Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

APPENDIX J
Baseline Climate Report

Minto Explorations Ltd

ISSUED FOR USE

MINTO MINE
2010 CLIMATE BASELINE REPORT

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1.0 INTRODUCTION

Minto Explorations Ltd. (MintoEx) is planning the Phase IV expansion of their Minto Mine, located in central Yukon.

EBA Engineering Consultants Ltd. (EBA) was retained by Minto Explorations Ltd to help prepare baseline environmental data to support the assessment and regulatory processes for the mine expansion. This report provides a comprehensive summary of baseline meteorology and climate studies that have been conducted since 1994 by Hallam Knight Piésold Ltd. and Access Consulting Ltd. in the Minto Mine area.

2.0 STUDY BACKGROUND

The climate in the Minto region is subarctic continental with long, cold winters and short, cool summers. The area experiences moderate precipitation in the form of rain and snow and a large range of temperatures on a yearly basis with a mean annual temperature below 0°C.

To record meteorological parameters on site, a basic meteorological station was established at the Minto Mine site in late September 1993 at an elevation of 884 m asl (above sea level) and intermittent temperature and precipitation data was collected (HKP, 1994).

On September 7, 2005, a HOBO meteorological station on a three-metre tripod was installed by Access Consulting Ltd. with instrumentation to record wind speed and direction, air temperature, relative humidity, barometric pressure, solar radiation and rainfall at a location near camp. On April 11, 2006, the station was relocated to the airstrip (62 36' 17"N 137 13' 19", el. 887 m asl). The station has recorded, over hourly sampling intervals, the parameters of: average wind speed and direction; highest three-second wind gust; air temperature; relative humidity; on-site barometric pressure; incident solar radiation and total wet precipitation. A photo of the station, the specifications of the installed instrumentation and details of the data collection program are contained in Appendix A. The data collection program and station maintenance has been the responsibility of Access Consulting Ltd.

Two Meteorological Service of Canada stations provide a long-term climate record for the region (Figure 2.1). Pelly Ranch (Fort Selkirk – Climate ID#2100880), located at 62° 49' 12" N 137° 22' 11" W, approximately 25 km northwest of the site at an elevation of 454 m, provides a continuous record of daily air temperatures and precipitation in the form of rainfall and snowfall from March 24 1956 to February 28, 2007. Carmacks (Climate ID#2100300, located at 62° 6' 0" N 136° 28' 0" W, approximately 70 km southeast of the site at an elevation of 525 m, provides a continuous record of daily air temperatures and precipitation in the form of rainfall and snowfall from August 28, 1963 to the present.

Meteorological data recorded by the Minto meteorological station over a four and a half-year period between September 7, 2005 and March 13, 2010 provides the database for monthly and yearly averages and seasonal observations which are discussed in detail in the following sections. Meteorological data was not recorded between May 14 and July 2, 2009 while the station was not logging data due to operator error. Gaps in the data record have also occurred between July 16 and 24, 2008 and August 27 and 31, 2009. The total period of recorded meteorological data is 1585 days. Further missing data due to specific instrument malfunction will be noted in the appropriate sections below.

Pelly Ranch and Carmacks daily data provide the database for 50 and 40-year regional trends of temperature and precipitation respectively, which are discussed following the presentation of the Minto meteorological data.

3.0 METEOROLOGICAL PARAMETERS & CLIMATE

3.1 AIR TEMPERATURE

3.1.1 Site Observations

Hourly air temperatures have been plotted for the entire period of record in Figure 3.1. The plot shows a strong sinusoidal seasonal pattern. The summer period, between late-May and early-September, is characterized by temperatures in the range of 10°C and 20°C. The winter period, between October and March, is characterized by a much larger day-to-day variation in air temperatures, typically between -10°C and -30°C, although winter temperatures in the range of 0°C and -40°C are not uncommon. Diurnal variation in air temperatures tends to be less during the winter period than during the summer. The transitions between these seasons are characterized by a quick rise or fall in air temperatures during March / April and mid-September / early-October, respectively.

Table 3.1 contains the average monthly maximum, mean and minimum air temperature as well as the extreme maximum and minimum temperature for each month on record. July has been the warmest month on average (15.4°C) while the coldest has been January (-19.1°C). The mean annual air temperature at the site is -1.9°C.

Based on the data record, air temperatures would be expected to remain above zero throughout the day between June and September, while between October and March, air temperatures would typically remain below zero. The maximum air temperature ever recorded was 30.3°C on July 29, 2009. The minimum air temperature ever recorded was -43.2 on November 27, 2006 and again on January 8, 2009. Air temperatures in excess of 5°C have been observed in every winter month. Sub-zero temperatures have been recorded every month except July and August.

3.1.2 Regional & Future Trends

Meteorological Service of Canada stations located at Pelly Ranch and Carmacks provide a historical record of 50 and 42 years respectively, of monthly averages of daily maximum, mean and minimum air temperatures from which an annual average is determined.

Figure 3.2 illustrates the annual maximum (plotted in red), mean (green) and minimum (blue) air temperatures along with the respective trendlines and slopes at Pelly Ranch between 1957 and 2006. Annual maximums and minimums are calculated as an average of monthly maximum and minimum temperatures for each year. Annual averages are not plotted in years where months with missing data exist.

The plots show a similar trend for all annual averages. The annual mean temperature has been increasing at Pelly Ranch by 0.06°C per year on average over the 50-year period corresponding to a total average increase of 3°C from 1957 to 2006. It is also important to note that the average annual minimum temperature has been increasing at a faster rate than the average annual maximum temperature, thus implying that the average diurnal range has also been decreasing over the same 50-year period.

Figure 3.3 illustrates the average maximum, mean and minimum temperatures for January (blue), April (green) and July (blue) over the same period in order to better illustrate the trend with respect to seasonality. The plot shows that January (winter) mean temperatures have experienced the highest rate of increase (0.13°C per year on average), corresponding to a total average increase of 6.5°C over the 50-year period.

The same data plotted for Carmacks, in Figures 3.4 and 3.5 respectively, shows a similar trend. The mean annual temperature has been increasing by 0.09°C per year on average, corresponding to a total average increase of 3.8°C between 1964 and 2005. The 50-year trend shows that the average annual maximum temperature has been increasing at a faster rate on average than the average annual minimum temperatures, which is atypical of the general observed trend in Canada. However, when the trends in average annual maximum and minimum temperatures are plotted for the period between 1991 and 2005 (plotted in black and navy blue respectively), average minimums have been increasing at a faster rate annually relative to maximums. With respect to seasonality, January mean temperatures have been increasing by 0.27°C per year on average, corresponding to a total average increase of 11.3°C from 1964 to 2005.

The proximity of the regional stations to the Minto mine site (25 km and 70 km, respectively) would suggest that the observed trends in annual temperatures are applicable to the Minto region as well. To show the correlation of air temperatures between sites, mean monthly air temperatures recorded at all three sites have been plotted together over the period between October 2005 and March 2010 in Figure 3.6. The data record at Pelly Ranch ends in March 2007. Months where a complete set of daily data does not exist have been omitted from the plot.

The plot shows a close correlation between the three data sets, however mean winter temperatures are approximately 3°C to 5°C higher at Minto (887m) than at the regional stations (454m, 525m) due to a general winter temperature inversion in the Yukon where temperatures increase with height (Wahl et al, 1987). Analysis of a 43-year period of radiosonde data (1958-2000) from Whitehorse shows a long-term average lapse rate of approximately +8°C/ km up to an elevation of 1500 m during the winter (Pinard, 2009). The positive sign indicates a warming with elevation, or an inversion.

The data in Figure 3.6 would suggest that based on the past five years of data, the observed 50 and 42-year trends are also applicable to the Minto site although the magnitude of the increase can not be definitively determined, in particular, during the winter months.

Due to an exponential increase in global CO_2 and to other anthropogenic factors, past trends provide only a conservative estimate when predicting temperature increase due to climate change into the future.

The Coupled Global Climate Model 2 (CGCM2) developed at the Canadian Centre for Climate Modelling and Analysis of Environment Canada uses various scenarios to portray several possible futures on a global scale. The IS92a scenario is a commonly applied "middle range" scenario which considers only current internationally agreed emission controls and national policies enacted into law, a population rise to 11.3 billion by 2100 and an economic growth of 2.3%/year (Leggett, 1992).

Figure 3.7 shows the CGCM2 predicted increase in annual mean temperatures from the reference period (1961 to 1990) to the middle of the current century (2040 to 2060) for the Yukon Territory. The model predicts an increase in mean annual temperature in the Minto area between 3°C and 4°C. Future climate scenario results however, must be treated with caution and this is especially the case when results are viewed at smaller local scales (Leggett, 1992).

3.2 WINDS

The average wind speed and direction and the maximum wind gust averaged over a three-second period for each hour are recorded by the Minto meteorological station. Since the current installation is strongly affected by rime icing (see Photo 3.1), much of the record is ice-affected at temperatures below zero.

Photo 3.1: Rime Icing Affecting the Minto Met Station Wind Sensor

Periods when the anemometer cups are not rotating due to ice build-up are recorded as 0 m/s and are easily identified in the record and flagged. However, ice build-up on the anemometer cups often results in extended periods of non-zero but diminished wind speeds of varying degree and duration which are difficult to arbitrarily omit from the record. In order to remove any uncertainty in the data, all wind speeds and directions recorded below 0°C were flagged and omitted from analysis. As a result, the majority of winter wind observations (those occurring when air temperatures are below freezing) have not been included in the study.

3.2.1 Average Wind Speed & Direction

The wind rose in Figure 3.8 is a graphic representation of wind observations recorded by the Minto meteorological station over the period of record. It illustrates the frequency of occurrence of winds blowing within a specified speed range and compass direction from which winds were observed, expressed as a percentage of the period of record. It illustrates predominant wind directions and the distribution of speeds at which these winds blow.

The wind rose presented in this report groups wind speeds into ranges from 0 to 1 m/s (calm), 1 to 3 m/s, 3 to 6 m/s, 6 to 9 m/s and 9 to 12 m/s. Wind directions are grouped into 16 compass directions each with a range of 22.5 degrees and denoted as N, NNE, NE, etc... The data is summarized in the wind speed and direction frequency distribution table, which is located in the lower right of the figure. The colour of the section used to display winds in each compass direction is indicative of the wind speed. The length of the coloured section represents the percentage of time winds blew at that speed from that particular direction.

Based only on recorded winds at temperatures above 0°C, two predominant wind directions at site are illustrated: S (including SSW, S and SSE) and NW (including NNW, NW and WNW). The frequency of winds originating from the S is 23.45%. This is the cumulative of winds from the SSW (6.73%), S (9.43%) and SE (7.29%). The frequency of winds originating from the NW is 17.78%. This is the cumulative of winds from the NNW (5.92%), NW (6.83%) and WNW (5.03%).

The bottom row in the distribution table in Figure 3.8 totals all recorded wind speeds within the specified speed ranges. Over the period of record, winds have been below 3 m/s 65.13% of the time, of which 19.38% are considered as calm (less than 1 m/s). Winds have been recorded in excess of 6 m/s over only 4.65% of the record. As previously mentioned however, this distribution accounts only for winds occurring above 0°C, represented mainly by the wind conditions at site between March and October.

Hourly wind vectors (showing the direction and magnitude in which the wind was blowing) are plotted in Figures 3.9 and 3.10 for 2005 through 2007 and 2008 through 2010, respectively. The plots illustrate that it is not uncommon for winds from one of the two predominant directions to dominate over durations of 10 to 14 days before a switch to conditions which favour the other direction for a similar duration of time. Since only winds recorded above 0°C are plotted, it is obvious that southerly winds (plotted pointing to the north) accompany brief periods of warming during the winter.

Table 3.1 displays the average wind speed by month based on the period of record. The mean annual wind speed is 3.4 m/s. A seasonal pattern is evident, with average wind speeds exceeding 4 m/s during the winter months (November through March at temperatures greater than 0ºC). During the spring, summer and early fall, wind speeds average less than 3 m/s.

3.2.2 Wind Gusts

Table 3.1 also shows the average and maximum recorded three-second wind gust by month. Following the trend observed for average wind speeds, wind gusts are more intense during the winter months (typically in excess of 8 m/s) than during the spring and summer (typically less than 6 m/s). The annual mean wind gust speed is 7.1 m/s. The highest three-second gust recorded was 23.8 m/s on March 5, 2008, although higher wind gusts occurring during the winter may not have been recorded.

3.2.3 Future Trends

Projected wind patterns affected by climate change are estimated principally by increasing wind strength and heightened frequency of extreme weather events in Canada (Pearce *et al.*, 2009). Hinzman *et al.* (2005), found that the number of high wind events (defined as those with peak wind gusts in excess of 25 m/s, and a sustained wind of minimum 20 m/s) in Barrow, Alaska have increased significantly, particularly in winter, from 1970-1980 (mean of 5 events annually) to 1990-2000 (mean of 12 events annually) as a result of synoptic conditions characterized most generally by stronger cyclonic and anti-cyclonic systems.

As wind speeds at the Minto site are relatively low (less than 6 m/s over 95% of the time, Fig. 3.8), it is unlikely that the predicted increase in wind speeds will be overly significant in an overall sense, however instantaneous gusts would be expected to be stronger on occasion with speeds exceeding 25 m/s during peak wind events.

