NORTH AMERICAN TUNGSTEN CORPORATION LTD




North American Tungsten Corporation Ltd.

MACTUNG PROJECT

2007 HYDROMETEOROLOGICAL SURVEY

W23101021.003

February 2008

CREATING AND DELIVERING BETTER SOLUTIONS

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North American Tungsten Corporation Ltd.

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MACTUNG PROJECT
HYDROMETEOROLOGICAL SURVEY 2007

W23101021

February 2008

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EXECUTIVE SUMMARY

North American Tungsten Corp. Ltd. is conducting baseline environmental studies at its MacTung project site to assist in developing a new mine in the area. In 2005, EBA Engineering Consultants Limited was retained by North American Tungsten Corp. Ltd. to execute the necessary baseline environmental study program to update and build on previous studies conducted for AMAX in the 1970's.

This report is a continuation of the hydrometeorological baseline studies conducted by Hay & Company Consultants, a division of EBA Engineering Consultants Ltd, and consists of a summary of the data collected at the MacTung project site during the summer of 2007. Included in this report is a summary of the meteorological data collected by Meteorological Services of Canada (MSC) at their weather station installed at MacMillan Pass, approximately seven kilometres southeast of the MacTung Camp.

The hydrology component commenced on June 16, 2007 and involved the determination of a time history of discharge and water temperatures for Tributary C (Yukon) and Dale Creek (NWT). Both creeks flow off the MacTung property.

The 2007 data indicate that Tributary C had a base summer flow of 1.4 m^3/s, with short term increases of up to 1.7 m^3/s, due to precipitation events. The peak flow measurement was of 3.1 m^3/s and it occurred on July 25, 2007. By September, the flow was less than 0.5 m^3/s.

Dale Creek had a summer base flow of 3.2 m^3/s with peaks greater than 5.0 m^3/s due to precipitation events. A peak flow of 6.1 m^3/s was recorded on July 7, 2007. In August, creek flows began to decrease, with the onset of winter, to the lowest recorded flows of 0.5 m^3/s in September 2007.

Creek water temperatures were measured at both hydrometric stations and exhibited a diurnal variation of approximately ±1.5°C, about the mean summer temperature of 8°C. In early September, creek water temperatures began to decrease to a mean average daily temperature of 6°C.

The objective of the meteorological component of the study was to continually record weather conditions at the MacTung property site. In July 2005, a meteorological station was installed at the MacTung Camp. It has been operating continuously since the installation, recording the weather parameters of wind speed and direction, air temperature, relative humidity and solar incident radiation. Typical maximum daily wind gusts are in the range of 7 m/s, but wind speeds greater than 23 m/s have been recorded by the station. Air temperatures at camp are typically 5 to 10°C during the summer with maximums of 20°C. Typical winter temperatures are –15°C but have been recorded as low as -30°C. Relative humidity is typically near 90%, but frequently can drop as low as 30% for periods of

up to a day. Peak solar incident radiation during the summer is in the vicinity of 900 W/m^2 while during the winter period (Dec to Jan) the radiation is near 50 W/m^2.

Similar meteorological data are presented for the MSC meteorological station located at MacMillan Pass.

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1.0 INTRODUCTION

North American Tungsten Corp. Ltd. is conducting baseline environmental studies at its MacTung project site to assist in the development of a new mine in the area. In 2005, EBA Engineering Consultants Limited was retained by North American Tungsten Corp. Ltd. to undertake the necessary baseline environmental study program. The project is located on the boundary between the Yukon and Northwest Territories, shown in Figure 1.1.

This report summarizes the hydrometeorological data collected at the MacTung Project site during 2007, and is a continuation of the Hay & Company Consultants report published in 2006 entitled "MacTung Project 2006 Hydrometeorological Survey".

During the period from July 2006 to September 2007, Hay & Company Consultants conducted the hydrology and meteorology components of the overall study program for the MacTung project.

The objective of the hydrology component was to determine the time history of discharge and water temperature for two of the creeks flowing off the MacTung property. The meteorological component of the study was to continually record weather conditions at the MacTung property site.

The hydrology portion of this year's study began with a site visit on June 16, 2007. The purpose of this trip was to re-install the pressure transducer/data loggers within the instrument housing for each of the creeks to be monitored. The pressure transducer/data logger records creek stage and water temperature four times per hour. A staff gauge was also installed at each site for the manual measurement of creek stages. During this initial visit, stage-discharge information was collected on the selected creeks using a Swoffer meter to measure flows.

Second and third site visits were conducted on July 10, 2007 and September 4, 2007, for the purpose of collecting further stage-discharge data and to inspect and download stage and temperature data from the hydrometric stations. During the latter visit the instrumentation was removed from the housings and put into storage to prevent damage to the sensitive pressure transducer diaphragm due to freezing conditions.

The hydrometric and meteorological stations discussed in this report are listed below, with the main objective for each station. Figure 1.2 is a site location map showing a portion of a 1:250,000 scale National Topographic Series (NTS) map of the area, on which the sites are indicated. Table 1.1 lists the GPS positions for the four hydrometeorological sites near the MacTung project site.

- Site 1 – Tributary A, collect stage, stage-discharge, flow and water temperature data.
- Site 2 – Dale Creek, collect stage, stage-discharge, flow and water temperature data.

- MacTung Camp Meteorological Station, record site meteorological parameters.
- MacMillan Pass Meteorological Station, Meteorological Service of Canada (MSC), long-term data record and data comparison.

Further detailed information on these sites is provided in the site description documents included in Appendix A.

Section 2 of this report presents the hydrological component of the baseline study program. Section 3 discusses the meteorological component and Section 4 contains recommendations.

2.0 HYDROLOGY

2.1 METHOD

To gain an understanding of the hydrological conditions present in the MacTung project study area, hydrometric stations were installed at the two sites identified on Figure 1.2 as TRIB A and DALE. For each hydrometric station, a standard method was employed to determine time history of discharge for the creek. First an appropriate hydrometric site was chosen, which represented all the flow from the drainage basin of interest. A staff gauge was installed to enable the manual recording of water surface elevations. The pressure transducer/data logger instrumentation and protective housing were also installed in the creek. Each time hydrology personnel were at site, the data loggers were downloaded and creek velocity data were recorded to enable the development of a stage-discharge relationship for each site.

To develop a stage-discharge relationship, the most common and precise practice is to measure creek discharge and stage simultaneously. The method used to determine creek discharge requires the measurement of no less than 10 sets of water velocities along a transect spanning the creek width. The measured velocities are multiplied by a representative flow area determined from the creek depth at the location of the velocity measurement and the horizontal distance to the flanking velocity measurements.

The stage and discharge data collected are plotted on a graph relating discharge to creek stage. The stage-discharge function is developed as the best-fit curve through the plotted stage-discharge data points. The stages recorded by the data logger are then used in the stage-discharge relationship to determine a time history of creek discharge.

2.2 TRIBUTARY A (SITE 1)

The hydrometric station is located on Tributary A, approximately 50 meters downstream of the confluence of Tributary C in a well-defined channel. Tributary A flows northwest to the Hess River, and eventually to the Stewart River in the Yukon Territory. The eastern tributary, Tributary C, originating close to the territorial border and within the MacTung property, is the basin of interest for this study. Tributary C basin is approximately

five kilometres by five kilometres and has a catchment of 24.2 km^2. There was no suitable reach along Tributary C for the installation of a hydrometric station so the station was installed on Tributary A. The discharge history for Tributary C must be deduced from concurrent discharge data obtained from measured Tributary A and Tributary C discharges. The method of deriving the discharges for Tributary C is presented in Section 2.2.6 of this report.

The Tributary A drainage basin, including Tributary B and Tributary C, (Figure 1.2), is approximately 10 km by 11 km and has a catchment area of 80.2 km^2. The elevation of the hydrometric station is 1133 m above sea level (asl). The highest basin elevation is 1951 m (asl). Inflows to Tributary A, at the location of the hydrometric station, consist of flows from two smaller creeks, Tributary B to the west and Tributary C to the east.

Figure 2.1, Photo 1, shows the reach of Tributary A where the monitoring station is installed, as well as the confluence of Tributary C with Tributary A. Photo 2 shows details of the hydrometric station.

There was a problem with the recording of data from the initial installation on June 16 to July 10, 2007 due to battery failure and the subsequent loss of the sampling program from the logger. On July 10, 2007 the problem was rectified and the station recorded data for the remainder of the summer without problems.

2.2.1 Stage Measurements

Creek stage data were recorded every 15 minutes by the hydrological station instrumentation during the period from July 10, 2007 to September 4, 2007. The time history of recorded stage measurements is presented in Figure 2.2. During this period, whenever site visits occurred, staff gauge readings were manually recorded and used as a check on the stage monitoring instrumentation accuracy.

2.2.2 Discharge Measurements

A total of 8 discrete discharge measurements were collected for Tributary A during the period from July 10, 2007 to September 4, 2007. These data have been summarized in Table 2.1 along with the data collected from the previous year.

The data collected on Tributary A were used to develop a stage-discharge relationship for this site, which enables the determination of the time history of creek discharge, using the creek stage data recorded by the logger.

2.2.3 Stage-Discharge Relationship

Figure 2.3 shows the stage-discharge relationship for the hydrometric station on Tributary A developed using the collected 2007 stage-discharge data. This data consists of the measured discharges and the creek stage as recorded by the data logger. The data were fitted using an exponential function to best fit the data set. The regression coefficient (R^2) was 0.9892.

To calculate the discharge at any point in time from the stage records, the following function was determined from the fit to the observed data:

$$y = 0.1596e^{13.047x}$$

where y = creek discharge (m^3/s)

x = recorded water depth over transducer (m)

e = Naperian log (2.71828)

2.2.4 Time History of Discharge

The time history of discharges for Tributary A at the location of the hydrometric station is shown in Figure 2.4 as a solid blue line. The black circles are the discharges that were determined in the field by measuring creek velocities and calculating discharge from representative flow areas. The red line is water temperature.

Based on Figure 2.4, the time history of discharge for Tributary A for the summer of 2007, the following observations were made:

1. Creek discharge was 5 m^3/s on July 10, 2007, the re-installation date of the hydrometric station.
2. During July 2007 there were two large flow events. The first event started on the afternoon of July 16 and peaked at 10.3 m^3/s in the early morning of July 17. By the morning of July 18 the discharge was back to the monthly average of 5 m^3/s. The second flow event occurred six days later on the evening of July 24 and peaked the following morning at 10.4 m^3/s. The flow returned to the normal 5.0 m^3/s by the morning of July 26, 2007.
3. During this same period, minor storms could increase creek flows by more than 2 m^3/s. This is evidenced by the lesser peaks in the July 2007 discharge history.
4. From early August to the end of the record (September 5, 2007) flows decreased from the July average flow of 5.0 m^3/s to less than 2.0 m^3/s. It is assumed that creek flows will continue to decrease until the creek freezes up.
5. Average recorded flows at this station for July 2007 were 5.0 m^3/s. This was 39% higher than the 3.6 m^3/s average flow for the same month in 2006. The August, 2007 average flow of 2.7 m^3/s was 18% lower than the average August 2006 flow of 3.3 m^3/s.
6. The response to the onset of a rainfall event is rapid, and the response to the cessation of rain is also rapid, as would be expected for a small drainage basin and the steeply sloped terrain.

2.2.5 Time History of Tributary A Water Temperatures

During the period of flow measurement on Tributary A, creek water temperatures were recorded using the temperature instrumentation contained within the pressure transducer. The creek temperature data is presented as a red line in Figure 2.4.

This data indicates a diurnal temperature cycle with maximum water temperatures occurring in the late afternoon near 5:30 PM and minimum temperatures occurring near 8:00 AM in the morning. The typical daily temperature variation is approximately ±1.5°C from the daily mean for the period of record. The warmest water temperature recorded was 9.7°C, which occurred on August 17 and the coolest, 2.8°C, occurred on August 10, 2007.

2.2.6 Tributary C Discharges

There was no suitable site for the installation of a hydrometric station on Tributary C, therefore it was necessary to estimate creek flows for this basin, based on the larger Tributary A discharges, collected just downstream of the confluence of Tributary C with Tributary A.

During the 2007 survey period, five discrete discharge measurements were made on both tributaries at similar times. Table 2.2 summarizes all discharge measurements collected for Tributary C since the beginning of the program in 2006. The ratio of the discharge data collected on Tributary A to similar data collected on Tributary C was used to generate a time history of discharge for Tributary C. Figure 2.5 is a graph which shows the concurrent discharge measurements for both tributaries and a best fit line equation through the data. The equation allows the estimation of Tributary C flows based on the measured Tributary A discharges. The results indicate that Tributary C discharges are approximately one third of the corresponding flows corresponding in Tributary A. Using this flow correlation technique, the time history of discharge for Tributary C was generated for the same period of record as Tributary A and is shown in Figure 2.6. The black circles on the graph represent the actual discharge measurements collected on Tributary C. The ratio of flows between Tributary A and Tributary C is about 0.308, according to Figure 2.5. The ratio of catchment area is 0.302, providing a further check on the methodology.

The estimated Tributary C monthly average discharges for July and August 2007 are 1.4 m^3/s and 0.7 m^3/s, respectively. The two large flow events in July correspond to peak flows of just over 3 m^3/s for July 17 and July 25, 2007. During August the estimated flows reduced from the July average of 1.4 m^3/s to 0.4 m^3/s by early September.

2.3 DALE CREEK (SITE 2)

Dale Creek basin is about 7.0 km by 6.4 km with an area of 33.9 km^2. The elevation of the Dale Creek hydrometric station is 1355 m (asl) and the highest elevation within the basin is 2300 m (asl). Inflows to Dale Creek consist of the runoff from two western tributaries originating at the territorial border. The most northerly tributary originates from Cirque Lake.

The hydrometric station at Dale Creek was established on July 10, 2006. The location is shown in Figure 1.2. Discharge from Dale Creek basin flows eastward to the Tsichu River, and eventually to the Keele River in the Northwest Territories.

Figure 2.7 (Photo 1) shows an aerial view of the reach of Dale Creek, in which the hydrometric station is installed. Figure 2.7 (Photo 2) shows the hydrometric station from ground level looking upstream.

2.3.1 Stage Measurements

From June 16, 2007 to September 5, 2007, creek stage data were recorded every 15 minutes by the hydrological station instrumentation. The time history of recorded stage measurements is presented in Figure 2.8. Creek stages from the staff gauge were manually recorded during site visits.

2.3.2 Point Discharge Measurements

A total of 9 discharge measurements were recorded over the duration of the field survey for 2007. The time, date, stage and discharge for each measurement are summarized in Table 2.3. The data collected on Dale Creek was used to develop a stage-discharge relationship for this site, which enables the determination of a discharge hydrograph for Dale Creek.

2.3.3 Stage-Discharge Relationship

The stage-discharge relationship for Dale Creek is shown in Figure 2.9. This figure shows the measured creek discharges plotted against the data logger recorded creek stages. The data was fitted using a power function to best fit the data set. The regression coefficient (R^2) was 0.9841.

To calculate the discharge at any point in time from the stage records, the following relationship was determined from the fit to the observed data:

$$y = 23.31x^{3.4655}$$

Where y = creek discharge (m^3/s)

and x = recorded water depth over transducer (m).

Note that a different functional form was used compared to the fit of the data for Tributary A, as in each case, a range of fitting functions was considered, and the one that provided the maximum R^2 was used.

2.3.4 Time History of Discharge

The time history of discharge for Dale Creek is shown in Figure 2.10. This figure shows the discharge history as a solid blue line. The black circles are the discharges that were

determined in the field during site visits by measuring creek velocities and calculating discharge from representative flow areas. The red line indicates creek water temperatures.

Based on the history of Dale Creek discharges for the summer of 2007, the following observations were made:

1. The peak flow measured on Dale Creek was 6.1 m^3/s and it occurred on July 7, 2007. This high flow was likely the result of a storm event.
2. The average creek flow from mid-June to early July was 3.2 m^3/s.
3. During this same period, storms increased creek flows by up to 2.9 m^3/s above the base level. This is evidenced by the four peaks in the discharge history that are greater than 5 m^3/s.
4. From mid-July to the first week in August, the flows reduced from about 2.0 m^3/s to 1.0 m^3/s.
5. From the second week in August to the end of the record in early September flows remained near 0.5 m^3/s with small short term increases up to 1.0 m^3/s likely due to precipitation events.

2.3.5 Time History of Creek Water Temperatures

During the period of stage measurement on Dale Creek, creek water temperatures were recorded using the temperature instrumentation contained within the pressure transducer. The creek temperature data are presented as a red line in Figure 2.10.

These data indicate a similar diurnal temperature cycle with maximum daily water temperatures occurring each evening from 5:00 to 6:00 PM and minimum temperatures occurring in the mornings from 7:30 to 9:00 AM. The typical daily maximum to minimum temperature variation is approximately ±1.5°C. The warmest water temperature, 11.8°C, occurred on the evening of August 18, 2007, and the coolest, 1.7°C, occurred on the morning of June 18, 2007.

3.0 METEOROLOGY

On July 14, 2005, Hay & Company installed a meteorological station at the MacTung project site, near the camp. The NAD 27 GPS coordinates for this station are provided in Table 1.1.

Specifications and descriptions of the instruments installed on this weather station are contained in the site descriptions included in Appendix A.

In addition to the MacTung Camp meteorological station, there is a Meteorological Services Canada station located at MacMillan Pass, seven kilometres southwest of the project site, at an elevation of 1379 m. As this station is relatively far from the site, at a much lower elevation and on the other side of the divide, the weather parameters measured may not be

representative of true meteorological conditions at the project site; however, it provides a longer record of meteorological conditions and precipitation data, and is included in this report. The NAD 27 GPS coordinates for this station are also provided in Table 1.1.

This report presents data from both the MacTung Camp and the MacMillan Pass stations over the period of August 2006 to August 2007.

3.1 MACTUNG CAMP METEOROLOGICAL STATION

The MacTung Camp station measures wind speed and direction, relative humidity, air temperature and incident solar radiation, which is saved to a logger at 15-minute intervals throughout the day. At midnight, the logger produces a 24-hour daily summary. The data is retrieved by downloading, at convenient times, with a laptop computer or by exchanging the memory storage module at site and subsequently downloading the data at a later date. The storage module enables MacTung staff to download the collected data without the need for a portable computer or training.

Within the data record, there is one period of missing data from September 13, 2006 to November 15, 2006. When the data was downloaded in the spring of 2007, the entire record from June 2006 to June 2007 was saved. Upon inspection, the above mentioned data gap was discovered. It is not known why the data was not recorded during this period. However, the meteorological station has since recorded all meteorological data in 15 minute intervals on site without any problems.

The soil temperature probe failed in June 2006 and therefore no soil data is presented in this report. There are no plans at his time to replace this defective probe.

3.1.1 Winds

Wind data at the MacTung Camp site has been collected since the installation of the meteorological station on July 14, 2005. The data for the period of August 2006 to August 2007 has been summarized and presented in three different forms, as described below.

3.1.1.1 Maximum Wind Speed

The maximum gust wind speed for the day is recorded by the meteorological station at midnight in the 24 hour data array. This data, collected over the period of August 1, 2006 to August 31, 2007, is displayed in Figure 3.1.

The maximum wind gust of 14.9 m/s was recorded on December 20, 2006. The average maximum gust on a daily basis is approximately 6.0 m/s. On a calm day, maximum wind gusts are in the order of 4.0 m/s, whereas on a windy day maximum gusts are in the order of 10.0 m/s.

3.1.1.2 Wind Speed and Direction Stick Plots

Figure 3.2 is a sample of the wind speed and direction figures presented in Appendix B. Each figure in Appendix B represents one month of wind data over the survey period from August 2006 to August 2007. Each figure consists of three panels.

The upper panel is a stick plot that displays the hourly wind vector. Direction is indicated by the angle of each hourly stick with true north towards the top of the page. Using this convention, a wind vector pointing due north indicates a wind blowing to the north, which is considered a south wind, as winds are referenced to the direction from which they blow. The wind speed is indicated by the length of the stick and is determined using the scale in m/s given at the left and right of the plot. For example, in Figure 3.2, on April 9, 2007, winds were blowing from the north at a speed of about 2.0 m/s. A shift in the winds is evident during the evening, with winds changing from blowing from the north to blowing from the west with an increase in speed to 6 m/s.

The central panel indicates the average hourly wind speed in metres per second. Viewing the central panel on Figure 3.2 for April 9, winds were 2 m/s. During the evening of April 9, the winds increased in speed to 6 m/s. These high winds persisted till the end of April 12, 2007.

The lower panel in Figure 3.2 shows the direction from which the wind was blowing on an hourly basis. A shift in the wind direction is evident on the evening of April 9 when the wind direction changes from the north to the west. The winds continued blowing from the west until late on April 12, 2007.

3.1.1.3 Wind Roses

A wind rose is a useful tool that displays an entire period of recorded wind data on a single graph. The total duration of wind occurring within a specified speed range and compass direction is determined as a percentage of the total period of record. Average hourly wind speeds are grouped into ranges from 0 to 1 m/s (calm), 1 to 3 m/s, 3 to 6 m/s etc., in 3 m/s ranges, to 18+ m/s. The wind direction is grouped into 16 compass direction ranges of 22.5 degrees starting at north. This data is summarized in the wind speed and direction frequency distribution table, which is located in the lower right of the figure. The wind rose is a visual display of the data contained within the table.

The length of the line indicates the frequency of winds from each compass direction over the period. The color and thickness associated with the line indicates the percentage of the time that winds of a particular speed range were blowing from a particular direction. Figure 3.3 is a wind rose for the entire period of record from August 1, 2006 to August 30, 2007, excluding the 64 days where no data was recorded. Over this period, winds blew from the north northeast (NNE) at a frequency of 16.29%. The thin black portion of the line closest to the centre is representative of the 8.78% of the time winds were blowing from this direction at a speed between 1 and 3 m/s. The light blue portion represents the 7.22% of the time winds were blowing at a speed between 3 and 6 m/s from

the north northeast (NNE). The dark blue line indicates that for 0.29% of the period of record, winds from the north northeast (NNE) were blowing at a speed between 6 and 9 m/s. At no time during the period of record did winds exceed 6 m/s in the NNE direction.

It is also possible to determine the percentage of time the wind was blowing at a specific speed by viewing the "total (%)" row at the bottom of the frequency distribution table. At the MacTung camp, for the period from August 2006 to August 2007, the wind was considered calm (wind speeds less than 1 m/s) 13.54% of the time, wind speeds were between 1 and 3 m/s 39.73% of the time, between 3 and 6 m/s 38.55% of the time, between 6 and 9 m/s 6.57% of the time and between 9 and 12 m/s 1.53% of the time. Wind speeds in excess of 12 m/s occurred 0.08% of the time during the recorded period.

Appendix C contains the 13 wind rose / frequency distribution figures for each month for the period of record. The 13 month period of record indicates two prevailing wind directions at the MacTung Camp station. Winds come from the west about 34% of the year and from the northeast approximately 24% of the year. During the winter months, winds blow more frequently from the northeast. Over the period of record, northeast winds in November 2006, February 2007 and March 2007 had a frequency of occurrence of over 30%. In the summer, winds were observed to be blowing more frequently from the west and southwest.

3.1.2 Air Temperature

Air temperatures are presented in terms of daily extreme temperatures and means as well as hourly averages as recorded by the MacTung Camp station.

3.1.2.1 Daily Extremes for Air Temperature

The maximum, minimum and mean air temperatures for each day are recorded by the meteorological station at midnight. Figure 3.4 summarizes the daily recorded air temperatures for the period of record from August 1, 2006 to August 31, 2007. The mean temperature for the day is plotted as a thick orange line bounded by the daily maximum and minimum temperatures which are indicated by thin red lines. Generally, the daily variance in air temperature is ±5°C from the mean daily air temperature.

As would be expected at this latitude, a pattern to air temperatures is evident in the year-long data record. The warmest period (summer) is from June to the end of August with a mean daily temperature of approximately 7.0°C. During summer, temperatures can fluctuate between a high of 16°C and a low of 4°C. The maximum recorded daily temperature for the period of record was 17.5°C which occurred on August 17, 2007.

The coldest period (winter) at the site occurs between November and the end of April. During this period the mean daily temperature is -15°C. During the winter period, temperatures can fluctuate between a high of -7°C and a low of -20°C, however temperatures can drop as low as -36°C. The minimum recorded daily temperature for the

period of record was -36.6°C which occurred on March 1, 2007. In April, air temperatures begin to warm to summer temperature conditions.

3.1.2.2 Hourly Air Temperatures

Figure 3.5 is an example of the 13 monthly weather parameter figures contained in Appendix D. The upper panel in Figure 3.5 and in the figures in Appendix D show average hourly air temperatures recorded by the station for each day of the months. These figures are useful for viewing diurnal temperature patterns for a short period of time such as during a storm. For example, viewing the upper panel of Figure 3.5, temperatures just prior to the evening of April 9, 2007 were fluctuating around zero. There was a decrease in temperature over the next three days, reaching -10°C on April 12, 2007. This cooling was accompanied by the shift in wind direction, as discussed in Section 3.1.1.2, and is further evidence of a new weather system moving into the area.

3.1.3 Relative Humidity

Relative humidity is presented in terms of daily extremes and means as well as hourly averages as recorded by the MacTung Camp station.

3.1.3.1 Daily Extremes for Relative Humidity

The maximum, minimum and mean relative humidity for the day are recorded by the meteorological station at midnight. Figure 3.6 summarizes this data for the period of record. The daily mean relative humidity is plotted as a thick light blue line bounded by the recorded maximum and minimum relative humidity indicated by thin black lines.

The variance of relative humidity is indicated by the envelope of maximum and minimum values. Over the period of record the relative humidity varied from short duration lows of less than 20% to a high of 99%, which can occur at any time of the year. During the summer months there is generally a larger daily variation in relative humidity than during the winter months. Maximum relative humidity in the winter months is approximately 5% lower than in the summer. During the warmer summer months, the daily range of relative humidity is typically from 40% to 99% or ±30% from the daily mean, whereas during the winter, the daily range of relative humidity is typically from 70% to 94% or ± 17% from the daily mean. The highest daily recorded relative humidity was 99.2% on August 28, 2006. The lowest was 12.5% on February 25, 2007.

3.1.3.2 Hourly Relative Humidity

Figure 3.5 is an example of the 13 monthly weather parameter figures contained in Appendix D. The middle panel in Figure 3.5 and in the figures in Appendix D show the average hourly relative humidity, recorded by the station for each day in the month. From April 10 to the afternoon of April 12 the relative humidity remained constant at 90%. This indicated that a moist air mass was being pushed onto the site by the west winds discussed in the previous sections.

Looking at the center panel of Figure 3.5, a slight diurnal cycle is evident, with relative humidity dropping during the daytime hours, and increasing overnight. Day to day fluctuations in relative humidity at the MacTung Camp, due to moving air masses, is more prominent than the diurnal cycle.

3.1.4 Solar Incident Radiation

Solar incident radiation is presented in terms of daily extremes as well as hourly averages as recorded by the MacTung Camp station.

3.1.4.1 Daily Extremes for Incident Solar Radiation

At the conclusion of each day, the station records the maximum incident solar radiation (isolation) in Watts per metre squared (W/m^2) for the day. The minimum daily incident solar radiation will be zero throughout the year, as at this latitude, it gets dark for at least a short time each night. Figure 3.7 shows the daily maximum recorded incident solar radiation plotted from August 1, 2006 to August 31, 2007.

There is a strong yearly cycle. Over the winter period, from mid-November to mid-January, the sun is lowest in the sky and solar radiation is at a minimum, typically less than 50 W/m^2. During this winter period daily variations to the maximum incident solar radiation are less than 30 W/m^2.

During the summer period, from April to July, solar radiation is at its highest, with a typical maximum radiation of 850 W/m^2 for the day. The highest recorded incident solar radiation of 1141 W/m^3 occurred on May 24, 2007. During the summer months, there are large variations in the daily maximums due to cloud cover. This cloud cover can reduce the maximum daily insolation from an average of 850 W/m^2 to under 600 W/m^2 for the day.

3.1.4.2 Hourly Incident Solar Radiation

The lower panel in Figure 3.5 and in the figures in Appendix D show the average hourly solar incident radiation recorded by the station for each month over the period of record.

Peaks typically occur at midday, when the sun is at its highest. Radiation drops to zero during the night. The data can be used to determine the number of daylight hours at site for any day of the year, or to determine the incident solar radiation at any point in time. It can also be used to identify periods of cloud cover. In Figure 3.5, from April 1 to April 5, a consistent diurnal pattern of insolation is evident with a slightly increasing peak value each day. This indicates days with little or no cloud cover. On April 6, the daily insolation peaks are less indicating increased cloud cover. A return to the expected insolation peak values on April 12, 2007 indicates a return to clearer skies.

3.2 MACMILLAN PASS STATION (METEOROLOGICAL SERVICES OF CANADA)

The Meteorological Service of Canada station at MacMillan Pass records meteorological parameters at hourly intervals throughout the day. A 24-hour daily summary is

also recorded. Further details on this station can be obtained from the site description for this station included in Appendix A. The station is currently active and has an existing data record of hourly observations since June 29, 1998. Monthly data exists back to February 1998.

This station is relatively far from the MacTung camp site, at a lower elevation, and on the opposite side of the divide, therefore the parameters measured may not be representative of the meteorological conditions at the MacTung site. This data is used in conjunction with the data recorded from the MacTung Camp meteorological station, to further understand the meteorology of the area. This station records barometric pressure and precipitation data which are not recorded at the MacTung Camp station, and therefore, these measured parameters serve as an estimate of conditions at the MacTung site.

Periods of data are missing throughout the Macmillan Pass record. These periods will be noted when applicable in the sections outlining the various recorded meteorological parameters.

3.2.1 Winds

The MacMillan Pass station records wind data on an hourly and daily basis. Wind data for the period from August 2006 to August 2007 have been summarized and presented in three different forms, and described below.

3.2.1.1 Maximum Wind Speed

The maximum gust wind speed for the day is recorded by the meteorological station. At a speed of less than 31 km/h (8.6 m/s), the maximum gust is denoted by Environment Canada as < 31. This data, collected over the period of August 1, 2006 to August 31, 2007, is displayed in Figure 3.8.

Days where maximum gust wind speeds are less than 8.6 m/s are indicated with a solid black triangle. Maximum wind gust data is missing for the entire months of November 2006 and February, April and June 2007. The maximum recorded wind gust of 20.6 m/s occurred on December 20, 2006. Wind gusts over 15 m/s were recorded on 10 different occasions as indicated in Figure 3.8. The MacMillan Pass station has recorded considerably faster maximum wind gusts than the MacTung station, possibly due its location and orientation in the valley.

3.2.1.2 Wind Speed and Direction Stick Plots

Figure 3.9 is a sample of the wind speed and direction figures, presented in Appendix E, that were produced from data recorded at the MacMillan Pass meteorological station for the same period as the MacTung camp data as presented in Figure 3.2.

The change of weather observed by the MacTung Camp meteorological station from April 9 to 12, 2007 is also evident in the data collected from the Macmillan Pass station for the same period.

Viewing the upper panel of Figure 3.9, it is observed that for the two days prior to April 9, the winds were predominantly blowing from the north at approximately 1.5 m/s. At midnight on the evening of April 9, the winds shifted from the north to winds blowing from the south southwest with increased speed of over 5 m/s.

The central panel indicates the average hourly wind speed in m/s. A period of relative calm can be seen for the period of April 8 and 9, where the winds were blowing at 1.5 m/s. This calm period lasted until midnight of April 9, when the wind speed increased to greater than 5 m/s. These winds lasted for 3 days until midnight of April 12, 2007.

The lower panel in Figure 3.9 shows the bearing from which the wind was blowing on an hourly basis. During the evening of April 9, 2007 a shift in the wind direction from winds blowing from the north (bearing 5 to 10 degrees) to wind blowing from the south southwest (bearing 203 degrees) is evident.

There is an observed difference in the wind direction for the period of April 10 to 12, 2007 between the two meteorological stations. The MacTung camp station indicates winds blowing from the west (bearing 270 degrees) whereas the MacMillan Pass station shows winds blowing from the south southwest (bearing 203 degrees) during the same time period. This 67 degree change in wind direction between the two stations is likely due to the stations being on different sides of the divide and at different elevations.

In general, the two stations agree with respect to the occurrence and timing of storm events, as well as the wind speed during these events. However, the MacTung site recorded generally greater wind speeds and greater directional variability during the calmer periods than did the MSC station.

3.2.1.3 Wind Roses

Figure 3.10 is a wind rose for the entire period of record from August 1, 2006 to August 30, 2007 for MacMillan Pass. The pattern is similar to that of the MacTung Camp wind rose in Figure 3.3, except the Macmillan Pass northeast prevailing winds are more diffuse in that they have similar percent occurrence for the N, NNE, NE, ENE directions whereas the MacTung Pass is predominantly in the NNE direction. Also the winds from the Macmillan Pass station that blow in the southwest direction are primarily from SSW, whereas the comparable MacPass winds are more diffuse as they tend to be from the WNW,W,WSW directions.

In general, winds at the MacTung site are considerably faster than at the MacMillan Pass station, as can be readily seen by comparing the 'Total %' of the speed and direction tables in Figures 3.3 and 3.10.

Winds at MacMillan Pass blew from a south-westerly direction (including SSW, SW and WSW) 30.08% of the time and from a north-easterly direction (NNE, NE, and ENE) 28.85% of the time.

Using hourly averaged wind speeds over the period of August 2006 to August 2007, the winds at MacMillan Pass were considered calm (wind speeds less than 1 m/s) 8.10% of the time, wind speeds were between 1 and 3 m/s 64.29% of the time, between 3 and 6 m/s 27.06% of the time, and between 6 and 9 m/s 0.55% of the time. There was no recorded occurrence of averaged hourly wind speed in excess of 9 m/s.

The 13 wind rose / frequency distribution figures for each month for the period of record are contained in Appendix F. Over the 13 month period, the pattern of winds is similar to those observed at MacTung Camp.

3.2.2 Air Temperature

Air temperature is presented in terms of daily extreme temperatures and means as well as hourly averages as recorded by the MacMillan Pass station.

3.2.2.1 Daily Extremes for Air Temperature

The maximum, minimum and mean air temperatures for the day are recorded at Macmillan Pass. The mean air temperature for the day is plotted as a thick orange line bounded by the maximum and minimum temperatures, indicated by thin red lines in Figure 3.11. There are 83 days of missing data in the record; however no data gaps were longer than four concurrent days. The daily variance in air temperature is ±5°C from the mean daily air temperature.

During the summer of 2007, temperatures at MacMillan Pass fluctuated between 4°C to 16°C, with a mean temperature of 10°C. The maximum recorded daily temperature for the period of record was 22.3°C on August 17, 2007. This is the same day as the highest recorded maximum temperature of 17.5°C at MacTung Camp.

During the winter of 2006/2007, temperatures at MacMillan Pass fluctuated between a high of -5°C and a low of -20°C with a mean of -15°C, however temperatures can drop into the -30°C to -35°C range for extended periods of time. The minimum recorded daily temperature for the period of record was -40°C on March 2, 2007. This occurred a day after the lowest recorded temperature of -36.63°C at the MacTung Camp.

To compare temperatures at MacTung Camp to MacMillan Pass, daily mean air temperatures are plotted for the period of record covered in this report and shown in Figure 3.12. A similar yearly pattern is evident for both stations.

Mean air temperatures at Macmillan Pass are generally 2 to 5°C colder than those recorded at the MacTung Camp during the winter. During the summer, mean temperatures at MacMillan Pass tend to be 2° to 3°C warmer. This is likely due to the higher elevation of the MacTung Camp Station.

3.2.2.2 Hourly Air Temperatures

Figure 3.13 is an example of the 13 monthly weather parameter figures contained in Appendix G. The upper panel in Figure 3.13 and in the figures in Appendix D show

average hourly air temperatures recorded by the MacMillan Pass station for each day of the month for the period of record.

Viewing the middle panel of Figure 3.13 for the period from April 9 to April 11, it can be seen that there is a temperature drop from near zero to -5°C, similar to that observed at the MacTung station, however the net temperature drop was only half as much. A diurnal temperature pattern is evident during this month, with a peak in air temperature occurring around 3:00 to 5:00 PM and the coolest temperatures occurring in the early morning between 5:00 and 7:00 AM.

3.2.3 Relative Humidity

Relative humidity is presented in terms of daily extremes and means as well as hourly averages as recorded by the MacMillan Pass station.

3.2.3.1 Daily Extremes for Relative Humidity

The maximum, minimum and mean relative humidity for the day are recorded by the MacMillan Pass meteorological station. Figure 3.14 is a graph showing the mean relative humidity for the day, plotted as a thick light blue line bounded by the maximum and minimum relative humidity indicated by thin black lines. Data is missing for a total of 83 days over the record.

The variance in relative humidity is indicated by the envelope of maximum and minimum relative humidity. Over the period of record, the relative humidity varied from short duration lows of slightly less than 20% to a high of 99%, which can occur at any time of the year. During the summer months there is a larger daily variation in %RH. This is demonstrated by the fact that the daily range during the summer is 50% to 99% or ±25% from the daily mean, whereas during the winter, the daily range of relative humidity is 70% to 94% or ±17% from the daily mean. The lowest recorded relative humidity was 16% on June 20, 2007.

The daily mean relative humidity for MacMillan Pass and MacTung Camp is shown in Figure 3.15 and indicated similar daily fluctuations for both stations. However, during the winter period, on days with a low mean relative humidity, the MacTung Camp station recorded values of 30 to 35% lower than those recorded at the MacMillan Pass Station.

3.2.3.2 Hourly Relative Humidity

Figure 3.13 is an example of the 13 monthly weather parameter figures contained in Appendix G. The middle panel in Figure 3.13 and the figures in Appendix G show the average hourly relative humidity recorded by the station for each day of each month over the period of record.

The diurnal relative humidity cycle at MacMillan Pass is more pronounced than at MacTung Camp for the month of April 2007. In Figure 3.13, the daily relative humidity fluctuates up to 40% between the overnight maximum and midday minimum.

Comparing the middle panel in Figure 3.5 (MacTung Pass) and the middle panel of Figure 3.13 (MacMillan Pass), it is evident by the large long term fluctuations in %RH at the MacTung site, that weather systems affect relative humidity more at the camp than at MacMillan Pass. The figures in Appendix G indicate that this daily fluctuation pattern at MacMillan occurs in spring and summer and is minimal during the winter months where only small diurnal fluctuations of 2 or 3 % were observed.

3.2.4 Barometric Pressure

MacMillan Pass barometric pressure is presented in terms of daily extremes as well as hourly averages. A barometric pressure sensor was not installed on the MacTung Camp station; therefore the barometric pressure data recorded at MacMillan Pass must be used to estimate conditions at the MacTung Camp. This is accomplished by subtracting 49.3 hPa from the Macmillan Pass data to account for the 481 metre elevation difference, between the two stations, causing a decrease in barometric pressure due to the increased elevation of the MacTung Station.

3.2.4.1 Daily Extremes for Barometric Pressure

The maximum, minimum and mean relative humidity for the day are recorded by the MacMillan Pass meteorological station and saved to a daily summary data array. This data is presented in Figure 3.16. The daily mean barometric pressure is plotted as a thick green line bounded by the maximum and minimum barometric pressures indicated by thin black lines. No barometric pressure data exists for the month of September 2006. There are 98 days of missing data for the reported period of record. The reported barometric pressure is in terms of on site pressure which has not been corrected to sea level equivalent pressures.

There is a seasonal variation in barometric pressure at MacMillan Pass over the period of record. The mean barometric pressure in summer is 857 hPa, while during winter it is 847 hPa. During the warmer summer months, the daily variations of barometric pressure are small, typically from 865 hPa to 850 hPa or ±7.5 from the daily mean. During the winter, barometric pressure fluctuates more, typically from 865 hPa to 830 hPa or ±17.5 hPa from the daily mean. The lowest recorded barometric pressure was 821 hPa on January 2, 2007. The highest was 871 hPa on January 31, 2007. Four out of five of the highest recorded barometric pressures occurred during the winter, even though this is time of the year where the lowest pressures have been recorded.

3.2.4.2 Hourly Barometric Pressure

The bottom panel in Figure 3.13 and the figures in Appendix G show the average hourly barometric pressure recorded by the MacMillan Pass station for each day of each month over the period of record. No barometric pressure data exists for September 2006.

During the spring and summer months, there is little variance in barometric pressure. Slight rises and falls due to the movement of air masses can be seen, but fluctuations are

gradual, and in the range of 5 to 10 hPa over the course of three to four days. During the winter months, fluctuations are more prominent, in the range of 40 hPa.

3.2.5 Precipitation

The MacMillan Pass meteorological station has recorded daily precipitation since June 1998. During the analysis of the precipitation data, it was observed that the precipitation records were incorrect post-March 2005. This was discovered because the recorded rainfall and water equivalent snowfall for each day did not add up to the total precipitation recorded for that day. Having questioned MSC on this discrepancy, they stated that there is a problem and it has existed since March 2005. Inspection of the data from March 2005 to the end of the year indicated that during this period the error was very small. Therefore data post-January 2006 has not been analysed or presented in this report.

Total monthly precipitation for the entire period of record from June 1998 to December 2005 for the MSC MacMillan Pass station is summarized in Table 3.1. A yearly average of 663.4 mm was calculated using annual totals for 2003, 2004 and 2005, years in which complete monthly data records exist with the exception of January 2004. An estimate for this month was determined by averaging the four existing totals for January in the record: January 1999, 2003, 2005 and 2006.

Average monthly precipitation based on existing monthly data from 1998 to 2005 is shown as a histogram in Figure 3.17. Precipitation is highest in the spring and summer months and generally lowest in the winter, with the minimum amount of precipitation occurring in January.

4.0 RECOMMENDATIONS

It is recommended that the hydrometric stations be re-installed in the spring of 2008. This will enable a more accurate assessment of the year to year variability of discharge and water temperature. A third season of discharge data is advised to improve the confidence level for the determination of return periods and other hydrological parameters.

The meteorological station should remain in operation through 2008 at the MacTung Camp for similar reasons as the hydrological stations but with respect to weather parameters.

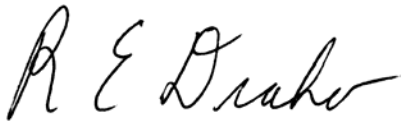
Precipitation data recorded at the Ministry of Environment operated MacMillan Pass meteorological station provides only a rough estimate of conditions at the MacTung Camp site. A difference of nearly half a kilometre in elevation exists between the two sites and can lead to erroneous assumptions, especially in mountainous terrain. Furthermore, numerous precipitation data is missing from the record and MSC has stated that the precipitation gauge is not functioning correctly and no time frame has been set for the repair to the gauge. Therefore it is recommended that an all-weather precipitation gauge be installed in the vicinity of the existing meteorological station at MacTung Camp, to obtain accurate precipitation data for the site.

The data from the two meteorological stations should be correlated in a quantitative manner, to determine if it is possible to generate a synthetic description of weather conditions for MacTung from data collected over the period of record at MacMillan Pass.

We trust this report meets your present requirements. Should you have any questions or comments, please contact one of the undersigned at your convenience.

Prepared by,

Hay & Company Consultants
(A division of EBA Engineering Consultants Ltd.)



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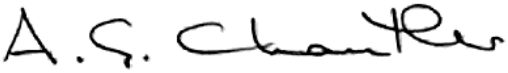

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TABLES

TABLE 1.1: HYDROMETEOROLOGICAL STATION COORDINATES							
Station	Station Type	Longitude			Latitude		
		Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
MacTung Camp	Meteorological	130	8	50.3	63	16	50.2
MacMillan Pass	Meteorological	130	2	7.1	63	14	36.9
Tributary A	Hydrological	130	17	19.0	63	17	22.6
Dale Creek	Hydrological	130	1	36.8	63	16	44.7

*All coordinates given in NAD 27

TABLE 2.1: TRIBUTARY A DISCHARGE MEASUREMENTS

Date/Time PDST	Staff Gauge Reading m	Logger Stage m	Measured Discharge m3/s
2006			
Jul 10, 2006 16:41	0.450	0.299	0.450
Jul 10, 2006 17:25	0.450	0.298	0.451
Aug 04, 2006 13:12	0.398	0.266	1.492
Aug 04, 2006 13:46	0.398	0.263	1.573
Aug 05, 2006 09:39	0.385	0.242	2.009
Aug 05, 2006 10:18	0.385	0.241	1.862
Aug 05, 2006 11:30	0.385	0.240	3.068
Aug 06, 2006 09:47	0.373	0.227	3.399
Aug 06, 2006 10:24	0.370	0.227	3.185
Sep 19, 2006 11:27	0.334	0.186	3.224
Sep 19, 2006 12:23	0.335	0.189	3.343
Sep 19, 2006 13:10	0.334	0.190	3.313
Sep 19, 2006 13:46	0.334	0.194	3.469
Sep 20, 2006 15:19	0.329	0.173	3.572
Sep 20, 2006 15:49	0.329	0.175	2.258
2007			
Jul 10, 2007 13:51	0.45	0.266	5.145
Jul 10, 2007 14:21	0.4465	0.265	4.729
Jul 11, 2007 12:54	0.429	0.260	4.818
Jul 11, 2007 13:30	0.4305	0.260	4.990
Sep 04, 2007 13:04	0.322	0.182	1.545
Sep 04, 2007 13:54	0.324	0.182	1.720
Sep 05, 2007 14:38	0.328	0.183	1.790
Sep 05, 2007 15:20	0.328	0.182	1.828

TABLE 2.2: TRIBUTARY C DISCHARGE MEASUREMENTS

Date/Time	Staff Gauge Reading	Logger Stage	Measured Discharge
PDST	m	m	m^3/s
2006			
Aug 06, 2006 11:22	no staff	no logger	0.78
Aug 06, 2006 11:43	no staff	no logger	0.78
Sep 19, 2006 14:30	no staff	no logger	0.57
Sep 19, 2006 14:51	no staff	no logger	0.53
Sep 20, 2006 16:24	no staff	no logger	0.45
2007			
Jul 11 2007 14:26	no staff	no logger	1.43
Jul 11, 2007 14:26	no staff	no logger	1.37
Jul 11, 2007 15:17	no staff	no logger	1.32
Sep 04, 2007 14:43	no staff	no logger	0.43
Sep 04,2007 15:12	no staff	no logger	0.44

TABLE 2.3: DALE CREEK DISCHARGE MEASUREMENTS

Date/Time	Staff Gauge Reading	Logger Stage	Measured Discharge
PDST	m	m	m^3/s
2006			
Jul 10, 2006 20:07	0.345	0.491	2.096
Jul 10, 2006 21:02	0.345	0.488	1.969
Aug 04, 2006 10:52	0.304	0.472	1.912
Aug 04, 2006 11:24	0.302	0.476	1.715
Aug 05, 2006 14:04	0.268	0.424	1.208
Aug 05, 2006 14:32	0.267	0.430	1.187
Aug 05, 2006 15:25	0.265	0.424	1.200
Aug 06, 2006 15:11	0.259	0.410	1.172
Aug 06, 2006 15:53	0.259	0.414	1.198
Aug 07, 2006 09:16	0.255	0.417	1.078
Aug 07, 2006 09:48	0.254	0.421	1.073
Sep 19, 2006 16:12	0.213	0.363	0.689
Sep 19, 2006 16:50	0.213	0.369	0.662
Sep 19, 2006 17:25	0.213	0.368	0.714
Sep 19, 2006 18:00	0.212	0.372	0.660
Sep 20, 2006 13:12	0.212	0.362	0.675
Sep 20, 2006 13:37	0.212	0.365	0.689
2007			
Jul 10, 2007 10:04	0.755	0.525	2.540
Jul 10, 2007 10:38	0.754	0.523	2.436
Jul 11, 2007 09:39	0.725	0.503	2.069
Jul 11, 2007 10:11	0.725	0.501	2.102
Jul 11, 2007 10:44	0.725	0.501	2.052
Sep 04, 2007 10:36	0.49	0.335	0.526
Sep 04, 2007 11:11	0.4895	0.335	0.519
Sep 05, 2007 10:12	0.517	0.349	0.685
Sep 05, 2007 10:48	0.516	0.348	0.676

TABLE 3.1: MACMILLAN PASS PRECIPITATION DATA FOR 2007

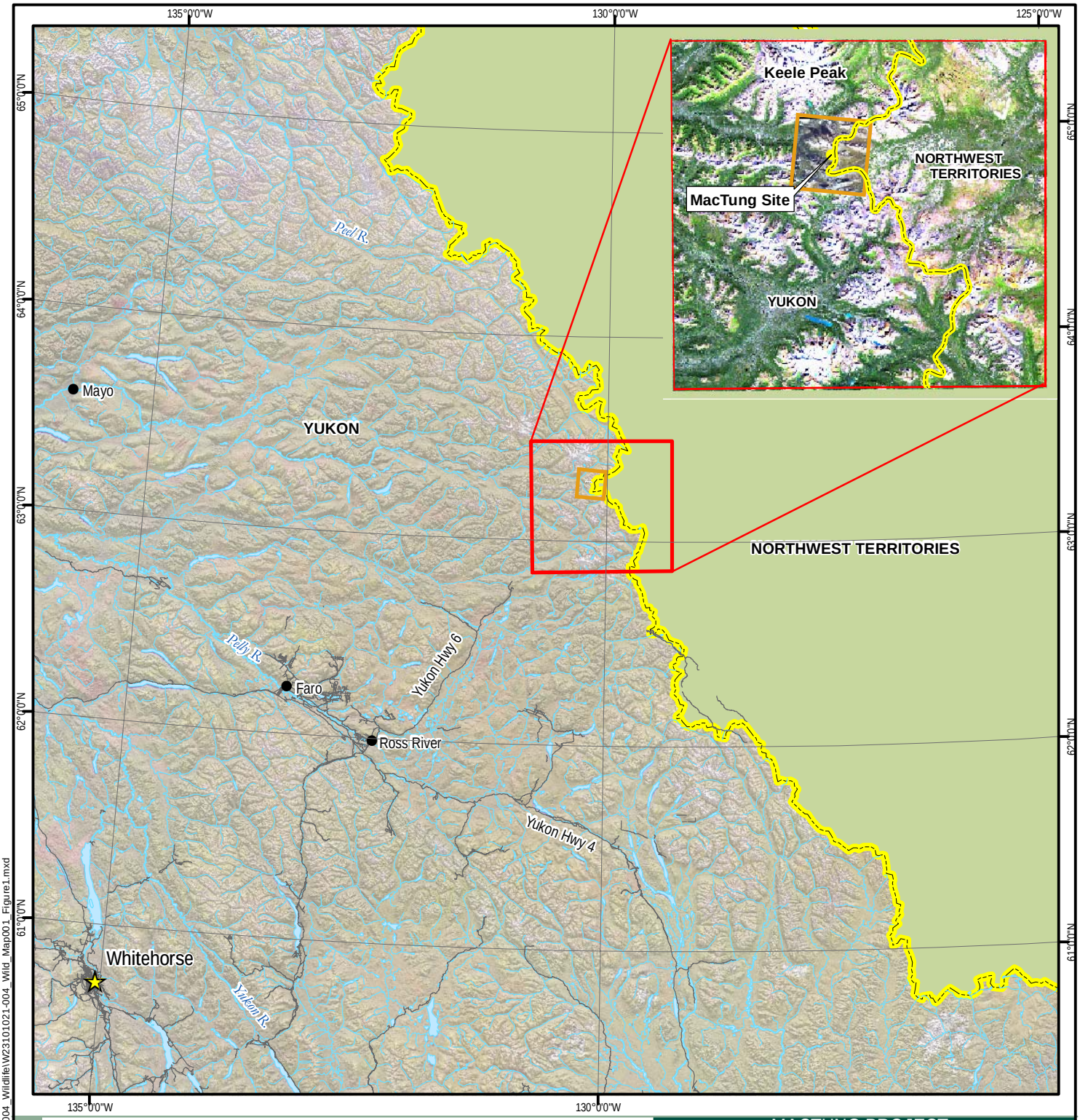
	Month											
Date	Jan (mm)	Feb (mm)	Mar (mm)	Apr (mm)	May (mm)	Jun (mm)	Jul (mm)	Aug (mm)	Sep (mm)	Oct (mm)	Nov (mm)	
1	M	-	3.2	18.4	1.7	-	7.6	M	4.0	0.3	12.3	
2	M	-	M	18.5	M	-	2.1	M	5.6	1.2	9.0	
3	1.3	-	3.8	18.4	-	-	8.1	-	-	1.3	5.3	
4	1.2	-	3.0	18.7	M	0.3	1.1	M	3.0	5.4	7.7	
5	1.7	-	1.3	20.1	1.9	0.2	-	1.6	5.3	4.8	16.7	
6	0.3	-	1.2	8.6	-	0.3	22.3	1.0	3.1	14.4	M	
7	0.6	-	1.0	44.8	1.9	13.7	13.3	2.3	4.2	3.3	21.5	
8	0.3	-	1.9	2.8	-	0.3	1.1	M	0.4	2.6	32.4	
9	3.1	-	1.4	2.4	-	-	1.9	-	6.5	0.8	36.7	
10	2.5	-	M	6.7	-	0.4	0.4	-	M	3.3	30.8	
11	M	-	1.2	0.7	M	11.9	0.8	M	M	12.2	M	
12	0.3	-	0.3	0.4	3.3	12.2	M	-	M	0.6	11.5	
13	0.6	-	1.8	1.5	M	1.4	6.4	1.3	M	M	M	
14	-	-	1.4	7.5	-	6.6	M	M	1.3	M	M	
15	M	-	3.2	1.1	-	0.7	-	-	9.4	8.6	24.9	
16	M	-	1.5	8.0	-	0.5	8.9	0.3	M	12.9	M	
17	1.8	-	1.2	6.5	-	3.9	5.0	-	1.4	1.3	6.4	
18	2.4	-	M	2.0	-	0.2	2.1	-	0.9	5.8	11.1	
19	0.6	-	M	1.7	M	0.2	-	2.8	0.3	13.5	M	
20	0.3	-	1.5	2.0	-	0.5	-	M	1.3	13.2	25.4	
21	-	-	0.6	1.2	M	2.0	-	M	3.0	3.9	M	
22	0.9	-	-	1.3	-	0.4	-	4.9	0.9	7.2	M	
23	2.1	-	5.1	1.2	M	4.2	4.4	0.3	2.4	16.9	M	
24	-	-	1.2	9.8	-	11.1	M	-	3.7	8.9	M	
25	2.1	-	13.1	0.7	-	1.4	M	1.0	1.3	9.8	25.0	
26	1.2	-	M	1.4	M	6.7	1.7	-	1.5	7.5	M	
27	0.4	-	M	4.3	0.3	0.2	10.5	-	0.3	18.3	42.2	
28	0.5	-	M	2.1	-	9.0	2.5	-	-	3.5	61.5	
29	-		M	4.5	-	9.3	3.4	-	1.8	4.4	37.8	
30	0.6		17.0	1.1	2.3	12.9	5.6	-	-	5.6	34.8	
31	0.6		8.5		M		5.4	-		16.5		
Total	***25.4***	**0.0**	***74.4***	**218.4**	***11.4***	**110.5**	***114.6***	***15.5***	***61.6***	***208.0***	***453.0***	

* Total water equivilent precipitation for January 2007 to November 2007= **1292.8 mm**

M = Missing Data

*The yearly precipitation total is based on known and estimated Environment Canada daily data for MacMillan Pass. There are 52 instances of missing data. This figure represents a precipitation total for 282 days for the year 2007 .

FIGURES



LEGEND

- Territorial Boundary
- Local Study Area
- Watercourse
- Waterbody
- Roads

N
W E
S

NOTES Landsat TM imagery Earthsat acquired Sept,17, 1995
Bands 432 enhanced

MACTUNG PROJECT
2007 ENVIRONMENTAL BASELINE STUDIES
HYDROMETEOROLOGICAL SURVEY

Project Location Map

PROJECTION	DATUM
UTM Zone 9	NAD83

Scale: 1:3,000,000
0 12.5 25 50 75 100
Kilometres

EBA Engineering Consultants Ltd.

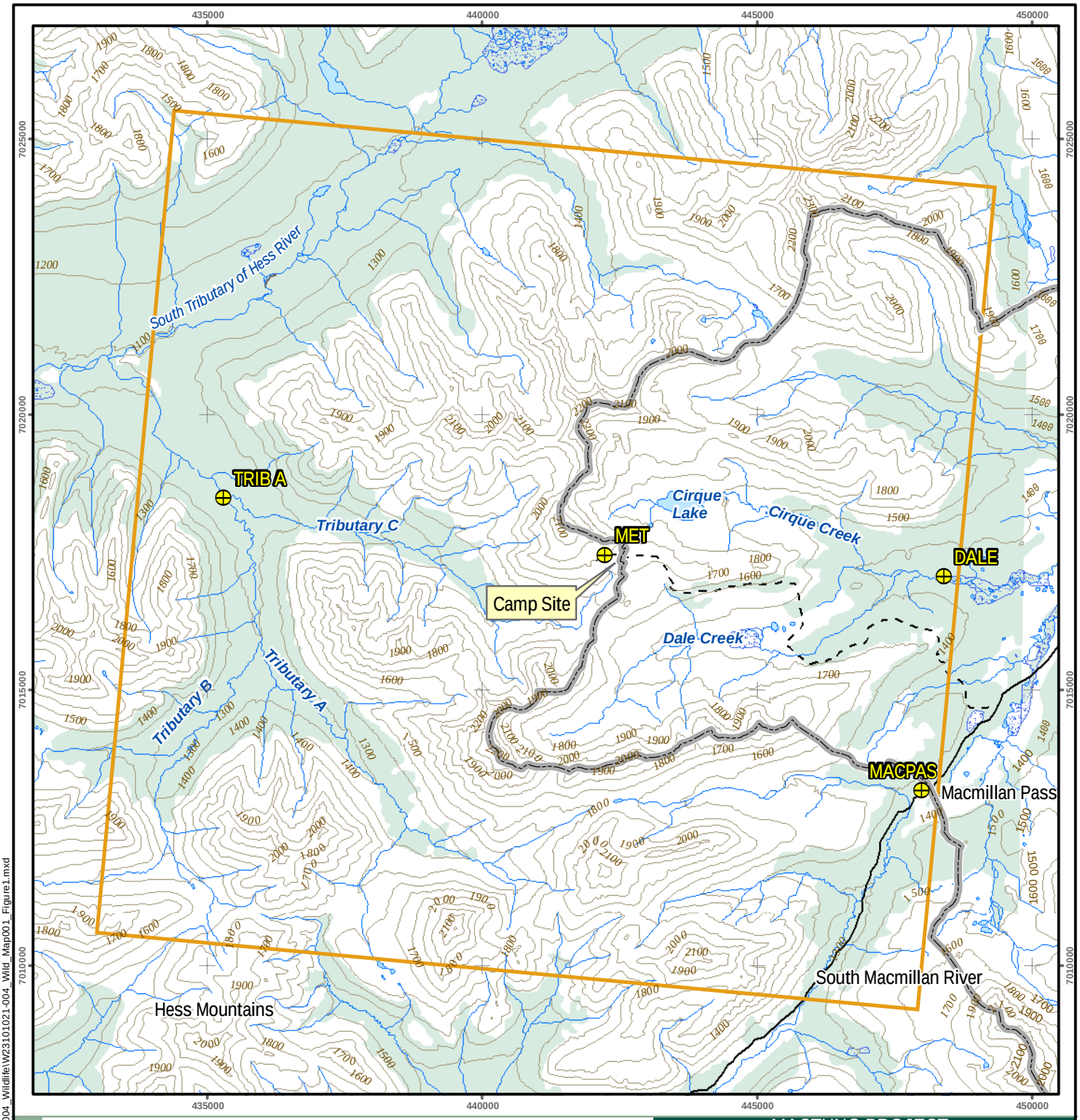
FILE NO.
W23101021-003_Hydro_Map001_Figure1-1.mxd

PROJECT NO.	DWN	CKD	REV
W23101021.004	KMW	KL	0

OFFICE	DATE
EBA-VANC	January 14, 2008

Figure 1.1

Q:\Vancouver\GIS\ENVIRONMENTAL\W231\W23101021_MacTung\Maps\004_Wildlife\W23101021-004_Wild_Map001_Figure1.mxd



LEGEND

- Hydrometric Station
- NWT - Yukon Border
- Local Study Area
- Road
- Trail
- Watercourse
- Contour (100m interval)
- Waterbody
- Wetland
- Vegetation

TRIB A	Tributary A Hydrometric Station
DALE	Dale Creek Hydrometric Startion
MET	MacTung Camp Meteorological Station
MACPAS	MSC Macmillian Pass Meteorological Station

NOTES Base data source: NTS 1:50,000

MACTUNG PROJECT
2007 ENVIRONMENTAL BASELINE STUDIES
HYDROMETEOROLOGICAL SURVEY

Hydrometeorological Site Location Map

PROJECTION	DATUM
UTM Zone 9	NAD83

Scale: 1:100,000

0 0.5 1 2 3

Kilometres

EBA Engineering Consultants Ltd.

