent airstrips at the George Property Area and Goose Property Area;
- **Scenario 4** – representative of helicopter operations between the George Property Area and Goose Property Area;
- **Scenario 5** - representative of blasting activities (Year 3 for the Goose Property Area and Year 7 for the George Property Area); and
- **Scenario 6** – representative of winter road transportation (Year 3 for the Goose Property Area and Year 7 for the George Property Area).

Scenarios 1 and 2 offer a representative snap shot of mining and processing operations and construction activities. Scenarios 3 to 6 offer a representative snap shot of aviation operations and blasting impacts at, and between, each of the PDA's.

3.5.2 Source Term Data

The noise source term data (spectral data and overall dBA values) adopted for this model are presented in Appendix 1 and are as provided by the manufacturer or from the Rescan noise database.

3.6 MODELLING COMPONENTS

3.6.1 Operation and Construction Noise Modelling

Bruel and Kjaer noise modelling software package, Predictor V9.01 was utilised to calculate noise levels using the ISO 9613-2:1996 (ISO 1996) noise propagation algorithms. The Predictor software package allows topographic details to be combined with ground regions, water, grass, significant building structures etc. and project-specific assessment locations (sensitive receptors) to create a detailed and accurate representation of the site and surrounding area. Noise emission sources deemed representative of operating conditions under each scenario were placed at relevant locations within the site area. Site terrain was taken into account and modelled using available topographical data and maps.

ISO 9613 describes a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level (as described in ISO 1996) and has been used to predict noise transmission from mining operations.

The noise model allowed quantification of noise levels from multiple sources, based on noise emission levels representative of the plant and equipment to be used for the Project. The model computed the noise propagation in the Project area of influence, providing overall A-weighted noise levels at

identified sensitive receptors. It has been conservatively assumed that modelled sources will be operating concurrently on a 24-hour basis.

3.6.2 Aviation Noise Modelling

The US Federal Aviation Administration (FAA) Integrated Noise Model (INM) version 7.0d (FAA 2013) was used to calculate flight profiles and noise emission levels based on the following main forms of data:

- Runway geometry;
- Aircraft types;
- Aircraft performance data;
- Aircraft numbers during the operating phase;
- Flight tracks (or routes); and
- Meteorological data.

The INM was developed in the USA, and is maintained with an up to date database of aircraft performance and noise data. Version 7.0d has such data for 157 types of commercial aircraft, 115 military aircraft and 26 helicopters. The model is not solely a noise model. As well as predicting noise levels, the INM computes 3-dimensional flight paths, based on the 2-dimensional flight "track" and the vertical flight profile that it computes from individual aircraft thrust and flap settings, aircraft air speed, and headwind data specific to each aircraft operation that the user defines. INM implements the following standards:

- SAE-AIR-1845;
- SAE-AIR-5662;
- SAE-ARP-866A;
- ECAC Doc 29; and
- ICAO Circular 205.

For this study the necessary aircraft performance data was available in the INM databases. Only three types of aircraft are expected to use the two airstrips routinely as follows (Table 3.6-1):

Table 3.6-1. Aircraft Types

Aircraft Type	Description	Daily Arrivals/Departures[1]	Airstrip
Dash 8 (DHC8)	Large twin turboprop fixed-wing aircraft	3 / 3	Goose
Twin Otter (DHC6)	Small twin turboprop fixed-wing aircraft	3 / 3	George
Bell 206 Jet Ranger	11 m rotor diameter turboshaft helicopter (modeled as a B206 Long Ranger)	1 / 1	Goose and George

[1] *The flight numbers are for typical days in the busiest period of production.*

The Back River 2006 to 2012 Meteorology Baseline Report notes the area is subject to high wind speeds due to the relative absence of obstructions to impede the wind (e.g., trees, buildings, mountains) (Rescan 2012c). Wind speeds in the Project areas are generally greater than 3 m/s and predominately from the north westerly quadrant and therefore, a runway headwind speed of 3 m/s has been assumed in the modelling. Wind direction is predominantly from the northwest quadrant and in the summer months are often from the Easterly quadrants, therefore, it has been assumed that fixed wing and

helicopter flights could operate in either direction on both of the runways. Annual mean daily temperature was taken as 0°C and pressure as 760mmHg.

In the absence of routing information, all flights were assumed to approach and depart either airstrip on the extended runway centre line. Standard aircraft operating procedures were assumed, including a 3-degree approach slope for fixed wing aircraft and helicopters flying on visual flight rules to/from altitudes of 1,000 ft. A nominal route was assumed for helicopters flying at 1,000 ft directly between the Goose and George airstrips with helipads located at the centre of the runways.

3.6.3 Road Transportation Noise Modelling

Calculation of winter road transportation noise (L_{Aeq}) was determined using the US Environment Protection Agency's traffic noise model (Report 550/9-74-004; US EPA 1978). The US EPA's method for calculation of the L_{Aeq} noise levels from traffic is an internationally accepted theoretical traffic noise prediction model which takes into account the L_{Amax} vehicle noise level (light and heavy), receiver offset distance, passby duration, vehicle speed, ground absorption (based on the ratio of soft ground and average height of propagation), number of hourly vehicle movements, receiver height, truck exhaust height and the height and location of any intervening barriers.

3.6.4 Blasting

ANSI 12.9 2005 Part 4 was used to calculate the adjusted sound exposure from C-weighted sound exposure level. The results of the blasting calculations with reference to the Project locations and closest noise sensitive receptors, and noise levels are presented in tabular form, can be found in Section 4.4.

Noise levels from blasting has been calculated for six blast locations in the Goose Property and four blast locations at the George Property, representing each end of each open pit mining area (Table 3.6-2).

Table 3.6-2. Blast Locations and Input Data

PDA	Description	X (m)[1]	Y (m)[1]	Charge Weight TNT (kg)[2]	Blast Hole Depth (m)
Goose	Llama Pit (open) North	428625	7272396	320	15
	Llama Pit (open) South	428994	7272024	320	15
	Umwelt Pit (open) North	429661	7271111	296	4.5
	Umwelt Pit (open) South	430024	7270636	296	4.5
	Main Pit (open) West	433730	7269721	187	10
	Main Pit (open) East	434471	7269477	187	10
George	LCP North Pit	386130	7317033	427	10
	Locale1 Pit	387152	7313828	320	15
	Locale 2 Pit North	387874	7313059	274	15
	Locale 2 Pit South	388265	7312606	274	15

[1] *Geographic reference UTM 13N*
[2] *ANSI S12.17 – 1996 requires explosive mass to be a TNT equivalent*

3.6.4.1 Peak Sound Pressure Levels

Peak sound pressure levels (L_{peak}) were used to assess Wildlife effects. Airblast overpressure levels (L_{peak}) have been predicted using the methodology outlined in the *ICI Blasting Guide* (ICI 1995) as follows.

$$\text{Airblast OP (dB)} = 165.3 - 24 \log_{10} SD$$

Where Scaled distance (SD)

$$SD = \frac{d}{\sqrt[3]{MIC}}$$

d = distance in metres between the charge (blast location) and receptor
MIC is the maximum explosive charge mass (kilograms) detonated per delay

3.6.4.2 Vibration

Based on the size of the blast charges, the proximity of relevant receptors to the blast sites and experience from similar projects, it is not anticipated that there will be any impacts from Project-generated vibrations. As such, the potential impact of the Project on vibration is not included in this modelling study.

3.7 LIMITATIONS

For sound calculated using the ISO 9613 standard, the indicated accuracy is ± 3 dBA at source to receiver distances of up to 1,000 m and unknown at distances above 1,000 m. The noise modelling software is limited to calculate all sources within 10 km of a receiver point, as items at distances greater than 10 km would have no influence on the calculation.

The estimated sound power levels for mobile equipment are generally based on new, well-maintained equipment. Older pieces of mobile equipment would likely produce higher noise emissions. For individually modelled noise sources (fixed and mobile equipment and roads), the estimated accuracy of the sound power levels is ± 5 dBA.

Helicopter noise modelling assumes a nominal route between the two airstrips and a cruising altitude of 1,000 ft. The exact routing is not known, but deviations from that assumed would change noise levels on the ground. The aircraft noise model assumed flat ground, which is realistic at the airstrips. Local topography could change noise screening, but these effects are likely to be small when the aircraft are at altitude further from the airstrips.

4. Results

4. Results

This section presents the results of the noise modelling, with results presented for each of the scenarios. A full discussion of these results, quantification of potential effects and provision of necessary mitigation are included in the Noise and Vibration chapter (Volume 4, Chapter 2), the Wildlife chapters (Volume 5) and Human Health and Environmental Risk Assessment (Volume 8, Chapter 6).

4.1 MINING OPERATIONS

4.1.1 Human Receptors

As there are no known existing human receptors within 10 km of either the George Property Area or the Goose Property Area, the results of noise modelling on human health focus solely on the Project worker's camps. In line with current best practice the noise assessment for the worker's camps will consider the potential effects on sleep disturbance.

Calculated noise levels for each of the mining scenarios with respect to human receptors are presented in Table 4.1-1. Contour plots of predicted noise levels for Scenarios 1 and 2 are shown in Figures 4.1-1 and 4.1-2, respectively.

Table 4.1-1. Mining Operations Scenario 1 and 2: Human Receptors

Receptor	Calculated Noise Level (L_n)[1]	Limiting Criteria (L_n)[2]	Below Threshold?
George camp	57	60	Yes
Goose camp	61	60	No

[1] All noise levels are external dBA re 2 x 10-5 Pa assuming a noise attenuation of 30 dBA to internal noise levels
[2] Night-time noise level for assessing sleep disturbance inside the Project boundary

Table 4.1-1 shows that predicted noise levels meet the limiting criteria at George camp and exceed the criteria at Goose camp by 1 dBA. This exceedance is considered to be within a tolerable range and could be easily mitigated through building construction and design.

4.1.2 Wildlife Receptors

Calculated noise levels for each of the mining scenarios with respect to wildlife receptors are presented in Table 4.1-2 and Table 4.1-3. Contour plots of predicted noise levels for Scenarios 1 and 2 are shown in Figures 4.1-1 and 4.1-2, respectively. The noise modelling has assumed that operations are constant throughout the day and therefore L_d and L_n noise levels are predicted to be the same. L_n values are presented below as the L_n threshold is the most stringent.

Table 4.1-2. Mining Scenario 1 – George Property Area: Wildlife Receptors

Receptor	Calculated Noise Level (L_n)	Limiting Criteria (L_n)	Below Threshold?
Peregrine falcon nest	**48**	45	**No**
Rough-legged hawk nest	38	45	Yes
Waterbirds - Staging area	43	45	Yes
Active and productive fox den	**53**	45	**No**

Exceedances (if any) are highlighted in bold

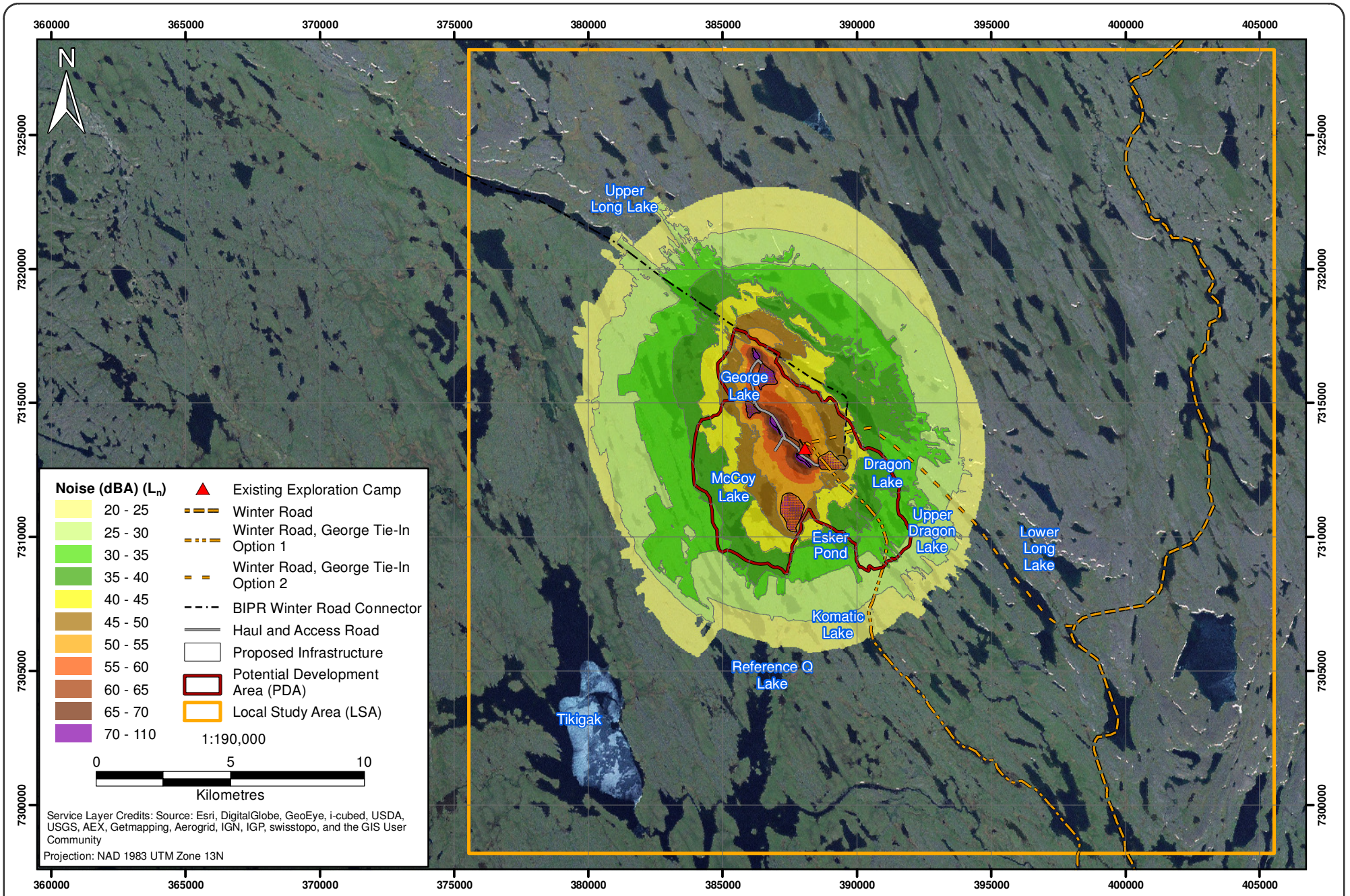


Figure 4.1-1

Sabina GOLD & SILVER CORP.

Predicted Night-time Noise (L_n) - Mining Operations George Property Area

Figure 4.1-1

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PROJECT # 0194096-0040 GIS # BAC-12-035a October 31 2013

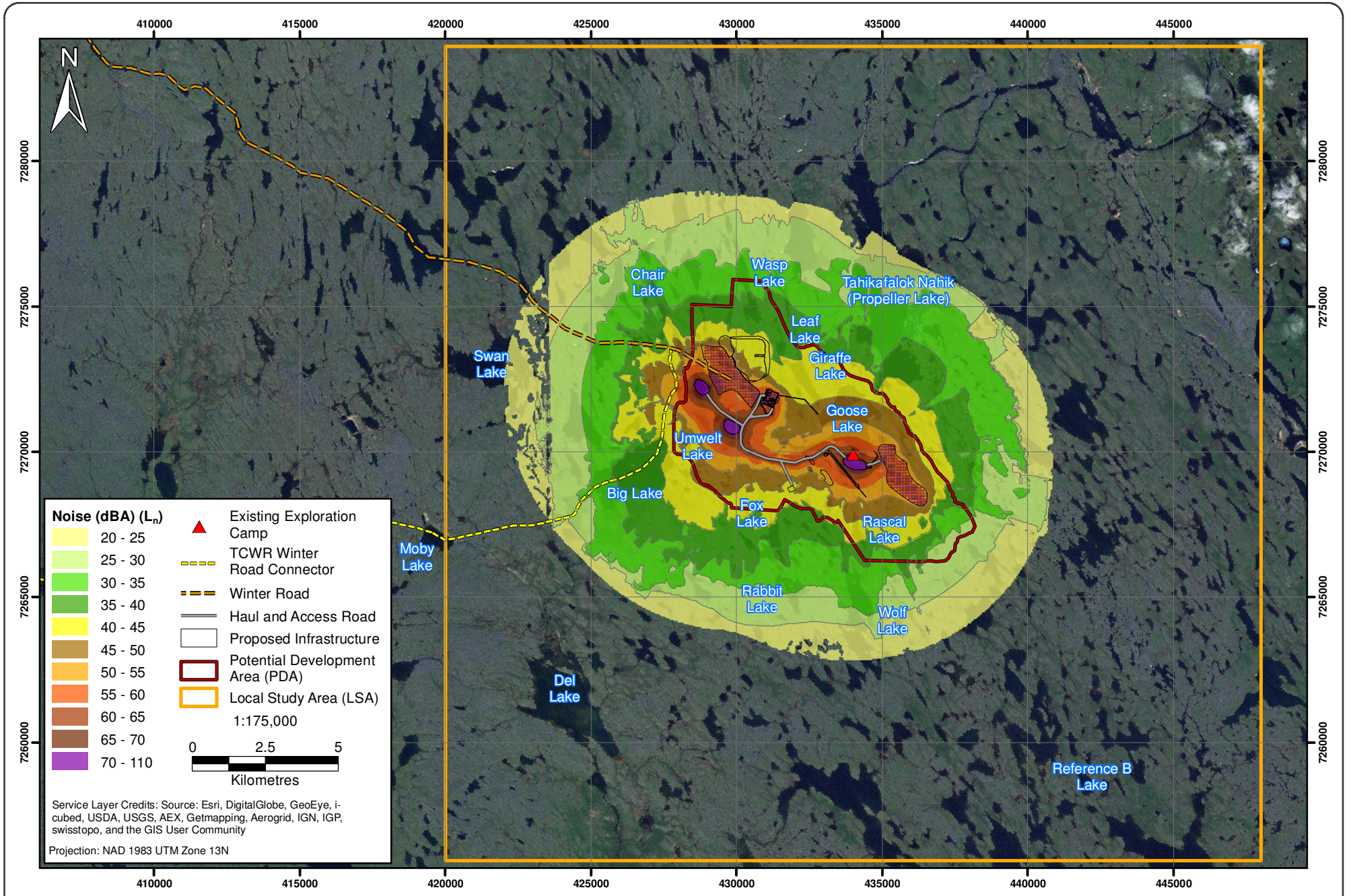


Figure 4.1-2

Sabina GOLD & SILVER CORP.

Predicted Night-time Noise (L_n) - Mining Operations
Goose Property Area

Figure 4.1-2

Rescan an ERM company

Table 4.1-3. Mining Scenario 2 – Goose Property Area: Wildlife Receptors

Receptor	Calculated Noise Level (L_n)	Limiting Criteria(L_n)	Below Threshold?
Caribou camera location BR28	<25	45	Yes
Gyrfalcon nest	**57**	45	**No**
Waterbirds - Staging area	31	45	Yes
Wolverine - Active den	**59**	45	**No**
Wolverine - Active den	23	45	Yes

Exceedances (if any) are highlighted in bold

Calculated noise levels associated with mining and construction operations are expected to comply with the criteria for all scenarios at the majority of Project-specific assessment locations (sensitive receptors), with the following exceptions:

- Peregrine falcon nest near proposed George camp (exceeds night time criteria by 3 dB);
- Active and productive fox den near proposed George camp (exceeds night time criteria by 8 dB);
- Gyrfalcon nest near proposed Goose camp in the Goose neck of Goose Lake (exceed night time criteria by 12 dB); and
- Active den in the Goose neck of Goose Lake (exceed night time criteria by 14 dB).

Further detailed discussion is included in the wildlife chapters of the DEIS (Volume 5, Chapters 5-10).

4.2 AVIATION OPERATIONS

4.2.1 Human Receptors

There will be about eight flights per day at the George and Goose airstrips[1] in the busiest period of production. For this reason, the noise modelling for aircraft operations is based on noise event levels (L_{AE}) rather than period averaged noise levels (L_n, L_d, etc.).

Calculated noise levels for each of the aviation scenarios with respect to human receptors are presented in Table 4.2-1. Contour plots of predicted noise levels for fixed wing and helicopter operations at the George PDA and Goose PDA are shown in Figures 4.2-1 to 4.2-4.

Table 4.2-1. Aviation Noise (Scenarios 3 and 4) Human Receptors

	Calculated Noise Level (L_{AE}) [1]			
Receptor	Fixed Wing	Helicopter	Limiting Criteria (L_{AE})	Below Threshold?
George camp	87	70	90	Yes
Goose camp	86	78	90	Yes

[1] *All noise levels are external dBA re 2 x 10-5 Pa*

Table 4.2-1 shows that aviation noise is not predicted to exceed the limiting criteria at either the proposed George or the Goose camps within the PDAs.

[1] Three aircraft and one helicopter flight per day at each area

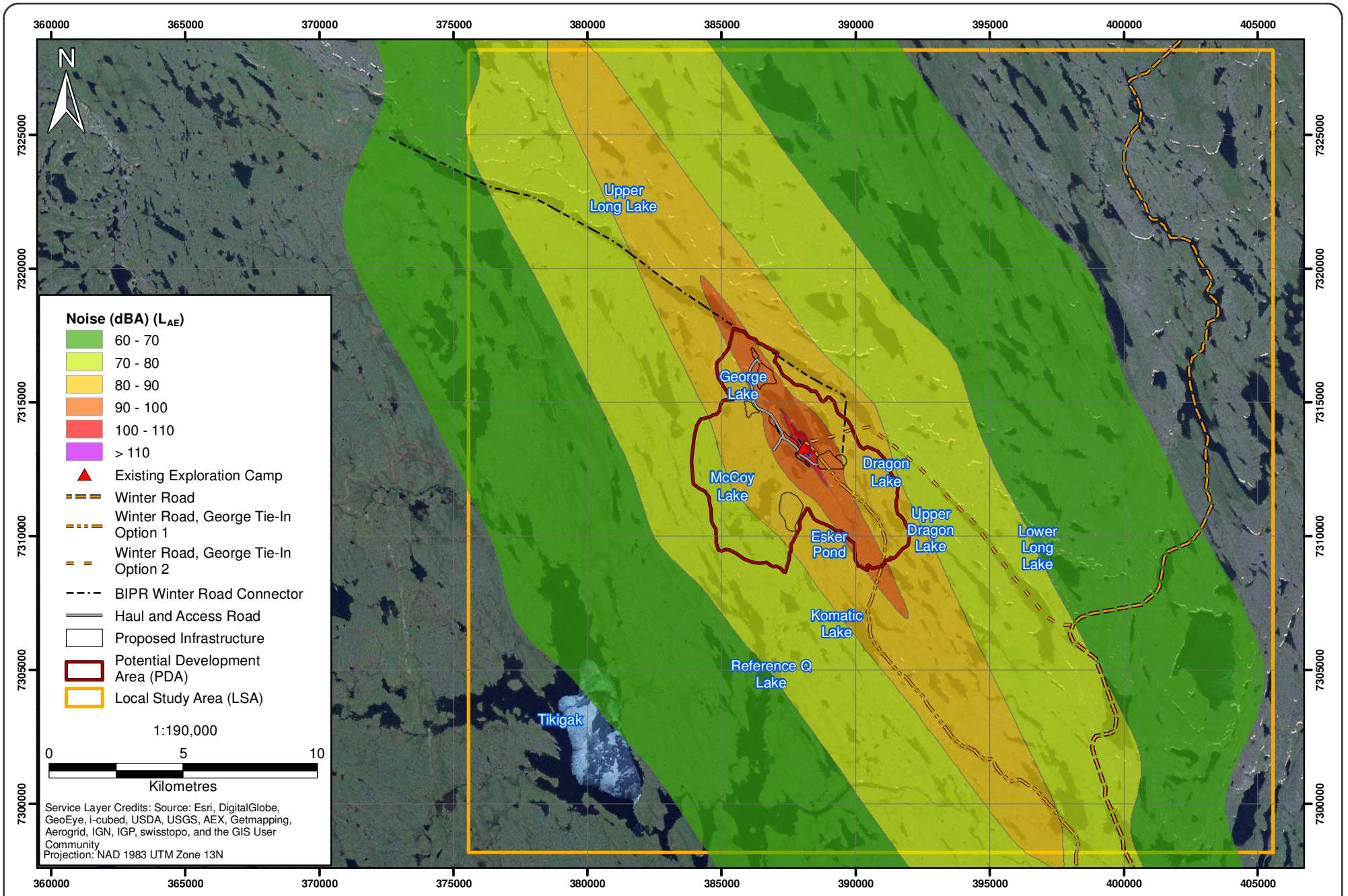


Figure 4.2-1

Sabina GOLD & SILVER CORP.

Predicted Noise Levels (L_{AE}) - Fixed Wing Aircraft George Property Area

Figure 4.2-1

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PROJECT # 0194096-0040 GIS # BAC-12-036a October 31 2013

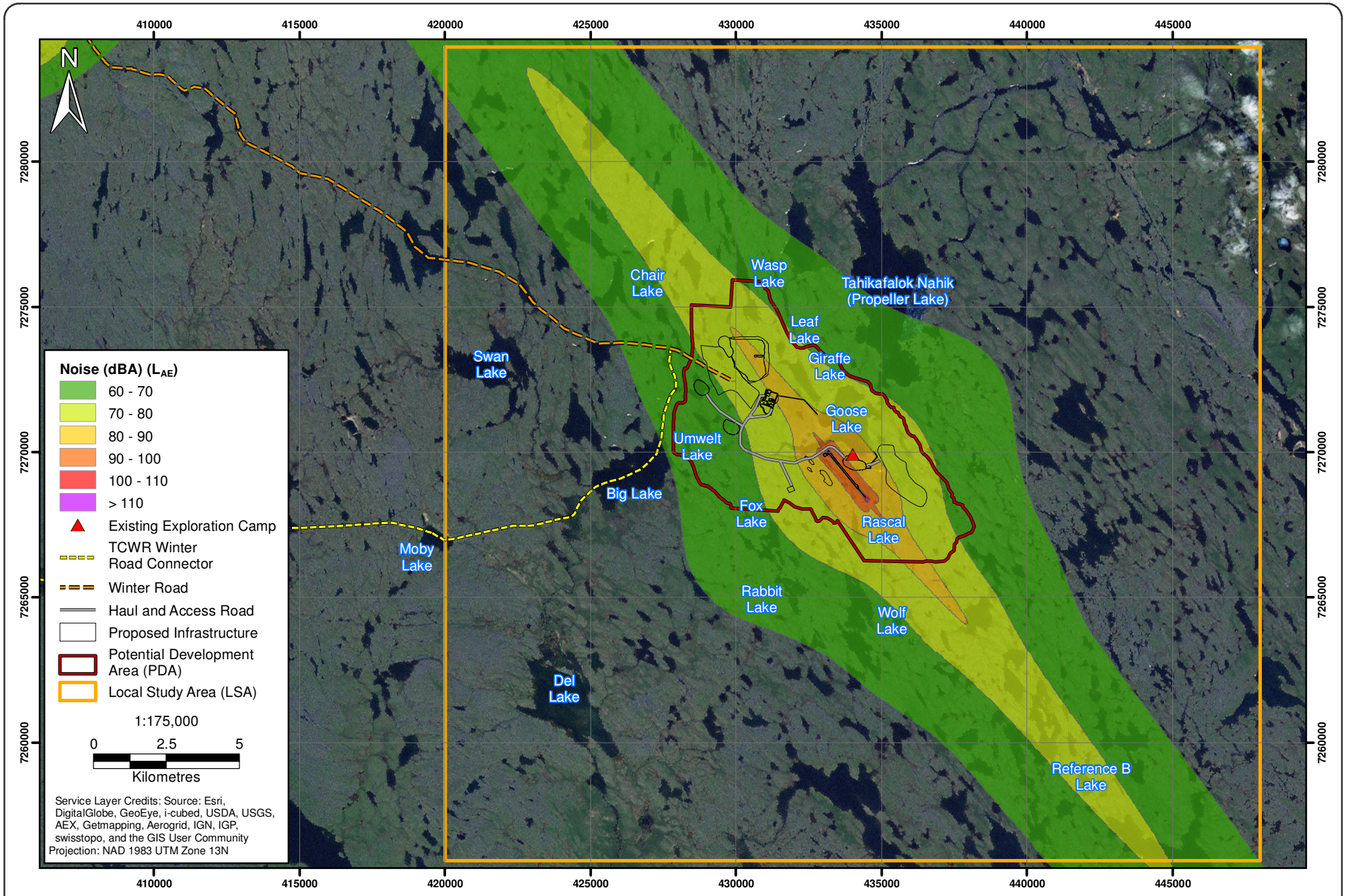


Figure 4.2-2

Sabina GOLD & SILVER CORP.

Predicted Noise Levels (L_{AE}) - Fixed Wing Aircraft
Goose Property Area

Figure 4.2-2

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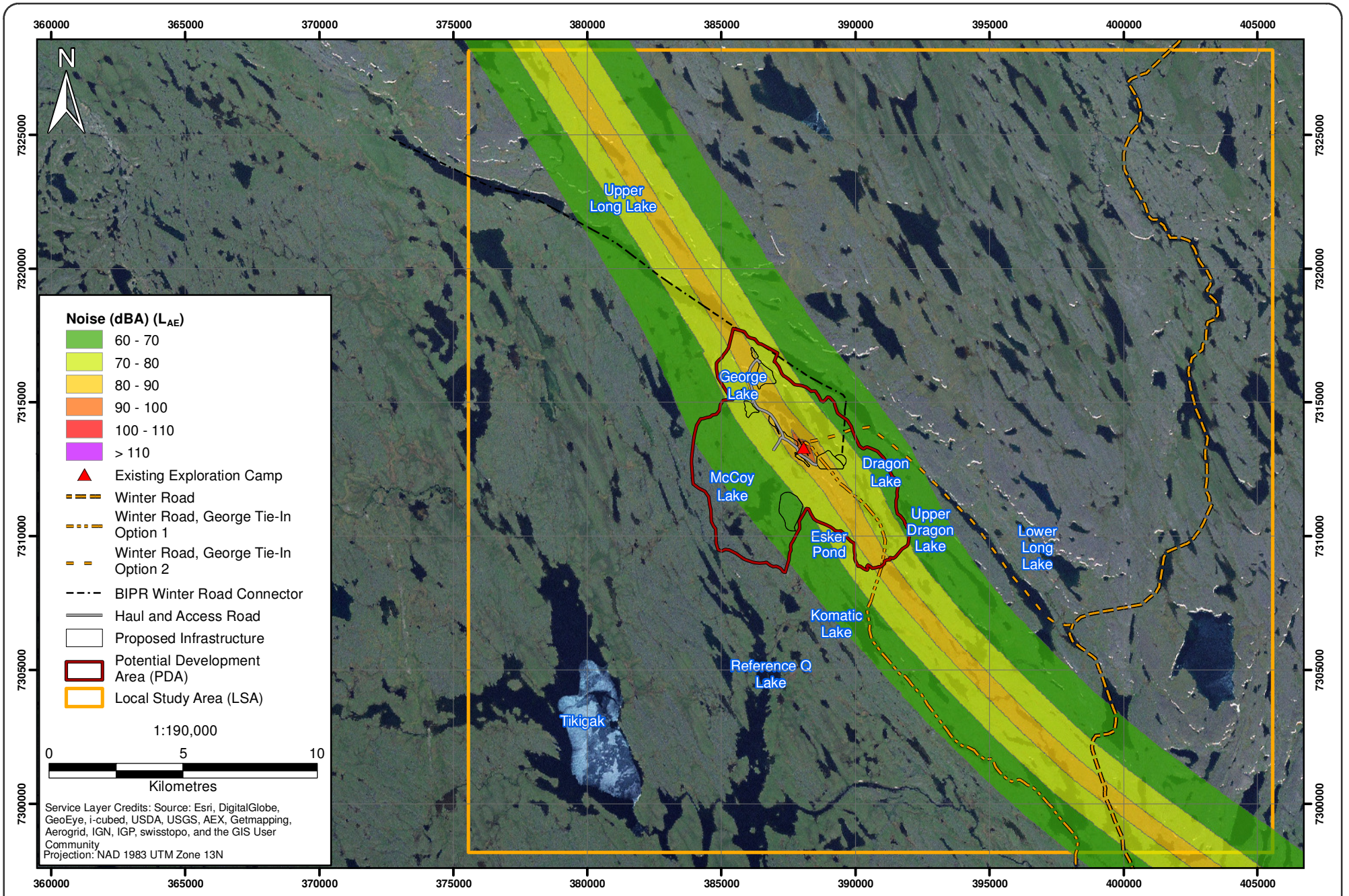


Figure 4.2-3

Sabina GOLD & SILVER CORP.

Predicted Noise Levels (L_{AE}) - Helicopters
George Property Area

Figure 4.2-3

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PROJECT # 0194096-0040 GIS # BAC-12-037a October 31 2013

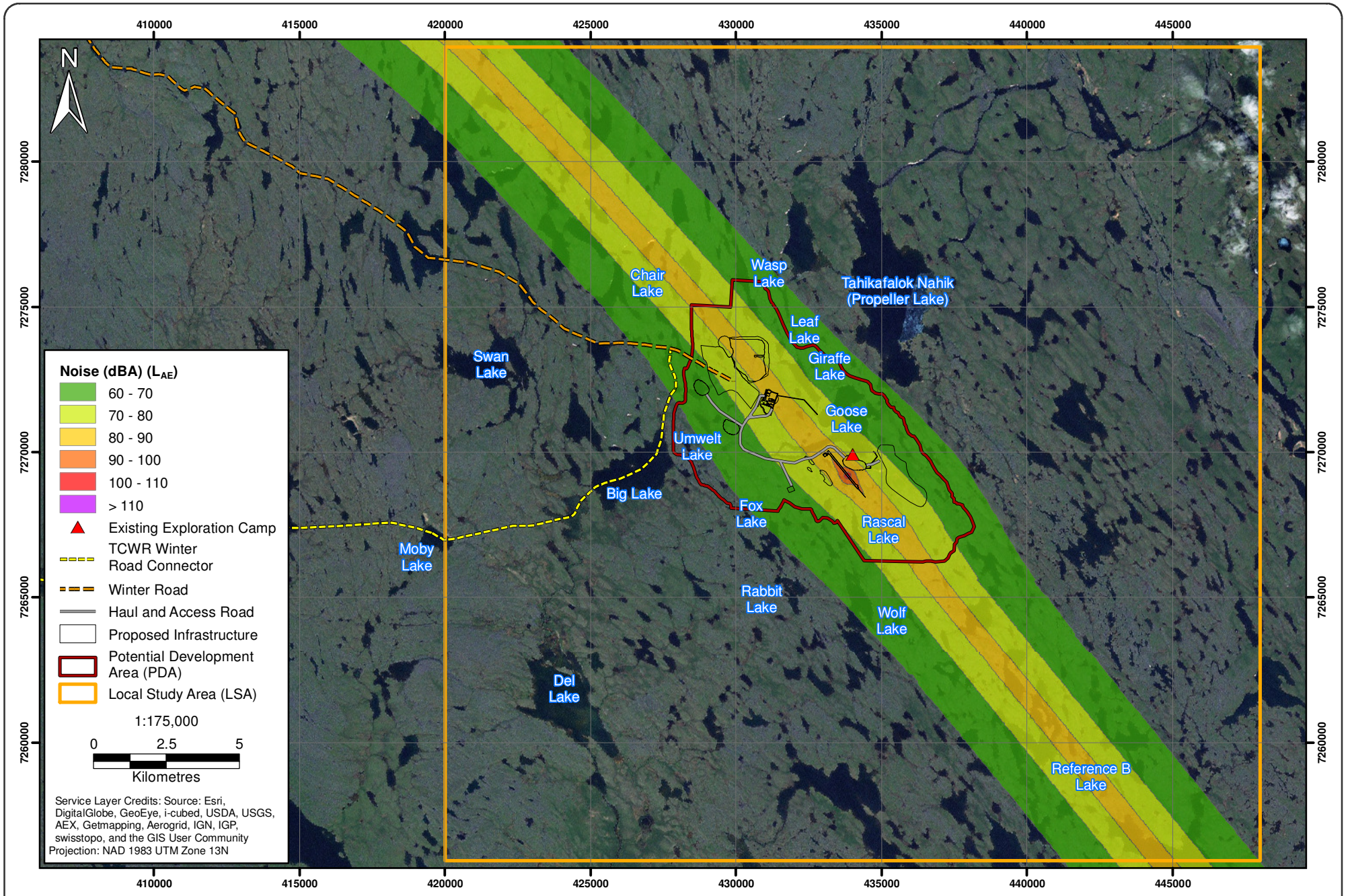


Figure 4.2-4

Sabina GOLD & SILVER CORP.

Predicted Noise Levels (L_{AE}) - Helicopters
Goose Property Area

Figure 4.2-4

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4.2.2 Wildlife Receptors

Calculated noise levels for each of the aviation scenarios with respect to wildlife receptors are presented in Table 4.2-2. Contour plots of predicted noise levels for fixed wing and helicopter operations are shown in Figures 4.2-1 to 4.2-4, respectively.

Table 4.2-2. Aviation Noise (Scenarios 3 and 4) Wildlife Receptors

Receptor	Calculated Noise Level (L_{AE})		Limiting Criteria (L_{AE})	Below Threshold?
	Fixed Wing	Helicopters		
Caribou crossing at Beechy Lake - caribou cam	37	35	85	Yes
Caribou camera location BR28	47	42		Yes
Caribou camera location BR4	54	39		Yes
Caribou camera location BR1	60	49		Yes
Caribou camera location BR2	54	39		Yes
Peregrine falcon nest	**101**	**87**		**No**
Gyrfalcon nest	74	71		Yes
Rough-legged hawk nest	77	58		Yes
Wolverine - Active den	73	70		Yes
Wolverine - Active den	60	53		Yes
Marine area near confluence of Western River	30	27		Yes
Waterbirds - Staging area	80	61		Yes
Active and productive wolf den	42	34		Yes
Active wolf den	39	34		Yes
Active and productive fox den	**87**	70		**No**
Waterbirds - Staging area	73	70		Yes

The noise modelling suggests that noise thresholds for wildlife disturbance (L_{AE} 85dB outside) will be exceeded at the following two wildlife receptors:

- active and productive fox den near the proposed George camp; and
- peregrine falcon nest near the proposed George camp.

The highest noise level are at wildlife receptors closest to the airstrips. Potential effects from helicopters en-route are lower, as there are no receptors close to the route helicopters are assumed to fly directly between the two camps. Further information is provided in the wildlife chapters of the DEIS (Volume 5, Chapter 5 – 10).

4.3 WINTER ROAD TRANSPORTATION

A generic calculation of road traffic noise has been undertaken to provide indicative offset buffers or avoidance buffers when considering the proximity of roads to wildlife receptors.

Based on the US EPA traffic noise model (US EPA 1978) and expected Project transportation requirements the winter roads would need to be a minimum of 200 metres from a wildlife receptor to meet the most stringent night time criteria of 45 dBA. Further information is provided in the wildlife chapters of the DEIS (Volume 5, Chapter 5 – 10).

4.4 BLASTING NOISE

4.4.1 Human Receptors

Calculated noise levels from blasting operations with respect to human receptors are presented in Table 4.4-1. Contour plots noise levels from blasting are shown in Figure 4.4-1.

Table 4.4-1. Blasting Noise: Human Receptors

Location	Predicted Noise Level, dBL_{peak}			
	LCP North Pit	Locale1 Pit	Locale 2 Pit N	Locale 2 Pit S
Charge Weight (kg TNT)	427	320	274	274
Receptor				
Proposed George camp	96	78	108	110
Proposed Goose camp	71	72	70	71

Location	Predicted Noise Level, dB					
	Llama Pit (open) N	Llama Pit (open) S	Umwelt Pit (open) N	Umwelt Pit (open) S	Main Pit (open) West	Main Pit (open) East
Charge Weight (kg TNT)	321	321	296	296	187	187
Receptor						
Proposed George camp	72	71	71	71	72	69
Proposed Goose Camp	104	106	108	107	85	97

Table 4.4-1 shows that predicted external noise levels from blasting exceed the sleep disturbance limit of 45 dBA at both the George Property Area and the Goose Property Area proposed camp locations. Noise levels within the camp will be reduced by at least 30 dBA which removes the majority of the predicted exceedances, although some still remain. However, this limit needs to be exceeded 10-15 times to result in sleep disturbance and blasts are expected to occur less frequently than this.

4.4.2 Wildlife Receptors

Calculated peak noise levels (L_{peak}) from blasting operations in each of the PDA with respect to wildlife receptors are presented in Table 4.4-2 and Table 4.4-3. Contour plots of noise levels from blasting at the George and Goose Property Areas are shown in Figures 4.4-1 and 4.4-2, respectively.

Table 4.4-2. Blasting Noise: Wildlife Receptors at George Property Area

George Property Area Location	Predicted Peak Noise Level, dB			
	LCP North Pit	Locale1 Pit	Locale 2 Pit N	Locale 2 Pit S
Charge Weight (kg TNT)	427	320	274	274
Receptor	dB LCE	dB LCE	dB LCE	dB LCE
Active and productive wolf den	48	39	38	38
Active wolf den	38	29	27	27
Active and productive fox den	70	40	73	76
Wolverine - Active den	40	33	30	30
Wolverine - Active den	40	33	29	29
Caribou crossing	36	32	24	25

(continued)

Table 4.4-2. Blasting Noise: Wildlife Receptors at George Property Area (completed)

George Property Area Location	Predicted Peak Noise Level, dB			
	LCP North Pit	Locale1 Pit	Locale 2 Pit N	Locale 2 Pit S
Caribou camera location BR28	40	35	29	29
Caribou camera location BR4	56	38	44	43
Caribou camera location BR1	58	38	43	43
Caribou camera location BR2	56	39	45	45
Peregrine falcon nest	72	40	80	89
Gyrfalcon nest	40	33	30	30
Rough-legged hawk nest	70	40	63	64
Marine area near confluence of Western River	44	38	32	32
Waterbirds - Staging area	72	40	69	68
Waterbirds - Staging area	39	32	28	29

Predicted peak noise levels from blasting do not exceed the threshold of 108 dB at any of the identified wildlife receptor locations. Figure 4.4-1 shows the area of predicted exceedance of the 108 dB and 120 dB thresholds associated with blasting. Further information is provided in the wildlife chapters of the DEIS (Volume 5, Chapter 5 – 10).

Table 4.4-3. Blasting Noise: Wildlife Receptors at Goose Property Area

Goose Property Area Location	Predicted Peak Noise Level, dB					
	Llama Pit (open) N	Llama Pit (open) S	Umwelt Pit (open) N	Umwelt Pit (open) S	Main Pit (open) West	Main Pit (open) East
Charge Weight (kg TNT)	321	321	296	296	187	187
Receptor	dB LCE	dB LCE	dB LCE	dB LCE	dB LCE	dB LCE
Active and productive wolf den	34	34	49	49	52	35
Active wolf den	40	40	55	55	62	44
Active and productive fox den	33	32	47	47	54	33
Wolverine - Active den	68	70	91	96	71	70
Wolverine - Active den	56	56	73	74	71	62
Caribou crossing at Beechy Lake - caribou cam	38	38	53	53	71	41
Caribou camera location BR28	50	50	65	65	67	51
Caribou camera location BR4	29	29	44	43	50	30
Caribou camera location BR1	28	28	43	43	51	29
Caribou camera location BR2	31	31	46	46	51	32
Peregrine falcon nest	32	32	47	47	54	33
Gyrfalcon nest	67	69	90	94	71	71
Rough-legged hawk nest	32	32	47	47	55	33
Marine area near confluence of Western River	26	26	40	40	59	27
Waterbirds - Staging area	32	32	46	46	54	33
Waterbirds - Staging area	55	56	73	74	71	69

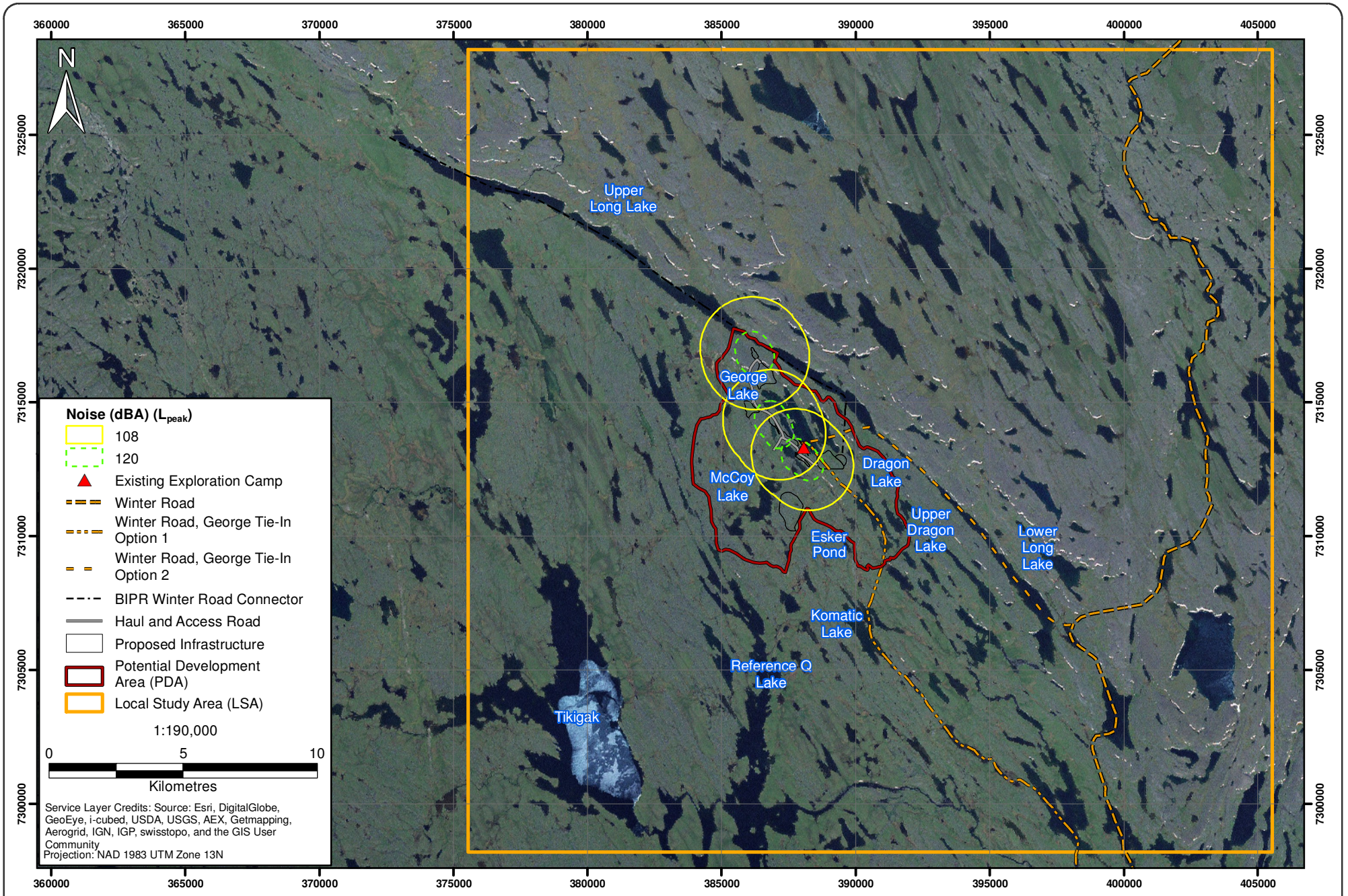


Figure 4.4-1

Sabina GOLD & SILVER CORP.

Predicted Noise Levels (L_{peak}) - Blasting
George Property Area

Figure 4.4-1

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PROJECT # 0194096-0040 GIS # BAC-12-038a October 31 2013

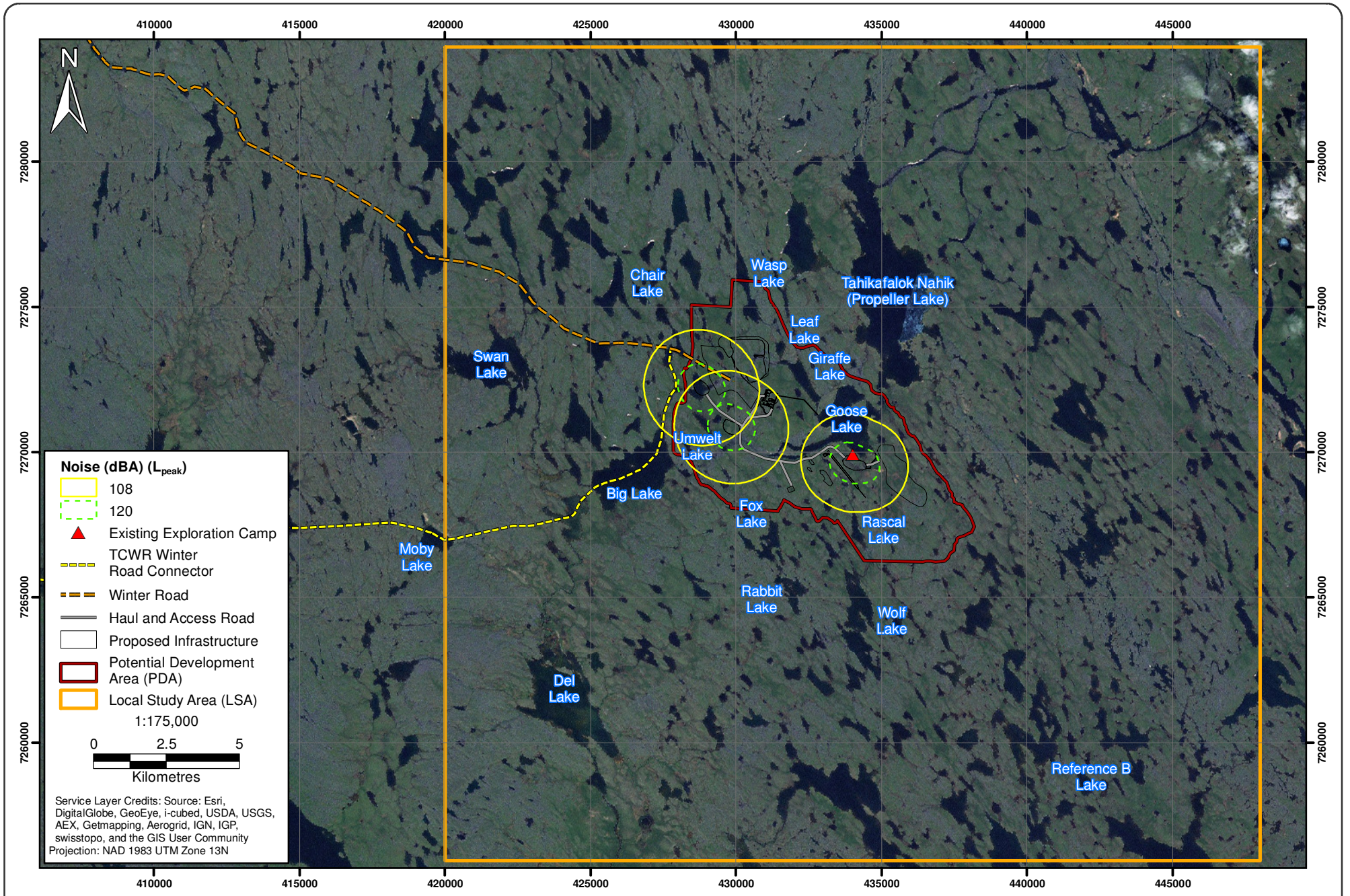


Figure 4.4-2

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Predicted Noise Levels (L_{peak}) - Blasting
Goose Property Area

Figure 4.4-2

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Appendix 1
Source Term Data

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Table A1-1. Source Term Data – Mobile Equipment

Item	Lw 1/1 Octave Band Value, dBA										
	31.5	63	125	250	500	1k	2k	4k	8k	16K	dBA
Haul Truck CAT-785D	74	91	106	111	116	114	111	105	96	81	120
Haul Truck CAT-777G	78	91	101	106	112	113	113	107	99	85	118
Front end loader CAT 993K	79	91	96	103	106	105	104	99	88	73	111
Rubber Tyre Dozers CAT 824 H	72	90	99	99	104	105	105	101	91	22	111
Bulldozer CAT D-10 (Push+Rev)	81	89	95	104	116	112	114	105	91	76	119
Graders CAT 16M	67	81	101	100	106	106	106	100	92	81	112
Drill Rig MD 6240 (rotary)	67	90	101	104	110	111	111	105	97	87	116
Drill Rig MD 5125 (Track)	67	82	98	106	108	108	109	101	91	76	114

Table A1-2. Source Term Data – Fixed Plant

Item	Lw 1/1 Octave Band Value, dBA										
	31.5	63	125	250	500	1k	2k	4k	8k	16K	dBA
Processing Plant	72	89	97	106	114	115	114	110	102	--	120
Crushing Plant	56	88	93	98	106	107	108	106	99	--	113
Jaw Crusher	82	99	108	116	118	120	118	113	105	--	124
Jaw Crusher (full steel enclosure)	74	87	87	98	93	90	84	75	69	--	100
Jaw Crusher (partial enclosed)	74	87	94	105	100	97	91	82	76	--	107
Pumps, Fans, Compressors	78	97	104	104	106	107	104	97	88	--	113
Winder, cage, motor and gearbox	74	87	98	112	110	112	108	102	96	--	117

Appendix V4-2C

Marine Laydown Area Qualitative Noise Assessment

Sabina
GOLD & SILVER CORP.

RWDI
CONSULTING ENGINEERS & SCIENTISTS

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September 16, 2015

Jeff Eng, P.Eng
Director, Engineering
Sabina Gold & Silver Corp.
202 - 930 West First Street
North Vancouver, BC V7P 3N4

Re: Marine Laydown Area Qualitative Noise Assessment: Draft
Sabina Gold and Silver Corporation Back River Project
RWDI Reference No. 1502212

Email: jeng@sabinagoldsilver.com

Dear Max,

Activities at the Marine Laydown Area (MLA) were assessed qualitatively (*i.e.,* no site-specific numerical modelling was conducted), primarily by comparison with activities at the Goose Property (which were modelled). In each case operations during Year 3 were considered (the year with maximum estimated activity and therefore potential effects). Sources of noise at the MLA include aircraft as well as stationary and mobile equipment on site. Conclusions were drawn by comparing the type and quantity of equipment at each site and considering site specific geometries. Comparisons were developed between the MLA and the Goose Property for site noise due to the similar proximities to stationary equipment. Blasting does not occur at the MLA and was therefore not included in the assessment.

Operational Noise

A qualitative assessment of site operational noise was conducted for the MLA. This assessment includes the noise from stationary and mobile equipment, excluding aircraft. The sound levels of some pieces of equipment such as the incinerator and mobile equipment are expected to be similar between the MLA and Goose Property. Other sources such as the generators are expected to be quieter at the MLA. There are fewer pieces of equipment overall at the MLA therefore the operations at the MLA are likely to be quieter than at Goose Property. Noise generated by the loading and unloading of vessels is unique to the MLA. Loading and unloading of the vessels will include noise from mobile equipment and from shipboard power generation equipment. Similar equipment is present at Goose Property, in larger quantities. The sound level from vessel loading and unloading is therefore expected to be less than noise from these activities at Goose Property.

The general sound levels at the MLA, and ultimately at the bounds of its Local Study Area (LSA), are likely to be lower at the MLA than at Goose. The MLA accommodations area, however, is located closer to both the haul routes and stationary equipment than the corresponding geometry at Goose Property. The sound levels at the MLA accommodations area are predicted to be comparable to those at the Goose accommodations area. In the quantitative study for Goose Property, the Goose accommodations area was predicted to experience sound levels up to 5 dBA in excess of 60 dBA which is the limiting criteria for

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human receptors. The residual effects were noted, and are discussed in detail in the report for Goose Property. Similar residual effects are expected at the MLA.

Aircraft Noise

Sound levels due to aircraft operations at the MLA were similarly evaluated by comparing them with existing levels at the Goose Property. During the winter, aircraft land on an ice strip at the MLA. During the summer, aircraft land on the water in Bathurst Inlet. The aircraft anticipated for use at the MLA is the de Havilland Canada DHC-6 Twin Otter, which is a turboprop aircraft. The contour plots of predicted noise levels for aviation at the Goose Property were assessed using British Aerospace 146 which is a jet aircraft. At the MLA, a maximum of three aircraft arrivals and departures are expected per day in Year 3, whereas two per day were modelled at the Goose Property for the same year. In comparison to the sound contour created by the jet used at the Goose Property, it is expected the area of influence at the MLA will be wider around the airstrip, extend further in the direction of arrival and decrease in the direction of departure. It is assumed the aircraft will arrive and depart to the east or west and will not fly over the camp area directly. The sound level at the MLA is expected to comply with the 90 dBA limiting criterion for human receptors.

Conclusions

Similar to the predicted noise effects modelled at Goose Property, the operational noise from the MLA is expected to exceed the 60 dBA criteria at the MLA accommodations area. The Goose Property operational noise was predicted to exceed the 60 dBA criteria by no more than 5 dBA at the accommodations area. Similar sound levels are expected at the MLA accommodations area and therefore similar residual effects are expected. The aircraft noise at the MLA camp is predicted to be below 90 dBA criteria and therefore no residual effects are anticipated.

Yours very truly,

RWDI AIR Inc.

Alain Carriere, B.A., Dipl., Ecotox.
Senior Project Manager, Associate

AJC/kta

Appendix V4-3A

Back River Project: 2004 to 2014 Meteorology Baseline Report

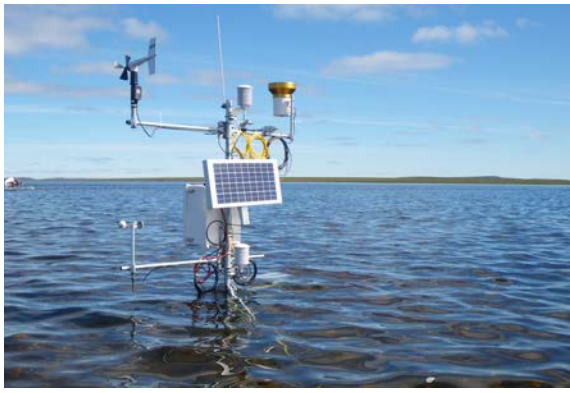
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Sabina Gold & Silver Corp.

BACK RIVER PROJECT
2004 to 2014 Meteorology Baseline Report







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December 2014

BACK RIVER PROJECT
2004 TO 2014 METEOROLOGY BASELINE REPORT

December 2014
Project #0234411-0021

Citation:
ERM Rescan. 2014. *Back River Project: 2004 to 2014 Meteorology Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan Environmental Services Ltd., an ERM company
Vancouver, British Columbia

Executive Summary

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Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut. The meteorology baseline work in 2014 included servicing three meteorology stations located at the Goose Property, George Property, and near the Marine Laydown Area. This report presents the available meteorology information to date.

The last meteorology baseline report covered the period of January 1, 2006 to August 2013. This report presents the meteorological data from August 4, 2004 to June 2014.

Observations recorded at meteorological stations operating at the Goose and George properties and in southern Bathurst Inlet (near the Marine Laydown Area) during the period August 2004 to June 2014 indicate that the climate in the Project area is typical of the Arctic, and consists of a winter period (October to May) of snow and extremely cold mean monthly temperatures ranging from -33.0 to -0.1ºC, and a cool spring, summer and fall period (June to September) with mean monthly temperatures ranging from -0.3 to 14.6ºC.

The precipitation gauges recorded summer rainfall (June through September). In addition, in March 2012 winter adapters were installed at the Goose and George meteorological stations to allow for year-round precipitation data collection. Therefore, precipitation data collected after the installation represents both rainfall and snow for these two stations. In 2014, due to limited access and lack of onsite personnel for maintenance, the winter adapters were not installed. Therefore, for the 2014/2015 winter period, precipitation data is limited to summer rainfall only. During the 2004 to 2013 monitoring period, summer rainfall ranged from 4 mm to 211 mm. 2014 data was only available until June 15, 2014, therefore summer rainfall values are not available. Summer rainfall for the months with available data is generally similar to data from the regional stations for the same period. Therefore, annual precipitation at the Back River Project area can be inferred from the regional station data.

Based on data from regional meteorological stations, total annual precipitation ranged from a low of 125.2 mm in 2009 to a high of 344.2 mm in 2007 during the 2004 to 2013 period. 2014 data was only available until June 2014, therefore annual precipitation values are not available. Compared to climate normal (1981 to 2010) total annual precipitation, which ranges from 247 to 299 mm, total annual precipitation at the regional stations was lower in 2004, 2006, 2008, 2009, 2010, 2011, and 2012, about the same in 2005 and higher in 2007, suggesting that the 2006 to 2013 period was generally drier than the climate normals. At the Kugluktuk A regional climate station, the majority of the precipitation (66%) occurred during the spring, summer and fall months. Climate normal data indicate that 53 to 60% of total precipitation fell during the spring, summer and fall months, suggesting that a slightly greater proportion of the total annual precipitation was falling during these seasons during the 2004 to 2013 period. The discrepancy between climate normal and the period reported could be from sample size differences or changes in seasonal variation.

The Back River Project area lies near the northern reaches of the North American continent. As such, it is primarily subject to cold, dry Arctic air masses and American continental air masses from the south. The area is subject to high wind speeds due to the relative absence of obstructions to impede the wind (e.g., trees, buildings, mountains). In the Project area wind speeds are generally greater than 3 m/s and predominately from the north westerly quadrant.

Solar radiation is monitored at the Goose, George and Bathurst Inlet meteorological stations. Summer is a season of nearly perpetual sunlight, while winter is dominated by night, twilight and extreme cold. Generally there is an energy deficit during winter months (October through May) and an energy surplus during summer months (June through September).

Lake evaporation was calculated using data from the Goose Lake micro-meteorology station installed on July 7, 2012 and June 26, 2013. The micro-meteorology station was not installed in 2014 due to the short time that the exploration camp was open. Total evaporation values in the Back River Project area from June 1 to September 15, 2012 were estimated to be 269 and 261 mm based on total monthly evaporation values calculated using the Penman Combination and Priestly-Taylor methods, respectively. Total evaporation values in the Back River Project area from June 1, 2013 to September 13, 2013 were estimated to be 391 and 335 mm for Penman Combination and Priestly-Taylor methods. The data is consistent with other Arctic evaporation studies.

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BACK RIVER PROJECT
2006 TO 2013 METEOROLOGY BASELINE REPORT

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Appendix 2. Goose and George Meteorological Stations Daily Temperature (January to December) and Rainfall Data (June to September up to 2011)/Precipitation (March 2012 onward), 2004 to 2014

Appendix 3. Goose, George and Bathurst Inlet Meteorological Stations Wind Roses

Glossary and Abbreviations

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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.

GLOSSARY

Bright Sunshine Hour	An hour when the average global solar radiation is greater than 120 W/m^2.
Climate Normal	The arithmetic average of a climate element such as temperature over a prescribed 30-year interval.
Extraterrestrial Solar Radiation	The solar radiation incident on top of the terrestrial atmosphere.
Energy Deficit	Total solar radiation absorbed from the Earth's surface is less than the heat radiated back out to space.
Energy Surplus	Total solar radiation absorbed from the Earth's surface is greater than the heat radiated back out to space.
Global Solar Radiation	Total incoming direct and diffuse short-wave solar radiation received from the whole dome of the sky on a horizontal surface.
Precipitation	Liquid or solid products of the condensation of water vapour falling from the clouds which include rain, hail, snow, dew, rime hoar frost, and mist precipitation.
Pyranometer	A device used for measuring global solar radiation.
Solar Radiation	The electromagnetic energy of the sun, of which 97% is confined to the spectral range 0.29 to 3.0 microns.
Tipping Bucket Rain Gauge (TBRG)	A device used to measure liquid precipitation. If retrofitted with an adapter it may also be used to measure solid precipitation.

ACRONYMS AND ABBREVIATIONS

EC	Environment Canada
masl	Metres Above Sea Level
MSC	Meteorological Services of Canada
The Project	Back River Project
SWE	Snow Water Equivalent
W/m^2	Watts per Square Metre
WMO	World Meteorological Organization

1. Introduction

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut (Figure 1-1). The 2014 meteorology baseline program included servicing three meteorology stations associated with the three main areas of the proposed project; the Goose Property Area, the George Property Area, and the Marine Laydown Area.

For 2014, meteorology data are available up to June as the exploration camp closed shortly thereafter. The previous meteorology baseline report covered the period of January 1, 2006 to August 2013 (Rescan 2014). This report expands the period of record from last August and includes data from August 4, 2004 to June 2014.

Chapter 2 of this report presents the methods, Chapter 3 presents the results, and Chapter 4 presents a summary of all available data. Temperature, precipitation and wind data collected are included as appendices to this report.

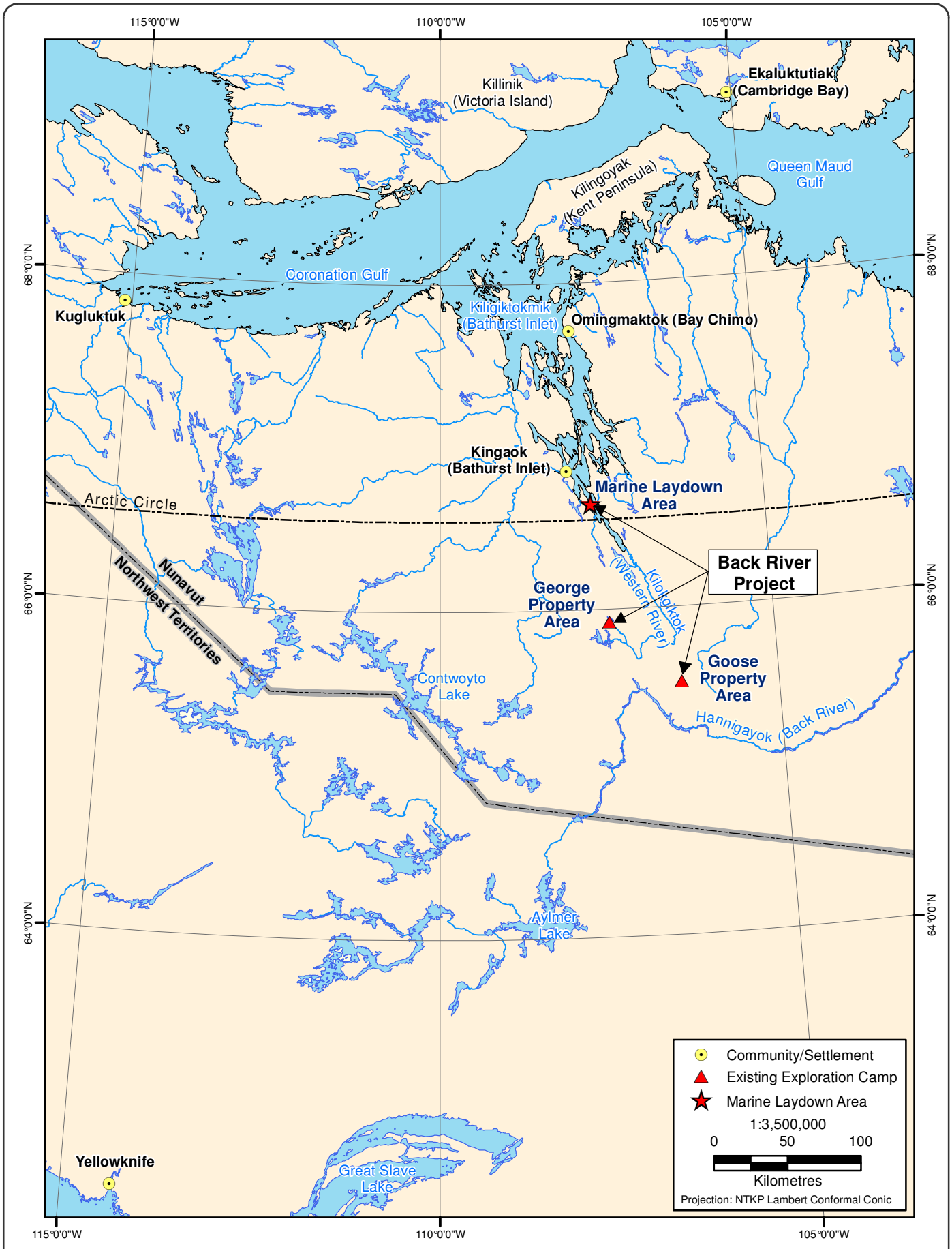


Figure 1-1

Back River Project Location

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2. Meterials and Methods

2. Materials and Methods

Project-specific meteorological baseline data collection commenced in August 2004 at the Goose and George meteorological stations located at the existing Goose and George exploration camps (Figure 2-1). These stations continued to be operational in 2014, and in addition, a micro-meteorology station (micro-met) was installed in Goose Lake on July 7, 2012 and June 26, 2013 to gather data to calculate site-specific evaporation rates. The micro-met station was not installed in 2014 due to the short time period the camp was open. The Bathurst Inlet meteorological station, located in southern Bathurst Inlet, started in late August 2001 and is currently still operational. However, following damage by a bear in August 2004, new sensors were installed in June 2007 and data collected after the new sensor installation are included in this report.

Environment Canada – Meteorological Service of Canada operates meteorological stations in the West Kitikmeot Region of Nunavut (Figure 2-2). The closest stations which are currently operating are the Lupin CS and Kugluktuk A and CS meteorological stations. Data from these stations have also been presented in this report. The coordinates of the monitoring stations, as well as their location in the regional are, are given in Table 2-1 and shown in Figure 2-1.

This report presents the meteorological baseline data collected from August 2004 to June 2014 for the Goose and George meteorological stations. Data from August 2004 to August 2006 from both stations were reported in Golder 2006 and Golder 2007, and data from August 2004 to August 2008 for the George station were reported in Rescan 2008a and Rescan 2008b.

2.1 GOOSE AND GEORGE METEOROLOGICAL STATIONS

The site-specific meteorological monitoring program for the Project began in August 2004 with the commissioning of the Goose and George meteorological stations. The original sensors were installed on 3 metre tripods. In March 2012, the sensors were installed on 10 metre towers as per guidelines prescribed by Environment Canada, which were set by the World Meteorological Organization (WMO 2008). The Goose and George meteorological stations are shown in Plates 2.1-1 and 2.1-2, and 2.1-3 and 2.1-4, respectively. The international standard for measuring surface wind speed is at a height of 10 m (EC-MSC 2004).

Previously, the stations were unable to measure precipitation as snowfall. In March 2012, a CS705 winter precipitation adapter was installed on both of the TE525 WS tipping bucket rain gauges (Plate 2.1-5). The CS705 uses antifreeze to convert snow to liquid water. The CS705 was removed from the tipping buckets in June 2012, and re-installed in September 2012. In 2013, the CS705 was removed again from the tipping buckets in June 2013, and re-installed in September 2013. In 2014, due to limited access and lack of onsite personnel for maintenance, the winter adapters were not installed. Therefore, for the 2014/2015 winter period, precipitation data is limited to summer rainfall only.

The climatic variables monitored by the Goose and George meteorological stations are air temperature, precipitation as rainfall, precipitation as snowfall (only some years), solar radiation, wind speed and wind direction. Table 2.1-1 lists the sensors included on the Goose and George meteorological stations and the parameters monitored. On June 26, 2013, pressure data began being collected at the Goose meteorological station, however due to a malfunction with the sensor, data is unavailable. The sensor will be replaced in 2015

Table 2-1. Locations of Meteorological Stations in the Back River Project Area and Regional Area

Station Name	Station ID	UTM (mE)	UTM (mN)	Zone	Elevation (masl)	Approximate Distance from Back River Project Atmospheric LSA or RSA	Meteorological Parameters Monitored	Data Period Available
Back River Project Stations								
Goose		434,132	7,269,906	13	277	Within LSA	Temperature, Rainfall, Wind Speed, Wind Direction, Global Radiation, Barometric Pressure	Aug 2004 to June 2014
George		388,206	7,313,156	13	355	Within LSA	Temperature, Rainfall, Wind Speed, Wind Direction, Global Radiation	Aug 2004 to June 2014
Bathurst Inlet		385,895	7,379,846	13	170	15 km southeast of MLA LSA	Temperature, Rainfall, Wind Speed, Wind Direction, Snow Depth, Global Radiation	Jan 2007 to June 2014
Goose Lake Micro-met Station		433,994	7,270,087	13	270	Within LSA	Air Temperature, Water Temperature, Rainfall, Wind Speed, Wind Direction, Global Radiation	July 2012 to Sep 2013
Environment Canada Stations								
Lupin CS[a]	230N002	488,735	7,292,657	12	488	150 km west of RSA	Temperature, Dew Point Temperature, Total Precipitation, Relative Humidity, Wind Direction, Wind Speed, Barometric Pressure	1997-present
Lupin A[a]	23026HN	488,546	7,293,089	12	490	150 km west of RSA	Temperature, Dew Point Temperature, Total Precipitation, Relative Humidity, Wind Direction, Wind Speed, Barometric Pressure	1982-2006
Kugluktuk A[b]	2300902	578,198	7,523,598	11	22.6	350 km northwest of RSA	Temperature, Total Precipitation, Snow Depth, Relative Humidity, Wind Direction, Wind Speed, Barometric Pressure	1978-present
Kugluktuk CS[b]	2300904	578,559	7,523,670	11	22.6	350 km northwest of RSA	Temperature, Total Precipitation, Snow Depth, Relative Humidity, Wind Direction, Wind Speed, Barometric Pressure	2005-present
Bathurst Inlet (EC)[c]	2300551	367,716	7,416,467	13	5	15 km north of RSA	Temperature, Total Precipitation, Snow Depth, Wind Direction, Wind Speed	2012 - present

[a] *EC-MSC has two meteorological stations located at Lupin. EC-MSC uses the Lupin CS meteorological station as the default station for presentation of hourly, monthly and yearly data from 2006 onwards. EC-MSC uses the Lupin A station for the calculation of climate normals.*

[b] *EC-MSC has two meteorological stations located at Kugluktuk. Both stations provide data verified by EC_MSC. Previous versions of this report have used Kugluktuk CS to calculate monthly values. This current version uses Kugluktuk A.*

[c] *Since there are two stations named Bathurst Inlet, the Environment Canada Bathurst Inlet station will be referred to as Bathurst Inlet (EC).*

PROJECT # 0234411-0021 GIS # BAC-12-048 November 26 2014

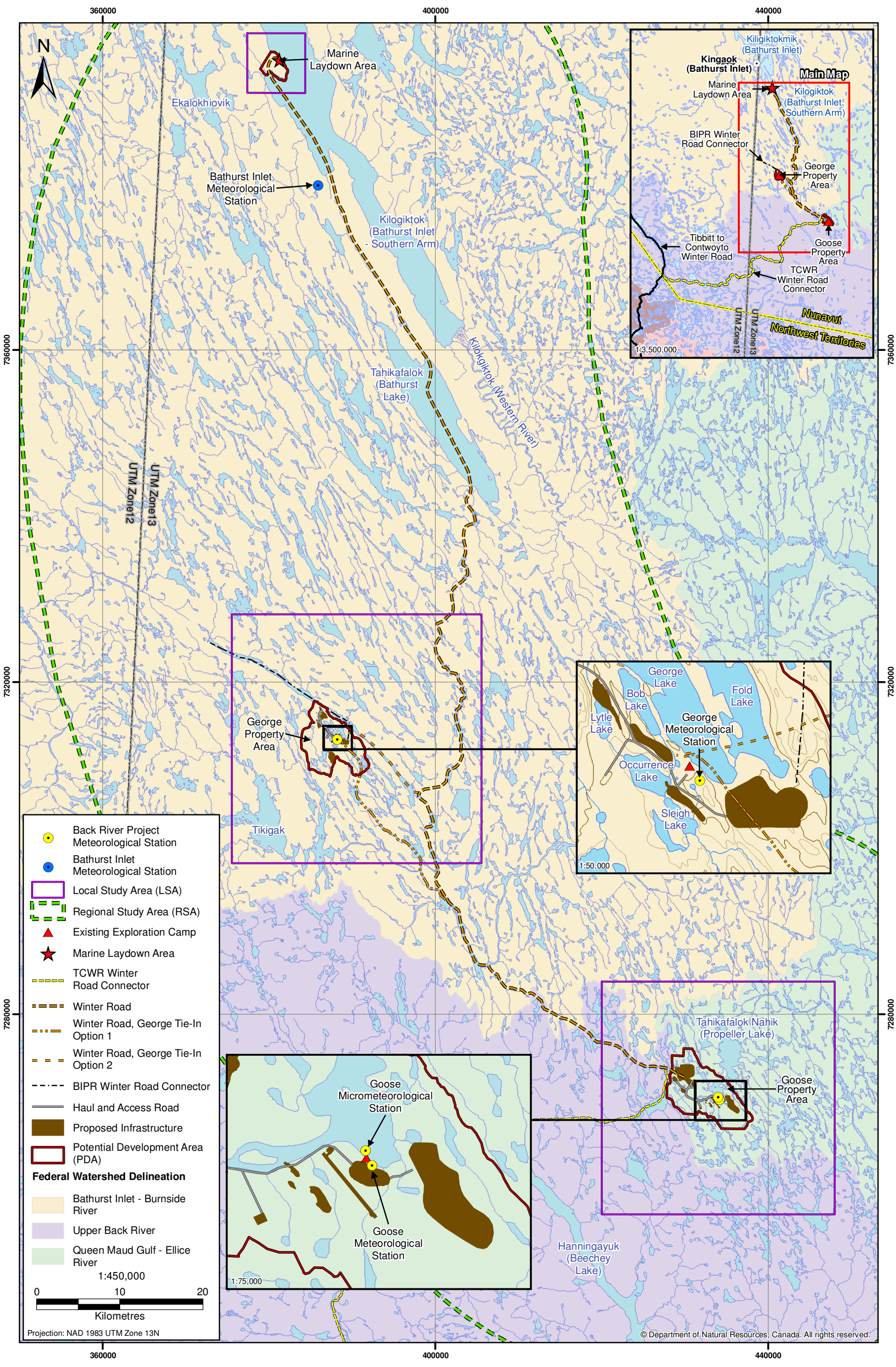


Figure 2-1

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Locations of the Back River Project Meteorological Stations

Figure 2-1

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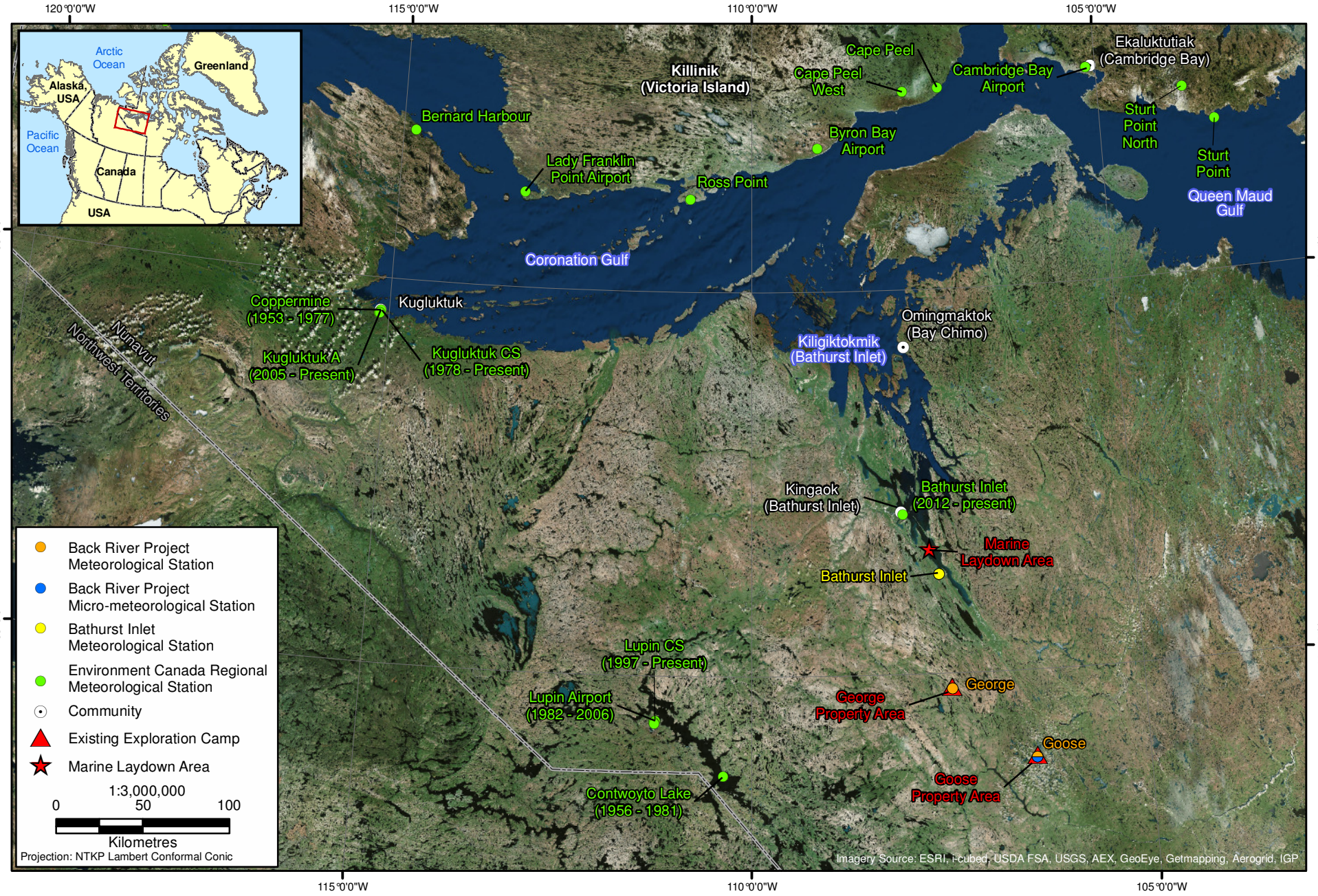


Figure 2-2

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Locations of Back River Project and Environment Canada Meteorological Stations

Figure 2-2

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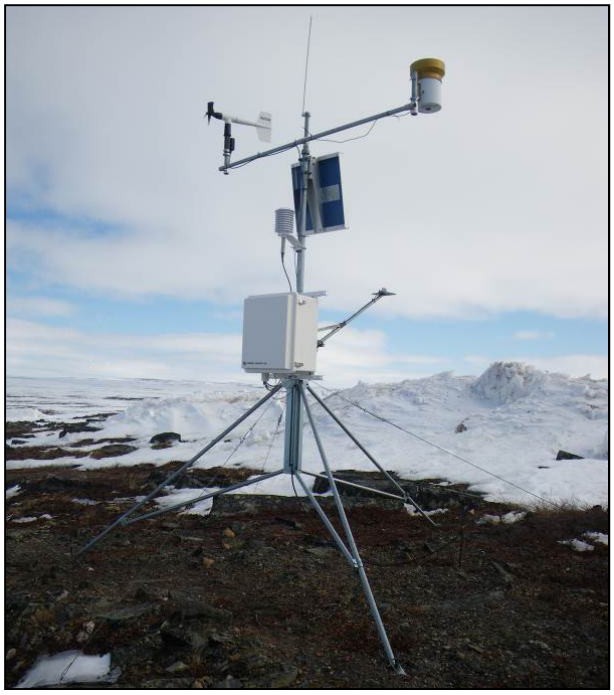


Plate 2.1-1. Goose meteorological station on a 3 m tripod. May 23, 2011 (view to the south east). The station was upgraded to a 10 m tower in 2012.



Plate 2.1-2. Goose meteorological station on June 16, 2012. The station was upgraded to a 10 m tower in March 2012.

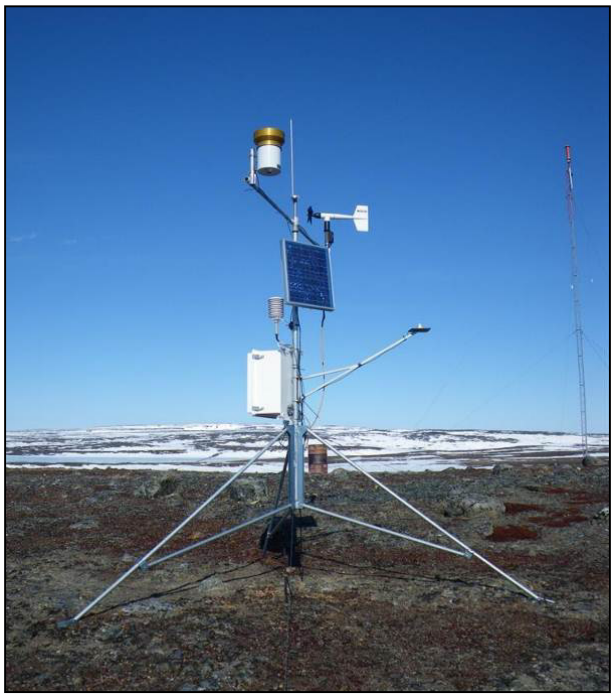


Plate 2.1-3. George meteorological station on a 3 m tripod. May 25, 2011. The station was upgraded to a 10 m tower in 2012.



Plate 2.1-4. George meteorological station on March 25, 2012. The station was upgraded to a 10 m tower in March 2012.

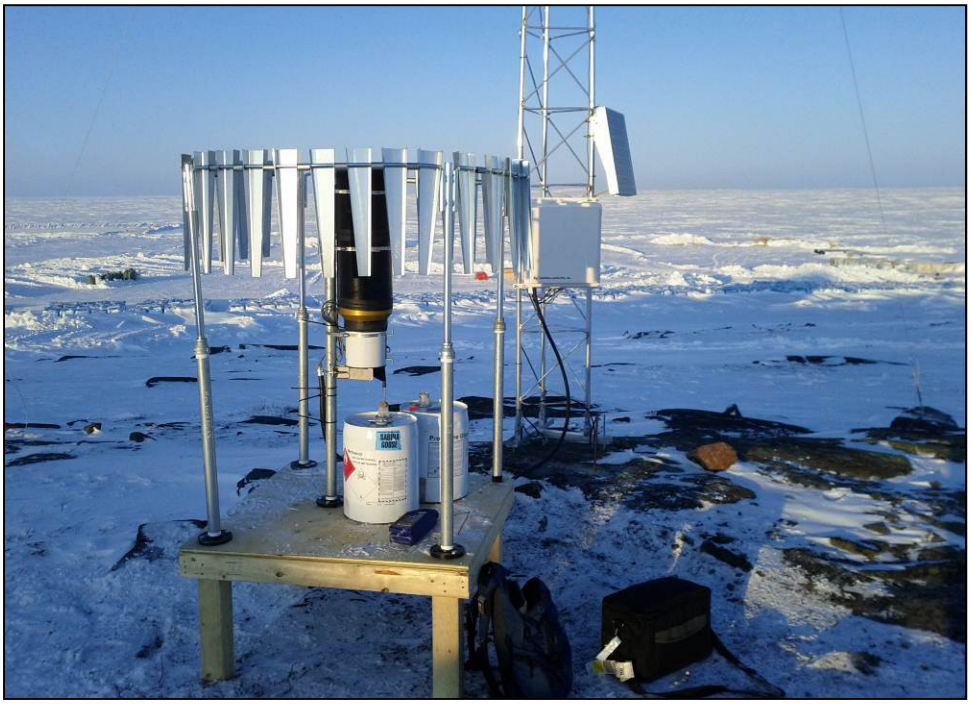


Plate 2.1-5. The CS 705 winter precipitation adapter is the black cylinder installed on the top of the white and gold TE525 tipping bucket rain gauge. These adapters were installed on both the Goose and George stations in 2012 and 2013, however due to limited access, the stations were not installed in 2014.

Table 2.1-1. Sensors and Variables Measured at the Back River Project Meteorological Stations

Variable	Sensor	Manufacturer
Air Temperature	YSI 44002A thermistor	Campbell Scientific
Precipitation – rain	TE525 WS Tipping Bucket Rain Gauge	Texas Electronics
Precipitation – snow[a]	CS705 Precipitation Adapter	Campbell Scientific
Wind Speed	05103 Wind Monitor	R. M. Young Company
Wind Direction (degrees)	05103 Wind Monitor	R. M. Young Company
Standard deviation of wind direction (degrees)	05103 Wind Monitor (calculated internally in the datalogger using the Yarmartino algorithm)	R. M. Young Company, Traverse City
Relative Humidity	capacity relative humidity sensor	Vaisala
Global Radiation	SPLite Silicon Pyranometer	Kipp & Zonen
Barometric Pressure[b]	61205V Barometer	R. M. Young Company

[a] On March 26, 2012, a winter adaptor was added to the Goose and George Meteorological stations in order to record precipitation as snow.
[b] On June 26, 2013, pressure data began being collected at the Goose meteorological station, however due to a malfunction with the sensor, data is unavailable. The sensor will be replaced in 2015.

A Campbell Scientific CR1000-55 datalogger (Campbell Scientific, Inc., Logan, UT, USA) records all measurements and stores hourly and daily averages as well as daily minimum and maximum for all variables. Data are stored on a memory card in the datalogger that is retrieved periodically by Sabina or Rescan personnel. The most recent data were retrieved from the Goose and George meteorological

stations on June 13, 2014. Air temperature at the George meteorological station was unavailable after March 2014 due to a sensor malfunction.

2.2 BATHURST INLET METEOROLOGICAL STATION

The collection of meteorological data in southern Bathurst Inlet started in late August 2001 with the installation of an automated meteorological station on a 10 metre tower (Plates 2.2-1 and 2.2-2). The station was installed in an open area that was not targeted for future development.



Plate 2.2-1. Bathurst Inlet meteorological station, June 2010.



Plate 2.2-2. Sensors at Bathurst Inlet meteorological station, June 2010.

The climatic variables monitored are relative humidity, rain precipitation, snow depth, incoming global short-wave solar radiation, air temperature and wind speed and direction (Table 2.1-1). A Campbell Scientific CR1000 datalogger processes and records all measurements.

Following damage by a bear in August 2004, new sensors were installed in June 2007 along with steel enclosures for the datalogger and batteries to prevent future wildlife damage. In addition, all wires within 5 m of the ground were enclosed in metal conduits. A Campbell Scientific CR10X datalogger (Campbell Scientific, Inc., Logan, UT, USA) records all measurements and stores hourly average as well as daily minima and maxima for all variables. Data are stored on a memory card in the datalogger that is retrieved periodically by field personnel.

In the past years, frequent gaps were experienced at the Bathurst Inlet meteorological station due to its remote nature. New or recalibrated sensors were installed in July 2012. The old CR10 datalogger was replaced with a new CR1000 datalogger and a new program was installed. Data were available for the Bathurst Inlet station from July 2007 to April 2008, October 2008 to April 2009, July and August

2010, October 2011, January 2012 to November 2012 for some parameters, and February 2013 to June 2014.

2.3 GOOSE LAKE MICRO-METEOROLOGY (EVAPORATION) STATION

In 2012 and 2013, the meteorological program included measurements of open-water evaporation at Goose Lake. A micro-meteorological station was installed in a shallow area of this lake on July 7, 2012 (and decommissioned on September 9, 2012), and on June 26, 2013 (and decommissioned on September 13, 2013) (Plate 2.3-1; Figure 2-1). The station was operated as close as possible to the beginning and end of the open-water season. Data collected at this station was used to calculate daily evaporation rates using both the Penman Combination and Preistly-Taylor methods. The micro-meteorology station was not installed in 2014 due to the short time that the exploration camp was open.

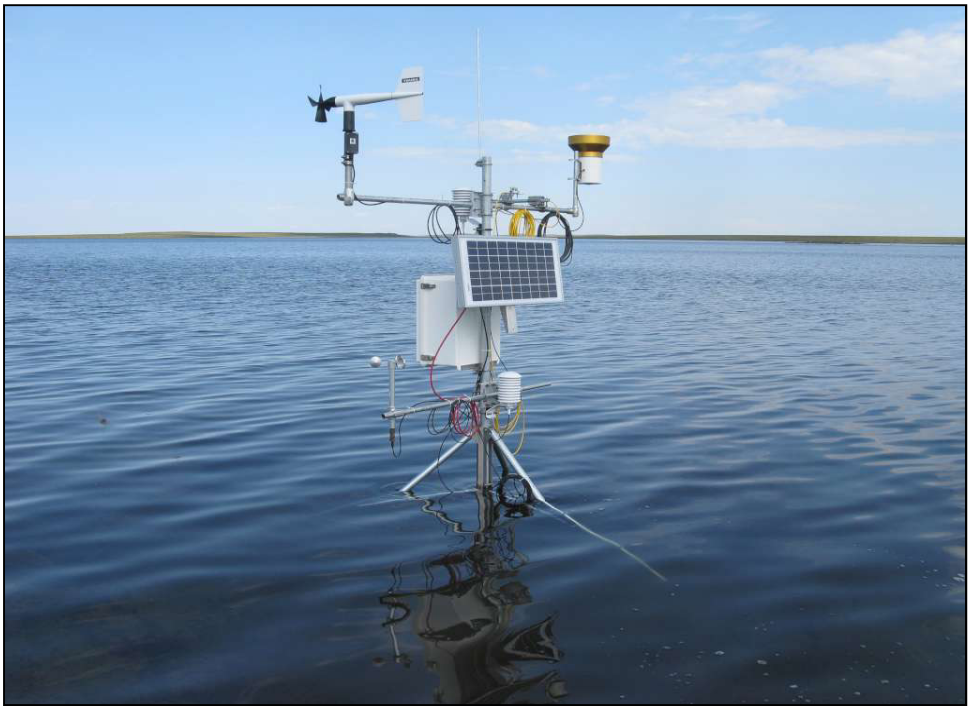


Plate 2.3-1. The Goose Lake micro-meteorology (evaporation) station on July 7, 2012.

The station is powered with a sealed rechargeable 8.5 Amp-hour battery that is recharged with a 50 watt solar panel. Operation of the station is controlled by a CR1000-55 datalogger whose program dictates how often the sensors will be monitored (every 5 seconds) and generates and stores hourly and daily means. Sensors for this station are mounted on a 3 m tripod which is partially submerged in the lake. Sensors (units of measure are shown in brackets) include:

- an SP Lite silicon pyranometer (solar radiation; W/m^2);
- an NR Lite net radiometer (net radiation; W/m^2);
- two HMP45C212 air temperature (°C) and relative humidity (%) probes;
- an RM young 05103-10 wind speed (m/s) and direction (degrees from true north) sensor;
- a Met One 014A Anemometer;

- two 107B water temperature thermistors (ºC); and
- a TE525M tipping bucket rain gauge (rain precipitation; mm).

Lake evaporation rates were calculated from mean daily weather data using the Penman Combination (PC) Method from Chow, Maidment, and Mays (1988). The Penman model is a combined energy-balance/aerodynamic mathematical model defined by the general equation:

$$E(PC) = \frac{\Delta}{\Delta + \gamma} E_R + + \frac{\gamma}{\Delta + \gamma} E_A \quad \text{with} \quad \Delta = \frac{4098 e_{as}}{(237.3 + T)^2} \quad \text{and} \quad \gamma = \frac{C_P P_A}{0.622 l_v}$$

where Δ is the slope of the temperature-saturated vapour pressure curve in Pa ºC; γ is the psychometric constant in Pa ºC; e_{as} is the saturated vapour pressure at air temperature T in ºC; C_P = 1006 J kg^{-1} ºC is the specified heat of air; P_A = 101.3 × 10^3 Pa is air pressure at 20ºC; and l_v = 2.501 × 10^6 – 2370T J kg^{-1} is the latent heat of vaporization.

The energy-balance component E_R in mm/day is determined by the equation:

$$E_R = \frac{R_n - H - G}{l_v \rho_w} * 8.64 * 10^7 \quad \text{with} \quad H = -k_a \left(\frac{T_2 - T_1}{z_2} \right) \quad \text{and} \quad G = -k_w \left(\frac{T_{w2} - T_{w1}}{z_w} \right)$$

where R_n is the net solar radiation measured over water in W m^{-2}; H and G are the sensible heat flux and water heat flux; ρ_w = 999.7 kg m^{-3} is the water density at 10ºC; T_2 - T_1 and T_{w2} - T_{w1} are the change in mean daily air and water temperatures from the previous day, as measured at height z_2 and depth z_w in metres from the water surface. Yarwood & Castle (1970) give the thermal conductivities of air k_a and water k_w at 10ºC as 0.0241 and 0.615 W/m/ºC, respectively. The energy-balance equation can be simplified to a constant if it is assumed that the sensible heat flux H and water heat flux G are negligible, such that Chow et al. (1988) calculate the energy-balance component by E_R = 0.0353 * R_n.

Two modifications to the above equation were used in order to calculate the instantaneous evaporation rate. Rather than using the difference in mean daily air and water temperatures from the previous day, the instantaneous heat flux from above and below the water's surface is determined by the equations:

$$H = -k_a \left(\frac{T_2 - T_1}{z_2 - z_1} \right) \quad \text{and} \quad G = -k_w \left(\frac{T_{w2} - T_{w1}}{z_{w2} - z_{w1}} \right)$$

where T_2 - T_1 is the change in air temperature over height z_2 - z_1 and T_{w2} - T_{w1} is the change in water temperature over depth z_{w2} - z_{w1}.

The aerodynamic component E_A in mm/day is calculated as:

$$E_A = \frac{0.1062 u_2}{[\ln(z_2 / z_0)]^2} * (e_{as} - e_a) \quad \text{with} \quad e_a = -RH * e_{as} \quad \text{and} \quad e_{as} = 611 \exp\left(\frac{17.27 * T}{237.3 + T} \right)$$

where u_2 is wind speed in m s^{-1} measured at a height of z_2 in cm; Brutsaert (1982) gives the surface water roughness height z_0 as 0.01 cm; the term e_{as} - e_a is the difference between saturated vapour pressure e_{as} and actual vapour pressure e_a in Pa; and relative humidity (RH) is given as a proportion ($0 \leq RH \leq 1$).

The Priestly-Taylor (PT) method is similar to the Penman Combination method and defined by the general equation:

$$E(PT) = \alpha \frac{\Delta}{\Delta + \gamma} E_R$$

where the weighted aerodynamic component E_A is replaced by a constant α, and where the sensible heat flux term H is omitted from the energy flux term, E_R, after Shuttleworth (1993). Stewart and Rouse (1977) substantiate the constant α = 1.26 for subarctic regions.

This report uses both of the described methods for calculating evaporation.

2.4 REGIONAL DATA

Data from Lupin, Kugluktuk and Bathurst Inlet meteorological stations, the closest currently operating Environment Canada stations, were used to characterize the climate in the regional Project Area (Table 2-1). Lupin A station (EC ID 23026HN) and Lupin CS station (EC ID 230N002) are located 200 km west of the Back River Project at the north end of Contwoyto Lake. Lupin A station replaced Contwoyto Lake station (EC ID 2300850), which operated from 1956 to 1981 approximately 50 km southeast of Lupin (Figure 2-1).

Lupin CS Station eventually replaced Lupin A station at approximately the same location and has records dating from 1997. Kugluktuk CS station (EC ID 2300904) has been operating since 1978 and is located approximately 400 km northwest of the Back River Project. Kugluktuk A station (EC ID 2300902) has been operating since 2005.

Bathurst Inlet Station (EC ID 2300551) has been operating since 2012 and is located close to the heritage Bathurst Inlet station which operated from 1958 to 1962 by Environment Canada. Since there are two stations named Bathurst Inlet, the Environment Canada Bathurst Inlet station will be referred to as Bathurst Inlet (EC).

Climate normals are arithmetic averages of climate elements over a prescribed 30-year interval. At the completion of each decade, Environment Canada updates its climate normals. The most updated climate normals and extremes currently offered by Environment Canada are based on Canadian climate stations with at least 15 years of data between 1981 to 2010 (EC 2013). Climate normals for precipitation and temperature were collected from Environment Canada for the Kugluktuk CS meteorological station using all data available for the 1981 to 2010 period.

3. Results and Discussion

3. Results and Discussion

The Back River Project area is located near the northern boundary of the North American Continent in the vicinity of the Arctic Circle. The climate in the area is characterized by extremes. The Project area experiences relatively low amounts of precipitation, but due to sub-zero temperatures for the majority of the year also experiences snow accumulation. Summer is a season of nearly perpetual sunlight, while winter is dominated by night, twilight and extreme cold. Due to the relative absence of obstructions to impede the wind (e.g., trees, buildings, mountains), wind speeds are generally high.

The following sections describe the meteorological conditions within the Back River Project area including temperature, precipitation, wind speed and direction and solar radiation over the period of 2004 through 2014. Tables 3-1 to 3-3 contain summaries of the meteorological conditions recorded by the Goose, George and Bathurst Inlet meteorological stations.

It should be noted that the Goose meteorological station did not record data from late 2005 to September 2006, and did not record temperature and relative humidity from February to May 2010. The reason for this data gap was unknown at the time of reporting. Invalid data for temperature and solar radiation were removed from February to May 2011 from the George meteorological station dataset. The reasons for this data gap were due to a damaged temperature and relative humidity cable, and a disconnected solar radiation sensor. Additionally, temperature data from March to June 2014 was unavailable due sensor malfunction. Frequent data gaps were experienced at the Bathurst Inlet meteorological station. New sensors were installed with new datalogger in July 2012. All sensors have been operating since that time with the exception of the pyranometer which is missing a resister and data during the winter of 2013/2014 due to a power loss. Historical climate normal data collected from Lupin A and Kugluktuk CS are included in Appendix 1 and daily precipitation and air temperature data from Goose, George and Bathurst Inlet stations are presented in Appendix 2.

3.1 AIR TEMPERATURE

Figures 3.1-1 to 3.1-3 summarize the daily average, daily minimum and daily maximum air temperatures at the Goose, George, Bathurst Inlet and regional EC-MSC meteorological stations from 2004 to 2014. Tables 3.1-1a to 3.1-1k summarize the monthly average air temperatures over the reporting period and compare them to the regional climate normals.

The mean monthly air temperatures at the Goose meteorological station ranged from -30.8ºC to 6.8ºC between August and December 2004 (the available data range), -32.6ºC to 9.8ºC in 2005 (up to November), -20.8ºC to 3.4ºC between September and December 2006 (the available data range), -29.1ºC to 14.0ºC in 2007, -33.0ºC to 13.1ºC in 2008, -29.2ºC to 11.4ºC in 2009, -26.5ºC to 13.8ºC in 2010, -30ºC to 14.5ºC in 2011, -30.8ºC to 14.2ºC in 2012, -31.7ºC to 11.4ºC in 2013, and -30.2 to 2.9ºC (up to June 2014). At the George meteorological station mean monthly air temperatures ranged from -30.3ºC to 6.1ºC between August and December 2004 (the available data range), -31.9ºC to 9.2ºC in 2005, -26.9ºC to 11.4ºC in 2006, -28.8ºC to 13.9ºC in 2007, -32.2ºC to 12.7ºC in 2008, -29.1ºC to 11.0ºC in 2009, -26.6ºC to 13.0ºC in 2010, -29.4ºC in January 2011 to 14.4ºC in 2011, -30.3ºC to 13.9ºC in 2012, -31.9ºC to 11.2ºC in 2013, and -30 to -28.6ºC (up to March 2014). Air temperature at the George meteorological station was unavailable after March 2014 due to a sensor malfunction. At the Bathurst Inlet meteorological station, mean monthly air temperature ranged from -24.4ºC to 14.5ºC in 2007, -29.3ºC to 14.6ºC in 2012, -28.7ºC to 12.1ºC in 2013, and -29.1 to -1.9ºC (up to May 2014). For 2008 to 2011, data were missing for an extended period such that the entire winter or summer data sets were missing; therefore, the range is not representative of annual temperature variation.

Table 3-1a. 2004 Monthly Meteorological Conditions at Goose Meteorological Station (January 2004 to December 2004)

Date	Average Temperature (°C)	Mean Daily Minimum Temperature (°C)	Mean Daily Maximum Temperature (°C)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-04	-	-	-	-	-	-	-	-	-
Feb-04	-	-	-	-	-	-	-	-	-
Mar-04	-	-	-	-	-	-	-	-	-
Apr-04	-	-	-	-	-	-	-	-	-
May-04	-	-	-	-	-	-	-	-	-
Jun-04	-	-	-	-	-	-	-	-	-
Jul-04	-	-	-	-	-	-	-	-	-
Aug-04[a]	6.8	3.9	10.0	5.0	347	20.9	8/15/04 2:39 PM	40.1	104.3
Sep-04	1.7	-1.2	4.6	5.4	322	15.9	9/17/04 10:02 AM	25.7	73.9
Oct-04	-10.1	-14.1	-7.0	4.9	280	17.8	10/31/04 2:56 PM	0.3	37.3
Nov-04	-22.4	-27.4	-17.7	4.4	248	16.1	11/13/04 11:23 PM	0.0	9.3
Dec-04	-30.8	-34.4	-27.2	4.4	270	16.1	12/29/04 2:18 PM	0.0	2.0
Average	**-**	**-**	**-**	**-**	**-**	**-**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**-**	**n/a**
Minimum	**-**	**-**	**-**	**-**	**n/a**	**-**	**n/a**	**0.0**	**-**
Maximum	**-**	**-**	**-**	**-**	**n/a**	**-**	**n/a**	**-**	**-**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.
[a] *Data available starting on August 4th*

Table 3-1b. 2005 Monthly Meteorological Conditions at Goose Meteorological Station (January 2005 to December 2005)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-05	-30.6	-34.3	-27.1	4.1	276	15.9	1/5/05 10:49 PM	0.0	6.0
Feb-05	-32.6	-36.6	-28.9	3.5	281	11.9	2/5/05 5:52 PM	0.0	35.9
Mar-05	-26.1	-30.9	-21.2	4.5	278	15.5	3/3/05 12:11 PM	0.0	102.1
Apr-05	-13.0	-17.7	-8.7	5.0	8	21.4	4/9/05 4:43 AM	0.0	176.4
May-05	-8.7	-13.3	-5.0	5.2	345	15.0	5/9/05 4:03 PM	0.0	257.4
Jun-05	5.1	0.6	9.5	3.8	346	15.4	6/16/05 8:55 PM	11.4	232.2
Jul-05	9.6	5.5	13.9	4.7	345	14.5	7/19/05 1:30 PM	57.7	172.9
Aug-05	9.8	5.5	14.0	4.7	315	15.7	8/3/05 10:49 AM	16.0	136.9
Sep-05	0.6	-2.3	3.3	4.8	54	14.8	9/30/05 3:23 AM	14.0	75.1
Oct-05[a]	-7.3	-10.4	-4.3	5.5	320	19.1	10/17/05 12:53 PM	2.8	49.0
Nov-05	-	-	-	-	-	-	-	-	-
Dec-05	-	-	-	-	-	-	-	-	-
Average	**-**	**-**	**-**	**-**	**-**	**-**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**101.9**	**n/a**
Minimum	**-32.6**	**-36.6**	**-28.9**	**-**	**n/a**	**-**	**n/a**	**0.0**	**-**
Maximum	**9.8**	**5.5**	**14.0**	**-**	**n/a**	**-**	**n/a**	**57.7**	**257.4**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.
[a] *Data available up to October 17th*

Table 3-1c. 2006 Monthly Meteorological Conditions at Goose Meteorological Station (January 2006 to December 2006)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-06	-	-	-	-	-	-	-	-	-
Feb-06	-	-	-	-	-	-	-	-	-
Mar-06	-	-	-	-	-	-	-	-	-
Apr-06	-	-	-	-	-	-	-	-	-
May-06	-	-	-	-	-	-	-	-	-
Jun-06	-	-	-	-	-	-	-	-	-
Jul-06	-	-	-	-	-	-	-	-	-
Aug-06	-	-	-	-	-	-	-	-	-
Sep-06	3.4	-0.2	5.7	3.6	325	13.9	12/09/2006 23:00	0.0	87.5
Oct-06	-5.9	-9.3	-3.4	5.2	300	16.7	29/10/2006 8:00	-	42.0
Nov-06	-20.8	-23.8	-18.1	4.5	306	20.3	18/11/2006 17:00	-	10.6
Dec-06	-20.4	-24.8	-16.0	4.5	227	18.1	05/12/2006 8:00	-	2.0
Average	**-**	**-**	**-**	**-**	**-**	**-**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**-**	**n/a**
Minimum	**-**	**-**	**-**	**-**	**n/a**	**13.9**	**n/a**	**0.0**	-
Maximum	**-**	**-**	**-**	**-**	**n/a**	**20.3**	**n/a**	**-**	-

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1d. 2007 Monthly Meteorological Conditions at Goose Meteorological Station (January 2007 to December 2007)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-07	-26.3	-29.9	-22.9	4.0	280	22.1	31/01/2007 23:00	-	5.0
Feb-07	-29.1	-33.1	-25.4	4.8	313	22.8	01/02/2007 6:00	-	36.4
Mar-07	-28.8	-33.7	-24.3	3.5	273	15.7	16/03/2007 8:00	-	114.5
Apr-07	-15.0	-20.5	-9.7	3.4	235	13.7	21/04/2007 22:00	-	217.2
May-07	-5.8	-10.8	-1.8	4.5	250	17.5	06/05/2007 3:00	-	261.6
Jun-07	4.7	0.4	8.6	4.3	339	15.2	06/06/2007 11:00	0.3	286.3
Jul-07	14.0	8.5	19.2	3.7	355	13.5	23/07/2007 15:00	0.8	266.3
Aug-07	7.1	4.1	9.9	6.1	338	15.3	08/08/2007 18:00	0.3	124.3
Sep-07	-0.3	-2.9	2.3	4.4	13	14.3	29/09/2007 22:00	2.3	82.3
Oct-07	-6.1	-9.4	-3.7	5.0	142	15.4	16/10/2007 9:00	-	37.7
Nov-07	-22.4	-26.0	-18.5	5.2	308	16.9	30/11/2007 3:00	-	11.9
Dec-07	-27.1	-30.6	-23.6	4.4	280	16.0	04/12/2007 19:00	-	1.9
Average	**-11.3**	**-15.3**	**-7.5**	**4.5**	**314**	**16.5**	**n/a**	**n/a**	**120.5**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**3.6**	**n/a**
Minimum	**-29.1**	**-33.7**	**-25.4**	**3.4**	**n/a**	**13.5**	**n/a**	**0.3**	**1.9**
Maximum	**14.0**	**8.5**	**19.2**	**6.1**	**n/a**	**22.8**	**n/a**	**2.3**	**286.3**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1e. 2008 Monthly Meteorological Conditions at Goose Meteorological Station (January 2008 to December 2008)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-08	-29.1	-32.6	-25.8	5.2	265	19.2	24/01/2008 10:00	-	7.0
Feb-08	-33.0	-36.8	-29.2	3.1	289	14.7	25/02/2008 20:00	-	40.9
Mar-08	-30.6	-35.6	-25.1	3.2	286	17.1	05/03/2008 6:00	-	122.6
Apr-08	-17.5	-23.0	-11.9	4.3	267	20.0	15/04/2008 12:00	-	218.1
May-08	-5.2	-9.7	-1.3	4.2	268	18.9	31/05/2008 19:00	-	288.4
Jun-08	5.2	0.8	9.5	3.9	13	19.1	03/06/2008 15:00	20.8	263.6
Jul-08	13.1	7.5	18.0	3.9	278	14.6	25/07/2008 17:00	1.8	236.1
Aug-08	9.7	5.7	13.8	4.8	27	18.8	19/08/2008 10:00	71.1	149.5
Sep-08	0.8	-1.5	2.9	5.1	330	18.0	24/09/2008 18:00	35.6	64.9
Oct-08	-4.9	-8.2	-1.9	4.0	242	14.8	01/10/2008 0:00	-	34.6
Nov-08	-18.7	-23.6	-14.6	3.1	228	11.8	17/11/2008 17:00	-	9.3
Dec-08	-27.9	-31.5	-24.4	4.6	296	17.0	03/12/2008 7:00	-	2.0
Average	**-11.5**	**-15.7**	**-7.5**	**4.1**	**291**	**17.0**	**n/a**	**n/a**	**119.8**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**129.3**	**n/a**
Minimum	**-33.0**	**-36.8**	**-29.2**	**3.1**	**n/a**	**11.8**	**n/a**	**1.8**	**2.0**
Maximum	**13.1**	**7.5**	**18.0**	**5.2**	**n/a**	**20.0**	**n/a**	**71.1**	**288.4**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1f. 2009 Monthly Meteorological Conditions at Goose Meteorological Station (January 2009 to December 2009)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-09	-27.1	-30.7	-23.6	4.9	286	22.6	19/01/2009 21:00	-	6.9
Feb-09	-28.2	-32.4	-24.2	4.3	259	18.9	04/02/2009 5:00	-	37.0
Mar-09	-29.2	-34.1	-24.7	3.4	289	17.0	05/03/2009 13:00	-	119.5
Apr-09	-14.5	-19.1	-10.7	5.1	290	16.8	29/04/2009 15:00	-	203.4
May-09	-9.2	-13.1	-5.9	4.3	314	17.5	15/05/2009 1:00	-	288.1
Jun-09	4.5	-0.1	8.6	3.8	47	11.5	18/06/2009 16:00	21.3	272.0
Jul-09	11.4	6.3	16.1	4.2	266	14.0	08/07/2009 8:00	27.2	252.2
Aug-09	9.6	4.2	14.6	4.5	298	16.2	31/08/2009 20:00	25.1	172.3
Sep-09	4.7	0.7	9.1	4.9	187	19.5	24/09/2009 23:00	37.1	93.6
Oct-09	-9.4	-12.4	-7.0	4.3	351	18.1	09/10/2009 3:00	-	39.8
Nov-09	-17.0	-20.8	-13.8	4.9	163	18.2	18/11/2009 15:00	-	10.6
Dec-09	-24.9	-28.8	-21.3	6.0	303	22.5	30/12/2009 6:00	-	2.1
Average	**-10.8**	**-15.0**	**-6.9**	**4.6**	**289**	**17.7**	**n/a**	**n/a**	**124.8**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**110.7**	**n/a**
Minimum	**-29.2**	**-34.1**	**-24.7**	**3.4**	**n/a**	**11.5**	**n/a**	**21.3**	**2.1**
Maximum	**11.4**	**6.3**	**16.1**	**6.0**	**n/a**	**22.6**	**n/a**	**37.1**	**288.1**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1g. 2010 Monthly Meteorological Conditions at Goose Meteorological Station (January 2010 to December 2010)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-10	-26.5	-30.6	-23.0	4.5	292	20.9	26/01/2010 5:00	-	6.7
Feb-10	-22.7	-10.2	-7.6	3.4	228	12.8	18/02/2010 12:00	-	35.4
Mar-10	-	-	-	3.7	234	15.5	08/03/2010 2:00	-	101.2
Apr-10	-	-	-	4.5	181	17.1	17/04/2010 3:00	-	201.3
May-10	-6.3	-8.7	-1.5	2.9	276	10.6	31/05/2010 6:00	-	299.1
Jun-10	6.5	2.1	11.0	4.1	299	12.5	27/06/2010 13:00	18.5	252.4
Jul-10	13.8	9.0	18.9	4.3	55	14.4	09/07/2010 17:00	41.2	208.0
Aug-10	10.6	6.0	15.1	4.5	355	17.3	03/08/2010 22:00	6.4	179.0
Sep-10	2.6	1.0	5.6	4.1	79	17.3	15/9/2010 11:00	16.0	89.4
Oct-10	-4.4	0.0	0.0	4.6	313	17.0	11/10/2010 2:00	5.8	30.7
Nov-10	-16.1	0.0	0.0	5.8	301	24.4	21/11/2010 17:00	0.0	10.2
Dec-10	-23.6	0.0	0.0	5.3	309	18.5	25/12/2010 7:00	0.0	1.8
Average	**-6.6**	**-3.1**	**1.8**	**4.3**	**281**	**16.5**	**n/a**	**n/a**	**117.9**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**87.9**	**n/a**
Minimum	**-26.5**	**-30.6**	**-23.0**	**2.9**	**n/a**	**10.6**	**n/a**	**0.0**	**1.8**
Maximum	**13.8**	**9.0**	**18.9**	**5.8**	**n/a**	**24.4**	**n/a**	**41.2**	**299.1**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1h. 2011 Monthly Meteorological Conditions at Goose Meteorological Station (January 2011 to December 2011)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-11	-30.0	-30.4	-23.0	3.5	272	16.3	1/24/2011 6:00	-	7.1
Feb-11	-26.5	-26.9	-7.6	5.4	290	22.7	2/8/2011 6:00	-	35.8
Mar-11	-24.0	-24.6	0.0	2.6	295	15.1	3/10/2011 5:00	-	111.1
Apr-11	-19.0	-19.5	0.0	3.9	292	14.4	4/15/2011 4:00	-	229.0
May-11	-3.5	-4.0	-1.5	4.2	143	14.3	2/23/2011 8:00	-	291.3
Jun-11	5.3	4.8	11.0	4.8	0	17.3	6/26/2011 19:00	13.5	247.2
Jul-11	14.5	13.9	18.9	4.0	38	15.2	7/1/2011 14:00	21.1	274.4
Aug-11	11.4	10.9	15.1	4.4	53	15.9	8/22/2011 7:00	53.6	167.7
Sep-11	3.7	0.7	7.4	4.8	282	19.1	9/8/2011 2:00	65.3	84.3
Oct-11	-5.5	-8.6	-2.8	4.9	161	19.2	10/1/2011 9:40	-	34.1
Nov-11	-18.6	-22.7	-15.7	4.7	300	19.1	11/28/2011 4:18	-	11.1
Dec-11	-25.8	-29.7	-21.6	4.8	292	30.7	12/7/2011 12:50	-	1.6
Average	**-9.8**	**-11.4**	**-1.6**	**4.3**	**304.0**	**18.3**	**n/a**	**n/a**	**124.6**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**153.4**	**n/a**
Minimum	**-30.0**	**-30.4**	**-23.0**	**2.6**	**n/a**	**14.3**	**n/a**	**13.5**	**1.6**
Maximum	**14.5**	**13.9**	**18.9**	**5.4**	**n/a**	**30.7**	**n/a**	**65.3**	**291.3**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1i. 2012 Monthly Meteorological Conditions at Goose Meteorological Station (January 2012 to December 2012)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Precipitation (mm)	Average Solar Radiation (W/m^2)
Jan-12	-30.8	-35.1	-26.0	3.8	239	20.2	1/2/2012 16:18	-	6.6
Feb-12	-23.6	-27.7	-19.4	4.1	270	16.9	2/18/2012 11:04	-	37.9
Mar-12	-25.9	-30.3	-21.5	4.0	213	17.1	3/12/2012 21:41	3.6	110.2
Apr-12	-15.2	-20.5	-10.1	5.1	284	17.0	4/10/2012 12:52	5.1	224.4
May-12	-1.3	-4.6	1.8	4.5	141	16.6	5/9/2012 10:46	10.2	269.9
Jun-12	7.7	2.9	12.3	4.3	46	18.6	6/20/2012 17:33	16.0	266.5
Jul-12	14.2	8.7	19.0	4.8	31	17.8	7/20/2012 9:14	20.6	256.4
Aug-12	11.0	5.8	15.7	4.7	348	15.1	8/19/2012 18:06	32.3	166.8
Sep-12	5.7	1.6	9.9	5.6	259	20.0	9/23/12 12:39 AM	27.9	96.0
Oct-12	-6.4	-9.5	-3.8	4.8	141	18.1	10/10/12 7:31 AM	2.5	41.6
Nov-12	-19.8	-23.3	-17.1	6.2	291	21.3	11/20/12 7:34 AM	7.9	11.8
Dec-12	-28.5	-31.8	-25.2	4.1	306	15.2	12/22/12 7:15 AM	4.8	2.3
Average	**-9.4**	**-13.7**	**-5.4**	**4.7**	**285**	**17.8**	**41091.2**	**15.5**	**124.5**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**185.7**	**n/a**
Minimum	**-30.8**	**-35.1**	**-26.0**	**3.8**	**n/a**	**15.1**	**40910.7**	**0.0**	**2.3**
Maximum	**14.2**	**8.7**	**19.0**	**6.2**	**n/a**	**21.3**	**41265.3**	**58.4**	**269.6**

On March 27, 2012, winter adaptor was added to Goose Meteorological station in order to record precipitation as snow.
Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-1j. 2013 Monthly Meteorological Conditions at Goose Meteorological Station

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Precipitation (mm)	Average Solar Radiation (W/m^2)
Jan-13	-31.7	-35.0	-28.3	5.1	297	18.3	1/2/13 7:44 PM	0.8	6.5
Feb-13	-29.9	-33.8	-26.2	4.1	270	15.8	2/11/13 7:44 PM	5.6	37.2
Mar-13	-25.7	-30.2	-21.5	5.4	269	18.7	3/21/13 1:45 AM	2.0	115.5
Apr-13	-17.5	-22.7	-12.6	5.3	302	20.6	4/10/13 1:19 PM	0.0	227.6
May-13	-4.5	-8.1	-0.9	4.7	172	13.9	5/19/13 2:41 AM	6.4	261.9
Jun-13	11.4	5.2	17.8	5.2	330	22.3	6/22/13 7:17 PM	25.7	271.6
Jul-13	10.8	6.7	14.8	5.8	2	21.7	7/18/13 8:45 AM	39.6	198.2
Aug-13	11.4	0.7	7.9	4.3	285	18.2	8/22/13 6:14 PM	36.3	186.8
Sep-13	3.2	0.5	6.3	5.2	68	18.4	9/13/13 10:50 AM	40.1	64
Oct-13	-3.9	-6.4	-1.8	5.3	262	17.0	10/29/13 9:02 PM	6.9	34
Nov-13	-22.0	-25.8	-18.4	4.8	263	21.2	11/11/13 2:47 AM	3.3	11
Dec-13	-28.5	-32.0	-25.2	6.0	306	22.3	12/7/13 3:54 PM	0.8	2
Average	**-9.5**	**-14.2**	**-5.1**	**5.0**	**301**	**18.7**	**n/a**	**14.5**	**163.2**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**116.3**	**n/a**
Minimum	**-31.7**	**-35.1**	**-28.3**	**4.1**	**n/a**	**13.9**	**n/a**	**0.0**	**6.5**
Maximum	**11.4**	**6.5**	**17.4**	**5.8**	**n/a**	**22.3**	**n/a**	**39.6**	**271.6**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.
[a] *Pressure data began being collected in June 2013.*

Table 3-1k. 2014 Monthly Meteorological Conditions at Goose Meteorological Station (January 2014 to June 2014)

Date	Average Temperature (°C)	Mean Daily Minimum Temperature (°C)	Mean Daily Maximum Temperature (°C)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Precipitation (mm)	Average Solar Radiation (W/m^2)	Average Relative Humidity (%)
Jan-14	-30.2	-33.8	-26.3	6.2	309	25.5	1/23/14 9:26 AM	6.4	8	72.6
Feb-14	-28.4	-32.1	-24.7	6.5	322	19.2	2/5/14 7:37 AM	6.1	39	73.6
Mar-14	-26.6	-30.6	-22.9	6.1	305	19.2	3/19/14 9:51 PM	6.9	116	73.2
Apr-14	-17.5	-23.0	-12.4	4.9	286	19.2	4/16/14 11:37 AM	3.8	229	77.7
May-14	-3.2	-7.7	1.1	5.6	74	19.8	5/1/14 5:56 PM	14.7	258	82.3
Jun-14	2.9	-0.4	3.0	5.5	5	15.1	6/3/14 6:09 PM	4.3	251	73.7
Jul-14	-	-	-	-	-	-	-	-	-	-
Aug-14	-	-	-	-	-	-	-	-	-	-
Sep-14	-	-	-	-	-	-	-	-	-	-
Oct-14	-	-	-	-	-	-	-	-	-	-
Nov-14	-	-	-	-	-	-	-	-	-	-
Dec-14	-	-	-	-	-	-	-	-	-	-
Average	**-**	**-**	**-**	**5.8**	**315**	**19.7**	**n/a**	**7.0**	**150**	**75.5**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**42.2**	**n/a**	**n/a**
Maximum	**-**	**-**	**-**	**6.5**	**n/a**	**25.5**	**n/a**	**14.7**	**258**	**82.3**
Minimum	**-**	**-**	**-**	**4.9**	**n/a**	**15.1**	**n/a**	**3.8**	**8**	**72.6**

Data available until the last data download on June 13, 2014.
Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2a. 2004 Monthly Meteorological Conditions at George Meteorological Station (January 2004 to December 2004)

Date	Average Temperature (°C)	Mean Daily Minimum Temperature (°C)	Mean Daily Maximum Temperature (°C)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-04	-	-	-	-	-	-	-	-	-
Feb-04	-	-	-	-	-	-	-	-	-
Mar-04	-	-	-	-	-	-	-	-	-
Apr-04	-	-	-	-	-	-	-	-	-
May-04	-	-	-	-	-	-	-	-	-
Jun-04	-	-	-	-	-	-	-	-	-
Jul-04	-	-	-	-	-	-	-	-	-
Aug-04[a]	6.1	3.5	9.2	5.4	350	18.7	8/15/04 11:26 AM	29.7	107.1
Sep-04	0.9	-1.9	3.6	6.2	358	21.6	9/17/04 1:24 AM	28.2	78.3
Oct-04	-10.8	-14.4	-7.6	5.1	323	24.3	10/31/04 3:24 PM	0.8	38.8
Nov-04	-22.3	-26.5	-17.7	4.6	317	19.9	11/12/04 10:53 PM	0.0	8.5
Dec-04	-30.3	-33.6	-26.9	4.6	313	18.7	12/29/04 3:18 PM	0.0	1.3
Average	-	-	-	-	-	-	**n/a**	**n/a**	-
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	-	**n/a**
Minimum	-	-	-	-	**n/a**	-	**n/a**	**0.0**	-
Maximum	-	-	-	-	**n/a**	-	**n/a**	-	-

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.
[a] *Data available starting on August 4th*

Table 3-2b. 2005 Monthly Meteorological Conditions at George Meteorological Station (January 2005 to December 2005)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-05	-30.0	-33.9	-26.3	4.1	319	18.8	1/2/05 12:58 AM	M	4.1
Feb-05	-31.9	-35.4	-28.2	3.2	339	17.9	2/8/05 3:23 AM	M	12.2
Mar-05	-25.5	-29.7	-20.8	5.1	347	18.8	3/3/05 1:22 PM	M	101.7
Apr-05	-12.9	-17.3	-8.7	5.9	36	19.9	4/9/05 6:30 AM	M	176.3
May-05	-8.9	-13.0	-5.0	6.2	10	21.8	5/21/05 5:35 PM	M	269.9
Jun-05	4.7	0.6	8.8	4.6	10	20.1	6/16/05 3:04 PM	M	234.8
Jul-05	9.1	4.9	13.4	5.3	0	17.0	7/14/05 11:11 PM	M	183.5
Aug-05	9.2	5.2	13.2	5.5	348	18.0	8/28/05 12:27 PM	M	141.9
Sep-05	0.1	-2.3	2.8	5.2	50	17.9	9/9/05 2:34 PM	M	75.9
Oct-05	-8.4	-11.6	-5.4	5.9	89	24.8	10/17/05 7:31 AM	M	35.1
Nov-05	-18.2	-21.3	-15.4	6.1	46	26.9	11/12/05 4:45 AM	M	7.4
Dec-05	-23.0	-26.4	-19.7	2.5	33	18.0	12/18/05 7:07 PM	M	1.1
Average	**-11.3**	**-15.0**	**-7.6**	**5.0**	**6**	**20.0**	**n/a**	**n/a**	**103.7**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	-	**n/a**
Minimum	**-31.9**	**-35.4**	**-28.2**	**2.5**	**n/a**	**17.0**	**n/a**	-	**1.1**
Maximum	**9.2**	**5.2**	**13.4**	**6.2**	**n/a**	**26.9**	**n/a**	-	**269.9**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2c. 2006 Monthly Meteorological Conditions at George Meteorological Station (January 2006 to December 2006)