3.3 RELATIVE HUMIDITY

Hourly relative humidity recorded at the site is plotted for the entire period of record in Figure 3.11 and illustrates a seasonal pattern. %RH is highest during the winter months (typically in the range of 75% to 95%) and lowest during the spring and early summer, typically in the range of 40% to 60%, although levels exceeding 90% are not uncommon. Relative humidity has a much larger day-to-day variability during the summer months. The lowest daily average recorded relative humidity was 20%. The highest was 100%.

Table 3.1 shows average daily mean %RH by month. Relative humidity is typically greater than 80% between October and February. During the summer months, the daily mean is typically in the range of 50% to 60%, although part of the reason for the lower average is a higher variance. Annually, mean relative humidity is 70%.

3.4 BAROMETRIC PRESSURE

Barometric pressure recorded on-site at 885m elevation has been converted into a meteorological standard sea-level equivalent using the formula:

$$BP_{sl} = \frac{BP_{el}}{(1 - 2.25577 \cdot 10^{-5} \cdot h)^{5.25588}}$$

where: BP_{sl} = *sea-level equivalent barometric pressure*

BP_{el} = *barometric pressure recorded at elevation*

h = *height above sea-level (in m)*

Hourly sea-level equivalent barometric pressure recorded at the site is plotted for the entire period of record in Figure 3.12. A slight seasonal pattern is evident with a higher mean during summer than during fall and early winter. Winter is also characterized by a much higher day-to-day variability.

Table 3.1 shows average sea-level equivalent barometric pressure by month at the site. Barometric pressure is slightly higher on average between May and August (above 1010 hPa), and lowest between September and December (below 1010 hPa). Mean annual sea-level equivalent barometric pressure is 1008 hPa.

3.5 SOLAR RADIATION

Hourly solar radiation is plotted for the entire period of record in Figure 3.13. Data is missing between June 15 and July 19, 2006 due to instrument error. Other gaps in the data are inherent in the record for all parameters and were explained in previous sections.

As would be expected at a latitude near 62 °N, a strong seasonal pattern is evident, with maximum solar radiation being received near the summer solstice in late June (daily maximums on the order of 750 W/m^2), and values just slightly above zero around the winter solstice when the site experiences only about 3 hours of direct sunlight. Large fluctuations from the general trend during the summer are due to cloud cover.

Table 3.1 shows the average amount of solar radiation received each day at the site by month. The highest amount is received on average in June (242 W/m^2). The lowest is in December (5 W/m^2). Mean annual solar radiation is 112 W/m^2.

3.6 PRECIPITATION

3.6.1 Rainfall

The Minto meteorological station has been recording rainfall on site since its installation in September 2005. In addition to the aforementioned gaps in the data record, precipitation data was not recorded between March 30 and April 11, 2006.

The HOBO Rain Gauge Smart Sensor measures rainfall with a tipping bucket mechanism where each tip of the bucket is the equivalent of 0.2 mm of precipitation. The logger records the number of tips occurring over each hourly interval. The HOBO rain gauge is not designed to record snowfall as precipitation occurring below 0°C will not melt and the tipping mechanism may freeze in prolonged sub-zero temperatures. As well, precipitation recorded at temperatures slightly above zero is of questionable accuracy as the data may be a result of accumulated snow above the gauge falling into the tipping bucket producing an over-reading. Any incidence of precipitation data at temperatures below zero was omitted from the record as this would not represent any contribution to total rainfall.

Monthly recorded rainfall totals are shown in Table 3.2 for the duration of the study. Months in which a partial record exists are shaded in light grey and are denoted below the table. Entire months in which rainfall was not recorded are hashed.

Average monthly rainfall is shown at the bottom of the table. Partial months are accounted for by extrapolating the recorded rainfall amount over the entire month. Total rainfall by year at the right of the table is the sum of all recorded rainfall over each year. The totals may reflect slightly less than actual annual rainfall in a year where a partial month of data exists as the totals include only real data and not extrapolated data.

It should be noted that during winter months, although little to no rainfall has been recorded in the table, precipitation in the form of snow most likely would have fallen. The table represents rainfall only due to limitations of the installed instrumentation, and not total precipitation.

Table 3.2 shows that based on monthly average rainfall over five years, 175 mm of rainfall is expected on average in a single year. August is the rainiest month with an average rainfall of 52.1 mm. The two largest monthly rainfall totals occurred in August 2008 and 2009 with 100.6 mm and 50.8 mm (27-day record), respectively. The table also shows that rainfall has occurred in every month of the year.

The maximum recorded daily rainfall for each month, shown at the bottom of the table, shows that the most intense one-day rainfall occurred in August (28.2 mm).

Since snowfall is not recorded on site, total annual precipitation cannot be directly determined. To provide an estimate, Environment Canada's Canadian Climate Normals (1971-2000) for Pelly Ranch indicate that on average, annual precipitation occurs 64% as rainfall and 36% as snow. With the assumption that regional precipitation is homogeneous and ignoring any significance of the 400 m elevation difference between the sites, orographic effects or valley orientation, the site can be estimated to receive an additional 100 mm of water-equivalent precipitation in the form of snow annually.

The difference in elevation would theoretically result in a larger annual snowfall at Minto than what is observed at Pelly Ranch, however since many factors can attribute to the occurrence of snowfall (slope aspect, temperature inversions), a simple orographic correlation cannot be accurately determined from nearby records. A precipitation model may provide a more accurate estimate of total annual precipitation at site, however the installation of an all-weather precipitation gauge is recommended for accurate measurement.

3.6.2 Snow Pack

Annual snow surveys have been conducted by J. Gibson & Associates in 1994, 1995, 1998, 2006, 2007, 2008 and 2009 at three locations in the Minto Creek catchment area shown on the map in Figure 3.14. Minto#1 is located south of the airstrip with a north-facing aspect. Minto#2 is located near the explosives storage area with an east-facing aspect. Minto#3 is located north of the mill with a south-facing aspect. Due to site operations, the snow survey sites were relocated to their present positions in 2007 at the approximate aspects and elevations of the previous sites.

Snow surveys have been conducted on the on the first day of March, April and May, or within 2 days before or after these dates as conditions allowed. Due to the lack of snow remaining on site by the 1st of May, February snow surveys were begun in 2009 to ensure a consistent annual 3-month record. Snow collection procedures are in accordance with the Snow Survey Sampling Guide (SS13-81) published by the British Columbia Ministry of Environment (Water Management Branch, Surface Water Section).

Table 3.3 shows, as an average of data recorded at all three snow survey stations, the mean snowpack depth (cm), snow density (%) and water-equivalency (mm) on the first day of each month of the survey. Possible errors in the record identified in quality checking of the field data (where the recorded water-equivalency does not equal the product of the recorded snow density and snow depth) have been shaded grey but were included in the analysis.

Based on the seven years of snow surveys, the average water-equivalent snow depth remaining on the 1st of March and April is 80.1 mm and 91.4 mm respectively. The data which slightly underestimates total annual snowfall due to the fact that it fails to account for snow that has melted during the winter, agrees with the annual snowfall estimate from interpolated data recorded at Pelly Ranch, discussed previously.

In four of the seven surveys, the snowpack had melted entirely by May 1st. In the three years where snow remained on the ground on May 1st (1995, 2006 & 2008), the mean snowpack had reduced to 10%, 27% and 20%, respectively of the peak measured snowpack in that year. The data indicates that the majority of runoff due to snowmelt occurs in April.

3.6.3 Regional & Future Trends

Global precipitation has increased more than 10% at higher latitudes during the 20th century in the Northern Hemisphere (Hengeveld, 1997). However, a study published in 1995 by the Intergovernmental Panel on Climate Change (IPCC) and Environment Canada determined that annual precipitation in the Yukon and coastal British Columbia has shown only a slight increase over the last 50 years when compared to eastern regions of North America at higher latitudes (Hengeveld, 1997).

Total annual precipitation recorded at Pelly Ranch and Carmacks between 1955 and 2006 were plotted along with the respective trendlines in Figure 3.15 in blue and red, respectively to illustrate the observed regional trend over central Yukon during the last half of the 20th century. The figure shows a general increase in total annual precipitation over the 51-year period of 1.1 mm/year for Pelly Ranch and 1.4 mm/year at Carmacks, on average. With approximately 300 mm of precipitation per year, this equates to more than a 20% increase. The effects of climate change on precipitation patterns are quite complex as they vary locally. Trends in annual precipitation over the past century are more representative of changes to regional and local precipitation (Trenberth *et* al., 2007). The proximity of the Environment Canada stations to the mine site would allow for reasonable confidence in assuming that the observed trends for Pelly Ranch and Carmacks are also applicable to the Minto site, excluding regional variability of precipitation events due to orographic effects or valley orientations.

Under the IS92a scenario described previously, CGCM2 projects an increase in annual precipitation in the Minto region of between 0% and 10% for the period 2040-2060 compared to the annual mean between 1961 and 1990. (Figure 3.17). If total annual precipitation at Minto is assumed to be on the order of 275 mm (Section 3.6.1), the resulting increase would be expected to be in the range of 0 and 30 mm over this period. However, since precipitation patterns are significantly influenced by changes in global circulation patterns, regional projections are uncertain (Hengeveld, 1997).

3.7 EVAPORATION

No evaporation records are available for the Minto site. Monthly lake evaporation is reported by Environment Canada for Pelly Ranch over the period 1971-1999 as a mean daily evaporation. The data shows measureable evaporation occurring only between May and September. An estimate of mean annual lake evaporation is determined to be 460 mm for Pelly Ranch by multiplying each month's daily mean by the number of days in the month. The Ministry of Environment's Manual of Operational Hydrology in B.C. suggests a reduction in evaporation with elevation equal to 10% per 350 m elevation rise (HPK, 1994). With an elevation difference of slightly over 400 m, the interpolation would suggest an annual evaporation at site on the order of 400 mm/year.

The extrapolation of past and current trends in observed data and climate scenarios both predict increases in mean temperature and wind speeds. The predicted changes in temperatre and wind speed are favourable for increased evaporation, and thus evaporation would be expected to increase over the next fifty years.

4.0 DATA GAPS & RECOMMENDATIONS

The current wind anemometer installation consisting of three rotating cups (for wind speed) and a vane (for direction) is prone to icing which greatly affects the accuracy of its readings at temperatures below zero. Recorded wind speeds are diminished when affected by ice cover, but it is difficult to determine which parts of the data record are affected. To eliminate any uncertainty, the wind analyses contained in this report include only wind data which was recorded at air temperatures above 0°C and as a result, omits the majority of the period between November and March when more intense winds tend to occur. As a result, peak wind speeds may not have been recorded and seasonal averages may be higher than reported. The wind data record analyzed in this report covers 68% of the total study period. Replacing the current installation with a heated blade-type or acoustic anemometer may significantly reduce ice build up and allow for a more complete winter wind data collection.

Total annual precipitation at site is unknown. An attempt was made to estimate snowfall at site from data recorded at nearby regional stations, however several factors which affect precipitation such as slope orientation, winter temperature inversions and orographic lifting factors result in high variability in accurately interpolating the data. Comparisons of monthly snowfalls at recording stations within 100 km of each other in mountainous terrain have shown very little month-to-month correlation. A regional precipitation model may be applied to the area to provide a more accurate estimate of mean annual precipitation, however in order to provide accurate annual precipitation to be used in water balance analyses, consideration should be given to replacing the current rain gauge with an all-weather gauge which records rainfall and snowfall as water-equivalent precipitation.

Station maintenance has been the responsibility of Access Consulting Ltd. The analyses contained in this report were written with the assumption that regular calibration of the station instrumentation has been performed on an annual basis. Based on the information from the manufacturer:

- the tipping bucket mechanism in the rain gauge requires annual calibration;
- the service life of the wind sensor is 2 to 5 years depending on environmental conditions;
- the air temperature sensor has a drift of less than 0.1°C per year;
- the relative humidity sensor has a drift of ±1% (typical) up to ±3% in RH above 70% per year;
- the barometric pressure sensor has a drift of ±0.6 hPa per year; and
- the pryronometer has a drift of less than 2% per year.

5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Minto Explorations Ltd. and their agents. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Minto Explorations Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement. EBA's General Conditions are attached to this report.

6.0 CLOSURE

EBA Engineering Consultants Ltd. is pleased to provide Minto Explorations Ltd. with this Minto Mine Climate baseline data summary. We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Sincerely,
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GEO-ENVIRONMENTAL REPORT – GENERAL CONDITIONS

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REFERENCES

Environment Canada. The Canadian Centre for Climate Modelling and Analysis. The Second Generation Coupled General Circulation Model (CGCM2). Ottawa.

Hallam Knight Piesold Limited (HKP). 1994. Minto Project: Environmental Setting (Vol. 2). Report prepared for Minto Explorations Limited, Vancouver, B.C.

Hengeveld, H. 1997. The science of climate change. *In*: Responding to Global Climate Change in British Columbia and Yukon, Volume I of the Canada Country Study: Climate Impacts and Adaptation. *Edited by*: E. Taylor and B. Taylor. Aquatic and Atmospheric Sciences Division, Pacific and Yukon Region, and the Air Resources Branch, British Columbia Ministry of Environment, Lands and Parks, Vancouver, BC, p. 2-1–2-6.