FILE NO.
W23101021-003_Hydro_Map002_Figure1-2.mxd

PROJECT NO.	DWN	CKD	REV
W23101021.004	KMW	KL	0

OFFICE	DATE
EBA-VANC	January 14, 2008

Figure 1.2

Q:\Vancouver\GIS\ENVIRONMENTAL\W231\W23101021_MacTung\Maps\004_Wildlife\W23101021-004_Wild_Map001_Figure1.mxd

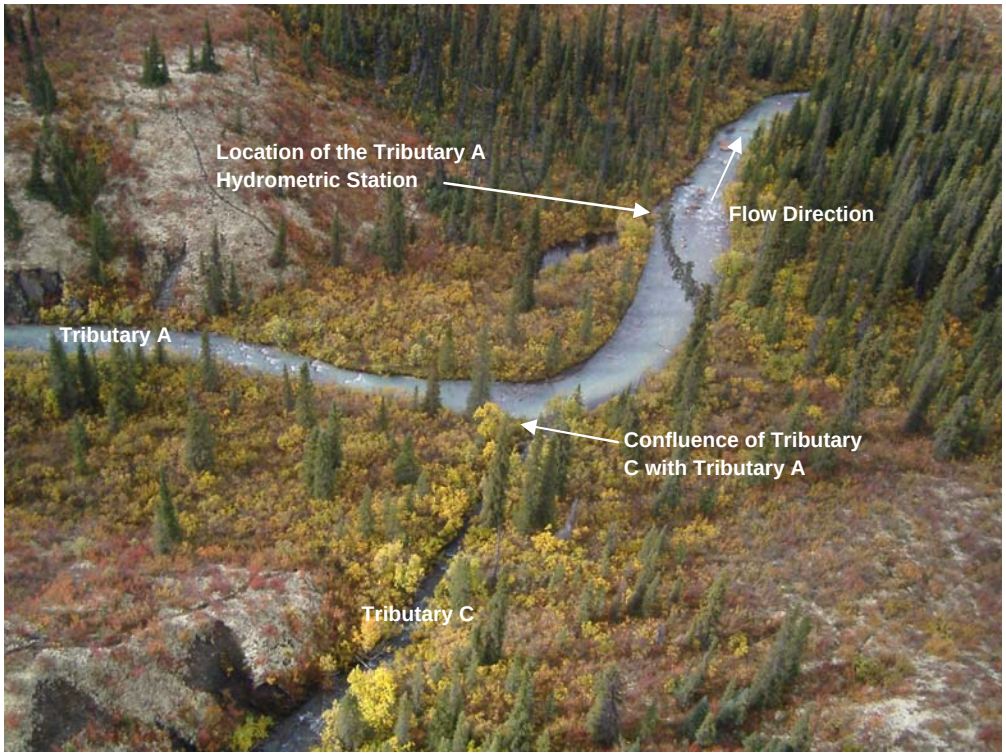


Photo 1 Aerial View of Site 1 Tributary A Hydrometric Station July 2007

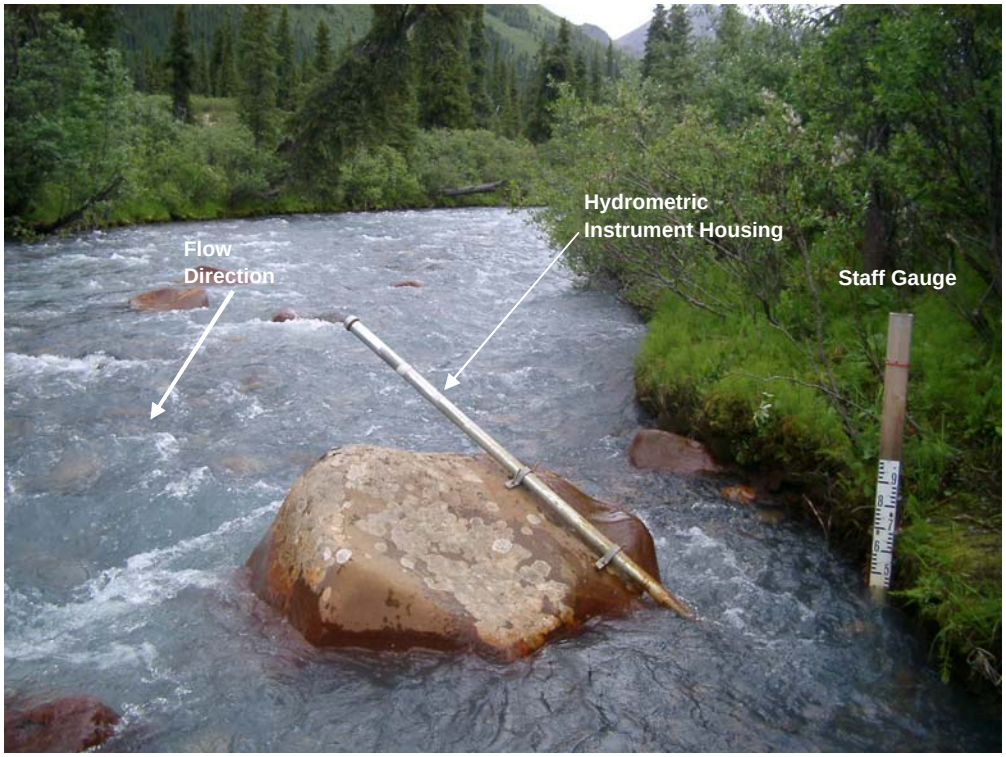


Photo 2 - View Upstream of Site 1 Tributary A Hydrometric Station July 2007

NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

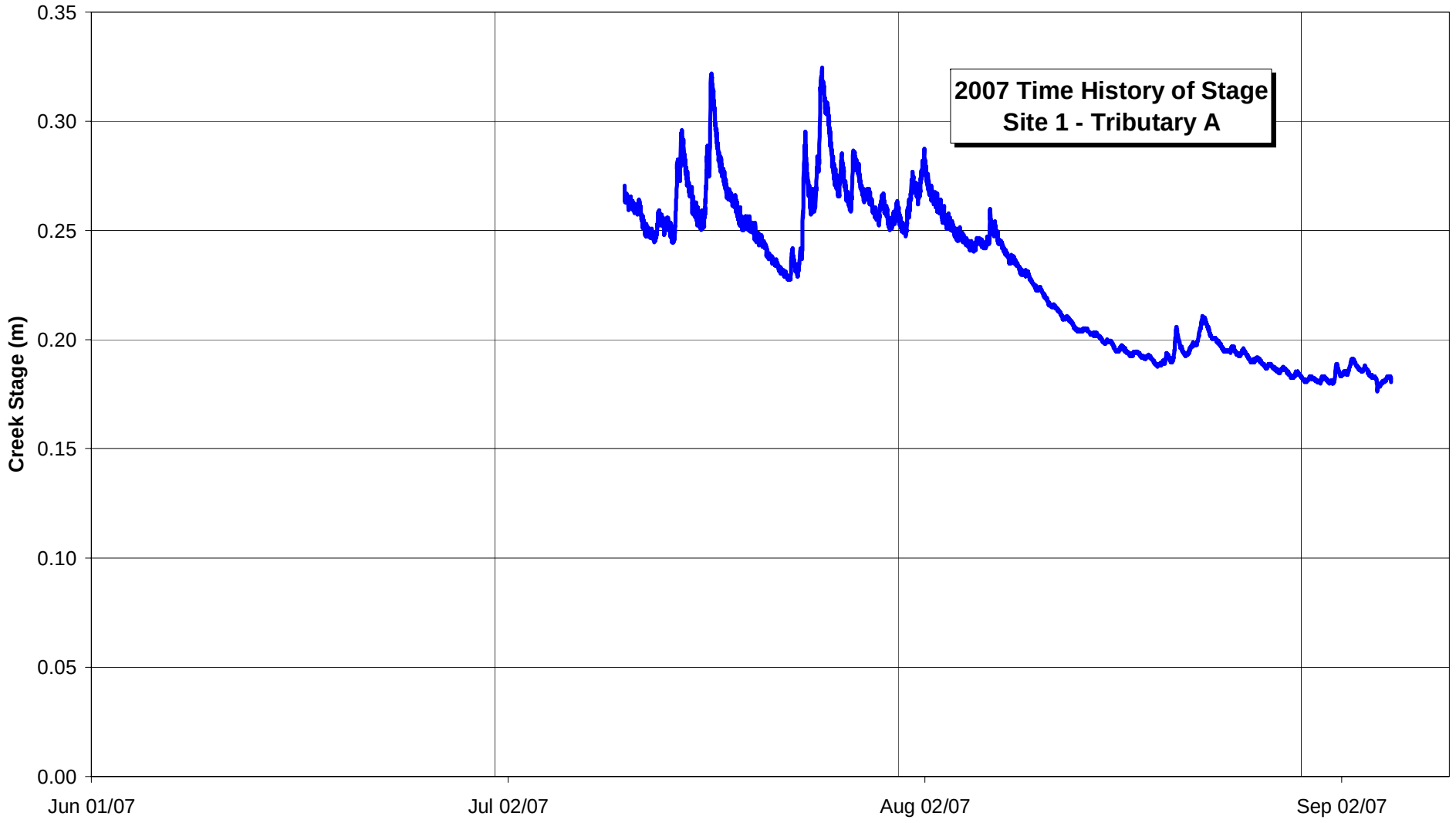
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

Site 1
Tributary A
Hydrometric Station

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W32101021	RED	TM	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure 2.1



NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

2007 Time History of Stage
Site 1 - Tributary A

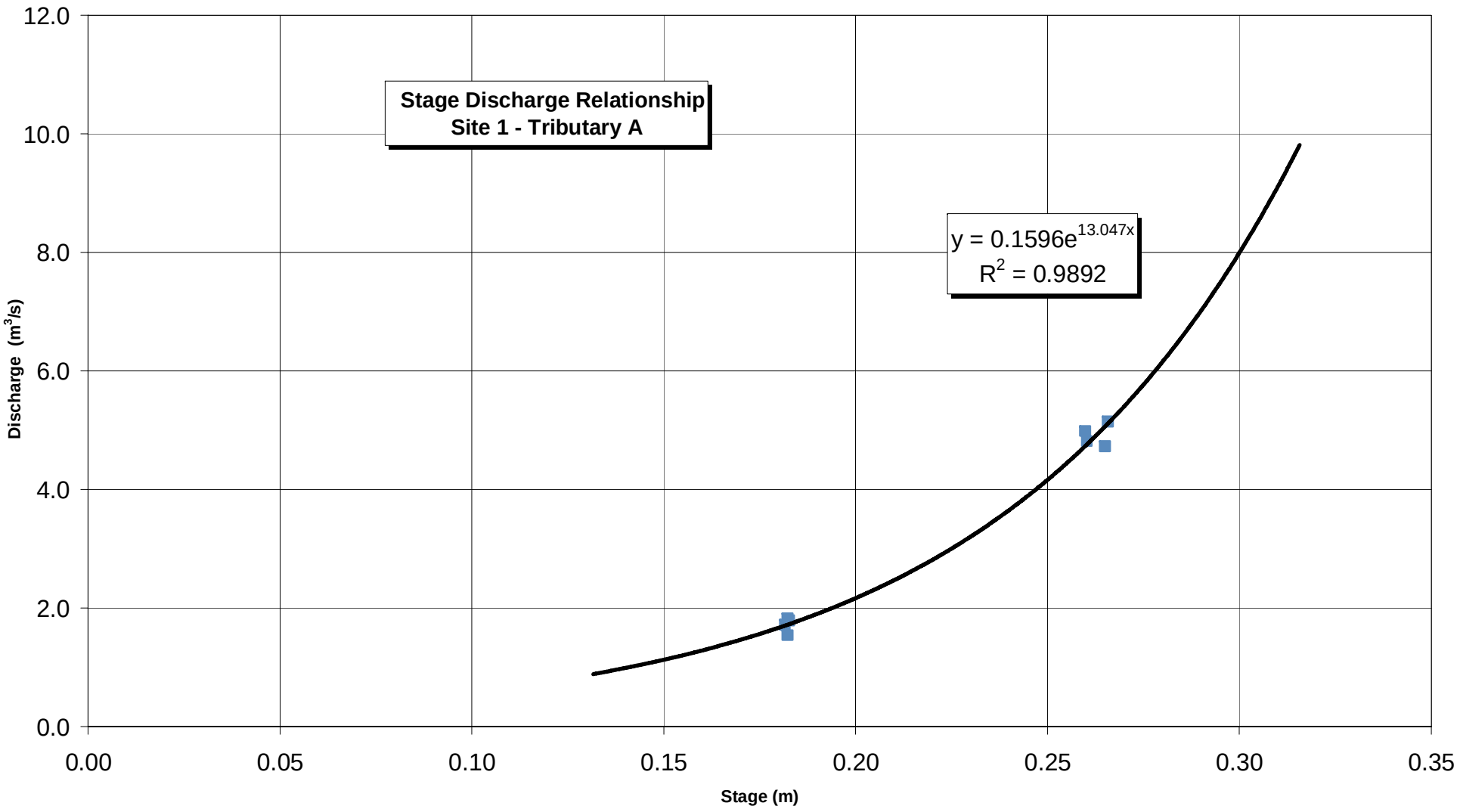
HAYCO HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TMW	0

OFFICE: EBA-VANC

DATE: December, 2007

Figure 2.2



NOTES

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

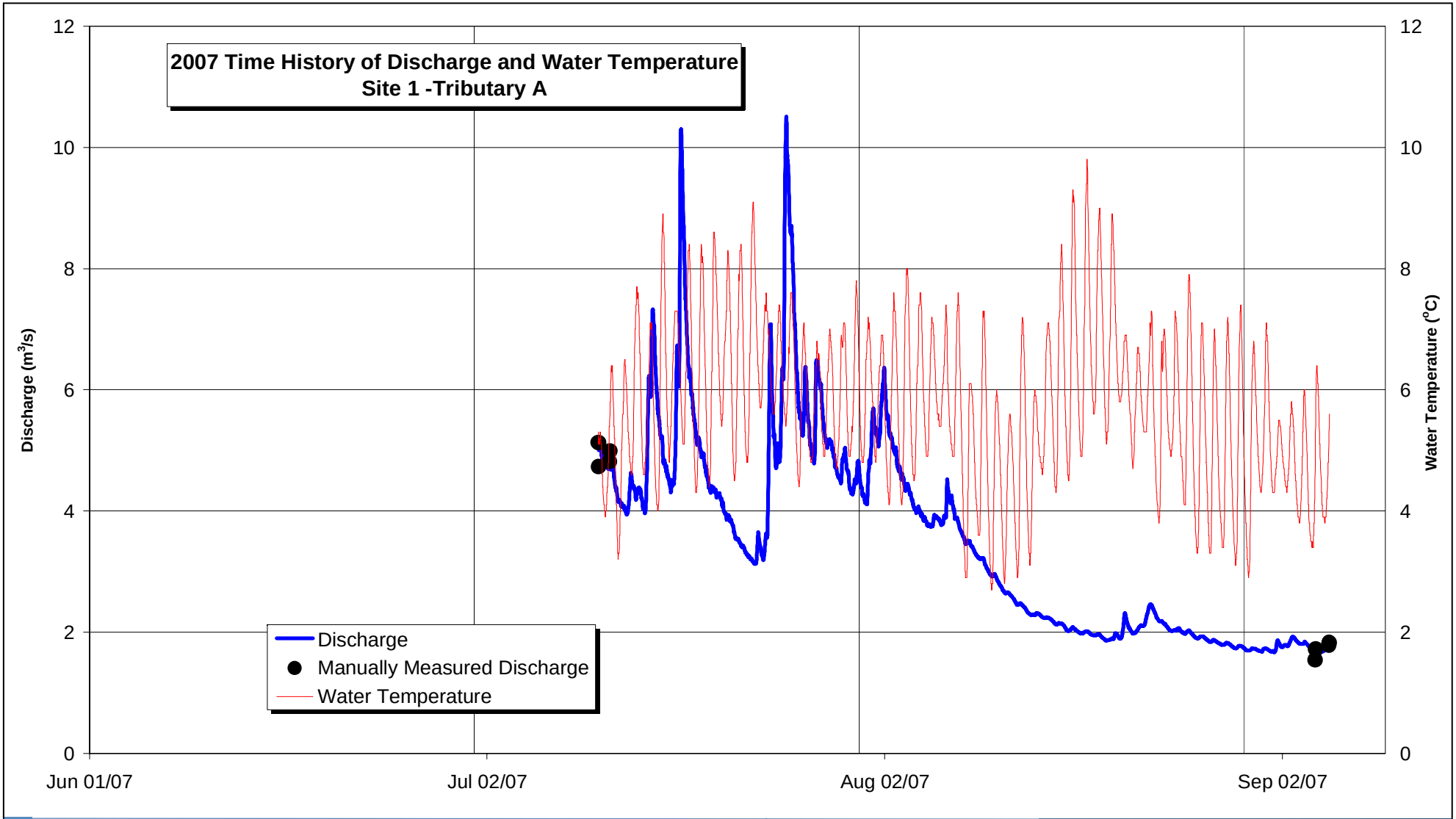
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

Stage Discharge Relationship
Site 1 - Tributary A

HAYCO HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TM	0
OFFICE: EBA-VANC	DATE: December, 2007		

Figure 2.3



NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

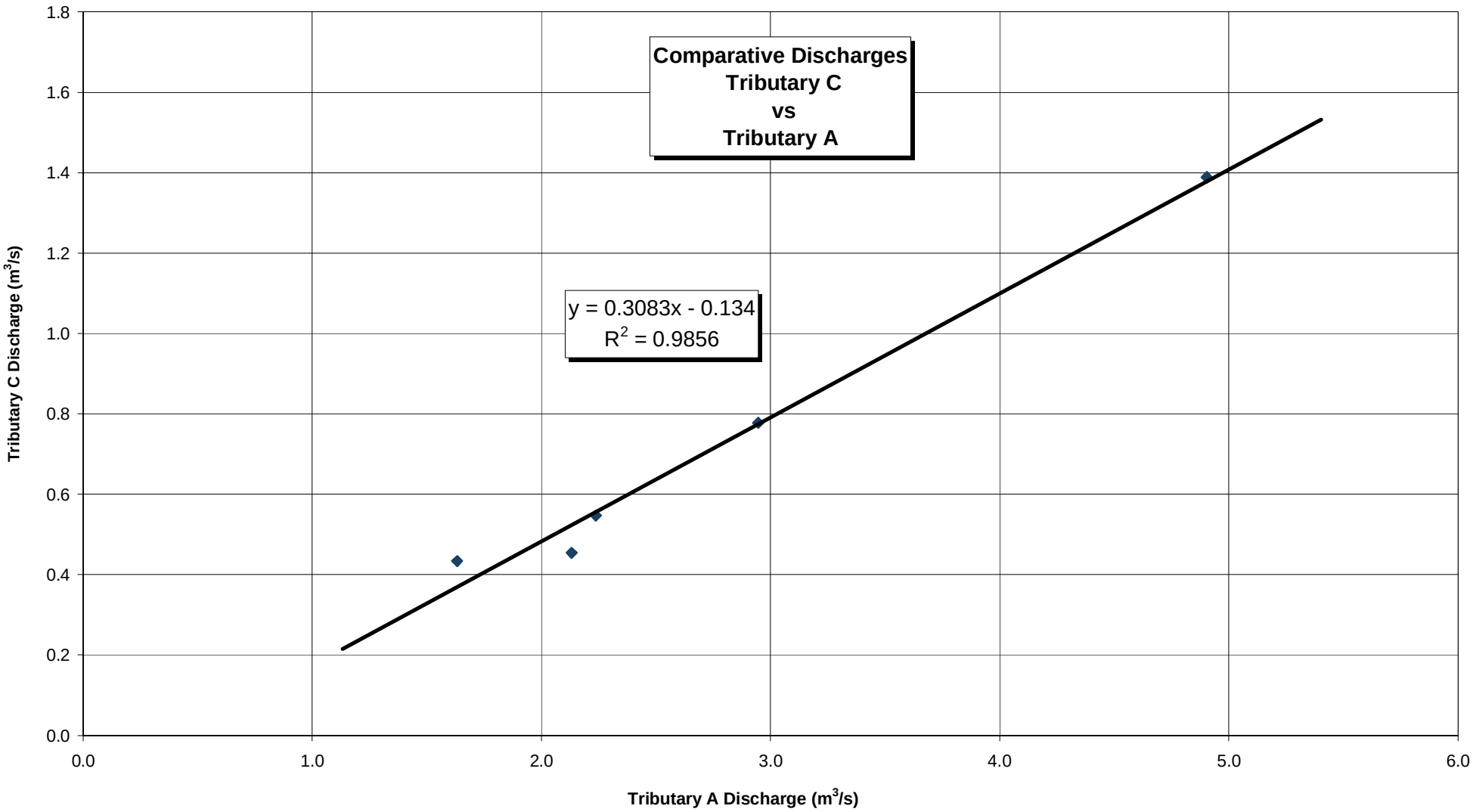
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

2007 Time History of
Discharge and Water Temperature
Site 1 - Tributary A

HAYCO HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TMW	0
OFFICE	DATE		
EBA-VANC	December, 2007		

Figure 2.4



NOTES

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

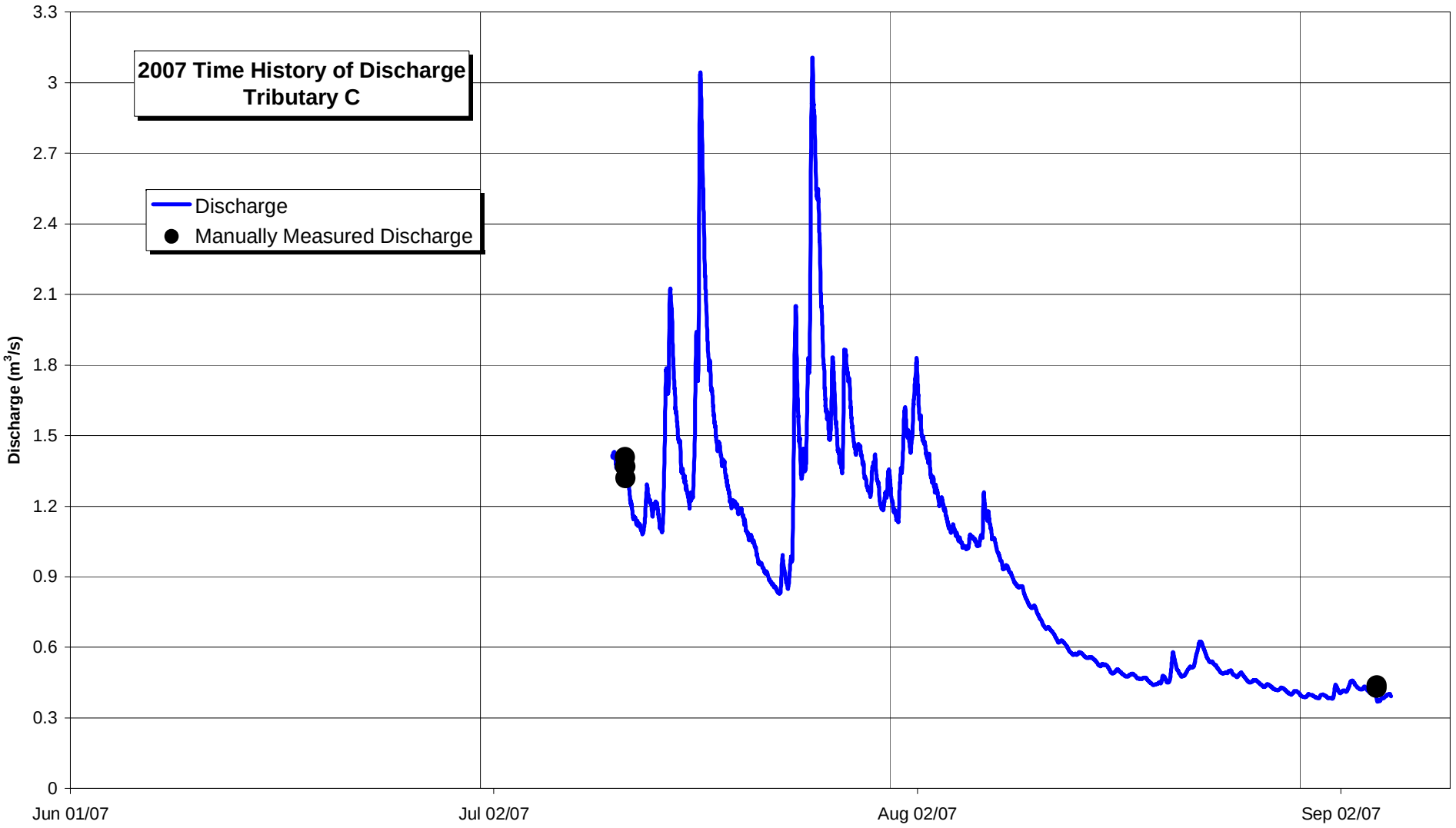
Comparative Discharges
Tributary C vs
Tributary A

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TM	0

OFFICE: EBA-VANC

DATE: December, 2007

Figure 2.5



NOTES

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

2007 Time History of Discharge
Tributary C

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TM	0
OFFICE: EBA-VANC	DATE: December, 2007		

Figure 2.6

Photo 1 - Aerial View of Site 2 Dale Creek Hydrometric Station on September 2007

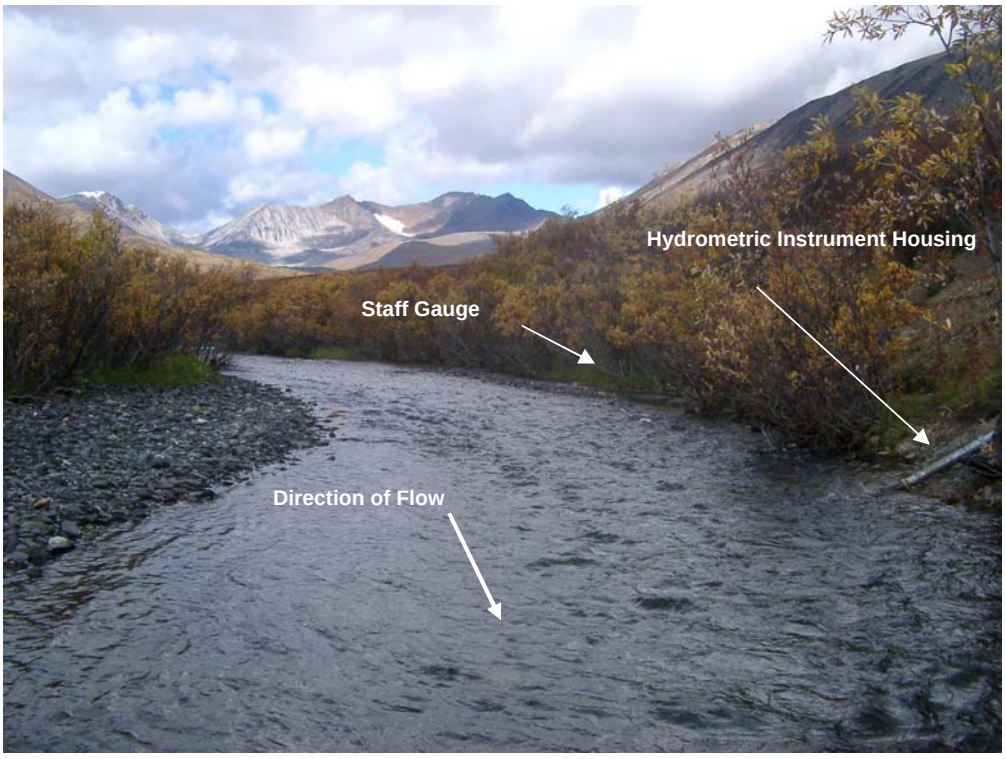


Photo 2 - View Upstream of Site 2 Dale Creek Hydrometric Station September 2007

NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

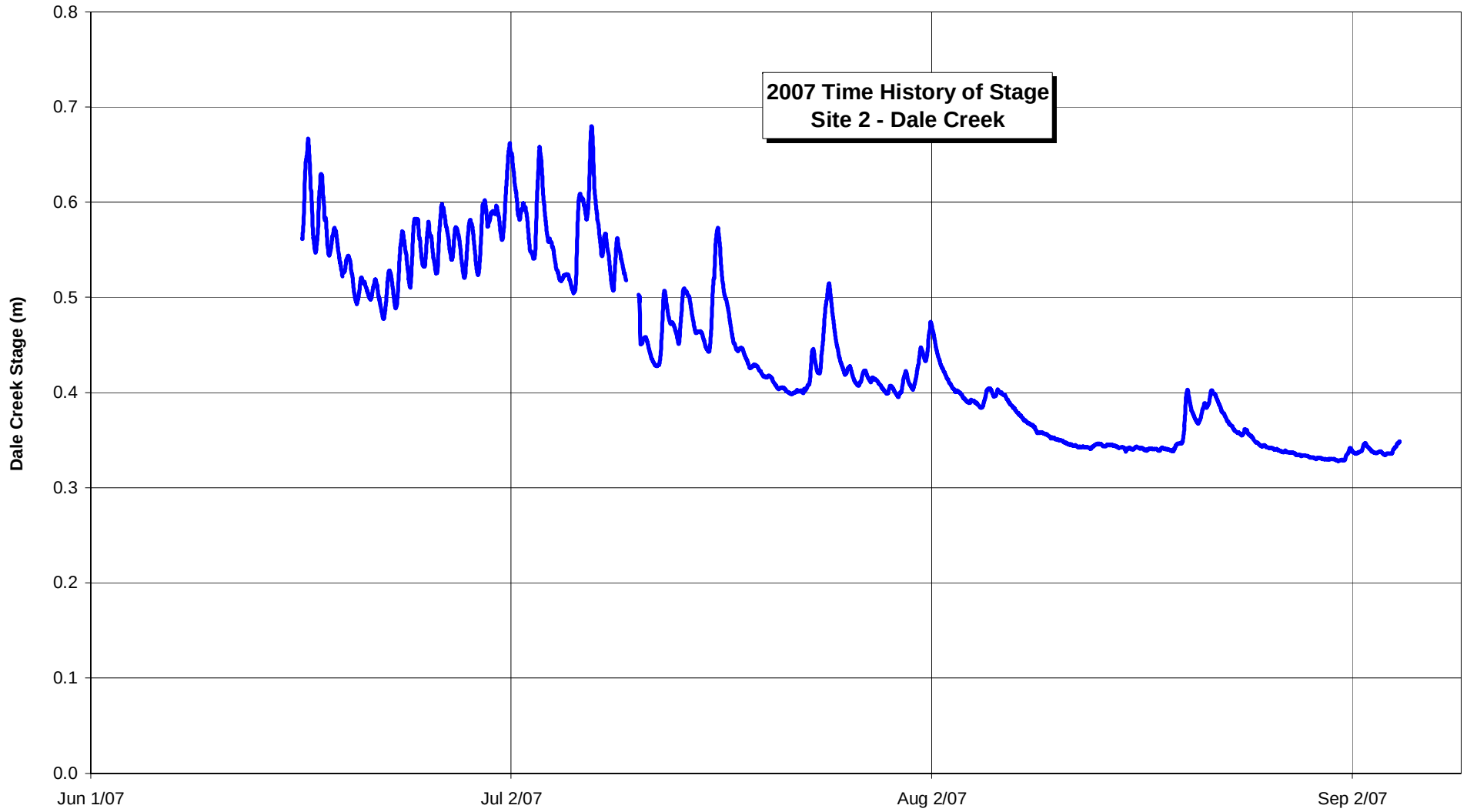
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

Site 2
Dale Creek
Hydrometric Station

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W32101021	RED	TM	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure 2.7



NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

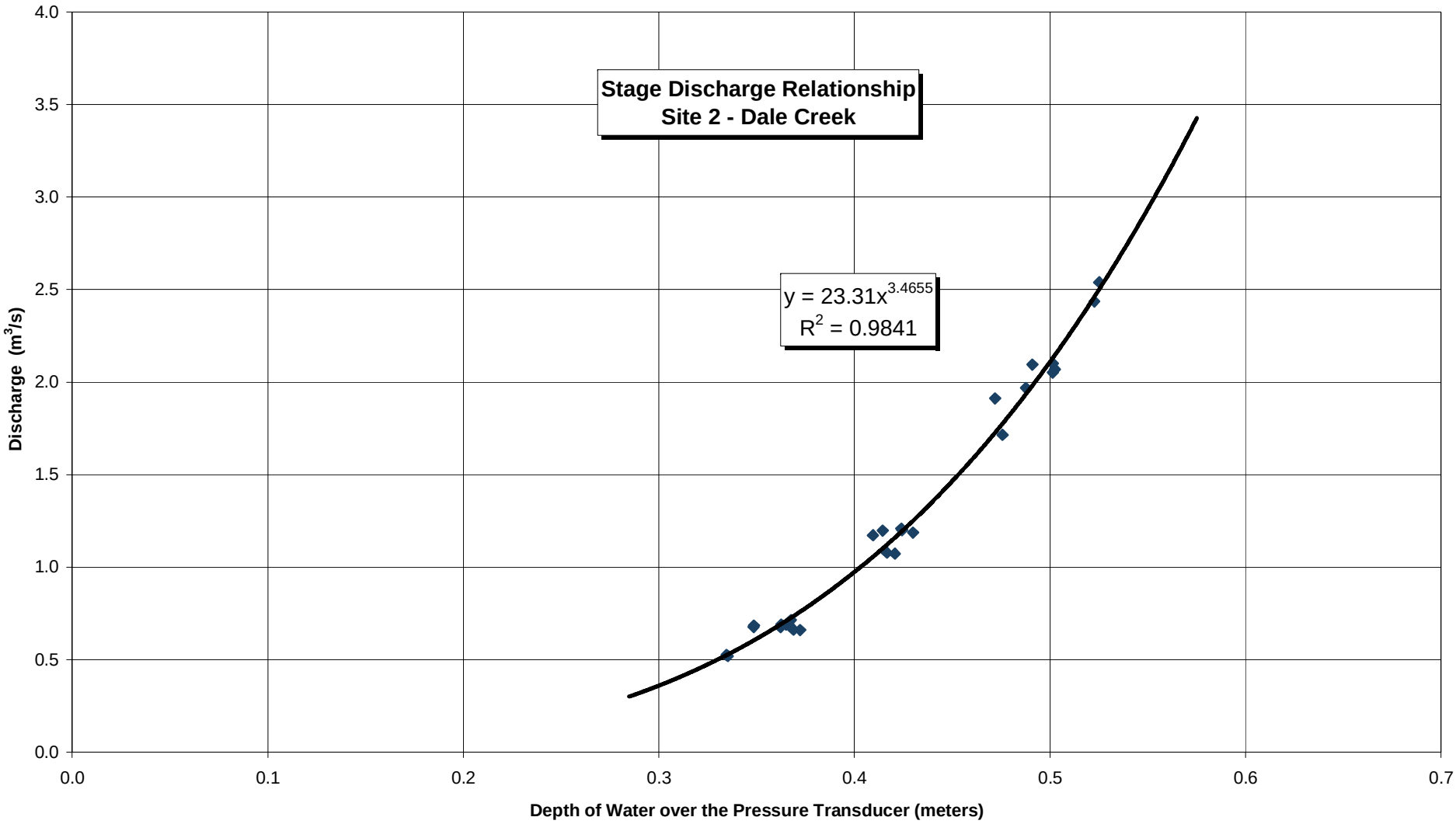
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

2007 Time History of Stage
Site 2 - Dale Creek

HAYCO HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TM	0
OFFICE: EBA-VANC	DATE: December 2007		

Figure 2.8



NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

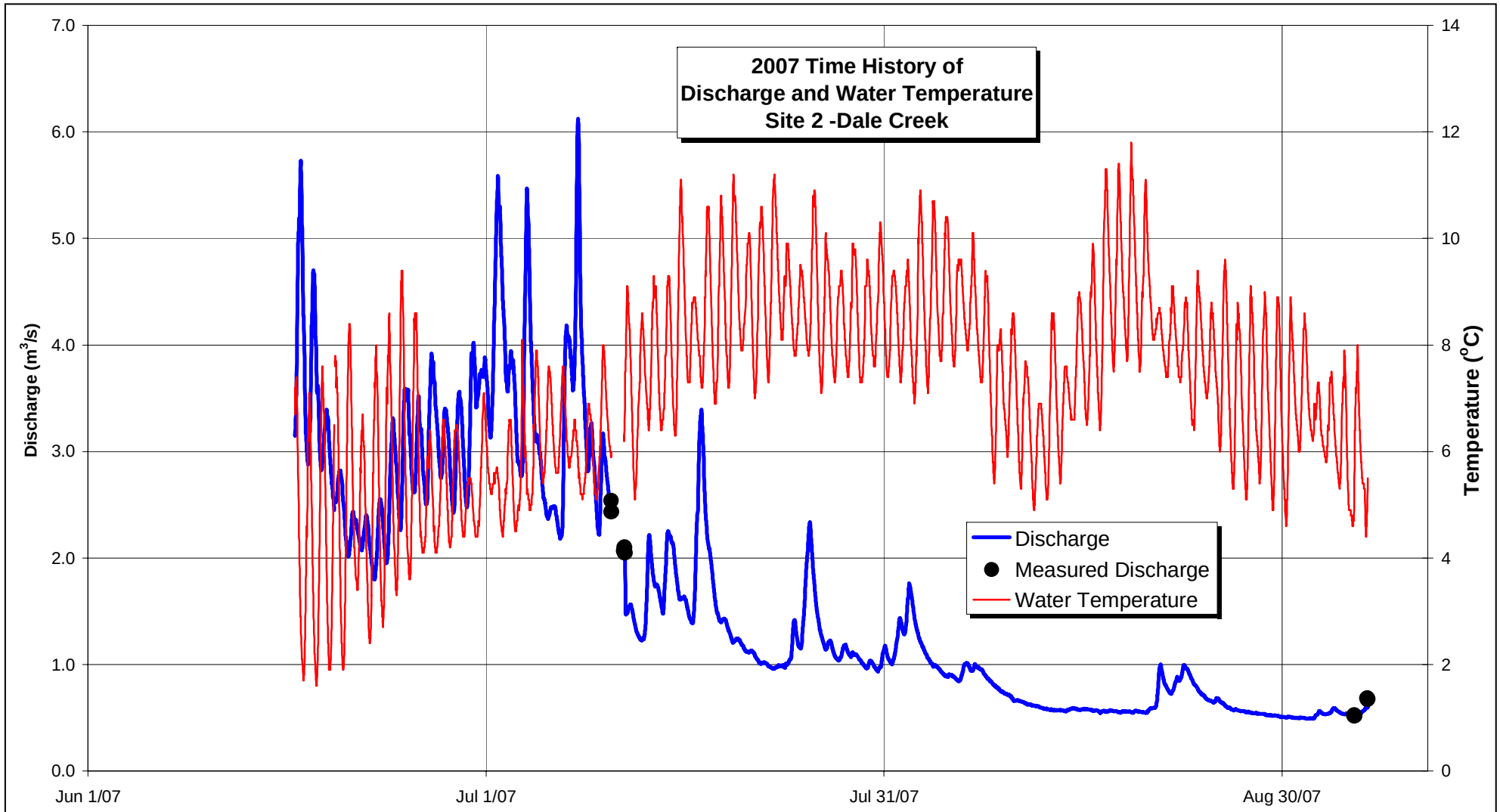
Stage Discharge Relationship
Site 2 - Dale Creek

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TM	0

OFFICE: EBA-VANC

DATE: December, 2007

Figure 2.9



NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

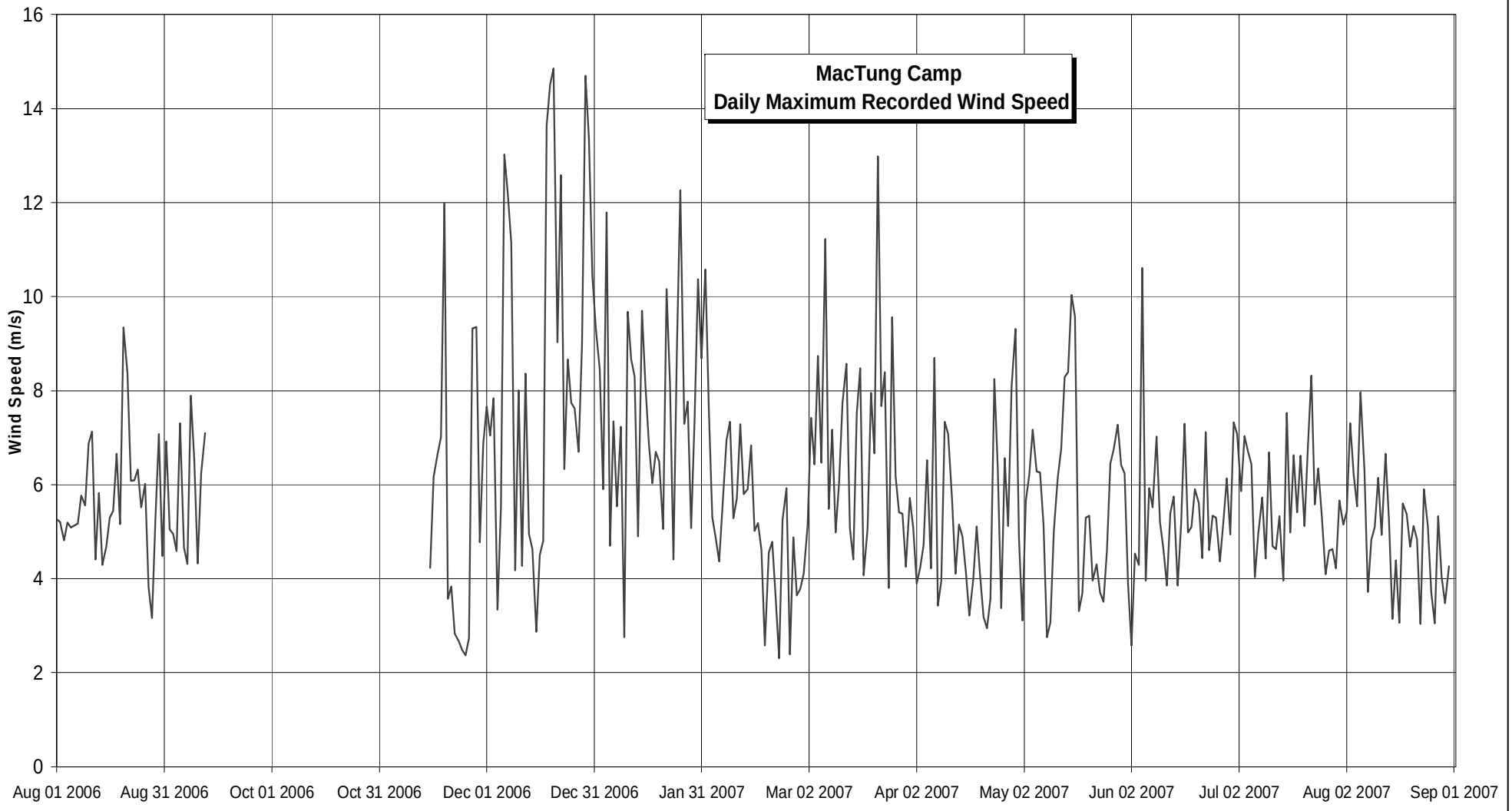
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

2007 Time History of
Discharge and Water Temperature
Site 2 - Dale Creek

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W32101021	RFD	TM	0
OFFICE: EBA-VANC	DATE: December 2007		

Figure 2.10



NOTES

Data is missing for the period from September 13, 2006 to November 15, 2006.

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

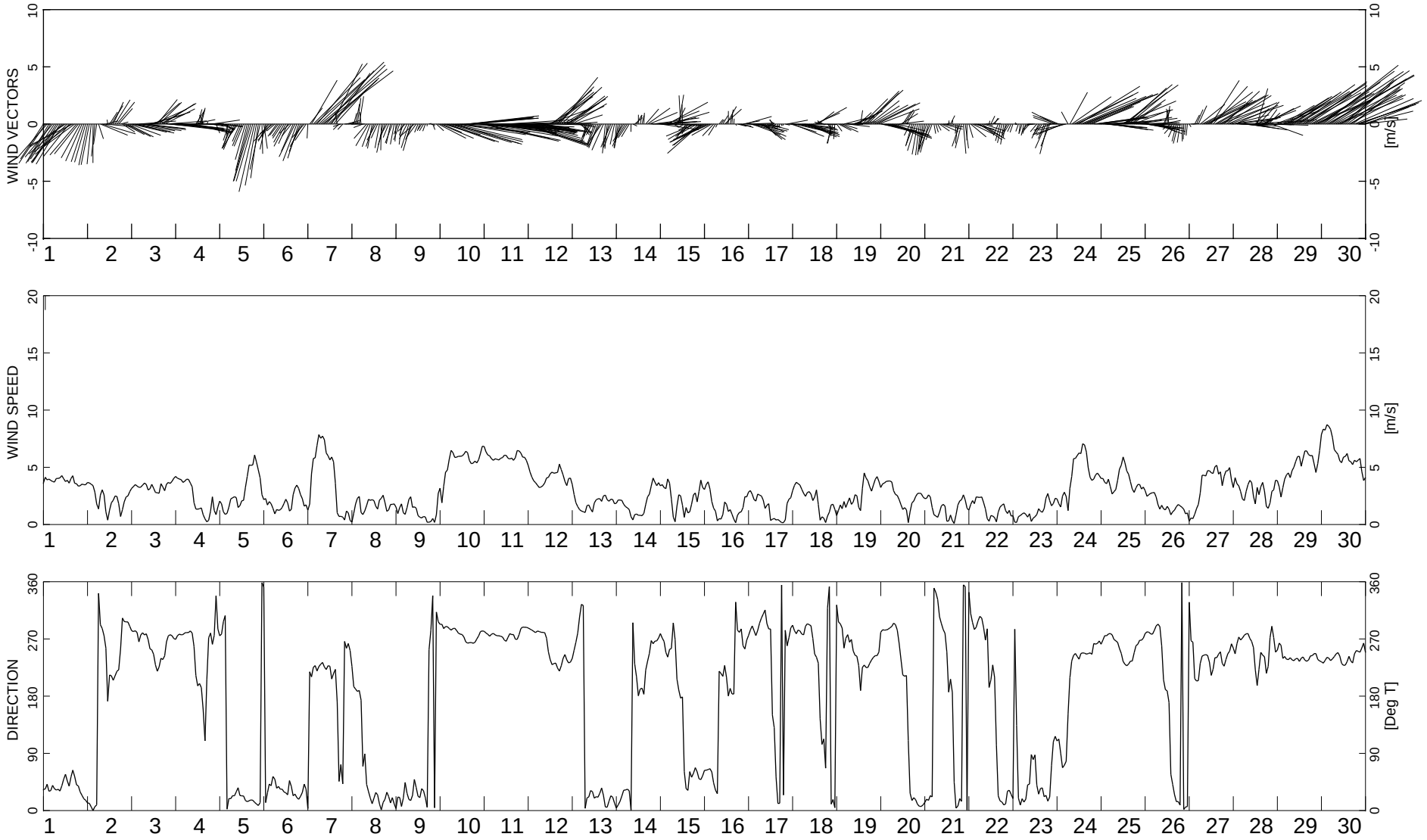
Daily Maximum Recorded Wind Speeds
August 2006 - August 2007
MacTung Camp

PROJECT NO.	DWN	CKD	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure 3.1



CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

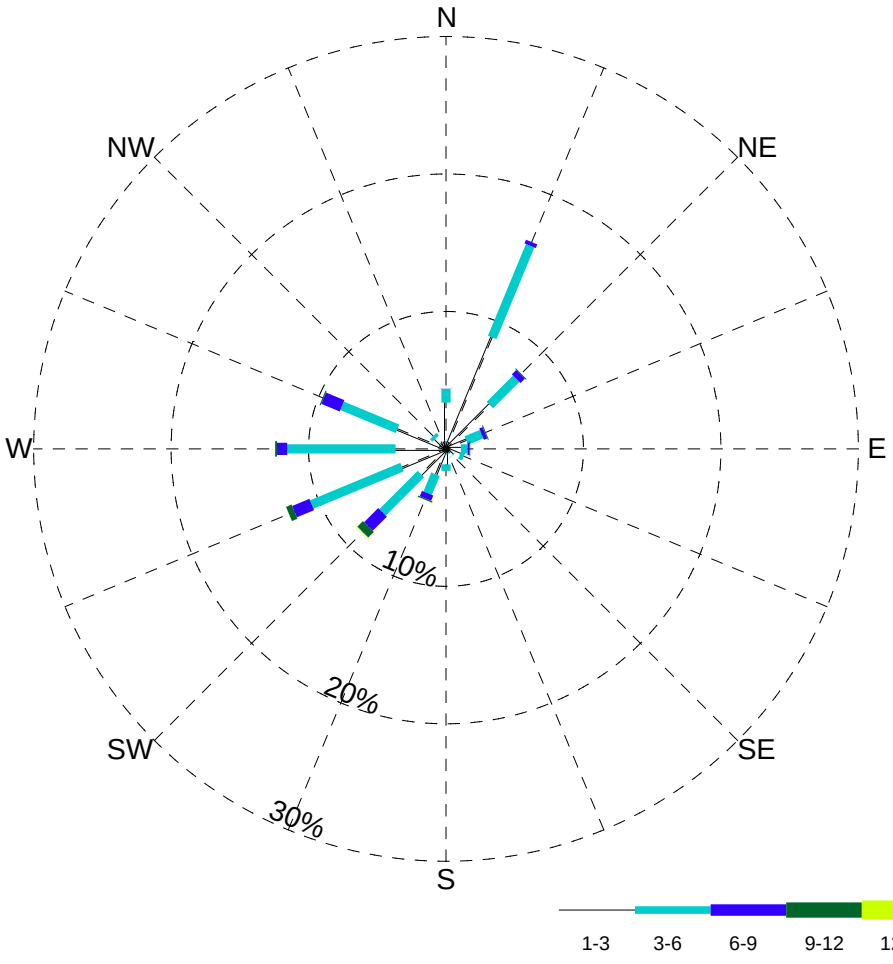
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
APRIL 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure 3.2



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 333 of 396 days
Start Date: Aug. 01, 2006
End Date: Aug. 31, 2007

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	-	1.60	1.21	0.26	0.08	-	-	-	3.14
NE	-	4.51	2.71	0.45	0.06	-	-	-	7.74
NNE	-	8.78	7.22	0.29	-	-	-	-	16.29
N	-	3.37	0.99	0.01	-	-	-	-	4.37
NNW	-	0.59	0.03	-	-	-	-	-	0.62
NW	-	1.07	0.25	-	-	-	-	-	1.32
WNW	-	3.82	4.37	1.44	0.09	-	-	-	9.72
W	-	3.67	7.89	0.74	0.14	-	-	-	12.43
WSW	-	3.47	7.11	1.36	0.44	0.01	-	-	12.38
SW	-	2.59	3.94	1.46	0.58	0.04	-	-	8.60
SSW	-	2.00	1.49	0.41	0.10	0.03	-	-	4.03
S	-	1.13	0.47	-	-	-	-	-	1.60
SSE	-	0.35	0.05	-	-	-	-	-	0.40
SE	-	0.64	0.03	-	-	-	-	-	0.67
ESE	-	1.09	0.31	-	-	-	-	-	1.41
E	-	1.08	0.49	0.14	0.05	-	-	-	1.76
Calm	13.54	-	-	-	-	-	-	-	13.54
Total (%)	13.54	39.73	38.55	6.57	1.53	0.08	-	-	100.00

Note:
Excluding missing data from period of
Sept. 12 2006 18:00 through Nov. 15 22:00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

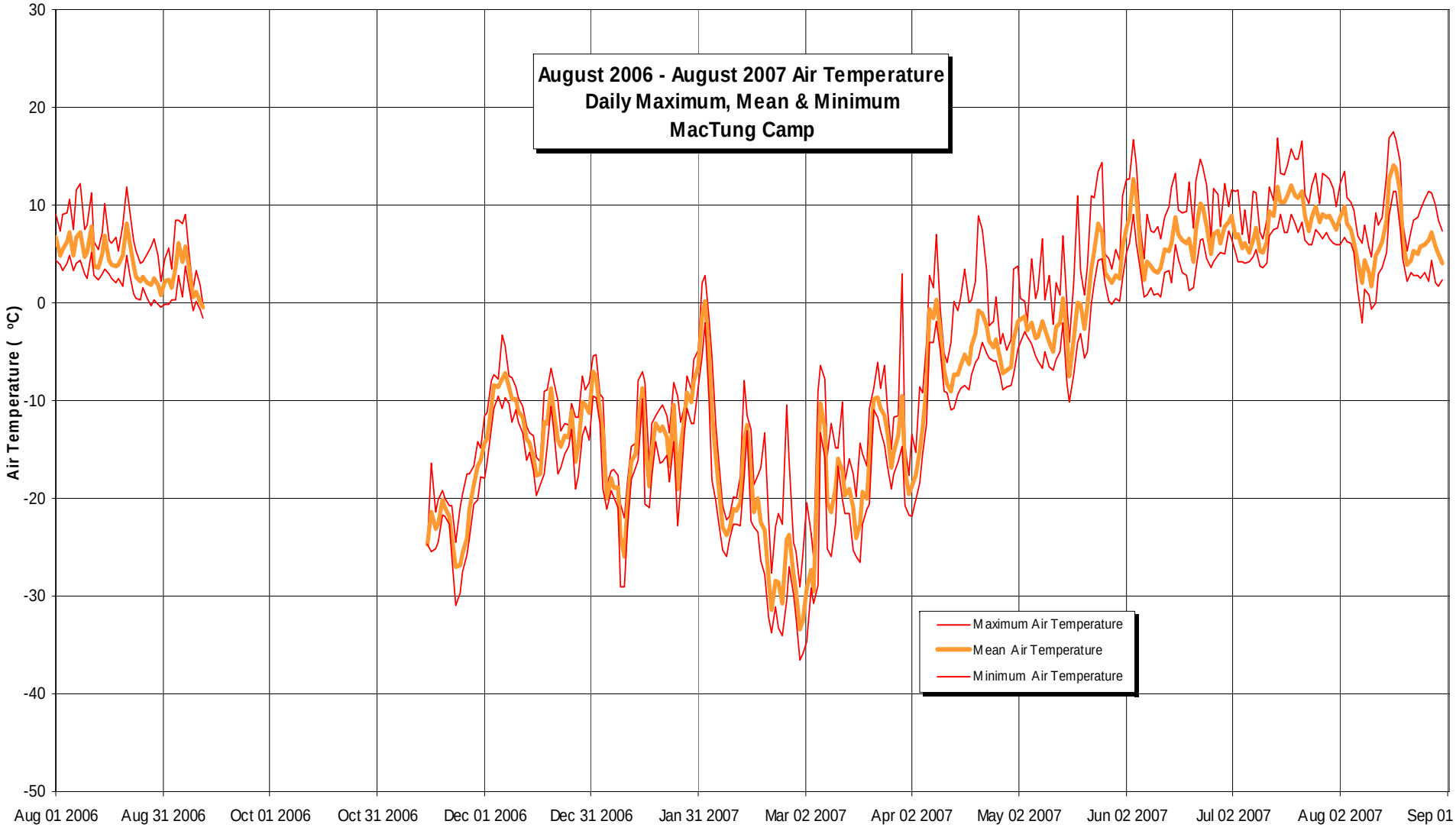
MACTUNG CAMP
WIND ROSE
AUGUST 2006 to AUGUST 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure 3.3



NOTES

Data is missing for the period from September 13, 2006 to November 15, 2006.