Date	Average Temperature (°C)	Mean Daily Minimum Temperature (°C)	Mean Daily Maximum Temperature (°C)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-06	-26.9	-30.0	-23.4	2.2	324	16.4	26/01/2006 16:00	-	4.2
Feb-06	-23.7	-27.8	-20.2	5.0	337	20.3	09/02/2006 11:00	-	30.0
Mar-06	-19.9	-23.8	-15.5	3.5	81	15.2	14/03/2006 18:00	-	92.4
Apr-06	-14.8	-19.8	-9.7	5.1	63	34.5	29/04/2006 16:00	-	185.3
May-06	-1.3	-4.9	2.2	3.9	109	13.2	05/05/2006 0:00	-	229.4
Jun-06	9.2	4.2	14.6	5.5	23	18.4	30/06/2006 1:00	1.5	250.3
Jul-06	10.9	7.0	15.0	5.5	4	18.7	28/07/2006 5:00	1.3	202.5
Aug-06	11.4	7.3	15.5	4.7	32	15.1	31/08/2006 12:00	1.0	162.7
Sep-06	3.6	0.2	7.9	3.9	344	13.3	13/09/2006 10:00	0.0	109.1
Oct-06	-6.1	-9.0	-3.7	6.1	345	21.1	30/10/2006 2:00	-	36.7
Nov-06	-20.8	-23.4	-18.2	5.6	339	24.0	18/11/2006 11:00	-	9.9
Dec-06	-20.7	-24.8	-16.7	4.9	199	18.8	05/12/2006 6:00	-	1.8
Average	**-8.3**	**-12.1**	**-4.3**	**4.7**	**2**	**19.1**	**n/a**	**n/a**	**109.5**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**3.8**	**n/a**
Minimum	**-26.9**	**-30.0**	**-23.4**	**2.2**	**n/a**	**13.18**	**n/a**	**0.0**	**1.8**
Maximum	**11.4**	**7.3**	**15.5**	**6.1**	**n/a**	**34.53**	**n/a**	**1.5**	**250.3**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2d. 2007 Monthly Meteorological Conditions at George Meteorological Station (January 2007 to December 2007)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-07	-26.3	-29.9	-22.5	4.4	349	21.1	31/01/2007 0:00	-	4.2
Feb-07	-28.8	-32.1	-25.5	5.2	349	23.9	01/02/2007 3:00	-	36.9
Mar-07	-28.4	-32.6	-24.2	4.1	344	19.9	16/03/2007 3:00	-	114.0
Apr-07	-14.6	-19.7	-9.4	3.8	56	14.7	01/04/2007 11:00	-	214.8
May-07	-8.4	-7.0	-2.3	6.2	43	19.3	05/05/2007 6:00	-	256.2
Jun-07	8.1	2.3	7.8	4.1	341	13.2	15/06/2007 11:00	7.4	289.6
Jul-07	13.9	9.0	18.7	4.5	26	19.7	31/07/2007 23:00	4.1	276.7
Aug-07	6.6	3.9	9.7	6.6	344	19.1	09/08/2007 4:00	33.5	130.6
Sep-07	-0.8	-3.1	1.8	4.9	12	14.2	29/09/2007 18:00	7.9	87.1
Oct-07	-6.9	-10.5	-4.4	6.1	67	21.4	25/10/2007 16:00	-	38.7
Nov-07	-22.6	-25.8	-19.1	6.2	5	23.3	25/11/2007 3:00	-	11.2
Dec-07	-27.1	-30.4	-23.7	4.5	324	17.6	05/12/2007 4:00	-	1.5
Average	**-11.3**	**-14.7**	**-7.7**	**5.0**	**359**	**19.0**	**n/a**	**n/a**	**121.8**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**52.8**	**n/a**
Minimum	**-28.8**	**-32.6**	**-25.5**	**3.8**	**n/a**	**13.2**	**n/a**	**4.1**	**1.5**
Maximum	**13.9**	**9.0**	**18.7**	**6.6**	**n/a**	**23.9**	**n/a**	**33.5**	**289.6**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2e. 2008 Monthly Meteorological Conditions at George Meteorological Station (January 2008 to December 2008)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-08	-28.8	-32.1	-25.6	5.6	324	23.4	23/01/2008 0:00	-	6.6
Feb-08	-32.2	-35.6	-28.5	3.5	337	15.7	25/02/2008 15:00	-	37.4
Mar-08	-30.4	-34.8	-25.4	3.6	320	17.2	09/03/2008 7:00	-	121.5
Apr-08	-17.6	-22.5	-12.5	5.0	4	22.6	15/04/2008 11:00	-	218.1
May-08	-5.0	-8.6	-1.4	4.8	50	19.0	31/05/2008 17:00	-	289.4
Jun-08	4.7	0.5	8.8	4.7	33	25.3	03/06/2008 14:00	49.5	277.6
Jul-08	12.7	8.0	17.5	4.8	36	22.8	20/07/2008 18:00	29.7	246.6
Aug-08	9.0	5.9	12.6	5.6	30	19.2	19/08/2008 7:00	102.4	-
Sep-08	0.2	-1.8	2.3	5.8	333	20.8	24/09/2008 18:00	29.5	-
Oct-08	-5.5	-8.4	-2.6	4.6	240	16.7	11/10/2008 15:00	-	-
Nov-08	-19.0	-23.1	-15.3	3.0	34	13.4	02/11/2008 15:00	-	-
Dec-08	-27.6	-31.1	-24.2	5.1	326	15.9	14/12/2008 15:00	-	-
Average	**-11.6**	**-15.3**	**-7.9**	**4.7**	**346**	**19.3**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**211.1**	**n/a**
Minimum	**-32.2**	**-35.6**	**-28.5**	**3.0**	**n/a**	**13.4**	**n/a**	**29.5**	**-**
Maximum	**12.7**	**8.0**	**17.5**	**5.8**	**n/a**	**25.3**	**n/a**	**102.4**	**289.4**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2f. 2009 Monthly Meteorological Conditions at George Meteorological Station (January 2009 to December 2009)

Date	Average Temperature (°C)	Mean Daily Minimum Temperature (°C)	Mean Daily Maximum Temperature (°C)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-09	-26.9	-30.7	-23.1	5.3	322	23.1	16/01/2009 0:00	-	-
Feb-09	-28.0	-32.1	-24.2	4.3	314	19.6	20/02/2009 16:00	-	-
Mar-09	-29.1	-33.5	-24.4	3.9	357	20.8	07/03/2009 16:00	-	-
Apr-09	-14.7	-18.9	-10.8	5.5	356	21.9	07/04/2009 1:00	-	-
May-09	-9.5	-13.4	-6.2	5.0	322	21.5	15/05/2009 9:00	-	-
Jun-09	4.6	0.3	8.4	4.5	52	14.3	04/06/2009 8:00	16.5	-
Jul-09	11.0	6.4	15.8	5.0	311	18.2	08/07/2009 6:00	23.9	-
Aug-09	9.1	4.9	13.7	4.9	7	16.2	07/08/2009 4:00	40.4	-
Sep-09	4.2	0.7	8.1	5.6	109	23.2	25/09/2009 5:00	34.5	-
Oct-09	-9.9	-12.9	-7.5	4.8	352	20.6	09/10/2009 1:00	-	-
Nov-09	-17.0	-20.4	-14.0	5.6	118	20.5	07/11/2009 6:00	-	-
Dec-09	-24.7	-28.2	-21.3	6.8	338	27.8	12/12/2009 0:00	-	-
Average	**-10.9**	**-14.8**	**-7.1**	**5.1**	**351**	**20.6**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**115.3**	**n/a**
Minimum	**-29.1**	**-33.5**	**-24.4**	**3.9**	**n/a**	**14.3**	**n/a**	**16.5**	**-**
Maximum	**11.0**	**6.4**	**15.8**	**6.8**	**n/a**	**27.8**	**n/a**	**40.4**	**-**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2g. 2010 Monthly Meteorological Conditions at George Meteorological Station (January 2010 to December 2010)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-10	-26.6	-30.1	-23.3	4.7	344	22.8	29/01/2010 4:00	-	-
Feb-10	-23.2	-27.0	-19.4	2.5	329	15.2	18/02/2010 13:00	-	-
Mar-10	-18.7	-22.3	-14.5	3.8	327	19.6	16/03/2010 16:00	-	-
Apr-10	-8.3	-12.7	-4.7	5.1	130	24.7	17/04/2010 1:00	-	-
May-10	-7.7	-11.6	-4.1	3.7	306	14.3	09/05/2010 5:00	-	324.2
Jun-10	6.5	2.2	11.0	4.8	28	18.2	14/06/2010 18:00	11.4	262.9
Jul-10	13.0	9.1	17.6	5.4	53	17.1	04/07/2010 2:00	49.8	206.6
Aug-10	10.2	6.4	14.2	5.2	355	18.1	03/08/2010 15:00	9.1	181.3
Sep-10	2.2	-1.0	5.2	5.0	58	18.7	15/9/2010 9:00	21.1	36.7
Oct-10	-4.7	-8.2	-2.2	5.2	338	17.5	13/10/2010 23:00	-	-
Nov-10	-16.5	-22.2	-11.7	6.2	332	27.5	22/11/2010 3:00	-	-
Dec-10	-23.6	-27.8	-19.6	5.9	359	20.4	19/12/2010 0:00	-	-
Average	**-8.1**	**-12.1**	**-4.3**	**4.8**	**1**	**19.5**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**91.4**	**n/a**
Minimum	**-26.6**	**-30.1**	**-23.3**	**2.5**	**n/a**	**14.3**	**n/a**	**8.9**	**-**
Maximum	**13.0**	**9.1**	**17.6**	**6.2**	**n/a**	**27.5**	**n/a**	**50.0**	**324.2**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2h. 2011 Monthly Meteorological Conditions at George Meteorological Station (January 2011 to December 2011)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-11	-29.4	-29.8	-28.9	3.8	320	19.2	1/15/2011 12:58	-	-
Feb-11	-	-	-	6.0	312	26.2	2/7/2011 16:30	-	-
Mar-11	-	-	-	3.2	336	17.2	3/2/2011 2:26	-	-
Apr-11	-	-	-	5.2	306	19.3	4/9/2011 2:16	-	-
May-11	-	-	-	5.3	106	16.0	5/23/2011 16:58	-	-
Jun-11	4.9	0.5	9.4	5.8	21	19.6	6/1/2011 20:01	14.2	-
Jul-11	14.4	9.7	18.9	4.8	55	19.4	7/1/2011 14:15	20.6	247.0
Aug-11	11.2	7.8	14.9	5.2	60	17.4	8/16/2011 18:05	70.1	171.6
Sep-11	3.2	0.5	6.6	5.8	39	24.0	9/7/2011 17:24	46.5	85.2
Oct-11	-5.9	-8.6	-3.3	5.7	140	22.4	10/27/2011 14:21	-	33.4
Nov-11	-18.9	-22.3	-16.0	4.6	350	20.7	11/27/2011 14:03	-	7.9
Dec-11	-25.8	-29.3	-21.8	5.7	329	28.4	12/6/2011 16:36	-	1.6
Average	**n/a**	**n/a**	**n/a**	**5.1**	**320.0**	**20.8**	**n/a**	**n/a**	**-**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**151.4**	**n/a**
Minimum	**n/a**	**n/a**	**n/a**	**3.2**	**n/a**	**16.0**	**n/a**	**14.2**	**-**
Maximum	**14.4**	**9.7**	**18.9**	**6.0**	**n/a**	**28.4**	**n/a**	**70.1**	**-**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2i. 2012 Monthly Meteorological Conditions at George Meteorological Station (January 2012 to December 2012)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Precipitation (mm)	Average Solar Radiation (W/m^2)
Jan-12	-30.3	-34.2	-25.8	4.7	350	22.2	1/2/2012 17:19	-	6.2
Feb-12	-23.7	-27.4	-19.5	4.8	324	19.8	2/11/2012 3:19	-	38.0
Mar-12	-26.1	-29.8	-21.2	4.9	23	21.7	3/20/2012 20:45	2.8	109.2
Apr-12	-15.1	-19.4	-10.2	5.1	326	18.7	4/6/2012 22:56	5.8	220.6
May-12	-1.3	-5.0	2.4	4.8	107	16.4	5/9/2012 6:43	3.3	267.2
Jun-12	7.9	3.7	12.4	4.9	40	16.0	6/14/2012 18:10	13.2	277.6
Jul-12	13.9	9.7	18.4	5.3	45	19.0	7/17/2012 18:24	24.1	253.1
Aug-12	10.4	6.3	15.0	5.2	32	18.6	8/30/2012 4:52	42.4	170.1
Sep-12	5.3	1.9	9.4	5.7	213	20.7	9/22/12 11:12 PM	29.5	96.9
Oct-12	-6.8	-9.5	-4.2	5.5	34	18.2	10/10/12 12:17 AM	3.3	40.8
Nov-12	-20.2	-23.3	-17.3	6.2	304	23.9	11/20/12 7:52 AM	6.9	11.6
Dec-12	-28.0	-31.3	-24.9	4.0	343	16.8	12/21/12 3:56 AM	0.0	2.0
Average	**-9.5**	**-13.2**	**-5.6**	**5.1**	**358**	**19.3**	**n/a**	**10.9**	**124.3**
Sum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**131.3**	**n/a**
Minimum	**-30.3**	**-34.2**	**-25.8**	**4.0**	**n/a**	**16.0**	**n/a**	**0.0**	**2.0**
Maximum	**13.9**	**9.7**	**18.4**	**6.2**	**n/a**	**23.9**	**n/a**	**42.4**	**277.6**

On March 26, 2012, winter adaptor has been added to George Meteorological station in order to record precipitation as snow.
Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2j. 2013 Monthly Meteorological Conditions at George Meteorological Station (January 2013 to August 2013)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Precipitation (mm)	Average Solar Radiation (W/m^2)
Jan-13	-31.9	-35.0	-28.5	5.0	319	22.0	1/4/13 1:25 AM	0.0	6.6
Feb-13	-29.6	-32.8	-25.7	4.4	35	22.5	2/11/13 7:18 PM	0.0	37.3
Mar-13	-25.9	-29.9	-21.5	5.3	25	17.6	3/21/13 6:27 PM	27.2	110.2
Apr-13	-17.5	-22.2	-13.1	5.3	310	18.6	4/10/13 2:25 PM	0.0	229.7
May-13	-5.0	-8.8	-1.0	5.0	114	18.3	5/4/13 2:48 PM	1.8	269.1
Jun-13	11.0	5.3	16.9	5.4	7	24.8	6/7/13 1:05 PM	31.7	286.4
Jul-13	10.1	6.8	14.0	6.2	0	23.3	7/1/13 3:16 AM	22.9	205.8
Aug-13	11.2	6.3	16.1	4.5	328	18.5	8/20/13 1:14 AM	33.8	185
Sep-13	2.6	0.2	5.2	5.8	67	18.2	9/5/13 9:25 PM	29.2	64.5
Oct-13	-4.1	-6.3	-2.1	5.5	264	15.7	10/29/13 11:53 PM	5.3	30.6
Nov-13	-21.7	-25.4	-17.9	4.3	295	20.3	11/10/13 10:06 PM	0.0	11.1
Dec-13	-28.5	-32.0	-25.0	5.7	312	21.9	12/7/13 8:58 PM	0.0	2.0
Average	**-9.7**	**-13.9**	**-5.4**	**5.1**	**332**	**20.7**	**n/a**	**12.6**	**166.2**
Sum	**11.2**	**6.7**	**16.7**	**6.2**	**n/a**	**24.8**	**n/a**	**33.8**	**286.4**
Minimum	**-31.9**	**-35.0**	**-28.4**	**4.4**	**n/a**	**17.6**	**n/a**	**0.0**	**6.6**
Maximum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**129.8**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-2k. 2014 Monthly Meteorological Conditions at George Meteorological Station (January 2014 to June 2014)

Date	Average Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Average Wind Speed (m/s)	Average Wind Direction (Degrees from True North)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed	Precipitation (mm)	Average Solar Radiation (W/m^2)
Jan-14	-30.0	-33.6	-25.8	6.2	321	24.6	1/3/14 3:07 PM	5.1	7.4
Feb-14	-28.1	-31.7	-24.5	7.1	330	21.3	2/27/14 12:47 PM	0.0	40
Mar-14	-28.6	-13.5	-10.3	6.2	324	22.3	3/19/14 4:51 PM	0.0	119
Apr-14	-	-	-	4.9	319	20.9	4/4/14 11:51 PM	0.5	235
May-14	-	-	-	6.3	36	27.8	5/2/14 2:26 AM	7.6	267
Jun-14	-	-	-	7.0	8	15.2	6/10/14 5:01 PM	1.0	247
Jul-14	-	-	-	-	-	-	-	-	-
Aug-14	-	-	-	-	-	-	-	-	-
Sep-14	-	-	-	-	-	-	-	-	-
Oct-14	-	-	-	-	-	-	-	-	-
Nov-14	-	-	-	-	-	-	-	-	-
Dec-14	-	-	-	-	-	-	-	-	-
Average	-	-	-	6.3	335	22.0	n/a	2.4	152.7
Sum	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14.2	n/a
Minimum	-30.0	-33.6	-25.8	4.9	n/a	15.2	n/a	0.0	7.4
Maximum	-	-	-	7.1	n/a	27.8	n/a	7.6	267.3

Data available until the last data download on June 13, 2014. Air temperature was unavailable after March 2014 due to a sensor malfunction.
Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-3a. 2007 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January 2007 to December 2007)

Date	Average Temperature (°C)	Mean Daily Maximum Temperature (°C)	Mean Daily Minimum Temperature (°C)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-07	-	-	-	-	-	-	-	-	-
Feb-07	-	-	-	-	-	-	-	-	-
Mar-07	-	-	-	-	-	-	-	-	-
Apr-07	-	-	-	-	-	-	-	-	-
May-07	-	-	-	-	-	-	-	-	-
Jun-07	-	-	-	-	-	-	-	-	-
Jul-07	14.5	18.5	9.9	5.1	1.5	18.8	7/21/07 1:22 PM	13.0	247.2
Aug-07	7.2	9.7	4.9	7.0	1.4	21.0	8/9/07 6:05 PM	84.2	106.9
Sep-07	0.5	2.8	-1.5	5.1	2.0	15.8	9/3/07 12:04 PM	13.2	72.8
Oct-07	-5.8	-3.3	-8.6	6.4	3.6	24.2	10/9/07 3:25 PM	2.6	30.0
Nov-07	-20.8	-17.7	-23.6	5.8	1.0	20.5	11/30/07 2:07 AM	0.0	8.1
Dec-07	-24.4	-21.4	-27.2	5.9	0.9	22.7	12/4/07 7:44 PM	0.0	1.0
Average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Maximum	**14.5**	**18.5**	**9.9**	**7.0**	**3.6**	**24.2**	**n/a**	**84.2**	**247.2**
Minimum	**-24.4**	**-21.4**	**-27.2**	**4.6**	**0.9**	**0.0**	**n/a**	**0.0**	**1.0**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**113.4**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-3b. 2008 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January 2008 to December 2008)

Date	Average Temperature (°C)	Mean Daily Maximum Temperature (°C)	Mean Daily Minimum Temperature (°C)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-08	-26.2	-23.6	-28.7	6.7	1.0	24.0	1/23/08 8:31 PM	0.1	4.0
Feb-08	-29.0	-26.0	-31.9	5.0	0.6	22.5	2/10/08 12:08 PM	0.0	30.7
Mar-08	-27.8	-23.5	-31.6	5.0	0.6	19.0	3/9/08 11:00 PM	0.0	103.1
Apr-08	-16.0	-11.7	-19.8	6.1	1.0	25.5	4/15/08 6:09 AM	0.0	190.3
May-08	-	-	-	-	-	-	-	-	-
Jun-08	-	-	-	-	-	-	-	-	-
Jul-08	-	-	-	-	-	-	-	-	-
Aug-08	-	-	-	-	-	-	-	-	-
Sep-08	-	-	-	-	-	-	-	-	-
Oct-08	-3.7	-1.0	-6.2	5.6	1.8	19.5	10/3/08 11:25 PM	6.8	32.3
Nov-08	-17.0	-13.8	-20.2	-	8.3	-	-	0.0	6.4
Dec-08	-25.0	-22.1	-28.0	-	2.8	-	-	0.0	1.0
Average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Maximum	**-3.7**	**-1.0**	**-6.2**	**6.7**	**8.3**	**25.5**	**n/a**	**6.8**	**190.3**
Minimum	**-29.0**	**-26.0**	**-31.9**	**0.0**	**0.6**	**0.0**	**n/a**	**0.0**	**1.0**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**6.9**	**367.8**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-3c. 2009 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January 2009 to December 2009)

Date	Average Temperature (°C)	Mean Daily Maximum Temperature (°C)	Mean Daily Minimum Temperature (°C)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-09	-24.1	-21.2	-27.5	-	2.6	-	-	0.0	4.1
Feb-09	-25.0	-21.7	-28.4	-	2.5	-	-	0.0	26.8
Mar-09	-26.9	-23.6	-30.1	-	3.2	-	-	0.0	100.6
Apr-09	-13.3	-	-	-	3.0	-	-	-	182.7
May-09	-	-	-	-	-	-	-	-	-
Jun-09	-	-	-	-	-	-	-	-	-
Jul-09	-	-	-	-	-	-	-	-	-
Aug-09	-	-	-	-	-	-	-	-	-
Sep-09	-	-	-	-	-	-	-	-	-
Oct-09	-	-	-	-	-	-	-	-	-
Nov-09	-	-	-	-	-	-	-	-	-
Dec-09	-	-	-	-	-	-	-	-	-
Average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Maximum	**-13.3**	**-21.2**	**-27.5**	**0.0**	**3.2**	**0.0**	**n/a**	**0.0**	**182.7**
Minimum	**-26.9**	**-23.6**	**-30.1**	**0.0**	**2.5**	**0.0**	**n/a**	**0.0**	**4.1**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**0.0**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-3d. 2010 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January 2010 to December 2010)

Date	Average Temperature (°C)	Mean Daily Maximum Temperature (°C)	Mean Daily Minimum Temperature (°C)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-10	-	-	-	-	-	-	-	-	-
Feb-10	-	-	-	-	-	-	-	-	-
Mar-10	-	-	-	-	-	-	-	-	-
Apr-10	-	-	-	-	-	-	-	-	-
May-10	-	-	-	-	-	-	-	-	-
Jun-10	-	-	-	-	-	-	-	-	-
Jul-10	13.3	17.4	9.8	5.3	-	15.2	7/11/10 8:36 PM	60.5	37.5
Aug-10	11.0	14.4	7.5	5.8	-	19.4	8/2/10 1:25 PM	15.5	32.4
Sep-10	-	-	-	-	-	-	-	-	-
Oct-10	-	-	-	-	-	-	-	-	-
Nov-10	-	-	-	-	-	-	-	-	-
Dec-10	-	-	-	-	-	-	-	-	-
Average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Maximum	**13.3**	**17.4**	**9.8**	**5.8**	**0.0**	**19.4**	**n/a**	**60.5**	**37.5**
Minimum	**11.0**	**14.4**	**7.5**	**5.3**	**0.0**	**15.2**	**n/a**	**15.5**	**32.4**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**76.0**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Table 3-3e. 2011 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January 2011 to December 2011)

Date	Average Temperature (°C)	Mean Daily Maximum Temperature (°C)	Mean Daily Minimum Temperature (°C)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-11	-	-	-	-	-	-	-	-	-
Feb-11	-	-	-	-	-	-	-	-	-
Mar-11	-	-	-	-	-	-	-	-	-
Apr-11	-	-	-	-	-	-	-	-	-
May-11	-	-	-	-	-	-	-	-	-
Jun-11	-	-	-	-	-	-	-	-	-
Jul-11	-	-	-	-	-	-	-	-	-
Aug-11	-	-	-	-	-	-	-	-	-
Sep-11	-	-	-	-	-	-	-	-	-
Oct-11	-4.3	-2.0	-7.0	6.2	-	18.3	10/1/11 9:06 PM	4.1	0.0
Nov-11	-	-	-	-	-	-	-	-	-
Dec-11	-	-	-	-	-	-	-	-	-
Average	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Maximum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Minimum	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**-**	**n/a**	**n/a**	**n/a**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variables

Table 3-3f. 2012 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January 2012 to December 2012)

Date	Average Temperature (°C)	Mean Daily Maximum Temperature (°C)	Mean Daily Minimum Temperature (°C)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-12	-29.3	-	-	5.5	-	-	-	-	4.1
Feb-12	-21.3	-	-	5.8	-	-	-	-	13.4
Mar-12	-24.0	-	-	4.9	-	-	-	-	44.1
Apr-12	-13.0	-	-	5.5	-	-	-	-	89.0
May-12	-0.1	-	-	5.1	-	-	-	0.0	110.1
Jun-12	8.5	-	-	4.7	-	-	-	0.0	114.9
Jul-12	14.6	15.9	7.3	5.2	-	19.5	7/22/12 5:11 PM	6.8	237.0
Aug-12	11.2	14.9	7.3	5.1	-	16.5	8/20/12 5:14 PM	51.5	366.5
Sep-12	6.7	10.3	3.4	5.8	-	22.0	9/22/12 5:17 PM	40.3	320.1
Oct-12	-4.8	-2.7	-7.1	5.8	2.6	17.5	10/10/12 5:19 PM	-	311.2
Nov-12	-17.3	-12.3	-17.3	7.7	1.4	21.7	11/10/12 5:22 PM	-	364.0
Dec-12	-	-	-	-	-	-	-	-	-
Average	**-6.2**	**n/a**	**n/a**	**5.5**	**n/a**	**n/a**	**n/a**	**n/a**	**179.5**
Maximum	**14.6**	**15.9**	**7.3**	**7.7**	**2.6**	**n/a**	**n/a**	**51.5**	**366.5**
Minimum	**-29.3**	**-12.3**	**-17.3**	**4.7**	**1.4**	**n/a**	**n/a**	**0.0**	**4.1**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**101.9**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variables

Table 3-3g. 2013 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station

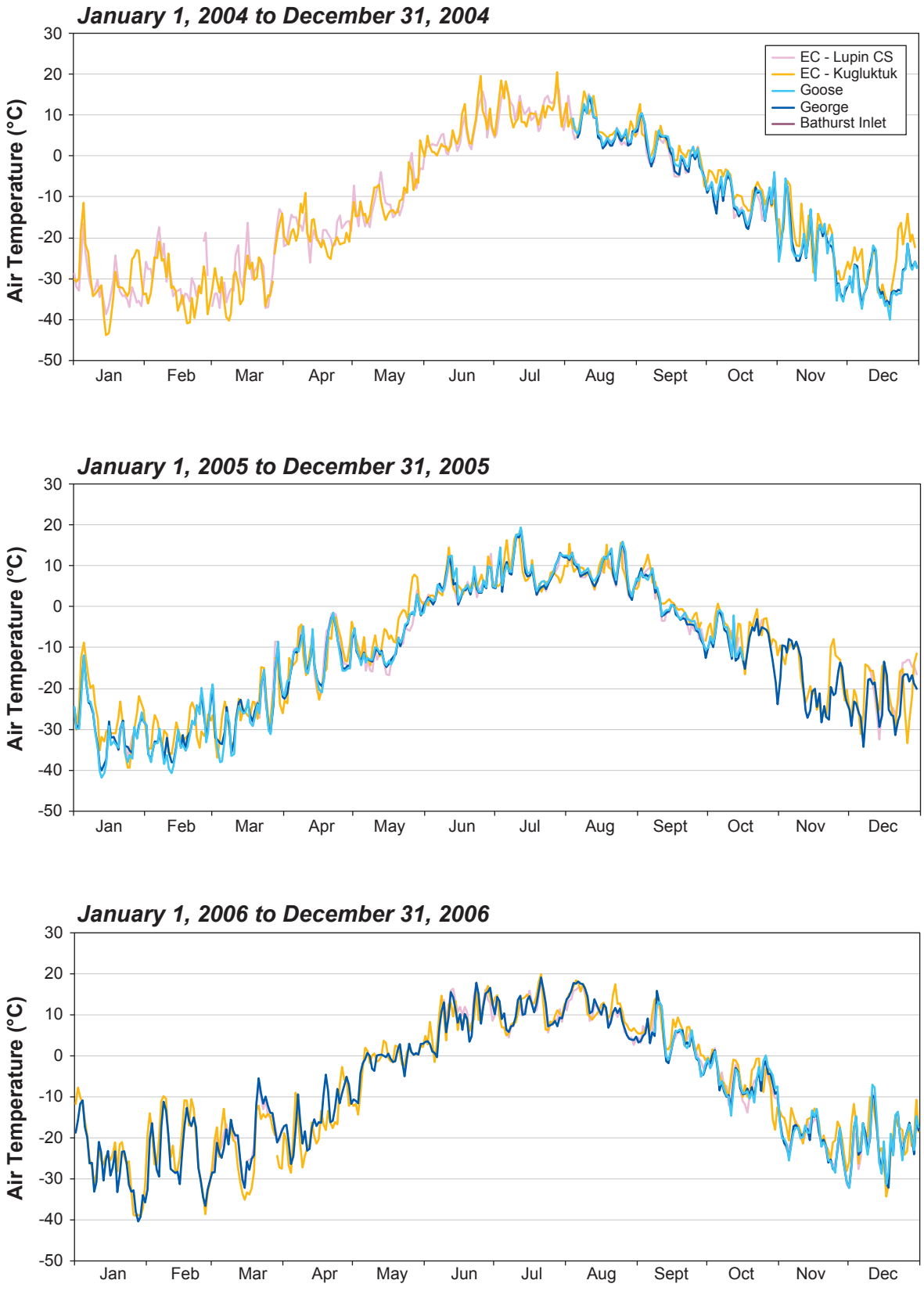
Date	Average Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Average Snow Depth (cm)	Rainfall (mm)	Average Solar Radiation (W/m^2)
Jan-13	-	-	-	-	-	-	-	-	0.0	-
Feb-13	-28.7	-25.7	-31.6	6.3	0.9	15.2	2/2/2013 8:56	0.9	0.0	-
Mar-13	-23.9	-20.9	-27.6	5.8	0.0	22.4	3/21/2013 0:43	0.0	0.0	-
Apr-13	-15.4	-11.7	-19.1	5.0	0.0	20.5	4/10/2013 11:35	0.0	0.0	-
May-13	-4.1	-1.6	-8.2	5.1	3.9	17.1	5/9/2013 18:29	3.9	11.3	-
Jun-13	11.9	16.9	6.2	6.0	5.2	17.8	6/7/2013 17:09	5.2	33.3	-
Jul-13	10.7	15.3	7.4	4.9	0	19.6	7/1/2013 0:09	0	47.6	-
Aug-13	12.2	16.2	7.4	5.7	0	17.5	8/24/2013 0:25	0	29.1	-
Sep-13	3.7	5.7	1.1	5.2	0.0	18.9	9/5/2013 20:34	0.0	32.0	-
Oct-13	-2.6	-1.1	-4.7	6.2	0.3	17.7	10/29/2013 21:33	0.3	6.9	-
Nov-13	-	-	-	6.4	0.1	22.7	11/11/2013 0:53	0.1	0.0	-
Dec-13	-	-	-	5.8	0.1	-	-	0.1	0.0	-
Average	**-5.5**	**-1.4**	**-9.2**	**5.3**	**0.9**	**19.1**	**n/a**	**0.9**	**17.3**	**-**
Maximum	**12.1**	**17.5**	**7.5**	**6.4**	**5.2**	**22.4**	**n/a**	**5.2**	**47.6**	**-**
Minimum	**-28.7**	**-25.5**	**-31.5**	**4.2**	**0.0**	**15.2**	**n/a**	**0.0**	**0.0**	**-**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**121.3**	**-**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variables

Table 3-3h. 2014 Monthly Meteorological Conditions at Bathurst Inlet Meteorological Station (January to June 2014)

Date	Average Temperature (ºC)	Mean Daily Maximum Temperature (ºC)	Mean Daily Minimum Temperature (ºC)	Average Wind Speed (m/s)	Average Snow Depth (cm)	Average Relative Humidity (%)	Maximum Instantaneous Wind Speed (m/s)	Time of Maximum Hourly Wind Speed mm/dd/yy hh:mm	Rainfall (mm)	Average Solar Radiation (W/m^2)	Average Barometric Pressure (kPa)
Jan-13	-29.1	-16.6	-23.6	6.3	0.0	60.8	20.2	1/25/2014 12:45	0.0	-	-
Feb-13	-26.3	-23.1	-30.2	6.8	0.0	64.2	23.0	2/5/2014 1:50	0.0	-	-
Mar-13	-24.5	-21.4	-27.9	7.0	0.0	62.3	20.1	3/20/2014 15:45	0.0	-	-
Apr-13	-16.5	-12.4	-20.4	5.6	0.0	66.8	31.7	4/16/2014 9:24	0.3	-	-
May-13	-2.6	1.8	-6.9	5.8	0.0	74.4	22.3	5/24/2014 21:48	20.7	-	-
Jun-13	1.9	1.8	-0.8	6.0	0.0	69.9	16.8	6/3/2014 16:32	3.4	-	-
Jul-13	-	-	-	-	-	-	-	-	-	-	-
Aug-13	-	-	-	-	-	-	-	-	-	-	-
Sep-13	-	-	-	-	-	-	-	-	-	-	-
Oct-13	-	-	-	-	-	-	-	-	-	-	-
Nov-13	-	-	-	-	-	-	-	-	-	-	-
Dec-13	-	-	-	-	-	-	-	-	-	-	-
Average	**-16.2**	**-11.6**	**-18.3**	**6.3**	**0.0**	**66.4**	**22.4**	**n/a**	**4.1**	**-**	**-**
Maximum	**1.9**	**1.8**	**-0.8**	**7.0**	**0.0**	**74.4**	**31.7**	**n/a**	**20.7**	**-**	**-**
Minimum	**-26.3**	**-23.1**	**-30.2**	**5.6**	**0.0**	**62.3**	**16.8**	**n/a**	**0.0**	**-**	**-**
Total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**24.4**	**n/a**	**n/a**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variables
Data available until the last data download on June 11, 2014.



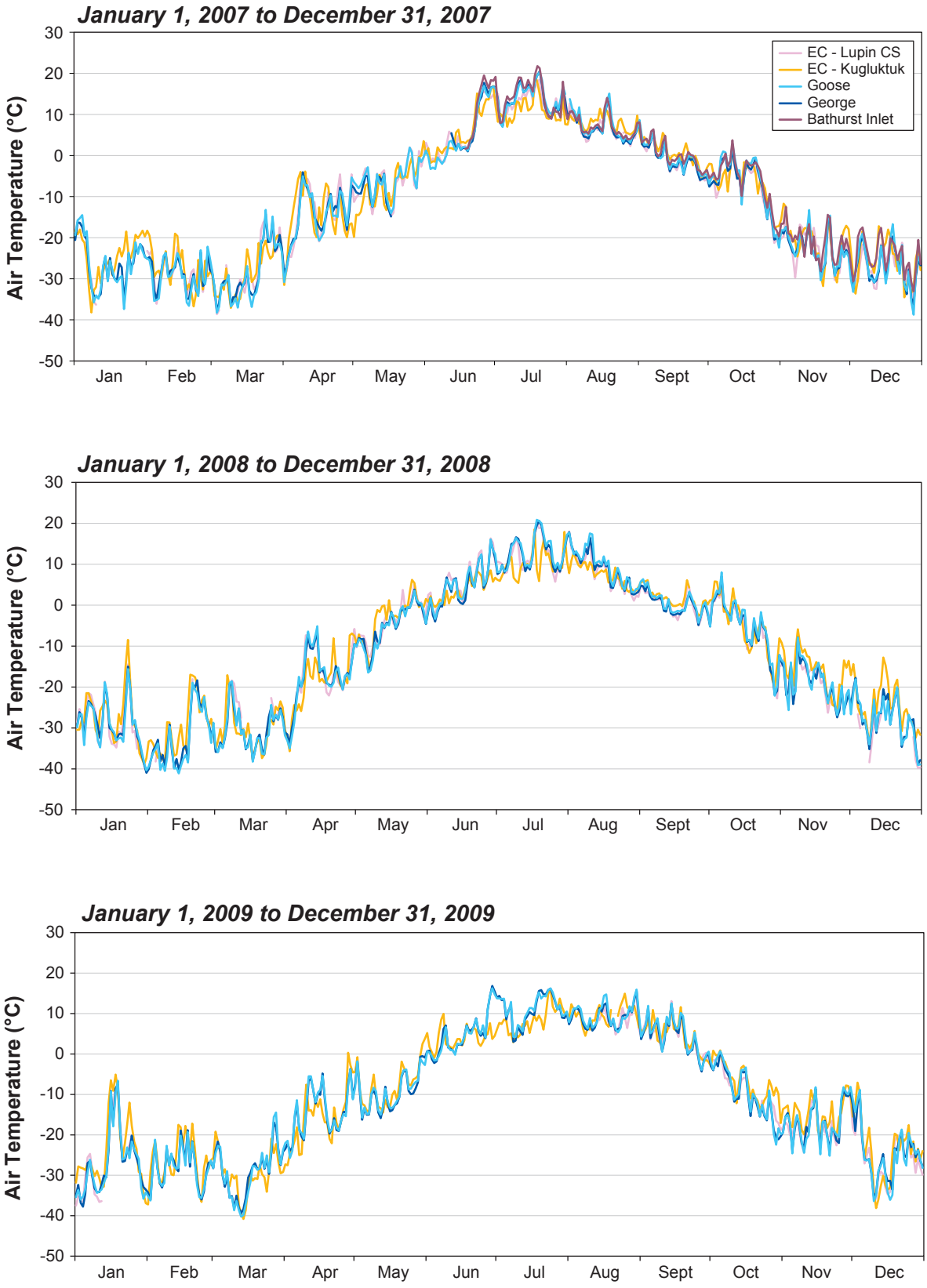
Note: Breaks in line indicate mising data.

Figure 3.1-1a

Site-specific and Regional Daily Average Air Temperatures, 2004 to 2006

Sabina GOLD & SILVER CORP.

Rescan an ERM company



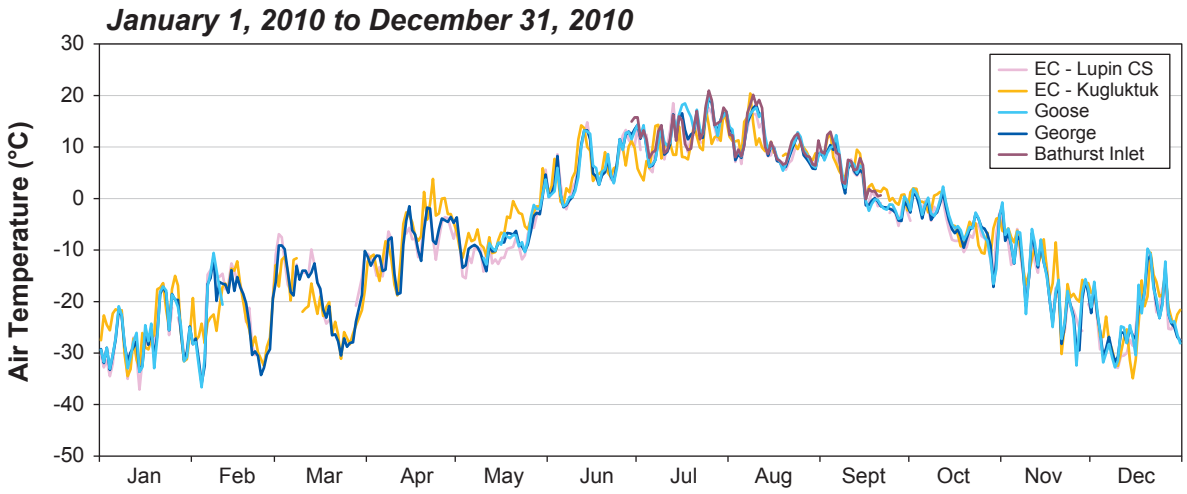
Note: Breaks in line indicate mising data.

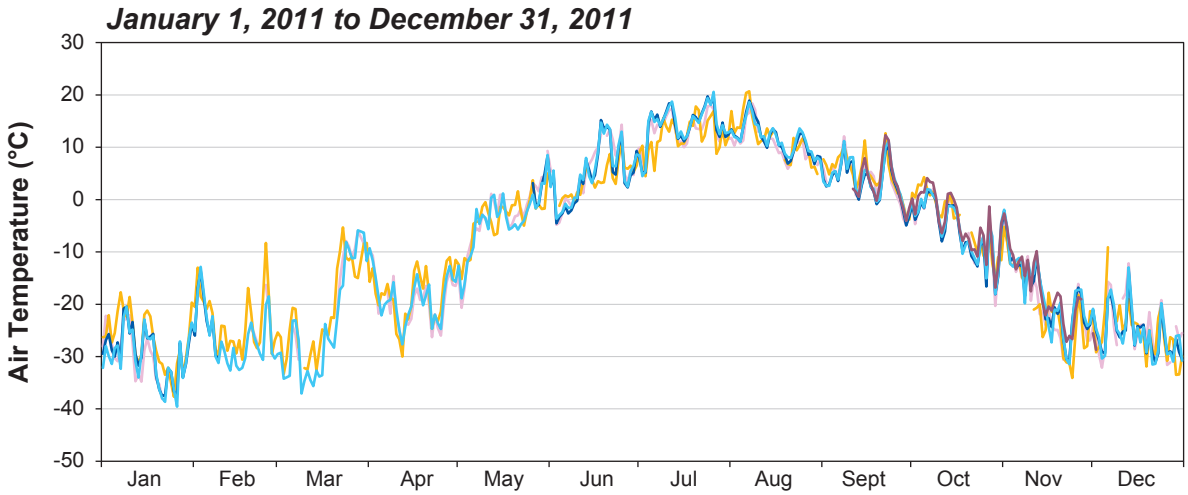
Figure 3.1-1b

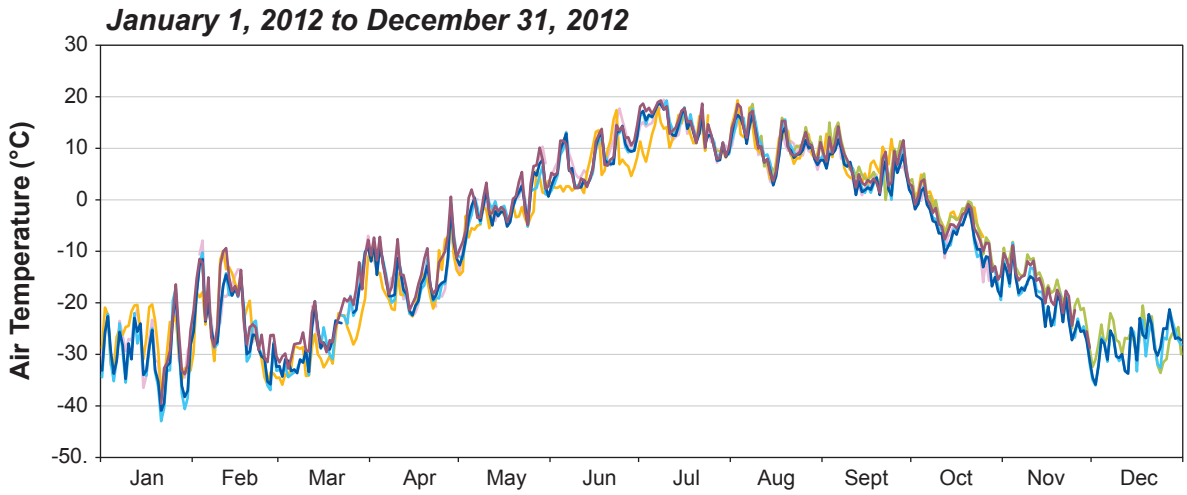
Site-specific and Regional Daily Average Air Temperatures, 2007 to 2009

Sabina GOLD & SILVER CORP.

Rescan an ERM company







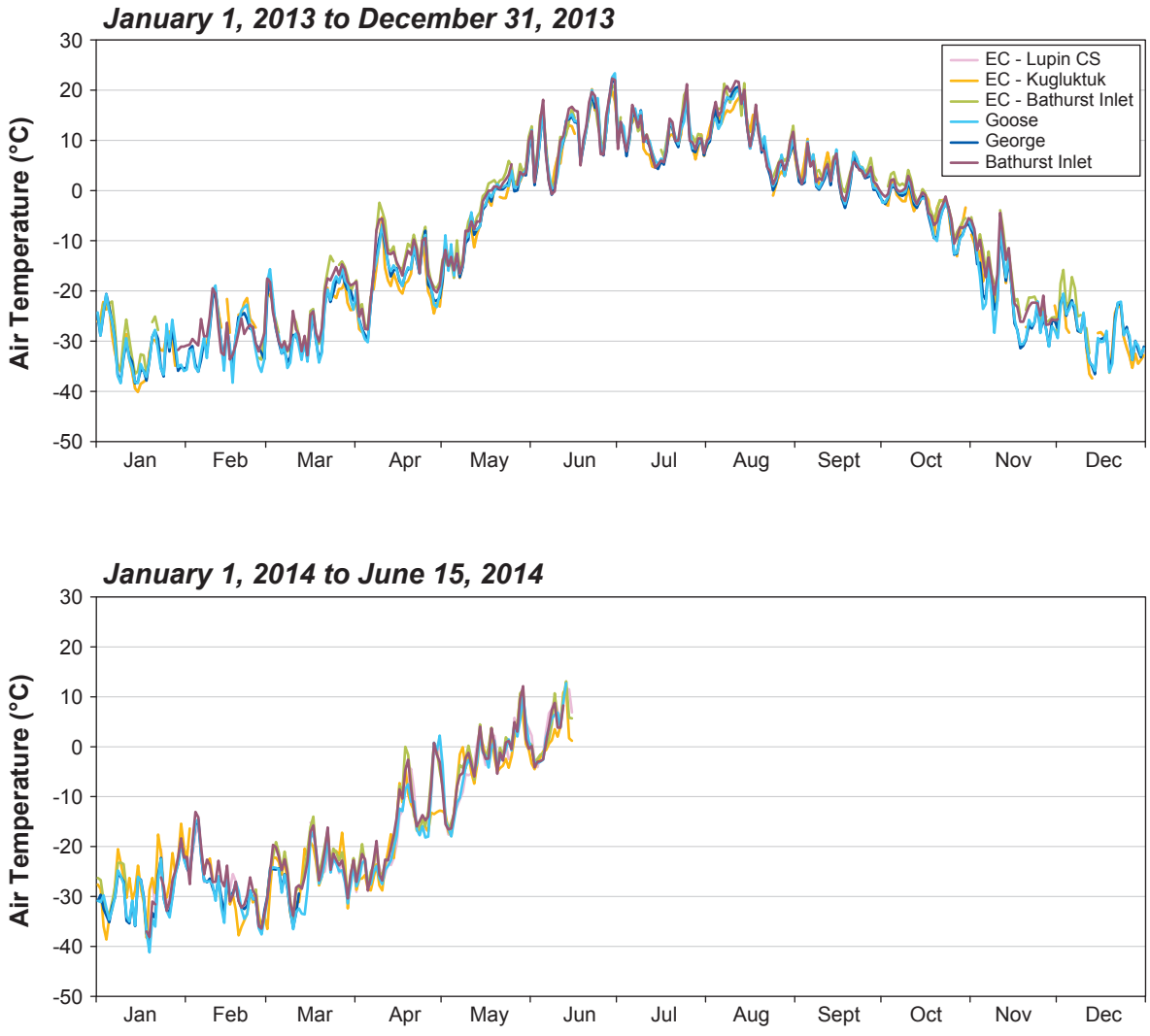
Note: Breaks in line indicate mising data.

Figure 3.1-1c

Site-specific and Regional Daily Average Air Temperatures, 2010 to 2012

Sabina GOLD & SILVER CORP.

Rescan an ERM company



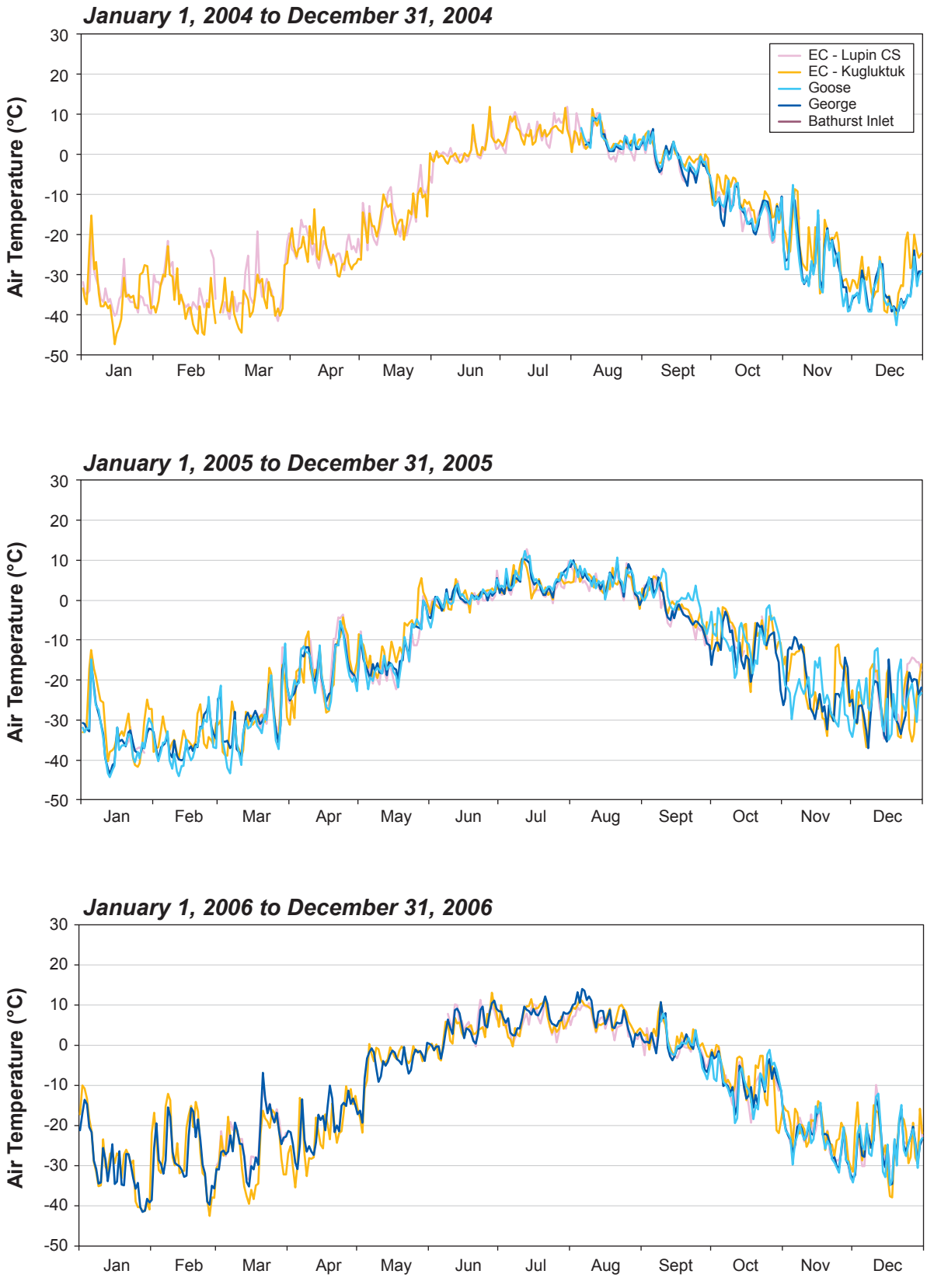
Note: Breaks in line indicate mising data.

Figure 3.1-1d

Sabina GOLD & SILVER CORP.

Site-specific and Regional Daily Average Air Temperatures, 2013 to 2014

Rescan an ERM company



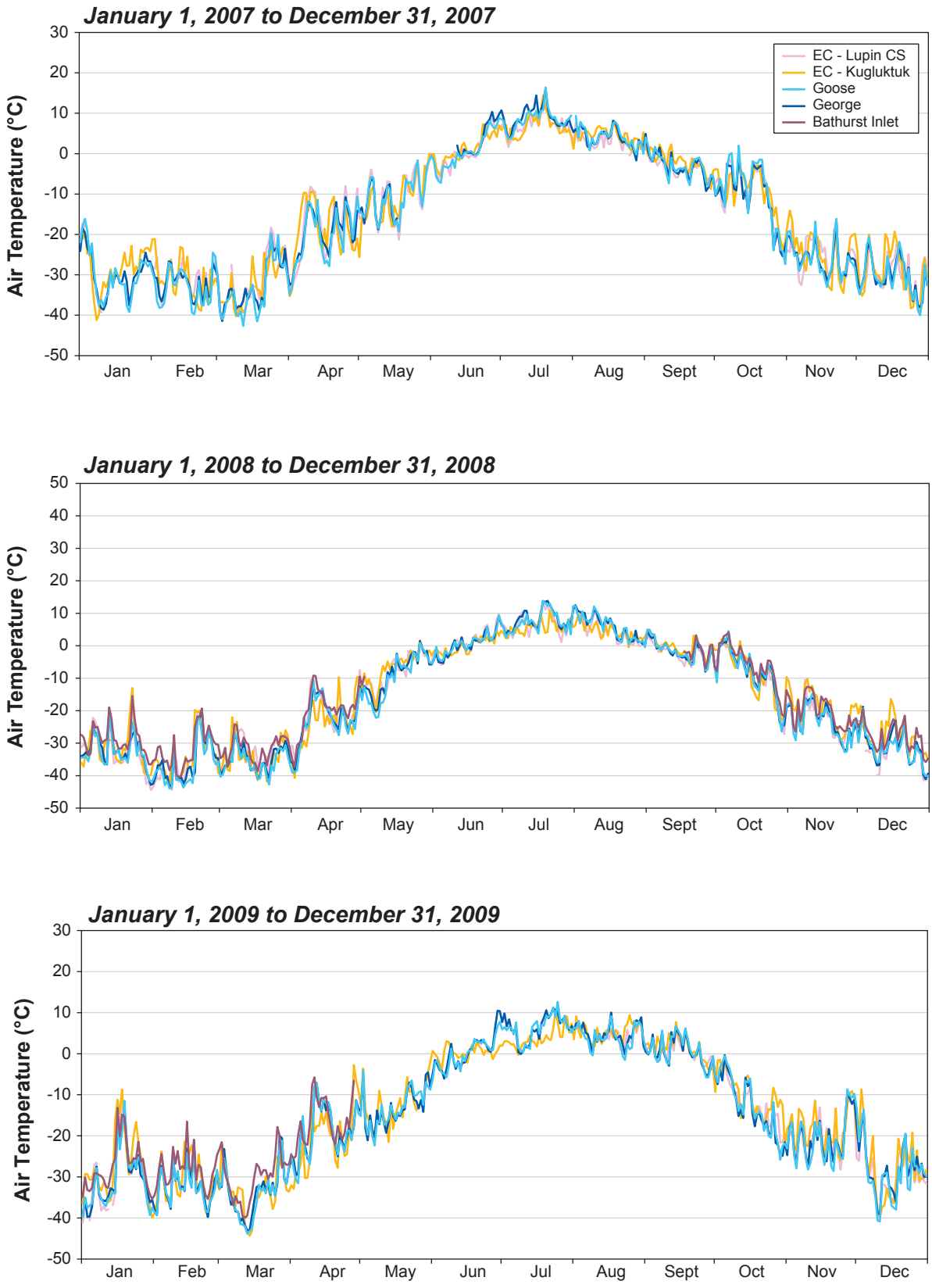
Note: Breaks in line indicate missing data.

Figure 3.1-2a

Site-specific and Regional Daily Minimum Air Temperatures, 2004 to 2006

Sabina GOLD & SILVER CORP.

Rescan an ERM company



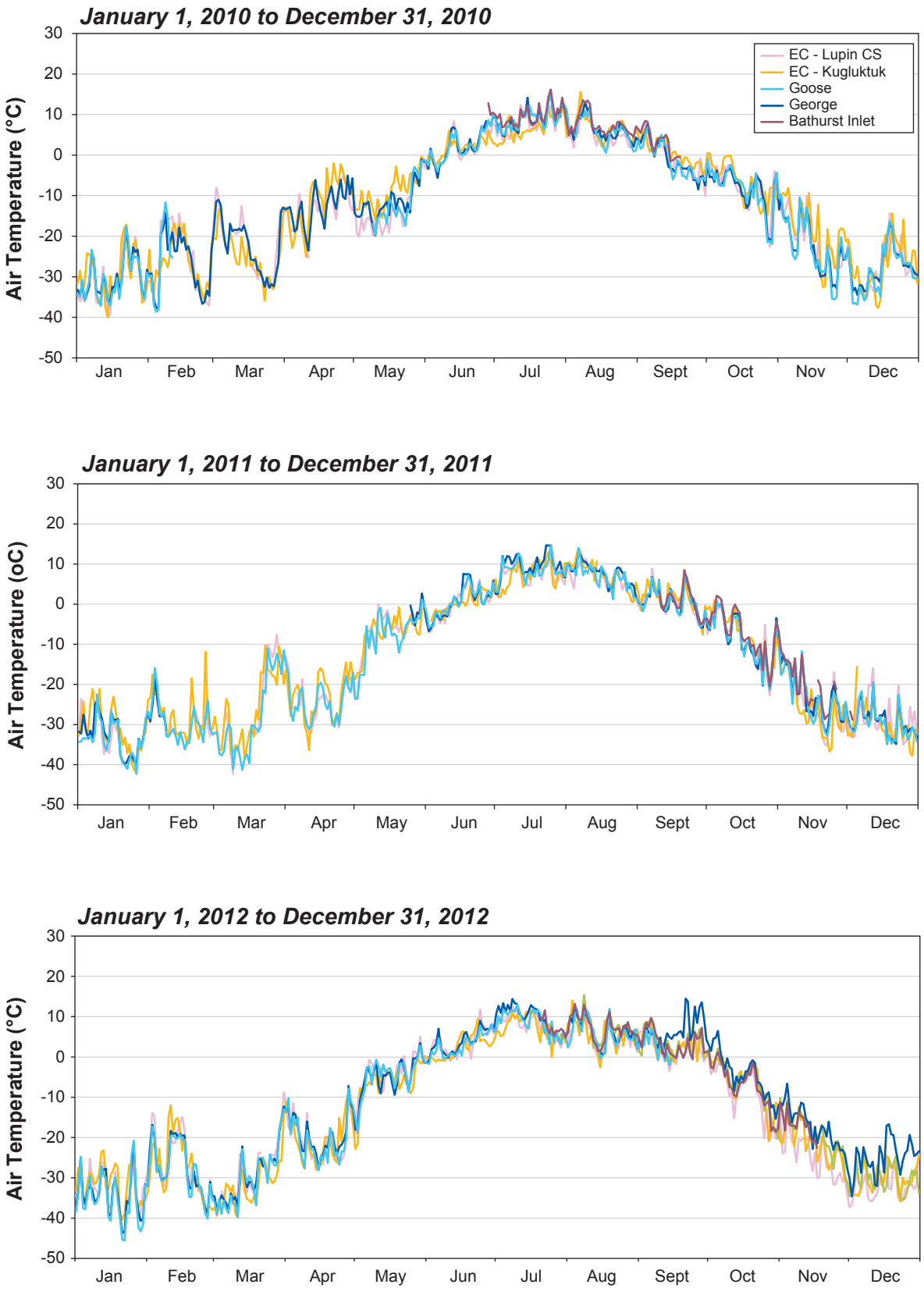
Note: Breaks in line indicate missing data.

Figure 3.1-2b

Sabina GOLD & SILVER CORP.

Site-specific and Regional Daily Minimum Air Temperatures, 2007 to 2009

Rescan an ERM company



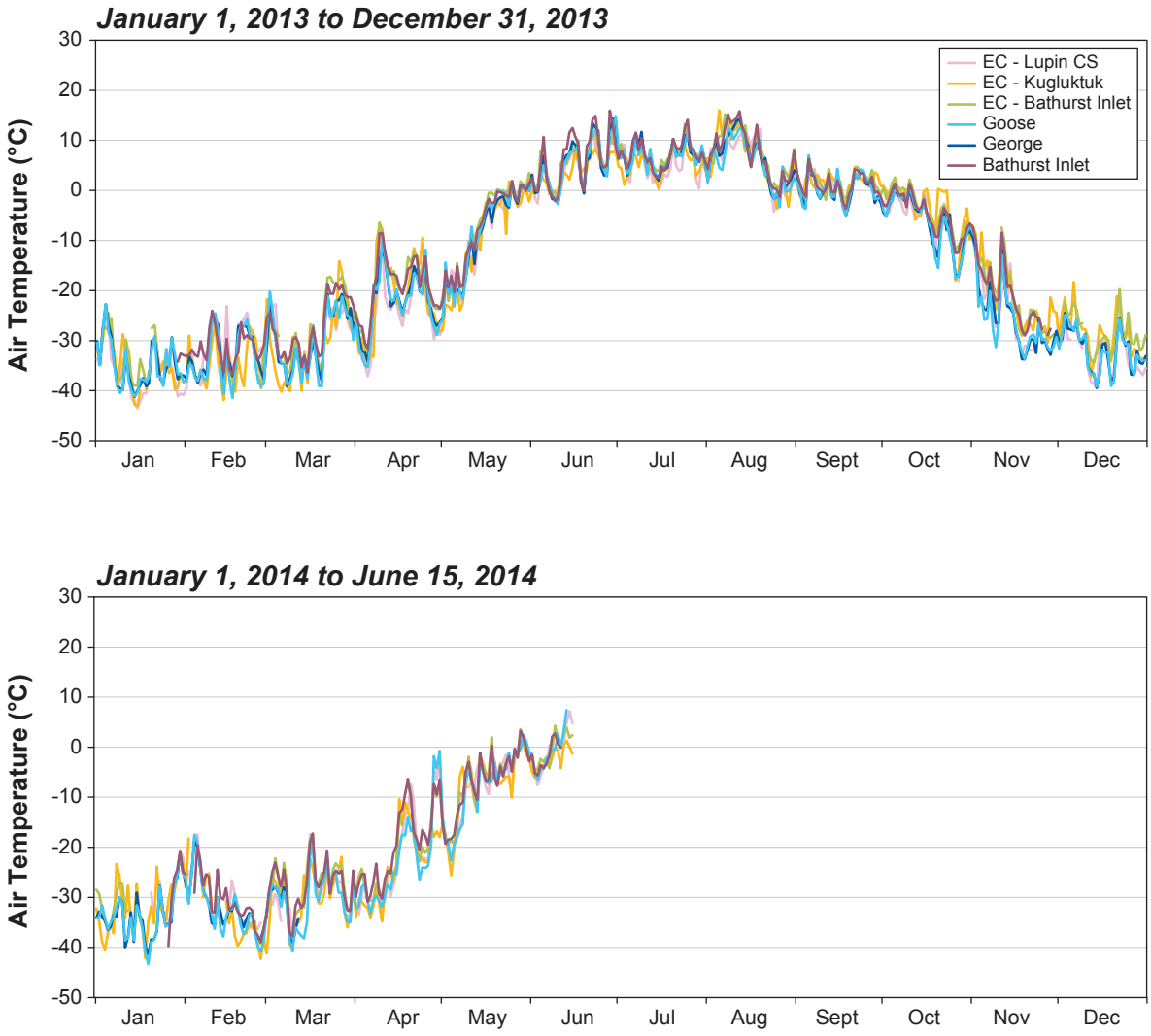
Note: Breaks in line indicate missing data.

Figure 3.1-2c

Site-specific and Regional Daily Minimum Air Temperatures, 2010 to 2012

Sabina GOLD & SILVER CORP.

Rescan an ERM company



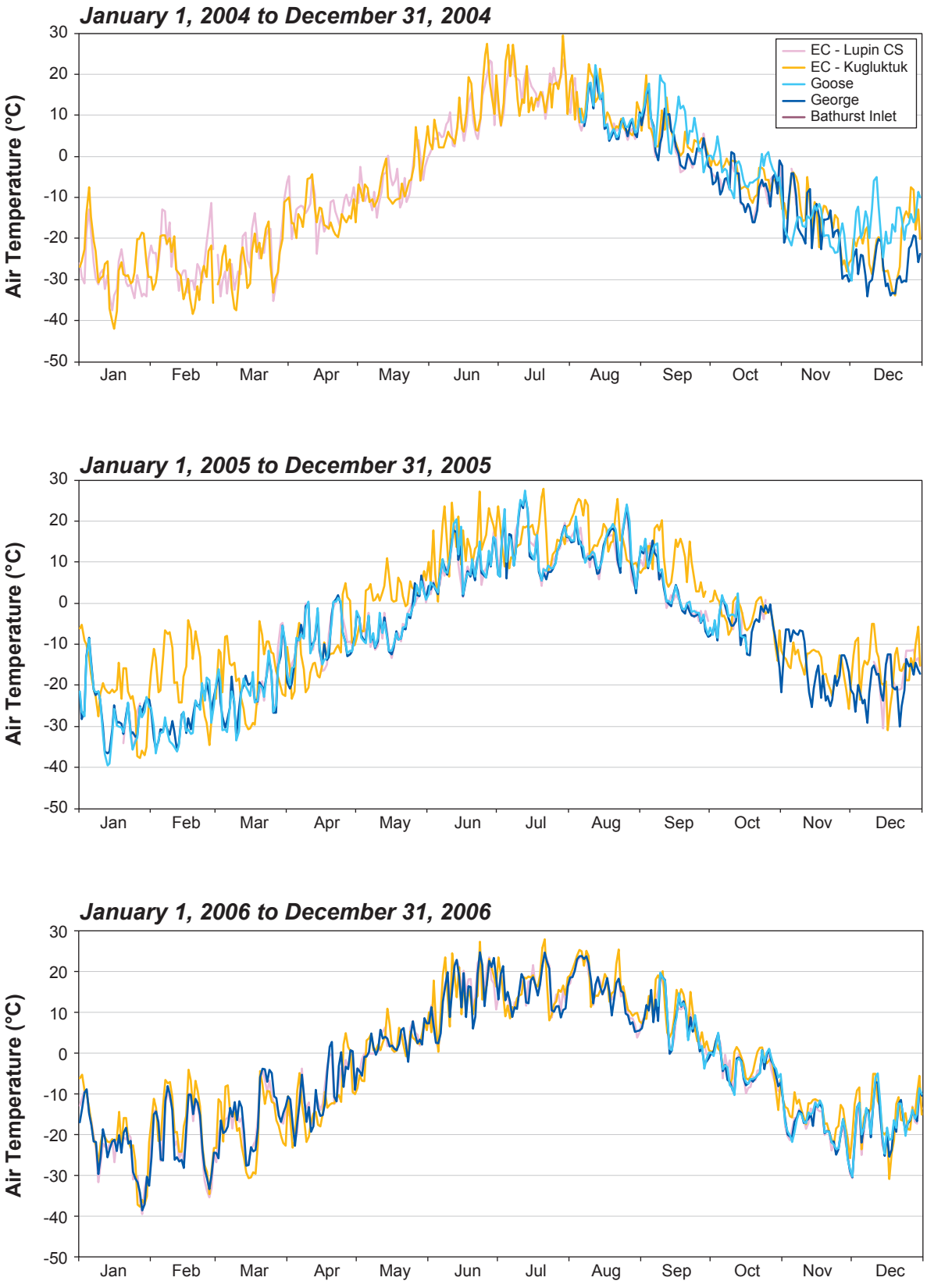
Note: Breaks in line indicate missing data.

Figure 3.1-2d

Site-specific and Regional Daily Minimum Air Temperatures, 2013 to 2014

Sabina GOLD & SILVER CORP.

Rescan an ERM company



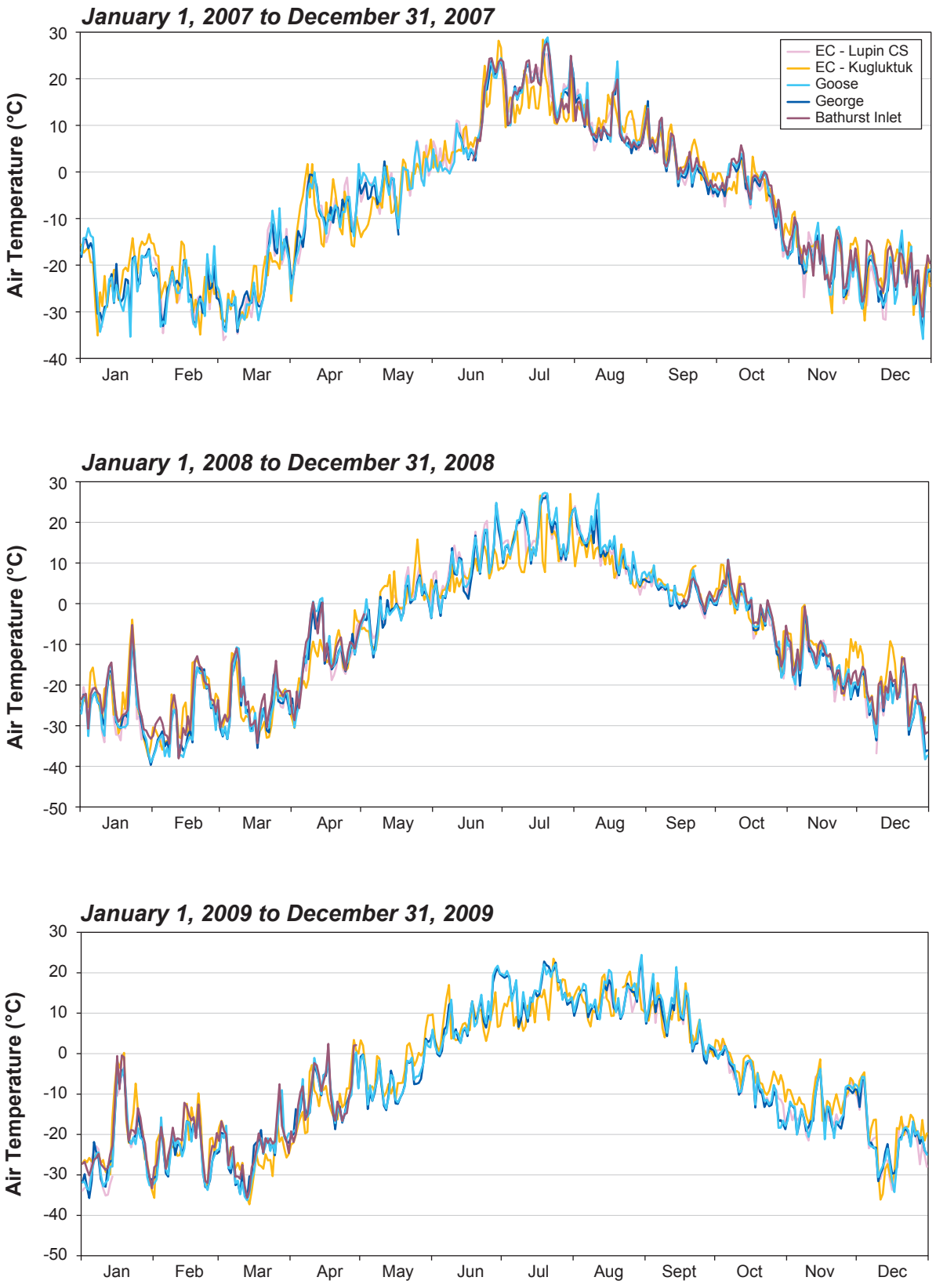
Note: Breaks in line indicate missing data.

Figure 3.1-3a

Site-specific and Regional Daily Maximum Air Temperatures, 2004 to 2006

Sabina GOLD & SILVER CORP.

Rescan an ERM company



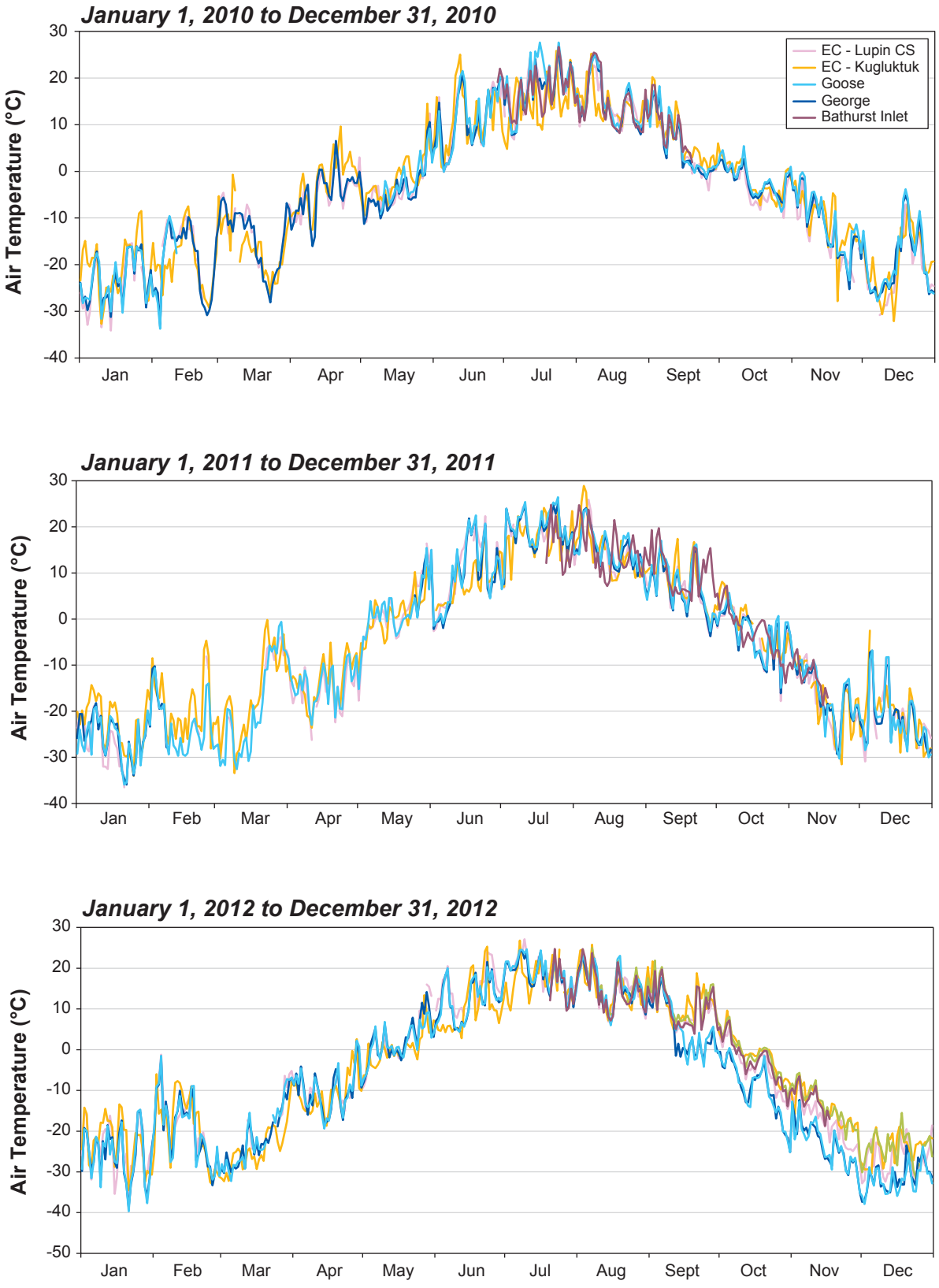
Note: Breaks in line indicate missing data.

Figure 3.1-3b

Site-specific and Regional Daily Maximum Air Temperatures, 2007 to 2009

Sabina GOLD & SILVER CORP.

Rescan an ERM company



Note: Breaks in line indicate missing data.

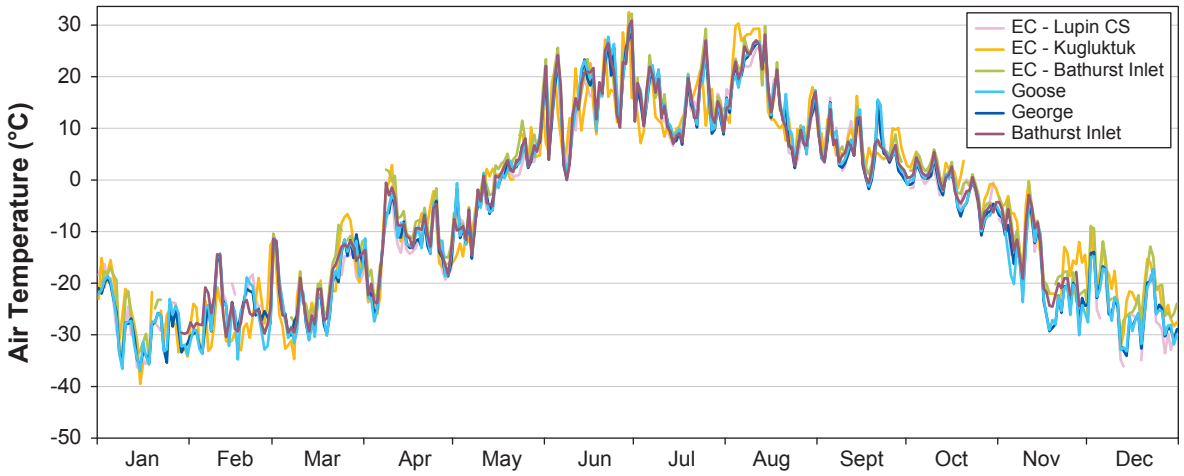
Figure 3.1-3c

Site-specific and Regional Daily Maximum Air Temperatures, 2010 to 2012

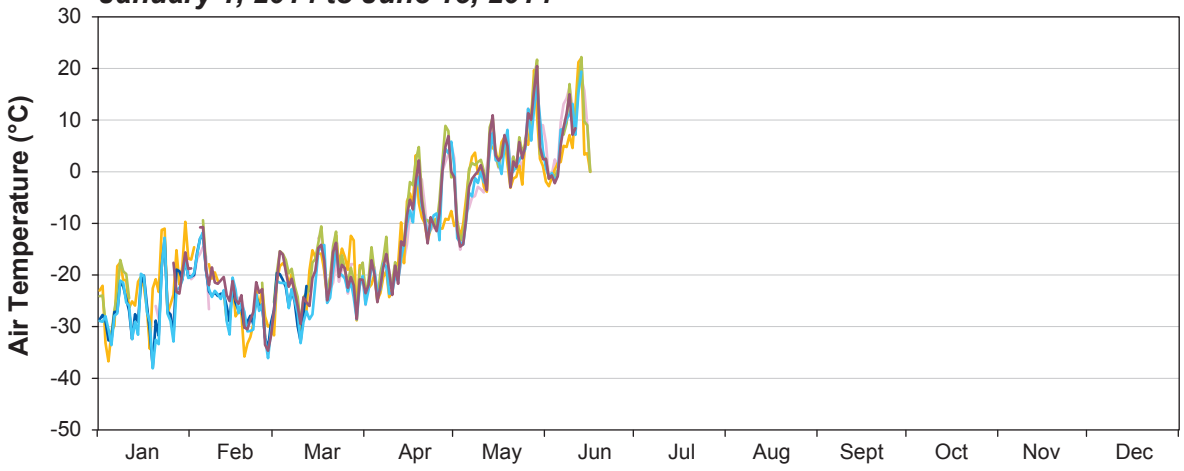
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January 1, 2013 to December 31, 2013



January 1, 2014 to June 15, 2014



Note: Breaks in line indicate missing data.

Figure 3.1-3d

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Site-specific and Regional Daily Maximum Air Temperatures, 2013 to 2014

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Table 3.1-1a. 2004 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2004	George (355 masl) 2004	Lupin CS (488 masl) 2004	Kugluktuk A (22.6 masl) 2004	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-	-	-32.1	-30.5	-29.9	-27.3
February	-	-	-28.8	-32.5	-28.5	-27.7
March	-	-	-28.4	-29.9	-24.8	-25.3
April	-	-	-18.4	-19.5	-15.8	-16.3
May	-	-	-10.2	-10.1	-5.9	-5.3
June	-	-	5.4	5.7	6.4	5.5
July	-	-	11.6	11.1	11.5	10.9
August	6.8	6.1	6.5	7.7	8.8	9.0
September	1.7	0.9	0.4	2.2	2.1	3.3
October	-10.1	-10.8	-10.9	-8.3	-8.4	-6.6
November	-22.4	-22.3	-	-19.6	-20.4	-18.7
December	-30.8	-30.3	-	-26.0	-26.2	-24.5
Average	**-**	**-**	**-**	**-12.5**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1b. 2005 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2005	George (355 masl) 2005	Lupin CS (488 masl) 2005	Kugluktuk A (22.6 masl) 2005	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-30.6	-30.0	-	-26.7	-29.9	-27.3
February	-32.6	-31.9	-	-30.8	-28.5	-27.7
March	-26.1	-25.5	-	-25.4	-24.8	-25.3
April	-13.0	-12.9	-12.0	-12.9	-15.8	-16.3
May	-8.7	-8.9	-9.6	-5.3	-5.9	-5.3
June	5.1	4.7	4.7	5.2	6.4	5.5
July	9.6	9.1	9.3	8.5	11.5	10.9
August	9.8	9.2	8.6	8.7	8.8	9.0
September	0.6	0.1	0.1	2.0	2.1	3.3
October	-7.3	-8.4	-	-5.8	-8.4	-6.6
November	-	-18.2	-	-16.5	-20.4	-18.7
December	-	-23.0	-	-21.5	-26.2	-24.5
Average	**-**	**-11.3**	**-**	**-10.0**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1c. 2006 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2006	George (355 masl) 2006	Lupin CS (488 masl) 2006	Kugluktuk CS (22.6 masl) 2006	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-	-26.9	-	-25.3	-29.9	-27.3
February	-	-23.7	-	-21.3	-28.5	-27.7
March	-	-19.9	-19.4	-22.2	-24.8	-25.3
April	-	-14.8	-	-16.8	-15.8	-16.3
May	-	-1.3	-	-1.2	-5.9	-5.3
June	-	9.2	12.2	9.3	6.4	5.5
July	-	10.9	10.7	11.0	11.5	10.9
August	-	11.4	10.7	12.0	8.8	9.0
September	3.4	3.6	4.3	5.7	2.1	3.3
October	-5.9	-6.1	-6.2	-5.6	-8.4	-6.6
November	-20.8	-20.8	-20.9	-18.2	-20.4	-18.7
December	-20.4	-20.7	-20.9	-19.6	-26.2	-24.5
Average	**-**	**-8.3**	**-**	**-7.7**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1d. 2007 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2007	George (355 masl) 2007	Bathurst Inlet (170 masl) 2007	Lupin CS (488 masl) 2007	Kugluktuk CS (22.6 masl) 2007	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-26.3	-26.3	-	-25.6	-24.5	-29.9	-27.3
February	-29.1	-28.8	-	-28.3	-27.4	-28.5	-27.7
March	-28.8	-28.4	-	-27.8	-28.4	-24.8	-25.3
April	-15.0	-14.6	-	-14.3	-14.1	-15.8	-16.3
May	-5.8	-8.4	-	-6.5	-7.6	-5.9	-5.3
June	4.7	8.1	11.8	5.3	5.4	6.4	5.5
July	14.0	13.9	14.5	12.8	11.1	11.5	10.9
August	7.1	6.6	7.2	7.0	7.9	8.8	9.0
September	-0.3	-0.8	0.5	-0.8	0.9	2.1	3.3
October	-6.1	-6.9	-5.8	-7.6	-6.5	-8.4	-6.6
November	-22.4	-22.6	-20.8	-22.1	-21.0	-20.4	-18.7
December	-27.1	-27.1	-24.4	-27.0	-25.4	-26.2	-24.5
Average	**-11.3**	**-11.3**	**-**	**-11.2**	**-10.8**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1e. 2008 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2008	George (355 masl) 2008	Bathurst Inlet (170 masl) 2008	Lupin CS (488 masl) 2008	Kugluktuk CS (22.6 masl) 2008	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-29.1	-28.8	-26.2	-27.6	-27.7	-29.9	-27.3
February	-33.0	-32.2	-29.0	-31.1	-29.8	-28.5	-27.7
March	-30.6	-30.4	-27.8	-23.9	-29.9	-24.8	-25.3
April	-17.5	-17.6	-16.0	-15.8	-18.6	-15.8	-16.3
May	-5.2	-5.0	-	-4.1	-3.0	-5.9	-5.3
June	5.2	4.7	-	5.9	3.7	6.4	5.5
July	13.1	12.7	-	12.2	10.0	11.5	10.9
August	9.7	9.0	-	8.3	7.4	8.8	9.0
September	0.8	0.2	-	0.2	1.8	2.1	3.3
October	-4.9	-5.5	-3.7	-6.0	-5.0	-8.4	-6.6
November	-18.7	-19.0	-17.0	-18.4	-15.8	-20.4	-18.7
December	-27.9	-27.6	-25.0	-31.6	-24.4	-26.2	-24.5
Average	**-11.5**	**-11.6**	**-**	**-11.0**	**-10.9**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1f. 2009 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2009	George (355 masl) 2009	Bathurst Inlet (170 masl) 2009	Lupin CS (488 masl) 2009	Kugluktuk CS (22.6 masl) 2009	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-27.1	-26.9	-24.1	-26.7	-23.8	-29.9	-27.3
February	-28.2	-28.0	-25.0	-	-26.4	-28.5	-27.7
March	-29.2	-29.1	-26.9	-	-29.6	-24.8	-25.3
April	-14.5	-14.7	-13.3	-	-16.1	-15.8	-16.3
May	-9.2	-9.5	-	-	-7.9	-5.9	-5.3
June	4.5	4.6	-	-	3.9	6.4	5.5
July	11.4	11.0	-	-	8.4	11.5	10.9
August	9.6	9.1	-	9.1	9.6	8.8	9.0
September	4.7	4.2	-	4.3	4.6	2.1	3.3
October	-9.4	-9.9	-	-9.3	-7.0	-8.4	-6.6
November	-17.0	-17.0	-	-17.0	-14.6	-20.4	-18.7
December	-24.9	-24.7	-	-25.3	-23.9	-26.2	-24.5
Average	**-10.8**	**-10.9**	**-**	**-**	**-10.2**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1g. 2010 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2010	George (355 masl) 2010	Bathurst Inlet (170 masl) 2010	Lupin CS (488 masl) 2010	Kugluktuk CS (22.6 masl) 2010	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-26.5	-26.6	-	-27.5	-25.1	-29.9	-27.3
February	-22.7	-23.2	-	-18.8	-23.0	-28.5	-27.7
March	-	-18.7	-	-15.0	-20.3	-24.8	-25.3
April	-	-8.3	-	-8.8	-6.8	-15.8	-16.3
May	-6.3	-7.7	-	-8.7	-5.4	-5.9	-5.3
June	6.5	6.5	-	6.6	6.6	6.4	5.5
July	13.8	13.0	13.3	12.6	10.7	11.5	10.9
August	10.6	10.2	11.0	9.7	10.6	8.8	9.0
September	2.6	2.2	-	2.4	3.8	2.1	3.3
October	-4.4	-4.7	-	-5.6	-4.1	-8.4	-6.6
November	-16.1	-16.5	-	-16.3	-14.4	-20.4	-18.7
December	-23.6	-23.6	-	-23.7	-23.6	-26.2	-24.5
Average	**-**	**-8.1**	**-**	**-7.8**	**-7.6**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1h. 2011 Site-specific and Regional Monthly Average Air Temperature (°C)

Month	Goose (277 masl) 2011	George (355 masl) 2011	Bathurst Inlet (170 masl) 2011	Lupin CS (488 masl) 2011	Kugluktuk A (22.6 masl) 2011	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-30.0	-29.4	-	-29.1	-26.9	-29.9	-27.3
February	-26.5	-	-	-24.5	-23.5	-28.5	-27.7
March	-24.0	-	-	-15.3	-21.0	-24.8	-25.3
April	-19.0	-	-	-19.7	-18.2	-15.8	-16.3
May	-3.5	-	-	-2.8	-3.1	-5.9	-5.3
June	5.3	4.9	-	5.4	4.1	6.4	5.5
July	14.5	14.4	-	13.3	12.4	11.5	10.9
August	11.4	11.2	-	10.7	11.1	8.8	9.0
September	3.7	3.2	-	3.7	4.7	2.1	3.3
October	-5.5	-5.9	-4.3	-5.4	-4.2	-8.4	-6.6
November	-18.6	-18.9	-	-19.9	-21.1	-20.4	-18.7
December	-25.8	-25.8	-	-24.6	-25.7	-26.2	-24.5
Average	**-9.8**	**-**	**-**	**-9.0**	**-9.3**	**-10.9**	**-10.3**

Lupin CS and Kugluktuk stations have adjustments to the data from last issued report.
Dash (-) indicates data missing.

Table 3.1-1i. 2012 Site-specific and Regional Monthly Average Air Temperature (ºC)

Month	Goose (277 masl) 2012	George (355 masl) 2012	Bathurst Inlet (170 masl) 2012	Lupin CS (488 masl) 2012	Kugluktuk A (22.6 masl) 2012	Bathurst Inlet (EC) (5 masl) 2012	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-30.8	-30.3	-29.3	-28.6	-27.1	-	-29.9	-27.3
February	-23.6	-23.7	-21.3	-21.0	-23.0	-	-28.5	-27.7
March	-25.9	-26.1	-24.0	-20.7	-28.1	-	-24.8	-25.3
April	-15.2	-15.1	-13.0	-15.3	-15.6	-	-15.8	-16.3
May	-1.3	-1.3	-0.1	-1.1	-3.0	-	-5.9	-5.3
June	7.7	7.9	8.5	9.4	6.3	-	6.4	5.5
July	14.2	13.9	14.6	13.5	12.4	-	11.5	10.9
August	11.0	10.4	11.2	10.3	10.8	10.9	8.8	9.0
September	5.7	5.3	6.7	6.4	7.2	7.4	2.1	3.3
October	-6.4	-6.8	-4.8	-6.6	-3.7	-3.9	-8.4	-6.6
November	-19.8	-20.2	-17.3	-21.3	-18.1	-16.6	-20.4	-18.7
December	-28.5	-28.0	-29.3	-29.2	-27.2	-27.3	-26.2	-24.5
Average	**-9.4**	**-9.5**	**-6.2**	**-7.9**	**-9.1**	**-**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1j. 2013 Site-specific and Regional Monthly Average Air Temperature (ºC)

Month	Goose (277 masl) 2013	George (355 masl) 2013	Bathurst Inlet (170 masl) 2013	Lupin CS (488 masl) 2013	Kugluktuk A (22.6 masl) 2013	Bathurst Inlet (EC) (5 masl) 2013	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-31.7	-31.9	-29.9	-31.6	-30.8	-29.3	-29.9	-27.3
February	-29.9	-29.6	-28.7	-25.3	-30.9	-31.7	-28.5	-27.7
March	-25.7	-25.9	-24.2	-21.5	-25.4	-23.4	-24.8	-25.3
April	-17.5	-17.5	-15.4	-17.9	-16.7	-14.4	-15.8	-16.3
May	-4.5	-4.9	-4.9	-8.6	-5.4	-3.2	-5.9	-5.3
June	11.4	11.0	11.5	8.8	9.8	11.5	6.4	5.5
July	10.8	10.1	11.2	11.0	9.4	11.4	11.5	10.9
August	11.4	11.2	12.1	12.4	11.9	12.6	8.8	9.0
September	3.2	2.6	3.7	4.0	4.2	4.2	2.1	3.3
October	-3.9	-4.1	-2.6	-0.6	-1.9	-1.9	-8.4	-6.6
November	-22.0	-21.7	-	-13.2	-17.0	-17.7	-20.4	-18.7
December	-28.5	-28.5	-	-26.5	-25.2	-23.1	-26.2	-24.5
Average	**-9.5**	**-9.7**	**-**	**-7.0**	**-9.8**	**-6.3**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

Table 3.1-1k. 2014 Site-specific and Regional Monthly Average Air Temperature (°C) (January 2014 to June 2014)

Month	Goose (277 masl) 2013	George (355 masl) 2013	Bathurst Inlet (170 masl) 2013	Lupin CS (488 masl) 2013	Kugluktuk A (22.6 masl) 2013	Bathurst Inlet (EC) (5 masl) 2013	Lupin A (490 masl) 1981 - 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 - 2010 Climate Normal
January	-30.2	-30.0	-29.1	-27.8	-27.4	-28.0	-29.9	-27.3
February	-28.4	-28.1	-26.3	-23.6	-29.5	-27.5	-28.5	-27.7
March	-26.6	-	-24.5	-22.8	-25.0	-23.6	-24.8	-25.3
April	-17.5	-	-16.5	-16.3	-18.7	-16.0	-15.8	-16.3
May	-3.2	-	-2.6	-3.0	-3.3	-2.0	-5.9	-5.3
June	-	-	-	7.3	6.2	8.1	6.4	5.5
July	-	-	-	13.5	11.3	13.4	11.5	10.9
August	-	-	-	7.9	7.7	9.0	8.8	9.0
September	-	-	-	0.6	2.1	2.3	2.1	3.3
October	-	-	-	-	-	-	-8.4	-6.6
November	-	-	-	-	-	-	-20.4	-18.7
December	-	-	-	-	-	-	-26.2	-24.5
Average	**-**	**-**	**-**	**-**	**-**	**-**	**-10.9**	**-10.3**

Dash (-) indicates data missing.

From the available data, annual average air temperatures were-11.0ºC (2004), -9.3ºC (2005), -10.9ºC (2006), -11.3ºC (2007), -11.5ºC (2008), -10.8ºC (2009), -6.6ºC (2010), -9.8ºC (2011), -9.4ºC (2012), and -9.5ºC (2013) at Goose; and -11.3ºC (2004), -11.3ºC (2005), -8.3ºC (2006), -11.3ºC (2007), -11.6ºC (2008), -10.9ºC (2009), -8.1ºC (2010), -5.8ºC (2011), -9.5 (2012), and -9.7ºC (2013) at George. Please note that the 2004 average temperature for both Goose and George is based on data from August to December only, and the average temperature at Goose in 2006 and George in 2011 includes a period of missing data from January to August and February to May, respectively, which may biased the values. Annual average air temperatures for the Bathurst Inlet meteorological station were -6.2 in 2012. Annual average for the other years at Bathurst Inlet were not calculated because extensive data gaps and would not be representative of annual average. Annual averages were not available for 2014 at the time of reporting, as the last downloads were made in June while the exploration camps were still open.

Observations indicated that air temperatures are very similar at Goose and George meteorological stations for the period 2004 to 2014. Comparisons to EC-MSC regional data from the nearest stations show that temperatures recorded in the Back River Project area followed regional climate trends (Figures 3.1-1 to 3.1-3 and Table 3.1-1).

In terms of annual average air temperatures, data from the Back River Project area and EC-MSC regional stations show that 2006, 2010, 2011, and 2012 were warmer than climate normal, 2005, 2007, 2008, 2009 and 2013 were similar to climate normals, and 2004 was colder than the climate normal. In terms of minimum and maximum air temperatures the observations at the Goose and George meteorological stations for the period 2004 to 2013 are generally similar to the climate normals and observations at regional stations for the 2004 to 2013 period.

The extreme daily maximum temperature at the Goose meteorological station over the 2004 to 2013 period of record was 29.8ºC, recorded on June 30, 2013 and the extreme minimum temperature was -45.5ºC on January 22, 2012. The extreme daily maximum temperature at the George meteorological station over the 2004 to 2014 period of record was 28.4ºC, recorded on June 30, 2013, and the extreme minimum temperature was -43.8ºC on January 21, 2012. The 1981 to 2010 climate normal record maximum temperature at the EC-MSC operated Kugluktuk station was 34.9ºC and occurred on July 15, 1989. The record low extreme minimum temperature was -49.0ºC and occurred on January 26, 1990 at the EC-MSC Lupin A station.

3.2 PRECIPITATION AND RAINFALL

Precipitation climate normals in the regional area range from 247 mm (Kugluktuk A) to 298 mm (Lupin A) per year, which are typical for the area (NRCan 2009). Site-specific meteorological station precipitation was measured as rainfall during the summer period only (June, July, August, and September), when temperatures were above freezing for the Goose, George and Bathurst Inlet meteorological stations. A winter precipitation adapter was installed at the Goose and George meteorological stations on March 27 and March 26 2012, respectively. The winter precipitation adapter allows precipitation data to be collected during the months temperatures fall below freezing as long as the antifreeze solution inside of it is refreshed often enough to maintain a freezing point lower than the ambient air temperature. In 2013, the CS705 was removed again from the tipping buckets in June 2013, and re-installed in September 2013. In 2014, due to limited access and lack of onsite personnel for maintenance, the winter adapters were not installed. Therefore future precipitation data is limited to summer rainfall only.

Daily rainfall recorded at the Goose and George meteorological stations are presented in Figures 3.2-1a, 3.2-1b and 3.2-1c. Tables 3.2-1a to 3.2-1k summarize the total monthly rainfall/precipitation values from site-specific meteorological stations and monthly precipitation at the regional meteorological stations at Lupin CS and Kugluktuk.

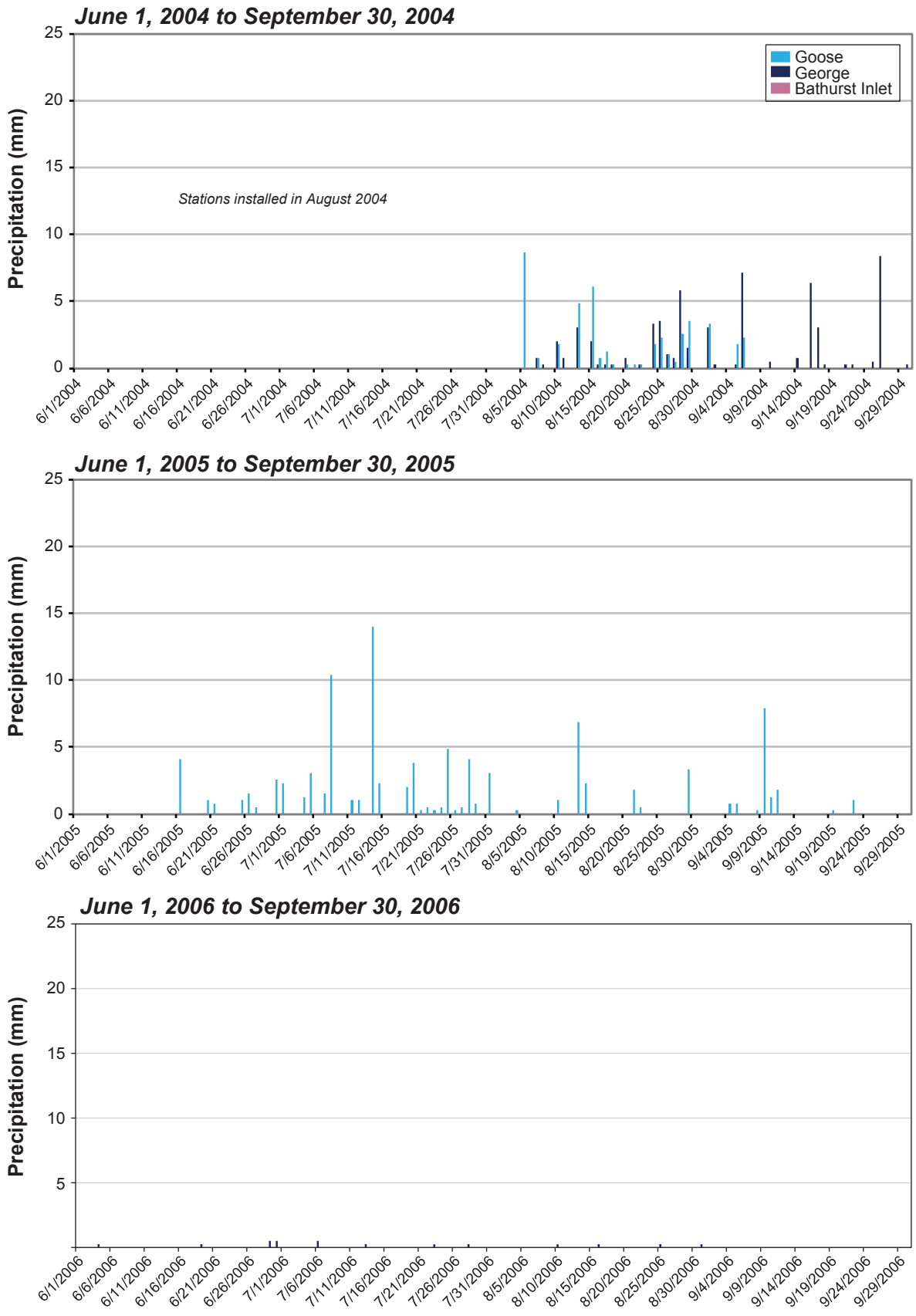


Figure 3.2-1a

Back River Project Rainfall, 2004 to 2006

Sabina GOLD & SILVER CORP.

Rescan an ERM company

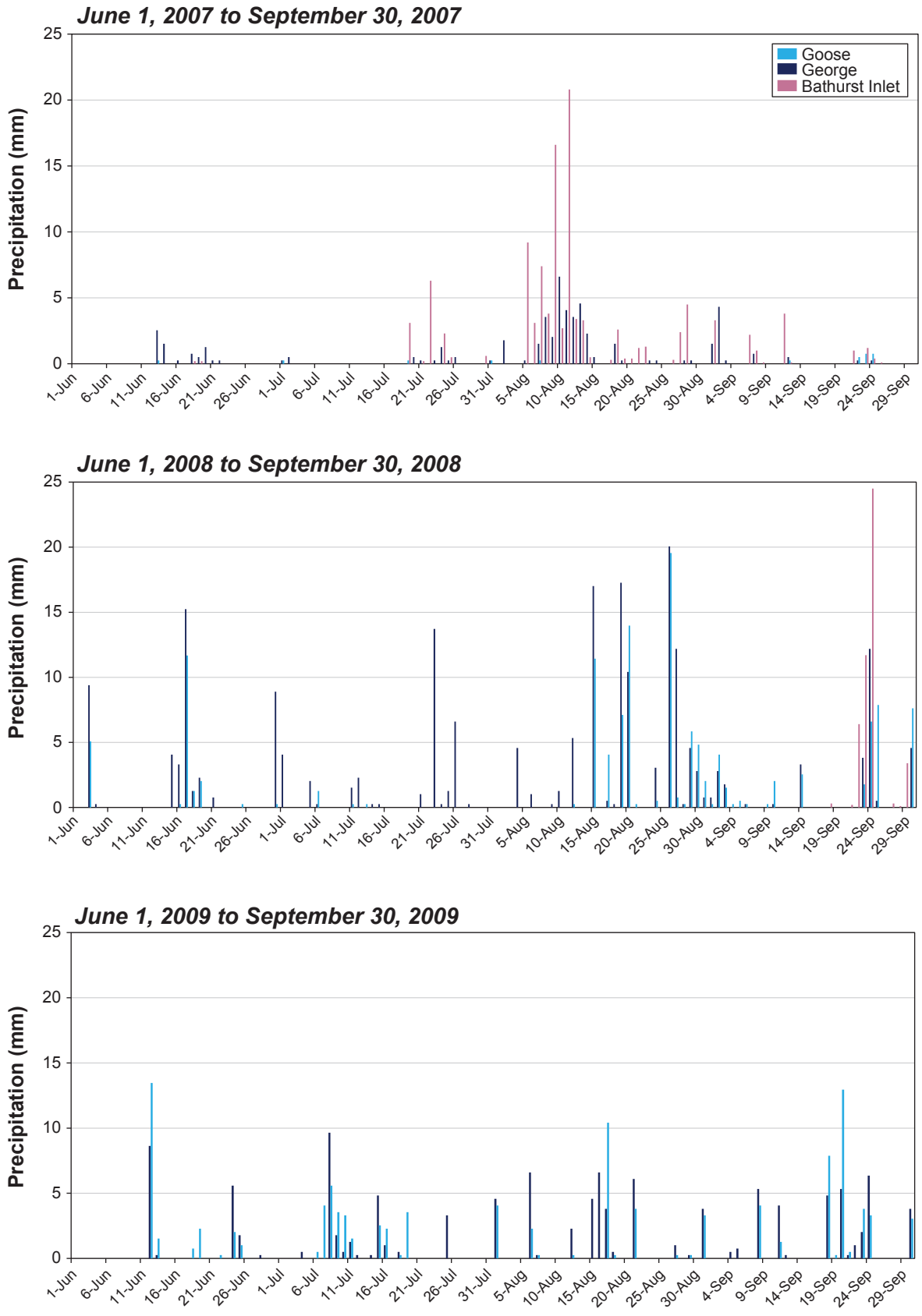


Figure 3.2-1b

Back River Project Rainfall, 2007 to 2009

Sabina GOLD & SILVER CORP.

Rescan an ERM company

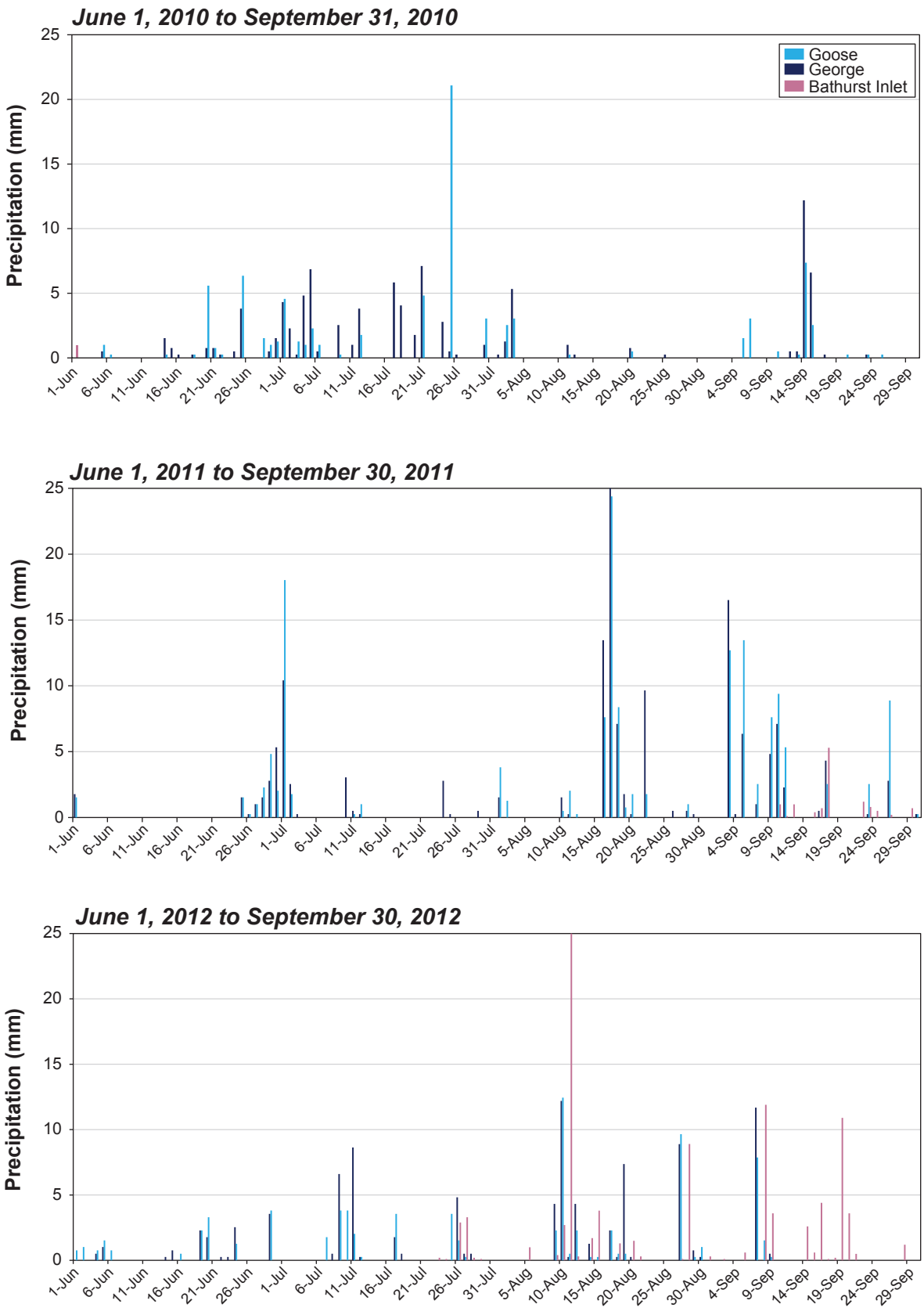


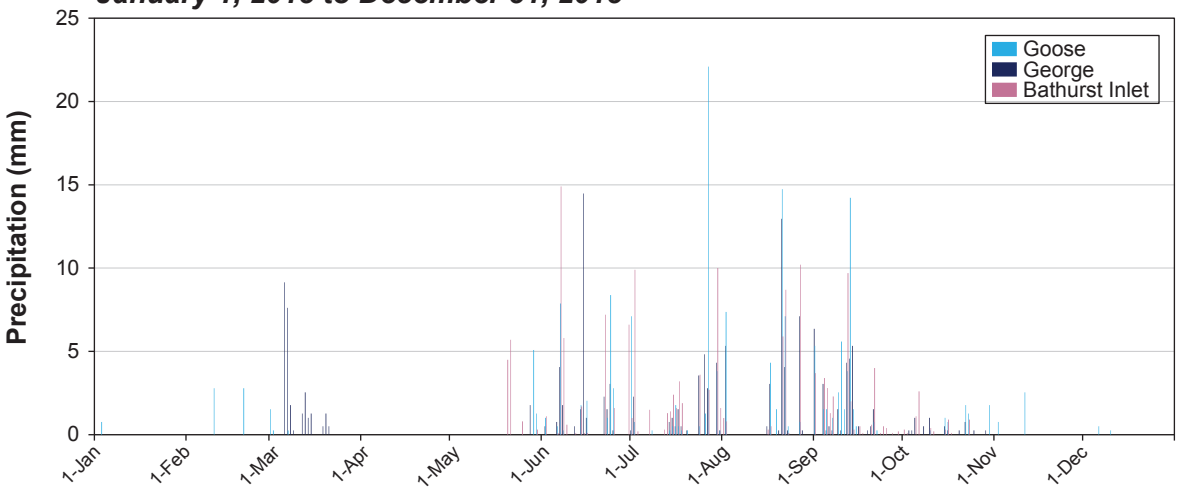
Figure 3.2-1c

Back River Project Rainfall, 2010 to 2012

Sabina GOLD & SILVER CORP.

Rescan an ERM company

January 1, 2013 to December 31, 2013



January 1, 2014 to June 15, 2014

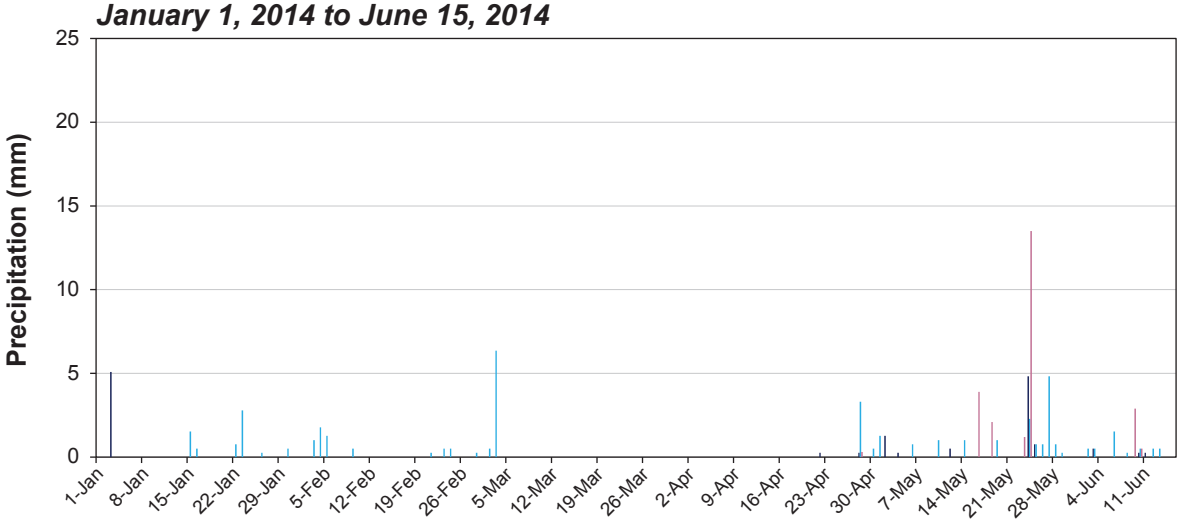


Figure 3.2-1d

Back River Project Rainfall, 2013 to 2014

Sabina GOLD & SILVER CORP.

Rescan an ERM company

Table 3.2-1a. 2004 Back River Project Rainfall and Regional Total Monthly Precipitation (mm) (January 2004 to December 2004)

Month	Goose (277 masl) 2004	George (355 masl) 2004	Lupin CS (488 masl) 2004	Kugluktuk A (22.6 masl) 2004	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	7.0	9.4	10.4
February	-	-	-	3.7	7.8	8.4
March	-	-	-	6.4	12.2	9.9
April	-	-	-	8.9	14.6	10.0
May	-	-	-	18.2	17.8	14.6
June	-	-	-	23.4	30.4	16.6
July	-	-	-	41.6	41.5	44.5
August	40.1	29.7	31.0	36.8	62.5	45.1
September	25.7	28.2	35.6	31.7	42.6	37.8
October	0.3	0.8	12.4	9.0	28.7	26.5
November	-	-	-	12.7	17.4	13.0
December	-	-	-	7.8	13.7	10.4
June to September Total	**-**	**-**	**-**	**133.5**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**207.2**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1b. 2005 Back River Project Rainfall and Regional Total Monthly Precipitation (mm) (January 2005 to December 2005)

Month	Goose (277 masl) 2005	George (355 masl) 2005	Lupin CS (488 masl) 2005	Kugluktuk A (22.6 masl) 2005	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	32.0	8.0	9.4	10.4
February	-	-	-	1.5	7.8	8.4
March	-	-	-	3.7	12.2	9.9
April	-	-	-	13.5	14.6	10.0
May	-	-	4.5	3.2	17.8	14.6
June	11.4	-	31.4	37.0	30.4	16.6
July	57.7	-	14.0	67.2	41.5	44.5
August	16.0	-	42.0	49.4	62.5	45.1
September	14.0	-	-	7.2	42.6	37.8
October	2.8	-	-	24.5	28.7	26.5
November	-	-	-	16.7	17.4	13.0
December	-	-	11.8	11.9	13.7	10.4
June to September Total	**99.1**	**-**	**-**	**160.8**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**243.8**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1c. 2006 Back River Project Rainfall and Regional Total Monthly Precipitation (mm) (January 2006 to December 2006)

Month	Goose (277 masl) 2006	George (355 masl) 2006	Lupin CS (488 masl) 2006	Kugluktuk CS (22.6 masl) 2006	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	4.1	9.4	10.4
February	-	-	-	5.4	7.8	8.4
March	-	-	0.0	17.1	12.2	9.9
April	-	-	-	11.8	14.6	10.0
May	-	-	-	9.0	17.8	14.6
June	-	1.5	-	8.6	30.4	16.6
July	-	1.3	0.0	16.1	41.5	44.5
August	-	1.0	0.0	43.1	62.5	45.1
September	0.0	0.0	0.0	16.0	42.6	37.8
October	-	-	30.8	43.3	28.7	26.5
November	-	-	0.0	6.6	17.4	13.0
December	-	-	8.0	10.2	13.7	10.4
June to September Total	**-**	**3.8**	**-**	**83.8**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**191.3**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1d. 2007 Back River Project Rainfall and Regional Monthly Total Precipitation (mm) (January 2007 to December 2007)

Month	Goose (277 masl) 2007	George (355 masl) 2007	Bathurst Inlet (170 masl) 2007	Lupin CS (488 masl) 2007	Kugluktuk CS (22.6 masl) 2007	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	-	5.3	9.4	10.4
February	-	-	-	-	12.0	7.8	8.4
March	-	-	-	-	3.1	12.2	9.9
April	-	-	-	14.2	11.3	14.6	10.0
May	-	-	-	-	27.1	17.8	14.6
June	0.3	7.4	0.4	1.0	8.3	30.4	16.6
July	0.8	4.1	13.0	44.4	183.6	41.5	44.5
August	0.3	33.5	84.2	-	38.3	62.5	45.1
September	2.3	7.9	13.2	-	8.5	42.6	37.8
October	-	-	2.6	19.9	37.2	28.7	26.5
November	-	-	-	-	2.5	17.4	13.0
December	-	-	-	0.7	7.0	13.7	10.4
June to September Total	**3.6**	**52.8**	**110.4**	**-**	**238.7**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**-**	**344.2**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1e. 2008 Back River Project Rainfall and Regional Monthly Total Precipitation (mm) (January 2008 to December 2008)

Month	Goose (277 masl) 2008	George (355 masl) 2008	Bathurst Inlet (170 masl) 2008	Lupin CS (488 masl) 2008	Kugluktuk CS (22.6 masl) 2008	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	-	12.8	9.4	10.4
February	-	-	-	-	2.5	7.8	8.4
March	-	-	-	-	7.6	12.2	9.9
April	-	-	-	3.7	20.1	14.6	10.0
May	-	-	-	19.2	3.5	17.8	14.6
June	20.8	49.5	-	32.9	15.6	30.4	16.6
July	1.8	29.7	-	18.3	33.8	41.5	44.5
August	71.1	102.4	-	116.6	58.4	62.5	45.1
September	35.6	29.5	46.9	44.5	21.1	42.6	37.8
October	-	-	6.8	16.9	16.6	28.7	26.5
November	-	-	-	14.4	4.6	17.4	13.0
December	-	-	-	-	2.2	13.7	10.4
June to September Total	**129.3**	**211.1**	**-**	**212.3**	**128.9**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**-**	**198.8**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1f. 2009 Back River Project Rainfall and Regional Monthly Total Precipitation (mm) (January 2009 to December 2009)

Month	Goose (277 masl) 2009	George (355 masl) 2009	Bathurst Inlet (170 masl) 2009	Lupin CS (488 masl) 2009	Kugluktuk CS (22.6 masl) 2009	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	5.5	1.1	9.4	10.4
February	-	-	-	-	3.8	7.8	8.4
March	-	-	-	-	1.2	12.2	9.9
April	-	-	-	-	11.8	14.6	10.0
May	-	-	-	-	1.6	17.8	14.6
June	21.3	16.5	-	-	26.0	30.4	16.6
July	27.2	23.9	-	-	26.0	41.5	44.5
August	25.1	40.4	-	-	18.0	62.5	45.1
September	37.1	34.5	-	45.5	29.1	42.6	37.8
October	-	-	-	5.5	3.9	28.7	26.5
November	-	-	-	19.9	2.4	17.4	13.0
December	-	-	-	1.3	0.3	13.7	10.4
June to September Total	**110.7**	**115.3**	**-**	**-**	**99.1**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**-**	**125.2**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1g. 2010 Back River Project Rainfall and Regional Monthly Total Precipitation (mm) (January 2010 to December 2010)

Month	Goose (277 masl) 2010	George (355 masl) 2010	Bathurst Inlet (170 masl) 2010	Lupin CS (488 masl) 2010	Kugluktuk CS (22.6 masl) 2010	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	0.6	10.4	9.4	10.4
February	-	-	-	3.0	0.9	7.8	8.4
March	-	-	-	46.9	8.9	12.2	9.9
April	-	-	-	22.2	2.3	14.6	10.0
May	-	-	-	6.2	6.3	17.8	14.6
June	18.5	11.4	0.5	16.6	20.2	30.4	16.6
July	41.2	49.8	60.5	80.6	40.7	41.5	44.5
August	6.4	9.1	15.5	6.5	24.1	62.5	45.1
September	-	-	33.9	37.5	23.1	42.6	37.8
October	-	-	-	6.6	23.6	28.7	26.5
November	-	-	-	12.6	2.3	17.4	13.0
December	-	-	-	1.5	1.8	13.7	10.4
June to September Total	**66.0**	**70.4**	**110.4**	**141.2**	**108.1**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**240.8**	**164.6**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1h. 2011 Back River Project Rainfall and Regional Monthly Total Precipitation (mm) (January 2011 to December 2011)

Month	Goose (277 masl) 2011	George (355 masl) 2011	Bathurst Inlet (170 masl) 2011	Lupin CS (488 masl) 2011	Kugluktuk A (22.6 masl) 2011	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	-	10.6	9.4	10.4
February	-	-	-	-	10.3	7.8	8.4
March	-	-	-	-	6.4	12.2	9.9
April	-	-	-	18.4	6.0	14.6	10.0
May	-	-	-	6.3	4.8	17.8	14.6
June	13.5	14.2	-	6.7	9.0	30.4	16.6
July	21.1	20.6	-	12.3	20.0	41.5	44.5
August	53.6	70.1	-	25.0	97.9	62.5	45.1
September	65.3	46.5	11.9	35.2	69.0	42.6	37.8
October	-	-	4.1	3.4	17.0	28.7	26.5
November	-	-	-	1.6	6.2	17.4	13.0
December	-	-	-	3.5	6.3	13.7	10.4
June to September Total	**153.4**	**151.4**	**-**	**79.2**	**195.9**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**-**	**263.5**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1i. 2012 Back River Project Rainfall and Regional Monthly Total Precipitation (mm) (January 2012 to October 2012)

Month	Goose (277 masl) 2012	George (355 masl) 2012	Bathurst Inlet (170 masl) 2012	Lupin CS (488 masl) 2012	Kugluktuk A (22.6 masl) 2012	Bathurst Inlet (5 masl) 2012	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	-	-	-	2.4	13.2	-	9.4	10.4
February	-	-	-	19.6	6.5	-	7.8	8.4
March	3.6	2.8	-	-	8.0	-	12.2	9.9
April	5.1	5.8	-	-	9.2	-	14.6	10.0
May	10.2	3.3	-	-	5.1	-	17.8	14.6
June	16.0	13.2	0	-	15.8	-	30.4	16.6
July	20.6	24.1	6.8	-	27.3	-	41.5	44.5
August	32.3	42.4	51.5	-	23.4	22.2	62.5	45.1
September	27.9	29.5	40.3	5.3	11.1	27.4	42.6	37.8
October	2.5	3.3	-	22.0	23.2	12.2	28.7	26.5
November	7.9	6.9	-	6.8	6.9	2.2	17.4	13.0
December	4.8	0.0	-	3.3	1.7	7	13.7	10.4
June to September Total	**96.8**	**109.2**	**98.6**	**-**	**77.6**	**-**	**177.0**	**143.9**
Annual Total	**185.7**	**131.3**	**-**	**-**	**151.4**	**-**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1j. 2013 Back River Project Regional Monthly Total Precipitation (mm)

Month	Goose (277 masl) 2013	George (355 masl) 2013	Bathurst Inlet (170 masl) 2013	Lupin CS (488 masl) 2013	Kugluktuk A (22.6 masl) 2013	Bathurst Inlet (5 masl) 2013	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	0.8	0.0	-	5.7	12.6	5.6	9.4	10.4
February	5.6	0.0	-	19	5.6	3.2	7.8	8.4
March	2.0	10.4	-	33.1	9.5	22.5	12.2	9.9
April	0.0	0.0	-	124.6	6.4	16.5	14.6	10.0
May	6.4	1.8	11.3	50.1	5.2	33.0	17.8	14.6
June	25.7	32.0	33.3	1.1	13.9	56.4	30.4	16.6
July	39.6	22.6	47.6	22	74.5	46.6	41.5	44.5
August	36.3	33.8	29.1	40.1	35.5	38.7	62.5	45.1
September	40.1	29.2	32.0	38.9	50.4	36.3	42.6	37.8
October	6.9	5.3	-	7.2	32.4	3.8	28.7	26.5
November	3.3	0.0	-	2	3.4	1.8	17.4	13.0
December	0.8	0.0	-	1	5.2	0.0	13.7	10.4
June to September Total	**141.7**	**117.6**	**142.0**	**102.1**	**174.3**	**178.0**	**177.0**	**143.9**
Annual Total	**167.4**	**135.1**	**-**	**344.8**	**254.6**	**264.4**	**298.5**	**247.2**

Dash (-) indicates data missing.

Table 3.2-1k. 2014 Back River Project Regional Monthly Total Precipitation (mm) (January to June 2014)

Month	Goose (277 masl) 2014	George (355 masl) 2014	Bathurst Inlet (170 masl) 2014	Lupin CS (488 masl) 2014	Kugluktuk A (22.6 masl) 2014	Bathurst Inlet (5 masl) 2014	Lupin A (490 masl) 1981 – 2010 Climate Normal	Kugluktuk A (22.6 masl) 1981 – 2010 Climate Normal
January	0.8	0.0	-	2	3.6	0.9	9.4	10.4
February	5.6	0.0	-	0.9	5.2	0	7.8	8.4
March	2.0	27.2	-	42.3	7	9.1	12.2	9.9
April	0.0	0.0	-	102.7	3	9.6	14.6	10.0
May	6.4	1.8	20.7	28.3	15.2	21.9	17.8	14.6
June	25.7	31.7	-	27.1	25.6	18	30.4	16.6
July	39.6	22.9	-	12.6	46.2	21.7	41.5	44.5
August	36.3	33.8	-	91.2	18.2	31.7	62.5	45.1
September	-	-	-	18.6	49.2	48.8	42.6	37.8
October	-	-	-	-	-	-	28.7	26.5
November	-	-	-	-	-	-	17.4	13.0
December	-	-	-	-	-	-	13.7	10.4
June to September Total	**-**	**-**	**-**	**102.1**	**-**	**-**	**177.0**	**143.9**
Annual Total	**-**	**-**	**-**	**-**	**-**	**-**	**298.5**	**247.2**

Dash (-) indicates data missing.
n/a indicates statistic is not applicable for variable.

Annual precipitation data are available from the Goose and George meteorological stations during the summer months only from 2004 to 2012, and from all seasons from 2012 to present. The Bathurst Inlet station also only recorded rainfall data during specific months between 2007 and 2012. Comparing the precipitation totals for the months with available data, to data from the regional stations for the same period, the precipitation is generally similar and therefore annual precipitation at the Goose and George meteorological stations can be inferred from the regional station data.

Total annual precipitation at the Lupin CS meteorological station was 266.5 mm in 2008, 240.8 mm in 2010, and 112.4 mm in 2011. There was not sufficient data capture to calculate total precipitation in 2004, 2005, 2006, 2007, 2009, or 2012, and in 2013 and 2014 the data is suspect due to very high readings in the late winter/early spring. At the Kugluktuk meteorological station total annual precipitation was 133.5 mm in 2004, 160.8 mm in 2005, 191.3 mm in 2006, 344.2 mm in 2007, 198.8 mm in 2008, 125.2 mm in 2009, 164.6 mm in 2010, 120.6 mm in 2011, 151.4 mm in 2012, and 254.6 mm in 2013. Climate normal total precipitation was 298.5 mm and 247.2 mm at the Lupin A and Kugluktuk meteorological stations respectively. Compared to climate normals, total precipitation at the regional stations was lower in 2004, 2006, 2008, 2009, 2010, 2011, and 2012, about the same in 2005, and higher in 2007 and 2013, suggesting that the 2006 to 2014 period was generally drier than climate normals.

At the Kugluktuk A regional climate station, the majority of the precipitation (65%) occurred during the spring, summer and fall months during the 2004 to 2013 period. Climate normal data indicate that 53 to 60% of total precipitation fell during the spring, summer and fall months, suggesting that a slightly greater proportion of the total annual precipitation was falling during these seasons during the 2004 to 2012 period. This discrepancy could be from sample size differences or changes in seasonal variation.

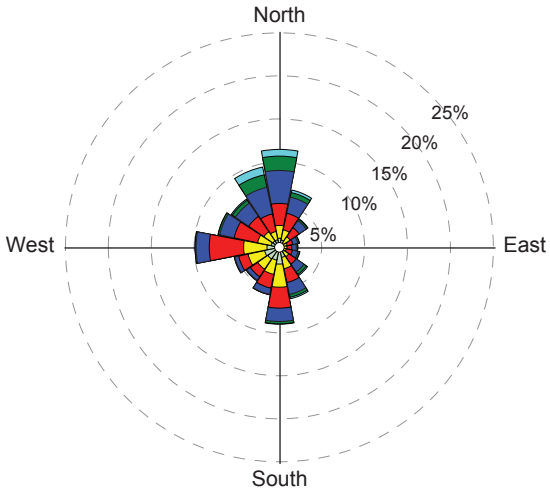
3.3 WIND SPEED AND DIRECTION

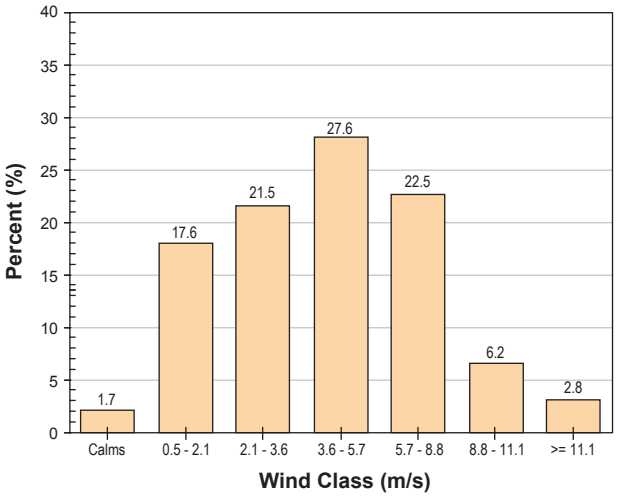
The Back River Project area lies near the northern reaches of the North American continent. As such, it is primarily subject to cold, dry Arctic air masses and American continental air masses from the south. The area is subject to a high wind speeds due to the relative absence of obstructions to impede the wind (e.g., trees, buildings, mountains).

Figures 3.3-1 to 3.3-3 show average annual, summer and winter wind roses based on data collected during the measurement period for Goose and George stations (2004 to June 2014) and Bathurst Inlet meteorological station (2007 to September 2013), respectively. Appendix 3 shows annual, summer, and winter wind distributions for each year at the Goose and George meteorological stations (2005 to 2013). Due to the timing of the monitoring period and the data collection trips, the 2004 and 2014 years did not include enough data for wind distribution figures to be produced. At both meteorological stations the trends in wind speed and direction are fairly consistent for the years 2004 to 2013. Appendix 3 also includes annual, summer, and winter wind distributions for each year at the Bathurst Inlet meteorological station (2007 to 2013). Note that the Bathurst Inlet meteorological station experienced frequent data gaps and therefore the trends in wind speed and direction vary from year to year mainly because of the variation in data availability.

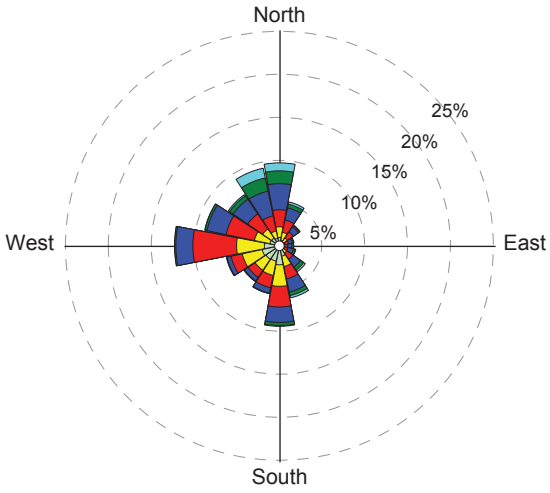
At the Goose meteorological station, the dominant wind direction is from the west to north quadrant, blowing from this quadrant approximately 44% of the time and also from the southerly direction for approximately 9% of the time (Figure 3.3-1). Wind speeds were in excess of 5 m/s from all directions over 40% of the time. Broken down into summer (June to September) and winter seasons (October to May), both seasons had wind speeds that were in excess of 5 m/s from all directions over 39% of the time. In the winter period the dominant wind direction was from the north to west quadrant approximately 44% of the time and also from the southerly direction for approximately 10% of the time. In the summer wind direction was predominantly from the north northeast to north northwest approximately 35% of the time and also from the southeast to south direction for approximately 14% of the time.