Hinzman, L.D., N.D. Bettez, W.R. Bolton, F.S. Chapin, M.B. Dyurgerov, C.L. Fastie, B. Griffith, R.D. Hollister, A. Hope, H.P. Huntington, A.M. Jensen, G.J. Jia, T. Jorgenson, D.L. Kane, D.R. Klein, G. Kofinas, A.H. Lynch, A.H. Lloyd, A.D. McGuire, F.E. Nelson, W.C. Oechel, T.E. Osterkamp, C.H. Racine, V.E. Romanovsky, R.S. Stone, D.A. Stow, M. Sturm, C.E. Tweedie, G.L. Vourlitis, M.D. Walker, D.A. Walker, P.J. Webber, J.M. Welker, K.S. Winker and K. Yoshikawa. 2005. Evidence and implications of recent climate change in Northern Alaska and other Arctic regions. *Climatic Change* 72: 251-298.

Leggett, J., Pepper, W.J. & Swart, R.J. 1992: Emissions Scenarios for the IPCC: An Update. In: *Climate Change 1992: The Supplementary Report to the IPCC Scientific Assessment* (Eds. Houghton, J.T., Callander, B.A. & Varney, S.K.). Cambridge University Press, Cambridge, pp.69-95.

Pearce, T., J.D. Ford, J. Prno and F. Duerden. 2009. Climate change and Canadian mining: opportunities for adaptation. Report prepared by ArcticNorth Consulting for the David Suzuki Foundation.

Pinard, J.P., R. Benoit and J. D. Wilson. 2009. Mesoscale Wind Climate Modelling in Steep Mountains. *Department of Earth and Atmospheric Sciences University of Alberta & Recherche en Prevision Numerique (RPN), Environment Canada.* Atmosphere-Ocean 47 (1), Canadian Meteorological and Oceanographic Society, pp 63-78

Wahl, H.E., D.B. Fraser, R.D. Harvey and J.B. Maxwell. 1987. Climate of the Yukon. Climatological Studies No. 40, Atmospheric Environmental Service, Environment Canada, Downsview, ON.

TABLES

TABLE 3.1: SUMMARY OF MINTO AVERAGE MONTHLY METEOROLOGICAL OBSERVATIONS

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Wind													
Average Wind Speed (m/s)	4.0	6.0	3.8	2.7	3.0	2.7	2.6	2.1	2.1	2.6	5.4	4.1	**3.4**
‡Average Daily Wind Gust (m/s)	8.3	11.7	8.0	5.6	6.3	5.7	5.5	4.6	4.6	5.6	11.1	8.7	**7.1**
‡Peak Wind Gust (m/s)	18.9	16.5	23.8	21.3	20.6	16.1	17.9	17.7	15.8	20.4	19.5	17.3	**23.8**
Air Temperature													
Extreme Hourly Maximum Temperature (°C)	6.2	5.8	5.4	17.5	22.5	26.0	30.3	25.6	16.0	15.2	7.4	6.2	**30.3**
Average Daily Maximum (°C)	-16.3	-12.8	-8.0	4.0	11.8	17.7	19.8	15.6	9.9	-0.3	-11.6	-12.7	**1.4**
Average Daily Mean (°C)	-19.1	-15.4	-11.3	0.0	7.6	13.3	15.4	11.8	6.6	-2.5	-13.9	-15.4	**-1.9**
Average Daily Minimum (°C)	-21.6	-18.1	-14.5	-3.8	3.4	8.9	11.3	8.3	3.5	-4.6	-16.2	-18.2	**-5.1**
Extreme Hourly Minimum Temperature (°C)	-43.2	-41.3	-32.5	-15.4	-2.4	-0.6	5.4	2.9	-5.8	-18.8	-43.2	-35.1	**-43.2**
Relative Humidity													
Average Daily Mean (%)	83	80	68	58	51	51	55	69	72	85	85	83	**70**
Barometric Pressure (sea-level equivalent)													
Average Daily Mean (hPa)	1004	1009	1006	1007	1010	1011	1012	1010	1009	1005	1003	1006	**1008**
Incident Solar Radiation													
Average Daily Total (W/m^2)	9	40	104	185	218	242	218	162	100	45	13	5	**112**

Based on average hourly observations between September 8, 2005 and March 12, 2009
‡Gust speeds calculated over three-second intervals

TABLE 3.2: TOTAL MINTO RAINFALL BY MONTH

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2005									21.6	23.0	11.6	4.6	**60.8**
2006					22.8	35.8	28.6	29.2	12.2	12.2			**140.8**
2007			0.4	5.8	4.6	36.0	47.8	21.0	33.8	11.8			**161.2**
2008		2.0	0.8	1.8	9.6	26.2	25.8	100.6	21.8	6.4			**195.0**
2009	5.2				9.2		6.1	50.8	7.2	16.6			**95.1**
Average	1.3	0.5	0.3	8.4	13.5	32.7	29.7	52.1	19.3	14.0	2.3	0.9	**175.0**
Maximum Daily	2.4	2.6	2.6	3.0	10.2	14.0	18.0	28.2	13.0	10.0	10.8	3.2	**28.2**

NOTE: This table represents TOTAL RAINFALL at site . It should be noted that during winter months, although little to no rainfall has been recorded in the table, precipitation in the form of snow most likely would have fallen. The table represents rainfall only due to limitations of the installed instrumentation, and not total precipitation.

indicates partial month due to instrument or logger malfunction.

March 2006 - 30 days
April 2006 - 19 days
July 2008 - 22 days
May 2009 - 13 days
July 2009 - 29 days
August 2009 - 27 days

TABLE 3.3: SUMMARY OF MINTO SNOW SURVEY DATA

Year	February 1st			March 1st			April 1st			May 1st		
	Snow Depth (cm)	Snow Density (%)	Water Equivalent (mm)	Snow Depth (cm)	Snow Density (%)	Water Equivalent (mm)	Snow Depth (cm)	Snow Density (%)	Water Equivalent (mm)	Snow Depth (cm)	Snow Density (%)	Water Equivalent (mm)
1994				52.2	17.1	89.7	50.3	18.8	94.3	0.0	N/A	0.0
1995				41.7	13.8	57.3	38.9	14.9	58.0	4.1	*30.7	18.0
1998				37.3	****18.1	65.0	39.3	18.2	70.7	0.0	N/A	0.0
2006				44.7	16.2	72.7	57.4	17.1	97.7	15.4	**34.5	52.7
2007				40.5	19.6	79.3	49.0	20.2	98.7	0.0	N/A	0.0
2008				50.9	17.1	87.0	48.9	***20.0	97.5	10.3	**25.1	34.0
2009	55.6	16.6	92.7	70.2	15.7	110.0	67.4	22.3	150.7	0.0	N/A	0.0
2010	60.5	17.8	107.7	58.1	20.7	120.7						
Mean	**55.6**	**16.6**	**92.7**	**48.2**	**16.8**	**80.1**	**48.1**	**18.2**	**91.3**	**5.0**	**8.4**	**17.4**

All snow surveys performed by J. Gibson & Associates

possible measurement error

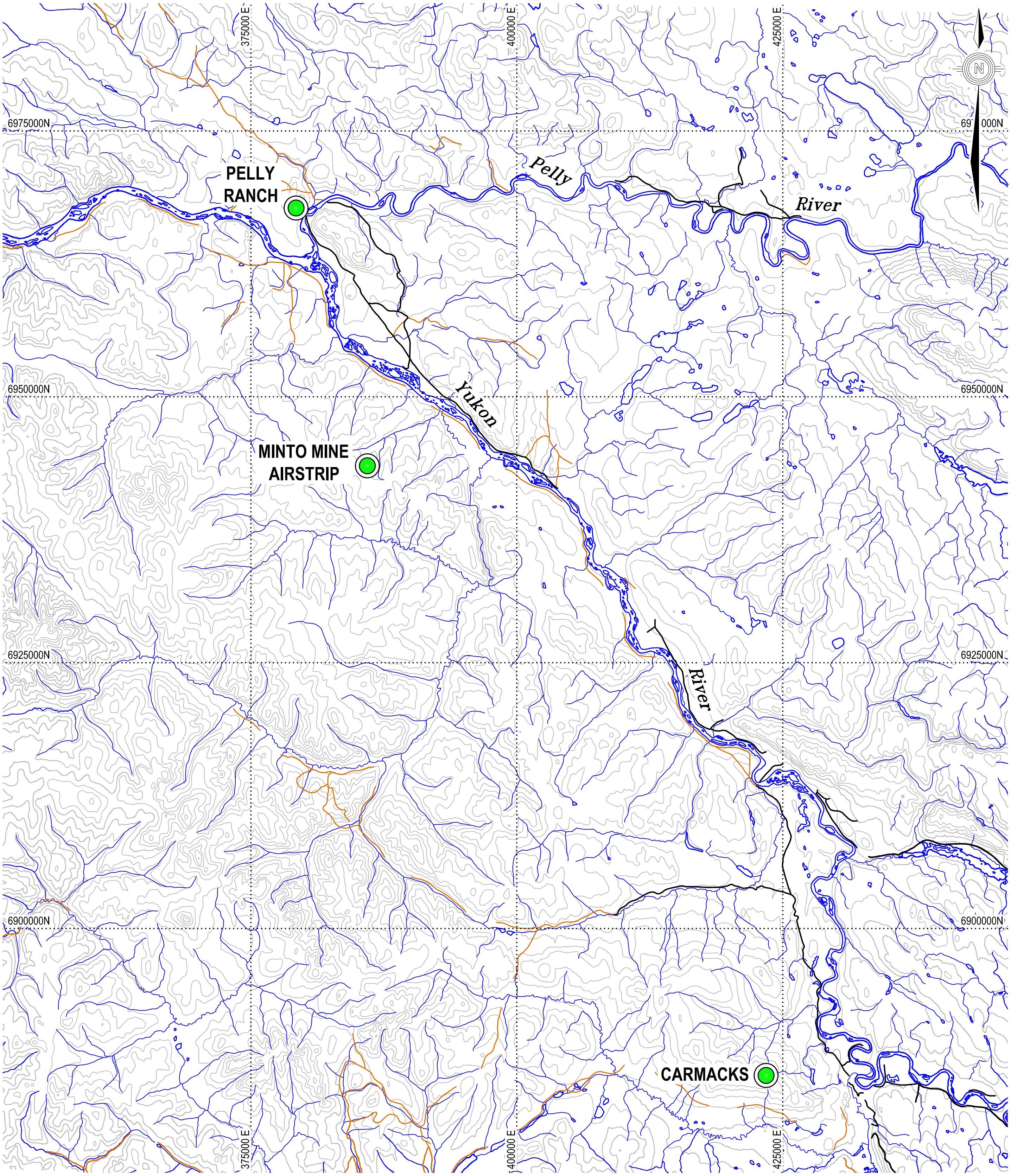
* zero snow recorded at #2 and #3 - density is based on #1 only, average depth and water-equivalent is average of all sites

** zero snow at #3, density is an average of snowpack at #1 and #2, average depth and water-equivalent is average of all sites