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

August 2006 - August 2007 Air Temperature
Daily Maximum, Mean & Minimum
MacTung Camp

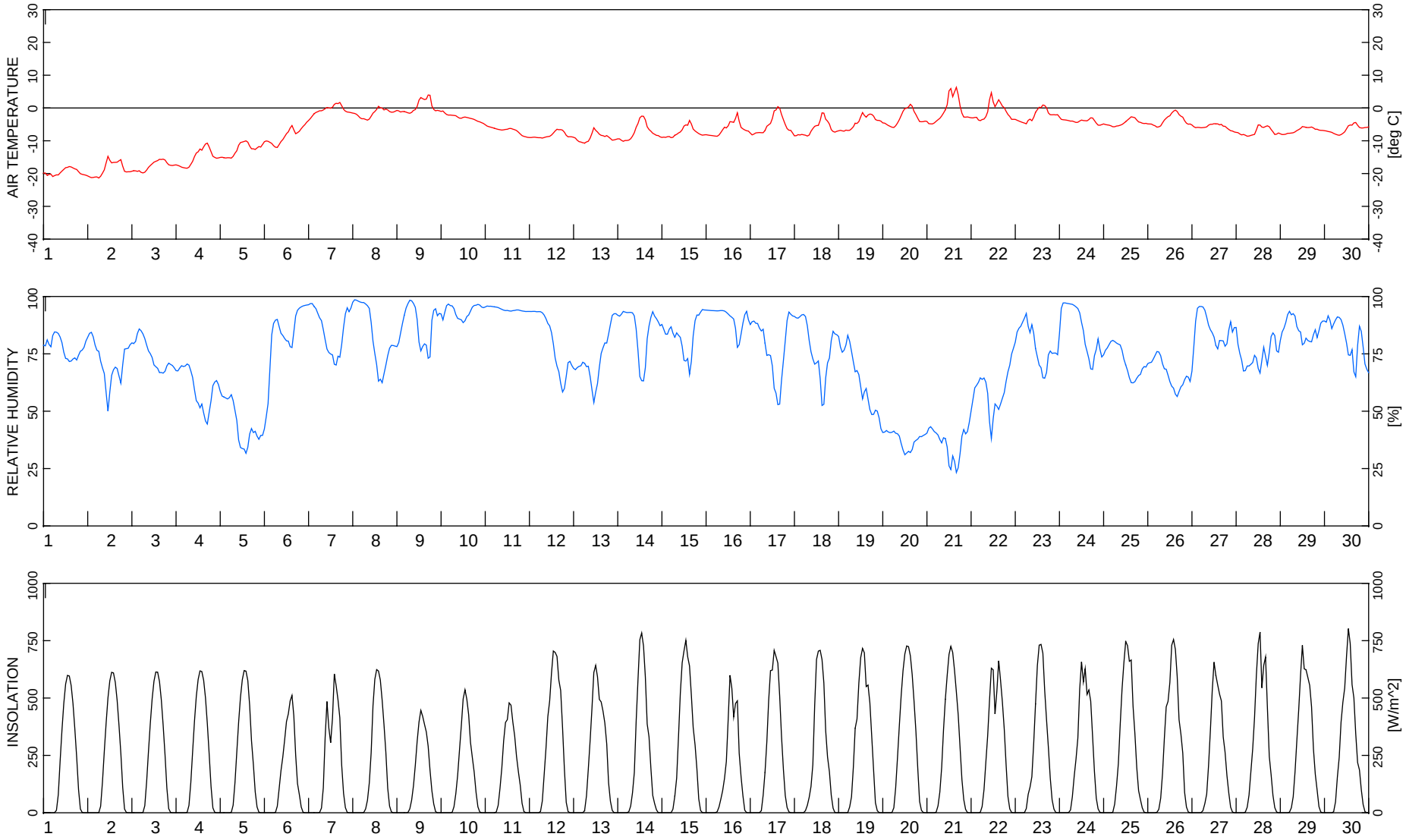
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure 3.4



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

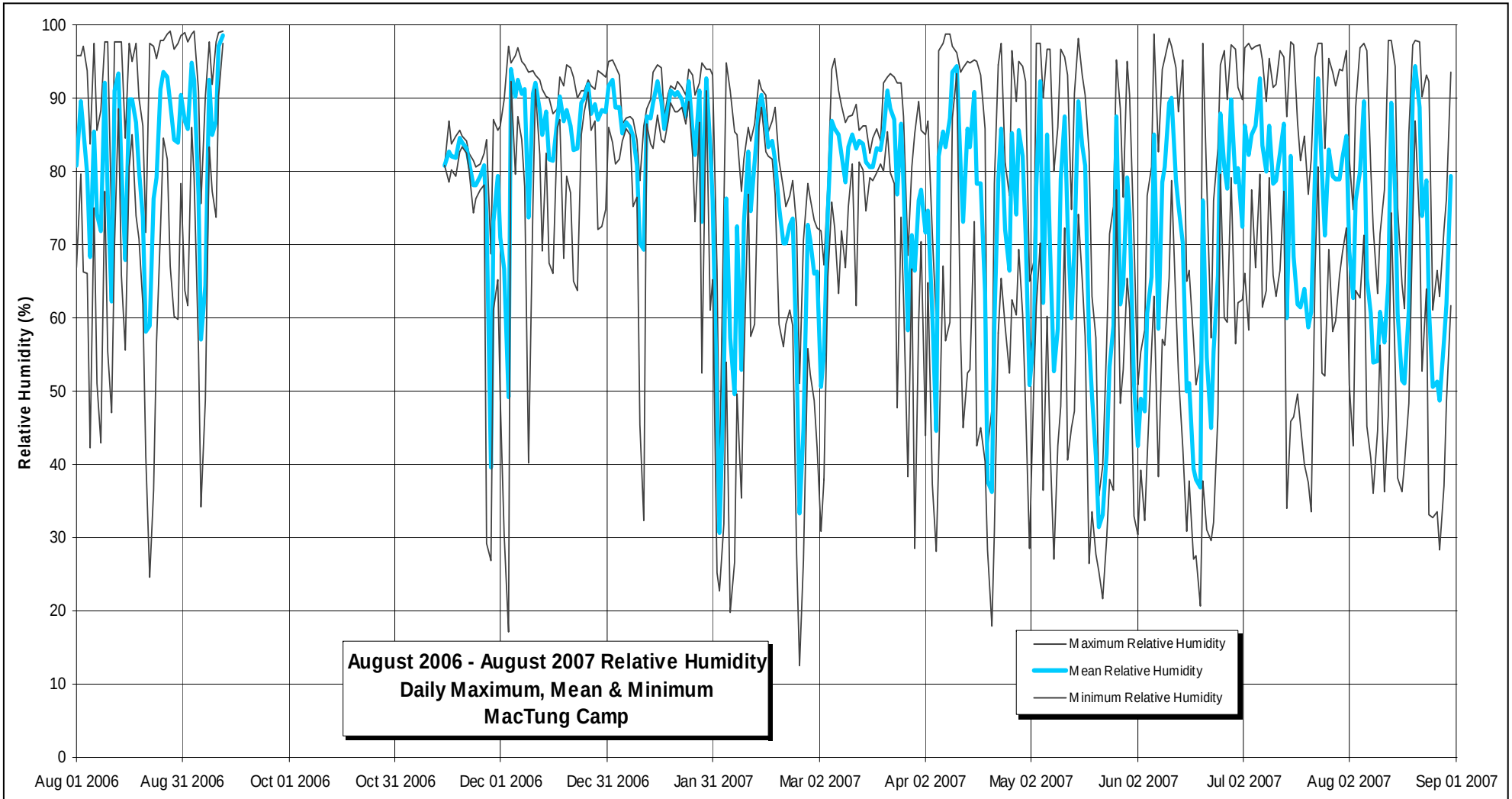
MACTUNG CAMP
WEATHER
APRIL 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure 3.5

Thu Dec 06 13:42:43 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007



NOTES

Data is missing for the period from September 13, 2006 to November 15, 2006.

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

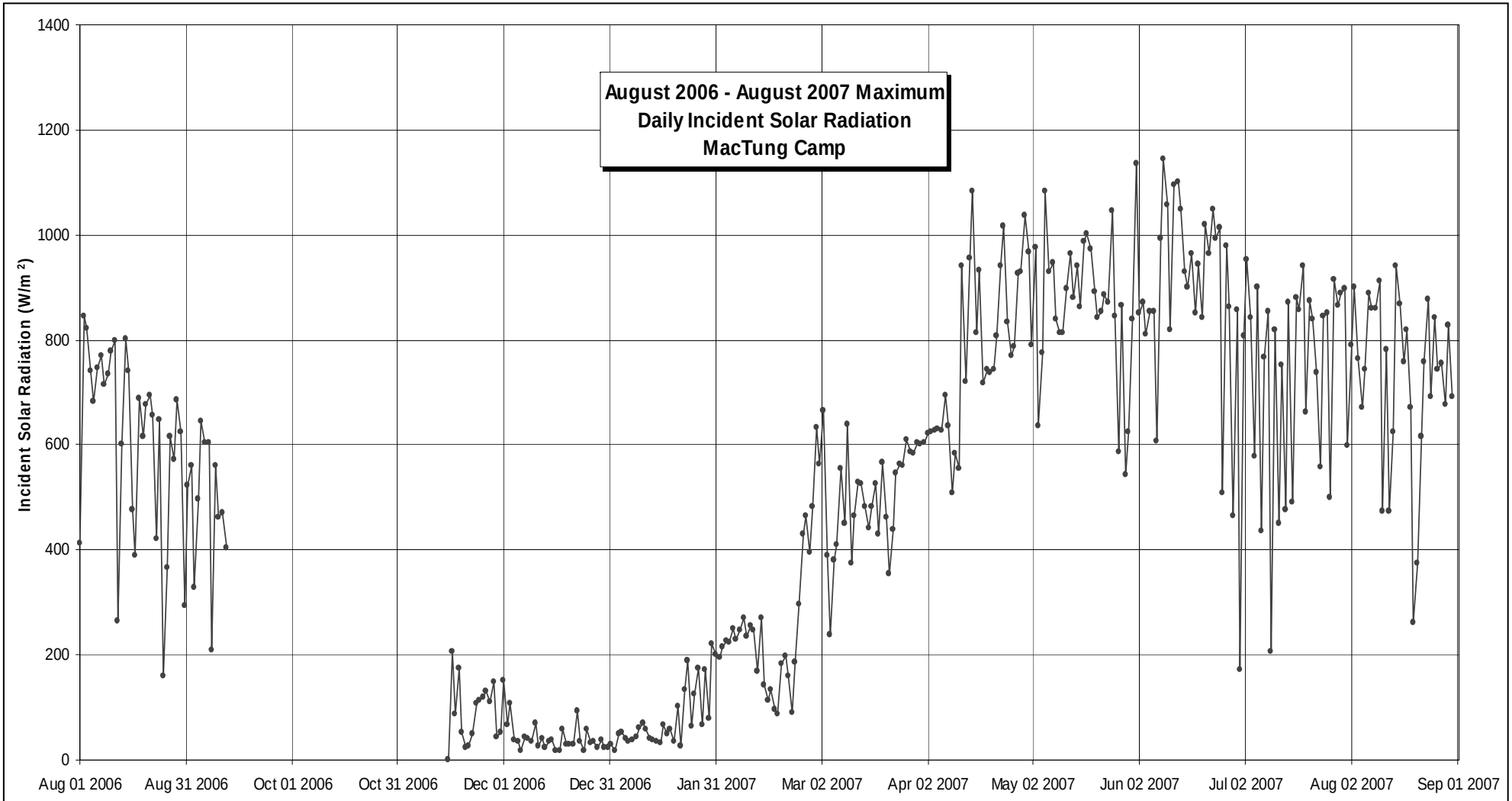
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

August 2006 - August 2007 Relative Humidity
Daily Maximum, Mean & Minimum
MacTung Camp

HAYCO HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W23101021	TM	JAS	0
OFFICE: EBA-VANC	DATE: December 2007		

Figure 3.6



NOTES

Data is missing for the period from September 13, 2006 to November 15, 2006.

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

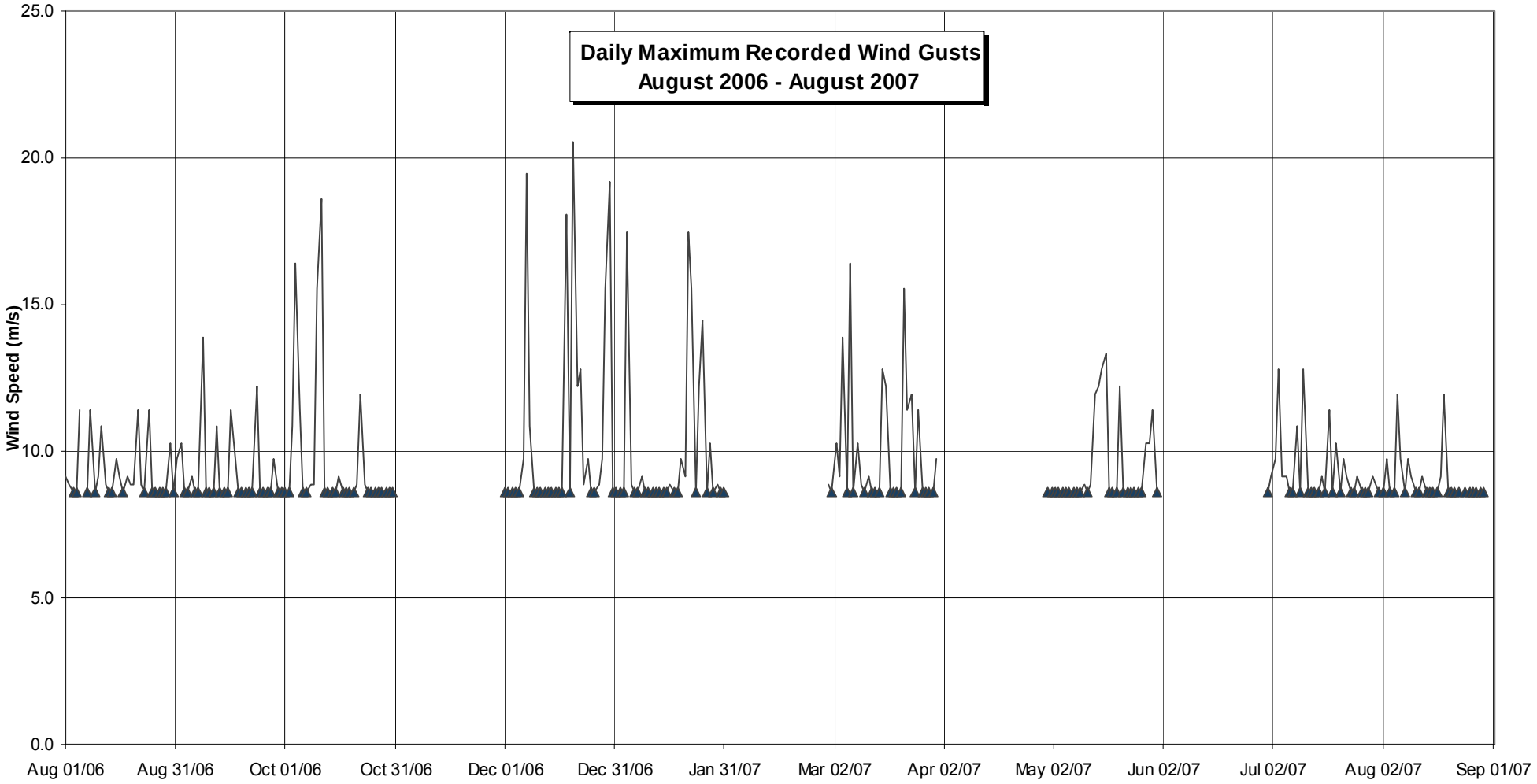
August 2006 - August 2007 Maximum
Daily Incident Solar Radiation
MacTung Camp

PROJECT NO.	DWN	CKD	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure 3.7



NOTES

The lowest maximum wind gust recorded by the Meteorological Service of Canada for MacMillan Pass is 8.6 m/s. Any daily maximum recorded below this level is denoted with a ▲ and is assumed to be some value equal to or below 8.6 m/s. Data is missing for November 2007, February 2007, April 2007 and June 2007. A total of 120 days are missing from this record.

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

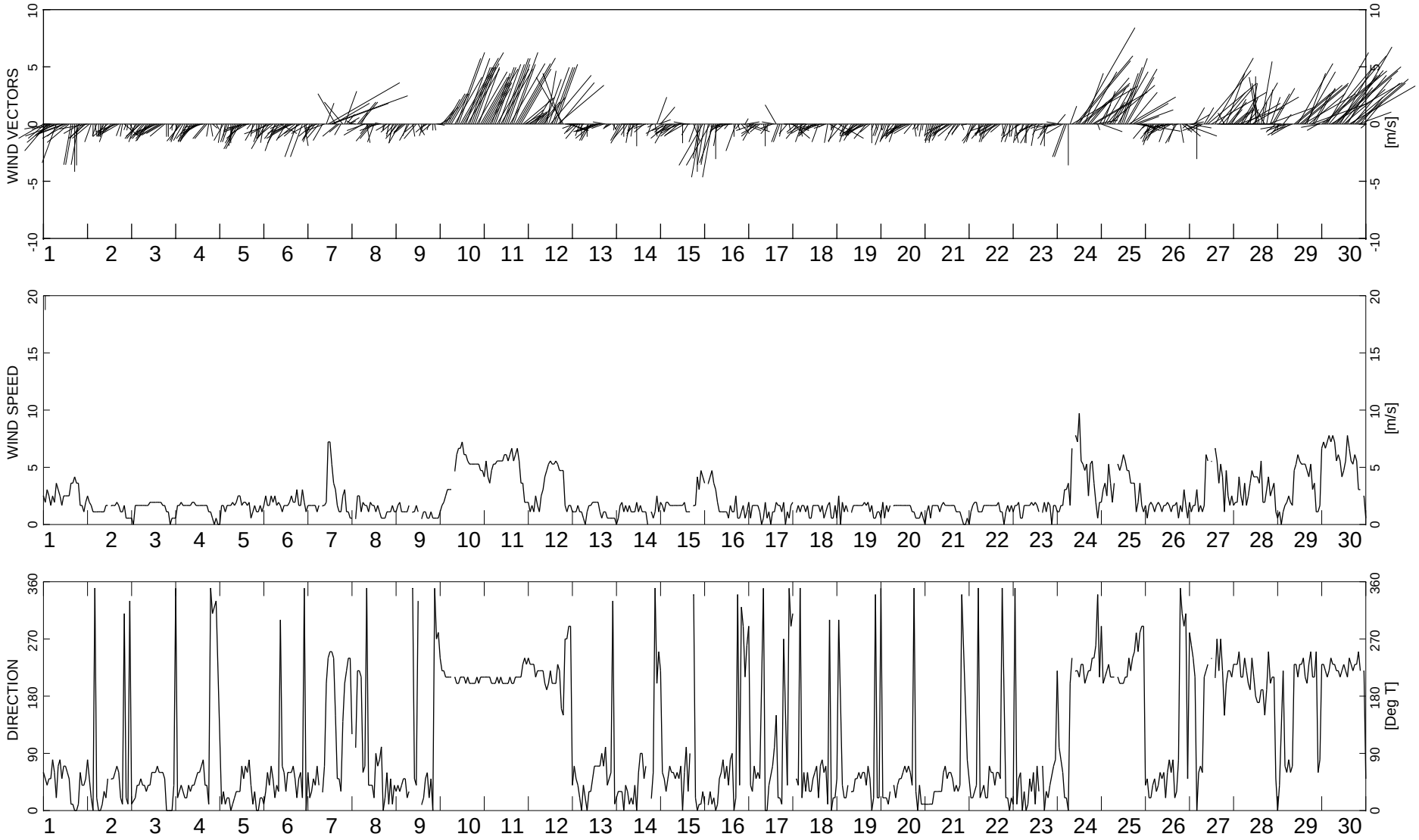
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

Daily Maximum Recorded Wind Gusts
August 2006 - August 2007
MacMillan Pass

PROJECT NO.	DWN	CKD	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure 3.8



CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
APRIL 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure 3.9

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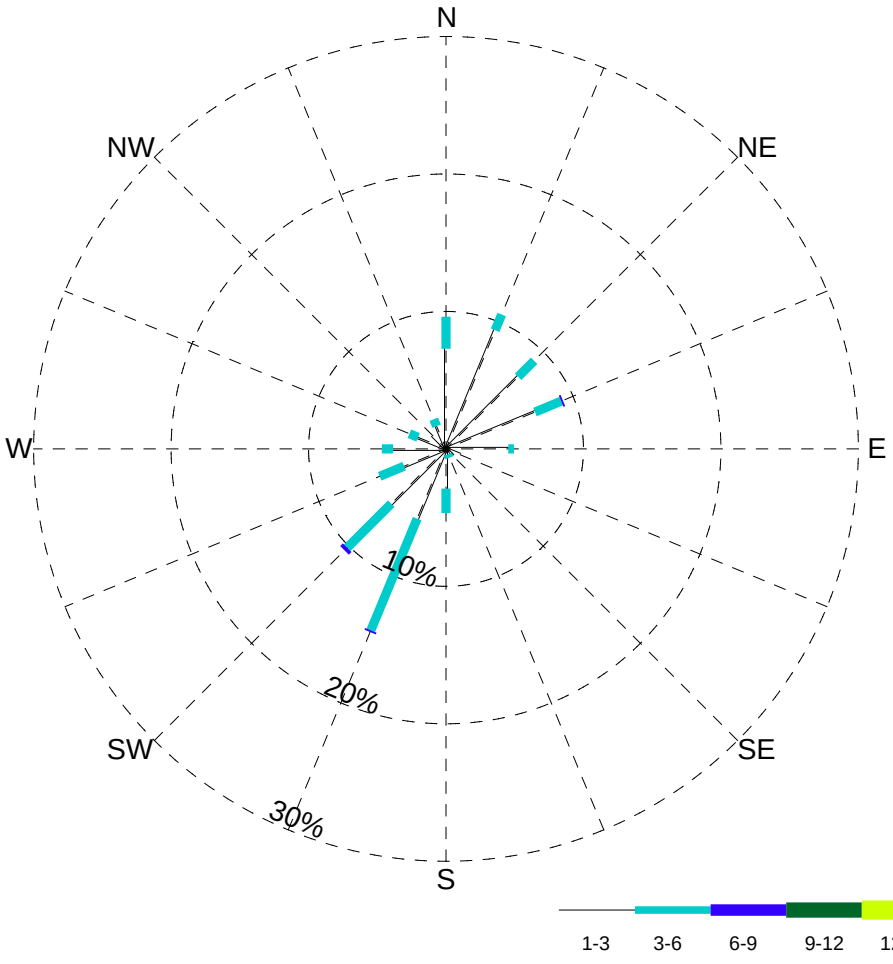

Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 396 days
Start Date: Aug. 01, 2006
End Date: Aug. 31, 2007

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	-	7.01	2.06	0.14	-	-	-	-	9.20
NE	-	7.42	1.65	-	-	-	-	-	9.07
NNE	-	9.34	1.24	-	-	-	-	-	10.58
N	-	7.28	2.34	-	-	-	-	-	9.61
NNW	-	1.79	0.55	-	-	-	-	-	2.34
NW	-	1.37	-	-	-	-	-	-	1.37
WNW	-	2.20	0.69	-	-	-	-	-	2.88
W	-	3.85	0.82	-	-	-	-	-	4.67
WSW	-	3.30	1.92	-	-	-	-	-	5.22
SW	-	5.63	4.53	0.28	-	-	-	-	10.44
SSW	-	5.49	8.79	0.14	-	-	-	-	14.42
S	-	2.88	1.79	-	-	-	-	-	4.67
SSE	-	0.41	0.28	-	-	-	-	-	0.69
SE	-	0.69	-	-	-	-	-	-	0.69
ESE	-	1.10	-	-	-	-	-	-	1.10
E	-	4.53	0.41	-	-	-	-	-	4.95
Calm	8.10	-	-	-	-	-	-	-	8.10
Total (%)	8.10	64.29	27.06	0.55	-	-	-	-	100.00

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
AUGUST 2006 to AUGUST 2007

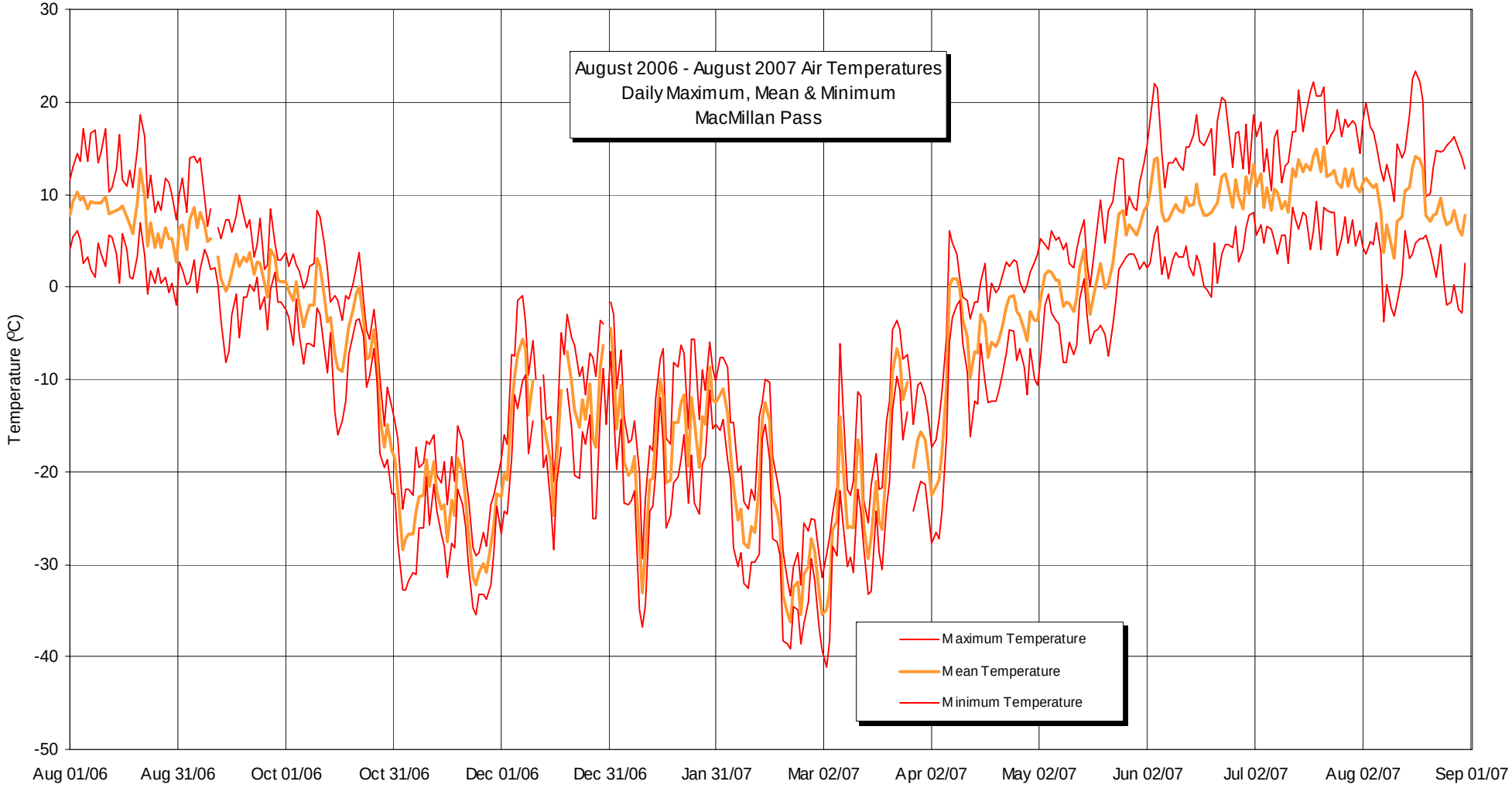
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure 3.10

Thu Dec 06 16:20:55 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\Wind_roses\2007



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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

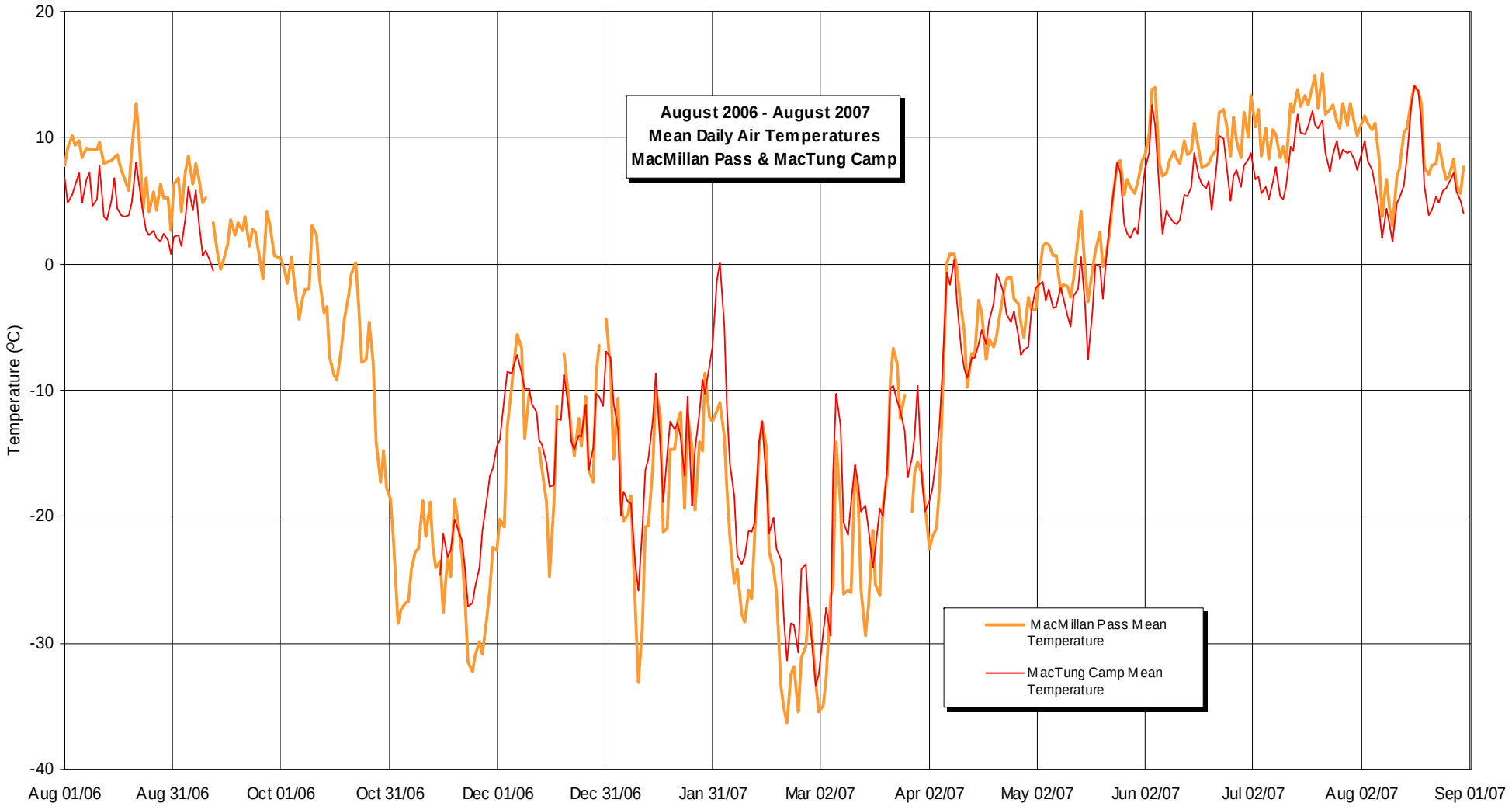
August 2006 - August 2007 Air Temperatures
Daily Maximum, Mean & Minimum
MacMillan Pass

PROJECT NO.	DWN	CKD	REV
W23101021	RFD	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure 3.11



NOTES

MacTung Camp data is missing for the period of September 13, 2006 to November 15, 2006 .

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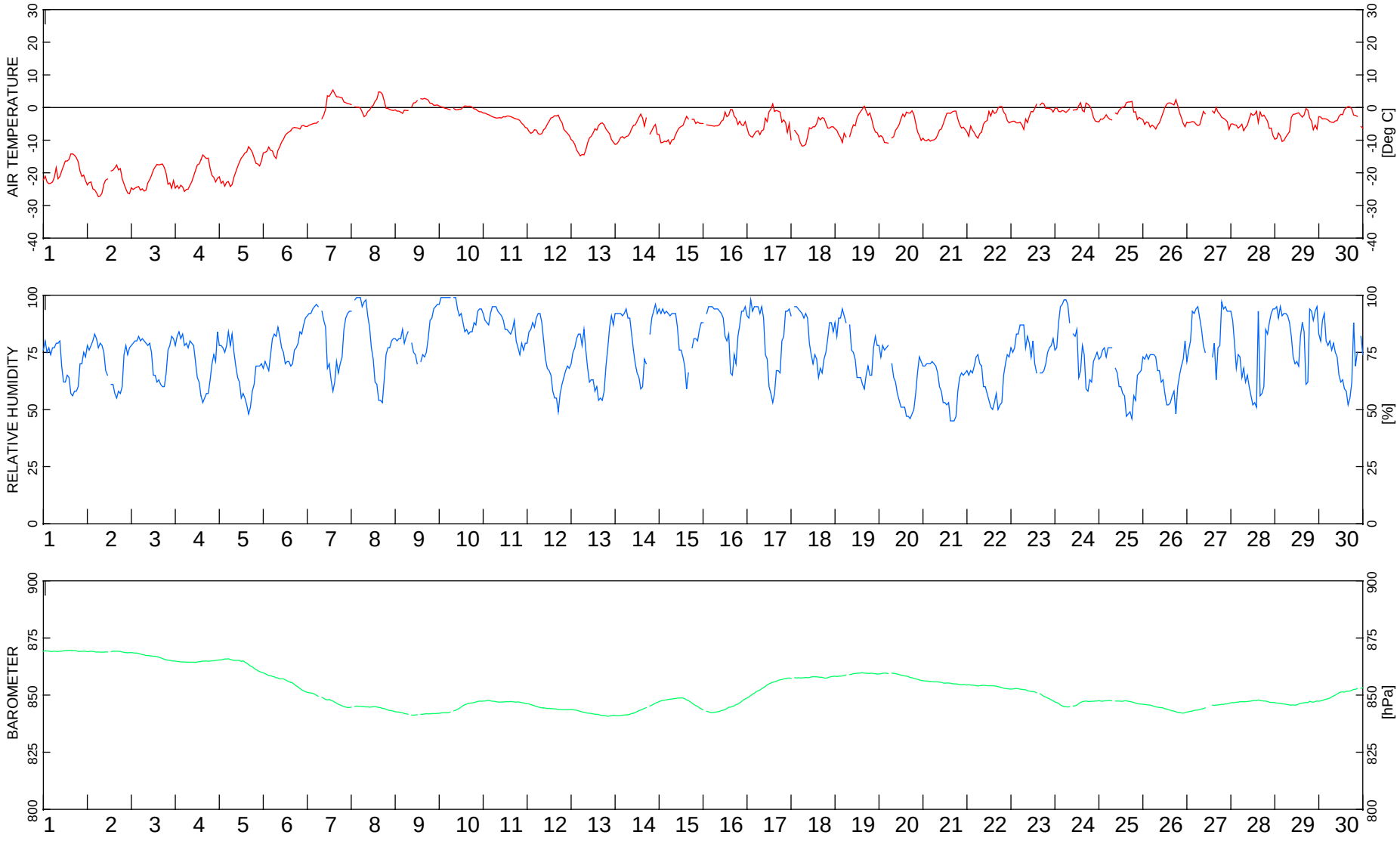
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

August 2006 - August 2007
Mean Daily Air Temperatures
MacMillan Pass & MacTung Camp

PROJECT NO.	DWN	CKD	REV
W23101021	RFD	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure 3.12



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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
APRIL 2007

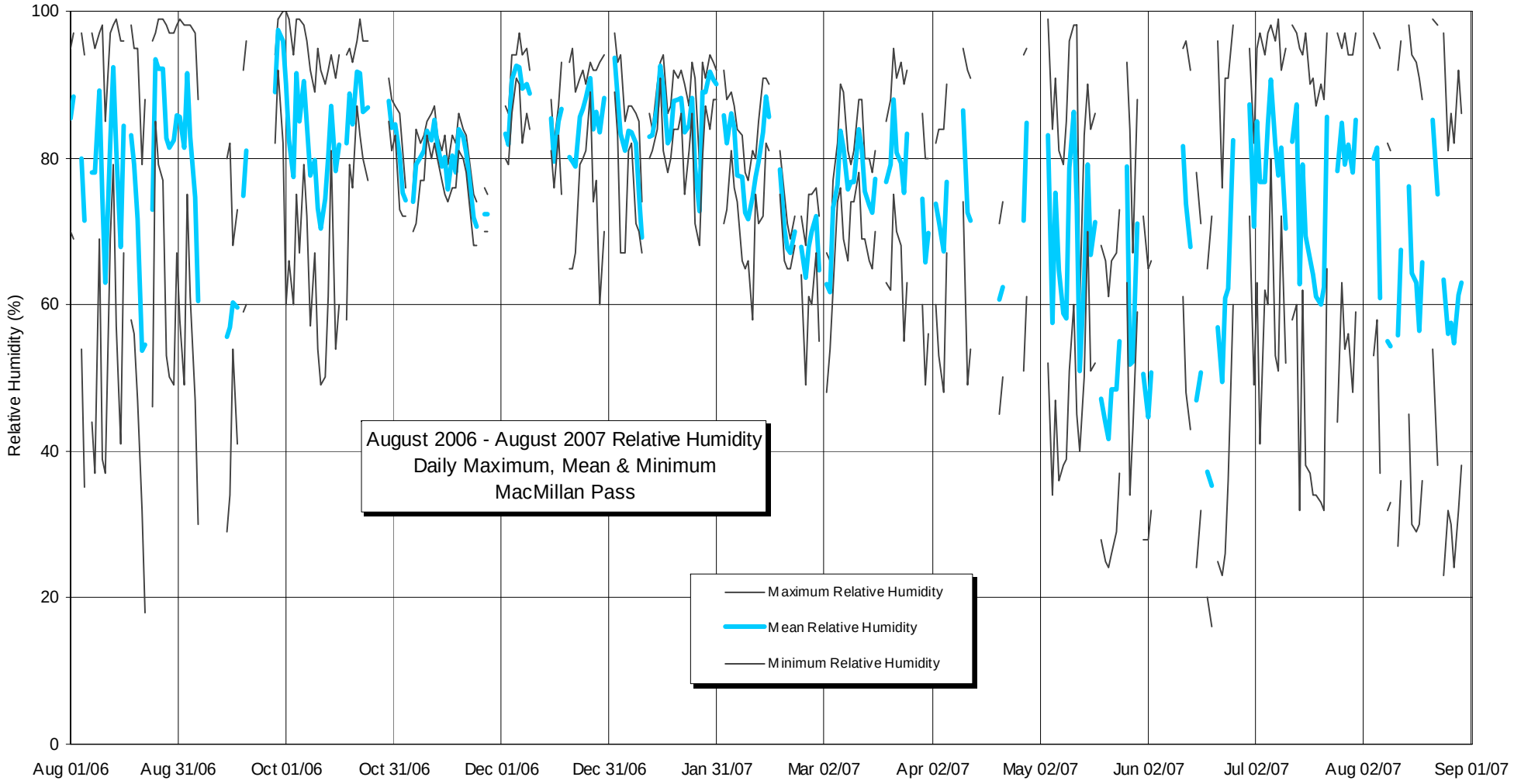
PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure 3.13

Fri Dec 21 08:31:39 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

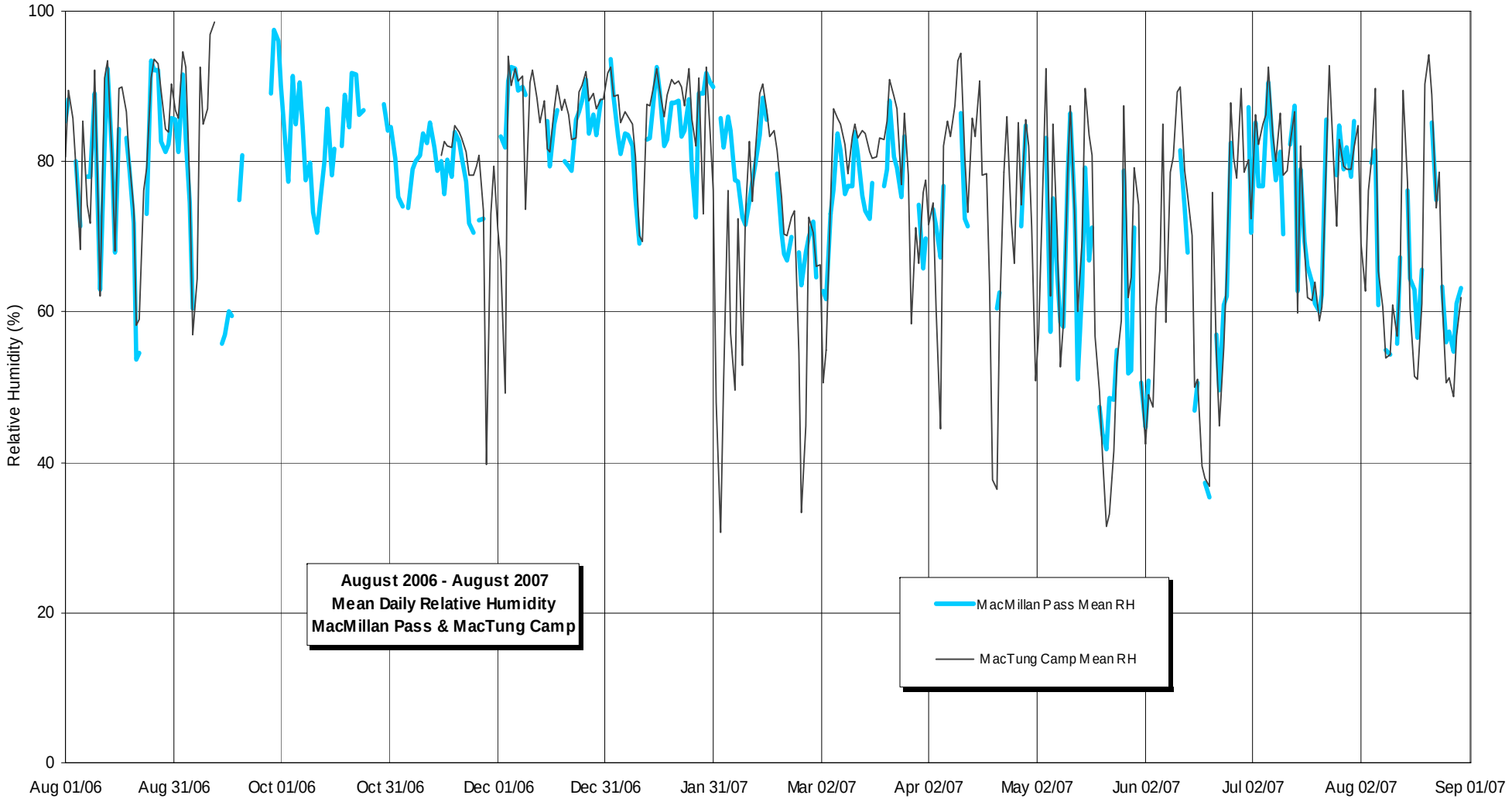
August 2006 - August 2007 Relative Humidity
Daily Maximum, Mean & Minimum
MacMillan Pass

PROJECT NO.	DWN	CKD	REV
W23101021	RFD	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure 3.14



NOTES

MacTung Camp data is missing for the period of September 13, 2006 to November 15, 2006 .

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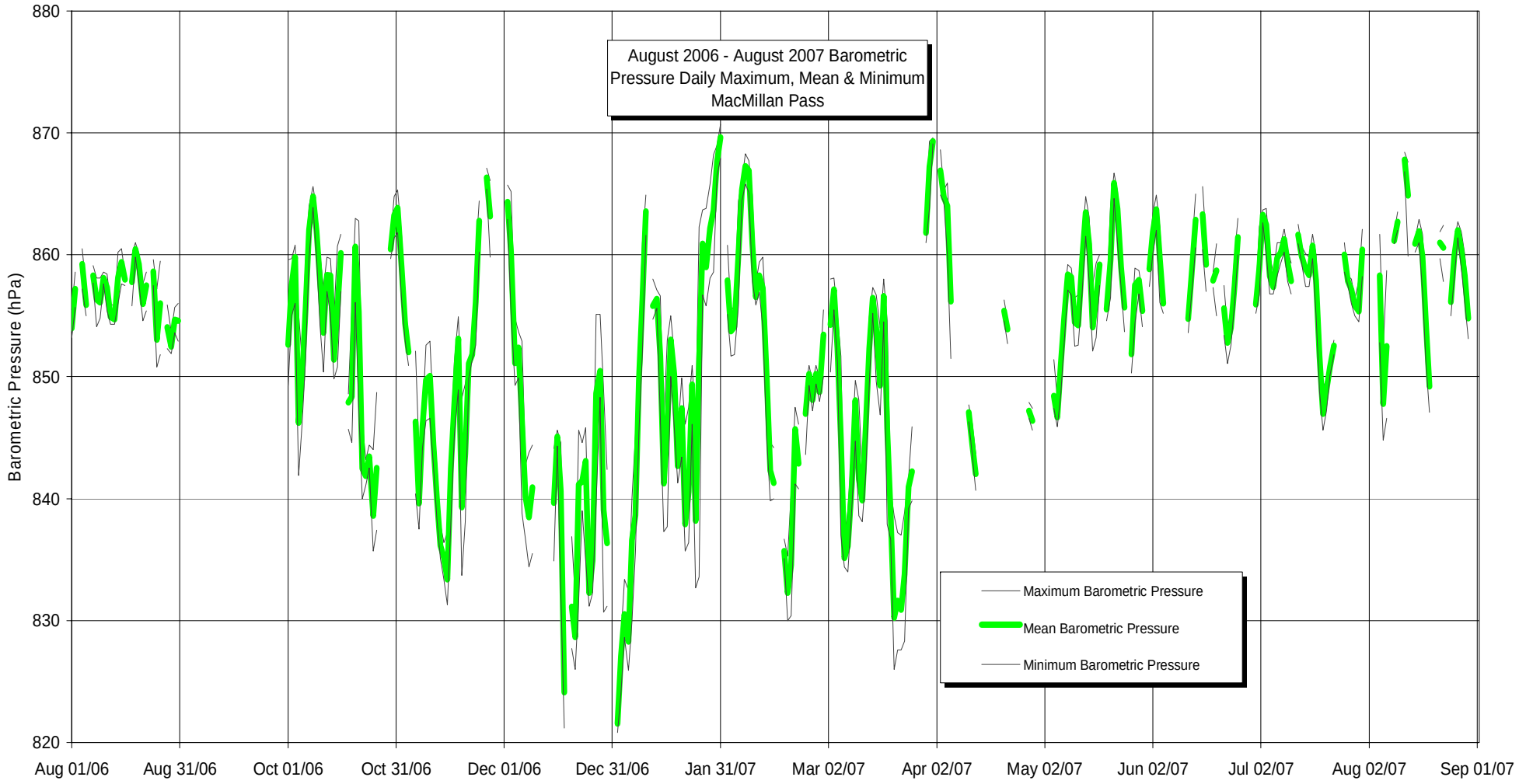
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

August 2006 - August 2007
Mean Daily Relative Humidity
MacMillan Pass & MacTung Camp

PROJECT NO.	DWN	CKD	REV
W23101021	RFD	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure 3.15



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

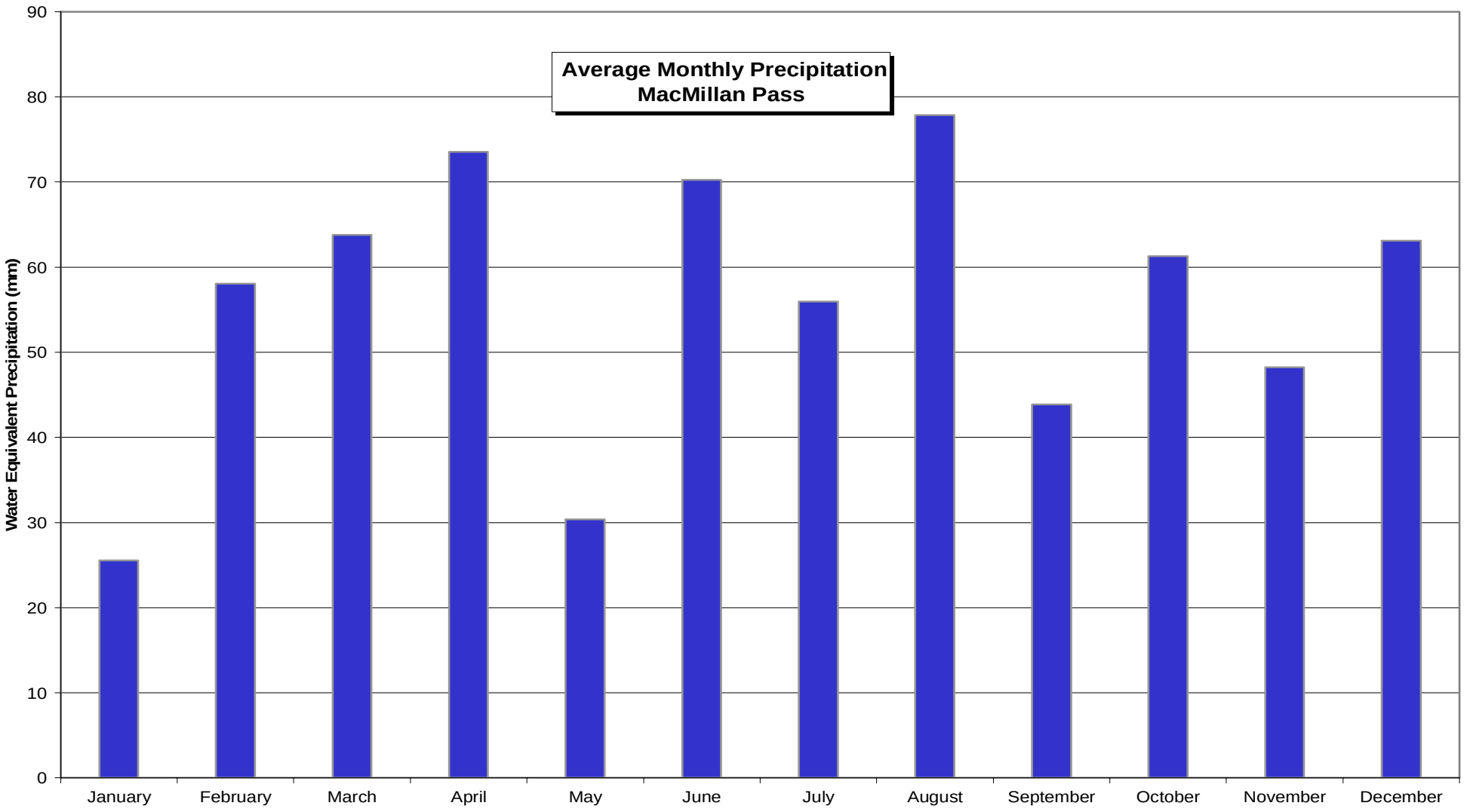
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

August 2006 - August 2007 Barometric Pressure Daily Maximum, Mean & Minimum MacMillan Pass

HAYCO HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W23101021	RFD	JAS	0
OFFICE: EBA-VANC	DATE: December 2007		

Figure 3.16



NOTES

Average monthly precipitation for MacMillan pass based on period of record from January 1998 to December 2005.

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

Average Monthly Precipitation
MacMillan Pass

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CKD	REV
W23101021	RFD	JAS	0
OFFICE: EBA-VANC	DATE: December 2007		

Figure 3.17

APPENDIX

APPENDIX A HYDROMETEOROLOGICAL SITE DESCRIPTIONS

Site Identification: Site: #1 **GPS Waypoint: TRIB A** **Name: Tributary A**

Site GPS Coordinates (NAD27): 130° 17' 19.0" Longitude 63° 17' 22.6" Latitude

Site Location:

Site 1, installed on July 8, 2006, is located on Tributary A approximately five km due west of the MacTung camp. The hydrometric station is located on the south-west side of the creek near the left bank approximately 50 m downstream of the junction of Tributary C with Tributary A. Tributary C drains the western portion of the MacTung property and is the discharge of interest for this project. The approximate site elevation is 1133 m above sea level.

Description:

Tributary A is a fast flowing creek with a moderate water surface slope. The reach selected for Site 1 flows to the northwest. The creek is wide (12 m) but shallow (0.4 m maximum depth) at the location of the hydrometric station. The creek bed consists of course gravel and rock with boulders up to 2 metres in diameter.

Instrumentation:

The hydrometric station consists of a PT2X stage recorded with a 5 PSI pressure transducer and a data logger which is housed in a .05 metre by 2.5 metres long galvanized steel pipe bolted to a large boulder. The data logger collects both depth of water over the pressure transducer and water temperature at 15-minute intervals. A Water Survey of Canada type staff gauge is mounted less than 1 metre away from the pressure transducer near the bank. The flow gauging station is located about 15 metres upstream from the hydrometric station in an area of the creek where there are no large boulders impeding the flow.

Specifics on Measurements:

1133.000 m sea level, benchmark elevation at the site (approximate)

1132.148 m sea level, elevation of zero reading on staff gauge

1132.300 m sea level, elevation of zero reading on pressure transducer

0.852 m difference in elevation from staff gauge zero reading to BM

0.700 m difference in elevation from pressure transducer to BM

0.152 m difference from staff gauge zero to transducer elevation

2620031 Serial number of the pressure transducer / data logger

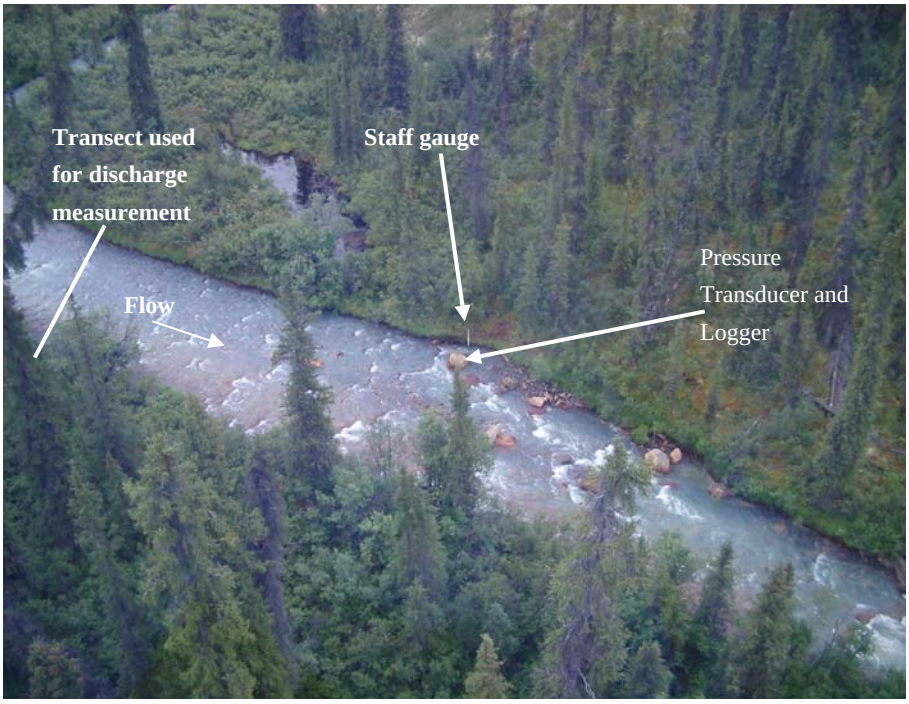


Photo A: Aerial view of the Tributary A hydrometric station.

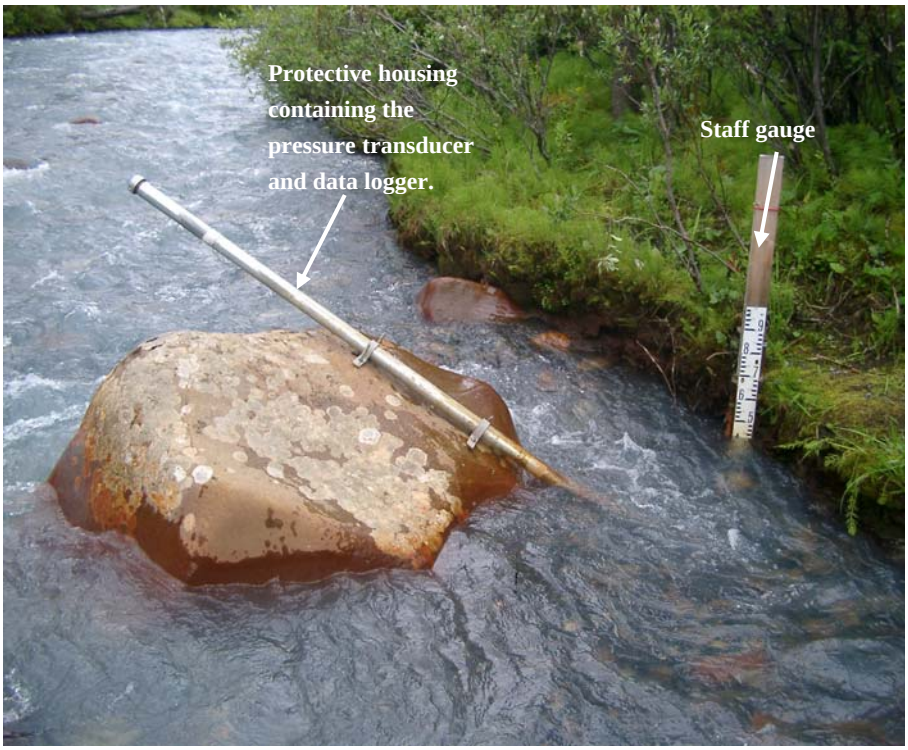


Photo B: View looking upstream at the Tributary A hydrometric station.

Site Identification: Site: #2 **GPS Waypoint: DALECR** **Name: Dale Creek**

Site GPS Coordinates (NAD27): 130° 01' 36.8" Longitude 63° 16' 44.7 " Latitude

Site Location:

Site 2, installed on July 10, 2006, is located on Dale Creek in the NWT. The hydrometric station is located 6 km east of the MacTung camp, downstream of the junction of the two branches of Dale Creek. Creek flow at this location is toward the east. The approximate site elevation is 1355 m above sea level.

Description:

The reach of Dale Creek where the station is installed has a gentle surface water slope. The creek is approximately 5 metres wide with a maximum depth of 0.5 m. The creek bed consists of gravel with small to medium size boulders up to 0.2 metre in diameter.

Instrumentation:

The hydrometric station includes a PT2X stage recorder consisting of a 5 PSI pressure transducer and a data logger which is housed in a .05 metre by 2.5 metres long galvanized steel pipe bolted to rock on the bank of the creek. The data logger collects both the depth of water over the pressure transducer as well as the water temperature at 15-minute intervals. A Water Survey of Canada type staff gauge is mounted approximately 12 m upstream of the pressure transducer. The flow gauging station is located approximately 2 metres downstream from the stage recording station in a portion of the river which is relatively level and has a bed consisting of gravel with no large boulders.

Specifics on Measurements:

1355.000 m sea level, benchmark elevation at the site (approximate)

1353.985 m sea level, elevation of zero reading on staff gauge

1353.500 m sea level, elevation of zero reading on pressure transducer

1.015 m difference in elevation from staff gauge zero reading to BM

1.500 m difference in elevation from pressure transducer to BM

-0.485 m difference from staff gauge zero to transducer elevation

2524014 Serial number of the pressure transducer / data logger

Photographs of the Dale Creek Site:

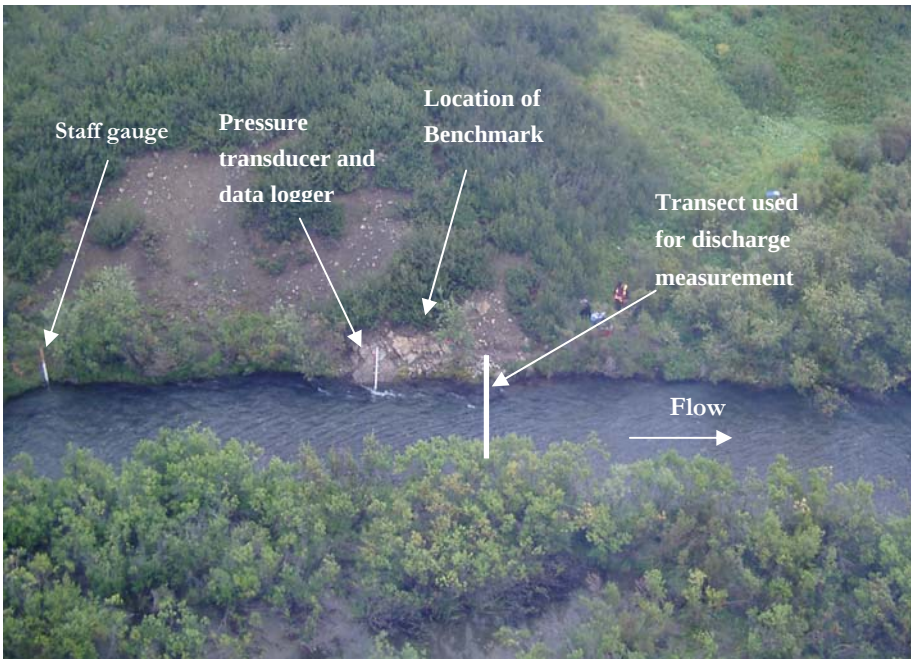


Photo A: Aerial view of the Dale Creek hydrometric station.