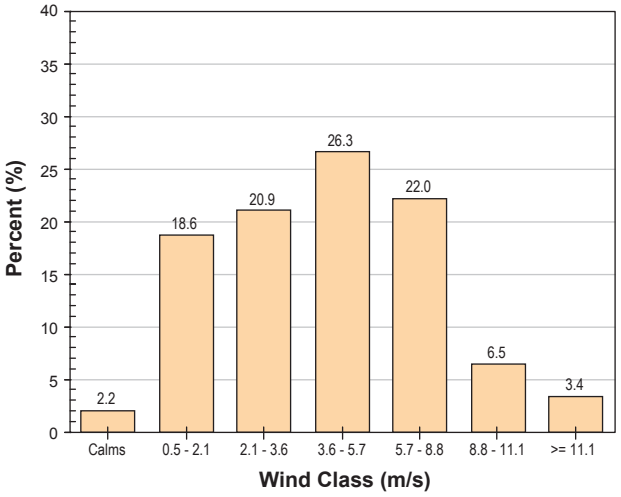
Annual



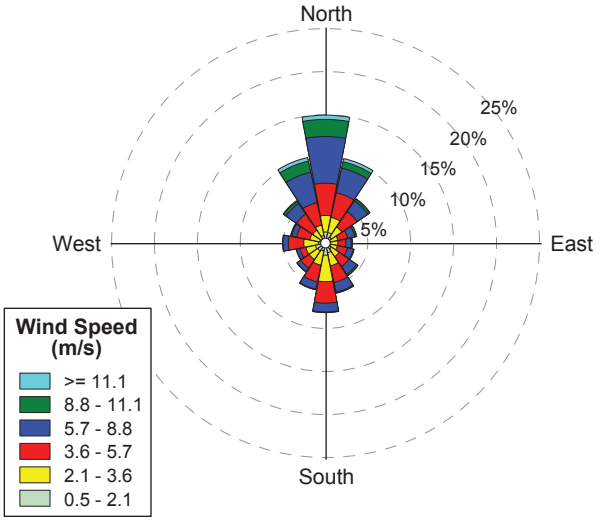


Winter





Summer



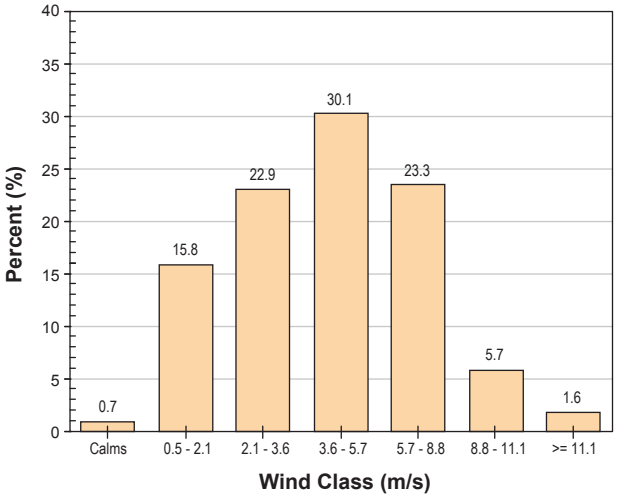


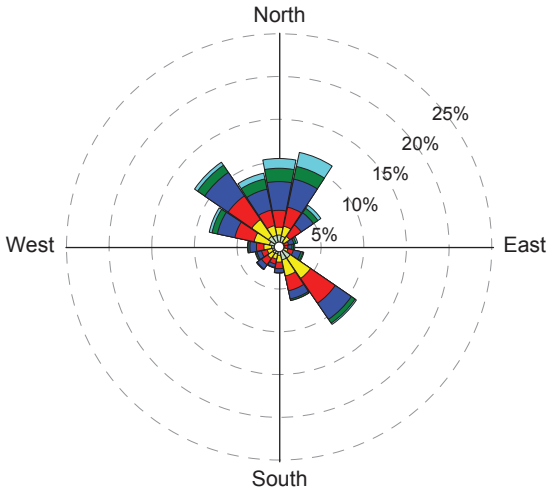
Figure 3.3-1

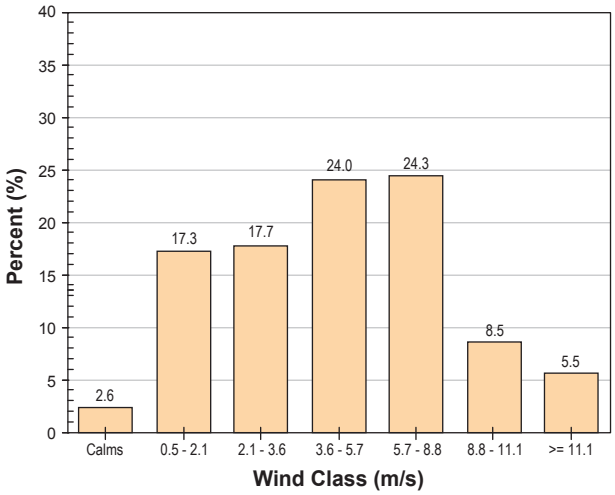
Goose Meteorological Station Windroses, 2004 to 2014

Sabina GOLD & SILVER CORP.

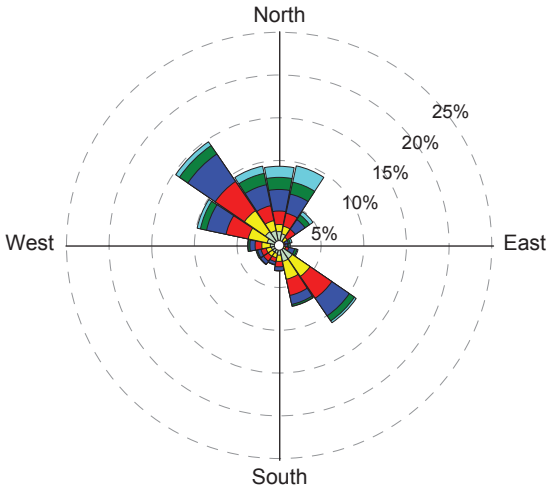
Rescan an ERM company

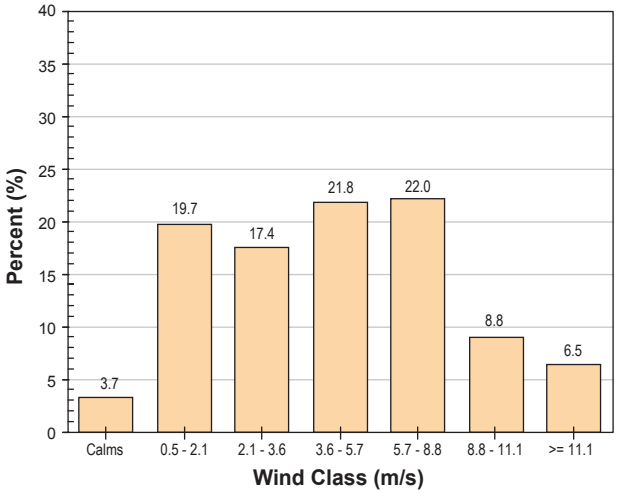
Annual



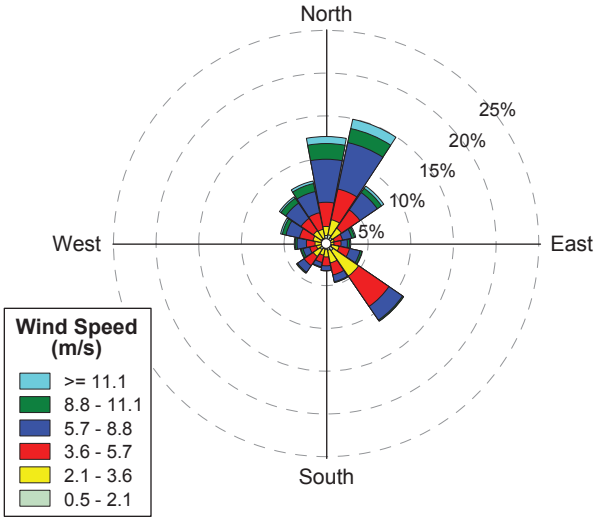


Winter





Summer



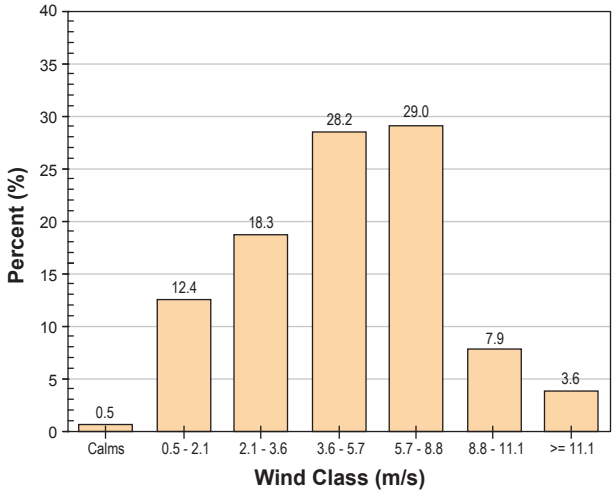


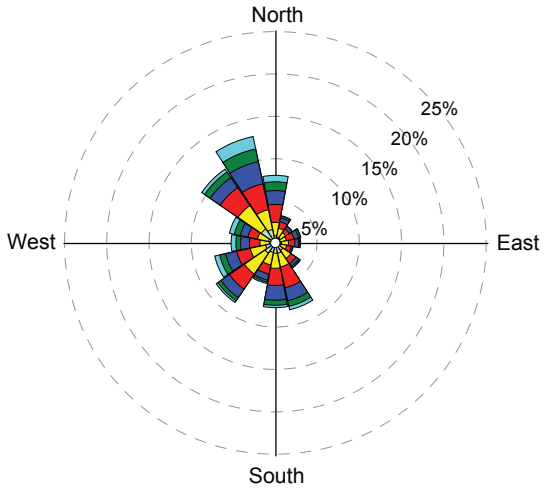
Figure 3.3-2

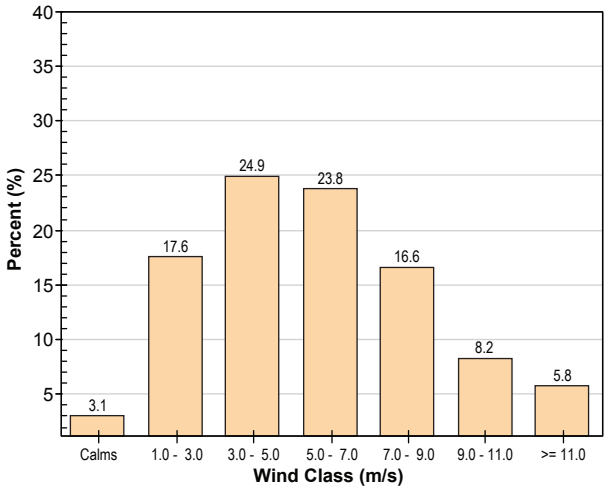
George Meteorological Station Windroses, 2004 to 2014

Sabina GOLD & SILVER CORP.

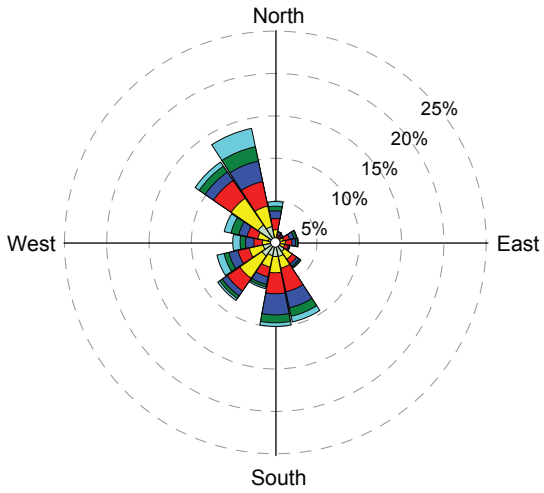
Rescan an ERM company

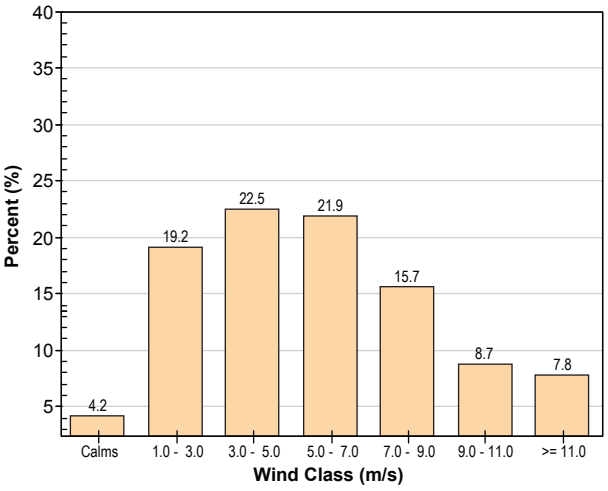
Annual



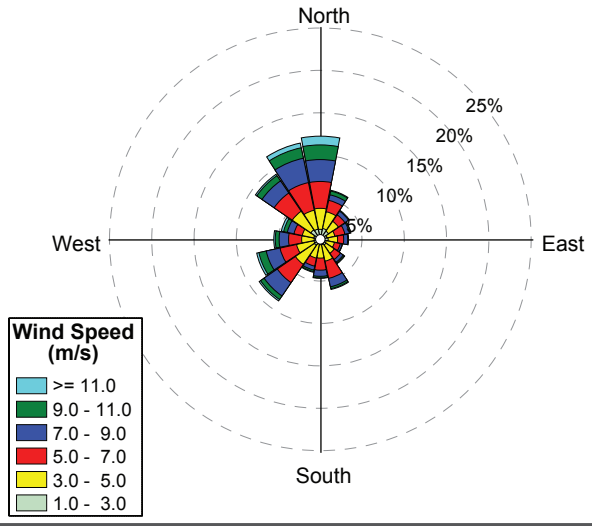


Winter





Summer



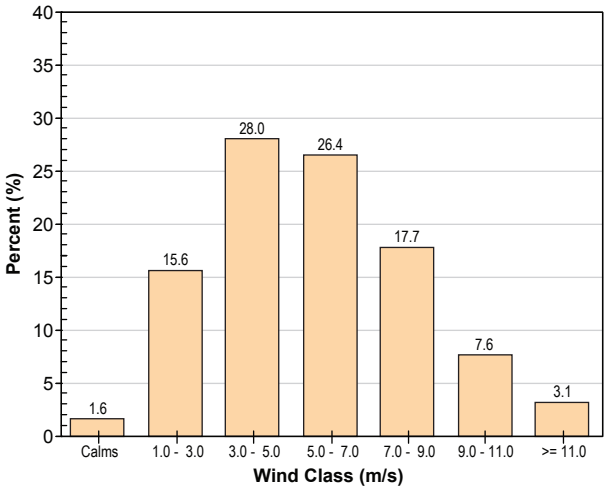


Figure 3.3-3

Bahturst Inlet Meteorological Station Windroses, 2007 to 2013

Sabina GOLD & SILVER CORP.

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At the George meteorological station the winds blow from north, north northeast, northwest and southeast most frequently (Figure 3.3-2). Wind speeds were in excess of 5 m/s from all directions 47% of the time. Broken down into summer (June to September) and winter seasons (October to May), both seasons had wind speeds that were in excess of 5 m/s from all directions over 45% of the time. In the winter period the dominant wind direction was from the northwest to north northeast quadrant approximately 45% of the time and also from the southeast direction for approximately 10% of the time. In the summer wind direction was predominantly from the north to north northeast approximately 27% of the time and also from the southeast direction for approximately 12% of the time.

3.4 SOLAR RADIATION

Solar radiation is electromagnetic energy from the sun. Solar energy accounts for 99% of the Earth's energy budget. The solar radiation incident on top of the terrestrial atmosphere is called extraterrestrial solar radiation. Ninety seven percent of this radiation is confined to the spectral range of 0.29 to 3.0 microns and is referred to as short-wave radiation. A portion of the extraterrestrial solar radiation penetrates through the atmosphere to the earth's surface, while part of it is scattered and/or absorbed in the atmosphere by gases, aerosol particles, cloud droplets and cloud crystals. Global solar radiation is monitored at the Goose and George meteorological stations using a silicone pyranometer. Global solar radiation is the total incoming direct and diffuse short-wave solar radiation received from the whole dome of the sky on a horizontal surface.

Figures 3.4-1 and 3.4-2 summarize the mean daily solar radiation values for the 2004 to 2014 period at the Goose and George meteorological stations, respectively. Due to frequent data gaps experienced at the Bathurst Inlet meteorological station, the period from June 2007 to May 2008 is the only complete year (Figure 3.4-3). After new sensor installation in July 2012, the pyranometer was found to be missing a resistor and therefore was not able to report data. As such, solar radiation data are considered missing for Bathurst Inlet meteorological station.

The highest daily average solar radiation readings were 387 W/m^2, recorded on June 8, 2008, at Goose, and 396 W/m^2 also recorded on June 8, 2008 at George. A maximum hourly average solar radiation value of 942 W/m^2 was recorded at the George meteorological station on May 17, 2008. A maximum hourly average solar radiation value of 949 W/m^2 was recorded at the Goose meteorological station on May 10, 2013.

The lowest solar radiation values were recorded during winter months, when the sun is low and the regional area experiences near perpetual night and twilight for several weeks. This period starts in late November and ends in mid-January. Average daily and hourly solar radiation values hover around zero during this time. All of the hourly average solar radiation values recorded during night time hours were 0 W/m^2.

Tables 3.4-1a to 3.4-1k show total bright sunshine hours and mean daily global solar radiation recorded at the Goose and George meteorological stations. A bright sunshine hour is defined by the World Meteorological Organization (WMO 2008) as an hour when the average global solar radiation is greater than 120 W/m^2.

The number of hours of bright sunshine at George was 2,352 in 2005, 2,516 in 2006, 2,258 in 2007, 2,063 in 2008, 2,637 in 2012, and 2,491 in 2013. Total hours cannot be reported for 2004, 2009, 2010 or 2011 due to insufficient data capture. At Goose there were 2,587 hours in 2007, 2,555 hours in 2008, 2,674 hours in 2009, 2,489 hours in 2010, 2,623 hours in 2011, 2,630 in 2012, and 2,511 in 2013. Total hours cannot be reported for 2004, 2005 and 2006 due to insufficient data capture.

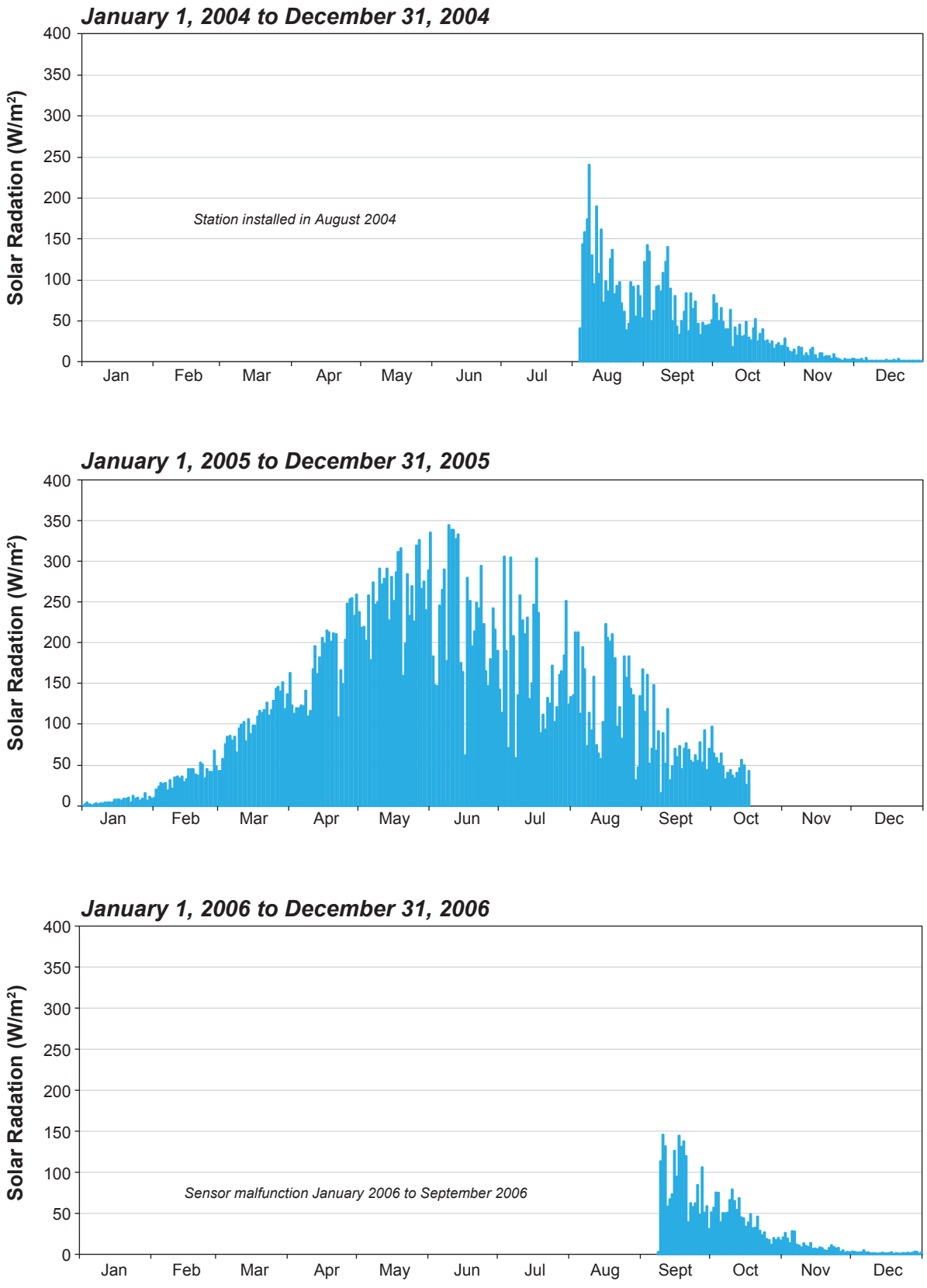


Figure 3.4-1a

Goose Meteorological Station Average
Solar Radiation, 2004 to 2006

Sabina GOLD & SILVER CORP.

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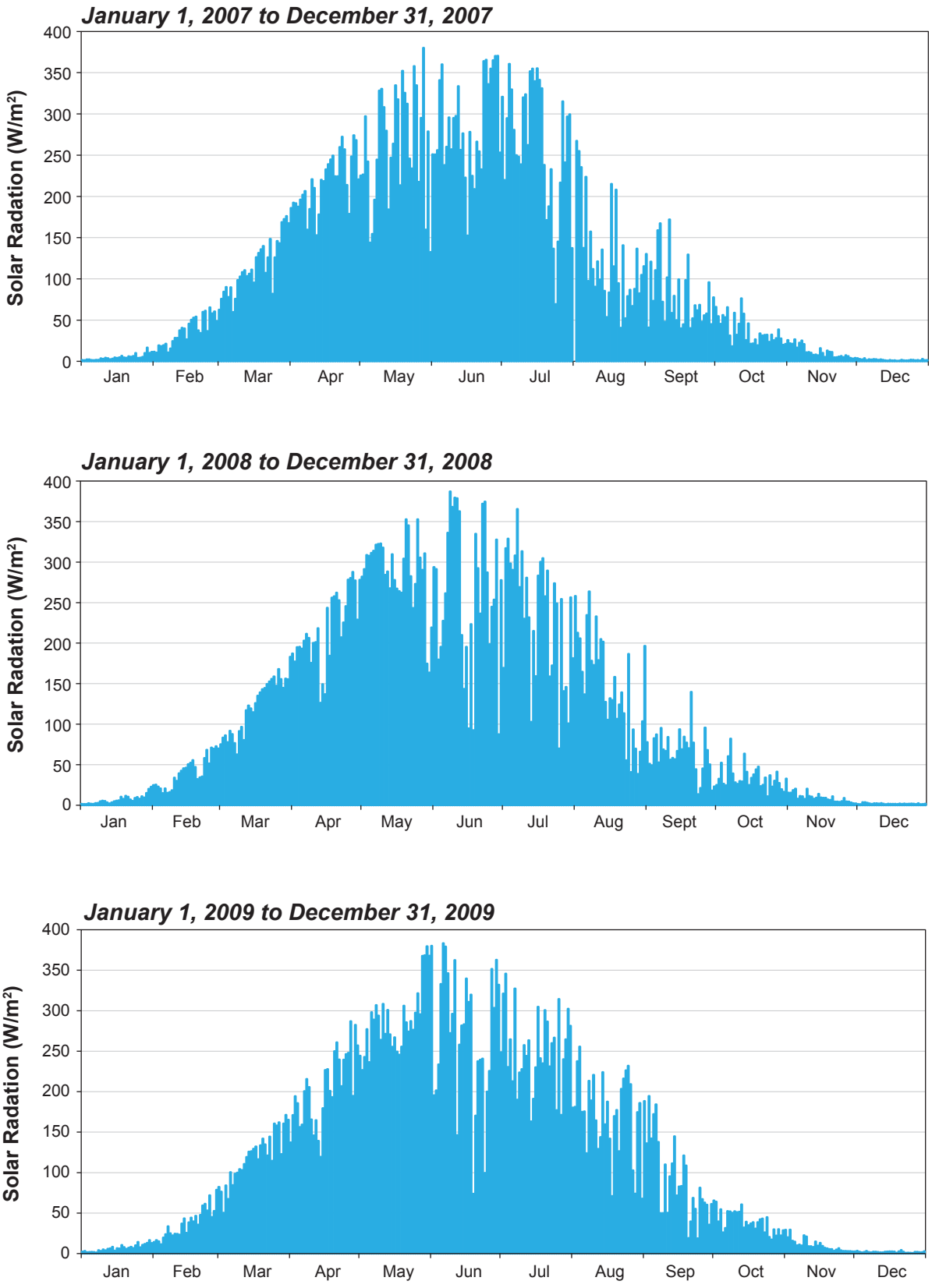
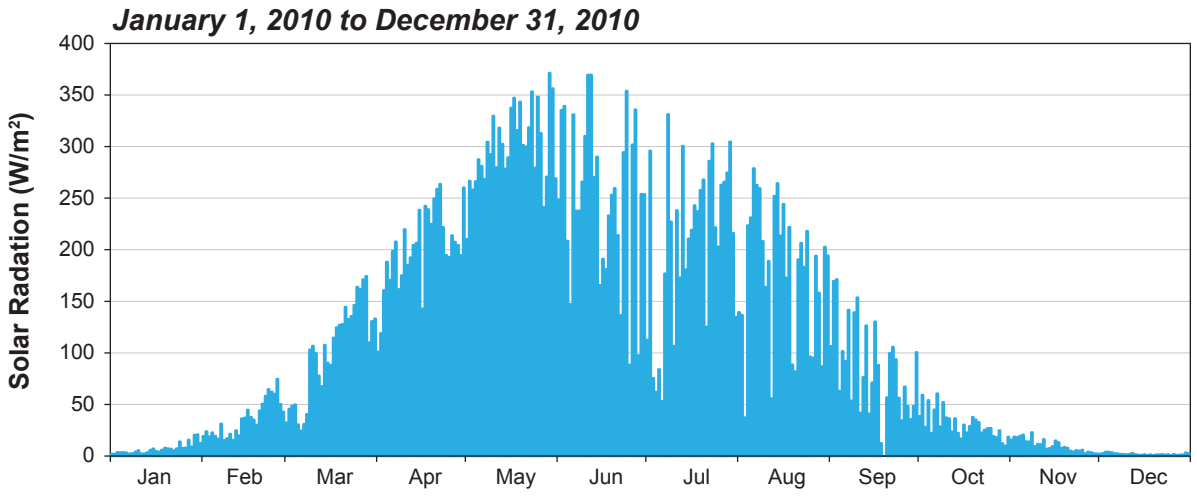


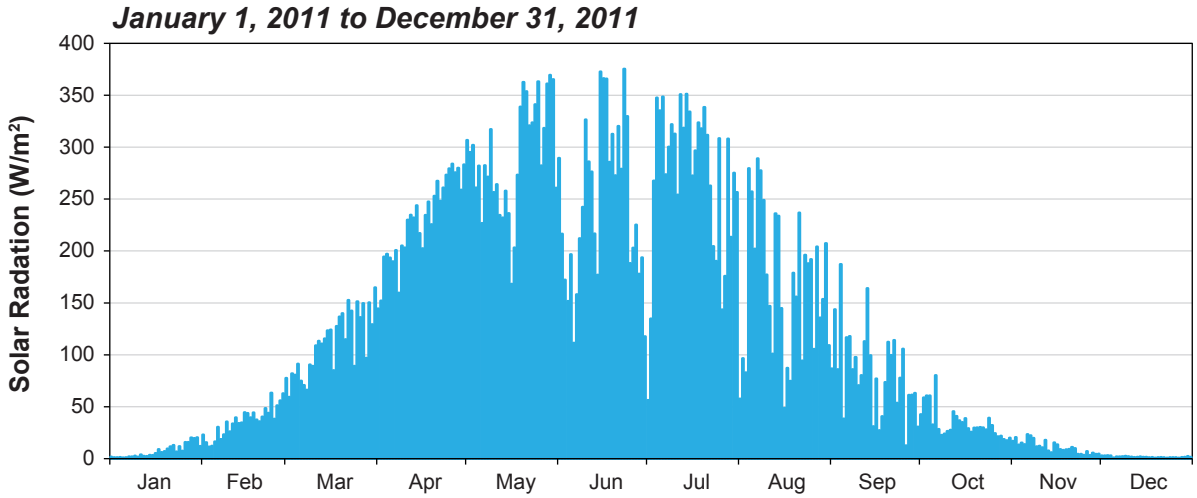
Figure 3.4-1b

Goose Meteorological Station Average
Solar Radiation, 2007 to 2009

Sabina GOLD & SILVER CORP.

Rescan an ERM company





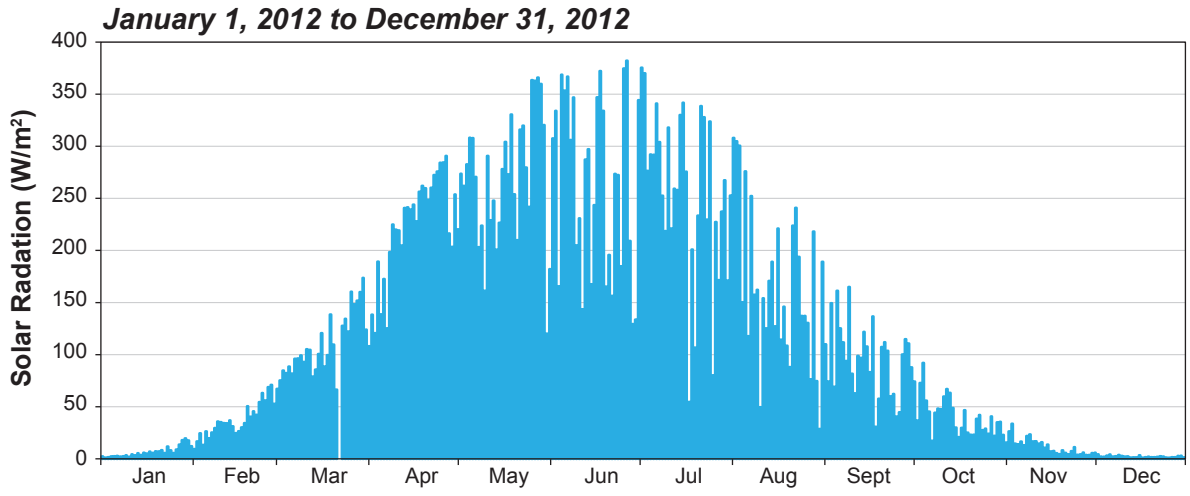


Figure 3.4-1c

Goose Meteorological Station Average
Solar Radiation, 2010 to 2012

Sabina GOLD & SILVER CORP.

Rescan an ERM company

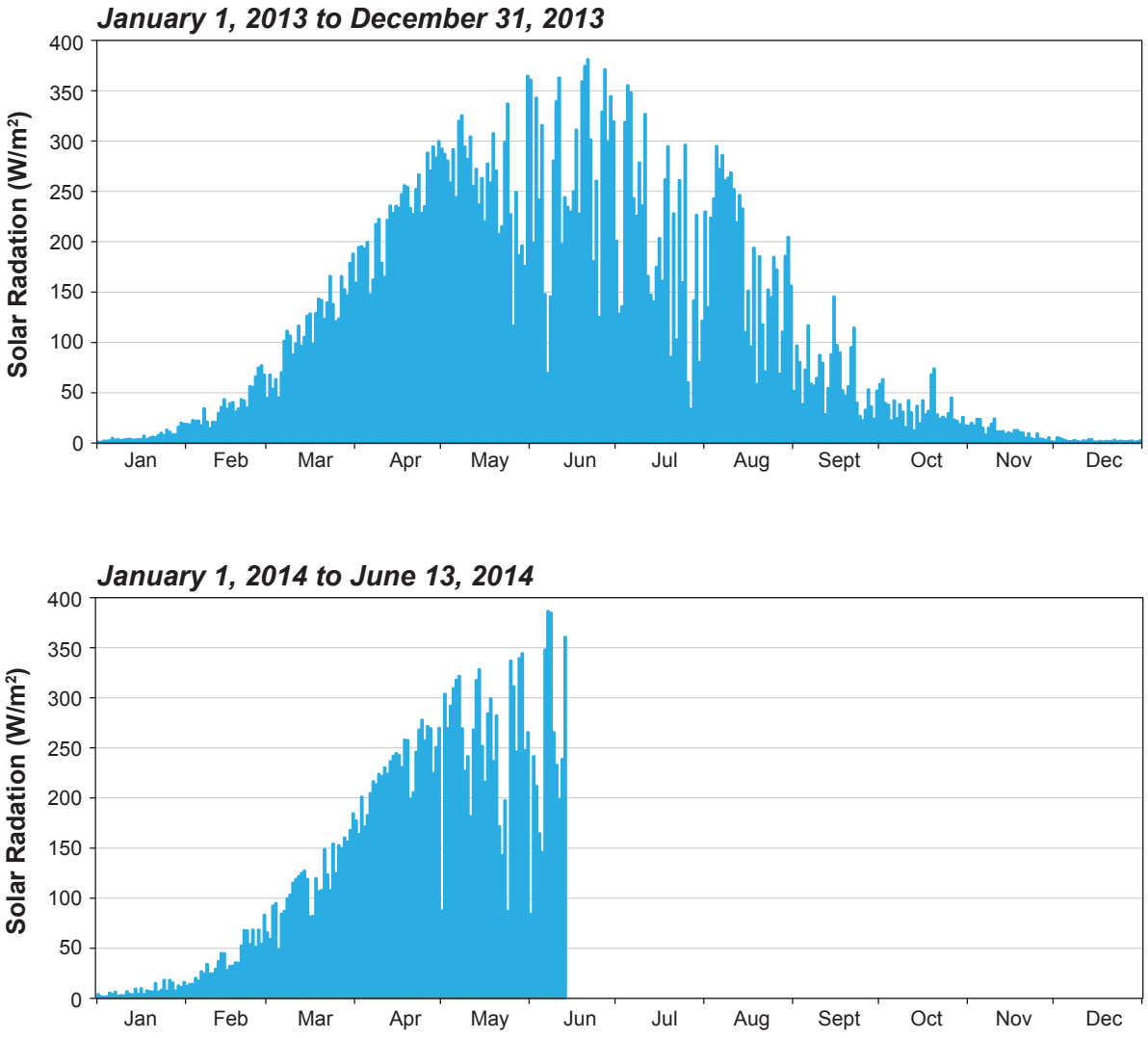


Figure 3.4-1d

Goose Meteorological Station
Average Solar Radiation, 2013 to 2014

Sabina GOLD & SILVER CORP.

Rescan an ERM company

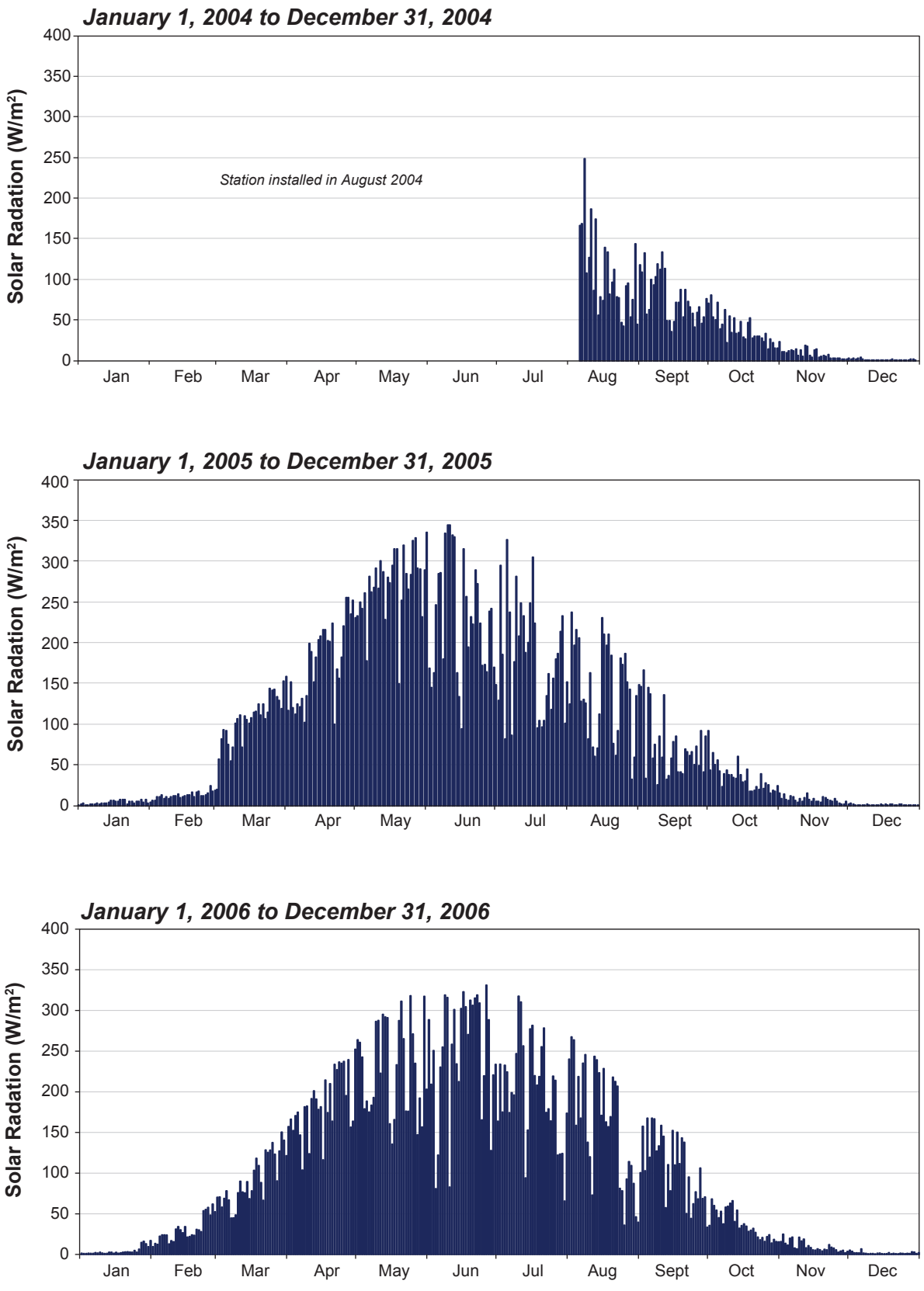


Figure 3.4-2a

George Meteorological Station Average
Solar Radiation, 2004 to 2006

Sabina GOLD & SILVER CORP.

Rescan an ERM company

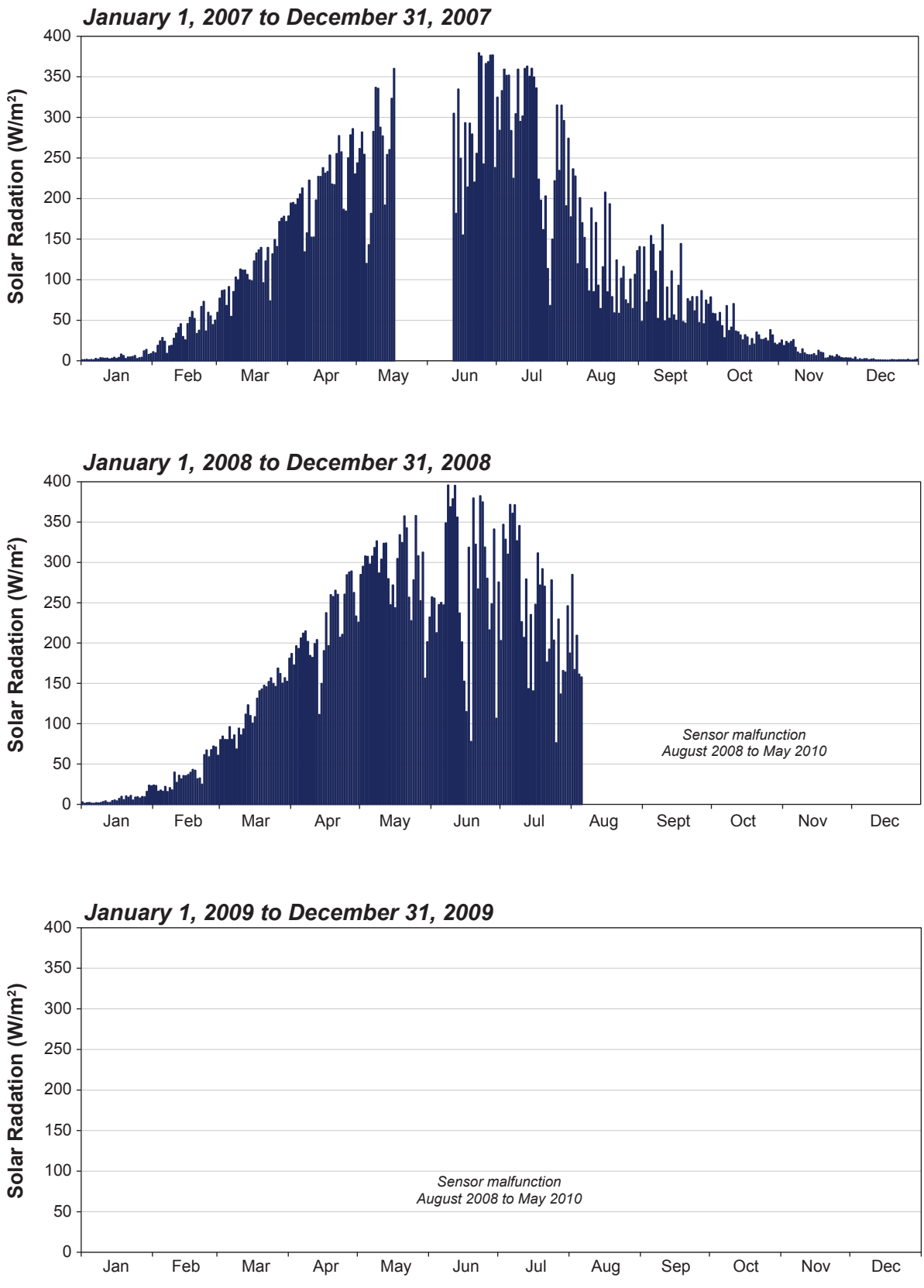
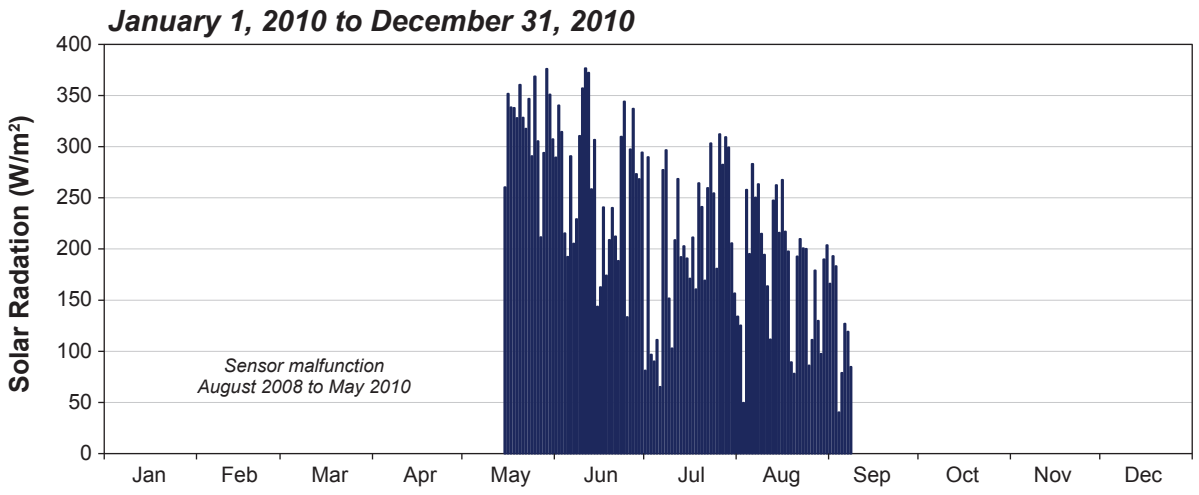


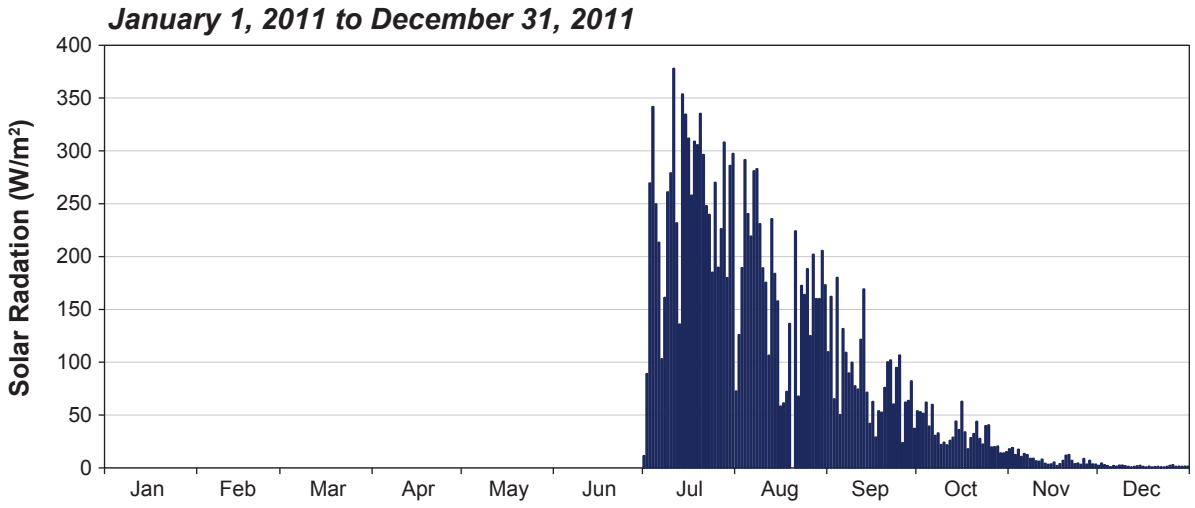
Figure 3.4-2b

George Meteorological Station Average Solar Radiation, 2007 to 2009

Sabina GOLD & SILVER CORP.

Rescan an ERM company





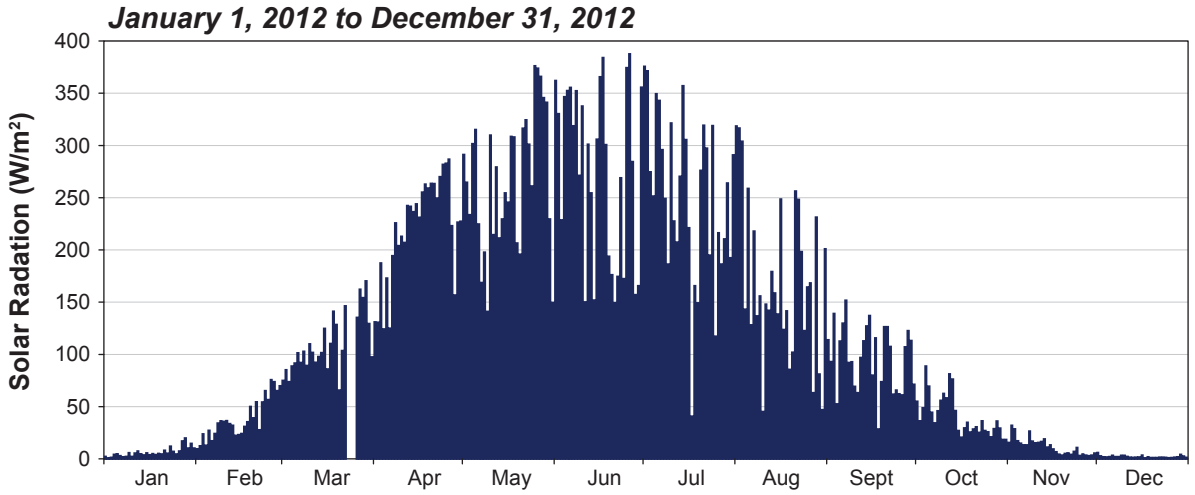
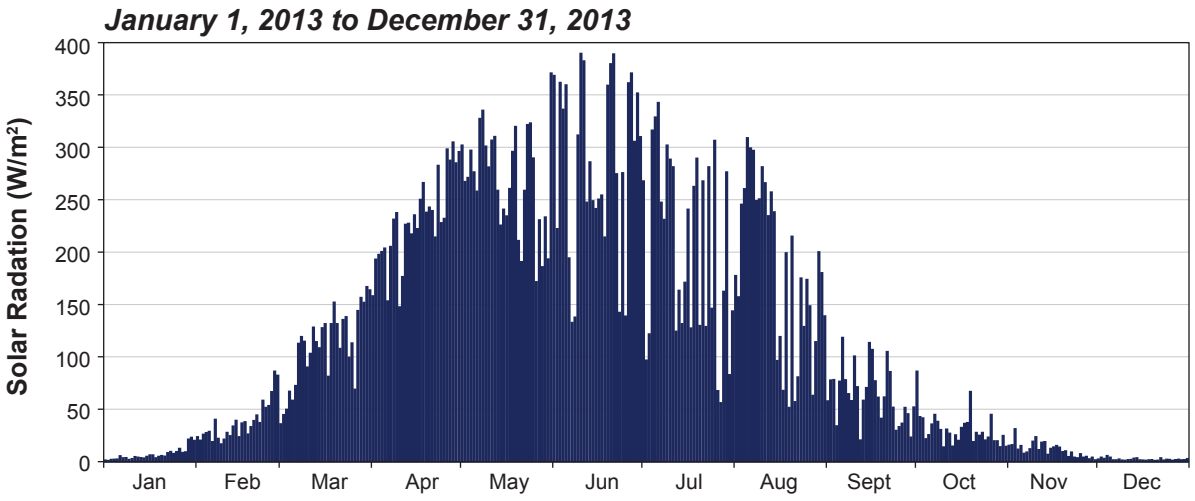


Figure 3.4-2c

George Meteorological Station Average Solar Radiation, 2010 to 2012

Sabina GOLD & SILVER CORP.

Rescan an ERM company



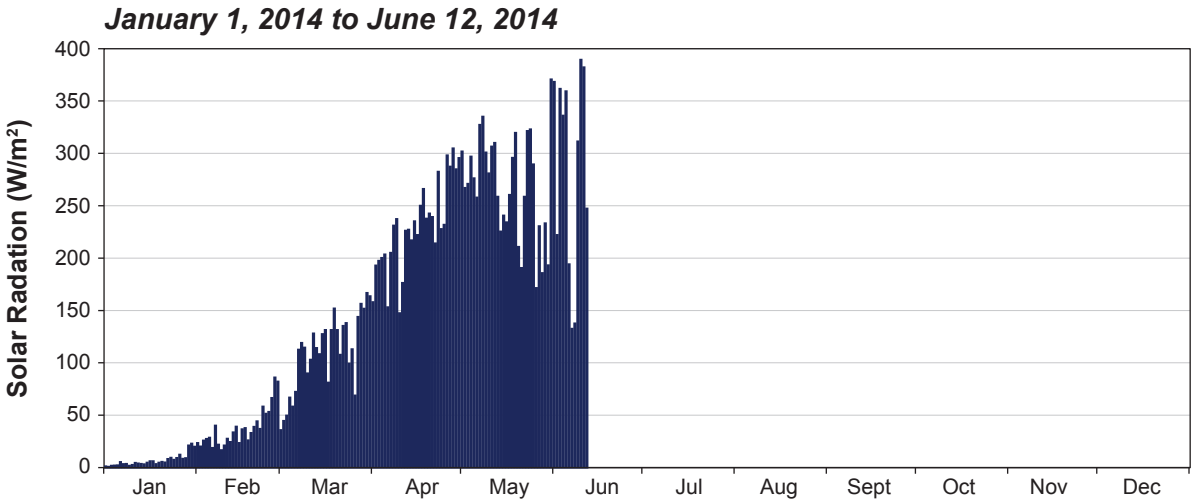


Figure 3.4-2d

George Meteorological Station
Average Solar Radiation, 2013 to 2014

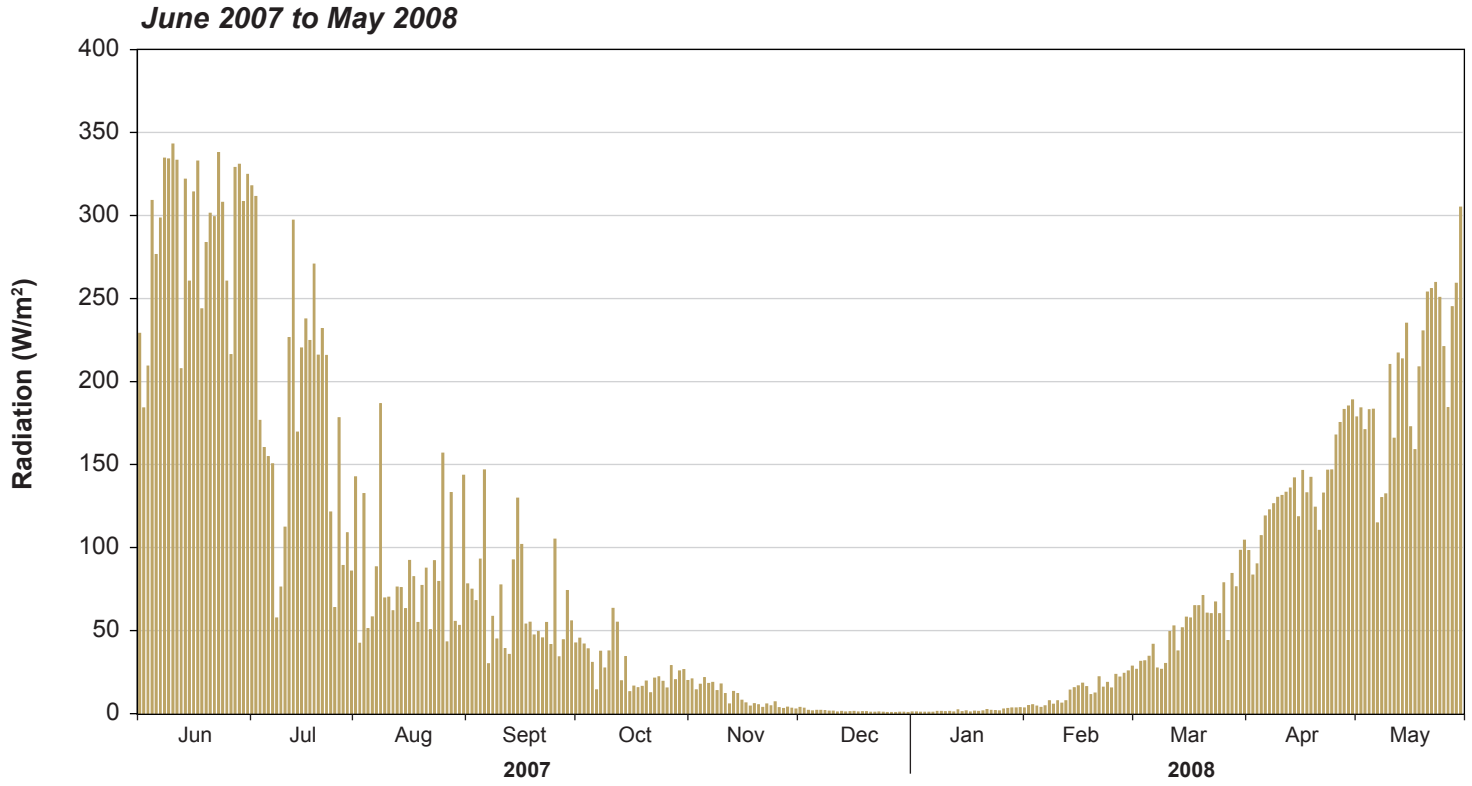


Figure 3.4-3

Sabina GOLD & SILVER CORP.

Bathurst Inlet Meteorological Station Average Solar Radiation, June 2007 to May 2008

Figure 3.4-3

Rescan an ERM company

Table 3.4-1a. 2004 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2004 Total Bright Sunshine Hours	2004 Mean Daily Global Solar Radiation (W/m^2)	2004 Total Bright Sunshine Hours	2004 Mean Daily Global Solar Radiation (W/m^2)
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April	-	-	-	-
May	-	-	-	-
June	-	-	-	-
July	-	-	-	-
August	226	104.3	220	107.1
September	190	73.9	202	78.3
October	95	37.3	102	38.8
November	3	9.3	0	8.5
December	0	2.0	0	1.3
Average	**-**	**-**	**-**	**-**
Sum	**-**	**n/a**	**-**	**n/a**
Minimum	**0**	**-**	**0**	**-**
Maximum	**-**	**-**	**-**	**-**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1b. 2005 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2005 Total Bright Sunshine Hours	2005 Mean Daily Global Solar Radiation (W/m^2)	2005 Total Bright Sunshine Hours	2005 Mean Daily Global Solar Radiation (W/m^2)
January	0	6.0	0	4.1
February	96	35.9	0	12.2
March	247	102.1	247	101.7
April	337	176.4	329	176.3
May	426	257.4	434	269.9
June	411	232.2	409	234.8
July	360	172.9	364	183.5
August	305	136.9	306	141.9
September	190	75.1	181	75.9
October	73	49.0	82	35.1
November	-	-	0	7.4
December	-	-	0	1.1
Average	**-**	**-**	**-**	**103.7**
Sum	**-**	**n/a**	**2,352**	**n/a**
Minimum	**0**	**-**	**0**	**1.1**
Maximum	**426**	**257.4**	**434**	**269.9**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1c. 2006 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2006 Total Bright Sunshine Hours	2006 Mean Daily Global Solar Radiation (W/m^2)	2006 Total Bright Sunshine Hours	2006 Mean Daily Global Solar Radiation (W/m^2)
January	-	-	0	4
February	-	-	59	30
March	-	-	238	92
April	-	-	343	185
May	-	-	413	229
June	-	-	410	250
July	-	-	398	202
August	-	-	316	163
September	154	88	244	109
October	109	42	88	37
November	9	11	7	10
December	0	2	0	2
Average	**-**	**-**	**210**	**110**
Sum	**-**	**n/a**	**2,516**	**n/a**
Minimum	**0**	**2**	**0**	**2**
Maximum	**154**	**88**	**413**	**250**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1d. 2007 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2007 Total Bright Sunshine Hours	2007 Mean Daily Global Solar Radiation (W/m^2)	2007 Total Bright Sunshine Hours	2007 Mean Daily Global Solar Radiation (W/m^2)
January	0	5	0	4
February	89	36	94	37
March	266	115	261	114
April	353	217	355	215
May	426	262	221	256
June	443	286	284	290
July	419	266	433	277
August	276	124	299	131
September	210	82	205	87
October	93	38	97	39
November	12	12	9	11
December	0	2	0	2
Average	**216**	**120**	**188**	**122**
Sum	**2,587**	**n/a**	**2,258**	**n/a**
Minimum	**0**	**2**	**0**	**2**
Maximum	**443**	**286**	**433**	**290**

n/a indicates statistic is not applicable for variable.

Table 3.4-1e. 2008 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2008 Total Bright Sunshine Hours	2008 Mean Daily Global Solar Radiation (W/m^2)	2008 Total Bright Sunshine Hours	2008 Mean Daily Global Solar Radiation (W/m^2)
January	2	7	3	7
February	107	41	92	37
March	275	123	267	121
April	360	218	357	218
May	436	288	434	289
June	410	264	424	278
July	412	236	420	247
August	306	150	66	201
September	171	65	-	-
October	76	35	-	-
November	0	9	-	-
December	0	2	-	-
Average	**213**	**120**	**-**	**-**
Sum	**2,555**	**n/a**	**-**	**n/a**
Minimum	**0**	**2**	**3**	**7**
Maximum	**436**	**288**	**434**	**289**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1f. 2009 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2009 Total Bright Sunshine Hours	2009 Mean Daily Global Solar Radiation (W/m^2)	2009 Total Bright Sunshine Hours	2009 Mean Daily Global Solar Radiation (W/m^2)
January	0	7	-	-
February	92	37	-	-
March	266	119	-	-
April	344	203	-	-
May	435	288	-	-
June	421	272	-	-
July	433	252	-	-
August	348	172	-	-
September	213	94	-	-
October	115	40	-	-
November	7	11	-	-
December	0	2	-	-
Average	**223**	**125**	**-**	**-**
Sum	**2,674**	**n/a**	**-**	**n/a**
Minimum	**0**	**2**	**-**	**-**
Maximum	**435**	**288**	**-**	**-**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1g. 2010 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2010 Total Bright Sunshine Hours	2010 Mean Daily Global Solar Radiation (W/m^2)	2010 Total Bright Sunshine Hours	2010 Mean Daily Global Solar Radiation (W/m^2)
January	0	7	-	-
February	77	35	-	-
March	230	101	-	-
April	349	201	-	-
May	439	299	246	324
June	407	252	421	263
July	374	208	372	207
August	340	179	346	181
September	209	89	77	37
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Average	-	-	**-**	**-**
Sum	-	**n/a**	**-**	**n/a**
Minimum	**0**	**7**	**77**	**37**
Maximum	**439**	**299**	**421**	**324**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1h. 2011 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2011 Total Bright Sunshine Hours	2011 Mean Daily Global Solar Radiation (W/m^2)	2011 Total Bright Sunshine Hours	2011 Mean Daily Global Solar Radiation (W/m^2)
January	2	7	-	-
February	96	36	-	-
March	259	111	-	-
April	364	229	-	-
May	437	291	162	87
June	412	247	-	-
July	445	274	475	247
August	326	168	344	172
September	200	84	207	85
October	76	34	72	33
November	6	11	0	8
December	0	2	0	2
Average	**219**	**125**	**-**	**-**
Sum	**2,623**	**n/a**	**-**	**n/a**
Minimum	**0**	**2**	**-**	**-**
Maximum	**445**	**291**	**-**	**-**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1i. 2012 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2012 Total Bright Sunshine Hours	2012 Mean Daily Global Solar Radiation (W/m^2)	2012 Total Bright Sunshine Hours	2012 Mean Daily Global Solar Radiation (W/m^2)
January	2	7	0	6
February	103	38	94	38
March	246	114	241	109
April	359	224	355	221
May	421	270	424	267
June	420	266	440	278
July	418	257	409	253
August	316	167	318	170
September	231	96	239	97
October	103	42	107	41
November	11	12	10	12
December	0	2	0	2
Average	**219**	**125**	**220**	**124**
Sum	**2,630**	**n/a**	**2,637**	**n/a**
Minimum	**0**	**2**	**0**	**2**
Maximum	**421**	**270**	**440**	**278**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1j. 2013 Mean Daily Solar Radiation and Total Bright Sunshine Hours

	Goose (277 masl)		George (355 masl)	
	2013 Total Bright Sunshine Hours	2013 Mean Daily Global Solar Radiation (W/m^2)	2013 Total Bright Sunshine Hours	2013 Mean Daily Global Solar Radiation (W/m^2)
January	0	6	4	7
February	84	37	90	37
March	266	115	258	110
April	365	228	359	230
May	419	262	423	269
June	426	272	423	286
July	370	198	366	206
August	352	187	338	185
September	155	64	163	65
October	70	34	58	31
November	4	11	9	11
December	0	2	0	2
Average	**209**	**118**	**208**	**120**
Sum	**2,511**	**n/a**	**2,491**	**n/a**
Minimum	**0**	**2**	**0**	**2**
Maximum	**426**	**272**	**423**	**286**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Table 3.4-1k. 2014 Mean Daily Solar Radiation and Total Bright Sunshine Hours (January 2014 to June 2014)

	Goose (277 masl)		George (355 masl)	
	2014 Total Bright Sunshine Hours	2014 Mean Daily Global Solar Radiation (W/m^2)	2014 Total Bright Sunshine Hours	2014 Mean Daily Global Solar Radiation (W/m^2)
January	0	8	1	7
February	97	39	91	40
March	263	116	267	119
April	363	229	360	235
May	405	258	412	267
June	-	-	-	-
July	-	-	-	-
August	-	-	-	-
September	-	-	-	-
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Average	**-**	**-**	**-**	**-**
Sum	**-**	**n/a**	**-**	**n/a**
Minimum	**-**	**-**	**-**	**-**
Maximum	**-**	**-**	**-**	**-**

Dash (-) indicates data missing. n/a indicates statistic is not applicable for variable.

Mean daily global solar radiation during this period was 104 W/m^2, 110 W/m^2, 122 W/m^2, 124 W/m^2, 120 W/m^2 in 2005, 2006, 2007, 2012 and 2013 respectively at George, and 120 W/m^2, 120 W/m^2, 125 W/m^2, 125 W/m^2, 125 W/m^2, and 118 W/m^2 in 2007, 2008, 2009, 2011, 2012 and 2013 respectively at Goose. Note that the annual mean daily global radiation for some years was not reported due to missing data.

3.5 EVAPORATION

Lake evaporation rates were calculated using data from the Goose Lake micro-meteorological (evaporation) station (installed on July 7, 2012 and on June 26, 2013) and the Goose meteorological station by two methods, the Penman Combination and the Priestly-Taylor. In total, 71 days of data were collected from the micro-met station in 2012 (July 7, 2012 to September 15, 2012) and 79 days of data were collected from the micro-met station in 2013 (June 26, 2013 to September 13, 2013). On average, the Back River Project area experiences an open-water season that starts in June; however, there are variations in the length of the open-water season year to year.

Total evaporation values from June 1 to September 15, 2012 were estimated to be 269 and 261 mm based on total monthly evaporation values calculated using the Penman Combination and Priestly-Taylor methods, respectively (Table 3.5-1a). Total evaporation values from June 1 to September 13, 2013 were estimated to be 391 and 335 mm based on total monthly evaporation values calculated using the Penman Combination and Priestly-Taylor methods, respectively (Table 3.5-1b).

Table 3.5-1a. Back River Project – 2012 Monthly Evaporation

Month	Mean Daily Evaporation Rate (mm/day)		Total Monthly Evaporation (mm)	
	Penman Method	Priestly-Taylor Method	Penman Method	Priestly-Taylor Method
June[a]	3.63	3.22	109	97
July[b]	3.32	3.44	103	107
August	1.56	1.61	48	50
September[c]	0.62	0.51	9.3	7.6
2012 Mean[d]	**2.28**	**2.19**	**n/a**	**n/a**
2012 Sum[d]	**n/a**	**n/a**	**269**	**261**

Notes: n/a indicates statistic is not applicable for variable.
[a] All values in June were estimated using data from the Goose meteorological station.
[b] The Micro-meteorology station was installed on July 7, 2012. Values for this month are based on 25 days of collected data and 6 days of estimated values using data from the Goose Meteorological station.
[c] The micro-meteorology station was uninstalled on September 15, 2012. Data for this month is based on 15 days of data.
[d] Values based on 71 days of collected data and 36 days of data extrapolated from the Goose Meteorological station.

Table 3.5-1b. Back River Project – 2013 Monthly Evaporation

Month	Mean Daily Evaporation Rate (mm/day)		Total Monthly Evaporation (mm)	
	Penman Method	Priestly-Taylor Method	Penman Method	Priestly-Taylor Method
June[a]	7.72	6.43	232	193
July	2.74	2.44	85	76
August	2.18	2.00	68	62
September[b]	0.54	0.32	7	4
2013 Mean[c]	**3.73**	**3.19**	**n/a**	**n/a**
2013 Sum[c]	**n/a**	**n/a**	**391**	**335**

Notes: n/a indicates statistic is not applicable for variable.
[a] The Micro-meteorology station was installed on June 26, 2013. Data in June prior to micro-meteorology station installation were estimated using data from the Goose meteorological station
[b] The micro-meteorology station was uninstalled on September 13, 2013. Data for this month is based on 13 days of data.
[c] Values based on 79 days of collected data and 26 days of data extrapolated from the Goose Meteorological station.

Evaporation measured from this station between July and August shows how evaporation in August is roughly half of the evaporation in July in 2012. This is due to the fact that solar radiation has the largest influence on evaporation rate, and the water surface receives significantly more solar radiation in July than August, after which it decreases significantly (see Figure 3.4-2). In 2013, solar radiation received in July and August was similar and therefore difference in evaporation amounts between July and August in 2012 are not as significant.

Total monthly evaporation at the Back River Project is similar to estimates from other areas in the central Arctic. Evaporation measured at Polar Lake for the EKATI Diamond Mine Project in 2008 was approximately 277 mm using the Penman method and based on 122 days of measurement (June 1 to September 31, 2008; Rescan 2009b). The EKATI Diamond Mine Project is located about 220 km to the southwest of the Back River Project, and it experiences a slightly longer open-water season and more heating days. Lake evaporation has also been measured at the Lupin mine site that is approximately 220 km to the west of the Back River Project. The Priestly-Taylor evaporation calculated for a 54 day period in summer 1992 was 171 mm and for a 46 day period in 1993 it was 103 mm (Gibson, Prowse, and Edwards 1996).

4. Summary

4. Summary

The meteorology baseline work in 2014 included servicing three meteorology stations located at the Goose Property, George Property, and near the Marine Laydown Area. This report presents the available meteorology information to date.

The last meteorology baseline report covered the period of January 1, 2006 to August 2013. This report presents the meteorological data from August 4, 2004 to June 2014.

Observations recorded at meteorological stations operating at the Goose and George properties and in southern Bathurst Inlet (near the Marine Laydown Area) during the period August 2006 to June 2014 indicate that the climate in the Project area is typical of the Arctic, and consists of a winter period (October to May) of snow and extremely cold mean monthly temperatures ranging from -33.0 to -0.1ºC, and a cool spring, summer and fall period (June to September) with mean monthly temperatures ranging from -0.3 to 14.6ºC.

The precipitation gauges recorded summer rainfall (June through September). In addition, in March 2012 winter adapters were installed at the Goose and George meteorological stations to allow for year-round precipitation data collection. Therefore, precipitation data collected after the installation represents both rainfall and snow for these two stations. In 2014, due to limited access and lack of onsite personnel for maintenance, the winter adapters were not installed. Therefore future precipitation data is limited to summer rainfall only. During the 2004 to 2013 monitoring period, summer rainfall ranged from 4 mm to 211 mm. 2014 data was only available until June 15, 2014, therefore summer rainfall values are not available. Summer rainfall for the months with available data is generally similar to data from the regional stations for the same period. Therefore, annual precipitation at the Back River Project area can be inferred from the regional station data.

Based on data from regional meteorological stations, total annual precipitation ranged from a low of 125.2 mm in 2009 to a high of 344.2 mm in 2007 during the 2004 to 2013 period. 2014 data was only available until June 2014, therefore annual precipitation values are not available. Compared to climate normal (1981 to 2010) total annual precipitation, which ranges from 247 to 299 mm, total annual precipitation at the regional stations was lower in 2004, 2006, 2008, 2009, 2010, 2011, and 2012, about the same in 2005 and higher in 2007, suggesting that the 2006 to 2013 period was generally drier than the climate normals. At the Kugluktuk A regional climate station, the majority of the precipitation (66%) occurred during the spring, summer and fall months. Climate normal data indicate that 53 to 60% of total precipitation fell during the spring, summer and fall months, suggesting that a slightly greater proportion of the total annual precipitation was falling during these seasons during the 2004 to 2013 period. The discrepancy between climate normal and the period reported could be from sample size differences or changes in seasonal variation.

The Back River Project area lies near the northern reaches of the North American continent. As such, it is primarily subject to cold, dry Arctic air masses and American continental air masses from the south. The area is subject to high wind speeds due to the relative absence of obstructions to impede the wind (e.g., trees, buildings, mountains). In the Project area wind speeds are generally greater than 3 m/s and predominately from the north westerly quadrant.

Solar radiation is monitored at the Goose, George and Bathurst Inlet meteorological stations. Summer is a season of nearly perpetual sunlight, while winter is dominated by night, twilight and extreme cold.

Generally there is an energy deficit during winter months (October through May) and an energy surplus during summer months (June through September).

Lake evaporation was calculated using data from the Goose Lake micro-meteorology station installed on July 7, 2012 and June 26, 2013. The micro-meteorology station was not installed in 2014 due to the short time that the exploration camp was open. Total evaporation values in the Back River Project area from June 1 to September 15, 2012 were estimated to be 269 and 261 mm based on total monthly evaporation values calculated using the Penman Combination and Priestly-Taylor methods, respectively. Total evaporation values in the Back River Project area from June 1, 2013 to September 13, 2013 were estimated to be 391 and 335 mm for Penman Combination and Priestly-Taylor methods. The data is consistent with other Arctic evaporation studies.

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Appendix 1

Climate Normal Data from Environment Canada

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Appendix 1. Climate Normal Data from Environment Canada

LUPIN A, NUNAVUT (1981 – 2010)

Latitude: 65°45'33.000" N; **Longitude**: 111°15'00.000" W; **Elevation**: 490.10 m; **Climate ID**: 23026HN; **WMO ID**: n/a; **TC ID**: YWO.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature:													
Daily Average (°C)	-29.88	-28.5	-24.83	-15.79	-5.85	6.39	11.53	8.84	2.11	-8.38	-20.39	-26.17	-10.91
Daily Maximum (°C)	-26.32	-24.85	-20.87	-11.45	-2.07	10.83	16.29	12.6	4.8	-5.83	-16.87	-22.55	-7.19
Daily Minimum (°C)	-33.4	-32.1	-28.74	-20.09	-9.61	1.92	6.72	5.02	-0.59	-10.88	-23.86	-29.74	-14.61
Extreme Maximum (°C)	-5	-5	0.5	6	17.5	27.5	31	27.5	21	13	0	-4.5	31
Date (yyyy/dd)	08-Jan-87	28-Feb-86	23-Mar-93	18-Apr-98	25-May-94	18-Jun-99	15-Jul-89	14-Aug-89	02-Sep-97	03-Oct-03	02-Nov-83	29-Dec-91	15-Jul-89
Extreme Minimum (°C)	-49	-46	-44	-38	-29.5	-9	-1.5	-6.5	-13.5	-30.5	-40.5	-42	-49
Date (yyyy/dd)	26-Jan-90	05-Feb-93	05-Mar-91	06-Apr-97	02-May-83	04-Jun-86	03-Jul-83	23-Aug-82	28-Sep-05	30-Oct-96	19-Nov-82	24-Dec-93	26-Jan-90
Precipitation:													
Rainfall (mm)	0	0	0	0.35	5.32	26.77	41.11	59.83	25.52	1.6	0.01	0	160.51
Snowfall (cm)	9.4	7.79	12.18	14.26	12.46	3.62	0.38	2.63	17.1	27.09	17.42	13.66	137.99
Precipitation (mm)	9.4	7.79	12.18	14.62	17.78	30.39	41.48	62.46	42.62	28.68	17.43	13.66	298.49
Extreme Daily Rainfall (mm)	0	0	0	5.8	10.2	36.8	41.8	38.6	34.2	10.8	0.2	0	41.8
Date (yyyy/dd)	01-Jan-82	01-Feb-82	01-Mar-82	22-Apr-05	26-May-92	13-Jun-87	09-Jul-83	29-Aug-86	10-Sep-99	08-Oct-88	02-Nov-87	01-Dec-82	09-Jul-83
Extreme Daily Snowfall (cm)	11.6	14.2	10	13.8	14.3	13.4	3.4	8.8	17	31.8	14	10	31.8
Date (yyyy/dd)	02-Jan-92	01-Feb-93	14-Mar-03	08-Apr-91	11-May-89	15-Jun-92	18-Jul-85	19-Aug-85	27-Sep-83	28-Oct-98	09-Nov-87	08-Dec-87	28-Oct-98
Extreme Daily Precipitation (mm)	11.6	14.2	10	13.8	14.3	36.8	41.8	38.6	34.2	31.8	14	10	41.8
Date (yyyy/dd)	02-Jan-92	01-Feb-93	14-Mar-03	08-Apr-91	11-May-89	13-Jun-87	09-Jul-83	29-Aug-86	10-Sep-99	28-Oct-98	09-Nov-87	08-Dec-87	09-Jul-83
Extreme Snow Depth (cm)	20	24	21	25	25	0	0	0	4	10	18	24	25
Date (yyyy/dd)	31-Jan-02	28-Feb-03	31-Mar-02	30-Apr-02	01-May-02	18-Jun-82	01-Jul-82	01-Aug-82	30-Sep-93	31-Oct-01	30-Nov-01	31-Dec-02	30-Apr-02

KUGLUKTUK A, NUNAVUT

Latitude: 67°49'00.000" N; **Longitude**: 115°08'38.000" W; **Elevation**: 22.60 m; **Climate ID**: 2300902; **WMO ID**: 71938; **TC ID**: YCO.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature:	-27.3	-27.71	-25.25	-16.34	-5.28	5.5	10.88	8.97	3.26	-6.64	-18.72	-24.46	-10.26
Daily Average (°C)	3.55	3.7	3.1	3.4	3.02	1.72	1.76	1.74	1.66	1.83	4.02	3.44	1.41
Standard Deviation	-23.17	-23.41	-20.66	-11.43	-1.32	9.94	15.6	13.11	6.45	-3.48	-14.82	-20.3	-6.12
Daily Maximum (°C)	0.8	-1.2	-0.1	9.8	19.8	31.1	34.9	29.2	22.6	13.8	2.8	-0.5	34.9
Daily Minimum (°C)	-31.39	-31.96	-29.79	-21.2	-9.22	1.03	6.11	4.78	0.05	-9.76	-22.57	-28.58	-14.38
Extreme Maximum (°C)	0.8	-1.2	-0.1	9.8	19.8	31.1	34.9	29.2	22.6	13.8	2.8	-0.5	34.9
Date (yyyy/dd)	16-Jan-81	07-Feb-80	22-Mar-99	22-Apr-10	24-May-94	25-Jun-96	15-Jul-89	01-Aug-00	01-Sep-94	01-Oct-03	03-Nov-83	10-Dec-06	15-Jul-89
Extreme Minimum (°C)	-47.3	-47.2	-47	-40.2	-30.2	-12.1	-0.8	-4.4	-18.9	-35.4	-41	-44.5	-47.3
Date (yyyy/dd)	15-Jan-04	20-Feb-98	05-Mar-79	02-Apr-08	03-May-83	01-Jun-00	30-Jul-02	29-Aug-95	26-Sep-00	29-Oct-96	24-Nov-85	12-Dec-77	15-Jan-04
Precipitation:													
Rainfall (mm)	0.07	0	0	0.09	4.31	14.61	44.44	44.85	31.42	4.68	0.01	0.01	144.49
Snowfall (cm)	19.56	16.28	19.38	18.24	16.15	2.13	0.02	0.22	7.74	35.03	25.49	21.85	182.09
Precipitation (mm)	10.42	8.39	9.9	10.04	14.62	16.55	44.46	45.07	37.84	26.52	13.02	10.39	247.22
Average Snow Depth (cm)	31.44	35.19	39.1	39.96	23.64	2.05	0.04	0	0.38	8.08	18.78	26.23	18.74
Median Snow Depth (cm)	31.2	35.03	38.78	40.7	23.43	0.75	0	0	0	7.6	18.42	25.8	18.48
Snow Depth at Month-end (cm)	31.73	36.8	41.1	35.77	11.24	0.2	0	0	2.21	15.47	22.8	29.57	18.91
Extreme Daily Rainfall (mm)	2	0	0	7.4	20.6	27.4	118.3	53.7	28.8	19.3	0.2	0.4	118.3
Date (yyyy/dd)	05-Jan-03	06-Feb-78	01-Mar-78	27-Apr-80	27-May-92	13-Jun-87	21-Jul-07	12-Aug-82	07-Sep-83	08-Oct-80	02-Nov-00	30-Dec-05	21-Jul-07
Extreme Daily Snowfall (cm)	26.2	24.6	10.6	19.6	21.2	13	0.4	5	13.5	23	12.4	26	26.2
Date (yyyy/dd)	01-Jan-88	21-Feb-81	08-Mar-08	10-Apr-08	09-May-04	05-Jun-91	07-Jul-85	23-Aug-86	22-Sep-81	29-Oct-81	06-Nov-81	25-Dec-94	01-Jan-88
Extreme Daily Precipitation (mm)	25.8	9.1	8	16	21.8	27.4	118.3	53.7	28.8	23	12.4	14.8	118.3
Date (yyyy/dd)	01-Jan-88	21-Feb-81	07-Mar-10	30-Apr-80	25-May-78	13-Jun-87	21-Jul-07	12-Aug-82	07-Sep-83	29-Oct-81	06-Nov-81	25-Dec-94	21-Jul-07

Appendix 2

Goose and George Meteorological Stations Daily Temperature (January to December) and Rainfall Data (June to September up to 2011)/Precipitation (March 2012 onward), 2004 to 2014