*** omitted snow survey site #3 - error in snow depth reading

**** includes potential measurement error from site 3

FIGURES



LEGEND

Locations of Interest

SCALE 1:500,000

5 0 5 10 20km

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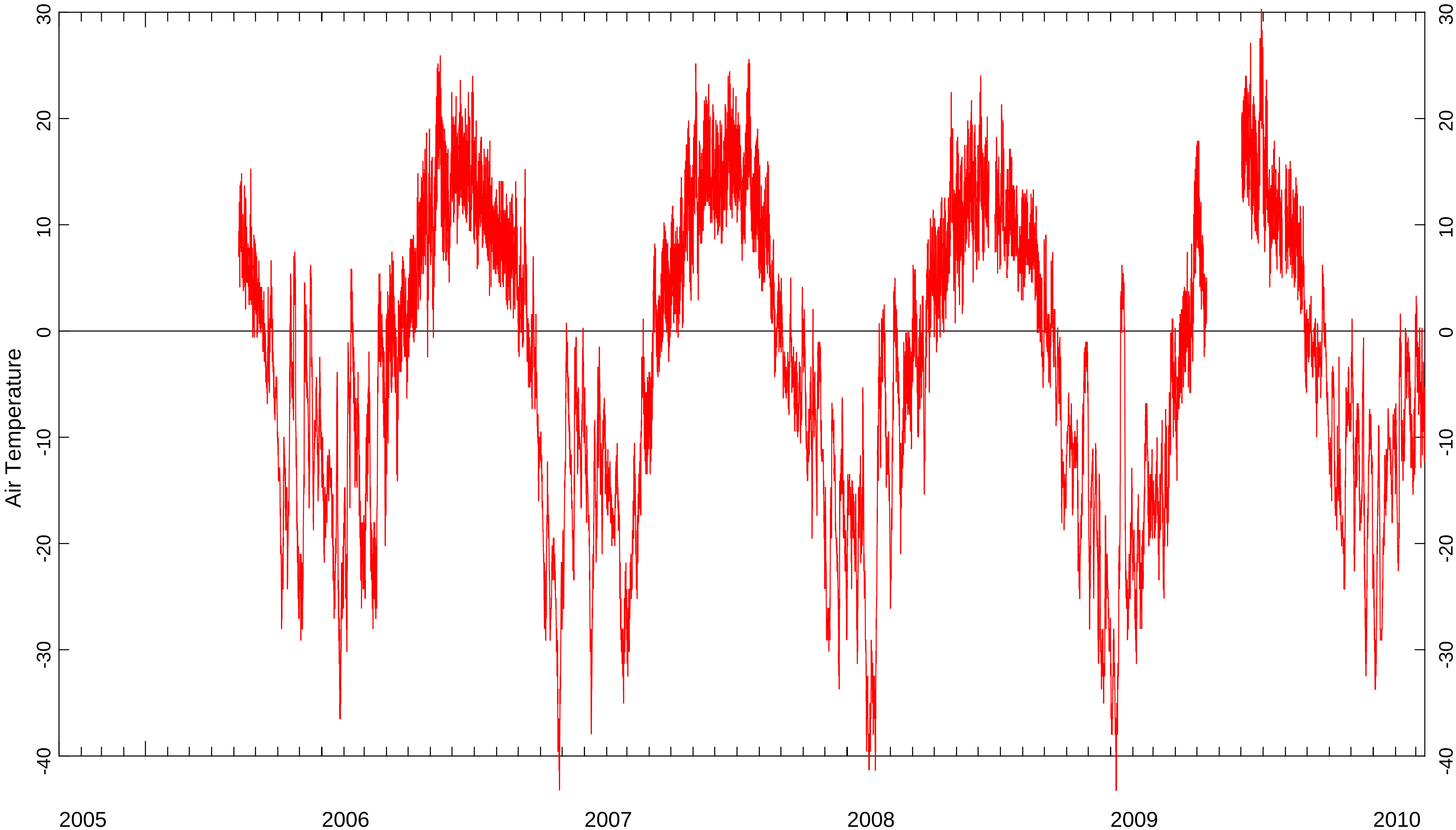
MINTO MINE
2010 CLIMATE BASELINE REPORT

SITE LOCATION

PROJECT NO.	DWN	CKD	REV
W14101068.025	JAB	TM	0
OFFICE	DATE		
VANC	April 30, 2010		

Figure 2.1

Q:\Vancouver\Drafting\Engineering\W141\W14101068\025\W14101068.025_FIG 2.1&3.14_R0.dwg [FIGURE 2.1] August 10, 2010 - 3:14:17 pm (BY: JON BOKIC)



NOTES

See report for information on missing data

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MINTO MINE
2010 CLIMATE BASELINE REPORT

Minto Station
Hourly Air Temperature
Period of Record

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0

OFFICE	DATE
EBA-VANC	April 2010

Figure 3.1

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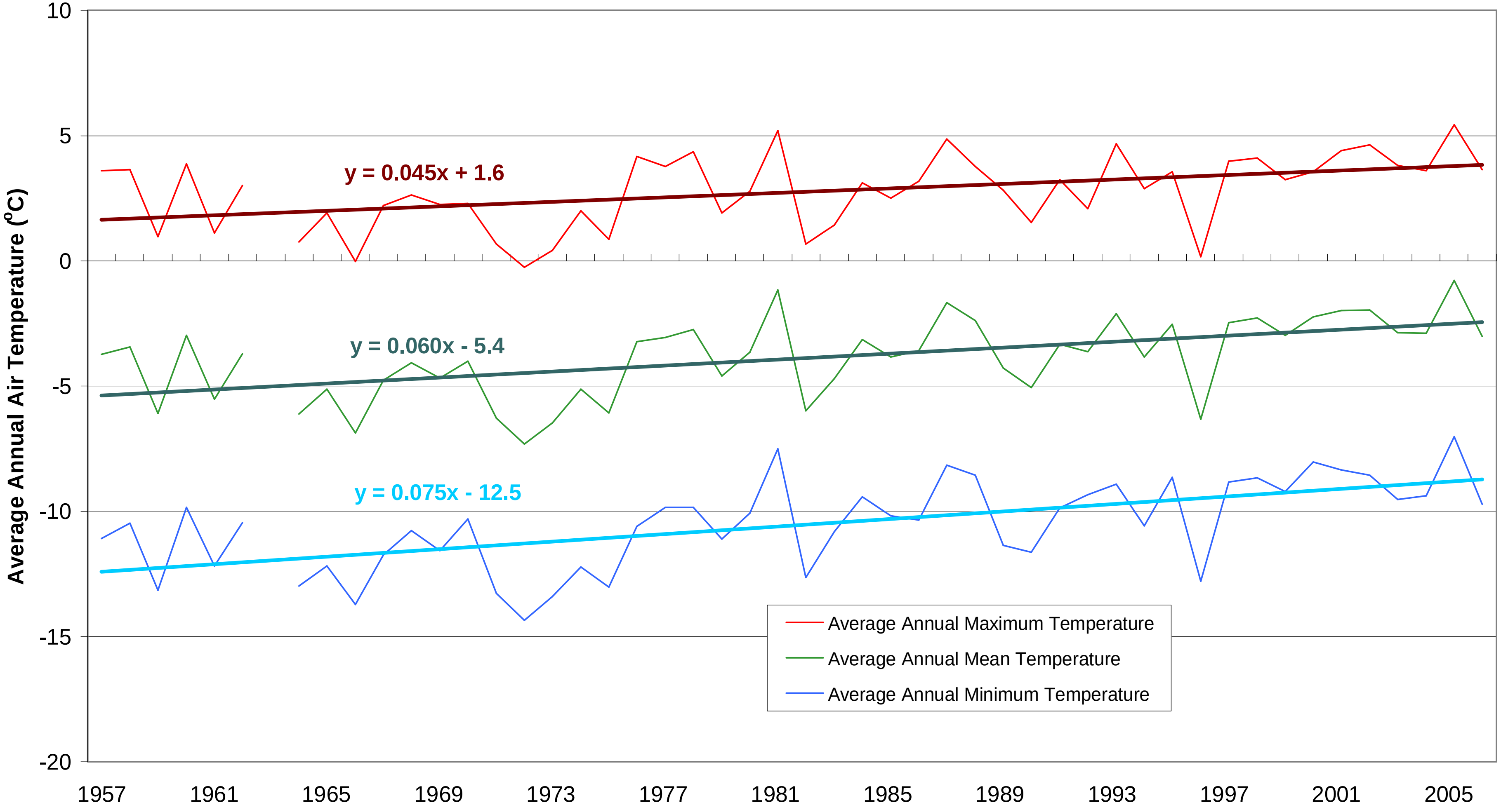

NOTES

The slope of each trendline represents the average annual increase in air temperature

Source: Meteorological Service of Canada

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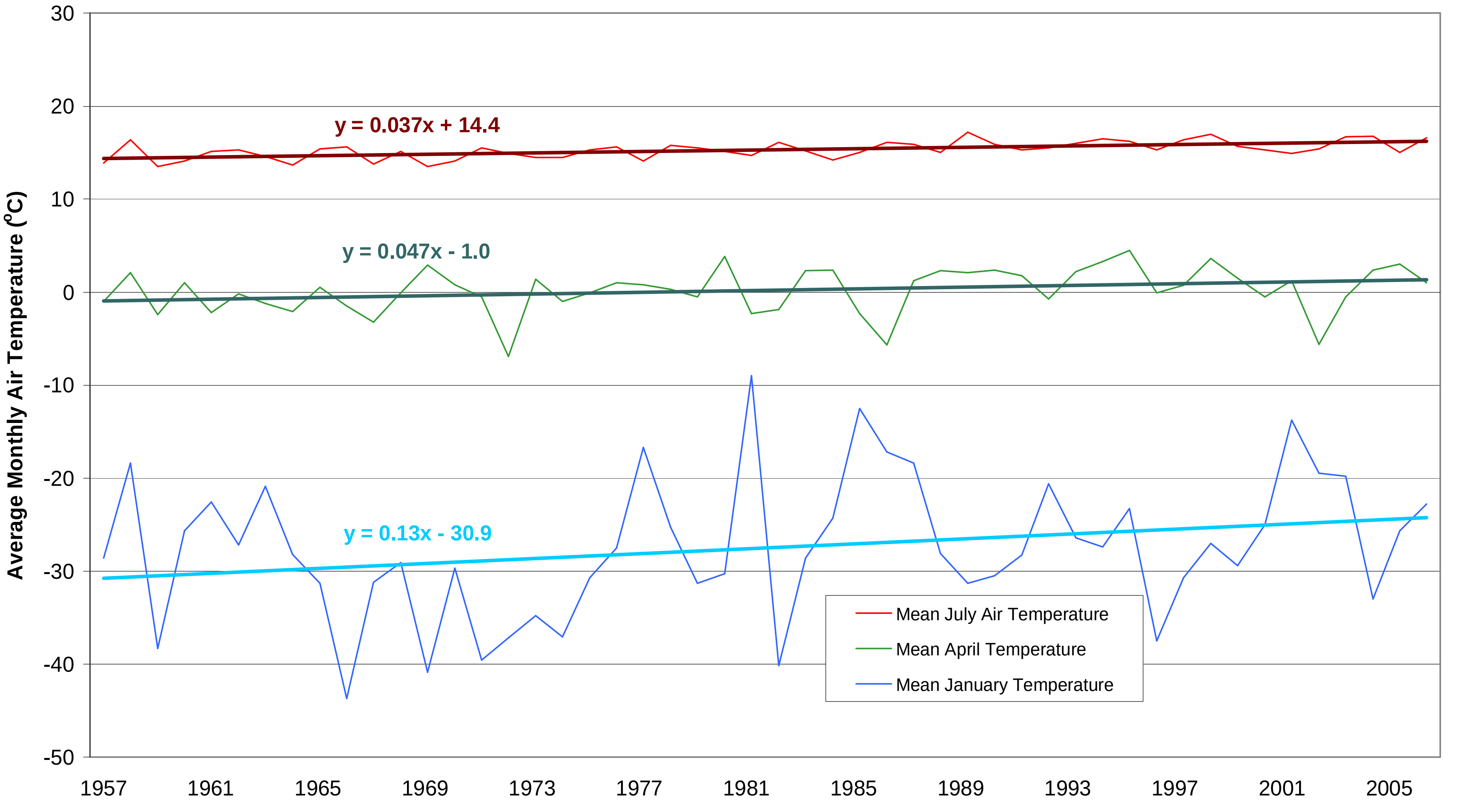
MINTO MINE
2010 CLIMATE BASELINE REPORT

Pelly Ranch
Annual Temperature Trends
1957 - 2006

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.2



NOTES

The slope of each trendline represents the average annual increase in air temperature

Source: Meteorological Service of Canada

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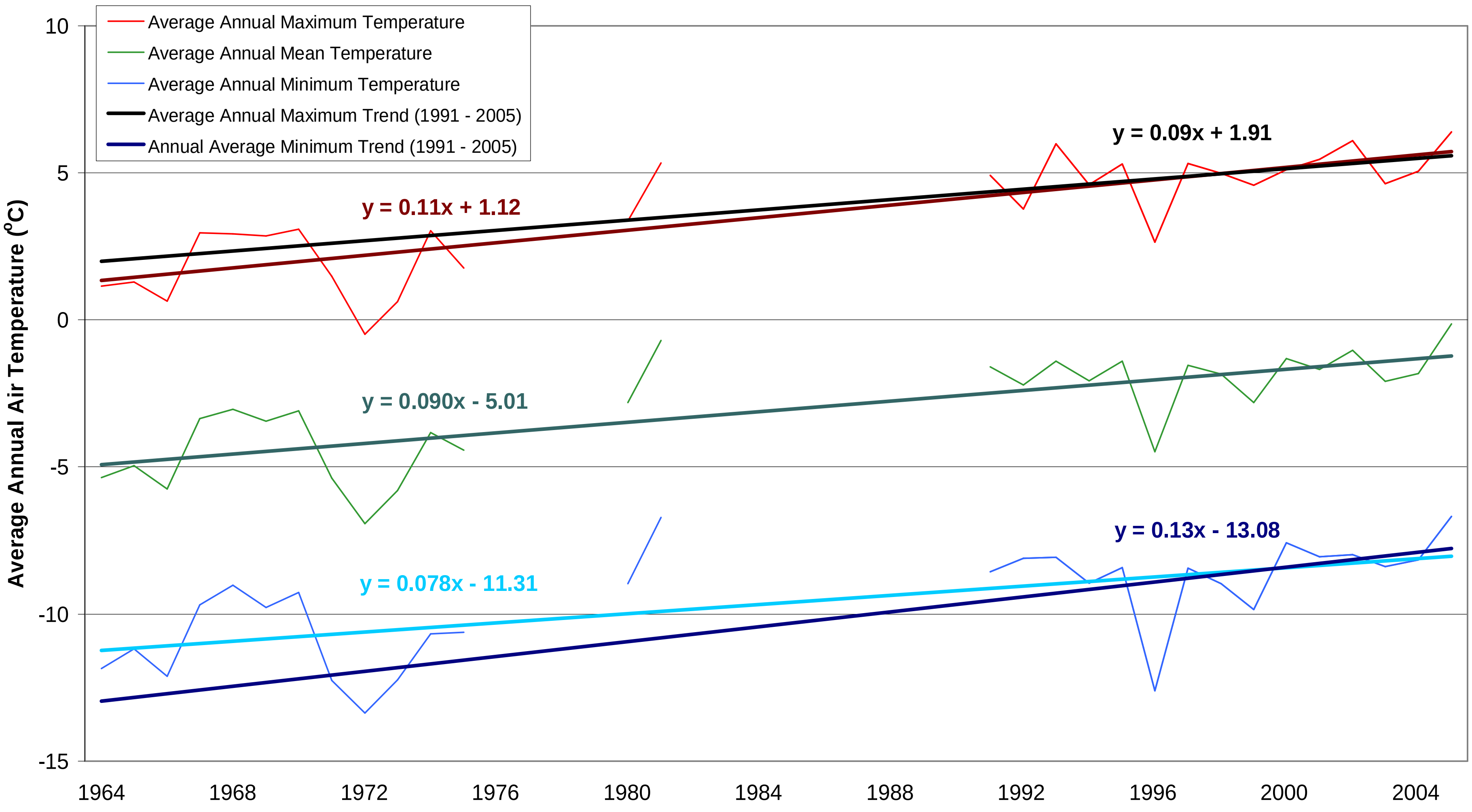
MINTO MINE
2010 CLIMATE BASELINE REPORT