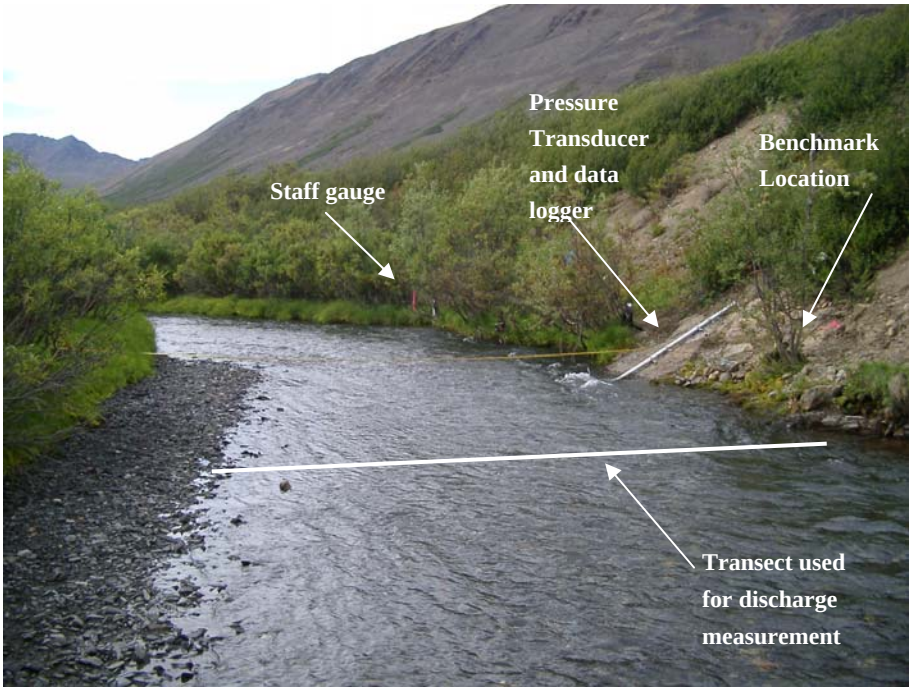


Photo B: View looking upstream at the Dale Creek Hydrometric Station

Station Name: MacTung Camp Station **Date of Installation: July 15, 2005**

Station Coordinates (NAD27): North 63° 16' 50.2" Tower Height: 3 m
West 130° 8' 50.3" Site elevation above sea level: 1860 m
Magnetic Deviation: 26.47° or TN=333.53° mag. North alignment pole set 333.53°mag.

Site Description:

This weather station consists of a standard three meter meteorological tower with instrumentation to measure wind speed and direction, air temperature, relative humidity, soil temperature and a pyranometer for incident solar radiation. The station is powered by a 12 Vdc 8.5 Ahr battery with a 20-watt solar panel for charging. Data is recorded to a Campbell Scientific CR10X data logger. The data collection cycle is 5 seconds and the data is averaged over the 15 minute archiving period and saved to the logger memory. Station memory capacity exceeds one year of data at the current sampling rate.

Site Location:

The station is located on the MacTung property in a clearing overlooking MacMillan Pass. It is approximately 50 metres south of the MacTung camp site.

Installation Notes:

The tripod tower was fixed to the ground by stakes and then large boulders were placed on each of the tripod legs to further secure the tower. There are no wind obstructions within 50 metres of the station.

Recorded Data:

The two tables below show examples of the data array collected every 15 minutes as well as a 24-hour summary of the day's maximums and minimums.

15 Minute Record

Date	Time (hhmm)	Wind Speed (m/s)	Wind Direction (degrees)	SD Wind Direction (degrees)	Air Temp (°C)	Relative Humidity (%)	Pyrano-meter W/m2	Soil Temp (°C)
Aug 21/07	900	1.093	81.5	28.42	3.33	95.8	83.60	6.092
Aug 21/07	915	0.603	78.6	31.56	2.78	96.7	97.48	6.071
Aug 21/07	930	0.343	138.5	26.88	3.34	94.7	103.66	6.057

Daily Summary

Date	Time (hhmm)	Wind Speed (m/s)	Maximum Logger Box Temperature (°C)	Minimum Logger Box Temperature (°C)	Minimum Battery Voltage (Vdc)	Station ID
Aug 21/06	2400	8.383	13.64	4.509	12.65	1
Aug 22/06	2400	6.082	11.51	3.469	12.64	1
Aug 23/06	2400	6.092	6.77	1.210	12.65	1

Station Instrumentation:

The MacTung Camp weather station is a standard three meter meteorological tower, with instrumentation to measure wind speed and direction, air temperature, relative humidity and incident solar radiation. The meteorological station is powered by a 12 V DC battery and 20-watt solar panel. Data is recorded to a Campbell Scientific CR10X data logger.

Brief descriptions of these instruments, based on material provided by the manufacturers, are provided below.

Meteorological Station Instrumentation Parameters

Instrument	Model	Measuring Range	Sensitivity/Accuracy
Wind Monitor	05103-10 R.M. Young	0 to 60 m/s 0 to 100 m/s gusts	Accuracy ±0.3 m/s Threshold wind = 1.0 m/s
		0 to 355 degrees	±1.4°
Relative Humidity /Air Temperature Probe	CS500-U Vaisala	Relative Humidity 0.0 to 100	Accuracy at 20 °C ±3% RH (10-90% RH) ±6% RH (90-100% RH)
		Air Temperature -40° to +60°C	Accuracy at 20 °C ± 0.4 °C
Pyranometer	LI200S LI-COR	Spectral Waveband. 400-1100 nm	1.0% Linearity (at 3000 W/m²) 2.0% Non stability (% change/year)
Soil Temperature	107B	-35° to +50°C	Less than ±0.5 °C

Wind Speed and Direction Monitor:

Model 05103-10 Wind Speed and Direction Monitor is manufactured by R.M. Young. It is composed of a four-blade propeller mounted on a torpedo-shaped wind vane. Rotation of the propeller produces an alternating current with a frequency that is directly proportional to the wind speed. Wind direction is sensed by a potentiometer that is excited by an applied voltage.

The potentiometer outputs a voltage that is directly proportional to the azimuth angle. Wind data is collected every five seconds and the mean wind vector magnitude and direction are calculated and stored at 15 minute intervals. The standard deviation of wind direction is also determined and indicates the variability of wind direction over the archiving period.

Temperature and Relative Humidity Probe:

The CS500-U relative humidity and air temperature probe measures relative humidity (RH) using a laser-trimmed INTERCAP capacitive chip. Temperature is measured with a 1000 ohm platinum resistance thermometer (PRT). Both sensors are enclosed in a 6-plate gill radiation shield designed to shield the sensors from precipitation and solar radiation.

Pyranometer:

A pyranometer is a device used to measure incident solar radiation. The LI-COR LI-200S pyranometer consists of a high stability silicon photovoltaic detector (blue enhanced), which converts incident solar radiation to an electrical signal proportional to the received solar radiation. The photodiode is housed in a weatherproof anodized aluminum case with an acrylic diffuser. It has a spectral sensitivity between 400 and 1100 nm.

Data Storage:

Data is recorded to a Campbell Scientific CR10X data logger. The archiving interval for all parameters is 15 minutes. At a 15-minute sample frequency, the station will log more than a year of data before filling the memory module. Meteorological data on all instruments is collected at 5-second intervals, then averaged over the archiving period and saved to the logger memory every 15 minutes. At the conclusion of each 24-hour period, a daily summary is saved to the logger memory. Variables that are indicative of the status of the meteorological station, such as battery power and internal logger temperatures, are saved in this 24-hour data array.

Station Power:

The meteorological station is powered by a 12 V DC battery, a 20-watt solar panel and a charge regulator, all of which are attached to the three meter tripod. With this power configuration the station can operate unattended for more than a year.

Photograph of the MacTung Meteorological Station

Station Name: MacMillan Pass **Date of Installation: February 1, 1998**

Station Coordinates (NAD27): North 63º 14' 36.9" Tower Height: 10 m
West 130º 2' 7.1" Site elevation above sea level: 1379 m

Site Description:

This weather station is operated by the Meteorological Services of Canada (MSC). It consists of a ten metre meteorological tower with instrumentation to measure hourly values for wind speed and direction, air temperature, relative humidity, barometric pressure and dew point temperature. Other instrumentation mounted at ground level record daily totals for rainfall, snowfall, total precipitation and snow depth. The station is powered by 12 V DC batteries and uses a solar panel for charging augmented by a 12 V DC wind powered generator.

Site Location:

The station is located in MacMillan pass about 7 kilometres southwest from the MacTung camp site. It is in the Northwest Territories near the border between the Yukon and Northwest Territories. The station is approximately 25 metres north of the access road that connects MacTung Camp to the MacMillan Airstrip.

Installation Notes:

The station is located in a clear area with no nearby trees. The ground cover consists of squat bushes and lichens. The base of the tower is mounted to a concrete base and the top of the tower is further secured by guy wires. The remaining meteorological instruments, not mounted on the tower, are located within a 15 metre radius of the tower.

Recorded Data:

The two tables below show examples of the hourly collected data and the 24 hour summary:

15 Minute Record

Date	Time (hhmm)	Air Temp (ºC)	Dew Point Temp (degrees)	Relative Humidity (%)	Wind Dir Direction (10's deg)	Wind Speed (km/h)	Standard Pressure hPa
Aug 02/06	10:00	7.9	6.6	91	20	11	85.73
Aug 02/06	11:00	9.5	7.3	86	20	11	85.73
Aug 02/06	12:00	9.3	6.1	80	20	13	85.74

Daily Summary

Date	Maximum Air Temperature (ºC)	Minimum Air Temperature (ºC)	Mean Air Temperature (ºC)	Heat Degree Days (ºC)	Cool Degree Days (ºC)	Total Precip (mm)	Total Snow (cm)	Snow on Ground (cm)	Direction of Max Wind Gust (10's deg)	Speed Of Max Wind Gust (10's deg)
Oct 21/06	2.0	-3.6	-0.8	18.8	0	0	7	6	19	32
Oct 22/06	3.7	-3.5	0.1	17.9	0	0	1	11	23	43
Oct 23/06	-1.5	-5.3	-3.4	21.4	0	0	1	13	23	32

Station Instrumentation:

Brief descriptions of these instruments, based on material provided by the manufacturers, are provided below.

Meteorological Station Instrumentation Parameters

Instrument	Model	Measuring Range	Sensitivity/Accuracy
Wind Monitor (Two units installed for the station)	05103-10 R.M. Young	0 to 60 m/s 0 to 100 m/s gusts	0 to 100 m/s gusts Threshold wind = 1.0 m/s
		0 to 355 degrees	±1.4°
Relative Humidity /Air Temperature Probe	HMP45C Vaisala	Relative Humidity 0.0 to 100	Accuracy at 20 ºC ±2% RH (10-90% RH) ±3% RH (90-100% RH)
		Air Temperature -40° to +60°C	Accuracy at 20 ºC ± 0.4 ºC
Barometric Pressure Sensor	SBP270 Setra	800 – 1100 hPa	± 0.2 hPa accuracy ±0.1% long term stability
Tipping Bucket Rain Gauge	TB3 Hydrological Services Pty.	0 to 700 mm/hr	± 3% accuracy (25-500 mm/hr) 0.25 mm resolution
All- weather precipitation gauge	Ott Pluvio	0 to 250 mm then needs to be drained	0.25 mm resolution 0.04 mm accuracy
Snow depth sensor	SR50-45 Sonic Ranger 50KHz	0.5 to 10 metres	±1.0 cm accuracy or ± 0.4% of distance to target (whichever is greater)
Soil temperature	107B	-35° to +50°C	Less than ±0.5 ºC

Wind Speed and Direction Monitor:

The Model 05103-10 Wind Speed and Direction Monitor is manufactured by R.M. Young. It is composed of a four-blade propeller mounted on a torpedo-shaped wind vane. Rotation of the propeller produces an alternating current with a frequency that is directly proportional to the wind speed. Wind direction is sensed by a potentiometer that is excited by an applied voltage. The potentiometer outputs a voltage that is directly proportional to the azimuth angle.

Temperature and Relative Humidity Probe:

The Vaisala HMP45C relative humidity and air temperature probe measures relative humidity (RH) using a HUMICAP capacitive polymer H chip. Temperature is measured with a 1000 ohm platinum resistance thermometer (PRT). Both sensors are enclosed in a radiation shield designed to shield the sensors from precipitation and solar radiation.

Barometric Pressure Sensor:

The station uses a SBP270 Setra Barometric Pressure Sensor to measure barometric pressure conditions at the site consisting of a SETRACERAM capacitive sensor and an IC analog circuit.

Tipping Bucket Rain Gauge:

The TB3 Hydrological Services Pty. Tipping rain gauge measures water equivalent precipitation. The unit consists of a 200 mm diameter collector funnel, a stainless steel filter and a tipping bucket mechanism. The bucket tips when precipitation of 0.2 mm has been collected. Each tip is marked by a reed switch closure and stored on the Data Logger.

All-Weather Precipitation Gauge:

The Ott Pluvio all-weather precipitation gauge allows for the continuous and automatic recording of precipitation volume and intensity. An electronic weighing cell measures the weight of precipitation in the collection container. The gauge is equipped with an integrated multi-channel data logger and an RS-232C interface for downloading or linking to a remote data-transmission system. Hardware and software filters are included to minimize the distortion of the precipitation signal that may be influenced by wind, temperature, and/or evaporation. The gage has an aerodynamic protective housing made of stainless steel.

Snow Depth Sensor:

The SR50-45 Sonic Ranger is based on an electronic transducer that determines the distance to a target by sending out ultrasonic pulses and measuring the time it takes for the echoes to return.

Soil Temperature:

The 107B soil temperature sensor consists of a thermistor encapsulated in a cylindrical aluminum housing.

Data Storage:

Data is recorded to a data logger. The archiving interval for all parameters is 1 hour. At the conclusion of each 24-hour period, a daily summary is saved to the logger memory.

Station Power:

The meteorological station is powered by a 12 V DC battery and a 20-watt solar panel which are attached to the 10 metre tower. A Rutland 910 Series wind generator is attached to a four metre tower, and augments power supplied to the station.

Photograph of the MSC MacMillan Pass Meteorological Station

APPENDIX

APPENDIX B MACTUNG CAMP MONTHLY WIND DATA – AUGUST 2006 TO AUGUST 2007

APPENDIX B

Monthly MacTung Camp Wind Summaries

August 2006 – August 2007

B-01 MacTung Camp Wind Data – August 2006

B-02 MacTung Camp Wind Data – September 2006

B-03 MacTung Camp Wind Data – October 2006

B-04 MacTung Camp Wind Data – November 2006

B-05 MacTung Camp Wind Data – December 2006

B-06 MacTung Camp Wind Data – January 2007

B-07 MacTung Camp Wind Data – February 2007

B-08 MacTung Camp Wind Data – March 2007

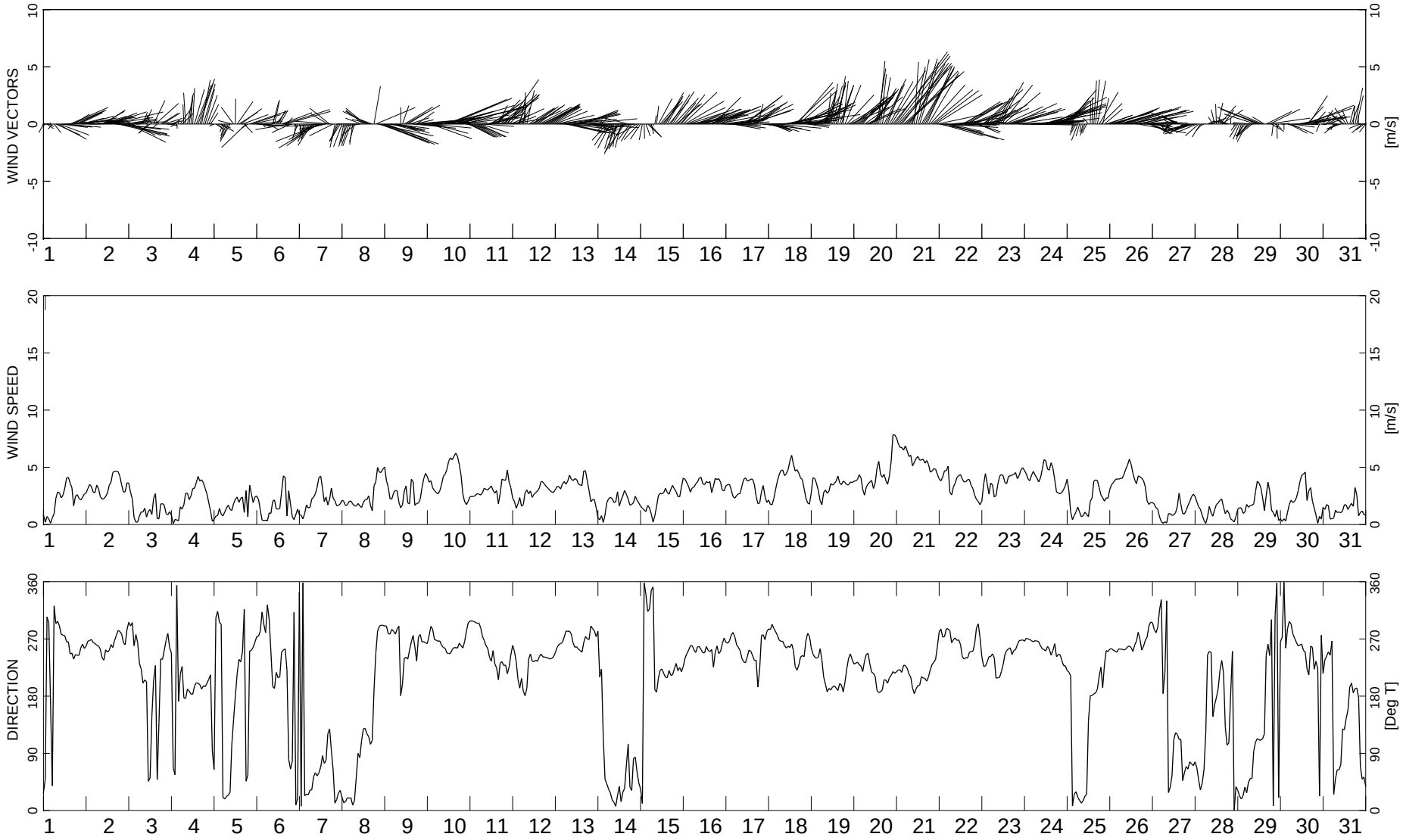
B-09 MacTung Camp Wind Data – April 2007

B-10 MacTung Camp Wind Data – May 2007

B-11 MacTung Camp Wind Data – June 2007

B-12 MacTung Camp Wind Data – July 2007

B-13 MacTung Camp Wind Data – August 2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

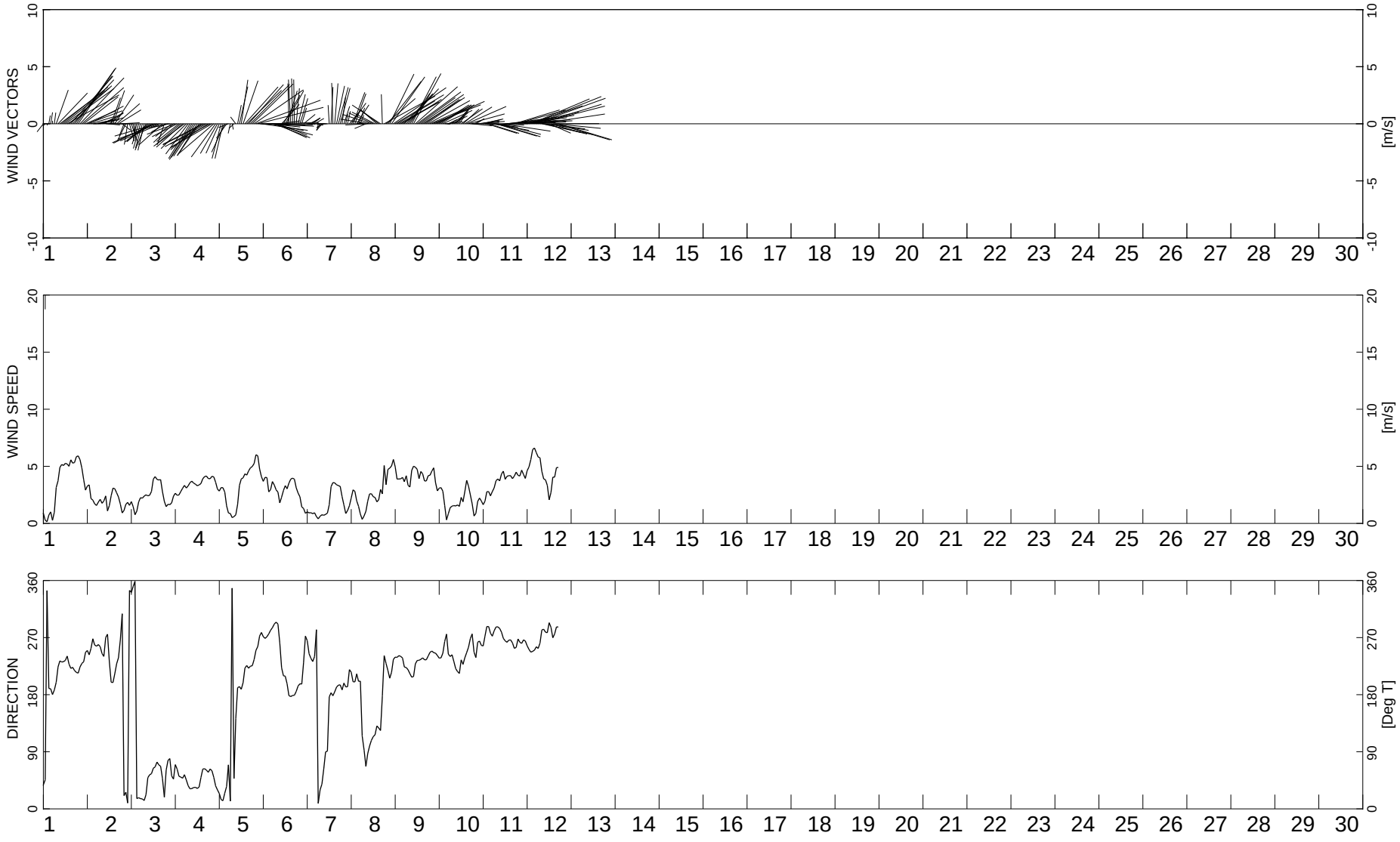
MACTUNG CAMP
WIND DATA
AUGUST 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-01

Thu Dec 06 13:30:42 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007



Data is missing from Sept.13 to Nov.15 2006

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
SEPTEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-02

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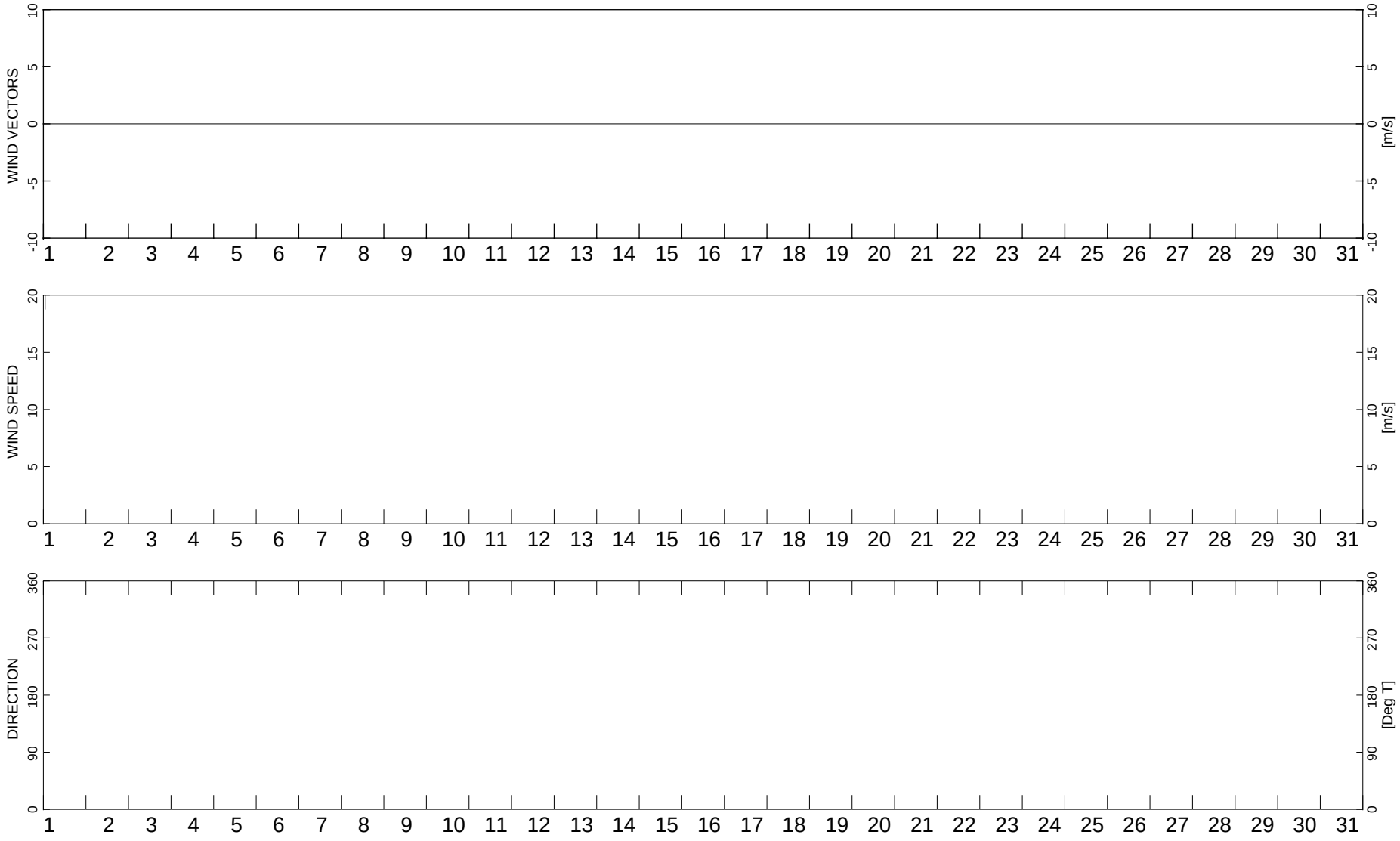

Data is missing from Sept.13 to Nov.15 2006

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
OCTOBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-03

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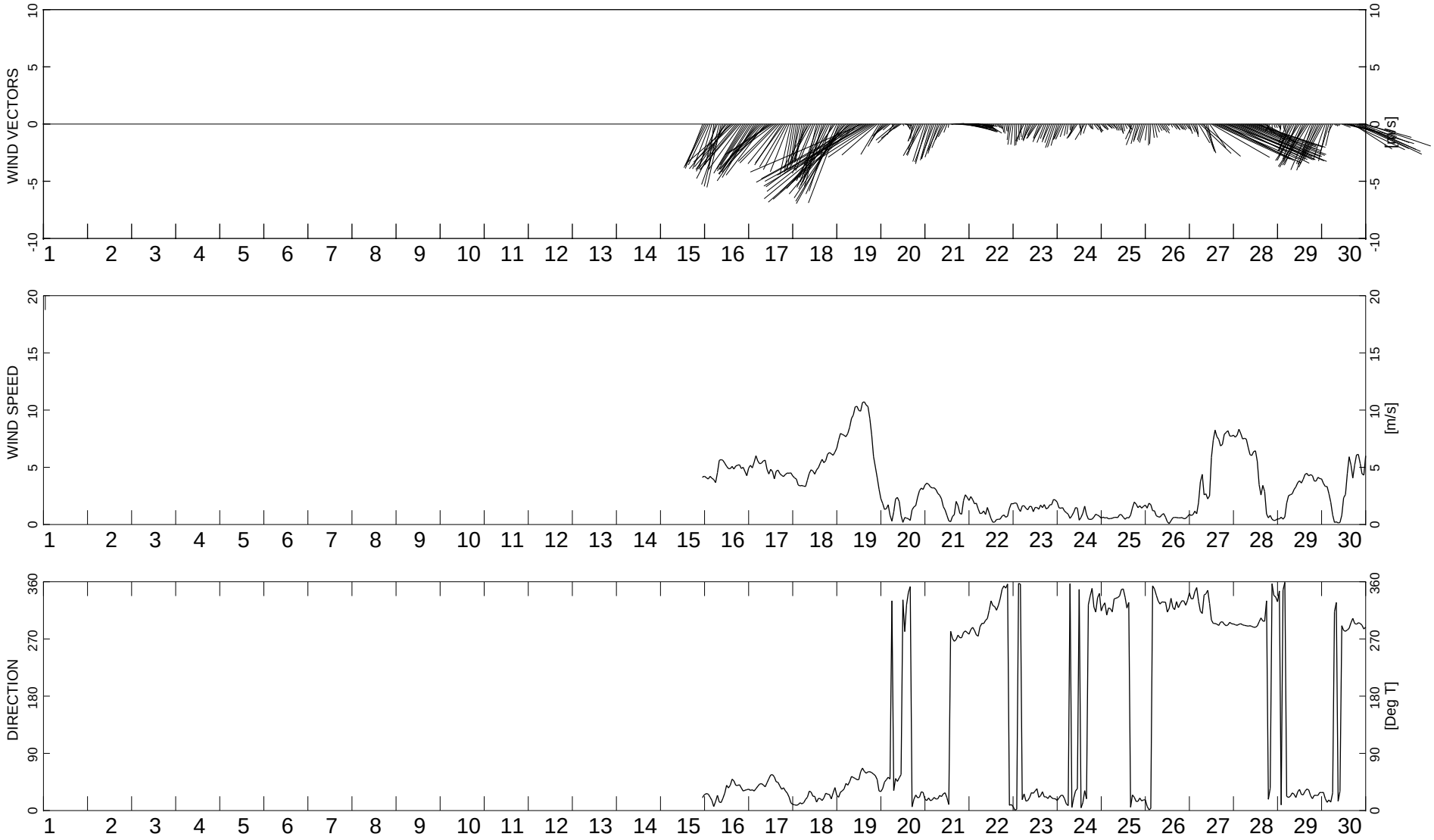

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

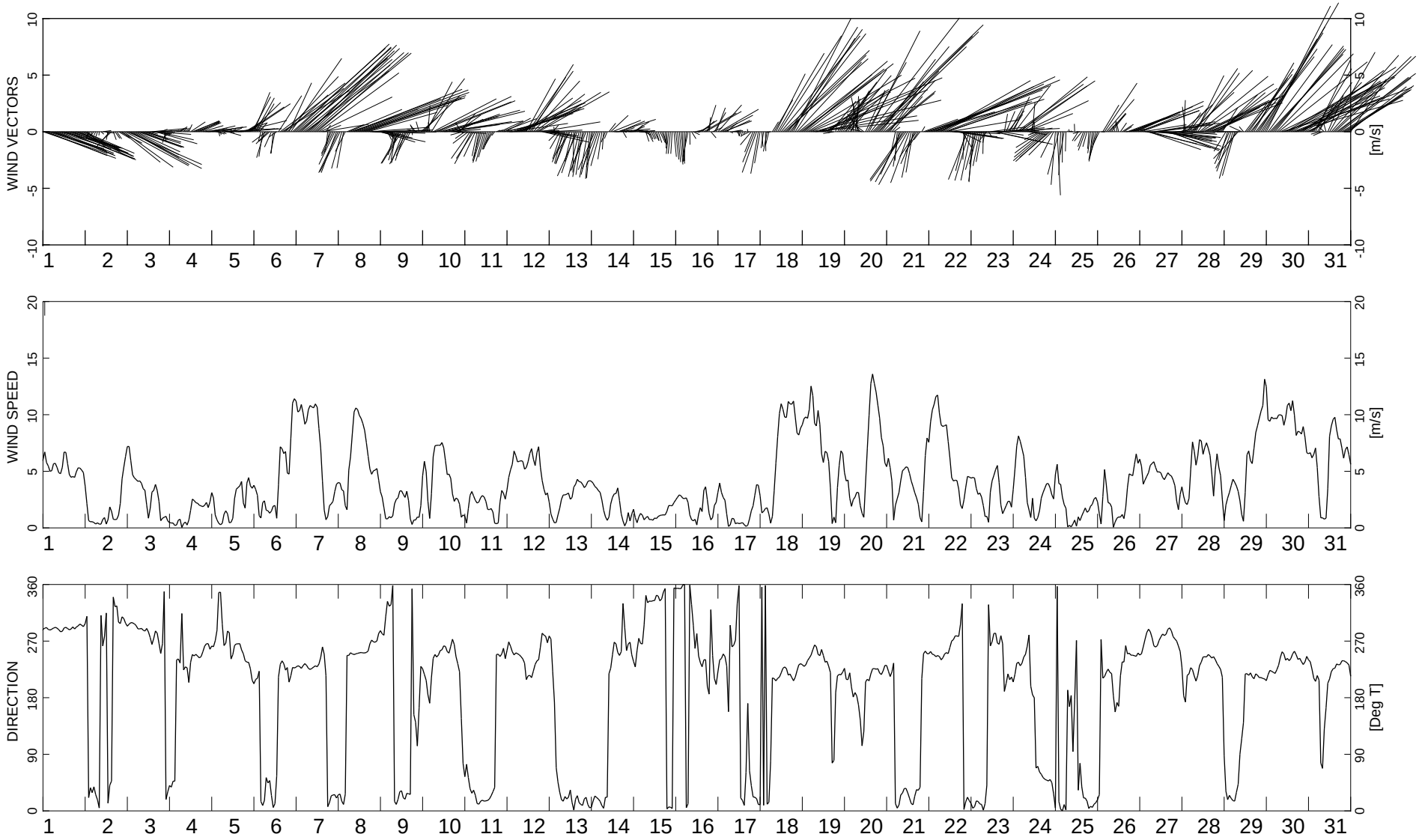
MACTUNG CAMP
WIND DATA
NOVEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure B-04



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
DECEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure B-05

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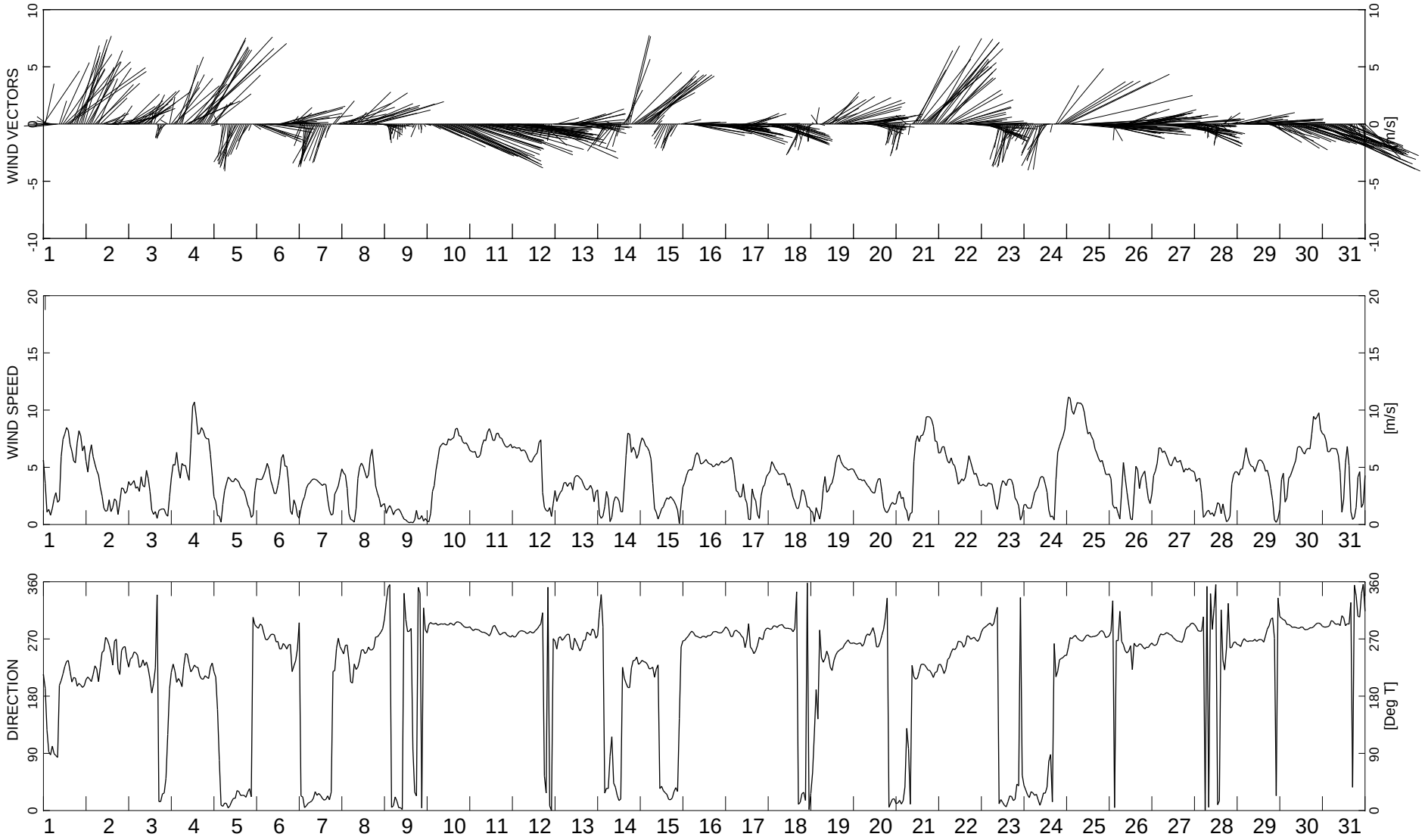

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
JANUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-06

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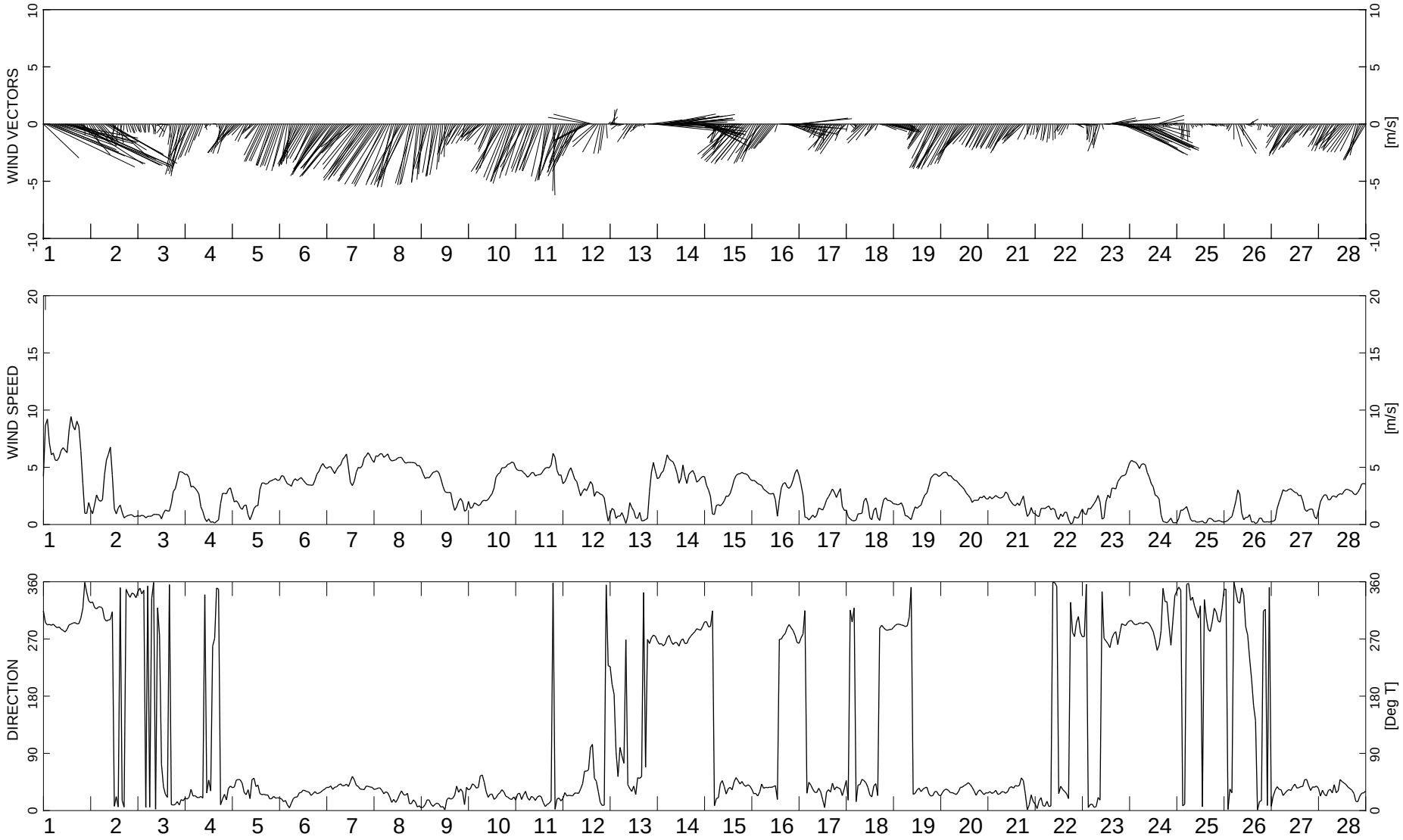

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
FEBRUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-07

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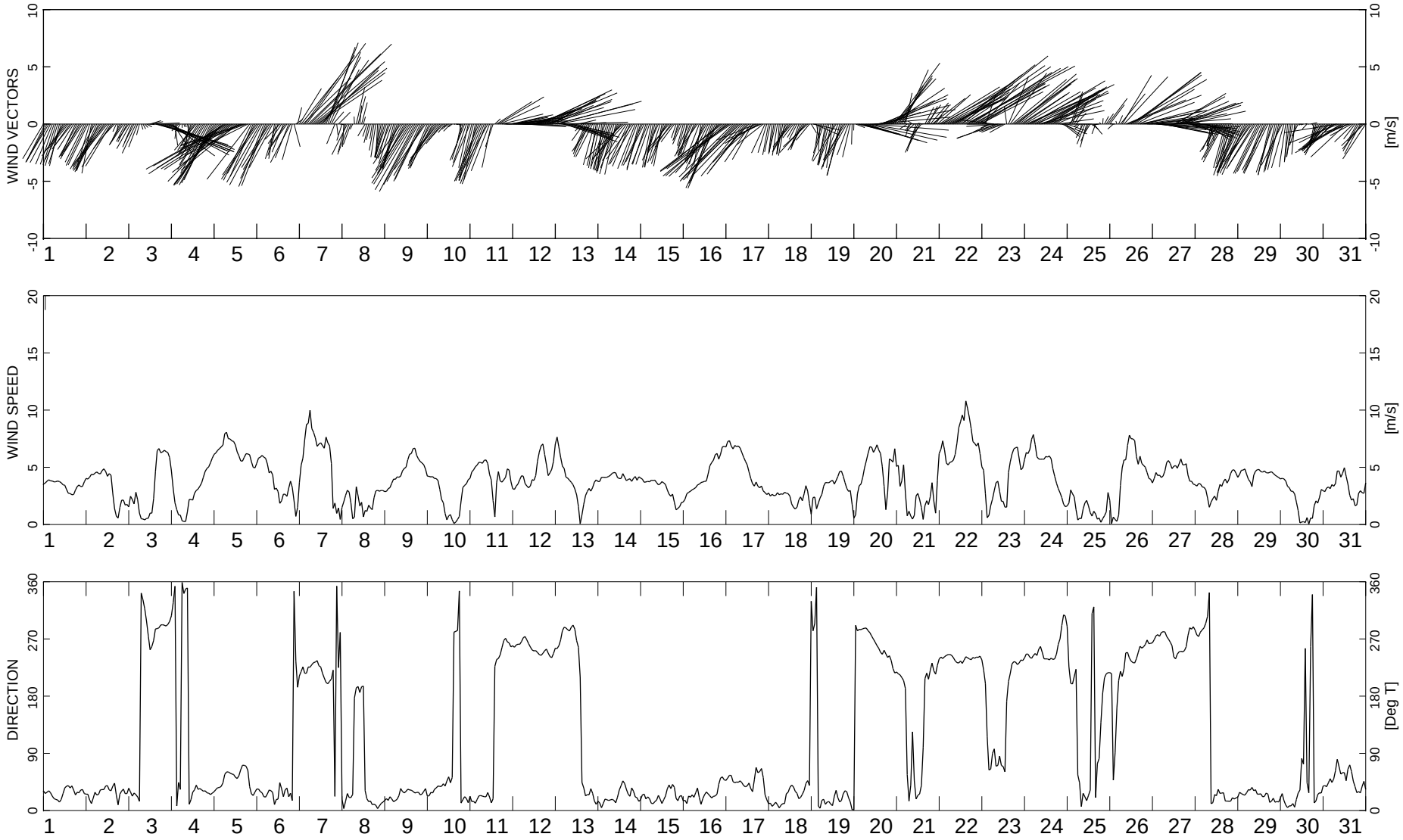

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

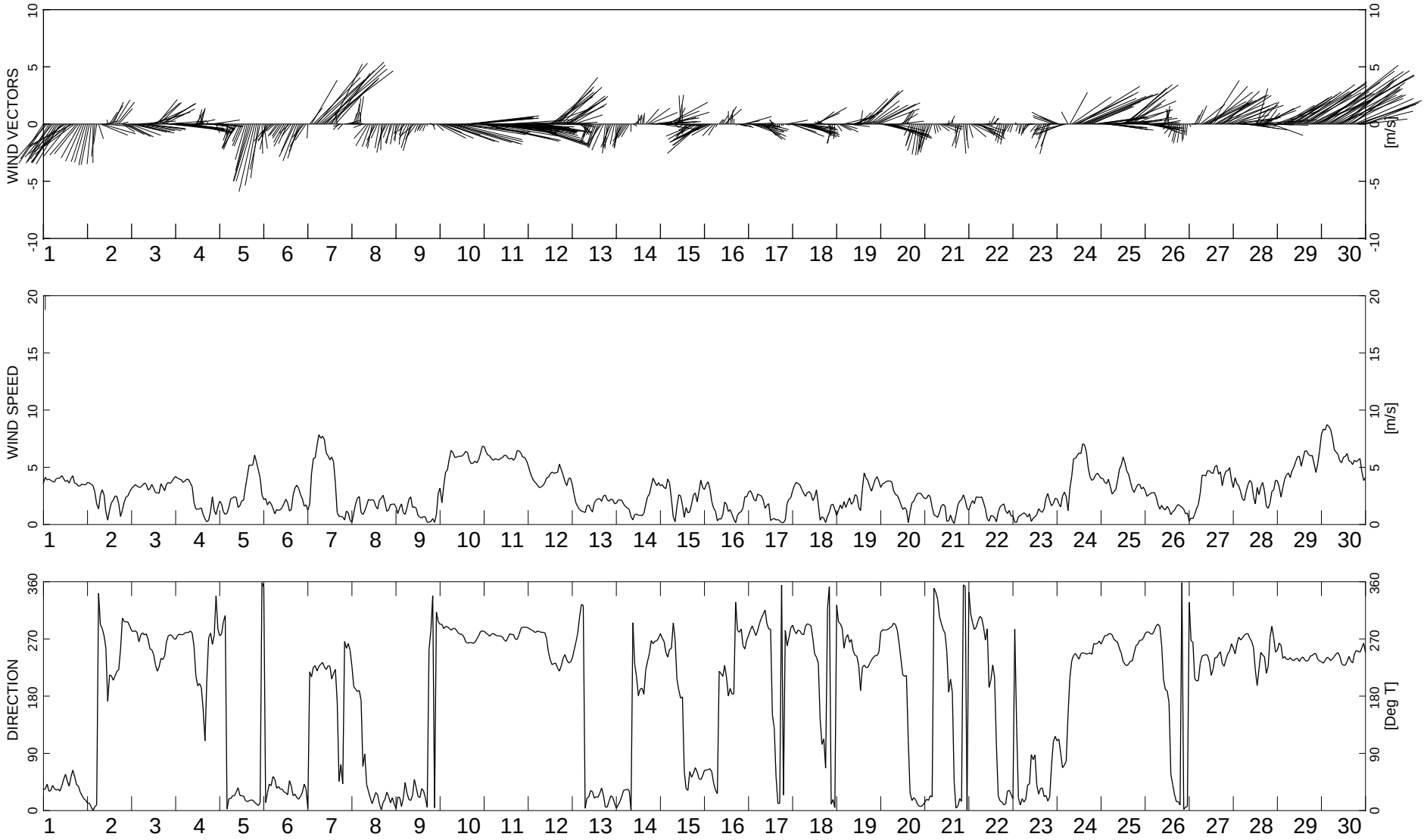
MACTUNG CAMP
WIND DATA
MARCH 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-08

Thu Dec 06 13:30:51 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
APRIL 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure B-09

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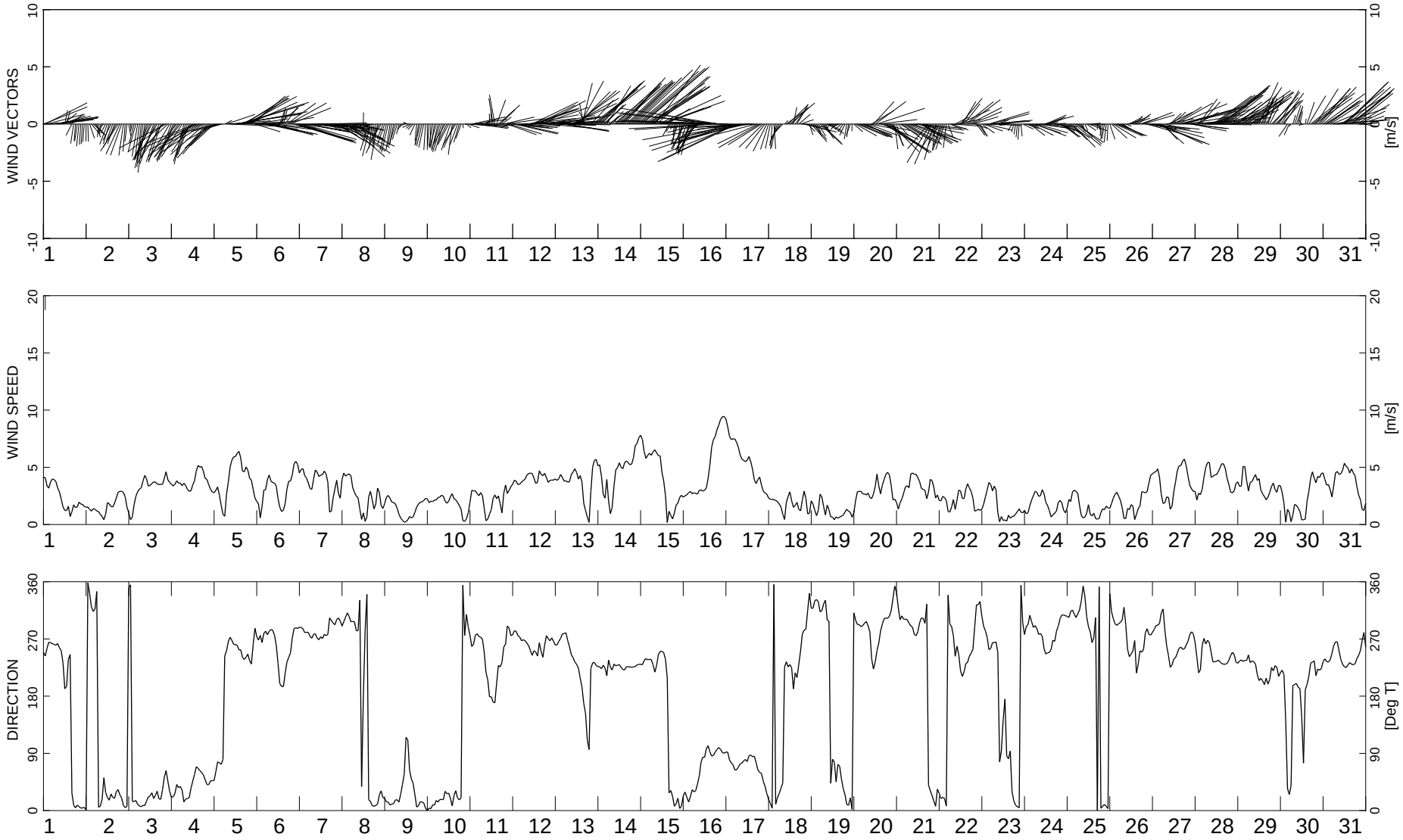

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
MAY 2007

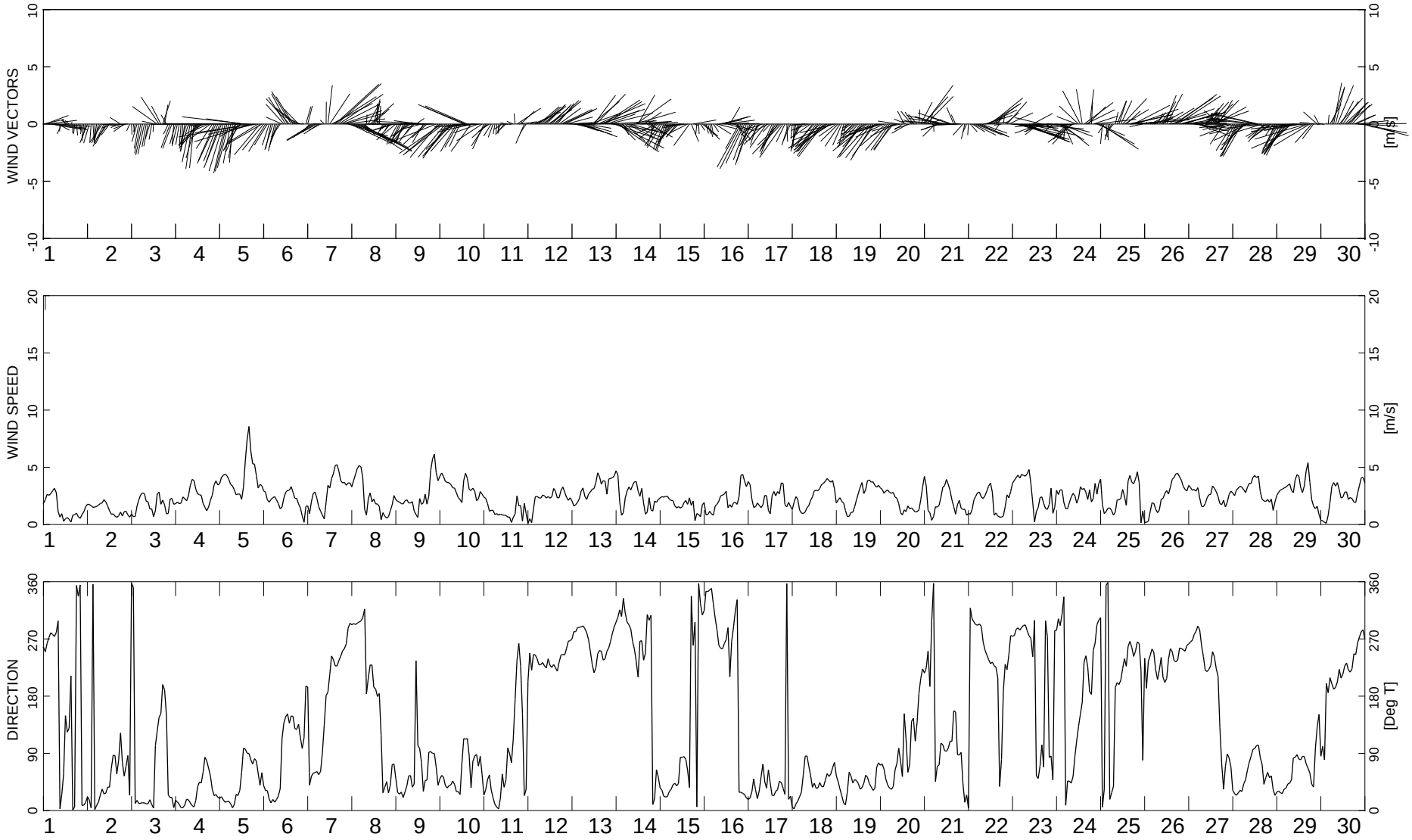
PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure B-10

Thu Dec 06 13:30:54 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

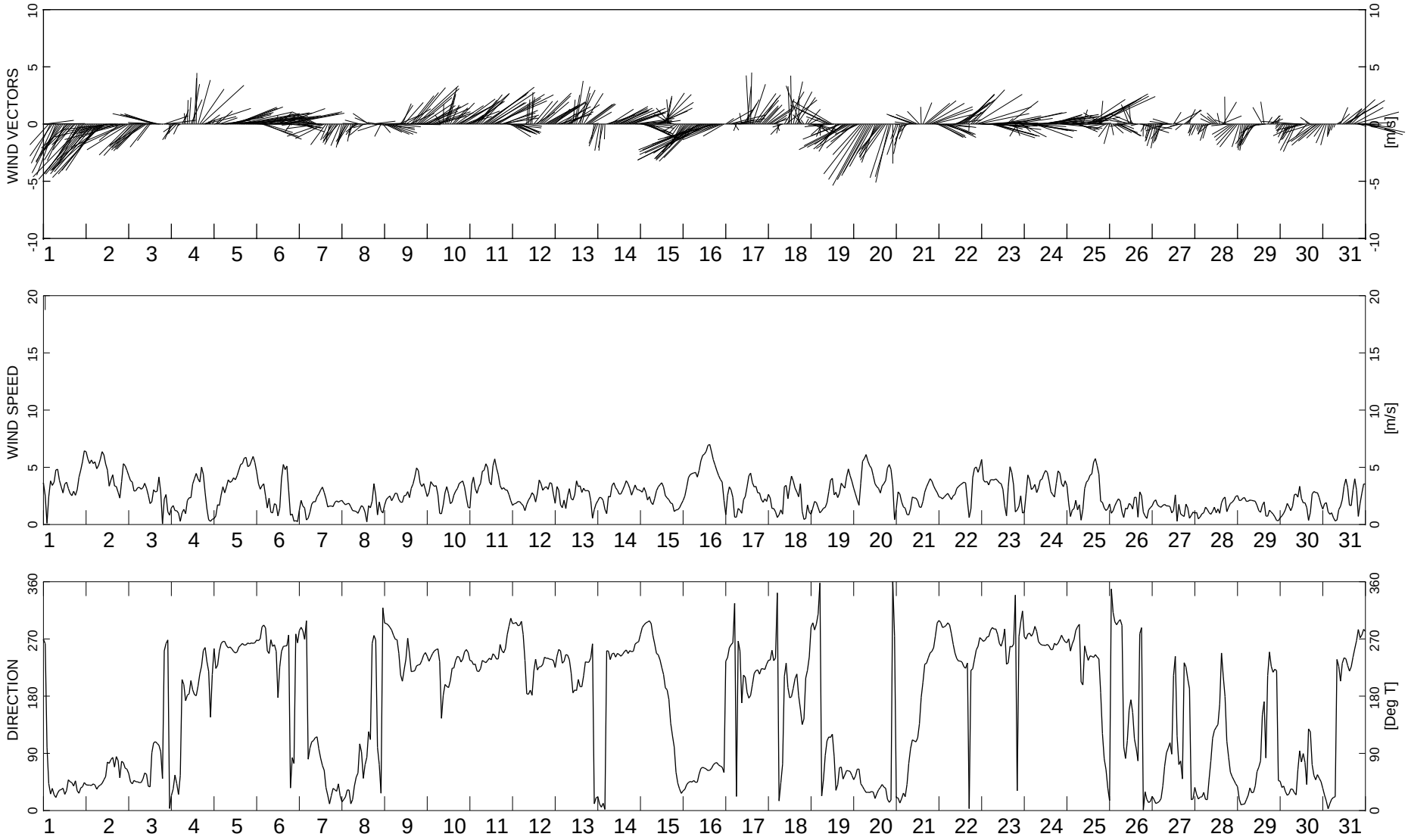
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
JUNE 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure B-11