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Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
04/08/2004	9.3	n/a	n/a	11.6	n/a	n/a	6.7	n/a	n/a	8.6	n/a	n/a
05/08/2004	6.3	n/a	n/a	8.3	n/a	n/a	4.4	n/a	n/a	0.0	n/a	n/a
06/08/2004	5.3	4.6	n/a	8.2	7.4	n/a	3.3	2.5	n/a	0.8	0.8	n/a
07/08/2004	6.7	5.7	n/a	10.4	9.7	n/a	2.5	2.9	n/a	0.0	0.3	n/a
08/08/2004	10.4	10.4	n/a	17.7	17.6	n/a	1.8	2.6	n/a	0.0	0.0	n/a
09/08/2004	12.7	11.8	n/a	18.0	16.3	n/a	9.2	8.2	n/a	1.8	2.0	n/a
10/08/2004	10.5	10.4	n/a	12.3	11.7	n/a	8.6	9.2	n/a	0.0	0.8	n/a
11/08/2004	14.8	14.6	n/a	22.1	20.7	n/a	8.5	8.7	n/a	0.0	0.0	n/a
12/08/2004	14.0	12.6	n/a	18.6	15.9	n/a	10.0	9.6	n/a	4.8	3.0	n/a
13/08/2004	9.6	9.8	n/a	13.9	14.3	n/a	4.5	5.1	n/a	0.0	0.0	n/a
14/08/2004	9.4	9.2	n/a	15.4	13.9	n/a	3.8	5.2	n/a	6.1	2.0	n/a
15/08/2004	5.5	4.4	n/a	7.4	6.8	n/a	3.6	2.8	n/a	0.8	0.3	n/a
16/08/2004	4.7	4.0	n/a	7.8	7.3	n/a	1.5	1.0	n/a	1.3	0.3	n/a
17/08/2004	2.6	1.9	n/a	4.2	3.7	n/a	1.3	0.9	n/a	0.3	0.3	n/a
18/08/2004	3.6	2.7	n/a	5.9	5.2	n/a	1.6	0.8	n/a	0.0	0.0	n/a
19/08/2004	4.5	4.1	n/a	6.7	6.4	n/a	2.8	2.2	n/a	0.3	0.8	n/a
20/08/2004	3.3	2.6	n/a	4.7	4.3	n/a	2.1	1.7	n/a	0.3	0.0	n/a
21/08/2004	3.5	2.4	n/a	5.2	4.3	n/a	2.2	1.3	n/a	0.3	0.3	n/a
22/08/2004	4.4	4.3	n/a	7.9	8.6	n/a	1.5	1.5	n/a	0.0	0.0	n/a
23/08/2004	6.8	6.4	n/a	9.4	9.0	n/a	4.6	4.5	n/a	1.8	3.3	n/a
24/08/2004	5.7	4.2	n/a	7.1	6.7	n/a	4.2	3.1	n/a	2.3	3.6	n/a
25/08/2004	4.5	3.6	n/a	7.1	5.0	n/a	1.4	2.4	n/a	1.0	1.0	n/a
26/08/2004	5.3	5.1	n/a	8.8	7.9	n/a	1.3	2.3	n/a	0.5	0.8	n/a
27/08/2004	6.6	5.9	n/a	9.2	8.6	n/a	5.1	4.4	n/a	2.5	5.8	n/a
28/08/2004	3.7	2.7	n/a	5.8	5.4	n/a	2.3	1.4	n/a	3.6	1.5	n/a
29/08/2004	3.5	3.0	n/a	6.1	4.7	n/a	1.8	1.4	n/a	0.0	0.0	n/a
30/08/2004	5.4	6.2	n/a	10.4	10.8	n/a	2.8	2.5	n/a	0.0	0.0	n/a
31/08/2004	6.6	5.8	n/a	9.9	7.7	n/a	4.7	3.3	n/a	3.3	3.0	n/a
01/09/2004	6.9	6.2	n/a	12.3	11.2	n/a	1.3	1.9	n/a	0.0	0.3	n/a
02/09/2004	10.2	9.6	n/a	15.4	15.0	n/a	6.0	4.4	n/a	0.0	0.0	n/a
03/09/2004	10.5	10.2	n/a	17.7	16.4	n/a	2.7	4.1	n/a	0.0	0.0	n/a
04/09/2004	7.8	7.9	n/a	9.3	9.5	n/a	5.6	6.3	n/a	1.8	0.3	n/a
05/09/2004	5.0	3.1	n/a	6.8	7.4	n/a	1.3	0.2	n/a	2.3	7.1	n/a
06/09/2004	0.4	-0.5	n/a	2.4	1.2	n/a	-1.1	-2.2	n/a	0.0	0.0	n/a
07/09/2004	-1.4	-2.5	n/a	0.1	-1.0	n/a	-2.9	-4.3	n/a	0.0	0.0	n/a
08/09/2004	0.2	-0.4	n/a	3.8	3.1	n/a	-3.1	-3.8	n/a	0.3	0.0	n/a
09/09/2004	1.9	1.9	n/a	4.9	4.8	n/a	-0.4	-0.3	n/a	1.8	0.5	n/a
10/09/2004	6.3	6.0	n/a	12.5	11.6	n/a	1.2	2.2	n/a	0.0	0.0	n/a
11/09/2004	5.2	4.7	n/a	11.7	10.1	n/a	-1.2	0.2	n/a	0.0	0.0	n/a
12/09/2004	4.7	4.7	n/a	10.2	10.3	n/a	-1.0	1.1	n/a	0.0	0.0	n/a
13/09/2004	5.0	4.7	n/a	7.5	6.3	n/a	3.4	3.4	n/a	0.8	0.8	n/a
14/09/2004	4.7	3.6	n/a	6.7	5.3	n/a	1.7	1.2	n/a	0.3	0.0	n/a
15/09/2004	2.3	1.1	n/a	4.0	2.3	n/a	-1.0	0.2	n/a	6.4	6.4	n/a
16/09/2004	1.6	-0.2	n/a	3.0	0.6	n/a	-0.5	-2.2	n/a	7.4	3.0	n/a
17/09/2004	-2.0	-3.7	n/a	-0.4	-2.2	n/a	-2.8	-4.9	n/a	0.0	0.3	n/a
18/09/2004	-2.3	-4.3	n/a	-1.1	-2.7	n/a	-3.7	-6.0	n/a	0.0	0.0	n/a
19/09/2004	-2.6	-4.5	n/a	-1.2	-2.9	n/a	-4.2	-7.8	n/a	0.0	0.0	n/a
20/09/2004	0.1	-0.6	n/a	1.3	0.6	n/a	-2.0	-3.1	n/a	1.8	0.3	n/a
21/09/2004	-0.8	-1.6	n/a	0.2	-0.3	n/a	-2.7	-4.0	n/a	0.0	0.3	n/a
22/09/2004	-2.4	-3.2	n/a	-1.0	-1.8	n/a	-3.4	-4.9	n/a	0.0	0.0	n/a
23/09/2004	-2.5	-4.0	n/a	-0.3	-1.9	n/a	-5.0	-7.1	n/a	0.0	0.0	n/a
24/09/2004	0.7	-0.1	n/a	3.6	2.1	n/a	-3.0	-3.4	n/a	1.0	0.5	n/a
25/09/2004	2.2	0.3	n/a	4.9	2.1	n/a	-0.4	-1.0	n/a	2.0	8.4	n/a
26/09/2004	-0.2	-0.8	n/a	2.5	1.3	n/a	-2.0	-2.7	n/a	0.0	0.0	n/a
27/09/2004	1.9	0.7	n/a	7.8	4.5	n/a	-1.8	-2.9	n/a	0.0	0.0	n/a
28/09/2004	-1.5	-2.5	n/a	1.1	0.7	n/a	-4.4	-4.7	n/a	0.0	0.0	n/a
29/09/2004	-4.4	-4.0	n/a	-3.0	-2.4	n/a	-5.4	-5.1	n/a	0.0	0.3	n/a
30/09/2004	-5.3	-5.1	n/a	-3.4	-2.9	n/a	-8.4	-10.6	n/a	0.0	0.0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
01/10/2004	-8.3	-9.0	n/a	-5.5	-6.8	n/a	-12.8	-11.9	n/a	n/a	n/a	n/a
02/10/2004	-8.2	-8.1	n/a	-6.5	-6.1	n/a	-11.7	-11.8	n/a	n/a	n/a	n/a
03/10/2004	-6.4	-6.7	n/a	-3.7	-3.9	n/a	-10.6	-10.7	n/a	n/a	n/a	n/a
04/10/2004	-9.0	-11.0	n/a	-8.0	-9.3	n/a	-12.1	-15.9	n/a	n/a	n/a	n/a
05/10/2004	-10.7	-14.1	n/a	-9.0	-8.5	n/a	-13.1	-17.7	n/a	n/a	n/a	n/a
06/10/2004	-8.2	-8.8	n/a	-5.4	-5.4	n/a	-10.9	-13.3	n/a	n/a	n/a	n/a
07/10/2004	-5.0	-6.2	n/a	-4.1	-5.2	n/a	-6.6	-8.1	n/a	n/a	n/a	n/a
08/10/2004	-9.7	-10.9	n/a	-6.0	-7.8	n/a	-14.2	-13.5	n/a	n/a	n/a	n/a
09/10/2004	-5.5	-6.2	n/a	1.5	1.0	n/a	-12.2	-12.6	n/a	n/a	n/a	n/a
10/10/2004	-3.7	-4.8	n/a	1.3	0.7	n/a	-7.6	-7.8	n/a	n/a	n/a	n/a
11/10/2004	-5.6	-5.9	n/a	-3.7	-4.1	n/a	-7.0	-8.0	n/a	n/a	n/a	n/a
12/10/2004	-8.0	-9.1	n/a	-3.0	-4.2	n/a	-13.4	-12.5	n/a	n/a	n/a	n/a
13/10/2004	-12.4	-12.8	n/a	-10.7	-11.1	n/a	-13.7	-14.0	n/a	n/a	n/a	n/a
14/10/2004	-12.5	-13.4	n/a	-11.0	-11.8	n/a	-13.4	-14.7	n/a	n/a	n/a	n/a
15/10/2004	-14.1	-14.9	n/a	-12.2	-13.5	n/a	-17.3	-16.7	n/a	n/a	n/a	n/a
16/10/2004	-13.2	-13.4	n/a	-10.8	-11.5	n/a	-16.9	-17.3	n/a	n/a	n/a	n/a
17/10/2004	-13.3	-14.4	n/a	-11.3	-12.4	n/a	-16.0	-17.0	n/a	n/a	n/a	n/a
18/10/2004	-16.4	-17.4	n/a	-15.1	-16.0	n/a	-18.6	-19.3	n/a	n/a	n/a	n/a
19/10/2004	-16.8	-17.8	n/a	-15.1	-16.0	n/a	-18.7	-20.0	n/a	n/a	n/a	n/a
20/10/2004	-14.3	-14.9	n/a	-12.8	-13.1	n/a	-15.9	-17.5	n/a	n/a	n/a	n/a
21/10/2004	-11.9	-11.9	n/a	-8.6	-7.5	n/a	-15.2	-14.1	n/a	n/a	n/a	n/a
22/10/2004	-9.0	-7.8	n/a	-6.6	-5.8	n/a	-13.3	-11.4	n/a	n/a	n/a	n/a
23/10/2004	-8.3	-8.9	n/a	-6.5	-7.3	n/a	-11.6	-11.6	n/a	n/a	n/a	n/a
24/10/2004	-8.7	-8.7	n/a	-5.8	-6.7	n/a	-13.6	-11.7	n/a	n/a	n/a	n/a
25/10/2004	-10.6	-10.8	n/a	-8.5	-8.8	n/a	-15.2	-14.1	n/a	n/a	n/a	n/a
26/10/2004	-15.7	-15.8	n/a	-11.6	-12.2	n/a	-21.4	-20.2	n/a	n/a	n/a	n/a
27/10/2004	-11.4	-12.4	n/a	-3.3	-5.1	n/a	-20.7	-19.8	n/a	n/a	n/a	n/a
28/10/2004	-7.6	-8.5	n/a	-3.0	-4.4	n/a	-13.4	-12.8	n/a	n/a	n/a	n/a
29/10/2004	-11.7	-12.0	n/a	-8.8	-9.0	n/a	-16.1	-15.5	n/a	n/a	n/a	n/a
30/10/2004	-3.9	-4.5	n/a	-0.1	-1.1	n/a	-10.7	-10.3	n/a	n/a	n/a	n/a
31/10/2004	-11.6	-14.0	n/a	-3.4	-2.3	n/a	-23.4	-23.3	n/a	n/a	n/a	n/a
01/11/2004	-25.9	-23.9	n/a	-23.4	-21.1	n/a	-28.5	-26.4	n/a	n/a	n/a	n/a
02/11/2004	-22.8	-21.9	n/a	-17.9	-18.5	n/a	-28.5	-26.0	n/a	n/a	n/a	n/a
03/11/2004	-14.5	-15.8	n/a	-7.5	-10.8	n/a	-17.9	-18.6	n/a	n/a	n/a	n/a
04/11/2004	-5.5	-6.8	n/a	-3.8	-4.2	n/a	-7.4	-10.8	n/a	n/a	n/a	n/a
05/11/2004	-7.9	-7.4	n/a	-3.5	-4.1	n/a	-14.4	-11.5	n/a	n/a	n/a	n/a
06/11/2004	-17.8	-14.6	n/a	-12.5	-9.4	n/a	-22.3	-18.9	n/a	n/a	n/a	n/a
07/11/2004	-23.0	-21.0	n/a	-20.6	-17.4	n/a	-26.6	-23.0	n/a	n/a	n/a	n/a
08/11/2004	-24.6	-23.8	n/a	-20.3	-18.8	n/a	-31.6	-30.4	n/a	n/a	n/a	n/a
09/11/2004	-24.3	-25.8	n/a	-19.6	-19.5	n/a	-31.9	-32.1	n/a	n/a	n/a	n/a
10/11/2004	-24.6	-25.7	n/a	-20.2	-21.3	n/a	-30.2	-30.6	n/a	n/a	n/a	n/a
11/11/2004	-23.3	-23.8	n/a	-9.6	-8.9	n/a	-32.9	-32.6	n/a	n/a	n/a	n/a
12/11/2004	-19.0	-20.2	n/a	-7.3	-8.0	n/a	-26.5	-26.8	n/a	n/a	n/a	n/a
13/11/2004	-24.7	-25.1	n/a	-21.4	-22.4	n/a	-30.0	-28.8	n/a	n/a	n/a	n/a
14/11/2004	-19.2	-19.5	n/a	-14.0	-14.4	n/a	-27.1	-27.0	n/a	n/a	n/a	n/a
15/11/2004	-12.9	-13.3	n/a	-12.0	-11.5	n/a	-14.0	-14.9	n/a	n/a	n/a	n/a
16/11/2004	-23.2	-24.3	n/a	-13.8	-14.9	n/a	-32.9	-31.2	n/a	n/a	n/a	n/a
17/11/2004	-30.4	-29.0	n/a	-23.8	-22.7	n/a	-34.3	-33.2	n/a	n/a	n/a	n/a
18/11/2004	-18.5	-18.5	n/a	-14.7	-15.4	n/a	-23.8	-22.7	n/a	n/a	n/a	n/a
19/11/2004	-16.8	-16.7	n/a	-14.7	-15.3	n/a	-18.8	-18.3	n/a	n/a	n/a	n/a
20/11/2004	-18.8	-19.7	n/a	-13.5	-15.2	n/a	-23.9	-23.6	n/a	n/a	n/a	n/a
21/11/2004	-16.6	-18.0	n/a	-12.4	-13.1	n/a	-21.5	-21.2	n/a	n/a	n/a	n/a
22/11/2004	-23.8	-21.0	n/a	-19.7	-19.7	n/a	-27.7	-23.3	n/a	n/a	n/a	n/a
23/11/2004	-21.5	-21.6	n/a	-17.1	-18.4	n/a	-25.1	-25.5	n/a	n/a	n/a	n/a
24/11/2004	-19.3	-22.4	n/a	-17.0	-18.0	n/a	-24.4	-27.9	n/a	n/a	n/a	n/a
25/11/2004	-24.8	-24.6	n/a	-21.2	-20.2	n/a	-33.9	-30.8	n/a	n/a	n/a	n/a
26/11/2004	-35.5	-31.6	n/a	-31.6	-29.8	n/a	-37.7	-33.1	n/a	n/a	n/a	n/a
27/11/2004	-31.4	-31.2	n/a	-28.0	-29.1	n/a	-34.6	-33.1	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
28/11/2004	-34.1	-33.7	n/a	-29.2	-28.9	n/a	-39.1	-37.8	n/a	n/a	n/a	n/a
29/11/2004	-35.6	-35.0	n/a	-31.1	-30.4	n/a	-38.9	-38.4	n/a	n/a	n/a	n/a
30/11/2004	-32.0	-33.1	n/a	-29.2	-29.1	n/a	-35.2	-35.9	n/a	n/a	n/a	n/a
01/12/2004	-31.5	-31.6	n/a	-25.3	-24.5	n/a	-35.0	-35.3	n/a	n/a	n/a	n/a
02/12/2004	-29.5	-30.2	n/a	-21.6	-22.7	n/a	-34.4	-34.6	n/a	n/a	n/a	n/a
03/12/2004	-33.4	-32.8	n/a	-30.0	-28.6	n/a	-37.0	-36.1	n/a	n/a	n/a	n/a
04/12/2004	-26.7	-26.6	n/a	-24.1	-24.0	n/a	-31.0	-28.7	n/a	n/a	n/a	n/a
05/12/2004	-27.9	-26.9	n/a	-24.4	-24.2	n/a	-31.5	-31.1	n/a	n/a	n/a	n/a
06/12/2004	-33.7	-32.1	n/a	-29.8	-29.2	n/a	-37.5	-35.5	n/a	n/a	n/a	n/a
07/12/2004	-37.5	-36.7	n/a	-35.3	-34.0	n/a	-39.0	-38.8	n/a	n/a	n/a	n/a
08/12/2004	-34.0	-33.8	n/a	-30.5	-30.8	n/a	-39.2	-38.7	n/a	n/a	n/a	n/a
09/12/2004	-32.0	-32.4	n/a	-30.2	-30.0	n/a	-33.5	-34.5	n/a	n/a	n/a	n/a
10/12/2004	-28.2	-29.0	n/a	-25.6	-26.8	n/a	-32.0	-30.5	n/a	n/a	n/a	n/a
11/12/2004	-26.8	-25.4	n/a	-22.5	-21.7	n/a	-30.6	-29.2	n/a	n/a	n/a	n/a
12/12/2004	-22.0	-22.6	n/a	-19.2	-20.0	n/a	-26.4	-27.3	n/a	n/a	n/a	n/a
13/12/2004	-23.0	-23.5	n/a	-19.6	-20.8	n/a	-29.0	-27.2	n/a	n/a	n/a	n/a
14/12/2004	-32.8	-31.9	n/a	-28.4	-26.6	n/a	-36.2	-34.7	n/a	n/a	n/a	n/a
15/12/2004	-34.7	-33.8	n/a	-32.1	-31.6	n/a	-37.6	-35.8	n/a	n/a	n/a	n/a
16/12/2004	-34.1	-33.2	n/a	-32.1	-30.9	n/a	-37.1	-35.3	n/a	n/a	n/a	n/a
17/12/2004	-36.8	-36.6	n/a	-35.0	-33.9	n/a	-38.3	-39.0	n/a	n/a	n/a	n/a
18/12/2004	-36.0	-35.5	n/a	-33.8	-33.1	n/a	-38.2	-37.7	n/a	n/a	n/a	n/a
19/12/2004	-40.2	-36.4	n/a	-36.5	-33.4	n/a	-42.5	-38.8	n/a	n/a	n/a	n/a
20/12/2004	-34.2	-33.5	n/a	-30.8	-30.1	n/a	-38.2	-39.0	n/a	n/a	n/a	n/a
21/12/2004	-33.2	-32.9	n/a	-28.4	-29.0	n/a	-36.2	-36.0	n/a	n/a	n/a	n/a
22/12/2004	-34.0	-33.2	n/a	-29.1	-30.7	n/a	-38.4	-37.0	n/a	n/a	n/a	n/a
23/12/2004	-33.6	-32.7	n/a	-31.6	-30.2	n/a	-37.0	-36.4	n/a	n/a	n/a	n/a
24/12/2004	-33.7	-33.0	n/a	-32.1	-30.4	n/a	-34.8	-35.2	n/a	n/a	n/a	n/a
25/12/2004	-28.4	-28.0	n/a	-22.4	-22.4	n/a	-35.4	-35.1	n/a	n/a	n/a	n/a
26/12/2004	-27.6	-27.3	n/a	-21.1	-21.8	n/a	-31.5	-30.6	n/a	n/a	n/a	n/a
27/12/2004	-21.5	-21.4	n/a	-19.2	-19.1	n/a	-25.5	-23.9	n/a	n/a	n/a	n/a
28/12/2004	-26.9	-26.0	n/a	-20.6	-19.5	n/a	-32.9	-31.2	n/a	n/a	n/a	n/a
29/12/2004	-27.8	-27.4	n/a	-26.1	-25.8	n/a	-30.2	-29.0	n/a	n/a	n/a	n/a
30/12/2004	-25.8	-25.8	n/a	-22.6	-23.8	n/a	-29.2	-29.1	n/a	n/a	n/a	n/a
31/12/2004	-27.5	-27.2	n/a	-24.9	-22.8	n/a	-30.8	-31.4	n/a	n/a	n/a	n/a
01/01/2005	-24.6	-24.9	n/a	-21.5	-22.2	n/a	-32.0	-30.8	n/a	n/a	n/a	n/a
02/01/2005	-30.0	-29.6	n/a	-26.4	-28.2	n/a	-33.0	-30.9	n/a	n/a	n/a	n/a
03/01/2005	-29.9	-29.0	n/a	-27.6	-26.1	n/a	-32.0	-32.2	n/a	n/a	n/a	n/a
04/01/2005	-22.9	-21.3	n/a	-13.4	-13.0	n/a	-32.1	-32.8	n/a	n/a	n/a	n/a
05/01/2005	-11.9	-12.1	n/a	-8.6	-8.4	n/a	-14.9	-15.7	n/a	n/a	n/a	n/a
06/01/2005	-17.1	-17.5	n/a	-14.6	-13.8	n/a	-22.6	-21.6	n/a	n/a	n/a	n/a
07/01/2005	-23.2	-23.4	n/a	-21.0	-21.0	n/a	-26.2	-25.8	n/a	n/a	n/a	n/a
08/01/2005	-23.3	-23.8	n/a	-21.7	-22.3	n/a	-27.5	-28.4	n/a	n/a	n/a	n/a
09/01/2005	-25.7	-26.1	n/a	-21.6	-21.4	n/a	-30.3	-30.3	n/a	n/a	n/a	n/a
10/01/2005	-30.3	-30.1	n/a	-23.6	-23.8	n/a	-34.5	-33.6	n/a	n/a	n/a	n/a
11/01/2005	-35.0	-34.1	n/a	-32.1	-30.4	n/a	-39.1	-39.3	n/a	n/a	n/a	n/a
12/01/2005	-40.2	-38.9	n/a	-36.9	-36.0	n/a	-43.3	-42.1	n/a	n/a	n/a	n/a
13/01/2005	-41.8	-40.1	n/a	-39.4	-36.5	n/a	-44.2	-43.6	n/a	n/a	n/a	n/a
14/01/2005	-40.8	-38.5	n/a	-39.1	-36.2	n/a	-42.5	-41.2	n/a	n/a	n/a	n/a
15/01/2005	-38.2	-37.4	n/a	-31.9	-30.8	n/a	-41.5	-40.9	n/a	n/a	n/a	n/a
16/01/2005	-29.2	-28.1	n/a	-25.7	-24.8	n/a	-31.9	-31.9	n/a	n/a	n/a	n/a
17/01/2005	-33.8	-32.1	n/a	-29.8	-29.2	n/a	-37.5	-35.3	n/a	n/a	n/a	n/a
18/01/2005	-33.0	-32.0	n/a	-30.1	-28.9	n/a	-36.3	-34.8	n/a	n/a	n/a	n/a
19/01/2005	-33.7	-32.9	n/a	-30.2	-29.4	n/a	-36.3	-35.6	n/a	n/a	n/a	n/a
20/01/2005	-34.4	-34.9	n/a	-31.4	-31.8	n/a	-36.3	-36.6	n/a	n/a	n/a	n/a
21/01/2005	-29.7	-29.9	n/a	-27.9	-27.1	n/a	-33.6	-33.0	n/a	n/a	n/a	n/a
22/01/2005	-28.3	-27.9	n/a	-24.1	-24.4	n/a	-33.8	-32.5	n/a	n/a	n/a	n/a
23/01/2005	-35.7	-34.2	n/a	-32.2	-31.9	n/a	-39.3	-35.9	n/a	n/a	n/a	n/a
24/01/2005	-38.1	-34.2	n/a	-35.7	-31.3	n/a	-40.5	-37.8	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
25/01/2005	-36.3	-35.2	n/a	-33.7	-32.4	n/a	-38.0	-38.2	n/a	n/a	n/a	n/a
26/01/2005	-37.2	-35.8	n/a	-32.6	-32.4	n/a	-39.7	-38.9	n/a	n/a	n/a	n/a
27/01/2005	-29.5	-30.3	n/a	-25.3	-25.1	n/a	-35.5	-36.8	n/a	n/a	n/a	n/a
28/01/2005	-32.2	-31.8	n/a	-27.7	-26.7	n/a	-37.1	-37.1	n/a	n/a	n/a	n/a
29/01/2005	-29.6	-29.0	n/a	-26.4	-24.3	n/a	-31.6	-33.2	n/a	n/a	n/a	n/a
30/01/2005	-25.9	-27.2	n/a	-22.9	-23.3	n/a	-29.6	-32.2	n/a	n/a	n/a	n/a
31/01/2005	-28.1	-28.1	n/a	-25.2	-23.6	n/a	-31.1	-32.4	n/a	n/a	n/a	n/a
01/02/2005	-28.9	-29.0	n/a	-25.6	-26.2	n/a	-33.8	-33.0	n/a	n/a	n/a	n/a
02/02/2005	-35.9	-36.1	n/a	-30.2	-33.0	n/a	-38.5	-37.5	n/a	n/a	n/a	n/a
03/02/2005	-38.2	-37.4	n/a	-36.5	-35.5	n/a	-40.3	-39.7	n/a	n/a	n/a	n/a
04/02/2005	-34.8	-35.0	n/a	-33.3	-33.7	n/a	-37.7	-36.8	n/a	n/a	n/a	n/a
05/02/2005	-33.4	-32.9	n/a	-31.6	-30.6	n/a	-35.6	-36.3	n/a	n/a	n/a	n/a
06/02/2005	-33.3	-33.1	n/a	-31.3	-31.0	n/a	-35.5	-35.9	n/a	n/a	n/a	n/a
07/02/2005	-29.8	-31.0	n/a	-27.7	-29.1	n/a	-32.9	-34.1	n/a	n/a	n/a	n/a
08/02/2005	-35.3	-34.5	n/a	-31.8	-31.0	n/a	-40.0	-38.2	n/a	n/a	n/a	n/a
09/02/2005	-38.4	-37.3	n/a	-33.6	-32.0	n/a	-42.2	-39.3	n/a	n/a	n/a	n/a
10/02/2005	-36.2	-32.1	n/a	-34.3	-28.6	n/a	-38.4	-35.1	n/a	n/a	n/a	n/a
11/02/2005	-39.6	-35.7	n/a	-34.9	-31.1	n/a	-42.9	-38.8	n/a	n/a	n/a	n/a
12/02/2005	-40.7	-38.0	n/a	-36.2	-35.8	n/a	-44.1	-39.9	n/a	n/a	n/a	n/a
13/02/2005	-38.9	-38.2	n/a	-34.6	-34.1	n/a	-41.5	-40.1	n/a	n/a	n/a	n/a
14/02/2005	-34.7	-34.2	n/a	-27.6	-27.0	n/a	-41.5	-39.9	n/a	n/a	n/a	n/a
15/02/2005	-30.2	-30.6	n/a	-26.5	-26.6	n/a	-34.9	-36.1	n/a	n/a	n/a	n/a
16/02/2005	-34.5	-34.5	n/a	-31.1	-31.5	n/a	-38.0	-37.5	n/a	n/a	n/a	n/a
17/02/2005	-33.9	-31.4	n/a	-30.6	-28.0	n/a	-40.0	-36.7	n/a	n/a	n/a	n/a
18/02/2005	-35.2	-35.1	n/a	-31.8	-30.7	n/a	-39.3	-37.7	n/a	n/a	n/a	n/a
19/02/2005	-34.4	-31.8	n/a	-31.7	-27.9	n/a	-36.5	-36.1	n/a	n/a	n/a	n/a
20/02/2005	-31.0	-30.6	n/a	-23.8	-23.7	n/a	-36.5	-36.7	n/a	n/a	n/a	n/a
21/02/2005	-27.9	-28.3	n/a	-24.7	-25.0	n/a	-32.0	-31.5	n/a	n/a	n/a	n/a
22/02/2005	-28.9	-28.5	n/a	-25.9	-24.7	n/a	-32.0	-31.9	n/a	n/a	n/a	n/a
23/02/2005	-24.0	-24.6	n/a	-19.5	-20.5	n/a	-29.7	-28.7	n/a	n/a	n/a	n/a
24/02/2005	-26.4	-25.1	n/a	-23.7	-22.3	n/a	-30.4	-27.7	n/a	n/a	n/a	n/a
25/02/2005	-19.8	-21.1	n/a	-18.2	-19.3	n/a	-24.1	-25.9	n/a	n/a	n/a	n/a
26/02/2005	-25.5	-27.3	n/a	-18.7	-22.7	n/a	-32.3	-31.6	n/a	n/a	n/a	n/a
27/02/2005	-33.1	-30.9	n/a	-29.1	-26.2	n/a	-36.9	-33.4	n/a	n/a	n/a	n/a
28/02/2005	-30.8	-29.7	n/a	-24.7	-22.7	n/a	-37.0	-34.6	n/a	n/a	n/a	n/a
01/03/2005	-21.5	-23.2	n/a	-20.0	-20.5	n/a	-25.6	-24.7	n/a	n/a	n/a	n/a
02/03/2005	-19.0	-19.9	n/a	-16.1	-16.8	n/a	-21.4	-24.1	n/a	n/a	n/a	n/a
03/03/2005	-30.3	-32.0	n/a	-19.3	-24.1	n/a	-35.0	-35.5	n/a	n/a	n/a	n/a
04/03/2005	-34.5	-32.6	n/a	-31.0	-27.5	n/a	-38.9	-35.4	n/a	n/a	n/a	n/a
05/03/2005	-38.0	-33.3	n/a	-30.8	-30.3	n/a	-41.8	-35.2	n/a	n/a	n/a	n/a
06/03/2005	-37.9	-33.7	n/a	-31.3	-28.7	n/a	-43.3	-36.9	n/a	n/a	n/a	n/a
07/03/2005	-32.0	-30.6	n/a	-25.6	-25.4	n/a	-38.6	-36.2	n/a	n/a	n/a	n/a
08/03/2005	-25.8	-24.6	n/a	-21.5	-17.9	n/a	-29.9	-27.9	n/a	n/a	n/a	n/a
09/03/2005	-28.4	-29.8	n/a	-23.9	-25.3	n/a	-35.7	-37.2	n/a	n/a	n/a	n/a
10/03/2005	-36.5	-35.9	n/a	-33.5	-32.3	n/a	-38.9	-38.3	n/a	n/a	n/a	n/a
11/03/2005	-36.0	-32.7	n/a	-31.1	-25.8	n/a	-41.2	-39.6	n/a	n/a	n/a	n/a
12/03/2005	-28.4	-27.3	n/a	-22.3	-21.8	n/a	-33.1	-33.4	n/a	n/a	n/a	n/a
13/03/2005	-24.4	-23.5	n/a	-18.3	-20.0	n/a	-30.2	-29.1	n/a	n/a	n/a	n/a
14/03/2005	-25.3	-22.8	n/a	-20.2	-17.6	n/a	-32.2	-28.1	n/a	n/a	n/a	n/a
15/03/2005	-26.2	-26.1	n/a	-21.5	-19.8	n/a	-31.6	-30.3	n/a	n/a	n/a	n/a
16/03/2005	-25.9	-25.3	n/a	-22.6	-19.6	n/a	-30.1	-29.3	n/a	n/a	n/a	n/a
17/03/2005	-22.8	-23.6	n/a	-16.8	-18.9	n/a	-29.0	-27.6	n/a	n/a	n/a	n/a
18/03/2005	-28.3	-26.5	n/a	-24.2	-23.5	n/a	-31.3	-28.8	n/a	n/a	n/a	n/a
19/03/2005	-29.1	-28.2	n/a	-23.7	-23.8	n/a	-32.5	-31.0	n/a	n/a	n/a	n/a
20/03/2005	-27.2	-25.7	n/a	-19.8	-19.3	n/a	-33.3	-30.5	n/a	n/a	n/a	n/a
21/03/2005	-23.8	-23.6	n/a	-20.5	-20.4	n/a	-28.6	-29.0	n/a	n/a	n/a	n/a
22/03/2005	-26.1	-25.6	n/a	-22.8	-21.1	n/a	-29.9	-29.3	n/a	n/a	n/a	n/a
23/03/2005	-18.9	-18.9	n/a	-17.1	-17.4	n/a	-22.8	-21.1	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
24/03/2005	-15.4	-15.9	n/a	-11.6	-13.1	n/a	-18.9	-20.3	n/a	n/a	n/a	n/a
25/03/2005	-23.0	-22.8	n/a	-17.1	-16.7	n/a	-29.7	-28.6	n/a	n/a	n/a	n/a
26/03/2005	-30.4	-29.7	n/a	-26.4	-26.6	n/a	-35.0	-32.5	n/a	n/a	n/a	n/a
27/03/2005	-31.3	-30.7	n/a	-24.8	-26.7	n/a	-37.2	-35.6	n/a	n/a	n/a	n/a
28/03/2005	-22.8	-24.2	n/a	-16.2	-15.6	n/a	-30.8	-31.4	n/a	n/a	n/a	n/a
29/03/2005	-16.1	-15.2	n/a	-10.8	-12.8	n/a	-20.1	-17.4	n/a	n/a	n/a	n/a
30/03/2005	-8.5	-9.7	n/a	-5.4	-5.6	n/a	-10.9	-14.1	n/a	n/a	n/a	n/a
31/03/2005	-16.4	-17.5	n/a	-9.5	-10.5	n/a	-21.8	-21.4	n/a	n/a	n/a	n/a
01/04/2005	-21.5	-22.0	n/a	-17.2	-19.2	n/a	-24.5	-25.1	n/a	n/a	n/a	n/a
02/04/2005	-21.8	-22.6	n/a	-19.9	-20.9	n/a	-24.1	-24.2	n/a	n/a	n/a	n/a
03/04/2005	-18.1	-21.3	n/a	-15.8	-19.4	n/a	-19.9	-23.2	n/a	n/a	n/a	n/a
04/04/2005	-18.2	-18.2	n/a	-15.4	-14.5	n/a	-21.0	-21.7	n/a	n/a	n/a	n/a
05/04/2005	-13.5	-14.0	n/a	-8.3	-9.1	n/a	-20.6	-19.7	n/a	n/a	n/a	n/a
06/04/2005	-11.0	-11.0	n/a	-9.1	-9.0	n/a	-12.4	-13.7	n/a	n/a	n/a	n/a
07/04/2005	-10.2	-11.1	n/a	-7.6	-5.1	n/a	-11.6	-14.0	n/a	n/a	n/a	n/a
08/04/2005	-11.0	-10.5	n/a	-8.7	-8.2	n/a	-12.9	-11.9	n/a	n/a	n/a	n/a
09/04/2005	-8.0	-7.1	n/a	-1.7	-0.7	n/a	-13.2	-11.9	n/a	n/a	n/a	n/a
10/04/2005	-4.8	-6.5	n/a	0.3	-0.2	n/a	-14.4	-15.1	n/a	n/a	n/a	n/a
11/04/2005	-15.8	-15.3	n/a	-12.3	-10.3	n/a	-20.5	-19.6	n/a	n/a	n/a	n/a
12/04/2005	-16.3	-15.2	n/a	-10.1	-9.7	n/a	-23.2	-20.1	n/a	n/a	n/a	n/a
13/04/2005	-12.4	-12.3	n/a	-8.2	-8.8	n/a	-18.4	-17.0	n/a	n/a	n/a	n/a
14/04/2005	-5.5	-6.7	n/a	-1.3	-2.2	n/a	-11.3	-12.4	n/a	n/a	n/a	n/a
15/04/2005	-14.3	-14.4	n/a	-10.5	-11.5	n/a	-18.8	-19.4	n/a	n/a	n/a	n/a
16/04/2005	-18.3	-17.8	n/a	-15.1	-14.6	n/a	-22.9	-22.7	n/a	n/a	n/a	n/a
17/04/2005	-20.4	-18.9	n/a	-13.8	-9.9	n/a	-26.7	-25.2	n/a	n/a	n/a	n/a
18/04/2005	-21.1	-19.5	n/a	-13.3	-13.9	n/a	-27.4	-23.5	n/a	n/a	n/a	n/a
19/04/2005	-17.7	-17.8	n/a	-10.8	-13.1	n/a	-25.3	-23.2	n/a	n/a	n/a	n/a
20/04/2005	-10.5	-9.3	n/a	-5.0	-3.2	n/a	-17.2	-16.5	n/a	n/a	n/a	n/a
21/04/2005	-5.8	-5.8	n/a	0.5	0.1	n/a	-11.3	-11.1	n/a	n/a	n/a	n/a
22/04/2005	-3.3	-2.8	n/a	0.5	1.2	n/a	-11.3	-11.2	n/a	n/a	n/a	n/a
23/04/2005	-1.5	-1.9	n/a	1.3	1.9	n/a	-5.2	-6.2	n/a	n/a	n/a	n/a
24/04/2005	-5.0	-5.2	n/a	0.4	-0.2	n/a	-7.6	-8.0	n/a	n/a	n/a	n/a
25/04/2005	-8.3	-8.4	n/a	-7.2	-7.1	n/a	-11.8	-10.1	n/a	n/a	n/a	n/a
26/04/2005	-12.6	-11.3	n/a	-9.5	-9.5	n/a	-16.7	-15.3	n/a	n/a	n/a	n/a
27/04/2005	-15.8	-14.9	n/a	-12.3	-12.9	n/a	-19.0	-17.3	n/a	n/a	n/a	n/a
28/04/2005	-15.7	-15.1	n/a	-11.5	-12.6	n/a	-20.4	-18.3	n/a	n/a	n/a	n/a
29/04/2005	-15.1	-14.5	n/a	-11.8	-11.9	n/a	-19.1	-18.8	n/a	n/a	n/a	n/a
30/04/2005	-15.0	-14.4	n/a	-8.5	-8.0	n/a	-22.9	-21.4	n/a	n/a	n/a	n/a
01/05/2005	-7.4	-7.9	n/a	-1.8	-3.1	n/a	-13.9	-14.9	n/a	n/a	n/a	n/a
02/05/2005	-5.3	-5.8	n/a	-3.5	-3.4	n/a	-8.8	-9.6	n/a	n/a	n/a	n/a
03/05/2005	-10.3	-10.8	n/a	-8.4	-7.8	n/a	-13.3	-14.7	n/a	n/a	n/a	n/a
04/05/2005	-12.4	-12.6	n/a	-9.2	-9.1	n/a	-17.4	-16.3	n/a	n/a	n/a	n/a
05/05/2005	-14.3	-13.1	n/a	-9.8	-9.0	n/a	-22.2	-18.0	n/a	n/a	n/a	n/a
06/05/2005	-11.4	-11.2	n/a	-3.0	-3.2	n/a	-19.2	-19.6	n/a	n/a	n/a	n/a
07/05/2005	-13.7	-13.2	n/a	-9.6	-9.0	n/a	-20.1	-16.0	n/a	n/a	n/a	n/a
08/05/2005	-12.7	-12.8	n/a	-7.4	-8.4	n/a	-17.9	-17.5	n/a	n/a	n/a	n/a
09/05/2005	-13.1	-13.1	n/a	-10.6	-10.8	n/a	-16.9	-15.7	n/a	n/a	n/a	n/a
10/05/2005	-13.0	-13.5	n/a	-8.4	-9.4	n/a	-17.3	-18.1	n/a	n/a	n/a	n/a
11/05/2005	-9.8	-11.0	n/a	-2.4	-3.8	n/a	-18.4	-18.4	n/a	n/a	n/a	n/a
12/05/2005	-10.0	-10.4	n/a	-7.3	-6.9	n/a	-13.9	-14.5	n/a	n/a	n/a	n/a
13/05/2005	-11.2	-11.7	n/a	-4.6	-3.4	n/a	-17.3	-18.7	n/a	n/a	n/a	n/a
14/05/2005	-11.2	-10.8	n/a	-8.4	-8.0	n/a	-16.7	-15.4	n/a	n/a	n/a	n/a
15/05/2005	-13.8	-13.8	n/a	-11.6	-11.8	n/a	-16.1	-16.0	n/a	n/a	n/a	n/a
16/05/2005	-14.4	-14.9	n/a	-11.5	-12.5	n/a	-17.9	-16.9	n/a	n/a	n/a	n/a
17/05/2005	-13.3	-13.8	n/a	-10.2	-10.9	n/a	-19.1	-17.3	n/a	n/a	n/a	n/a
18/05/2005	-14.2	-13.1	n/a	-7.3	-6.7	n/a	-21.9	-20.1	n/a	n/a	n/a	n/a
19/05/2005	-12.8	-12.0	n/a	-8.8	-8.9	n/a	-18.3	-15.3	n/a	n/a	n/a	n/a
20/05/2005	-11.0	-11.7	n/a	-8.6	-8.7	n/a	-13.6	-15.0	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
21/05/2005	-7.7	-7.7	n/a	-5.9	-6.1	n/a	-9.2	-9.8	n/a	n/a	n/a	n/a
22/05/2005	-8.8	-9.7	n/a	-5.6	-6.3	n/a	-12.5	-12.8	n/a	n/a	n/a	n/a
23/05/2005	-7.4	-6.9	n/a	-2.5	-3.1	n/a	-15.2	-12.7	n/a	n/a	n/a	n/a
24/05/2005	-4.3	-4.9	n/a	-3.0	-3.8	n/a	-6.0	-6.0	n/a	n/a	n/a	n/a
25/05/2005	-3.9	-4.2	n/a	-1.5	-1.5	n/a	-6.8	-6.4	n/a	n/a	n/a	n/a
26/05/2005	-1.8	-1.8	n/a	0.4	4.9	n/a	-4.6	-6.7	n/a	n/a	n/a	n/a
27/05/2005	-1.3	-1.6	n/a	4.5	1.9	n/a	-5.7	-6.8	n/a	n/a	n/a	n/a
28/05/2005	-2.0	-1.6	n/a	2.1	1.8	n/a	-7.4	-7.1	n/a	n/a	n/a	n/a
29/05/2005	3.0	3.0	n/a	5.4	6.6	n/a	-0.1	-0.1	n/a	n/a	n/a	n/a
30/05/2005	0.7	0.4	n/a	2.8	2.7	n/a	-1.4	-1.4	n/a	n/a	n/a	n/a
31/05/2005	-2.0	-2.2	n/a	0.9	1.3	n/a	-4.7	-4.1	n/a	n/a	n/a	n/a
01/06/2005	-1.5	0.1	n/a	2.2	4.2	n/a	-6.8	-4.6	n/a	0.0	n/a	n/a
02/06/2005	0.9	1.1	n/a	5.1	3.3	n/a	-4.9	-2.3	n/a	0.0	n/a	n/a
03/06/2005	1.9	2.4	n/a	4.1	4.8	n/a	0.5	0.8	n/a	0.0	n/a	n/a
04/06/2005	2.0	1.7	n/a	3.7	3.5	n/a	0.9	0.4	n/a	0.0	n/a	n/a
05/06/2005	1.3	0.5	n/a	2.7	2.2	n/a	0.1	-0.5	n/a	0.0	n/a	n/a
06/06/2005	1.5	1.5	n/a	6.3	6.6	n/a	-1.2	-2.6	n/a	0.0	n/a	n/a
07/06/2005	5.3	5.1	n/a	10.9	10.6	n/a	-2.0	-1.7	n/a	0.0	n/a	n/a
08/06/2005	4.8	5.6	n/a	7.9	8.9	n/a	1.7	2.6	n/a	0.0	n/a	n/a
09/06/2005	3.6	3.8	n/a	7.4	7.0	n/a	-0.6	0.2	n/a	0.0	n/a	n/a
10/06/2005	4.7	5.1	n/a	9.9	9.4	n/a	-1.0	0.2	n/a	0.0	n/a	n/a
11/06/2005	8.6	9.3	n/a	14.6	15.4	n/a	-0.5	2.3	n/a	0.0	n/a	n/a
12/06/2005	12.4	12.3	n/a	19.2	17.8	n/a	3.2	3.6	n/a	0.0	n/a	n/a
13/06/2005	12.5	9.6	n/a	20.5	17.2	n/a	4.1	2.1	n/a	0.0	n/a	n/a
14/06/2005	6.9	5.4	n/a	11.9	10.6	n/a	1.2	0.5	n/a	0.0	n/a	n/a
15/06/2005	9.5	5.8	n/a	18.7	14.0	n/a	1.6	0.2	n/a	0.0	n/a	n/a
16/06/2005	1.2	0.4	n/a	2.1	1.7	n/a	0.4	-0.6	n/a	4.1	n/a	n/a
17/06/2005	2.7	2.3	n/a	5.8	5.4	n/a	-0.2	-0.6	n/a	0.0	n/a	n/a
18/06/2005	4.1	4.0	n/a	7.4	7.9	n/a	-1.0	-0.3	n/a	0.0	n/a	n/a
19/06/2005	4.6	4.1	n/a	6.8	6.5	n/a	1.3	1.4	n/a	0.0	n/a	n/a
20/06/2005	5.4	4.9	n/a	10.8	8.2	n/a	0.2	0.8	n/a	1.0	n/a	n/a
21/06/2005	3.7	3.0	n/a	6.5	5.6	n/a	1.2	0.4	n/a	0.8	n/a	n/a
22/06/2005	4.6	5.0	n/a	8.8	9.8	n/a	0.3	0.5	n/a	0.0	n/a	n/a
23/06/2005	9.8	8.6	n/a	15.1	13.4	n/a	0.9	2.0	n/a	0.0	n/a	n/a
24/06/2005	5.3	4.2	n/a	8.3	7.4	n/a	2.7	2.0	n/a	0.0	n/a	n/a
25/06/2005	3.7	3.4	n/a	7.1	6.6	n/a	1.7	1.5	n/a	1.0	n/a	n/a
26/06/2005	3.6	3.4	n/a	6.3	6.2	n/a	1.0	-0.2	n/a	1.5	n/a	n/a
27/06/2005	6.4	5.5	n/a	12.8	10.8	n/a	2.4	2.2	n/a	0.5	n/a	n/a
28/06/2005	4.8	4.6	n/a	9.2	9.0	n/a	1.8	1.1	n/a	0.0	n/a	n/a
29/06/2005	9.9	10.0	n/a	16.1	15.9	n/a	2.3	2.1	n/a	0.0	n/a	n/a
30/06/2005	9.7	9.3	n/a	15.4	14.3	n/a	5.4	5.4	n/a	2.5	n/a	n/a
01/07/2005	5.0	4.8	n/a	6.9	6.9	n/a	3.1	1.9	n/a	2.3	n/a	n/a
02/07/2005	4.9	4.6	n/a	6.5	6.4	n/a	3.7	3.0	n/a	0.0	n/a	n/a
03/07/2005	9.2	9.1	n/a	15.4	15.8	n/a	3.2	1.5	n/a	0.0	n/a	n/a
04/07/2005	14.5	12.9	n/a	22.8	20.6	n/a	7.8	5.9	n/a	1.3	n/a	n/a
05/07/2005	5.2	3.6	n/a	10.0	6.0	n/a	3.5	2.5	n/a	3.0	n/a	n/a
06/07/2005	8.8	9.7	n/a	16.1	16.9	n/a	3.1	2.4	n/a	0.0	n/a	n/a
07/07/2005	10.2	11.0	n/a	15.2	16.6	n/a	3.8	6.4	n/a	1.5	n/a	n/a
08/07/2005	8.5	8.0	n/a	9.2	9.2	n/a	7.3	5.6	n/a	10.4	n/a	n/a
09/07/2005	8.6	7.9	n/a	12.7	12.6	n/a	6.3	5.2	n/a	0.0	n/a	n/a
10/07/2005	13.6	13.4	n/a	21.5	20.9	n/a	5.0	4.6	n/a	0.0	n/a	n/a
11/07/2005	17.6	17.1	n/a	25.2	24.5	n/a	9.3	10.2	n/a	1.0	n/a	n/a
12/07/2005	17.6	16.9	n/a	23.7	23.2	n/a	12.4	10.3	n/a	1.0	n/a	n/a
13/07/2005	19.5	18.9	n/a	27.4	26.6	n/a	10.3	10.0	n/a	0.0	n/a	n/a
14/07/2005	16.1	15.5	n/a	22.3	22.4	n/a	11.1	9.3	n/a	14.0	n/a	n/a
15/07/2005	10.0	8.3	n/a	12.8	11.5	n/a	7.1	5.5	n/a	2.3	n/a	n/a
16/07/2005	8.3	7.3	n/a	11.3	10.6	n/a	4.9	3.9	n/a	0.0	n/a	n/a
17/07/2005	8.4	7.5	n/a	10.5	10.7	n/a	5.2	4.4	n/a	0.0	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
18/07/2005	10.3	9.6	n/a	16.5	15.5	n/a	3.9	4.8	n/a	0.0	n/a	n/a
19/07/2005	6.0	5.3	n/a	8.3	7.5	n/a	3.7	2.6	n/a	2.0	n/a	n/a
20/07/2005	3.8	2.9	n/a	5.5	5.6	n/a	2.0	1.3	n/a	3.8	n/a	n/a
21/07/2005	5.1	4.3	n/a	8.3	7.3	n/a	2.4	1.4	n/a	0.3	n/a	n/a
22/07/2005	6.1	4.7	n/a	7.7	5.7	n/a	3.4	3.3	n/a	0.5	n/a	n/a
23/07/2005	6.4	5.1	n/a	9.2	7.6	n/a	3.4	2.4	n/a	0.3	n/a	n/a
24/07/2005	5.2	4.3	n/a	8.5	7.6	n/a	2.5	0.7	n/a	0.5	n/a	n/a
25/07/2005	6.3	6.0	n/a	8.4	8.3	n/a	4.4	4.0	n/a	4.8	n/a	n/a
26/07/2005	7.3	6.7	n/a	9.7	9.8	n/a	5.3	4.6	n/a	0.3	n/a	n/a
27/07/2005	8.6	8.2	n/a	12.8	12.8	n/a	4.7	4.9	n/a	0.5	n/a	n/a
28/07/2005	10.4	10.2	n/a	14.5	14.3	n/a	6.9	6.0	n/a	4.1	n/a	n/a
29/07/2005	11.3	11.7	n/a	16.4	16.8	n/a	6.5	7.1	n/a	0.8	n/a	n/a
30/07/2005	13.1	13.2	n/a	18.7	18.9	n/a	5.5	7.6	n/a	0.0	n/a	n/a
31/07/2005	12.6	12.3	n/a	16.3	16.1	n/a	8.5	8.3	n/a	3.0	n/a	n/a
01/08/2005	12.6	12.1	n/a	16.2	15.8	n/a	10.1	8.4	n/a	0.0	n/a	n/a
02/08/2005	12.4	12.1	n/a	15.4	14.8	n/a	9.2	10.0	n/a	0.0	n/a	n/a
03/08/2005	12.0	11.5	n/a	15.2	14.9	n/a	8.6	8.2	n/a	0.0	n/a	n/a
04/08/2005	13.3	13.3	n/a	21.1	20.5	n/a	5.8	7.1	n/a	0.3	n/a	n/a
05/08/2005	11.2	10.6	n/a	16.0	14.3	n/a	8.6	7.8	n/a	0.0	n/a	n/a
06/08/2005	10.3	10.1	n/a	14.5	15.0	n/a	6.2	5.5	n/a	0.0	n/a	n/a
07/08/2005	10.3	9.3	n/a	13.7	11.3	n/a	7.8	6.8	n/a	0.0	n/a	n/a
08/08/2005	8.0	7.3	n/a	10.0	10.5	n/a	6.0	5.4	n/a	0.0	n/a	n/a
09/08/2005	8.5	7.9	n/a	11.3	11.2	n/a	5.4	4.9	n/a	0.0	n/a	n/a
10/08/2005	8.8	8.1	n/a	11.5	10.4	n/a	3.5	4.5	n/a	1.0	n/a	n/a
11/08/2005	9.5	8.6	n/a	12.6	11.5	n/a	6.1	5.7	n/a	0.0	n/a	n/a
12/08/2005	7.9	7.3	n/a	12.2	10.9	n/a	3.0	3.7	n/a	0.0	n/a	n/a
13/08/2005	6.5	5.5	n/a	8.5	7.1	n/a	4.8	4.2	n/a	6.9	n/a	n/a
14/08/2005	6.2	5.0	n/a	8.5	7.4	n/a	4.1	2.8	n/a	2.3	n/a	n/a
15/08/2005	7.4	6.4	n/a	10.1	11.0	n/a	4.8	4.3	n/a	0.0	n/a	n/a
16/08/2005	8.0	7.9	n/a	13.0	14.0	n/a	0.2	0.7	n/a	0.0	n/a	n/a
17/08/2005	10.7	10.5	n/a	16.5	16.1	n/a	3.2	4.3	n/a	0.0	n/a	n/a
18/08/2005	12.3	11.9	n/a	17.7	16.7	n/a	6.8	6.9	n/a	0.0	n/a	n/a
19/08/2005	11.7	12.0	n/a	18.5	18.0	n/a	3.4	5.8	n/a	0.0	n/a	n/a
20/08/2005	13.0	12.7	n/a	19.3	18.2	n/a	5.0	5.3	n/a	0.0	n/a	n/a
21/08/2005	14.3	13.3	n/a	17.9	17.2	n/a	10.7	9.8	n/a	1.8	n/a	n/a
22/08/2005	9.7	8.0	n/a	14.7	10.6	n/a	5.4	5.4	n/a	0.5	n/a	n/a
23/08/2005	6.6	5.4	n/a	8.9	7.3	n/a	4.5	3.5	n/a	0.0	n/a	n/a
24/08/2005	9.8	9.2	n/a	16.4	16.1	n/a	2.0	0.9	n/a	0.0	n/a	n/a
25/08/2005	14.7	14.2	n/a	21.2	20.7	n/a	7.7	6.8	n/a	0.0	n/a	n/a
26/08/2005	15.8	15.9	n/a	24.1	23.8	n/a	6.7	9.1	n/a	0.0	n/a	n/a
27/08/2005	13.5	12.6	n/a	20.0	17.5	n/a	7.5	7.4	n/a	0.0	n/a	n/a
28/08/2005	8.1	6.8	n/a	10.6	8.9	n/a	6.3	5.3	n/a	0.0	n/a	n/a
29/08/2005	4.3	3.0	n/a	7.1	5.4	n/a	2.2	1.6	n/a	3.3	n/a	n/a
30/08/2005	2.6	1.7	n/a	3.6	2.5	n/a	1.6	0.8	n/a	0.0	n/a	n/a
31/08/2005	4.5	4.5	n/a	9.2	10.0	n/a	1.9	-1.1	n/a	0.0	n/a	n/a
01/09/2005	7.0	6.4	n/a	14.0	12.7	n/a	0.3	0.4	n/a	0.0	n/a	n/a
02/09/2005	6.3	7.2	n/a	12.8	12.2	n/a	-0.1	2.8	n/a	0.0	n/a	n/a
03/09/2005	8.6	9.3	n/a	15.7	15.5	n/a	1.4	4.2	n/a	0.0	n/a	n/a
04/09/2005	7.4	7.1	n/a	8.9	8.6	n/a	5.8	5.4	n/a	0.8	n/a	n/a
05/09/2005	7.1	7.9	n/a	9.8	11.7	n/a	2.3	5.4	n/a	0.8	n/a	n/a
06/09/2005	6.5	7.3	n/a	12.6	15.2	n/a	0.6	1.8	n/a	0.0	n/a	n/a
07/09/2005	8.0	8.0	n/a	14.0	12.2	n/a	2.5	2.7	n/a	0.0	n/a	n/a
08/09/2005	9.5	8.5	n/a	14.5	11.3	n/a	4.1	5.8	n/a	0.3	n/a	n/a
09/09/2005	4.4	3.5	n/a	7.9	5.8	n/a	2.4	2.4	n/a	7.9	n/a	n/a
10/09/2005	4.7	4.3	n/a	8.2	7.6	n/a	1.9	2.1	n/a	1.3	n/a	n/a
11/09/2005	2.1	1.3	n/a	4.8	3.8	n/a	-2.2	-2.7	n/a	1.8	n/a	n/a
12/09/2005	-2.1	-2.4	n/a	0.3	0.4	n/a	-3.8	-4.4	n/a	0.0	n/a	n/a
13/09/2005	-1.2	-1.8	n/a	0.5	-0.2	n/a	-4.3	-4.9	n/a	0.0	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
14/09/2005	-0.8	-1.5	n/a	-0.1	-0.7	n/a	-1.6	-2.6	n/a	0.0	n/a	n/a
15/09/2005	-0.8	-1.1	n/a	1.3	1.6	n/a	-3.5	-4.6	n/a	0.0	n/a	n/a
16/09/2005	0.6	0.2	n/a	4.1	4.5	n/a	-1.6	-2.0	n/a	0.0	n/a	n/a
17/09/2005	0.2	0.4	n/a	2.1	3.0	n/a	-2.6	-1.0	n/a	0.0	n/a	n/a
18/09/2005	-1.1	-1.9	n/a	0.2	-0.4	n/a	-2.2	-2.7	n/a	0.0	n/a	n/a
19/09/2005	-2.5	-2.6	n/a	-1.4	-1.8	n/a	-3.7	-3.6	n/a	0.3	n/a	n/a
20/09/2005	-2.9	-3.2	n/a	-1.4	-2.5	n/a	-4.6	-4.0	n/a	0.0	n/a	n/a
21/09/2005	-2.3	-2.7	n/a	-0.1	-0.2	n/a	-3.4	-4.1	n/a	0.0	n/a	n/a
22/09/2005	-1.6	-3.1	n/a	0.5	-2.0	n/a	-3.0	-5.4	n/a	1.0	n/a	n/a
23/09/2005	-2.9	-4.4	n/a	-2.0	-3.1	n/a	-3.7	-6.2	n/a	0.0	n/a	n/a
24/09/2005	-3.2	-4.3	n/a	-2.0	-3.1	n/a	-4.3	-5.2	n/a	0.0	n/a	n/a
25/09/2005	-3.6	-4.2	n/a	-2.3	-3.0	n/a	-5.0	-5.5	n/a	0.0	n/a	n/a
26/09/2005	-3.5	-4.5	n/a	-2.3	-2.6	n/a	-5.3	-6.5	n/a	0.0	n/a	n/a
27/09/2005	-5.5	-5.8	n/a	-4.7	-4.8	n/a	-6.8	-6.9	n/a	0.0	n/a	n/a
28/09/2005	-5.4	-6.3	n/a	-2.9	-3.2	n/a	-8.1	-9.1	n/a	0.0	n/a	n/a
29/09/2005	-7.3	-8.1	n/a	-5.8	-6.8	n/a	-10.2	-10.7	n/a	0.0	n/a	n/a
30/09/2005	-9.2	-9.6	n/a	-7.7	-8.2	n/a	-11.4	-11.4	n/a	0.0	n/a	n/a
01/10/2005	-10.6	-12.5	n/a	-6.0	-8.0	n/a	-15.1	-16.2	n/a	n/a	n/a	n/a
02/10/2005	-9.8	-9.7	n/a	-7.7	-7.1	n/a	-13.2	-13.0	n/a	n/a	n/a	n/a
03/10/2005	-7.2	-7.9	n/a	-4.2	-4.8	n/a	-10.0	-10.7	n/a	n/a	n/a	n/a
04/10/2005	-9.0	-9.8	n/a	-8.3	-9.0	n/a	-9.8	-10.5	n/a	n/a	n/a	n/a
05/10/2005	-6.5	-6.9	n/a	-2.6	-2.8	n/a	-12.3	-12.6	n/a	n/a	n/a	n/a
06/10/2005	-1.2	-1.7	n/a	1.9	1.5	n/a	-4.5	-5.5	n/a	n/a	n/a	n/a
07/10/2005	-0.7	-1.3	n/a	0.5	0.3	n/a	-1.9	-3.0	n/a	n/a	n/a	n/a
08/10/2005	-1.6	-2.9	n/a	-0.5	-1.9	n/a	-3.4	-4.0	n/a	n/a	n/a	n/a
09/10/2005	-5.0	-5.7	n/a	-3.2	-3.8	n/a	-6.7	-7.9	n/a	n/a	n/a	n/a
10/10/2005	-5.0	-6.3	n/a	-2.7	-5.4	n/a	-6.8	-7.5	n/a	n/a	n/a	n/a
11/10/2005	-7.5	-8.9	n/a	-2.8	-5.6	n/a	-12.3	-13.4	n/a	n/a	n/a	n/a
12/10/2005	-12.1	-12.9	n/a	-3.5	-4.4	n/a	-17.2	-17.0	n/a	n/a	n/a	n/a
13/10/2005	-2.1	-3.9	n/a	2.5	0.9	n/a	-8.4	-10.5	n/a	n/a	n/a	n/a
14/10/2005	-12.3	-13.2	n/a	-8.0	-10.3	n/a	-14.3	-14.9	n/a	n/a	n/a	n/a
15/10/2005	-11.3	-12.6	n/a	-8.1	-8.1	n/a	-15.0	-17.1	n/a	n/a	n/a	n/a
16/10/2005	-9.8	-10.2	n/a	-8.4	-7.6	n/a	-13.1	-13.9	n/a	n/a	n/a	n/a
17/10/2005	-12.9	-13.3	n/a	-11.8	-12.5	n/a	-13.5	-14.7	n/a	n/a	n/a	n/a
18/10/2005	n/a	-15.1	n/a	n/a	-12.6	n/a	n/a	-20.5	n/a	n/a	n/a	n/a
19/10/2005	n/a	-10.5	n/a	n/a	-7.1	n/a	n/a	-18.3	n/a	n/a	n/a	n/a
20/10/2005	n/a	-7.6	n/a	n/a	-4.5	n/a	n/a	-9.4	n/a	n/a	n/a	n/a
21/10/2005	n/a	-5.0	n/a	n/a	-3.9	n/a	n/a	-5.7	n/a	n/a	n/a	n/a
22/10/2005	n/a	-5.8	n/a	n/a	-4.6	n/a	n/a	-6.8	n/a	n/a	n/a	n/a
23/10/2005	n/a	-2.9	n/a	n/a	-0.7	n/a	n/a	-6.4	n/a	n/a	n/a	n/a
24/10/2005	n/a	-6.9	n/a	n/a	-2.2	n/a	n/a	-10.6	n/a	n/a	n/a	n/a
25/10/2005	n/a	-5.1	n/a	n/a	-0.6	n/a	n/a	-11.4	n/a	n/a	n/a	n/a
26/10/2005	n/a	-5.2	n/a	n/a	-2.3	n/a	n/a	-9.0	n/a	n/a	n/a	n/a
27/10/2005	n/a	-5.7	n/a	n/a	-0.2	n/a	n/a	-8.6	n/a	n/a	n/a	n/a
28/10/2005	n/a	-6.5	n/a	n/a	-5.4	n/a	n/a	-8.0	n/a	n/a	n/a	n/a
29/10/2005	n/a	-10.7	n/a	n/a	-7.8	n/a	n/a	-13.1	n/a	n/a	n/a	n/a
30/10/2005	n/a	-13.7	n/a	n/a	-12.3	n/a	n/a	-15.6	n/a	n/a	n/a	n/a
31/10/2005	n/a	-18.6	n/a	n/a	-15.6	n/a	n/a	-22.6	n/a	n/a	n/a	n/a
01/11/2005	n/a	-23.9	n/a	n/a	-21.8	n/a	n/a	-26.2	n/a	n/a	n/a	n/a
02/11/2005	n/a	-17.4	n/a	n/a	-11.3	n/a	n/a	-24.5	n/a	n/a	n/a	n/a
03/11/2005	n/a	-9.4	n/a	n/a	-6.4	n/a	n/a	-12.4	n/a	n/a	n/a	n/a
04/11/2005	n/a	-9.7	n/a	n/a	-6.4	n/a	n/a	-11.8	n/a	n/a	n/a	n/a
05/11/2005	n/a	-11.3	n/a	n/a	-9.2	n/a	n/a	-12.2	n/a	n/a	n/a	n/a
06/11/2005	n/a	-7.8	n/a	n/a	-6.6	n/a	n/a	-9.2	n/a	n/a	n/a	n/a
07/11/2005	n/a	-8.3	n/a	n/a	-7.3	n/a	n/a	-9.7	n/a	n/a	n/a	n/a
08/11/2005	n/a	-10.4	n/a	n/a	-7.8	n/a	n/a	-12.3	n/a	n/a	n/a	n/a
09/11/2005	n/a	-8.5	n/a	n/a	-6.7	n/a	n/a	-11.1	n/a	n/a	n/a	n/a
10/11/2005	n/a	-9.8	n/a	n/a	-6.9	n/a	n/a	-13.6	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
11/11/2005	n/a	-12.5	n/a	n/a	-9.3	n/a	n/a	-17.7	n/a	n/a	n/a	n/a
12/11/2005	n/a	-18.3	n/a	n/a	-17.1	n/a	n/a	-21.8	n/a	n/a	n/a	n/a
13/11/2005	n/a	-25.4	n/a	n/a	-21.8	n/a	n/a	-27.0	n/a	n/a	n/a	n/a
14/11/2005	n/a	-27.1	n/a	n/a	-25.4	n/a	n/a	-28.5	n/a	n/a	n/a	n/a
15/11/2005	n/a	-25.4	n/a	n/a	-20.8	n/a	n/a	-29.8	n/a	n/a	n/a	n/a
16/11/2005	n/a	-20.8	n/a	n/a	-16.6	n/a	n/a	-25.7	n/a	n/a	n/a	n/a
17/11/2005	n/a	-20.2	n/a	n/a	-15.3	n/a	n/a	-23.4	n/a	n/a	n/a	n/a
18/11/2005	n/a	-24.4	n/a	n/a	-23.2	n/a	n/a	-28.0	n/a	n/a	n/a	n/a
19/11/2005	n/a	-21.3	n/a	n/a	-17.8	n/a	n/a	-26.6	n/a	n/a	n/a	n/a
20/11/2005	n/a	-28.3	n/a	n/a	-23.6	n/a	n/a	-32.3	n/a	n/a	n/a	n/a
21/11/2005	n/a	-24.3	n/a	n/a	-22.6	n/a	n/a	-26.4	n/a	n/a	n/a	n/a
22/11/2005	n/a	-27.0	n/a	n/a	-25.0	n/a	n/a	-28.2	n/a	n/a	n/a	n/a
23/11/2005	n/a	-27.7	n/a	n/a	-23.4	n/a	n/a	-30.2	n/a	n/a	n/a	n/a
24/11/2005	n/a	-19.6	n/a	n/a	-17.7	n/a	n/a	-23.4	n/a	n/a	n/a	n/a
25/11/2005	n/a	-21.6	n/a	n/a	-20.1	n/a	n/a	-23.4	n/a	n/a	n/a	n/a
26/11/2005	n/a	-21.3	n/a	n/a	-17.7	n/a	n/a	-24.4	n/a	n/a	n/a	n/a
27/11/2005	n/a	-16.0	n/a	n/a	-12.7	n/a	n/a	-21.2	n/a	n/a	n/a	n/a
28/11/2005	n/a	-13.6	n/a	n/a	-12.6	n/a	n/a	-14.3	n/a	n/a	n/a	n/a
29/11/2005	n/a	-14.8	n/a	n/a	-13.8	n/a	n/a	-16.9	n/a	n/a	n/a	n/a
30/11/2005	n/a	-21.4	n/a	n/a	-16.8	n/a	n/a	-25.5	n/a	n/a	n/a	n/a
01/12/2005	n/a	-23.3	n/a	n/a	-21.1	n/a	n/a	-24.9	n/a	n/a	n/a	n/a
02/12/2005	n/a	-25.2	n/a	n/a	-22.2	n/a	n/a	-29.5	n/a	n/a	n/a	n/a
03/12/2005	n/a	-29.3	n/a	n/a	-26.4	n/a	n/a	-30.7	n/a	n/a	n/a	n/a
04/12/2005	n/a	-23.2	n/a	n/a	-20.0	n/a	n/a	-26.5	n/a	n/a	n/a	n/a
05/12/2005	n/a	-23.6	n/a	n/a	-21.7	n/a	n/a	-26.3	n/a	n/a	n/a	n/a
06/12/2005	n/a	-26.2	n/a	n/a	-24.5	n/a	n/a	-28.5	n/a	n/a	n/a	n/a
07/12/2005	n/a	-27.1	n/a	n/a	-23.6	n/a	n/a	-32.9	n/a	n/a	n/a	n/a
08/12/2005	n/a	-34.3	n/a	n/a	-29.2	n/a	n/a	-37.1	n/a	n/a	n/a	n/a
09/12/2005	n/a	-28.1	n/a	n/a	-21.9	n/a	n/a	-30.3	n/a	n/a	n/a	n/a
10/12/2005	n/a	-17.9	n/a	n/a	-15.9	n/a	n/a	-21.9	n/a	n/a	n/a	n/a
11/12/2005	n/a	-17.6	n/a	n/a	-15.3	n/a	n/a	-20.2	n/a	n/a	n/a	n/a
12/12/2005	n/a	-18.9	n/a	n/a	-17.5	n/a	n/a	-20.6	n/a	n/a	n/a	n/a
13/12/2005	n/a	-18.6	n/a	n/a	-17.1	n/a	n/a	-24.0	n/a	n/a	n/a	n/a
14/12/2005	n/a	-24.3	n/a	n/a	-22.2	n/a	n/a	-29.1	n/a	n/a	n/a	n/a
15/12/2005	n/a	-29.5	n/a	n/a	-23.8	n/a	n/a	-33.8	n/a	n/a	n/a	n/a
16/12/2005	n/a	-26.5	n/a	n/a	-14.9	n/a	n/a	-35.4	n/a	n/a	n/a	n/a
17/12/2005	n/a	-13.4	n/a	n/a	-12.4	n/a	n/a	-14.9	n/a	n/a	n/a	n/a
18/12/2005	n/a	-16.7	n/a	n/a	-12.5	n/a	n/a	-24.4	n/a	n/a	n/a	n/a
19/12/2005	n/a	-25.2	n/a	n/a	-20.3	n/a	n/a	-28.7	n/a	n/a	n/a	n/a
20/12/2005	n/a	-26.5	n/a	n/a	-21.0	n/a	n/a	-30.1	n/a	n/a	n/a	n/a
21/12/2005	n/a	-26.9	n/a	n/a	-20.4	n/a	n/a	-30.9	n/a	n/a	n/a	n/a
22/12/2005	n/a	-31.5	n/a	n/a	-30.1	n/a	n/a	-33.5	n/a	n/a	n/a	n/a
23/12/2005	n/a	-27.8	n/a	n/a	-25.0	n/a	n/a	-31.3	n/a	n/a	n/a	n/a
24/12/2005	n/a	-26.6	n/a	n/a	-21.2	n/a	n/a	-28.9	n/a	n/a	n/a	n/a
25/12/2005	n/a	-17.2	n/a	n/a	-13.6	n/a	n/a	-21.2	n/a	n/a	n/a	n/a
26/12/2005	n/a	-16.6	n/a	n/a	-15.3	n/a	n/a	-18.1	n/a	n/a	n/a	n/a
27/12/2005	n/a	-16.5	n/a	n/a	-14.6	n/a	n/a	-20.5	n/a	n/a	n/a	n/a
28/12/2005	n/a	-18.3	n/a	n/a	-17.5	n/a	n/a	-19.8	n/a	n/a	n/a	n/a
29/12/2005	n/a	-16.7	n/a	n/a	-14.6	n/a	n/a	-20.0	n/a	n/a	n/a	n/a
30/12/2005	n/a	-18.8	n/a	n/a	-16.3	n/a	n/a	-23.7	n/a	n/a	n/a	n/a
31/12/2005	n/a	-20.0	n/a	n/a	-17.3	n/a	n/a	-21.7	n/a	n/a	n/a	n/a
01/01/2006	n/a	-18.7	n/a	n/a	-17.0	n/a	n/a	-21.2	n/a	n/a	n/a	n/a
02/01/2006	n/a	-15.6	n/a	n/a	-13.6	n/a	n/a	-17.0	n/a	n/a	n/a	n/a
03/01/2006	n/a	-11.7	n/a	n/a	-9.7	n/a	n/a	-13.6	n/a	n/a	n/a	n/a
04/01/2006	n/a	-10.8	n/a	n/a	-8.9	n/a	n/a	-14.7	n/a	n/a	n/a	n/a
05/01/2006	n/a	-17.3	n/a	n/a	-14.7	n/a	n/a	-20.4	n/a	n/a	n/a	n/a
06/01/2006	n/a	-19.9	n/a	n/a	-17.7	n/a	n/a	-21.7	n/a	n/a	n/a	n/a
07/01/2006	n/a	-26.2	n/a	n/a	-21.7	n/a	n/a	-28.7	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
08/01/2006	n/a	-26.1	n/a	n/a	-21.8	n/a	n/a	-30.8	n/a	n/a	n/a	n/a
09/01/2006	n/a	-33.1	n/a	n/a	-29.7	n/a	n/a	-34.5	n/a	n/a	n/a	n/a
10/01/2006	n/a	-30.8	n/a	n/a	-25.6	n/a	n/a	-34.2	n/a	n/a	n/a	n/a
11/01/2006	n/a	-21.0	n/a	n/a	-18.7	n/a	n/a	-25.6	n/a	n/a	n/a	n/a
12/01/2006	n/a	-23.5	n/a	n/a	-21.3	n/a	n/a	-28.5	n/a	n/a	n/a	n/a
13/01/2006	n/a	-30.4	n/a	n/a	-25.6	n/a	n/a	-33.9	n/a	n/a	n/a	n/a
14/01/2006	n/a	-25.5	n/a	n/a	-23.4	n/a	n/a	-29.8	n/a	n/a	n/a	n/a
15/01/2006	n/a	-23.2	n/a	n/a	-21.7	n/a	n/a	-24.7	n/a	n/a	n/a	n/a
16/01/2006	n/a	-29.2	n/a	n/a	-21.3	n/a	n/a	-34.6	n/a	n/a	n/a	n/a
17/01/2006	n/a	-27.2	n/a	n/a	-24.0	n/a	n/a	-34.0	n/a	n/a	n/a	n/a
18/01/2006	n/a	-23.2	n/a	n/a	-20.1	n/a	n/a	-26.4	n/a	n/a	n/a	n/a
19/01/2006	n/a	-33.2	n/a	n/a	-24.4	n/a	n/a	-34.7	n/a	n/a	n/a	n/a
20/01/2006	n/a	-29.0	n/a	n/a	-19.5	n/a	n/a	-34.9	n/a	n/a	n/a	n/a
21/01/2006	n/a	-23.3	n/a	n/a	-18.3	n/a	n/a	-27.0	n/a	n/a	n/a	n/a
22/01/2006	n/a	-23.3	n/a	n/a	-22.3	n/a	n/a	-27.1	n/a	n/a	n/a	n/a
23/01/2006	n/a	-26.2	n/a	n/a	-21.5	n/a	n/a	-29.8	n/a	n/a	n/a	n/a
24/01/2006	n/a	-31.4	n/a	n/a	-29.1	n/a	n/a	-33.1	n/a	n/a	n/a	n/a
25/01/2006	n/a	-33.1	n/a	n/a	-30.7	n/a	n/a	-35.8	n/a	n/a	n/a	n/a
26/01/2006	n/a	-32.8	n/a	n/a	-31.7	n/a	n/a	-34.3	n/a	n/a	n/a	n/a
27/01/2006	n/a	-38.0	n/a	n/a	-34.3	n/a	n/a	-40.3	n/a	n/a	n/a	n/a
28/01/2006	n/a	-40.4	n/a	n/a	-38.6	n/a	n/a	-41.5	n/a	n/a	n/a	n/a
29/01/2006	n/a	-39.3	n/a	n/a	-37.2	n/a	n/a	-41.2	n/a	n/a	n/a	n/a
30/01/2006	n/a	-34.0	n/a	n/a	-30.3	n/a	n/a	-38.3	n/a	n/a	n/a	n/a
31/01/2006	n/a	-35.7	n/a	n/a	-32.5	n/a	n/a	-39.2	n/a	n/a	n/a	n/a
01/02/2006	n/a	-32.6	n/a	n/a	-25.6	n/a	n/a	-38.5	n/a	n/a	n/a	n/a
02/02/2006	n/a	-20.3	n/a	n/a	-15.0	n/a	n/a	-25.6	n/a	n/a	n/a	n/a
03/02/2006	n/a	-16.4	n/a	n/a	-14.3	n/a	n/a	-19.4	n/a	n/a	n/a	n/a
04/02/2006	n/a	-22.9	n/a	n/a	-17.0	n/a	n/a	-28.6	n/a	n/a	n/a	n/a
05/02/2006	n/a	-27.7	n/a	n/a	-26.1	n/a	n/a	-29.6	n/a	n/a	n/a	n/a
06/02/2006	n/a	-29.4	n/a	n/a	-26.4	n/a	n/a	-32.0	n/a	n/a	n/a	n/a
07/02/2006	n/a	-17.3	n/a	n/a	-11.7	n/a	n/a	-28.7	n/a	n/a	n/a	n/a
08/02/2006	n/a	-11.2	n/a	n/a	-8.1	n/a	n/a	-15.5	n/a	n/a	n/a	n/a
09/02/2006	n/a	-13.2	n/a	n/a	-10.3	n/a	n/a	-17.8	n/a	n/a	n/a	n/a
10/02/2006	n/a	-18.9	n/a	n/a	-14.1	n/a	n/a	-26.6	n/a	n/a	n/a	n/a
11/02/2006	n/a	-27.6	n/a	n/a	-26.2	n/a	n/a	-29.3	n/a	n/a	n/a	n/a
12/02/2006	n/a	-28.1	n/a	n/a	-25.5	n/a	n/a	-29.8	n/a	n/a	n/a	n/a
13/02/2006	n/a	-28.6	n/a	n/a	-26.6	n/a	n/a	-30.2	n/a	n/a	n/a	n/a
14/02/2006	n/a	-28.2	n/a	n/a	-26.2	n/a	n/a	-31.2	n/a	n/a	n/a	n/a
15/02/2006	n/a	-31.3	n/a	n/a	-28.2	n/a	n/a	-32.8	n/a	n/a	n/a	n/a
16/02/2006	n/a	-23.3	n/a	n/a	-18.8	n/a	n/a	-32.5	n/a	n/a	n/a	n/a
17/02/2006	n/a	-17.1	n/a	n/a	-10.2	n/a	n/a	-22.5	n/a	n/a	n/a	n/a
18/02/2006	n/a	-12.7	n/a	n/a	-10.2	n/a	n/a	-15.7	n/a	n/a	n/a	n/a
19/02/2006	n/a	-15.8	n/a	n/a	-15.0	n/a	n/a	-16.5	n/a	n/a	n/a	n/a
20/02/2006	n/a	-17.1	n/a	n/a	-11.3	n/a	n/a	-22.9	n/a	n/a	n/a	n/a
21/02/2006	n/a	-15.0	n/a	n/a	-12.3	n/a	n/a	-18.4	n/a	n/a	n/a	n/a
22/02/2006	n/a	-17.4	n/a	n/a	-15.3	n/a	n/a	-23.6	n/a	n/a	n/a	n/a
23/02/2006	n/a	-27.4	n/a	n/a	-23.6	n/a	n/a	-29.8	n/a	n/a	n/a	n/a
24/02/2006	n/a	-30.4	n/a	n/a	-28.5	n/a	n/a	-32.0	n/a	n/a	n/a	n/a
25/02/2006	n/a	-34.5	n/a	n/a	-30.7	n/a	n/a	-38.9	n/a	n/a	n/a	n/a
26/02/2006	n/a	-36.6	n/a	n/a	-33.4	n/a	n/a	-39.7	n/a	n/a	n/a	n/a
27/02/2006	n/a	-32.6	n/a	n/a	-29.9	n/a	n/a	-35.0	n/a	n/a	n/a	n/a
28/02/2006	n/a	-30.4	n/a	n/a	-24.4	n/a	n/a	-35.7	n/a	n/a	n/a	n/a
01/03/2006	n/a	-28.4	n/a	n/a	-24.5	n/a	n/a	-30.8	n/a	n/a	n/a	n/a
02/03/2006	n/a	-28.4	n/a	n/a	-25.8	n/a	n/a	-31.0	n/a	n/a	n/a	n/a
03/03/2006	n/a	-21.2	n/a	n/a	-16.5	n/a	n/a	-26.6	n/a	n/a	n/a	n/a
04/03/2006	n/a	-23.6	n/a	n/a	-19.6	n/a	n/a	-26.2	n/a	n/a	n/a	n/a
05/03/2006	n/a	-24.9	n/a	n/a	-19.3	n/a	n/a	-27.2	n/a	n/a	n/a	n/a
06/03/2006	n/a	-22.6	n/a	n/a	-18.0	n/a	n/a	-26.5	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
07/03/2006	n/a	-17.9	n/a	n/a	-13.5	n/a	n/a	-22.5	n/a	n/a	n/a	n/a
08/03/2006	n/a	-21.6	n/a	n/a	-15.6	n/a	n/a	-26.4	n/a	n/a	n/a	n/a
09/03/2006	n/a	-15.5	n/a	n/a	-12.0	n/a	n/a	-19.2	n/a	n/a	n/a	n/a
10/03/2006	n/a	-18.3	n/a	n/a	-16.5	n/a	n/a	-21.4	n/a	n/a	n/a	n/a
11/03/2006	n/a	-19.4	n/a	n/a	-11.8	n/a	n/a	-24.5	n/a	n/a	n/a	n/a
12/03/2006	n/a	-19.3	n/a	n/a	-13.3	n/a	n/a	-24.6	n/a	n/a	n/a	n/a
13/03/2006	n/a	-24.9	n/a	n/a	-19.4	n/a	n/a	-27.7	n/a	n/a	n/a	n/a
14/03/2006	n/a	-30.2	n/a	n/a	-27.7	n/a	n/a	-34.0	n/a	n/a	n/a	n/a
15/03/2006	n/a	-32.2	n/a	n/a	-27.5	n/a	n/a	-35.2	n/a	n/a	n/a	n/a
16/03/2006	n/a	-25.8	n/a	n/a	-23.1	n/a	n/a	-30.1	n/a	n/a	n/a	n/a
17/03/2006	n/a	-27.8	n/a	n/a	-24.1	n/a	n/a	-30.9	n/a	n/a	n/a	n/a
18/03/2006	n/a	-25.1	n/a	n/a	-23.7	n/a	n/a	-27.9	n/a	n/a	n/a	n/a
19/03/2006	n/a	-24.2	n/a	n/a	-18.3	n/a	n/a	-29.8	n/a	n/a	n/a	n/a
20/03/2006	n/a	-12.0	n/a	n/a	-5.9	n/a	n/a	-19.3	n/a	n/a	n/a	n/a
21/03/2006	n/a	-5.5	n/a	n/a	-3.8	n/a	n/a	-6.9	n/a	n/a	n/a	n/a
22/03/2006	n/a	-9.0	n/a	n/a	-4.0	n/a	n/a	-13.2	n/a	n/a	n/a	n/a
23/03/2006	n/a	-11.6	n/a	n/a	-7.1	n/a	n/a	-17.0	n/a	n/a	n/a	n/a
24/03/2006	n/a	-9.9	n/a	n/a	-4.1	n/a	n/a	-14.7	n/a	n/a	n/a	n/a
25/03/2006	n/a	-12.1	n/a	n/a	-4.9	n/a	n/a	-17.7	n/a	n/a	n/a	n/a
26/03/2006	n/a	-13.9	n/a	n/a	-10.6	n/a	n/a	-19.3	n/a	n/a	n/a	n/a
27/03/2006	n/a	-14.0	n/a	n/a	-11.1	n/a	n/a	-16.8	n/a	n/a	n/a	n/a
28/03/2006	n/a	-17.6	n/a	n/a	-15.3	n/a	n/a	-21.4	n/a	n/a	n/a	n/a
29/03/2006	n/a	-21.1	n/a	n/a	-16.9	n/a	n/a	-24.7	n/a	n/a	n/a	n/a
30/03/2006	n/a	-19.9	n/a	n/a	-14.7	n/a	n/a	-23.0	n/a	n/a	n/a	n/a
31/03/2006	n/a	-18.3	n/a	n/a	-13.1	n/a	n/a	-22.7	n/a	n/a	n/a	n/a
01/04/2006	n/a	-17.1	n/a	n/a	-10.6	n/a	n/a	-21.4	n/a	n/a	n/a	n/a
02/04/2006	n/a	-16.8	n/a	n/a	-11.4	n/a	n/a	-21.7	n/a	n/a	n/a	n/a
03/04/2006	n/a	-21.1	n/a	n/a	-17.3	n/a	n/a	-24.6	n/a	n/a	n/a	n/a
04/04/2006	n/a	-26.4	n/a	n/a	-22.7	n/a	n/a	-29.2	n/a	n/a	n/a	n/a
05/04/2006	n/a	-24.5	n/a	n/a	-17.3	n/a	n/a	-30.8	n/a	n/a	n/a	n/a
06/04/2006	n/a	-17.9	n/a	n/a	-12.1	n/a	n/a	-24.6	n/a	n/a	n/a	n/a
07/04/2006	n/a	-9.4	n/a	n/a	-5.3	n/a	n/a	-13.5	n/a	n/a	n/a	n/a
08/04/2006	n/a	-16.2	n/a	n/a	-10.7	n/a	n/a	-23.6	n/a	n/a	n/a	n/a
09/04/2006	n/a	-21.4	n/a	n/a	-16.9	n/a	n/a	-26.5	n/a	n/a	n/a	n/a
10/04/2006	n/a	-18.4	n/a	n/a	-13.3	n/a	n/a	-25.1	n/a	n/a	n/a	n/a
11/04/2006	n/a	-23.1	n/a	n/a	-19.3	n/a	n/a	-26.5	n/a	n/a	n/a	n/a
12/04/2006	n/a	-22.7	n/a	n/a	-18.0	n/a	n/a	-27.3	n/a	n/a	n/a	n/a
13/04/2006	n/a	-17.5	n/a	n/a	-9.0	n/a	n/a	-24.1	n/a	n/a	n/a	n/a
14/04/2006	n/a	-15.4	n/a	n/a	-13.6	n/a	n/a	-17.3	n/a	n/a	n/a	n/a
15/04/2006	n/a	-17.1	n/a	n/a	-15.4	n/a	n/a	-18.6	n/a	n/a	n/a	n/a
16/04/2006	n/a	-16.1	n/a	n/a	-15.2	n/a	n/a	-17.6	n/a	n/a	n/a	n/a
17/04/2006	n/a	-16.3	n/a	n/a	-12.4	n/a	n/a	-21.2	n/a	n/a	n/a	n/a
18/04/2006	n/a	-9.7	n/a	n/a	-4.4	n/a	n/a	-15.1	n/a	n/a	n/a	n/a
19/04/2006	n/a	-4.6	n/a	n/a	1.5	n/a	n/a	-10.1	n/a	n/a	n/a	n/a
20/04/2006	n/a	-8.5	n/a	n/a	2.7	n/a	n/a	-13.3	n/a	n/a	0.3	n/a
21/04/2006	n/a	-16.2	n/a	n/a	-10.7	n/a	n/a	-21.6	n/a	n/a	n/a	n/a
22/04/2006	n/a	-15.8	n/a	n/a	-11.9	n/a	n/a	-20.0	n/a	n/a	n/a	n/a
23/04/2006	n/a	-12.8	n/a	n/a	-3.2	n/a	n/a	-21.4	n/a	n/a	n/a	n/a
24/04/2006	n/a	-8.0	n/a	n/a	0.2	n/a	n/a	-15.0	n/a	n/a	n/a	n/a
25/04/2006	n/a	-11.6	n/a	n/a	-8.3	n/a	n/a	-14.3	n/a	n/a	n/a	n/a
26/04/2006	n/a	-9.1	n/a	n/a	-3.3	n/a	n/a	-15.1	n/a	n/a	n/a	n/a
27/04/2006	n/a	-7.2	n/a	n/a	-4.0	n/a	n/a	-11.3	n/a	n/a	n/a	n/a
28/04/2006	n/a	-5.1	n/a	n/a	0.7	n/a	n/a	-14.6	n/a	n/a	n/a	n/a
29/04/2006	n/a	-7.1	n/a	n/a	0.4	n/a	n/a	-13.3	n/a	n/a	0.8	n/a
30/04/2006	n/a	-11.7	n/a	n/a	-9.0	n/a	n/a	-15.0	n/a	n/a	n/a	n/a
01/05/2006	n/a	-10.6	n/a	n/a	-3.8	n/a	n/a	-17.2	n/a	n/a	n/a	n/a
02/05/2006	n/a	-11.0	n/a	n/a	-4.4	n/a	n/a	-16.3	n/a	n/a	n/a	n/a
03/05/2006	n/a	-11.6	n/a	n/a	-5.6	n/a	n/a	-19.3	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
04/05/2006	n/a	-4.1	n/a	n/a	-0.9	n/a	n/a	-8.3	n/a	n/a	n/a	n/a
05/05/2006	n/a	-1.8	n/a	n/a	-0.9	n/a	n/a	-3.3	n/a	n/a	n/a	n/a
06/05/2006	n/a	-0.8	n/a	n/a	0.2	n/a	n/a	-1.8	n/a	n/a	n/a	n/a
07/05/2006	n/a	0.7	n/a	n/a	4.8	n/a	n/a	-0.8	n/a	n/a	n/a	n/a
08/05/2006	n/a	0.0	n/a	n/a	1.5	n/a	n/a	-1.8	n/a	n/a	n/a	n/a
09/05/2006	n/a	-3.1	n/a	n/a	-0.4	n/a	n/a	-5.8	n/a	n/a	n/a	n/a
10/05/2006	n/a	-3.6	n/a	n/a	1.0	n/a	n/a	-9.1	n/a	n/a	n/a	n/a
11/05/2006	n/a	0.1	n/a	n/a	5.7	n/a	n/a	-7.7	n/a	n/a	n/a	n/a
12/05/2006	n/a	0.2	n/a	n/a	3.6	n/a	n/a	-3.9	n/a	n/a	n/a	n/a
13/05/2006	n/a	0.3	n/a	n/a	4.0	n/a	n/a	-5.1	n/a	n/a	n/a	n/a
14/05/2006	n/a	0.1	n/a	n/a	3.6	n/a	n/a	-4.2	n/a	n/a	n/a	n/a
15/05/2006	n/a	-0.3	n/a	n/a	1.6	n/a	n/a	-2.4	n/a	n/a	n/a	n/a
16/05/2006	n/a	0.6	n/a	n/a	1.9	n/a	n/a	-1.3	n/a	n/a	n/a	n/a
17/05/2006	n/a	-0.7	n/a	n/a	1.1	n/a	n/a	-1.9	n/a	n/a	n/a	n/a
18/05/2006	n/a	-1.5	n/a	n/a	0.7	n/a	n/a	-3.5	n/a	n/a	n/a	n/a
19/05/2006	n/a	-1.3	n/a	n/a	2.2	n/a	n/a	-4.0	n/a	n/a	n/a	n/a
20/05/2006	n/a	1.4	n/a	n/a	5.6	n/a	n/a	-4.8	n/a	n/a	n/a	n/a
21/05/2006	n/a	2.9	n/a	n/a	6.2	n/a	n/a	-0.4	n/a	n/a	n/a	n/a
22/05/2006	n/a	-1.1	n/a	n/a	1.9	n/a	n/a	-4.3	n/a	n/a	n/a	n/a
23/05/2006	n/a	-5.0	n/a	n/a	-2.1	n/a	n/a	-7.1	n/a	n/a	n/a	n/a
24/05/2006	n/a	-0.8	n/a	n/a	4.2	n/a	n/a	-6.2	n/a	n/a	n/a	n/a
25/05/2006	n/a	3.0	n/a	n/a	7.8	n/a	n/a	-2.6	n/a	n/a	n/a	n/a
26/05/2006	n/a	0.9	n/a	n/a	4.5	n/a	n/a	-1.0	n/a	n/a	n/a	n/a
27/05/2006	n/a	0.3	n/a	n/a	2.4	n/a	n/a	-1.8	n/a	n/a	n/a	n/a
28/05/2006	n/a	0.7	n/a	n/a	3.3	n/a	n/a	-1.4	n/a	n/a	n/a	n/a
29/05/2006	n/a	0.3	n/a	n/a	2.1	n/a	n/a	-2.5	n/a	n/a	n/a	n/a
30/05/2006	n/a	2.9	n/a	n/a	8.6	n/a	n/a	-3.9	n/a	n/a	n/a	n/a
31/05/2006	n/a	2.9	n/a	n/a	7.3	n/a	n/a	0.6	n/a	n/a	n/a	n/a
01/06/2006	n/a	3.4	n/a	n/a	7.3	n/a	n/a	0.3	n/a	n/a	0.0	n/a
02/06/2006	n/a	3.6	n/a	n/a	11.2	n/a	n/a	0.0	n/a	n/a	0.0	n/a
03/06/2006	n/a	2.9	n/a	n/a	6.5	n/a	n/a	-1.2	n/a	n/a	0.0	n/a
04/06/2006	n/a	1.1	n/a	n/a	2.5	n/a	n/a	-0.3	n/a	n/a	0.3	n/a
05/06/2006	n/a	0.7	n/a	n/a	2.4	n/a	n/a	-0.3	n/a	n/a	0.0	n/a
06/06/2006	n/a	-0.3	n/a	n/a	4.8	n/a	n/a	-3.3	n/a	n/a	0.0	n/a
07/06/2006	n/a	6.6	n/a	n/a	12.6	n/a	n/a	-0.6	n/a	n/a	0.0	n/a
08/06/2006	n/a	10.8	n/a	n/a	16.4	n/a	n/a	3.3	n/a	n/a	0.0	n/a
09/06/2006	n/a	13.1	n/a	n/a	19.8	n/a	n/a	6.4	n/a	n/a	0.0	n/a
10/06/2006	n/a	5.8	n/a	n/a	8.8	n/a	n/a	4.3	n/a	n/a	0.0	n/a
11/06/2006	n/a	9.4	n/a	n/a	15.6	n/a	n/a	2.8	n/a	n/a	0.0	n/a
12/06/2006	n/a	15.6	n/a	n/a	21.4	n/a	n/a	8.7	n/a	n/a	0.0	n/a
13/06/2006	n/a	14.3	n/a	n/a	22.9	n/a	n/a	9.1	n/a	n/a	0.0	n/a
14/06/2006	n/a	11.4	n/a	n/a	18.7	n/a	n/a	8.0	n/a	n/a	0.0	n/a
15/06/2006	n/a	8.1	n/a	n/a	11.2	n/a	n/a	5.2	n/a	n/a	0.0	n/a
16/06/2006	n/a	10.2	n/a	n/a	19.6	n/a	n/a	1.8	n/a	n/a	0.0	n/a
17/06/2006	n/a	6.4	n/a	n/a	8.8	n/a	n/a	4.2	n/a	n/a	0.0	n/a
18/06/2006	n/a	10.2	n/a	n/a	16.4	n/a	n/a	3.9	n/a	n/a	0.0	n/a
19/06/2006	n/a	9.0	n/a	n/a	16.2	n/a	n/a	3.1	n/a	n/a	0.3	n/a
20/06/2006	n/a	3.5	n/a	n/a	6.0	n/a	n/a	1.1	n/a	n/a	0.0	n/a
21/06/2006	n/a	4.8	n/a	n/a	9.0	n/a	n/a	0.4	n/a	n/a	0.0	n/a
22/06/2006	n/a	12.5	n/a	n/a	19.5	n/a	n/a	2.9	n/a	n/a	0.0	n/a
23/06/2006	n/a	17.9	n/a	n/a	24.7	n/a	n/a	8.8	n/a	n/a	0.0	n/a
24/06/2006	n/a	15.1	n/a	n/a	21.6	n/a	n/a	9.6	n/a	n/a	0.0	n/a
25/06/2006	n/a	7.8	n/a	n/a	11.5	n/a	n/a	5.0	n/a	n/a	0.0	n/a
26/06/2006	n/a	12.0	n/a	n/a	17.2	n/a	n/a	4.4	n/a	n/a	0.0	n/a
27/06/2006	n/a	15.2	n/a	n/a	22.6	n/a	n/a	8.1	n/a	n/a	0.0	n/a
28/06/2006	n/a	15.7	n/a	n/a	21.1	n/a	n/a	10.4	n/a	n/a	0.0	n/a
29/06/2006	n/a	16.6	n/a	n/a	23.4	n/a	n/a	11.1	n/a	n/a	0.5	n/a
30/06/2006	n/a	12.6	n/a	n/a	18.4	n/a	n/a	9.1	n/a	n/a	0.5	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
01/07/2006	n/a	10.2	n/a	n/a	13.2	n/a	n/a	8.4	n/a	n/a	0.0	n/a
02/07/2006	n/a	14.4	n/a	n/a	19.4	n/a	n/a	8.4	n/a	n/a	0.0	n/a
03/07/2006	n/a	13.4	n/a	n/a	21.4	n/a	n/a	6.7	n/a	n/a	0.0	n/a
04/07/2006	n/a	9.0	n/a	n/a	12.9	n/a	n/a	5.6	n/a	n/a	0.0	n/a
05/07/2006	n/a	10.4	n/a	n/a	15.0	n/a	n/a	6.7	n/a	n/a	0.0	n/a
06/07/2006	n/a	6.4	n/a	n/a	12.6	n/a	n/a	3.2	n/a	n/a	0.5	n/a
07/07/2006	n/a	5.8	n/a	n/a	8.9	n/a	n/a	2.5	n/a	n/a	0.0	n/a
08/07/2006	n/a	7.2	n/a	n/a	11.3	n/a	n/a	2.4	n/a	n/a	0.0	n/a
09/07/2006	n/a	7.4	n/a	n/a	10.8	n/a	n/a	4.2	n/a	n/a	0.0	n/a
10/07/2006	n/a	9.5	n/a	n/a	15.2	n/a	n/a	4.2	n/a	n/a	0.0	n/a
11/07/2006	n/a	13.7	n/a	n/a	19.4	n/a	n/a	6.6	n/a	n/a	0.0	n/a
12/07/2006	n/a	14.7	n/a	n/a	18.1	n/a	n/a	9.6	n/a	n/a	0.0	n/a
13/07/2006	n/a	10.1	n/a	n/a	12.4	n/a	n/a	8.8	n/a	n/a	0.3	n/a
14/07/2006	n/a	10.2	n/a	n/a	12.2	n/a	n/a	8.5	n/a	n/a	0.0	n/a
15/07/2006	n/a	13.7	n/a	n/a	17.9	n/a	n/a	7.6	n/a	n/a	0.0	n/a
16/07/2006	n/a	14.6	n/a	n/a	18.6	n/a	n/a	9.0	n/a	n/a	0.0	n/a
17/07/2006	n/a	12.6	n/a	n/a	16.7	n/a	n/a	7.7	n/a	n/a	0.0	n/a
18/07/2006	n/a	10.6	n/a	n/a	14.1	n/a	n/a	7.4	n/a	n/a	0.0	n/a
19/07/2006	n/a	12.8	n/a	n/a	16.8	n/a	n/a	8.6	n/a	n/a	0.0	n/a
20/07/2006	n/a	16.0	n/a	n/a	21.5	n/a	n/a	9.8	n/a	n/a	0.0	n/a
21/07/2006	n/a	19.2	n/a	n/a	24.7	n/a	n/a	12.2	n/a	n/a	0.0	n/a
22/07/2006	n/a	16.1	n/a	n/a	22.5	n/a	n/a	10.4	n/a	n/a	0.0	n/a
23/07/2006	n/a	12.7	n/a	n/a	20.7	n/a	n/a	6.5	n/a	n/a	0.3	n/a
24/07/2006	n/a	7.2	n/a	n/a	10.5	n/a	n/a	5.4	n/a	n/a	0.0	n/a
25/07/2006	n/a	7.5	n/a	n/a	10.1	n/a	n/a	5.1	n/a	n/a	0.0	n/a
26/07/2006	n/a	7.8	n/a	n/a	11.4	n/a	n/a	4.7	n/a	n/a	0.0	n/a
27/07/2006	n/a	8.6	n/a	n/a	11.6	n/a	n/a	6.1	n/a	n/a	0.0	n/a
28/07/2006	n/a	7.2	n/a	n/a	8.7	n/a	n/a	6.2	n/a	n/a	0.3	n/a
29/07/2006	n/a	9.4	n/a	n/a	10.6	n/a	n/a	8.2	n/a	n/a	0.0	n/a
30/07/2006	n/a	9.1	n/a	n/a	10.9	n/a	n/a	7.8	n/a	n/a	0.0	n/a
31/07/2006	n/a	11.5	n/a	n/a	16.4	n/a	n/a	7.9	n/a	n/a	0.0	n/a
01/08/2006	n/a	13.8	n/a	n/a	18.5	n/a	n/a	8.6	n/a	n/a	0.0	n/a
02/08/2006	n/a	14.4	n/a	n/a	18.6	n/a	n/a	10.0	n/a	n/a	0.0	n/a
03/08/2006	n/a	15.9	n/a	n/a	20.2	n/a	n/a	10.4	n/a	n/a	0.0	n/a
04/08/2006	n/a	17.8	n/a	n/a	23.0	n/a	n/a	13.2	n/a	n/a	0.0	n/a
05/08/2006	n/a	17.6	n/a	n/a	23.7	n/a	n/a	10.6	n/a	n/a	0.0	n/a
06/08/2006	n/a	18.1	n/a	n/a	23.8	n/a	n/a	14.0	n/a	n/a	0.0	n/a
07/08/2006	n/a	17.6	n/a	n/a	23.1	n/a	n/a	13.6	n/a	n/a	0.0	n/a
08/08/2006	n/a	17.5	n/a	n/a	23.7	n/a	n/a	11.3	n/a	n/a	0.0	n/a
09/08/2006	n/a	16.4	n/a	n/a	22.0	n/a	n/a	12.2	n/a	n/a	0.0	n/a
10/08/2006	n/a	14.6	n/a	n/a	18.0	n/a	n/a	11.1	n/a	n/a	0.3	n/a
11/08/2006	n/a	10.4	n/a	n/a	12.2	n/a	n/a	6.8	n/a	n/a	0.0	n/a
12/08/2006	n/a	10.8	n/a	n/a	16.8	n/a	n/a	4.4	n/a	n/a	0.0	n/a
13/08/2006	n/a	13.8	n/a	n/a	18.7	n/a	n/a	8.3	n/a	n/a	0.0	n/a
14/08/2006	n/a	12.5	n/a	n/a	16.2	n/a	n/a	8.6	n/a	n/a	0.0	n/a
15/08/2006	n/a	11.2	n/a	n/a	14.4	n/a	n/a	8.5	n/a	n/a	0.0	n/a
16/08/2006	n/a	10.1	n/a	n/a	16.0	n/a	n/a	5.2	n/a	n/a	0.3	n/a
17/08/2006	n/a	12.6	n/a	n/a	18.4	n/a	n/a	6.8	n/a	n/a	0.0	n/a
18/08/2006	n/a	11.8	n/a	n/a	15.0	n/a	n/a	8.7	n/a	n/a	0.0	n/a
19/08/2006	n/a	6.8	n/a	n/a	9.2	n/a	n/a	4.5	n/a	n/a	0.0	n/a
20/08/2006	n/a	8.2	n/a	n/a	13.3	n/a	n/a	4.3	n/a	n/a	0.0	n/a
21/08/2006	n/a	10.5	n/a	n/a	17.2	n/a	n/a	5.6	n/a	n/a	0.0	n/a
22/08/2006	n/a	11.7	n/a	n/a	18.3	n/a	n/a	5.4	n/a	n/a	0.0	n/a
23/08/2006	n/a	10.4	n/a	n/a	15.2	n/a	n/a	5.5	n/a	n/a	0.0	n/a
24/08/2006	n/a	11.6	n/a	n/a	14.8	n/a	n/a	8.7	n/a	n/a	0.0	n/a
25/08/2006	n/a	8.6	n/a	n/a	9.7	n/a	n/a	6.3	n/a	n/a	0.3	n/a
26/08/2006	n/a	6.8	n/a	n/a	9.3	n/a	n/a	3.8	n/a	n/a	0.0	n/a
27/08/2006	n/a	5.1	n/a	n/a	7.1	n/a	n/a	2.1	n/a	n/a	0.0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
28/08/2006	n/a	4.2	n/a	n/a	7.6	n/a	n/a	-0.4	n/a	n/a	0.0	n/a
29/08/2006	n/a	4.0	n/a	n/a	5.2	n/a	n/a	2.9	n/a	n/a	0.0	n/a
30/08/2006	n/a	3.9	n/a	n/a	5.4	n/a	n/a	2.4	n/a	n/a	0.0	n/a
31/08/2006	n/a	4.7	n/a	n/a	5.5	n/a	n/a	3.2	n/a	n/a	0.3	n/a
01/09/2006	n/a	3.3	n/a	n/a	6.1	n/a	n/a	1.5	n/a	n/a	0.0	n/a
02/09/2006	n/a	3.6	n/a	n/a	8.6	n/a	n/a	0.7	n/a	n/a	0.0	n/a
03/09/2006	n/a	4.9	n/a	n/a	11.8	n/a	n/a	0.9	n/a	n/a	0.0	n/a
04/09/2006	n/a	5.5	n/a	n/a	10.4	n/a	n/a	0.5	n/a	n/a	0.0	n/a
05/09/2006	n/a	9.1	n/a	n/a	15.5	n/a	n/a	3.1	n/a	n/a	0.0	n/a
06/09/2006	n/a	3.1	n/a	n/a	7.6	n/a	n/a	0.4	n/a	n/a	0.0	n/a
07/09/2006	n/a	5.7	n/a	n/a	13.1	n/a	n/a	-2.0	n/a	n/a	0.0	n/a
08/09/2006	5.9	4.8	n/a	11.6	7.9	n/a	n/a	2.8	n/a	n/a	0.0	n/a
09/09/2006	12.3	15.9	n/a	19.7	19.6	n/a	5.8	10.7	n/a	n/a	0.0	n/a
10/09/2006	13.2	12.9	n/a	18.4	18.5	n/a	7.9	6.7	n/a	n/a	0.0	n/a
11/09/2006	12.1	12.2	n/a	17.7	17.9	n/a	6.7	8.0	n/a	n/a	0.0	n/a
12/09/2006	5.7	4.4	n/a	9.3	9.2	n/a	0.8	-0.6	n/a	n/a	0.0	n/a
13/09/2006	-0.2	-1.3	n/a	1.0	-0.2	n/a	-1.4	-2.7	n/a	n/a	0.0	n/a
14/09/2006	-0.9	-1.8	n/a	0.7	0.7	n/a	-2.3	-3.8	n/a	n/a	0.0	n/a
15/09/2006	1.1	1.0	n/a	6.5	6.5	n/a	-2.4	-2.7	n/a	n/a	0.0	n/a
16/09/2006	3.7	3.7	n/a	8.8	9.7	n/a	-0.2	-0.8	n/a	n/a	0.0	n/a
17/09/2006	6.0	6.1	n/a	14.7	13.6	n/a	-0.3	-0.8	n/a	n/a	0.0	n/a
18/09/2006	6.0	5.8	n/a	11.6	11.4	n/a	0.7	-0.4	n/a	n/a	0.0	n/a
19/09/2006	6.5	6.2	n/a	12.2	12.7	n/a	0.5	0.8	n/a	n/a	0.0	n/a
20/09/2006	5.1	6.2	n/a	11.0	10.5	n/a	0.4	2.7	n/a	n/a	0.0	n/a
21/09/2006	2.6	2.6	n/a	3.1	3.9	n/a	1.9	1.4	n/a	n/a	0.0	n/a
22/09/2006	1.9	3.3	n/a	6.2	8.8	n/a	0.2	-0.1	n/a	n/a	0.0	n/a
23/09/2006	2.9	2.3	n/a	6.0	5.3	n/a	0.0	-0.9	n/a	n/a	0.0	n/a
24/09/2006	6.3	5.4	n/a	9.3	8.5	n/a	3.8	2.9	n/a	n/a	0.0	n/a
25/09/2006	2.7	2.0	n/a	5.4	5.1	n/a	0.7	0.0	n/a	n/a	0.0	n/a
26/09/2006	-0.4	-0.6	n/a	1.2	0.4	n/a	-2.0	-1.8	n/a	n/a	0.0	n/a
27/09/2006	-0.8	-1.1	n/a	1.7	1.2	n/a	-5.7	-3.2	n/a	n/a	0.0	n/a
28/09/2006	-5.1	-4.4	n/a	-3.8	-2.7	n/a	-6.9	-6.1	n/a	n/a	0.0	n/a
29/09/2006	-4.3	-4.6	n/a	-1.3	-2.0	n/a	-8.5	-6.7	n/a	n/a	0.0	n/a
30/09/2006	-2.1	-2.9	n/a	0.1	-1.2	n/a	-5.8	-4.8	n/a	n/a	0.0	n/a
01/10/2006	-0.7	-1.1	n/a	0.1	0.0	n/a	-3.0	-1.7	n/a	n/a	n/a	n/a
02/10/2006	-3.0	-1.9	n/a	-0.7	0.3	n/a	-8.3	-3.3	n/a	n/a	n/a	n/a
03/10/2006	-1.7	0.2	n/a	1.8	2.9	n/a	-8.9	-2.9	n/a	n/a	n/a	n/a
04/10/2006	1.1	1.4	n/a	5.0	4.8	n/a	-2.1	-1.5	n/a	n/a	n/a	n/a
05/10/2006	-1.6	-2.2	n/a	0.6	0.4	n/a	-4.1	-4.7	n/a	0.3	n/a	n/a
06/10/2006	-7.1	-8.4	n/a	-4.0	-4.4	n/a	-9.2	-10.2	n/a	n/a	n/a	n/a
07/10/2006	-6.2	-6.3	n/a	-3.0	-2.9	n/a	-9.8	-9.7	n/a	n/a	n/a	n/a
08/10/2006	-8.1	-8.7	n/a	-3.5	-6.6	n/a	-10.8	-10.2	n/a	n/a	n/a	n/a
09/10/2006	-9.7	-9.9	n/a	-7.9	-7.1	n/a	-12.7	-12.0	n/a	n/a	n/a	n/a
10/10/2006	-9.9	-9.5	n/a	-8.5	-8.5	n/a	-11.6	-10.4	n/a	n/a	n/a	n/a
11/10/2006	-14.6	-12.8	n/a	-10.3	-10.0	n/a	-19.4	-17.3	n/a	n/a	n/a	n/a
12/10/2006	-8.3	-7.2	n/a	-1.9	-1.3	n/a	-18.2	-15.1	n/a	n/a	n/a	n/a
13/10/2006	-3.3	-2.9	n/a	-1.3	-1.1	n/a	-6.8	-5.1	n/a	n/a	n/a	n/a
14/10/2006	-4.1	-3.8	n/a	-2.2	-1.9	n/a	-5.7	-6.3	n/a	n/a	n/a	n/a
15/10/2006	-7.2	-7.8	n/a	-5.7	-6.2	n/a	-8.7	-10.6	n/a	n/a	n/a	n/a
16/10/2006	-9.1	-9.3	n/a	-7.1	-7.9	n/a	-10.3	-13.3	n/a	n/a	n/a	n/a
17/10/2006	-9.0	-9.3	n/a	-7.5	-7.4	n/a	-11.1	-12.6	n/a	n/a	n/a	n/a
18/10/2006	-8.6	-8.0	n/a	-6.4	-6.4	n/a	-13.6	-10.4	n/a	n/a	n/a	n/a
19/10/2006	-10.4	-9.9	n/a	-6.4	-7.0	n/a	-18.4	-15.5	n/a	n/a	n/a	n/a
20/10/2006	-8.6	-7.6	n/a	-6.0	-6.2	n/a	-14.9	-12.4	n/a	n/a	n/a	n/a
21/10/2006	-11.4	-10.1	n/a	-5.5	-5.4	n/a	-16.0	-15.0	n/a	n/a	n/a	n/a
22/10/2006	-6.1	-6.2	n/a	-4.9	-4.9	n/a	-7.0	-7.2	n/a	n/a	n/a	n/a
23/10/2006	-2.6	-3.6	n/a	0.7	0.7	n/a	-8.2	-9.5	n/a	n/a	n/a	n/a
24/10/2006	-6.0	-8.5	n/a	-2.3	-3.9	n/a	-11.1	-11.6	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
25/10/2006	-1.2	-2.5	n/a	0.1	-0.5	n/a	-2.3	-4.8	n/a	n/a	n/a	n/a
26/10/2006	0.1	-1.2	n/a	1.0	0.9	n/a	-1.1	-3.4	n/a	n/a	n/a	n/a
27/10/2006	-2.7	-4.4	n/a	-1.1	-1.9	n/a	-4.9	-8.4	n/a	n/a	n/a	n/a
28/10/2006	-3.7	-4.4	n/a	-3.1	-3.0	n/a	-4.3	-5.7	n/a	n/a	0.3	n/a
29/10/2006	-4.7	-6.7	n/a	-3.8	-5.6	n/a	-6.0	-8.2	n/a	n/a	n/a	n/a
30/10/2006	-7.9	-9.2	n/a	-6.0	-8.2	n/a	-8.5	-9.7	n/a	n/a	n/a	n/a
31/10/2006	-7.4	-8.7	n/a	-5.1	-7.2	n/a	-11.3	-11.4	n/a	n/a	0.3	n/a
01/11/2006	-15.7	-15.4	n/a	-11.2	-11.4	n/a	-17.7	-17.3	n/a	n/a	1.0	n/a
02/11/2006	-20.1	-19.1	n/a	-17.2	-16.3	n/a	-21.4	-21.0	n/a	n/a	n/a	n/a
03/11/2006	-20.3	-21.3	n/a	-19.2	-20.0	n/a	-22.0	-22.4	n/a	n/a	n/a	n/a
04/11/2006	-21.5	-22.1	n/a	-20.2	-20.5	n/a	-23.2	-23.5	n/a	n/a	n/a	n/a
05/11/2006	-25.5	-24.7	n/a	-21.8	-20.6	n/a	-29.7	-26.7	n/a	n/a	n/a	n/a
06/11/2006	-21.8	-21.5	n/a	-19.4	-16.9	n/a	-24.2	-24.8	n/a	n/a	n/a	n/a
07/11/2006	-18.5	-17.1	n/a	-16.4	-15.8	n/a	-22.6	-20.3	n/a	n/a	n/a	n/a
08/11/2006	-17.5	-16.9	n/a	-14.7	-14.2	n/a	-19.7	-19.7	n/a	n/a	n/a	n/a
09/11/2006	-17.5	-17.7	n/a	-15.0	-14.7	n/a	-21.9	-20.9	n/a	n/a	n/a	n/a
10/11/2006	-20.0	-19.4	n/a	-16.9	-17.1	n/a	-23.5	-23.6	n/a	n/a	n/a	n/a
11/11/2006	-19.8	-19.1	n/a	-17.2	-16.7	n/a	-22.1	-22.5	n/a	n/a	n/a	n/a
12/11/2006	-16.9	-18.0	n/a	-14.6	-16.1	n/a	-19.2	-19.8	n/a	n/a	n/a	n/a
13/11/2006	-18.7	-17.7	n/a	-15.1	-15.0	n/a	-24.4	-22.0	n/a	n/a	n/a	n/a
14/11/2006	-18.8	-20.5	n/a	-14.5	-17.9	n/a	-23.4	-22.3	n/a	n/a	n/a	n/a
15/11/2006	-13.3	-14.7	n/a	-12.1	-12.5	n/a	-15.2	-17.9	n/a	n/a	n/a	n/a
16/11/2006	-14.8	-14.9	n/a	-13.2	-13.3	n/a	-16.9	-16.1	n/a	n/a	0.3	n/a
17/11/2006	-12.9	-13.8	n/a	-11.6	-12.5	n/a	-14.3	-15.3	n/a	n/a	0.3	n/a
18/11/2006	-17.2	-18.7	n/a	-12.9	-13.6	n/a	-22.4	-22.3	n/a	n/a	22.9	n/a
19/11/2006	-22.1	-21.0	n/a	-19.5	-19.7	n/a	-25.8	-22.1	n/a	n/a	n/a	n/a
20/11/2006	-21.0	-20.4	n/a	-19.2	-19.1	n/a	-23.8	-22.4	n/a	n/a	n/a	n/a
21/11/2006	-22.1	-22.1	n/a	-19.3	-19.2	n/a	-25.0	-24.5	n/a	n/a	n/a	n/a
22/11/2006	-25.5	-26.0	n/a	-21.8	-21.9	n/a	-28.4	-28.2	n/a	n/a	n/a	n/a
23/11/2006	-25.7	-25.3	n/a	-22.5	-21.7	n/a	-29.3	-27.9	n/a	n/a	n/a	n/a
24/11/2006	-27.3	-27.6	n/a	-23.6	-24.9	n/a	-30.4	-30.1	n/a	n/a	n/a	n/a
25/11/2006	-28.5	-27.7	n/a	-23.4	-23.6	n/a	-31.7	-30.6	n/a	n/a	n/a	n/a
26/11/2006	-22.0	-22.2	n/a	-19.6	-20.0	n/a	-25.6	-26.2	n/a	0.3	n/a	n/a
27/11/2006	-17.6	-17.7	n/a	-16.2	-16.2	n/a	-20.5	-20.4	n/a	n/a	0.3	n/a
28/11/2006	-22.8	-23.8	n/a	-19.1	-19.6	n/a	-28.6	-28.5	n/a	n/a	n/a	n/a
29/11/2006	-27.2	-27.4	n/a	-26.0	-25.7	n/a	-29.1	-29.7	n/a	n/a	n/a	n/a
30/11/2006	-30.8	-30.7	n/a	-28.5	-28.9	n/a	-32.7	-32.1	n/a	n/a	n/a	n/a
01/12/2006	-32.2	-32.1	n/a	-30.3	-30.5	n/a	-34.2	-33.3	n/a	n/a	n/a	n/a
02/12/2006	-27.1	-26.6	n/a	-22.0	-21.6	n/a	-31.4	-32.3	n/a	n/a	n/a	n/a
03/12/2006	-17.9	-17.6	n/a	-13.4	-13.4	n/a	-22.0	-23.1	n/a	n/a	n/a	n/a
04/12/2006	-14.7	-15.0	n/a	-12.2	-12.2	n/a	-20.0	-22.1	n/a	n/a	n/a	n/a
05/12/2006	-23.3	-24.1	n/a	-20.0	-22.0	n/a	-25.0	-27.5	n/a	n/a	0.3	n/a
06/12/2006	-23.1	-23.3	n/a	-18.5	-18.1	n/a	-26.0	-27.8	n/a	n/a	n/a	n/a
07/12/2006	-16.4	-16.4	n/a	-13.5	-13.8	n/a	-19.6	-20.9	n/a	n/a	n/a	n/a
08/12/2006	-20.6	-18.8	n/a	-15.0	-14.1	n/a	-27.0	-23.1	n/a	n/a	n/a	n/a
09/12/2006	-24.1	-23.4	n/a	-19.8	-20.7	n/a	-27.6	-25.6	n/a	n/a	n/a	n/a
10/12/2006	-19.5	-20.1	n/a	-12.8	-12.9	n/a	-22.9	-23.6	n/a	n/a	n/a	n/a
11/12/2006	-7.0	-9.6	n/a	-6.0	-7.2	n/a	-12.8	-13.4	n/a	n/a	n/a	n/a
12/12/2006	-7.7	-10.1	n/a	-5.0	-7.2	n/a	-12.0	-15.1	n/a	n/a	n/a	n/a
13/12/2006	-15.9	-17.5	n/a	-11.8	-15.0	n/a	-20.0	-20.8	n/a	n/a	n/a	n/a
14/12/2006	-25.9	-24.5	n/a	-20.0	-20.7	n/a	-31.5	-28.1	n/a	n/a	n/a	n/a
15/12/2006	-28.7	-28.2	n/a	-24.7	-25.2	n/a	-32.8	-30.4	n/a	n/a	n/a	n/a
16/12/2006	-20.8	-22.5	n/a	-18.3	-20.0	n/a	-24.7	-25.4	n/a	n/a	n/a	n/a
17/12/2006	-31.3	-31.1	n/a	-21.3	-25.4	n/a	-34.8	-34.8	n/a	n/a	n/a	n/a
18/12/2006	-28.4	-32.2	n/a	-21.1	-23.7	n/a	-33.5	-34.5	n/a	n/a	n/a	n/a
19/12/2006	-19.0	-19.9	n/a	-16.4	-17.2	n/a	-23.4	-23.7	n/a	n/a	n/a	n/a
20/12/2006	-24.3	-24.1	n/a	-18.4	-19.3	n/a	-30.0	-27.6	n/a	n/a	n/a	n/a
21/12/2006	-14.4	-14.6	n/a	-12.4	-12.4	n/a	-18.4	-19.3	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
22/12/2006	-13.6	-13.7	n/a	-12.4	-11.5	n/a	-14.9	-15.9	n/a	n/a	n/a	n/a
23/12/2006	-20.1	-20.2	n/a	-14.9	-15.9	n/a	-26.1	-24.9	n/a	n/a	n/a	n/a
24/12/2006	-25.5	-24.1	n/a	-20.3	-19.5	n/a	-27.6	-26.5	n/a	n/a	n/a	n/a
25/12/2006	-20.7	-20.4	n/a	-16.9	-17.2	n/a	-24.7	-24.5	n/a	n/a	n/a	n/a
26/12/2006	-18.5	-18.5	n/a	-16.3	-16.6	n/a	-22.7	-22.8	n/a	n/a	n/a	n/a
27/12/2006	-16.7	-16.3	n/a	-13.9	-14.3	n/a	-20.9	-20.3	n/a	n/a	n/a	n/a
28/12/2006	-19.8	-19.3	n/a	-16.1	-15.5	n/a	-24.6	-24.1	n/a	n/a	n/a	n/a
29/12/2006	-23.0	-24.0	n/a	-15.0	-16.7	n/a	-30.5	-29.4	n/a	n/a	n/a	n/a
30/12/2006	-14.7	-14.8	n/a	-8.6	-9.0	n/a	-24.1	-24.9	n/a	n/a	n/a	n/a
31/12/2006	-17.4	-18.2	n/a	-10.1	-10.4	n/a	-23.1	-23.4	n/a	n/a	0.3	n/a
01/01/2007	-19.4	-20.6	n/a	-17.7	-18.2	n/a	-22.0	-24.1	n/a	n/a	n/a	n/a
02/01/2007	-15.8	-16.3	n/a	-14.2	-14.2	n/a	-18.0	-18.4	n/a	n/a	n/a	n/a
03/01/2007	-15.2	-16.4	n/a	-14.1	-14.5	n/a	-16.1	-19.6	n/a	n/a	n/a	n/a
04/01/2007	-14.5	-17.4	n/a	-12.0	-16.4	n/a	-19.1	-23.3	n/a	n/a	n/a	n/a
05/01/2007	-19.5	-19.6	n/a	-13.7	-15.3	n/a	-25.2	-24.7	n/a	n/a	n/a	n/a
06/01/2007	-18.4	-20.4	n/a	-14.0	-16.7	n/a	-22.2	-24.2	n/a	n/a	n/a	n/a
07/01/2007	-26.8	-28.2	n/a	-22.2	-23.9	n/a	-29.4	-31.1	n/a	n/a	n/a	n/a
08/01/2007	-31.8	-32.2	n/a	-28.0	-30.4	n/a	-34.9	-33.8	n/a	n/a	n/a	n/a
09/01/2007	-35.8	-34.2	n/a	-34.3	-30.2	n/a	-37.6	-37.0	n/a	n/a	n/a	n/a
10/01/2007	-34.0	-34.4	n/a	-32.3	-32.0	n/a	-36.2	-38.3	n/a	n/a	n/a	n/a
11/01/2007	-34.8	-34.5	n/a	-30.0	-28.9	n/a	-37.8	-38.6	n/a	n/a	n/a	n/a
12/01/2007	-32.6	-33.7	n/a	-28.4	-28.7	n/a	-35.6	-37.2	n/a	n/a	n/a	n/a
13/01/2007	-26.9	-27.2	n/a	-23.0	-23.7	n/a	-34.9	-33.7	n/a	n/a	n/a	n/a
14/01/2007	-24.4	-24.6	n/a	-22.7	-21.9	n/a	-29.2	-29.4	n/a	n/a	n/a	n/a
15/01/2007	-30.6	-30.5	n/a	-27.9	-28.1	n/a	-33.2	-32.5	n/a	n/a	n/a	n/a
16/01/2007	-25.6	-24.9	n/a	-24.2	-19.7	n/a	-28.3	-30.2	n/a	n/a	n/a	n/a
17/01/2007	-27.9	-28.8	n/a	-26.1	-27.1	n/a	-29.9	-30.1	n/a	n/a	n/a	n/a
18/01/2007	-30.1	-30.0	n/a	-28.5	-27.8	n/a	-31.7	-32.1	n/a	n/a	n/a	n/a
19/01/2007	-30.9	-30.3	n/a	-29.9	-27.1	n/a	-32.5	-31.7	n/a	n/a	n/a	n/a
20/01/2007	-29.9	-26.3	n/a	-26.9	-23.0	n/a	-32.2	-29.1	n/a	n/a	n/a	n/a
21/01/2007	-29.3	-27.2	n/a	-24.2	-23.3	n/a	-37.6	-31.6	n/a	n/a	n/a	n/a
22/01/2007	-37.4	-35.0	n/a	-35.4	-31.4	n/a	-39.2	-37.5	n/a	n/a	n/a	n/a
23/01/2007	-31.6	-30.1	n/a	-19.2	-18.5	n/a	-36.1	-34.6	n/a	n/a	n/a	n/a
24/01/2007	-23.6	-23.9	n/a	-18.3	-18.1	n/a	-31.9	-30.7	n/a	n/a	n/a	n/a
25/01/2007	-28.9	-26.8	n/a	-25.7	-22.7	n/a	-32.2	-30.0	n/a	n/a	n/a	n/a
26/01/2007	-25.5	-26.3	n/a	-23.4	-24.1	n/a	-30.2	-28.9	n/a	n/a	n/a	n/a
27/01/2007	-21.1	-22.6	n/a	-17.9	-18.0	n/a	-26.2	-29.3	n/a	n/a	n/a	n/a
28/01/2007	-23.9	-23.6	n/a	-18.3	-18.3	n/a	-27.1	-27.7	n/a	n/a	n/a	n/a
29/01/2007	-21.5	-21.5	n/a	-18.3	-17.7	n/a	-26.9	-24.5	n/a	n/a	n/a	n/a
30/01/2007	-23.3	-22.4	n/a	-16.9	-16.5	n/a	-28.0	-26.6	n/a	n/a	n/a	n/a
31/01/2007	-24.7	-24.7	n/a	-20.9	-21.0	n/a	-27.1	-26.7	n/a	n/a	n/a	n/a
01/02/2007	-25.1	-25.1	n/a	-21.9	-22.3	n/a	-29.3	-28.4	n/a	n/a	n/a	n/a
02/02/2007	-25.4	-24.7	n/a	-21.0	-20.7	n/a	-31.2	-30.8	n/a	n/a	n/a	n/a
03/02/2007	-28.4	-25.8	n/a	-21.8	-22.9	n/a	-36.6	-30.8	n/a	n/a	n/a	n/a
04/02/2007	-35.4	-32.9	n/a	-33.2	-30.3	n/a	-38.2	-35.4	n/a	n/a	n/a	n/a
05/02/2007	-35.1	-35.1	n/a	-32.0	-33.1	n/a	-38.0	-36.6	n/a	n/a	n/a	n/a
06/02/2007	-34.8	-31.6	n/a	-32.6	-29.2	n/a	-37.1	-34.5	n/a	n/a	n/a	n/a
07/02/2007	-29.0	-28.2	n/a	-26.5	-25.0	n/a	-33.4	-31.6	n/a	n/a	n/a	n/a
08/02/2007	-24.5	-24.9	n/a	-23.7	-23.9	n/a	-27.0	-26.7	n/a	n/a	n/a	n/a
09/02/2007	-23.7	-23.8	n/a	-21.5	-21.3	n/a	-27.5	-26.9	n/a	n/a	n/a	n/a
10/02/2007	-29.6	-29.4	n/a	-24.1	-24.4	n/a	-32.4	-31.6	n/a	n/a	n/a	n/a
11/02/2007	-29.3	-28.0	n/a	-26.0	-23.3	n/a	-32.6	-31.1	n/a	n/a	n/a	n/a
12/02/2007	-28.1	-27.7	n/a	-26.0	-24.0	n/a	-30.3	-29.9	n/a	n/a	n/a	n/a
13/02/2007	-26.6	-27.2	n/a	-24.4	-24.9	n/a	-28.6	-29.4	n/a	n/a	n/a	n/a
14/02/2007	-23.7	-24.2	n/a	-19.2	-18.9	n/a	-28.8	-30.8	n/a	n/a	n/a	n/a
15/02/2007	-25.1	-26.2	n/a	-18.8	-19.6	n/a	-29.8	-30.0	n/a	n/a	n/a	n/a
16/02/2007	-29.8	-28.8	n/a	-27.9	-26.3	n/a	-32.0	-31.3	n/a	n/a	n/a	n/a
17/02/2007	-29.3	-28.9	n/a	-27.2	-26.3	n/a	-33.6	-32.9	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
18/02/2007	-35.8	-34.8	n/a	-32.3	-31.9	n/a	-39.4	-36.9	n/a	n/a	n/a	n/a
19/02/2007	-36.6	-34.9	n/a	-33.3	-33.1	n/a	-39.8	-37.4	n/a	n/a	n/a	n/a
20/02/2007	-32.5	-31.4	n/a	-28.8	-28.4	n/a	-36.7	-35.9	n/a	n/a	n/a	n/a
21/02/2007	-29.4	-28.8	n/a	-27.2	-26.8	n/a	-31.4	-30.4	n/a	n/a	n/a	n/a
22/02/2007	-32.3	-32.8	n/a	-28.1	-30.2	n/a	-37.3	-34.9	n/a	n/a	n/a	n/a
23/02/2007	-34.2	-33.7	n/a	-30.9	-30.4	n/a	-37.6	-37.0	n/a	n/a	n/a	n/a
24/02/2007	-23.0	-23.5	n/a	-17.6	-19.2	n/a	-32.9	-30.9	n/a	n/a	n/a	n/a
25/02/2007	-30.3	-31.8	n/a	-21.8	-25.1	n/a	-37.4	-35.5	n/a	n/a	n/a	n/a
26/02/2007	-31.3	-31.1	n/a	-23.6	-24.8	n/a	-36.8	-35.1	n/a	n/a	n/a	n/a
27/02/2007	-22.2	-23.5	n/a	-15.9	-20.1	n/a	-24.5	-27.1	n/a	n/a	n/a	n/a
28/02/2007	-24.9	-27.8	n/a	-24.4	-27.0	n/a	-25.4	-28.7	n/a	n/a	n/a	n/a
01/03/2007	-28.2	-28.6	n/a	-25.3	-27.4	n/a	-30.6	-30.3	n/a	n/a	n/a	n/a
02/03/2007	-31.9	-32.1	n/a	-28.0	-29.2	n/a	-39.0	-39.0	n/a	n/a	n/a	n/a
03/03/2007	-38.3	-37.8	n/a	-33.8	-33.2	n/a	-41.0	-41.4	n/a	n/a	n/a	n/a
04/03/2007	-36.8	-35.8	n/a	-34.3	-33.5	n/a	-39.2	-37.4	n/a	n/a	n/a	n/a
05/03/2007	-31.3	-31.4	n/a	-27.4	-27.7	n/a	-36.3	-36.6	n/a	n/a	n/a	n/a
06/03/2007	-31.6	-30.6	n/a	-28.7	-28.6	n/a	-35.9	-33.7	n/a	n/a	n/a	n/a
07/03/2007	-30.7	-30.4	n/a	-28.7	-28.3	n/a	-34.9	-33.4	n/a	n/a	n/a	n/a
08/03/2007	-29.1	-30.2	n/a	-26.8	-28.6	n/a	-33.8	-34.9	n/a	n/a	n/a	n/a
09/03/2007	-36.7	-36.5	n/a	-33.6	-34.3	n/a	-39.7	-38.5	n/a	n/a	n/a	n/a
10/03/2007	-36.1	-34.5	n/a	-31.7	-29.6	n/a	-40.3	-37.8	n/a	n/a	n/a	n/a
11/03/2007	-34.7	-34.5	n/a	-30.6	-28.5	n/a	-39.0	-37.8	n/a	n/a	n/a	n/a
12/03/2007	-37.0	-31.9	n/a	-31.8	-26.5	n/a	-42.7	-36.3	n/a	n/a	n/a	n/a
13/03/2007	-33.6	-30.9	n/a	-28.4	-25.6	n/a	-38.6	-33.5	n/a	n/a	n/a	n/a
14/03/2007	-31.9	-31.9	n/a	-28.6	-27.5	n/a	-35.5	-36.0	n/a	n/a	n/a	n/a
15/03/2007	-30.6	-31.0	n/a	-27.7	-28.1	n/a	-34.2	-34.3	n/a	n/a	n/a	n/a
16/03/2007	-26.9	-27.4	n/a	-23.7	-24.4	n/a	-32.4	-32.8	n/a	n/a	n/a	n/a
17/03/2007	-34.0	-32.9	n/a	-28.3	-27.8	n/a	-38.3	-35.9	n/a	n/a	n/a	n/a
18/03/2007	-36.8	-33.9	n/a	-31.8	-28.8	n/a	-41.5	-36.6	n/a	n/a	n/a	n/a
19/03/2007	-34.1	-34.0	n/a	-29.3	-28.9	n/a	-39.4	-38.9	n/a	n/a	n/a	n/a
20/03/2007	-33.3	-32.0	n/a	-27.3	-27.1	n/a	-36.5	-35.6	n/a	n/a	n/a	n/a
21/03/2007	-30.5	-30.2	n/a	-23.0	-23.7	n/a	-38.0	-37.4	n/a	n/a	n/a	n/a
22/03/2007	-20.8	-21.5	n/a	-16.9	-18.0	n/a	-26.8	-26.3	n/a	n/a	n/a	n/a
23/03/2007	-20.6	-20.3	n/a	-15.2	-13.3	n/a	-25.2	-25.4	n/a	n/a	n/a	n/a
24/03/2007	-13.2	-14.2	n/a	-8.3	-11.2	n/a	-19.7	-20.0	n/a	n/a	n/a	n/a
25/03/2007	-19.9	-21.1	n/a	-11.9	-16.8	n/a	-26.5	-24.2	n/a	n/a	n/a	n/a
26/03/2007	-20.9	-20.9	n/a	-16.2	-17.5	n/a	-26.3	-23.5	n/a	n/a	n/a	n/a
27/03/2007	-14.9	-15.8	n/a	-7.8	-9.4	n/a	-20.1	-23.0	n/a	n/a	n/a	n/a
28/03/2007	-22.6	-23.2	n/a	-18.9	-18.1	n/a	-27.2	-28.0	n/a	n/a	n/a	n/a
29/03/2007	-21.5	-22.4	n/a	-14.4	-16.0	n/a	-28.0	-28.2	n/a	n/a	n/a	n/a
30/03/2007	-21.5	-19.3	n/a	-16.4	-13.9	n/a	-26.9	-23.6	n/a	n/a	n/a	n/a
31/03/2007	-23.5	-22.6	n/a	-18.9	-18.1	n/a	-30.3	-29.7	n/a	n/a	n/a	n/a
01/04/2007	-30.8	-28.6	n/a	-26.1	-22.9	n/a	-34.8	-32.5	n/a	n/a	n/a	n/a
02/04/2007	-27.5	-27.2	n/a	-21.7	-21.9	n/a	-32.8	-32.1	n/a	n/a	n/a	n/a
03/04/2007	-24.3	-24.1	n/a	-18.7	-18.0	n/a	-29.0	-28.7	n/a	n/a	n/a	n/a
04/04/2007	-22.0	-21.7	n/a	-16.9	-12.7	n/a	-26.3	-26.5	n/a	n/a	n/a	n/a
05/04/2007	-21.0	-20.3	n/a	-14.4	-13.9	n/a	-26.7	-24.7	n/a	n/a	n/a	n/a
06/04/2007	-19.7	-20.2	n/a	-14.0	-16.1	n/a	-26.0	-25.1	n/a	n/a	n/a	n/a
07/04/2007	-16.7	-16.9	n/a	-11.0	-12.2	n/a	-23.1	-21.4	n/a	n/a	n/a	n/a
08/04/2007	-10.1	-9.4	n/a	-4.5	-3.6	n/a	-16.4	-16.8	n/a	n/a	n/a	n/a
09/04/2007	-5.0	-4.1	n/a	-2.4	-0.5	n/a	-11.9	-11.9	n/a	n/a	n/a	n/a
10/04/2007	-7.3	-6.9	n/a	-3.5	-0.6	n/a	-12.3	-12.9	n/a	n/a	n/a	n/a
11/04/2007	-7.2	-8.0	n/a	0.0	-1.2	n/a	-15.3	-14.0	n/a	n/a	n/a	n/a
12/04/2007	-10.1	-9.6	n/a	-4.3	-3.2	n/a	-18.1	-16.4	n/a	n/a	n/a	n/a
13/04/2007	-9.2	-10.1	n/a	-7.8	-8.3	n/a	-11.4	-15.2	n/a	n/a	n/a	n/a
14/04/2007	-14.2	-15.0	n/a	-9.0	-9.5	n/a	-20.0	-19.0	n/a	n/a	n/a	n/a
15/04/2007	-18.9	-16.2	n/a	-10.6	-9.8	n/a	-24.2	-21.5	n/a	n/a	n/a	n/a
16/04/2007	-20.7	-17.4	n/a	-13.3	-11.9	n/a	-27.2	-22.5	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
17/04/2007	-19.8	-18.3	n/a	-9.0	-10.1	n/a	-26.5	-23.6	n/a	n/a	n/a	n/a
18/04/2007	-18.7	-17.2	n/a	-10.3	-7.6	n/a	-27.9	-25.5	n/a	n/a	n/a	n/a
19/04/2007	-13.7	-14.7	n/a	-8.4	-10.9	n/a	-20.0	-20.0	n/a	n/a	n/a	n/a
20/04/2007	-12.5	-11.4	n/a	-7.1	-7.6	n/a	-19.6	-16.5	n/a	n/a	n/a	n/a
21/04/2007	-9.7	-9.3	n/a	-8.4	-7.6	n/a	-13.5	-12.0	n/a	n/a	n/a	n/a
22/04/2007	-14.7	-13.6	n/a	-11.9	-11.5	n/a	-18.5	-17.0	n/a	n/a	n/a	n/a
23/04/2007	-14.6	-12.3	n/a	-8.5	-5.9	n/a	-20.6	-17.9	n/a	n/a	n/a	n/a
24/04/2007	-15.0	-12.8	n/a	-8.6	-7.6	n/a	-24.4	-19.0	n/a	n/a	n/a	n/a
25/04/2007	-8.6	-7.8	n/a	-5.3	-5.7	n/a	-11.9	-10.8	n/a	n/a	n/a	n/a
26/04/2007	-9.2	-10.2	n/a	-5.3	-6.3	n/a	-12.8	-13.8	n/a	n/a	n/a	n/a
27/04/2007	-13.2	-14.3	n/a	-11.5	-12.8	n/a	-14.8	-16.0	n/a	n/a	n/a	n/a
28/04/2007	-17.0	-18.1	n/a	-13.8	-12.7	n/a	-21.1	-22.0	n/a	n/a	n/a	n/a
29/04/2007	-12.1	-13.7	n/a	-7.5	-7.8	n/a	-16.7	-21.3	n/a	n/a	n/a	n/a
30/04/2007	-5.4	-7.2	n/a	1.7	-1.6	n/a	-10.7	-14.1	n/a	n/a	n/a	n/a
01/05/2007	-6.5	-7.9	n/a	-2.5	-4.7	n/a	-14.5	-14.3	n/a	n/a	n/a	n/a
02/05/2007	-7.2	-9.0	n/a	-0.2	-3.5	n/a	-14.8	-13.3	n/a	n/a	n/a	n/a
03/05/2007	-8.0	-9.3	n/a	-0.9	-2.3	n/a	-15.9	-17.3	n/a	n/a	n/a	n/a
04/05/2007	-7.1	-9.3	n/a	-2.1	-5.8	n/a	-14.3	-13.9	n/a	n/a	n/a	n/a
05/05/2007	-5.7	-7.3	n/a	-2.8	-5.3	n/a	-7.9	-8.7	n/a	0.3	0.3	n/a
06/05/2007	-4.2	-4.9	n/a	-2.7	-2.6	n/a	-5.8	-6.1	n/a	n/a	n/a	n/a
07/05/2007	-2.8	-5.1	n/a	-1.1	-3.1	n/a	-6.0	-6.9	n/a	n/a	n/a	n/a
08/05/2007	-8.3	-10.0	n/a	-5.1	-6.9	n/a	-15.8	-15.4	n/a	n/a	n/a	n/a
09/05/2007	-12.4	-12.5	n/a	-6.4	-5.6	n/a	-18.6	-18.8	n/a	n/a	n/a	n/a
10/05/2007	-9.5	-9.8	n/a	-2.4	-3.1	n/a	-16.2	-16.2	n/a	n/a	n/a	n/a
11/05/2007	-4.6	-5.0	n/a	1.0	2.3	n/a	-11.3	-11.4	n/a	n/a	n/a	n/a
12/05/2007	-6.7	-5.2	n/a	-2.2	-1.9	n/a	-12.5	-9.9	n/a	n/a	n/a	n/a
13/05/2007	-7.1	-6.3	n/a	-5.0	-4.1	n/a	-8.0	-8.1	n/a	n/a	n/a	n/a
14/05/2007	-4.6	-4.4	n/a	-1.3	-1.5	n/a	-8.8	-7.5	n/a	n/a	n/a	n/a
15/05/2007	-9.9	-11.5	n/a	-1.4	-1.5	n/a	-13.2	-15.1	n/a	n/a	n/a	n/a
16/05/2007	-12.5	-13.2	n/a	-8.1	-8.6	n/a	-17.7	-17.7	n/a	n/a	n/a	n/a
17/05/2007	-14.1	-14.8	n/a	-12.1	-13.4	n/a	-16.6	-16.0	n/a	n/a	n/a	n/a
18/05/2007	-12.7	n/a	n/a	-6.1	n/a	n/a	-19.2	n/a	n/a	n/a	n/a	n/a
19/05/2007	-5.7	n/a	n/a	1.0	n/a	n/a	-12.1	n/a	n/a	n/a	n/a	n/a
20/05/2007	-5.2	n/a	n/a	0.5	n/a	n/a	-13.4	n/a	n/a	n/a	n/a	n/a
21/05/2007	-2.6	n/a	n/a	0.4	n/a	n/a	-6.3	n/a	n/a	n/a	n/a	n/a
22/05/2007	-5.4	n/a	n/a	-3.7	n/a	n/a	-7.4	n/a	n/a	n/a	n/a	n/a
23/05/2007	-4.9	n/a	n/a	-3.5	n/a	n/a	-7.0	n/a	n/a	n/a	n/a	n/a
24/05/2007	-1.4	n/a	n/a	3.3	n/a	n/a	-9.3	n/a	n/a	n/a	n/a	n/a
25/05/2007	1.9	n/a	n/a	6.5	n/a	n/a	-4.1	n/a	n/a	n/a	n/a	n/a
26/05/2007	0.7	n/a	n/a	2.8	n/a	n/a	-1.7	n/a	n/a	n/a	n/a	n/a
27/05/2007	-5.8	n/a	n/a	-1.5	n/a	n/a	-9.3	n/a	n/a	n/a	n/a	n/a
28/05/2007	-8.0	n/a	n/a	-3.0	n/a	n/a	-13.1	n/a	n/a	n/a	n/a	n/a
29/05/2007	-0.5	n/a	n/a	2.9	n/a	n/a	-8.7	n/a	n/a	0.3	n/a	n/a
30/05/2007	-1.6	n/a	n/a	0.1	n/a	n/a	-2.9	n/a	n/a	n/a	n/a	n/a
31/05/2007	-0.4	n/a	n/a	0.7	n/a	n/a	-1.7	n/a	n/a	n/a	n/a	n/a
01/06/2007	1.2	n/a	n/a	4.9	n/a	n/a	-0.5	n/a	n/a	0	0	n/a
02/06/2007	-0.2	n/a	n/a	1.3	n/a	n/a	-1.8	n/a	n/a	0	0	n/a
03/06/2007	-3.3	n/a	n/a	0.1	n/a	n/a	-5.8	n/a	n/a	0	0	n/a
04/06/2007	-2.9	n/a	n/a	2.2	n/a	n/a	-6.8	n/a	n/a	0	0	n/a
05/06/2007	-3.3	n/a	n/a	0.2	n/a	n/a	-7.3	n/a	n/a	0	0	n/a
06/06/2007	-0.5	n/a	n/a	0.8	n/a	n/a	-3.0	n/a	n/a	0	0	n/a
07/06/2007	-1.3	n/a	n/a	0.4	n/a	n/a	-3.3	n/a	n/a	0	0	n/a
08/06/2007	-2.0	n/a	n/a	-0.3	n/a	n/a	-3.5	n/a	n/a	0	0	n/a
09/06/2007	-1.0	n/a	n/a	1.0	n/a	n/a	-3.1	n/a	n/a	0	0	n/a
10/06/2007	0.3	n/a	n/a	2.2	n/a	n/a	-1.5	n/a	n/a	0	0	n/a
11/06/2007	3.3	n/a	n/a	10.4	n/a	n/a	-3.5	n/a	n/a	0	0	n/a
12/06/2007	3.6	5.5	n/a	7.7	8.4	n/a	0.2	2.0	n/a	0	0	n/a
13/06/2007	2.2	3.4	n/a	6.8	7.0	n/a	-0.7	-0.3	n/a	0.3	2.5	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
14/06/2007	1.1	1.4	n/a	3.9	4.7	n/a	-1.2	-1.1	n/a	0	1.5	n/a
15/06/2007	2.9	2.9	n/a	5.2	5.0	n/a	0.1	1.1	n/a	0	0	n/a
16/06/2007	1.5	1.4	n/a	3.0	2.7	n/a	0.4	0.4	n/a	0	0.3	n/a
17/06/2007	2.1	1.8	n/a	4.9	4.2	n/a	0.4	0.1	n/a	0	0	n/a
18/06/2007	2.0	1.8	1.6	4.3	4.1	2.5	0.6	0.3	1.2	0	0.8	0.0
19/06/2007	1.2	1.0	1.8	3.2	2.5	3.9	0.0	-0.1	-0.1	0	0.5	0.2
20/06/2007	3.1	2.9	3.7	7.1	7.4	7.0	-0.4	-0.3	0.8	0	1.3	0.2
21/06/2007	4.7	3.5	4.4	8.7	6.9	6.6	0.0	0.3	1.8	0	0.3	0.0
22/06/2007	5.9	5.9	6.9	10.6	11.7	10.9	1.8	1.7	2.7	0	0.3	0.0
23/06/2007	11.0	11.0	12.7	16.5	17.6	18.3	4.2	3.6	5.4	0	0	0.0
24/06/2007	13.7	13.3	15.2	19.6	17.7	20.4	4.2	7.1	8.8	0	0	0.0
25/06/2007	15.3	14.3	17.3	23.1	21.0	24.3	6.4	7.7	10.2	0	0	0.0
26/06/2007	16.9	17.7	19.5	23.3	24.0	24.4	8.0	8.6	12.5	0	0	0.0
27/06/2007	15.1	16.3	17.9	20.4	20.8	22.4	7.0	10.3	11.6	0	0	0.0
28/06/2007	14.2	14.9	16.3	20.2	21.3	21.4	6.2	8.0	9.0	0	0	0.0
29/06/2007	16.3	16.6	18.4	22.8	23.3	23.6	7.1	8.6	10.9	0	0	0.0
30/06/2007	16.8	16.8	18.1	24.5	23.7	24.2	8.8	9.8	12.2	0	0	0.0
01/07/2007	16.3	16.6	19.1	22.1	22.1	23.6	8.6	10.7	13.0	0.3	0.3	0.0
02/07/2007	13.2	13.6	11.4	19.6	18.5	18.5	8.1	8.7	7.7	0	0.5	0.0
03/07/2007	7.9	8.0	7.9	10.8	10.0	10.2	4.9	5.6	5.9	0	0	0.0
04/07/2007	7.0	7.2	8.2	10.0	10.2	10.6	3.7	3.8	4.8	0	0	0.0
05/07/2007	9.9	10.4	12.1	15.5	15.5	16.0	3.7	4.0	6.0	0	0	0.0
06/07/2007	12.5	13.0	14.4	18.0	18.4	17.2	4.6	6.7	9.1	0	0	0.0
07/07/2007	12.1	12.4	13.5	15.6	15.5	16.7	6.6	7.7	10.2	0	0	0.0
08/07/2007	12.9	12.6	13.9	17.0	17.2	18.2	8.6	8.3	9.5	0	0	0.0
09/07/2007	12.5	12.7	14.4	17.0	17.9	18.0	8.1	7.7	10.8	0	0	0.0
10/07/2007	14.7	15.5	17.1	20.5	20.9	20.7	7.0	8.9	10.6	0	0	0.0
11/07/2007	17.0	17.7	19.0	23.1	22.7	23.7	7.7	11.3	12.0	0	0	0.0
12/07/2007	17.9	18.4	18.9	23.1	22.8	24.0	9.9	12.1	12.1	0	0	0.0
13/07/2007	15.4	15.4	16.4	19.6	19.7	19.2	10.5	10.2	13.1	0	0	0.0
14/07/2007	15.7	15.9	16.5	20.0	20.2	19.6	9.5	10.6	13.1	0	0	0.0
15/07/2007	16.6	17.3	18.4	22.0	22.6	23.1	9.4	11.1	12.0	0	0	0.0
16/07/2007	16.5	17.2	17.0	19.9	19.6	19.2	10.6	14.4	13.9	0	0	0.0
17/07/2007	14.4	14.5	15.5	19.2	18.8	18.6	8.7	9.5	11.3	0	0	0.0
18/07/2007	18.4	18.2	19.7	25.1	24.2	25.6	10.5	10.7	11.7	0	0	0.0
19/07/2007	19.6	19.5	21.8	28.2	27.6	27.3	10.9	12.7	14.8	0.3	0	0.0
20/07/2007	20.3	20.4	21.3	28.9	28.2	27.6	16.4	16.0	16.8	0	0.5	3.1
21/07/2007	18.4	17.1	17.6	24.8	23.1	24.8	11.6	10.9	10.2	0	0.3	0.0
22/07/2007	13.9	12.7	13.3	20.2	18.1	17.4	9.6	8.9	9.3	0	0	0.2
23/07/2007	11.8	10.5	10.6	15.2	12.7	12.6	8.8	8.6	9.7	0	0.3	6.3
24/07/2007	10.6	9.4	9.4	11.7	10.7	10.6	9.1	8.1	8.4	0	1.3	0.0
25/07/2007	10.0	9.1	8.9	13.6	12.3	11.8	7.6	7.0	7.0	0	0.3	2.3
26/07/2007	11.0	10.6	11.7	15.3	15.2	15.7	7.2	6.8	6.9	0	0.5	0.5
27/07/2007	13.1	12.1	10.6	17.6	17.3	13.5	7.1	7.6	8.0	0	0	0.0
28/07/2007	11.1	10.8	10.5	17.9	17.1	14.6	6.8	6.8	7.9	0	0	0.0
29/07/2007	13.6	11.5	9.2	18.2	16.3	12.8	8.2	7.1	6.1	0	0	0.0
30/07/2007	16.8	16.6	18.0	24.8	24.0	25.0	8.5	8.6	8.1	0	0	0.0
31/07/2007	14.9	13.6	11.6	20.5	21.3	18.4	9.5	6.7	7.6	0.3	0.3	0.6
01/08/2007	n/a	9.3	8.8	n/a	14.9	11.0	n/a	5.3	5.7	0	0	0.0
02/08/2007	13.7	10.6	10.7	16.3	15.7	15.0	9.3	6.1	6.5	0	1.8	0.0
03/08/2007	11.4	10.8	10.8	16.7	16.3	15.0	3.9	5.2	5.1	0	0	0.0
04/08/2007	10.7	9.9	9.7	13.9	13.5	11.8	7.9	7.5	7.4	0	0	0.0
05/08/2007	8.5	7.9	8.5	10.3	9.7	10.1	6.8	6.1	6.8	0	0.3	0.0
06/08/2007	11.7	10.5	9.9	19.2	17.0	15.5	6.5	6.2	6.9	0	0	9.2
07/08/2007	7.3	6.1	6.1	10.1	9.8	9.6	4.1	1.9	3.2	0.3	1.5	3.1
08/08/2007	5.3	4.6	5.6	9.2	8.5	7.9	0.8	1.3	2.9	0	3.6	7.4
09/08/2007	5.6	4.5	5.9	7.5	7.0	8.2	3.9	3.1	4.8	0	2.0	3.8
10/08/2007	4.9	4.1	5.3	7.2	6.5	7.3	2.3	2.3	4.1	0	6.6	16.6

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
11/08/2007	5.7	5.6	6.8	8.5	8.9	9.5	2.5	2.6	4.6	0	4.1	2.7
12/08/2007	6.2	5.8	6.5	8.9	6.8	7.3	4.7	4.7	5.7	0	3.6	20.8
13/08/2007	7.1	6.7	7.2	9.3	9.3	9.8	5.5	5.1	6.1	0	4.6	3.4
14/08/2007	7.3	6.9	7.6	9.0	8.6	8.5	4.7	5.5	6.4	0	2.3	3.3
15/08/2007	6.9	6.1	6.7	8.0	7.1	8.1	5.5	5.3	5.5	0	0.5	0.5
16/08/2007	5.3	5.4	5.9	6.5	7.3	7.8	4.1	3.8	4.1	0	0	0.0
17/08/2007	9.7	10.1	11.7	16.2	16.6	16.9	4.7	4.5	5.1	0	0	0.0
18/08/2007	13.2	12.5	14.0	18.1	16.7	17.8	7.6	8.2	9.9	0	1.5	0.3
19/08/2007	15.1	13.1	11.9	23.8	22.3	19.9	7.8	7.7	8.1	0	0.3	2.6
20/08/2007	8.9	7.0	7.1	11.2	8.2	8.4	7.1	6.0	6.2	0	0	0.4
21/08/2007	6.4	5.2	6.1	7.7	6.8	7.3	4.8	3.6	4.9	0	0	0.4
22/08/2007	5.1	4.4	5.1	6.8	6.7	6.3	3.8	2.8	3.7	0	0	1.2
23/08/2007	4.7	4.5	5.7	5.8	5.7	7.6	3.8	3.0	4.0	0	0.3	1.3
24/08/2007	4.3	4.7	5.1	5.2	6.6	6.9	2.2	2.3	3.6	0	0.3	0.0
25/08/2007	3.3	2.8	4.1	5.8	4.0	5.2	1.5	1.6	3.1	0	0	0.0
26/08/2007	4.7	3.8	4.8	6.9	6.1	6.4	3.3	2.6	3.1	0	0	0.0
27/08/2007	3.9	3.4	3.9	5.6	4.8	5.6	1.0	0.5	1.8	0	0	0.3
28/08/2007	3.2	2.8	4.0	6.5	5.8	5.2	-0.2	-1.7	2.2	0	0.3	2.4
29/08/2007	4.9	4.3	4.7	6.2	5.7	5.6	3.0	3.3	3.9	0	0.3	4.5
30/08/2007	5.4	5.1	5.6	8.3	7.4	8.0	2.9	2.7	3.9	0	0	0.0
31/08/2007	6.2	6.2	8.0	11.5	10.6	10.6	-0.1	1.3	3.3	0	0	0.0
01/09/2007	8.6	8.1	8.1	13.8	15.2	13.6	4.0	4.9	5.4	0	1.5	0.0
02/09/2007	4.6	2.8	3.1	6.1	4.9	5.5	2.2	0.6	2.3	0	4.3	3.3
03/09/2007	2.6	2.1	3.8	6.7	6.3	6.9	-0.7	-1.1	1.3	0	0.3	0.0
04/09/2007	2.6	2.3	4.1	4.8	4.5	5.4	-1.7	-1.9	2.8	0	0	0.0
05/09/2007	2.9	1.9	2.9	5.2	4.4	4.2	1.7	0.5	2.0	0	0	0.0
06/09/2007	3.6	3.9	5.9	9.6	9.3	10.9	0.3	-0.1	0.9	0	0	0.0
07/09/2007	5.9	5.4	6.4	11.4	10.7	11.7	-0.9	1.5	0.8	0	0.8	2.2
08/09/2007	0.6	0.1	0.7	3.1	2.6	1.8	-1.0	-1.4	-0.5	0	0	1.0
09/09/2007	-0.1	-0.6	-0.2	0.9	0.1	1.2	-1.5	-2.1	-1.7	0	0	0.1
10/09/2007	-0.7	-0.4	0.4	2.3	3.5	2.6	-4.9	-3.4	-1.3	0	0	0.0
11/09/2007	-0.1	0.7	3.2	7.4	7.0	8.3	-7.4	-5.6	-1.8	0	0	0.0
12/09/2007	3.4	3.6	4.8	6.6	6.8	7.7	-1.0	0.3	3.2	0.3	0.5	3.8
13/09/2007	-0.2	-1.2	-1.1	4.0	3.4	3.7	-3.5	-4.0	-2.6	0	0	0.1
14/09/2007	-3.3	-3.8	-2.3	-2.3	-3.1	-1.6	-4.5	-4.7	-3.2	0	0	0.0
15/09/2007	-2.0	-2.6	-1.0	-0.3	-0.6	1.0	-3.8	-5.0	-2.9	0	0	0.0
16/09/2007	-2.2	-2.7	-1.4	-0.3	-1.1	-0.3	-3.6	-4.1	-2.1	0	0	0.0
17/09/2007	-2.5	-2.8	-0.8	-0.5	-1.2	0.7	-3.8	-4.6	-2.7	0	0	0.0
18/09/2007	-0.6	-1.4	0.1	2.1	0.0	2.0	-3.3	-3.6	-1.0	0	0	0.0
19/09/2007	-2.4	-1.6	0.3	2.6	3.0	4.3	-6.3	-4.9	-3.2	0	0	0.0
20/09/2007	-4.5	-4.7	-2.0	-2.4	-3.2	0.1	-7.8	-7.1	-3.7	0	0	0.0
21/09/2007	-1.6	-2.3	-0.7	-0.3	-0.7	0.9	-3.0	-3.8	-2.6	0	0	0.0
22/09/2007	-0.2	-0.4	0.8	1.4	1.2	3.0	-1.4	-1.5	-0.8	0.5	0.3	1.0
23/09/2007	-0.2	-1.1	0.1	1.3	-0.1	1.3	-1.3	-2.3	-1.3	0.8	0	0.0
24/09/2007	-0.2	-0.8	0.0	0.4	-0.3	1.0	-1.0	-1.3	-0.5	0.8	0.3	1.2
25/09/2007	-1.6	-1.8	-0.9	-0.8	-1.0	-0.1	-2.5	-2.7	-2.0	0	0	0.4
26/09/2007	-2.6	-4.1	-3.5	-1.3	-2.5	-1.8	-4.1	-5.4	-4.8	0	0	0.1
27/09/2007	-4.8	-6.0	-3.8	-3.1	-4.8	-2.9	-7.1	-9.3	-5.3	0	0	0.0
28/09/2007	-5.1	-5.7	-4.8	-1.8	-1.8	-1.8	-8.0	-8.3	-7.5	0	0	0.0
29/09/2007	-4.5	-5.4	-4.1	-3.7	-4.6	-3.3	-5.2	-6.2	-6.7	0	0	0.0
30/09/2007	-4.7	-5.2	-3.5	-3.7	-4.0	-2.6	-5.7	-5.8	-4.8	0	0	0.0
01/10/2007	-6.9	-7.6	-5.5	-4.4	-5.3	-3.6	-10.3	-10.5	-8.1	n/a	n/a	0.0
02/10/2007	-5.4	-6.9	-5.0	-3.1	-3.7	-4.0	-8.6	-9.7	-6.6	n/a	n/a	0.0
03/10/2007	-4.8	-6.2	-4.2	-3.0	-3.8	-2.3	-6.2	-8.3	-6.9	n/a	n/a	0.0
04/10/2007	-5.6	-7.0	-5.9	-3.1	-5.2	-3.9	-8.7	-10.9	-8.3	n/a	n/a	0.0
05/10/2007	-6.2	-7.1	-5.6	-1.4	-1.5	-1.0	-13.3	-12.8	-10.7	n/a	n/a	0.0
06/10/2007	-0.3	-1.1	-2.5	1.7	0.8	-1.1	-3.1	-2.5	-4.1	1.5	0.3	0.0
07/10/2007	1.0	-0.7	-1.4	2.0	2.1	2.7	-0.2	-3.1	-3.7	0.8	0.3	0.5