Pelly Ranch
Seasonal Temperature Trends
January, April & July (1957 - 2006)

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.3



NOTES

The slope of each trendline represents the average annual increase in air temperature

Source: Meteorological Service of Canada

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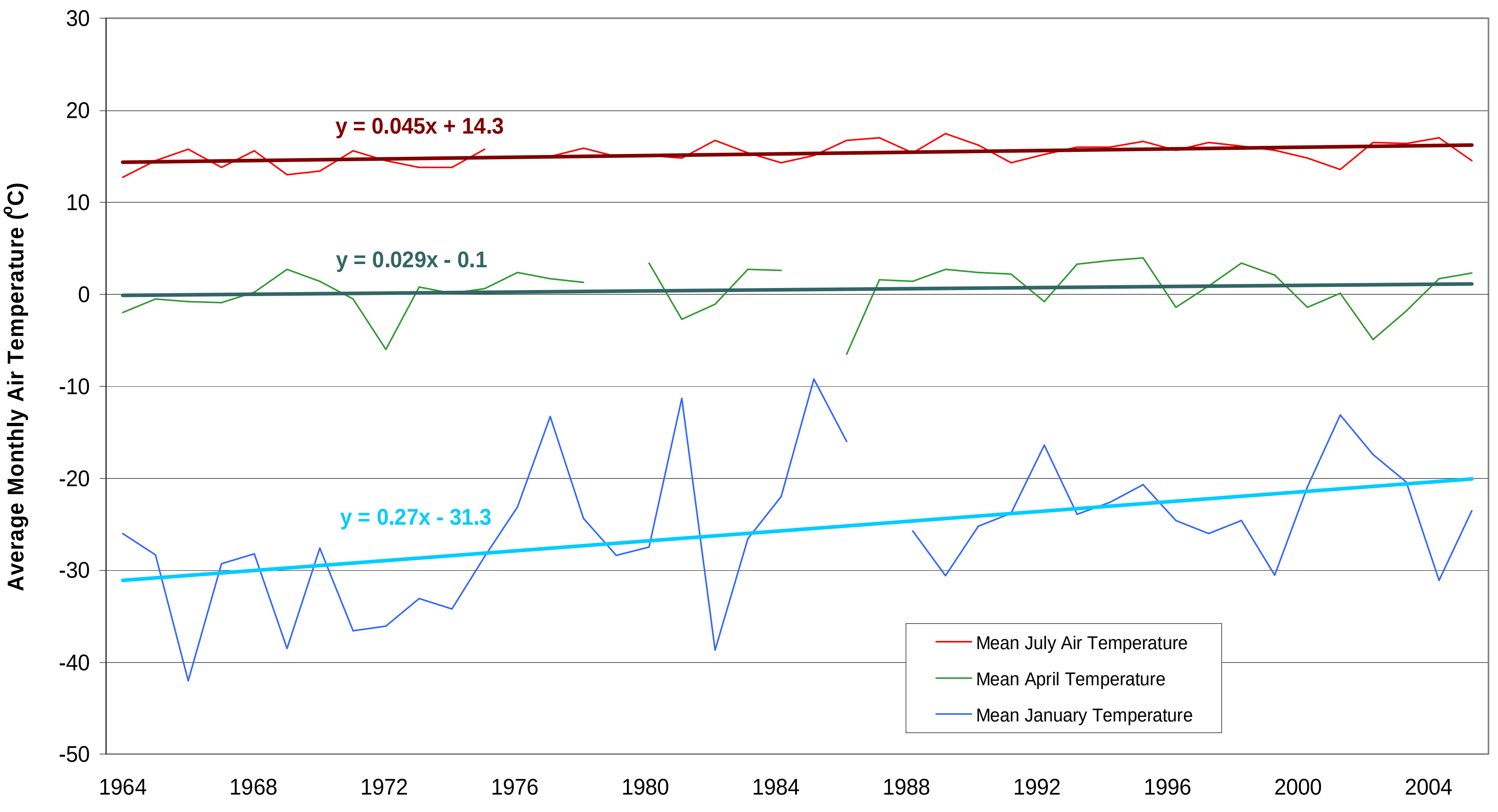
MINTO MINE
2010 CLIMATE BASELINE REPORT

Carmacks
Annual Temperature Trends
1964 - 2005

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.4



NOTES

The slope of each trendline represents the average annual increase in air temperature

Source: Meteorological Service of Canada

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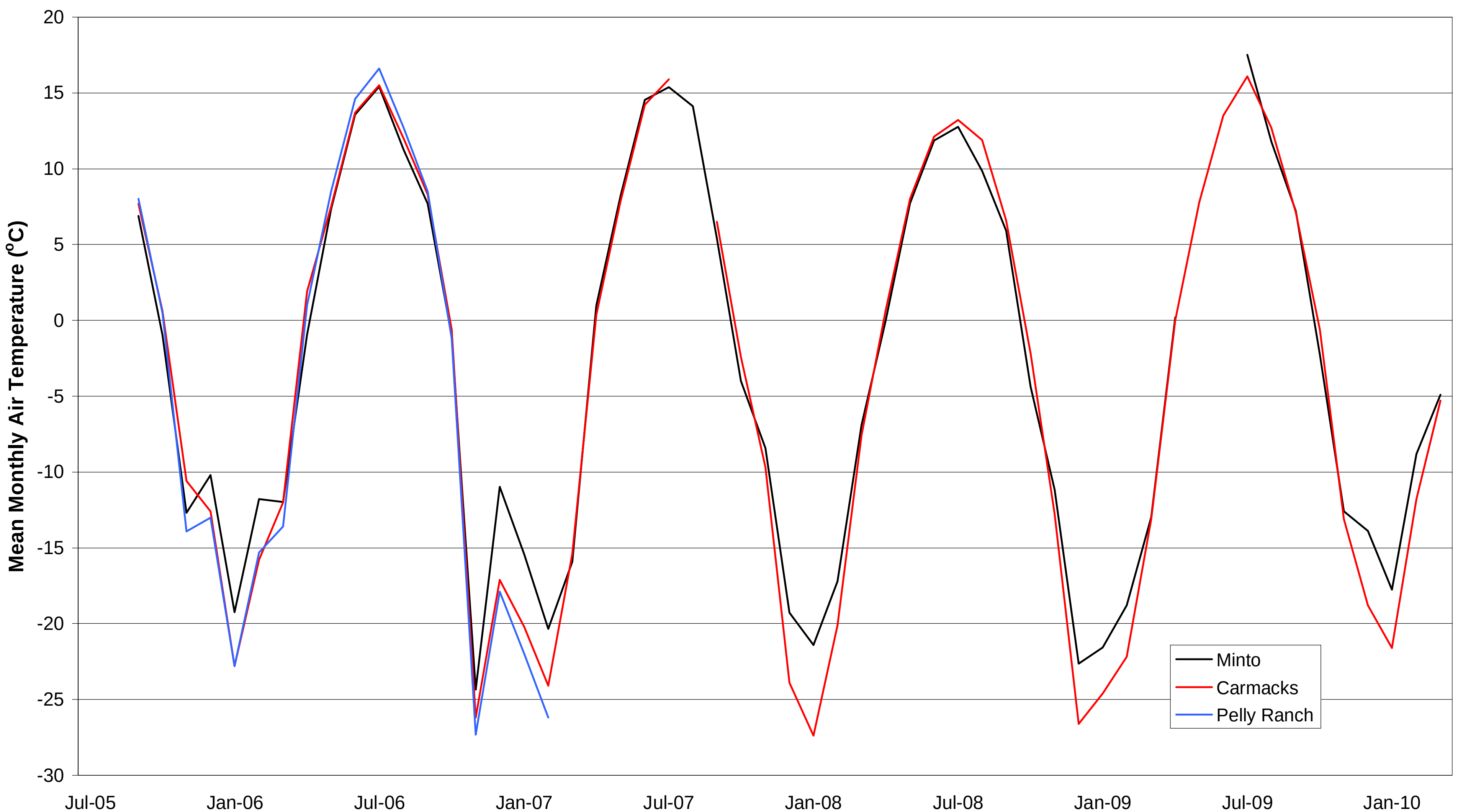
MINTO MINE
2010 CLIMATE BASELINE REPORT

Carmacks
Seasonal Temperature Trends
January, April & July (1964 - 2005)

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.5



NOTES

Source: Meteorological Service of Canada, Minto Meteorological Station

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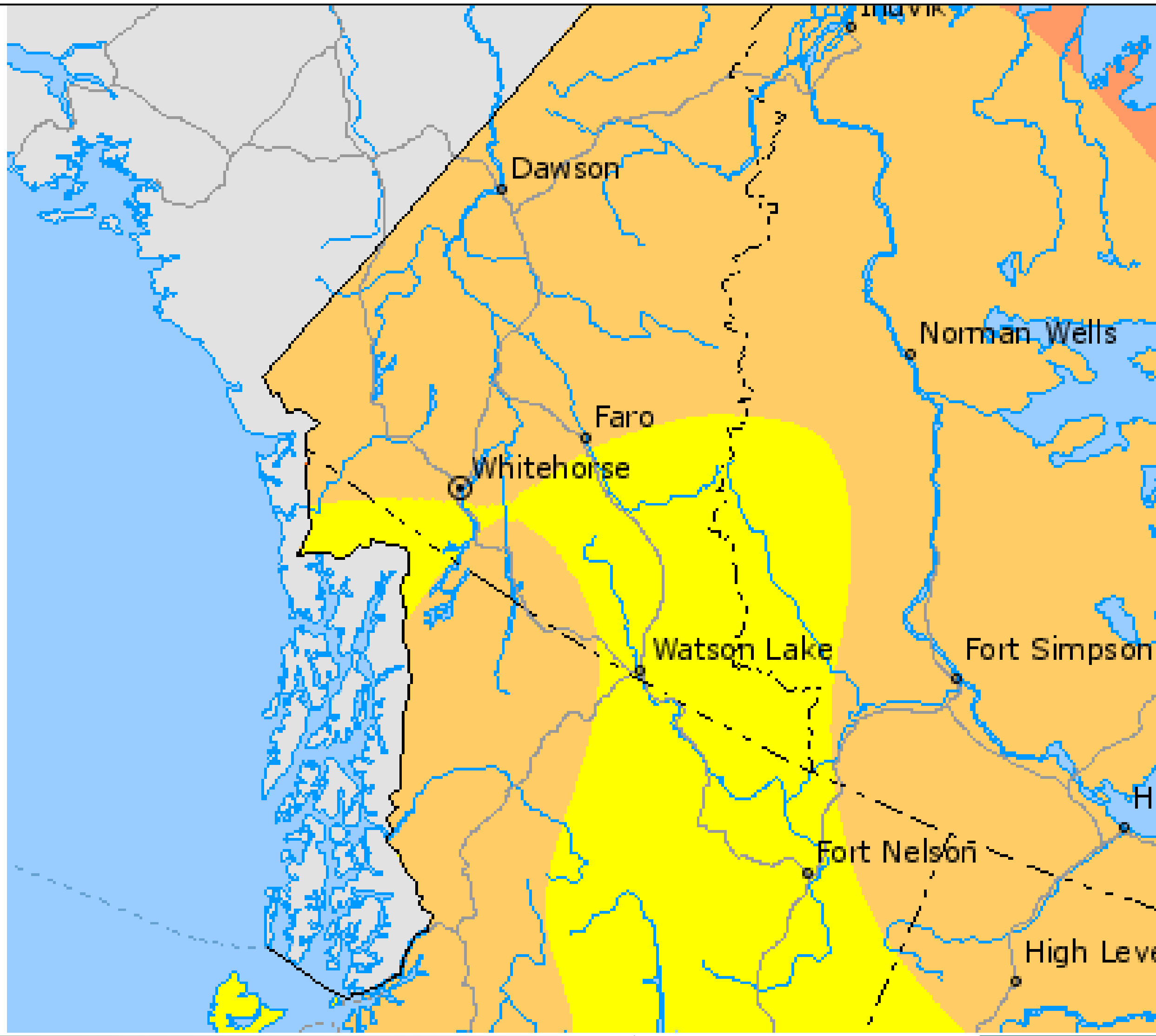
MINTO MINE
2010 CLIMATE BASELINE REPORT