Thu Dec 06 13:30:55 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

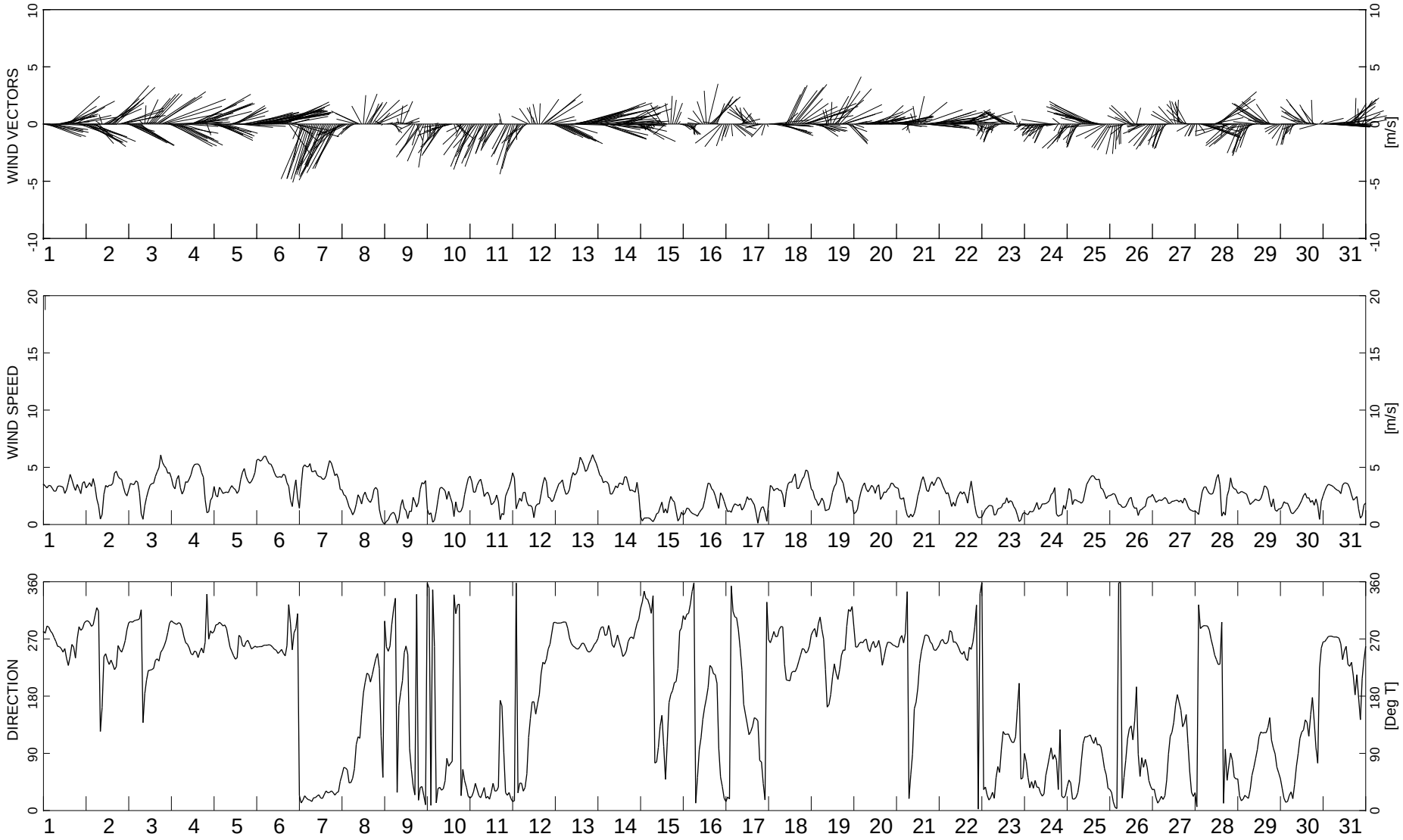
MACTUNG CAMP
WIND DATA
JULY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure B-12

Thu Dec 06 13:30:56 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND DATA
AUGUST 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure B-13

Thu Dec 06 13:30:58 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\data_reduction_programs\Aug2006_Aug2007

APPENDIX

APPENDIX C MACTUNG CAMP MONTHLY WIND ROSES – AUGUST 2006 TO AUGUST 2007

APPENDIX C

MacTung Camp Monthly Wind Roses

August 2006 – August 2007

C-01 MacTung Camp Wind Rose – August 2006

C-02 MacTung Camp Wind Rose – September 2006

C-03 MacTung Camp Wind Rose – October 2006

C-04 MacTung Camp Wind Rose – November 2006

C-05 MacTung Camp Wind Rose – December 2006

C-06 MacTung Camp Wind Rose – January 2007

C-07 MacTung Camp Wind Rose – February 2007

C-08 MacTung Camp Wind Rose – March 2007

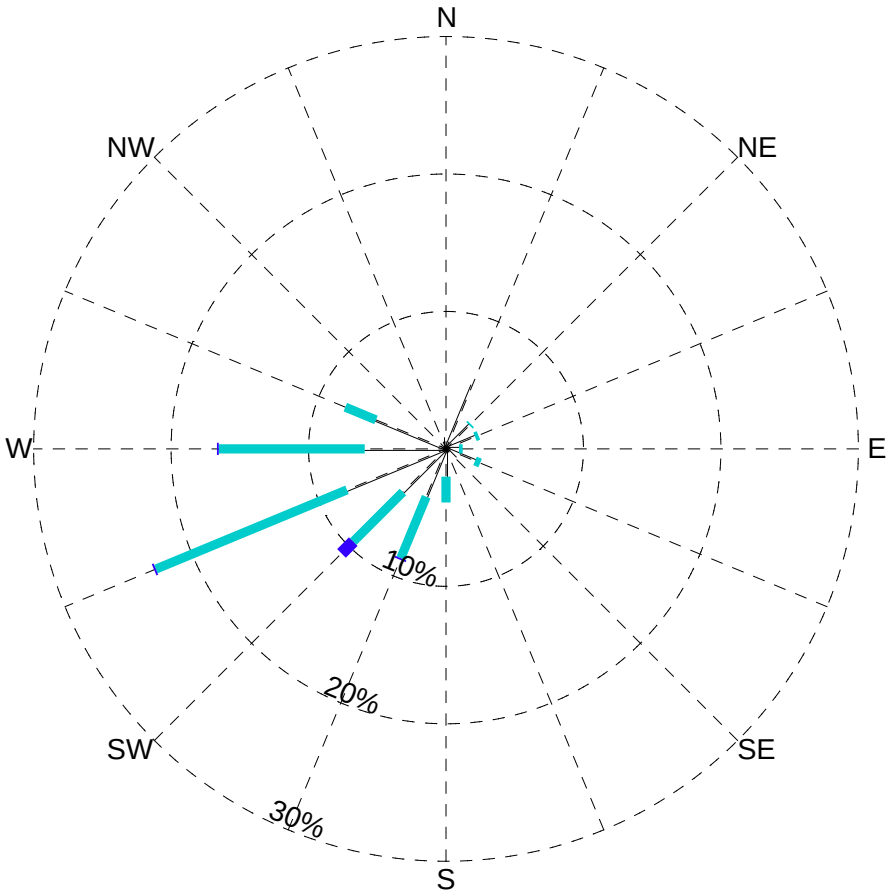
C-09 MacTung Camp Wind Rose – April 2007

C-10 MacTung Camp Wind Rose – May 2007

C-11 MacTung Camp Wind Rose – June 2007

C-12 MacTung Camp Wind Rose – July 2007

C-13 MacTung Camp Wind Rose – August 2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: Aug. 01, 2006
End Date: Aug. 31, 2006

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	-	2.29	0.27	-	-	-	-	-	2.55
NE	-	2.42	0.13	-	-	-	-	-	2.55
NNE	-	4.97	-	-	-	-	-	-	4.97
N	-	0.81	-	-	-	-	-	-	0.81
NNW	-	0.13	-	-	-	-	-	-	0.13
NW	-	0.40	-	-	-	-	-	-	0.40
WNW	-	5.51	2.42	-	-	-	-	-	7.93
W	-	5.91	10.62	0.13	-	-	-	-	16.67
WSW	-	7.80	15.05	0.13	-	-	-	-	22.98
SW	-	4.43	5.11	1.21	-	-	-	-	10.75
SSW	-	3.76	4.84	0.13	-	-	-	-	8.74
S	-	2.02	1.88	-	-	-	-	-	3.90
SSE	-	0.27	-	-	-	-	-	-	0.27
SE	-	0.94	-	-	-	-	-	-	0.94
ESE	-	2.29	0.40	-	-	-	-	-	2.69
E	-	0.94	0.27	-	-	-	-	-	1.21
Calm	12.50	-	-	-	-	-	-	-	12.50
Total (%)	12.50	44.89	40.99	1.61	-	-	-	-	100.00

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
AUGUST 2006

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-01

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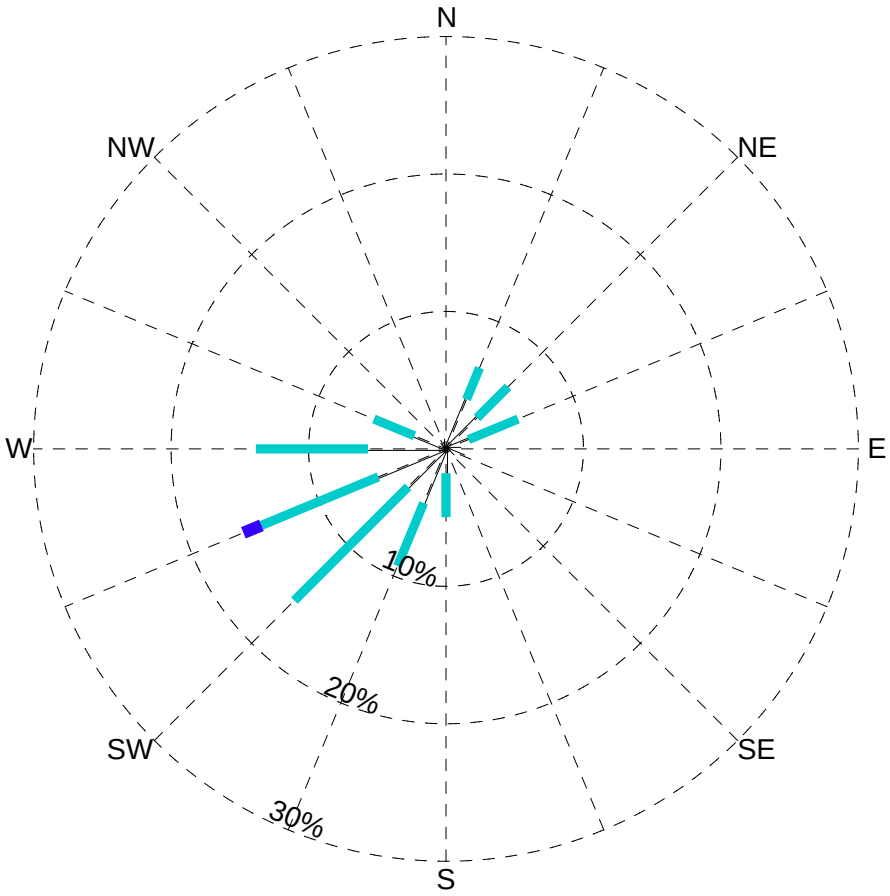

Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 12 days
Start Date: Sep. 01, 2006
End Date: Sep. 12, 2006

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	-	1.77	3.90	-	-	-	-	-	5.67
NE	-	3.19	3.19	-	-	-	-	-	6.38
NNE	-	3.90	2.48	-	-	-	-	-	6.38
N	-	0.71	-	-	-	-	-	-	0.71
NNW	-	0.71	-	-	-	-	-	-	0.71
NW	-	-	-	-	-	-	-	-	-
WNW	-	2.48	3.19	-	-	-	-	-	5.67
W	-	5.67	8.16	-	-	-	-	-	13.83
WSW	-	5.32	9.22	1.42	-	-	-	-	15.96
SW	-	3.90	11.70	-	-	-	-	-	15.60
SSW	-	4.26	4.97	-	-	-	-	-	9.22
S	-	1.77	3.19	-	-	-	-	-	4.97
SSE	-	-	-	-	-	-	-	-	-
SE	-	0.71	-	-	-	-	-	-	0.71
ESE	-	1.42	-	-	-	-	-	-	1.42
E	-	1.06	-	-	-	-	-	-	1.06
Calm	11.70	-	-	-	-	-	-	-	11.70
Total (%)	11.70	36.88	50.00	1.42	-	-	-	-	100.00

Note:
No data exists for period of
Sept. 12 18:00 through Sept. 30

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
SEPTEMBER 2006

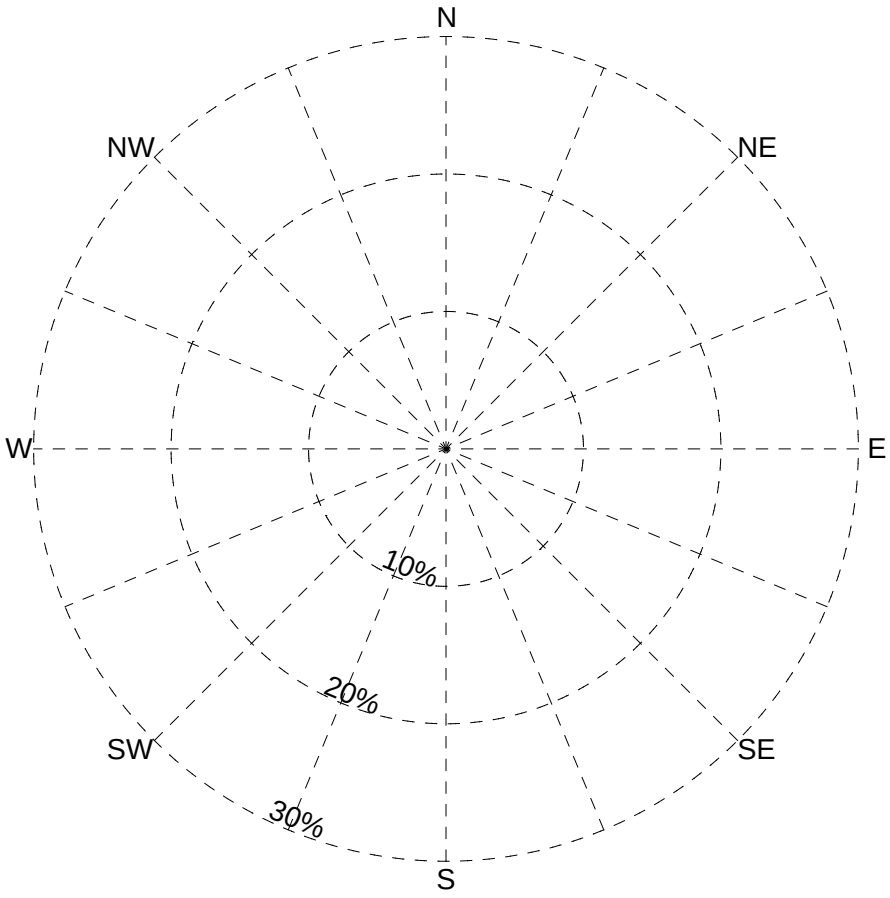
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-02

Thu Dec 06 16:12:50 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp

NAD 27 Location:

N63° 16' 50.2" W130° 8' 50.3"

Elev. above SL: 1860 m

Tower height: 3 m

Record Length:

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	-	-	-	-	-	-	-	-	-
NE	-	-	-	-	-	-	-	-	-
NNE	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-
NNW	-	-	-	-	-	-	-	-	-
NW	-	-	-	-	-	-	-	-	-
WNW	-	-	-	-	-	-	-	-	-
W	-	-	-	-	-	-	-	-	-
WSW	-	-	-	-	-	-	-	-	-
SW	-	-	-	-	-	-	-	-	-
SSW	-	-	-	-	-	-	-	-	-
S	-	-	-	-	-	-	-	-	-
SSE	-	-	-	-	-	-	-	-	-
SE	-	-	-	-	-	-	-	-	-
ESE	-	-	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-	-	-
Calm	-	-	-	-	-	-	-	-	-
Total (%)	-	-	-	-	-	-	-	-	-

Note:

No data exists for October 2006

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HAY & COMPANY CONSULTANTS A DIVISION OF EBA

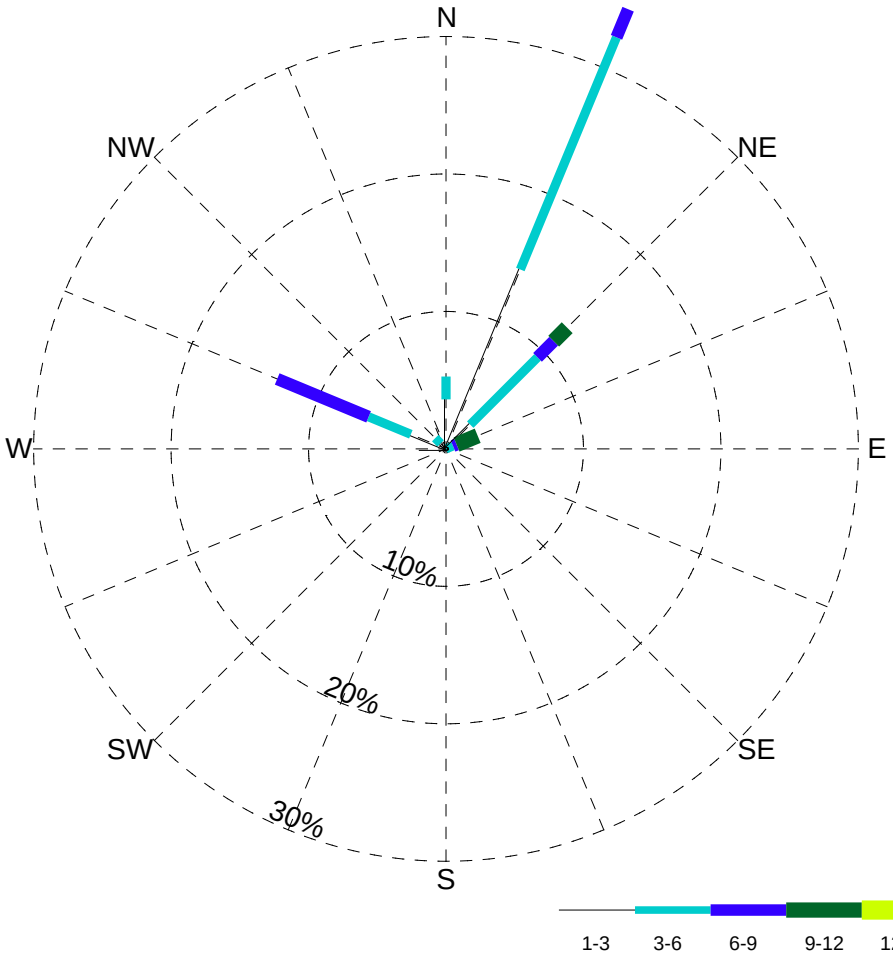
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
OCTOBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure C-03



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 15 days
Start Date: Nov. 15, 2006
End Date: Nov. 30, 2006

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	-	-	0.55	0.28	1.66	-	-	-	2.49
NE	-	2.49	6.93	1.66	1.38	-	-	-	12.47
NNE	-	14.13	18.28	2.22	-	-	-	-	34.63
N	-	3.60	1.66	-	-	-	-	-	5.26
NNW	-	1.66	-	-	-	-	-	-	1.66
NW	-	0.55	0.55	-	-	-	-	-	1.11
WNW	-	2.77	3.32	7.20	-	-	-	-	13.30
W	-	1.94	-	-	-	-	-	-	1.94
WSW	-	-	-	-	-	-	-	-	-
SW	-	-	-	-	-	-	-	-	-
SSW	-	-	-	-	-	-	-	-	-
S	-	-	-	-	-	-	-	-	-
SSE	-	-	-	-	-	-	-	-	-
SE	-	-	-	-	-	-	-	-	-
ESE	-	-	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-	-	-
Calm	27.15	-	-	-	-	-	-	-	27.15
Total (%)	27.15	27.15	31.30	11.36	3.05	-	-	-	100.00

Note:
No data exists for period of
Nov. 1 through Nov. 15 22:00

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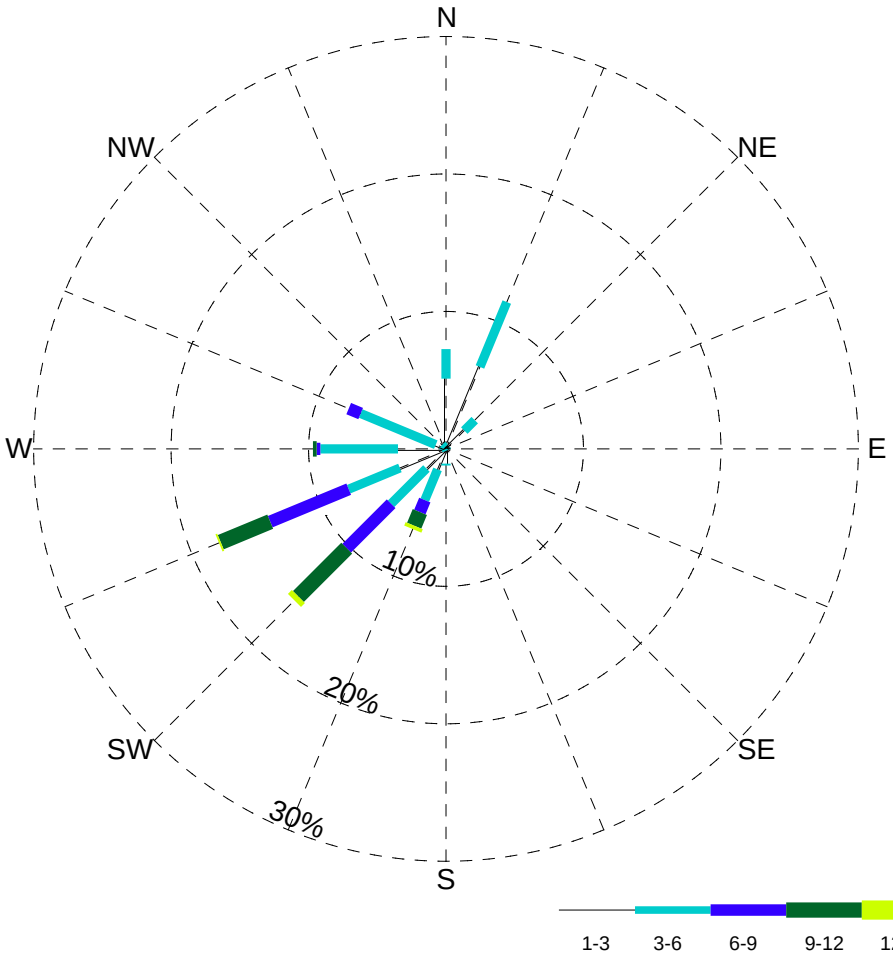
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
NOVEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-04



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: Dec. 01, 2006
End Date: Dec. 31, 2006

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	-	0.40	-	-	-	-	-	-	0.40
NE	-	1.88	1.08	-	-	-	-	-	2.96
NNE	-	6.45	5.11	-	-	-	-	-	11.56
N	-	5.11	2.15	-	-	-	-	-	7.26
NNW	-	0.81	-	-	-	-	-	-	0.81
NW	-	0.13	0.27	-	-	-	-	-	0.40
WNW	-	0.81	5.91	0.94	-	-	-	-	7.66
W	-	3.49	5.64	0.27	0.27	-	-	-	9.68
WSW	-	3.63	4.03	6.18	3.90	0.13	-	-	17.88
SW	-	2.02	3.63	4.57	4.97	0.40	-	-	15.59
SSW	-	1.61	2.42	0.94	1.08	0.27	-	-	6.32
S	-	1.08	0.13	-	-	-	-	-	1.21
SSE	-	-	0.13	-	-	-	-	-	0.13
SE	-	0.13	-	-	-	-	-	-	0.13
ESE	-	0.27	-	-	-	-	-	-	0.27
E	-	0.13	-	-	-	-	-	-	0.13
Calm	17.61	-	-	-	-	-	-	-	17.61
Total (%)	17.61	27.96	30.51	12.90	10.22	0.81	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
DECEMBER 2006

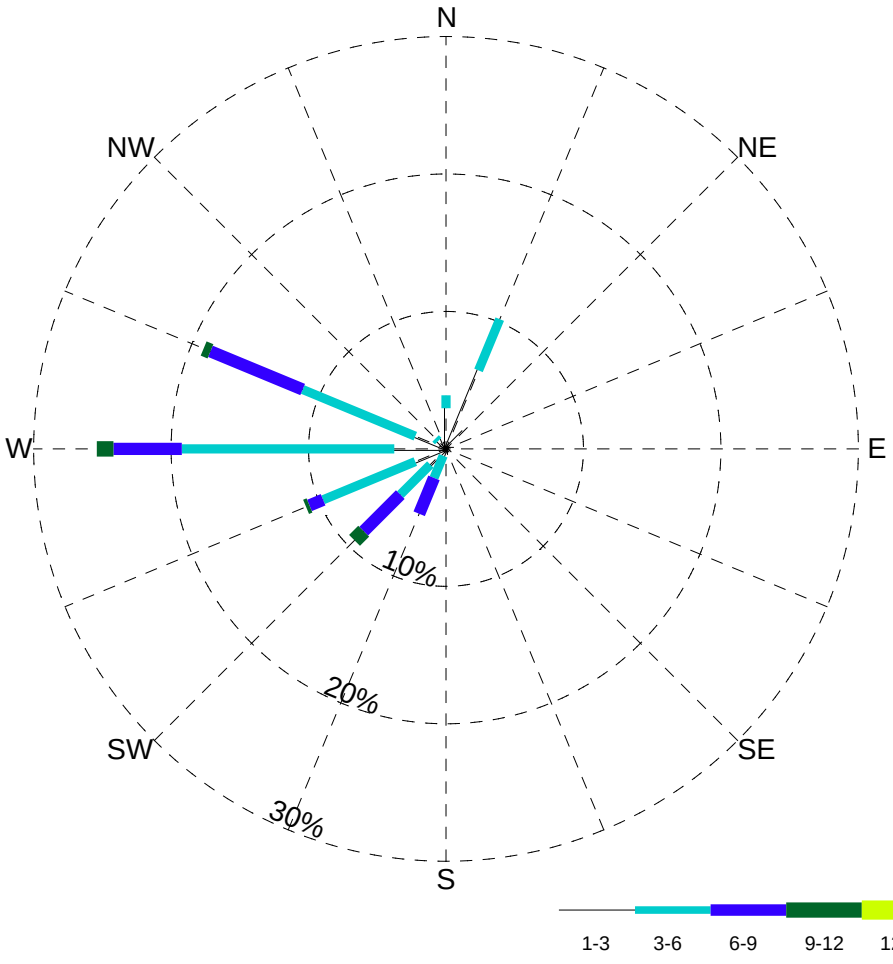
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-05

Thu Dec 06 16:12:52 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: Jan. 01, 2007
End Date: Jan. 31, 2007

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	-	0.27	-	-	-	-	-	-	0.27
NE	-	1.75	-	-	-	-	-	-	1.75
NNE	-	6.18	4.03	-	-	-	-	-	10.22
N	-	2.96	0.94	-	-	-	-	-	3.90
NNW	-	0.81	-	-	-	-	-	-	0.81
NW	-	0.81	0.27	-	-	-	-	-	1.08
WNW	-	2.42	8.87	7.26	0.54	-	-	-	19.09
W	-	3.76	15.46	4.97	1.21	-	-	-	25.40
WSW	-	2.42	7.26	1.08	0.27	-	-	-	11.02
SW	-	1.61	3.09	3.76	0.94	-	-	-	9.41
SSW	-	0.54	1.75	2.82	-	-	-	-	5.11
S	-	0.40	-	-	-	-	-	-	0.40
SSE	-	-	-	-	-	-	-	-	-
SE	-	0.40	-	-	-	-	-	-	0.40
ESE	-	0.13	-	-	-	-	-	-	0.13
E	-	0.54	-	-	-	-	-	-	0.54
Calm	10.48	-	-	-	-	-	-	-	10.48
Total (%)	10.48	25.00	41.67	19.89	2.96	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
JANUARY 2007

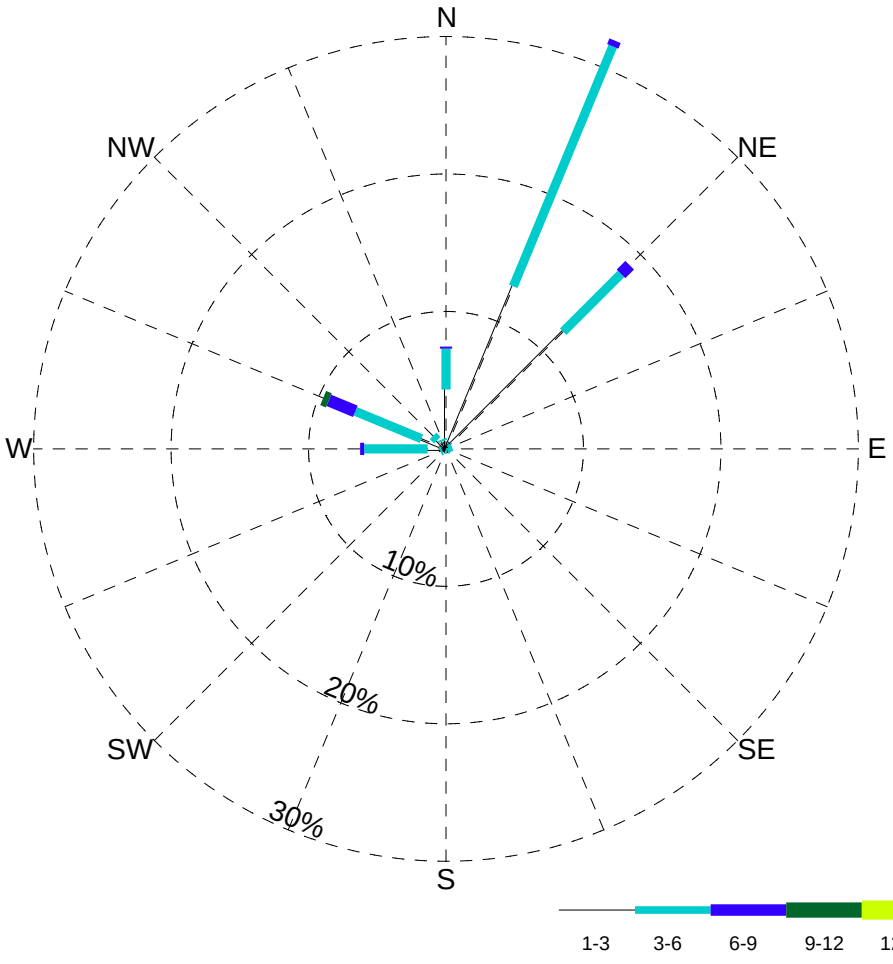
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-06

Thu Dec 06 16:12:53 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 28 days
Start Date: Feb. 01, 2007
End Date: Feb. 28, 2007

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	-	0.15	0.30	-	-	-	-	-	0.45
NE	-	12.05	5.95	0.89	-	-	-	-	18.90
NNE	-	12.80	18.90	0.45	-	-	-	-	32.14
N	-	4.32	2.98	0.15	-	-	-	-	7.44
NNW	-	0.60	0.15	-	-	-	-	-	0.74
NW	-	0.89	0.45	-	-	-	-	-	1.34
WNW	-	1.93	5.21	2.08	0.45	-	-	-	9.67
W	-	1.34	4.61	0.30	-	-	-	-	6.25
WSW	-	0.30	0.15	-	-	-	-	-	0.45
SW	-	-	-	-	-	-	-	-	-
SSW	-	0.15	-	-	-	-	-	-	0.15
S	-	0.15	-	-	-	-	-	-	0.15
SSE	-	-	-	-	-	-	-	-	-
SE	-	-	-	-	-	-	-	-	-
ESE	-	-	0.15	-	-	-	-	-	0.15
E	-	0.15	0.15	-	-	-	-	-	0.30
Calm	21.88	-	-	-	-	-	-	-	21.88
Total (%)	21.88	34.82	38.99	3.87	0.45	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

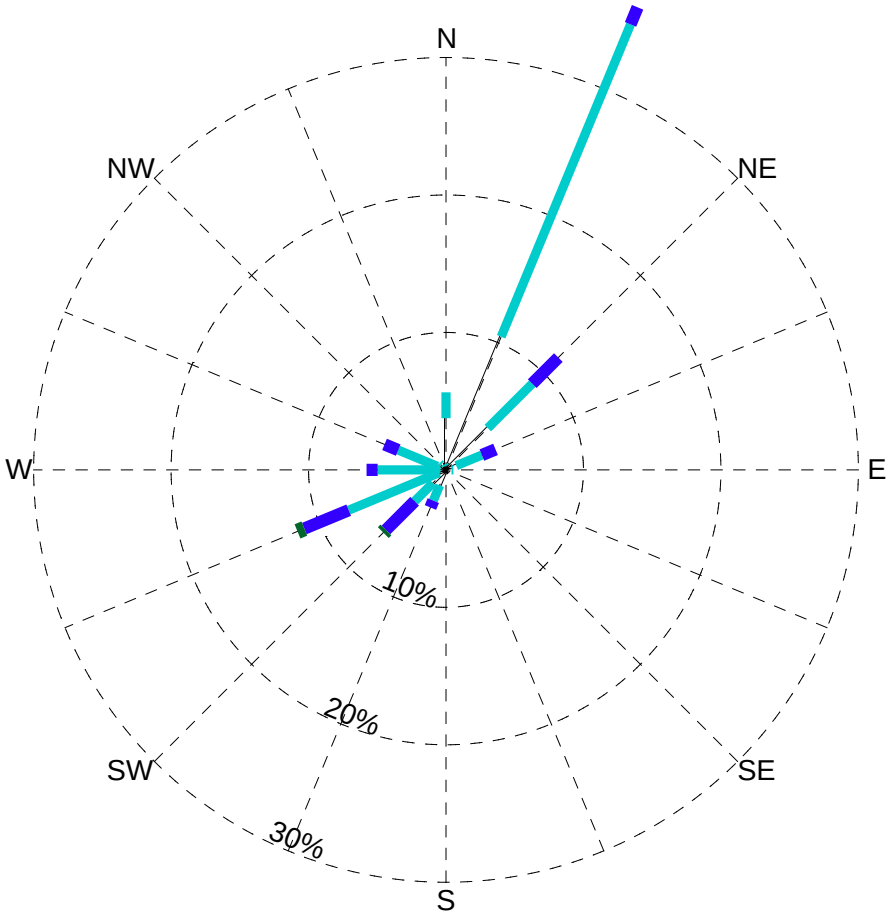
MACTUNG CAMP
WIND ROSE
FEBRUARY 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-07



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: Mar. 01, 2007
End Date: Mar. 31, 2007

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	-	0.81	2.02	1.08	-	-	-	-	3.90
NE	-	4.30	4.57	2.69	-	-	-	-	11.56
NNE	-	10.48	24.60	1.34	-	-	-	-	36.42
N	-	3.76	1.88	-	-	-	-	-	5.64
NNW	-	0.27	0.13	-	-	-	-	-	0.40
NW	-	0.54	0.13	-	-	-	-	-	0.67
WNW	-	0.67	3.09	1.08	-	-	-	-	4.84
W	-	0.40	4.57	0.81	-	-	-	-	5.78
WSW	-	0.54	7.12	3.49	0.54	-	-	-	11.69
SW	-	1.34	1.88	2.96	0.27	-	-	-	6.45
SSW	-	1.21	1.21	0.54	-	-	-	-	2.96
S	-	0.27	-	-	-	-	-	-	0.27
SSE	-	-	-	-	-	-	-	-	-
SE	-	-	-	-	-	-	-	-	-
ESE	-	-	-	-	-	-	-	-	-
E	-	0.40	0.13	-	-	-	-	-	0.54
Calm	8.87	-	-	-	-	-	-	-	8.87
Total (%)	8.87	25.00	51.34	13.98	0.81	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
MARCH 2007

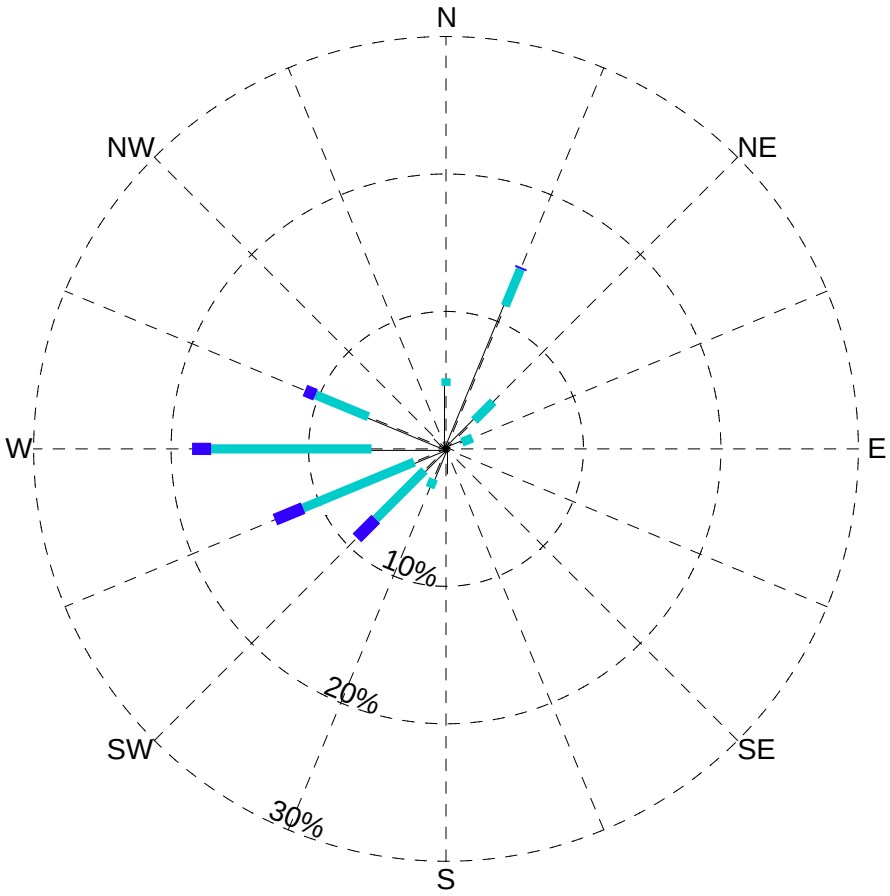
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-08

Thu Dec 06 16:12:55 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 30 days
Start Date: Apr. 01, 2007
End Date: Apr. 30, 2007

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	-	1.25	0.83	-	-	-	-	-	2.08
NE	-	2.92	1.94	-	-	-	-	-	4.86
NNE	-	11.25	2.92	0.14	-	-	-	-	14.31
N	-	4.58	0.56	-	-	-	-	-	5.14
NNW	-	0.28	-	-	-	-	-	-	0.28
NW	-	1.11	-	-	-	-	-	-	1.11
WNW	-	6.11	4.17	0.83	-	-	-	-	11.11
W	-	5.42	11.67	1.39	-	-	-	-	18.47
WSW	-	2.50	8.75	2.22	-	-	-	-	13.47
SW	-	2.22	5.00	1.94	-	-	-	-	9.17
SSW	-	2.36	0.69	-	-	-	-	-	3.06
S	-	1.81	-	-	-	-	-	-	1.81
SSE	-	0.14	-	-	-	-	-	-	0.14
SE	-	-	-	-	-	-	-	-	-
ESE	-	0.56	-	-	-	-	-	-	0.56
E	-	0.28	-	-	-	-	-	-	0.28
Calm	14.17	-	-	-	-	-	-	-	14.17
Total (%)	14.17	42.78	36.53	6.53	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
APRIL 2007

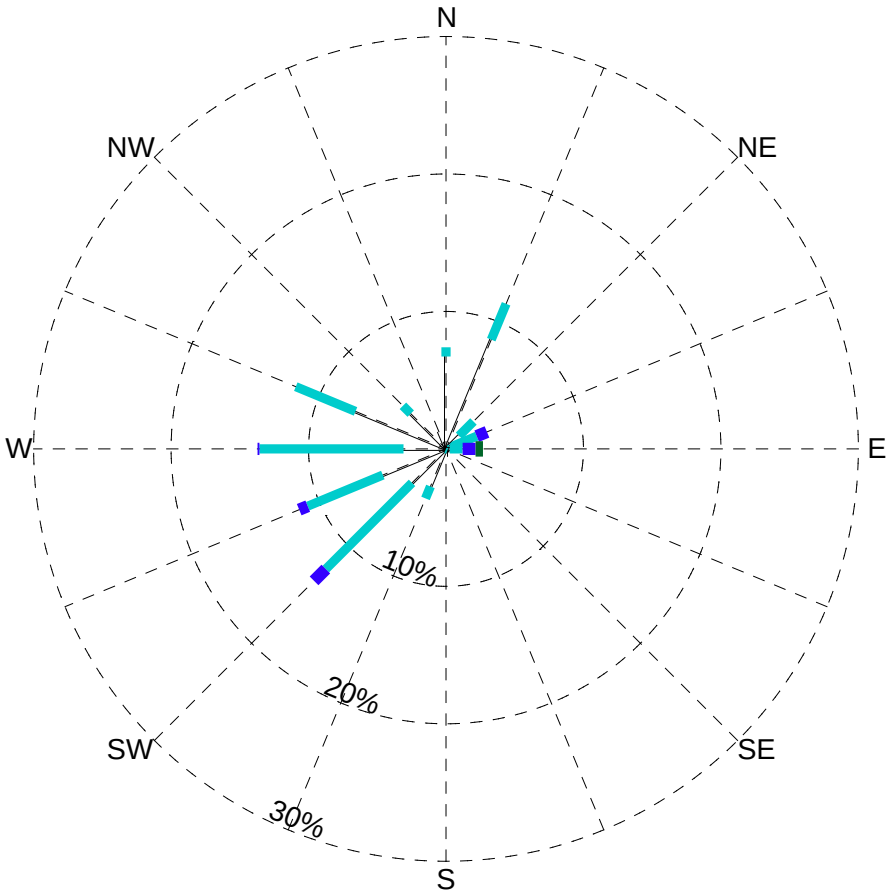
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-09

Thu Dec 06 16:12:56 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: May 01, 2007
End Date: May 31, 2007

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	-	0.40	2.02	0.81	-	-	-	-	3.23
NE	-	1.34	1.48	-	-	-	-	-	2.82
NNE	-	8.60	2.82	-	-	-	-	-	11.43
N	-	6.72	0.67	-	-	-	-	-	7.39
NNW	-	1.34	-	-	-	-	-	-	1.34
NW	-	3.63	0.81	-	-	-	-	-	4.43
WNW	-	7.12	4.70	-	-	-	-	-	11.83
W	-	3.09	10.48	0.13	-	-	-	-	13.71
WSW	-	4.97	5.91	0.67	-	-	-	-	11.56
SW	-	3.49	8.87	1.21	-	-	-	-	13.57
SSW	-	2.96	0.94	-	-	-	-	-	3.90
S	-	0.54	-	-	-	-	-	-	0.54
SSE	-	0.27	-	-	-	-	-	-	0.27
SE	-	-	-	-	-	-	-	-	-
ESE	-	-	0.13	-	-	-	-	-	0.13
E	-	0.27	0.94	0.94	0.54	-	-	-	2.69
Calm	11.16	-	-	-	-	-	-	-	11.16
Total (%)	11.16	44.76	39.78	3.76	0.54	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
MAY 2007

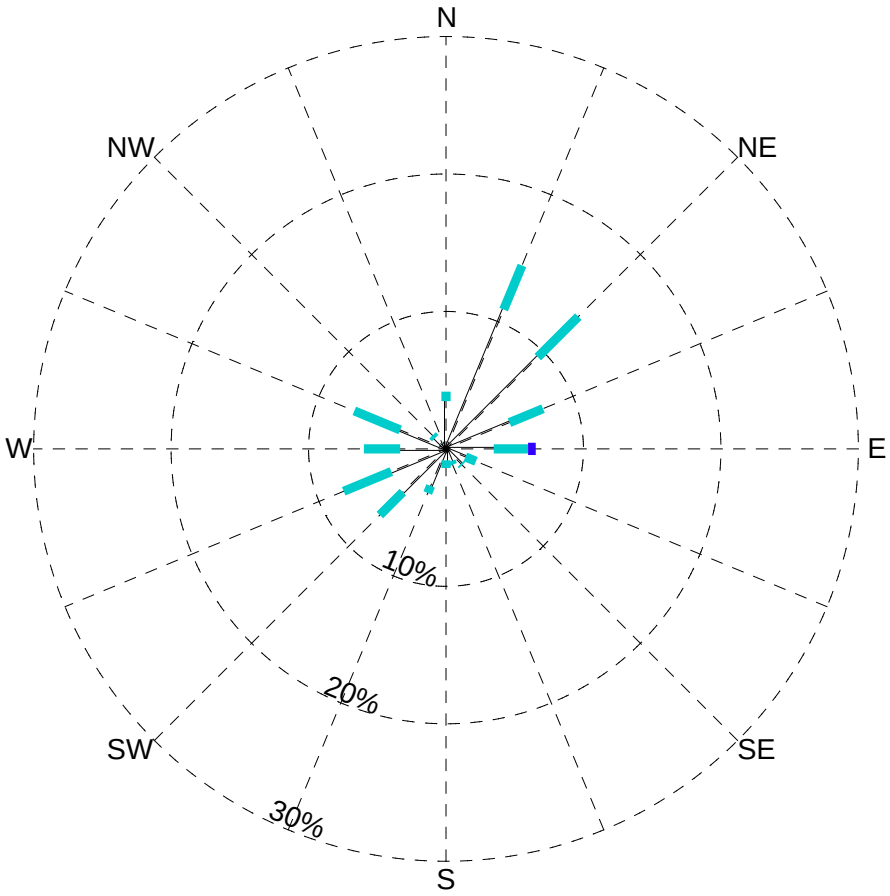
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-10

Thu Dec 06 16:12:56 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 30 days
Start Date: June 01, 2007
End Date: June 30, 2007

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	-	5.00	2.64	-	-	-	-	-	7.64
NE	-	9.44	4.17	-	-	-	-	-	13.61
NNE	-	10.97	3.47	-	-	-	-	-	14.44
N	-	3.47	0.69	-	-	-	-	-	4.17
NNW	-	0.69	-	-	-	-	-	-	0.69
NW	-	1.11	0.28	-	-	-	-	-	1.39
WNW	-	3.61	3.61	-	-	-	-	-	7.22
W	-	3.33	2.64	-	-	-	-	-	5.97
WSW	-	4.31	3.75	-	-	-	-	-	8.06
SW	-	4.44	2.36	-	-	-	-	-	6.81
SSW	-	2.92	0.56	-	-	-	-	-	3.47
S	-	0.83	0.56	-	-	-	-	-	1.39
SSE	-	0.97	0.28	-	-	-	-	-	1.25
SE	-	1.53	0.14	-	-	-	-	-	1.67
ESE	-	1.53	0.83	-	-	-	-	-	2.36
E	-	3.47	2.50	0.56	-	-	-	-	6.53
Calm	13.33	-	-	-	-	-	-	-	13.33
Total (%)	13.33	57.64	28.47	0.56	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
JUNE 2007

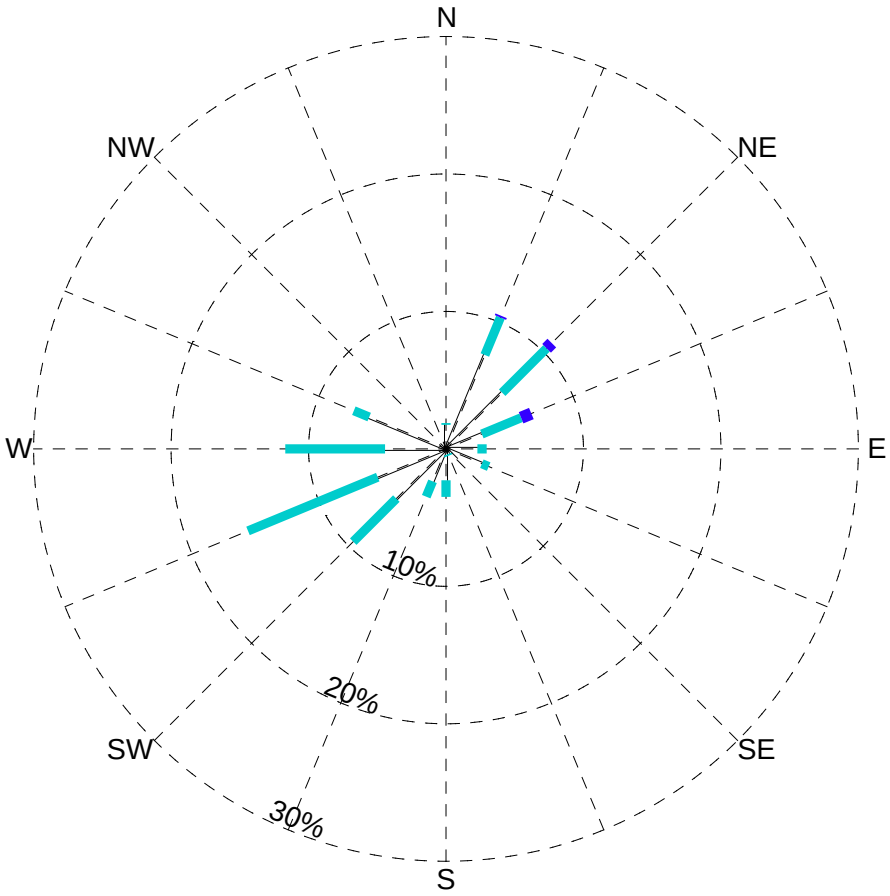
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-11

Thu Dec 06 16:12:57 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: July 01, 2007
End Date: July 31, 2007

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	-	2.82	3.09	0.81	-	-	-	-	6.72
NE	-	5.78	4.57	0.54	-	-	-	-	10.89
NNE	-	7.39	2.96	0.13	-	-	-	-	10.48
N	-	1.75	0.13	-	-	-	-	-	1.88
NNW	-	0.13	-	-	-	-	-	-	0.13
NW	-	0.54	-	-	-	-	-	-	0.54
WNW	-	6.05	1.21	-	-	-	-	-	7.26
W	-	4.43	7.26	-	-	-	-	-	11.69
WSW	-	5.38	10.22	-	-	-	-	-	15.59
SW	-	5.11	4.43	-	-	-	-	-	9.54
SSW	-	2.55	1.21	-	-	-	-	-	3.76
S	-	2.29	1.21	-	-	-	-	-	3.49
SSE	-	0.40	0.13	-	-	-	-	-	0.54
SE	-	1.08	-	-	-	-	-	-	1.08
ESE	-	2.82	0.54	-	-	-	-	-	3.36
E	-	2.29	0.67	-	-	-	-	-	2.96
Calm	10.08	-	-	-	-	-	-	-	10.08
Total (%)	10.08	50.81	37.63	1.48	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
JULY 2007

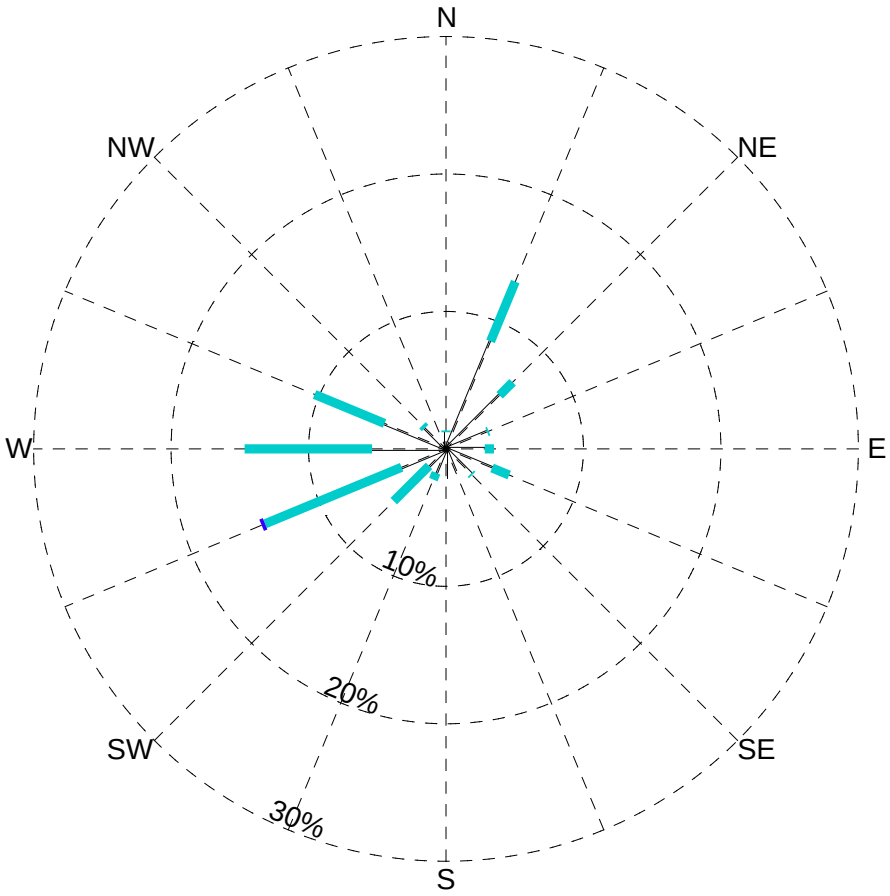
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-12

Thu Dec 06 16:12:58 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007



Station Name: MacTung Camp
NAD 27 Location:
N63° 16' 50.2" W130° 8' 50.3"
Elev. above SL: 1860 m
Tower height: 3 m
Record Length: 31 days
Start Date: Aug. 01, 2007
End Date: Aug. 31, 2007

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	-	3.23	0.13	-	-	-	-	-	3.36
NE	-	5.51	1.34	-	-	-	-	-	6.86
NNE	-	8.47	4.70	-	-	-	-	-	13.17
N	-	1.21	0.13	-	-	-	-	-	1.34
NNW	-	0.27	-	-	-	-	-	-	0.27
NW	-	2.15	0.27	-	-	-	-	-	2.42
WNW	-	4.84	5.51	-	-	-	-	-	10.35
W	-	5.38	9.27	-	-	-	-	-	14.65
WSW	-	3.49	10.75	0.27	-	-	-	-	14.52
SW	-	1.75	3.63	-	-	-	-	-	5.38
SSW	-	1.88	0.54	-	-	-	-	-	2.42
S	-	2.15	-	-	-	-	-	-	2.15
SSE	-	1.75	-	-	-	-	-	-	1.75
SE	-	2.55	0.13	-	-	-	-	-	2.69
ESE	-	3.63	1.34	-	-	-	-	-	4.97
E	-	2.82	0.67	-	-	-	-	-	3.49
Calm	10.22	-	-	-	-	-	-	-	10.22
Total (%)	10.22	51.08	38.44	0.27	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WIND ROSE
AUGUST 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure C-13

Thu Dec 06 16:12:58 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\Camp Station\Wind_roses\2007

APPENDIX

APPENDIX D MACTUNG CAMP MONTHLY WEATHER – AUGUST 2006 TO AUGUST 2007

APPENDIX D

Monthly MacTung Camp Weather Summaries

August 2006 – August 2007

D-01 MacTung Camp Weather – August 2006

D-02 MacTung Camp Weather – September 2006

D-03 MacTung Camp Weather – October 2006

D-04 MacTung Camp Weather – November 2006

D-05 MacTung Camp Weather – December 2006

D-06 MacTung Camp Weather – January 2007

D-07 MacTung Camp Weather – February 2007

D-08 MacTung Camp Weather – March 2007

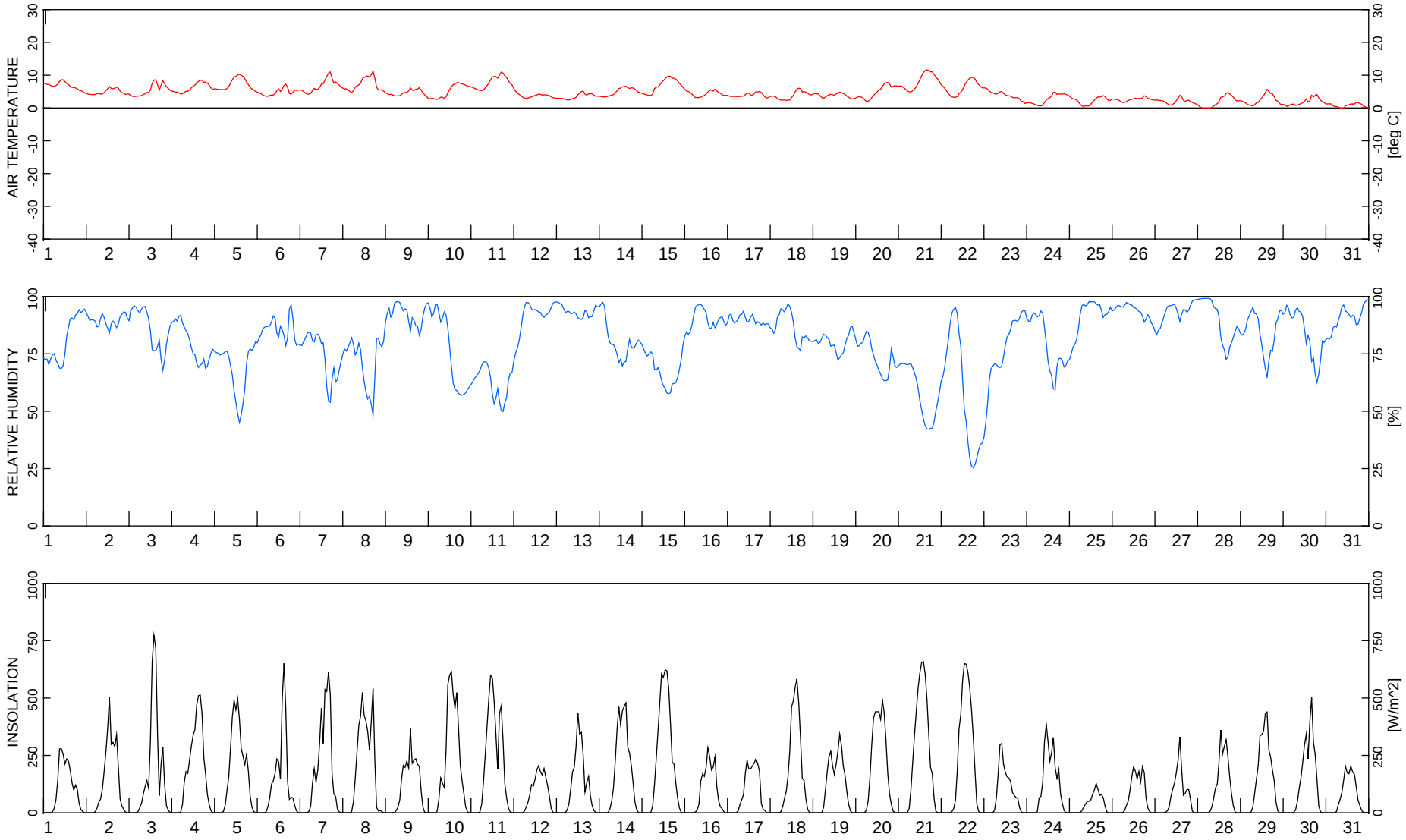
D-09 MacTung Camp Weather – April 2007

D-10 MacTung Camp Weather – May 2007

D-11 MacTung Camp Weather – June 2007

D-12 MacTung Camp Weather – July 2007

D-13 MacTung Camp Weather – August 2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
AUGUST 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure D-01