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
08/10/2007	0.7	-0.2	0.5	1.7	1.3	2.9	0.1	-3.0	-3.7	8.1	0.5	1.7
09/10/2007	-2.6	-3.7	-2.6	1.0	0.1	1.8	-7.3	-8.7	-6.5	n/a	n/a	0.1
10/10/2007	-2.2	-3.2	-1.4	2.3	0.9	2.3	-7.7	-9.1	-5.8	n/a	n/a	0.0
11/10/2007	2.8	1.9	3.7	4.0	3.8	5.8	2.0	-0.6	1.8	0.3	n/a	0.1
12/10/2007	-0.7	-2.5	-1.3	2.9	2.4	4.0	-5.5	-5.4	-3.2	n/a	n/a	0.0
13/10/2007	-3.6	-5.6	-4.0	-2.1	-3.5	-1.5	-4.9	-11.2	-7.1	n/a	n/a	0.0
14/10/2007	-3.6	-5.5	-5.2	-0.9	-3.8	-3.7	-6.9	-9.1	-7.5	0.3	n/a	0.0
15/10/2007	-12.0	-10.4	-9.8	-6.9	-6.9	-5.8	-14.8	-14.4	-13.8	n/a	n/a	0.0
16/10/2007	-4.4	-5.3	-3.9	-1.4	-2.3	-1.2	-8.5	-10.3	-10.1	n/a	n/a	0.0
17/10/2007	-1.2	-1.8	-1.2	-0.8	-1.4	-0.7	-1.9	-2.4	-1.6	n/a	n/a	0.0
18/10/2007	-2.0	-3.0	-2.1	-1.6	-2.4	-1.2	-2.3	-3.4	-2.6	n/a	n/a	0.0
19/10/2007	-2.0	-3.4	-2.5	-1.3	-3.1	-2.2	-2.5	-3.8	-2.9	n/a	n/a	0.0
20/10/2007	-0.6	-2.1	-2.2	0.0	-1.1	-1.6	-1.5	-3.2	-2.9	0.3	n/a	0.0
21/10/2007	-0.5	-0.8	-1.6	0.1	0.0	0.0	-1.5	-2.8	-3.0	n/a	0.3	0.1
22/10/2007	-3.0	-3.8	-2.5	-1.3	-1.4	-0.5	-7.3	-8.1	-5.1	n/a	n/a	0.0
23/10/2007	-5.4	-5.9	-3.8	-4.6	-5.0	-2.8	-7.5	-7.7	-5.1	n/a	n/a	0.0
24/10/2007	-7.5	-8.1	-7.2	-4.9	-5.4	-2.9	-11.9	-13.3	-11.3	n/a	n/a	0.0
25/10/2007	-12.0	-12.0	-10.5	-8.5	-9.2	-7.4	-14.5	-13.5	-12.6	n/a	0.3	0.0
26/10/2007	-15.4	-15.5	-12.7	-10.9	-12.0	-9.6	-24.0	-23.6	-17.9	n/a	n/a	0.0
27/10/2007	-10.5	-10.9	-9.3	-7.6	-7.7	-6.0	-18.7	-20.9	-15.0	n/a	n/a	0.0
28/10/2007	-15.0	-15.7	-13.6	-11.3	-12.0	-9.0	-18.6	-19.4	-15.5	n/a	n/a	0.1
29/10/2007	-19.7	-20.5	-17.4	-16.9	-16.9	-14.5	-23.8	-24.4	-22.6	n/a	n/a	0.0
30/10/2007	-19.3	-20.1	-18.2	-15.9	-16.0	-16.5	-24.1	-25.4	-21.8	n/a	n/a	0.0
31/10/2007	-22.4	-20.5	-19.7	-18.6	-18.3	-17.8	-27.4	-23.0	-21.7	n/a	n/a	0.0
01/11/2007	-18.2	-18.5	-16.6	-17.1	-17.7	-14.9	-19.3	-20.3	-18.9	n/a	n/a	0.0
02/11/2007	-18.2	-19.0	-16.6	-17.2	-16.8	-13.4	-19.2	-20.6	-19.6	n/a	n/a	0.0
03/11/2007	-17.4	-17.4	-12.5	-12.7	-10.2	-9.7	-22.1	-22.4	-15.1	n/a	n/a	0.0
04/11/2007	-19.6	-20.5	-18.9	-11.0	-11.1	-11.5	-25.4	-25.0	-20.9	n/a	n/a	0.0
05/11/2007	-21.5	-22.0	-19.3	-18.0	-19.7	-16.5	-24.9	-24.5	-21.8	n/a	n/a	0.0
06/11/2007	-22.9	-23.6	-20.9	-17.8	-19.7	-19.6	-29.1	-27.7	-23.2	n/a	n/a	0.0
07/11/2007	-24.6	-24.1	-19.5	-19.7	-21.8	-15.8	-27.5	-26.9	-22.3	n/a	n/a	0.0
08/11/2007	-23.4	-22.6	-20.5	-21.0	-21.2	-17.7	-25.6	-25.3	-23.4	n/a	n/a	0.0
09/11/2007	-18.6	-18.4	-17.4	-15.2	-15.2	-15.2	-24.3	-24.3	-21.3	n/a	n/a	0.0
10/11/2007	-20.9	-19.7	-20.4	-17.2	-16.7	-17.6	-25.4	-24.6	-23.7	n/a	n/a	0.0
11/11/2007	-24.5	-23.4	-24.6	-19.8	-19.9	-22.3	-27.5	-27.4	-27.8	n/a	n/a	0.0
12/11/2007	-19.2	-19.8	-18.9	-13.7	-15.2	-15.0	-24.0	-24.3	-25.4	n/a	n/a	0.0
13/11/2007	-13.3	-15.8	-16.7	-10.9	-13.6	-14.9	-16.8	-19.7	-20.2	n/a	n/a	0.0
14/11/2007	-21.7	-23.4	-23.9	-16.8	-19.7	-19.7	-25.7	-25.7	-25.7	n/a	n/a	0.0
15/11/2007	-24.2	-23.3	-19.7	-17.0	-17.4	-13.6	-29.5	-27.7	-24.6	n/a	n/a	0.0
16/11/2007	-25.1	-25.4	-25.5	-18.5	-22.3	-23.1	-28.6	-28.9	-26.9	n/a	n/a	0.0
17/11/2007	-24.2	-24.6	-25.1	-22.5	-22.8	-22.0	-31.0	-29.3	-28.8	n/a	n/a	0.0
18/11/2007	-30.3	-28.4	-28.2	-26.4	-24.0	-24.8	-33.0	-31.5	-30.5	n/a	n/a	0.0
19/11/2007	-27.9	-27.6	-23.3	-26.3	-23.9	-20.9	-30.0	-30.1	-26.6	n/a	n/a	0.0
20/11/2007	-25.6	-26.3	-19.8	-20.2	-22.5	-15.9	-28.2	-28.5	-22.7	n/a	n/a	0.0
21/11/2007	-15.7	-16.6	-14.4	-12.5	-13.9	-12.5	-20.2	-22.5	-16.6	n/a	n/a	0.0
22/11/2007	-14.6	-15.6	-15.1	-11.8	-14.2	-13.8	-16.1	-16.5	-16.5	n/a	n/a	0.0
23/11/2007	-23.5	-24.6	-24.6	-14.4	-15.1	-16.5	-28.0	-27.6	-26.6	n/a	n/a	0.0
24/11/2007	-29.3	-29.0	-26.6	-26.6	-26.9	-25.0	-31.9	-31.2	-29.0	n/a	n/a	0.0
25/11/2007	-26.9	-27.7	-26.5	-24.0	-26.1	-24.6	-29.3	-29.6	-28.0	n/a	n/a	0.0
26/11/2007	-27.1	-27.3	-22.5	-25.1	-24.6	-20.9	-29.5	-30.3	-25.9	n/a	n/a	0.0
27/11/2007	-21.9	-22.4	-19.5	-19.1	-19.5	-16.8	-25.4	-24.6	-22.1	n/a	n/a	0.0
28/11/2007	-24.7	-24.0	-22.8	-22.5	-21.2	-21.2	-26.6	-26.1	-25.3	n/a	n/a	0.0
29/11/2007	-23.4	-23.0	-20.3	-18.6	-18.9	-16.4	-27.3	-25.9	-23.5	n/a	n/a	0.0
30/11/2007	-24.7	-24.2	-22.3	-21.2	-21.3	-19.6	-28.2	-26.4	-24.1	n/a	n/a	0.0
01/12/2007	-30.2	-28.8	-26.6	-27.7	-25.5	-23.6	-32.6	-30.8	-27.9	n/a	n/a	0.0
02/12/2007	-33.2	-32.5	-30.7	-29.4	-29.3	-27.8	-34.8	-33.9	-32.1	n/a	n/a	0.0
03/12/2007	-28.0	-28.5	-28.2	-23.5	-26.1	-26.2	-32.3	-32.4	-30.8	n/a	n/a	0.0
04/12/2007	-24.6	-25.3	-19.8	-19.3	-20.6	-14.7	-30.8	-30.2	-26.7	n/a	n/a	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
05/12/2007	-20.3	-21.3	-18.1	-18.1	-19.0	-15.0	-22.8	-24.4	-19.8	n/a	n/a	0.0
06/12/2007	-19.0	-19.7	-17.5	-17.9	-18.8	-16.0	-20.7	-22.1	-20.1	n/a	n/a	0.0
07/12/2007	-22.8	-22.6	-20.4	-20.7	-20.0	-19.2	-24.7	-24.5	-21.5	n/a	n/a	0.0
08/12/2007	-26.2	-26.1	-23.2	-22.7	-21.9	-20.7	-29.5	-29.3	-25.4	n/a	n/a	0.0
09/12/2007	-29.6	-30.6	-25.9	-26.3	-27.9	-24.2	-31.0	-32.4	-26.9	n/a	n/a	0.0
10/12/2007	-29.9	-29.1	-27.1	-27.1	-25.5	-24.8	-31.5	-31.5	-29.0	n/a	n/a	0.0
11/12/2007	-30.8	-30.9	-26.9	-28.6	-29.2	-25.7	-32.9	-32.3	-28.2	n/a	n/a	0.0
12/12/2007	-29.7	-30.4	-24.9	-27.7	-26.3	-22.7	-31.7	-32.2	-27.8	n/a	n/a	0.0
13/12/2007	-27.5	-28.2	-19.2	-24.2	-25.4	-16.8	-30.6	-32.3	-23.3	n/a	n/a	0.0
14/12/2007	-22.1	-22.0	-17.6	-18.3	-18.6	-15.9	-25.4	-26.3	-20.3	n/a	n/a	0.0
15/12/2007	-25.7	-25.1	-22.3	-19.8	-21.2	-17.9	-30.9	-28.6	-25.4	n/a	n/a	0.0
16/12/2007	-31.1	-29.1	-28.0	-28.3	-25.3	-24.6	-33.4	-31.9	-30.0	n/a	n/a	0.0
17/12/2007	-27.9	-27.0	-25.3	-26.2	-25.2	-23.6	-29.8	-28.8	-27.9	n/a	n/a	0.0
18/12/2007	-20.2	-21.0	-20.1	-16.1	-17.1	-17.4	-26.8	-25.8	-24.0	n/a	n/a	0.0
19/12/2007	-16.7	-19.7	-21.0	-12.5	-14.3	-17.7	-21.8	-23.1	-23.5	n/a	n/a	0.0
20/12/2007	-22.5	-23.1	-22.1	-20.7	-21.3	-19.8	-24.2	-25.9	-26.7	n/a	n/a	0.0
21/12/2007	-25.7	-25.1	-25.5	-24.2	-24.2	-24.7	-27.8	-27.0	-26.9	n/a	n/a	0.0
22/12/2007	-28.8	-28.0	-23.4	-21.8	-21.1	-19.8	-33.7	-32.7	-26.1	n/a	n/a	0.0
23/12/2007	-21.8	-22.5	-22.0	-16.0	-18.6	-17.3	-28.5	-28.2	-26.5	n/a	n/a	0.0
24/12/2007	-31.5	-31.0	-30.3	-28.5	-28.2	-26.4	-34.3	-33.9	-31.5	n/a	n/a	0.0
25/12/2007	-32.9	-33.8	-27.1	-26.5	-28.3	-21.2	-36.3	-36.5	-32.0	n/a	n/a	0.0
26/12/2007	-28.2	-27.7	-26.1	-24.1	-22.1	-21.1	-33.8	-32.6	-29.4	n/a	n/a	0.0
27/12/2007	-35.5	-34.6	-30.7	-31.9	-30.7	-28.5	-38.8	-37.6	-31.8	n/a	n/a	0.0
28/12/2007	-38.7	-36.3	-33.0	-35.9	-34.4	-31.1	-40.0	-38.0	-35.0	n/a	n/a	0.0
29/12/2007	-28.4	-29.4	-27.5	-24.5	-25.3	-22.8	-35.9	-36.9	-33.8	n/a	n/a	0.0
30/12/2007	-24.7	-25.6	-20.5	-21.0	-21.4	-17.9	-27.6	-28.7	-24.1	n/a	n/a	0.0
31/12/2007	-25.9	-26.7	-26.4	-20.9	-21.4	-19.6	-32.6	-32.5	-29.5	n/a	n/a	0.0
01/01/2008	-29.8	-29.6	-24.9	-27.1	-26.6	-23.5	-34.5	-34.0	-27.4	n/a	n/a	0.0
02/01/2008	-26.6	-26.1	-24.5	-22.6	-22.3	-22.6	-34.4	-33.6	-28.2	n/a	n/a	0.0
03/01/2008	-26.6	-27.5	-27.5	-22.4	-23.4	-22.2	-34.1	-32.8	-31.0	n/a	n/a	0.0
04/01/2008	-34.2	-32.1	-32.4	-32.6	-29.7	-30.7	-35.6	-33.8	-33.7	n/a	n/a	0.0
05/01/2008	-27.6	-26.7	-26.0	-25.0	-24.1	-22.4	-32.6	-31.4	-33.2	n/a	n/a	0.0
06/01/2008	-23.8	-23.4	-21.7	-22.7	-22.6	-21.0	-25.3	-24.6	-23.3	n/a	n/a	0.0
07/01/2008	-24.6	-24.2	-22.4	-22.0	-21.8	-20.7	-27.9	-27.1	-25.2	n/a	n/a	0.0
08/01/2008	-25.0	-25.3	-22.9	-24.3	-24.2	-21.9	-26.7	-27.0	-25.0	n/a	n/a	0.0
09/01/2008	-28.9	-27.1	-24.6	-24.7	-25.0	-22.4	-32.9	-30.2	-27.8	n/a	n/a	0.0
10/01/2008	-33.1	-29.6	-28.2	-30.9	-28.1	-27.0	-35.2	-31.3	-30.0	n/a	n/a	0.0
11/01/2008	-34.8	-32.5	-27.5	-32.5	-29.9	-25.4	-36.6	-35.6	-29.2	n/a	n/a	0.0
12/01/2008	-28.8	-28.7	-22.3	-20.7	-21.8	-18.9	-36.3	-36.5	-28.9	n/a	n/a	0.0
13/01/2008	-18.8	-19.6	-17.3	-15.6	-16.6	-15.5	-20.9	-21.8	-19.0	n/a	n/a	0.0
14/01/2008	-21.7	-21.9	-20.1	-15.5	-16.6	-14.5	-26.1	-24.7	-22.3	n/a	n/a	0.0
15/01/2008	-28.8	-30.0	-27.5	-21.9	-22.2	-21.3	-33.2	-33.3	-29.1	n/a	n/a	0.0
16/01/2008	-30.4	-30.5	-28.2	-28.5	-29.1	-27.3	-33.2	-32.8	-29.2	n/a	n/a	0.0
17/01/2008	-31.0	-31.3	-30.3	-30.3	-30.2	-29.0	-31.7	-31.9	-31.6	n/a	n/a	0.0
18/01/2008	-33.0	-33.0	-30.4	-30.5	-30.6	-28.3	-35.2	-34.8	-31.7	n/a	n/a	0.0
19/01/2008	-32.6	-31.6	-28.8	-30.4	-27.9	-27.3	-34.7	-34.8	-30.6	n/a	n/a	0.0
20/01/2008	-32.3	-31.4	-28.4	-30.3	-27.2	-27.1	-34.5	-33.2	-30.3	n/a	n/a	0.0
21/01/2008	-33.4	-31.9	-29.6	-29.6	-28.0	-26.2	-36.0	-34.8	-31.9	n/a	n/a	0.0
22/01/2008	-25.4	-24.0	-21.7	-19.7	-19.8	-13.9	-30.7	-29.6	-28.7	n/a	n/a	0.0
23/01/2008	-15.6	-15.0	-10.8	-8.5	-8.3	-5.2	-23.6	-27.5	-15.5	n/a	n/a	0.0
24/01/2008	-20.3	-20.4	-19.9	-12.1	-14.8	-14.6	-26.7	-26.3	-22.7	n/a	n/a	0.1
25/01/2008	-29.2	-28.7	-25.0	-25.0	-24.7	-20.5	-33.8	-31.0	-27.0	n/a	n/a	0.0
26/01/2008	-28.1	-28.4	-26.8	-26.4	-26.3	-25.9	-29.9	-29.5	-27.7	n/a	n/a	0.0
27/01/2008	-31.1	-32.2	-30.8	-27.8	-29.3	-27.7	-33.8	-33.9	-32.1	n/a	n/a	0.0
28/01/2008	-33.0	-33.3	-31.6	-31.9	-32.8	-30.9	-33.7	-34.2	-32.0	n/a	n/a	0.0
29/01/2008	-35.7	-36.4	-32.2	-33.3	-34.1	-31.2	-37.8	-38.4	-33.5	n/a	n/a	0.0
30/01/2008	-38.6	-38.9	-34.2	-36.9	-37.2	-32.5	-41.0	-40.9	-36.5	n/a	n/a	0.0
31/01/2008	-40.4	-41.0	-34.5	-39.0	-39.6	-33.2	-41.8	-42.8	-36.6	n/a	n/a	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
01/02/2008	-39.4	-40.1	-33.7	-37.8	-37.6	-32.5	-41.2	-42.4	-35.3	n/a	n/a	0.0
02/02/2008	-37.7	-37.8	-32.4	-36.2	-35.7	-29.7	-38.9	-40.3	-35.0	n/a	n/a	0.0
03/02/2008	-36.0	-35.4	-30.1	-34.0	-33.4	-28.7	-38.2	-36.8	-31.2	n/a	n/a	0.0
04/02/2008	-35.1	-34.4	-29.9	-32.9	-32.5	-27.9	-37.6	-36.8	-30.9	n/a	n/a	0.0
05/02/2008	-33.8	-32.9	-31.8	-32.3	-31.4	-29.4	-38.8	-35.1	-34.7	n/a	n/a	0.0
06/02/2008	-40.2	-38.2	-34.0	-37.5	-35.1	-32.2	-42.9	-40.8	-35.9	n/a	n/a	0.0
07/02/2008	-38.7	-36.5	-34.3	-35.5	-34.0	-32.5	-41.7	-40.1	-35.3	n/a	n/a	0.0
08/02/2008	-40.5	-39.3	-36.7	-37.6	-36.1	-34.5	-43.9	-43.4	-38.3	n/a	n/a	0.0
09/02/2008	-37.2	-35.6	-29.9	-29.1	-27.8	-25.2	-43.7	-43.0	-36.7	n/a	n/a	0.0
10/02/2008	-29.6	-29.2	-25.4	-26.0	-26.2	-22.4	-31.9	-31.9	-27.5	n/a	n/a	0.0
11/02/2008	-34.4	-35.3	-35.6	-27.3	-27.2	-26.0	-41.3	-41.3	-39.8	n/a	n/a	0.0
12/02/2008	-39.9	-39.8	-39.3	-37.5	-37.6	-38.0	-41.2	-41.2	-40.4	n/a	n/a	0.0
13/02/2008	-39.8	-37.6	-37.7	-37.2	-34.6	-35.2	-41.7	-40.2	-40.2	n/a	n/a	0.0
14/02/2008	-41.1	-40.2	-33.7	-37.7	-36.1	-30.6	-43.7	-42.5	-37.2	n/a	n/a	0.0
15/02/2008	-39.2	-38.3	-33.4	-35.1	-35.3	-32.3	-42.4	-41.2	-34.7	n/a	n/a	0.0
16/02/2008	-37.6	-35.0	-31.7	-33.8	-32.2	-27.7	-41.8	-37.8	-35.7	n/a	n/a	0.0
17/02/2008	-36.6	-34.4	-33.5	-32.7	-31.2	-31.1	-41.0	-37.2	-35.4	n/a	n/a	0.0
18/02/2008	-38.5	-37.8	-28.2	-33.5	-34.1	-23.2	-42.3	-40.4	-35.2	n/a	n/a	0.0
19/02/2008	-26.8	-27.3	-16.6	-18.5	-18.6	-14.1	-35.8	-39.1	-25.1	n/a	n/a	0.0
20/02/2008	-19.0	-19.6	-19.5	-15.6	-16.1	-12.9	-21.6	-22.1	-21.9	n/a	n/a	0.0
21/02/2008	-20.7	-20.1	-17.8	-17.1	-15.8	-15.3	-22.6	-22.4	-21.8	n/a	n/a	0.0
22/02/2008	-21.5	-18.4	-18.0	-17.1	-16.4	-15.8	-26.8	-19.7	-19.3	n/a	n/a	0.0
23/02/2008	-25.0	-23.9	-25.9	-16.8	-16.1	-19.0	-33.4	-29.7	-29.5	n/a	n/a	0.0
24/02/2008	-26.1	-24.9	-22.2	-20.7	-20.9	-19.9	-31.8	-30.2	-27.4	n/a	n/a	0.0
25/02/2008	-22.4	-22.9	-22.6	-20.1	-20.2	-19.9	-25.4	-26.2	-24.6	n/a	n/a	0.0
26/02/2008	-27.4	-27.5	-25.4	-25.3	-25.7	-23.5	-29.0	-28.7	-27.3	n/a	n/a	0.0
27/02/2008	-29.2	-29.0	-26.5	-25.4	-24.8	-23.8	-35.0	-32.8	-29.4	n/a	n/a	0.0
28/02/2008	-33.7	-31.7	-28.5	-31.1	-27.2	-26.6	-36.6	-34.6	-30.4	n/a	n/a	0.0
29/02/2008	-28.7	-30.2	-26.4	-25.2	-27.0	-23.7	-35.6	-34.6	-30.4	n/a	n/a	0.0
01/03/2008	-34.8	-35.9	-33.6	-28.8	-30.8	-30.4	-40.4	-39.6	-34.7	n/a	n/a	0.0
02/03/2008	-35.9	-35.8	-30.9	-32.4	-32.7	-28.7	-39.7	-38.7	-33.9	n/a	n/a	0.0
03/03/2008	-34.0	-33.5	-29.1	-30.2	-30.6	-27.3	-37.4	-36.9	-31.4	n/a	n/a	0.0
04/03/2008	-35.0	-34.8	-34.1	-33.2	-33.3	-29.0	-36.5	-37.3	-37.2	n/a	n/a	0.0
05/03/2008	-32.0	-32.5	-30.4	-28.9	-29.4	-27.6	-34.5	-35.3	-33.6	n/a	n/a	0.0
06/03/2008	-27.5	-28.7	-20.8	-18.0	-17.8	-14.8	-35.8	-35.8	-31.2	n/a	n/a	0.0
07/03/2008	-19.0	-19.3	-18.6	-14.7	-15.3	-12.7	-26.6	-27.3	-24.2	n/a	n/a	0.0
08/03/2008	-18.6	-19.5	-16.1	-10.7	-12.3	-11.0	-28.5	-28.8	-24.4	n/a	n/a	0.0
09/03/2008	-24.2	-25.6	-27.0	-11.0	-12.5	-14.1	-32.2	-31.1	-29.7	n/a	n/a	0.0
10/03/2008	-29.4	-29.0	-26.1	-24.0	-25.1	-23.0	-34.7	-33.1	-31.0	n/a	n/a	0.0
11/03/2008	-25.2	-25.3	-24.5	-18.1	-18.4	-20.3	-31.7	-29.9	-28.3	n/a	n/a	0.0
12/03/2008	-31.6	-30.6	-27.8	-26.8	-26.9	-25.0	-35.2	-33.5	-29.8	n/a	n/a	0.0
13/03/2008	-30.5	-30.7	-27.2	-27.2	-26.0	-24.0	-34.4	-34.5	-30.3	n/a	n/a	0.0
14/03/2008	-35.0	-35.2	-33.0	-31.4	-31.2	-30.0	-38.1	-38.4	-34.8	n/a	n/a	0.0
15/03/2008	-34.7	-34.1	-33.1	-31.3	-30.4	-29.6	-38.4	-38.0	-36.0	n/a	n/a	0.0
16/03/2008	-31.6	-31.7	-32.4	-26.8	-28.4	-28.7	-35.9	-36.6	-36.3	n/a	n/a	0.0
17/03/2008	-38.2	-37.9	-36.5	-32.2	-35.5	-34.3	-40.9	-40.9	-38.6	n/a	n/a	0.0
18/03/2008	-35.7	-35.6	-30.8	-30.6	-30.5	-27.1	-40.9	-40.3	-35.9	n/a	n/a	0.0
19/03/2008	-32.5	-32.6	-27.9	-25.9	-27.7	-23.8	-36.1	-36.4	-31.6	n/a	n/a	0.0
20/03/2008	-32.5	-31.6	-29.4	-27.7	-25.6	-22.2	-36.9	-36.1	-33.7	n/a	n/a	0.0
21/03/2008	-36.3	-35.2	-33.7	-29.3	-31.1	-30.4	-40.6	-39.0	-36.8	n/a	n/a	0.0
22/03/2008	-36.4	-36.5	-29.8	-30.5	-31.7	-26.6	-42.8	-40.8	-33.4	n/a	n/a	0.0
23/03/2008	-32.3	-31.3	-27.2	-26.8	-25.2	-23.7	-36.8	-35.7	-30.8	n/a	n/a	0.0
24/03/2008	-31.7	-27.3	-24.1	-24.8	-17.6	-19.0	-38.6	-31.8	-29.7	n/a	n/a	0.0
25/03/2008	-24.4	-25.0	-20.4	-16.4	-16.3	-14.0	-33.4	-31.6	-27.9	n/a	n/a	0.0
26/03/2008	-28.1	-28.4	-25.1	-23.2	-24.0	-20.7	-31.8	-33.1	-30.7	n/a	n/a	0.0
27/03/2008	-26.8	-27.0	-25.5	-23.1	-24.4	-21.8	-31.5	-31.0	-28.0	n/a	n/a	0.0
28/03/2008	-27.9	-28.0	-25.6	-23.8	-24.5	-22.9	-32.5	-31.9	-27.8	n/a	n/a	0.0
29/03/2008	-25.6	-25.2	-24.6	-21.4	-22.1	-21.7	-30.7	-29.2	-28.1	n/a	n/a	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
30/03/2008	-27.9	-27.3	-26.5	-22.5	-23.7	-21.5	-33.9	-31.5	-28.8	n/a	n/a	0.0
31/03/2008	-31.9	-31.1	-29.5	-26.9	-27.2	-21.5	-36.7	-35.8	-31.9	n/a	n/a	0.0
01/04/2008	-33.1	-31.6	-32.7	-24.9	-23.3	-26.8	-39.1	-35.9	-35.2	n/a	n/a	0.0
02/04/2008	-35.0	-34.0	-32.8	-30.5	-29.6	-28.7	-38.9	-38.3	-37.2	n/a	n/a	0.0
03/04/2008	-32.1	-30.1	-28.1	-27.0	-25.8	-21.6	-38.4	-35.3	-30.7	n/a	n/a	0.0
04/04/2008	-28.8	-27.4	-27.5	-25.1	-23.5	-25.7	-32.2	-31.0	-29.8	n/a	n/a	0.0
05/04/2008	-23.2	-22.0	-24.0	-18.4	-18.4	-20.5	-29.7	-27.6	-29.3	n/a	n/a	0.0
06/04/2008	-17.5	-19.0	-17.8	-13.3	-15.1	-13.5	-22.0	-23.9	-22.2	n/a	n/a	0.0
07/04/2008	-20.0	-20.0	-15.4	-14.7	-12.8	-9.4	-25.4	-25.0	-20.4	n/a	n/a	0.0
08/04/2008	-17.4	-18.2	-13.0	-9.0	-13.7	-8.2	-24.5	-23.7	-19.6	n/a	n/a	0.0
09/04/2008	-9.3	-11.4	-7.3	-2.8	-6.1	-2.6	-15.9	-18.8	-13.4	1.0	n/a	0.0
10/04/2008	-6.5	-7.6	-5.7	0.6	-1.2	0.4	-10.5	-12.6	-9.2	n/a	n/a	0.0
11/04/2008	-9.4	-10.5	-6.5	-1.9	-6.2	-3.4	-17.0	-14.9	-9.3	n/a	n/a	0.0
12/04/2008	-10.0	-10.7	-10.8	-1.7	-3.7	-7.3	-15.5	-14.4	-13.5	n/a	0.3	0.0
13/04/2008	-7.8	-8.7	-9.0	1.1	-0.2	-2.5	-14.3	-14.4	-14.2	0.3	n/a	0.0
14/04/2008	-5.2	-6.6	-8.2	1.4	0.5	0.3	-13.1	-14.8	-14.1	n/a	0.3	0.0
15/04/2008	-16.1	-16.4	-16.7	-13.1	-14.8	-14.1	-17.3	-18.2	-17.8	n/a	n/a	0.0
16/04/2008	-15.6	-15.6	-15.1	-11.4	-12.0	-9.7	-19.7	-19.4	-19.1	n/a	n/a	0.0
17/04/2008	-15.2	-16.6	-16.4	-7.9	-10.2	-14.8	-20.0	-20.9	-18.9	n/a	n/a	0.0
18/04/2008	-18.8	-19.1	-17.6	-15.6	-16.2	-15.7	-22.3	-22.2	-19.9	n/a	n/a	0.0
19/04/2008	-19.7	-19.4	-16.9	-15.3	-15.3	-14.5	-24.6	-23.7	-19.0	n/a	n/a	0.0
20/04/2008	-20.0	-19.8	-17.1	-13.7	-14.4	-10.8	-25.7	-24.5	-21.3	n/a	n/a	0.0
21/04/2008	-19.0	-18.6	-13.3	-12.2	-11.7	-9.3	-27.5	-25.8	-19.4	n/a	n/a	0.0
22/04/2008	-16.2	-14.9	-13.6	-10.5	-10.6	-8.3	-22.3	-19.3	-18.3	n/a	n/a	0.0
23/04/2008	-15.3	-16.3	-15.1	-12.4	-14.1	-12.8	-18.4	-19.8	-18.5	n/a	n/a	0.0
24/04/2008	-18.3	-19.0	-19.3	-15.0	-16.6	-16.4	-24.8	-23.9	-21.0	n/a	n/a	0.0
25/04/2008	-20.7	-20.4	-17.1	-14.2	-14.3	-11.9	-27.1	-26.1	-22.3	n/a	n/a	0.0
26/04/2008	-17.3	-17.5	-15.2	-10.6	-11.8	-9.4	-22.8	-23.7	-19.3	n/a	n/a	0.0
27/04/2008	-16.9	-16.6	-14.5	-9.8	-7.4	-10.0	-23.6	-23.4	-18.2	n/a	n/a	0.0
28/04/2008	-18.2	-17.2	-14.3	-12.3	-12.5	-11.1	-25.7	-23.0	-19.5	n/a	n/a	0.0
29/04/2008	-13.4	-13.5	-11.1	-9.3	-8.7	-8.3	-18.8	-19.0	-15.6	n/a	n/a	0.0
30/04/2008	-9.5	-9.5	-7.4	-6.7	-6.3	-5.4	-13.1	-12.5	-9.5	n/a	n/a	0.0
01/05/2008	-10.1	-10.0	-7.8	-4.6	-4.6	-3.9	-16.7	-15.2	-12.2	n/a	n/a	0.0
02/05/2008	-8.3	-8.1	-6.2	-3.7	-3.8	-2.6	-12.8	-12.5	-9.5	n/a	n/a	0.0
03/05/2008	-8.9	-8.3	n/a	1.1	-4.1	n/a	-15.4	-13.2	n/a	0.3	n/a	n/a
04/05/2008	-10.5	-8.3	n/a	-3.7	-1.5	n/a	-18.0	-13.5	n/a	n/a	n/a	n/a
05/05/2008	-12.1	-11.7	n/a	-10.0	-8.9	n/a	-17.6	-15.5	n/a	n/a	n/a	n/a
06/05/2008	-16.5	-16.0	n/a	-12.4	-13.3	n/a	-20.4	-19.3	n/a	n/a	n/a	n/a
07/05/2008	-16.0	-15.1	n/a	-11.4	-9.7	n/a	-22.2	-20.0	n/a	n/a	n/a	n/a
08/05/2008	-13.4	-12.1	n/a	-6.5	-4.5	n/a	-22.0	-19.6	n/a	n/a	n/a	n/a
09/05/2008	-9.1	-6.5	n/a	0.9	1.7	n/a	-17.6	-13.5	n/a	n/a	n/a	n/a
10/05/2008	-10.7	-8.8	n/a	-3.9	-5.9	n/a	-17.5	-13.1	n/a	n/a	n/a	n/a
11/05/2008	-8.2	-9.2	n/a	-3.7	-4.9	n/a	-15.7	-14.9	n/a	n/a	n/a	n/a
12/05/2008	-4.6	-4.3	n/a	-1.1	0.9	n/a	-9.1	-8.1	n/a	n/a	n/a	n/a
13/05/2008	-5.4	-5.6	n/a	-2.8	-2.3	n/a	-9.9	-9.7	n/a	n/a	n/a	n/a
14/05/2008	-4.6	-4.3	n/a	-2.0	-1.3	n/a	-8.5	-6.5	n/a	n/a	n/a	n/a
15/05/2008	-4.9	-4.6	n/a	-1.3	-1.1	n/a	-11.2	-9.9	n/a	n/a	n/a	n/a
16/05/2008	-1.8	-1.6	n/a	-0.4	0.0	n/a	-2.7	-2.4	n/a	0.8	0.3	n/a
17/05/2008	-2.9	-3.6	n/a	-1.7	-1.5	n/a	-4.8	-6.2	n/a	n/a	n/a	n/a
18/05/2008	-5.5	-5.8	n/a	-4.2	-3.8	n/a	-6.8	-7.6	n/a	n/a	n/a	n/a
19/05/2008	-4.0	-4.6	n/a	-1.8	-2.2	n/a	-5.9	-6.8	n/a	0.3	n/a	n/a
20/05/2008	-1.1	-1.6	n/a	4.3	4.5	n/a	-6.8	-6.7	n/a	n/a	n/a	n/a
21/05/2008	-0.3	-1.1	n/a	6.9	4.5	n/a	-7.0	-5.3	n/a	n/a	n/a	n/a
22/05/2008	-2.8	-1.1	n/a	0.9	0.1	n/a	-8.3	-3.1	n/a	n/a	n/a	n/a
23/05/2008	-0.5	-0.7	n/a	1.0	0.9	n/a	-1.9	-1.8	n/a	n/a	n/a	n/a
24/05/2008	-0.7	-0.7	n/a	1.1	1.1	n/a	-2.6	-2.0	n/a	n/a	n/a	n/a
25/05/2008	0.8	1.0	n/a	4.6	5.3	n/a	-4.7	-5.5	n/a	n/a	n/a	n/a
26/05/2008	3.5	3.8	n/a	6.5	7.0	n/a	0.9	1.4	n/a	n/a	0.3	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
27/05/2008	1.3	1.0	n/a	2.3	2.1	n/a	-0.7	-0.8	n/a	0.3	0.3	n/a
28/05/2008	0.5	-0.1	n/a	4.8	3.0	n/a	-1.7	-2.3	n/a	n/a	n/a	n/a
29/05/2008	0.4	0.3	n/a	2.0	2.2	n/a	-3.0	-1.6	n/a	n/a	n/a	n/a
30/05/2008	-1.3	-2.3	n/a	0.4	0.0	n/a	-5.1	-5.8	n/a	2.3	n/a	n/a
31/05/2008	-4.5	-4.6	n/a	-3.4	-3.6	n/a	-5.4	-5.8	n/a	n/a	n/a	n/a
01/06/2008	-1.0	-1.5	n/a	3.2	2.3	n/a	-4.6	-4.3	n/a	0	0	n/a
02/06/2008	1.8	1.8	n/a	4.9	5.7	n/a	-0.3	-2.2	n/a	5.1	9.4	n/a
03/06/2008	-1.2	-2.5	n/a	1.2	0.4	n/a	-3.9	-5.0	n/a	0	0.3	n/a
04/06/2008	-3.4	-4.0	n/a	-2.3	-3.0	n/a	-4.6	-5.2	n/a	0	0	n/a
05/06/2008	-1.3	-1.8	n/a	1.8	1.9	n/a	-4.4	-5.4	n/a	0	0	n/a
06/06/2008	0.4	-0.2	n/a	1.7	1.4	n/a	-1.6	-2.5	n/a	0	0	n/a
07/06/2008	0.4	-0.4	n/a	4.8	4.3	n/a	-2.6	-3.7	n/a	0	0	n/a
08/06/2008	3.3	3.5	n/a	7.2	7.1	n/a	-2.0	-2.4	n/a	0	0	n/a
09/06/2008	6.3	6.8	n/a	12.8	13.7	n/a	-1.2	0.0	n/a	0	0	n/a
10/06/2008	5.2	4.7	n/a	8.4	7.3	n/a	1.2	1.7	n/a	0	0	n/a
11/06/2008	3.9	3.2	n/a	7.3	7.1	n/a	-0.2	-1.4	n/a	0	0	n/a
12/06/2008	6.1	6.2	n/a	10.9	11.3	n/a	0.7	-0.1	n/a	0	0	n/a
13/06/2008	6.3	6.6	n/a	10.3	11.0	n/a	1.5	2.6	n/a	0	0	n/a
14/06/2008	1.8	1.2	n/a	4.5	3.1	n/a	0.1	-0.2	n/a	0	4.1	n/a
15/06/2008	1.5	0.5	n/a	4.1	2.3	n/a	-1.6	-1.3	n/a	0.3	3.3	n/a
16/06/2008	1.5	0.3	n/a	5.0	1.2	n/a	0.2	-0.4	n/a	11.7	15.2	n/a
17/06/2008	3.6	1.2	n/a	6.9	5.2	n/a	0.2	-1.2	n/a	1.3	1.3	n/a
18/06/2008	7.6	5.6	n/a	12.5	8.9	n/a	2.5	2.3	n/a	2.0	2.3	n/a
19/06/2008	9.4	9.1	n/a	16.3	16.8	n/a	2.3	1.5	n/a	0	0	n/a
20/06/2008	6.0	5.5	n/a	12.3	11.3	n/a	2.0	1.8	n/a	0	0.8	n/a
21/06/2008	4.3	4.3	n/a	7.7	7.3	n/a	1.2	1.0	n/a	0	0	n/a
22/06/2008	8.6	8.0	n/a	13.8	12.3	n/a	2.1	1.8	n/a	0	0	n/a
23/06/2008	11.3	11.4	n/a	18.2	17.3	n/a	2.4	4.5	n/a	0	0	n/a
24/06/2008	12.4	12.1	n/a	18.2	17.6	n/a	5.7	5.8	n/a	0.3	0	n/a
25/06/2008	4.8	4.2	n/a	7.5	7.8	n/a	2.0	1.7	n/a	0	0	n/a
26/06/2008	5.7	5.4	n/a	9.9	9.5	n/a	1.6	1.8	n/a	0	0	n/a
27/06/2008	8.9	8.7	n/a	15.0	14.4	n/a	3.4	2.4	n/a	0	0	n/a
28/06/2008	16.1	15.8	n/a	24.8	24.3	n/a	5.0	6.1	n/a	0	0	n/a
29/06/2008	13.5	13.5	n/a	20.3	18.2	n/a	9.3	9.1	n/a	0.3	8.9	n/a
30/06/2008	12.4	11.4	n/a	16.8	15.5	n/a	7.2	6.9	n/a	0	4.1	n/a
01/07/2008	8.0	7.6	n/a	10.8	10.0	n/a	5.5	5.6	n/a	0	0	n/a
02/07/2008	8.1	8.0	n/a	14.0	14.1	n/a	2.5	3.3	n/a	0	0	n/a
03/07/2008	9.7	9.9	n/a	14.6	14.0	n/a	3.7	4.6	n/a	0	0	n/a
04/07/2008	8.2	8.0	n/a	11.9	12.2	n/a	4.3	4.1	n/a	0	2.0	n/a
05/07/2008	8.5	9.4	n/a	14.1	14.5	n/a	3.4	3.9	n/a	1.3	0.3	n/a
06/07/2008	10.6	12.0	n/a	15.8	16.7	n/a	5.3	6.2	n/a	0	0	n/a
07/07/2008	14.3	14.9	n/a	20.5	19.9	n/a	5.9	7.9	n/a	0	0	n/a
08/07/2008	15.2	15.2	n/a	20.5	19.9	n/a	6.3	9.0	n/a	0	0	n/a
09/07/2008	16.4	16.6	n/a	23.2	22.4	n/a	8.0	8.9	n/a	0	0	n/a
10/07/2008	15.6	16.2	n/a	22.3	22.6	n/a	6.5	10.8	n/a	0.3	1.5	n/a
11/07/2008	15.2	14.3	n/a	21.2	19.3	n/a	9.6	10.8	n/a	0	2.3	n/a
12/07/2008	12.6	12.0	n/a	16.5	16.6	n/a	6.7	6.5	n/a	0.3	0	n/a
13/07/2008	9.5	8.3	n/a	10.6	9.8	n/a	8.0	7.3	n/a	0	0.3	n/a
14/07/2008	9.9	9.5	n/a	13.9	13.6	n/a	7.2	6.2	n/a	0	0.3	n/a
15/07/2008	9.2	8.7	n/a	11.8	12.1	n/a	5.6	5.7	n/a	0	0	n/a
16/07/2008	11.4	11.3	n/a	16.9	16.2	n/a	3.7	5.4	n/a	0	0	n/a
17/07/2008	17.8	17.6	n/a	25.0	24.2	n/a	9.5	9.6	n/a	0	0	n/a
18/07/2008	20.9	19.4	n/a	27.0	25.9	n/a	13.9	13.7	n/a	0	0	n/a
19/07/2008	20.6	20.6	n/a	27.2	25.9	n/a	13.2	13.5	n/a	0	0	n/a
20/07/2008	20.0	19.4	n/a	27.1	26.7	n/a	12.3	13.8	n/a	0	1.0	n/a
21/07/2008	17.1	16.6	n/a	20.8	20.9	n/a	13.0	12.6	n/a	0	0	n/a
22/07/2008	14.4	13.6	n/a	19.3	17.5	n/a	10.9	11.2	n/a	0	13.7	n/a
23/07/2008	15.6	14.8	n/a	20.9	20.2	n/a	9.1	9.9	n/a	0	0.3	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
24/07/2008	15.7	13.9	n/a	23.6	19.3	n/a	10.3	9.6	n/a	0	1.3	n/a
25/07/2008	10.7	9.4	n/a	14.6	14.7	n/a	6.7	5.9	n/a	0	6.6	n/a
26/07/2008	9.1	8.1	n/a	11.7	10.9	n/a	6.0	5.1	n/a	0	0	n/a
27/07/2008	10.3	9.7	n/a	14.6	13.5	n/a	6.7	6.8	n/a	0	0.3	n/a
28/07/2008	8.8	8.2	n/a	11.5	10.8	n/a	3.8	5.4	n/a	0	0	n/a
29/07/2008	10.7	10.5	n/a	13.0	14.2	n/a	8.1	8.0	n/a	0	0	n/a
30/07/2008	13.7	13.5	n/a	20.8	20.6	n/a	3.5	5.9	n/a	0	0	n/a
31/07/2008	17.2	16.5	n/a	22.9	23.0	n/a	12.2	11.2	n/a	0	0	n/a
01/08/2008	17.7	17.8	n/a	23.4	23.4	n/a	12.2	12.5	n/a	0	0	n/a
02/08/2008	14.8	14.7	n/a	20.8	19.0	n/a	9.6	10.8	n/a	0	0	n/a
03/08/2008	12.4	13.1	n/a	17.7	17.7	n/a	6.9	10.4	n/a	0	4.6	n/a
04/08/2008	13.2	12.2	n/a	16.7	15.8	n/a	10.6	9.9	n/a	0	0	n/a
05/08/2008	12.2	12.1	n/a	14.8	14.9	n/a	8.1	10.2	n/a	0	1.0	n/a
06/08/2008	11.1	10.2	n/a	14.9	14.0	n/a	7.9	6.5	n/a	0	0	n/a
07/08/2008	11.4	11.4	n/a	15.9	16.6	n/a	7.1	7.5	n/a	0	0	n/a
08/08/2008	15.1	13.9	n/a	21.5	19.8	n/a	8.0	8.3	n/a	0	0.3	n/a
09/08/2008	14.5	12.5	n/a	18.2	14.9	n/a	12.1	10.9	n/a	0	1.3	n/a
10/08/2008	17.5	16.5	n/a	24.1	23.2	n/a	10.9	10.5	n/a	0	0	n/a
11/08/2008	17.3	13.3	n/a	27.1	17.2	n/a	9.6	8.1	n/a	0.3	5.3	n/a
12/08/2008	10.0	8.5	n/a	12.4	11.5	n/a	7.7	6.5	n/a	0	0	n/a
13/08/2008	10.4	9.9	n/a	13.9	13.0	n/a	4.4	6.1	n/a	0	0	n/a
14/08/2008	10.8	9.5	n/a	14.5	11.7	n/a	8.9	8.3	n/a	11.4	17.0	n/a
15/08/2008	9.9	9.5	n/a	12.9	12.7	n/a	7.8	6.9	n/a	0	0	n/a
16/08/2008	11.9	11.2	n/a	15.6	14.8	n/a	8.0	8.4	n/a	4.1	0.5	n/a
17/08/2008	9.8	9.5	n/a	13.5	13.4	n/a	6.8	6.6	n/a	0	0.3	n/a
18/08/2008	10.9	9.7	n/a	16.7	14.8	n/a	4.1	6.1	n/a	7.1	17.3	n/a
19/08/2008	6.0	4.3	n/a	10.5	8.7	n/a	2.9	1.9	n/a	14.0	10.4	n/a
20/08/2008	4.6	4.2	n/a	7.4	7.0	n/a	1.7	1.4	n/a	0.3	0	n/a
21/08/2008	6.8	6.2	n/a	11.5	10.7	n/a	1.1	2.1	n/a	0	0	n/a
22/08/2008	9.1	8.8	n/a	13.5	12.6	n/a	5.3	5.4	n/a	0	0	n/a
23/08/2008	7.6	6.8	n/a	9.2	8.6	n/a	5.5	4.2	n/a	0.5	3.0	n/a
24/08/2008	4.6	4.8	n/a	8.8	8.5	n/a	0.4	1.7	n/a	0	0	n/a
25/08/2008	3.7	3.4	n/a	5.0	5.0	n/a	1.7	1.2	n/a	19.6	20.1	n/a
26/08/2008	6.9	5.6	n/a	12.8	9.5	n/a	2.7	1.4	n/a	0.8	12.2	n/a
27/08/2008	6.2	6.7	n/a	9.5	8.7	n/a	1.9	4.7	n/a	0.3	0.3	n/a
28/08/2008	3.2	2.8	n/a	5.7	5.7	n/a	1.7	1.3	n/a	5.8	4.6	n/a
29/08/2008	3.1	2.6	n/a	4.7	4.4	n/a	1.0	1.2	n/a	4.8	2.8	n/a
30/08/2008	3.9	2.9	n/a	7.5	5.9	n/a	1.6	0.6	n/a	2.0	0.8	n/a
31/08/2008	4.0	3.3	n/a	7.9	6.0	n/a	-0.5	0.2	n/a	0.3	0.8	n/a
01/09/2008	5.7	4.8	n/a	6.6	5.5	n/a	5.0	4.4	n/a	4.1	2.8	n/a
02/09/2008	6.4	4.6	n/a	7.7	5.3	n/a	4.9	3.1	n/a	1.5	1.8	n/a
03/09/2008	4.5	3.4	n/a	5.3	5.6	n/a	3.4	2.3	n/a	0.3	0	n/a
04/09/2008	5.6	5.4	n/a	9.4	8.0	n/a	3.5	2.9	n/a	0.5	0	n/a
05/09/2008	3.2	2.3	n/a	5.0	4.7	n/a	-0.4	-0.9	n/a	0.3	0.3	n/a
06/09/2008	1.9	1.4	n/a	4.0	3.3	n/a	-0.2	-0.3	n/a	0	0	n/a
07/09/2008	2.2	1.3	n/a	5.1	4.0	n/a	-1.4	-1.2	n/a	0	0	n/a
08/09/2008	1.8	1.5	n/a	4.3	4.2	n/a	-0.2	-0.1	n/a	0.3	0	n/a
09/09/2008	2.3	1.8	n/a	3.9	3.4	n/a	0.6	0.7	n/a	2.0	0.3	n/a
10/09/2008	2.4	1.4	n/a	4.8	4.3	n/a	-0.7	-0.8	n/a	0	0	n/a
11/09/2008	-0.9	-1.4	n/a	0.0	-0.6	n/a	-1.7	-2.4	n/a	0	0	n/a
12/09/2008	-1.0	-1.6	n/a	-0.1	-0.4	n/a	-2.2	-3.0	n/a	0	0	n/a
13/09/2008	1.5	1.0	n/a	4.3	4.4	n/a	-1.4	-1.2	n/a	2.5	3.3	n/a
14/09/2008	-1.6	-2.0	n/a	0.7	-0.1	n/a	-3.1	-3.2	n/a	0	0	n/a
15/09/2008	-1.8	-2.4	n/a	-0.1	-1.2	n/a	-3.2	-3.3	n/a	0	0	n/a
16/09/2008	-1.7	-2.3	-1.4	0.2	0.0	-0.1	-3.2	-3.7	n/a	0	0	0.0
17/09/2008	-1.4	-2.0	-0.2	0.1	-0.8	1.1	-3.1	-3.3	-1.9	0	0	0.0
18/09/2008	-1.5	-2.3	-1.2	0.0	-0.3	0.0	-2.6	-4.3	-2.2	0	0	0.3
19/09/2008	-1.1	-1.5	0.0	1.0	1.1	1.5	-4.6	-4.4	-1.9	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
20/09/2008	-1.5	-1.3	1.0	4.7	4.2	5.7	-5.7	-5.9	-4.2	0	0	0.0
21/09/2008	0.8	1.1	3.0	8.2	7.9	6.2	-5.7	-4.8	-1.6	0	0	0.2
22/09/2008	3.3	2.9	4.3	5.6	4.3	5.2	1.7	1.8	3.3	1.8	3.8	6.4
23/09/2008	2.0	1.2	2.1	2.5	2.5	4.2	1.1	-0.4	0.7	6.6	12.2	11.7
24/09/2008	0.4	0.0	0.7	1.1	0.4	1.7	-0.4	-0.6	-0.1	7.9	0.5	24.5
25/09/2008	-0.9	-1.3	-0.6	-0.3	-0.6	0.1	-2.0	-2.6	-2.2	0	0	0.0
26/09/2008	-4.3	-4.9	-4.5	-1.8	-2.6	-1.9	-7.7	-8.0	-7.0	0	0	0.0
27/09/2008	-2.7	-2.6	-0.8	-0.8	-0.6	1.4	-7.2	-6.3	-4.7	0	0	0.3
28/09/2008	0.0	-0.5	1.5	2.3	1.2	3.0	-2.9	-2.7	0.0	0	0	0.1
29/09/2008	0.7	0.1	0.8	1.5	0.7	1.9	0.0	-0.6	0.3	7.6	4.6	3.4
30/09/2008	-1.7	-2.2	-2.7	0.0	-0.2	0.5	-6.3	-5.9	-6.5	0.3	0	0.0
01/10/2008	-5.2	-5.2	-3.8	0.1	-0.4	1.0	-11.3	-8.7	-7.9	n/a	n/a	0.0
02/10/2008	0.9	0.5	1.8	2.4	1.9	3.2	0.1	-0.4	0.8	0.3	2.0	5.8
03/10/2008	2.0	1.5	2.6	3.3	2.9	3.5	0.4	0.4	0.8	0.3	n/a	0.0
04/10/2008	3.5	2.7	4.2	5.1	4.7	5.7	2.3	1.1	3.0	n/a	n/a	0.0
05/10/2008	2.9	2.8	4.0	4.5	4.4	4.8	1.8	0.9	3.4	n/a	n/a	0.0
06/10/2008	8.0	7.0	8.4	10.9	9.2	10.8	4.5	4.1	4.1	0.5	n/a	0.0
07/10/2008	0.6	-0.2	1.1	5.8	4.2	6.8	-2.6	-1.8	0.0	n/a	n/a	0.0
08/10/2008	-1.2	-1.3	0.8	1.4	1.5	3.0	-3.1	-2.7	-1.3	n/a	n/a	0.0
09/10/2008	-2.4	-2.1	-1.5	-0.9	-0.5	1.3	-5.1	-4.6	-3.0	n/a	n/a	0.0
10/10/2008	-3.8	-3.8	-1.4	-1.2	-1.5	0.2	-7.0	-5.9	-2.9	n/a	n/a	0.0
11/10/2008	0.7	0.4	2.7	4.4	3.1	4.8	-2.4	-2.4	0.0	n/a	n/a	0.0
12/10/2008	1.2	0.7	1.3	3.6	3.1	4.8	-4.3	-4.2	-2.2	n/a	n/a	0.0
13/10/2008	-3.0	-3.0	-0.5	1.8	2.6	4.9	-7.1	-6.2	-4.2	n/a	n/a	0.0
14/10/2008	-4.7	-4.7	-2.3	-1.7	-1.6	0.6	-8.7	-9.6	-5.6	n/a	n/a	0.0
15/10/2008	-1.1	-2.6	-3.1	0.0	-1.3	0.0	-2.4	-4.8	-3.7	n/a	n/a	0.0
16/10/2008	-1.2	-2.5	-2.4	1.5	0.8	0.9	-5.8	-6.9	-5.3	n/a	0.3	0.4
17/10/2008	-8.8	-9.0	-6.9	-5.5	-6.5	-4.9	-11.7	-10.9	-9.0	n/a	n/a	0.0
18/10/2008	-8.4	-8.5	-7.0	-5.7	-6.6	-4.5	-13.0	-12.3	-8.2	n/a	n/a	0.0
19/10/2008	-9.7	-10.0	-7.5	-5.5	-6.3	-5.0	-13.9	-13.6	-11.3	n/a	n/a	0.0
20/10/2008	-3.2	-4.0	-2.7	-0.8	-1.6	-0.3	-6.7	-7.6	-5.6	n/a	n/a	0.0
21/10/2008	-6.0	-7.3	-6.1	-1.5	-3.0	-2.6	-8.6	-9.7	-7.9	n/a	n/a	0.0
22/10/2008	-8.2	-8.8	-7.2	-5.0	-5.4	-4.4	-9.9	-10.4	-8.9	n/a	n/a	0.0
23/10/2008	-1.7	-2.5	-1.3	0.5	0.1	0.9	-5.3	-5.6	-4.5	0.3	n/a	0.3
24/10/2008	-5.0	-5.3	-3.4	-2.2	-2.7	-1.0	-7.6	-6.5	-4.7	n/a	n/a	0.0
25/10/2008	-6.1	-6.3	-5.1	-3.8	-4.0	-3.2	-8.1	-8.9	-7.1	n/a	n/a	0.0
26/10/2008	-8.7	-9.6	-8.7	-7.3	-7.9	-6.7	-11.3	-13.7	-10.5	n/a	n/a	0.0
27/10/2008	-14.7	-15.9	-13.2	-11.3	-12.4	-10.5	-18.0	-17.5	-15.3	n/a	n/a	0.0
28/10/2008	-14.2	-17.0	-14.2	-9.3	-12.9	-11.0	-22.4	-23.4	-17.3	n/a	n/a	0.3
29/10/2008	-22.1	-22.0	-17.7	-18.2	-17.7	-15.5	-26.4	-25.1	-21.1	n/a	n/a	n/a
30/10/2008	-19.8	-21.0	-17.6	-17.0	-17.1	-13.5	-21.8	-24.4	-21.9	n/a	n/a	n/a
31/10/2008	-12.2	-12.2	-8.2	-8.3	-8.5	-5.4	-18.6	-19.0	-13.7	n/a	n/a	n/a
01/11/2008	-13.5	-14.0	-12.0	-10.4	-10.3	-8.7	-17.8	-18.5	-15.5	n/a	n/a	n/a
02/11/2008	-14.1	-15.3	-15.9	-9.9	-10.6	-9.5	-17.9	-18.1	-17.6	n/a	n/a	n/a
03/11/2008	-21.4	-22.1	-20.7	-17.8	-18.1	-17.6	-26.9	-25.4	-25.0	n/a	n/a	n/a
04/11/2008	-25.7	-21.0	-21.9	-19.9	-15.5	-16.4	-29.1	-25.5	-26.5	n/a	n/a	n/a
05/11/2008	-14.0	-14.5	-14.2	-11.3	-11.8	-11.3	-19.9	-20.3	-16.8	n/a	n/a	n/a
06/11/2008	-21.9	-24.2	-19.9	-17.1	-20.2	-16.4	-25.9	-26.3	-23.2	n/a	n/a	n/a
07/11/2008	-21.2	-20.0	-14.2	-15.9	-13.7	-9.9	-27.3	-26.8	-19.8	n/a	n/a	n/a
08/11/2008	-7.9	-7.9	-5.2	-2.4	-2.6	-0.7	-16.0	-16.0	-13.5	n/a	n/a	n/a
09/11/2008	-12.4	-14.3	-10.8	-3.2	-5.3	-4.4	-18.2	-17.1	-12.7	n/a	n/a	n/a
10/11/2008	-12.4	-12.9	-11.6	-9.6	-11.7	-10.3	-17.4	-16.3	-12.7	n/a	n/a	n/a
11/11/2008	-13.3	-13.7	-12.1	-11.3	-11.9	-11.2	-14.8	-16.1	-13.1	n/a	n/a	n/a
12/11/2008	-14.6	-15.6	-14.1	-13.8	-14.3	-12.1	-15.9	-16.4	-15.4	n/a	n/a	n/a
13/11/2008	-19.2	-18.3	-18.0	-15.8	-15.8	-14.8	-22.3	-21.9	-21.6	n/a	n/a	n/a
14/11/2008	-20.7	-19.1	-14.5	-14.9	-14.9	-10.2	-24.8	-22.6	-21.1	n/a	n/a	n/a
15/11/2008	-15.8	-16.6	-12.0	-12.4	-11.6	-9.2	-20.9	-21.0	-15.6	n/a	n/a	n/a
16/11/2008	-15.4	-18.0	-15.2	-9.7	-12.9	-10.7	-21.2	-21.8	-16.9	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
17/11/2008	-14.1	-14.5	-14.3	-10.5	-11.6	-12.4	-18.9	-17.5	-16.3	n/a	n/a	n/a
18/11/2008	-17.6	-16.9	-15.4	-14.8	-15.4	-13.0	-21.0	-19.0	-17.8	n/a	n/a	n/a
19/11/2008	-16.7	-17.5	-14.9	-14.7	-15.4	-12.4	-20.8	-21.8	-18.4	n/a	n/a	n/a
20/11/2008	-21.3	-20.6	-19.1	-15.6	-16.7	-16.5	-26.8	-23.1	-21.3	n/a	n/a	n/a
21/11/2008	-24.0	-23.4	-21.8	-21.1	-20.6	-18.8	-27.5	-26.8	-24.7	n/a	n/a	n/a
22/11/2008	-20.8	-21.6	-20.3	-15.8	-17.4	-16.4	-27.3	-26.6	-25.5	n/a	n/a	n/a
23/11/2008	-18.9	-19.9	-19.7	-15.1	-16.6	-16.4	-28.7	-28.6	-24.8	n/a	n/a	n/a
24/11/2008	-23.9	-24.4	-23.4	-19.8	-20.4	-22.1	-29.7	-30.7	-25.7	n/a	n/a	n/a
25/11/2008	-26.9	-27.4	-24.3	-19.9	-21.1	-22.1	-32.7	-32.1	-26.4	n/a	n/a	n/a
26/11/2008	-24.5	-25.7	-22.1	-17.5	-19.5	-19.6	-32.7	-32.0	-26.2	n/a	n/a	n/a
27/11/2008	-19.7	-20.7	-19.3	-16.1	-18.1	-17.2	-25.9	-25.4	-21.4	n/a	n/a	n/a
28/11/2008	-26.7	-25.7	-22.7	-23.1	-23.5	-19.7	-31.4	-27.8	-24.8	n/a	n/a	n/a
29/11/2008	-21.9	-23.7	-20.0	-19.5	-21.3	-17.1	-24.6	-26.0	-23.0	n/a	n/a	n/a
30/11/2008	-20.7	-22.0	-18.7	-19.4	-20.0	-16.5	-23.0	-24.0	-22.3	n/a	n/a	n/a
01/12/2008	-26.7	-24.6	-23.2	-20.6	-22.7	-20.0	-29.8	-28.6	-25.1	n/a	n/a	n/a
02/12/2008	-21.3	-20.4	-20.1	-18.3	-18.2	-17.9	-25.4	-23.6	-23.4	n/a	n/a	n/a
03/12/2008	-18.1	-17.8	-17.9	-16.7	-16.9	-15.5	-19.3	-18.8	-19.6	n/a	n/a	n/a
04/12/2008	-23.1	-23.9	-21.5	-16.6	-17.8	-16.3	-27.5	-28.2	-24.6	n/a	n/a	n/a
05/12/2008	-23.9	-24.0	-23.5	-22.3	-22.1	-21.8	-27.8	-28.8	-26.2	n/a	n/a	n/a
06/12/2008	-28.4	-29.2	-25.3	-26.7	-27.4	-23.8	-30.5	-31.8	-27.5	n/a	n/a	n/a
07/12/2008	-28.0	-28.0	-26.2	-24.3	-24.7	-22.9	-30.6	-31.5	-29.0	n/a	n/a	n/a
08/12/2008	-30.9	-31.1	-29.7	-29.3	-29.9	-28.1	-33.8	-34.4	-31.0	n/a	n/a	n/a
09/12/2008	-34.0	-35.2	-30.6	-32.9	-33.6	-29.6	-35.7	-36.9	-32.7	n/a	n/a	n/a
10/12/2008	-29.6	-29.6	-24.1	-22.6	-22.0	-19.8	-35.8	-36.7	-31.6	n/a	n/a	n/a
11/12/2008	-23.0	-23.7	-22.3	-20.2	-20.4	-19.1	-25.7	-26.9	-25.6	n/a	n/a	n/a
12/12/2008	-30.7	-31.2	-30.6	-25.6	-26.5	-25.6	-33.0	-33.1	-32.0	n/a	n/a	n/a
13/12/2008	-26.2	-26.3	-23.5	-21.9	-22.0	-20.3	-32.7	-33.1	-30.4	n/a	n/a	n/a
14/12/2008	-26.2	-26.4	-24.3	-23.6	-23.6	-21.9	-29.7	-30.1	-27.3	n/a	n/a	n/a
15/12/2008	-22.3	-20.5	-18.5	-19.0	-18.2	-16.7	-29.3	-27.3	-24.5	n/a	n/a	n/a
16/12/2008	-28.1	-23.1	-20.7	-24.5	-20.3	-19.2	-30.2	-24.6	-22.6	n/a	n/a	n/a
17/12/2008	-23.4	-21.7	-20.5	-20.0	-19.9	-18.7	-28.1	-23.0	-23.5	n/a	n/a	n/a
18/12/2008	-29.2	-29.2	-26.7	-23.2	-22.4	-23.5	-32.6	-32.5	-29.0	n/a	n/a	n/a
19/12/2008	-26.0	-25.6	-23.1	-22.9	-23.0	-21.7	-31.2	-29.4	-25.6	n/a	n/a	n/a
20/12/2008	-22.8	-23.0	-17.7	-16.2	-17.0	-13.5	-28.2	-27.6	-24.3	n/a	n/a	n/a
21/12/2008	-20.1	-20.4	-18.5	-15.3	-15.9	-13.4	-24.1	-24.3	-21.5	n/a	n/a	n/a
22/12/2008	-26.4	-27.0	-26.4	-21.2	-21.3	-18.6	-31.4	-32.3	-30.2	n/a	n/a	n/a
23/12/2008	-34.1	-34.6	-31.3	-31.0	-32.3	-30.1	-36.3	-36.7	-32.6	n/a	n/a	n/a
24/12/2008	-32.8	-32.2	-28.7	-29.5	-29.7	-27.1	-36.0	-36.2	-30.9	n/a	n/a	n/a
25/12/2008	-32.4	-32.3	-25.7	-27.8	-28.1	-20.0	-35.8	-35.3	-31.6	n/a	n/a	n/a
26/12/2008	-26.8	-27.2	-23.2	-23.9	-24.2	-19.9	-30.7	-29.6	-25.3	n/a	n/a	n/a
27/12/2008	-28.3	-28.2	-26.1	-23.7	-24.5	-24.7	-32.7	-31.8	-28.2	n/a	n/a	n/a
28/12/2008	-30.0	-27.9	-26.0	-27.7	-24.4	-24.5	-33.4	-32.5	-27.6	n/a	n/a	n/a
29/12/2008	-35.3	-34.6	-32.3	-32.0	-28.9	-26.8	-39.0	-39.8	-34.9	n/a	n/a	n/a
30/12/2008	-39.1	-38.8	-33.2	-38.3	-36.4	-32.0	-40.1	-41.1	-35.8	n/a	n/a	n/a
31/12/2008	-38.9	-37.9	-33.0	-37.3	-36.1	-31.6	-40.0	-39.4	-34.8	n/a	n/a	n/a
01/01/2009	-35.4	-35.0	-30.2	-31.8	-31.9	-27.2	-39.7	-39.7	-34.8	n/a	n/a	n/a
02/01/2009	-33.6	-32.4	-28.2	-31.8	-29.8	-26.8	-34.9	-35.1	-30.1	n/a	n/a	n/a
03/01/2009	-36.0	-36.8	-31.0	-33.4	-33.0	-28.6	-37.5	-39.7	-33.2	n/a	n/a	n/a
04/01/2009	-35.2	-37.8	-32.1	-33.7	-35.7	-30.1	-37.0	-39.7	-33.5	n/a	n/a	n/a
05/01/2009	-33.4	-34.5	-30.2	-29.4	-31.6	-28.1	-36.5	-37.3	-32.6	n/a	n/a	n/a
06/01/2009	-29.4	-27.0	-28.0	-26.7	-21.9	-26.3	-32.2	-31.6	-29.1	n/a	n/a	n/a
07/01/2009	-26.1	-26.4	-27.4	-24.8	-24.4	-25.8	-27.8	-27.5	-29.2	n/a	n/a	n/a
08/01/2009	-29.7	-30.3	-27.3	-24.4	-25.9	-24.8	-33.7	-34.2	-29.5	n/a	n/a	n/a
09/01/2009	-32.3	-33.2	-28.6	-29.9	-31.0	-27.3	-35.2	-35.4	-29.8	n/a	n/a	n/a
10/01/2009	-34.3	-34.2	-29.2	-32.8	-32.6	-28.0	-36.4	-35.8	-30.5	n/a	n/a	n/a
11/01/2009	-34.0	-34.2	-31.0	-31.9	-32.9	-28.8	-37.1	-35.9	-32.4	n/a	n/a	n/a
12/01/2009	-33.5	-32.3	-29.7	-31.3	-27.9	-28.2	-35.3	-34.9	-32.7	n/a	n/a	n/a
13/01/2009	-31.9	-30.1	-27.3	-27.9	-26.6	-25.0	-35.0	-32.7	-29.7	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
14/01/2009	-30.2	-30.5	-25.1	-27.9	-26.6	-22.8	-33.8	-33.1	-26.9	n/a	n/a	n/a
15/01/2009	-22.8	-23.8	-17.0	-15.1	-15.9	-12.9	-34.1	-33.7	-25.6	n/a	n/a	n/a
16/01/2009	-9.3	-9.1	-4.8	-4.7	-5.2	-0.6	-15.1	-15.9	-13.2	n/a	n/a	n/a
17/01/2009	-17.9	-17.3	-16.1	-6.5	-7.9	-8.8	-23.3	-21.4	-20.0	n/a	n/a	n/a
18/01/2009	-9.8	-8.5	-4.2	-5.5	-4.1	-0.4	-19.1	-17.9	-14.8	n/a	n/a	n/a
19/01/2009	-6.6	-7.5	-5.6	-3.5	-4.3	-0.9	-11.5	-13.6	-15.3	n/a	n/a	n/a
20/01/2009	-18.4	-18.8	-19.4	-11.5	-13.6	-15.3	-21.0	-21.7	-21.9	n/a	n/a	n/a
21/01/2009	-26.1	-26.7	-25.2	-20.8	-21.7	-21.5	-27.7	-28.7	-26.7	n/a	n/a	n/a
22/01/2009	-25.8	-26.4	-23.1	-22.4	-22.2	-18.9	-28.0	-29.0	-26.6	n/a	n/a	n/a
23/01/2009	-23.1	-23.8	-22.3	-20.7	-21.0	-19.0	-25.4	-26.7	-25.4	n/a	n/a	n/a
24/01/2009	-25.8	-24.3	-22.3	-22.4	-20.2	-19.8	-27.9	-28.1	-25.6	n/a	n/a	n/a
25/01/2009	-21.6	-20.2	-16.1	-18.4	-15.0	-13.5	-25.2	-24.7	-21.5	n/a	n/a	n/a
26/01/2009	-23.5	-23.8	-23.1	-20.9	-18.0	-15.8	-26.1	-29.5	-26.2	n/a	n/a	n/a
27/01/2009	-24.8	-25.6	-22.2	-21.3	-21.4	-19.9	-29.3	-30.4	-25.6	n/a	n/a	n/a
28/01/2009	-26.0	-27.6	-25.0	-23.3	-24.7	-22.2	-32.7	-31.4	-29.3	n/a	n/a	n/a
29/01/2009	-33.1	-31.0	-30.6	-30.5	-28.6	-27.6	-36.6	-34.1	-32.6	n/a	n/a	n/a
30/01/2009	-35.8	-32.9	-32.1	-32.6	-30.8	-30.4	-39.3	-36.2	-34.3	n/a	n/a	n/a
31/01/2009	-34.2	-33.6	-34.3	-32.4	-31.2	-33.3	-37.5	-35.6	-35.4	n/a	n/a	n/a
01/02/2009	-35.2	-34.2	-31.3	-32.1	-30.6	-28.1	-38.6	-37.8	-34.4	n/a	n/a	n/a
02/02/2009	-36.2	-36.1	-30.0	-31.1	-30.4	-27.6	-39.3	-39.3	-32.3	n/a	n/a	n/a
03/02/2009	-28.1	-27.5	-25.4	-25.6	-24.3	-23.3	-31.1	-31.1	-27.9	n/a	n/a	n/a
04/02/2009	-21.2	-22.0	-21.0	-15.8	-18.2	-18.1	-27.7	-27.3	-24.4	n/a	n/a	n/a
05/02/2009	-28.1	-28.0	-25.4	-24.8	-24.3	-22.3	-30.3	-30.1	-28.5	n/a	n/a	n/a
06/02/2009	-31.8	-31.9	-30.9	-28.7	-29.6	-28.5	-33.9	-34.2	-32.0	n/a	n/a	n/a
07/02/2009	-32.7	-33.0	-27.3	-29.9	-30.4	-25.1	-35.1	-35.6	-31.7	n/a	n/a	n/a
08/02/2009	-31.9	-30.9	-26.1	-25.3	-23.4	-22.7	-37.3	-37.8	-30.4	n/a	n/a	n/a
09/02/2009	-22.7	-23.1	-21.0	-18.9	-20.3	-18.3	-25.3	-25.2	-22.7	n/a	n/a	n/a
10/02/2009	-27.5	-27.5	-24.7	-23.0	-25.1	-21.6	-30.8	-30.9	-26.8	n/a	n/a	n/a
11/02/2009	-24.6	-25.1	-22.2	-21.3	-22.5	-20.9	-28.6	-29.5	-23.7	n/a	n/a	n/a
12/02/2009	-27.6	-26.3	-24.3	-22.6	-22.5	-21.2	-33.1	-32.9	-28.1	n/a	n/a	n/a
13/02/2009	-28.4	-28.3	-24.0	-25.4	-25.0	-21.5	-32.8	-32.3	-27.4	n/a	n/a	n/a
14/02/2009	-28.1	-29.0	-19.1	-23.5	-22.4	-12.2	-33.3	-33.5	-28.1	n/a	n/a	n/a
15/02/2009	-20.2	-18.9	-14.9	-16.8	-16.7	-13.1	-24.2	-23.1	-16.5	n/a	n/a	n/a
16/02/2009	-23.3	-22.5	-23.4	-17.0	-17.1	-15.2	-30.5	-28.4	-27.7	n/a	n/a	n/a
17/02/2009	-27.6	-26.4	-20.7	-21.8	-20.0	-16.5	-32.7	-30.3	-28.7	n/a	n/a	n/a
18/02/2009	-19.3	-18.8	-18.3	-17.7	-17.4	-15.7	-21.8	-21.3	-20.9	n/a	n/a	n/a
19/02/2009	-26.8	-27.9	-26.5	-18.9	-20.5	-20.9	-33.9	-33.9	-30.7	n/a	n/a	n/a
20/02/2009	-21.7	-21.6	-20.2	-14.2	-14.4	-12.6	-33.4	-32.3	-27.0	n/a	n/a	n/a
21/02/2009	-26.2	-26.1	-25.1	-20.9	-20.3	-20.8	-31.0	-31.0	-27.7	n/a	n/a	n/a
22/02/2009	-32.3	-31.4	-29.3	-29.8	-29.2	-26.2	-34.8	-33.4	-31.9	n/a	n/a	n/a
23/02/2009	-35.4	-34.7	-32.8	-32.6	-33.0	-31.6	-38.2	-36.8	-34.4	n/a	n/a	n/a
24/02/2009	-35.6	-36.0	-33.6	-33.8	-33.2	-32.0	-38.6	-39.8	-35.4	n/a	n/a	n/a
25/02/2009	-33.3	-34.0	-30.3	-30.7	-31.3	-25.9	-35.9	-36.1	-33.0	n/a	n/a	n/a
26/02/2009	-30.1	-29.5	-24.8	-26.6	-26.6	-22.8	-34.8	-34.3	-29.3	n/a	n/a	n/a
27/02/2009	-28.2	-26.9	-25.4	-25.2	-24.3	-23.2	-33.0	-30.6	-27.7	n/a	n/a	n/a
28/02/2009	-26.4	-26.7	-22.3	-23.8	-24.8	-19.6	-28.3	-29.0	-24.7	n/a	n/a	n/a
01/03/2009	-28.2	-28.3	-24.5	-23.7	-24.3	-21.6	-32.7	-32.7	-27.0	n/a	n/a	n/a
02/03/2009	-24.6	-23.8	-19.0	-20.1	-19.6	-16.8	-31.9	-32.4	-23.2	n/a	n/a	n/a
03/03/2009	-22.7	-21.7	-20.6	-20.9	-19.9	-19.0	-25.5	-23.2	-21.5	n/a	n/a	n/a
04/03/2009	-22.9	-24.2	-23.9	-17.8	-20.4	-20.0	-28.3	-28.8	-27.6	n/a	n/a	n/a
05/03/2009	-29.9	-30.0	-29.0	-28.3	-28.4	-27.6	-32.7	-33.4	-30.3	n/a	n/a	n/a
06/03/2009	-32.1	-32.8	-27.2	-28.4	-29.6	-24.0	-35.6	-36.8	-31.9	n/a	n/a	n/a
07/03/2009	-29.0	-30.2	-29.3	-24.5	-25.8	-23.0	-35.2	-36.2	-34.3	n/a	n/a	n/a
08/03/2009	-35.5	-35.6	-33.4	-32.1	-32.5	-30.5	-38.1	-38.4	-36.9	n/a	n/a	n/a
09/03/2009	-35.4	-35.2	-32.3	-31.4	-31.9	-30.4	-38.5	-38.4	-34.7	n/a	n/a	n/a
10/03/2009	-38.7	-38.1	-34.6	-34.8	-34.7	-30.9	-41.5	-40.9	-36.3	n/a	n/a	n/a
11/03/2009	-36.3	-35.0	-31.9	-31.9	-29.3	-27.5	-41.6	-40.0	-36.0	n/a	n/a	n/a
12/03/2009	-38.6	-38.1	-37.8	-35.3	-33.8	-32.7	-42.0	-41.8	-39.5	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
13/03/2009	-40.2	-39.4	-37.5	-36.3	-36.0	-35.7	-43.8	-43.1	-40.0	n/a	n/a	n/a
14/03/2009	-39.8	-38.3	-36.1	-34.6	-30.4	-33.7	-43.2	-42.9	-39.4	n/a	n/a	n/a
15/03/2009	-37.1	-35.6	-31.8	-31.3	-30.4	-28.2	-42.6	-39.6	-36.3	n/a	n/a	n/a
16/03/2009	-34.1	-30.5	-29.6	-29.1	-22.7	-26.7	-39.3	-36.1	-34.0	n/a	n/a	n/a
17/03/2009	-31.7	-29.4	-26.3	-25.2	-22.0	-23.7	-36.5	-32.5	-30.1	n/a	n/a	n/a
18/03/2009	-27.7	-27.7	-23.2	-23.1	-21.6	-19.7	-31.9	-32.2	-26.8	n/a	n/a	n/a
19/03/2009	-27.8	-27.0	-25.8	-20.9	-18.9	-21.9	-33.3	-32.6	-27.6	n/a	n/a	n/a
20/03/2009	-28.6	-28.5	-27.6	-24.6	-24.8	-24.5	-32.6	-31.1	-29.5	n/a	n/a	n/a
21/03/2009	-28.3	-28.3	-23.9	-22.8	-21.1	-20.9	-34.0	-32.9	-28.3	n/a	n/a	n/a
22/03/2009	-24.4	-25.5	-25.5	-20.9	-21.1	-22.1	-30.7	-31.7	-28.3	n/a	n/a	n/a
23/03/2009	-28.1	-28.4	-24.8	-24.1	-23.1	-21.0	-34.1	-34.3	-30.5	n/a	n/a	n/a
24/03/2009	-25.1	-25.9	-26.4	-21.8	-22.3	-22.3	-32.0	-31.4	-29.1	n/a	n/a	n/a
25/03/2009	-29.2	-29.7	-25.6	-24.6	-25.1	-21.8	-34.5	-34.5	-30.0	n/a	n/a	n/a
26/03/2009	-23.5	-24.5	-18.8	-18.2	-18.6	-14.7	-30.8	-31.6	-25.1	n/a	n/a	n/a
27/03/2009	-15.6	-16.9	-14.7	-10.3	-10.1	-7.6	-21.9	-20.0	-17.9	n/a	n/a	n/a
28/03/2009	-14.5	-18.2	-18.9	-9.1	-14.6	-17.9	-21.2	-20.6	-20.0	n/a	n/a	n/a
29/03/2009	-24.2	-23.5	-23.0	-20.4	-20.4	-20.0	-30.6	-30.6	-27.8	n/a	n/a	n/a
30/03/2009	-27.3	-27.5	-24.3	-21.2	-21.7	-21.5	-31.7	-31.5	-26.5	n/a	n/a	n/a
31/03/2009	-23.7	-24.1	-25.8	-19.7	-22.1	-24.6	-27.5	-27.9	-27.1	n/a	n/a	n/a
01/04/2009	-22.0	-23.5	-24.3	-20.0	-20.5	-19.2	-24.3	-26.1	-26.9	n/a	n/a	n/a
02/04/2009	-21.4	-22.2	-23.1	-19.3	-19.9	-21.9	-28.0	-25.9	-24.7	n/a	n/a	n/a
03/04/2009	-25.7	-23.9	-22.7	-18.7	-13.7	-19.9	-30.7	-29.6	-25.5	n/a	n/a	n/a
04/04/2009	-23.9	-23.1	-18.3	-16.4	-16.0	-12.8	-31.5	-29.2	-24.9	n/a	n/a	n/a
05/04/2009	-15.2	-15.8	-13.5	-12.5	-13.8	-9.6	-20.5	-19.7	-19.7	n/a	n/a	n/a
06/04/2009	-11.4	-12.4	-12.6	-6.3	-8.4	-8.1	-15.2	-16.8	-16.5	0.5	n/a	n/a
07/04/2009	-18.9	-18.5	-19.4	-15.2	-13.6	-16.5	-24.2	-22.4	-21.0	n/a	n/a	n/a
08/04/2009	-19.5	-20.5	-18.2	-15.6	-15.4	-15.0	-25.0	-25.5	-22.0	n/a	n/a	n/a
09/04/2009	-21.0	-21.4	-15.3	-14.2	-14.6	-10.9	-26.9	-26.4	-22.2	0.3	n/a	n/a
10/04/2009	-12.9	-14.1	-11.3	-7.3	-8.5	-6.5	-21.5	-20.4	-17.2	n/a	n/a	n/a
11/04/2009	-5.5	-6.5	-5.0	-1.0	-2.7	-2.4	-7.8	-8.8	-7.5	n/a	1.0	n/a
12/04/2009	-5.5	-6.1	-4.4	-4.0	-4.7	-2.9	-7.0	-7.4	-5.7	n/a	n/a	n/a
13/04/2009	-9.0	-8.8	-8.1	-7.0	-7.0	-5.4	-11.8	-11.6	-10.6	n/a	n/a	n/a
14/04/2009	-11.9	-12.3	-11.0	-10.1	-10.3	-9.3	-13.9	-14.1	-13.0	n/a	n/a	n/a
15/04/2009	-9.5	-9.8	-9.2	-5.4	-5.3	-6.8	-11.3	-11.2	-10.7	n/a	n/a	n/a
16/04/2009	-8.9	-10.1	-7.6	-4.6	-5.6	-4.8	-12.0	-13.8	-10.8	n/a	0.3	n/a
17/04/2009	-5.4	-4.8	-3.5	-1.8	-1.0	2.4	-11.8	-11.8	-10.4	n/a	n/a	n/a
18/04/2009	-10.5	-11.2	-11.8	-8.6	-9.8	-9.9	-13.7	-14.3	-14.7	n/a	0.5	n/a
19/04/2009	-15.9	-16.7	-16.2	-12.1	-14.3	-14.5	-19.9	-19.6	-17.6	n/a	n/a	n/a
20/04/2009	-19.2	-19.7	-19.3	-17.2	-18.7	-16.6	-21.0	-22.0	-20.7	n/a	n/a	n/a
21/04/2009	-18.7	-18.5	-16.6	-13.2	-13.5	-11.9	-24.6	-25.0	-22.0	n/a	n/a	n/a
22/04/2009	-16.4	-15.9	-15.6	-14.5	-13.1	-13.8	-21.2	-19.3	-17.6	n/a	n/a	n/a
23/04/2009	-18.3	-18.8	-18.4	-16.8	-17.1	-16.7	-22.1	-21.6	-19.8	n/a	n/a	n/a
24/04/2009	-18.9	-19.1	-17.7	-15.2	-15.0	-15.0	-23.9	-22.7	-20.9	n/a	n/a	n/a
25/04/2009	-16.5	-16.5	-16.4	-12.9	-12.2	-14.7	-18.9	-20.4	-19.4	n/a	n/a	n/a
26/04/2009	-14.8	-14.3	-13.6	-11.3	-10.5	-10.7	-18.6	-17.8	-15.6	n/a	n/a	n/a
27/04/2009	-15.4	-14.4	-13.3	-10.2	-9.1	-8.0	-21.0	-20.2	-18.1	n/a	n/a	n/a
28/04/2009	-7.9	-7.4	-1.4	-1.5	-1.3	2.0	-17.5	-17.8	-12.0	n/a	n/a	n/a
29/04/2009	-3.8	-3.7	-3.0	0.3	0.1	2.1	-11.4	-11.3	-6.5	n/a	n/a	n/a
30/04/2009	-11.2	-10.8	n/a	-8.6	-8.4	n/a	-14.6	-13.4	n/a	n/a	n/a	n/a
01/05/2009	-8.3	-7.4	n/a	-1.5	-0.7	n/a	-15.2	-14.1	n/a	n/a	n/a	n/a
02/05/2009	-1.8	-2.0	n/a	-0.4	-0.2	n/a	-4.0	-5.8	n/a	n/a	n/a	n/a
03/05/2009	-7.9	-9.1	n/a	-3.5	-4.5	n/a	-16.6	-18.2	n/a	n/a	n/a	n/a
04/05/2009	-15.8	-16.3	n/a	-12.6	-13.7	n/a	-19.7	-21.1	n/a	n/a	n/a	n/a
05/05/2009	-13.2	-13.5	n/a	-7.8	-9.7	n/a	-16.3	-15.0	n/a	n/a	n/a	n/a
06/05/2009	-14.8	-15.0	n/a	-11.6	-11.7	n/a	-20.1	-18.7	n/a	n/a	n/a	n/a
07/05/2009	-14.8	-15.0	n/a	-9.0	-9.7	n/a	-22.4	-20.4	n/a	n/a	n/a	n/a
08/05/2009	-9.7	-9.9	n/a	-6.8	-6.3	n/a	-16.3	-13.8	n/a	n/a	n/a	n/a
09/05/2009	-8.3	-9.1	n/a	-1.7	-2.3	n/a	-16.9	-17.2	n/a	0.5	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
10/05/2009	-9.2	-10.2	n/a	-7.0	-8.0	n/a	-12.4	-13.9	n/a	n/a	n/a	n/a
11/05/2009	-13.9	-14.5	n/a	-12.3	-12.9	n/a	-17.3	-16.8	n/a	n/a	n/a	n/a
12/05/2009	-15.0	-15.9	n/a	-13.6	-14.0	n/a	-16.8	-19.2	n/a	n/a	n/a	n/a
13/05/2009	-13.0	-13.3	n/a	-10.8	-10.1	n/a	-15.9	-16.4	n/a	n/a	n/a	n/a
14/05/2009	-8.6	-8.1	n/a	-5.3	-4.2	n/a	-12.5	-12.0	n/a	n/a	n/a	n/a
15/05/2009	-11.8	-12.1	n/a	-5.8	-6.4	n/a	-14.5	-15.2	n/a	n/a	n/a	n/a
16/05/2009	-13.3	-14.2	n/a	-11.4	-12.3	n/a	-16.0	-16.3	n/a	n/a	n/a	n/a
17/05/2009	-13.3	-13.9	n/a	-12.1	-12.4	n/a	-14.3	-14.7	n/a	n/a	n/a	n/a
18/05/2009	-12.6	-12.7	n/a	-10.8	-10.9	n/a	-14.8	-15.2	n/a	n/a	n/a	n/a
19/05/2009	-11.6	-12.2	n/a	-9.6	-9.8	n/a	-12.7	-13.7	n/a	n/a	n/a	n/a
20/05/2009	-10.6	-10.7	n/a	-8.1	-7.7	n/a	-13.1	-13.6	n/a	n/a	n/a	n/a
21/05/2009	-5.3	-5.6	n/a	-1.8	-1.8	n/a	-8.3	-8.9	n/a	n/a	n/a	n/a
22/05/2009	-4.0	-4.0	n/a	-2.1	-2.3	n/a	-7.6	-7.0	n/a	n/a	n/a	n/a
23/05/2009	-3.8	-4.5	n/a	-1.0	-1.4	n/a	-6.5	-8.3	n/a	n/a	0.3	n/a
24/05/2009	-8.7	-9.1	n/a	-6.5	-7.6	n/a	-10.2	-11.2	n/a	n/a	n/a	n/a
25/05/2009	-8.6	-9.9	n/a	-5.7	-7.5	n/a	-10.1	-11.6	n/a	n/a	n/a	n/a
26/05/2009	-7.6	-9.8	n/a	-5.6	-7.2	n/a	-9.4	-13.3	n/a	n/a	n/a	n/a
27/05/2009	-6.9	-8.5	n/a	-4.2	-6.2	n/a	-9.1	-11.2	n/a	n/a	n/a	n/a
28/05/2009	-6.6	-7.0	n/a	-2.4	-1.8	n/a	-12.5	-14.2	n/a	n/a	n/a	n/a
29/05/2009	-1.1	-0.7	n/a	3.2	3.7	n/a	-6.9	-5.1	n/a	n/a	n/a	n/a
30/05/2009	-2.0	-0.5	n/a	1.8	2.8	n/a	-8.1	-4.6	n/a	n/a	0.3	n/a
31/05/2009	-2.8	-0.9	n/a	1.5	3.4	n/a	-8.8	-8.1	n/a	n/a	n/a	n/a
01/06/2009	0.6	0.7	n/a	6.0	5.3	n/a	-6.3	-4.8	n/a	0	0	n/a
02/06/2009	0.4	0.8	n/a	1.9	2.8	n/a	-2.2	-1.5	n/a	0	0	n/a
03/06/2009	-0.6	-1.3	n/a	0.3	-0.1	n/a	-1.5	-2.5	n/a	0	0	n/a
04/06/2009	-1.6	-2.3	n/a	-0.1	-0.7	n/a	-3.5	-4.0	n/a	0	0	n/a
05/06/2009	-1.5	-1.9	n/a	2.0	0.7	n/a	-4.6	-4.2	n/a	0	0	n/a
06/06/2009	-0.5	0.2	n/a	4.4	6.0	n/a	-4.8	-6.1	n/a	0	0	n/a
07/06/2009	0.8	1.9	n/a	5.1	6.7	n/a	-5.7	-3.7	n/a	0	0	n/a
08/06/2009	3.6	6.2	n/a	9.1	12.1	n/a	-2.9	-0.6	n/a	0	0	n/a
09/06/2009	6.6	7.1	n/a	13.4	12.7	n/a	1.3	2.4	n/a	0	0	n/a
10/06/2009	1.7	1.6	n/a	3.7	3.9	n/a	-1.6	-1.7	n/a	0	0	n/a
11/06/2009	0.9	1.3	n/a	5.4	6.1	n/a	-3.1	-3.7	n/a	0	0	n/a
12/06/2009	1.0	0.9	n/a	5.0	3.7	n/a	-2.0	-1.8	n/a	13.5	8.6	n/a
13/06/2009	-0.2	0.0	n/a	2.6	2.7	n/a	-4.3	-3.3	n/a	1.5	0.3	n/a
14/06/2009	2.6	2.3	n/a	5.9	5.4	n/a	-0.5	-2.2	n/a	0	0	n/a
15/06/2009	2.4	2.4	n/a	6.5	6.3	n/a	-1.8	-2.1	n/a	0	0	n/a
16/06/2009	2.8	2.3	n/a	4.9	4.3	n/a	0.3	-0.5	n/a	0	0	n/a
17/06/2009	4.2	4.5	n/a	9.0	9.1	n/a	0.8	0.9	n/a	0	0	n/a
18/06/2009	7.0	7.1	n/a	12.9	12.9	n/a	0.9	1.2	n/a	0.8	0	n/a
19/06/2009	5.2	5.7	n/a	6.7	8.6	n/a	3.6	3.2	n/a	2.3	0	n/a
20/06/2009	5.0	5.9	n/a	7.5	8.7	n/a	2.9	3.3	n/a	0	0	n/a
21/06/2009	6.8	6.7	n/a	11.6	11.5	n/a	3.0	2.8	n/a	0	0	n/a
22/06/2009	8.7	8.8	n/a	14.6	13.1	n/a	2.4	3.4	n/a	0.3	0	n/a
23/06/2009	6.0	5.7	n/a	9.4	8.0	n/a	3.5	2.9	n/a	0	0	n/a
24/06/2009	5.0	4.5	n/a	7.5	6.4	n/a	2.2	2.3	n/a	2.0	5.6	n/a
25/06/2009	7.1	5.2	n/a	13.0	9.3	n/a	1.7	1.0	n/a	1.0	1.8	n/a
26/06/2009	4.1	3.9	n/a	8.2	9.3	n/a	0.9	0.4	n/a	0	0	n/a
27/06/2009	11.1	11.1	n/a	19.3	17.6	n/a	0.9	1.7	n/a	0	0	n/a
28/06/2009	14.5	14.3	n/a	21.0	20.0	n/a	4.6	6.6	n/a	0	0.3	n/a
29/06/2009	16.2	16.8	n/a	21.7	21.1	n/a	6.7	10.5	n/a	0	0	n/a
30/06/2009	14.7	15.4	n/a	19.9	19.7	n/a	7.8	10.3	n/a	0	0	n/a
01/07/2009	13.7	13.9	n/a	19.6	19.2	n/a	5.9	7.7	n/a	0	0	n/a
02/07/2009	13.8	14.4	n/a	19.2	18.8	n/a	6.5	9.8	n/a	0	0	n/a
03/07/2009	13.6	13.3	n/a	20.5	19.2	n/a	5.7	6.7	n/a	0	0	n/a
04/07/2009	13.7	13.4	n/a	18.9	19.1	n/a	6.6	8.4	n/a	0	0.5	n/a
05/07/2009	9.3	8.5	n/a	13.0	13.6	n/a	6.2	5.7	n/a	0	0	n/a
06/07/2009	10.4	10.9	n/a	15.2	15.4	n/a	4.7	5.6	n/a	0.5	0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
07/07/2009	12.9	11.9	n/a	18.2	17.8	n/a	7.6	6.1	n/a	4.1	0	n/a
08/07/2009	4.2	3.0	n/a	8.7	6.6	n/a	1.4	0.4	n/a	5.6	9.7	n/a
09/07/2009	4.2	3.3	n/a	9.4	8.3	n/a	0.9	-0.1	n/a	3.6	1.8	n/a
10/07/2009	7.2	6.6	n/a	15.2	12.6	n/a	0.3	0.6	n/a	3.3	0.5	n/a
11/07/2009	6.6	5.6	n/a	11.7	10.5	n/a	2.4	1.9	n/a	1.5	1.3	n/a
12/07/2009	5.5	4.7	n/a	8.7	7.9	n/a	1.6	1.5	n/a	0	0.3	n/a
13/07/2009	9.1	8.4	n/a	13.9	12.6	n/a	1.2	2.3	n/a	0	0	n/a
14/07/2009	10.1	9.4	n/a	12.8	13.7	n/a	6.6	5.9	n/a	0	0.3	n/a
15/07/2009	11.4	10.3	n/a	15.7	15.5	n/a	7.3	5.4	n/a	2.5	4.8	n/a
16/07/2009	11.4	9.9	n/a	15.5	14.1	n/a	7.9	6.0	n/a	2.3	1.0	n/a
17/07/2009	10.6	9.6	n/a	15.2	14.6	n/a	4.9	3.6	n/a	0	0	n/a
18/07/2009	13.6	12.8	n/a	19.6	18.2	n/a	7.0	7.5	n/a	0.3	0.5	n/a
19/07/2009	15.2	15.6	n/a	22.1	22.8	n/a	6.8	8.7	n/a	3.6	0	n/a
20/07/2009	13.7	15.8	n/a	19.6	21.9	n/a	9.2	10.5	n/a	0	0	n/a
21/07/2009	14.4	14.8	n/a	20.7	21.5	n/a	8.9	8.6	n/a	0	0	n/a
22/07/2009	14.2	14.7	n/a	18.9	20.0	n/a	9.3	9.5	n/a	0	0	n/a
23/07/2009	15.8	15.8	n/a	21.5	20.6	n/a	11.3	11.1	n/a	0	0	n/a
24/07/2009	16.2	16.2	n/a	22.1	22.5	n/a	8.9	10.6	n/a	0	0	n/a
25/07/2009	15.2	14.7	n/a	17.9	17.8	n/a	12.6	10.2	n/a	0	3.3	n/a
26/07/2009	13.2	12.8	n/a	18.2	17.6	n/a	8.2	7.4	n/a	0	0	n/a
27/07/2009	11.0	11.0	n/a	13.3	13.6	n/a	7.6	8.3	n/a	0	0	n/a
28/07/2009	12.1	11.7	n/a	15.0	15.0	n/a	9.3	8.9	n/a	0	0	n/a
29/07/2009	9.4	9.0	n/a	12.9	12.1	n/a	6.1	6.5	n/a	0	0	n/a
30/07/2009	9.6	8.9	n/a	13.3	12.6	n/a	6.4	5.8	n/a	0	0	n/a
31/07/2009	10.5	10.0	n/a	14.0	12.9	n/a	5.1	6.8	n/a	0	0	n/a
01/08/2009	7.8	7.4	n/a	10.3	9.4	n/a	6.4	5.9	n/a	4.1	4.6	n/a
02/08/2009	9.5	8.6	n/a	12.6	11.4	n/a	6.1	7.4	n/a	0	0	n/a
03/08/2009	11.3	10.8	n/a	14.9	14.2	n/a	8.0	7.6	n/a	0	0	n/a
04/08/2009	11.2	11.3	n/a	15.2	15.7	n/a	5.5	5.9	n/a	0	0	n/a
05/08/2009	11.9	11.1	n/a	17.3	15.7	n/a	5.1	7.5	n/a	0	0	n/a
06/08/2009	11.2	10.1	n/a	16.9	15.6	n/a	3.6	5.1	n/a	2.3	6.6	n/a
07/08/2009	8.3	7.5	n/a	10.3	9.0	n/a	3.5	4.8	n/a	0.3	0.3	n/a
08/08/2009	7.0	6.2	n/a	12.2	10.6	n/a	0.4	2.6	n/a	0	0	n/a
09/08/2009	6.3	6.0	n/a	11.4	11.5	n/a	-0.4	-0.3	n/a	0	0	n/a
10/08/2009	8.9	7.8	n/a	13.4	11.8	n/a	5.8	5.0	n/a	0	0	n/a
11/08/2009	6.5	5.8	n/a	9.8	8.6	n/a	3.1	2.9	n/a	0	0	n/a
12/08/2009	7.0	6.4	n/a	8.4	8.7	n/a	4.6	4.8	n/a	0.3	2.3	n/a
13/08/2009	7.8	8.1	n/a	13.5	14.1	n/a	3.3	3.0	n/a	0	0	n/a
14/08/2009	10.9	11.4	n/a	17.9	16.9	n/a	3.4	5.0	n/a	0	0	n/a
15/08/2009	11.5	10.4	n/a	17.4	15.7	n/a	3.8	4.4	n/a	0	4.6	n/a
16/08/2009	14.4	12.2	n/a	20.7	18.2	n/a	6.8	5.7	n/a	0	6.6	n/a
17/08/2009	14.7	12.5	n/a	20.1	17.0	n/a	9.1	10.0	n/a	10.4	3.8	n/a
18/08/2009	9.5	8.2	n/a	13.0	11.5	n/a	5.4	5.2	n/a	0.3	0.5	n/a
19/08/2009	7.1	6.9	n/a	10.3	10.5	n/a	4.0	3.4	n/a	0	0	n/a
20/08/2009	8.8	8.3	n/a	13.8	12.1	n/a	3.4	4.0	n/a	0	0	n/a
21/08/2009	6.2	5.8	n/a	9.0	8.6	n/a	2.5	4.4	n/a	3.8	6.1	n/a
22/08/2009	5.4	6.2	n/a	10.1	9.9	n/a	-0.6	2.2	n/a	0	0	n/a
23/08/2009	6.3	6.4	n/a	13.8	13.6	n/a	-1.5	-0.2	n/a	0	0	n/a
24/08/2009	9.1	9.4	n/a	16.8	17.4	n/a	2.4	2.6	n/a	0	0	n/a
25/08/2009	8.7	9.7	n/a	16.3	16.1	n/a	1.1	4.3	n/a	0	0	n/a
26/08/2009	9.4	9.4	n/a	16.2	15.2	n/a	1.5	3.6	n/a	0	0	n/a
27/08/2009	11.8	11.1	n/a	17.4	15.3	n/a	7.9	7.6	n/a	0.3	1.0	n/a
28/08/2009	10.5	10.3	n/a	13.5	12.8	n/a	6.6	8.2	n/a	0	0	n/a
29/08/2009	14.0	13.4	n/a	21.0	19.7	n/a	7.8	7.6	n/a	0.3	0.3	n/a
30/08/2009	15.9	15.7	n/a	24.4	23.2	n/a	6.9	8.9	n/a	0	0	n/a
31/08/2009	10.2	9.0	n/a	13.6	14.7	n/a	3.5	2.0	n/a	3.3	3.8	n/a
01/09/2009	4.3	3.7	n/a	7.9	7.4	n/a	1.3	0.5	n/a	0	0	n/a
02/09/2009	5.8	5.3	n/a	11.1	10.1	n/a	0.1	-0.1	n/a	0	0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
03/09/2009	7.3	7.3	n/a	15.6	14.6	n/a	0.7	0.8	n/a	0	0	n/a
04/09/2009	11.9	11.5	n/a	19.8	17.9	n/a	3.8	4.7	n/a	0	0.5	n/a
05/09/2009	5.1	4.0	n/a	12.4	10.2	n/a	-0.8	-0.8	n/a	0	0.8	n/a
06/09/2009	5.7	6.1	n/a	14.2	13.6	n/a	-2.0	-0.9	n/a	0	0	n/a
07/09/2009	7.4	7.6	n/a	14.5	13.5	n/a	-1.5	1.0	n/a	0	0	n/a
08/09/2009	8.9	7.8	n/a	13.1	9.9	n/a	5.6	5.4	n/a	4.1	5.3	n/a
09/09/2009	5.3	3.9	n/a	9.3	7.5	n/a	0.5	0.0	n/a	0	0	n/a
10/09/2009	0.6	0.6	n/a	5.1	4.3	n/a	-2.2	-1.8	n/a	0	0	n/a
11/09/2009	4.0	3.3	n/a	10.1	8.9	n/a	-2.5	-2.9	n/a	1.3	4.1	n/a
12/09/2009	9.2	8.5	n/a	13.9	12.2	n/a	4.3	5.3	n/a	0	0.3	n/a
13/09/2009	7.3	6.9	n/a	12.4	10.7	n/a	4.1	2.6	n/a	0	0	n/a
14/09/2009	12.5	12.3	n/a	21.4	20.5	n/a	6.6	6.5	n/a	0	0	n/a
15/09/2009	8.2	7.9	n/a	12.8	14.1	n/a	5.5	5.0	n/a	0	0	n/a
16/09/2009	6.2	5.8	n/a	9.5	8.9	n/a	4.5	4.2	n/a	0	0	n/a
17/09/2009	6.5	5.1	n/a	8.8	8.3	n/a	2.1	0.7	n/a	0	0	n/a
18/09/2009	10.2	9.4	n/a	15.6	14.3	n/a	6.2	5.6	n/a	7.9	4.8	n/a
19/09/2009	9.4	8.6	n/a	14.7	14.3	n/a	3.8	3.3	n/a	0.3	0	n/a
20/09/2009	4.5	3.3	n/a	8.2	6.4	n/a	1.2	0.4	n/a	13.0	5.3	n/a
21/09/2009	0.1	-0.2	n/a	1.2	0.5	n/a	-0.3	-0.9	n/a	0.5	0.3	n/a
22/09/2009	0.7	0.6	n/a	2.9	2.4	n/a	-0.8	-0.6	n/a	0	1.0	n/a
23/09/2009	1.5	1.0	n/a	2.9	2.5	n/a	0.2	-0.1	n/a	3.8	2.0	n/a
24/09/2009	5.3	4.7	n/a	8.4	7.3	n/a	2.7	2.2	n/a	3.3	6.4	n/a
25/09/2009	2.0	1.2	n/a	4.3	3.4	n/a	-1.5	-2.2	n/a	0	0	n/a
26/09/2009	-2.1	-2.5	n/a	0.0	-1.5	n/a	-3.5	-3.7	n/a	0	0	n/a
27/09/2009	-3.9	-4.3	n/a	-1.5	-2.4	n/a	-5.8	-5.3	n/a	0	0	n/a
28/09/2009	-1.9	-1.5	n/a	2.2	1.7	n/a	-5.8	-5.2	n/a	0	0	n/a
29/09/2009	-0.2	-0.6	n/a	1.8	1.1	n/a	-3.4	-2.5	n/a	0	0	n/a
30/09/2009	0.6	0.1	n/a	1.5	1.0	n/a	-0.5	-1.1	n/a	3.0	3.8	n/a
01/10/2009	-2.1	-3.1	n/a	0.8	-0.5	n/a	-5.6	-5.7	n/a	n/a	n/a	n/a
02/10/2009	-3.9	-4.0	n/a	-1.3	-0.9	n/a	-7.0	-7.4	n/a	n/a	n/a	n/a
03/10/2009	-1.7	-2.1	n/a	0.0	0.2	n/a	-3.3	-4.0	n/a	n/a	n/a	n/a
04/10/2009	-0.5	-3.1	n/a	0.8	-0.3	n/a	-2.1	-6.5	n/a	n/a	0.3	n/a
05/10/2009	0.7	0.6	n/a	1.8	1.9	n/a	-0.6	-0.3	n/a	0.5	0.3	n/a
06/10/2009	-0.8	-1.1	n/a	0.2	0.4	n/a	-2.3	-3.2	n/a	0.3	0.5	n/a
07/10/2009	-2.8	-3.7	n/a	-1.7	-2.5	n/a	-3.5	-4.8	n/a	n/a	n/a	n/a
08/10/2009	-4.0	-4.7	n/a	-2.7	-3.3	n/a	-5.6	-6.0	n/a	n/a	0.3	n/a
09/10/2009	-4.7	-5.8	n/a	-2.8	-4.4	n/a	-9.9	-8.7	n/a	n/a	n/a	n/a
10/10/2009	-8.8	-8.2	n/a	-7.0	-6.8	n/a	-10.8	-11.2	n/a	n/a	n/a	n/a
11/10/2009	-11.3	-11.8	n/a	-9.5	-10.2	n/a	-13.9	-15.2	n/a	n/a	n/a	n/a
12/10/2009	-10.7	-11.1	n/a	-9.4	-9.2	n/a	-12.2	-13.6	n/a	n/a	n/a	n/a
13/10/2009	-9.9	-11.1	n/a	-6.1	-5.8	n/a	-14.8	-15.7	n/a	n/a	n/a	n/a
14/10/2009	-4.0	-4.1	n/a	-2.1	-3.0	n/a	-6.6	-5.8	n/a	n/a	n/a	n/a
15/10/2009	-4.0	-4.6	n/a	-1.9	-1.8	n/a	-7.0	-7.9	n/a	n/a	n/a	n/a
16/10/2009	-3.3	-4.3	n/a	-1.6	-1.8	n/a	-6.1	-6.6	n/a	n/a	n/a	n/a
17/10/2009	-9.6	-10.3	n/a	-4.2	-4.3	n/a	-13.1	-14.4	n/a	n/a	n/a	n/a
18/10/2009	-14.3	-15.4	n/a	-12.6	-13.3	n/a	-15.8	-17.7	n/a	n/a	n/a	n/a
19/10/2009	-9.8	-10.7	n/a	-4.9	-6.2	n/a	-14.6	-14.8	n/a	n/a	n/a	n/a
20/10/2009	-10.8	-10.9	n/a	-8.7	-9.4	n/a	-14.1	-14.4	n/a	n/a	n/a	n/a
21/10/2009	-12.1	-12.9	n/a	-9.0	-9.9	n/a	-14.9	-16.3	n/a	n/a	n/a	n/a
22/10/2009	-15.4	-15.5	n/a	-11.7	-13.2	n/a	-18.8	-17.4	n/a	n/a	n/a	n/a
23/10/2009	-12.5	-13.1	n/a	-11.4	-11.9	n/a	-17.0	-16.4	n/a	n/a	n/a	n/a
24/10/2009	-15.0	-15.3	n/a	-12.6	-13.0	n/a	-20.0	-19.3	n/a	n/a	n/a	n/a
25/10/2009	-16.2	-16.4	n/a	-11.7	-12.7	n/a	-20.5	-19.6	n/a	n/a	n/a	n/a
26/10/2009	-9.0	-10.3	n/a	-7.8	-9.4	n/a	-11.8	-12.8	n/a	n/a	n/a	n/a
27/10/2009	-13.8	-13.9	n/a	-9.3	-10.5	n/a	-19.4	-21.7	n/a	n/a	n/a	n/a
28/10/2009	-19.7	-18.8	n/a	-18.3	-16.7	n/a	-21.7	-22.2	n/a	n/a	n/a	n/a
29/10/2009	-22.4	-20.6	n/a	-18.3	-16.5	n/a	-25.8	-24.7	n/a	n/a	n/a	n/a
30/10/2009	-18.4	-21.1	n/a	-16.6	-17.4	n/a	-22.4	-24.9	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
31/10/2009	-19.8	-20.3	n/a	-17.9	-18.7	n/a	-21.9	-21.6	n/a	n/a	n/a	n/a
01/11/2009	-19.5	-19.4	n/a	-16.6	-15.7	n/a	-23.1	-24.7	n/a	n/a	n/a	n/a
02/11/2009	-15.5	-15.5	n/a	-11.8	-12.4	n/a	-18.3	-18.0	n/a	n/a	n/a	n/a
03/11/2009	-15.1	-14.6	n/a	-12.9	-13.0	n/a	-16.7	-16.7	n/a	n/a	n/a	n/a
04/11/2009	-16.8	-17.3	n/a	-13.2	-13.6	n/a	-24.8	-23.9	n/a	n/a	n/a	n/a
05/11/2009	-24.6	-23.8	n/a	-20.0	-20.0	n/a	-27.9	-27.1	n/a	n/a	n/a	n/a
06/11/2009	-17.7	-18.7	n/a	-16.2	-17.4	n/a	-20.0	-20.1	n/a	n/a	n/a	n/a
07/11/2009	-15.1	-15.4	n/a	-13.7	-13.8	n/a	-16.6	-17.4	n/a	n/a	n/a	n/a
08/11/2009	-17.5	-17.8	n/a	-16.3	-16.1	n/a	-18.3	-19.6	n/a	n/a	n/a	n/a
09/11/2009	-21.8	-22.2	n/a	-18.1	-19.2	n/a	-25.4	-24.9	n/a	n/a	n/a	n/a
10/11/2009	-24.4	-23.0	n/a	-20.6	-18.1	n/a	-28.2	-27.8	n/a	n/a	n/a	n/a
11/11/2009	-21.0	-18.0	n/a	-18.4	-16.7	n/a	-26.7	-21.2	n/a	n/a	n/a	n/a
12/11/2009	-20.2	-19.4	n/a	-15.5	-16.6	n/a	-23.9	-23.4	n/a	n/a	n/a	n/a
13/11/2009	-13.6	-13.8	n/a	-9.5	-9.8	n/a	-16.7	-16.7	n/a	n/a	n/a	n/a
14/11/2009	-13.0	-13.4	n/a	-6.4	-6.5	n/a	-20.1	-21.0	n/a	n/a	n/a	n/a
15/11/2009	-8.2	-8.6	n/a	-3.7	-4.0	n/a	-16.7	-16.3	n/a	n/a	n/a	n/a
16/11/2009	-17.4	-17.4	n/a	-11.3	-11.5	n/a	-23.6	-22.3	n/a	n/a	n/a	n/a
17/11/2009	-24.8	-23.0	n/a	-21.2	-16.6	n/a	-26.9	-25.6	n/a	n/a	n/a	n/a
18/11/2009	-16.7	-17.0	n/a	-13.1	-13.6	n/a	-24.0	-26.2	n/a	n/a	n/a	n/a
19/11/2009	-16.8	-16.6	n/a	-13.3	-14.7	n/a	-20.0	-18.3	n/a	n/a	n/a	n/a
20/11/2009	-20.4	-20.2	n/a	-16.6	-17.9	n/a	-27.4	-23.2	n/a	n/a	n/a	n/a
21/11/2009	-25.2	-23.7	n/a	-20.9	-19.9	n/a	-28.6	-26.4	n/a	n/a	n/a	n/a
22/11/2009	-18.2	-18.5	n/a	-16.8	-16.8	n/a	-20.9	-21.0	n/a	n/a	n/a	n/a
23/11/2009	-19.1	-19.2	n/a	-17.2	-17.9	n/a	-23.1	-22.3	n/a	n/a	n/a	n/a
24/11/2009	-20.0	-21.4	n/a	-16.0	-18.5	n/a	-25.2	-24.7	n/a	n/a	n/a	n/a
25/11/2009	-20.6	-22.0	n/a	-15.1	-15.8	n/a	-25.6	-25.0	n/a	n/a	n/a	n/a
26/11/2009	-11.2	-11.8	n/a	-8.3	-8.8	n/a	-15.9	-15.8	n/a	n/a	n/a	n/a
27/11/2009	-8.2	-8.9	n/a	-7.9	-8.5	n/a	-8.6	-9.4	n/a	n/a	n/a	n/a
28/11/2009	-9.5	-10.3	n/a	-8.0	-9.1	n/a	-10.3	-10.9	n/a	n/a	n/a	n/a
29/11/2009	-10.0	-10.4	n/a	-8.8	-9.8	n/a	-10.6	-12.2	n/a	n/a	n/a	n/a
30/11/2009	-8.1	-9.6	n/a	-7.6	-8.8	n/a	-9.8	-11.2	n/a	n/a	n/a	n/a
01/12/2009	-11.2	-12.6	n/a	-8.0	-8.9	n/a	-13.4	-17.5	n/a	n/a	n/a	n/a
02/12/2009	-14.4	-19.1	n/a	-9.6	-13.2	n/a	-21.4	-23.7	n/a	n/a	n/a	n/a
03/12/2009	-11.4	-12.2	n/a	-5.7	-6.5	n/a	-16.7	-17.5	n/a	n/a	n/a	n/a
04/12/2009	-8.8	-9.8	n/a	-5.8	-6.6	n/a	-13.6	-14.4	n/a	n/a	n/a	n/a
05/12/2009	-20.3	-20.7	n/a	-13.6	-14.4	n/a	-24.5	-24.4	n/a	0.3	n/a	n/a
06/12/2009	-26.2	-26.0	n/a	-22.4	-22.1	n/a	-31.2	-30.0	n/a	n/a	n/a	n/a
07/12/2009	-26.3	-26.3	n/a	-23.0	-22.0	n/a	-31.6	-30.2	n/a	n/a	n/a	n/a
08/12/2009	-25.9	-26.0	n/a	-23.0	-23.3	n/a	-30.9	-30.4	n/a	n/a	n/a	n/a
09/12/2009	-29.3	-29.5	n/a	-23.8	-23.2	n/a	-34.6	-33.9	n/a	n/a	n/a	n/a
10/12/2009	-36.4	-35.3	n/a	-30.5	-31.6	n/a	-40.6	-38.7	n/a	n/a	n/a	n/a
11/12/2009	-34.9	-34.5	n/a	-29.0	-29.7	n/a	-40.9	-39.1	n/a	n/a	n/a	n/a
12/12/2009	-28.9	-29.2	n/a	-27.8	-28.3	n/a	-29.5	-29.7	n/a	n/a	0.3	n/a
13/12/2009	-27.7	-27.2	n/a	-26.2	-24.5	n/a	-29.2	-29.8	n/a	n/a	n/a	n/a
14/12/2009	-25.7	-24.7	n/a	-23.5	-22.4	n/a	-29.0	-27.2	n/a	n/a	n/a	n/a
15/12/2009	-29.7	-29.6	n/a	-27.1	-26.1	n/a	-32.6	-32.3	n/a	n/a	n/a	n/a
16/12/2009	-34.3	-31.5	n/a	-31.6	-29.7	n/a	-36.9	-32.8	n/a	n/a	n/a	n/a
17/12/2009	-36.1	-31.4	n/a	-34.2	-29.5	n/a	-37.5	-34.0	n/a	n/a	n/a	n/a
18/12/2009	-34.9	-33.6	n/a	-27.4	-28.3	n/a	-38.0	-36.1	n/a	n/a	n/a	n/a
19/12/2009	-23.5	-23.3	n/a	-21.1	-21.3	n/a	-27.4	-28.3	n/a	n/a	n/a	n/a
20/12/2009	-27.1	-23.8	n/a	-21.3	-20.5	n/a	-31.6	-28.9	n/a	n/a	n/a	n/a
21/12/2009	-20.7	-21.0	n/a	-18.5	-19.1	n/a	-23.2	-22.3	n/a	n/a	n/a	n/a
22/12/2009	-18.7	-19.1	n/a	-18.2	-18.6	n/a	-19.4	-19.7	n/a	n/a	n/a	n/a
23/12/2009	-26.0	-25.1	n/a	-19.0	-19.5	n/a	-32.8	-29.9	n/a	n/a	n/a	n/a
24/12/2009	-27.6	-25.5	n/a	-23.0	-22.7	n/a	-33.3	-28.0	n/a	n/a	n/a	n/a
25/12/2009	-19.5	-20.3	n/a	-16.8	-16.8	n/a	-23.0	-25.4	n/a	n/a	n/a	n/a
26/12/2009	-21.7	-23.0	n/a	-20.0	-20.4	n/a	-27.4	-28.4	n/a	n/a	n/a	n/a
27/12/2009	-22.9	-22.2	n/a	-19.3	-19.2	n/a	-27.4	-25.0	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
28/12/2009	-24.7	-25.5	n/a	-21.0	-22.3	n/a	-28.9	-28.9	n/a	n/a	n/a	n/a
29/12/2009	-23.8	-23.7	n/a	-20.6	-20.9	n/a	-27.0	-26.8	n/a	n/a	n/a	n/a
30/12/2009	-26.1	-26.4	n/a	-23.8	-23.9	n/a	-29.1	-29.9	n/a	n/a	n/a	n/a
31/12/2009	-28.2	-27.7	n/a	-25.0	-24.8	n/a	-29.8	-30.0	n/a	n/a	n/a	n/a
01/01/2010	-29.4	-29.2	n/a	-24.0	-23.9	n/a	-34.4	-33.2	n/a	n/a	n/a	n/a
02/01/2010	-31.8	-31.9	n/a	-28.3	-27.9	n/a	-34.9	-34.4	n/a	n/a	n/a	n/a
03/01/2010	-29.0	-29.0	n/a	-27.1	-26.8	n/a	-30.8	-31.6	n/a	n/a	n/a	n/a
04/01/2010	-33.0	-33.3	n/a	-27.2	-29.7	n/a	-35.9	-35.8	n/a	n/a	n/a	n/a
05/01/2010	-30.3	-30.5	n/a	-27.5	-28.0	n/a	-33.4	-34.1	n/a	n/a	n/a	n/a
06/01/2010	-27.1	-27.4	n/a	-23.3	-23.9	n/a	-31.3	-32.3	n/a	n/a	n/a	n/a
07/01/2010	-20.9	-21.5	n/a	-18.9	-19.3	n/a	-23.3	-23.9	n/a	n/a	n/a	n/a
08/01/2010	-22.6	-22.8	n/a	-17.5	-17.1	n/a	-25.9	-25.9	n/a	n/a	n/a	n/a
09/01/2010	-28.0	-28.5	n/a	-19.3	-20.5	n/a	-34.3	-33.5	n/a	n/a	n/a	n/a
10/01/2010	-33.0	-31.5	n/a	-31.6	-29.2	n/a	-35.8	-33.8	n/a	n/a	n/a	n/a
11/01/2010	-30.8	-29.9	n/a	-27.8	-27.1	n/a	-37.2	-34.2	n/a	n/a	n/a	n/a
12/01/2010	-27.8	-28.9	n/a	-26.2	-27.0	n/a	-29.3	-30.1	n/a	n/a	n/a	n/a
13/01/2010	-26.1	-27.7	n/a	-24.6	-26.4	n/a	-30.5	-31.2	n/a	n/a	n/a	n/a
14/01/2010	-33.6	-33.6	n/a	-30.0	-31.2	n/a	-36.0	-36.0	n/a	n/a	n/a	n/a
15/01/2010	-32.7	-32.4	n/a	-24.1	-24.3	n/a	-37.2	-36.1	n/a	n/a	n/a	n/a
16/01/2010	-24.6	-26.0	n/a	-19.4	-21.7	n/a	-33.7	-32.5	n/a	n/a	n/a	n/a
17/01/2010	-27.7	-28.4	n/a	-23.8	-24.6	n/a	-33.9	-32.6	n/a	n/a	n/a	n/a
18/01/2010	-24.3	-25.5	n/a	-22.8	-24.1	n/a	-30.3	-29.2	n/a	n/a	n/a	n/a
19/01/2010	-32.9	-30.8	n/a	-30.3	-29.1	n/a	-35.5	-33.2	n/a	n/a	n/a	n/a
20/01/2010	-27.1	-26.3	n/a	-23.5	-23.2	n/a	-31.1	-31.4	n/a	n/a	n/a	n/a
21/01/2010	-18.1	-18.6	n/a	-16.3	-16.5	n/a	-23.6	-24.1	n/a	n/a	n/a	n/a
22/01/2010	-17.1	-17.2	n/a	-16.3	-16.1	n/a	-17.5	-17.9	n/a	n/a	n/a	n/a
23/01/2010	-17.9	-18.3	n/a	-16.1	-16.3	n/a	-21.4	-22.4	n/a	n/a	n/a	n/a
24/01/2010	-25.5	-25.6	n/a	-21.3	-21.9	n/a	-28.5	-28.5	n/a	n/a	n/a	n/a
25/01/2010	-18.7	-18.5	n/a	-16.2	-16.1	n/a	-24.6	-22.7	n/a	n/a	n/a	n/a
26/01/2010	-19.6	-19.7	n/a	-16.7	-17.0	n/a	-25.3	-23.9	n/a	n/a	n/a	n/a
27/01/2010	-21.0	-19.7	n/a	-17.0	-15.6	n/a	-25.2	-23.3	n/a	n/a	n/a	n/a
28/01/2010	-24.7	-25.9	n/a	-20.8	-21.7	n/a	-28.3	-29.2	n/a	n/a	n/a	n/a
29/01/2010	-31.6	-31.4	n/a	-28.3	-29.2	n/a	-34.5	-34.2	n/a	n/a	n/a	n/a
30/01/2010	-30.7	-29.8	n/a	-26.0	-24.5	n/a	-35.4	-34.8	n/a	n/a	n/a	n/a
31/01/2010	-25.0	-24.9	n/a	-22.1	-21.1	n/a	-28.9	-28.2	n/a	n/a	n/a	n/a
01/02/2010	-28.2	-28.3	n/a	-26.8	-26.7	n/a	-30.0	-29.6	n/a	n/a	n/a	n/a
02/02/2010	-27.9	-27.2	n/a	-25.6	-25.0	n/a	-29.7	-29.2	n/a	n/a	n/a	n/a
03/02/2010	-32.4	-31.3	n/a	-28.3	-26.0	n/a	-37.0	-36.1	n/a	n/a	n/a	n/a
04/02/2010	-36.6	-35.9	n/a	-33.7	-33.2	n/a	-38.7	-37.7	n/a	n/a	n/a	n/a
05/02/2010	-30.9	-32.5	n/a	-19.4	-19.6	n/a	-38.1	-37.6	n/a	n/a	n/a	n/a
06/02/2010	-17.0	-16.6	n/a	-15.2	-15.3	n/a	-19.4	-19.6	n/a	n/a	n/a	n/a
07/02/2010	-14.5	-15.4	n/a	-11.5	-11.8	n/a	-16.2	-18.2	n/a	n/a	n/a	n/a
08/02/2010	-10.6	-11.3	n/a	-9.6	-9.8	n/a	-11.7	-14.3	n/a	n/a	n/a	n/a
09/02/2010	-13.9	-19.9	n/a	-11.4	-14.3	n/a	-15.4	-23.4	n/a	n/a	n/a	n/a
10/02/2010	-17.3	-16.2	n/a	-13.4	-14.2	n/a	-24.6	-21.4	n/a	n/a	n/a	n/a
11/02/2010	-20.6	-16.5	n/a	-17.6	-14.9	n/a	-25.3	-19.0	n/a	n/a	n/a	n/a
12/02/2010	n/a	-16.7	n/a	n/a	-13.8	n/a	n/a	-23.7	n/a	n/a	n/a	n/a
13/02/2010	n/a	-18.3	n/a	n/a	-14.3	n/a	n/a	-23.7	n/a	n/a	n/a	n/a
14/02/2010	n/a	-13.9	n/a	n/a	-12.1	n/a	n/a	-17.9	n/a	n/a	n/a	n/a
15/02/2010	n/a	-17.9	n/a	n/a	-14.4	n/a	n/a	-21.6	n/a	n/a	n/a	n/a
16/02/2010	n/a	-15.2	n/a	n/a	-9.8	n/a	n/a	-20.2	n/a	n/a	n/a	n/a
17/02/2010	n/a	-17.3	n/a	n/a	-10.7	n/a	n/a	-23.3	n/a	n/a	n/a	n/a
18/02/2010	n/a	-18.5	n/a	n/a	-15.0	n/a	n/a	-22.5	n/a	n/a	n/a	n/a
19/02/2010	n/a	-20.4	n/a	n/a	-17.0	n/a	n/a	-24.9	n/a	n/a	n/a	n/a
20/02/2010	n/a	-24.4	n/a	n/a	-17.0	n/a	n/a	-28.4	n/a	n/a	n/a	n/a
21/02/2010	n/a	-30.4	n/a	n/a	-25.6	n/a	n/a	-32.7	n/a	n/a	n/a	n/a
22/02/2010	n/a	-29.7	n/a	n/a	-28.3	n/a	n/a	-31.0	n/a	n/a	n/a	n/a
23/02/2010	n/a	-30.6	n/a	n/a	-29.2	n/a	n/a	-34.5	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
24/02/2010	n/a	-34.3	n/a	n/a	-30.8	n/a	n/a	-36.7	n/a	n/a	n/a	n/a
25/02/2010	n/a	-32.8	n/a	n/a	-29.8	n/a	n/a	-36.2	n/a	n/a	n/a	n/a
26/02/2010	n/a	-30.3	n/a	n/a	-27.5	n/a	n/a	-33.4	n/a	n/a	n/a	n/a
27/02/2010	n/a	-29.2	n/a	n/a	-21.9	n/a	n/a	-34.7	n/a	n/a	n/a	n/a
28/02/2010	n/a	-19.4	n/a	n/a	-14.2	n/a	n/a	-23.7	n/a	n/a	n/a	n/a
01/03/2010	n/a	-16.2	n/a	n/a	-11.4	n/a	n/a	-18.2	n/a	n/a	n/a	n/a
02/03/2010	n/a	-9.1	n/a	n/a	-6.4	n/a	n/a	-11.5	n/a	n/a	n/a	n/a
03/03/2010	n/a	-9.1	n/a	n/a	-5.6	n/a	n/a	-11.0	n/a	n/a	n/a	n/a
04/03/2010	n/a	-9.8	n/a	n/a	-7.1	n/a	n/a	-12.3	n/a	n/a	n/a	n/a
05/03/2010	n/a	-14.2	n/a	n/a	-11.5	n/a	n/a	-18.4	n/a	n/a	n/a	n/a
06/03/2010	n/a	-18.2	n/a	n/a	-10.5	n/a	n/a	-22.3	n/a	n/a	n/a	n/a
07/03/2010	n/a	-18.8	n/a	n/a	-12.9	n/a	n/a	-24.3	n/a	n/a	n/a	n/a
08/03/2010	n/a	-13.1	n/a	n/a	-9.0	n/a	n/a	-16.9	n/a	n/a	n/a	n/a
09/03/2010	n/a	-15.7	n/a	n/a	-9.0	n/a	n/a	-18.8	n/a	n/a	n/a	n/a
10/03/2010	n/a	-14.0	n/a	n/a	-8.9	n/a	n/a	-18.4	n/a	n/a	n/a	n/a
11/03/2010	n/a	-14.0	n/a	n/a	-9.3	n/a	n/a	-18.5	n/a	n/a	n/a	n/a
12/03/2010	n/a	-15.3	n/a	n/a	-12.3	n/a	n/a	-18.1	n/a	n/a	n/a	n/a
13/03/2010	n/a	-14.4	n/a	n/a	-11.1	n/a	n/a	-18.7	n/a	n/a	n/a	n/a
14/03/2010	n/a	-12.6	n/a	n/a	-9.5	n/a	n/a	-17.3	n/a	n/a	n/a	n/a
15/03/2010	n/a	-16.4	n/a	n/a	-12.2	n/a	n/a	-19.3	n/a	n/a	n/a	n/a
16/03/2010	n/a	-17.5	n/a	n/a	-11.7	n/a	n/a	-21.6	n/a	n/a	n/a	n/a
17/03/2010	n/a	-21.5	n/a	n/a	-18.1	n/a	n/a	-25.6	n/a	n/a	n/a	n/a
18/03/2010	n/a	-23.1	n/a	n/a	-19.8	n/a	n/a	-26.0	n/a	n/a	n/a	n/a
19/03/2010	n/a	-20.9	n/a	n/a	-18.5	n/a	n/a	-25.7	n/a	n/a	n/a	n/a
20/03/2010	n/a	-26.5	n/a	n/a	-23.6	n/a	n/a	-28.4	n/a	n/a	n/a	n/a
21/03/2010	n/a	-26.4	n/a	n/a	-23.6	n/a	n/a	-28.6	n/a	n/a	n/a	n/a
22/03/2010	n/a	-27.7	n/a	n/a	-25.8	n/a	n/a	-30.3	n/a	n/a	n/a	n/a
23/03/2010	n/a	-30.5	n/a	n/a	-28.1	n/a	n/a	-32.5	n/a	n/a	n/a	n/a
24/03/2010	n/a	-27.1	n/a	n/a	-24.1	n/a	n/a	-30.2	n/a	n/a	n/a	n/a
25/03/2010	n/a	-28.8	n/a	n/a	-22.3	n/a	n/a	-32.7	n/a	n/a	n/a	n/a
26/03/2010	n/a	-28.0	n/a	n/a	-21.0	n/a	n/a	-31.8	n/a	n/a	n/a	n/a
27/03/2010	n/a	-27.9	n/a	n/a	-20.6	n/a	n/a	-32.4	n/a	n/a	n/a	n/a
28/03/2010	n/a	-23.9	n/a	n/a	-16.7	n/a	n/a	-29.4	n/a	n/a	n/a	n/a
29/03/2010	n/a	-18.7	n/a	n/a	-13.1	n/a	n/a	-26.4	n/a	n/a	n/a	n/a
30/03/2010	n/a	-10.2	n/a	n/a	-6.8	n/a	n/a	-14.1	n/a	n/a	n/a	n/a
31/03/2010	n/a	-11.3	n/a	n/a	-8.1	n/a	n/a	-12.9	n/a	n/a	n/a	n/a
01/04/2010	n/a	-13.0	n/a	n/a	-12.5	n/a	n/a	-13.4	n/a	n/a	n/a	n/a
02/04/2010	n/a	-11.9	n/a	n/a	-11.0	n/a	n/a	-13.2	n/a	n/a	n/a	n/a
03/04/2010	n/a	-11.1	n/a	n/a	-8.4	n/a	n/a	-12.8	n/a	n/a	n/a	n/a
04/04/2010	n/a	-11.1	n/a	n/a	-8.5	n/a	n/a	-15.4	n/a	n/a	n/a	n/a
05/04/2010	n/a	-14.1	n/a	n/a	-5.7	n/a	n/a	-18.9	n/a	n/a	0.5	n/a
06/04/2010	n/a	-13.8	n/a	n/a	-9.2	n/a	n/a	-18.2	n/a	n/a	n/a	n/a
07/04/2010	n/a	-8.0	n/a	n/a	-4.4	n/a	n/a	-13.8	n/a	n/a	0.3	n/a
08/04/2010	n/a	-7.6	n/a	n/a	-2.8	n/a	n/a	-11.5	n/a	n/a	n/a	n/a
09/04/2010	n/a	-14.6	n/a	n/a	-11.5	n/a	n/a	-17.7	n/a	n/a	n/a	n/a
10/04/2010	n/a	-18.6	n/a	n/a	-16.0	n/a	n/a	-20.9	n/a	n/a	n/a	n/a
11/04/2010	n/a	-18.3	n/a	n/a	-14.0	n/a	n/a	-23.6	n/a	n/a	n/a	n/a
12/04/2010	n/a	-9.0	n/a	n/a	-2.3	n/a	n/a	-17.2	n/a	n/a	n/a	n/a
13/04/2010	n/a	-4.3	n/a	n/a	0.4	n/a	n/a	-10.2	n/a	n/a	n/a	n/a
14/04/2010	n/a	-1.5	n/a	n/a	0.4	n/a	n/a	-6.1	n/a	n/a	0.3	n/a
15/04/2010	n/a	-6.2	n/a	n/a	-2.6	n/a	n/a	-10.2	n/a	n/a	n/a	n/a
16/04/2010	n/a	-7.0	n/a	n/a	-2.5	n/a	n/a	-13.5	n/a	n/a	n/a	n/a
17/04/2010	n/a	-10.1	n/a	n/a	-5.3	n/a	n/a	-15.5	n/a	n/a	n/a	n/a
18/04/2010	n/a	-12.1	n/a	n/a	-6.1	n/a	n/a	-18.1	n/a	n/a	n/a	n/a
19/04/2010	n/a	-6.1	n/a	n/a	-0.8	n/a	n/a	-12.2	n/a	n/a	n/a	n/a
20/04/2010	n/a	-1.8	n/a	n/a	6.5	n/a	n/a	-9.6	n/a	n/a	n/a	n/a
21/04/2010	n/a	-1.9	n/a	n/a	1.4	n/a	n/a	-7.7	n/a	n/a	n/a	n/a
22/04/2010	n/a	-8.2	n/a	n/a	-5.3	n/a	n/a	-11.2	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
23/04/2010	n/a	-8.8	n/a	n/a	-6.3	n/a	n/a	-13.3	n/a	n/a	n/a	n/a
24/04/2010	n/a	-5.9	n/a	n/a	-3.8	n/a	n/a	-9.0	n/a	n/a	n/a	n/a
25/04/2010	n/a	-3.9	n/a	n/a	-1.6	n/a	n/a	-6.0	n/a	n/a	n/a	n/a
26/04/2010	n/a	-4.2	n/a	n/a	-2.1	n/a	n/a	-10.3	n/a	0.3	n/a	n/a
27/04/2010	n/a	-4.5	n/a	n/a	-1.2	n/a	n/a	-10.9	n/a	n/a	n/a	n/a
28/04/2010	n/a	-3.6	n/a	n/a	-2.5	n/a	n/a	-5.0	n/a	n/a	n/a	n/a
29/04/2010	n/a	-4.7	n/a	n/a	-2.5	n/a	n/a	-9.6	n/a	n/a	n/a	n/a
30/04/2010	n/a	-3.6	n/a	n/a	0.0	n/a	n/a	-5.7	n/a	n/a	n/a	n/a
01/05/2010	n/a	-8.6	n/a	n/a	-3.8	n/a	n/a	-14.4	n/a	n/a	n/a	n/a
02/05/2010	n/a	-13.4	n/a	n/a	-11.3	n/a	n/a	-15.1	n/a	n/a	n/a	n/a
03/05/2010	n/a	-13.0	n/a	n/a	-9.8	n/a	n/a	-15.2	n/a	n/a	n/a	n/a
04/05/2010	n/a	-9.8	n/a	n/a	-5.8	n/a	n/a	-14.9	n/a	n/a	n/a	n/a
05/05/2010	n/a	-9.3	n/a	n/a	-6.6	n/a	n/a	-11.8	n/a	n/a	n/a	n/a
06/05/2010	n/a	-9.0	n/a	n/a	-6.1	n/a	n/a	-12.1	n/a	n/a	n/a	n/a
07/05/2010	n/a	-9.4	n/a	n/a	-7.5	n/a	n/a	-11.5	n/a	n/a	n/a	n/a
08/05/2010	n/a	-10.5	n/a	n/a	-6.4	n/a	n/a	-15.2	n/a	n/a	n/a	n/a
09/05/2010	-11.5	-12.4	n/a	-9.2	-10.1	n/a	-16.9	-17.6	n/a	n/a	n/a	n/a
10/05/2010	-12.8	-14.1	n/a	-7.7	-8.7	n/a	-19.7	-19.8	n/a	n/a	n/a	n/a
11/05/2010	-8.7	-9.2	n/a	-2.1	-5.0	n/a	-15.6	-15.3	n/a	n/a	n/a	n/a
12/05/2010	-9.6	-10.3	n/a	-3.7	-8.5	n/a	-15.0	-13.6	n/a	0.3	n/a	n/a
13/05/2010	-10.1	-10.2	n/a	-6.9	-7.6	n/a	-14.5	-13.1	n/a	n/a	n/a	n/a
14/05/2010	-8.6	-8.7	n/a	-6.0	-6.6	n/a	-14.4	-12.4	n/a	n/a	n/a	n/a
15/05/2010	-9.0	-8.6	n/a	-4.5	-5.2	n/a	-17.0	-11.5	n/a	n/a	n/a	n/a
16/05/2010	-6.7	-8.5	n/a	-3.0	-1.8	n/a	-10.6	-14.9	n/a	n/a	n/a	n/a
17/05/2010	-7.4	-6.7	n/a	-4.5	-4.8	n/a	-11.8	-9.1	n/a	n/a	n/a	n/a
18/05/2010	-7.7	-6.8	n/a	-1.3	-3.9	n/a	-13.6	-9.7	n/a	n/a	n/a	n/a
19/05/2010	-7.1	-7.0	n/a	1.1	-1.7	n/a	-15.1	-13.4	n/a	n/a	n/a	n/a
20/05/2010	-7.1	-6.3	n/a	-3.2	-1.3	n/a	-12.7	-10.8	n/a	n/a	n/a	n/a
21/05/2010	-9.3	-8.7	n/a	-5.4	-5.9	n/a	-14.0	-10.7	n/a	n/a	n/a	n/a
22/05/2010	-8.5	-9.3	n/a	-4.4	-6.1	n/a	-14.9	-11.8	n/a	n/a	n/a	n/a
23/05/2010	-10.4	-10.2	n/a	-4.4	-5.5	n/a	-17.3	-14.1	n/a	n/a	n/a	n/a
24/05/2010	-8.3	-8.9	n/a	-3.2	-5.6	n/a	-13.8	-11.7	n/a	n/a	n/a	n/a
25/05/2010	-3.6	-6.3	n/a	0.6	-1.1	n/a	-13.2	-14.2	n/a	n/a	n/a	n/a
26/05/2010	-1.2	-3.4	n/a	4.5	0.3	n/a	-4.5	-7.6	n/a	n/a	n/a	n/a
27/05/2010	-2.0	-2.7	n/a	-1.0	-1.0	n/a	-2.9	-4.2	n/a	n/a	n/a	n/a
28/05/2010	-2.0	-3.0	n/a	-0.2	-0.8	n/a	-3.7	-5.6	n/a	n/a	n/a	n/a
29/05/2010	0.9	0.6	n/a	6.7	8.7	n/a	-5.6	-7.6	n/a	n/a	n/a	n/a
30/05/2010	3.7	4.7	n/a	9.2	10.6	n/a	-1.6	-1.0	n/a	n/a	n/a	n/a
31/05/2010	0.2	0.7	n/a	1.9	2.9	n/a	-1.0	-1.5	n/a	n/a	n/a	n/a
01/06/2010	0.9	1.0	n/a	4.8	5.1	n/a	-1.6	-1.7	n/a	0	0	n/a
02/06/2010	1.4	2.6	n/a	5.2	7.8	n/a	-2.5	-3.4	n/a	0	0	n/a
03/06/2010	6.0	8.3	n/a	12.9	14.7	n/a	1.2	1.6	n/a	0	0	n/a
04/06/2010	0.8	0.8	n/a	2.8	7.6	n/a	-0.8	-1.1	n/a	0	0	n/a
05/06/2010	-1.5	-1.7	n/a	0.0	-0.1	n/a	-2.7	-3.1	n/a	1.0	0.5	n/a
06/06/2010	-1.1	-1.3	n/a	1.6	1.7	n/a	-4.1	-5.6	n/a	0.3	0	n/a
07/06/2010	0.3	-0.3	n/a	1.5	1.5	n/a	-1.7	-2.3	n/a	0	0	n/a
08/06/2010	0.3	0.2	n/a	3.1	3.2	n/a	-2.2	-2.0	n/a	0	0	n/a
09/06/2010	1.5	2.0	n/a	5.0	6.1	n/a	-1.4	-1.4	n/a	0	0	n/a
10/06/2010	4.2	5.4	n/a	10.8	11.0	n/a	-0.3	0.4	n/a	0	0	n/a
11/06/2010	10.0	10.4	n/a	15.7	16.0	n/a	2.2	2.2	n/a	0	0	n/a
12/06/2010	13.2	13.2	n/a	20.2	18.3	n/a	5.5	6.6	n/a	0	0	n/a
13/06/2010	13.0	13.2	n/a	21.5	20.7	n/a	4.1	6.9	n/a	0	0	n/a
14/06/2010	12.6	11.5	n/a	19.2	17.8	n/a	6.2	6.0	n/a	0.3	1.5	n/a
15/06/2010	6.4	4.8	n/a	10.1	7.7	n/a	2.4	1.0	n/a	0	0.8	n/a
16/06/2010	5.9	4.3	n/a	11.5	9.3	n/a	0.0	0.4	n/a	0	0.3	n/a
17/06/2010	2.7	2.7	n/a	5.9	5.6	n/a	0.2	0.4	n/a	0	0	n/a
18/06/2010	5.2	4.5	n/a	9.7	7.5	n/a	0.3	1.5	n/a	0.3	0.3	n/a
19/06/2010	5.7	5.1	n/a	9.9	9.2	n/a	1.8	1.2	n/a	0	0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
20/06/2010	8.6	7.8	n/a	15.6	13.1	n/a	2.8	4.0	n/a	5.6	0.8	n/a
21/06/2010	4.6	4.3	n/a	6.5	6.3	n/a	2.5	1.4	n/a	0.8	0.8	n/a
22/06/2010	2.9	3.1	n/a	5.4	5.7	n/a	1.3	0.9	n/a	0.3	0.3	n/a
23/06/2010	5.9	6.7	n/a	11.6	12.3	n/a	1.0	1.4	n/a	0	0	n/a
24/06/2010	11.5	11.6	n/a	17.5	17.4	n/a	2.9	4.1	n/a	0	0.5	n/a
25/06/2010	9.4	9.6	n/a	11.5	13.0	n/a	7.1	6.8	n/a	6.4	3.8	n/a
26/06/2010	12.8	12.4	n/a	17.5	17.9	n/a	5.8	6.6	n/a	0	0	n/a
27/06/2010	12.9	13.0	n/a	17.9	17.5	n/a	6.6	8.4	n/a	0	0	n/a
28/06/2010	11.5	12.4	14.9	15.0	17.5	19.1	8.7	8.1	12.8	1.5	0	0.1
29/06/2010	13.1	13.5	15.7	20.3	19.8	22.0	7.1	7.5	9.9	1.0	0.5	0.3
30/06/2010	14.4	14.3	15.8	20.0	20.2	20.0	9.8	9.2	10.5	1.3	1.5	0.1
01/07/2010	12.3	11.6	11.8	16.5	14.2	15.6	9.6	9.6	9.9	4.6	4.3	6.7
02/07/2010	14.2	13.5	13.3	20.4	18.0	18.7	5.6	6.9	9.0	0	2.3	3.8
03/07/2010	9.6	10.0	11.5	13.0	13.8	14.0	7.9	7.8	10.1	1.3	0.3	0.0
04/07/2010	6.2	6.2	7.9	8.0	7.8	10.3	5.1	4.9	6.9	1.0	4.8	4.9
05/07/2010	6.7	6.4	9.0	8.6	7.9	10.9	5.0	4.6	7.1	2.3	6.9	0.5
06/07/2010	7.5	7.5	9.3	8.4	8.4	10.2	6.7	6.8	8.2	1.0	0.5	0.2
07/07/2010	10.8	11.3	13.1	14.6	15.4	17.0	7.5	7.2	8.4	0	0	1.1
08/07/2010	13.9	14.1	14.2	20.1	19.7	19.7	6.0	8.8	9.4	0	0	2.5
09/07/2010	11.0	8.5	8.8	14.6	13.1	13.5	8.7	6.5	6.9	0.3	2.5	1.6
10/07/2010	10.3	9.0	9.3	13.5	14.9	12.2	6.3	6.0	7.5	0	0	1.5
11/07/2010	10.8	10.5	11.6	17.8	17.9	17.6	6.2	5.4	6.8	0	1.0	4.8
12/07/2010	15.9	16.4	16.2	25.5	24.7	21.5	10.2	10.7	11.4	1.8	3.8	3.6
13/07/2010	13.4	11.8	11.3	15.9	15.3	16.3	10.8	10.0	9.3	0	0	0.0
14/07/2010	16.3	15.8	15.9	25.7	24.1	22.6	9.4	10.0	10.4	0	0	2.5
15/07/2010	18.2	16.5	15.1	24.5	19.2	19.6	11.7	14.2	12.3	0	0	1.4
16/07/2010	18.5	13.4	10.6	27.6	19.9	16.2	12.1	8.7	8.2	0	0	0.3
17/07/2010	17.1	11.5	9.4	25.1	17.6	11.7	9.7	7.7	7.4	0	5.8	1.3
18/07/2010	15.8	12.5	9.7	21.8	19.1	12.6	10.2	8.0	7.7	0	4.1	9.1
19/07/2010	13.3	12.8	14.0	18.3	18.6	18.0	9.1	8.3	8.5	0	0	0.0
20/07/2010	17.2	16.4	17.0	22.7	21.9	22.4	9.5	11.0	12.8	0	1.8	0.6
21/07/2010	13.6	12.2	11.5	15.8	14.3	14.4	10.3	8.8	9.1	4.8	7.1	11.8
22/07/2010	12.5	11.8	12.7	17.3	16.6	17.8	6.3	7.4	8.0	0	0	0.0
23/07/2010	16.2	16.3	17.9	22.3	22.0	22.8	7.1	9.3	10.3	0	0	0.0
24/07/2010	19.8	19.5	21.0	27.6	26.6	26.7	12.8	13.7	14.4	0	2.8	0.2
25/07/2010	18.9	18.6	19.1	23.8	21.4	23.7	15.4	15.9	16.2	21.1	0.5	0.0
26/07/2010	14.8	14.3	14.3	16.8	16.4	16.5	10.0	10.7	12.6	0	0.3	0.0
27/07/2010	12.2	13.3	14.7	17.3	18.7	19.8	7.2	8.4	8.9	0	0	0.0
28/07/2010	15.3	15.3	15.0	21.0	19.1	18.0	8.7	11.5	11.4	0	0	0.0
29/07/2010	16.0	16.5	17.7	23.1	23.4	23.0	9.9	9.5	10.6	0	0	0.0
30/07/2010	16.9	16.6	16.8	22.2	20.8	21.3	12.9	13.3	14.2	3.0	1.0	1.6
31/07/2010	13.9	13.4	12.4	16.2	16.4	14.6	12.3	11.3	11.3	0	0	0.5
01/08/2010	13.4	12.9	12.3	16.6	15.9	16.3	11.1	10.8	7.8	0	0.3	0.2
02/08/2010	8.5	7.4	8.1	14.0	11.3	10.5	5.6	4.9	4.9	2.5	1.3	3.7
03/08/2010	9.1	8.6	9.5	12.3	12.1	13.9	6.7	6.3	7.1	3.0	5.3	6.6
04/08/2010	8.2	7.9	8.2	11.6	12.2	10.9	5.4	3.7	5.3	0	0	0.0
05/08/2010	10.7	10.6	10.3	15.7	14.6	14.4	4.6	7.2	7.6	0	0	0.0
06/08/2010	15.3	14.7	16.6	20.9	20.5	21.8	9.6	9.8	8.8	0	0	0.0
07/08/2010	16.4	16.1	18.2	23.0	23.2	24.3	9.3	9.1	11.7	0	0	0.0
08/08/2010	17.1	17.6	20.1	24.4	24.9	25.5	9.4	10.8	13.6	0	0	0.0
09/08/2010	17.7	18.2	18.2	25.0	24.4	25.2	10.8	13.1	12.8	0	0	0.0
10/08/2010	15.8	16.4	19.1	22.2	21.6	23.8	9.3	11.0	13.5	0	0	0.0
11/08/2010	16.7	16.3	17.6	23.0	21.4	23.4	11.6	11.9	12.6	0.3	1.0	1.9
12/08/2010	12.1	10.8	10.0	15.0	13.3	12.7	7.9	7.1	6.9	0	0.3	0.9
13/08/2010	9.4	8.3	8.7	13.4	11.2	11.1	6.4	5.5	6.4	0	0	0.0
14/08/2010	9.8	10.1	11.0	15.1	15.4	15.8	5.1	5.4	6.5	0	0	0.0
15/08/2010	9.8	9.8	9.4	13.3	12.7	12.2	4.4	6.3	7.2	0	0	0.0
16/08/2010	8.0	7.3	7.6	11.6	10.2	9.9	3.8	4.1	5.8	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
17/08/2010	7.1	7.1	7.3	9.5	9.4	9.2	1.7	4.9	5.8	0	0	0.0
18/08/2010	5.4	5.9	6.6	10.3	8.6	8.9	0.5	3.6	4.6	0	0	0.0
19/08/2010	6.8	6.2	6.8	9.3	8.4	8.2	3.8	4.7	5.8	0	0	0.5
20/08/2010	8.3	7.8	9.0	11.2	10.5	11.4	5.9	5.3	5.8	0.5	0.8	0.9
21/08/2010	10.1	9.4	11.1	14.4	14.5	15.2	6.9	4.2	7.4	0	0	0.0
22/08/2010	11.0	10.9	12.1	17.7	17.1	16.4	5.1	4.1	6.4	0	0	0.2
23/08/2010	12.9	12.3	12.6	18.9	17.8	16.8	6.7	5.3	8.2	0	0	0.0
24/08/2010	12.0	11.3	11.0	16.5	15.4	14.7	6.0	8.1	8.2	0	0	0.0
25/08/2010	9.4	8.4	9.0	11.4	10.5	10.8	7.7	6.8	7.6	0	0.3	0.3
26/08/2010	8.7	7.7	8.2	10.8	10.1	9.3	6.3	6.1	6.9	0	0	0.2
27/08/2010	7.5	6.9	8.1	10.5	9.0	9.7	4.7	5.1	6.1	0	0	0.0
28/08/2010	6.4	5.8	6.6	9.5	7.9	8.5	4.2	4.1	5.4	0	0	0.0
29/08/2010	6.0	5.7	6.4	10.1	10.4	8.4	2.1	3.1	5.1	0	0	0.1
30/08/2010	8.2	8.7	11.3	15.7	15.1	17.5	0.9	2.1	4.4	0	0	0.0
31/08/2010	9.3	8.7	9.0	15.1	11.6	11.3	1.2	4.4	7.1	0	0	0.0
01/09/2010	7.4	7.7	8.8	9.5	10.8	12.4	3.6	3.6	6.4	0	0	0.0
02/09/2010	8.9	9.2	12.3	16.2	15.7	18.5	1.6	3.0	5.5	0	0	0.0
03/09/2010	9.9	10.4	13.0	17.4	17.3	18.5	2.1	4.7	7.3	0	0	0.0
04/09/2010	10.2	9.4	11.0	14.4	12.7	13.2	5.1	5.5	8.5	0	0	0.5
05/09/2010	12.3	10.9	8.9	18.3	16.8	11.1	6.9	7.6	8.2	1.5	0	7.3
06/09/2010	8.9	8.2	8.5	11.9	11.7	12.6	6.5	4.5	5.6	3.0	0	0.5
07/09/2010	4.8	3.3	3.2	6.8	5.1	5.7	2.0	1.4	2.3	0	0	0.1
08/09/2010	2.1	1.0	2.9	3.7	2.8	5.0	0.0	-0.3	0.8	0	0	0.4
09/09/2010	6.2	5.7	7.5	13.8	10.5	12.0	2.2	2.5	3.6	0	0	0.0
10/09/2010	7.1	7.1	7.3	12.4	10.8	10.2	1.9	3.8	4.3	0.5	0	0.0
11/09/2010	6.7	5.4	5.5	8.5	7.2	7.3	5.0	3.5	4.3	0	0	4.2
12/09/2010	5.0	4.6	5.7	6.8	6.8	6.8	3.1	3.7	4.3	0	0.5	3.7
13/09/2010	6.4	5.5	7.9	11.3	10.6	12.1	2.1	0.4	5.0	0.3	0.5	0.6
14/09/2010	5.9	4.9	6.5	9.0	8.4	10.0	2.3	-2.8	3.8	7.4	12.2	6.0
15/09/2010	-0.5	-1.3	-0.1	2.4	0.8	4.1	-2.9	-3.3	-1.5	2.5	6.6	8.6
16/09/2010	-2.4	-1.3	1.9	1.9	2.1	5.4	-6.0	-3.5	-1.2	0	0	0.0
17/09/2010	-1.0	-0.4	1.4	2.1	2.3	4.3	-4.7	-4.3	-0.8	0	0.3	0.1
18/09/2010	-0.2	0.1	1.5	1.3	2.3	4.0	-1.2	-2.0	-0.4	0	0	1.3
19/09/2010	-0.3	-0.6	0.4	1.2	0.7	1.9	-2.1	-2.4	-0.5	0	0	0.6
20/09/2010	-1.3	-1.5	n/a	-0.3	-0.2	n/a	-5.1	-3.3	n/a	0.3	0	n/a
21/09/2010	-1.9	-1.7	n/a	1.3	1.3	n/a	-5.1	-3.2	n/a	0	0	n/a
22/09/2010	-2.1	-1.8	n/a	1.0	0.0	n/a	-5.8	-3.4	n/a	0	0	n/a
23/09/2010	-1.1	-2.0	n/a	0.8	-0.5	n/a	-3.0	-2.8	n/a	0.3	0.3	n/a
24/09/2010	-1.2	-2.3	n/a	0.2	-0.8	n/a	-3.0	-3.9	n/a	0	0	n/a
25/09/2010	-2.4	-2.8	n/a	-1.4	-1.6	n/a	-5.7	-6.2	n/a	0.3	0	n/a
26/09/2010	-4.0	-4.3	n/a	0.6	0.0	n/a	-5.8	-5.9	n/a	0	0	n/a
27/09/2010	-3.6	-4.3	n/a	0.5	0.0	n/a	-6.7	-8.5	n/a	0	0	n/a
28/09/2010	0.4	-0.7	n/a	1.1	0.2	n/a	-5.7	-5.3	n/a	0	0	n/a
29/09/2010	-0.5	-1.5	n/a	0.7	1.0	n/a	-5.6	-5.2	n/a	0	0	n/a
30/09/2010	-2.3	-2.7	n/a	1.6	1.5	n/a	-6.3	-7.5	n/a	0	0	n/a
01/10/2010	1.9	0.9	n/a	3.7	2.5	n/a	-1.0	-2.4	n/a	n/a	0.3	n/a
02/10/2010	1.0	0.6	n/a	4.5	2.4	n/a	-4.5	-5.5	n/a	n/a	n/a	n/a
03/10/2010	-0.2	-1.4	n/a	2.0	0.4	n/a	-3.5	-5.3	n/a	0.3	n/a	n/a
04/10/2010	-3.2	-3.9	n/a	0.0	-0.2	n/a	-6.1	-6.6	n/a	n/a	n/a	n/a
05/10/2010	-1.1	-1.4	n/a	0.7	0.6	n/a	-4.5	-3.7	n/a	2.5	1.8	n/a
06/10/2010	0.2	-0.5	n/a	1.7	0.9	n/a	-7.5	-7.1	n/a	0.3	n/a	n/a
07/10/2010	-2.9	-4.1	n/a	-1.2	-1.9	n/a	-7.3	-7.5	n/a	n/a	n/a	n/a
08/10/2010	-3.4	-3.2	n/a	-1.4	-1.7	n/a	-7.6	-6.5	n/a	n/a	0.3	n/a
09/10/2010	-2.3	-2.6	n/a	1.0	0.6	n/a	-4.5	-3.9	n/a	0.3	n/a	n/a
10/10/2010	-0.4	-1.0	n/a	1.1	0.5	n/a	-3.4	-3.6	n/a	0.5	n/a	n/a
11/10/2010	2.3	1.3	n/a	5.4	2.6	n/a	-2.4	-3.2	n/a	1.8	0.3	n/a
12/10/2010	-0.8	-1.7	n/a	1.0	0.1	n/a	-3.9	-5.1	n/a	n/a	n/a	n/a
13/10/2010	-3.2	-4.2	n/a	-2.1	-3.1	n/a	-6.0	-6.9	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
14/10/2010	-5.0	-6.0	n/a	-3.9	-4.9	n/a	-6.0	-6.7	n/a	n/a	n/a	n/a
15/10/2010	-5.7	-6.7	n/a	-5.2	-5.8	n/a	-6.3	-7.5	n/a	n/a	n/a	n/a
16/10/2010	-5.4	-6.0	n/a	-4.8	-5.3	n/a	-6.8	-10.0	n/a	n/a	n/a	n/a
17/10/2010	-6.1	-7.3	n/a	-5.2	-5.8	n/a	-8.4	-10.3	n/a	n/a	n/a	n/a
18/10/2010	-8.0	-9.5	n/a	-4.2	-5.1	n/a	-11.8	-13.1	n/a	n/a	n/a	n/a
19/10/2010	-6.9	-7.7	n/a	-4.3	-4.2	n/a	-9.8	-12.0	n/a	n/a	n/a	n/a
20/10/2010	-5.6	-6.0	n/a	-2.3	-2.5	n/a	-6.7	-7.5	n/a	n/a	n/a	n/a
21/10/2010	-5.8	-5.6	n/a	-2.4	-2.7	n/a	-10.5	-8.4	n/a	n/a	n/a	n/a
22/10/2010	-2.7	-2.9	n/a	-1.6	-2.3	n/a	-4.5	-4.7	n/a	n/a	n/a	n/a
23/10/2010	-3.8	-3.9	n/a	-2.9	-3.3	n/a	-12.2	-5.7	n/a	n/a	n/a	n/a
24/10/2010	-6.1	-5.6	n/a	-4.1	-4.6	n/a	-10.6	-6.5	n/a	n/a	n/a	n/a
25/10/2010	-7.5	-5.8	n/a	-5.4	-4.8	n/a	-11.2	-10.3	n/a	n/a	n/a	n/a
26/10/2010	-8.2	-6.9	n/a	-6.8	-5.4	n/a	-14.9	-12.4	n/a	n/a	n/a	n/a
27/10/2010	-11.7	-9.1	n/a	-8.7	-6.6	n/a	-21.5	-20.3	n/a	n/a	n/a	n/a
28/10/2010	-16.6	-17.2	n/a	-7.6	-6.8	n/a	-21.2	-20.8	n/a	n/a	n/a	n/a
29/10/2010	-13.7	-12.0	n/a	-0.5	-1.2	n/a	-21.9	-20.8	n/a	0.3	n/a	n/a
30/10/2010	-3.6	-3.4	n/a	-0.4	-1.1	n/a	-8.0	-6.9	n/a	n/a	n/a	n/a
31/10/2010	-0.8	-1.3	n/a	1.0	0.0	n/a	-4.3	-4.6	n/a	n/a	n/a	n/a
01/11/2010	-7.1	-8.2	n/a	-3.7	-4.0	n/a	-10.7	-13.4	n/a	n/a	n/a	n/a
02/11/2010	-5.9	-6.7	n/a	-3.3	-4.1	n/a	-9.8	-10.8	n/a	n/a	n/a	n/a
03/11/2010	-8.9	-9.1	n/a	-7.4	-7.8	n/a	-15.5	-15.3	n/a	n/a	n/a	n/a
04/11/2010	-12.5	-12.6	n/a	-0.9	-1.6	n/a	-16.6	-15.7	n/a	n/a	n/a	n/a
05/11/2010	-6.4	-7.3	n/a	-0.2	-1.5	n/a	-15.0	-15.3	n/a	n/a	n/a	n/a
06/11/2010	-6.6	-8.0	n/a	-1.1	-2.0	n/a	-19.6	-19.6	n/a	n/a	n/a	n/a
07/11/2010	-12.8	-13.9	n/a	-11.0	-11.9	n/a	-24.7	-23.4	n/a	n/a	n/a	n/a
08/11/2010	-22.4	-20.9	n/a	-7.7	-9.0	n/a	-25.7	-23.5	n/a	n/a	n/a	n/a
09/11/2010	-14.8	-15.2	n/a	-4.5	-7.2	n/a	-24.2	-23.7	n/a	n/a	n/a	n/a
10/11/2010	-5.9	-6.7	n/a	-4.4	-4.7	n/a	-10.4	-10.8	n/a	n/a	n/a	n/a
11/11/2010	-8.6	-9.7	n/a	-5.9	-6.7	n/a	-13.6	-14.0	n/a	n/a	n/a	n/a
12/11/2010	-13.0	-13.4	n/a	-9.5	-9.9	n/a	-18.9	-18.3	n/a	n/a	n/a	n/a
13/11/2010	-8.0	-8.8	n/a	-5.5	-6.2	n/a	-12.9	-13.1	n/a	n/a	n/a	n/a
14/11/2010	-12.2	-12.4	n/a	-9.6	-10.0	n/a	-17.9	-15.9	n/a	n/a	n/a	n/a
15/11/2010	-15.2	-14.8	n/a	-12.9	-12.3	n/a	-23.1	-23.2	n/a	n/a	n/a	n/a
16/11/2010	-19.6	-19.8	n/a	-14.9	-15.9	n/a	-24.9	-22.2	n/a	n/a	n/a	n/a
17/11/2010	-24.9	-24.2	n/a	-16.3	-15.7	n/a	-28.0	-26.8	n/a	n/a	n/a	n/a
18/11/2010	-18.0	-18.5	n/a	-15.6	-16.2	n/a	-25.7	-27.5	n/a	n/a	n/a	n/a
19/11/2010	-15.8	-16.8	n/a	-8.5	-8.8	n/a	-28.8	-30.0	n/a	n/a	n/a	n/a
20/11/2010	-27.2	-28.2	n/a	-18.1	-18.6	n/a	-28.6	-29.7	n/a	n/a	n/a	n/a
21/11/2010	-24.2	-24.7	n/a	-17.4	-17.9	n/a	-28.9	-29.7	n/a	n/a	n/a	n/a
22/11/2010	-17.9	-18.5	n/a	-17.3	-17.9	n/a	-22.2	-23.4	n/a	n/a	1.3	n/a
23/11/2010	-20.8	-20.6	n/a	-17.3	-17.8	n/a	-28.2	-26.0	n/a	n/a	n/a	n/a
24/11/2010	-23.4	-22.8	n/a	-20.9	-21.1	n/a	-35.4	-32.4	n/a	n/a	n/a	n/a
25/11/2010	-32.4	-29.1	n/a	-23.4	-25.3	n/a	-35.6	-31.9	n/a	n/a	n/a	n/a
26/11/2010	-25.1	-29.5	n/a	-12.8	-16.9	n/a	-35.0	-32.9	n/a	n/a	n/a	n/a
27/11/2010	-18.3	-19.5	n/a	-13.2	-13.9	n/a	-23.6	-25.3	n/a	n/a	n/a	n/a
28/11/2010	-15.6	-15.9	n/a	-11.3	-14.0	n/a	-20.3	-22.6	n/a	n/a	n/a	n/a
29/11/2010	-17.5	-18.3	n/a	-13.8	-14.0	n/a	-25.4	-25.8	n/a	n/a	n/a	n/a
30/11/2010	-21.1	-22.3	n/a	-17.5	-18.8	n/a	-25.9	-25.2	n/a	n/a	n/a	n/a
01/12/2010	-16.2	-16.8	n/a	-12.7	-13.9	n/a	-22.7	-23.0	n/a	n/a	n/a	n/a
02/12/2010	-21.6	-22.4	n/a	-17.7	-18.8	n/a	-28.9	-29.0	n/a	n/a	n/a	n/a
03/12/2010	-26.1	-25.7	n/a	-22.7	-22.9	n/a	-36.6	-33.5	n/a	n/a	n/a	n/a
04/12/2010	-31.8	-30.6	n/a	-25.8	-26.1	n/a	-36.5	-32.8	n/a	n/a	n/a	n/a
05/12/2010	-30.1	-29.1	n/a	-25.4	-25.9	n/a	-36.9	-34.4	n/a	n/a	n/a	n/a
06/12/2010	-28.2	-26.8	n/a	-25.8	-24.8	n/a	-32.5	-32.0	n/a	n/a	n/a	n/a
07/12/2010	-30.8	-29.7	n/a	-27.9	-27.8	n/a	-34.2	-32.3	n/a	n/a	n/a	n/a
08/12/2010	-32.8	-31.7	n/a	-26.8	-26.4	n/a	-35.9	-33.6	n/a	n/a	n/a	n/a
09/12/2010	-31.5	-30.7	n/a	-24.4	-25.8	n/a	-34.7	-33.5	n/a	n/a	n/a	n/a
10/12/2010	-24.8	-26.0	n/a	-23.2	-23.9	n/a	-27.8	-28.9	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
11/12/2010	-25.0	-26.1	n/a	-23.1	-24.1	n/a	-28.2	-28.6	n/a	n/a	n/a	n/a
12/12/2010	-28.0	-28.0	n/a	-25.1	-25.2	n/a	-31.1	-30.2	n/a	n/a	n/a	n/a
13/12/2010	-24.6	-25.2	n/a	-22.8	-24.0	n/a	-33.8	-30.1	n/a	n/a	n/a	n/a
14/12/2010	-27.0	-26.6	n/a	-21.3	-24.0	n/a	-32.5	-30.6	n/a	n/a	n/a	n/a
15/12/2010	-30.4	-27.2	n/a	-22.1	-16.7	n/a	-34.9	-31.4	n/a	n/a	n/a	n/a
16/12/2010	-16.8	-20.9	n/a	-13.9	-14.7	n/a	-22.2	-24.4	n/a	n/a	n/a	n/a
17/12/2010	-22.3	-21.1	n/a	-16.3	-17.1	n/a	-25.0	-24.9	n/a	n/a	n/a	n/a
18/12/2010	-17.9	-18.0	n/a	-5.9	-6.6	n/a	-19.3	-19.6	n/a	n/a	n/a	n/a
19/12/2010	-9.7	-11.8	n/a	-3.8	-5.2	n/a	-16.3	-17.3	n/a	n/a	n/a	n/a
20/12/2010	-10.8	-11.1	n/a	-5.8	-6.5	n/a	-17.6	-17.5	n/a	n/a	n/a	n/a
21/12/2010	-17.5	-16.6	n/a	-13.1	-13.7	n/a	-23.4	-23.9	n/a	n/a	n/a	n/a
22/12/2010	-19.4	-20.4	n/a	-14.9	-16.8	n/a	-25.4	-24.4	n/a	n/a	n/a	n/a
23/12/2010	-23.2	-23.2	n/a	-18.0	-17.6	n/a	-25.2	-24.7	n/a	n/a	n/a	n/a
24/12/2010	-20.7	-20.3	n/a	-12.1	-13.9	n/a	-24.1	-24.4	n/a	n/a	n/a	n/a
25/12/2010	-12.2	-13.3	n/a	-8.5	-9.7	n/a	-26.8	-27.3	n/a	n/a	n/a	n/a
26/12/2010	-22.3	-22.4	n/a	-12.7	-14.5	n/a	-26.7	-27.1	n/a	n/a	n/a	n/a
27/12/2010	-24.1	-24.2	n/a	-21.8	-21.8	n/a	-26.7	-27.7	n/a	n/a	n/a	n/a
28/12/2010	-23.8	-24.9	n/a	-21.6	-22.1	n/a	-26.6	-27.1	n/a	n/a	n/a	n/a
29/12/2010	-26.4	-26.9	n/a	-25.9	-26.3	n/a	-30.3	-28.2	n/a	n/a	n/a	n/a
30/12/2010	-28.1	-27.6	n/a	-25.8	-25.5	n/a	-30.4	-29.2	n/a	n/a	n/a	n/a
31/12/2010	-28.5	-27.6	n/a	-26.2	-25.9	n/a	-30.3	-29.6	n/a	n/a	n/a	n/a
01/01/2011	-32.1	-29.5	n/a	-29.2	-25.8	n/a	-34.4	-31.8	n/a	n/a	n/a	n/a
02/01/2011	-28.0	-26.9	n/a	-23.9	-20.6	n/a	-34.2	-32.3	n/a	n/a	n/a	n/a
03/01/2011	-29.9	-25.7	n/a	-27.3	-20.6	n/a	-33.3	-27.5	n/a	n/a	n/a	n/a
04/01/2011	-31.4	-28.8	n/a	-28.8	-26.4	n/a	-33.6	-31.1	n/a	n/a	n/a	n/a
05/01/2011	-28.4	-30.0	n/a	-24.3	-25.3	n/a	-33.1	-33.5	n/a	n/a	n/a	n/a
06/01/2011	-27.9	-27.3	n/a	-22.3	-23.0	n/a	-32.8	-31.5	n/a	n/a	n/a	n/a
07/01/2011	-32.3	-30.8	n/a	-29.4	-22.0	n/a	-34.5	-33.9	n/a	n/a	n/a	n/a
08/01/2011	-22.4	-20.8	n/a	-19.6	-19.4	n/a	-32.0	-24.9	n/a	n/a	n/a	n/a
09/01/2011	-20.5	-20.5	n/a	-19.0	-18.2	n/a	-22.5	-24.0	n/a	n/a	n/a	n/a
10/01/2011	-25.4	-25.6	n/a	-22.5	-24.0	n/a	-28.3	-26.8	n/a	n/a	n/a	n/a
11/01/2011	-24.8	-23.4	n/a	-21.3	-21.0	n/a	-29.4	-28.5	n/a	n/a	n/a	n/a
12/01/2011	-30.9	-29.6	n/a	-27.4	-27.7	n/a	-35.0	-31.9	n/a	n/a	n/a	n/a
13/01/2011	-34.0	-31.7	n/a	-29.5	-29.6	n/a	-36.5	-33.1	n/a	n/a	n/a	n/a
14/01/2011	-29.5	-30.2	n/a	-26.5	-26.7	n/a	-33.6	-34.2	n/a	n/a	n/a	n/a
15/01/2011	-22.9	-23.1	n/a	-21.0	-21.5	n/a	-26.5	-26.8	n/a	n/a	n/a	n/a
16/01/2011	-26.3	-26.5	n/a	-21.7	-22.3	n/a	-29.8	-28.6	n/a	n/a	n/a	n/a
17/01/2011	-26.7	-26.2	n/a	-23.6	-23.0	n/a	-29.4	-28.9	n/a	n/a	n/a	n/a
18/01/2011	-26.0	-25.7	n/a	-24.2	-22.7	n/a	-28.9	-28.6	n/a	n/a	n/a	n/a
19/01/2011	-33.3	-33.7	n/a	-25.4	-28.1	n/a	-37.5	-37.7	n/a	n/a	n/a	n/a
20/01/2011	-36.2	-36.3	n/a	-32.7	-33.0	n/a	-39.6	-39.2	n/a	n/a	n/a	n/a
21/01/2011	-37.9	-37.5	n/a	-35.9	-34.6	n/a	-40.1	-40.0	n/a	n/a	n/a	n/a
22/01/2011	-38.7	-37.4	n/a	-35.4	-35.9	n/a	-41.1	-39.1	n/a	n/a	n/a	n/a
23/01/2011	-32.1	-32.4	n/a	-27.0	-26.6	n/a	-38.7	-37.9	n/a	n/a	n/a	n/a
24/01/2011	-32.9	-32.9	n/a	-29.7	-30.5	n/a	-36.9	-37.9	n/a	n/a	n/a	n/a
25/01/2011	-36.3	-36.7	n/a	-33.5	-33.9	n/a	-38.1	-39.3	n/a	n/a	n/a	n/a
26/01/2011	-39.6	-37.2	n/a	-31.1	-30.5	n/a	-42.4	-40.1	n/a	n/a	n/a	n/a
27/01/2011	-27.1	-27.4	n/a	-21.8	-21.9	n/a	-33.8	-33.6	n/a	n/a	n/a	n/a
28/01/2011	-34.1	-34.0	n/a	-31.8	-30.5	n/a	-35.9	-35.8	n/a	n/a	n/a	n/a
29/01/2011	-31.2	-31.4	n/a	-26.9	-26.6	n/a	-33.6	-33.1	n/a	n/a	n/a	n/a
30/01/2011	-26.5	-27.4	n/a	-24.8	-25.4	n/a	-28.5	-29.0	n/a	n/a	n/a	n/a
31/01/2011	-23.5	-23.7	n/a	-19.8	-20.2	n/a	-26.8	-27.1	n/a	n/a	n/a	n/a
01/02/2011	-25.2	-26.0	n/a	-23.0	-23.3	n/a	-28.4	-29.3	n/a	n/a	n/a	n/a
02/02/2011	-17.4	-16.9	n/a	-13.0	-10.8	n/a	-23.1	-25.0	n/a	n/a	n/a	n/a
03/02/2011	-12.9	-13.6	n/a	-10.6	-10.2	n/a	-15.9	-18.3	n/a	n/a	n/a	n/a
04/02/2011	-17.5	-18.3	n/a	-15.4	-16.2	n/a	-20.1	-23.7	n/a	n/a	n/a	n/a
05/02/2011	-22.5	-23.2	n/a	-19.3	-19.5	n/a	-27.1	-27.9	n/a	n/a	n/a	n/a
06/02/2011	-26.0	-25.7	n/a	-19.5	-18.4	n/a	-28.1	-27.9	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
07/02/2011	-22.3	-22.7	n/a	-18.4	-18.7	n/a	-26.8	-28.0	n/a	n/a	5.3	n/a
08/02/2011	-30.0	-29.8	n/a	-26.7	-27.8	n/a	-32.9	-31.5	n/a	n/a	0.3	n/a
09/02/2011	-31.2	-30.2	n/a	-29.4	-28.1	n/a	-33.0	-32.3	n/a	n/a	n/a	n/a
10/02/2011	-27.2	n/a	n/a	-22.6	n/a	n/a	-31.9	n/a	n/a	n/a	n/a	n/a
11/02/2011	-29.0	n/a	n/a	-27.4	n/a	n/a	-31.1	n/a	n/a	n/a	n/a	n/a
12/02/2011	-31.3	n/a	n/a	-28.2	n/a	n/a	-32.7	n/a	n/a	n/a	n/a	n/a
13/02/2011	-32.7	n/a	n/a	-29.7	n/a	n/a	-35.1	n/a	n/a	n/a	n/a	n/a
14/02/2011	-28.3	n/a	n/a	-25.8	n/a	n/a	-31.8	n/a	n/a	n/a	n/a	n/a
15/02/2011	-31.7	n/a	n/a	-29.3	n/a	n/a	-33.9	n/a	n/a	n/a	n/a	n/a
16/02/2011	-32.6	n/a	n/a	-29.7	n/a	n/a	-36.2	n/a	n/a	n/a	n/a	n/a
17/02/2011	-32.2	n/a	n/a	-29.1	n/a	n/a	-34.4	n/a	n/a	n/a	n/a	n/a
18/02/2011	-30.3	n/a	n/a	-25.6	n/a	n/a	-34.6	n/a	n/a	n/a	n/a	n/a
19/02/2011	-25.7	n/a	n/a	-22.5	n/a	n/a	-29.4	n/a	n/a	n/a	n/a	n/a
20/02/2011	-23.5	n/a	n/a	-21.6	n/a	n/a	-25.6	n/a	n/a	n/a	n/a	n/a
21/02/2011	-26.1	n/a	n/a	-24.1	n/a	n/a	-29.0	n/a	n/a	n/a	n/a	n/a
22/02/2011	-27.8	n/a	n/a	-25.7	n/a	n/a	-29.8	n/a	n/a	n/a	n/a	n/a
23/02/2011	-29.5	n/a	n/a	-28.4	n/a	n/a	-31.4	n/a	n/a	n/a	1.8	n/a
24/02/2011	-30.6	n/a	n/a	-25.7	n/a	n/a	-34.4	n/a	n/a	n/a	n/a	n/a
25/02/2011	-20.1	n/a	n/a	-14.4	n/a	n/a	-28.3	n/a	n/a	n/a	n/a	n/a
26/02/2011	-18.5	n/a	n/a	-14.0	n/a	n/a	-24.0	n/a	n/a	n/a	n/a	n/a
27/02/2011	-29.3	n/a	n/a	-24.0	n/a	n/a	-30.9	n/a	n/a	n/a	n/a	n/a
28/02/2011	-30.4	n/a	n/a	-28.2	n/a	n/a	-32.5	n/a	n/a	n/a	n/a	n/a
01/03/2011	-29.5	n/a	n/a	-27.6	n/a	n/a	-32.1	n/a	n/a	n/a	n/a	n/a
02/03/2011	-29.2	n/a	n/a	-27.2	n/a	n/a	-31.9	n/a	n/a	n/a	n/a	n/a
03/03/2011	-34.2	n/a	n/a	-31.9	n/a	n/a	-37.3	n/a	n/a	n/a	n/a	n/a
04/03/2011	-34.0	n/a	n/a	-30.5	n/a	n/a	-37.7	n/a	n/a	n/a	n/a	n/a
05/03/2011	-33.7	n/a	n/a	-31.7	n/a	n/a	-36.7	n/a	n/a	n/a	n/a	n/a
06/03/2011	-23.1	n/a	n/a	-19.5	n/a	n/a	-32.1	n/a	n/a	n/a	n/a	n/a
07/03/2011	-23.1	n/a	n/a	-19.8	n/a	n/a	-29.9	n/a	n/a	n/a	n/a	n/a
08/03/2011	-26.8	n/a	n/a	-22.8	n/a	n/a	-30.9	n/a	n/a	n/a	n/a	n/a
09/03/2011	-37.0	n/a	n/a	-30.6	n/a	n/a	-41.1	n/a	n/a	n/a	n/a	n/a
10/03/2011	-34.6	n/a	n/a	-32.6	n/a	n/a	-36.3	n/a	n/a	n/a	n/a	n/a
11/03/2011	-32.7	n/a	n/a	-29.1	n/a	n/a	-35.4	n/a	n/a	n/a	n/a	n/a
12/03/2011	-34.5	n/a	n/a	-29.9	n/a	n/a	-38.4	n/a	n/a	n/a	n/a	n/a
13/03/2011	-35.6	n/a	n/a	-26.6	n/a	n/a	-41.3	n/a	n/a	n/a	n/a	n/a
14/03/2011	-32.7	n/a	n/a	-25.7	n/a	n/a	-38.4	n/a	n/a	n/a	n/a	n/a
15/03/2011	-33.8	n/a	n/a	-30.8	n/a	n/a	-37.4	n/a	n/a	n/a	n/a	n/a
16/03/2011	-33.6	n/a	n/a	-28.7	n/a	n/a	-39.6	n/a	n/a	n/a	n/a	n/a
17/03/2011	-23.8	n/a	n/a	-18.7	n/a	n/a	-30.1	n/a	n/a	n/a	n/a	n/a
18/03/2011	-26.6	n/a	n/a	-23.6	n/a	n/a	-30.4	n/a	n/a	n/a	n/a	n/a
19/03/2011	-27.5	n/a	n/a	-22.4	n/a	n/a	-31.0	n/a	n/a	n/a	n/a	n/a
20/03/2011	-28.3	n/a	n/a	-22.6	n/a	n/a	-31.8	n/a	n/a	n/a	n/a	n/a
21/03/2011	-22.7	n/a	n/a	-18.1	n/a	n/a	-30.4	n/a	n/a	n/a	n/a	n/a
22/03/2011	-17.2	n/a	n/a	-11.1	n/a	n/a	-21.5	n/a	n/a	n/a	n/a	n/a
23/03/2011	-16.4	n/a	n/a	-10.9	n/a	n/a	-22.2	n/a	n/a	n/a	n/a	n/a
24/03/2011	-8.1	n/a	n/a	-5.8	n/a	n/a	-11.1	n/a	n/a	n/a	0.3	n/a
25/03/2011	-9.4	n/a	n/a	-7.1	n/a	n/a	-14.1	n/a	n/a	n/a	n/a	n/a
26/03/2011	-11.2	n/a	n/a	-5.8	n/a	n/a	-16.5	n/a	n/a	n/a	n/a	n/a
27/03/2011	-11.2	n/a	n/a	-7.5	n/a	n/a	-15.1	n/a	n/a	n/a	n/a	n/a
28/03/2011	-5.9	n/a	n/a	-1.6	n/a	n/a	-12.3	n/a	n/a	n/a	n/a	n/a
29/03/2011	-6.3	n/a	n/a	-0.6	n/a	n/a	-14.2	n/a	n/a	n/a	n/a	n/a
30/03/2011	-11.7	n/a	n/a	-6.6	n/a	n/a	-17.4	n/a	n/a	n/a	n/a	n/a
31/03/2011	-9.3	n/a	n/a	-7.0	n/a	n/a	-11.5	n/a	n/a	n/a	n/a	n/a
01/04/2011	-11.7	n/a	n/a	-8.5	n/a	n/a	-15.2	n/a	n/a	n/a	0.3	n/a
02/04/2011	-14.9	n/a	n/a	-12.5	n/a	n/a	-17.2	n/a	n/a	n/a	n/a	n/a
03/04/2011	-18.6	n/a	n/a	-14.8	n/a	n/a	-26.4	n/a	n/a	n/a	n/a	n/a
04/04/2011	-22.1	n/a	n/a	-16.6	n/a	n/a	-29.1	n/a	n/a	n/a	n/a	n/a
05/04/2011	-20.1	n/a	n/a	-16.2	n/a	n/a	-25.6	n/a	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
06/04/2011	-19.5	n/a	n/a	-12.4	n/a	n/a	-26.5	n/a	n/a	n/a	n/a	n/a
07/04/2011	-19.2	n/a	n/a	-15.5	n/a	n/a	-21.8	n/a	n/a	n/a	n/a	n/a
08/04/2011	-15.8	n/a	n/a	-11.2	n/a	n/a	-20.8	n/a	n/a	n/a	n/a	n/a
09/04/2011	-21.0	n/a	n/a	-13.0	n/a	n/a	-27.2	n/a	n/a	n/a	n/a	n/a
10/04/2011	-24.9	n/a	n/a	-19.9	n/a	n/a	-30.3	n/a	n/a	n/a	n/a	n/a
11/04/2011	-27.7	n/a	n/a	-23.0	n/a	n/a	-31.1	n/a	n/a	n/a	n/a	n/a
12/04/2011	-24.3	n/a	n/a	-18.1	n/a	n/a	-30.5	n/a	n/a	n/a	n/a	n/a
13/04/2011	-22.0	n/a	n/a	-17.7	n/a	n/a	-27.1	n/a	n/a	n/a	n/a	n/a
14/04/2011	-20.5	n/a	n/a	-15.8	n/a	n/a	-25.5	n/a	n/a	n/a	n/a	n/a
15/04/2011	-16.9	n/a	n/a	-12.6	n/a	n/a	-20.4	n/a	n/a	n/a	n/a	n/a
16/04/2011	-14.3	n/a	n/a	-9.6	n/a	n/a	-19.6	n/a	n/a	n/a	n/a	n/a
17/04/2011	-17.2	n/a	n/a	-12.4	n/a	n/a	-20.8	n/a	n/a	n/a	n/a	n/a
18/04/2011	-20.2	n/a	n/a	-18.5	n/a	n/a	-25.0	n/a	n/a	n/a	n/a	n/a
19/04/2011	-18.3	n/a	n/a	-11.1	n/a	n/a	-26.2	n/a	n/a	n/a	n/a	n/a
20/04/2011	-16.2	n/a	n/a	-10.1	n/a	n/a	-24.2	n/a	n/a	n/a	n/a	n/a
21/04/2011	-24.7	n/a	n/a	-21.4	n/a	n/a	-29.2	n/a	n/a	n/a	n/a	n/a
22/04/2011	-22.0	n/a	n/a	-14.7	n/a	n/a	-30.5	n/a	n/a	n/a	n/a	n/a
23/04/2011	-23.6	n/a	n/a	-19.4	n/a	n/a	-27.3	n/a	n/a	n/a	n/a	n/a
24/04/2011	-24.7	n/a	n/a	-19.6	n/a	n/a	-30.0	n/a	n/a	n/a	n/a	n/a
25/04/2011	-18.4	n/a	n/a	-11.3	n/a	n/a	-25.7	n/a	n/a	n/a	n/a	n/a
26/04/2011	-14.6	n/a	n/a	-8.0	n/a	n/a	-20.8	n/a	n/a	n/a	n/a	n/a
27/04/2011	-12.7	n/a	n/a	-7.5	n/a	n/a	-18.0	n/a	n/a	n/a	n/a	n/a
28/04/2011	-15.2	n/a	n/a	-13.5	n/a	n/a	-20.7	n/a	n/a	n/a	n/a	n/a
29/04/2011	-15.7	n/a	n/a	-12.2	n/a	n/a	-22.0	n/a	n/a	n/a	n/a	n/a
30/04/2011	-12.6	n/a	n/a	-7.9	n/a	n/a	-17.1	n/a	n/a	n/a	n/a	n/a
01/05/2011	-18.9	n/a	n/a	-15.2	n/a	n/a	-23.6	n/a	n/a	n/a	n/a	n/a
02/05/2011	-16.2	n/a	n/a	-9.0	n/a	n/a	-23.5	n/a	n/a	n/a	n/a	n/a
03/05/2011	-11.8	n/a	n/a	-3.8	n/a	n/a	-17.7	n/a	n/a	n/a	n/a	n/a
04/05/2011	-10.8	n/a	n/a	-4.5	n/a	n/a	-17.6	n/a	n/a	n/a	n/a	n/a
05/05/2011	-9.1	n/a	n/a	-1.3	n/a	n/a	-17.6	n/a	n/a	n/a	n/a	n/a
06/05/2011	-1.8	n/a	n/a	3.9	n/a	n/a	-5.4	n/a	n/a	n/a	n/a	n/a
07/05/2011	-4.7	n/a	n/a	0.2	n/a	n/a	-11.0	n/a	n/a	n/a	n/a	n/a
08/05/2011	-2.9	n/a	n/a	0.3	n/a	n/a	-6.3	n/a	n/a	n/a	n/a	n/a
09/05/2011	-3.5	n/a	n/a	2.7	n/a	n/a	-9.3	n/a	n/a	n/a	n/a	n/a
10/05/2011	-5.6	n/a	n/a	-0.5	n/a	n/a	-12.3	n/a	n/a	n/a	n/a	n/a
11/05/2011	0.4	n/a	n/a	3.1	n/a	n/a	-2.0	n/a	n/a	n/a	n/a	n/a
12/05/2011	0.9	n/a	n/a	3.8	n/a	n/a	-0.9	n/a	n/a	n/a	n/a	n/a
13/05/2011	-3.3	n/a	n/a	-0.5	n/a	n/a	-6.6	n/a	n/a	n/a	n/a	n/a
14/05/2011	-2.4	n/a	n/a	4.5	n/a	n/a	-8.3	n/a	n/a	n/a	n/a	n/a
15/05/2011	1.2	n/a	n/a	4.5	n/a	n/a	-2.4	n/a	n/a	n/a	n/a	n/a
16/05/2011	-3.4	n/a	n/a	-1.1	n/a	n/a	-5.2	n/a	n/a	n/a	n/a	n/a
17/05/2011	-5.7	n/a	n/a	-3.7	n/a	n/a	-7.8	n/a	n/a	n/a	n/a	n/a
18/05/2011	-5.4	n/a	n/a	-2.9	n/a	n/a	-7.3	n/a	n/a	n/a	n/a	n/a
19/05/2011	-4.7	n/a	n/a	-1.6	n/a	n/a	-8.0	n/a	n/a	n/a	n/a	n/a
20/05/2011	-5.7	n/a	n/a	0.0	n/a	n/a	-12.1	n/a	n/a	n/a	n/a	n/a
21/05/2011	-4.8	n/a	n/a	0.3	n/a	n/a	-9.6	n/a	n/a	n/a	n/a	n/a
22/05/2011	-4.1	n/a	n/a	1.0	n/a	n/a	-8.3	n/a	n/a	n/a	n/a	n/a
23/05/2011	-2.3	n/a	n/a	0.1	n/a	n/a	-5.3	n/a	n/a	n/a	n/a	n/a
24/05/2011	-0.9	n/a	n/a	2.7	n/a	n/a	-4.4	n/a	n/a	n/a	n/a	n/a
25/05/2011	0.9	3.1	n/a	4.5	5.2	n/a	-3.6	-0.3	n/a	n/a	n/a	n/a
26/05/2011	-1.7	-1.0	n/a	0.3	0.6	n/a	-4.5	-2.9	n/a	n/a	n/a	n/a
27/05/2011	-0.7	-1.0	n/a	5.1	4.5	n/a	-4.6	-5.3	n/a	n/a	n/a	n/a
28/05/2011	3.2	2.8	n/a	9.6	7.3	n/a	-3.5	-2.0	n/a	n/a	n/a	n/a
29/05/2011	3.0	5.0	n/a	8.9	12.0	n/a	-3.5	-2.6	n/a	n/a	n/a	n/a
30/05/2011	8.5	8.3	n/a	15.4	14.4	n/a	1.2	2.7	n/a	n/a	n/a	n/a
31/05/2011	2.4	2.6	n/a	6.4	8.2	n/a	-0.2	-0.4	n/a	n/a	n/a	n/a
01/06/2011	5.6	4.7	n/a	15.0	13.3	n/a	-2.2	-4.3	n/a	1.5	1.8	n/a
02/06/2011	-3.7	-4.5	n/a	-1.5	-2.2	n/a	-5.9	-6.8	n/a	0	0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
03/06/2011	-3.0	-3.3	n/a	-0.7	-0.6	n/a	-5.4	-5.9	n/a	0	0	n/a
04/06/2011	-2.3	-2.6	n/a	0.1	-0.5	n/a	-5.4	-4.6	n/a	0	0	n/a
05/06/2011	-0.8	-1.3	n/a	1.1	0.9	n/a	-1.9	-2.4	n/a	0	0	n/a
06/06/2011	-1.6	-2.7	n/a	-0.9	-2.0	n/a	-2.5	-3.2	n/a	0	0	n/a
07/06/2011	-1.5	-2.0	n/a	0.9	0.5	n/a	-3.6	-3.9	n/a	0	0	n/a
08/06/2011	0.4	-0.7	n/a	3.7	2.0	n/a	-1.5	-2.9	n/a	0	0	n/a
09/06/2011	0.3	-0.2	n/a	3.5	3.3	n/a	-1.8	-2.8	n/a	0	0	n/a
10/06/2011	4.8	4.2	n/a	11.6	10.6	n/a	-2.6	-3.1	n/a	0	0	n/a
11/06/2011	3.7	3.0	n/a	8.1	8.2	n/a	0.0	-0.8	n/a	0	0	n/a
12/06/2011	8.0	7.5	n/a	15.1	14.3	n/a	-0.3	-0.2	n/a	0	0	n/a
13/06/2011	4.5	5.7	n/a	9.5	10.7	n/a	2.0	1.9	n/a	0	0	n/a
14/06/2011	3.2	3.5	n/a	6.7	7.4	n/a	0.7	1.1	n/a	0	0	n/a
15/06/2011	5.7	4.7	n/a	11.2	9.6	n/a	-0.6	-0.3	n/a	0	0	n/a
16/06/2011	9.3	8.8	n/a	18.0	16.9	n/a	0.7	0.8	n/a	0	0	n/a
17/06/2011	14.7	15.2	n/a	21.5	21.8	n/a	4.2	7.6	n/a	0	0	n/a
18/06/2011	12.6	13.6	n/a	18.4	18.2	n/a	4.6	7.4	n/a	0	0	n/a
19/06/2011	14.3	13.9	n/a	20.3	20.4	n/a	7.2	7.5	n/a	0	0	n/a
20/06/2011	13.5	13.5	n/a	22.5	21.4	n/a	5.9	7.2	n/a	0	0	n/a
21/06/2011	6.4	5.3	n/a	10.5	8.5	n/a	2.9	2.7	n/a	0	0	n/a
22/06/2011	6.4	4.8	n/a	13.0	9.2	n/a	1.9	1.0	n/a	0	0	n/a
23/06/2011	10.7	10.2	n/a	16.8	16.6	n/a	3.1	2.7	n/a	0	0	n/a
24/06/2011	13.0	12.3	n/a	20.7	20.4	n/a	5.4	5.4	n/a	0	0	n/a
25/06/2011	3.6	3.1	n/a	7.8	6.6	n/a	0.6	0.4	n/a	1.5	1.5	n/a
26/06/2011	2.5	2.3	n/a	4.5	4.7	n/a	0.0	0.0	n/a	0.3	0.3	n/a
27/06/2011	5.4	4.6	n/a	9.8	8.1	n/a	2.4	1.8	n/a	1.0	1.0	n/a
28/06/2011	6.4	5.1	n/a	10.3	8.0	n/a	3.4	2.2	n/a	2.3	1.5	n/a
29/06/2011	8.6	9.3	n/a	13.6	15.4	n/a	1.9	1.9	n/a	4.8	2.8	n/a
30/06/2011	8.4	7.8	n/a	12.8	10.3	n/a	5.5	5.8	n/a	2.0	5.3	n/a
01/07/2011	4.5	5.1	n/a	6.4	7.6	n/a	3.2	2.6	n/a	18.0	10.4	n/a
02/07/2011	5.4	5.2	n/a	9.2	7.6	n/a	3.0	2.5	n/a	1.8	2.5	n/a
03/07/2011	15.1	14.5	n/a	23.9	23.9	n/a	6.8	5.7	n/a	0	0.3	n/a
04/07/2011	16.8	16.8	n/a	21.5	21.6	n/a	11.8	12.0	n/a	0	0	n/a
05/07/2011	14.8	15.2	n/a	19.6	19.1	n/a	9.1	10.3	n/a	0	0	n/a
06/07/2011	15.4	16.3	n/a	19.3	19.4	n/a	9.2	12.0	n/a	0	0	n/a
07/07/2011	14.1	13.9	n/a	17.8	16.4	n/a	8.9	11.8	n/a	0	0	n/a
08/07/2011	15.4	15.3	n/a	22.2	21.1	n/a	8.8	10.0	n/a	0	0	n/a
09/07/2011	16.5	16.8	n/a	22.0	21.8	n/a	9.2	10.9	n/a	0	0	n/a
10/07/2011	17.9	18.4	n/a	23.7	23.5	n/a	10.4	12.4	n/a	0	3.0	n/a
11/07/2011	18.8	18.3	n/a	25.4	24.3	n/a	12.6	12.6	n/a	0.3	0.5	n/a
12/07/2011	15.7	14.3	n/a	19.8	18.8	n/a	11.8	9.8	n/a	1.0	0.3	n/a
13/07/2011	11.8	11.6	n/a	15.9	15.7	n/a	8.0	7.5	n/a	0	0	n/a
14/07/2011	13.0	12.2	n/a	17.4	15.7	n/a	4.9	8.0	n/a	0	0	n/a
15/07/2011	11.6	11.1	n/a	15.5	14.3	n/a	7.5	8.0	n/a	0	0	n/a
16/07/2011	12.0	12.1	n/a	15.6	15.1	n/a	8.0	9.0	n/a	0	0	n/a
17/07/2011	13.9	13.7	n/a	19.3	19.1	n/a	7.2	7.3	n/a	0	0	n/a
18/07/2011	15.9	16.2	n/a	23.4	21.3	n/a	6.8	9.3	n/a	0	0	n/a
19/07/2011	15.3	15.8	n/a	19.9	19.1	n/a	10.1	11.7	n/a	0	0	n/a
20/07/2011	14.7	14.9	n/a	20.4	19.8	n/a	7.1	8.9	n/a	0	0	n/a
21/07/2011	16.3	16.5	n/a	23.1	22.3	n/a	7.3	10.1	n/a	0	0	n/a
22/07/2011	17.7	17.9	n/a	24.1	22.5	n/a	9.4	11.0	n/a	0	0	n/a
23/07/2011	19.4	19.7	n/a	25.3	24.7	n/a	9.4	14.7	n/a	0	0	n/a
24/07/2011	18.1	18.3	n/a	24.8	22.8	n/a	11.1	14.6	n/a	0	2.8	n/a
25/07/2011	20.6	19.6	n/a	26.4	25.0	n/a	14.7	14.7	n/a	0	0.3	n/a
26/07/2011	14.4	13.3	n/a	17.5	19.0	n/a	11.2	10.2	n/a	0	0	n/a
27/07/2011	12.5	12.0	n/a	17.1	16.1	n/a	7.4	8.0	n/a	0	0	n/a
28/07/2011	14.2	14.7	n/a	20.0	20.1	n/a	8.0	9.4	n/a	0	0	n/a
29/07/2011	12.7	12.0	n/a	16.1	13.8	n/a	7.8	10.6	n/a	0	0.5	n/a
30/07/2011	12.8	12.4	n/a	17.1	17.0	n/a	8.5	8.1	n/a	0	0	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
31/07/2011	13.2	13.4	n/a	18.5	18.8	n/a	7.0	6.6	n/a	0	0	n/a
01/08/2011	12.0	12.2	n/a	14.2	14.0	n/a	10.1	10.0	n/a	3.8	1.5	n/a
02/08/2011	11.8	11.9	n/a	14.4	15.1	n/a	9.3	9.6	n/a	1.3	0	n/a
03/08/2011	11.1	11.1	n/a	14.0	14.1	n/a	8.6	8.2	n/a	0	0	n/a
04/08/2011	13.9	13.8	n/a	19.3	20.0	n/a	8.8	8.3	n/a	0	0	n/a
05/08/2011	16.0	16.7	n/a	23.4	23.6	n/a	7.2	9.3	n/a	0	0	n/a
06/08/2011	18.6	18.9	n/a	23.8	24.0	n/a	14.0	12.8	n/a	0	0	n/a
07/08/2011	16.9	17.5	n/a	22.2	21.7	n/a	11.2	12.2	n/a	0	0	n/a
08/08/2011	14.5	15.9	n/a	19.8	20.4	n/a	7.3	10.7	n/a	0	0	n/a
09/08/2011	14.2	14.9	n/a	18.7	18.1	n/a	8.5	10.6	n/a	0	0	n/a
10/08/2011	11.9	12.0	n/a	16.6	15.5	n/a	7.7	9.8	n/a	0.5	1.5	n/a
11/08/2011	12.1	11.1	n/a	15.3	14.1	n/a	9.9	9.1	n/a	2.0	0.3	n/a
12/08/2011	10.3	9.9	n/a	11.8	11.4	n/a	8.4	8.1	n/a	0.3	0	n/a
13/08/2011	12.8	12.4	n/a	16.4	15.5	n/a	9.0	9.1	n/a	0	0	n/a
14/08/2011	13.7	13.5	n/a	19.1	18.3	n/a	5.1	8.3	n/a	0	0	n/a
15/08/2011	12.3	12.9	n/a	17.1	16.5	n/a	4.2	8.2	n/a	0	0	n/a
16/08/2011	10.4	10.4	n/a	11.9	13.6	n/a	9.5	9.1	n/a	7.6	13.5	n/a
17/08/2011	10.8	10.1	n/a	14.6	13.1	n/a	8.3	7.5	n/a	24.4	33.3	n/a
18/08/2011	8.8	8.6	n/a	11.9	10.9	n/a	7.2	7.1	n/a	8.4	7.1	n/a
19/08/2011	8.1	6.9	n/a	11.1	10.6	n/a	4.3	3.2	n/a	0.8	1.8	n/a
20/08/2011	8.0	7.4	n/a	11.4	10.3	n/a	5.0	4.6	n/a	1.8	0.3	n/a
21/08/2011	9.3	9.1	n/a	14.7	13.6	n/a	1.2	3.3	n/a	0	0	n/a
22/08/2011	11.9	11.0	n/a	18.1	15.6	n/a	8.5	8.3	n/a	1.8	9.7	n/a
23/08/2011	13.6	12.6	n/a	17.4	16.1	n/a	8.2	9.1	n/a	0	0	n/a
24/08/2011	12.9	12.7	n/a	18.7	17.3	n/a	6.0	9.0	n/a	0	0	n/a
25/08/2011	11.3	10.9	n/a	15.5	13.9	n/a	6.3	7.9	n/a	0	0	n/a
26/08/2011	9.3	8.6	n/a	11.6	10.8	n/a	8.0	7.5	n/a	0	0.5	n/a
27/08/2011	9.2	8.8	n/a	14.4	13.4	n/a	3.3	4.6	n/a	0	0	n/a
28/08/2011	7.4	6.8	n/a	10.4	9.3	n/a	5.4	4.1	n/a	1.0	0.5	n/a
29/08/2011	8.1	8.3	n/a	13.5	14.1	n/a	3.7	5.2	n/a	0	0.3	n/a
30/08/2011	7.5	8.1	n/a	12.4	11.6	n/a	1.8	4.6	n/a	0	0	n/a
31/08/2011	3.4	4.0	n/a	6.6	7.2	n/a	1.5	1.8	n/a	0	0	n/a
01/09/2011	2.7	2.5	n/a	4.1	5.0	n/a	0.6	0.5	n/a	0	0	n/a
02/09/2011	2.6	2.9	n/a	7.4	7.2	n/a	0.2	0.0	n/a	0	0	n/a
03/09/2011	5.1	4.6	n/a	11.8	10.5	n/a	-1.8	-0.2	n/a	12.7	16.5	n/a
04/09/2011	5.4	5.4	n/a	9.7	9.0	n/a	0.0	0.1	n/a	0	0.3	n/a
05/09/2011	3.8	3.6	n/a	5.2	5.0	n/a	2.6	2.4	n/a	13.5	6.4	n/a
06/09/2011	6.9	6.8	n/a	13.8	13.5	n/a	2.7	1.8	n/a	0	0	n/a
07/09/2011	11.2	10.6	n/a	17.0	16.2	n/a	6.6	6.8	n/a	2.5	1.0	n/a
08/09/2011	5.9	5.1	n/a	11.8	10.4	n/a	3.8	3.3	n/a	0	0	n/a
09/09/2011	8.1	7.1	n/a	13.0	11.2	n/a	2.1	2.5	n/a	7.6	4.8	n/a
10/09/2011	8.1	7.4	2.1	11.4	11.4	10.9	6.1	4.4	3.3	9.4	7.1	1.0
11/09/2011	2.1	1.3	1.5	6.2	4.3	4.2	0.3	-0.5	-0.3	5.3	2.3	0.1
12/09/2011	0.6	0.0	0.5	2.2	1.9	2.1	-0.9	-1.4	-1.1	0	0	1.0
13/09/2011	3.3	2.9	5.8	9.4	8.9	11.1	-1.7	-1.8	0.1	0	0	0.0
14/09/2011	5.7	4.8	7.9	10.7	9.5	11.5	0.1	-1.1	2.5	0	0	0.0
15/09/2011	5.4	4.9	4.7	6.5	7.1	9.6	3.5	3.7	2.7	0	0	0.4
16/09/2011	2.4	2.5	2.9	4.9	4.4	4.2	1.2	0.7	1.8	0	0.5	0.7
17/09/2011	2.0	1.5	1.5	3.9	3.6	2.7	0.5	0.4	0.2	2.5	4.3	5.3
18/09/2011	-0.4	-0.9	-0.2	1.5	0.6	0.6	-1.9	-2.0	-0.9	0	0	0.0
19/09/2011	0.1	-0.1	2.7	5.6	4.3	6.5	-2.8	-2.8	-1.0	0	0	0.0
20/09/2011	4.7	5.0	8.6	12.0	12.2	13.5	-1.9	-0.5	2.8	0	0	0.0
21/09/2011	10.0	9.3	12.3	15.7	14.8	16.6	5.6	5.4	8.4	0	0	0.0
22/09/2011	11.1	10.4	11.3	16.2	14.5	16.1	6.9	6.7	6.5	0	0	1.2
23/09/2011	6.5	5.6	6.3	10.6	8.7	8.7	4.6	3.6	4.1	2.5	0.3	0.8
24/09/2011	4.0	3.4	3.6	6.2	4.9	5.3	0.1	1.9	2.0	0	0	0.5
25/09/2011	2.4	1.8	2.5	4.7	3.8	4.4	0.1	0.3	1.3	0	0	0.0
26/09/2011	1.0	0.1	0.0	1.9	1.3	1.6	0.3	-1.6	-1.1	8.9	2.8	0.2