Mean Monthly Temperatures Comparison
Pelly Ranch, Carmacks & Minto
2005 - 2009

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.6



NOTES

Source: Natural Resources Canada/ Environment Canada

Predicted Annual Temperature Increase Over 1961 - 1990 Baseline (^{o}C)

- 2 - 3
- 3 - 4
- 4 - 5

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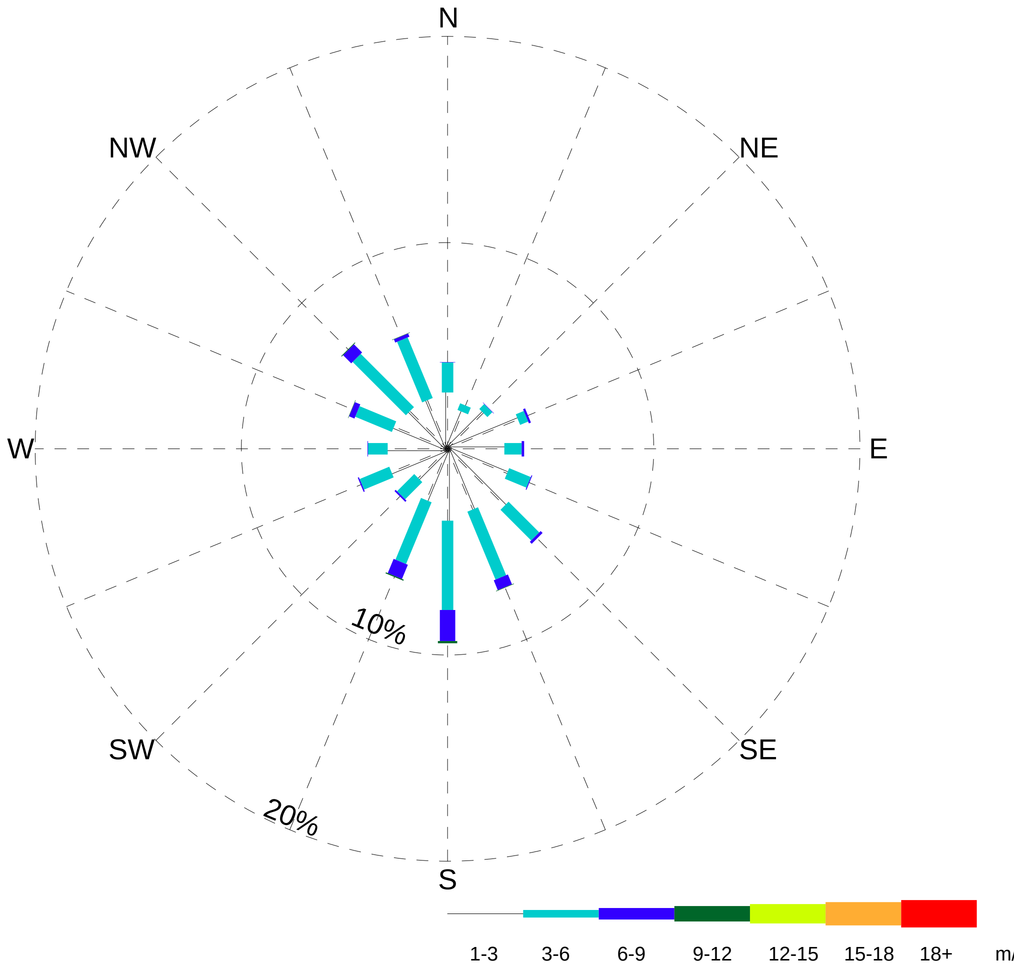
MINTO MINE
2010 CLIMATE BASELINE REPORT

Coupled Global Climate Model 2
Predicted Mean Annual Temperature
Increase Yukon Territory (2040 - 2060)

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JASW	0

OFFICE	DATE
EBA-VANC	April 2010

Figure 3.7



Station Name: Minto
NAD 27 Location:
N62° 36' 17.0" W137° 13' 19.0"
Elev. above SL: 887 m
Tower height: 3 m
Record length: *1585
Start Date: Sep. 7, 2005
End Date: Mar. 13, 2010
*Note: excluding periods of missing or ice-affected data

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	3.70	0.42	0.11	-	-	-	-	4.22
NE	-	2.45	0.34	0.02	-	-	-	-	2.81
NNE	-	1.93	0.35	-	-	-	-	-	2.28
N	-	2.73	1.46	0.02	-	-	-	-	4.21
NNW	-	2.55	3.18	0.17	0.02	-	-	-	5.92
NW	-	2.58	3.65	0.56	0.04	-	-	-	6.83
WNW	-	2.81	1.93	0.28	0.02	-	-	-	5.03
W	-	2.90	0.95	0.02	-	-	-	-	3.88
WSW	-	2.95	1.55	0.06	-	-	-	-	4.56
SW	-	2.01	1.18	0.08	-	-	-	-	3.28
SSW	-	2.69	3.24	0.74	0.05	-	-	-	6.73
S	-	3.49	4.33	1.51	0.11	-	-	-	9.43
SSE	-	3.19	3.56	0.52	0.02	-	-	-	7.29
SE	-	3.91	2.11	0.13	-	-	-	-	6.14
ESE	-	3.12	1.13	0.04	-	-	-	-	4.30
E	-	2.75	0.84	0.12	-	-	-	-	3.71
Calm	19.38	-	-	-	-	-	-	-	19.38
Total (%)	19.38	45.75	30.22	4.39	0.26	-	-	-	100.00

NOTE: The data presented in this wind rose and distribution table represents only winds recorded at temperatures above 0C. Thus, the majority of winds occurring during winter are not represented.

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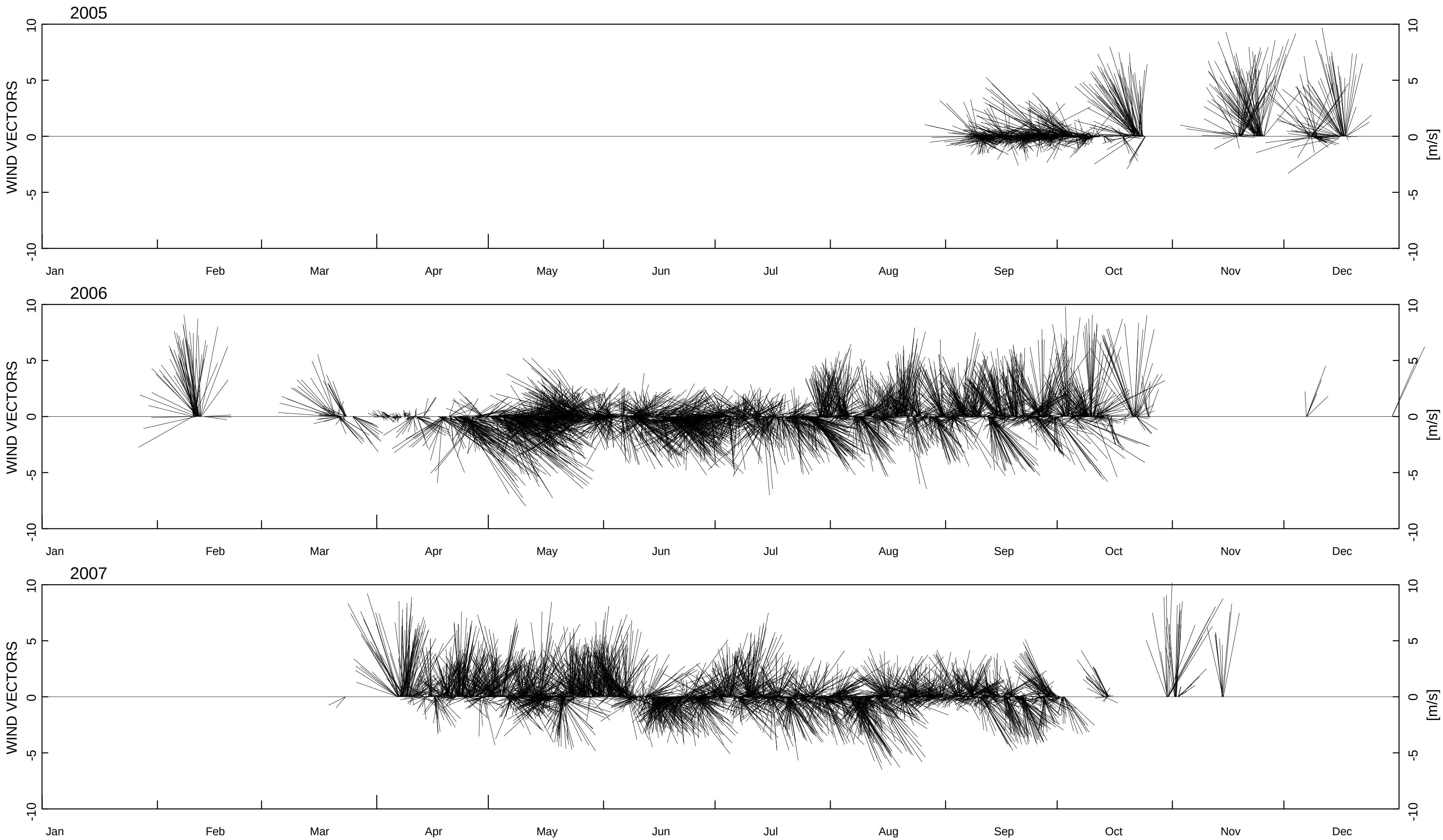
MINTO MINE
2010 CLIMATE BASELINE REPORT

Minto Station
Wind Rose
Period of Record

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.8



NOTES

Excluding periods of ice-affected or missing wind data

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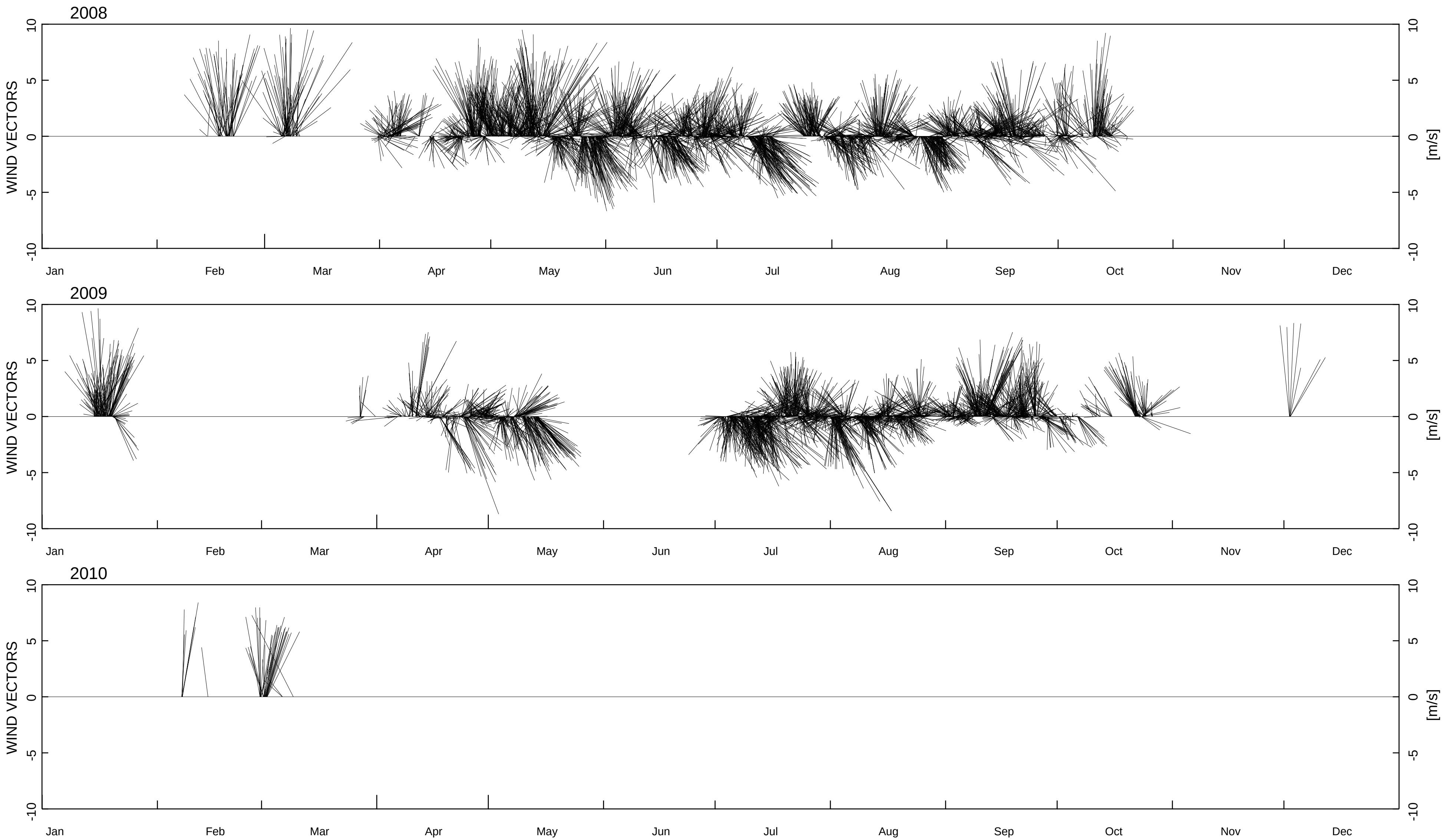
MINTO MINE
2010 CLIMATE BASELINE REPORT