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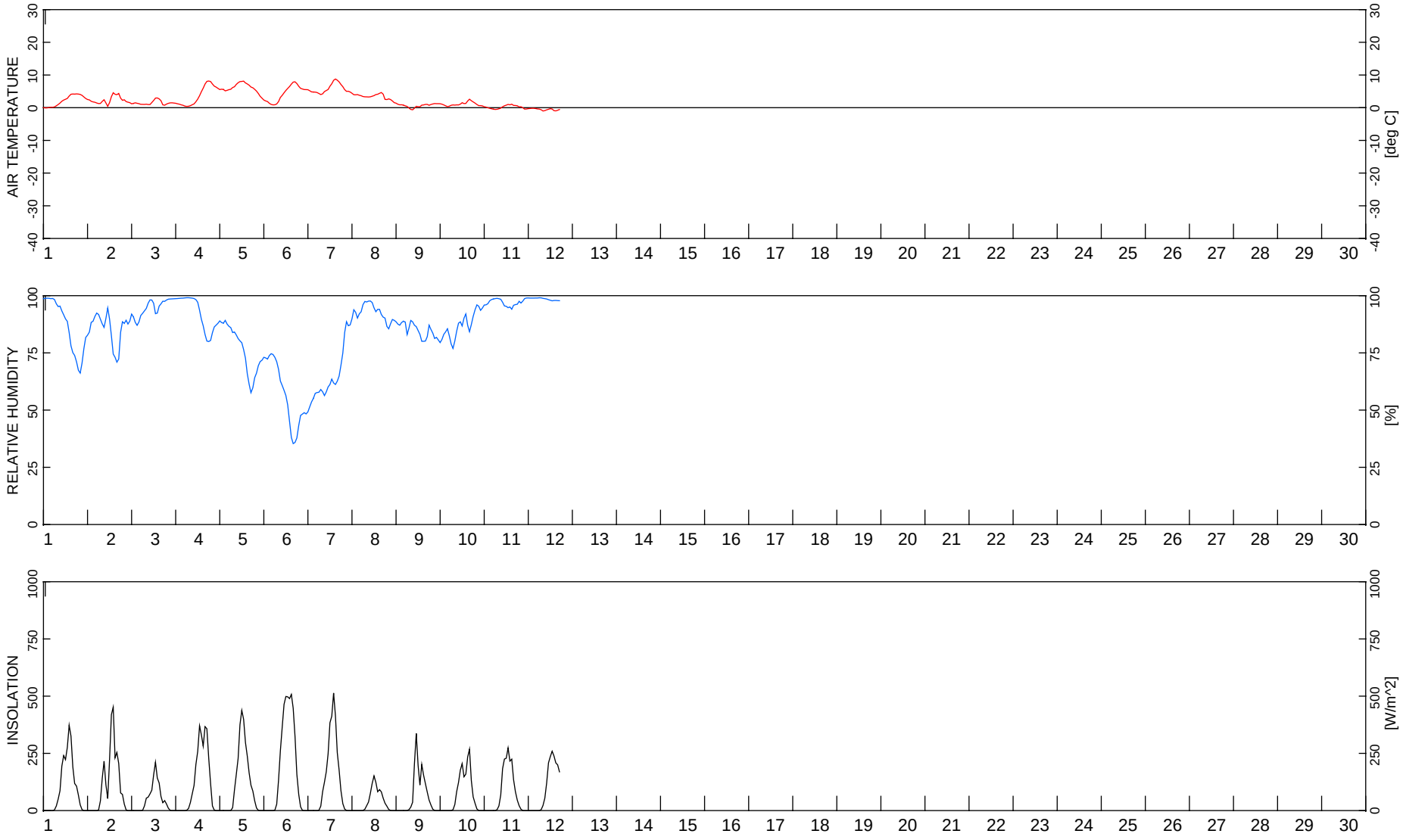

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
SEPTEMBER 2006

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W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

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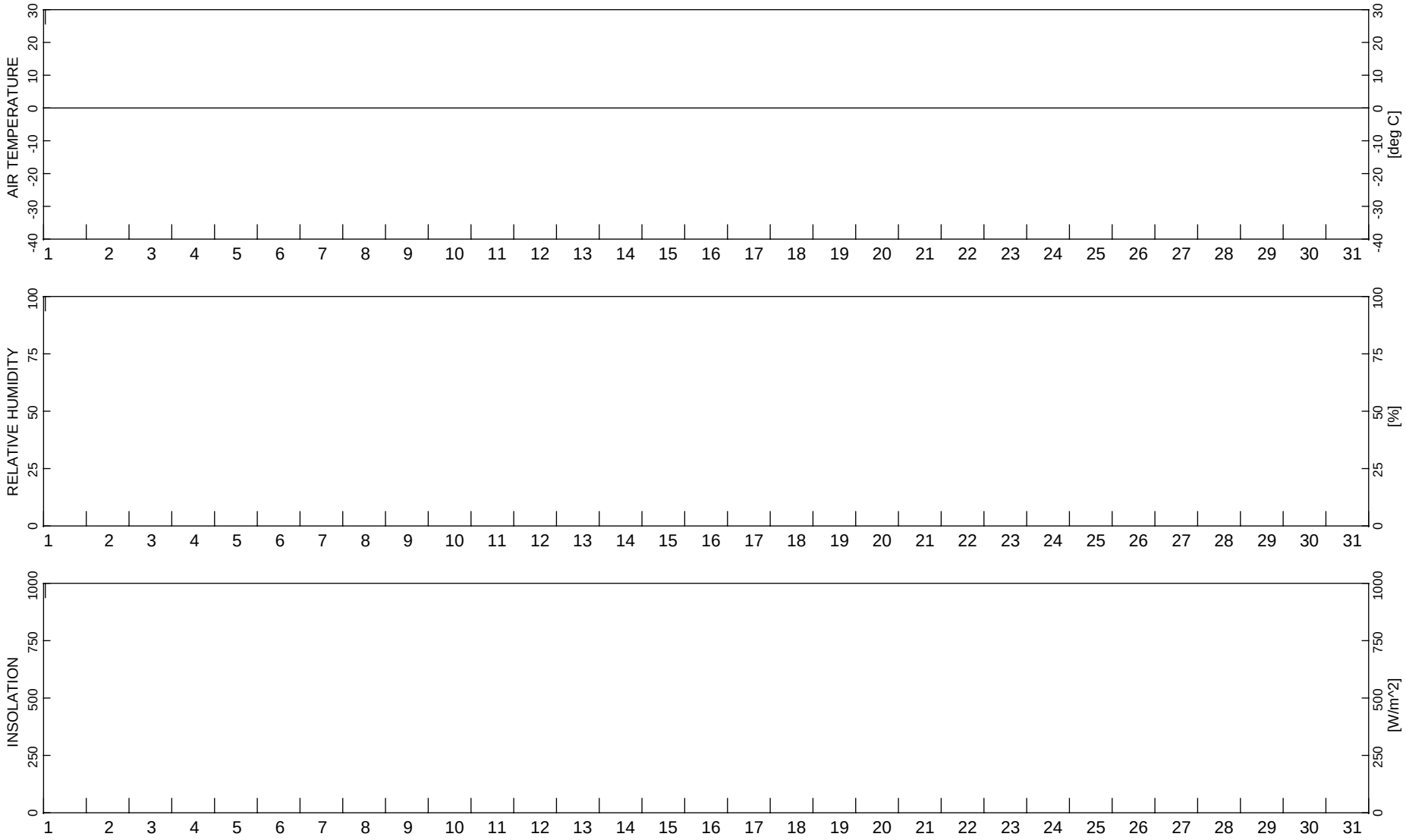

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
OCTOBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

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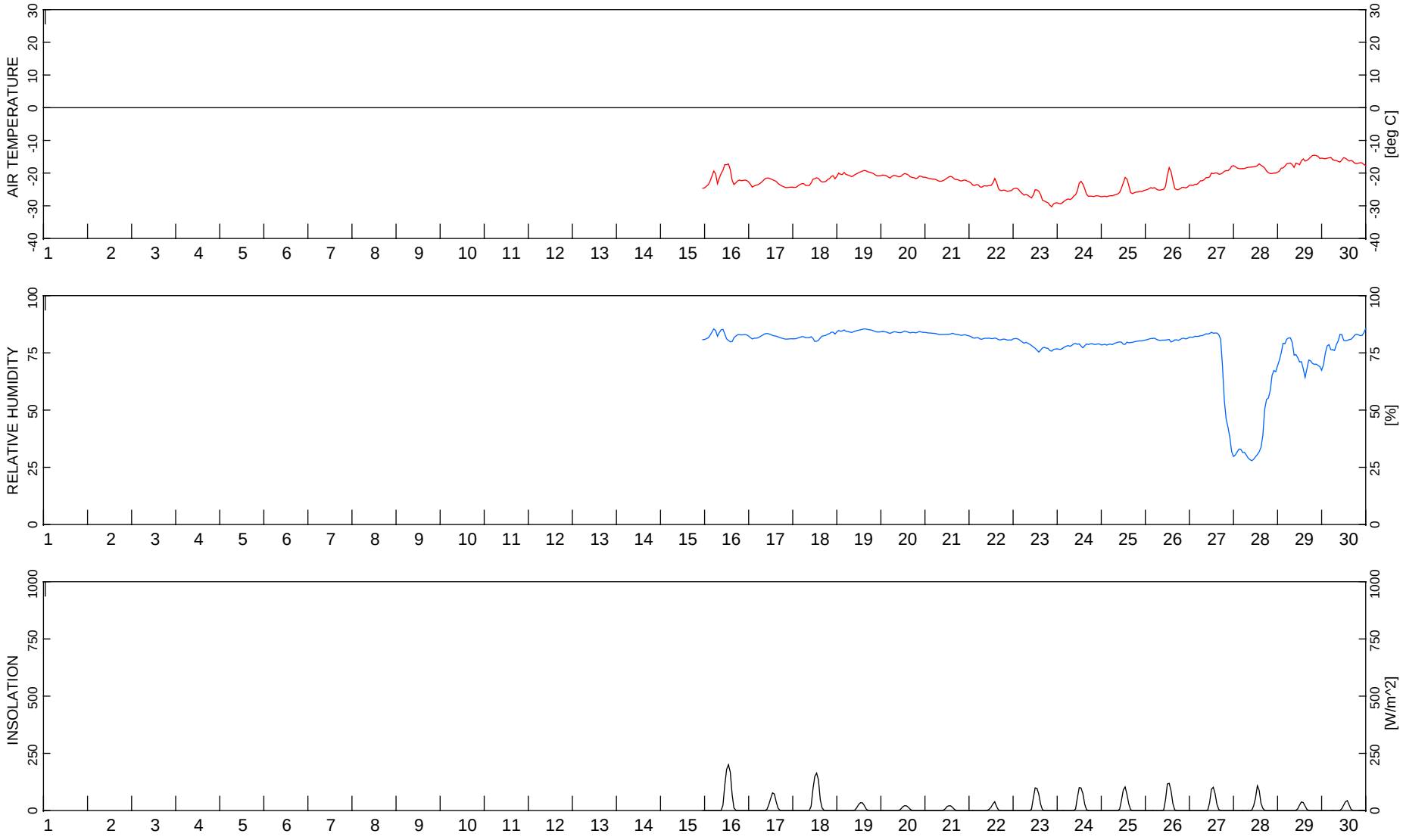

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
NOVEMBER 2006

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W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

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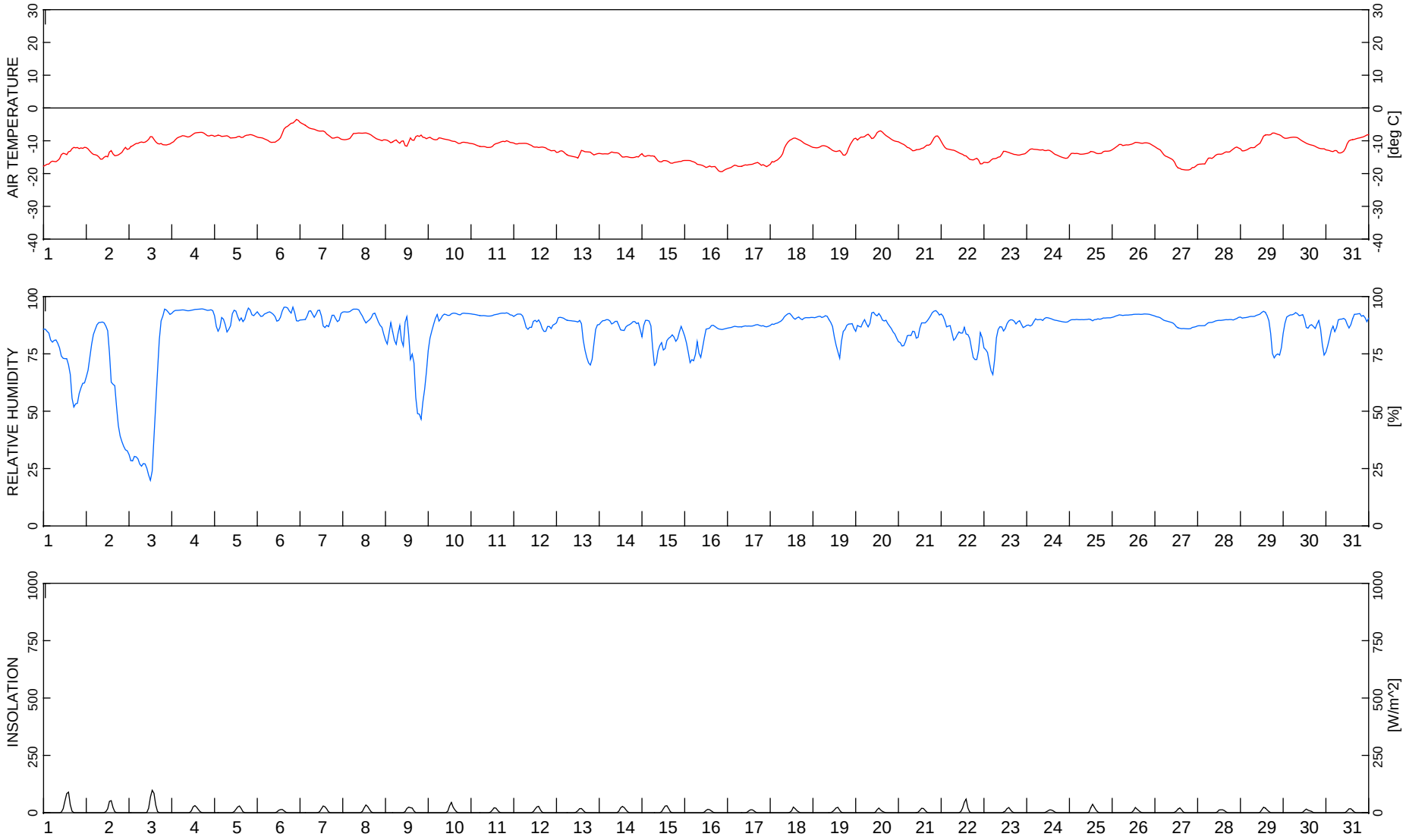

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
DECEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure D-05

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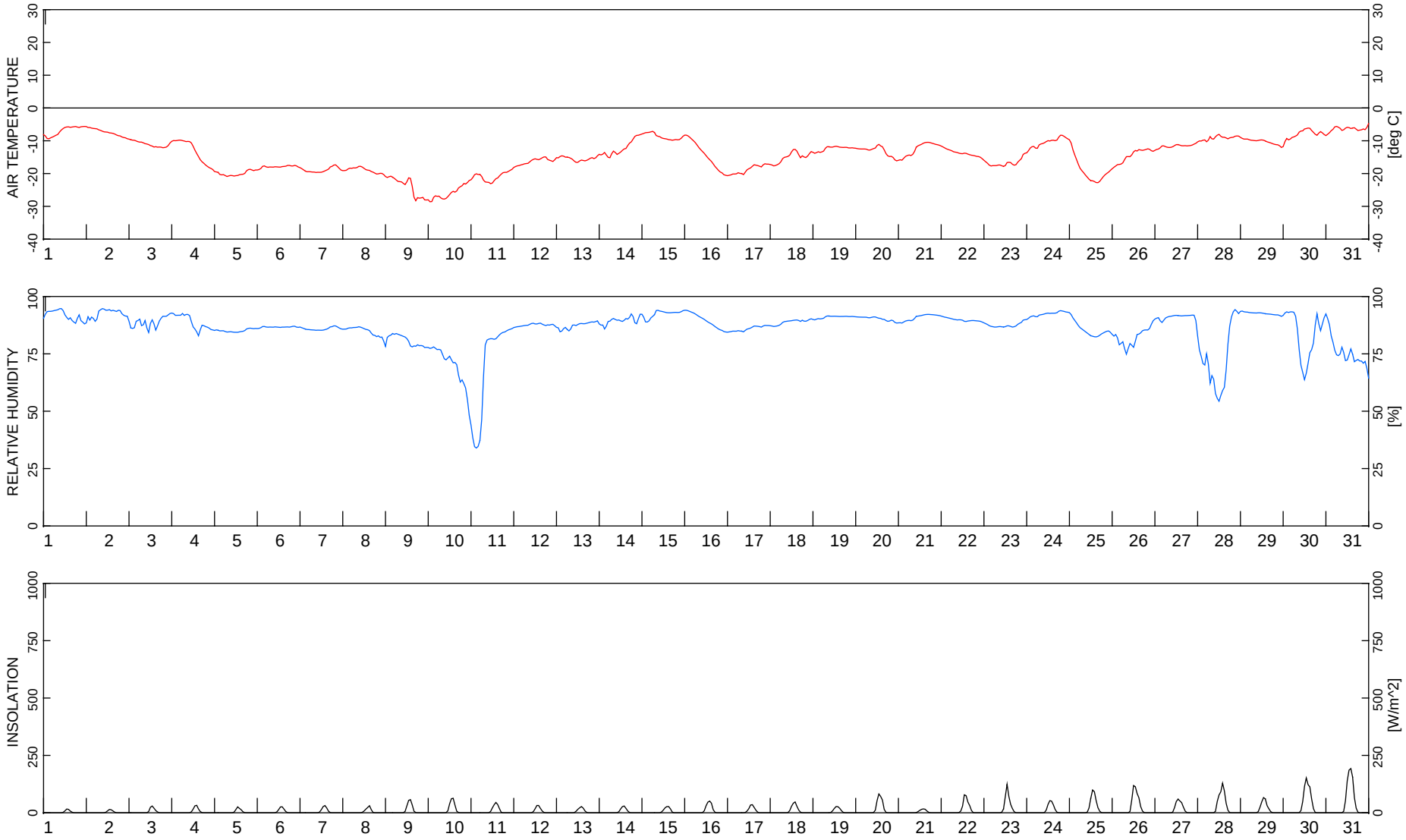

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
JANUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

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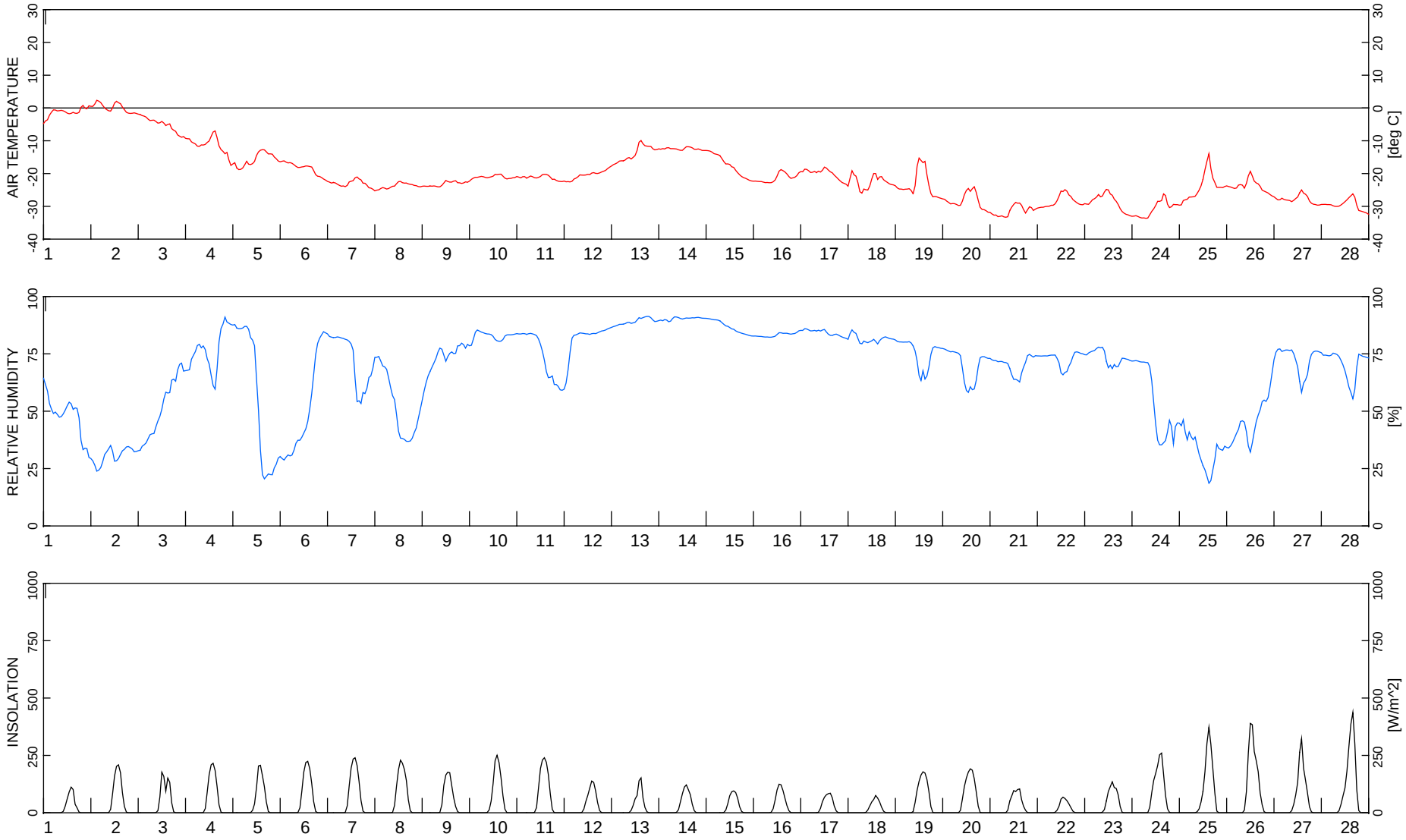

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

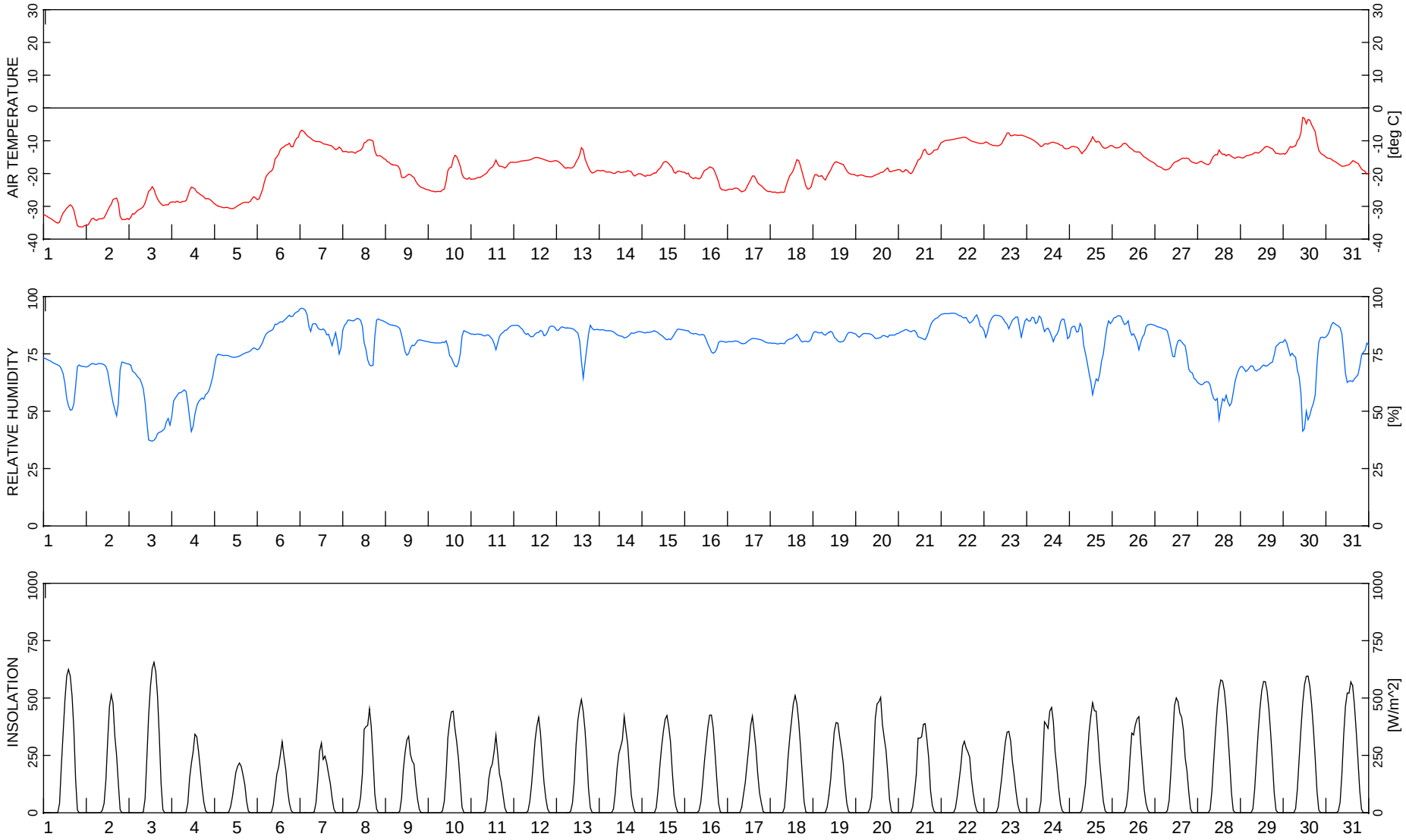
MACTUNG CAMP
WEATHER
FEBRUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure D-07



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
MARCH 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure D-08

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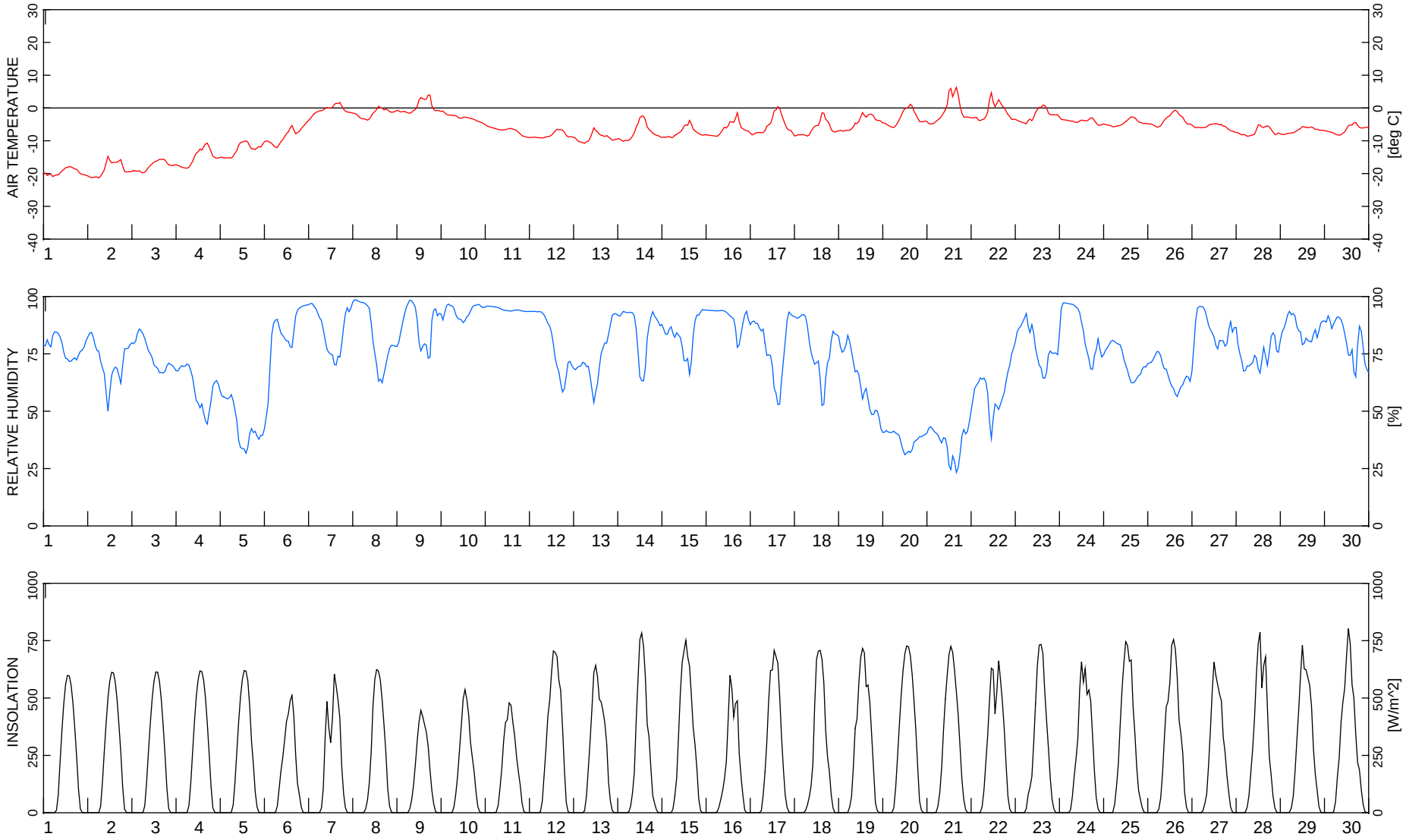

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
APRIL 2007

HAY & COMPANY CONSULTANTS — A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure D-09

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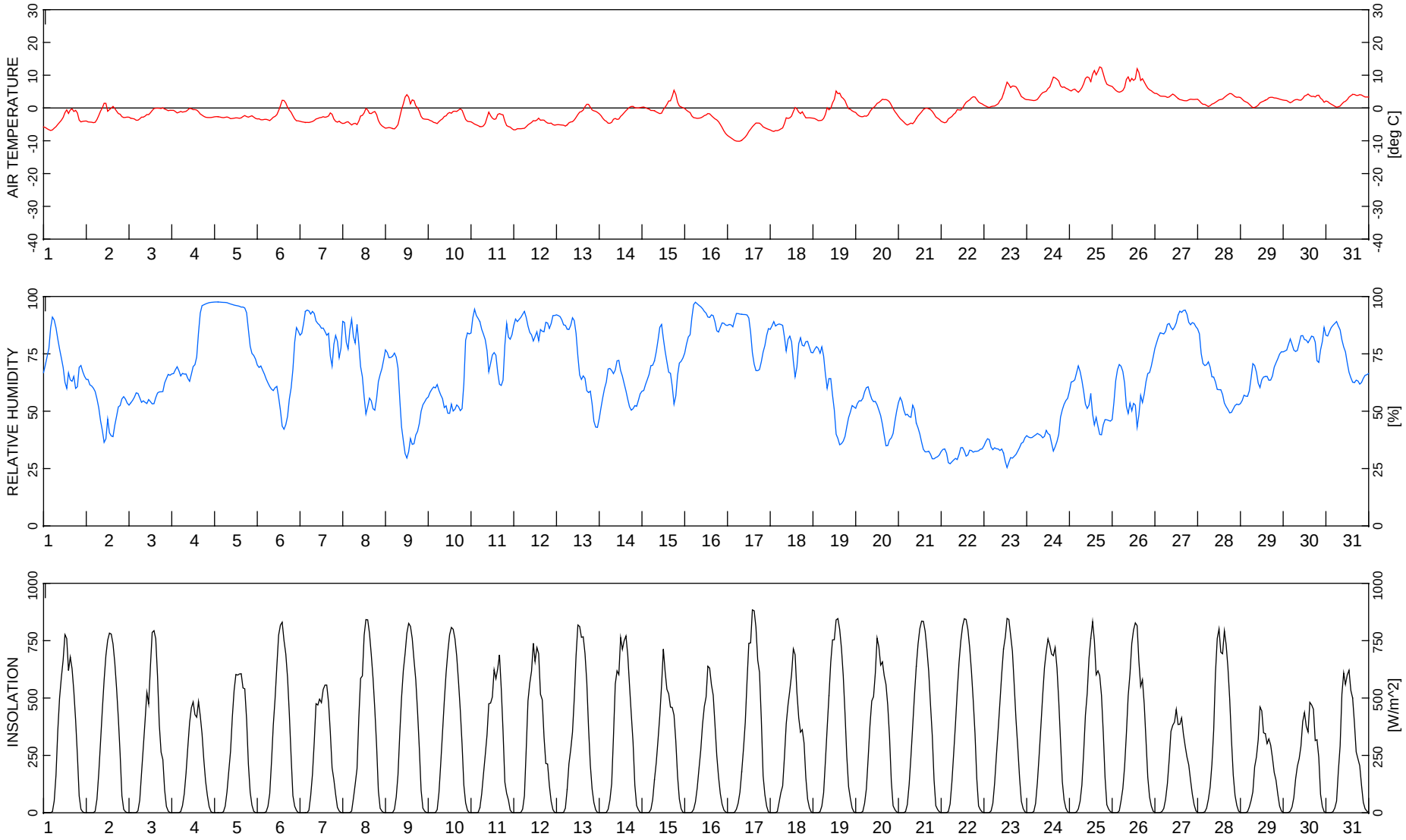

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
MAY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure D-10

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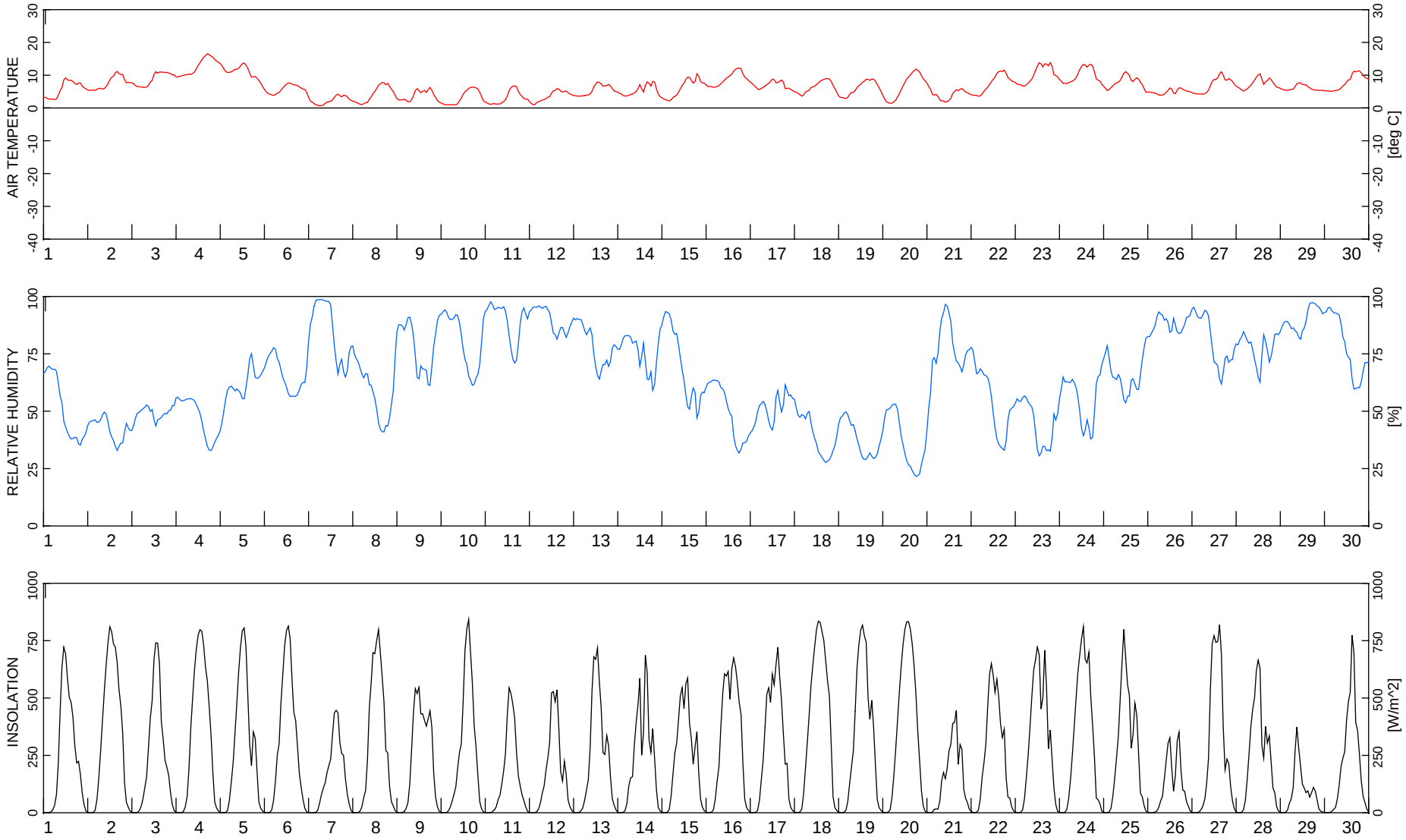

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
JUNE 2007

HAY & COMPANY CONSULTANTS — A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure D-11

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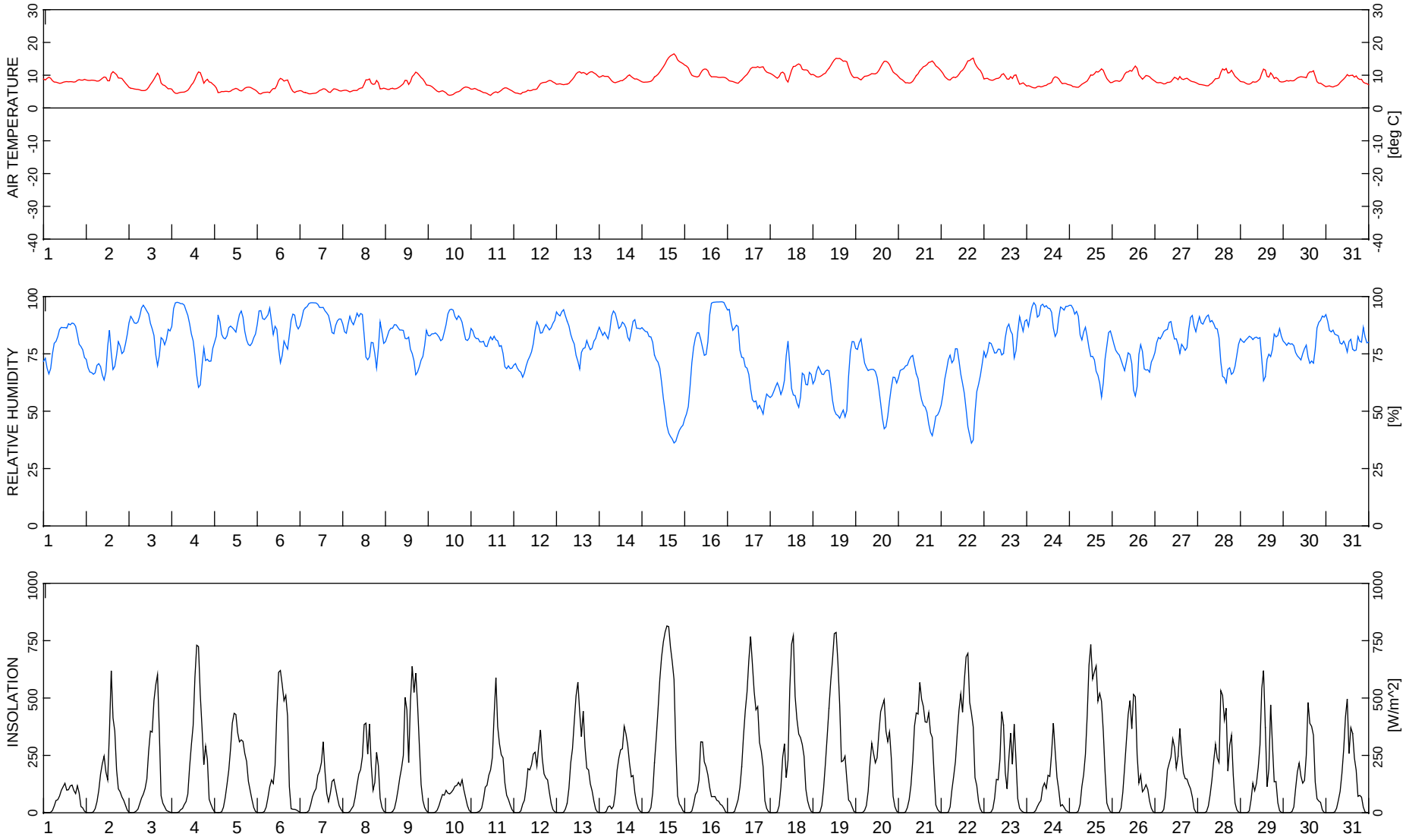

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
JULY 2007

PROJECT NO.	DWN	CHK	REV
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OFFICE	DATE
EBA-VANC	December 2007

Figure D-12

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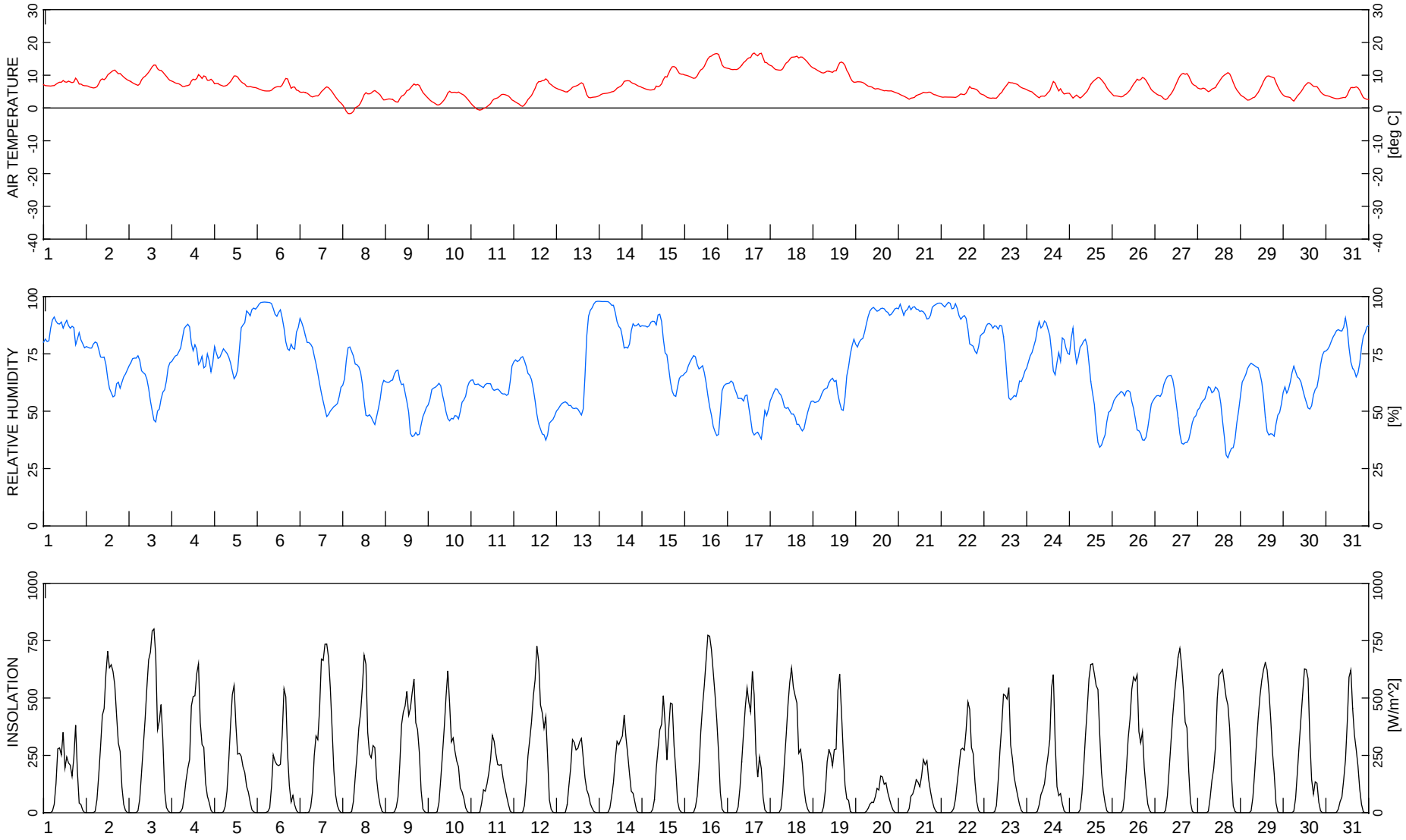

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACTUNG CAMP
WEATHER
AUGUST 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure D-13

APPENDIX

APPENDIX E MACMILLAN PASS MONTHLY WIND DATA – AUGUST 2006 TO AUGUST 2007

APPENDIX E

Monthly MacMillan Pass Wind Summaries

August 2006 – August 2007

E-01 MacMillan Pass Wind Data – August 2006

E-02 MacMillan Pass Wind Data – September 2006

E-03 MacMillan Pass Wind Data – October 2006

E-04 MacMillan Pass Wind Data – November 2006

E-05 MacMillan Pass Wind Data – December 2006

E-06 MacMillan Pass Wind Data – January 2007

E-07 MacMillan Pass Wind Data – February 2007

E-08 MacMillan Pass Wind Data – March 2007

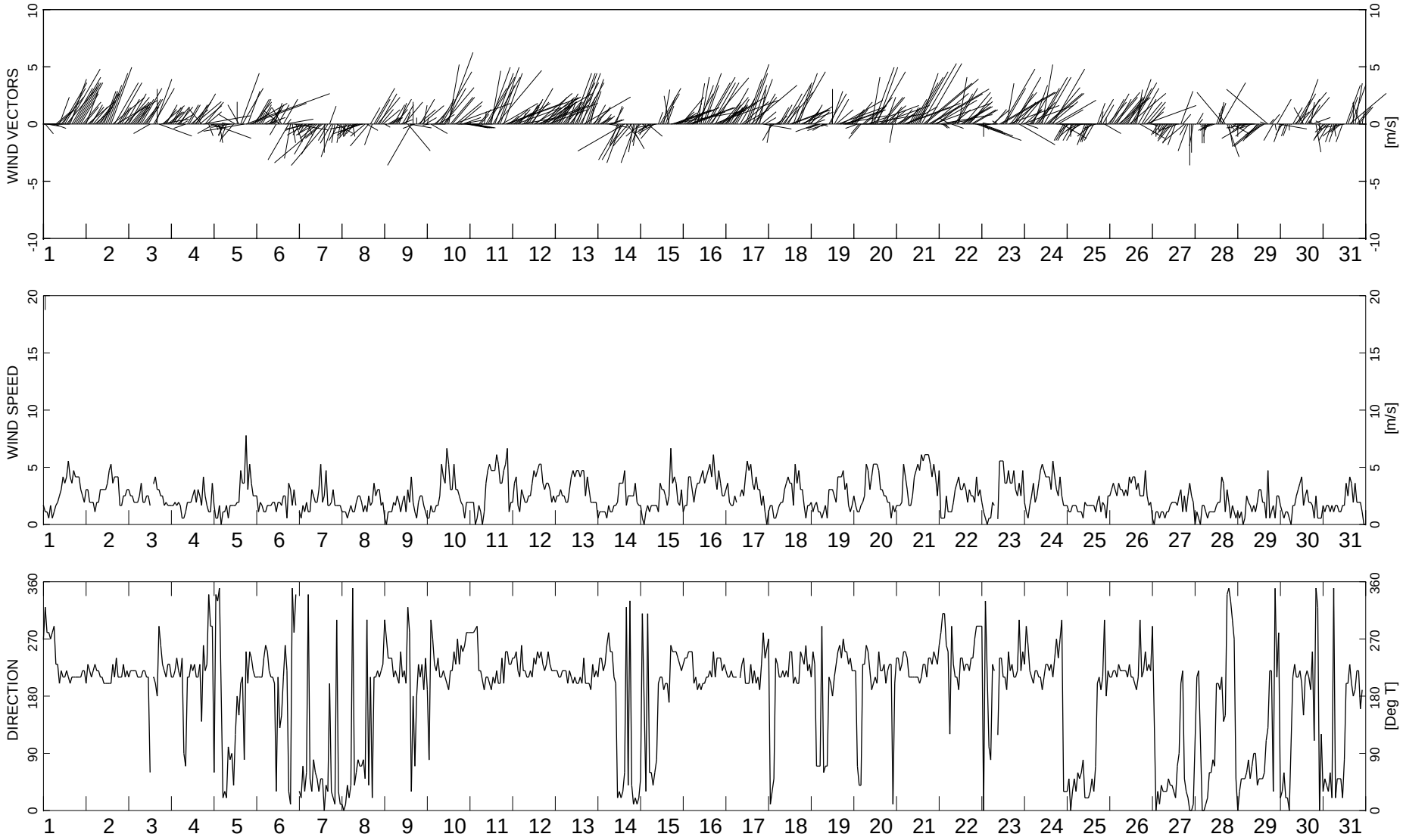
E-09 MacMillan Pass Wind Data – April 2007

E-10 MacMillan Pass Wind Data – May 2007

E-11 MacMillan Pass Wind Data – June 2007

E-12 MacMillan Pass Wind Data – July 2007

E-13 MacMillan Pass Wind Data – August 2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
AUGUST 2006

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W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure E-01

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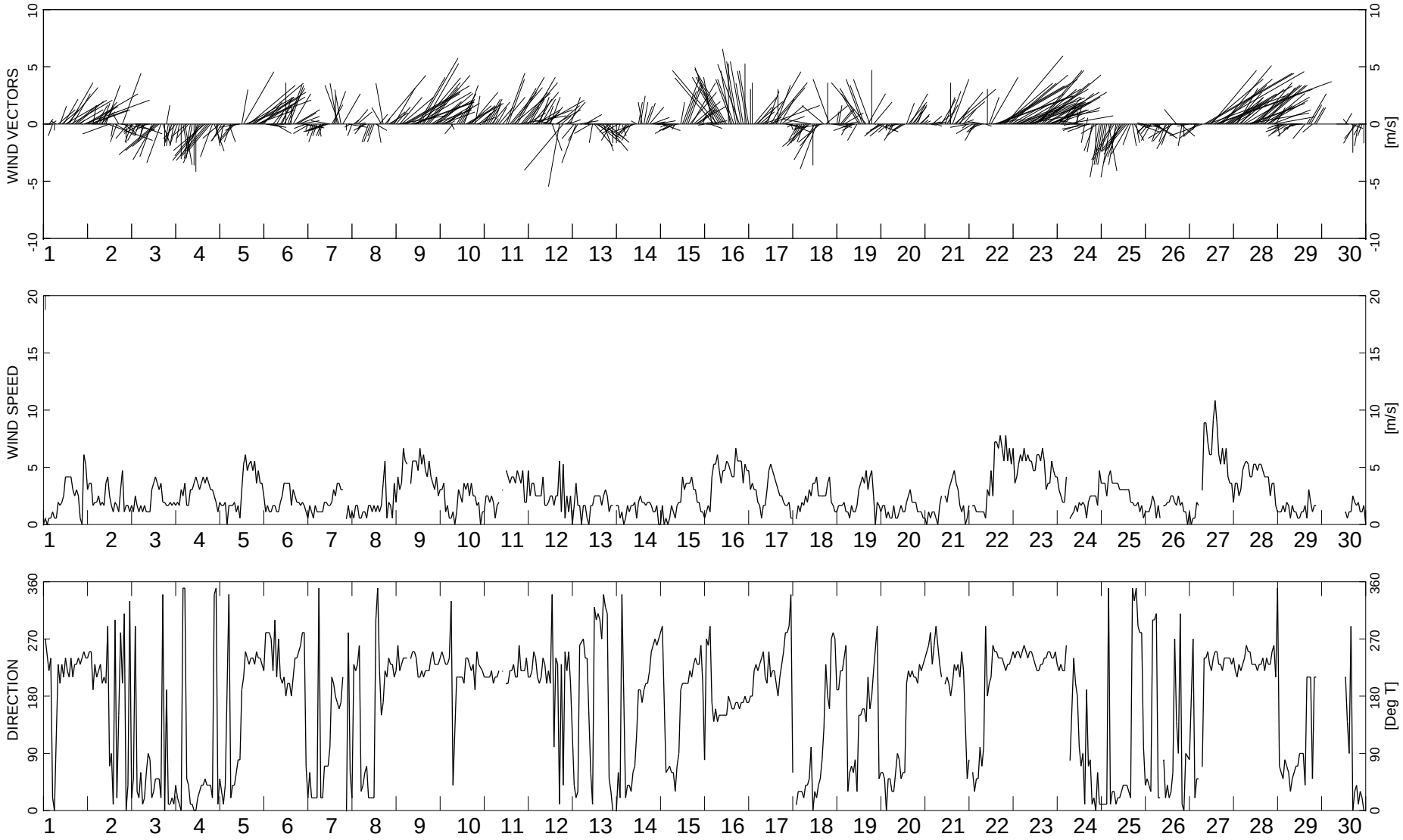

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
SEPTEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure E-02

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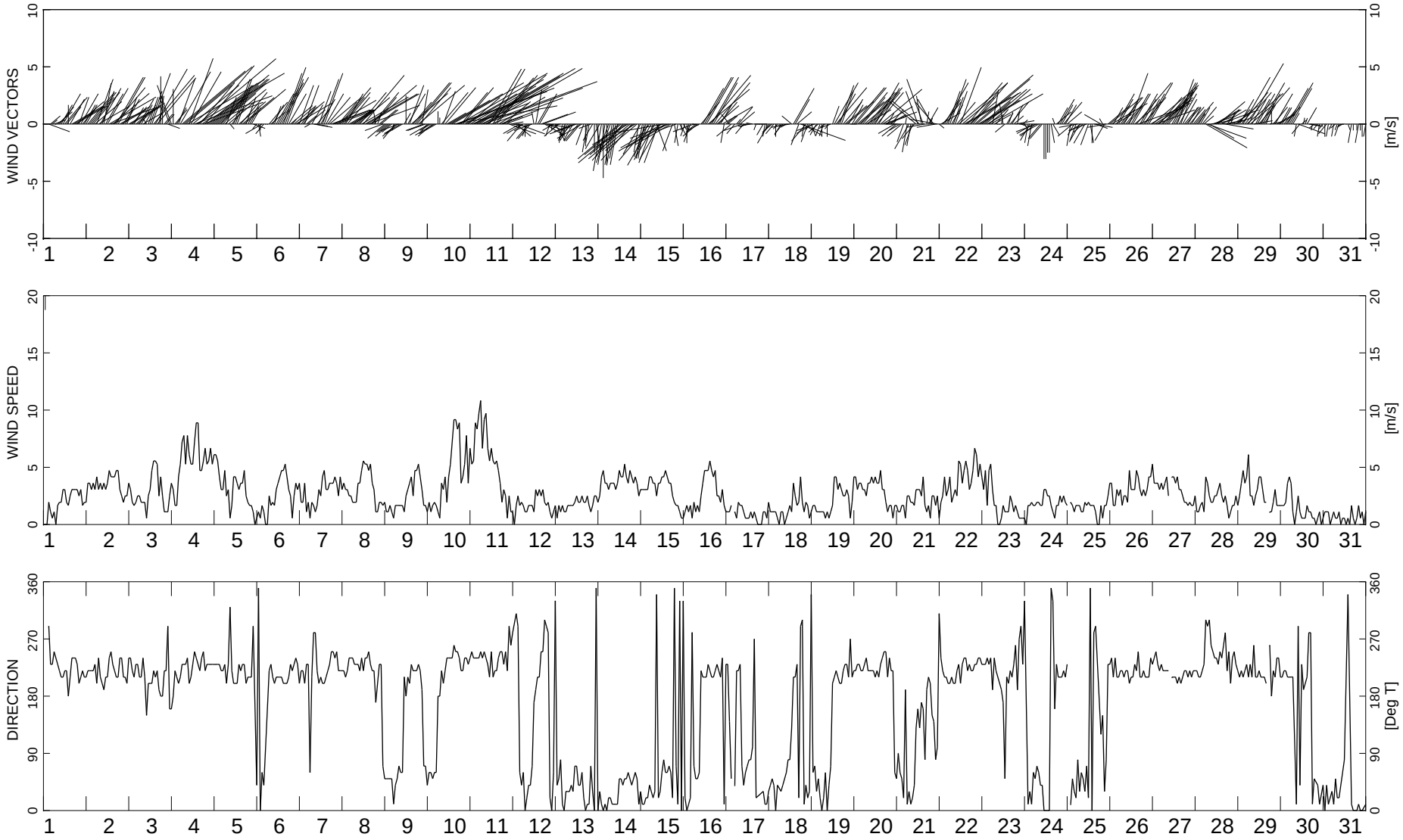

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
OCTOBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure E-03

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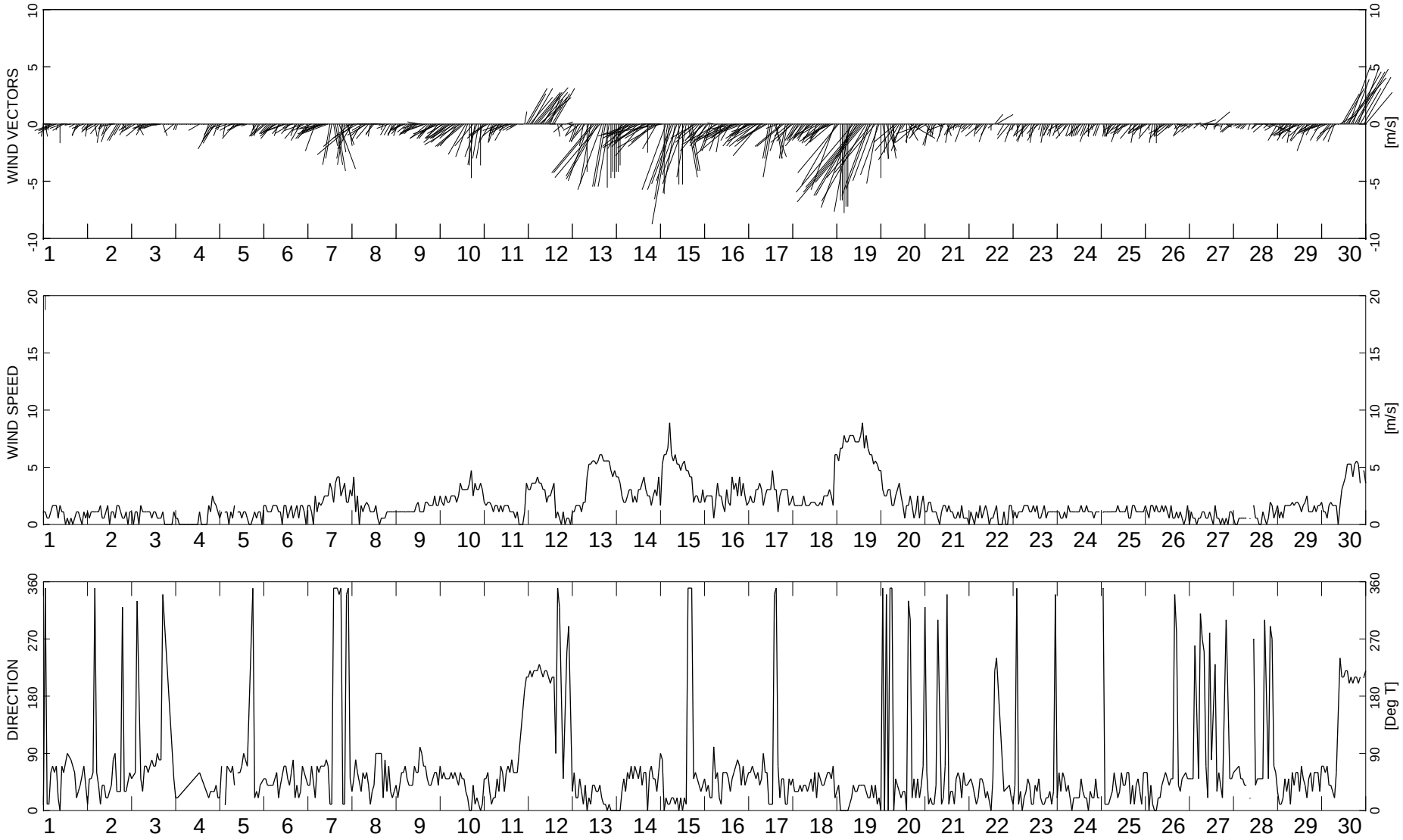