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
27/09/2011	-1.3	-2.3	-1.7	0.5	-1.2	0.0	-2.9	-3.8	-3.0	0	0	0.0
28/09/2011	-4.1	-4.9	-4.1	-2.7	-3.7	-2.9	-5.7	-5.7	-5.0	0	0	0.0
29/09/2011	-2.4	-3.2	-1.5	1.3	0.0	0.6	-5.0	-5.9	-4.6	0	0	0.7
30/09/2011	-0.4	-0.9	0.2	1.0	0.2	1.7	-1.5	-1.8	-3.6	0.3	0.3	0.0
01/10/2011	-3.1	-3.9	-2.8	-1.1	-1.5	-0.1	-4.7	-5.7	-3.7	n/a	n/a	0.0
02/10/2011	-2.4	-2.5	0.7	1.4	1.4	4.0	-6.2	-6.5	-5.3	n/a	n/a	0.0
03/10/2011	0.1	-0.6	1.4	1.6	1.4	3.6	-2.6	-2.4	-2.1	n/a	n/a	0.0
04/10/2011	-1.5	-1.6	1.4	2.1	1.1	3.4	-6.0	-5.3	-2.2	n/a	0.5	0.8
05/10/2011	2.0	1.4	4.1	4.0	3.1	5.9	0.8	0.3	2.1	3.6	0.3	0.0
06/10/2011	1.9	1.5	3.4	5.7	4.2	4.8	-0.5	-0.3	1.8	n/a	n/a	0.0
07/10/2011	0.8	1.0	3.2	2.3	2.2	5.2	-0.4	-0.2	1.2	3.8	1.0	0.0
08/10/2011	0.1	-0.2	0.4	0.8	1.1	2.9	-2.0	-2.7	-2.0	4.1	1.8	1.1
09/10/2011	-3.3	-4.4	-4.2	-1.7	-2.4	-2.0	-5.7	-7.0	-6.3	n/a	n/a	0.0
10/10/2011	-7.1	-8.0	-6.4	-5.7	-6.8	-5.0	-9.3	-10.0	-7.8	n/a	n/a	0.0
11/10/2011	-5.2	-6.1	-4.2	-2.1	-2.7	-1.3	-8.3	-9.2	-7.7	n/a	n/a	0.0
12/10/2011	-1.3	-1.0	1.1	-0.2	0.4	2.5	-2.8	-2.7	-1.4	n/a	0.3	1.7
13/10/2011	-1.2	-1.2	1.3	0.3	-0.1	3.1	-3.5	-2.3	-0.1	n/a	n/a	0.0
14/10/2011	-1.5	-1.1	0.0	-0.2	0.7	1.4	-2.9	-2.3	-1.3	n/a	n/a	0.4
15/10/2011	-2.8	-2.1	-1.5	-1.3	-1.0	-1.1	-5.7	-3.3	-2.2	n/a	n/a	0.0
16/10/2011	-5.2	-6.4	-5.7	-2.7	-3.2	-2.0	-10.2	-11.4	-8.2	n/a	n/a	0.1
17/10/2011	-10.4	-9.8	-7.9	-8.4	-7.4	-6.8	-13.1	-11.5	-9.3	n/a	n/a	0.0
18/10/2011	-8.7	-8.2	-6.5	-7.3	-7.0	-5.4	-9.7	-9.8	-8.7	n/a	n/a	0.0
19/10/2011	-7.9	-8.2	-7.4	-6.8	-7.4	-6.3	-9.2	-9.5	-8.2	n/a	n/a	0.0
20/10/2011	-9.9	-10.8	-9.7	-8.4	-9.3	-8.2	-10.8	-11.8	-10.6	n/a	n/a	0.0
21/10/2011	-11.2	-11.7	-9.5	-10.5	-10.9	-8.9	-12.4	-12.6	-10.1	n/a	n/a	0.0
22/10/2011	-12.5	-12.8	-10.9	-11.0	-11.5	-9.7	-14.8	-15.2	-12.9	n/a	n/a	0.0
23/10/2011	-8.6	-8.7	-5.4	-1.6	-1.4	-2.3	-14.6	-16.2	-11.0	n/a	n/a	0.0
24/10/2011	-7.0	-8.1	-6.8	-1.5	-2.8	-4.0	-10.9	-11.0	-9.9	n/a	n/a	0.0
25/10/2011	-15.0	-16.6	-12.5	-8.6	-11.0	-9.3	-20.1	-20.3	-16.4	n/a	n/a	0.0
26/10/2011	-4.9	-4.3	-1.3	-0.5	-1.6	0.1	-11.8	-11.4	-9.4	n/a	n/a	0.0
27/10/2011	-7.0	-8.6	-10.2	0.7	-0.9	-0.1	-17.4	-16.1	-15.1	n/a	0.3	0.0
28/10/2011	-18.1	-18.1	-16.8	-14.9	-16.1	-14.4	-21.3	-20.3	-20.5	n/a	n/a	0.0
29/10/2011	-14.3	-14.7	-12.8	-9.5	-10.1	-8.5	-17.8	-17.1	-17.4	n/a	n/a	0.0
30/10/2011	-4.3	-5.6	-4.6	-0.7	-2.3	-2.1	-9.8	-10.3	-8.6	n/a	n/a	0.0
31/10/2011	-1.9	-2.2	-2.7	-0.7	-1.4	-1.5	-4.5	-3.4	-4.3	n/a	n/a	0.0
01/11/2011	-5.2	-6.0	-5.3	-3.5	-3.4	-2.4	-8.1	-8.7	-6.9	n/a	n/a	0.0
02/11/2011	-12.2	-11.7	-9.4	-7.0	-8.1	-6.4	-17.7	-14.8	-11.7	n/a	n/a	0.0
03/11/2011	-12.8	-11.1	-10.6	-10.4	-9.5	-8.5	-16.7	-12.7	-12.6	n/a	n/a	0.0
04/11/2011	-11.7	-13.1	-13.3	-10.9	-12.1	-11.7	-13.8	-15.0	-14.2	n/a	n/a	0.0
05/11/2011	-11.2	-12.4	-11.8	-9.2	-10.1	-9.7	-13.9	-14.9	-14.2	n/a	n/a	0.0
06/11/2011	-12.2	-12.7	-10.9	-8.8	-9.7	-7.5	-18.4	-17.0	-14.7	n/a	n/a	0.0
07/11/2011	-19.8	-18.4	-14.6	-13.5	-13.8	-11.9	-24.9	-23.6	-18.1	n/a	n/a	0.0
08/11/2011	-11.9	-12.1	-11.5	-9.9	-10.0	-8.7	-14.1	-15.2	-13.5	n/a	n/a	0.0
09/11/2011	-14.5	-16.6	-17.5	-10.7	-11.7	-11.6	-20.5	-22.4	-22.5	n/a	n/a	0.0
10/11/2011	-14.2	-15.6	-12.1	-10.3	-11.7	-9.7	-21.5	-22.3	-22.0	n/a	n/a	0.0
11/11/2011	-10.5	-11.2	-9.9	-9.1	-10.0	-8.2	-11.7	-12.5	-12.5	n/a	n/a	0.0
12/11/2011	-15.2	-15.1	-16.4	-10.4	-11.2	-12.4	-19.1	-18.4	-19.1	n/a	n/a	0.0
13/11/2011	-17.9	-19.2	-19.8	-15.7	-15.3	-17.5	-20.7	-26.6	-23.4	n/a	n/a	0.0
14/11/2011	-20.6	-22.9	-22.1	-17.6	-19.0	-18.4	-26.8	-26.8	-25.3	n/a	n/a	0.0
15/11/2011	-24.3	-22.7	-20.4	-18.4	-18.6	-18.0	-28.3	-26.6	-23.7	n/a	n/a	0.0
16/11/2011	-27.3	-24.3	-21.2	-25.5	-20.8	-18.2	-29.8	-27.8	-23.9	n/a	n/a	0.0
17/11/2011	-21.0	-20.6	n/a	-18.7	-18.4	n/a	-28.6	-23.3	n/a	n/a	n/a	n/a
18/11/2011	-21.2	-21.8	n/a	-18.8	-19.9	n/a	-22.8	-23.5	n/a	n/a	n/a	n/a
19/11/2011	-19.6	-20.5	n/a	-18.5	-19.5	n/a	-23.4	-23.0	n/a	n/a	n/a	n/a
20/11/2011	-26.5	-26.7	n/a	-23.2	-22.6	n/a	-28.8	-29.4	n/a	n/a	n/a	n/a
21/11/2011	-30.5	-30.5	n/a	-28.5	-29.3	n/a	-31.8	-31.3	n/a	n/a	n/a	n/a
22/11/2011	-31.4	-30.7	n/a	-30.3	-28.0	n/a	-32.8	-32.1	n/a	n/a	n/a	n/a
23/11/2011	-23.6	-23.1	n/a	-21.1	-21.0	n/a	-30.3	-28.0	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
24/11/2011	-17.4	-18.7	n/a	-14.1	-15.7	n/a	-23.9	-21.8	n/a	n/a	n/a	n/a
25/11/2011	-17.3	-16.8	n/a	-13.7	-14.2	n/a	-22.1	-20.1	n/a	n/a	n/a	n/a
26/11/2011	-17.2	-18.0	n/a	-13.0	-14.3	n/a	-23.8	-23.7	n/a	n/a	n/a	n/a
27/11/2011	-22.2	-23.5	n/a	-20.0	-21.2	n/a	-24.6	-25.3	n/a	n/a	n/a	n/a
28/11/2011	-24.2	-24.7	n/a	-21.9	-22.1	n/a	-28.6	-29.2	n/a	n/a	n/a	n/a
29/11/2011	-23.7	-23.9	n/a	-18.7	-19.0	n/a	-28.8	-29.4	n/a	n/a	n/a	n/a
30/11/2011	-20.9	-21.1	n/a	-18.6	-19.3	n/a	-24.4	-24.4	n/a	n/a	n/a	n/a
01/12/2011	-24.7	-25.1	n/a	-21.9	-22.7	n/a	-29.2	-28.3	n/a	n/a	n/a	n/a
02/12/2011	-26.4	-27.0	n/a	-22.0	-23.9	n/a	-30.3	-30.5	n/a	n/a	n/a	n/a
03/12/2011	-30.4	-29.1	n/a	-28.4	-26.7	n/a	-31.8	-31.3	n/a	n/a	n/a	n/a
04/12/2011	-29.8	-29.3	n/a	-26.8	-27.0	n/a	-31.7	-31.2	n/a	n/a	n/a	n/a
05/12/2011	-18.9	-18.8	n/a	-8.9	-7.3	n/a	-28.9	-29.1	n/a	n/a	n/a	n/a
06/12/2011	-17.2	-18.2	n/a	-6.8	-6.8	n/a	-23.0	-23.7	n/a	0.8	n/a	n/a
07/12/2011	-20.1	-21.1	n/a	-18.7	-20.1	n/a	-21.6	-22.9	n/a	0.8	n/a	n/a
08/12/2011	-24.9	-25.1	n/a	-21.4	-22.7	n/a	-27.9	-28.2	n/a	n/a	n/a	n/a
09/12/2011	-25.7	-26.3	n/a	-21.2	-22.7	n/a	-28.1	-28.6	n/a	n/a	n/a	n/a
10/12/2011	-27.5	-25.2	n/a	-21.2	-22.6	n/a	-30.5	-26.7	n/a	n/a	n/a	n/a
11/12/2011	-23.9	-25.0	n/a	-19.1	-19.3	n/a	-28.8	-28.7	n/a	n/a	n/a	n/a
12/12/2011	-12.9	-13.5	n/a	-8.3	-10.0	n/a	-19.5	-19.6	n/a	n/a	n/a	n/a
13/12/2011	-20.4	-21.5	n/a	-8.3	-10.1	n/a	-28.4	-28.6	n/a	n/a	n/a	n/a
14/12/2011	-27.8	-27.9	n/a	-26.8	-26.6	n/a	-28.8	-29.2	n/a	n/a	n/a	n/a
15/12/2011	-24.5	-24.2	n/a	-21.2	-21.0	n/a	-28.1	-27.7	n/a	n/a	n/a	n/a
16/12/2011	-27.3	-24.4	n/a	-24.1	-19.5	n/a	-30.1	-27.9	n/a	n/a	n/a	n/a
17/12/2011	-24.4	-23.9	n/a	-21.9	-19.9	n/a	-28.5	-26.5	n/a	n/a	n/a	n/a
18/12/2011	-29.2	-29.4	n/a	-24.7	-24.1	n/a	-34.9	-33.7	n/a	n/a	n/a	n/a
19/12/2011	-25.0	-25.7	n/a	-21.9	-21.2	n/a	-32.6	-32.9	n/a	n/a	n/a	n/a
20/12/2011	-31.5	-29.4	n/a	-25.4	-25.9	n/a	-34.8	-33.8	n/a	n/a	n/a	n/a
21/12/2011	-31.4	-31.1	n/a	-28.7	-27.5	n/a	-33.7	-34.1	n/a	n/a	n/a	n/a
22/12/2011	-28.8	-29.4	n/a	-17.9	-18.7	n/a	-34.2	-34.9	n/a	n/a	n/a	n/a
23/12/2011	-19.8	-20.3	n/a	-17.7	-18.1	n/a	-22.5	-23.0	n/a	n/a	n/a	n/a
24/12/2011	-24.5	-25.5	n/a	-19.5	-21.6	n/a	-27.2	-27.7	n/a	n/a	n/a	n/a
25/12/2011	-29.5	-29.4	n/a	-25.7	-26.3	n/a	-32.9	-31.9	n/a	n/a	n/a	n/a
26/12/2011	-29.2	-29.0	n/a	-27.2	-27.4	n/a	-30.9	-30.4	n/a	n/a	n/a	n/a
27/12/2011	-31.0	-29.7	n/a	-27.3	-26.0	n/a	-33.8	-31.9	n/a	n/a	n/a	n/a
28/12/2011	-26.1	-26.7	n/a	-23.4	-24.8	n/a	-32.9	-31.1	n/a	n/a	n/a	n/a
29/12/2011	-25.9	-29.2	n/a	-24.0	-27.7	n/a	-30.5	-30.8	n/a	n/a	n/a	n/a
30/12/2011	-30.8	-30.5	n/a	-30.0	-29.4	n/a	-31.7	-31.8	n/a	n/a	n/a	n/a
31/12/2011	-30.4	-29.9	n/a	-29.4	-28.3	n/a	-34.3	-33.3	n/a	n/a	n/a	n/a
01/01/2012	-34.4	-33.1	n/a	-29.3	-29.8	n/a	-38.4	-36.8	n/a	n/a	n/a	n/a
02/01/2012	-26.2	-25.8	n/a	-19.5	-19.2	n/a	-33.6	-33.3	n/a	n/a	n/a	n/a
03/01/2012	-22.2	-22.6	n/a	-19.9	-20.3	n/a	-24.8	-24.9	n/a	n/a	n/a	n/a
04/01/2012	-31.7	-29.4	n/a	-24.8	-24.9	n/a	-37.6	-34.5	n/a	n/a	n/a	n/a
05/01/2012	-35.2	-33.7	n/a	-31.6	-29.3	n/a	-37.9	-36.5	n/a	n/a	n/a	n/a
06/01/2012	-31.1	-31.2	n/a	-27.7	-27.8	n/a	-33.7	-33.2	n/a	n/a	n/a	n/a
07/01/2012	-24.0	-25.6	n/a	-21.4	-21.5	n/a	-29.6	-32.1	n/a	n/a	n/a	n/a
08/01/2012	-29.7	-28.2	n/a	-22.7	-23.1	n/a	-34.9	-32.7	n/a	n/a	n/a	n/a
09/01/2012	-35.5	-34.8	n/a	-33.8	-32.0	n/a	-36.6	-36.0	n/a	n/a	n/a	n/a
10/01/2012	-29.5	-27.9	n/a	-22.8	-22.4	n/a	-36.0	-35.4	n/a	n/a	n/a	n/a
11/01/2012	-29.8	-30.9	n/a	-23.8	-26.9	n/a	-33.3	-33.7	n/a	n/a	n/a	n/a
12/01/2012	-22.0	-22.9	n/a	-18.7	-18.5	n/a	-27.1	-27.7	n/a	n/a	n/a	n/a
13/01/2012	-27.9	-25.6	n/a	-25.7	-21.9	n/a	-29.5	-28.0	n/a	n/a	n/a	n/a
14/01/2012	-25.5	-24.0	n/a	-22.0	-21.5	n/a	-30.0	-27.7	n/a	n/a	n/a	n/a
15/01/2012	-33.9	-34.0	n/a	-27.5	-27.6	n/a	-39.8	-38.7	n/a	n/a	n/a	n/a
16/01/2012	-34.1	-33.1	n/a	-27.9	-29.0	n/a	-40.7	-39.5	n/a	n/a	n/a	n/a
17/01/2012	-29.1	-28.5	n/a	-22.2	-20.3	n/a	-33.0	-32.2	n/a	n/a	n/a	n/a
18/01/2012	-25.0	-25.3	n/a	-17.8	-17.4	n/a	-29.8	-30.4	n/a	n/a	n/a	n/a
19/01/2012	-33.4	-33.0	n/a	-29.8	-30.4	n/a	-35.4	-33.9	n/a	n/a	n/a	n/a
20/01/2012	-36.3	-35.3	n/a	-32.5	-32.8	n/a	-39.7	-39.0	n/a	n/a	n/a	n/a

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
21/01/2012	-42.9	-40.9	-39.6	-39.7	-38.7	n/a	-45.4	-43.8	n/a	n/a	n/a	0.0
22/01/2012	-40.4	-39.5	-32.7	-32.5	-33.0	n/a	-45.5	-43.4	n/a	n/a	n/a	0.0
23/01/2012	-33.1	-32.3	-31.7	-29.8	-30.2	n/a	-38.4	-35.7	n/a	n/a	n/a	0.0
24/01/2012	-33.1	-31.6	-29.3	-23.9	-25.8	n/a	-38.8	-36.6	n/a	n/a	n/a	0.0
25/01/2012	-19.5	-22.9	-22.5	-15.2	-15.3	n/a	-24.4	-27.3	n/a	n/a	n/a	0.0
26/01/2012	-17.2	-18.1	-16.4	-14.7	-15.3	n/a	-20.8	-21.1	n/a	n/a	n/a	0.0
27/01/2012	-28.6	-28.2	-25.9	-20.8	-19.7	n/a	-34.5	-34.1	n/a	n/a	n/a	0.0
28/01/2012	-37.6	-36.1	-33.2	-33.8	-33.7	n/a	-42.3	-38.5	n/a	n/a	n/a	0.0
29/01/2012	-40.6	-38.3	-33.8	-37.7	-36.0	n/a	-43.3	-40.7	n/a	n/a	n/a	0.0
30/01/2012	-38.4	-37.0	-32.0	-31.8	-31.6	n/a	-41.7	-40.1	n/a	n/a	n/a	0.0
31/01/2012	-28.2	-28.1	-25.2	-25.1	-23.9	n/a	-31.8	-31.6	n/a	n/a	n/a	0.0
01/02/2012	-25.1	-25.6	-21.6	-19.1	-19.7	n/a	-32.0	-32.1	n/a	n/a	n/a	0.0
02/02/2012	-18.2	-18.1	-15.3	-9.1	-9.5	n/a	-25.5	-22.6	n/a	n/a	n/a	0.0
03/02/2012	-12.3	-12.7	-11.5	-8.2	-8.5	n/a	-17.3	-16.9	n/a	n/a	n/a	0.0
04/02/2012	-10.2	-11.5	-12.2	-1.5	-2.4	n/a	-18.9	-19.9	n/a	n/a	n/a	0.0
05/02/2012	-23.4	-23.6	-23.3	-18.4	-19.8	n/a	-28.4	-27.8	n/a	n/a	n/a	0.0
06/02/2012	-19.9	-20.0	-15.1	-13.8	-12.7	n/a	-26.9	-28.2	n/a	n/a	n/a	0.0
07/02/2012	-24.8	-25.1	-26.6	-17.1	-16.8	n/a	-30.6	-30.6	n/a	n/a	n/a	0.0
08/02/2012	-28.8	-28.2	-28.5	-27.6	-26.8	n/a	-30.7	-30.1	n/a	n/a	n/a	0.0
09/02/2012	-28.1	-27.6	-24.8	-26.6	-24.1	n/a	-29.5	-29.9	n/a	n/a	n/a	0.0
10/02/2012	-21.6	-21.4	-12.7	-17.6	-16.6	n/a	-27.3	-27.0	n/a	n/a	n/a	0.0
11/02/2012	-16.7	-16.6	-10.0	-14.7	-15.1	n/a	-19.7	-18.3	n/a	n/a	n/a	0.0
12/02/2012	-14.3	-14.5	-9.4	-11.4	-10.1	n/a	-19.4	-19.3	n/a	n/a	n/a	0.0
13/02/2012	-18.5	-16.4	-14.9	-16.6	-14.4	n/a	-20.1	-18.8	n/a	n/a	n/a	0.0
14/02/2012	-18.5	-18.6	-17.8	-16.3	-16.2	n/a	-20.3	-19.8	n/a	n/a	n/a	0.0
15/02/2012	-17.3	-17.2	-16.7	-15.8	-15.4	n/a	-19.1	-19.0	n/a	n/a	n/a	0.0
16/02/2012	-18.9	-18.5	-18.7	-16.9	-16.8	n/a	-20.6	-19.6	n/a	n/a	n/a	0.0
17/02/2012	-15.3	-15.0	-13.6	-9.0	-9.5	n/a	-20.5	-19.5	n/a	n/a	n/a	0.0
18/02/2012	-20.8	-22.2	-23.5	-8.9	-12.0	n/a	-29.2	-28.5	n/a	n/a	n/a	0.0
19/02/2012	-31.4	-30.0	-28.1	-28.8	-27.2	n/a	-34.8	-32.5	n/a	n/a	n/a	0.0
20/02/2012	-30.4	-29.5	-24.8	-25.9	-25.8	n/a	-34.7	-32.6	n/a	n/a	n/a	0.0
21/02/2012	-23.9	-26.2	-24.2	-20.7	-24.2	n/a	-26.4	-28.4	n/a	n/a	n/a	0.0
22/02/2012	-23.5	-26.3	-24.8	-21.5	-21.8	n/a	-26.8	-32.2	n/a	n/a	n/a	0.0
23/02/2012	-28.8	-29.1	-29.1	-23.5	-24.5	n/a	-31.4	-31.7	n/a	n/a	n/a	0.0
24/02/2012	-30.0	-30.4	-26.2	-27.4	-28.7	n/a	-32.7	-32.4	n/a	n/a	n/a	0.0
25/02/2012	-30.8	-30.9	-30.7	-29.3	-28.6	n/a	-34.6	-34.9	n/a	n/a	n/a	0.0
26/02/2012	-36.0	-35.3	-31.5	-31.9	-33.3	n/a	-38.9	-37.6	n/a	n/a	n/a	0.0
27/02/2012	-37.0	-35.8	-26.3	-31.1	-30.6	n/a	-40.1	-38.9	n/a	n/a	n/a	0.0
28/02/2012	-27.6	-28.0	-26.2	-23.8	-25.2	n/a	-31.5	-31.0	n/a	n/a	n/a	0.0
29/02/2012	-33.2	-32.4	-30.3	-31.0	-30.6	n/a	-35.3	-34.5	n/a	n/a	n/a	0.0
01/03/2012	-33.0	-32.2	-31.6	-28.1	-29.3	n/a	-36.1	-34.6	n/a	n/a	n/a	0.0
02/03/2012	-34.0	-34.3	-30.4	-30.0	-30.3	n/a	-39.0	-38.3	n/a	n/a	n/a	0.0
03/03/2012	-32.3	-30.9	-29.8	-27.0	-25.2	n/a	-35.3	-36.0	n/a	n/a	n/a	0.0
04/03/2012	-34.4	-31.3	-32.7	-29.9	-27.8	n/a	-39.0	-34.3	n/a	n/a	n/a	0.0
05/03/2012	-33.9	-33.2	-30.6	-32.3	-30.0	n/a	-35.7	-35.4	n/a	n/a	n/a	0.0
06/03/2012	-33.5	-32.9	-28.0	-28.3	-28.7	n/a	-37.7	-36.3	n/a	n/a	n/a	0.0
07/03/2012	-32.8	-33.6	-27.9	-28.5	-29.2	n/a	-38.8	-37.8	n/a	n/a	n/a	0.0
08/03/2012	-31.2	-31.0	-27.8	-27.5	-28.8	n/a	-34.4	-33.9	n/a	n/a	n/a	0.0
09/03/2012	-31.4	-31.6	-25.7	-27.2	-26.7	n/a	-36.4	-35.5	n/a	n/a	n/a	0.0
10/03/2012	-29.8	-29.2	-29.3	-26.3	-23.5	n/a	-36.5	-34.7	n/a	n/a	n/a	0.0
11/03/2012	-34.0	-33.4	-29.5	-29.1	-29.1	n/a	-39.8	-37.1	n/a	n/a	n/a	0.0
12/03/2012	-24.5	-24.8	-21.9	-19.3	-19.7	n/a	-30.5	-30.1	n/a	n/a	n/a	0.0
13/03/2012	-19.7	-20.5	-19.7	-15.5	-17.9	n/a	-22.9	-22.2	n/a	n/a	n/a	0.0
14/03/2012	-25.1	-24.8	-25.6	-22.6	-21.2	n/a	-28.3	-28.8	n/a	n/a	n/a	0.0
15/03/2012	-28.5	-28.8	-27.6	-25.3	-25.7	n/a	-31.3	-32.4	n/a	n/a	n/a	0.0
16/03/2012	-24.8	-27.7	-27.9	-21.4	-22.8	n/a	-29.6	-30.9	n/a	n/a	n/a	0.0
17/03/2012	-27.7	-29.0	-29.6	-24.4	-25.9	n/a	-30.6	-31.1	n/a	n/a	n/a	0.0
18/03/2012	-30.0	-29.0	-27.2	-24.6	-23.1	n/a	-33.1	-33.1	n/a	n/a	n/a	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
19/03/2012	-30.9	-27.1	-27.6	-24.4	-23.3	n/a	-36.9	-31.5	n/a	n/a	n/a	0.0
20/03/2012	-24.1	-23.4	-24.5	-22.6	-21.8	n/a	-25.0	-25.4	n/a	n/a	n/a	0.0
21/03/2012	n/a	-23.8	-23.0	n/a	-22.9	n/a	n/a	-25.3	n/a	0	0	0.0
22/03/2012	-22.3	-23.9	-21.1	6.3	-20.7	n/a	-24.9	-27.2	n/a	1.0	0	0.0
23/03/2012	-22.7	n/a	-19.1	-16.0	-17.8	n/a	-27.7	n/a	n/a	0	0	0.0
24/03/2012	-24.1	n/a	-19.7	-18.0	n/a	n/a	-31.3	n/a	n/a	0	0	0.0
25/03/2012	-18.6	n/a	-18.8	-14.4	-18.9	n/a	-24.2	n/a	n/a	0	0	0.0
26/03/2012	-22.5	-21.9	-20.4	-16.4	-15.8	n/a	-25.9	-26.0	n/a	0	0	0.0
27/03/2012	-21.3	-21.4	-17.2	-14.6	-13.9	n/a	-26.9	-25.2	n/a	0	2.8	0.0
28/03/2012	-17.1	-17.4	-12.1	-9.0	-10.5	n/a	-26.9	-26.3	n/a	2.3	0	0.0
29/03/2012	-13.3	-15.3	-17.4	-7.2	-12.2	n/a	-17.9	-18.6	n/a	0	0	0.0
30/03/2012	-10.2	-10.2	-11.0	-7.4	-7.6	n/a	-15.3	-15.3	n/a	0.3	0	0.0
31/03/2012	-8.9	-9.1	-7.8	-6.8	-6.9	n/a	-12.9	-12.3	n/a	0	0	0.0
01/04/2012	-11.5	-12.0	-10.8	-8.6	-8.7	n/a	-13.6	-13.7	n/a	0.3	0	0.0
02/04/2012	-8.3	-8.5	-7.3	-6.3	-5.9	n/a	-10.3	-11.9	n/a	1.5	0	0.0
03/04/2012	-13.7	-14.6	-11.7	-8.4	-11.2	n/a	-19.2	-19.2	n/a	0	0	0.0
04/04/2012	-9.4	-9.0	-7.2	-4.5	-4.1	n/a	-14.8	-13.9	n/a	0.3	1.5	0.0
05/04/2012	-11.5	-11.9	-12.4	-8.9	-8.0	n/a	-16.9	-14.2	n/a	0	0	0.0
06/04/2012	-14.3	-15.4	-14.9	-13.5	-12.9	n/a	-15.0	-16.6	n/a	0	0	0.0
07/04/2012	-17.9	-18.7	-18.3	-14.1	-16.0	n/a	-23.1	-20.9	n/a	0	3.6	0.0
08/04/2012	-20.0	-18.7	-16.9	-13.1	-11.0	n/a	-25.2	-23.3	n/a	0	0	0.0
09/04/2012	-19.4	-18.4	-13.2	-11.9	-13.7	n/a	-27.6	-23.4	n/a	0	0	0.0
10/04/2012	-12.0	-11.3	-7.6	-6.8	-5.8	n/a	-18.2	-16.0	n/a	1.0	0	0.0
11/04/2012	-13.1	-14.0	-14.6	-8.7	-8.5	n/a	-20.9	-20.2	n/a	0	0	0.0
12/04/2012	-17.8	-17.4	-14.6	-11.4	-11.5	n/a	-22.9	-22.4	n/a	0	0	0.0
13/04/2012	-18.9	-18.3	-17.3	-15.7	-14.1	n/a	-23.4	-22.2	n/a	0	0	0.0
14/04/2012	-22.1	-21.5	-21.4	-19.4	-18.4	n/a	-26.0	-24.0	n/a	0	0	0.0
15/04/2012	-22.4	-22.4	-20.2	-16.8	-17.7	n/a	-28.2	-28.0	n/a	0	0	0.0
16/04/2012	-20.7	-20.6	-18.9	-17.4	-17.2	n/a	-24.3	-25.0	n/a	0	0	0.0
17/04/2012	-19.9	-19.7	-16.5	-13.8	-14.6	n/a	-25.6	-24.4	n/a	0	0	0.0
18/04/2012	-17.3	-16.3	-14.5	-10.0	-6.9	n/a	-22.7	-22.0	n/a	0	0.8	0.0
19/04/2012	-16.6	-15.1	-11.4	-8.0	-4.8	n/a	-26.3	-22.6	n/a	0	0	0.0
20/04/2012	-11.4	-12.8	-9.4	-3.3	-6.3	n/a	-17.6	-18.5	n/a	0	0	0.0
21/04/2012	-16.3	-16.4	-16.8	-12.9	-13.7	n/a	-19.5	-18.7	n/a	0	0	0.0
22/04/2012	-19.7	-19.3	-18.2	-16.7	-17.3	n/a	-24.5	-22.3	n/a	0	0	0.0
23/04/2012	-19.0	-18.5	-17.4	-12.4	-12.4	n/a	-23.6	-24.2	n/a	0	0	0.0
24/04/2012	-19.1	-16.7	-12.2	-11.8	-10.9	n/a	-26.8	-22.3	n/a	0	0	0.0
25/04/2012	-16.4	-16.1	-11.2	-8.5	-9.2	n/a	-23.4	-21.8	n/a	0	0	0.0
26/04/2012	-16.3	-15.8	-10.1	-10.1	-11.9	n/a	-23.4	-20.7	n/a	0	0	0.0
27/04/2012	-12.0	-11.3	-6.9	-5.1	-5.6	n/a	-20.3	-18.5	n/a	0	0	0.0
28/04/2012	-0.7	-1.2	0.6	2.3	2.0	n/a	-7.8	-7.3	n/a	2.0	0	0.0
29/04/2012	-6.7	-8.4	-7.4	0.8	-1.0	n/a	-11.2	-11.7	n/a	0	0	0.0
30/04/2012	-10.7	-11.4	-11.3	-8.8	-9.3	n/a	-12.3	-12.8	n/a	0	0	0.0
01/05/2012	-11.1	-12.7	-9.6	-7.1	-8.0	n/a	-15.6	-18.1	n/a	0	0	0.0
02/05/2012	-11.5	-10.7	-8.1	-6.2	-6.2	n/a	-18.8	-16.6	n/a	0	0	0.0
03/05/2012	-8.1	-7.7	-6.0	-4.2	-3.9	n/a	-12.7	-10.7	n/a	0	0	0.0
04/05/2012	-4.5	-3.5	0.4	0.1	1.4	n/a	-9.9	-8.2	n/a	0	0	0.0
05/05/2012	-3.0	-1.2	2.0	1.5	3.4	n/a	-8.5	-5.7	n/a	0	0.8	0.0
06/05/2012	0.5	0.3	-0.1	5.7	5.3	n/a	-2.7	-2.6	n/a	1.3	1.0	0.0
07/05/2012	-1.5	-2.8	-3.5	-0.5	-1.3	n/a	-2.4	-3.7	n/a	0	0	0.0
08/05/2012	-4.7	-4.1	-3.5	-2.3	-1.8	n/a	-6.9	-5.2	n/a	0	0	0.0
09/05/2012	-0.8	-1.1	0.5	0.6	0.9	n/a	-2.8	-3.6	n/a	0.5	0	0.0
10/05/2012	2.2	1.9	3.3	6.8	6.3	n/a	-0.7	-1.5	n/a	7.1	1.5	0.0
11/05/2012	-0.7	-2.5	-2.8	0.6	1.5	n/a	-2.4	-7.1	n/a	0	0	0.0
12/05/2012	-1.7	-5.0	-2.6	0.3	-1.9	n/a	-4.8	-9.1	n/a	0	0	0.0
13/05/2012	-0.3	-2.2	-1.2	0.9	0.0	n/a	-1.9	-4.4	n/a	0	0	0.0
14/05/2012	-2.4	-3.2	-2.2	-1.3	-1.4	n/a	-3.7	-4.7	n/a	0	0	0.0
15/05/2012	-1.5	-2.3	-1.4	0.5	0.0	n/a	-3.0	-3.9	n/a	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
16/05/2012	-1.2	-2.5	-2.0	0.7	-0.8	n/a	-2.7	-3.8	n/a	0	0	0.0
17/05/2012	-3.1	-5.2	-4.3	-1.3	-2.6	n/a	-4.7	-7.0	n/a	0	0	0.0
18/05/2012	-4.3	-4.4	-3.0	-1.9	-0.4	n/a	-7.8	-9.4	n/a	0	0	0.0
19/05/2012	-1.5	-1.4	0.1	1.1	3.1	n/a	-5.6	-6.9	n/a	0	0	0.0
20/05/2012	0.2	0.4	0.7	3.2	2.8	n/a	-1.7	-1.4	n/a	0	0	0.0
21/05/2012	1.3	1.5	3.5	5.8	5.3	n/a	-1.8	-0.5	n/a	0	0	0.0
22/05/2012	2.7	2.7	5.4	6.0	7.9	n/a	-1.6	-2.6	n/a	0	0	0.0
23/05/2012	-0.2	-0.9	-1.8	2.9	3.9	n/a	-5.2	-5.3	n/a	0	0	0.0
24/05/2012	-5.2	-4.8	-4.9	-0.1	0.9	n/a	-8.7	-8.3	n/a	0	0	0.0
25/05/2012	1.7	1.5	3.1	7.3	7.0	n/a	-5.2	-5.5	n/a	0	0	0.0
26/05/2012	2.0	5.4	6.6	5.2	11.5	n/a	-2.7	-0.3	n/a	0	0	0.0
27/05/2012	2.3	4.7	6.7	5.6	8.8	n/a	-1.4	-0.4	n/a	0	0	0.0
28/05/2012	4.7	7.1	10.1	9.0	14.2	n/a	0.0	0.2	n/a	0	0	0.0
29/05/2012	6.4	7.7	7.8	9.3	10.7	n/a	2.8	3.4	n/a	0	0	0.0
30/05/2012	1.1	2.6	2.1	2.9	5.3	n/a	0.1	-0.1	n/a	0	0	0.0
31/05/2012	0.9	0.6	2.6	4.0	3.1	n/a	-1.2	-1.4	n/a	1.3	0	0.0
01/06/2012	1.8	2.7	5.2	6.1	7.1	n/a	-1.6	-1.5	n/a	0.8	0	0.0
02/06/2012	3.0	4.2	4.7	7.0	7.8	n/a	-1.7	-0.7	n/a	1.0	0	0.0
03/06/2012	4.7	5.1	5.3	8.6	10.1	n/a	1.4	1.9	n/a	0	0	0.0
04/06/2012	8.7	9.7	11.5	14.9	15.9	n/a	0.6	2.4	n/a	0.8	0.5	0.0
05/06/2012	9.8	11.2	11.5	18.2	18.3	n/a	1.5	3.3	n/a	1.5	1.0	0.0
06/06/2012	13.0	12.9	10.8	20.0	19.3	n/a	4.7	7.0	n/a	0.8	0	0.0
07/06/2012	5.8	5.6	5.9	10.6	10.5	n/a	2.0	1.9	n/a	0	0	0.0
08/06/2012	5.6	6.1	4.9	10.7	10.2	n/a	-0.4	1.2	n/a	0	0	0.0
09/06/2012	2.7	2.3	2.3	5.6	4.9	n/a	-0.2	0.6	n/a	0	0	0.0
10/06/2012	2.7	2.4	2.3	5.0	5.3	n/a	0.2	-0.2	n/a	0	0	0.0
11/06/2012	2.4	2.4	4.1	4.5	4.5	n/a	0.8	0.8	n/a	0	0	0.0
12/06/2012	3.6	3.9	3.8	6.6	6.9	n/a	0.9	1.4	n/a	0	0	0.0
13/06/2012	3.0	2.7	2.5	5.6	5.8	n/a	0.2	0.4	n/a	0	0	0.0
14/06/2012	3.8	3.9	4.1	7.6	7.2	n/a	1.0	1.5	n/a	0	0.3	0.0
15/06/2012	5.2	6.1	5.8	9.7	9.7	n/a	1.9	3.0	n/a	0	0.8	0.0
16/06/2012	9.9	10.4	11.3	16.7	16.3	n/a	0.3	3.5	n/a	0.5	0	0.0
17/06/2012	11.4	12.2	12.7	17.7	16.6	n/a	3.6	5.6	n/a	0	0	0.0
18/06/2012	12.2	12.9	13.8	18.4	18.9	n/a	4.9	6.2	n/a	0	0	0.0
19/06/2012	8.6	7.8	6.8	13.0	13.6	n/a	4.0	4.3	n/a	2.3	2.3	0.0
20/06/2012	7.6	7.1	6.6	15.6	14.2	n/a	3.0	3.3	n/a	3.3	1.8	0.0
21/06/2012	6.7	7.0	7.8	11.0	11.7	n/a	3.5	3.8	n/a	0	0	0.0
22/06/2012	7.8	7.0	8.2	11.4	10.9	n/a	4.5	3.8	n/a	0	0.3	0.0
23/06/2012	12.5	13.1	14.5	20.3	21.6	n/a	5.0	5.7	n/a	0	0.3	0.0
24/06/2012	13.0	13.3	13.4	17.2	16.5	n/a	7.8	9.0	n/a	1.3	2.5	0.0
25/06/2012	13.8	14.3	14.2	19.4	19.8	n/a	5.3	7.6	n/a	0	0	0.0
26/06/2012	10.3	10.9	12.0	13.7	14.1	n/a	5.7	6.7	n/a	0	0	0.0
27/06/2012	9.2	9.7	12.1	12.1	12.6	n/a	5.6	7.0	n/a	0	0	0.0
28/06/2012	9.5	9.3	10.6	12.8	11.6	n/a	6.9	6.8	n/a	0	0	0.0
29/06/2012	9.5	9.5	11.5	12.0	12.1	n/a	8.0	8.0	n/a	3.8	3.6	0.0
30/06/2012	12.6	12.3	14.5	17.7	17.1	n/a	6.3	7.0	n/a	0	0	0.0
01/07/2012	16.2	16.7	18.1	21.6	21.3	n/a	6.5	10.8	n/a	0	0	0.0
02/07/2012	17.0	17.2	18.7	21.7	21.1	n/a	10.1	12.7	n/a	0	0	0.0
03/07/2012	14.7	15.4	17.2	19.4	19.4	n/a	8.4	10.9	n/a	0	0	0.0
04/07/2012	16.5	16.5	17.9	20.6	19.6	n/a	11.7	13.4	n/a	0	0	0.0
05/07/2012	16.0	16.1	16.7	20.3	19.6	n/a	11.1	11.1	n/a	0	0	0.0
06/07/2012	17.5	17.3	17.7	22.1	20.9	n/a	10.4	12.9	n/a	0	0	0.0
07/07/2012	18.6	18.6	19.0	24.5	24.4	n/a	11.5	11.4	n/a	1.8	0	0.0
08/07/2012	18.7	18.5	19.3	24.5	24.1	n/a	11.6	14.4	n/a	0	0.5	0.0
09/07/2012	18.3	17.5	17.6	23.6	22.3	n/a	11.2	13.3	n/a	3.8	6.6	0.0
10/07/2012	19.3	18.1	18.1	24.7	23.6	n/a	13.0	13.1	n/a	3.8	0	0.0
11/07/2012	15.2	13.4	12.9	18.9	16.5	n/a	11.5	10.8	n/a	2.0	8.6	0.0
12/07/2012	13.6	12.5	13.4	16.6	15.5	n/a	9.4	9.9	n/a	0.3	0.3	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
13/07/2012	12.7	12.4	14.0	16.4	15.6	n/a	9.0	9.0	n/a	0	0	0.0
14/07/2012	13.9	14.5	15.5	18.1	18.1	n/a	7.5	10.1	n/a	0	0	0.0
15/07/2012	15.5	16.6	17.3	21.4	21.7	n/a	7.1	11.3	n/a	0	0	0.0
16/07/2012	18.0	17.7	17.8	24.4	24.2	n/a	10.9	12.9	n/a	0	0	0.0
17/07/2012	13.9	13.8	15.1	18.2	17.3	n/a	11.9	12.2	n/a	3.6	1.8	0.0
18/07/2012	16.6	15.3	15.3	21.9	20.4	n/a	10.7	11.9	n/a	0	0.5	0.0
19/07/2012	13.7	13.0	13.4	15.8	14.8	n/a	11.7	11.7	n/a	0	0	0.0
20/07/2012	12.1	11.1	11.0	13.8	13.0	12.1	10.8	9.1	9.8	0	0	0.0
21/07/2012	12.8	12.8	14.4	17.8	18.5	18.6	8.6	8.9	9.2	0	0	0.0
22/07/2012	16.3	16.4	18.7	23.5	22.5	24.8	5.8	9.2	11.6	0	0	0.0
23/07/2012	11.8	10.8	10.1	16.5	17.5	16.7	8.1	7.4	7.3	0	0	0.2
24/07/2012	12.2	12.5	14.7	19.9	20.5	22.4	3.1	4.5	5.9	0	0	0.1
25/07/2012	12.4	12.5	12.7	17.2	16.4	17.5	8.8	7.4	7.4	3.6	0	0.0
26/07/2012	11.2	10.2	10.2	19.4	18.4	17.6	3.5	4.1	5.2	1.5	4.8	2.9
27/07/2012	8.2	7.6	7.9	10.7	10.3	9.6	6.2	6.0	6.6	0.3	0.5	3.3
28/07/2012	8.8	7.7	8.2	11.6	11.1	10.3	4.2	4.3	6.3	0	0.5	0.2
29/07/2012	11.1	10.7	11.1	17.9	17.1	15.0	3.2	3.2	7.0	0	0	0.1
30/07/2012	9.0	8.3	8.4	12.0	10.4	11.2	6.5	6.3	6.5	0	0	0.0
31/07/2012	8.8	9.2	10.1	13.7	14.4	15.0	5.2	5.5	4.8	0	0	0.0
01/08/2012	11.6	12.8	13.9	17.7	19.0	18.9	2.4	6.0	6.3	0	0	0.0
02/08/2012	13.6	15.5	15.5	19.6	20.8	20.3	3.5	10.0	10.1	0	0	0.0
03/08/2012	16.1	16.5	18.6	23.4	22.9	24.7	6.3	8.5	10.5	0	0	0.0
04/08/2012	15.8	15.8	18.0	21.3	20.3	22.6	10.7	12.4	13.2	0	0	0.0
05/08/2012	15.9	14.2	14.0	19.2	17.5	17.4	11.8	10.2	10.7	0	0	1.0
06/08/2012	11.3	10.9	12.0	14.4	15.6	14.7	7.8	8.7	9.2	0	0	0.0
07/08/2012	14.7	14.4	16.7	21.7	21.6	23.7	6.3	7.9	9.3	0	0	0.0
08/08/2012	17.6	16.5	17.2	22.3	22.3	20.0	10.7	10.4	13.0	0	0	0.0
09/08/2012	15.2	13.6	13.0	20.3	19.3	17.6	11.8	10.5	10.6	2.3	4.3	0.4
10/08/2012	11.9	10.4	10.0	14.4	11.2	11.0	10.7	9.0	8.6	12.4	12.2	2.7
11/08/2012	10.9	10.0	10.4	14.7	13.6	14.4	7.8	7.8	8.0	0.5	0.3	29.2
12/08/2012	8.5	7.3	7.3	10.7	9.8	9.1	6.9	5.2	3.9	2.3	4.3	0.3
13/08/2012	8.8	7.9	7.9	13.4	12.5	12.3	3.1	3.2	3.3	0	0	0.0
14/08/2012	7.1	5.6	5.1	8.9	8.4	8.0	3.4	2.2	1.6	0.3	1.3	1.7
15/08/2012	3.0	2.8	3.6	6.0	6.5	7.1	-0.3	1.0	1.4	0.3	0	3.8
16/08/2012	5.3	4.6	5.6	8.8	8.8	8.2	0.2	0.6	2.6	0	0	0.0
17/08/2012	8.4	8.6	10.4	15.6	13.8	14.3	0.8	0.8	3.9	2.3	2.3	0.0
18/08/2012	13.5	12.9	15.3	22.3	20.7	21.5	5.8	6.8	9.3	0.5	0.3	1.3
19/08/2012	15.6	14.0	15.2	23.1	18.3	18.2	11.9	10.1	11.2	0.5	7.4	0.0
20/08/2012	11.2	10.2	10.2	14.4	13.5	13.1	6.2	6.2	7.5	0	0.3	1.5
21/08/2012	10.4	9.6	9.0	15.6	14.9	12.2	3.9	5.3	6.8	0	0	0.3
22/08/2012	9.1	8.1	8.6	14.9	14.2	11.1	2.7	3.4	6.8	0	0	0.0
23/08/2012	8.7	8.8	8.8	12.9	13.9	11.3	4.5	3.8	7.2	0	0	0.0
24/08/2012	8.9	8.9	9.3	12.2	11.3	12.7	5.8	6.2	5.0	0	0	0.0
25/08/2012	9.7	9.6	11.3	12.5	13.9	15.5	6.7	6.7	7.7	0	0	0.0
26/08/2012	11.5	11.6	13.1	15.6	16.2	18.2	6.6	7.9	7.3	0	0	0.0
27/08/2012	10.5	10.0	10.8	17.3	15.5	14.3	4.6	6.2	8.7	9.7	8.9	0.1
28/08/2012	10.6	10.4	10.6	15.9	15.6	14.8	4.3	4.4	6.3	0	0	8.9
29/08/2012	8.2	7.9	8.3	12.7	11.0	10.3	4.1	5.9	6.4	0.3	0.8	0.0
30/08/2012	8.3	6.8	7.6	10.2	8.6	9.2	6.8	5.1	5.3	1.0	0.3	0.0
31/08/2012	7.9	7.7	11.2	13.6	13.1	15.5	2.1	2.1	5.5	0	0	0.3
01/09/2012	8.7	7.7	8.9	13.0	11.1	13.1	3.5	4.1	4.3	0	0	0.0
02/09/2012	6.4	6.1	7.4	11.8	10.3	11.6	2.3	2.8	2.4	0	0	0.1
03/09/2012	9.3	8.9	12.2	16.5	15.8	19.3	3.0	4.7	6.3	0	0	0.0
04/09/2012	9.4	8.9	9.1	12.1	10.6	9.8	6.7	7.3	8.6	0	0	0.0
05/09/2012	10.3	9.7	11.0	17.1	15.6	17.6	3.2	6.1	7.4	0	0	0.6
06/09/2012	12.3	11.7	14.2	17.6	17.6	19.7	7.0	5.6	9.7	0	0	0.0
07/09/2012	10.2	10.0	10.9	14.0	13.6	14.9	6.0	6.2	8.4	7.9	11.7	0.0
08/09/2012	7.0	6.8	8.9	11.9	11.3	13.7	2.9	3.1	5.7	1.5	0	11.9

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
09/09/2012	6.9	6.4	7.8	13.2	11.7	12.1	-0.7	2.3	4.5	0.3	0.5	3.6
10/09/2012	7.3	7.3	6.4	11.7	9.9	8.4	3.1	4.8	3.5	0	0	0.0
11/09/2012	5.7	4.6	4.9	7.2	7.2	7.1	3.0	0.8	1.5	0	0	0.0
12/09/2012	1.4	0.9	2.4	4.7	3.7	5.0	-1.1	-1.5	-0.2	0	0.3	0.0
13/09/2012	4.4	3.6	5.0	6.7	5.9	7.0	0.9	1.5	3.2	1.8	3.3	0.0
14/09/2012	2.2	1.5	3.3	5.2	4.9	5.6	-2.0	-1.8	1.1	0	0	2.6
15/09/2012	1.4	1.9	2.8	4.3	4.5	5.5	-0.2	0.4	0.6	0	0.3	0.6
16/09/2012	2.7	2.4	3.8	-1.0	5.5	6.5	7.3	0.1	0.1	0	0.5	4.4
17/09/2012	1.4	2.0	3.4	-3.7	5.4	6.4	5.6	-1.1	-0.3	0	0	0.1
18/09/2012	3.0	3.5	4.1	0.8	6.2	6.1	6.1	1.4	2.8	3.0	9.1	0.2
19/09/2012	4.4	4.3	3.2	3.1	6.4	5.9	6.1	2.5	1.3	0	0.5	10.9
20/09/2012	1.6	0.9	1.3	-2.5	4.8	3.9	3.2	-1.4	-0.3	0.3	0	3.6
21/09/2012	3.9	5.3	7.9	-2.2	14.5	15.6	13.7	-1.4	1.2	1.0	0.3	0.5
22/09/2012	8.3	7.5	9.3	4.2	13.7	15.2	14.7	2.8	4.7	0.5	1.5	0.0
23/09/2012	3.4	2.0	2.8	-0.4	4.1	4.9	5.0	-0.6	0.8	0.3	0.5	0.0
24/09/2012	0.0	0.8	3.4	-4.2	5.8	7.8	5.3	-2.6	-0.6	0	0	0.0
25/09/2012	6.2	7.5	9.4	2.6	12.5	12.9	11.0	1.9	6.2	0	0	0.0
26/09/2012	6.0	5.2	6.8	3.2	8.5	10.1	8.0	1.6	4.5	0	0	0.0
27/09/2012	7.5	7.0	9.5	4.5	12.4	13.7	13.2	1.4	4.7	0.3	0	0.0
28/09/2012	10.2	8.8	11.6	5.7	13.6	15.4	14.6	5.3	7.2	0.5	1.0	1.2
29/09/2012	6.4	5.0	5.8	-0.4	9.5	9.3	12.0	1.3	0.9	0	0	0.0
30/09/2012	2.2	1.9	3.2	-0.3	4.3	4.8	5.2	-0.8	1.3	0	0	0.0
01/10/2012	0.9	1.0	2.7	-1.7	3.0	5.5	2.8	-0.5	1.5	0	0	0.1
02/10/2012	-1.2	-1.8	-0.9	-3.4	1.5	1.9	1.1	-4.2	-2.6	0	0	1.4
03/10/2012	-0.9	-0.8	0.7	-4.2	4.6	4.1	5.2	-4.6	-2.7	0	0	1.3
04/10/2012	1.5	1.7	3.5	-1.2	4.7	6.5	5.4	-0.7	-0.2	0	0	0.3
05/10/2012	2.7	2.3	3.9	0.4	6.4	7.2	5.8	-0.3	1.2	0	0	0.0
06/10/2012	0.1	-0.9	0.3	-1.2	1.5	1.3	2.2	-2.7	-0.6	0	0	0.0
07/10/2012	-1.5	-1.9	-0.8	-3.1	-1.3	0.8	-0.9	-3.3	-2.2	0	0	0.1
08/10/2012	-3.5	-4.1	-2.5	-4.5	-3.2	-1.1	-2.7	-5.2	-4.9	0	0	0.0
09/10/2012	-3.8	-4.3	-1.6	-8.1	-0.3	0.6	-1.3	-7.1	-3.3	0	0	0.0
10/10/2012	-5.9	-6.5	-4.8	-8.1	-2.5	-1.3	-2.2	-9.3	-7.5	0	1.8	0.1
11/10/2012	-5.3	-6.5	-5.2	-9.4	-3.0	-1.6	-3.0	-10.6	-7.8	0	0	0.0
12/10/2012	-8.8	-10.4	-7.7	-12.5	-8.4	-6.1	-7.2	-12.9	-9.5	0	0	0.0
13/10/2012	-9.0	-9.3	-6.3	-13.7	-4.8	-4.4	-4.0	-13.0	-9.8	0	0	0.0
14/10/2012	-8.8	-8.0	-4.7	-14.1	-6.5	-2.9	-4.8	-9.9	-7.4	0	0	0.0
15/10/2012	-5.8	-6.1	-4.9	-6.9	-4.8	-4.2	-3.9	-6.9	-6.2	0	0	0.0
16/10/2012	-6.1	-6.8	-5.5	-6.7	-5.9	-4.8	-3.8	-7.5	-6.4	0	0	0.0
17/10/2012	-4.6	-4.8	-4.4	-7.0	-3.6	-3.0	-3.4	-6.2	-5.6	0.3	0	0.0
18/10/2012	-4.8	-5.0	-2.9	-6.7	-3.6	-1.7	-2.3	-6.3	-3.9	0.3	0	0.0
19/10/2012	-3.2	-3.4	-2.4	-4.8	-1.6	-0.9	-0.8	-5.1	-4.5	0	0	0.0
20/10/2012	-1.0	-1.4	-0.8	-1.5	-0.8	-0.2	-0.3	-2.4	-1.4	1.0	0	0.0
21/10/2012	-2.6	-3.7	-1.7	-6.3	-1.5	-0.4	-1.1	-7.5	-3.1	1.0	0.5	0.0
22/10/2012	-8.4	-7.6	-5.6	-11.5	-6.3	-2.9	-6.1	-10.9	-8.4	0	0	0.0
23/10/2012	-11.1	-9.6	-6.6	-12.3	-6.4	-4.0	-7.9	-11.3	-8.7	0	0.3	0.0
24/10/2012	-10.6	-9.6	-8.0	-13.9	-7.4	-6.6	-8.3	-11.1	-9.7	0	0	0.0
25/10/2012	-11.8	-13.1	-10.0	-15.4	-10.9	-8.7	-10.4	-16.9	-12.1	0	0	0.0
26/10/2012	-11.7	-11.0	-8.3	-14.2	-9.5	-6.8	-9.2	-14.0	-11.6	0	0	0.0
27/10/2012	-11.0	-11.3	-8.5	-15.4	-8.8	-6.8	-9.1	-16.3	-10.9	0	0.5	0.0
28/10/2012	-14.0	-16.8	-14.0	-20.1	-12.5	-10.2	-11.5	-20.0	-18.4	0	0	0.0
29/10/2012	-13.8	-15.0	-12.9	-20.2	-11.9	-9.9	-11.0	-21.0	-17.5	0	0	0.0
30/10/2012	-16.6	-17.7	-15.5	-22.4	-15.4	-13.9	-14.7	-21.6	-18.6	0	0	0.0
31/10/2012	-19.5	-18.8	-14.5	-25.1	-12.4	-10.4	-11.2	-25.1	-17.9	0	0.3	0.0
01/11/2012	-11.9	-12.4	-10.4	-12.7	-11.3	-9.5	-10.5	-13.1	-11.2	0	0	0.0
02/11/2012	-14.0	-13.8	-11.6	-22.0	-12.1	-10.9	-12.0	-16.6	-13.7	0	0	0.0
03/11/2012	-16.9	-16.2	-14.1	-19.8	-10.1	-7.8	-11.0	-20.8	-18.3	0	0	0.0
04/11/2012	-8.4	-9.1	-8.8	-12.8	-6.6	-6.5	-5.3	-12.3	-11.4	1.5	2.5	0.0
05/11/2012	-14.0	-15.2	-14.2	-19.4	-12.3	-11.2	-11.8	-18.5	-16.8	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
06/11/2012	-18.6	-18.1	-15.6	-20.8	-16.4	-14.0	-16.8	-19.8	-17.2	0	0	0.0
07/11/2012	-18.1	-17.0	-14.9	-22.2	-14.1	-12.9	-14.7	-19.1	-17.0	0	0	0.0
08/11/2012	-16.8	-17.6	-14.7	-21.3	-13.9	-12.2	-14.0	-20.9	-17.8	0	0	0.0
09/11/2012	-16.4	-15.9	-11.9	-17.9	-14.2	-10.5	-14.5	-17.8	-13.7	0	0.3	0.0
10/11/2012	-13.2	-14.8	-12.7	-18.0	-11.3	-11.0	-8.9	-18.5	-14.7	1.8	3.8	0.0
11/11/2012	-13.3	-15.3	-11.8	-16.4	-11.7	-8.9	-11.1	-19.1	-15.1	0	0	0.0
12/11/2012	-17.5	-18.6	-15.7	-20.0	-15.1	-12.6	-15.1	-21.2	-17.5	0	0	0.0
13/11/2012	-17.9	-19.0	-15.2	-20.7	-16.7	-13.6	-15.0	-21.7	-16.8	0	0.3	0.0
14/11/2012	-17.8	-19.5	-16.9	-23.5	-16.1	-14.5	-15.1	-24.6	-19.9	0	0	0.0
15/11/2012	-23.6	-24.6	-20.1	-26.4	-22.9	-18.7	-20.8	-26.8	-21.3	0	0	0.0
16/11/2012	-21.1	-20.7	-17.0	-26.2	-17.3	-14.9	-17.6	-26.5	-20.6	0	0	0.0
17/11/2012	-23.6	-24.5	-19.7	-25.8	-21.5	-17.0	-22.5	-27.5	-22.6	0	0	0.0
18/11/2012	-24.3	-22.9	-20.4	-29.4	-19.1	n/a	-19.5	-28.6	n/a	0	0	0.0
19/11/2012	-18.7	-18.6	-17.5	-19.9	-17.1	n/a	-17.0	-19.8	n/a	0	0	n/a
20/11/2012	-18.3	-19.6	-18.8	-21.8	-17.8	n/a	-17.0	-23.0	n/a	4.3	0	n/a
21/11/2012	-23.3	-23.7	-22.0	-25.0	-19.8	n/a	-20.4	-25.3	n/a	0.3	0	n/a
22/11/2012	-18.5	-18.9	-17.7	-23.7	-16.1	n/a	-15.7	-24.1	n/a	0	0	n/a
23/11/2012	-23.3	-23.4	-18.7	-26.1	-20.6	n/a	-20.9	-25.5	n/a	0	0	n/a
24/11/2012	-26.6	-27.2	-24.4	-29.8	-23.1	-15.2	-21.8	-29.6	-26.8	0	0	n/a
25/11/2012	-26.7	-25.5	-21.4	-30.5	-21.3	n/a	-21.7	-30.8	n/a	0	0	0.0
26/11/2012	-23.0	-23.6	n/a	-26.2	-21.3	n/a	-21.7	-26.7	n/a	0	0	n/a
27/11/2012	-25.5	-25.6	-22.9	-27.4	-23.2	n/a	-23.9	-27.7	n/a	0	0	n/a
28/11/2012	-24.6	-25.4	n/a	-26.6	-23.1	n/a	-22.0	-26.8	n/a	0	0	n/a
29/11/2012	-26.6	-27.2	-25.5	-31.1	-24.1	n/a	-23.8	-30.9	n/a	0	0	n/a
30/11/2012	-31.8	-31.1	-28.7	-35.2	-27.7	n/a	-29.8	-35.1	n/a	0	0	n/a
01/12/2012	-35.0	-34.4	n/a	-35.9	-30.1	n/a	-34.2	-37.4	n/a	0	0	n/a
02/12/2012	-36.0	-35.9	n/a	-37.9	-34.6	n/a	-33.1	-37.0	n/a	0.3	0	n/a
03/12/2012	-32.1	-32.3	n/a	-34.8	-30.3	n/a	-27.7	-35.0	n/a	0	0	n/a
04/12/2012	-26.7	-27.1	n/a	-28.8	-22.5	n/a	-25.4	-30.6	n/a	0	0	n/a
05/12/2012	-27.5	-28.0	n/a	-31.3	-24.0	n/a	-23.7	-31.0	n/a	0	0	n/a
06/12/2012	-31.4	-31.0	n/a	-33.4	-28.8	n/a	-29.1	-33.2	n/a	0	0	n/a
07/12/2012	-26.1	-25.4	n/a	-29.3	-22.4	n/a	-22.4	-28.8	n/a	0	0	n/a
08/12/2012	-26.3	-26.6	n/a	-29.0	-24.7	n/a	-24.2	-28.4	n/a	0	0	n/a
09/12/2012	-30.1	-30.4	n/a	-32.8	-26.8	n/a	-27.8	-33.6	n/a	0	0	n/a
10/12/2012	-31.3	-30.7	n/a	-33.0	-27.4	n/a	-29.1	-33.0	n/a	0	0	n/a
11/12/2012	-30.3	-30.0	n/a	-35.4	-26.0	n/a	-26.9	-34.4	n/a	0	0	n/a
12/12/2012	-33.2	-33.2	n/a	-35.3	-31.8	n/a	-30.8	-34.9	n/a	0	0	n/a
13/12/2012	-33.3	-33.7	n/a	-34.6	-32.0	n/a	-28.8	-35.0	n/a	0	0	n/a
14/12/2012	-24.8	-24.8	n/a	-28.8	-22.1	n/a	-21.3	-32.0	n/a	0	0	n/a
15/12/2012	-25.7	-26.9	n/a	-32.8	-24.1	n/a	-21.5	-30.0	n/a	0	0	n/a
16/12/2012	-33.3	-31.1	n/a	-35.9	-28.7	n/a	-31.4	-33.7	n/a	0	0	n/a
17/12/2012	-24.5	-23.0	n/a	-34.5	-17.1	n/a	-14.3	-31.8	n/a	0.3	0	n/a
18/12/2012	-23.3	-26.2	n/a	-31.6	-16.7	n/a	-14.1	-33.1	n/a	0.3	0	n/a
19/12/2012	-30.4	-26.9	n/a	-32.1	-19.2	n/a	-27.9	-33.1	n/a	0	0	n/a
20/12/2012	-25.8	-22.2	n/a	-29.7	-19.4	n/a	-22.0	-23.5	n/a	2.5	0	n/a
21/12/2012	-23.6	-24.3	n/a	-25.4	-23.0	n/a	-22.5	-26.2	n/a	0.8	0	n/a
22/12/2012	-27.9	-29.1	n/a	-31.0	-26.1	n/a	-25.3	-31.1	n/a	0	0	n/a
23/12/2012	-31.9	-30.2	n/a	-34.7	-29.3	n/a	-30.7	-32.1	n/a	0	0	n/a
24/12/2012	-32.6	-28.6	n/a	-34.8	-25.8	n/a	-29.4	-33.4	n/a	0.3	0	n/a
25/12/2012	-26.7	-25.0	n/a	-29.6	-23.9	n/a	-24.4	-26.5	n/a	0.5	0	n/a
26/12/2012	-27.1	-25.1	n/a	-29.7	-23.3	n/a	-20.8	-27.6	n/a	0	0	n/a
27/12/2012	-21.3	-21.3	n/a	-23.8	-19.3	n/a	-20.2	-24.6	n/a	0	0	n/a
28/12/2012	-23.6	-24.5	n/a	-26.5	-21.7	n/a	-21.3	-27.1	n/a	0	0	n/a
29/12/2012	-25.5	-27.0	n/a	-30.4	-24.6	n/a	-22.5	-29.9	n/a	0	0	n/a
30/12/2012	-27.2	-26.7	n/a	-30.2	-24.2	n/a	-24.7	-30.0	n/a	0	0	n/a
31/12/2012	-28.1	-27.2	n/a	-32.8	-23.4	n/a	-23.3	-31.3	n/a	0	0	n/a
01/01/2013	-24.3	-24.9	n/a	-22.0	-21.0	n/a	-30.5	-30.1	n/a	0	0	0.0
02/01/2013	-28.9	-28.9	n/a	-21.2	-22.0	n/a	-34.9	-34.8	n/a	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
03/01/2013	-24.3	-24.8	n/a	-19.4	-20.0	n/a	-28.2	-27.9	n/a	0.8	0	0.0
04/01/2013	-20.6	-20.6	n/a	-18.6	-18.9	n/a	-22.7	-22.7	n/a	0	0	0.0
05/01/2013	-23.9	-23.1	n/a	-19.4	-20.2	n/a	-28.4	-26.8	n/a	0	0	0.0
06/01/2013	-26.1	-26.1	n/a	-22.7	-22.9	n/a	-29.9	-29.1	n/a	0	0	0.0
07/01/2013	-29.9	-29.4	n/a	-26.8	-25.7	n/a	-35.2	-34.7	n/a	0	0	0.0
08/01/2013	-36.9	-36.6	n/a	-33.7	-33.7	n/a	-39.2	-39.0	n/a	0	0	0.0
09/01/2013	-38.4	-38.0	n/a	-36.6	-34.7	n/a	-40.5	-39.5	n/a	0	0	0.0
10/01/2013	-33.1	-33.4	n/a	-27.8	-27.7	n/a	-39.5	-39.8	n/a	0	0	0.0
11/01/2013	-29.4	-30.3	n/a	-27.5	-27.8	n/a	-31.7	-32.9	n/a	0	0	0.0
12/01/2013	-33.5	-33.0	n/a	-27.3	-26.8	n/a	-38.0	-36.9	n/a	0	0	0.0
13/01/2013	-35.2	-34.1	n/a	-32.0	-30.3	n/a	-40.1	-39.2	n/a	0	0	0.0
14/01/2013	-38.2	-38.4	n/a	-34.6	-34.8	n/a	-41.1	-41.2	n/a	0	0	0.0
15/01/2013	-38.3	-38.0	n/a	-37.0	-36.0	n/a	-40.4	-40.0	n/a	0	0	0.0
16/01/2013	-34.5	-35.8	-32.5	-31.5	-33.4	n/a	-37.7	-38.9	n/a	0	0	0.0
17/01/2013	-36.0	-35.8	-31.8	-34.2	-33.9	n/a	-37.8	-37.5	n/a	0	0	0.0
18/01/2013	-37.1	-37.8	-33.1	-35.8	-35.5	n/a	-38.2	-39.1	n/a	0	0	0.0
19/01/2013	-34.1	-34.1	-32.0	-27.5	-28.1	n/a	-37.5	-38.5	n/a	0	0	0.0
20/01/2013	-29.2	-29.2	-27.8	-27.6	-27.6	n/a	-31.6	-30.0	n/a	0	0	0.0
21/01/2013	-27.7	-28.0	n/a	-25.8	-25.8	n/a	-29.1	-29.7	n/a	0	0	0.0
22/01/2013	-31.8	-29.6	-28.6	-26.1	-26.2	n/a	-37.1	-33.7	n/a	0	0	0.0
23/01/2013	-35.5	-35.2	-28.8	-33.2	-32.8	n/a	-37.2	-37.7	n/a	0	0	0.0
24/01/2013	-36.7	-37.0	-30.2	-32.8	-35.4	n/a	-39.1	-38.5	n/a	0	0	0.0
25/01/2013	-26.6	-27.9	-24.5	-23.1	-24.2	n/a	-31.7	-35.5	n/a	0	0	0.0
26/01/2013	-31.3	-32.0	-26.3	-26.1	-28.4	-19.0	-35.3	-35.1	-35.2	0	0	0.0
27/01/2013	-25.7	-27.5	-26.9	-24.4	-24.8	-23.3	-29.4	-29.3	-34.3	0	0	0.0
28/01/2013	-30.1	-31.6	-33.0	-25.9	-29.0	-29.6	-32.8	-34.5	-34.2	0	0	0.0
29/01/2013	-35.2	-35.9	-31.7	-32.2	-33.4	-29.8	-36.7	-37.7	-32.6	0	0	0.0
30/01/2013	-34.7	-35.0	-31.1	-31.9	-32.3	-29.6	-36.6	-36.9	-32.9	0	0	0.0
31/01/2013	-36.0	-35.5	-31.1	-33.8	-31.6	-27.6	-38.2	-37.0	-33.2	0	0	0.0
01/02/2013	-35.7	-35.2	-30.9	-31.1	-30.1	-28.7	-38.1	-37.5	-32.9	0	0	0.0
02/02/2013	-31.9	-31.5	-30.7	-29.1	-29.8	-27.7	-34.8	-33.1	-31.8	0	0	0.0
03/02/2013	-31.6	-31.0	-29.6	-29.1	-29.4	-28.0	-35.0	-34.2	-32.9	0	0	0.0
04/02/2013	-35.2	-34.5	-30.2	-32.7	-32.0	-28.1	-37.5	-37.0	-33.2	0	0	0.0
05/02/2013	-36.0	-36.1	-30.8	-33.7	-33.6	-20.8	-38.0	-38.5	-30.2	0	0	0.0
06/02/2013	-32.4	-33.8	-25.6	-25.1	-28.2	-21.9	-35.9	-36.5	-32.8	0	0	0.0
07/02/2013	-29.3	-30.0	-29.0	-24.2	-24.3	-25.8	-37.5	-35.8	-33.9	0	0	0.0
08/02/2013	-33.4	-32.3	-29.0	-29.2	-29.3	-22.7	-38.0	-37.0	-27.4	0	0	0.0
09/02/2013	-27.2	-27.9	-25.3	-23.4	-24.0	-14.4	-32.3	-30.7	-24.0	0	0	0.0
10/02/2013	-20.1	-21.6	-19.5	-15.0	-15.8	-14.5	-25.6	-25.3	-26.7	2.8	0	0.0
11/02/2013	-18.9	-19.9	-20.5	-14.2	-15.1	-25.8	-24.5	-26.2	-30.7	0	0	0.0
12/02/2013	-25.7	-25.4	-27.2	-24.2	-23.3	-30.4	-27.9	-26.8	-33.5	0	0	0.0
13/02/2013	-30.5	-30.4	-32.3	-23.9	-24.4	-27.4	-36.2	-33.5	-36.4	0	0	0.0
14/02/2013	-35.9	-34.1	-32.8	-32.1	-30.0	-23.8	-40.6	-37.6	-29.6	0	0	0.0
15/02/2013	-27.9	-26.8	-26.3	-24.8	-23.7	-28.9	-31.7	-33.6	-35.8	0	0	0.0
16/02/2013	-30.8	-31.6	-33.7	-25.3	-26.3	-29.3	-37.9	-34.3	-36.7	0	0	0.0
17/02/2013	-38.3	-34.5	-32.8	-34.8	-29.2	-27.7	-41.5	-37.1	-33.7	0	0	0.0
18/02/2013	-29.0	-29.6	-30.8	-25.4	-25.8	-23.8	-35.8	-35.7	-32.4	0	0	0.0
19/02/2013	-26.3	-25.2	-28.4	-24.6	-23.4	-23.2	-28.8	-27.1	-26.3	0	0	0.0
20/02/2013	-23.9	-24.9	-25.5	-18.9	-21.1	-25.9	-26.7	-27.0	-29.6	2.8	0	0.0
21/02/2013	-23.3	-24.4	-28.6	-20.1	-21.6	-26.3	-27.1	-27.1	-28.9	0	0	0.0
22/02/2013	-22.7	-25.6	-27.5	-20.6	-21.7	-25.4	-25.7	-27.2	-29.6	0	0	0.0
23/02/2013	-27.0	-27.5	-26.7	-25.0	-26.2	-25.1	-28.7	-28.9	-29.8	0	0	0.0
24/02/2013	-28.4	-27.2	-27.3	-26.3	-24.9	-27.8	-30.1	-29.3	-32.5	0	0	0.0
25/02/2013	-31.8	-30.6	-30.3	-29.3	-27.2	-29.7	-34.7	-33.4	-33.8	0	0	0.0
26/02/2013	-34.8	-31.3	-32.0	-32.8	-25.4	-28.1	-38.4	-34.0	-32.7	0	0	0.0
27/02/2013	-36.1	-32.3	-30.4	-32.1	-26.5	-25.1	-39.0	-36.2	-30.7	0	0	0.0
28/02/2013	-33.6	-33.6	-28.4	-27.6	-27.8	-11.4	-38.5	-37.7	-25.4	0	0	0.0
01/03/2013	-18.2	-21.1	-17.5	-11.3	-12.2	-11.9	-27.1	-30.8	-24.3	1.5	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
02/03/2013	-15.6	-17.9	-18.2	-11.7	-12.2	-20.6	-20.2	-21.8	-27.7	0.3	0	0.0
03/03/2013	-21.5	-23.3	-24.3	-19.4	-21.7	-26.2	-24.4	-26.6	-28.7	0	0	0.0
04/03/2013	-27.6	-27.4	-27.1	-23.4	-25.7	-26.4	-29.8	-29.3	-33.3	0	0	0.0
05/03/2013	-28.8	-30.0	-30.0	-27.1	-25.9	-29.6	-32.9	-34.3	-33.5	0	0	0.0
06/03/2013	-32.4	-32.5	-31.3	-30.6	-30.0	-28.6	-34.4	-34.6	-32.2	0	9.1	0.0
07/03/2013	-31.1	-31.8	-30.0	-28.5	-30.1	-29.5	-34.9	-34.8	-34.6	0.3	7.6	0.0
08/03/2013	-35.4	-34.2	-31.9	-31.6	-27.5	-27.2	-38.7	-39.1	-33.3	0	1.8	0.0
09/03/2013	-34.3	-33.1	-30.4	-29.1	-26.2	-18.9	-38.4	-37.5	-29.7	0	0.3	0.0
10/03/2013	-29.5	-28.8	-24.0	-21.7	-21.5	-22.8	-36.5	-35.7	-29.3	0	0	0.0
11/03/2013	-28.5	-28.9	-27.6	-21.7	-22.1	-26.6	-31.6	-31.6	-30.6	0	0	0.0
12/03/2013	-30.9	-30.4	-28.7	-27.2	-27.7	-29.3	-34.6	-34.3	-35.4	0	1.3	0.0
13/03/2013	-33.7	-32.6	-32.0	-31.1	-30.7	-26.2	-38.4	-34.4	-33.0	0	2.5	0.0
14/03/2013	-30.1	-30.6	-28.9	-27.5	-27.5	-27.9	-34.2	-33.1	-36.4	0	1.0	0.0
15/03/2013	-34.1	-33.4	-32.8	-30.4	-29.5	-21.1	-37.6	-36.6	-29.9	0	1.3	0.0
16/03/2013	-28.5	-28.3	-24.8	-23.0	-22.7	-21.1	-33.3	-33.2	-27.4	0	0	0.0
17/03/2013	-24.0	-24.7	-24.0	-22.0	-22.6	-27.2	-27.0	-30.0	-30.6	0	0	0.0
18/03/2013	-29.7	-29.8	-28.4	-26.6	-28.0	-26.8	-33.9	-33.1	-33.2	0	0	0.0
19/03/2013	-34.3	-33.6	-30.1	-30.2	-29.9	-22.1	-39.1	-36.1	-32.7	0	0.5	0.0
20/03/2013	-32.4	-32.0	-27.5	-26.0	-26.4	-17.3	-39.1	-38.0	-24.3	0	1.3	0.0
21/03/2013	-23.5	-23.0	-20.3	-19.7	-19.6	-16.3	-27.5	-26.7	-18.6	0	0.5	0.0
22/03/2013	-19.7	-19.8	-17.5	-17.6	-18.5	-14.8	-21.0	-20.6	-20.6	0	0	0.0
23/03/2013	-21.8	-22.2	-17.9	-19.0	-19.8	-12.9	-25.3	-24.9	-20.7	0	0	0.0
24/03/2013	-18.3	-20.3	-16.5	-13.6	-13.9	-12.5	-24.6	-25.1	-18.4	0	0	0.0
25/03/2013	-17.1	-17.9	-15.2	-11.6	-11.6	-13.1	-22.0	-22.1	-19.8	0	0	0.0
26/03/2013	-18.3	-18.4	-16.8	-13.9	-14.7	-11.8	-25.6	-21.9	-18.9	0	0	0.0
27/03/2013	-15.4	-16.1	-14.7	-11.9	-11.6	-12.9	-21.2	-20.7	-20.8	0	0	0.0
28/03/2013	-17.9	-18.5	-15.7	-13.4	-15.1	-15.7	-23.3	-22.3	-21.3	0	0	0.0
29/03/2013	-18.7	-19.8	-18.1	-11.8	-10.5	-14.8	-25.0	-25.6	-21.3	0	0	0.0
30/03/2013	-21.8	-19.9	-18.9	-18.7	-13.6	-14.3	-25.7	-23.5	-23.0	0	0	0.0
31/03/2013	-23.7	-21.9	-18.6	-17.0	-16.0	-13.6	-29.9	-28.0	-25.2	0	0	0.0
01/04/2013	-19.7	-21.3	-18.1	-11.3	-15.4	-22.3	-25.9	-25.6	-27.0	0	0	0.0
02/04/2013	-26.0	-25.6	-25.1	-22.9	-21.5	-20.1	-31.5	-29.3	-27.2	0	0	0.0
03/04/2013	-27.9	-27.5	-23.6	-22.8	-22.0	-23.7	-32.9	-32.2	-30.5	0	0	0.0
04/04/2013	-29.6	-28.7	-27.5	-27.4	-25.7	-23.9	-34.9	-32.4	-31.6	0	0	0.0
05/04/2013	-30.2	-29.8	-27.7	-25.3	-25.2	-18.0	-35.3	-34.2	-26.4	0	0	0.0
06/04/2013	-22.9	-23.1	-21.7	-18.1	-18.6	-12.8	-30.2	-29.4	-19.6	0	0	0.0
07/04/2013	-16.2	-16.7	-16.3	-11.7	-11.7	-0.5	-18.9	-20.0	-17.2	0	0	0.0
08/04/2013	-14.1	-12.9	-8.0	-7.8	-6.4	-2.9	-19.9	-20.5	-8.6	0	0	0.0
09/04/2013	-10.8	-9.5	-5.7	-5.2	-6.4	-1.5	-18.1	-14.4	-8.5	0	0	0.0
10/04/2013	-6.7	-7.3	-5.6	-2.9	-2.8	-3.3	-10.1	-11.6	-12.3	0	0	0.0
11/04/2013	-9.9	-11.0	-8.9	-3.9	-5.1	-8.7	-13.2	-13.6	-15.2	0	0	0.0
12/04/2013	-14.7	-14.2	-12.5	-11.2	-11.0	-8.8	-18.1	-18.2	-16.7	0	0	0.0
13/04/2013	-16.1	-17.1	-12.7	-8.3	-11.1	-8.6	-21.8	-23.2	-16.7	0	0	0.0
14/04/2013	-14.9	-15.9	-12.2	-8.5	-8.1	-10.9	-22.0	-22.4	-17.1	0	0	0.0
15/04/2013	-15.8	-15.4	-14.2	-12.6	-12.3	-11.3	-19.7	-20.1	-19.4	0	0	0.0
16/04/2013	-17.5	-17.9	-15.3	-12.6	-13.2	-13.2	-22.9	-22.2	-20.7	0	0	0.0
17/04/2013	-19.0	-19.0	-16.9	-13.2	-13.2	-9.3	-24.9	-24.3	-18.8	0	0	0.0
18/04/2013	-16.8	-16.8	-14.1	-10.6	-11.8	-9.4	-22.4	-22.4	-15.7	0	0	0.0
19/04/2013	-15.3	-15.6	-12.0	-9.1	-11.5	-9.7	-21.0	-20.7	-15.2	0	0	0.0
20/04/2013	-15.7	-15.6	-12.8	-13.2	-13.0	-6.7	-21.0	-19.0	-13.3	0	0	0.0
21/04/2013	-11.2	-11.6	-9.7	-6.4	-8.0	-10.7	-16.5	-15.1	-13.1	0	0	0.0
22/04/2013	-13.8	-14.0	-11.7	-11.4	-12.8	-12.9	-17.2	-16.5	-19.3	0	0	0.0
23/04/2013	-16.6	-16.4	-16.5	-14.1	-14.3	-5.4	-19.8	-20.1	-16.5	0	0	0.0
24/04/2013	-11.2	-11.0	-9.9	-4.7	-5.4	-4.7	-20.9	-20.7	-13.2	0	0	0.0
25/04/2013	-8.8	-8.0	-9.5	-6.4	-4.1	-13.2	-11.8	-14.0	-19.2	0	0	0.0
26/04/2013	-17.3	-18.8	-16.7	-11.8	-14.0	-14.7	-20.8	-22.1	-21.2	0	0	0.0
27/04/2013	-18.9	-19.6	-18.0	-11.8	-15.1	-16.4	-25.3	-23.7	-23.0	0	0	0.0
28/04/2013	-22.6	-22.0	-19.8	-18.6	-18.3	-18.3	-27.3	-26.3	-22.9	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
29/04/2013	-23.2	-21.9	-20.3	-18.4	-18.7	-13.6	-28.9	-27.0	-23.6	0	0	0.0
30/04/2013	-20.6	-21.4	-18.9	-14.5	-16.2	-7.6	-26.5	-26.2	-22.2	0	0	0.0
01/05/2013	-16.7	-18.0	-14.4	-9.5	-9.2	-9.8	-25.8	-25.6	-16.0	0	0	0.0
02/05/2013	-8.9	-10.5	-11.8	-0.6	-1.7	-9.5	-14.4	-16.6	-19.3	0	0	0.0
03/05/2013	-16.0	-15.4	-15.0	-10.8	-11.3	-8.9	-20.9	-20.6	-17.0	0	0	0.0
04/05/2013	-10.7	-12.9	-13.2	-9.1	-9.6	-11.6	-18.0	-19.0	-20.3	0	0	0.0
05/05/2013	-16.9	-16.1	-15.9	-12.5	-12.3	-5.8	-22.9	-20.9	-15.1	0	0	0.0
06/05/2013	-12.5	-13.5	-12.5	-6.0	-7.5	-14.6	-16.7	-19.7	-19.3	0	0	0.0
07/05/2013	-16.6	-17.3	-16.5	-14.6	-15.2	-9.6	-20.6	-20.4	-19.1	0	0	0.0
08/05/2013	-15.1	-15.2	-14.6	-8.2	-8.5	-1.9	-21.7	-21.0	-13.5	0	0	0.0
09/05/2013	-9.7	-10.5	-8.0	-3.8	-4.7	-4.1	-17.5	-17.4	-11.5	0	0	0.0
10/05/2013	-9.1	-9.8	-8.1	-5.4	-5.1	0.8	-12.4	-13.7	-10.3	0	0	0.0
11/05/2013	-4.3	-4.7	-6.1	1.3	0.3	-4.4	-7.2	-8.5	-11.9	0	0	0.0
12/05/2013	-7.8	-8.8	-7.8	-4.3	-2.8	-4.7	-12.0	-14.7	-7.9	0	0	0.0
13/05/2013	-7.8	-7.8	-6.1	-6.3	-6.5	-5.1	-10.2	-9.3	-7.2	0	0	0.0
14/05/2013	-7.1	-7.1	-6.2	-5.9	-3.9	0.8	-8.1	-8.6	-5.8	0	0	0.0
15/05/2013	-3.3	-3.8	-2.1	-0.4	-0.8	0.4	-6.3	-7.1	-3.4	0	0	0.0
16/05/2013	-2.8	-3.0	-1.1	-1.5	-1.1	1.4	-3.5	-4.6	-1.7	0	0	0.0
17/05/2013	-0.4	-0.9	0.0	1.5	0.8	2.6	-2.9	-2.8	-2.6	0	0	0.0
18/05/2013	-1.3	-2.2	0.0	0.3	0.7	3.9	-3.6	-6.4	-2.4	0	0	0.0
19/05/2013	-0.2	0.3	0.8	1.7	3.3	1.8	-2.3	-3.1	-0.2	0	0	0.0
20/05/2013	1.3	0.4	0.8	3.7	2.1	1.6	-0.1	-2.0	-0.4	0	0	4.5
21/05/2013	0.7	0.2	0.3	2.2	2.1	3.9	-0.1	-1.3	-0.6	0	0	5.7
22/05/2013	0.7	0.2	1.5	2.8	2.5	4.0	-0.5	-1.2	-1.1	0	0	0.0
23/05/2013	1.1	0.8	2.2	3.2	3.7	6.6	-0.7	-2.9	-1.3	0	0	0.0
24/05/2013	0.9	1.7	3.1	4.8	6.7	8.0	-3.0	-3.4	1.9	0	0	0.0
25/05/2013	4.0	3.7	5.2	7.8	6.2	2.7	1.5	1.4	-1.2	0	0	0.8
26/05/2013	0.5	-0.2	0.0	2.6	2.4	4.1	-1.0	-1.6	-2.2	0	0	0.0
27/05/2013	0.8	0.0	1.1	4.3	3.6	6.7	-1.6	-2.7	1.1	0	0	0.0
28/05/2013	2.1	2.4	3.7	4.5	5.7	5.5	0.0	0.3	0.7	0	1.8	0.0
29/05/2013	3.4	3.2	3.0	6.6	6.8	8.0	0.5	0.9	0.0	5.1	0	0.0
30/05/2013	4.0	3.0	3.5	8.5	7.3	15.2	1.1	0.1	1.5	1.3	0	0.3
31/05/2013	7.9	7.5	9.9	14.5	14.0	22.1	-0.2	0.3	2.5	0	0	0.0
01/06/2013	12.0	12.0	11.9	22.1	20.0	3.9	1.4	3.2	0.1	0	0	0.0
02/06/2013	2.4	1.1	1.6	12.2	4.9	12.9	0.5	-0.5	-0.2	1.0	0.5	1.1
03/06/2013	5.2	4.9	6.9	11.4	11.3	19.9	0.8	-0.3	5.1	0	0	0.0
04/06/2013	10.9	10.7	14.0	19.6	17.9	24.2	1.8	2.2	10.7	0	0	0.0
05/06/2013	15.6	15.9	18.1	23.9	22.4	18.3	5.0	6.9	3.0	0	0	0.0
06/06/2013	7.7	7.8	7.0	14.1	16.6	3.1	3.3	2.8	0.0	0.5	0.8	0.1
07/06/2013	3.5	1.8	1.7	5.0	2.8	0.0	1.6	0.2	-1.2	7.9	4.1	14.9
08/06/2013	0.4	-0.8	-0.7	1.6	0.2	3.1	-1.0	-1.7	-2.1	0.3	1.8	5.8
09/06/2013	0.7	0.5	-0.2	3.8	3.8	12.3	-1.4	-1.9	-1.5	0	0	0.6
10/06/2013	3.1	3.9	5.7	9.2	10.3	15.8	-2.8	-2.6	2.5	0	0	0.0
11/06/2013	7.6	7.7	9.9	13.7	13.9	13.7	0.2	1.4	8.2	0	0	0.0
12/06/2013	10.0	9.6	10.9	16.2	15.1	18.8	5.3	6.2	8.2	0	0.5	0.1
13/06/2013	13.8	13.9	13.5	21.5	20.5	20.8	6.1	7.0	11.6	0	0	0.0
14/06/2013	14.7	14.2	16.3	23.1	23.3	21.0	7.4	7.4	12.5	1.8	1.5	1.7
15/06/2013	15.2	14.8	16.7	21.4	19.6	20.8	7.9	9.8	10.7	0	14.5	0.1
16/06/2013	13.8	13.6	15.9	19.7	18.3	21.7	7.9	9.1	9.5	2.0	1.0	0.1
17/06/2013	13.9	13.5	15.8	20.6	20.2	11.8	9.0	8.1	2.0	0	0	0.0
18/06/2013	5.7	5.4	5.0	9.5	10.4	18.9	2.5	1.9	-0.1	0	0	0.0
19/06/2013	9.1	8.7	10.1	17.1	17.1	16.7	0.0	-0.6	8.9	0	0	0.0
20/06/2013	11.9	12.5	12.8	16.2	17.0	25.1	7.0	6.1	9.7	0	0	0.0
21/06/2013	16.5	15.8	17.6	24.0	22.9	26.5	7.5	6.5	14.1	0	0	0.0
22/06/2013	20.0	19.4	19.7	27.7	26.6	23.1	11.9	13.4	14.9	0	2.3	7.2
23/06/2013	17.7	16.5	18.9	24.2	20.3	20.9	11.8	12.6	10.6	1.0	1.5	0.0
24/06/2013	18.4	17.6	15.2	26.3	25.6	12.5	11.5	11.9	5.1	8.4	3.0	0.0
25/06/2013	9.4	7.9	7.2	16.6	12.6	10.1	6.3	4.4	4.6	2.8	0.3	1.6