Minto Station
Wind Vectors
2005 - 2007

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.9

Wed Apr 28 16:17:43 2010:Q:\Vancouver\Engineering\V132\Users\TM\Minto\met_data\met_figs\Vector_Plot



NOTES

Excluding periods of ice-affected or missing wind data

CLIENT

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MINTO MINE
2010 CLIMATE BASELINE REPORT

Minto Station
Wind Vectors
2008 - 2010

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0

OFFICE	DATE
EBA-VANC	April 2010

Figure 3.10

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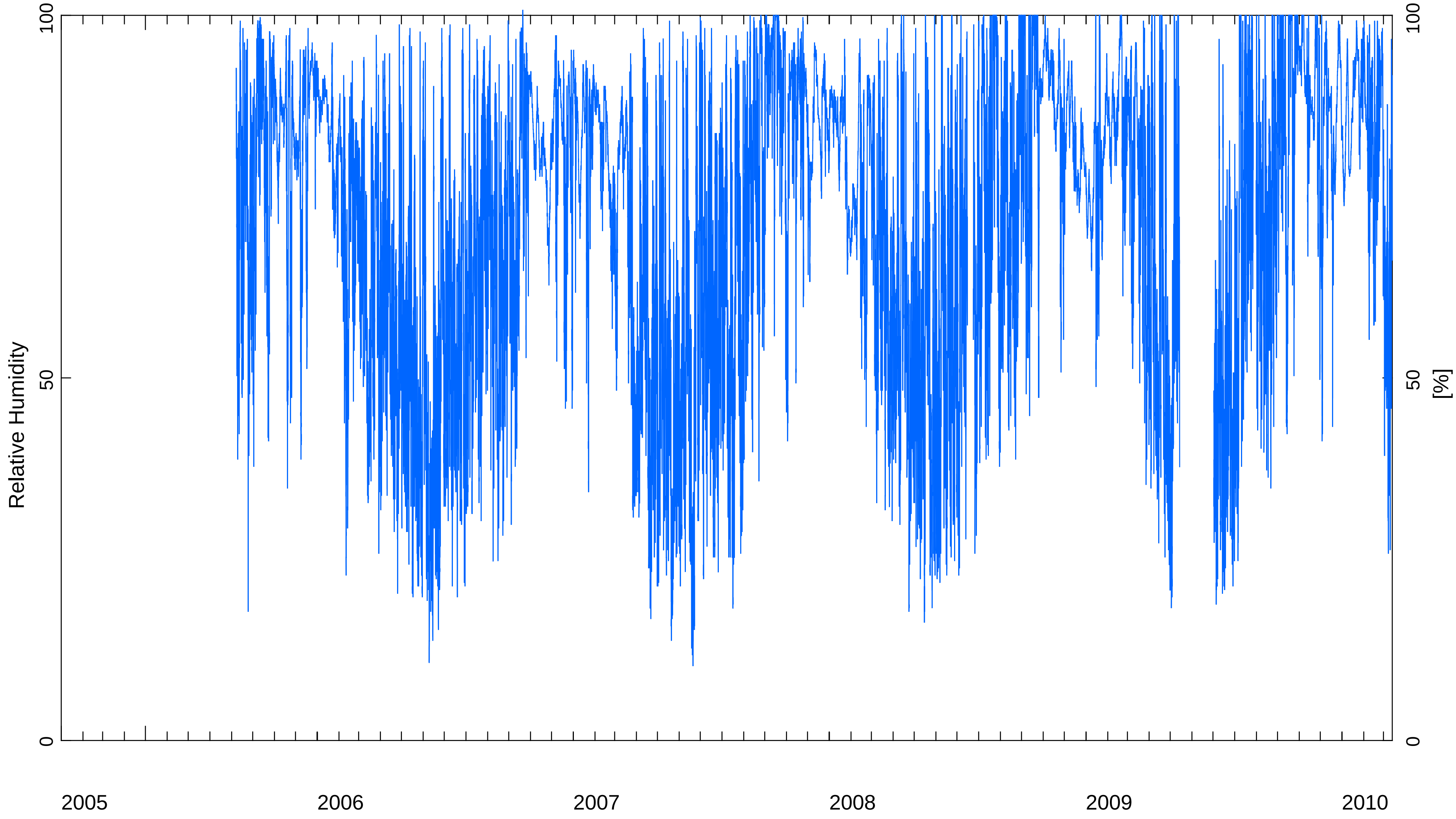

NOTES

See report for information on missing data

CLIENT

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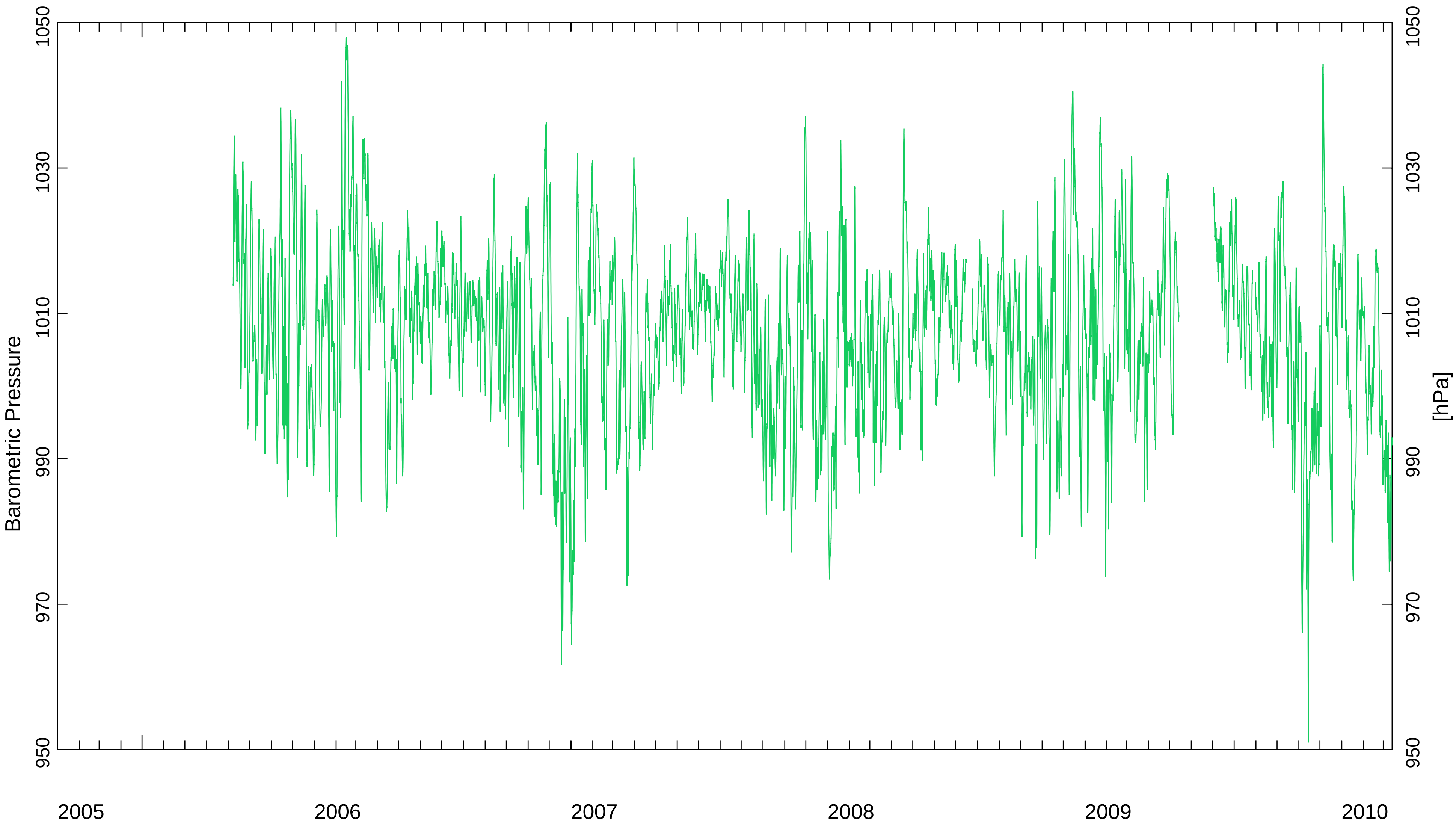
MINTO MINE
2010 CLIMATE BASELINE REPORT

Minto Station
Hourly Relative Humidity
Period of Record

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.11

Wed Apr 28 16:16:20 2010:Q:\Vancouver\Engineering\V132\Users\TM\Minto\met_data\met_figs



NOTES

See report for information on missing data

CLIENT

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MINTO MINE
2010 CLIMATE BASELINE REPORT

Minto Station
Hourly Sea-Level Equivalent Barometric Pressure
Period of Record

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.12

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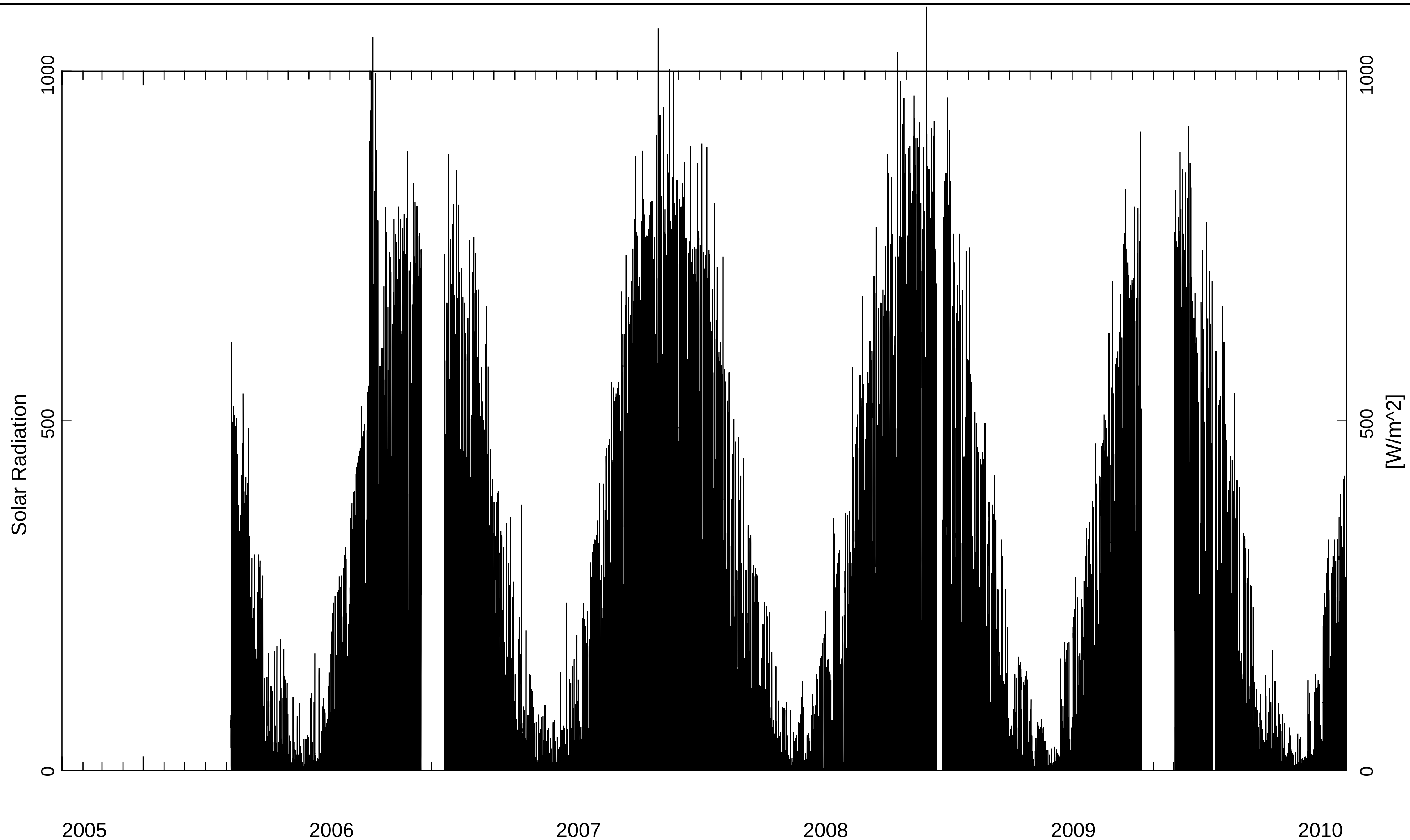

NOTES

Data is missing between June 15 and July 19, 2006 due to instrument error

See report for information on other periods of missing data

CLIENT

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MINTO MINE
2010 CLIMATE BASELINE REPORT