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
NOVEMBER 2006

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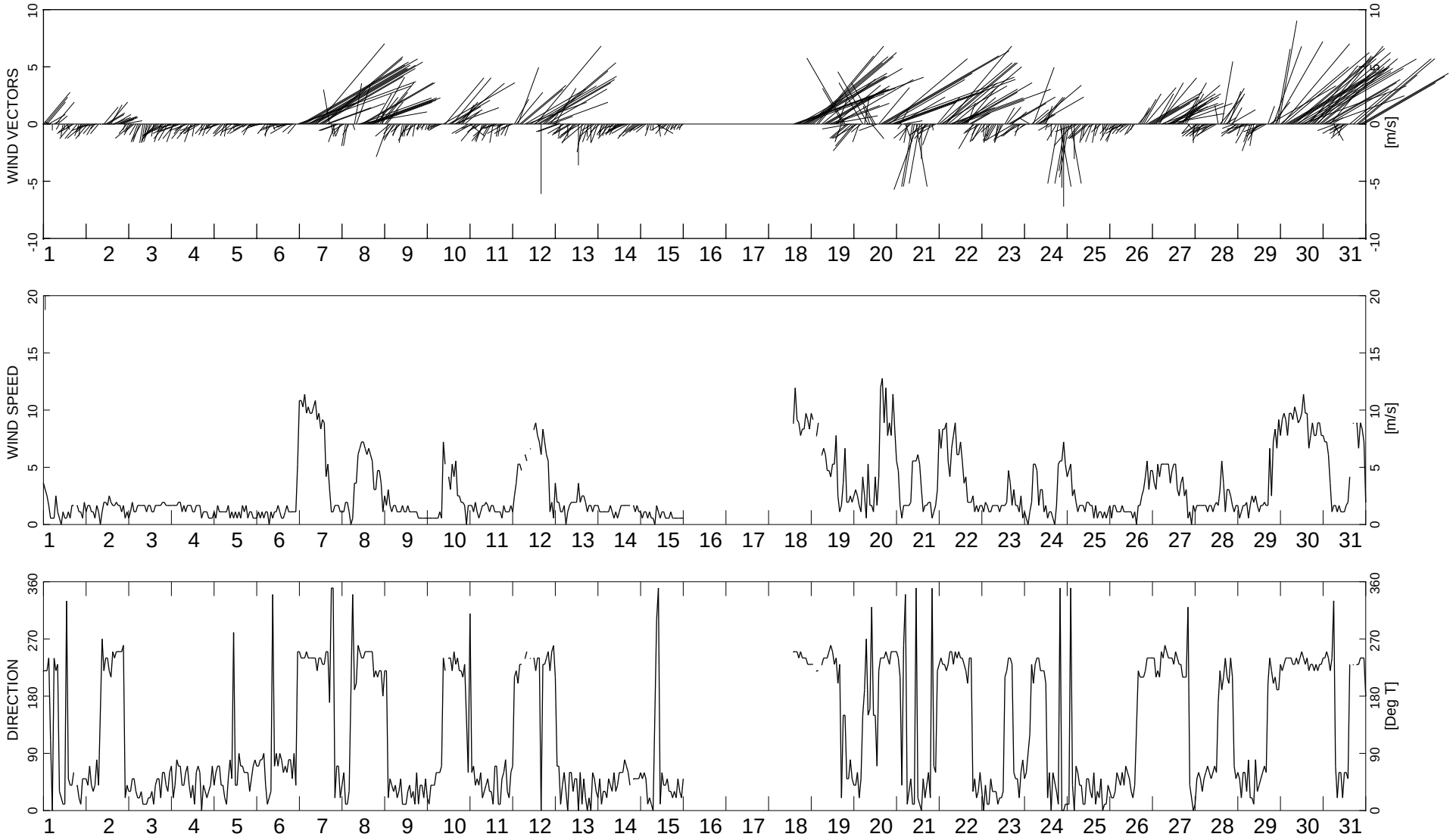
OFFICE: EBA-VANC

DATE: December 2007

Figure E-04



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
DECEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure E-05

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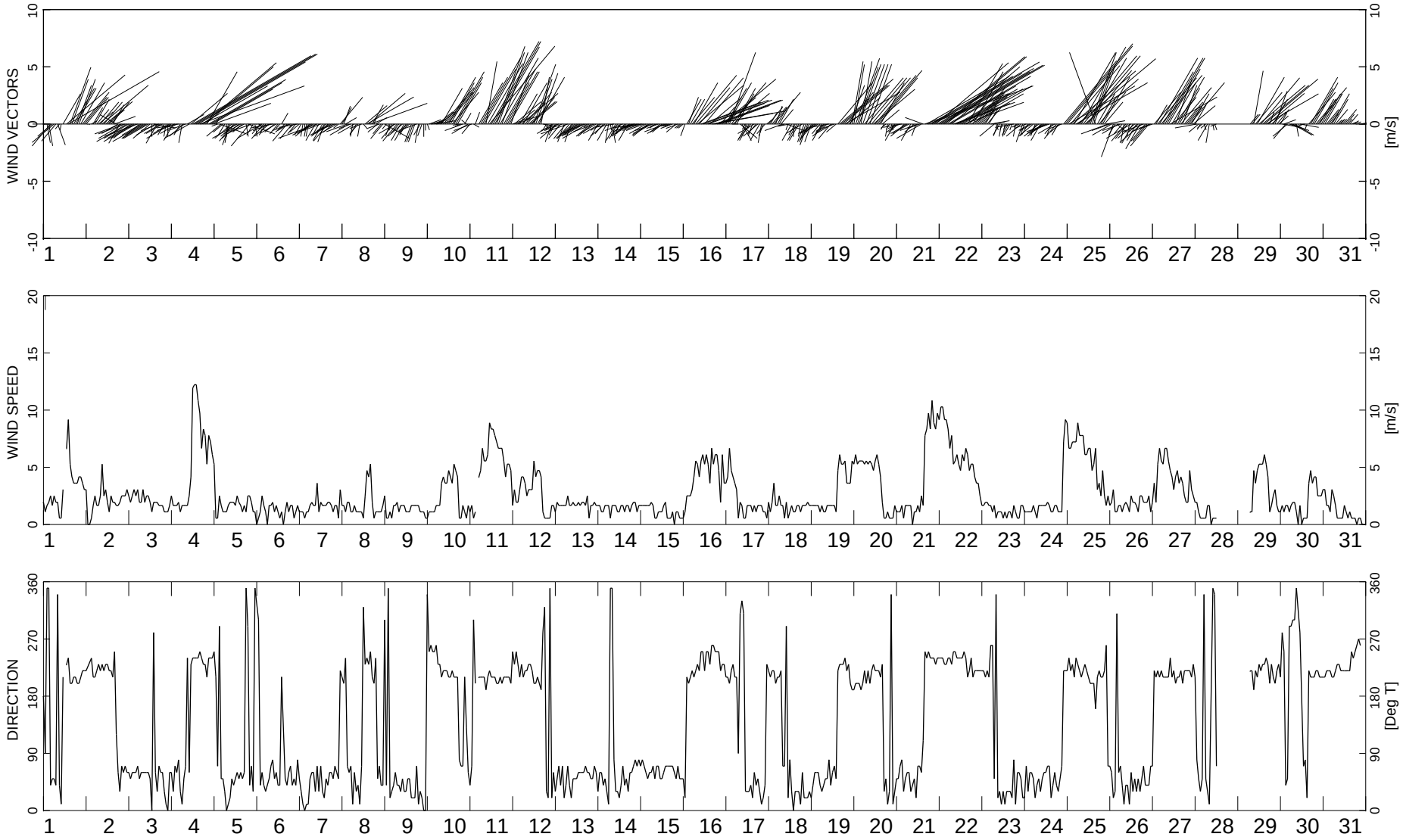

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
JANUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure E-06

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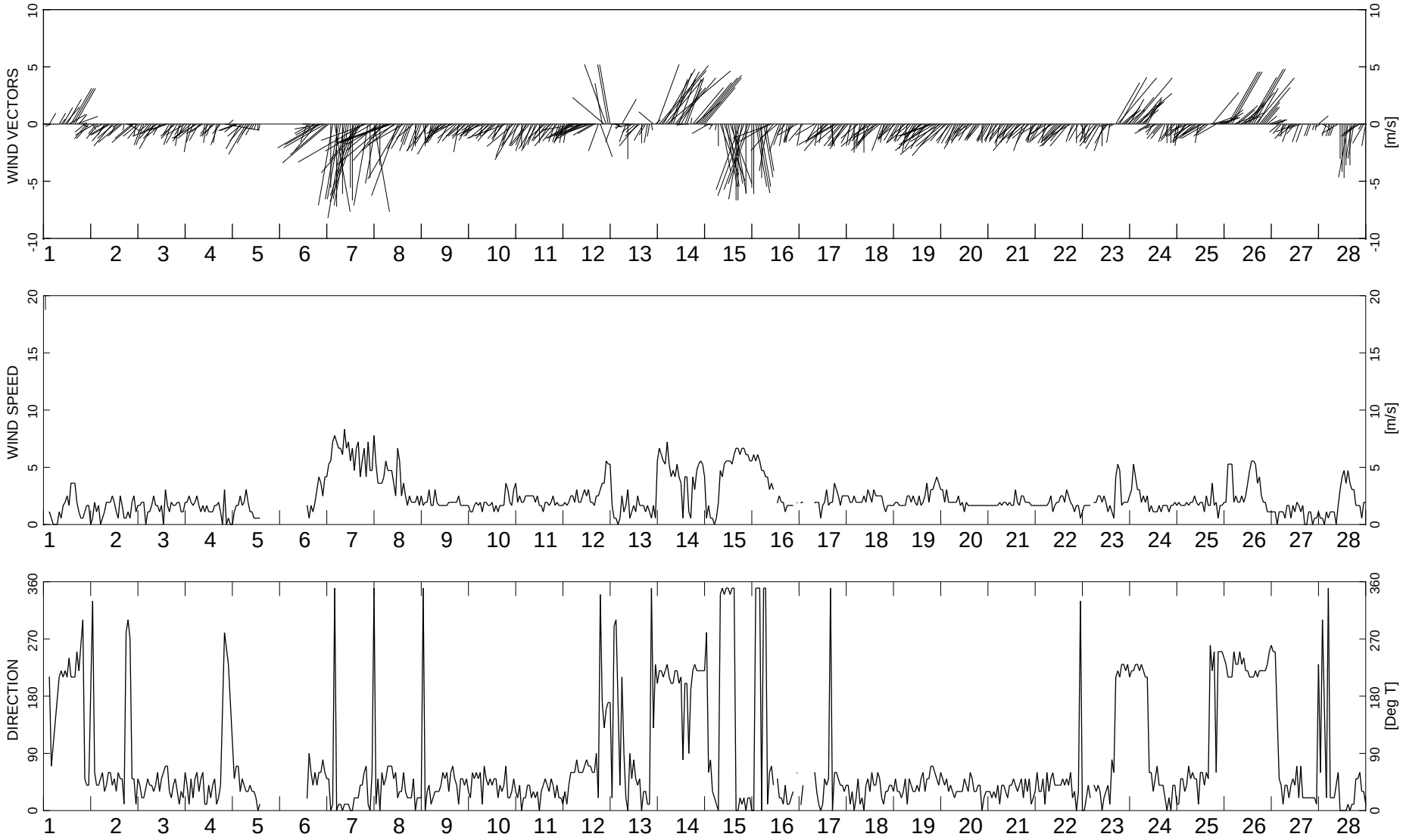

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

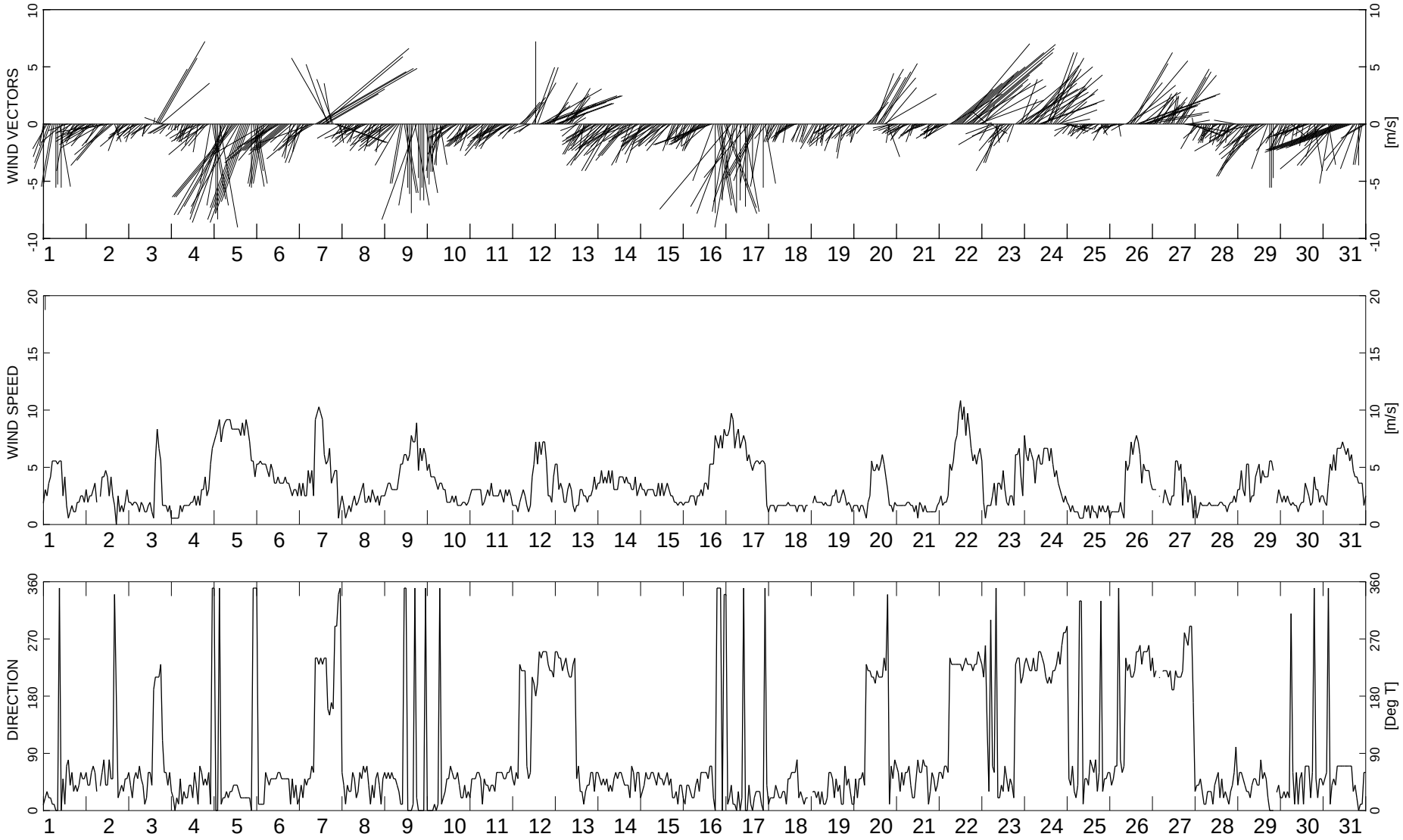
MACMILLAN PASS
WIND DATA
FEBRUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure E-07



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
MARCH 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure E-08

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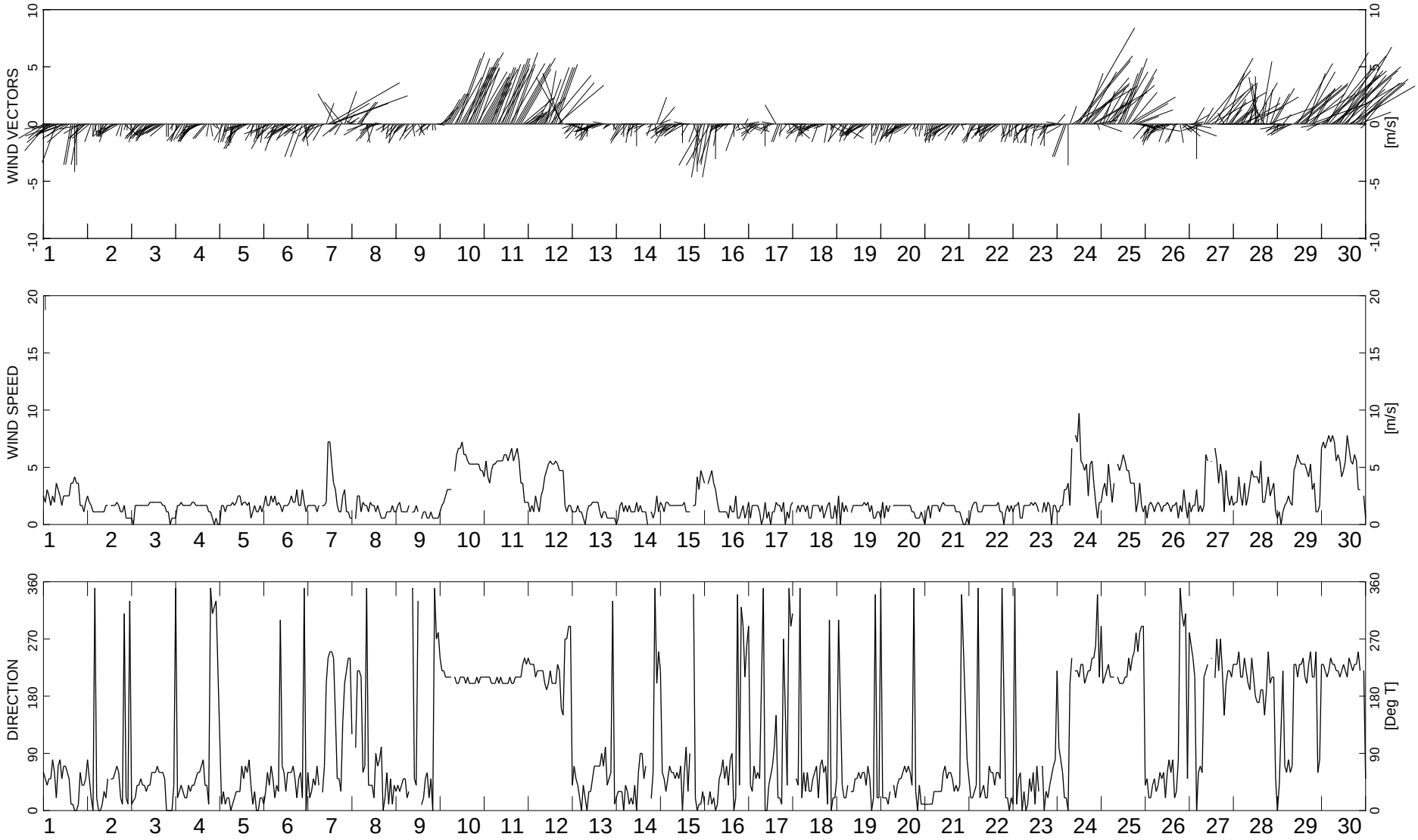

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
APRIL 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure E-09

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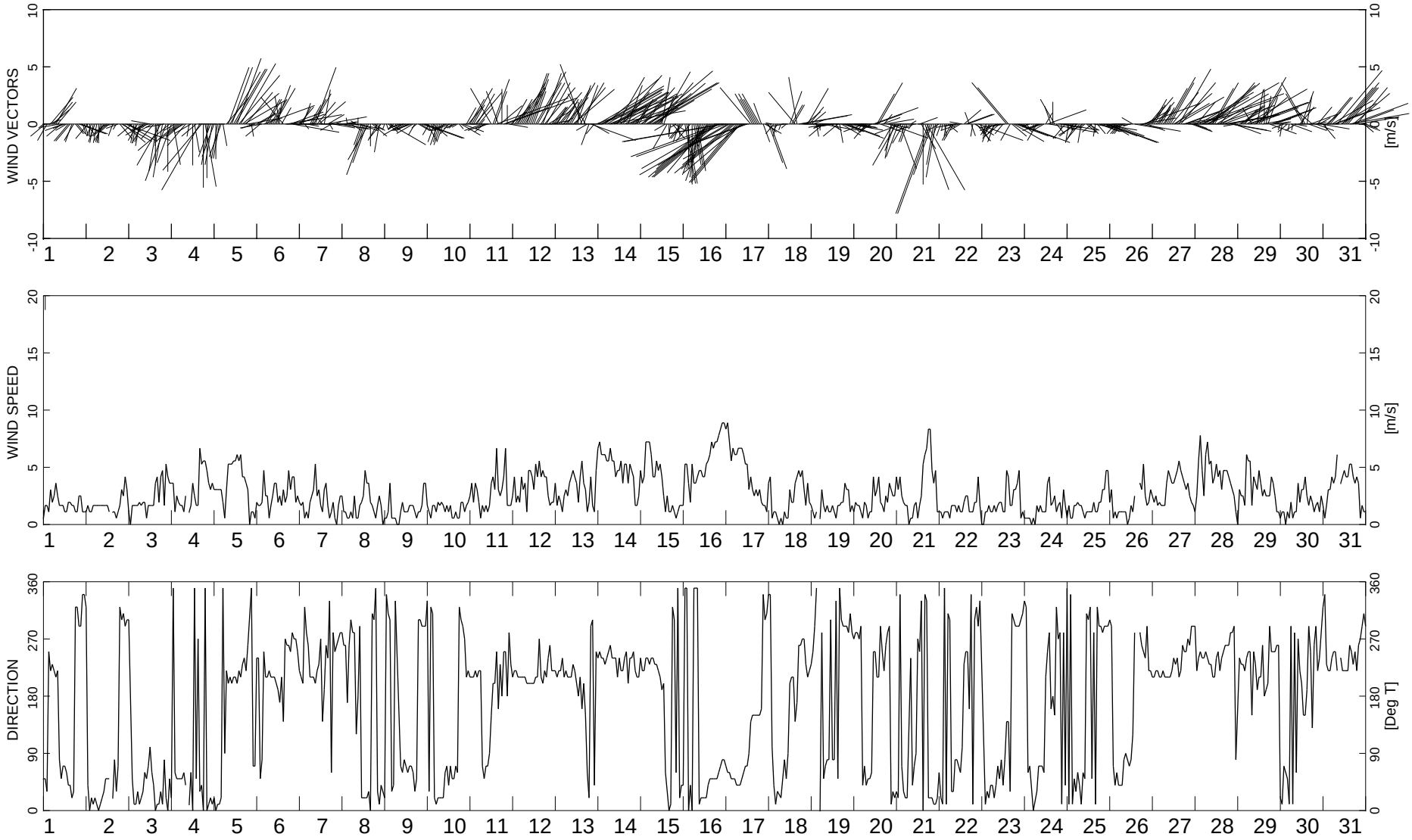

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
MAY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure E-10

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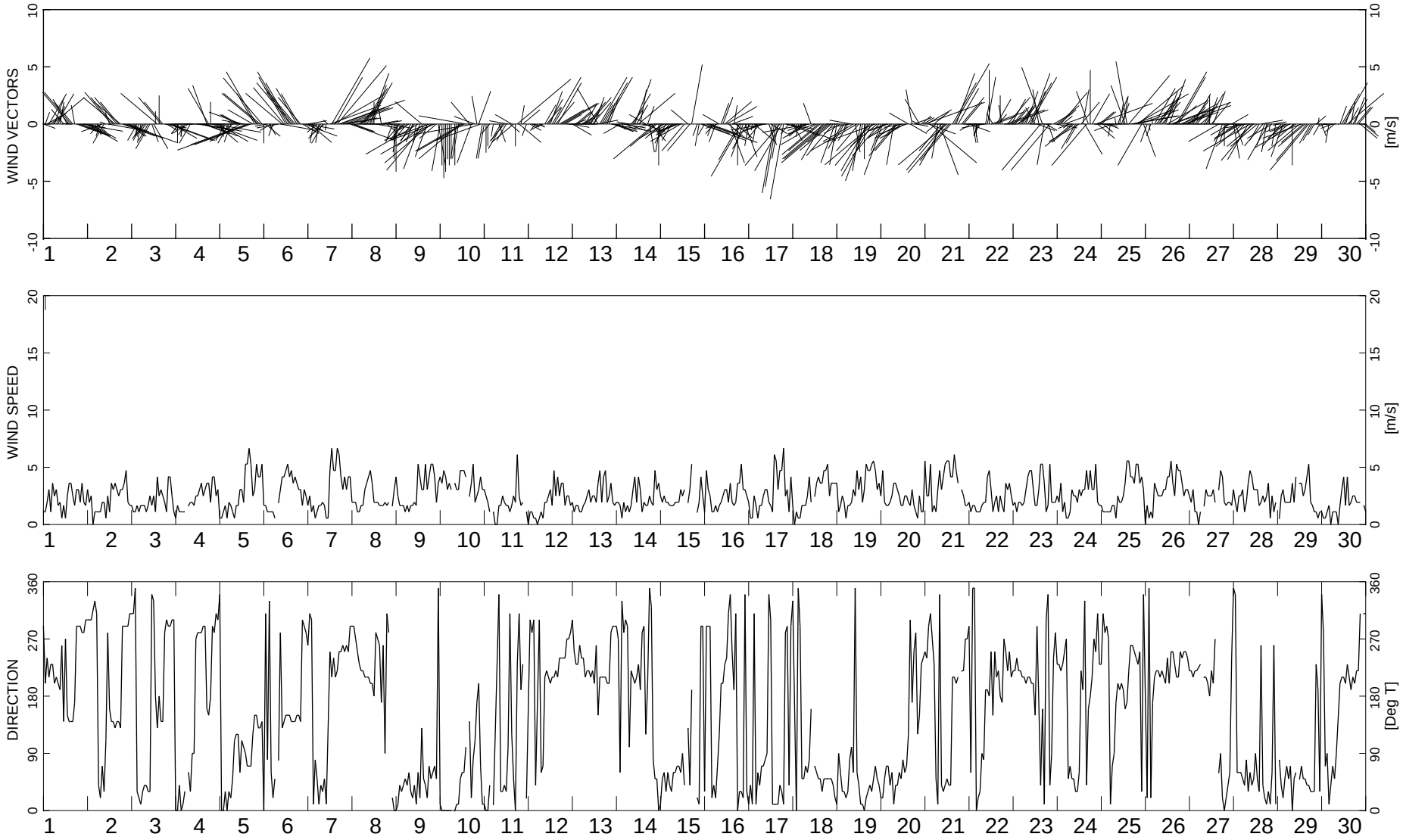

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
JUNE 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure E-11

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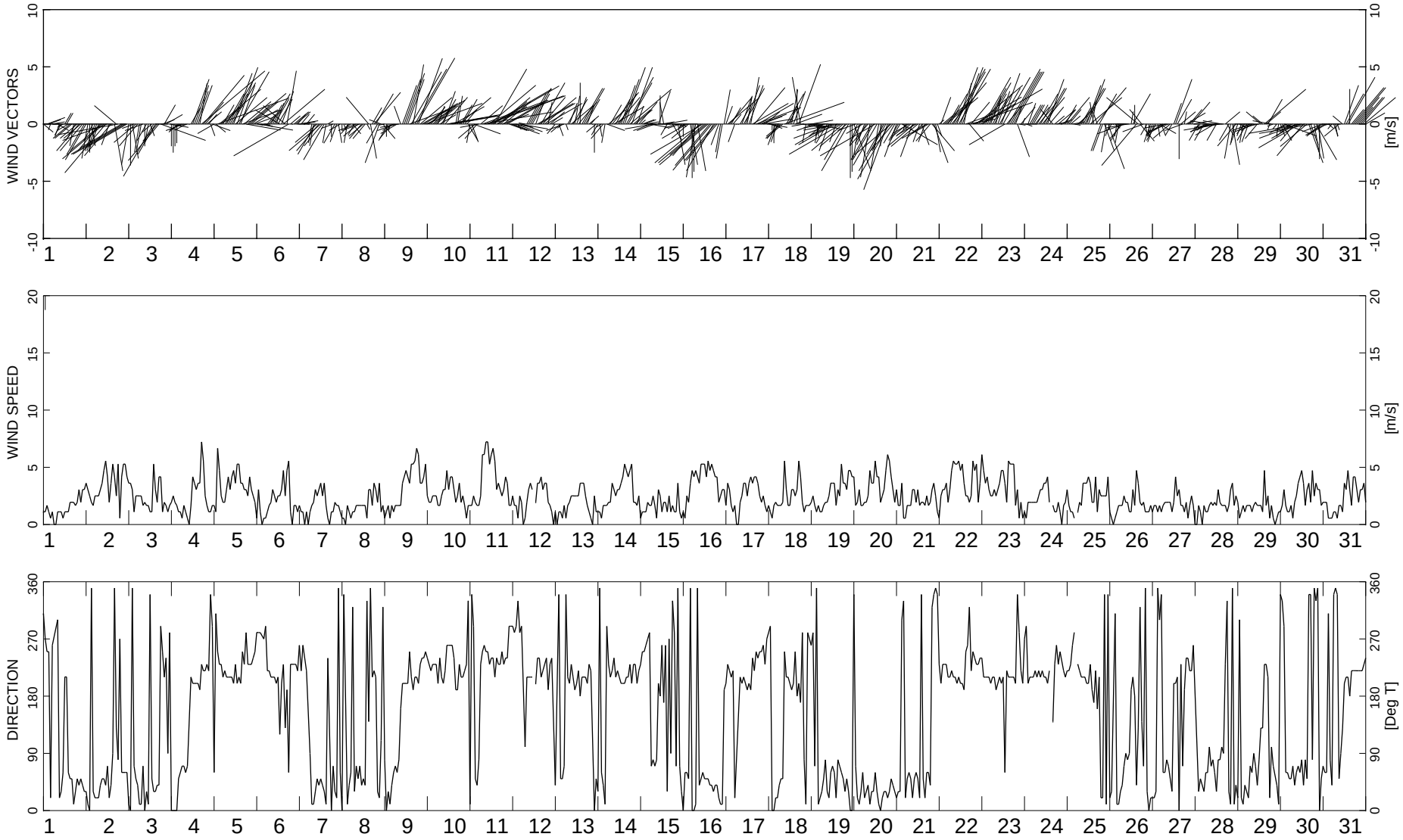

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

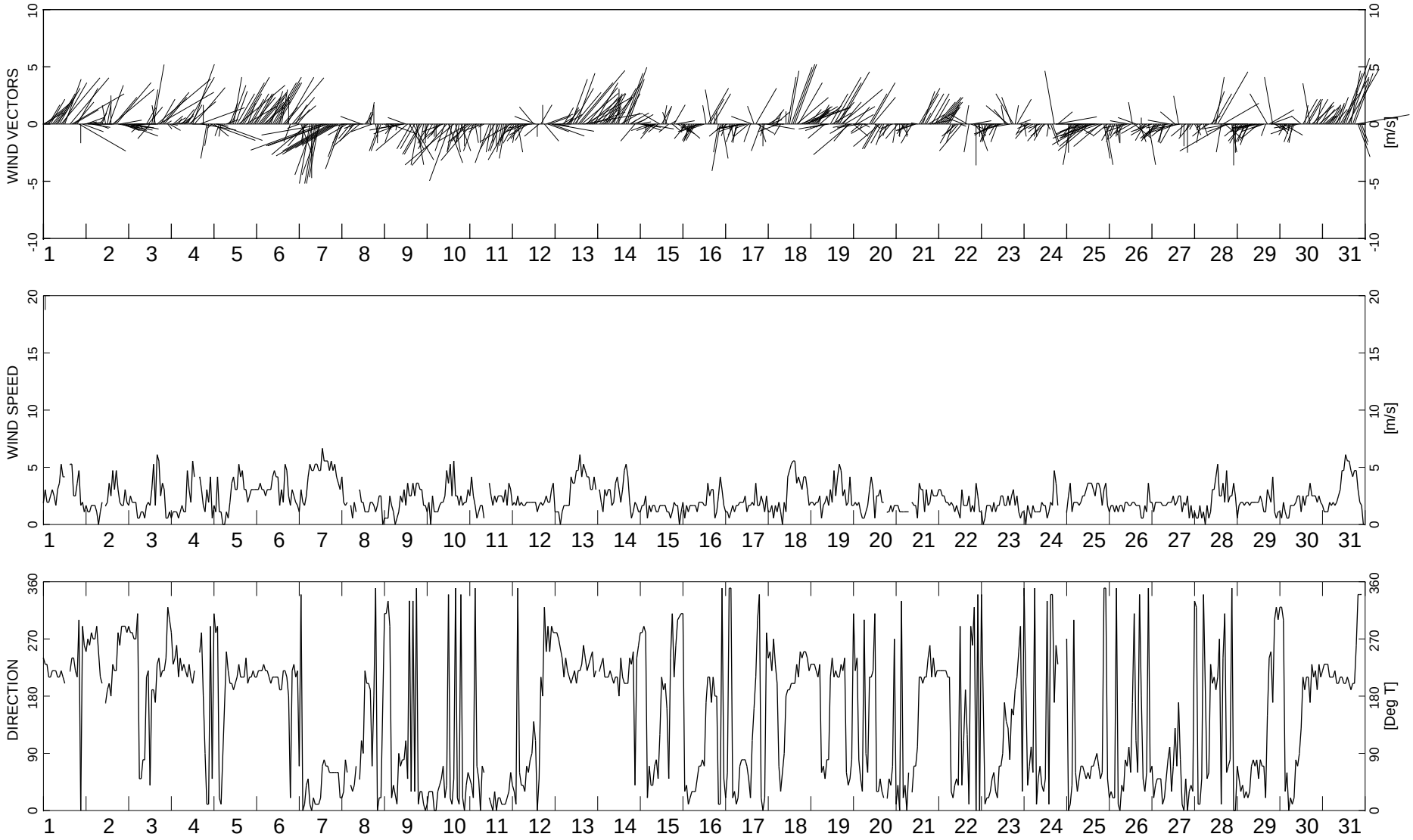
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
JULY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure E-12



CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND DATA
AUGUST 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure E-13

Thu Dec 06 14:31:25 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007

APPENDIX

APPENDIX F MACMILLAN PASS MONTHLY WIND ROSES – AUGUST 2006 TO AUGUST 2007

APPENDIX F

MacMillan Pass Monthly Wind Roses

August 2006 – August 2007

F-01 MacMillan Pass Wind Rose – August 2006

F-02 MacMillan Pass Wind Rose – September 2006

F-03 MacMillan Pass Wind Rose – October 2006

F-04 MacMillan Pass Wind Rose – November 2006

F-05 MacMillan Pass Wind Rose – December 2006

F-06 MacMillan Pass Wind Rose – January 2007

F-07 MacMillan Pass Wind Rose – February 2007

F-08 MacMillan Pass Wind Rose – March 2007

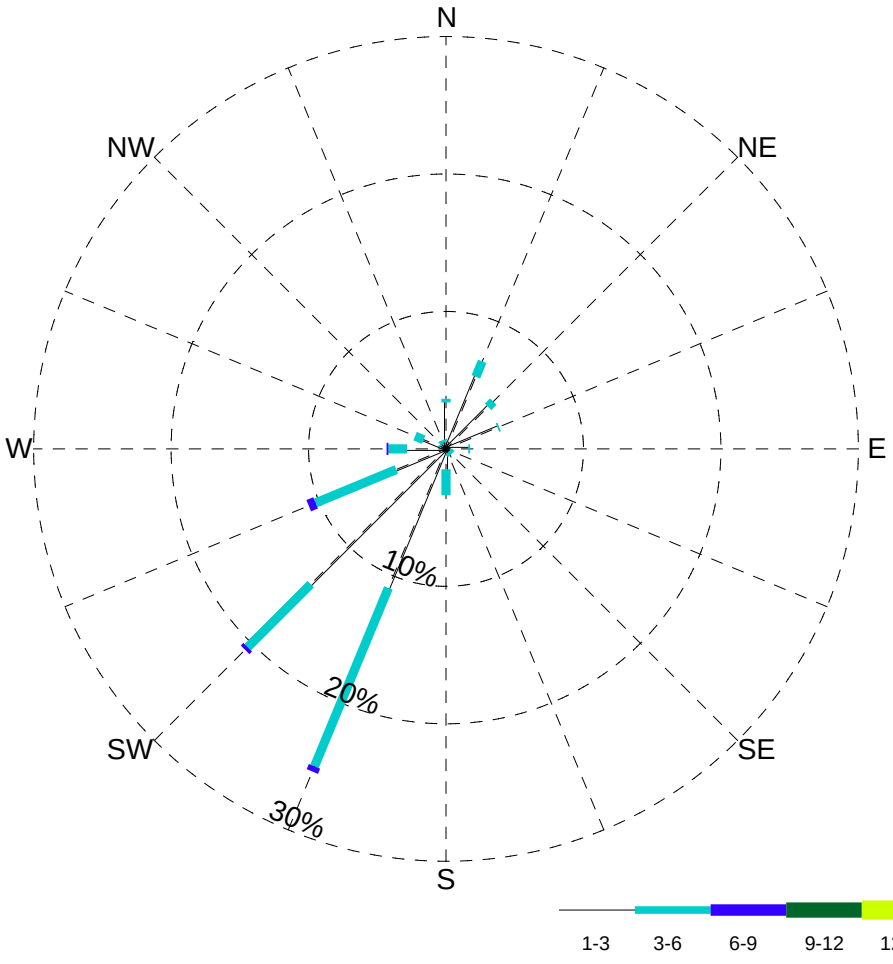
F-09 MacMillan Pass Wind Rose – April 2007

F-10 MacMillan Pass Wind Rose – May 2007

F-11 MacMillan Pass Wind Rose – June 2007

F-12 MacMillan Pass Wind Rose – July 2007

F-13 MacMillan Pass Wind Rose – August 2007



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: Aug. 01, 2006
End Date: Aug. 31, 2006

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	-	4.05	0.14	-	-	-	-	-	4.19
NE	-	4.32	0.54	-	-	-	-	-	4.86
NNE	-	5.68	1.22	-	-	-	-	-	6.89
N	-	3.38	0.27	-	-	-	-	-	3.65
NNW	-	0.54	0.14	-	-	-	-	-	0.68
NW	-	0.41	0.14	-	-	-	-	-	0.54
WNW	-	1.76	0.68	-	-	-	-	-	2.43
W	-	2.84	1.35	0.14	-	-	-	-	4.32
WSW	-	3.92	6.35	0.54	-	-	-	-	10.81
SW	-	13.92	6.49	0.27	-	-	-	-	20.68
SSW	-	10.95	14.05	0.41	-	-	-	-	25.41
S	-	1.49	1.89	-	-	-	-	-	3.38
SSE	-	0.68	-	-	-	-	-	-	0.68
SE	-	0.27	0.27	-	-	-	-	-	0.54
ESE	-	0.27	-	-	-	-	-	-	0.27
E	-	1.62	0.14	-	-	-	-	-	1.76
Calm	8.92	-	-	-	-	-	-	-	8.92
Total (%)	8.92	56.08	33.65	1.35	-	-	-	-	100.00

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HAY & COMPANY CONSULTANTS A DIVISION OF EBA

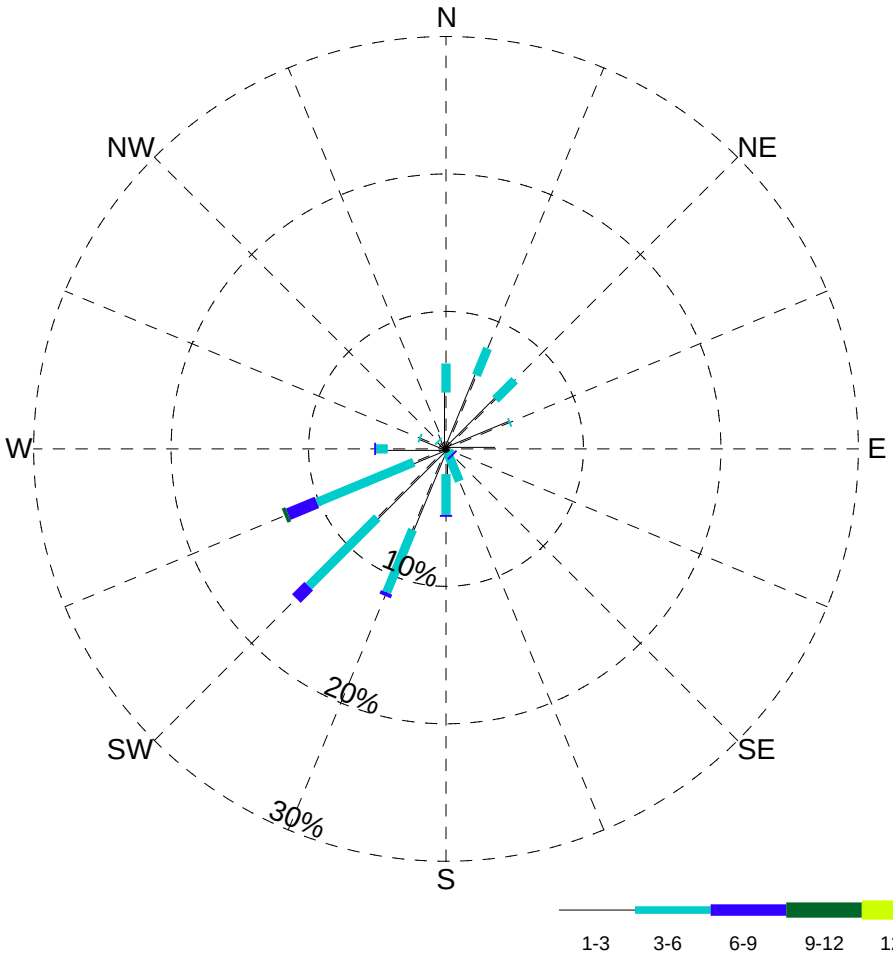
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
AUGUST 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-01



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 30 days
Start Date: Sep. 01, 2006
End Date: Sep. 30, 2006

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	-	4.94	0.14	-	-	-	-	-	5.09
NE	-	5.09	1.98	-	-	-	-	-	7.06
NNE	-	5.79	2.12	-	-	-	-	-	7.91
N	-	4.10	2.12	-	-	-	-	-	6.22
NNW	-	1.13	-	-	-	-	-	-	1.13
NW	-	0.71	0.14	-	-	-	-	-	0.85
WNW	-	1.98	0.14	-	-	-	-	-	2.12
W	-	4.24	0.85	0.14	-	-	-	-	5.23
WSW	-	2.54	7.63	2.26	0.28	-	-	-	12.71
SW	-	7.06	7.06	1.27	-	-	-	-	15.40
SSW	-	6.36	4.94	0.28	-	-	-	-	11.58
S	-	1.84	2.97	0.14	-	-	-	-	4.94
SSE	-	0.28	2.26	-	-	-	-	-	2.54
SE	-	0.28	0.28	0.14	-	-	-	-	0.71
ESE	-	-	-	-	-	-	-	-	-
E	-	3.53	-	-	-	-	-	-	3.53
Calm	12.99	-	-	-	-	-	-	-	12.99
Total (%)	12.99	49.86	32.63	4.24	0.28	-	-	-	100.00

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

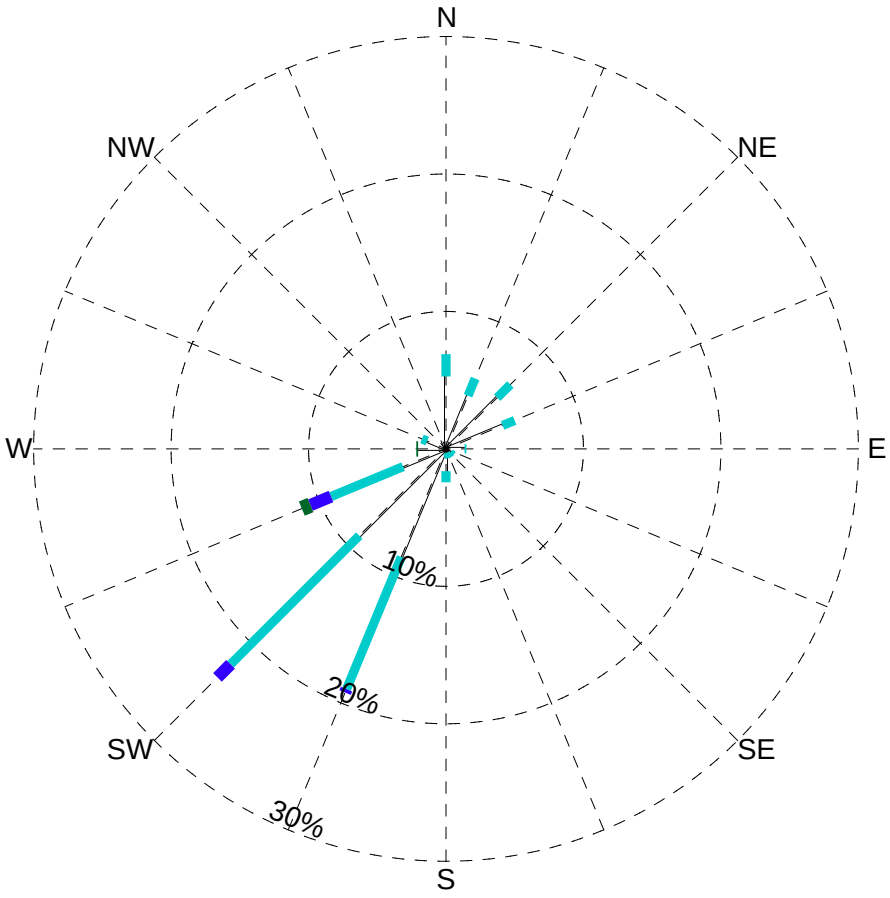
MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
SEPTEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-02



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: Oct. 01, 2006
End Date: Oct. 31, 2006

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	-	4.46	0.95	-	-	-	-	-	5.41
NE	-	5.27	1.35	-	-	-	-	-	6.62
NNE	-	4.19	1.35	-	-	-	-	-	5.54
N	-	5.27	1.62	-	-	-	-	-	6.89
NNW	-	0.68	-	-	-	-	-	-	0.68
NW	-	0.14	-	-	-	-	-	-	0.14
WNW	-	1.49	0.41	-	-	-	-	-	1.89
W	-	2.03	-	-	0.14	-	-	-	2.16
WSW	-	3.38	5.68	1.62	0.68	-	-	-	11.35
SW	-	8.92	13.24	1.35	-	-	-	-	23.51
SSW	-	8.51	10.40	0.27	-	-	-	-	19.19
S	-	1.62	0.81	-	-	-	-	-	2.43
SSE	-	0.27	0.41	-	-	-	-	-	0.68
SE	-	0.41	0.27	-	-	-	-	-	0.68
ESE	-	0.14	-	-	-	-	-	-	0.14
E	-	1.35	0.14	-	-	-	-	-	1.49
Calm	11.22	-	-	-	-	-	-	-	11.22
Total (%)	11.22	48.11	36.62	3.24	0.81	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
OCTOBER 2006

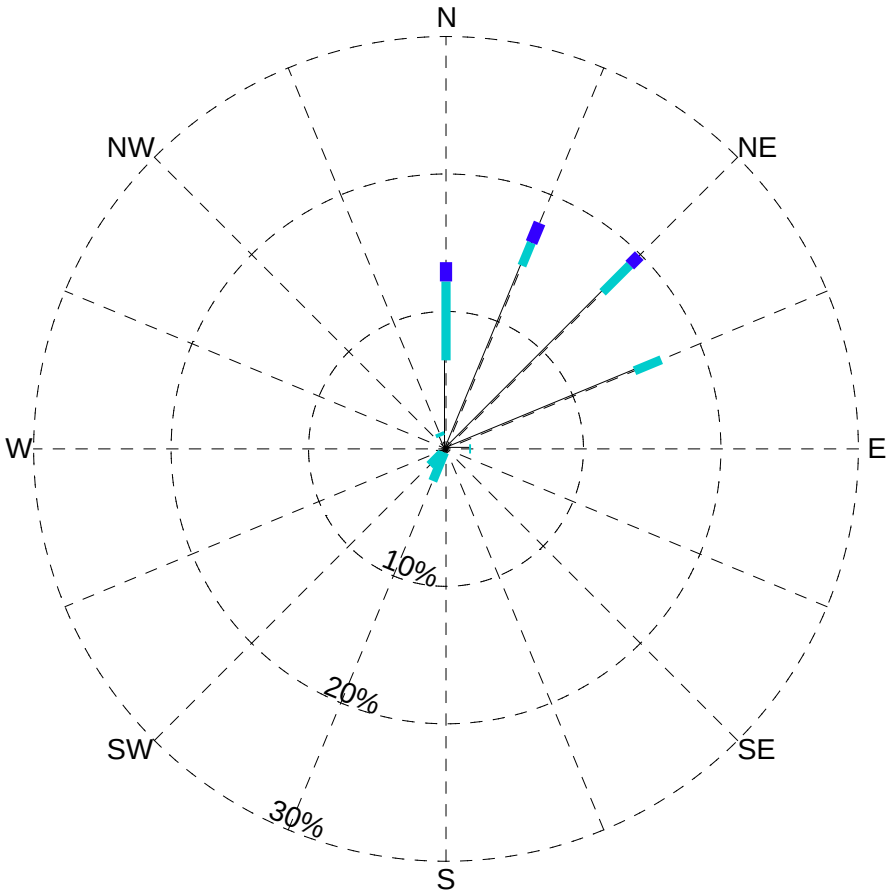
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-03

Thu Dec 06 16:20:47 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\Wind_roses\2007



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 30 days
Start Date: Nov. 01, 2006
End Date: Nov. 30, 2006

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	-	14.85	2.10	-	-	-	-	-	16.95
NE	-	16.11	2.80	0.98	-	-	-	-	19.89
NNE	-	14.43	1.82	1.54	-	-	-	-	17.79
N	-	6.44	5.74	1.40	-	-	-	-	13.59
NNW	-	0.98	0.28	-	-	-	-	-	1.26
NW	-	0.14	-	-	-	-	-	-	0.14
WNW	-	0.28	-	-	-	-	-	-	0.28
W	-	0.70	-	-	-	-	-	-	0.70
WSW	-	0.42	-	-	-	-	-	-	0.42
SW	-	0.42	1.26	-	-	-	-	-	1.68
SSW	-	0.28	2.24	-	-	-	-	-	2.52
S	-	0.14	-	-	-	-	-	-	0.14
SSE	-	-	-	-	-	-	-	-	-
SE	-	-	-	-	-	-	-	-	-
ESE	-	-	-	-	-	-	-	-	-
E	-	1.68	0.14	-	-	-	-	-	1.82
Calm	22.83	-	-	-	-	-	-	-	22.83
Total (%)	22.83	56.86	16.39	3.92	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

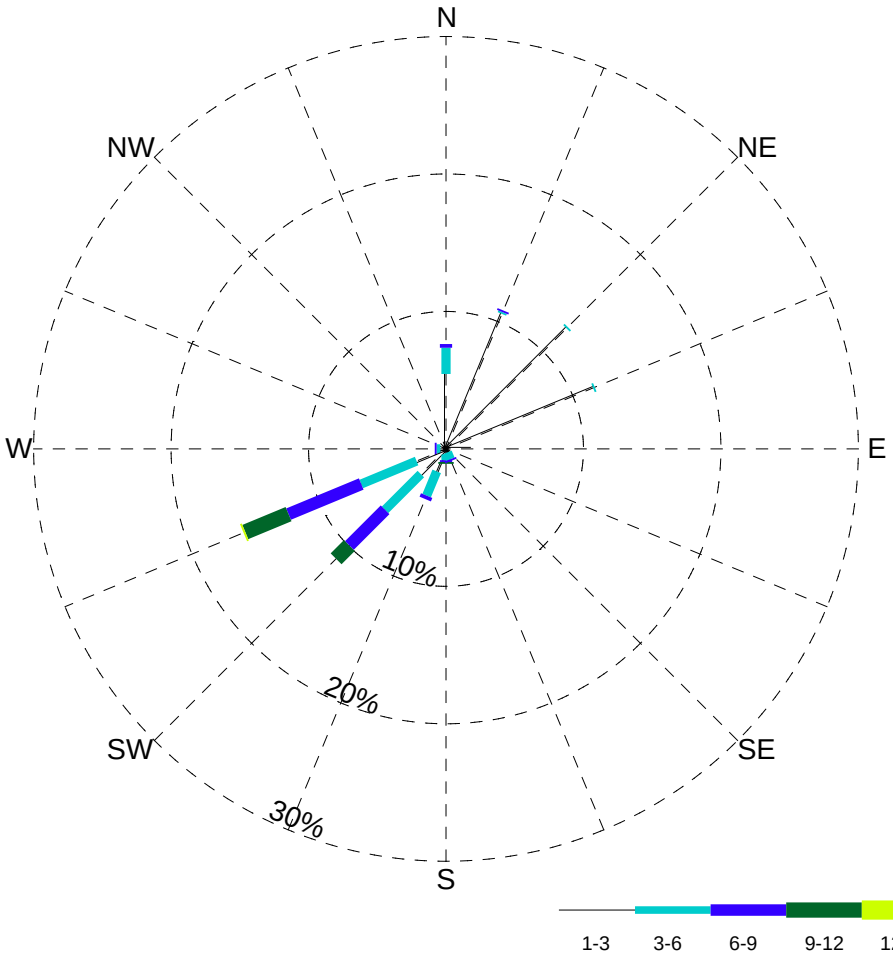
MACMILLAN PASS
WIND ROSE
NOVEMBER 2006

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-04



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: Dec. 01, 2006
End Date: Dec. 31, 2006

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	-	11.58	0.14	-	-	-	-	-	11.72
NE	-	12.40	0.14	-	-	-	-	-	12.53
NNE	-	10.63	0.14	0.14	-	-	-	-	10.90
N	-	5.45	1.91	0.27	-	-	-	-	7.63
NNW	-	0.27	-	-	-	-	-	-	0.27
NW	-	0.27	-	-	-	-	-	-	0.27
WNW	-	0.14	-	-	-	-	-	-	0.14
W	-	0.41	0.27	0.14	-	-	-	-	0.82
WSW	-	2.32	4.36	5.72	3.41	0.14	-	-	15.94
SW	-	2.59	3.68	3.68	1.36	-	-	-	11.31
SSW	-	1.77	1.91	0.27	-	-	-	-	3.95
S	-	0.41	0.41	0.14	0.14	-	-	-	1.09
SSE	-	0.27	0.55	0.14	-	-	-	-	0.95
SE	-	-	-	-	-	-	-	-	-
ESE	-	0.14	-	-	-	-	-	-	0.14
E	-	1.77	-	-	-	-	-	-	1.77
Calm	20.57	-	-	-	-	-	-	-	20.57
Total (%)	20.57	50.41	13.49	10.49	4.91	0.14	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

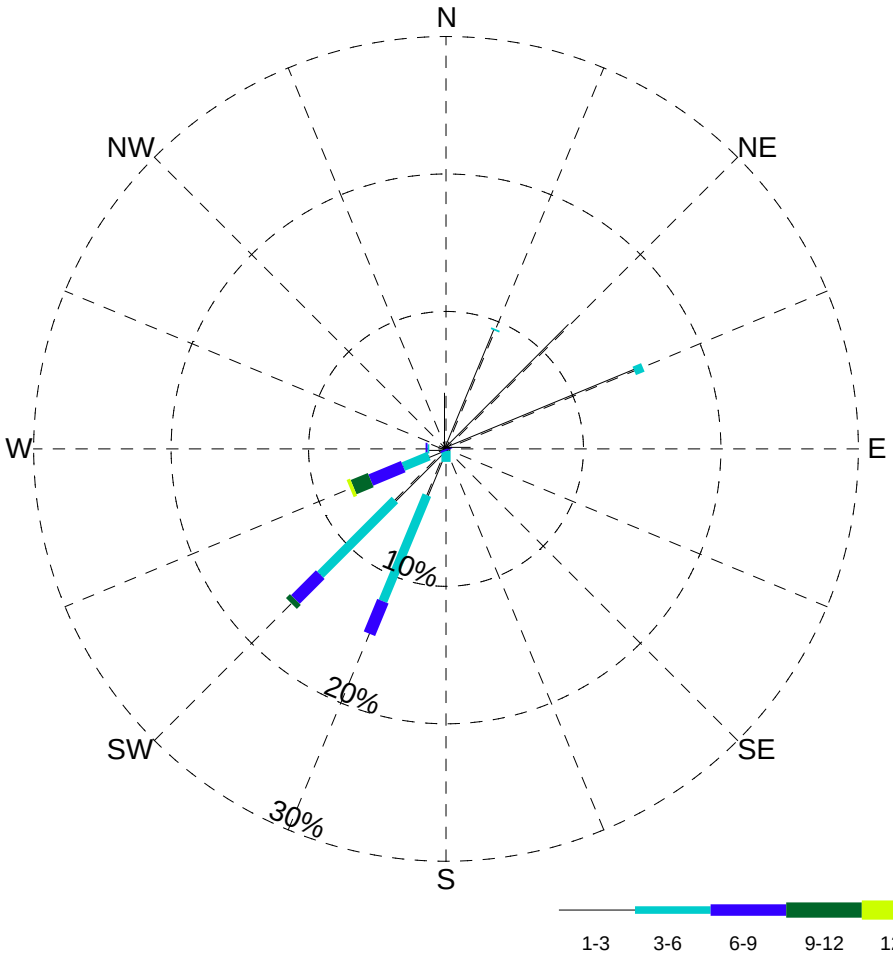
MACMILLAN PASS
WIND ROSE
DECEMBER 2006

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-05



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: Jan. 01, 2007
End Date: Jan. 31, 2007

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	-	14.82	0.67	-	-	-	-	-	15.50
NE	-	12.67	-	-	-	-	-	-	12.67
NNE	-	9.30	0.14	-	-	-	-	-	9.43
N	-	4.04	-	-	-	-	-	-	4.04
NNW	-	0.27	-	-	-	-	-	-	0.27
NW	-	0.27	-	-	-	-	-	-	0.27
WNW	-	1.08	-	-	-	-	-	-	1.08
W	-	1.21	0.14	0.14	-	-	-	-	1.48
WSW	-	1.35	2.02	2.56	1.35	0.27	-	-	7.55
SW	-	5.26	7.68	2.56	0.40	-	-	-	15.90
SSW	-	3.64	8.36	2.56	-	-	-	-	14.56
S	-	0.14	0.81	-	-	-	-	-	0.94
SSE	-	-	-	0.14	-	-	-	-	0.14
SE	-	-	-	-	-	-	-	-	-
ESE	-	0.27	-	-	-	-	-	-	0.27
E	-	1.75	-	-	-	-	-	-	1.75
Calm	14.15	-	-	-	-	-	-	-	14.15
Total (%)	14.15	56.06	19.81	7.95	1.75	0.27	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