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
26/06/2013	7.5	7.0	7.1	11.6	11.6	22.8	4.1	3.0	4.9	0	0	0.0
27/06/2013	12.0	12.2	14.9	19.9	19.5	22.5	2.8	3.7	15.9	0	0	0.0
28/06/2013	18.3	18.1	18.6	23.8	25.6	29.7	11.7	11.7	13.4	0	0	0.0
29/06/2013	22.5	21.7	22.3	28.6	27.4	30.9	12.1	14.4	8.9	0	0	0.0
30/06/2013	23.4	21.9	22.0	29.8	28.4	11.3	14.8	13.8	6.3	0	0	6.6
01/07/2013	10.7	9.4	8.3	16.1	14.0	18.8	8.4	6.5	8.0	7.1	0.3	1.0
02/07/2013	13.6	12.9	13.7	18.5	17.1	16.5	6.5	6.6	6.3	0.8	2.3	9.9
03/07/2013	12.8	10.7	10.1	17.4	14.9	10.5	8.1	6.7	4.5	0	0	0.2
04/07/2013	7.9	6.9	7.8	12.0	10.5	17.6	3.4	3.0	5.8	0	0	0.0
05/07/2013	10.0	10.0	11.1	14.4	14.6	21.9	4.2	5.1	9.9	0	0	0.0
06/07/2013	15.4	14.8	17.1	20.9	19.5	20.3	5.7	8.1	11.5	0	0	0.0
07/07/2013	16.4	15.1	15.0	22.2	20.4	16.9	10.5	11.3	8.0	0	0	1.5
08/07/2013	13.5	13.4	12.6	18.2	18.7	19.6	7.0	9.1	10.5	0.3	0	0.0
09/07/2013	15.8	16.0	15.0	21.4	21.0	12.0	9.2	11.7	7.4	0	0	0.0
10/07/2013	10.0	9.8	9.7	13.4	13.8	14.3	6.9	6.9	5.6	0	0	0.0
11/07/2013	9.7	9.9	11.1	14.7	14.0	10.2	3.1	4.8	6.4	0	0	0.0
12/07/2013	10.0	9.0	8.9	11.2	11.4	9.4	8.3	6.4	3.6	0	0	0.3
13/07/2013	7.6	6.5	7.0	10.6	9.2	7.0	4.8	4.0	2.7	0	0	1.3
14/07/2013	6.0	4.8	4.6	8.6	7.4	8.5	3.1	2.8	2.8	0.3	0.8	1.4
15/07/2013	5.2	4.3	5.2	9.0	7.6	9.0	2.6	1.9	4.8	0.5	1.0	2.4
16/07/2013	6.4	5.8	6.0	9.9	9.2	7.3	4.9	4.1	4.0	1.8	0.5	1.6
17/07/2013	6.0	5.2	5.6	7.8	6.8	12.6	4.7	4.1	5.2	0.5	1.5	3.2
18/07/2013	9.0	7.7	8.2	14.5	12.8	19.8	5.3	4.6	7.1	0.3	0.5	1.9
19/07/2013	13.6	13.2	14.3	20.2	18.9	16.3	7.0	7.3	10.2	0	0	0.0
20/07/2013	12.7	12.6	13.6	15.3	14.5	12.0	10.2	10.3	8.6	0.3	0.3	0.0
21/07/2013	10.8	9.9	9.9	14.0	13.2	12.1	6.6	7.6	8.2	0	0	0.0
22/07/2013	9.2	8.6	10.0	10.7	10.2	19.1	7.4	7.0	9.0	0	0	0.0
23/07/2013	12.2	12.6	13.9	18.3	18.4	22.4	6.8	7.7	12.4	0	0	0.0
24/07/2013	13.7	14.3	16.6	19.1	20.2	27.0	9.0	11.1	14.1	0.5	3.6	3.6
25/07/2013	19.2	18.4	21.2	25.9	24.6	18.4	11.6	10.9	8.0	0	0	0.0
26/07/2013	13.0	10.7	9.9	18.1	16.8	12.4	9.0	7.5	8.3	1.3	4.8	0.0
27/07/2013	8.4	7.9	9.5	9.7	9.0	11.1	7.8	7.1	6.7	22.1	2.8	2.7
28/07/2013	8.5	7.6	8.2	10.1	9.8	15.2	5.0	6.2	5.9	0	0	0.0
29/07/2013	9.5	9.2	10.4	14.8	14.7	13.8	6.6	5.7	7.6	0	0	0.0
30/07/2013	10.4	10.0	10.4	12.4	11.6	9.3	9.0	8.4	5.8	3.8	4.3	10.0
31/07/2013	8.0	7.0	7.5	9.3	8.9	13.9	5.7	5.8	4.3	0.3	0.3	1.6
01/08/2013	9.6	9.1	9.9	15.8	15.9	14.3	1.6	1.9	7.2	0	0	1.0
02/08/2013	10.4	9.7	10.6	13.8	13.1	20.0	6.8	6.4	8.1	7.4	5.3	0.8
03/08/2013	13.9	13.7	15.0	19.0	19.3	22.9	8.2	8.3	11.4	0	0	0.0
04/08/2013	14.3	16.2	17.7	20.2	22.4	19.6	6.8	9.9	7.7	0	0	0.0
05/08/2013	12.3	13.5	14.9	17.9	19.4	21.3	4.5	6.9	9.2	0	0	0.0
06/08/2013	13.4	13.8	15.8	20.9	20.3	25.9	4.0	7.4	12.4	0	0	0.0
07/08/2013	16.8	17.2	19.9	23.8	23.3	24.6	7.4	9.7	15.2	0	0	0.0
08/08/2013	18.6	18.2	20.8	24.3	23.8	24.4	12.1	10.9	13.5	0	0	0.0
09/08/2013	18.2	18.4	19.7	24.4	24.7	26.4	12.0	11.8	13.9	0	0	0.0
10/08/2013	18.2	19.7	20.6	26.4	25.5	27.1	10.3	12.6	14.5	0	0	0.0
11/08/2013	19.6	20.4	21.8	26.6	26.4	26.1	11.3	13.9	15.8	0	0	0.0
12/08/2013	20.0	20.7	21.6	26.8	26.5	21.4	12.4	14.2	12.5	0	0	0.0
13/08/2013	18.0	18.3	17.2	23.0	21.6	28.2	12.5	12.7	11.4	0	0	0.0
14/08/2013	17.8	17.9	20.1	27.0	26.1	17.8	8.6	10.6	7.3	0	0	0.0
15/08/2013	13.1	12.7	12.5	16.2	18.1	13.1	8.5	8.9	4.7	0	0	0.0
16/08/2013	8.4	8.4	8.7	12.6	12.1	16.7	4.7	5.1	9.2	0	0.5	0.3
17/08/2013	11.4	11.0	12.0	18.5	17.6	21.4	7.0	8.1	13.1	4.3	3.0	0.5
18/08/2013	14.3	14.2	17.1	19.4	20.4	14.5	8.9	9.4	7.7	0	0	0.0
19/08/2013	13.2	12.4	11.3	15.5	14.4	11.5	10.0	8.1	5.6	1.5	0	0.0
20/08/2013	8.6	7.5	8.1	11.4	11.6	10.2	5.6	4.7	5.8	0	0.3	0.0
21/08/2013	10.8	9.4	7.9	16.7	14.2	6.5	2.8	6.5	3.0	14.7	13.0	5.9
22/08/2013	6.8	4.8	4.6	10.0	6.9	6.4	3.6	2.4	0.9	7.1	4.1	8.7

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
23/08/2013	4.2	2.9	3.8	8.9	5.9	2.7	0.3	-0.6	0.4	0.5	0.3	0.1
24/08/2013	0.9	0.0	1.3	3.7	2.3	6.1	-1.8	-1.7	0.2	0	0	0.0
25/08/2013	2.0	1.4	2.6	5.6	5.9	9.7	-0.3	-1.2	-1.3	0	0	0.0
26/08/2013	4.1	4.3	5.5	9.6	9.4	7.1	-3.4	-1.5	3.9	0	0	0.0
27/08/2013	7.1	5.9	6.0	10.3	7.4	6.7	4.7	3.5	1.9	0.8	7.1	10.2
28/08/2013	2.9	3.0	4.1	4.9	5.5	10.5	-0.1	0.6	1.8	0	0.3	0.0
29/08/2013	5.9	5.6	6.0	11.7	11.5	15.5	-0.2	1.6	3.5	0	0	0.0
30/08/2013	7.8	7.4	9.9	14.1	13.1	17.0	0.7	2.3	8.0	0	0	0.0
31/08/2013	10.2	9.4	11.7	17.3	15.1	9.1	2.5	4.0	3.3	0	0	0.0
01/09/2013	7.2	6.7	6.6	12.4	10.2	4.9	1.5	3.4	1.4	5.3	6.4	3.7
02/09/2013	2.7	1.8	3.2	4.5	4.3	3.5	-0.1	-0.7	-0.3	0	0	0.0
03/09/2013	1.8	1.2	1.3	3.4	3.5	9.0	-3.2	-1.8	-1.3	0	0	0.0
04/09/2013	2.0	1.6	3.1	9.2	7.6	13.7	-3.7	-3.3	6.3	1.5	3.0	3.4
05/09/2013	9.8	9.2	9.5	14.9	15.0	6.8	7.0	6.4	3.8	1.5	0.3	2.8
06/09/2013	5.7	5.3	4.8	8.5	7.3	7.8	3.4	3.1	2.7	0	0.5	1.3
07/09/2013	7.2	6.0	5.9	9.5	7.6	3.5	2.9	2.8	0.6	1.0	0.3	2.3
08/09/2013	1.1	0.8	1.7	3.1	2.8	4.8	-0.4	-0.6	0.1	0	0	0.0
09/09/2013	0.5	0.2	2.5	3.3	2.4	5.2	-1.5	-1.6	-0.5	2.5	1.5	0.0
10/09/2013	1.7	1.2	2.0	4.1	3.3	7.4	0.3	-0.5	0.3	5.6	0.3	0.0
11/09/2013	3.1	2.4	4.2	5.7	4.8	6.4	0.6	0.4	3.4	1.5	0	0.0
12/09/2013	5.1	4.5	5.3	7.8	7.1	4.8	2.3	2.7	-0.2	3.8	4.3	9.7
13/09/2013	1.8	1.1	1.9	6.3	4.7	12.0	-1.4	-1.3	-0.4	14.2	4.6	2.0
14/09/2013	4.1	4.4	6.0	11.8	10.4	12.2	-1.3	-1.9	1.9	1.5	5.3	0.3
15/09/2013	8.2	7.0	7.4	13.7	11.8	3.2	4.3	2.5	0.4	0.5	0	0.0
16/09/2013	2.3	1.2	1.8	4.3	2.7	0.6	0.5	-0.1	-2.5	0	0.5	0.5
17/09/2013	-1.1	-1.7	-1.0	0.7	0.5	-0.6	-3.7	-3.3	-3.6	0	0	0.1
18/09/2013	-2.7	-3.5	-2.1	-1.2	-1.8	2.0	-5.0	-5.0	-0.8	0	0	0.0
19/09/2013	-0.8	-1.4	0.2	0.7	0.0	7.0	-1.9	-2.8	0.5	0	0.3	0.0
20/09/2013	2.6	1.8	3.5	5.5	4.4	7.8	0.3	-0.3	4.2	0	0.5	0.6
21/09/2013	7.7	7.1	5.7	15.6	15.2	6.5	3.6	3.2	4.0	0.8	1.5	4.0
22/09/2013	6.7	4.8	5.3	14.5	9.1	5.9	2.3	2.4	3.3	0.3	0	0.0
23/09/2013	4.8	4.4	4.0	5.8	5.1	4.7	4.2	3.6	3.4	0	0	0.1
24/09/2013	4.6	3.9	3.9	5.4	4.7	3.8	4.0	3.3	1.6	0	0	0.5
25/09/2013	3.2	2.5	2.6	4.2	3.4	5.4	2.4	1.3	1.5	0	0	0.4
26/09/2013	3.1	2.7	3.5	4.9	4.8	6.7	1.9	1.1	2.7	0	0	0.0
27/09/2013	3.4	3.2	4.7	5.5	5.3	3.3	0.2	1.7	-0.4	0	0	0.1
28/09/2013	0.6	0.1	1.8	2.9	1.8	2.5	-1.7	-2.5	-0.2	0	0	0.0
29/09/2013	0.4	0.1	1.2	1.8	1.0	1.8	-1.7	-1.2	-1.2	0	0	0.2
30/09/2013	-0.6	-1.2	0.1	1.2	0.2	0.4	-1.4	-2.4	-2.9	0	0	0.0
01/10/2013	-2.4	-2.0	-0.7	-0.9	-0.8	0.5	-3.9	-4.5	-3.1	0	0	0.3
02/10/2013	-2.3	-2.7	-1.2	0.1	-0.9	1.0	-5.3	-5.1	-1.7	0	0	0.1
03/10/2013	-1.3	-1.6	-0.7	-0.2	-0.5	4.4	-2.2	-2.7	0.1	0	0.3	0.0
04/10/2013	0.8	0.5	2.1	3.6	3.2	3.1	-2.3	-1.9	1.4	0	0.3	0.0
05/10/2013	1.3	0.9	2.3	2.5	2.0	1.4	0.1	0.3	-0.5	0	1.0	1.1
06/10/2013	0.3	-0.1	0.2	0.9	0.7	0.9	-0.4	-1.0	-1.0	0	0	2.6
07/10/2013	-0.5	-0.9	-0.2	0.3	0.2	0.8	-1.5	-1.3	-0.6	0	0	0.0
08/10/2013	-0.5	-1.1	0.0	1.4	0.3	2.3	-1.6	-1.8	-3.4	0	0.5	0.0
09/10/2013	-0.3	-0.7	0.5	1.7	0.8	5.4	-1.9	-2.3	1.3	0	0	0.0
10/10/2013	2.0	1.5	2.9	4.4	4.2	2.6	0.4	0.2	-0.2	0.3	1.0	0.4
11/10/2013	0.7	0.1	1.6	2.4	1.2	-0.1	-1.1	-2.0	-2.8	0	0	0.2
12/10/2013	-2.0	-2.8	-1.6	-0.8	-1.7	-1.9	-3.4	-3.6	-3.9	0	0	0.0
13/10/2013	-2.9	-3.5	-2.7	-2.2	-3.0	0.4	-3.5	-4.2	-3.5	0	0	0.0
14/10/2013	-1.9	-2.1	-1.4	1.1	0.7	1.0	-4.1	-4.0	-1.8	0	0	0.0
15/10/2013	-1.6	-1.2	-0.4	0.3	0.9	2.6	-2.5	-2.3	-4.3	1.0	0.5	0.3
16/10/2013	-1.4	-1.5	-0.9	1.1	1.0	-2.1	-4.6	-4.7	-6.2	0.8	0.3	0.9
17/10/2013	-4.3	-4.9	-4.5	0.2	-0.9	-3.7	-6.8	-7.6	-7.0	0	0	0.1
18/10/2013	-6.4	-7.1	-5.0	-5.1	-5.2	-4.5	-8.3	-10.5	-9.2	0	0	0.0
19/10/2013	-9.3	-9.4	-6.9	-6.0	-7.1	-3.6	-13.5	-11.8	-9.3	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
20/10/2013	-10.1	-9.3	-6.3	-5.2	-5.2	-2.1	-15.5	-13.4	-5.2	0	0.3	0.0
21/10/2013	-6.0	-5.8	-4.0	-4.3	-4.4	-2.1	-7.9	-7.2	-3.5	0	0	0.0
22/10/2013	-3.9	-3.8	-2.9	-2.2	-2.0	0.5	-5.2	-4.6	-4.5	1.8	0.8	0.0
23/10/2013	-2.5	-2.8	-1.2	0.0	-0.5	-1.6	-6.9	-7.9	-6.0	1.3	0	0.9
24/10/2013	-3.7	-3.3	-3.4	-1.8	-1.7	-4.1	-9.5	-4.8	-9.7	0	0	0.0
25/10/2013	-6.8	-7.5	-5.8	-3.5	-4.4	-9.4	-11.9	-12.3	-12.5	0	0.3	0.0
26/10/2013	-12.6	-12.8	-10.6	-9.9	-10.8	-6.3	-17.6	-16.8	-12.4	0	0	0.0
27/10/2013	-12.4	-12.6	-9.3	-7.9	-8.2	-5.7	-17.1	-17.2	-9.8	0	0	0.0
28/10/2013	-9.6	-9.4	-7.3	-7.1	-6.2	-5.0	-14.3	-14.4	-9.5	0	0	0.0
29/10/2013	-8.9	-8.7	-7.4	-6.9	-6.2	-6.3	-11.6	-10.2	-7.5	0	0.3	0.0
30/10/2013	-6.7	-7.1	-7.0	-5.5	-4.6	-4.3	-8.6	-8.7	-6.6	1.8	0	0.0
31/10/2013	-5.9	-6.5	-5.5	-4.9	-5.4	-4.3	-6.9	-8.0	-7.3	0	0	0.0
01/11/2013	-7.3	-7.9	-6.0	-6.0	-6.8	-5.7	-8.4	-9.5	-9.8	0	0	0.0
02/11/2013	-8.3	-9.1	-7.6	-6.9	-7.4	-9.6	-9.6	-11.5	-14.8	0.8	0	0.0
03/11/2013	-13.0	-14.7	-11.9	-9.5	-10.7	-5.6	-23.2	-19.4	-15.9	0	0	0.0
04/11/2013	-17.1	-14.4	-9.8	-14.2	-8.7	-9.0	-21.1	-22.2	-17.8	0	0	0.0
05/11/2013	-23.6	-20.8	-13.7	-18.5	-12.6	-13.7	-25.9	-23.7	-18.8	0	0	0.0
06/11/2013	-22.6	-21.7	-17.2	-20.1	-16.3	-11.6	-25.7	-24.0	-15.3	0	0	0.0
07/11/2013	-15.3	-14.4	-13.3	-12.8	-12.0	-15.3	-20.1	-18.3	-20.5	0	0	0.0
08/11/2013	-20.9	-18.5	-17.2	-16.0	-16.0	-19.1	-28.0	-21.9	-22.0	0	0	0.0
09/11/2013	-28.3	-23.7	-20.8	-23.7	-21.6	-8.4	-31.3	-26.5	-21.8	0	0	0.0
10/11/2013	-22.0	-22.0	-16.7	-12.8	-11.7	-2.9	-26.3	-26.6	-8.4	0	0	0.0
11/11/2013	-7.8	-7.4	-4.4	-5.0	-5.0	-5.0	-12.8	-11.7	-12.5	2.5	0	0.0
12/11/2013	-12.0	-13.3	-9.0	-5.0	-6.7	-9.4	-18.4	-18.4	-19.3	0	0	0.0
13/11/2013	-17.3	-18.0	-13.8	-11.9	-12.2	-8.2	-22.5	-23.1	-19.1	0	0	0.0
14/11/2013	-13.0	-13.7	-11.5	-8.9	-9.6	-12.1	-22.5	-23.5	-21.2	0	0	0.0
15/11/2013	-18.8	-19.1	-17.7	-10.5	-12.2	-21.0	-24.2	-24.5	-23.5	0	0	0.0
16/11/2013	-25.6	-26.5	-22.5	-22.8	-23.4	-21.8	-27.7	-28.3	-24.8	0	0	0.0
17/11/2013	-28.0	-27.7	-23.2	-26.3	-26.2	-24.4	-30.2	-30.0	-27.9	0	0	0.0
18/11/2013	-30.7	-31.4	-26.1	-29.1	-29.3	-24.5	-32.2	-33.7	-29.0	0	0	0.0
19/11/2013	-30.6	-30.9	-26.1	-27.1	-28.6	-22.3	-33.7	-33.7	-28.0	0	0	0.0
20/11/2013	-29.5	-29.7	-24.6	-28.0	-28.0	-20.1	-31.1	-31.8	-25.1	0	0	0.0
21/11/2013	-25.7	-26.8	-23.1	-22.4	-22.4	-21.0	-29.2	-29.8	-24.2	0	0	0.0
22/11/2013	-26.9	-27.5	-22.4	-25.4	-25.7	-19.0	-28.8	-29.7	-25.4	0	0	0.0
23/11/2013	-26.2	-26.3	-22.3	-21.1	-20.6	-19.0	-30.5	-32.5	-25.5	0	0	0.0
24/11/2013	-22.1	-22.8	-22.4	-20.1	-20.5	-22.3	-26.4	-25.6	-27.7	0	0	0.0
25/11/2013	-28.4	-28.0	-24.9	-26.2	-25.0	0.0	-29.9	-30.5	0.0	0	0	0.0
26/11/2013	-24.1	-25.5	-20.9	-20.3	-20.0	-17.8	-29.6	-30.0	-28.9	0	0	0.0
27/11/2013	-27.8	-27.6	-26.7	-21.2	-21.2	-24.4	-31.3	-31.6	-27.7	0	0	0.0
28/11/2013	-31.1	-31.1	-26.6	-30.1	-28.1	0.0	-32.1	-32.8	0.0	0	0	0.0
29/11/2013	-27.0	-25.9	-25.6	-24.3	-22.9	0.0	-31.3	-30.2	0.0	0	0	0.0
30/11/2013	-27.9	-26.0	-25.9	-25.9	-24.4	0.0	-29.3	-28.0	0.0	0	0	0.0
01/12/2013	-29.4	-27.4	-25.6	-27.6	-24.1	0.0	-31.6	-30.3	0.0	0	0	0.0
02/12/2013	-23.0	-22.3	-18.6	-14.9	-14.2	0.0	-28.9	-29.7	0.0	0	0	0.0
03/12/2013	-20.5	-20.9	-17.2	-14.8	-13.9	0.0	-24.8	-24.5	0.0	0	0	0.0
04/12/2013	-24.7	-24.9	n/a	-22.6	-22.9	0.0	-25.6	-27.6	0.0	0	0	0.0
05/12/2013	-23.7	-23.0	n/a	-21.2	-20.3	0.0	-26.9	-27.8	0.0	0	0	0.0
06/12/2013	-22.3	-21.8	n/a	-17.2	-16.8	0.0	-27.9	-28.0	0.0	0.5	0	0.0
07/12/2013	-23.0	-24.1	n/a	-17.3	-17.3	0.0	-25.7	-26.4	0.0	0	0	0.0
08/12/2013	-27.4	-28.0	n/a	-25.1	-26.0	0.0	-29.9	-29.8	0.0	0	0	0.0
09/12/2013	-28.2	-28.2	n/a	-27.3	-26.2	0.0	-29.7	-30.6	0.0	0	0	0.0
10/12/2013	-24.3	-24.6	n/a	-22.7	-23.1	0.0	-28.7	-28.6	0.0	0.3	0	0.0
11/12/2013	-30.4	-30.9	n/a	-23.8	-24.6	0.0	-35.4	-35.3	0.0	0	0	0.0
12/12/2013	-34.2	-33.9	n/a	-33.0	-32.0	0.0	-36.7	-36.2	0.0	0	0	0.0
13/12/2013	-34.7	-35.1	n/a	-32.4	-33.0	0.0	-36.5	-36.6	0.0	0	0	0.0
14/12/2013	-35.9	-36.6	n/a	-33.2	-34.1	0.0	-39.2	-39.4	0.0	0	0	0.0
15/12/2013	-29.3	-29.9	n/a	-26.4	-27.4	0.0	-36.7	-36.8	0.0	0	0	0.0
16/12/2013	-30.2	-29.6	n/a	-29.3	-28.5	0.0	-31.8	-30.8	0.0	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
17/12/2013	-30.1	-29.4	n/a	-27.0	-27.0	0.0	-32.4	-30.5	0.0	0	0	0.0
18/12/2013	-27.9	-28.6	n/a	-25.7	-26.0	0.0	-32.3	-33.9	0.0	0	0	0.0
19/12/2013	-36.2	-35.8	n/a	-31.8	-32.7	0.0	-39.1	-38.1	0.0	0	0	0.0
20/12/2013	-34.4	-33.1	n/a	-26.3	-26.2	0.0	-38.2	-37.3	0.0	0	0	0.0
21/12/2013	-26.3	-25.1	n/a	-20.7	-19.9	0.0	-30.0	-29.8	0.0	0	0	0.0
22/12/2013	-22.3	-22.4	n/a	-19.6	-19.7	0.0	-25.7	-25.5	0.0	0	0	0.0
23/12/2013	-22.1	-22.8	n/a	-17.3	-17.4	0.0	-29.8	-29.4	0.0	0	0	0.0
24/12/2013	-28.8	-28.8	n/a	-26.0	-25.7	0.0	-30.7	-31.0	0.0	0	0	0.0
25/12/2013	-27.7	-27.1	n/a	-25.2	-24.2	0.0	-30.6	-30.2	0.0	0	0	0.0
26/12/2013	-28.9	-29.7	n/a	-25.4	-24.9	0.0	-35.5	-36.8	0.0	0	0	0.0
27/12/2013	-33.8	-33.7	n/a	-30.0	-30.3	0.0	-36.7	-36.6	0.0	0	0	0.0
28/12/2013	-30.0	-29.9	n/a	-28.2	-28.6	0.0	-32.8	-32.0	0.0	0	0	0.0
29/12/2013	-30.8	-31.7	n/a	-28.1	-29.0	0.0	-33.7	-34.4	0.0	0	0	0.0
30/12/2013	-32.8	-33.2	n/a	-31.9	-31.0	0.0	-34.0	-34.6	0.0	0	0	0.0
31/12/2013	-31.4	-31.1	n/a	-29.9	-28.9	0.0	-34.1	-33.1	0.0	0	0	0.0
01/01/2014	-30.8	-30.8	n/a	-28.9	-28.6	n/a	-34.2	-34.1	n/a	0	0	0.0
02/01/2014	-31.1	-29.7	n/a	-29.1	-27.7	n/a	-33.8	-32.8	n/a	0	0	0.0
03/01/2014	-29.8	-32.5	n/a	-28.0	-28.9	n/a	-31.6	-33.8	n/a	0	5.1	0.0
04/01/2014	-32.4	-33.8	n/a	-30.5	-32.7	n/a	-34.1	-34.7	n/a	0	0	0.0
05/01/2014	-34.7	-35.2	n/a	-33.6	-32.7	n/a	-36.3	-36.5	n/a	0	0	0.0
06/01/2014	-32.6	-31.9	n/a	-27.9	-27.2	n/a	-35.0	-35.8	n/a	0	0	0.0
07/01/2014	-30.1	-30.2	n/a	-27.4	-27.1	n/a	-33.8	-33.5	n/a	0	0	0.0
08/01/2014	-24.8	-25.6	n/a	-21.1	-21.4	n/a	-32.3	-33.8	n/a	0	0	0.0
09/01/2014	-25.9	-26.0	n/a	-21.5	-22.2	n/a	-30.0	-30.1	n/a	0	0	0.0
10/01/2014	-27.5	-27.0	n/a	-25.3	-24.6	n/a	-31.2	-31.0	n/a	0	0	0.0
11/01/2014	-34.0	-34.8	n/a	-25.9	-26.9	n/a	-38.6	-40.0	n/a	0	0	0.0
12/01/2014	-35.0	-35.4	n/a	-32.4	-32.4	n/a	-38.1	-37.8	n/a	0	0	0.0
13/01/2014	-30.8	-31.0	n/a	-29.1	-27.6	n/a	-34.0	-33.0	n/a	0	0	0.0
14/01/2014	-35.8	-35.9	-31.3	-31.6	-29.1	n/a	-38.6	-38.9	n/a	0	0	0.0
15/01/2014	-26.0	-26.4	n/a	-19.8	-21.7	n/a	-31.6	-29.1	n/a	1.5	0	0.0
16/01/2014	-26.9	-26.6	n/a	-20.3	-20.1	n/a	-33.1	-33.6	n/a	0.5	0	0.0
17/01/2014	-30.5	-30.1	n/a	-27.1	-25.8	n/a	-36.2	-34.6	n/a	0	0	0.0
18/01/2014	-37.3	-37.4	-37.0	-29.1	-31.0	n/a	-40.9	-39.8	n/a	0	0	0.0
19/01/2014	-41.2	-39.4	-38.1	-38.1	-37.9	n/a	-43.3	-41.4	n/a	0	0	0.0
20/01/2014	-34.5	-33.3	-31.0	-32.5	-28.8	n/a	-38.9	-38.4	n/a	0	0	0.0
21/01/2014	-36.0	-34.3	-31.6	-33.4	-31.8	n/a	-38.5	-38.4	n/a	0	0	0.0
22/01/2014	-26.5	-25.7	n/a	-18.6	-18.5	n/a	-36.5	-36.8	n/a	0.8	0	0.0
23/01/2014	-22.4	-22.3	-26.2	-12.8	-12.9	n/a	-27.6	-27.5	n/a	2.8	0	0.0
24/01/2014	-30.6	-30.5	-28.2	-27.5	-27.1	n/a	-32.3	-32.3	n/a	0	0	0.0
25/01/2014	-32.9	-32.6	-32.9	-28.9	-27.6	n/a	-35.9	-35.7	n/a	0	0	0.0
26/01/2014	-34.2	-33.3	-30.9	-32.9	-31.8	-17.6	-35.5	-35.2	-39.7	0.3	0	0.0
27/01/2014	-30.0	-29.7	-26.7	-22.8	-18.9	-23.3	-34.2	-35.0	-30.6	0	0	0.0
28/01/2014	-25.6	-25.1	-24.8	-22.6	-19.3	-23.6	-27.9	-26.5	-26.1	0	0	0.0
29/01/2014	-23.3	-23.4	-22.0	-21.0	-20.9	-19.6	-25.7	-26.2	-24.6	0	0	0.0
30/01/2014	-18.8	-18.9	-18.3	-16.8	-17.1	-15.6	-21.3	-21.5	-20.7	0.5	0	0.0
31/01/2014	-22.6	-22.2	-22.2	-20.6	-20.4	-18.8	-25.3	-24.8	-25.0	0	0	0.0
01/02/2014	-24.3	-24.4	-22.1	-20.4	-20.3	-18.7	-26.3	-27.1	-25.4	0	0	0.0
02/02/2014	-24.9	-25.4	-27.5	-19.6	-20.0	n/a	-31.3	-30.7	n/a	0	0	0.0
03/02/2014	-20.4	-20.1	-18.8	-16.0	-15.7	n/a	-25.6	-25.4	n/a	1.0	0	0.0
04/02/2014	-15.3	-15.6	-13.1	-12.9	-13.0	-10.8	-17.5	-18.4	-29.1	1.8	0	0.0
05/02/2014	-14.5	-14.8	-14.2	-11.7	-12.1	-10.7	-18.8	-19.9	-19.5	1.3	0	0.0
06/02/2014	-21.6	-22.0	-20.5	-18.8	-19.1	-18.9	-23.9	-24.1	-22.5	0	0	0.0
07/02/2014	-26.9	-26.7	-25.6	-22.7	-23.2	-22.0	-28.8	-28.6	-27.6	0	0	0.0
08/02/2014	-27.0	-27.1	-22.6	-24.3	-24.0	-18.5	-29.6	-29.8	-25.4	0	0	0.0
09/02/2014	-26.9	-26.4	-23.7	-23.1	-23.4	-21.5	-31.7	-31.2	-25.9	0.5	0	0.0
10/02/2014	-27.7	-28.3	-27.1	-23.7	-24.1	-21.7	-33.1	-35.2	-32.8	0	0	0.0
11/02/2014	-30.9	-30.0	-27.0	-24.6	-23.6	-21.0	-36.3	-35.6	-33.0	0	0	0.0
12/02/2014	-25.9	-26.5	-22.8	-22.9	-23.6	-20.4	-30.1	-30.1	-24.5	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
13/02/2014	-32.3	-30.3	-26.8	-29.0	-26.1	-23.9	-36.2	-32.8	-29.9	0	0	0.0
14/02/2014	-35.3	-33.5	-28.0	-31.6	-29.0	-25.1	-37.9	-35.4	-30.4	0	0	0.0
15/02/2014	-25.7	-26.7	-23.8	-20.5	-22.2	-21.1	-33.8	-34.4	-28.2	0	0	0.0
16/02/2014	-30.1	-30.5	-31.0	-22.8	-25.3	-24.8	-32.1	-32.4	-32.5	0	0	0.0
17/02/2014	-29.8	-29.2	-29.7	-27.4	-26.9	-25.6	-32.4	-32.7	-32.0	0	0	0.0
18/02/2014	-27.1	-27.8	-27.0	-25.5	-26.4	-23.9	-29.4	-30.5	-31.3	0	0	0.0
19/02/2014	-28.9	-30.9	-30.9	-27.2	-30.2	-30.2	-31.7	-32.5	-32.8	0	0	0.0
20/02/2014	-32.6	-32.2	-32.3	-30.9	-29.1	-30.5	-35.4	-34.1	-33.6	0	0	0.0
21/02/2014	-34.5	-32.5	-31.6	-30.8	-27.9	-28.6	-37.3	-36.0	-33.5	0.3	0	0.0
22/02/2014	-33.6	-31.8	-29.8	-30.6	-29.4	-27.2	-36.5	-34.3	-32.2	0	0	0.0
23/02/2014	-28.9	-28.8	-26.2	-23.8	-24.3	-21.4	-33.6	-33.1	-32.0	0.5	0	0.0
24/02/2014	-30.6	-30.5	-28.8	-27.0	-26.0	-23.5	-33.1	-33.3	-32.6	0.5	0	0.0
25/02/2014	-30.2	-30.7	-29.8	-25.6	-25.9	-22.8	-37.1	-37.2	-36.9	0	0	0.0
26/02/2014	-36.3	-35.8	-36.0	-32.3	-32.1	-33.5	-40.0	-38.3	-37.6	0	0	0.0
27/02/2014	-37.6	-36.8	-36.4	-36.1	-34.3	-34.7	-40.7	-38.3	-39.0	0	0	0.0
28/02/2014	-34.2	-32.8	-33.5	-30.7	-29.2	-31.8	-38.7	-36.3	-36.2	0.3	0	0.0
01/03/2014	-30.3	-29.9	-30.2	-27.5	-26.8	-26.8	-33.4	-33.7	-33.0	0	0	0.0
02/03/2014	-24.6	-24.3	-24.9	-21.2	-19.6	-21.5	-30.0	-28.6	-28.2	0.5	0	0.0
03/03/2014	-24.2	-24.5	-19.7	-21.5	-19.8	-15.4	-27.3	-28.5	-24.9	6.4	0	0.0
04/03/2014	-24.2	-24.6	-20.2	-21.6	-20.9	-16.0	-28.1	-27.7	-23.0	0	0	0.0
05/03/2014	-24.5	-24.3	-22.1	-21.5	-22.3	-19.3	-28.5	-29.0	-25.8	0	0	0.0
06/03/2014	-29.3	-28.6	-24.7	-26.4	-26.1	-22.3	-31.9	-30.7	-27.8	0	0	0.0
07/03/2014	-25.6	-25.5	-22.5	-22.7	-23.0	-20.7	-28.9	-27.8	-24.4	0	0	0.0
08/03/2014	-28.2	-28.3	-25.2	-24.9	-25.1	-23.2	-31.7	-30.9	-28.5	0	0	0.0
09/03/2014	-32.5	-33.0	-31.4	-27.4	-29.9	-26.0	-38.5	-37.9	-37.1	0	0	0.0
10/03/2014	-36.6	-36.2	-33.9	-33.2	-32.8	-29.5	-40.6	-39.7	-37.8	0	0	0.0
11/03/2014	-33.1	-33.3	-28.2	-29.1	-27.4	-24.3	-36.0	-36.5	-31.8	0	0	0.0
12/03/2014	-32.4	-29.4	-27.7	-27.0	-22.1	-25.3	-37.0	-34.2	-30.3	0	0	0.0
13/03/2014	-33.4	n/a	-28.5	-28.5	n/a	-26.0	-37.7	n/a	-32.1	0	0	0.0
14/03/2014	-33.6	n/a	-26.1	-27.6	n/a	-20.6	-38.2	n/a	-31.2	0	0	0.0
15/03/2014	-28.5	n/a	-23.0	-21.8	n/a	-19.2	-35.0	n/a	-26.8	0	0	0.0
16/03/2014	-18.4	n/a	-17.1	-15.5	n/a	-14.8	-21.9	n/a	-19.2	0	0	0.0
17/03/2014	-17.1	n/a	-15.7	-14.4	n/a	-14.1	-19.0	n/a	-17.3	0	0	0.0
18/03/2014	-20.7	n/a	-21.0	-14.2	n/a	-17.3	-29.3	n/a	-26.6	0	0	0.0
19/03/2014	-27.4	n/a	-26.8	-25.4	n/a	-24.9	-30.8	n/a	-28.0	0	0	0.0
20/03/2014	-25.9	n/a	-24.1	-24.4	n/a	-22.3	-27.7	n/a	-26.5	0	0	0.0
21/03/2014	-23.1	n/a	-20.6	-19.1	n/a	-15.5	-26.4	n/a	-24.9	0	0	0.0
22/03/2014	-18.4	n/a	-16.2	-15.2	n/a	-13.8	-23.4	n/a	-20.6	0	0	0.0
23/03/2014	-25.2	n/a	-24.7	-19.6	n/a	-20.4	-29.1	n/a	-29.3	0	0	0.0
24/03/2014	-22.4	n/a	-21.4	-20.0	n/a	-18.0	-25.2	n/a	-25.6	0	0	0.0
25/03/2014	-23.3	n/a	-22.7	-20.7	n/a	-18.7	-25.4	n/a	-24.7	0	0	0.0
26/03/2014	-25.0	n/a	-23.8	-23.2	n/a	-22.5	-29.1	n/a	-25.3	0	0	0.0
27/03/2014	-24.7	n/a	-22.8	-21.3	n/a	-20.4	-29.1	n/a	-24.7	0	0	0.0
28/03/2014	-27.2	n/a	-25.9	-24.4	n/a	-22.0	-32.8	n/a	-29.8	0	0	0.0
29/03/2014	-31.4	n/a	-30.4	-28.6	n/a	-28.5	-34.9	n/a	-32.6	0	0	0.0
30/03/2014	-27.9	n/a	-25.5	-22.2	n/a	-20.9	-34.9	n/a	-32.7	0	0	0.0
31/03/2014	-23.9	n/a	-22.7	-20.2	n/a	-20.9	-27.0	n/a	-24.7	0	0	0.0
01/04/2014	-28.0	n/a	-27.1	-25.7	n/a	-23.5	-32.1	n/a	-29.9	0	0	0.0
02/04/2014	-26.4	n/a	-24.0	-22.8	n/a	-21.9	-31.9	n/a	-27.0	0	0	0.0
03/04/2014	-23.3	n/a	-21.5	-18.3	n/a	-17.1	-27.7	n/a	-25.4	0	0	0.0
04/04/2014	-22.8	n/a	-22.6	-19.2	n/a	-20.0	-27.3	n/a	-25.3	0	0	0.0
05/04/2014	-27.8	n/a	-28.8	-23.2	n/a	-25.2	-30.6	n/a	-30.9	0	0	0.0
06/04/2014	-27.5	n/a	-26.2	-22.9	n/a	-22.2	-33.2	n/a	-29.7	0	0	0.0
07/04/2014	-25.1	n/a	-22.8	-17.8	n/a	-18.4	-30.7	n/a	-27.0	0	0	0.0
08/04/2014	-23.9	n/a	-18.9	-18.4	n/a	-15.9	-29.8	n/a	-23.3	0	0	0.0
09/04/2014	-26.4	n/a	-25.6	-23.6	n/a	-19.3	-30.6	n/a	-29.3	0	0	0.0
10/04/2014	-27.5	n/a	-26.8	-23.5	n/a	-23.9	-31.9	n/a	-30.3	0	0	0.0
11/04/2014	-24.7	n/a	-22.6	-20.2	n/a	-18.2	-29.7	n/a	-26.3	0	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

	Average Daily Air Temperature (°C)			Maximum Daily Air Temperature (°C)			Minimum Daily Air Temperature (°C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
12/04/2014	-23.8	n/a	-22.8	-21.2	n/a	-21.7	-27.4	n/a	-24.7	0	0	0.0
13/04/2014	-22.8	n/a	-20.2	-16.8	n/a	-13.5	-28.5	n/a	-25.2	0	0	0.0
14/04/2014	-20.2	n/a	-17.7	-14.0	n/a	-14.3	-25.2	n/a	-21.1	0	0	0.0
15/04/2014	-17.9	n/a	-14.3	-10.2	n/a	-8.4	-25.4	n/a	-19.7	0	0	0.0
16/04/2014	-12.4	n/a	-8.5	-7.5	n/a	-5.4	-20.6	n/a	-13.2	0	0	0.0
17/04/2014	-12.9	n/a	-10.4	-9.8	n/a	-7.3	-17.5	n/a	-12.5	0	0	0.0
18/04/2014	-8.6	n/a	-4.7	-2.9	n/a	-1.8	-17.7	n/a	-9.5	0	0	0.0
19/04/2014	-7.5	n/a	-2.6	-1.0	n/a	2.2	-13.9	n/a	-6.3	0	0	0.0
20/04/2014	-11.0	n/a	-8.2	-6.9	n/a	-5.7	-16.8	n/a	-9.8	0	0	0.0
21/04/2014	-11.0	n/a	-12.7	-8.8	n/a	-9.7	-15.5	n/a	-17.0	0	0	0.0
22/04/2014	-16.6	n/a	-16.0	-12.6	n/a	-13.9	-21.6	n/a	-18.3	0	0.3	0.0
23/04/2014	-17.7	n/a	-14.9	-11.1	n/a	-8.8	-26.5	n/a	-20.4	0	0	0.0
24/04/2014	-15.9	n/a	-13.7	-8.5	n/a	-10.2	-24.0	n/a	-16.5	0	0	0.0
25/04/2014	-18.2	n/a	-14.7	-8.1	n/a	-11.5	-24.2	n/a	-17.6	0	0	0.0
26/04/2014	-18.0	n/a	-14.0	-13.3	n/a	-8.1	-23.7	n/a	-19.5	0	0	0.0
27/04/2014	-9.2	n/a	-7.9	0.8	n/a	0.2	-19.7	n/a	-16.2	0	0	0.0
28/04/2014	0.8	n/a	0.8	4.5	n/a	4.8	-1.8	n/a	-7.2	3.3	0.3	0.3
29/04/2014	-0.7	n/a	-1.6	3.6	n/a	6.9	-4.2	n/a	-9.5	0	0	0.0
30/04/2014	2.2	n/a	-3.1	5.8	n/a	0.0	-0.7	n/a	-6.5	0.5	0	0.0
01/05/2014	-3.7	n/a	-8.6	1.1	n/a	-1.1	-13.7	n/a	-15.1	1.3	0	0.0
02/05/2014	-14.9	n/a	-15.5	-12.9	n/a	-11.4	-18.2	n/a	-19.3	0	1.3	0.0
03/05/2014	-16.4	n/a	-16.6	-13.7	n/a	-14.5	-19.5	n/a	-18.4	0	0	0.0
04/05/2014	-18.0	n/a	-16.3	-14.1	n/a	-14.0	-22.6	n/a	-18.3	0	0.3	0.0
05/05/2014	-14.7	n/a	-13.3	-9.6	n/a	-9.3	-19.4	n/a	-17.6	0	0	0.0
06/05/2014	-11.2	n/a	-8.0	-4.1	n/a	-2.9	-18.1	n/a	-13.7	0.8	0	0.0
07/05/2014	-10.2	n/a	-5.7	-4.8	n/a	-1.4	-16.4	n/a	-11.5	0	0	0.0
08/05/2014	-7.1	n/a	-5.3	-1.2	n/a	-0.6	-15.4	n/a	-11.1	0	0	0.0
09/05/2014	-4.1	n/a	-2.2	-2.2	n/a	0.1	-6.3	n/a	-4.9	0	0	0.0
10/05/2014	-2.6	n/a	-1.2	0.0	n/a	1.2	-4.8	n/a	-2.9	1.0	0	0.0
11/05/2014	-3.7	n/a	-3.6	-2.1	n/a	-0.7	-6.6	n/a	-6.5	0	0	0.0
12/05/2014	-5.2	n/a	-6.0	-1.3	n/a	-3.6	-7.7	n/a	-9.0	0	0.5	0.0
13/05/2014	-3.1	n/a	-1.0	3.4	n/a	7.2	-12.9	n/a	-10.5	0	0	0.0
14/05/2014	2.4	n/a	4.0	7.5	n/a	11.0	-3.1	n/a	-1.1	1.0	0	0.0
15/05/2014	-1.2	n/a	-0.7	2.2	n/a	3.2	-4.7	n/a	-4.8	0	0	0.0
16/05/2014	-1.8	n/a	-2.4	2.1	n/a	2.2	-6.7	n/a	-6.7	0	0	3.9
17/05/2014	-4.2	n/a	-2.4	-0.4	n/a	2.9	-7.1	n/a	-6.5	0	0	0.0
18/05/2014	-0.4	n/a	3.7	4.8	n/a	7.1	-6.8	n/a	0.3	0	0	2.1
19/05/2014	1.3	n/a	0.5	8.1	n/a	5.0	-3.0	n/a	-5.9	1.0	0	0.0
20/05/2014	-3.8	n/a	-5.4	-0.6	n/a	-3.0	-7.0	n/a	-7.8	0	0	0.0
21/05/2014	-2.6	n/a	-1.2	0.1	n/a	2.0	-5.2	n/a	-3.8	0	0	0.0
22/05/2014	-2.2	n/a	-2.8	1.0	n/a	0.9	-4.7	n/a	-5.9	0	0	0.0
23/05/2014	-0.5	n/a	0.9	2.3	n/a	5.8	-4.4	n/a	-3.2	0	0	1.2
24/05/2014	1.5	n/a	1.2	3.2	n/a	2.6	-1.1	n/a	-1.8	2.3	4.8	13.5
25/05/2014	-0.8	n/a	-0.5	4.4	n/a	5.0	-4.3	n/a	-4.9	0.8	0.8	0.0
26/05/2014	4.6	n/a	4.9	12.2	n/a	11.3	-0.7	n/a	-0.3	0.8	0	0.0
27/05/2014	2.1	n/a	3.0	6.0	n/a	10.0	-1.1	n/a	-2.1	4.8	0	0.0
28/05/2014	5.5	n/a	9.6	12.2	n/a	15.7	-0.5	n/a	3.3	0.8	0	0.0
29/05/2014	10.2	n/a	12.1	16.5	n/a	20.5	2.5	n/a	2.1	0.3	0	0.0
30/05/2014	5.1	n/a	1.6	10.5	n/a	4.8	1.2	n/a	-0.3	0	0	0.0
31/05/2014	1.1	n/a	-0.4	4.1	n/a	2.4	-1.0	n/a	-2.8	0	0	0.0
01/06/2014	-0.2	n/a	0.1	0.7	n/a	2.4	-1.4	n/a	-1.6	0	0	0.0
02/06/2014	-3.3	n/a	-4.1	-0.9	n/a	-1.3	-5.4	n/a	-5.2	0.5	0	0.0
03/06/2014	-3.3	n/a	-3.0	-0.3	n/a	-0.7	-6.5	n/a	-5.6	0.5	0.5	0.0
04/06/2014	-3.0	n/a	-2.9	-1.7	n/a	-2.2	-4.2	n/a	-3.5	0	0	0.0
05/06/2014	-2.6	n/a	-2.5	-0.8	n/a	-0.9	-4.4	n/a	-4.2	0	0	0.0
06/06/2014	1.8	n/a	0.9	8.1	n/a	5.2	-2.3	n/a	-3.4	1.5	0	0.0
07/06/2014	3.8	n/a	4.0	8.3	n/a	8.6	-1.6	n/a	-1.7	0	0	0.0
08/06/2014	5.6	n/a	7.4	10.1	n/a	11.3	-0.5	n/a	2.1	0.3	0	0.0

Appendix 2. George, Goose and Bathurst Inlet Meteorological Stations Daily Temperature and Rainfall/Precipitation Data (2004 to 2014)

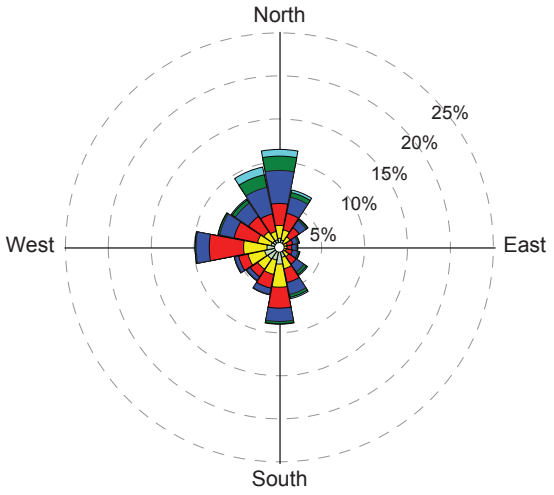
	Average Daily Air Temperature (˚C)			Maximum Daily Air Temperature (˚C)			Minimum Daily Air Temperature (˚C)			Total Daily Precipitation (mm)		
Date	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet	Goose	George	Bathurst Inlet
09/06/2014	6.4	n/a	8.8	11.2	n/a	15.0	-0.4	n/a	2.7	0	0	2.9
10/06/2014	6.9	n/a	3.8	13.1	n/a	7.1	2.6	n/a	0.6	0.5	0.3	0.5
11/06/2014	4.0	n/a	3.8	7.1	n/a	8.4	-0.1	n/a	-0.1	0	0.3	0.0
12/06/2014	8.9	n/a	8.3	15.3	n/a	0.0	3.5	n/a	0.0	0.5	0	0.0
13/06/2014	12.7	n/a	n/a	19.4	n/a	0.0	7.4	n/a	0.0	0.5	0	0.0

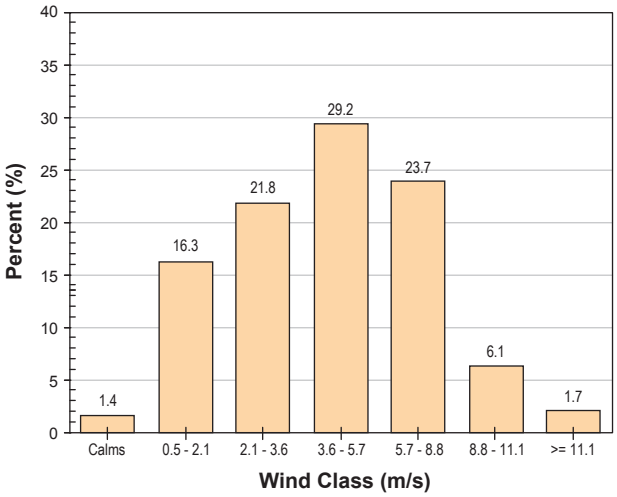
Appendix 3

Goose, George and Bathurst Inlet Meteorological Stations Wind Roses

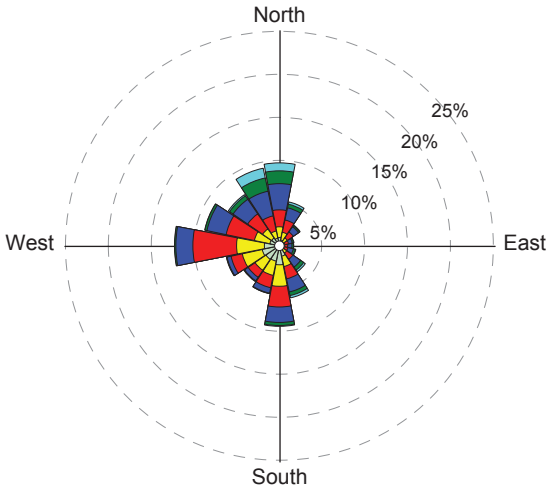
Rescan™
an ERM company

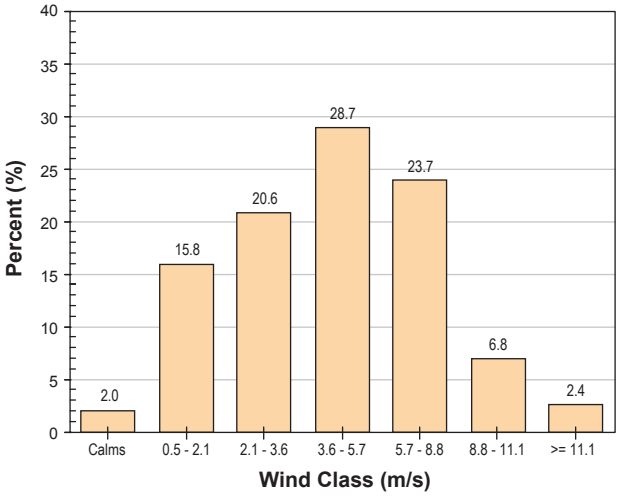
Annual



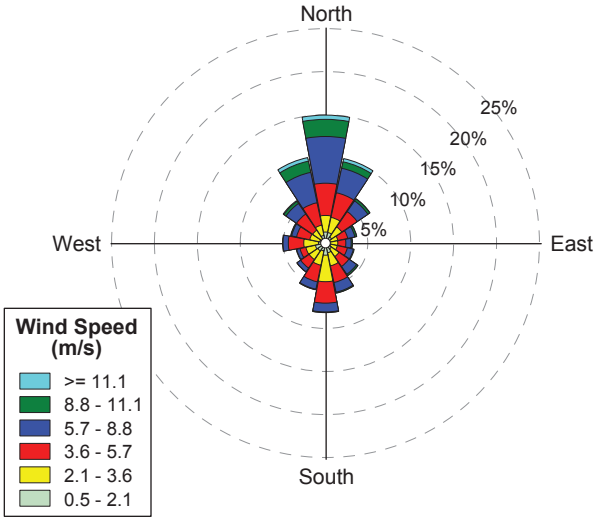


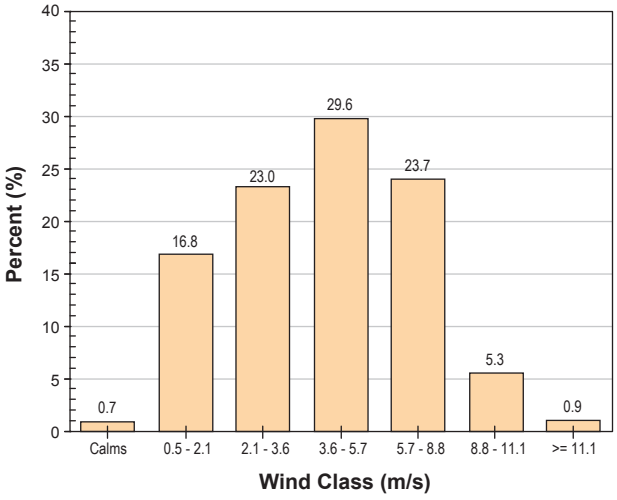
Winter





Summer





Note: Data available until Oct 17, 2005.

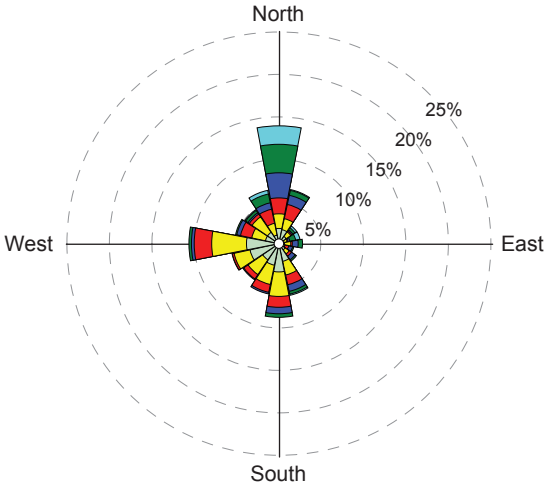
Figure A3-1a

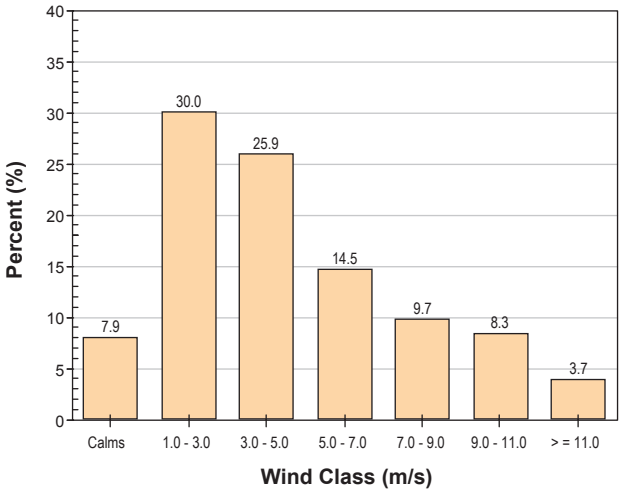
Goose Meteorological Station Windroses, 2005

Sabina GOLD & SILVER CORP.

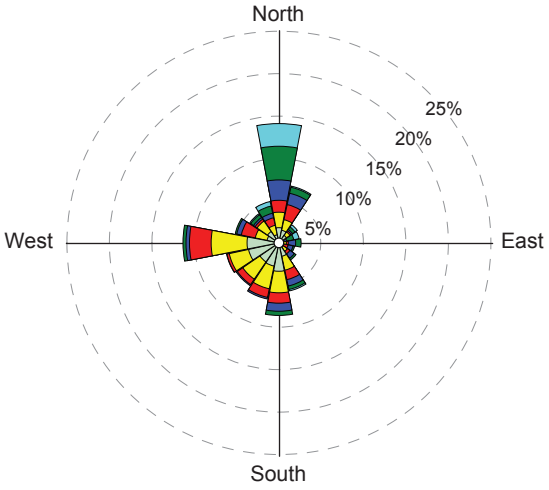
Rescan an ERM company

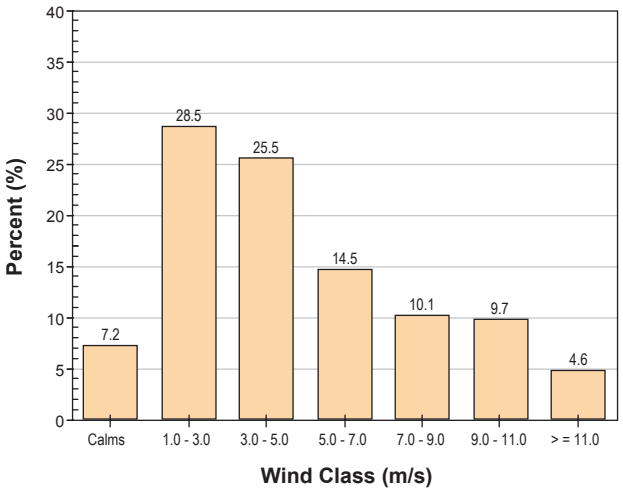
Annual



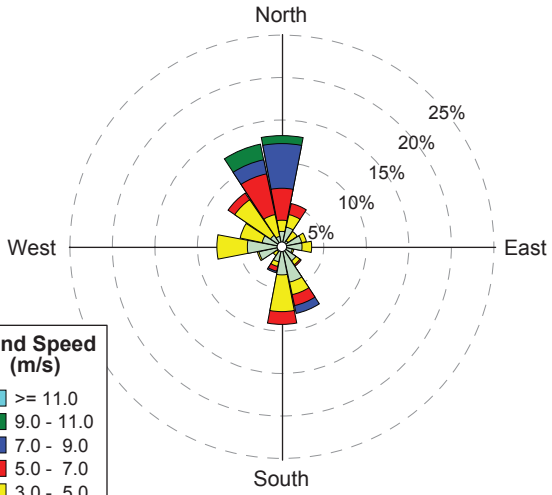


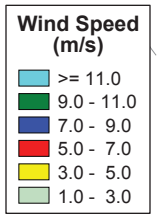
Winter





Summer





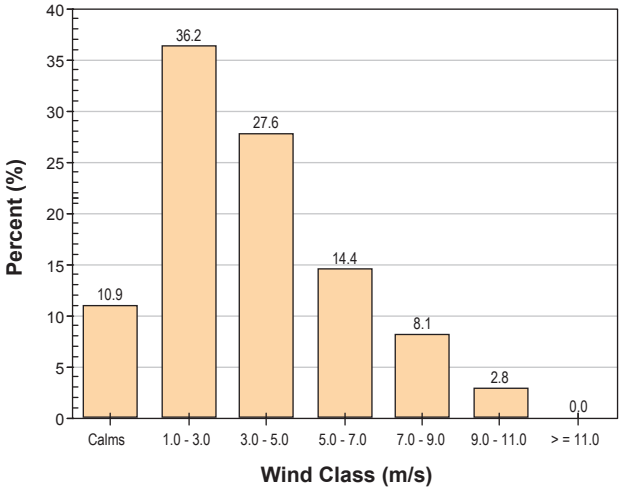


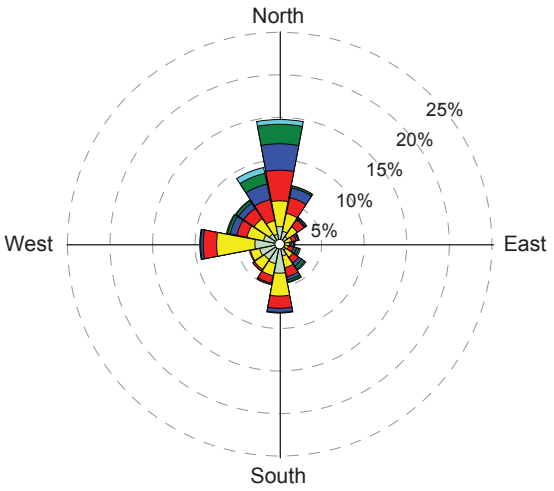
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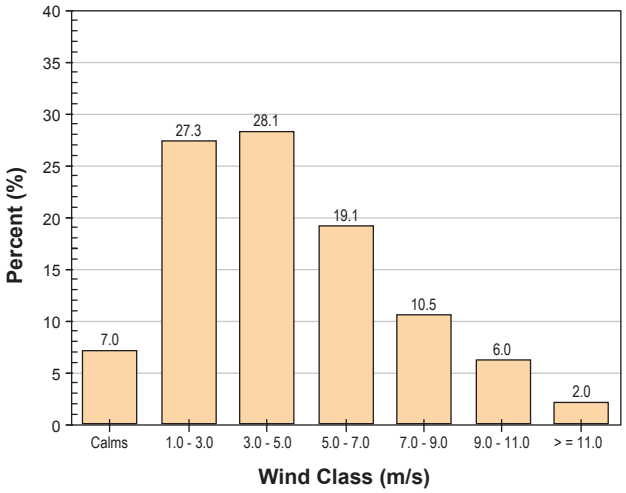
Goose Meteorological Station Windroses, 2006

Sabina GOLD & SILVER CORP.

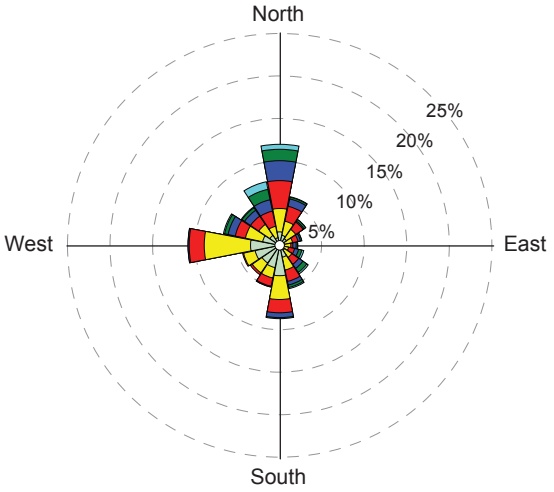
Rescan an ERM company

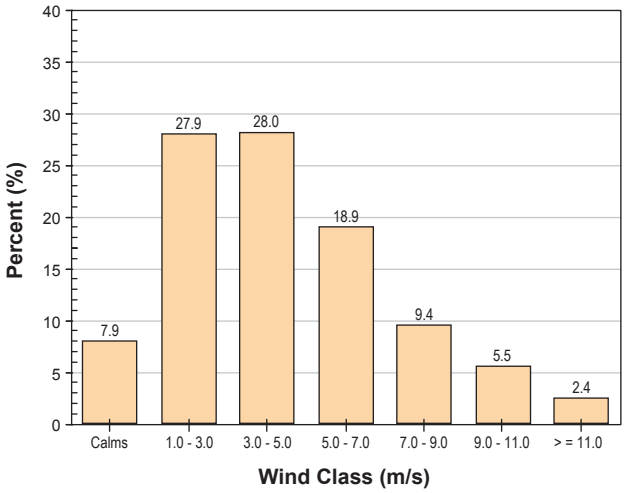
Annual



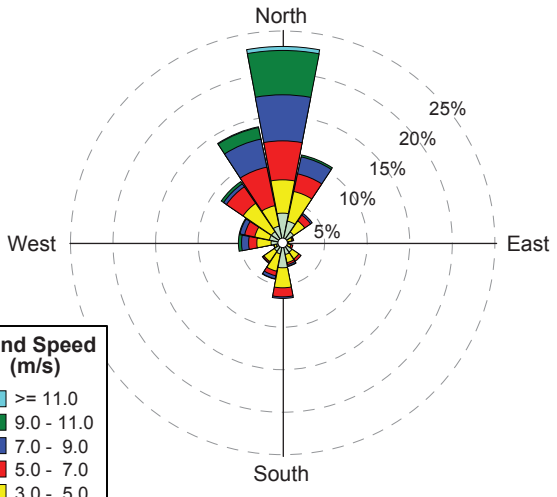


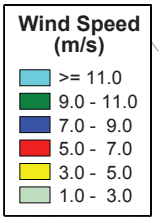
Winter





Summer





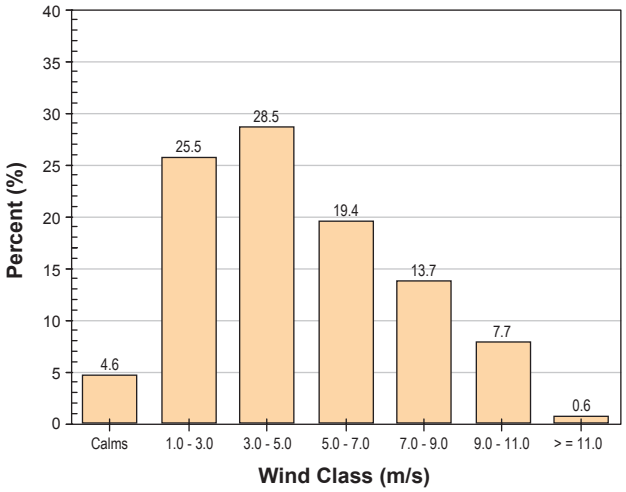
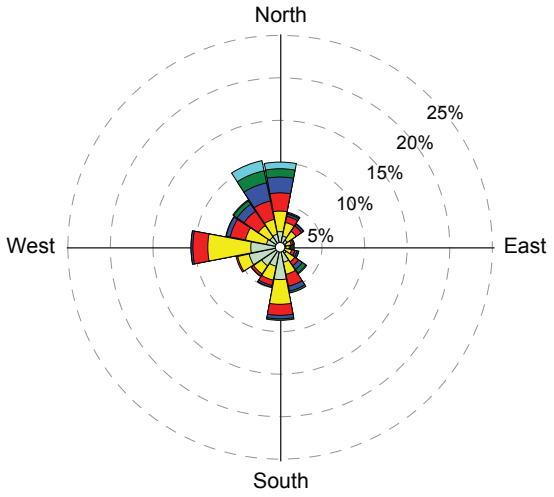
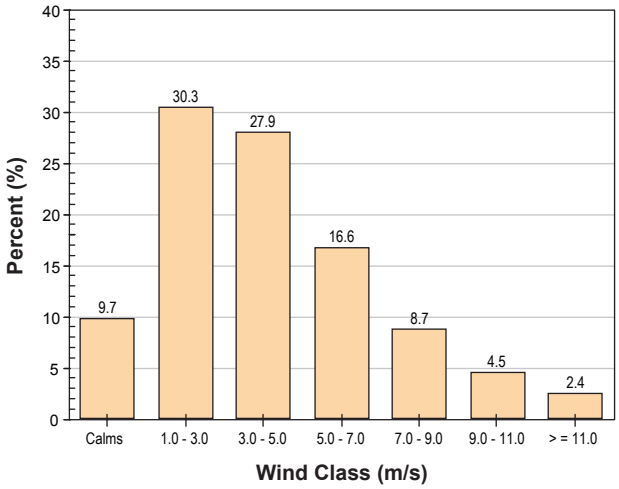


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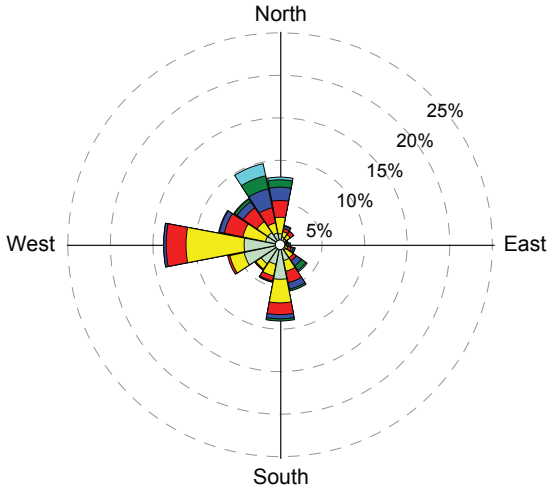
Goose Meteorological Station Windroses, 2007

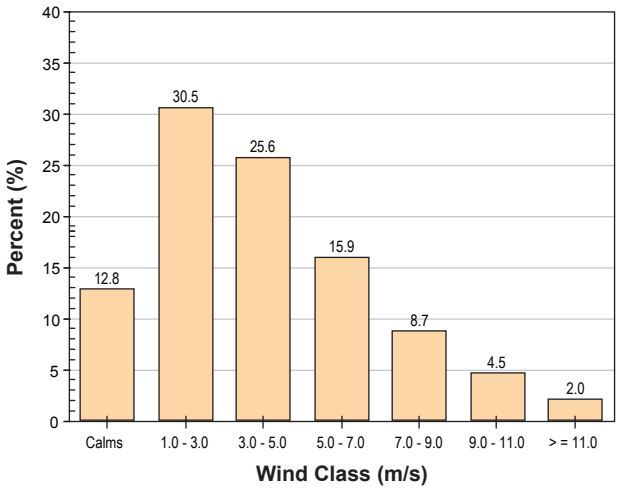
Annual



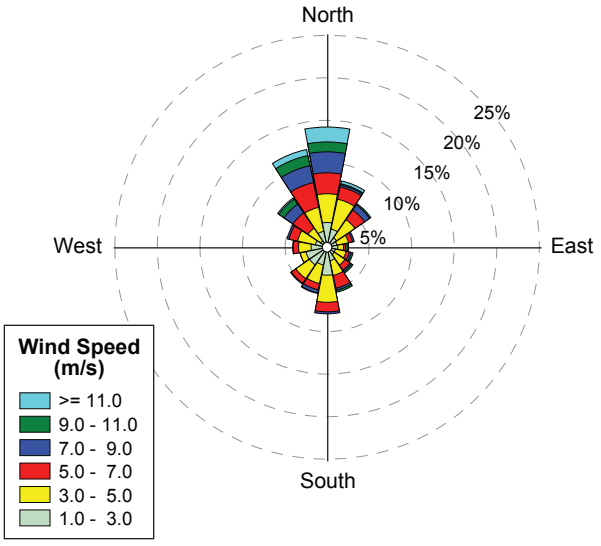


Winter





Summer



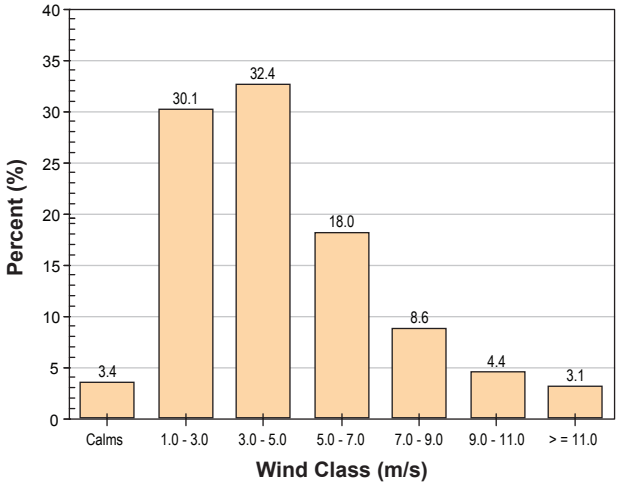
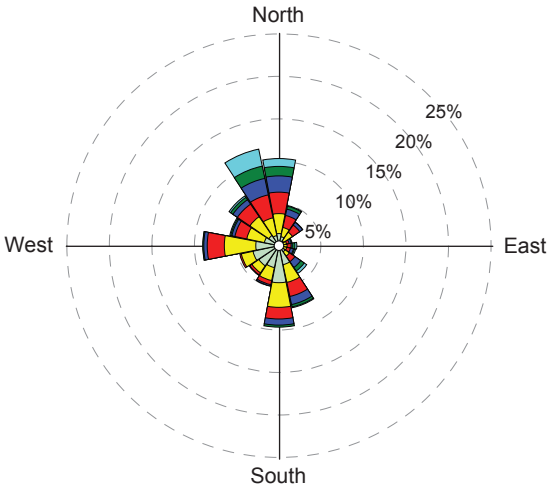
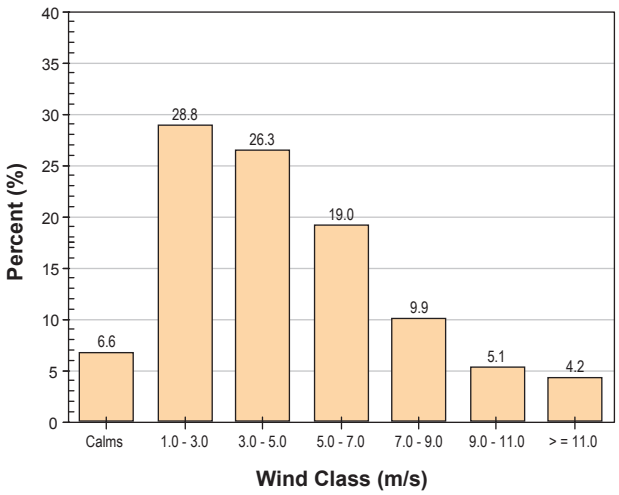


Figure A3-1d

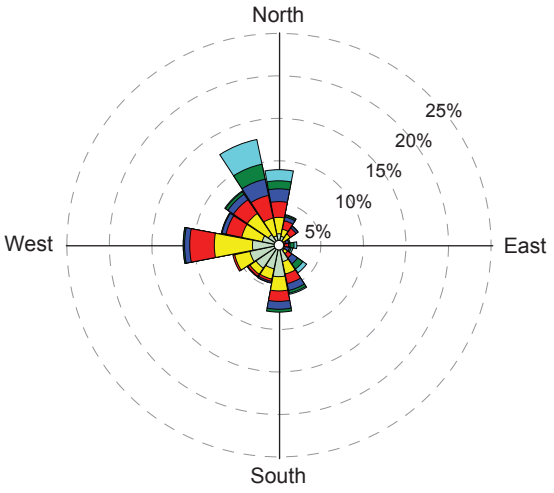
Goose Meteorological Station Windroses, 2008

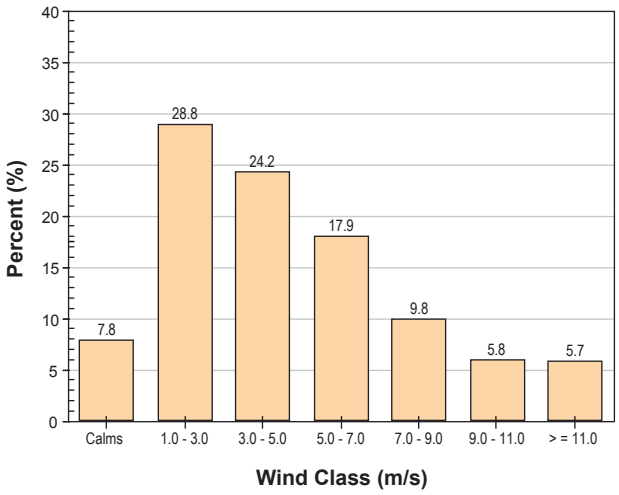
Annual



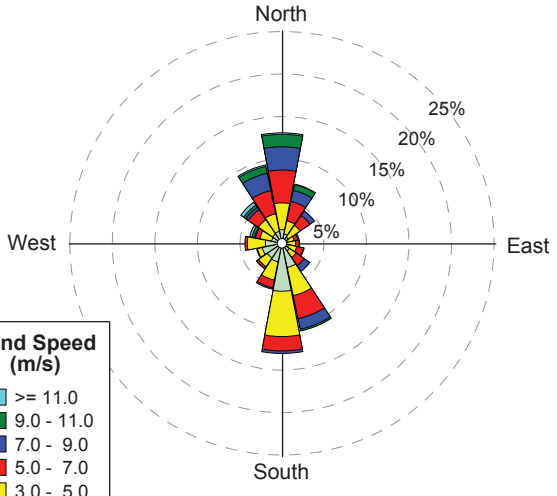


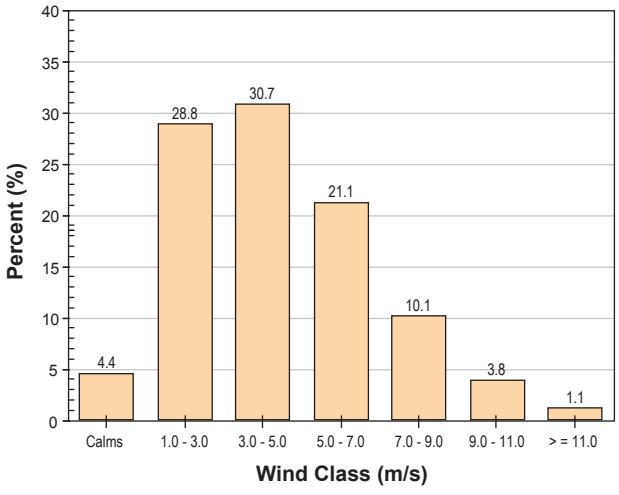
Winter





Summer





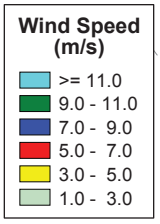
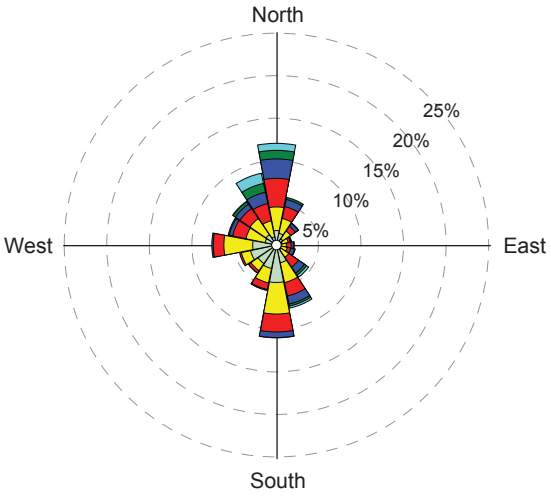
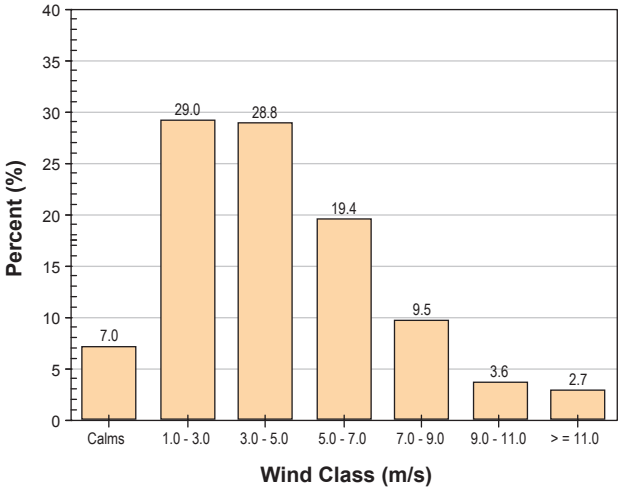


Figure A3-1e

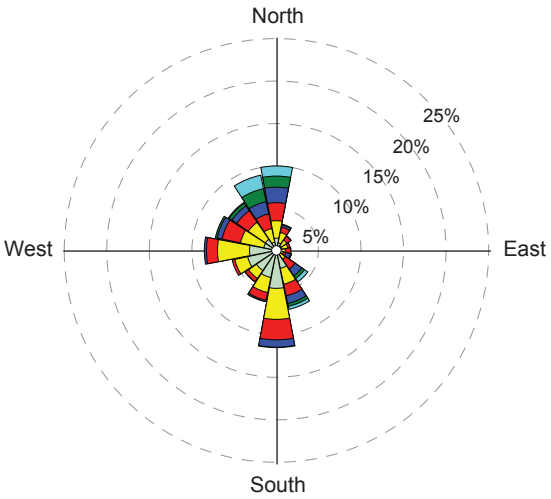
Goose Meteorological Station Windroses, 2009

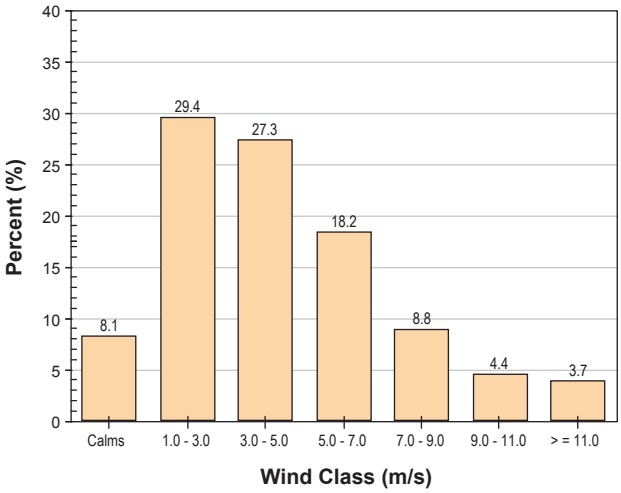
Annual



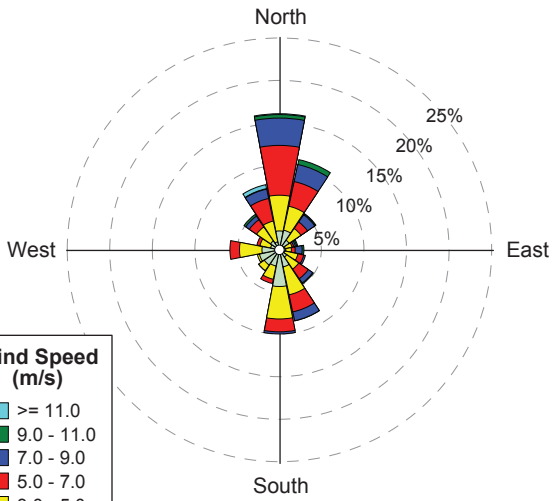


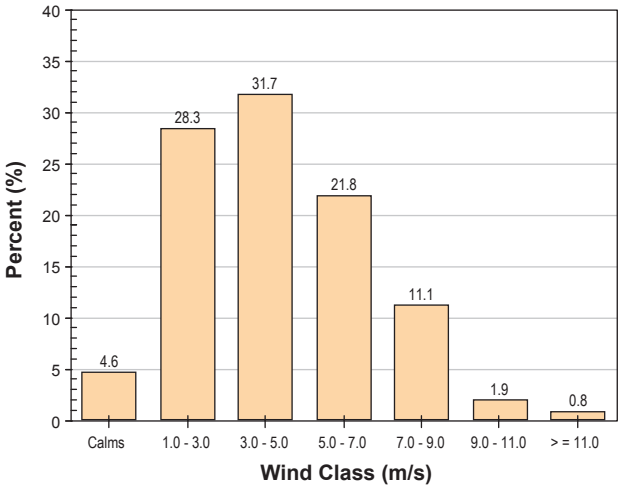
Winter





Summer





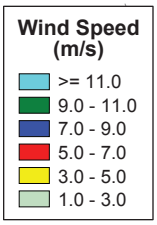


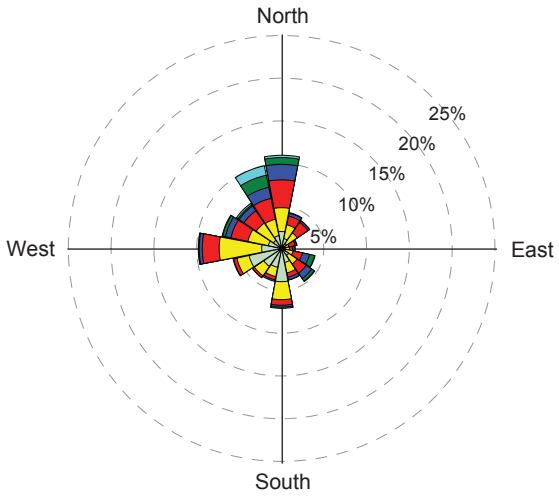
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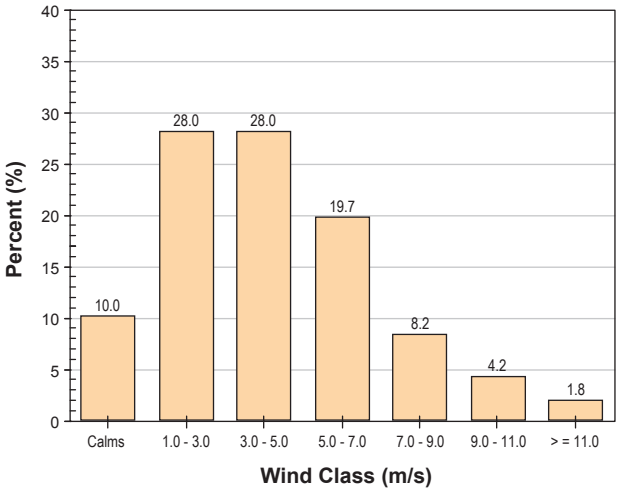
Goose Meteorological Station Windroses, 2010

Sabina GOLD & SILVER CORP.

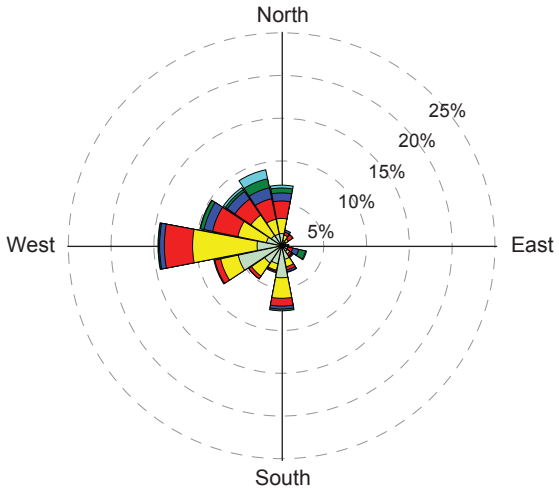
Rescan an ERM company

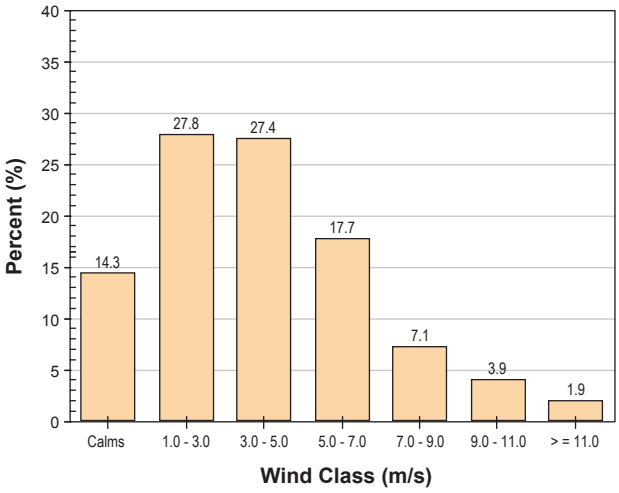
Annual



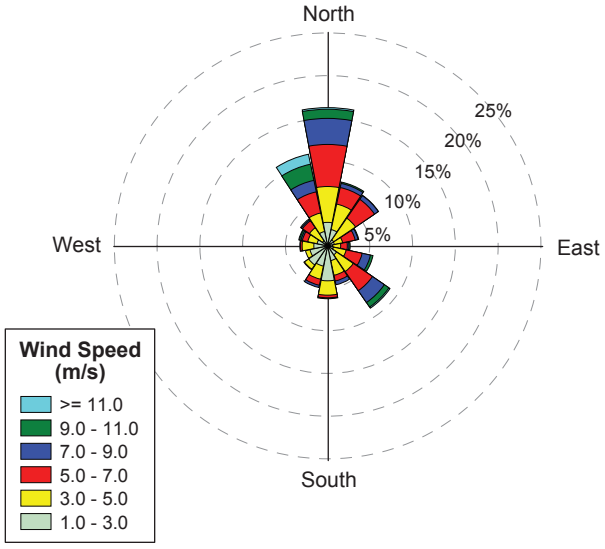


Winter





Summer



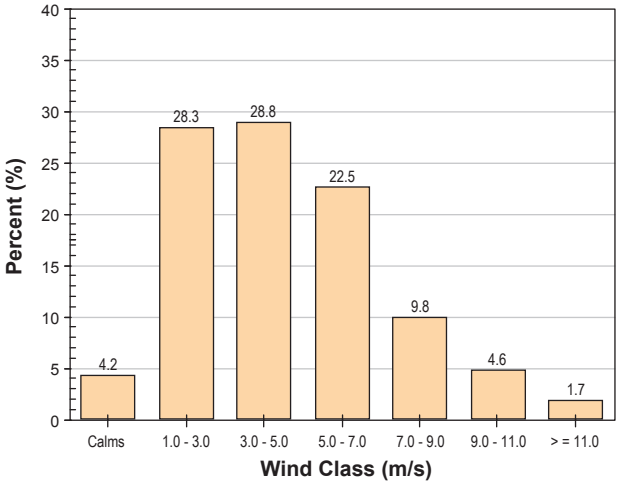


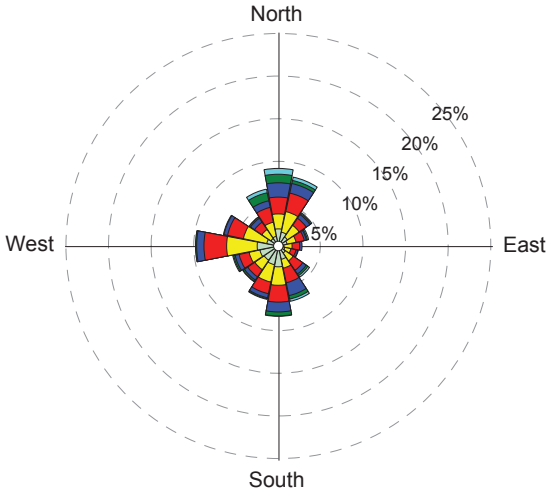
Figure A3-1g

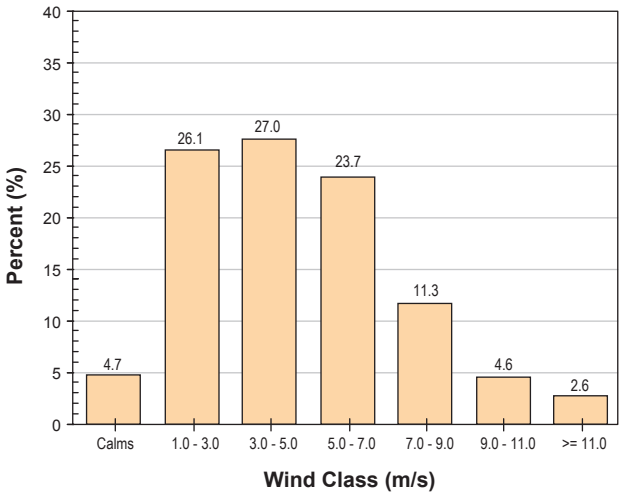
Goose Meteorological Station Windroses, 2011

Sabina GOLD & SILVER CORP.

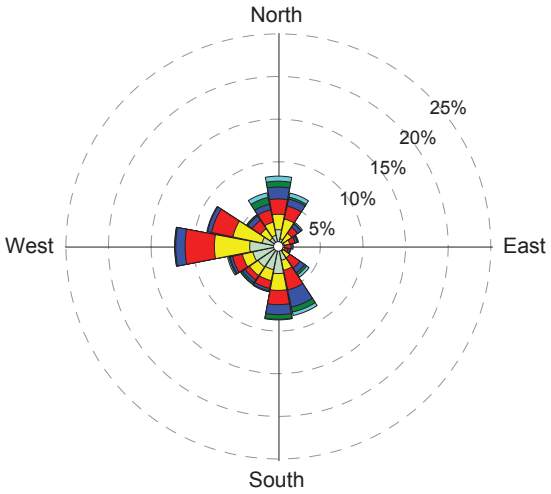
Rescan an ERM company

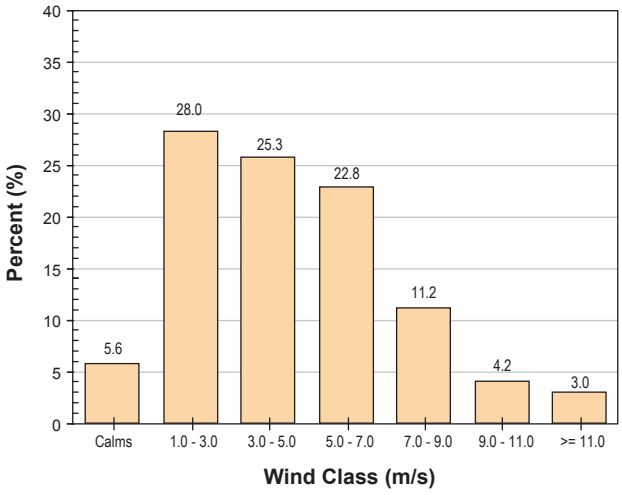
Annual



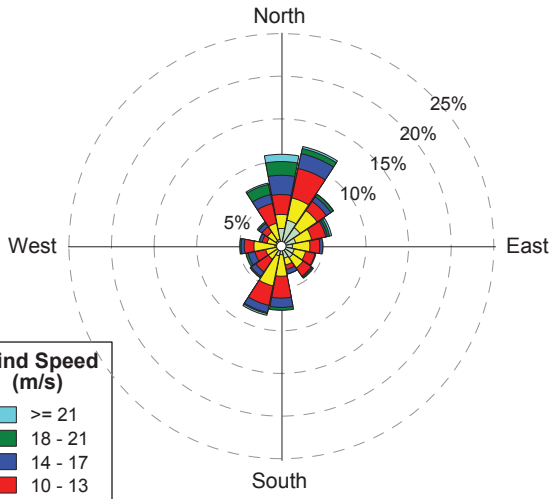


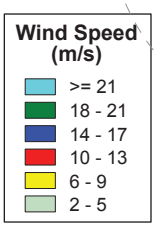
Winter





Summer





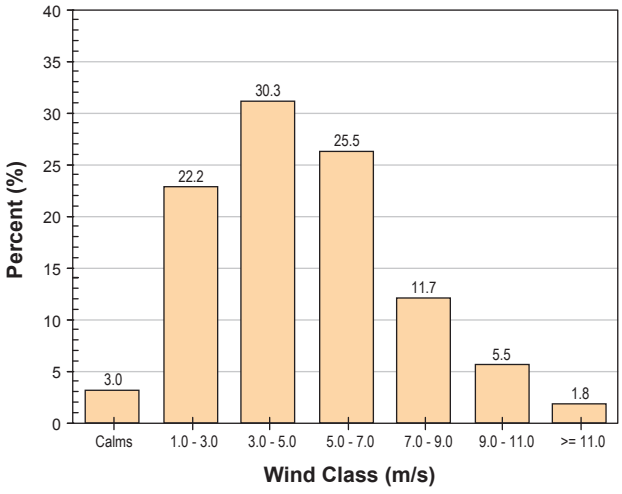


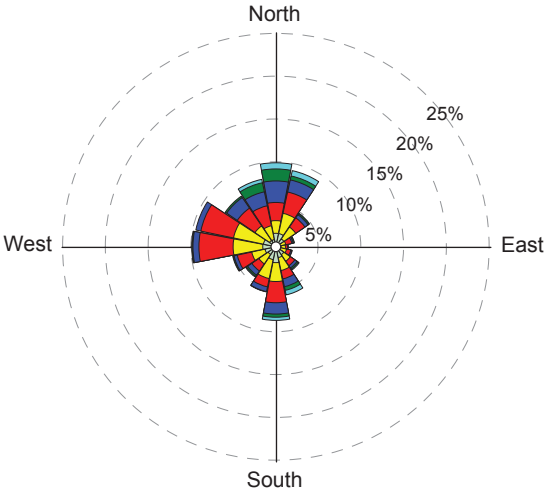
Figure A3-1h

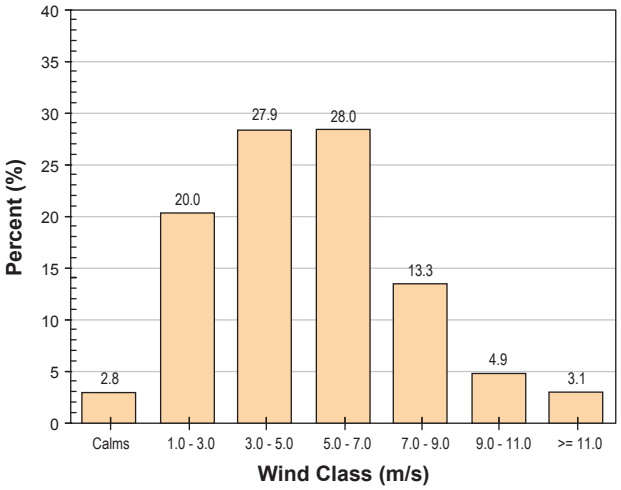
Goose Meteorology Station Windroses, 2012

Sabina GOLD & SILVER CORP.

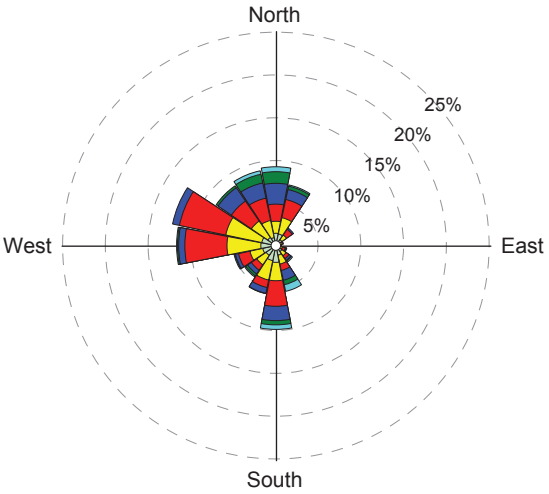
Rescan an ERM company

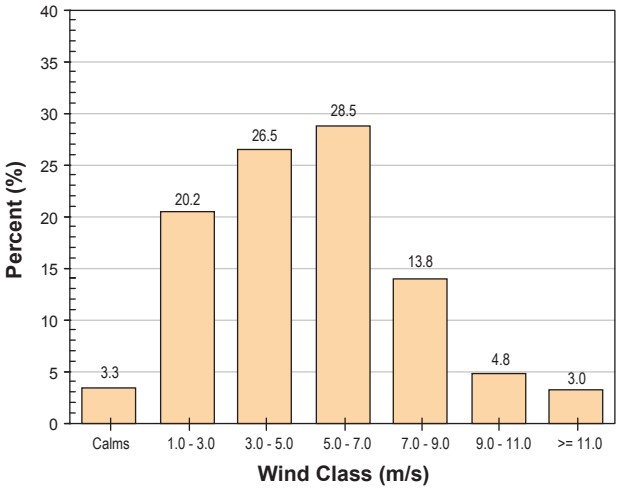
Annual



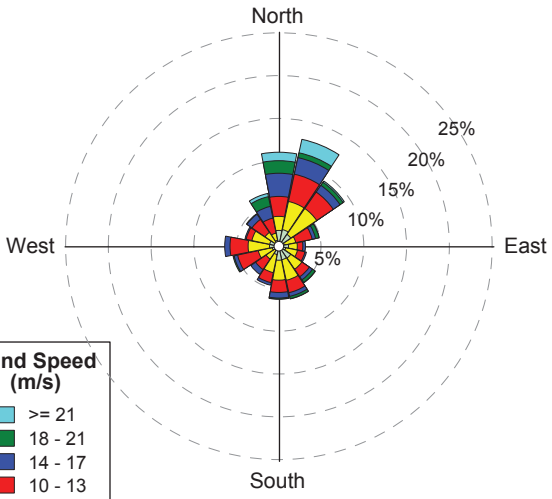


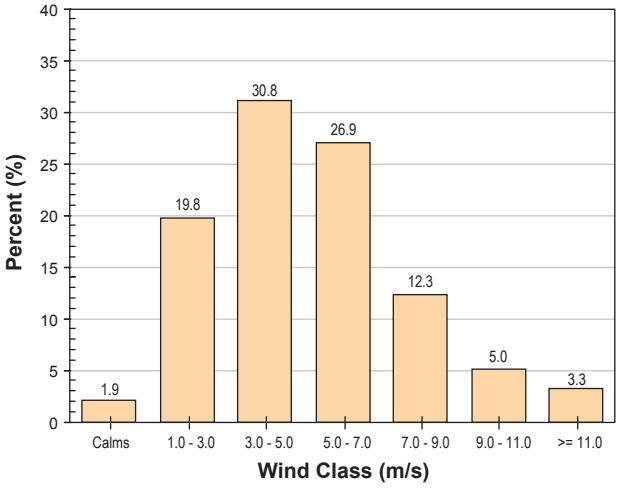
Winter





Summer





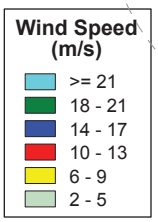
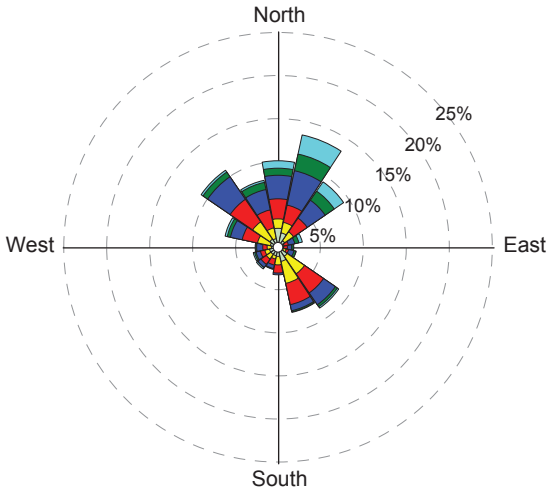
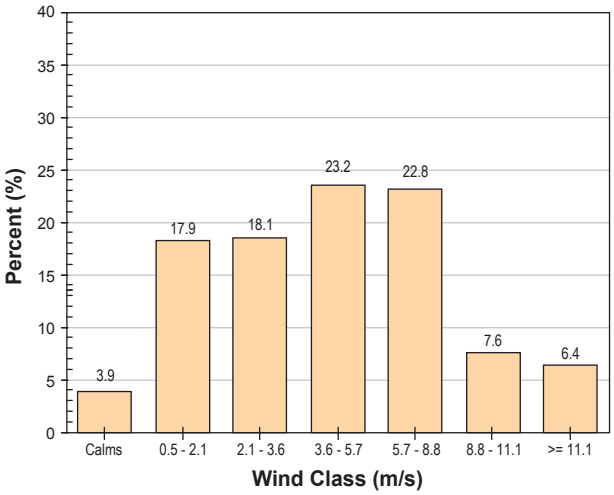


Figure A3-1i

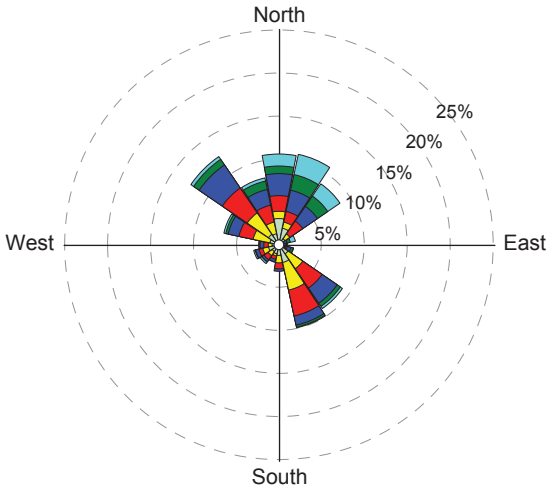
Goose Meteorology Station Windroses, 2013

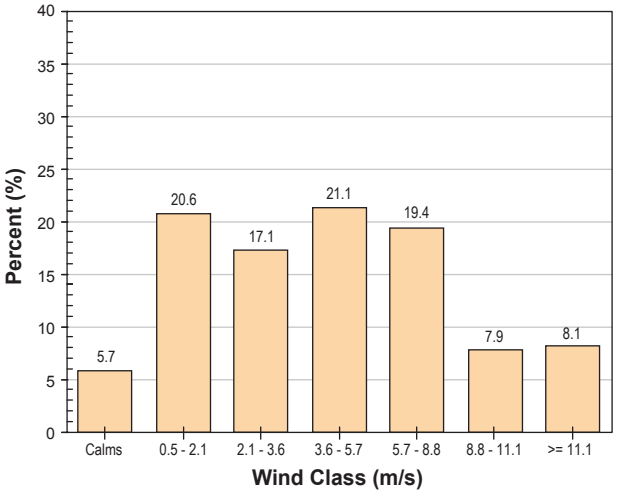
Annual



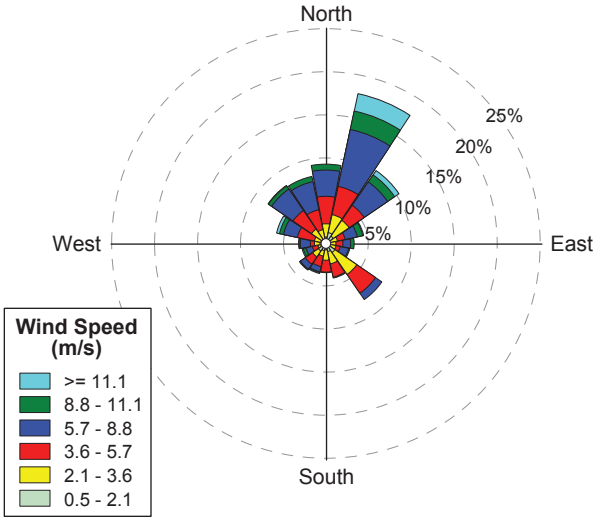


Winter





Summer



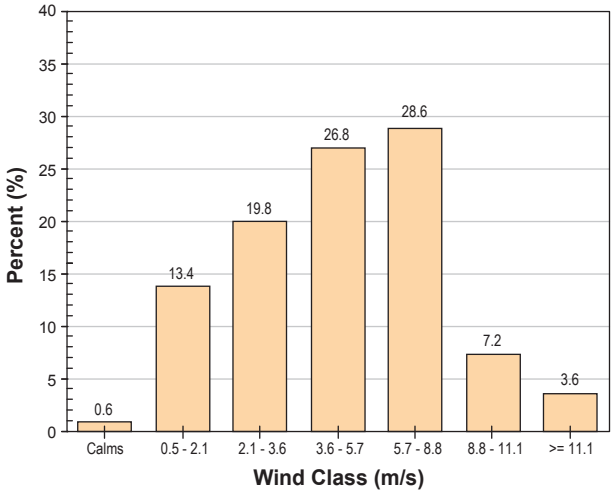


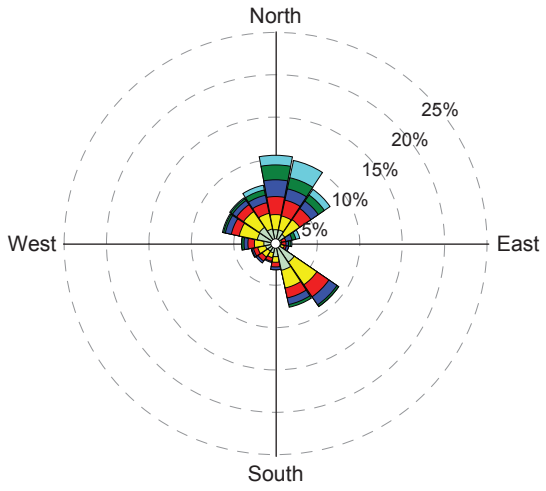
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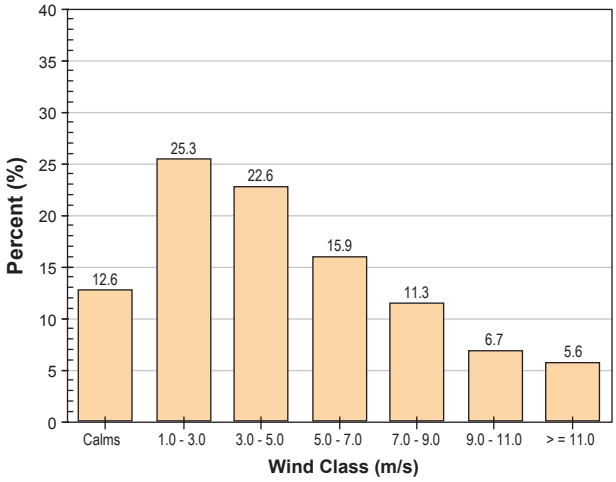
George Meteorological Station Windroses, 2005

Sabina GOLD & SILVER CORP.

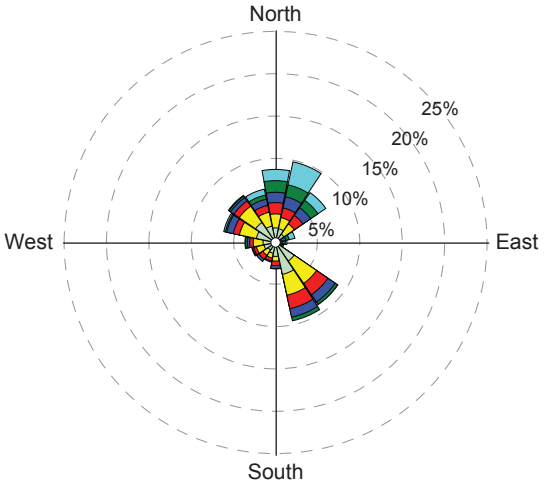
Rescan an ERM company

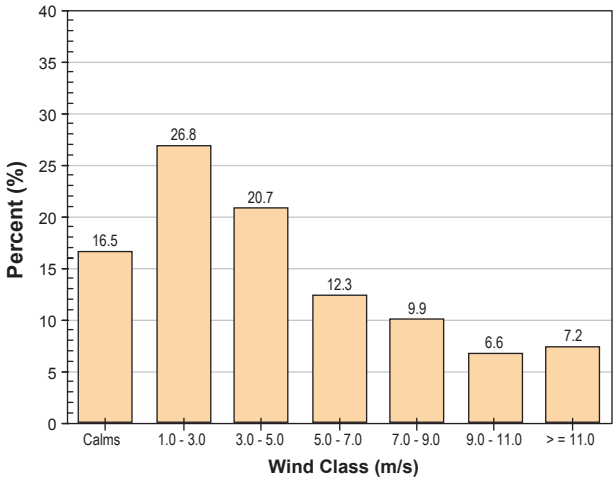
Annual



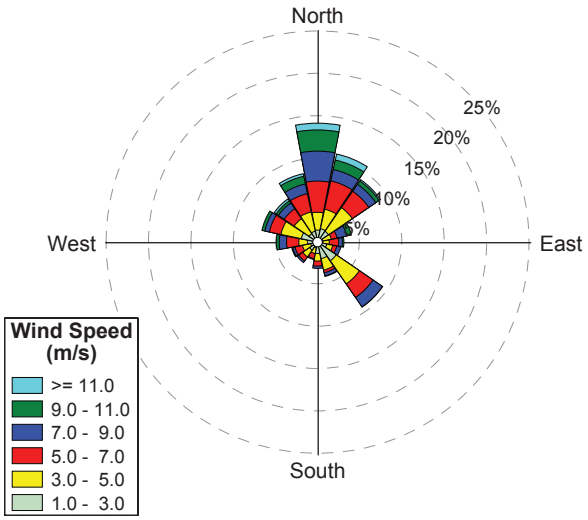


Winter





Summer



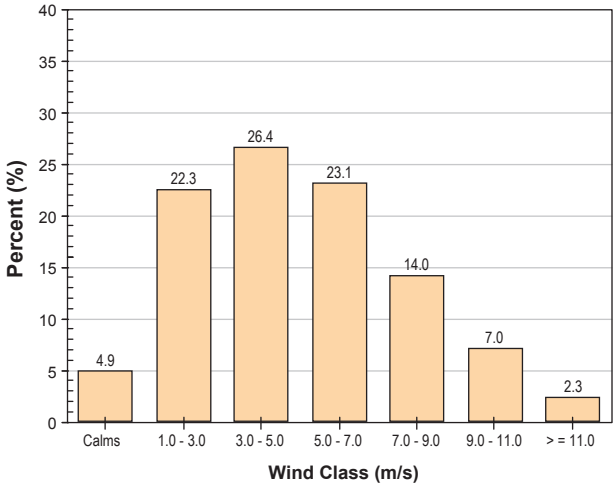


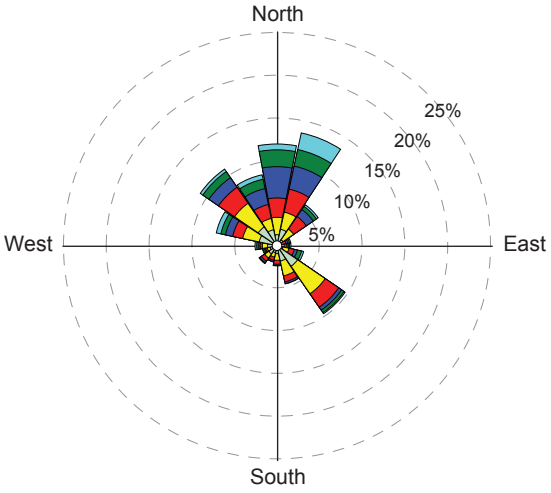
Figure A3-2b

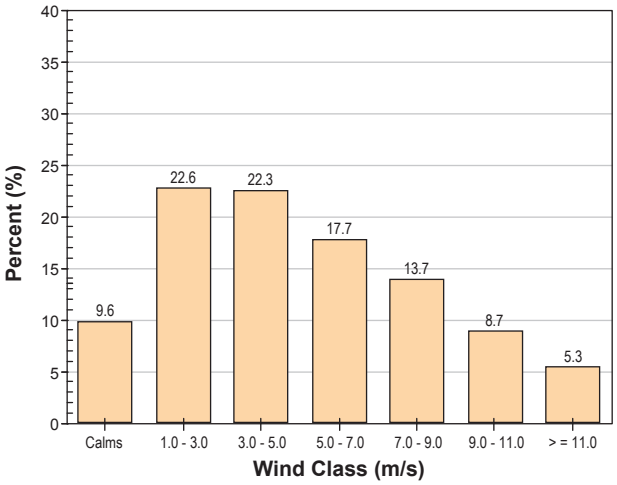
George Meteorological Station Windroses, 2006

Sabina GOLD & SILVER CORP.