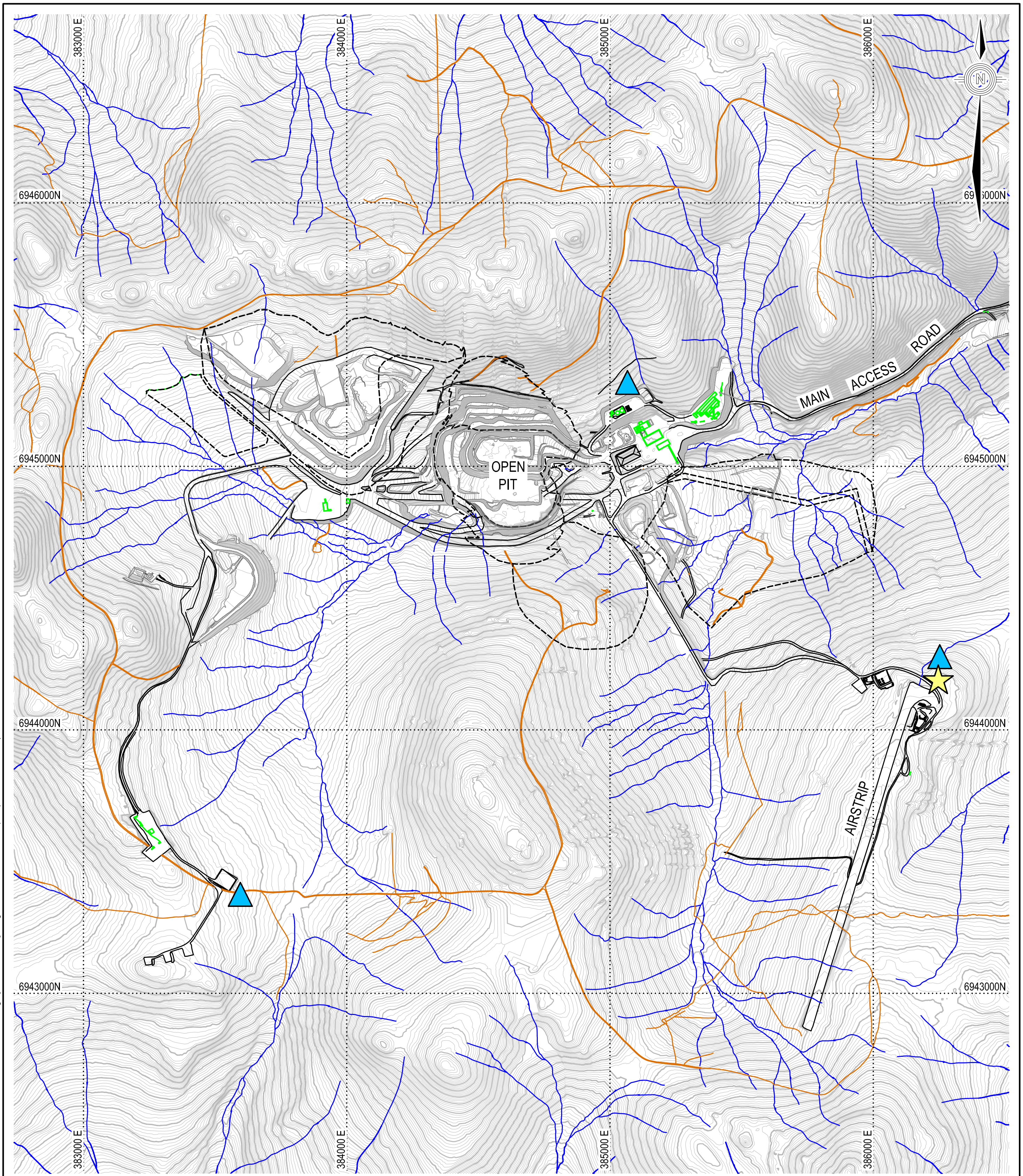
Minto Station
Hourly Solar Radiation
Period of Record

PROJECT NO.	DWN	CHK	REV
W14101068.025	TM	JAS	0

OFFICE	DATE
EBA-VANC	April 2010

Figure 3.13

Wed Apr 28 16:16:23 2010:Q:\Vancouver\Engineering\V132\Users\TM\Minto\met_data\met_figs



LEGEND

- Snow Pack Monitoring
- Weather Station

SCALE 1:2000

20 0 20 40 80m

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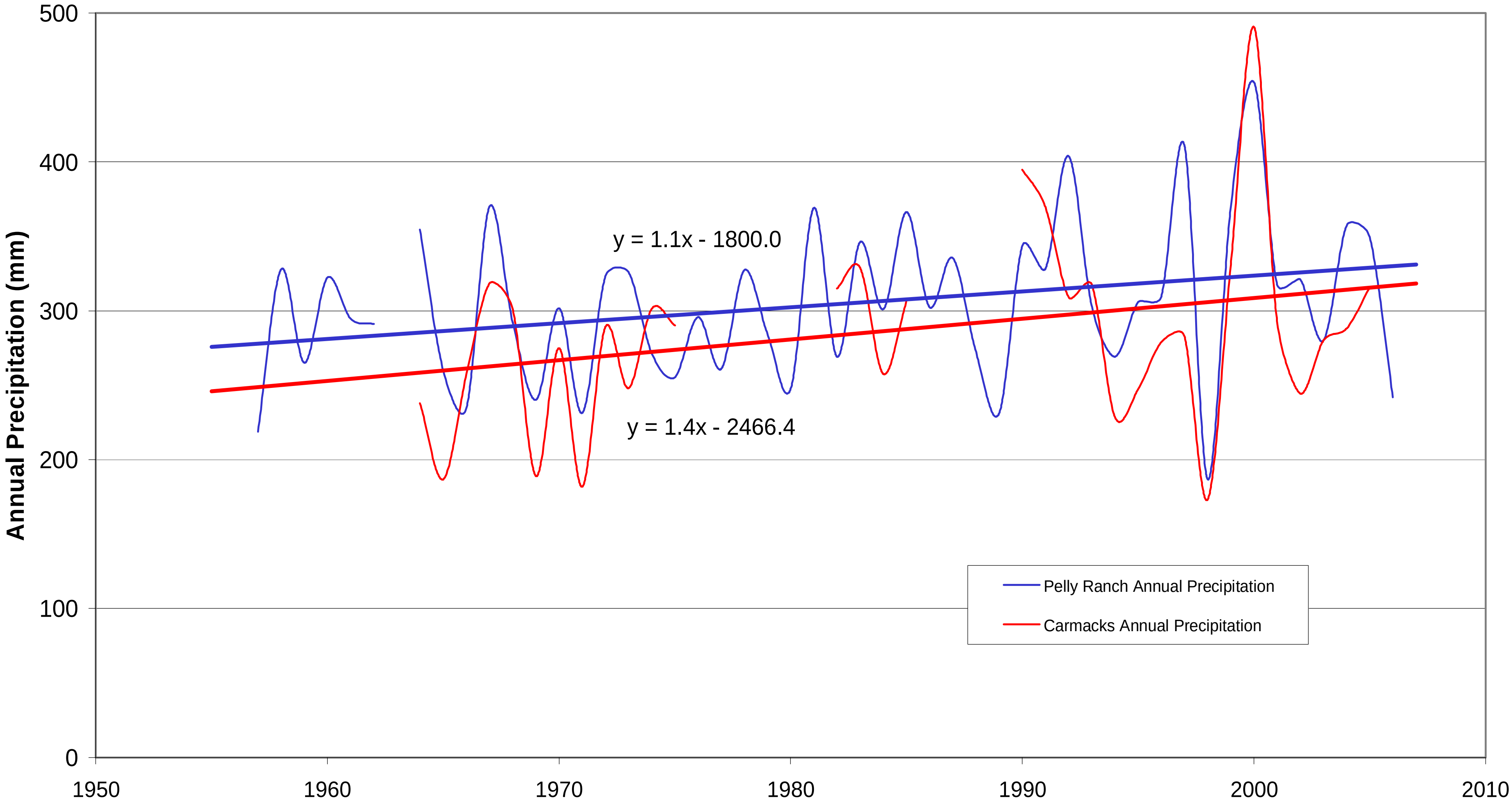
MINTO MINE
2010 CLIMATE BASELINE REPORT

SAMPLING LOCATIONS

PROJECT NO.	DWN	CKD	REV
W14101068.025	JAB	TM	0
OFFICE	DATE		
VANC	April 29, 2010		

Figure 3.14

Q:\Vancouver\Drafting\Engineering\W141\W14101068\025\W14101068.025_FIG 2.1&3.14_R0.dwg [FIGURE 3.14] August 10, 2010 - 3:15:16 pm (BY: JON BOKIC)



NOTES

Source: Meteorological Service of Canada

CLIENT

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MINTO MINE
2010 CLIMATE BASELINE REPORT

Pelly Ranch & Carmacks
Annual Precipitation Trend
(1955 - 2006)

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JASW	0
OFFICE	DATE		
EBA-VANC	April 2010		

Figure 3.15

NOTES

Source: Natural Resources Canada/ Environment Canada

Predicted Annual Percent Increase in Precipitation Over 1961 - 1990 Baseline

(orange)	-10 - 0
(light green)	0 - 10

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MINTO MINE
2010 CLIMATE BASELINE REPORT

Coupled Global Climate Model 2
Predicted Mean Annual Precipitation
Increase Yukon Territory (2040 - 2060)

PROJECT NO.	DWN	CKD	REV
W14101068.025	TM	JASW	0

OFFICE	DATE
EBA-VANC	April 2010

Figure 3.16

APPENDIX A

APPENDIX A MINTO METEOROLOGICAL STATION DESCRIPTION

Site Identification:	**Minto Station**		Installation Date:	September 18, 2005
Station Coordinates:	North	62° 36' 17"	Tower Height:	3 m
	West	137° 13' 19"	Site Elevation Above Sea Level:	887 m

1.0 STATION DESCRIPTION

The weather station consists of a three-meter tripod with instrumentation to measure wind speed and direction, air temperature, relative humidity, barometric pressure, incident solar radiation, and rainfall (wet-precipitation). The station is powered by two AA batteries. Data is recorded to a HOBO data logger. Data is averaged over the one-hour archiving period and saved to the logger memory. The station has an internal flash memory capacity of 512K.

2.0 SITE LOCATION

The meteorological station is located approximately 70 meters northeast of the north end of the airstrip. The station sits on the southern ridge of the main river valley and has good exposure in all directions. Surrounding the station are sparse growth of conifers under 2 meters.

3.0 INSTALLATION NOTES

The tower base supports are fixed to a square wooden frame. Sandbags are used at the base of the tripod legs to help stabilize the station.

The wind anemometer is installed at the top of the tower with the pyronometer and tipping bucket rain gauge fastened on the centre pole slightly below. The air temperature/RH sensor is installed inside a radiation shield near the middle of the tower. The barometric pressure sensor is located inside the logger box.

4.0 RECORDED DATA NOTES

4.1 WINDS

Cup revolutions are accumulated every three seconds for the duration of the logging interval (one hour). Wind speed is the average speed for the entire logging interval. Gust speed is the highest three-second wind in the logging interval.

Vector components of wind direction are accumulated every three seconds for the duration of the logging interval. Average direction is calculated from the sum of the vector components over the logging interval.

5.0 HOBO STATION INSTRUMENTATION

<table>
<tr><th>Instrument</th><th>Serial #</th><th>Measuring Range</th><th>Sensitivity/Accuracy</th></tr>
<tr><td rowspan="2">Wind Speed/Direction</td><td rowspan="2">S-WCA-M003</td><td>Speed: 0 to 44 m/s
(max. survival 54 m/s)</td><td>Accuracy: ±0.5 m/s (±3% 17 – 30 m/s)
Resolution: 0.19 m/s
Threshold wind = 0.5 m/s</td></tr>
<tr><td>Direction: 0 to 358 degrees
(2-degree dead band)</td><td>Accuracy: ± 5 degrees
Resolution: 1.4 degrees</td></tr>
<tr><td rowspan="2">Relative Humidity / Air Temperature</td><td rowspan="2">Smart Sensor</td><td>R.H. : 0 to 100%</td><td>Accuracy: ±3%; ±4% RH (condensing environment)
Resolution (at 25°C): 0.5%</td></tr>
<tr><td>Temp.: -40° to +75°C</td><td>Accuracy (at 25°C): ± 0.7°C
Resolution (at 25°C): 0.4°C</td></tr>
<tr><td>Barometric Pressure</td><td>S-BPA-CM10</td><td>660 – 1070 hPa</td><td>Accuracy (at 25°C): ±1.5 hPa
Resolution: 0.1 hPa</td></tr>
<tr><td>Pyranometer</td><td>S-LIB-M003</td><td>0 to 1280 W/m²
Spectral range: 300-1100 nm</td><td>Accuracy: greater of ±10 W/m² or 5%
Resolution: 1.25 W/m²</td></tr>
<tr><td>Tipping Bucket Rain Gauge</td><td>RGA-M0XX
RGB-M0XX</td><td>0 to 127 cm/hr</td><td>Accuracy: ±1.0% up to 20 mm/hr
Resolution: 0.2 mm</td></tr>
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6.0 STATION PHOTO