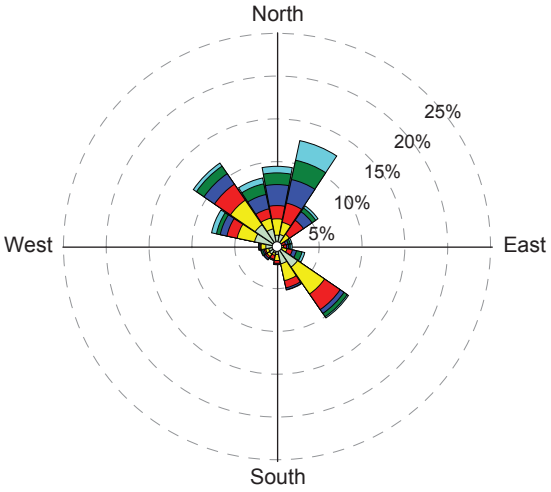
Rescan an ERM company

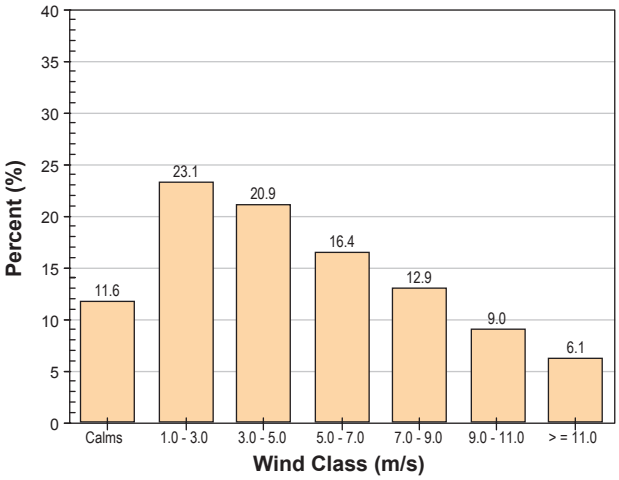
Annual



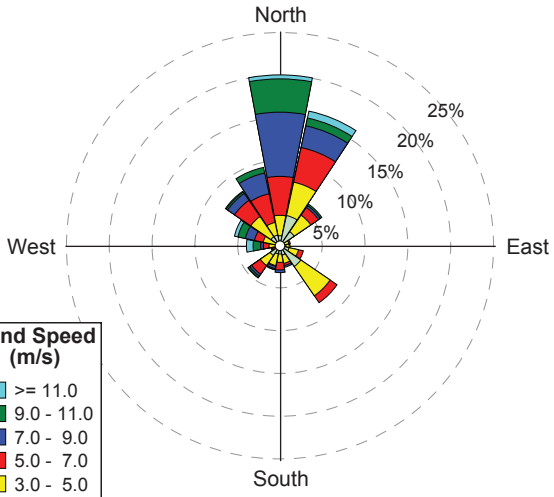


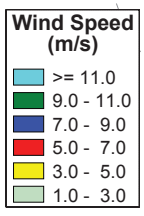
Winter





Summer





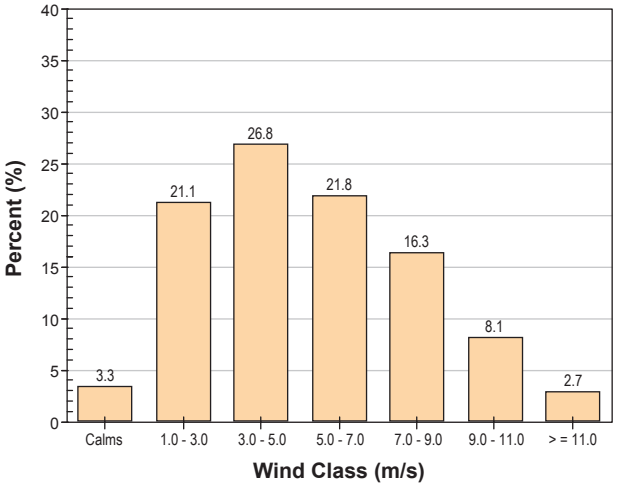


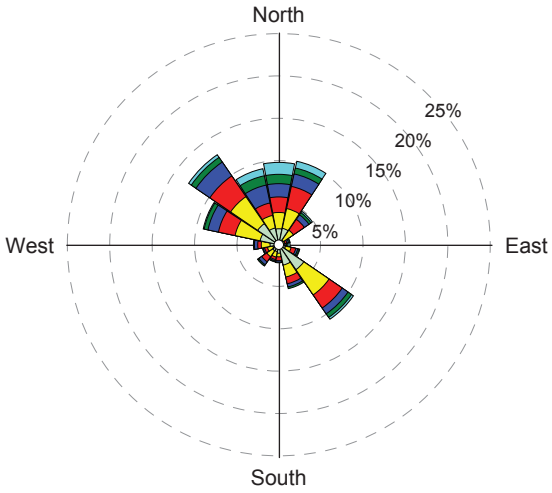
Figure A3-2c

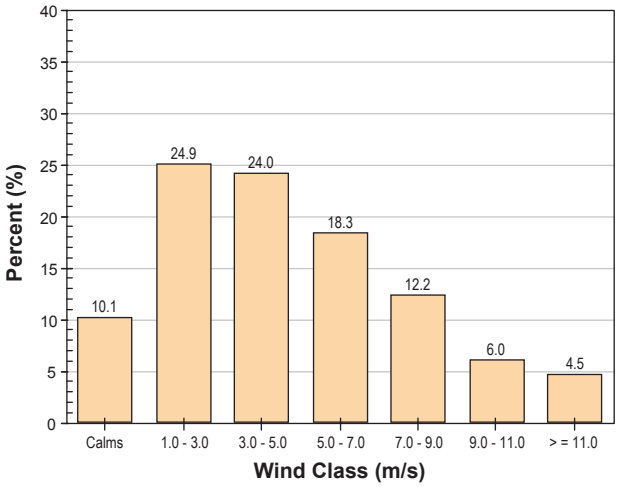
George Meteorological Station Windroses, 2007

Sabina GOLD & SILVER CORP.

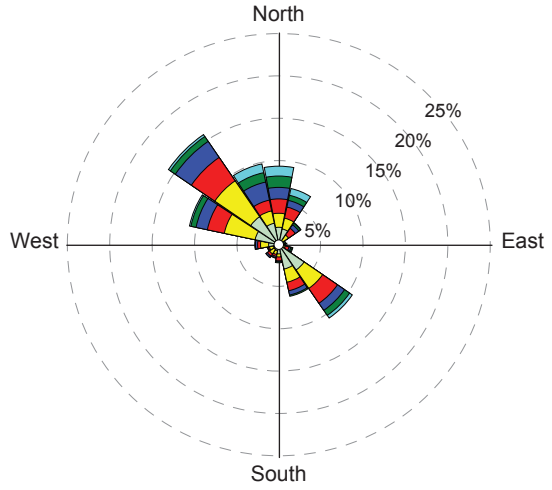
Rescan an ERM company

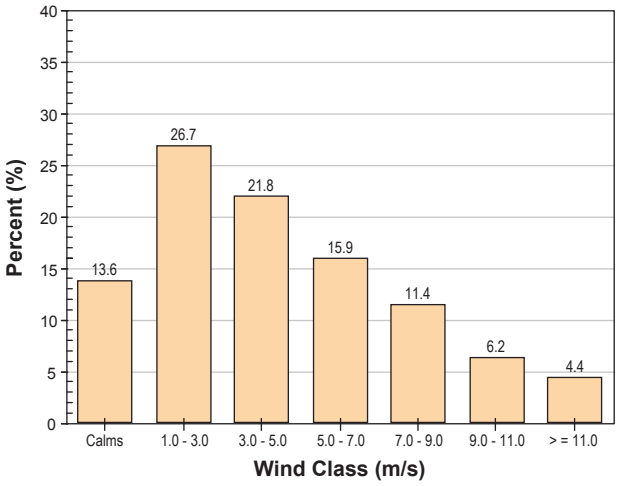
Annual



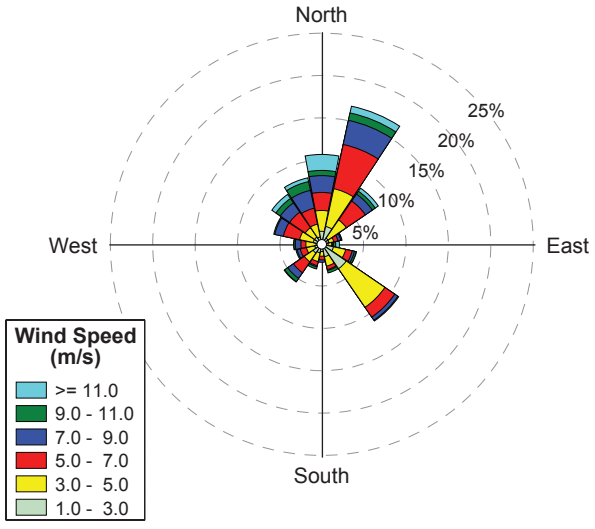


Winter





Summer



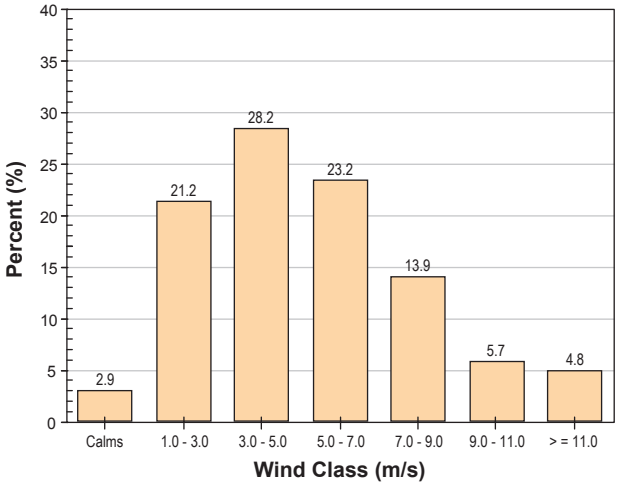


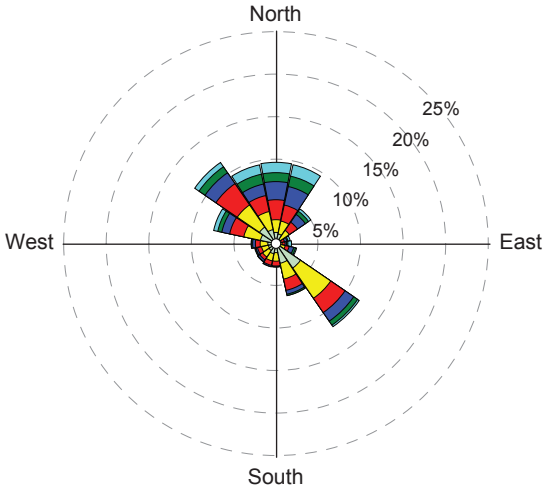
Figure A3-2d

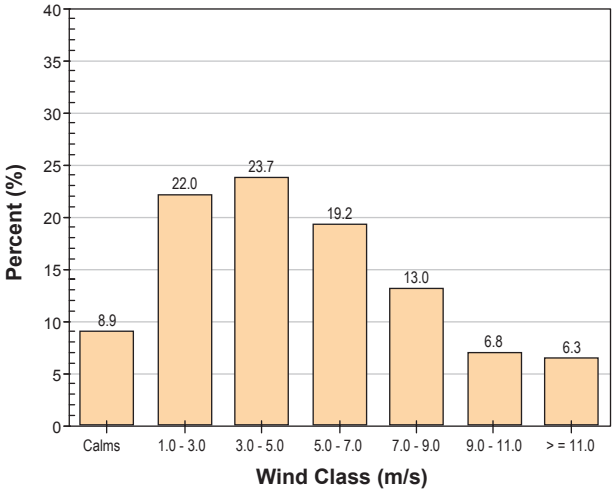
George Meteorological Station Windroses, 2008

Sabina GOLD & SILVER CORP.

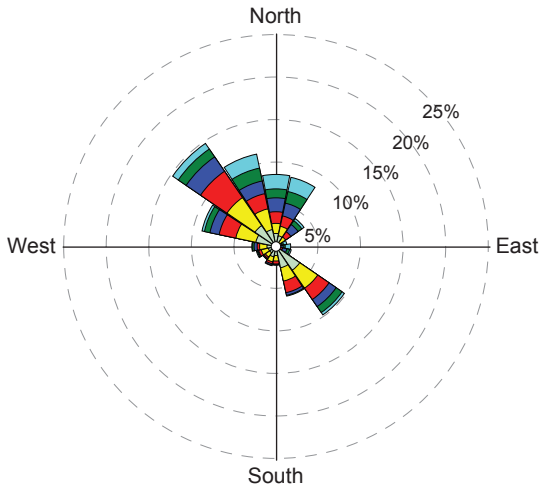
Rescan an ERM company

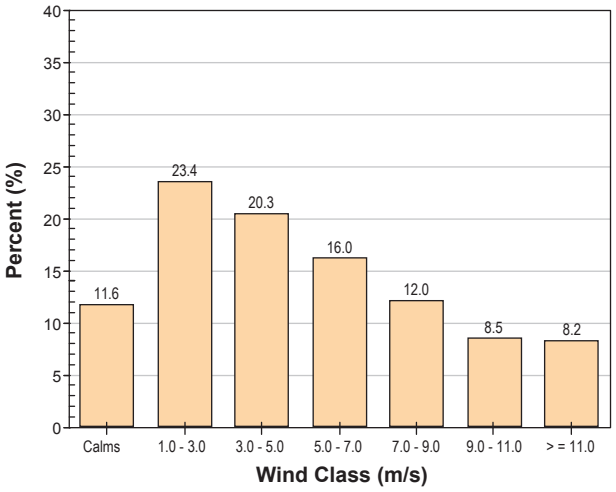
Annual



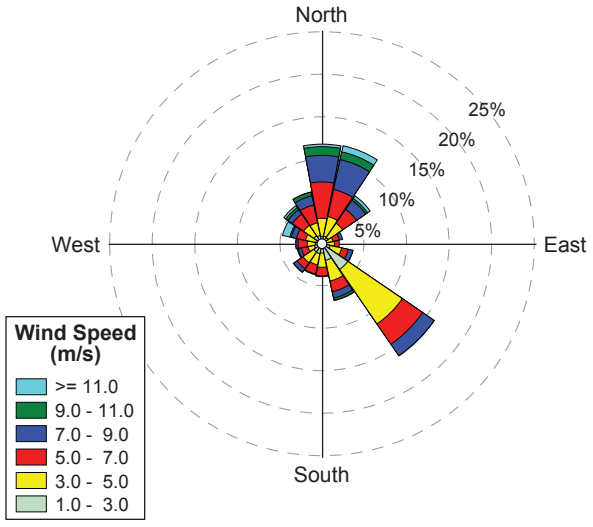


Winter





Summer



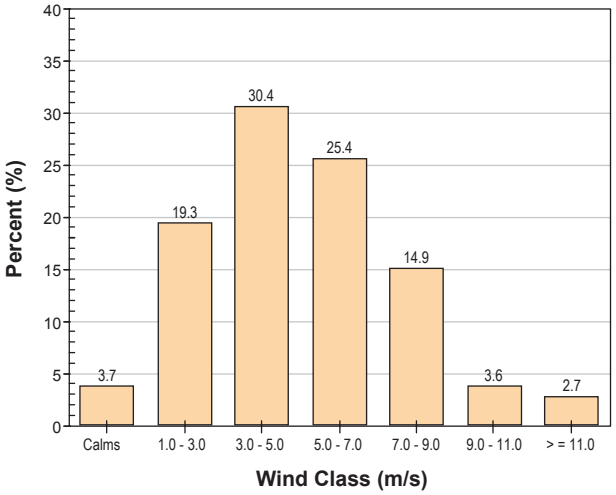


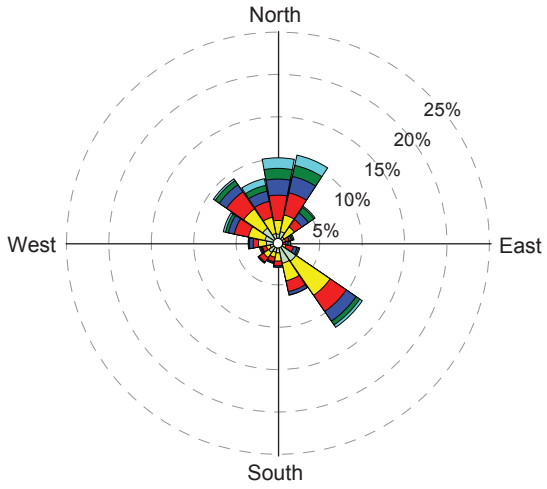
Figure A3-2e

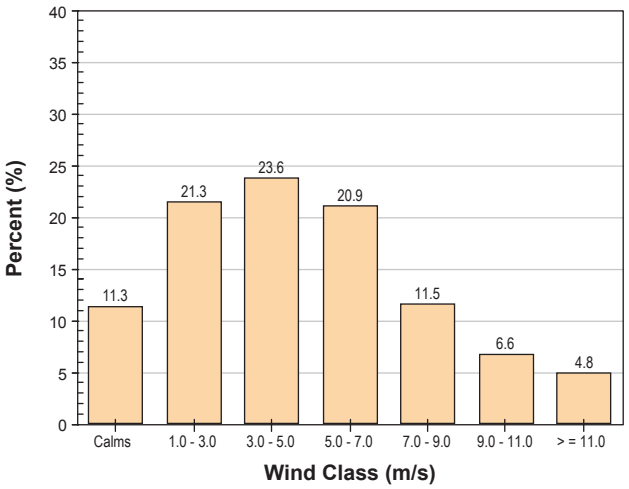
George Meteorological Station Windroses, 2009

Sabina GOLD & SILVER CORP.

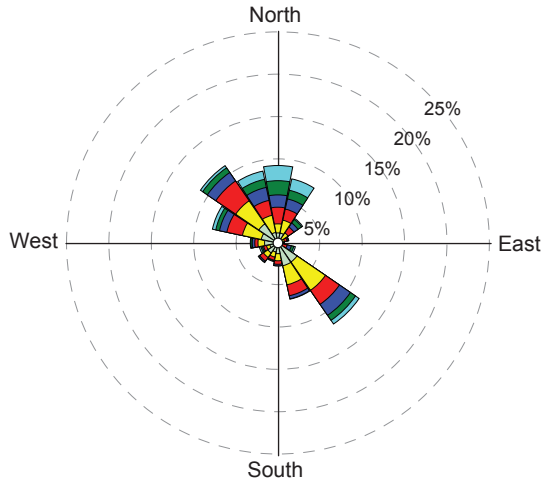
Rescan an ERM company

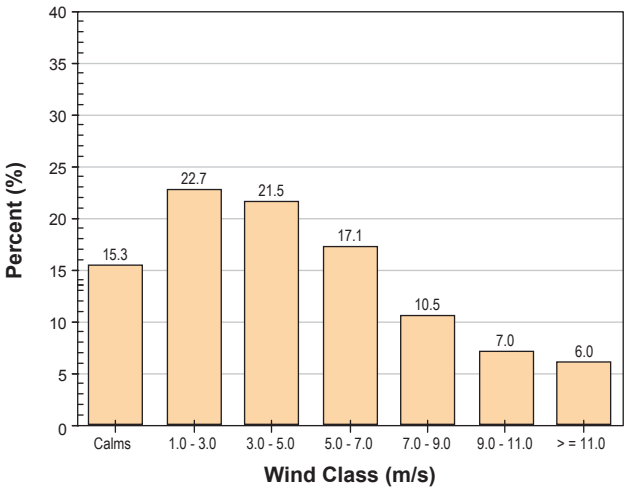
Annual



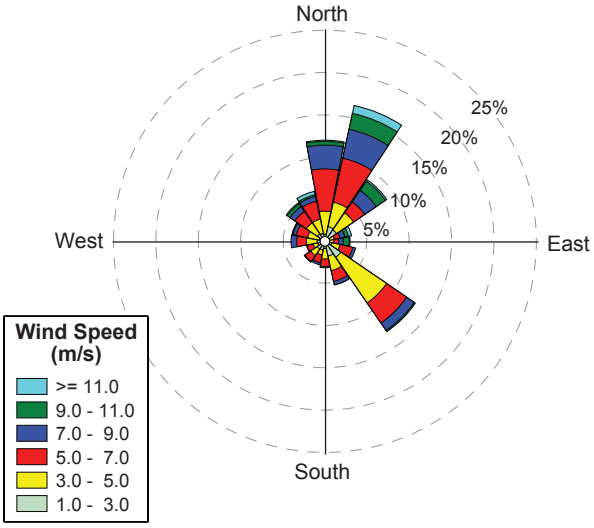


Winter





Summer



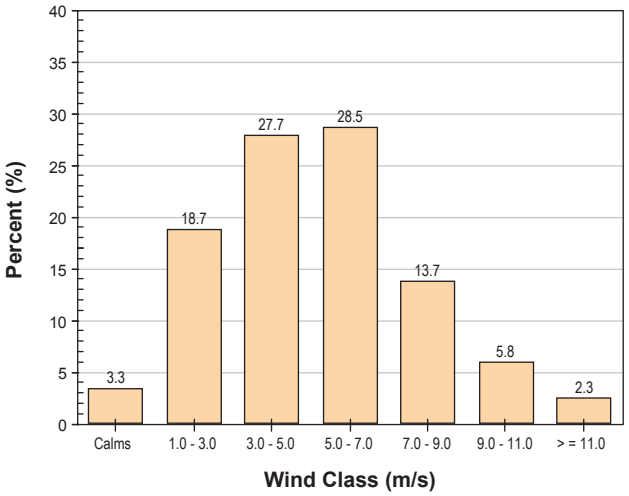


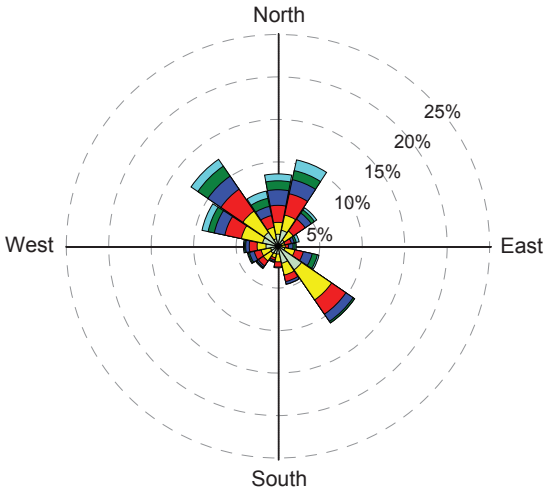
Figure A3-2f

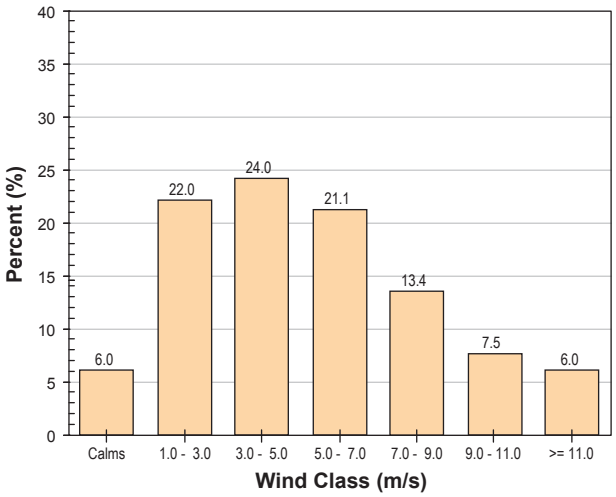
George Meteorological Station Windroses, 2010

Sabina GOLD & SILVER CORP.

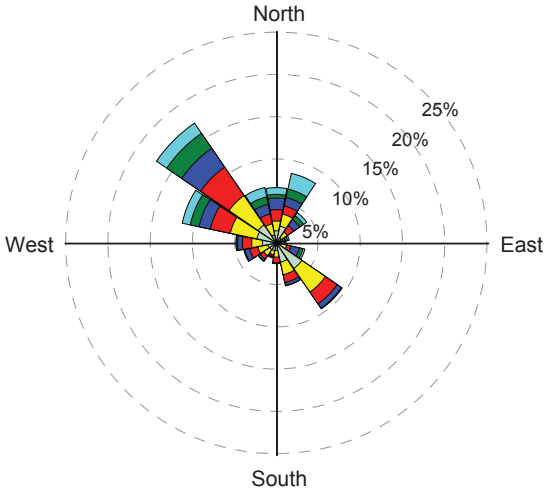
Rescan an ERM company

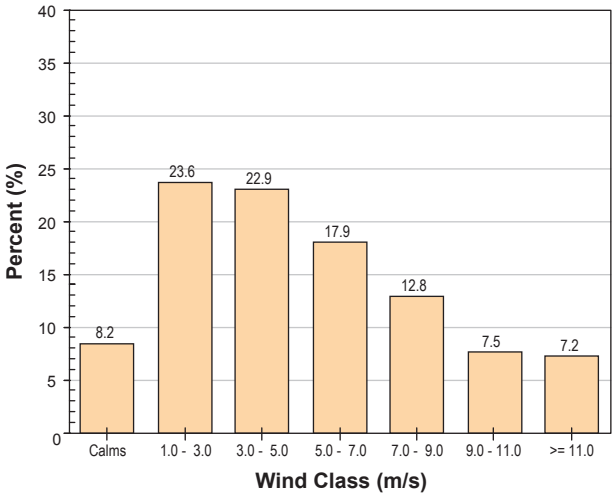
Annual



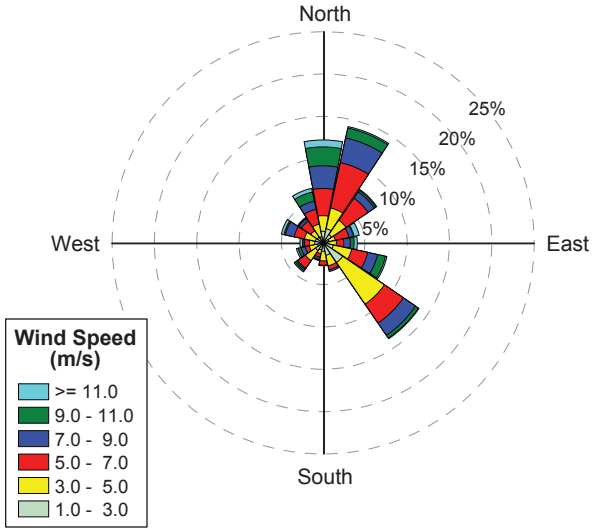


Winter





Summer



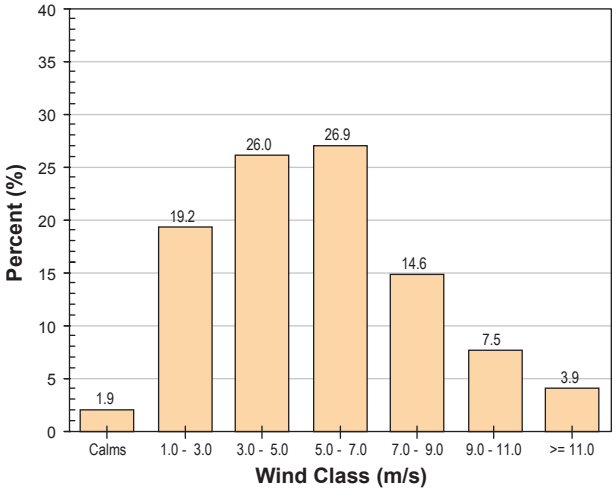
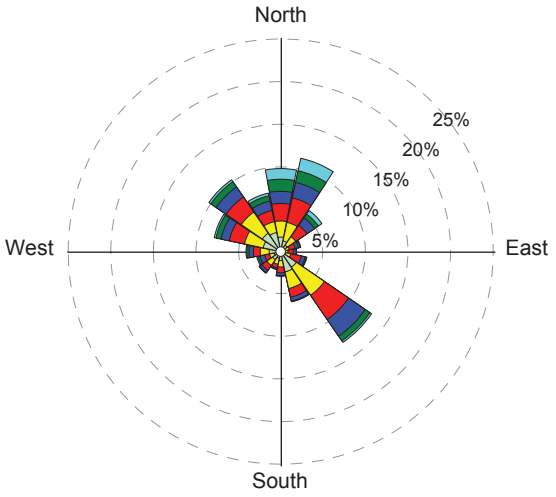
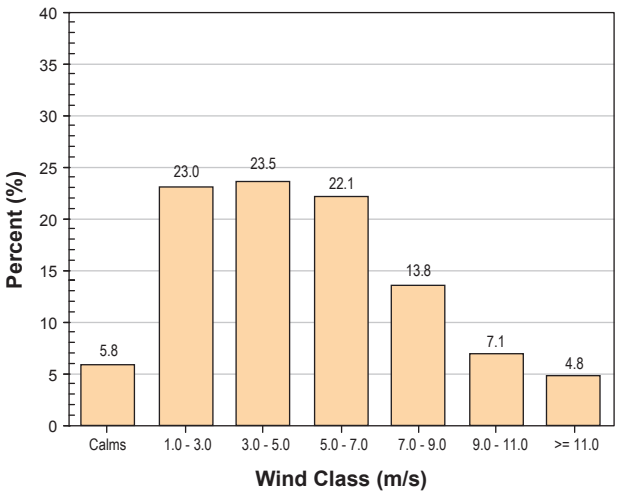


Figure A3-2g

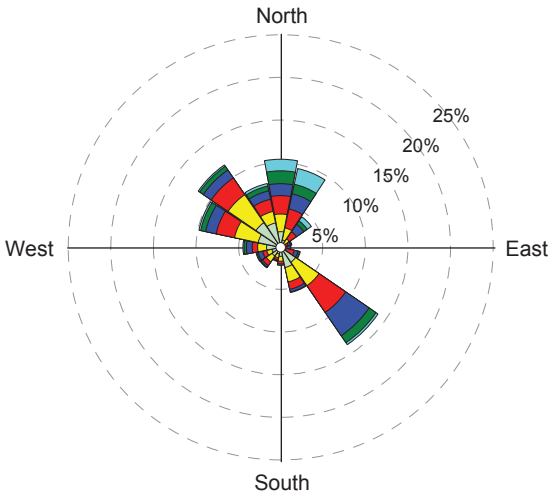
George Meteorological Station Windroses, 2011

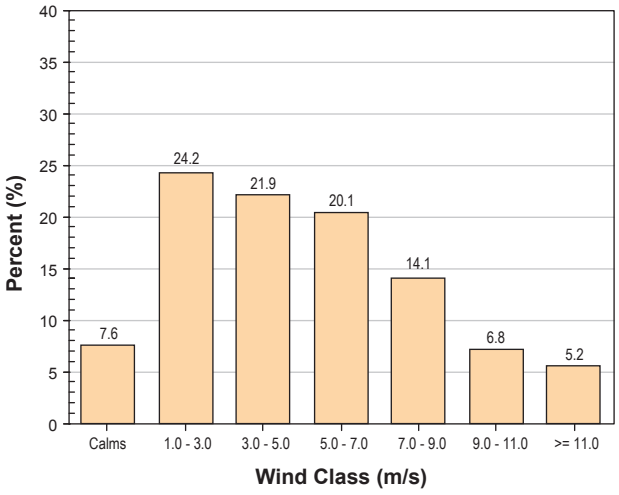
Annual



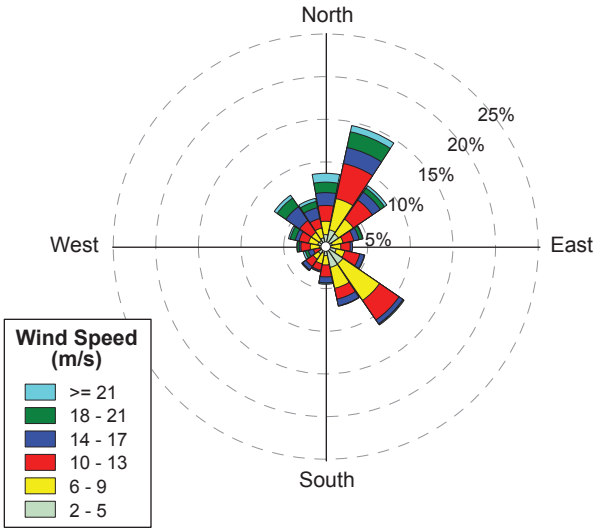


Winter





Summer



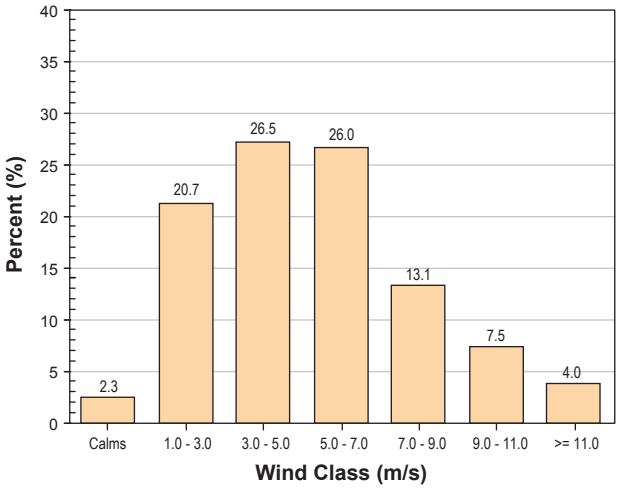
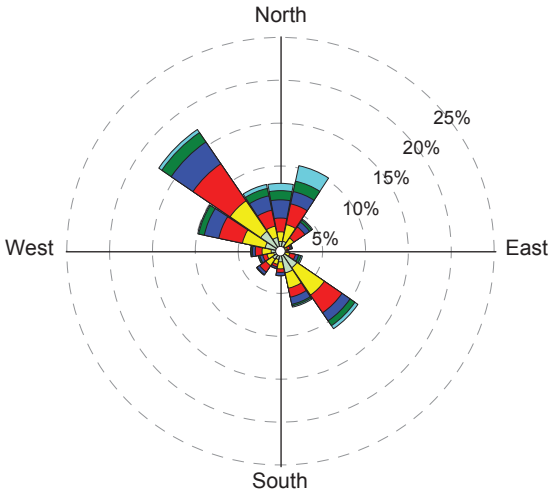
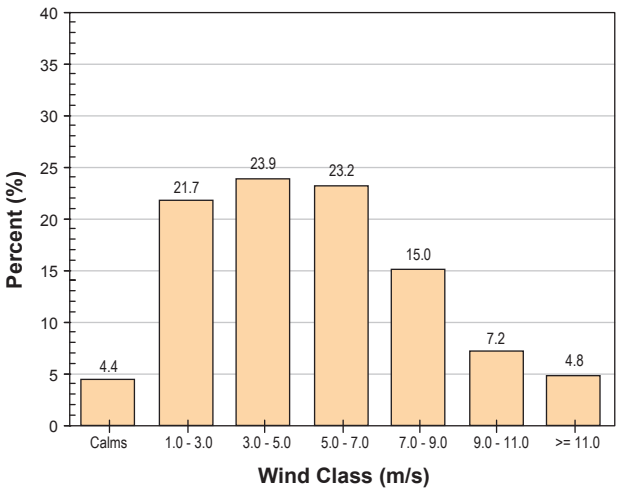


Figure A3-2h

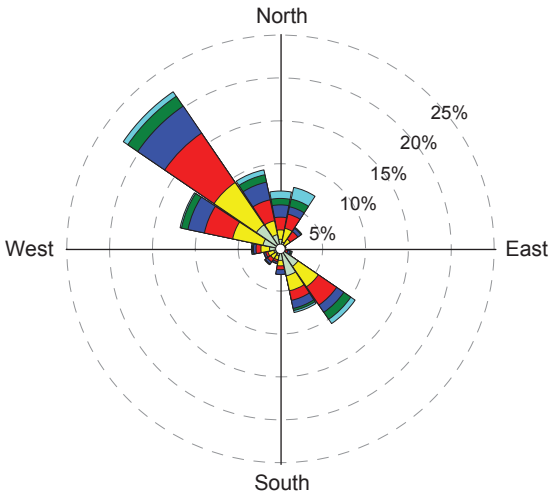
George Meteorology Station Windroses, 2012

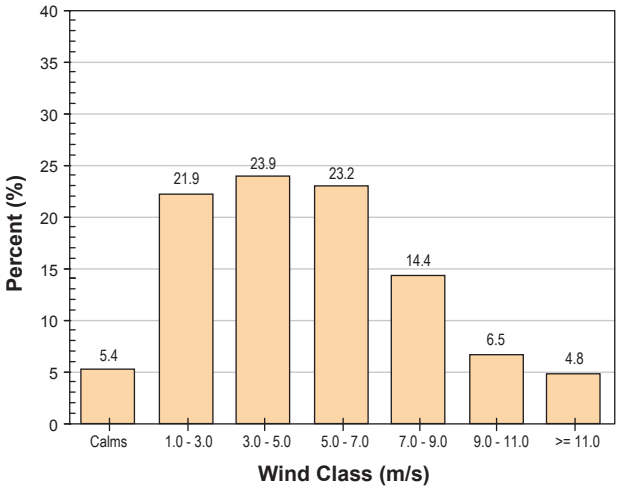
Annual



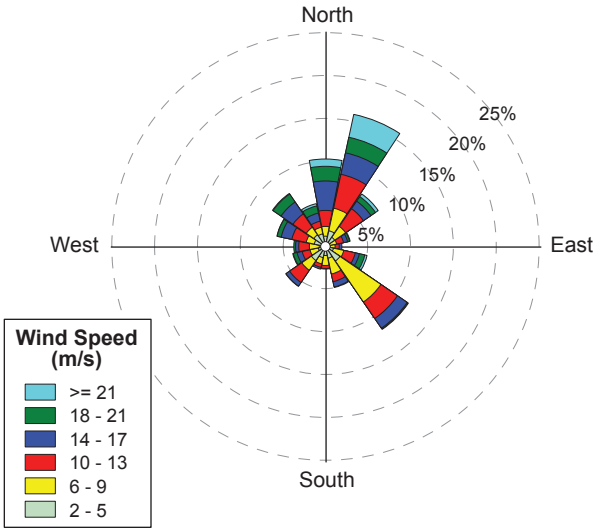


Winter





Summer



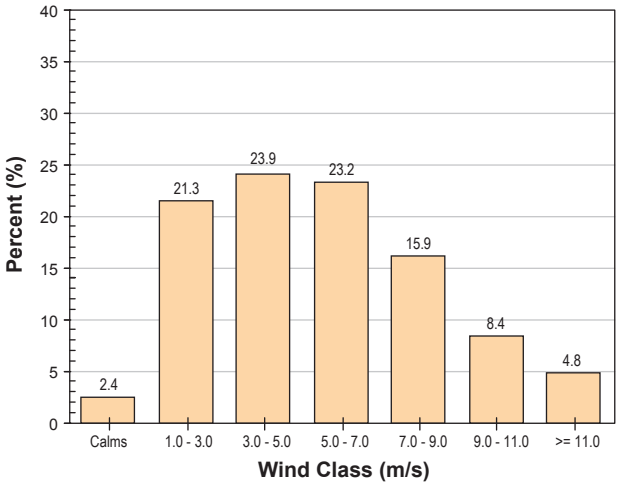


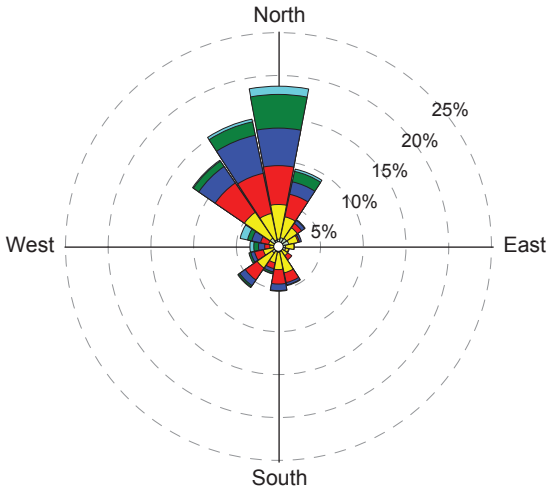
Figure A3-2i

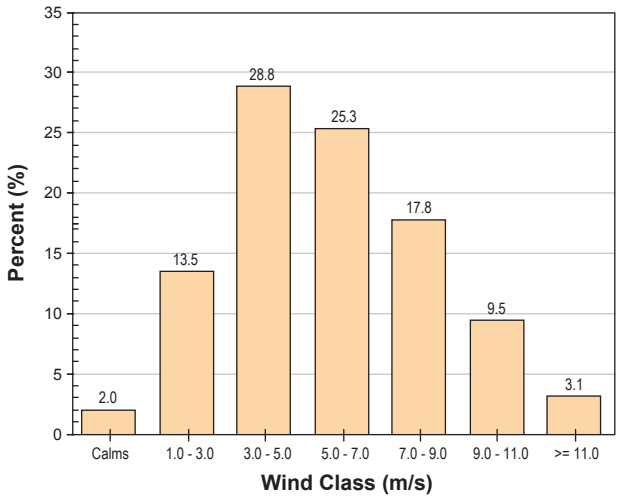
George Meteorology Station Windroses, 2013

Sabina GOLD & SILVER CORP.

Rescan an ERM company

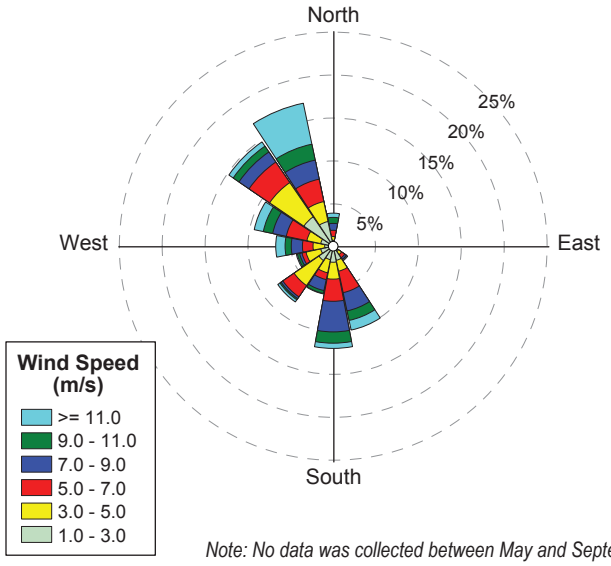
2007

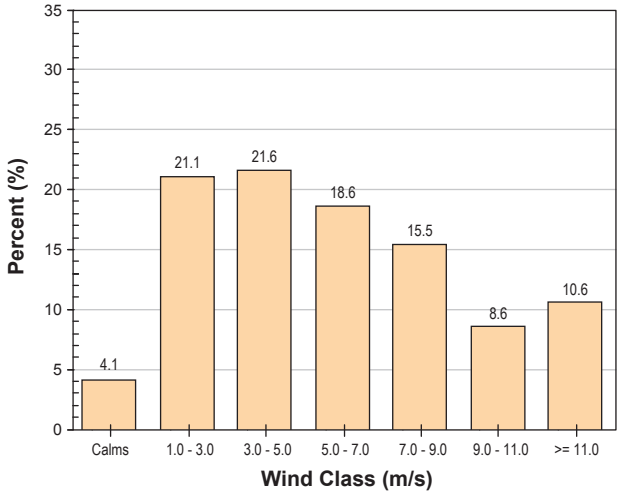




Note: Monitoring began in June 2007, therefore annual and winter wind roses are not available.

2008





Note: No data was collected between May and September 2008, therefore annual and summer wind roses are not available.

2009 *No wind data was collected, therefore wind roses are not available.*

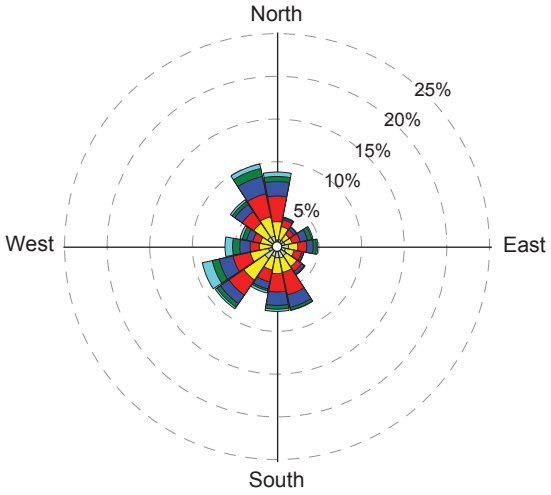
2010 *Wind data was only collected for two months, therefore wind roses are not available.*

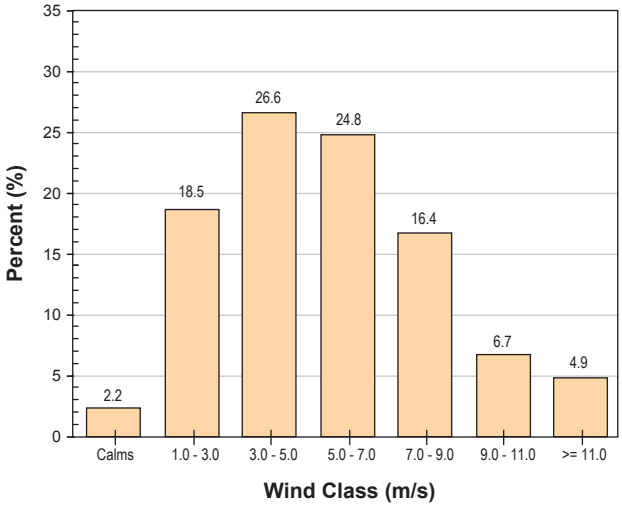
2011 *Wind data was only collected for one month, therefore wind roses are not available.*

Figure A3-3a

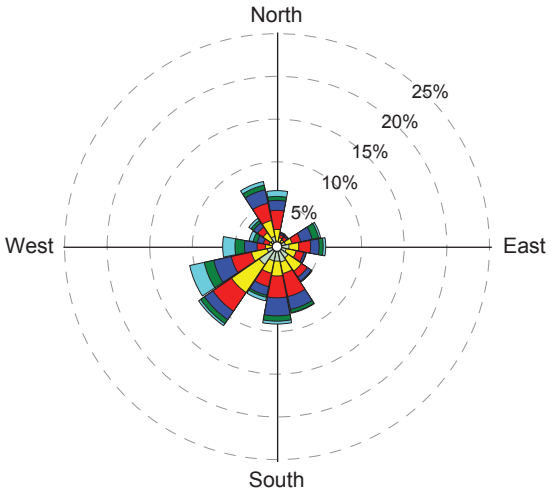
Bathurst Inlet Meteorological Station Windroses, 2007 to 2011

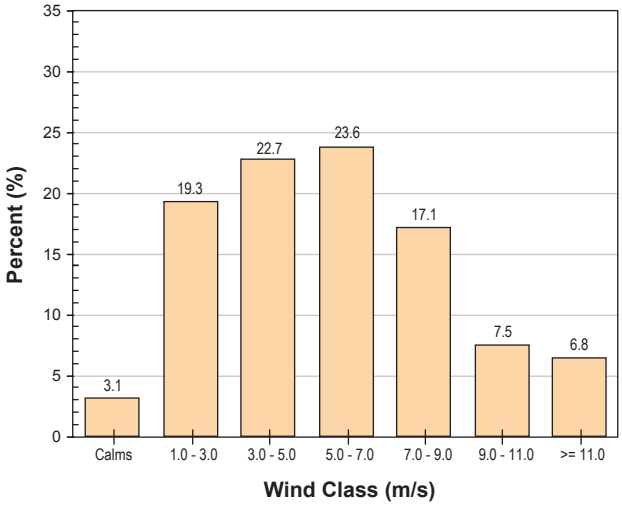
Annual



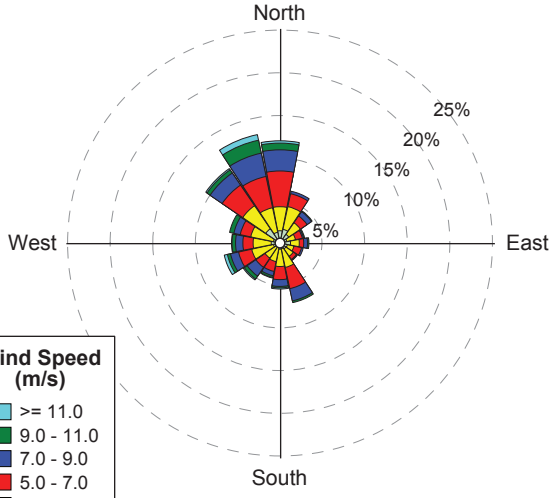


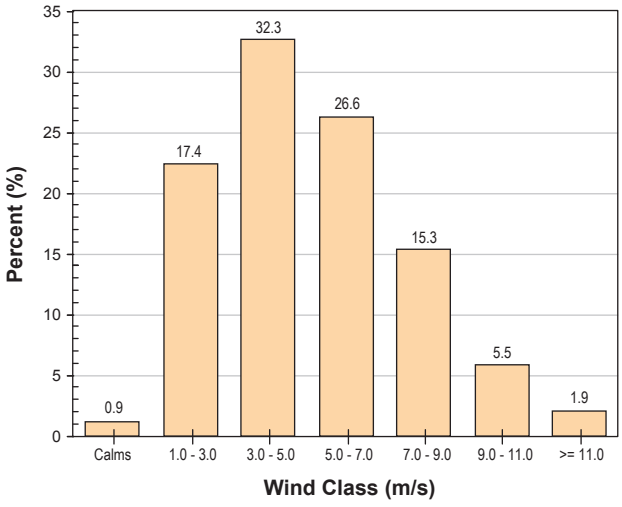
Winter





Summer





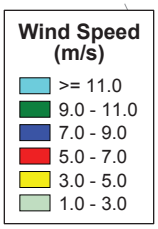


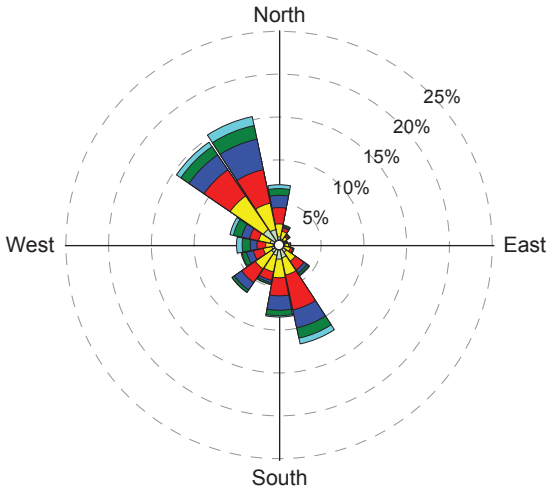
Figure A3-3b

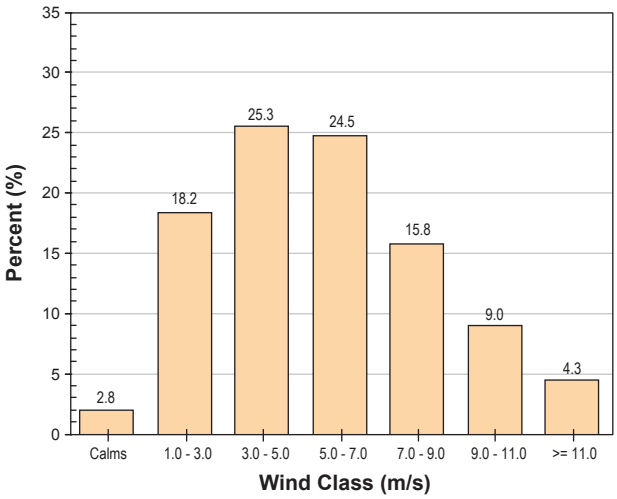
Bathurst Inlet Meteorology Station Windroses, 2012

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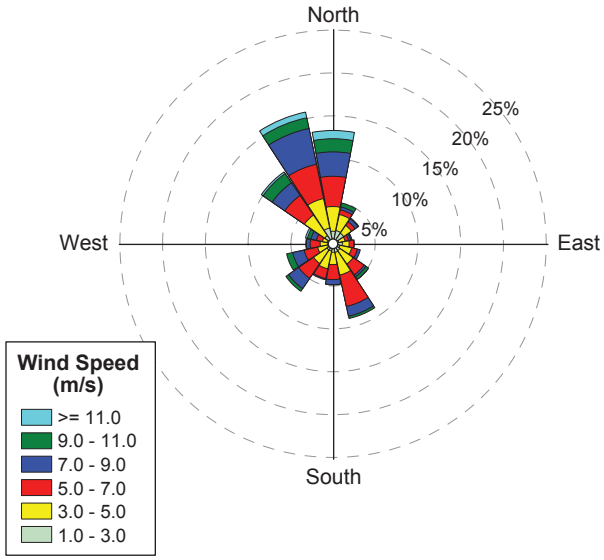
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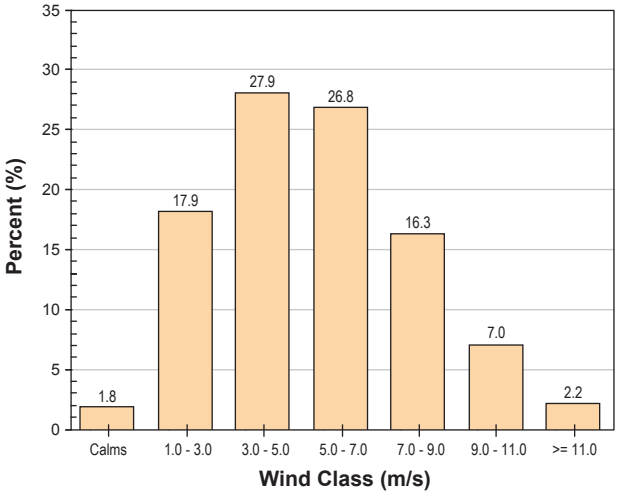
Annual





Summer





Note: For Winter 2013, data is missing for most of Jan, Nov and Dec, plus two days in Oct. Data capture is 85%.

Bathurst Inlet Meteorology Station
Windroses, 2013

Appendix V4-3B

Climate Change Projections - Model Variation

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Memo

To:	Jeff Eng, PEng.	**Client:**	Sabina Gold & Silver Corp.
From:	Maritz Rykaart, PEng.	**Project No:**	1CS020.008
cc:		**Date:**	November 6, 2015
Subject:	Back River Project: Climate Change Projections for Use in Engineering Design - Final		

1 Background

The Back River Property (the Property) is located in the continuous permafrost zone of Canada, about 100 km south of the Arctic Circle the territory of Nunavut roughly 525 km northeast of Yellowknife, and about 160 km south of Bathurst Inlet. The Back River Project (the Project) is comprised of two primary areas: Goose Property, and the Marine Laydown Area (MLA). Mining will be completed using both open pit and underground methods at Goose Property only.

The Project life is about 26 years; three years construction, ten years operation, eight years of closure, and five years post closure monitoring. Site infrastructure that supports mining activity therefore has a typical useable lifespan of between 10 and 20 years. Most earthworks elements of the surface infrastructure such as roads, pads, and the airstrip will remain essentially in-tact after mine closure, although after the closure period they are no longer required to fulfill their original design intent. Surface water management structure like ponds and diversions will be breached as soon as their effective use has been fulfilled. Waste Rock Storage Areas (WRSAs) will remain in perpetuity and have to maintain frozen conditions with the PAG waste rock for a long period which has been defined as at least to the year 2100.

There is agreement within the engineering community that climate change is occurring, and as a result there is an expectation that climate change needs to be integrated into engineering design. This memo described how this integration is carried out for the Project.

2 Procedure

There are few best practices and no common standards of practice that provide a prescribed and/or consistent process for incorporating climate change into engineering design (IAIA 2010). This shortcoming has been identified as a barrier in the ability to address the impacts of climate change to infrastructure (CSA 2012).

SRK (2015) describes a Standardized Procedure for Climate Change Integration into Engineering Design (Procedure) that was specifically developed to provide a practical, transparent and

consistent approach for establishing defensible climate change design criteria for integration into engineering design. The process recognizes that engineering judgement is required, and ensures that these decisions are properly documented. This procedure was used to develop the necessary climate change parameters to be adopted for engineering design for the Project.

3 Project Framing

The first step in the process is to objectively develop a concise project summary of engineering components listed in terms of the Project life cycle. Attachment 1 presents this information for the Project.

4 Project Screening

The next step in the process uses a risk assessment approach to determine whether climate change needs to be considered in the engineering designs, and specifically which design elements may be adversely affected by climate change. Attachment 2 contains the details of this Risk Assessment carried out for the Project, and Table 1 summarizes the overall outcome.

Table 1: Summary of Screening (Risk Assessment) for the Back River Project

Proposed Surface Infrastructure	Design Life	Should Design Consider Climate Change	Climate Parameter
Tailings Storage Area Containment Dam	10 years	No	-
Waste Rock Storage Areas	>100 years	Yes	Air Temperature; Precipitation; Wind Speed
Ore Stockpile Areas	10 years	No	-
Water Storage Ponds	10 – 20 years	No	-
Event Ponds	10 years	No	-
Water Diversions	20 years	No	-
Open Pits	>100 years	No	-
All-Weather Airstrip	20 years	No	-
All-Weather Roads	20 years	No	-
Building Foundation/Laydown Pads	20 years	No	-

5 Climate Change Projections

5.1 Long Term Temperature Trends

Table 2 shows that in accordance with climate change models the mean annual temperature will increase about 5.3ºC over the next century. The average predicted increase is 2.0ºC, 3.7ºC and 5.3ºC for the 2020s, 2050s and 2080s, respectively. This will increase annual mean temperatures to approximately -8.6ºC, -6.9ºC and -5.3ºC, respectively. This is similar to the observed temperature increase of 1.3 to 3ºC from approximately 1950 to 2005 (ACIASC 2005).

These predictions compare well with those presented by other studies. The IPCC state that for 2100, the projection for Northern Canada is approximately a 5ºC to 6ºC increase in temperature relative to 1980-1999 temperatures (IPCC 2007). Lenman et al. (2008) predicts that mean annual temperature may increase in Canada's North by approximately 2.0ºC for the climate normal period 2010 to 2030 and by approximately 6.0ºC for the climate normal period 2070 to 2100, compared to 1961 to 1990 baseline.

There is a high degree of variability regarding seasonal changes; however, the greatest temperature changes are predicted to occur during the winter, whereas the summer has the lowest projected temperature increases (Lenman et al. 2008). Tables 3 through 9 present additional temperature related climate change trends.

Table 2: Mean Annual Air Temperature

Timeline	Context	Value (˚C)	Change (˚C)	Change [%]
1979-2005	Baseline	-10.6	-	-
1979-2014	Current Reality	-10.4	0.2	0.08%
2011-2040	2020s	-8.6	2.0	0.75%
2041-2070	2050s	-6.9	3.7	1.40%
2071-2100	2080s	-5.3	5.3	2.00%

Table 3: Mean Maximum Air Temperature

Timeline	Context	Value (˚C)	Change (˚C)	Change [%]
1979-2005	Baseline	-7.72	-	-
1979-2014	Current Reality	-7.45	0.27	0.10%
2011-2040	2020s	-7.78	-0.06	0.78%
2041-2070	2050s	-7.83	-0.11	1.40%
2071-2100	2080s	-7.89	-0.17	2.20%

Table 4: Mean Minimum Air Temperature

Timeline	Context	Value (˚C)	Change (˚C)	Change [%]
1979-2005	Baseline	-13.2	-	-
1979-2014	Current Reality	-13.0	0.2	0.08%
2011-2040	2020s	-13.3	-0.1	0.68%
2041-2070	2050s	-13.4	-0.2	1.30%
2071-2100	2080s	-13.5	-0.3	1.90%

Table 5: Intra-Annual Extreme Temperature Range[1]

Timeline	Context	Value (˚C)	Change (˚C)	Change [%]
1979-2005	Baseline	66.3	-	-
1979-2014	Current Reality	66.0	-0.3	-0.45%
2011-2040	2020s	66.1	-0.2	-0.30%
2041-2070	2050s	65.9	-0.4	-0.63%
2071-2100	2080s	65.9	-0.4	-0.64%

1. The difference between the highest temperature of the year and the lowest

Table 6: Daily Minimum Temperature 90th Percentile

Timeline	Context	Value (%)	Change (%)	Change [%]
1979-2005	Baseline	10.0	-	-
1979-2014	Current Reality	10.6	0.6	6.00%
2011-2040	2020s	14.1	4.1	41.00%
2041-2070	2050s	19.6	9.6	96.00%
2071-2100	2080s	27.0	17.0	170.00%

Table 7: Growing Season Length[1]

Timeline	Context	Value (Days)	Change (Days)	Change [%]
1979-2005	Baseline	43.3	-	-
1979-2014	Current Reality	44.8	1.5	3.46%
2011-2040	2020s	45.4	2.1	4.80%
2041-2070	2050s	47.6	4.3	10.00%
2071-2100	2080s	52.0	8.7	20.00%

1. The number of days between the first 5 consecutive days of the year with the mean temperature above 5 degrees C, and the last 5 such days of the year.

Table 8: Heat Wave Duration Index[1]

Timeline	Context	Value (Days)	Change (Days)	Change [%]
1979-2005	Baseline	122	-	-
1979-2014	Current Reality	126	4.0	3.28%
2011-2040	2020s	170	47.6	39.00%
2041-2070	2050s	240	118.3	97.00%
2071-2100	2080s	317	195.2	160.00%

1. The maximum period for the year of at least 5 consecutive days with the maximum temperature at least 5 degrees C warmer than the daily climatology from the baseline.

Table 9: Frost Days[1]

Timeline	Context	Value (Days)	Change (Days)	Change [%]
1979-2005	Baseline	264	-	-
1979-2014	Current Reality	263	-1.0	-0.38%
2011-2040	2020s	256	-8.4	-3.20%
2041-2070	2050s	248	-15.8	-6.00%
2071-2100	2080s	238	-26.4	-10.00%

1. Total number of frost days, i.e. days with absolute minimum temperature < 0°C.

5.2 Long Term Precipitation Trends

In accordance with climate change models, Table 10 shows that precipitation will increase by 54 mm over the next century. The average predicted increase is 20 mm, 37 mm and 54 mm for the 2020s, 2050s and 2080s, respectively. This will increase precipitation to approximately 357 mm, 374 mm and 391 mm, respectively. In terms of percentage, the increase is predicted to be approximately 6%, 11% and 16% in the 2020s, 2050s and 2080s respectively. This is slightly lower than the observed changes in precipitation of 20 to 45% from approximately 1950 to 2005 (ACIASC 2005).

These predictions compare well with those presented by the IPCC, which projects an increase in annual mean precipitation in the north of up to 20% by 2100 (2007). Lenman et al. (2008) predicts that total annual precipitation could increase from 5 to 8% for the climate normal period 2010 to 2030, and 15 to 30% for the climate normal period 2070 to 2100, both when compared to 1961 to 1990 baseline.

Seasonal variations are also expected with precipitation changes, with most models projecting winter precipitation increases of 20 to 30% and increases of between 5 and 20% in summer by the 2050s (Lenman et al. 2008).

Table 10: Total Precipitation

Timeline	Context	Value (mm)	Change (mm)	Change [%]
1979-2005	Baseline	337	-	-
1979-2014	Current Reality	336	-1.0	-0.30%
2011-2040	2020s	357	20.2	6.00%
2041-2070	2050s	374	37.1	11.00%
2071-2100	2080s	391	53.9	16.00%

5.3 Frequency of Drought

Climate change models suggest that consecutive dry days will decrease by up to 13% over the next century as listed in Table 11. Although there is a clear mean annual air temperature increase trend, the increasing trend in precipitation and the decreasing trend of consecutive dry days suggests that there is a decreasing trend in frequency of drought.

Table 11: Consecutive Dry Days[1]

Timeline	Context	Value (Days)	Change (Days)	Change [%]
1979-2005	Baseline	20.1	-	-
1979-2014	Current Reality	20.9	0.8	3.98%
2011-2040	2020s	19.1	-1.0	-4.90%
2041-2070	2050s	18.6	-1.5	-7.70%
2071-2100	2080s	17.5	-2.6	-13.00%

1. Maximum number of consecutive dry day is a year, i.e. days with < 1 mm of precipitation

5.4 Frequency of Rainfall

Based on the climate change models, the simple daily precipitation intensity index will increase up to 10% in comparison with 1979-2005 by the 2080s as illustrated in Table 12. The simple daily intensity index is the mean annual precipitation (MAP) divided by the amount of rainy days (i.e. days with precipitation >1 mm). This means that the number of rainy days will tend to decrease.

Table 12: Simple Daily Precipitation Intensity Index[1]

Timeline	Context	Value (mm/day)	Change (mm/day)	Change [%]
1979-2005	Baseline	4.27	-	-
1979-2014	Current Reality	4.30	0.03	0.70%
2011-2040	2020s	4.37	0.10	2.40%
2041-2070	2050s	4.52	0.25	5.80%
2071-2100	2080s	4.70	0.43	10.00%

1. The annual total of precipitation divided by the total number of wet days in a year.

5.5 Heavy Rain

The proportion of days where precipitation is greater than the 95th percentile as compared to baseline conditions, increase by 30% over the next century. Similarly, based on the climate change models, the amount of days with precipitation higher than 10 mm/day will increase up to 50% in comparison with the 1979-2005 period by the 2080s as listed in Table 14. Similarly the maximum total precipitation in 5 days will increase up to 19% over this same period. It can therefore be concluded that the amount and frequency of high precipitation events will tend to increase.

Table 13: Fraction of Annual Precipitation > 95th Percentile[1]

Timeline	Context	Value (%)	Change (%)	Change [%]
1979-2005	Baseline	5.01	-	-
1979-2014	Current Reality	4.97	-0.04	-0.80%
2011-2040	2020s	5.38	0.37	7.30%
2041-2070	2050s	5.61	0.60	12.00%
2071-2100	2080s	6.51	1.50	30.00%

1. Percentage of days with precipitation > 95th percentile calculated for wet days from the baseline period.

Table 14: Days with Precipitation Greater than or Equal to 10 mm

Timeline	Context	Value (Days)	Change (Days)	Change [%]
1979-2005	Baseline	4.5	-	-
1979-2014	Current Reality	4.2	-0.4	-7.78%
2011-2040	2020s	5.0	0.5	12.00%
2041-2070	2050s	5.9	1.4	30.00%
2071-2100	2080s	6.8	2.3	50.00%

Table 15: Greatest 5 Days Total Rainfall

Timeline	Context	Value (mm)	Change (mm)	Change [%]
1979-2005	Baseline	38.0	-	-
1979-2014	Current Reality	37.1	-0.9	-2.37%
2011-2040	2020s	39.1	1.1	3.00%
2041-2070	2050s	42.2	4.2	11.00%
2071-2100	2080s	45.2	7.2	19.00%

5.6 Rain on Snow Events

Based on the reanalysis information from ERA-Interim (ECMWF 2015), coupled with climate change model estimations for precipitation, mean annual air temperature and wind speed, and through application of an energy snowmelt model presented by Walter (2005), there is no clear trend for the maximum daily snowmelt in an average year. As a result there is no trend for an increasing or decreasing trend associated with rain on snow events.

Table 16: Maximum Daily Snowmelt in Average Year

Timeline	Maximum daily snowmelt in an average year (mm)
1979-2005 (Baseline)	32
2020s	24
2050s	28
2080s	27

5.7 Snow Accumulation

Based on the reanalysis information from ERA-Interim, coupled with climate change model predictions for precipitation, temperature and wind speed, together with the energy snowmelt model presented by Walter (2005), snow depth throughout the year is trending downwards, and is expected to be 38% less by the 2080s. These results are presented in Table 17.

Table 17: Snow Accumulation

Time Frame	Snow Depth (m)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979-2005 (Baseline)	0.22	0.24	0.27	0.29	0.11	0.00	0.00	0.00	0.01	0.11	0.19	0.21
2020s	0.19	0.22	0.25	0.22	0.04	0.00	0.00	0.00	0.00	0.07	0.15	0.18
2050s	0.19	0.21	0.23	0.17	0.01	0.00	0.00	0.00	0.00	0.06	0.14	0.17
2080s	0.18	0.20	0.21	0.11	0.00	0.00	0.00	0.00	0.00	0.04	0.12	0.16

5.8 Snowmelt

As described in Section 5.7 and summarized in Table 18, the average maximum daily snowmelt tends to occur earlier in the year, from May to April, and over the next decade there appears to be no trend in terms of total annual snowmelt.

Table 18: Maximum Daily Snowmelt

Time Frame	Maximum Daily Snowmelt in Average Year (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979-2005 (Baseline)	0	0	4	15	32	1	0	0	4	6	1	0
2020s	0	1	6	24	24	0	0	0	2	7	2	1
2050s	0	1	11	28	15	0	0	0	1	6	4	1
2080s	0	1	15	27	6	0	0	0	1	8	4	2

5.9 Wind Speed

Mean annual wind speed is predicted to increase by 4.5% over the next century as described in Table 19. Additional detailed wind speed trends are presented in Tables 20 and 21.

Table 19: Mean Wind Speed

Timeline	Context	Value (m/s)	Change (m/s)	Change [%]
1979-2005	Baseline	4.83	-	-
1979-2014	Current Reality	4.82	-0.01	-0.21%
2011-2040	2020s	4.90	0.07	1.50%
2041-2070	2050s	4.96	0.13	2.70%
2071-2100	2080s	5.05	0.22	4.50%

Table 20: Meridional Wind Speed

Timeline	Context	Value (m/s)	Change (m/s)	Change [%]
1979-2005	Baseline	-1.19	-	-
1979-2014	Current Reality	-1.16	0.03	-2.52%
2011-2040	2020s	-1.18	0.01	-1.20%
2041-2070	2050s	-0.99	0.20	-17.00%
2071-2100	2080s	-0.95	0.24	-20.00%

Table 21: Zonal Wind Speed

Timeline	Context	Value (m/s)	Change (m/s)	Change [%]
1979-2005	Baseline	1.03	-	-
1979-2014	Current Reality	0.99	-0.05	-4.37%
2011-2040	2020s	1.12	0.09	9.10%
2041-2070	2050s	1.18	0.15	15.00%
2071-2100	2080s	1.29	0.26	25.00%

5.10 Permafrost

Permafrost is sensitive to climate change and an increase in air temperature is likely to cause natural permafrost degradation. Smith and Burgess (1998, 2004) assessed the sensitivity of permafrost to climate warming in Canada by categorizing the response of ground thermal conditions to climate, and the effects of permafrost thaw on terrain stability. At the Property, permafrost is regionally predicted to be thermally sensitive to climate change, with low physical response resulting from thaw (Smith and Burgess 2004). Permafrost; however, will be locally thaw-sensitive where ice-rich soils and massive ground ice are present. The Property is however predicted to stay within the zone of continuous permafrost (ACIASC 2005).

5.11 Active Layer Thickness

Widespread increases in active layer (seasonally thawed layer overlying the permafrost) depth are projected over most permafrost regions. The thin active layer of permafrost responds immediately to temperature changes, and climate change is likely to accelerate the increase in

depth, due to both higher temperatures and increased evapotranspiration, which makes the soil drier throughout the active layer and causes a descent of the permafrost table (ACIASC 2005).

Thaw season (summer) temperatures are most influential on active layer depth. By the year 2100, active layer thickness is estimated to increase by 65 cm for natural overburden sand at the Property, as determined using the long-term air temperature trends and the Stefan equation (Changwei and Gough 2013). Active layer thickness will be highly variable, and controlled by differences in soil texture, organic cover, and ground ice content, with deeper thaw penetration in coarser materials and bedrock.

5.12 Overall Climate Change Trends

Climate change effects develop over very long timescales relative to the Project life, and, as such, the trends listed in Table 10 will manifest as minimal increases and decreases over the length of the Project.

Table 22: Overall Climate Change Trends

Climate Factor	Trend	Justification
Frequency of Drought	Unknown	Although there is a clear mean annual air temperature increase trend, the increasing trend in precipitation and the decreasing trend of consecutive dry days suggest that there is a decreasing trend in frequency of drought
High Humidity Periods	Unknown	Trend unclear however there is a clear increasing trend in air temperature and the amount of rainy days, including the amount of heavy rainfall days
Frequency of Extreme Temperatures	Unknown	Possible increase in extreme temperatures but strength of trend is unknown
Frequency of Rainfall	Increasing	Trend is assumed to increase due to increased trend of precipitation days and total precipitation.
Heavy Rain	Increasing	Trend of heavy rainfall days is increasing.
Total Rainfall	Increasing	Increase of up to 16% total annual precipitation above historic baseline
Rain on Snow Events	Unknown	Trend is arguably increasing because precipitation shows increasing trend however snowfall shows no trend. If snowfall remains unchanged and precipitation increase it could be deduced that rain of snow events would increase
Snow Accumulation	Unknown	Trend is unclear due to unknown distribution of precipitation events in future projections
Snowmelt	Unknown	Trend is unclear due to unknown distribution of precipitation events in future projections
Floods and Storms	Unknown	Increasing temperature, precipitation, and heavy rainfall trends suggest an increasing trend in floods and storms might be reasonable.
Average Temperature	Increasing	Increase in mean annual air temperature of 5.3ºC by 2100

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The opinions expressed in this report have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

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Attachment 1: Project Framing

Standardized Procedure for Climate Change Integration into Engineering Design

Phase 1: Framing

Proposed Surface Infrastructure			Engineering Stage				Critical Project Stage				Site and System (by Component or Element) Design Considerations			
System	**Component**	**Element**	**Scoping**	**Pre-Feasibility**	**Feasibility**	**Detailed Engineering**	**Construction**	**Operation**	**Closure**	**Post Closure**	**Design Life**	**Performance Expectation(s)** *[this is a summary of how the component or element is intended to function over the design life]*	**Site Considerations** *[this is a summary of the site specific conditions as it pertains to the component or element]*	**Design Considerations** *[this is a summary of the design criteria included to attain the performance expectations of each component or element]*
Tailings Storage Area(s)	Containment Dam	Foundation			X			X			10 Yr.	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock and geosynthetics.	Cut and fill construction. Minimum above grade fill thickness of 2 m. retain Probable Maximum Flood (i.e. no spillway). Portion of dam covered in waste rock at closure. Remaining section breached post closure. Exposed geosynthetics removed at time of breach.
		Key Trench			X			X						
		Core			X			X						
		Liner			X			X						
		Transition/Filter Zone			X			X						
		Shell			X			X						
		Riprap			X			X						
		Instrumentation			X			X						
		Capacity			X			X						
		Freeboard			X			X						
Waste Rock Storage Area(s)	Waste Rock	Foundation			X					X	>100 Yr.	PAG waste rock body should remain frozen with the active layer being maintained in the NPAG shell. Avoid progressive slope or foundation movement post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	No cut but otherwise no specific foundation preparation. Create landform that promotes water and snow shedding. Moderate overall slopes.
		Slopes			X					X				
		Drainage			X					X				
	Closure Cover	Material			X					X				
		Landform			X					X				
Ore Stockpile Area(s)	Ore	Foundation			X			X			10 Yr.	Maintain stable foundation without resulting in permafrost degradation. Provide NPAG barrier between ore and ground surface.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Provide NPAG cover over tundra of minimum 1 m thickness before placing waste rock. Create landform that promotes water and snow shedding.
		Slopes			X			X						
		Drainage			X			X						
Water Storage Pond(s)	Contact Water Containment Dam	Foundation			X			X			20 Yr.	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock and geosynthetics.	Cut and fill construction. Minimum above grade fill thickness of 2 m. retain design flood based on risk rating with emergency spillway. Dam beached at closure. Exposed geosynthetics removed at time of breach.
		Key Trench			X			X						
		Core			X			X						
		Liner			X			X						
		Transition/Filter Zone			X			X						
		Shell			X			X						
		Riprap			X			X						
		Instrumentation			X			X						
		Capacity			X			X						
		Freeboard			X			X						
	Non Contact Water Containment Dam	Foundation			X			X			20 Yr.	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock and geosynthetics.	Cut and fill construction. Minimum above grade fill thickness of 2 m. retain design flood based on risk rating with emergency spillway. Dam beached at closure. Exposed geosynthetics removed at time of breach.
		Key Trench			X			X						
		Core			X			X						
		Liner			X			X						
		Transition/Filter Zone			X			X						
		Shell			X			X						
		Riprap			X			X						
		Instrumentation			X			X						
		Capacity			X			X						
		Freeboard			X			X						
	Saline Water Pond Containment Dam	Foundation			X			X			10 Yr	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemicaly suitable qaurry rock or waste rock and geosynthetics.	Cut and fill construction. Minimum above grade fill thickness of 2 m. retain design flood based on risk rating with emergency spillway. Dam beached at closure. Exposed geosynthetics removed at time of breach.
		Key Trench			X			X						
		Core			X			X						
		Liner			X			X						
		Transition/Filter Zone			X			X						
		Shell			X			X						
		Riprap			X			X						
		Instrumentation			X			X						
		Capacity			X			X						
		Freeboard			X			X						
	Spillway	Foundation			X			X			20 Yr.	Prevent breach of facility.		Provide overflow outlet across containment structure to avoid cutting into tundra.
		Riprap			X			X						
		Capacity			X			X						

Standardized Procedure for Climate Change Integration into Engineering Design

Phase 1: Framing

Proposed Surface Infrastructure			Engineering Stage				Critical Project Stage				Site and System (by Component or Element) Design Considerations			
System	**Component**	**Element**	**Scoping**	**Pre-Feasibility**	**Feasibility**	**Detailed Engineering**	**Construction**	**Operation**	**Closure**	**Post Closure**	**Design Life**	**Performance Expectation(s)** *[this is a summary of how the component or element is intended to function over the design life]*	**Site Considerations** *[this is a summary of the site specific conditions as it pertains to the component or element]*	**Design Considerations** *[this is a summary of the design criteria included to attain the performance expectations of each component or element]*
Event Ponds	Contact Water Containment Dam	Foundation			X			X			10 Yr.	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock and geosynthetics.	Cut and fill construction. Minimum above grade fill thickness of 2 m. retain design flood based on risk rating with emergency spillway. Dam beached at closure. Exposed geosynthetics removed at time of breach.
		Key Trench			X			X						
		Core			X			X						
		Liner			X			X						
		Transition/Filter Zone			X			X						
		Shell			X			X						
		Riprap			X			X						
		Instrumentation			X			X						
		Capacity			X			X						
		Freeboard			X			X						
	Non Contact Water Containment Dam	Foundation			X			X			10 Yr.	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock and geosynthetics.	Cut and fill construction. Minimum above grade fill thickness of 2 m. retain design flood based on risk rating with emergency spillway. Dam beached at closure. Exposed geosynthetics removed at time of breach.
		Key Trench			X			X						
		Core			X			X						
		Liner			X			X						
		Transition/Filter Zone			X			X						
		Shell			X			X						
		Riprap			X			X						
		Instrumentation			X			X						
		Capacity			X			X						
		Freeboard			X			X						
	Spillway	Foundation			X			X			10 Yr.	Prevent breach of facility.		Provide overflow outlet across containment structure to avoid cutting into tundra.
		Riprap			X			X						
		Capacity			X			X						
Water Diversions	Non Contact Water Diversion Berm	Foundation			X			X			20 Yr.	Create seal between water retaining elements of structure and permafrost to minimize leakage and seepage. Avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock and geosynthetics.	Fill construction only; directly on tundra surface stripping only organics. Minimum fill thickness of 2 m. Variable capacity based on risk rating. System breached in selected locations at closure. Remaining fill remain in place in perpetuity. Exposed geosynthetics removed at time of breach.
		Fill			X			X						
		Riprap			X			X						
		Liner			X			X						
		Capacity			X			X						
	Contact Water Diversion Berm	Foundation			X			X						
		Fill			X			X						
		Riprap			X			X						
		Liner			X			X						
		Capacity			X			X						
Open Pits	Open Pit	High wall (Bedrock)			X					X	> 100 Yr.	Pit walls must allow for safe mining to be carried out. Ongoing progressive post closure permafrost damage must be prevented. Post closure water discharge must not be negatively affected by progressive slope failures.	Thick, ice rich cold permafrost overburden overlying competent bedrock.	Overall pit slopes based on measured thawed material properties meeting stipulated industry best practice standards. Thermal cladding of overburden slopes not planned.
		High wall (Overburden)			X					X				
	Pit Lake	High wall (Bedrock)			X					X				
		High wall (Overburden)			X					X				
		Water Level			X					X				
		Outlet			X					X		Natural through-flow lake.	Diffuse inflow of natural catchment water plus concentrated inflow of ephemeral streams.	Probable Maximum Flood.
All-Weather Airstrip	Road	Foundation			X			X			20 Yr.	Limit increase in depth of active layer so as to minimize ongoing road maintenance during operation and avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Fill construction only; directly on tundra surface without stripping of organics (cut only allowed in bedrock). Minimum fill thickness of 1 m. Fill remain in place in perpetuity.
		Cut			X			X						
		Fill			X			X						
	Culvert	Foundation			X			X			20 Yr.	Limit increase in depth of active layer so as to minimize ongoing road maintenance during operation and avoid progressive permafrost damage post closure. Pass design flood.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Fill construction only; directly on tundra surface without stripping of organics (cut only allowed in bedrock). Minimum fill thickness of 1 m. Culverts manufactured from corrugated mild steel or PVC. Culvert removed at closure.
		Material			X			X						
		Capacity			X			X						

Standardized Procedure for Climate Change Integration into Engineering Design

Phase 1: Framing

Proposed Surface Infrastructure			Engineering Stage				Critical Project Stage				Site and System (by Component or Element) Design Considerations			
System	**Component**	**Element**	**Scoping**	**Pre-Feasibility**	**Feasibility**	**Detailed Engineering**	**Construction**	**Operation**	**Closure**	**Post Closure**	**Design Life**	**Performance Expectation(s)** *[this is a summary of how the component or element is intended to function over the design life]*	**Site Considerations** *[this is a summary of the site specific conditions as it pertains to the component or element]*	**Design Considerations** *[this is a summary of the design criteria included to attain the performance expectations of each component or element]*
All-Weather Roads	Road	Foundation			X			X			20 Yr.	Limit increase in depth of active layer so as to minimize ongoing road maintenance during operation and avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Fill construction only; directly on tundra surface without stripping of organics (cut only allowed in bedrock). Minimum fill thickness of 1 m. Fill remain in place in perpetuity.
		Cut			X			X						
		Fill			X			X						
	Culvert	Foundation			X			X			20 Yr.	Limit increase in depth of active layer so as to minimize ongoing road maintenance during operation and avoid progressive permafrost damage post closure. Pass design flood.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Fill construction only; directly on tundra surface without stripping of organics (cut only allowed in bedrock). Minimum fill thickness of 1 m. Culverts manufactured from corrugated mild steel or PVC. Culvert removed at closure.
		Material			X			X						
		Capacity			X			X						
Building Foundation/ Laydown Pads	Road	Foundation			X			X			20 Yr.	Limit increase in depth of active layer so as to minimize ongoing road maintenance during operation and avoid progressive permafrost damage post closure.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Fill construction only; directly on tundra surface without stripping of organics (cut only allowed in bedrock). Minimum fill thickness of 1 m. Fill remain in place in perpetuity.
		Cut			X			X						
		Fill			X			X						
	Culvert	Foundation			X			X			20 Yr.	Limit increase in depth of active layer so as to minimize ongoing road maintenance during operation and avoid progressive permafrost damage post closure. Pass design flood.	Thick, ice rich cold permafrost overburden profile. Construction (i.e. fill) material limited to geochemically suitable quarry rock or waste rock.	Fill construction only; directly on tundra surface without stripping of organics (cut only allowed in bedrock). Minimum fill thickness of 1 m. Culverts manufactured from corrugated mild steel or PVC. Culvert removed at closure.
		Material			X			X						
		Capacity			X			X						

Attachment 2: Project Screening

Standardized Procedure for Climate Change Integration into Engineering Design

Phase 2: Screening

| Proposed Surface Infrastructure | | | Climate Parameter / Event | | |

| Proposed Surface Infrastructure | | | Climate Parameter / Event | | |

| Proposed Surface Infrastructure | | | Climate Parameter / Event | | |

Appendix V4-3C

Climate Change Approach Memo

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Memo

To:	Project File	**Client:**	Sabina Gold & Silver Corp.
From:	Christopher Stevens, PhD Victor Munoz-Saavedra, PEng	**Project No:**	1CS020.008
Reviewed By:	Maritz Rykaart, PhD, PEng	**Date:**	September 21, 2015
Subject:	Standardized Procedure for Climate Change Integration into Engineering Design		

1 Introduction

There is agreement within the engineering community that climate change is occurring, and as a result there is an expectation that climate change needs to be integrated into engineering design. However, there are few best practices and no common standards of practice that provide a prescribed and/or consistent process for incorporating climate change into engineering design (IAIA 2010). This shortcoming has been identified as a barrier in the ability to address the impacts of climate change to infrastructure (CSA 2012).

This memo describes a Standardized Procedure for Climate Change Integration into Engineering Design (*Procedure*) developed by SRK Consulting (Canada) Inc. This *Procedure* was specifically developed to provide a practical, transparent and consistent approach for establishing defensible climate change design criteria for integration into engineering design. The process recognizes that engineering judgement is required, and ensures that these decisions are properly documented.

It is important to note that this *Procedure* is in addition to normal engineering best practices that are already implemented as a matter of course during engineering design. Such best practices already account for climate using historical records and projected trends, with consideration of site-specific scientific and engineering investigations, design codes, and the use of safety factors, risk management and professional judgement.

2 Climate Change Integration for Engineering Design

The Procedure for Climate Change Integration for Engineering Design is a systematic four phase process as illustrated in Figure 1. This *Procedure* includes select elements from EARG (1998) and PIEVC (2011), but is essentially a completely new fit-for-purpose process. The phases are described in greater detail in subsequent sections of this memo.

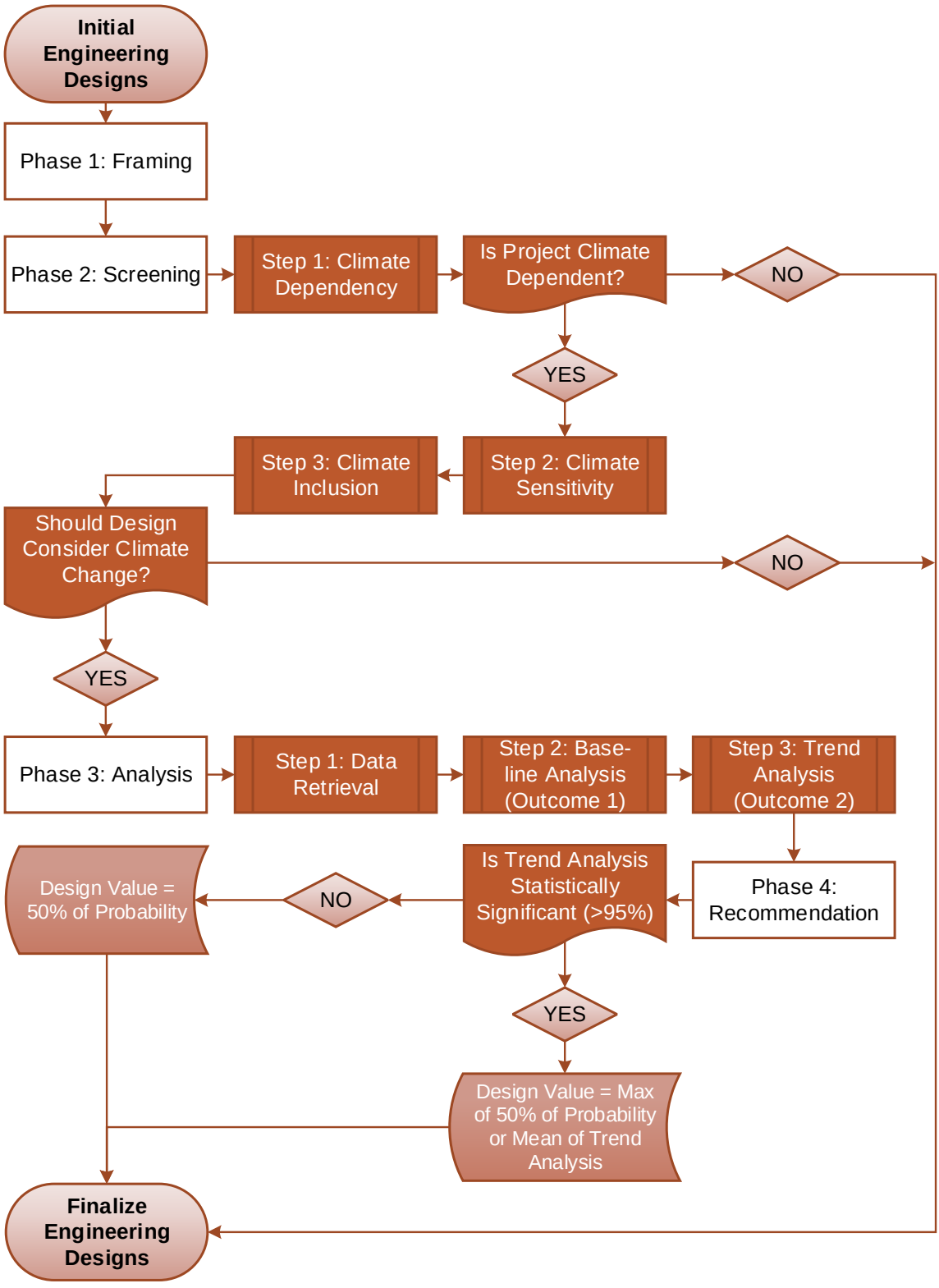


Figure 1: Procedure for Climate Change Integration for Engineering Design

3 Phase 1: Framing

The objective is to define the design elements of the project, such that during Phase 2 (Section 4), appropriate screening can be undertaken. To this end, this phase entails defining the project in terms of its geographic location, the level of engineering, the individual stages of the project and associated infrastructure systems and components, and project specific performance expectations of the systems which are beyond the normal function of the infrastructure.

Key site and design considerations relevant to assessing the need for high-level integration of climate change must also be documented. These considerations may include information on foundation conditions for the proposed site or mitigation techniques which will be used as part of engineering best practice.

The deliverables of this phase is a concise project summary, a table of engineering components listed in terms of the project life cycle, and accompanying site layout drawings(s). Attachment 1 provides an example of the level of detail required.

4 Phase 2: Screening

The screening process identifies infrastructure systems and components that may be adversely affected by climate change. For each component, the likelihood of climate change to negatively impact the infrastructure performance and the potential consequence of failure are assessed. Engineering best practices are considered to be adopted as a matter of course, and the evaluation is based on the current extent of site-specific science and engineering studies completed for the project. The screening process also determines which level of climate change analysis is required, and which climate parameters are of importance.

The deliverable of this phase is a summary of engineering components listed in terms of project life cycle, complete with a summary of which requires climate change to be considered in the engineering analysis, and if so which parameters and to what extent.

The screening phase entails the three steps illustrated in Figure 1 and outlined in Sections 4.1 through 4.3. Two decision points are reached throughout this phase, the outcome of which defines whether climate change needs to be considered in the engineering designs. Attachment 2 provides an example of the information compiled and analysis completed as part of this phase.

4.1 Step 1: Climate Dependency

For each of the Phase 1 identified infrastructure elements and components, consideration is given whether the design analysis is dependent on specific climate parameters. A dependency is assumed to exist if the climate parameter is determined to potentially have a measureable impact on infrastructure performance. If no dependency is identified, climate change does not need to be considered in the design, but if a dependency does exist, Step 2 below is initiated.

4.2 Step 2: Climate Sensitivity

This step assesses the relative sensitivity of each climate parameter to impact infrastructure performance. The Likelihood and potential Consequences of each identified dependency is independently scored (Table 1 and Table 2), followed by calculation of the Risk (Likelihood x Consequence).

Table 1: Likelihood Scale Factors

Scale	Likelihood (L)	Probability
1	Improbable (*aka* Very Unlikely, Rare)	< 1% chance of happening in timeframe
2	Remote (*aka* Unlikely)	1% to 10% chance of happening in timeframe
3	Occasional (*aka* Possible)	10% to 50% chance of happening in timeframe
4	Probable (*aka* Likely)	50% to 90% chance of happening in timeframe
5	Certain (*aka* Frequent, Very Likely)	> 90% chance of happening in timeframe

Table 2: Consequence Scale Factors

Scale	Consequence (C)	Context
1	Negligible (*aka* Insignificant)	No measurable impact of any nature
2	Minor (*aka* Marginal)	Short term minor impact to operation, potential for low impact to environment
3	Major (*aka* Critical)	Loss of infrastructure performance, potential for high impact to environment
4	Catastrophic	Loss of infrastructure performance, immediate response required, potential for long-term environmental impact

4.3 Step 3: Climate Inclusion

The last step in the screening process is to determine if rigorous quantitative analysis of climate change is required for the design of each infrastructure system. This assessment is based on the calculated risk score as outlined in Table 3. For low risk relationships (Risk score below 7), there is no need for inclusion of climate change in the engineering design. For high risk infrastructure, rigorous integration of climate change in engineering design is required and Phase 3 is initiated.

Table 3: Risk Score Outcomes from Screening Process

Likelihood (L)	Consequence (C)			
	Catastrophic	Major	Minor	Negligible
Certain	20	15	10	5
Probable	16	12	8	4
Occasional	12	9	6	3
Remote	8	6	4	2
Improbable	4	3	2	1

5 Phase 3: Analyses

This phase entails conducting the climate change analysis for each identified climate parameter in Phase 2 to determine the required climate change design parameters. This includes collating and evaluating baseline climate data, querying available climate change prediction models and making forecasting climate trends. The deliverable of this phase is a graphical summary documenting the results of the different climate change analysis completed.

The analysis phase entails three steps as illustrated in Figure 1 and outlined in Sections 5.1 through 5.3.

5.1 Step 1: Data Retrieval

The first step of this phase is to identify the availability of the climate change models for each climate parameter of significance identified in Phase 2. Environment Canada provides access to monthly climate change modeling predictions for the following climate change Assessment Reports, for any location in the World:

- Canadian Regional Climate Model (CRCM) (EC 2015), *aka* First Assessment Report (AR1)
- Second Assessment Report (AR2) (IPCC 1995)
- Third Assessment Report (AR3) (IPCC 2001)
- Fourth Assessment Report (AR4) (IPCC 2007)
- Fifth Assessment Report (AR5) (IPCC 2014)

Information for AR1 through AR4 is available between the years 1960 to 2100 for the meteorological variables listed in Table 4; however, there are significant gaps depending on the assessment report, scenario evaluated, and variable assessed. Information for AR5 is available for the years 1900 to 2100, but only includes mean temperature and total precipitation.

Table 4: Metrological parameters Listed in AR1 through AR4

Parameter	Base Parameter	Details
Air Temperature	Temperature	Mean, Mean Max, Mean Minimum, and Extreme Range at 2 m
Heat Wave Duration Index	Temperature	Maximum period > 5 consecutive days with Tmax > 5°C above the baseline Tmax normal
Frost Days	Temperature	Total number of frost days (days with absolute minimum temperature < 0°C)
GSL	Temperature	Growing season length: T mean > 5°C more than 5 days and T mean < 5°C more than 5 days
Air Temp. Extreme Range	Temperature	Intra-annual extreme temperature range: difference between the highest temperature and lowest temperature of the same calendar year.
Total Precipitation	Precipitation	Total precipitation including rainfall and snowfall as snow water equivalent
Days w/rain > 10 mm	Precipitation	Days with rain greater than or equal to 10 mm/day
Simple Daily Intensity Index	Precipitation	Annual total precipitation / number of precipitation days greater than or equal to 1 mm/day

Parameter	Base Parameter	Details
Dry Days	Precipitation	Max amount of consecutives dry days (precipitation < 1 mm)
Fraction of total annual precip. > 95th percentile	Precipitation	Annual Precipitation > 95th Percentile
Wind Speed	Wind Speed	Mean, Meridional, and Zonal 10 m
Solar Radiation	Radiation	Shortwave Surface Downwelling
Humidity	Humidity	Relative and Specific at 2 m
Sea Level Pressure	Air Pressure	Mean sea level pressure

As part of the *Procedure* described in this memo, data from the five Assessment Reports are downloaded from Environment Canada source files for any given site based on latitude and longitude. This process is automated through a purpose built script developed using "R" Software (CRAN 2015).

The meteorological parameters covered in AR1 through AR5 are used, though application of different empirical models to calculate climate change design parameters for other key meteorological parameters such as intensity duration frequency curves (i.e. extreme storm events), snowpack thickness, evaporation, etc.

5.2 Step 2: Baseline Analysis (Outcome 1)

Climate change models presented in the Assessment Reports assume application of radiative forces (energy flux) through different anthropogenic sources which results in discharge of varying concentrations of atmospheric greenhouse gases. These radiative forces are not constant through time, as it is based on global anthropogenic behavior such as environmental policies, population growth, economic growth, energy sources, land use, hydrocarbon usage, etc. Each individual climate change model presented in the Assessment Reports represent these non-linear radiative forces differently and thus present a different climate change scenario, underscored by its own model assumptions and boundary conditions.

None of these individual models are inherently superior or inferior over others, and likewise the newer generation of Assessment Reports are not necessarily more reliable than older versions, but rather represent more detailed consideration of global anthropogenic forces. Therefore, the user is forced to make a judgement call of which individual model, or generation of models are the most suitable to use in design, which invariably leads to bias. This *Procedure* is specifically aimed at eliminating this bias by analysing all the available climate change models with equal weight, and presenting a single climate change design parameter based on a rational statistical evaluation of the overall cumulative results.

Using each and every climate change model available in the five Assessment Reports, the projected change with respect to a set baseline condition can be calculated using Equation 1.

$$\boldsymbol{Change\ with\ respect\ to\ set\ baseline\ condition}\ [\%] = \frac{\boldsymbol{Projection - Baseline}}{\boldsymbol{Baseline}} \qquad \text{Eq. 1}$$

In Equation 1, the *Baseline* and *Projection* periods have a minimum timeframe of 30 years, which is generally recognized as being the minimum acceptable period length of record that is statistically significant (WMO 2007). These periods can be defined as follows:

- *Baseline* is the time frame associated with the past, i.e. estimation of the climate data based on the climate change models. For the purpose of this *Procedure*, this period is fixed from 1975 to 2005, which coincides with that adopted for AR5.
- *Projection* is the future time frame where climate change models are applied, reflecting climate change predictions. Three *Projection* periods are applied based on the outcome of the Risk Assessment completed in Phase 2; (1) From 2011 to 2040, (2) From 2041 to 2070, and (3) From 2071 to 2100. These 30 years periods are based on convention as stipulated in WMO (2007).

It is important to note that climate change model predictions are currently presented up to the year 2100 (IPCC 2014), which is deemed that maximum reasonable timeframe to extend predictions to. As a result this is the maximum timeframe for which this *Procedure* applies.

Equation 1 is automatically processed using a script developed in “R”. An example result is presented in Figure 2, which represents the outcome at a hypothetical site for the meteorological parameter Mean Air Temperature. For this example the *Projection* period is representative of 2041 to 2070.

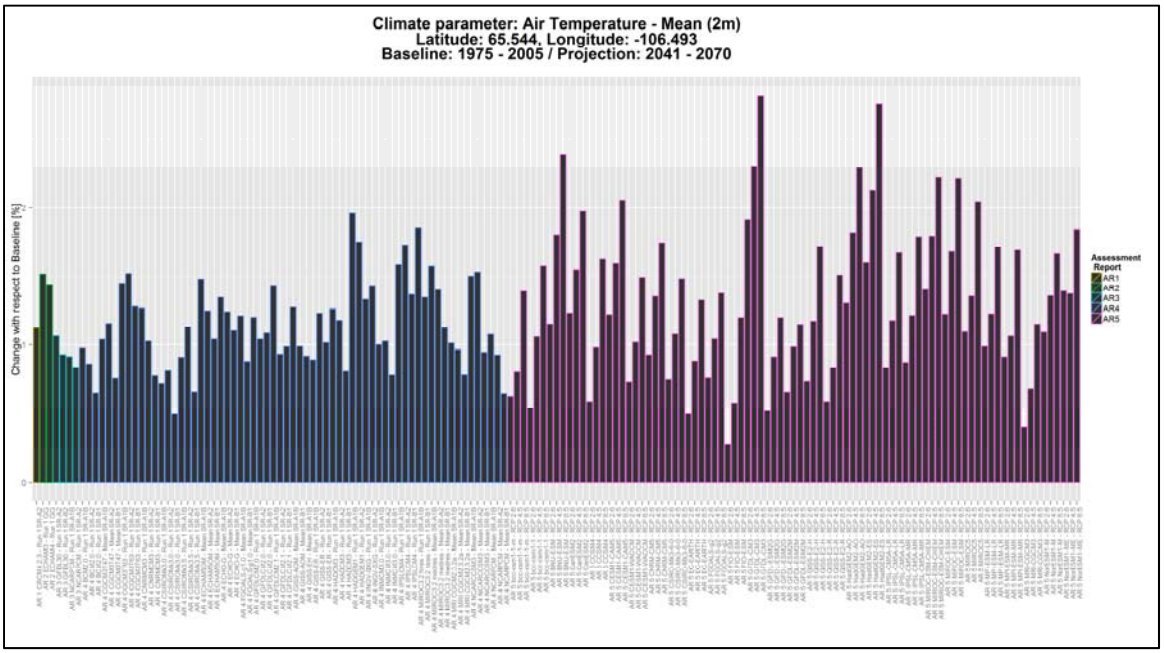


Figure 2: Example outcome for hypothetical site showing results of change to baseline conditions for individual climate change models associated with each of the five Assessment Reports for a Projection period from 2041 to 2070.

The analysis presented in Figure 2, can be presented as a box-whisker plot as illustrated in Figure 3. The change with respect to baseline conditions for each individual Assessment Report is summarized, together with an overall summary representing all the Assessment Reports combined. The centerline of the box represents the median value, while the upper and lower borders represent the first and third quartile values respectively. The whiskers extend to the maximum and minimum values provided which is less than 1.5 times the total range of the box (i.e. the third quartile minus first quartile). If values exist outside of the whisker limits, they are presented as dots.

The results in Figure 3 can also be presented as a cumulative probabilistic curve as illustrated in Figure 4. For the propose of this *Procedure*, only the overall cumulative probabilistic curve associated with data from all the available Assessment Reports combined are considered when making a decision on climate change parameters for design. The logic behind this reasoning is the fact that all climate change models are weighted equally (IPCC 2014). The overall spread of results as presented by the collection of box-whisker plots in Figure 3 illustrates why this is deemed appropriate.

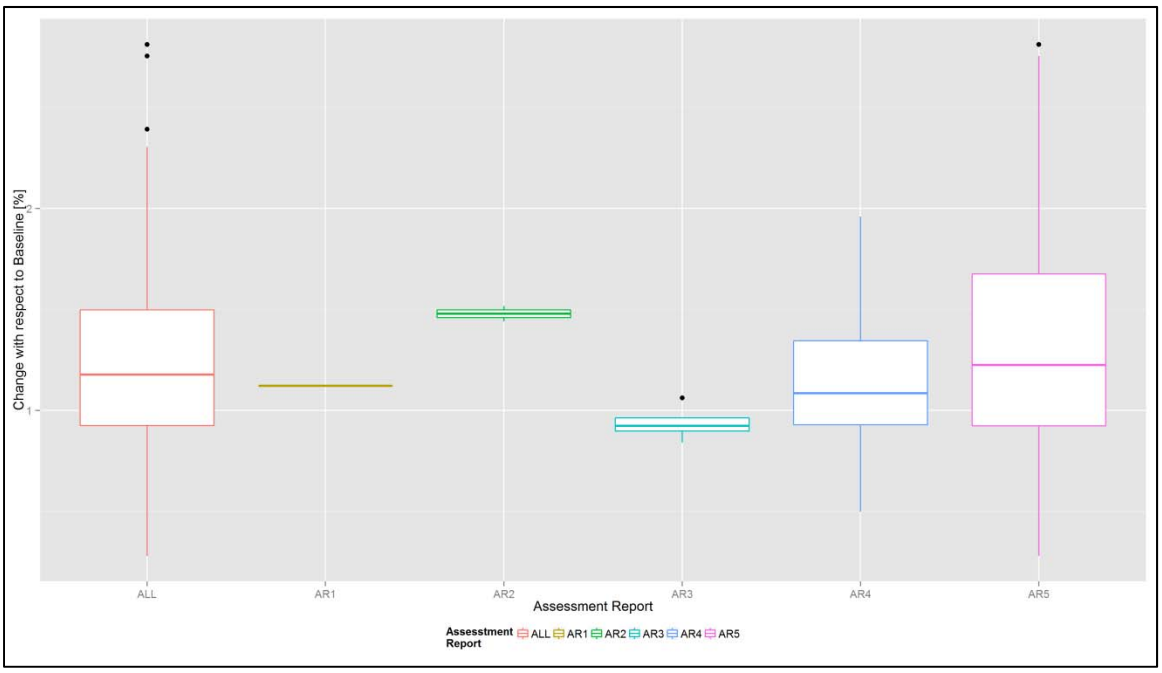


Figure 3: Combined Box-Whisker plot of change to baseline conditions for the individual climate change models presented in the Figure 2 example.

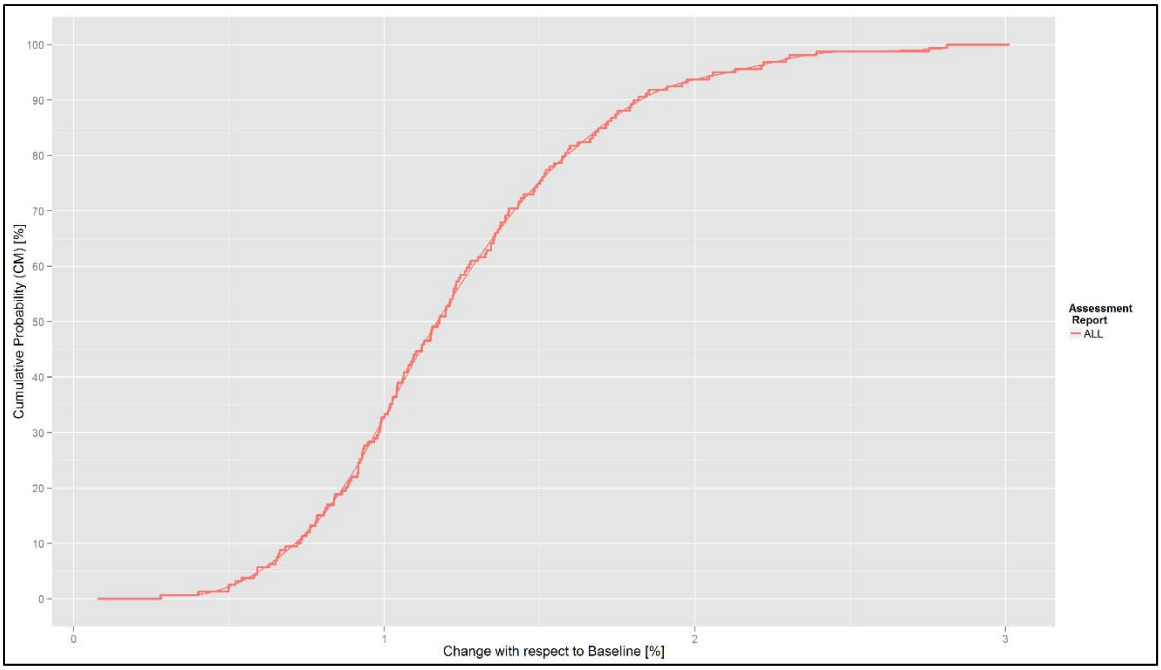


Figure 4: Cumulative probability curve of climate change prediction models from all Assessment Reports expressed as a percentage of change against baseline conditions

5.3 Step 3 – Trend Analysis (Outcome 2)

As discussed in Section 5.2, climate change models consider global anthropogenic forces which are not constant in time. Irrespective of such forces, the science of Hydrology estimates and predicts future meteorological conditions through consideration of historic trends. Therefore, to facilitate making a decision of selection of climate change parameters for design, a trend analysis approach is used as a reality check.

To best represent the historical trend, a global climatic model reanalysis approach is used, rather than relying on regional meteorological stations for historic data, since the availability and timespan of records vary greatly. Reanalysis combines satellite information, land records and numerical models that simulate the earth's climatic conditions. Typically reanalysis extends for several decades and covers the entire planet. State-of-the-art publically available reanalysis data from ERA-Interim produced by the European Center for Medium-Range Weather Forecast (ECMWF) was used in this *Procedure* (ECMWF 2015). ERA-Interim includes 12-hourly data form 1979 to the present (2015) for the entire world, based on a 0.75 degree latitude by 0.75 degree longitude grid.

The ERA-Interim data trend analysis entailed two parts; first, identification of the trend, and second, estimation of the statistical significance of the trend. Five different trend analysis methodologies were considered:

- Ordinary least square (Maidment 1993)
- Quantile regression (Koenker 1978)
- Mann-Kendall and Theil Sen (Mann 1945, Sen 1968)
- Zhang (Zhang 2000)
- Yue and Pilon (Yue and Pilon 2002)

Figure 5 presents the outcome of the reanalysis for the example presented in Figures 2 through 4. In this case each regression method has a statistical significance value over 95%; however this may not always be the case and the meaning of that is described further in Phase 4.

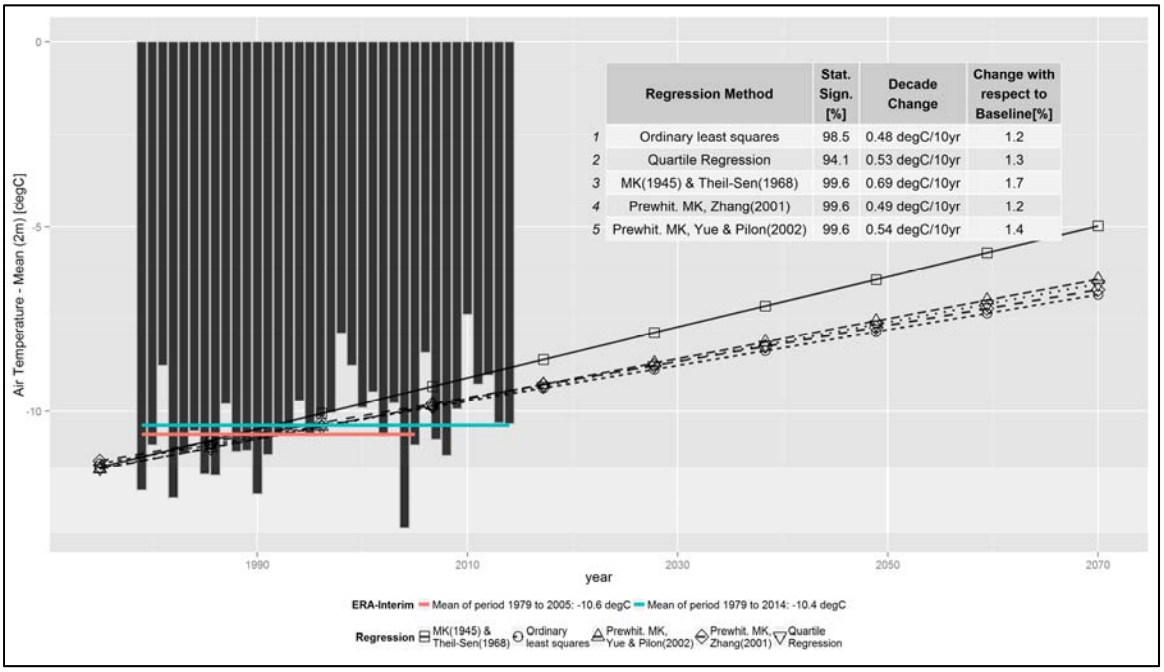


Figure 5: Trend analysis outcome based on reanalysis evaluation for hypothetical site presented in Figure 2

6 Phase 4: Recommendation

Following completion of Phase 3, a design recommendation for each identified climate change parameters is presented. The deliverable of this phase is a column added to the table prepared in Phase 2, which includes the selected climate change design parameter.

Phase 3 produces two outcomes as follows:

- Outcome 1 is a cumulative probability curve representing change relative to baseline conditions based on the Phase 3, Step 2 analysis; this is also represented by Figure 4.
- Outcome 2 is the five separate regression analysis results from the Phase 3, Step 3 trend analysis, again representing change relative to baseline conditions, also represented by Figure 5. The statistical significance of each regression analysis is calculated during this step and must yield a value greater than 95% to be deemed statistically significant.

As illustrated in Figure 1, if the trend analysis shows no regression of statistical significance (i.e. greater than 95%), the climate change design parameter is the 50% cumulative probability value based on the Phase 3, Step 2 baseline analysis. If on the other hand, one or more of the trend analysis suggest trends of statistical significance, the climate change parameter is the maximum of either the 50% cumulative probability value based on the Phase 3, Step 2 baseline analysis, or the mean of all the trend analysis values with statistical significance. Equation 2 provides an expression for this criteria.

$$Recommended\ Climate\ Change\ Design\ Parameter = \\ \text{Maximum}(50\%\ Cumulative\ Probability,\ Mean\{Regression_{Stat.\ Sign \geq 95\%}\}) \qquad \text{Eq. 2}$$

Attachments 3 and 4 provide examples of the typical overall summary outcome based on the Phase 3 and 4 analyses. The example in Attachment 3 is consistent with the hypothetical site example presented throughout this memo, and represents a case where the trend analysis suggests statistical significance. The example in Attachment 4 illustrates a case where the trend analysis shows no statistical significance.

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Attachment 1: Example Phase 1 Table

Standardized Procedure for Climate Change Integration into Engineering Design

Phase 1: Framing

Proposed Surface Infrastructure			Engineering Stage				Project Stage				Site and System (by Component or Element) Design Considerations			
System	**Component**	**Element**	**Scoping**	**Pre-Feasibility**	**Feasibility**	**Detailed Engineering**	**Construction**	**Operation**	**Closure**	**Post Closure**	**Design Life**	**Performance Expectation(s)** *[this is a summary of how the component or element is intended to function over the design life]*	**Site Considerations** *[this is a summary of the site specific conditions as it pertains to the component or element]*	**Design Considerations** *[this is a summary of the design criteria included to attain the performance expectations of each component or element]*
Tailings Storage Area(s)	Containment Dam	Foundation												
		Key Trench												
		Core												
		Liner												
		Transition/Filter Zone												
		Shell												
		Riprap												
		Instrumentation												
		Capacity												
		Freeboard												
		Other												
	Spillway	Foundation												
		Riprap												
		Capacity												
		Other												
	Closure Cover	Material												
		Landform												
		Other												
	Other	*Other*												
Waste Rock Storage Area(s)	Waste Rock	Foundation												
		Slopes												
		Drainage												
	Closure Cover	Material												
		Landform												
	Other	*Other*												
Ore Stockpile Area(s)	Ore	Foundation												
		Slopes												
		Drainage												
	Other	*Other*												
Contact Water Storage Pond(s)	Containment Dam	Foundation												
		Key Trench												
		Core												
		Liner												
		Transition/Filter Zone												
		Shell												
		Riprap												
		Instrumentation												
		Capacity												
		Freeboard												
		Other												
	Spillway	Foundation												
		Riprap												
		Capacity												
		Other												
	Other	*Other*												
Contact Water Event Pond(s)	Containment Dam	Foundation												
		Key Trench												
		Core												
		Liner												
		Transition/Filter Zone												
		Shell												
		Riprap												
		Instrumentation												
		Capacity												
		Freeboard												
		Other												
	Spillway	Foundation												
		Riprap												
		Capacity												
		Other												
	Other	*Other*												
Non Contact Water Diversion(s)	Diversion Berm	Foundation												
		Riprap												
		Liner												
		Capacity												
		Other												
	Other	*Other*												
Contact Water Diversion(s)	Diversion Berm	Foundation												
		Riprap												
		Liner												
		Capacity												
		Other												
	Other	*Other*												
Open Pit(s)	Open Pit	Foundation												
		Slopes												
		Other												
	Pit Lake	Foundation												
		Slopes												
		Water Level												
		Other												
	Other	*Other*												
Airstrip(s)	Airstrip	Foundation												
		Cut												
		Fill												
		Other												
	Culvert	Material												
		Capacity												
		Other												
	Other	*Other*												
Road(s)	Road	Foundation												
		Cut												
		Fill												
		Other												
	Culvert	Material												
		Capacity												
		Other												
	Other	*Other*												
Building Foundation/ Laydown Pads	Pad	Foundation												
		Cut												
		Fill												
		Other												
	Culvert	Material												
		Capacity												
		Other												
	Other	*Other*												

Attachment 2: Example Phase 2 Table

Standardized Procedure for Climate Change Integration into Engineering Design

Phase 1: Framing

Proposed Surface Infrastructure

System	Component	Element
Tailings Storage Area(s)	Containment Dam	Foundation
		Key Trench
		Core
		Liner
		Transition/Filter Zone
		Shell
		Riprap
		Instrumentation
		Capacity
		Freeboard
		Other
	Spillway	Foundation
		Riprap
		Capacity
		Other
	Closure Cover	Material
		Landform
		Other
Waste Rock Storage Area(s)	Waste Rock	Foundation
		Slopes
		Drainage
	Closure Cover	Material
		Landform
		Other
Ore Stockpile Area(s)	Ore	Foundation
		Slopes
		Drainage
		Other
Contact Water Storage Pond(s)	Containment Dam	Foundation
		Key Trench
		Core
		Liner
		Transition/Filter Zone
		Shell
		Riprap
		Instrumentation
		Capacity
		Freeboard
		Other
	Spillway	Foundation
		Riprap
		Capacity
		Other
		Other
Contact Water Event Pond(s)	Containment Dam	Foundation
		Key Trench
		Core
		Liner
		Transition/Filter Zone
		Shell
		Riprap
		Instrumentation
		Capacity
		Freeboard
		Other
	Spillway	Foundation
		Riprap
		Capacity
		Other
		Other
Non Contact Water Diversion(s)	Diversion Berm	Foundation
		Riprap
		Liner
		Capacity
		Other
		Other
Contact Water Diversion(s)	Diversion Berm	Foundation
		Riprap
		Liner
		Capacity
		Other
		Other
Open Pit(s)	Open Pit	Foundation
		Slopes
		Other
	Pit Lake	Foundation
		Slopes
		Water Level
		Other
Airstrip(s)	Airstrip	Foundation
		Cut
		Fill
		Other
	Culvert	Material
		Capacity
		Other
		Other
Road(s)	Road	Foundation
		Cut
		Fill
		Other
	Culvert	Material
		Capacity
		Other
		Other
Building Foundation/ Laydown Pads	Pad	Foundation
		Cut
		Fill
		Other
	Culvert	Material
		Capacity
		Other
		Other

Engineering Stage

Scoping | Pre-Feasibility | Feasibility | Detailed Engineering

Project Stage

Construction | Operation | Closure | Post Closure

Site and System (by Component or Element) Design Considerations

Design Life	Performance Expectation(s) *[this is a summary of how the component or element is intended to function over the design life]*	Site Considerations *[this is a summary of the site specific conditions as it pertains to the component or element]*	Design Considerations *[this is a summary of the design criteria included to attain the performance expectations of each component or element]*

Phase 2: Screening

Climate Parameter / Event

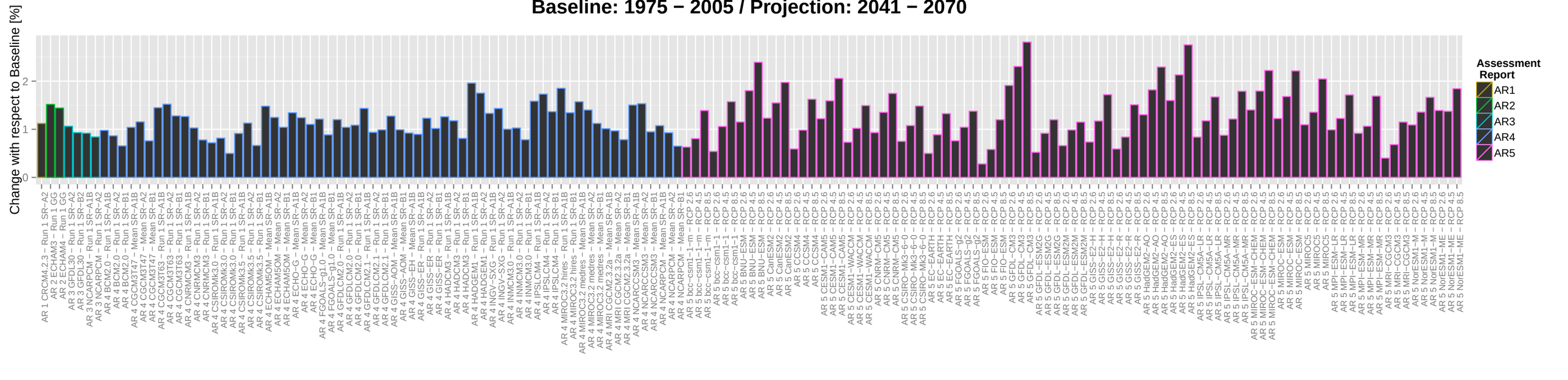
Air Temperature | Precipitation (Rainfall) | Precipitation (Snowfall) | Precipitation (Extreme Events) | Evaporation | Wind Speed | Growing Season Length

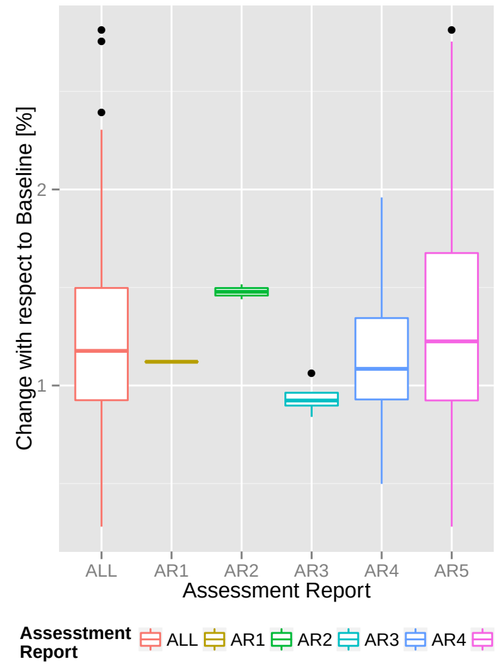
Will Parameter impact Design?	Likelihood (L)	Consequence (C)	Define Consequence *[summarize what consequence are being considered to provide context]*	Risk (R = L x C)	Should Design Consider Climate change?
	0	0		0	NO

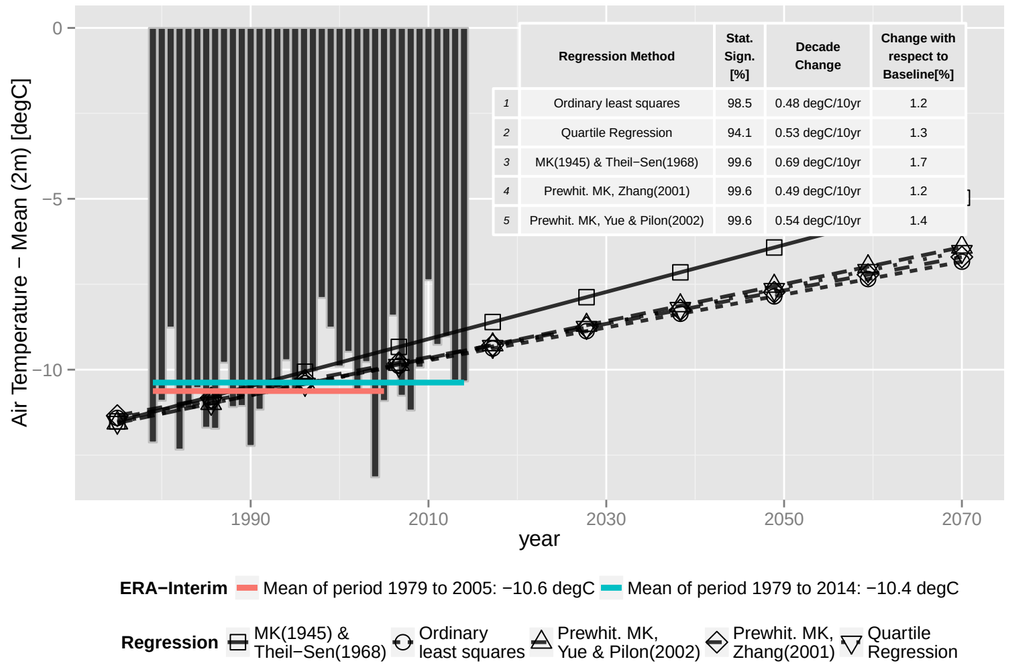
Repeated for each Element row listed above, for each climate parameter / event.

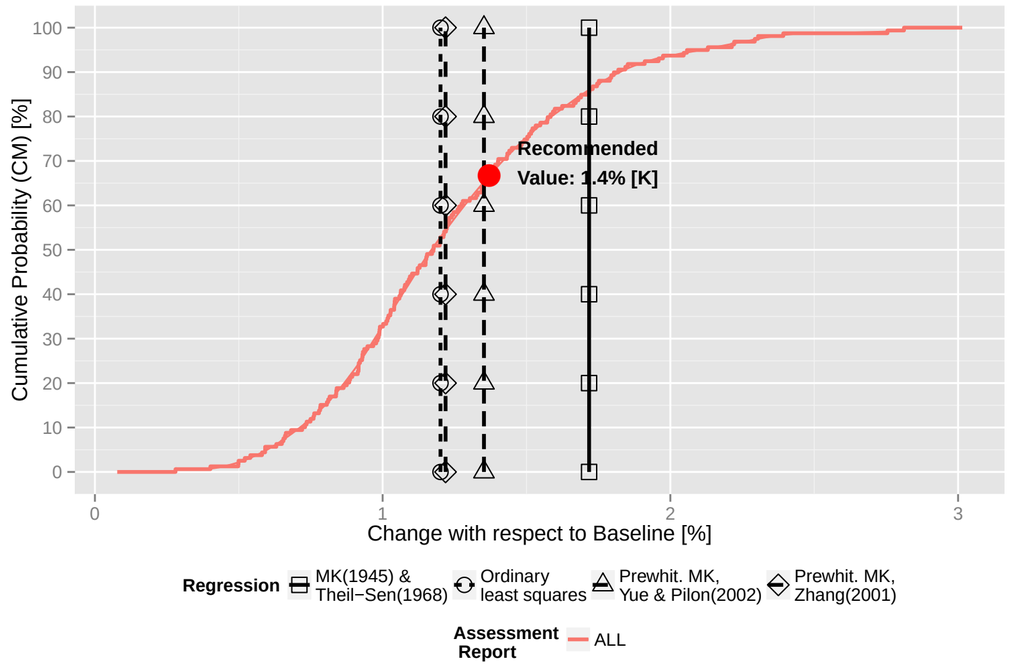
Attachment 3: Example Outcome for a Case Where the Trend Analysis Suggests Statistical Significance

Climate parameter: Air Temperature − Mean (2m)
Latitude: 65.544, Longitude: −106.493
Baseline: 1975 − 2005 / Projection: 2041 − 2070









Attachment 4: Example Outcome for a Case Where the Trend Analysis Suggests no Statistical Significance

Climate parameter: Precipitation − Total
Latitude: 65.544, Longitude: −106.493
Baseline: 1975 − 2005 / Projection: 2041 − 2070