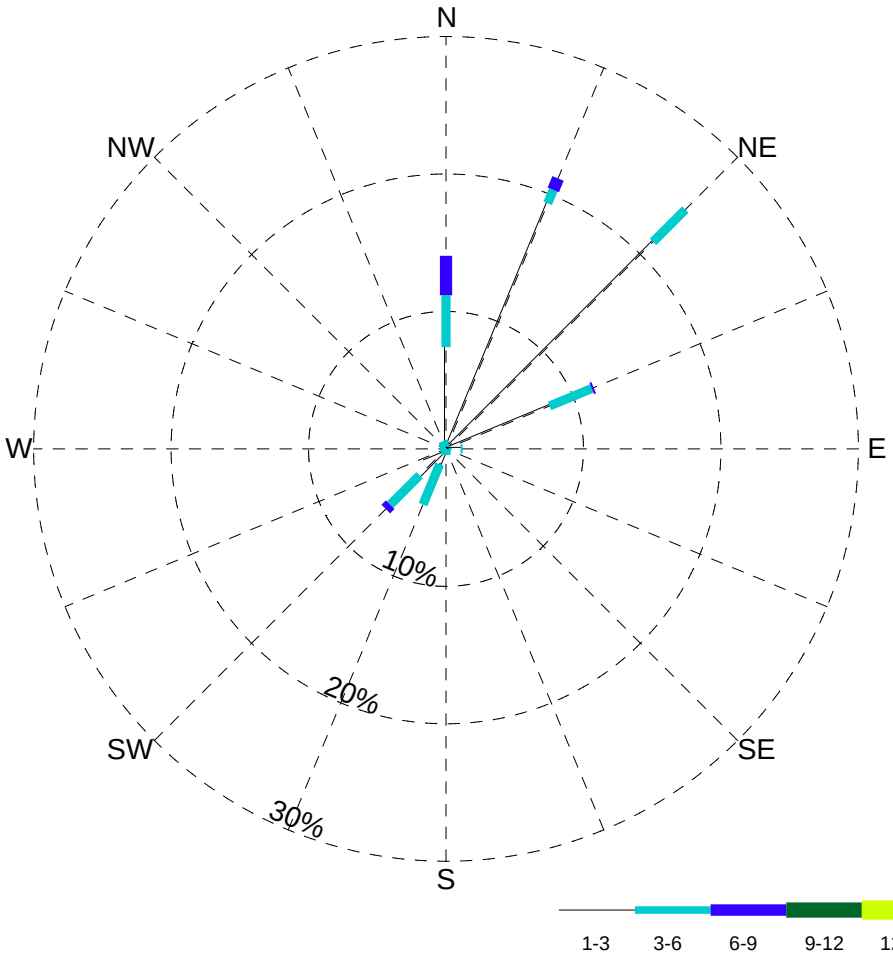
MACMILLAN PASS
WIND ROSE
JANUARY 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-06



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 28 days
Start Date: Feb. 01, 2007
End Date: Feb. 28, 2007

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	-	8.16	3.32	0.15	-	-	-	-	11.63
NE	-	21.30	3.32	-	-	-	-	-	24.62
NNE	-	19.33	1.06	0.91	-	-	-	-	21.30
N	-	7.40	3.78	2.87	-	-	-	-	14.05
NNW	-	-	0.60	-	-	-	-	-	0.60
NW	-	-	-	-	-	-	-	-	-
WNW	-	0.15	-	-	-	-	-	-	0.15
W	-	0.30	0.15	-	-	-	-	-	0.45
WSW	-	1.81	-	-	-	-	-	-	1.81
SW	-	2.72	3.02	0.45	-	-	-	-	6.19
SSW	-	1.21	3.17	-	-	-	-	-	4.38
S	-	-	0.45	-	-	-	-	-	0.45
SSE	-	-	0.15	-	-	-	-	-	0.15
SE	-	0.15	0.15	-	-	-	-	-	0.30
ESE	-	-	-	-	-	-	-	-	-
E	-	1.06	0.15	-	-	-	-	-	1.21
Calm	12.69	-	-	-	-	-	-	-	12.69
Total (%)	12.69	63.60	19.33	4.38	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
FEBRUARY 2007

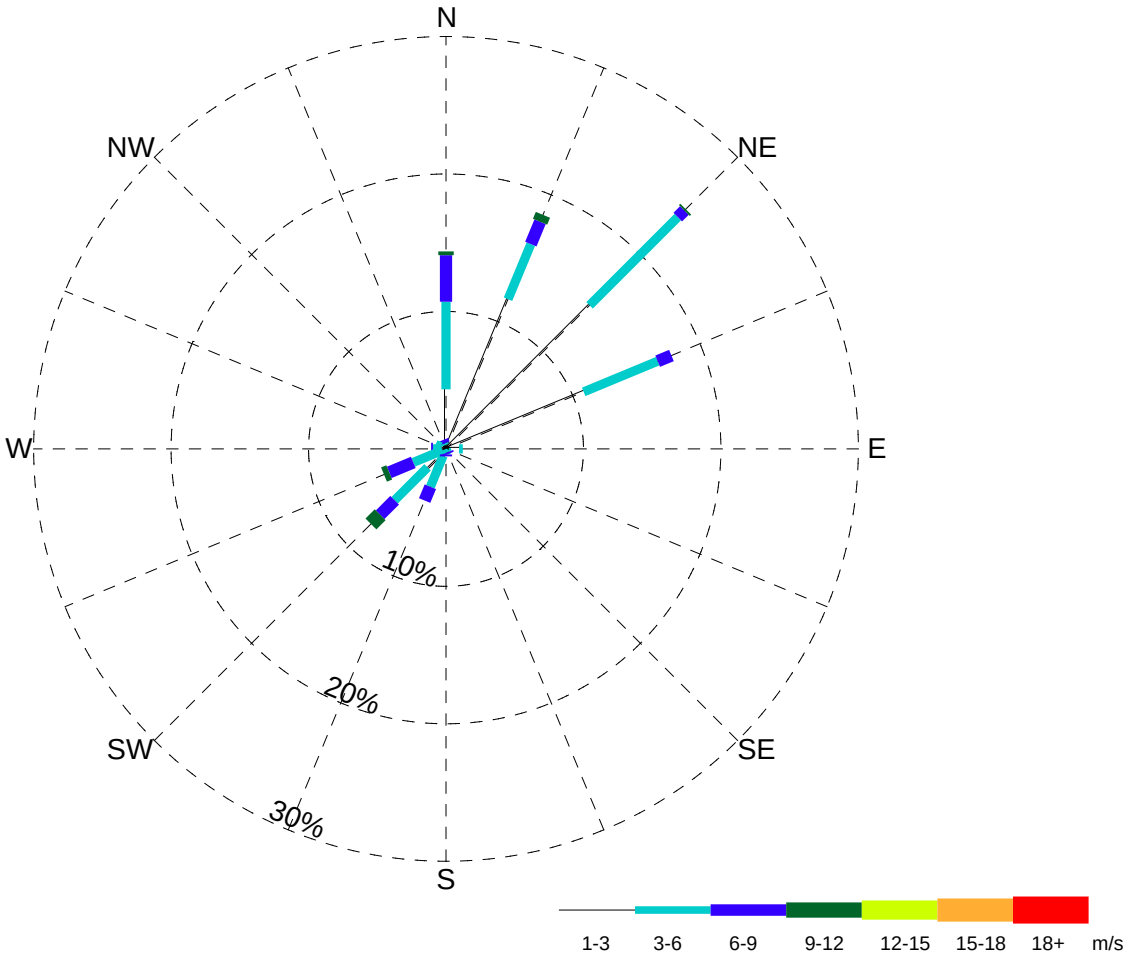
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-07

Thu Dec 06 16:20:49 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\Wind_roses\2007



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: Mar. 01, 2007
End Date: Mar. 31, 2007

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	-	10.84	5.83	1.08	-	-	-	-	17.75
NE	-	14.77	9.08	0.68	0.14	-	-	-	24.66
NNE	-	11.79	4.34	1.76	0.54	-	-	-	18.43
N	-	4.34	6.37	3.39	0.27	-	-	-	14.36
NNW	-	0.27	0.14	0.27	-	-	-	-	0.68
NW	-	0.14	-	-	-	-	-	-	0.14
WNW	-	0.41	0.41	-	-	-	-	-	0.81
W	-	0.54	0.41	0.14	-	-	-	-	1.08
WSW	-	0.27	2.30	1.90	0.41	-	-	-	4.88
SW	-	1.90	3.39	1.49	0.95	-	-	-	7.72
SSW	-	0.54	2.44	1.08	-	-	-	-	4.07
S	-	0.27	0.14	0.14	-	-	-	-	0.54
SSE	-	-	0.27	0.14	-	-	-	-	0.41
SE	-	0.14	-	-	-	-	-	-	0.14
ESE	-	0.14	-	-	-	-	-	-	0.14
E	-	0.95	0.27	-	-	-	-	-	1.22
Calm	2.98	-	-	-	-	-	-	-	2.98
Total (%)	2.98	47.29	35.37	12.06	2.30	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
MARCH 2007

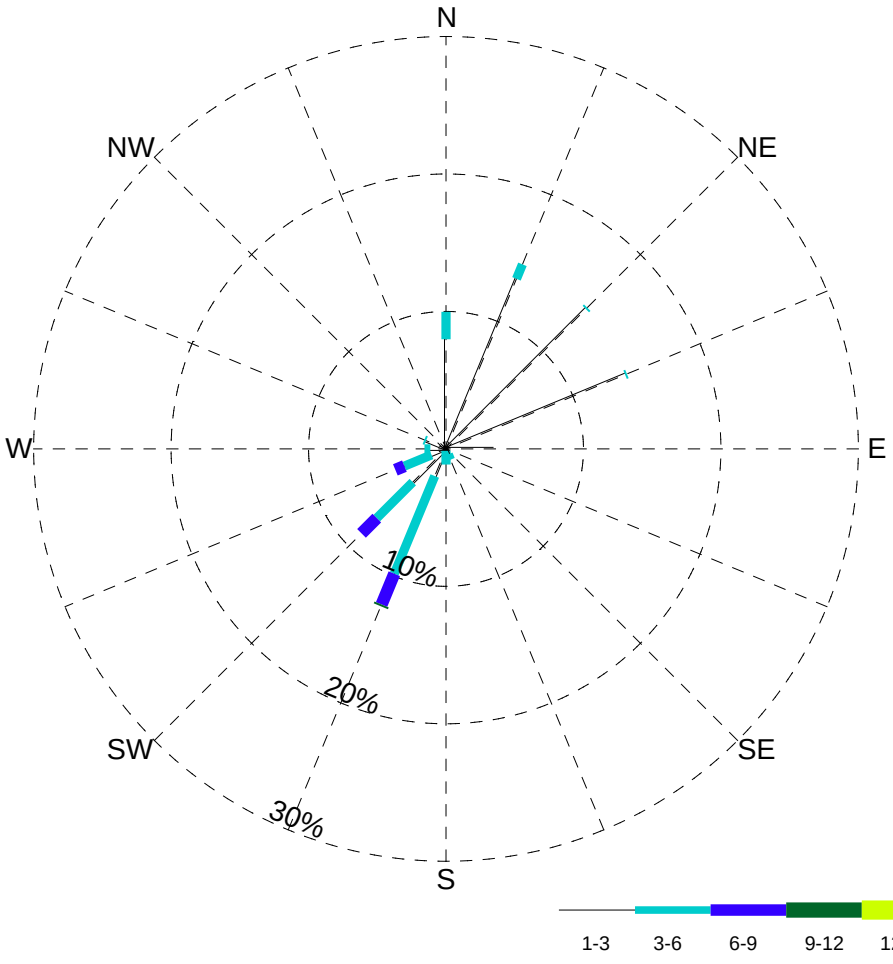
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-08

Thu Dec 06 16:20:50 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\Wind_roses\2007



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 30 days
Start Date: Apr. 01, 2007
End Date: Apr. 30, 2007

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	-	14.10	0.14	-	-	-	-	-	14.24
NE	-	14.39	0.14	-	-	-	-	-	14.53
NNE	-	13.39	1.14	-	-	-	-	-	14.53
N	-	7.98	1.99	-	-	-	-	-	9.97
NNW	-	0.28	-	-	-	-	-	-	0.28
NW	-	0.71	-	-	-	-	-	-	0.71
WNW	-	1.57	0.14	-	-	-	-	-	1.71
W	-	1.14	0.43	-	-	-	-	-	1.57
WSW	-	1.14	2.14	0.71	-	-	-	-	3.99
SW	-	3.42	3.70	1.57	-	-	-	-	8.69
SSW	-	2.14	7.69	2.42	0.14	-	-	-	12.39
S	-	0.14	1.00	-	-	-	-	-	1.14
SSE	-	0.43	0.43	-	-	-	-	-	0.86
SE	-	0.14	-	-	-	-	-	-	0.14
ESE	-	-	-	-	-	-	-	-	-
E	-	3.42	-	-	-	-	-	-	3.42
Calm	11.82	-	-	-	-	-	-	-	11.82
Total (%)	11.82	64.39	18.95	4.70	0.14	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

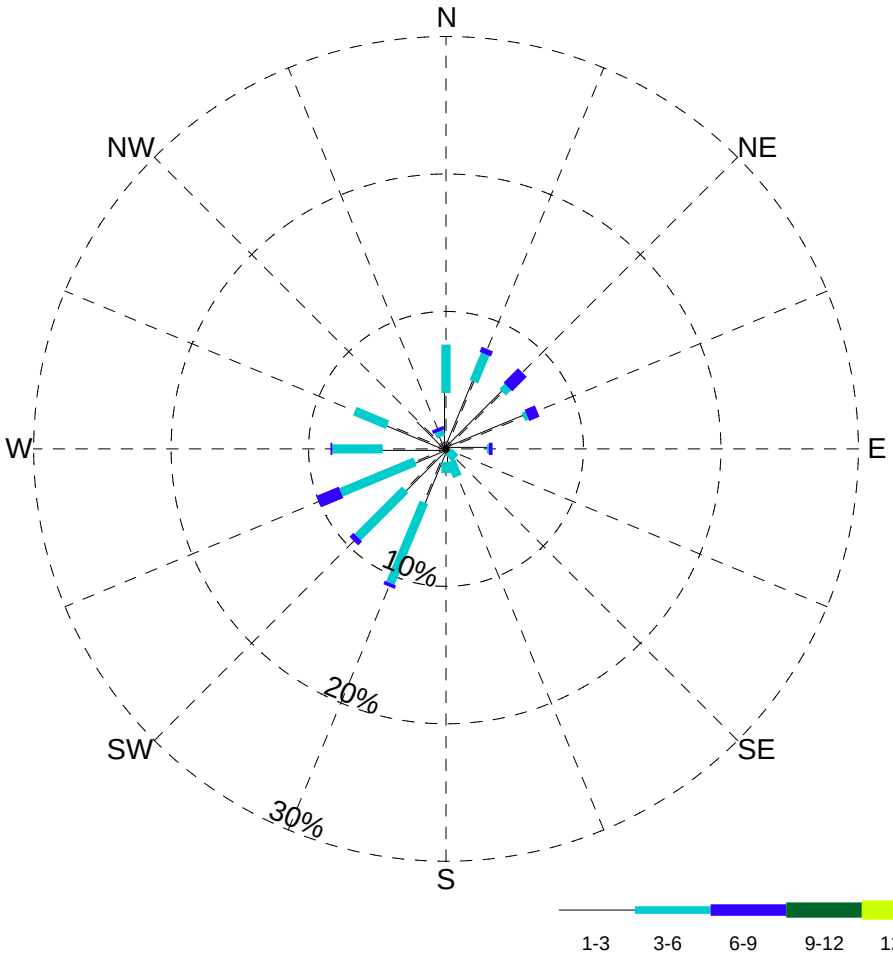
MACMILLAN PASS
WIND ROSE
APRIL 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-09



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: May 01, 2007
End Date: May 31, 2007

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	-	6.10	0.27	0.81	-	-	-	-	7.18
NE	-	5.83	0.54	1.49	-	-	-	-	7.86
NNE	-	5.28	2.17	0.41	-	-	-	-	7.86
N	-	4.07	3.52	-	-	-	-	-	7.59
NNW	-	0.95	0.41	0.27	-	-	-	-	1.63
NW	-	2.85	-	-	-	-	-	-	2.85
WNW	-	4.61	2.58	-	-	-	-	-	7.18
W	-	4.61	3.66	0.14	-	-	-	-	8.40
WSW	-	2.44	5.83	1.76	-	-	-	-	10.03
SW	-	4.20	4.88	0.41	-	-	-	-	9.48
SSW	-	4.20	6.37	0.27	-	-	-	-	10.84
S	-	0.95	0.81	-	-	-	-	-	1.76
SSE	-	0.95	1.22	-	-	-	-	-	2.17
SE	-	0.27	0.68	-	-	-	-	-	0.95
ESE	-	0.14	-	-	-	-	-	-	0.14
E	-	2.98	0.14	0.27	-	-	-	-	3.39
Calm	10.70	-	-	-	-	-	-	-	10.70
Total (%)	10.70	50.41	33.06	5.83	-	-	-	-	100.00

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

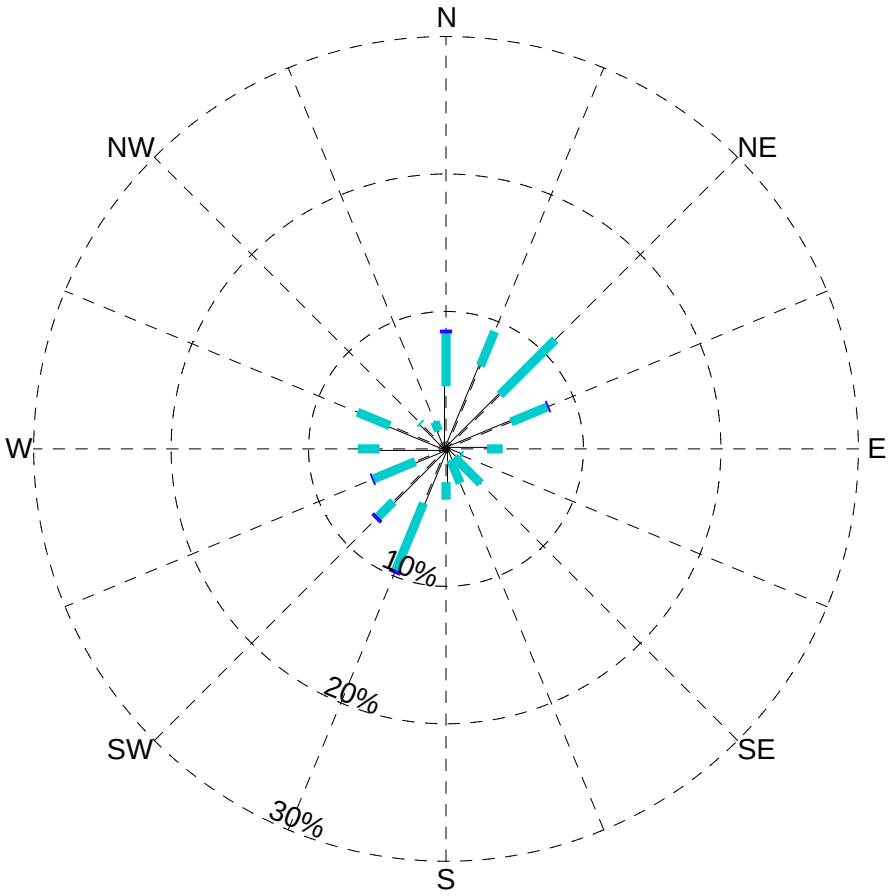
MACMILLAN PASS
WIND ROSE
MAY 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-10



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 30 days
Start Date: June 01, 2007
End Date: June 30, 2007

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	-	5.12	2.85	0.14	-	-	-	-	8.11
NE	-	5.55	5.69	-	-	-	-	-	11.24
NNE	-	6.54	2.70	-	-	-	-	-	9.25
N	-	4.55	3.84	0.28	-	-	-	-	8.68
NNW	-	1.42	0.71	-	-	-	-	-	2.13
NW	-	2.56	0.14	-	-	-	-	-	2.70
WNW	-	4.41	2.56	-	-	-	-	-	6.97
W	-	4.84	1.57	-	-	-	-	-	6.40
WSW	-	2.42	3.27	0.14	-	-	-	-	5.83
SW	-	5.41	1.57	0.28	-	-	-	-	7.26
SSW	-	4.27	5.26	0.28	-	-	-	-	9.81
S	-	2.42	1.28	-	-	-	-	-	3.70
SSE	-	0.85	1.85	-	-	-	-	-	2.70
SE	-	0.85	2.70	-	-	-	-	-	3.56
ESE	-	1.14	0.14	-	-	-	-	-	1.28
E	-	2.99	1.14	-	-	-	-	-	4.12
Calm	6.26	-	-	-	-	-	-	-	6.26
Total (%)	6.26	55.33	37.27	1.14	-	-	-	-	100.00

CLIENT
NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

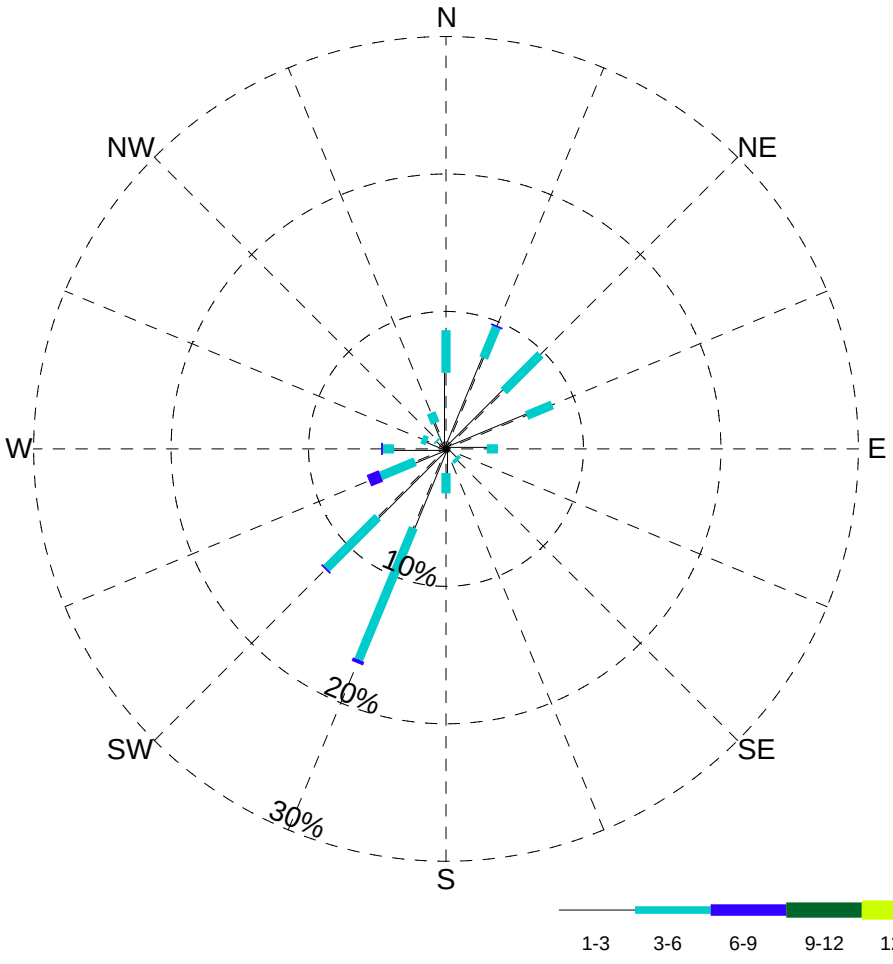
MACMILLAN PASS
WIND ROSE
JUNE 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-11



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: July 01, 2007
End Date: July 31, 2007

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	-	6.34	2.02	-	-	-	-	-	8.37
NE	-	5.94	3.78	-	-	-	-	-	9.72
NNE	-	7.15	2.43	0.14	-	-	-	-	9.72
N	-	5.53	3.10	-	-	-	-	-	8.64
NNW	-	2.02	0.81	-	-	-	-	-	2.83
NW	-	0.81	0.14	-	-	-	-	-	0.94
WNW	-	1.48	0.41	-	-	-	-	-	1.89
W	-	3.78	0.81	0.14	-	-	-	-	4.72
WSW	-	2.43	2.70	0.94	-	-	-	-	6.07
SW	-	7.02	5.26	0.14	-	-	-	-	12.42
SSW	-	6.21	10.39	0.27	-	-	-	-	16.87
S	-	1.75	1.48	-	-	-	-	-	3.24
SSE	-	0.27	-	-	-	-	-	-	0.27
SE	-	0.94	0.27	-	-	-	-	-	1.22
ESE	-	0.27	-	-	-	-	-	-	0.27
E	-	2.97	0.81	-	-	-	-	-	3.78
Calm	9.04	-	-	-	-	-	-	-	9.04
Total (%)	9.04	54.93	34.41	1.62	-	-	-	-	100.00

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

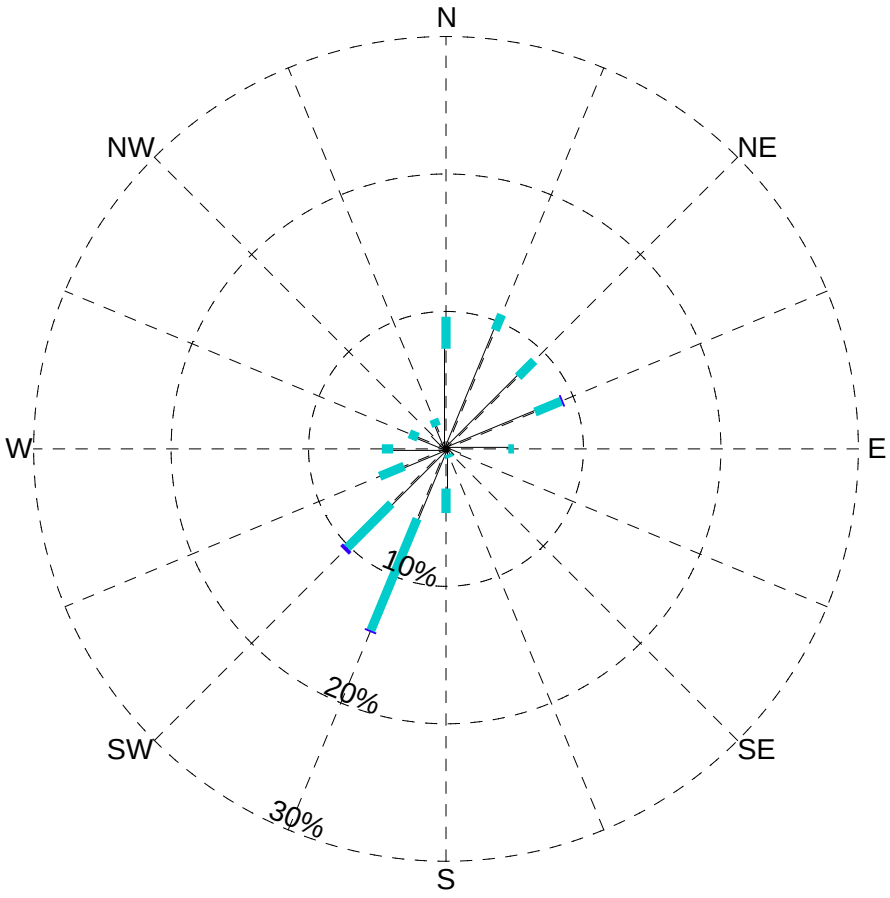
MACMILLAN PASS
WIND ROSE
JULY 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-12



Station Name: MSC MacMillan Pass
NAD 27 location:
N63° 14' 36.9" W130° 2' 7.1"
Elevation above SL: 1379 m
Tower Height: 10 m
Record Length: 31 days
Start Date: Aug. 01, 2007
End Date: Aug. 31, 2007

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	-	7.01	2.06	0.14	-	-	-	-	9.20
NE	-	7.42	1.65	-	-	-	-	-	9.07
NNE	-	9.34	1.24	-	-	-	-	-	10.58
N	-	7.28	2.34	-	-	-	-	-	9.61
NNW	-	1.79	0.55	-	-	-	-	-	2.34
NW	-	1.37	-	-	-	-	-	-	1.37
WNW	-	2.20	0.69	-	-	-	-	-	2.88
W	-	3.85	0.82	-	-	-	-	-	4.67
WSW	-	3.30	1.92	-	-	-	-	-	5.22
SW	-	5.63	4.53	0.28	-	-	-	-	10.44
SSW	-	5.49	8.79	0.14	-	-	-	-	14.42
S	-	2.88	1.79	-	-	-	-	-	4.67
SSE	-	0.41	0.28	-	-	-	-	-	0.69
SE	-	0.69	-	-	-	-	-	-	0.69
ESE	-	1.10	-	-	-	-	-	-	1.10
E	-	4.53	0.41	-	-	-	-	-	4.95
Calm	8.10	-	-	-	-	-	-	-	8.10
Total (%)	8.10	64.29	27.06	0.55	-	-	-	-	100.00

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WIND ROSE
AUGUST 2007

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure F-13

APPENDIX

APPENDIX G MACMILLAN PASS MONTHLY WEATHER – AUGUST 2006 TO AUGUST 2007*

APPENDIX G

Monthly MacMillan Pass Weather Summaries

August 2006 – August 2007

G-01 MacMillan Pass Weather – August 2006

G-02 MacMillan Pass Weather – September 2006

G-03 MacMillan Pass Weather – October 2006

G-04 MacMillan Pass Weather – November 2006

G-05 MacMillan Pass Weather – December 2006

G-06 MacMillan Pass Weather – January 2007

G-07 MacMillan Pass Weather – February 2007

G-08 MacMillan Pass Weather – March 2007

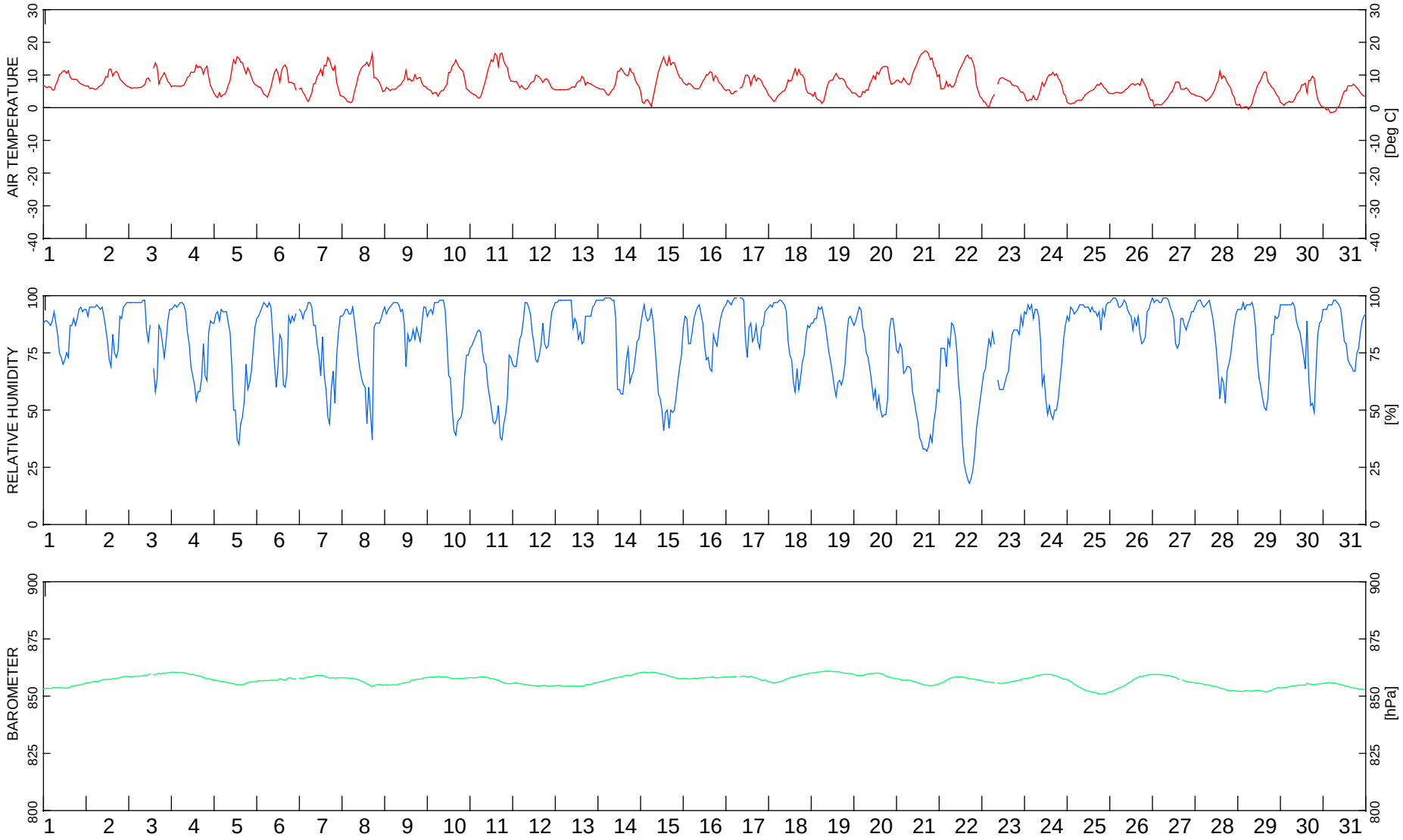
G-09 MacMillan Pass Weather – April 2007

G-10 MacMillan Pass Weather – May 2007

G-11 MacMillan Pass Weather – June 2007

G-12 MacMillan Pass Weather – July 2007

G-13 MacMillan Pass Weather – August 2007



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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
AUGUST 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure G-01

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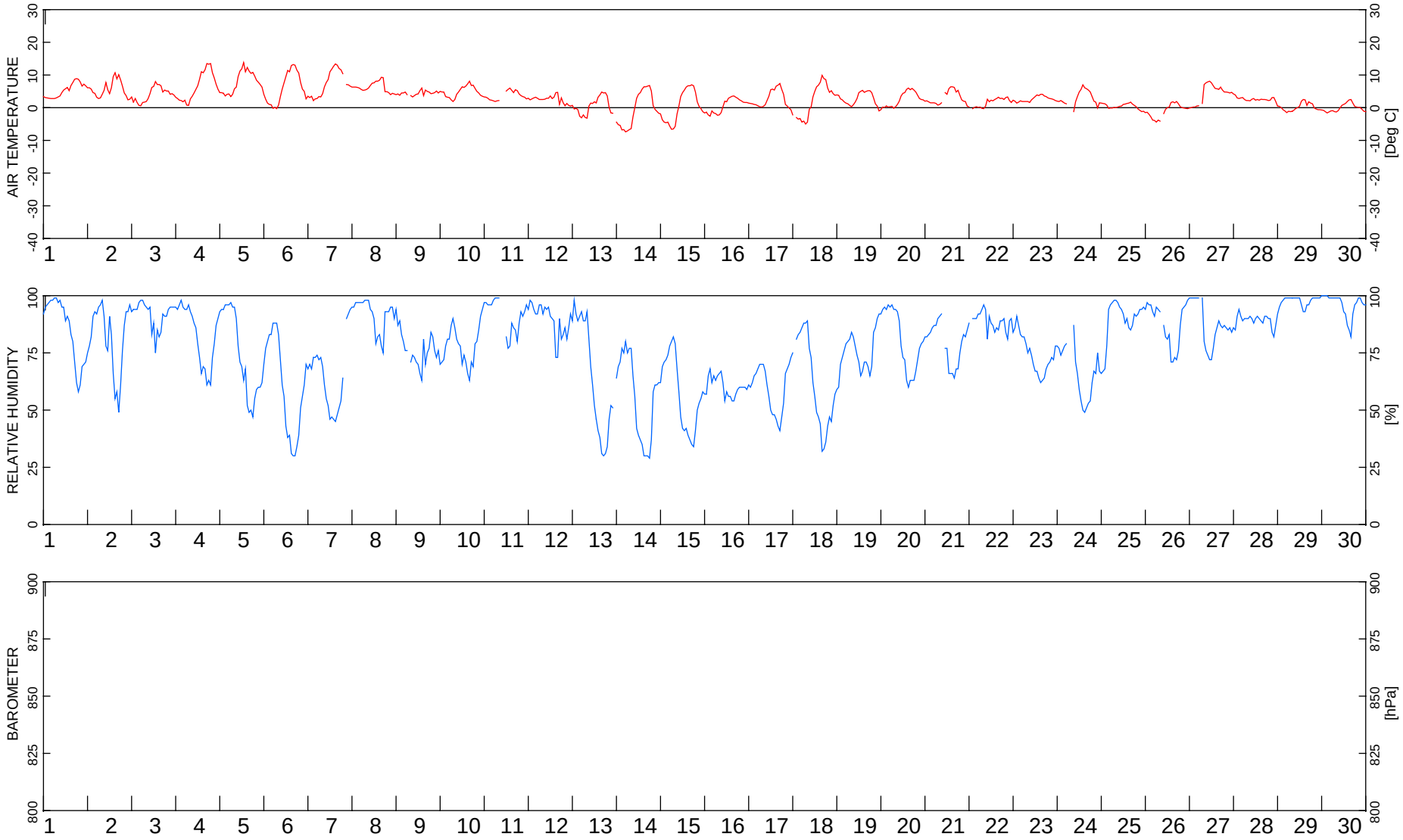

Barometric pressure data is missing for
September 2006

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
SEPTEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC
DATE: December 2007

Figure G-02

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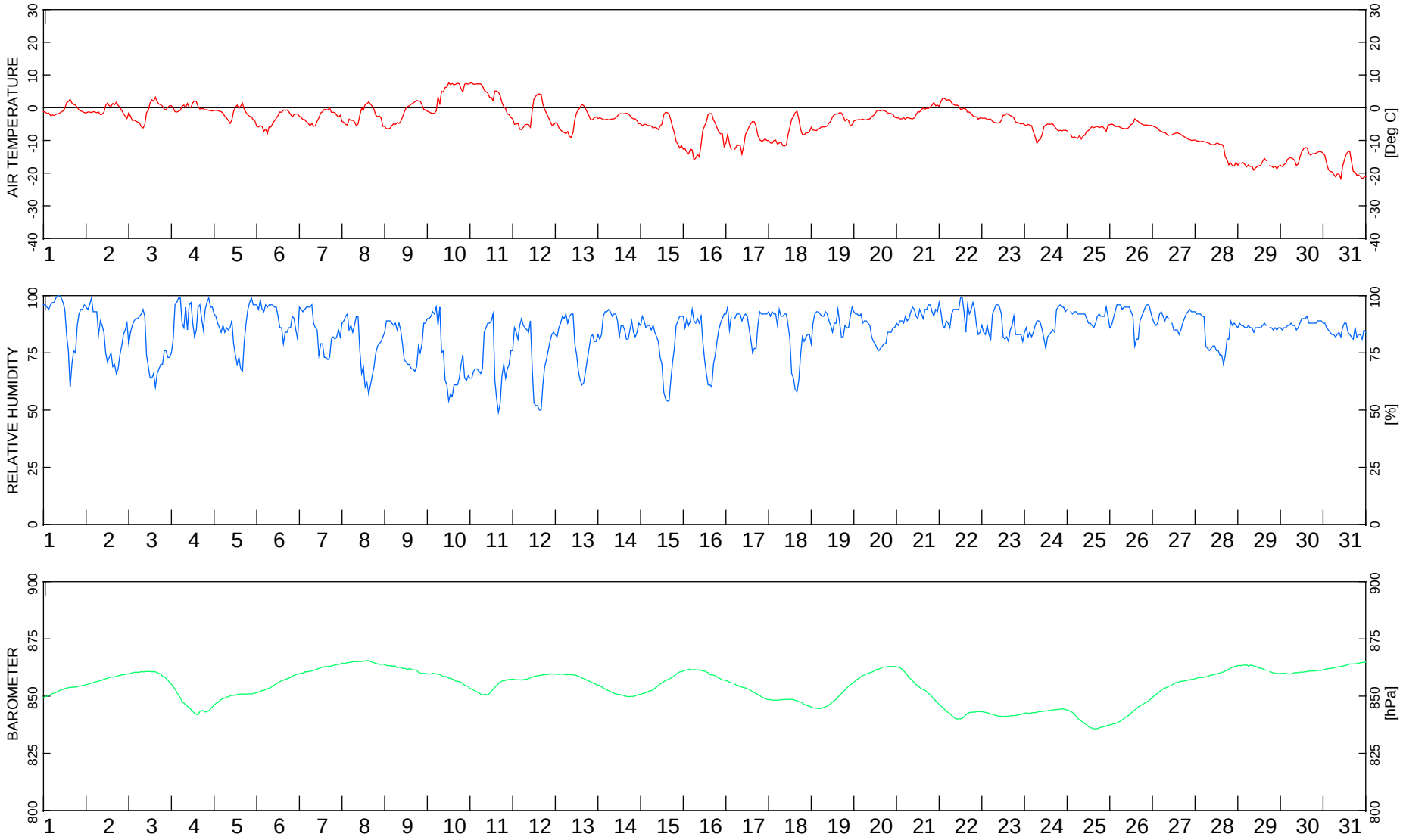

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
OCTOBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure G-03

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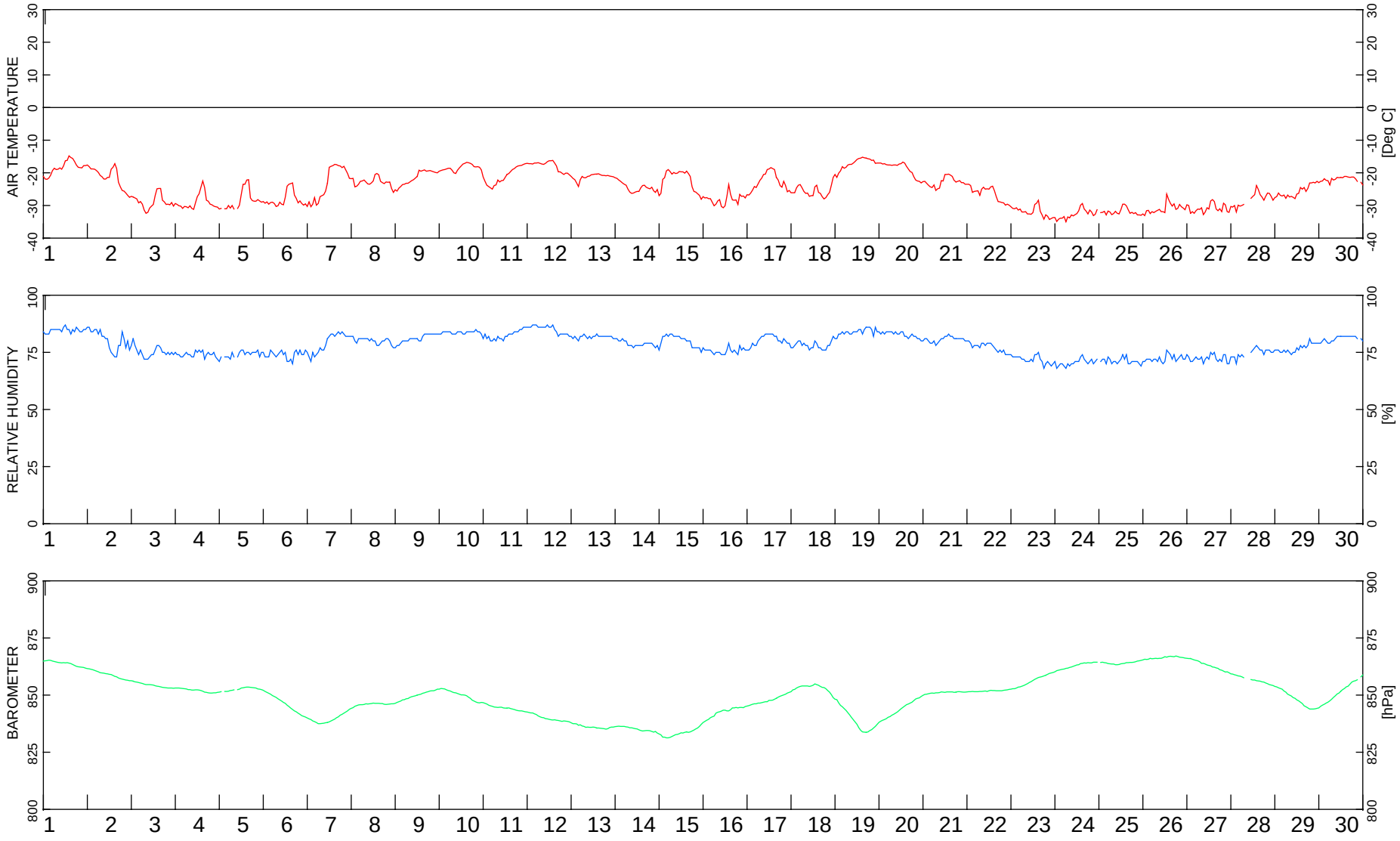

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
NOVEMBER 2006

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PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure G-04

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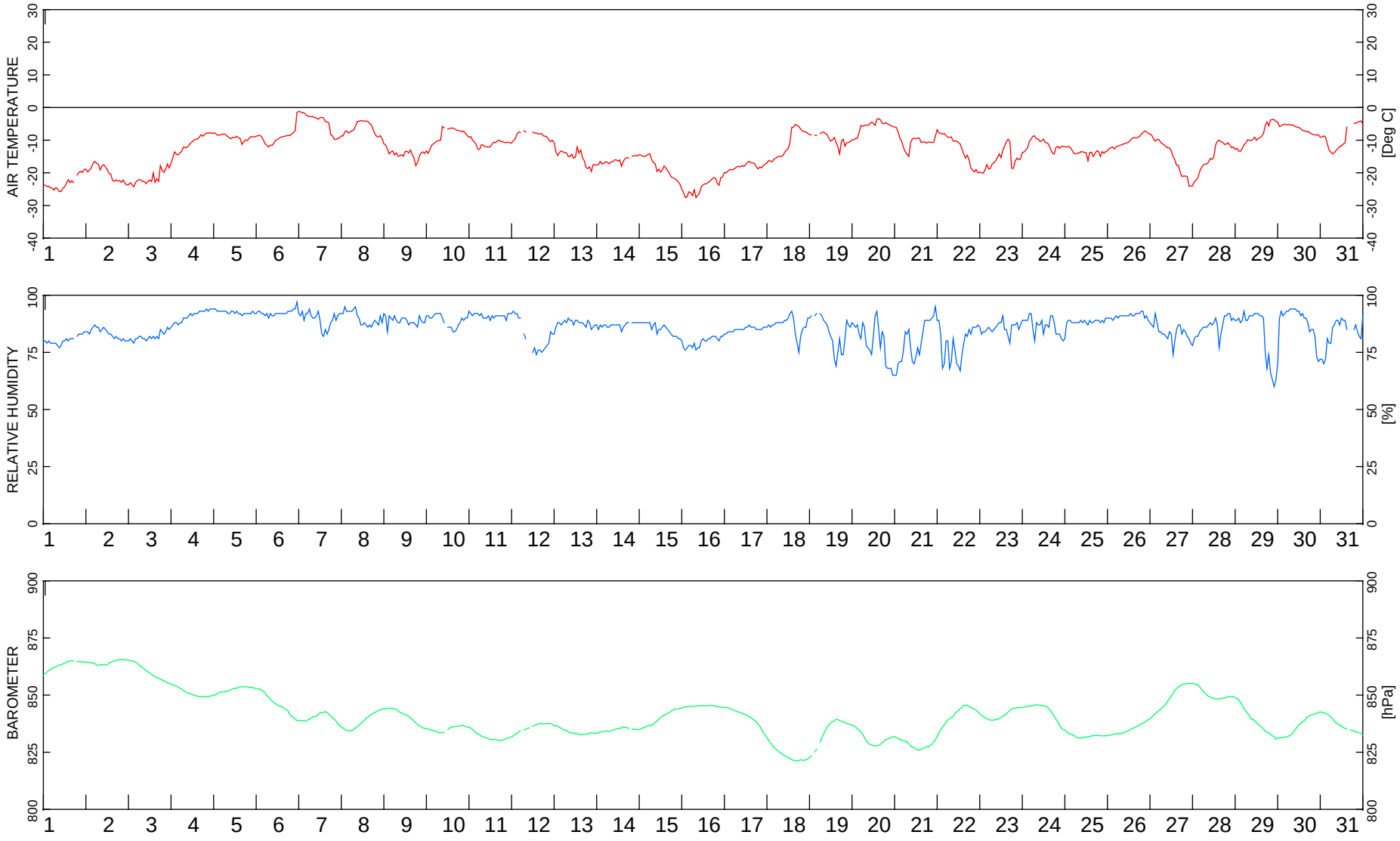

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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
DECEMBER 2006

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure G-05

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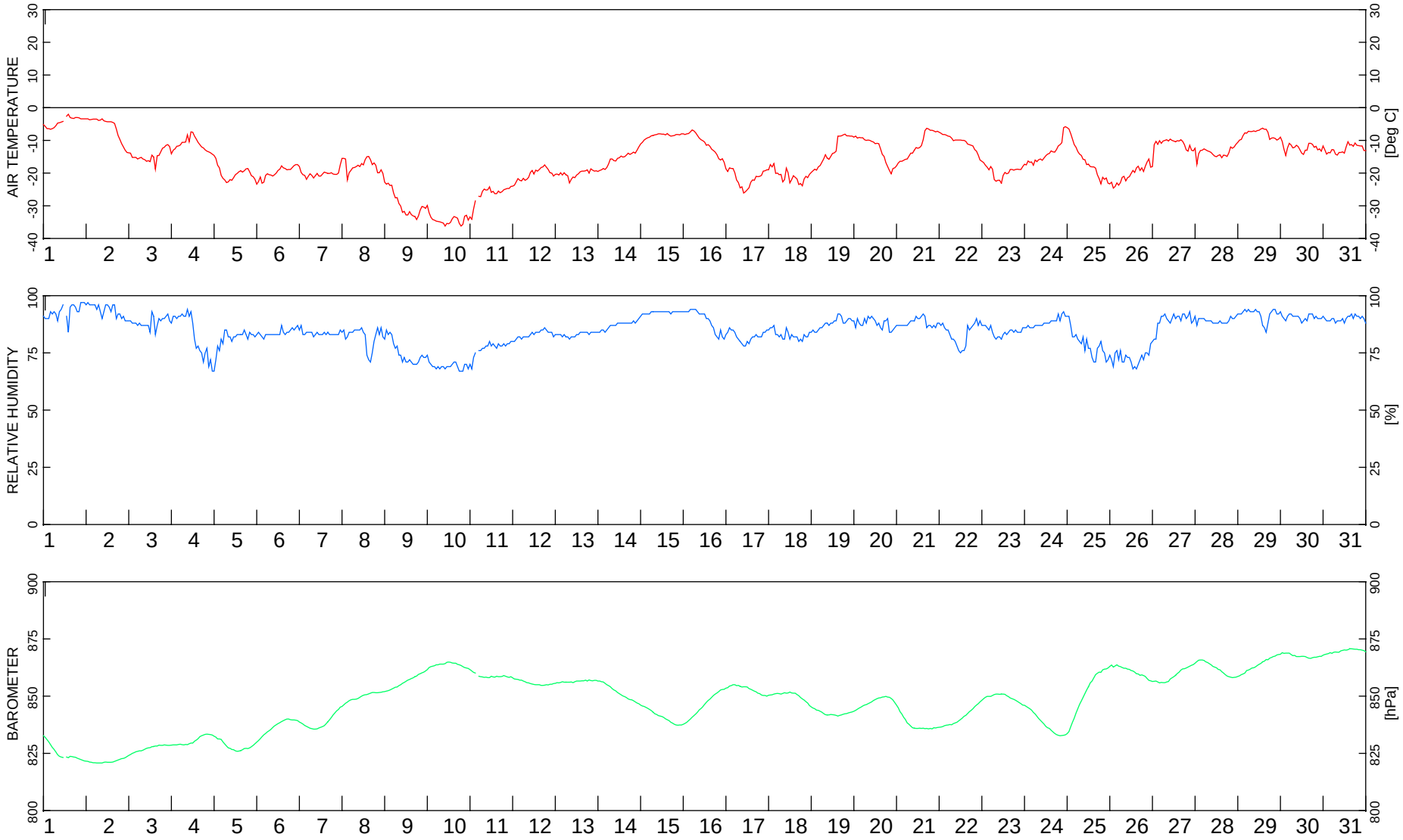

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MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
JANUARY 2007

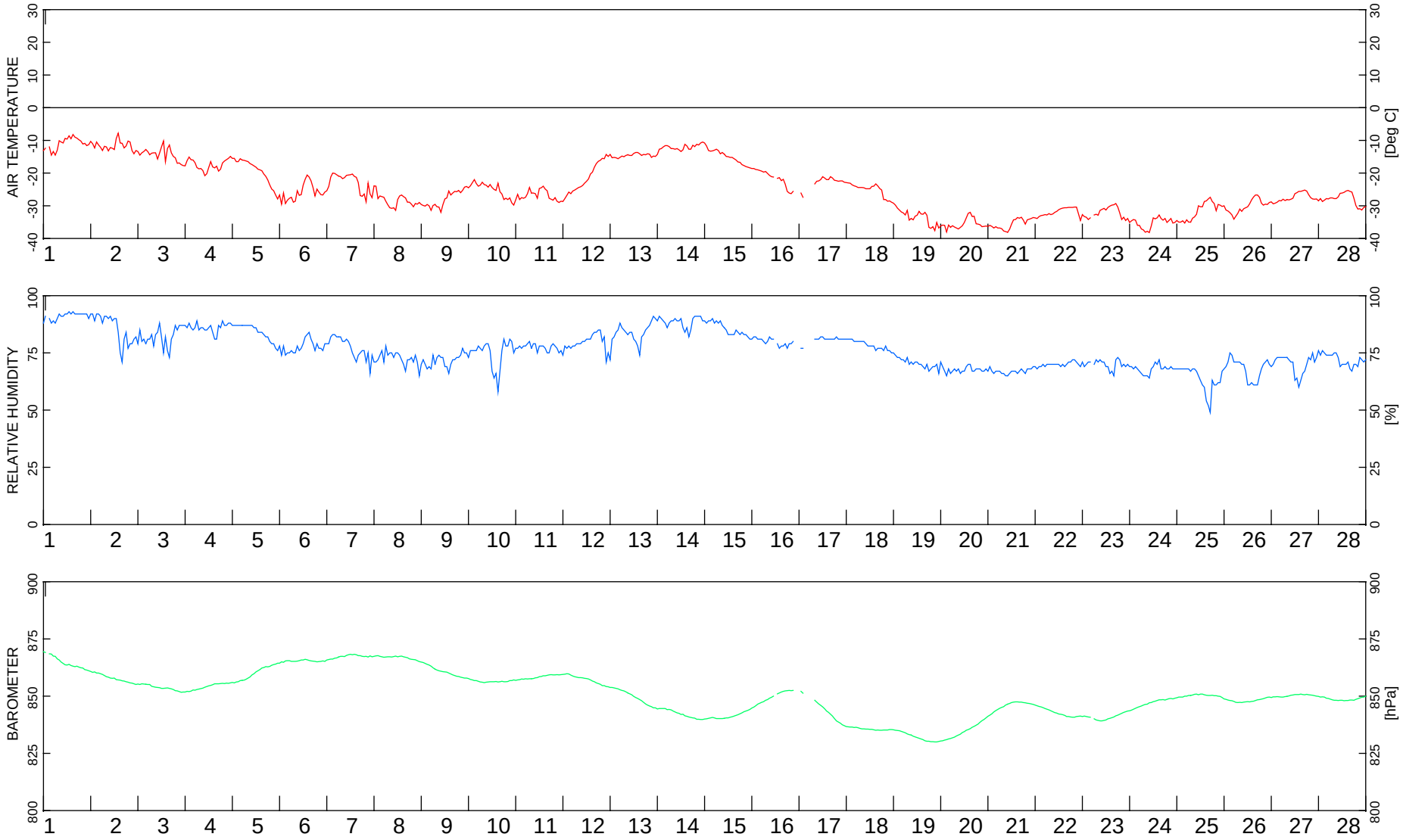
PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure G-06

Wed Dec 19 14:52:02 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



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HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

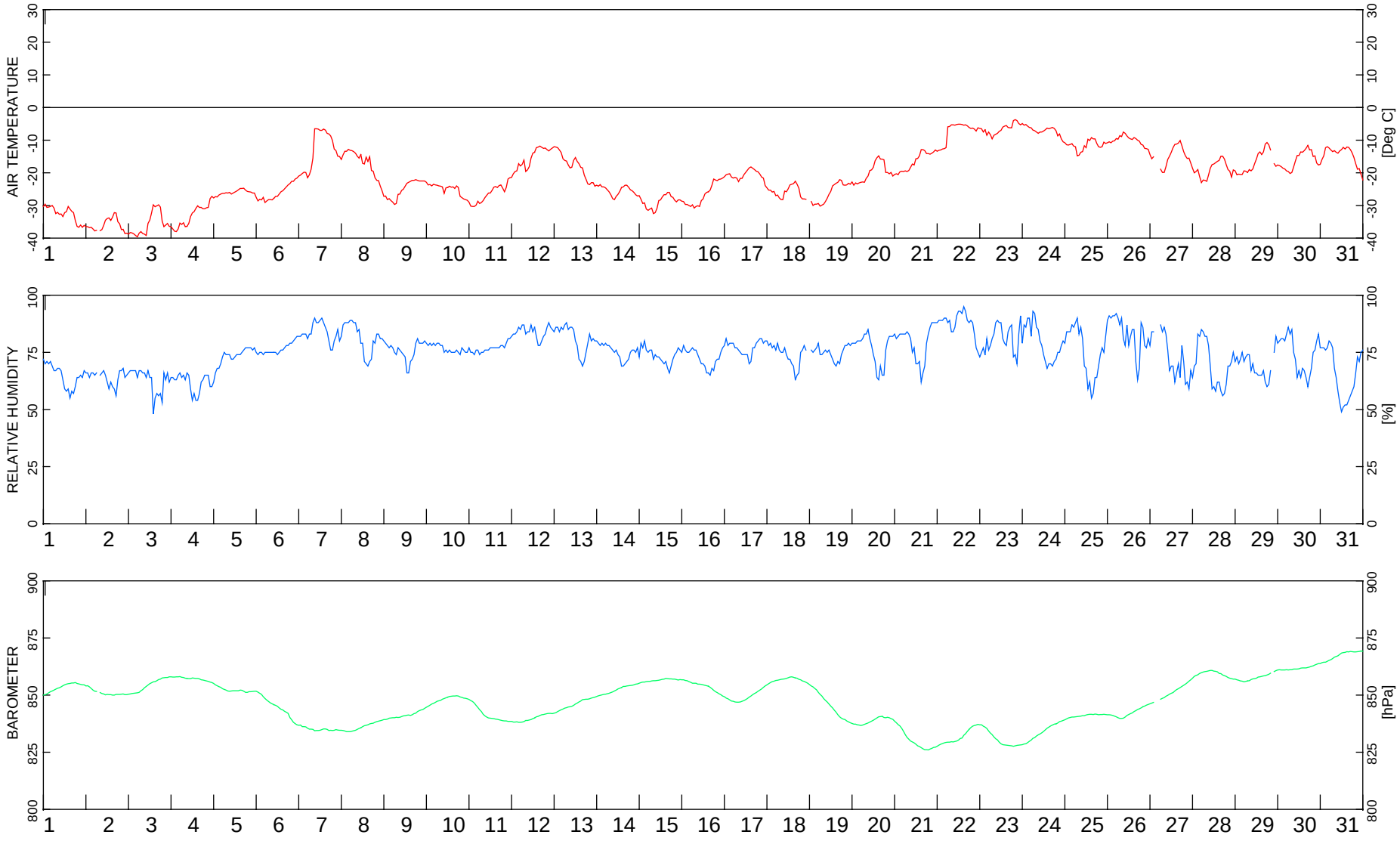
MACMILLAN PASS
WEATHER
FEBRUARY 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure G-07

Wed Dec 19 14:52:03 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
MARCH 2007

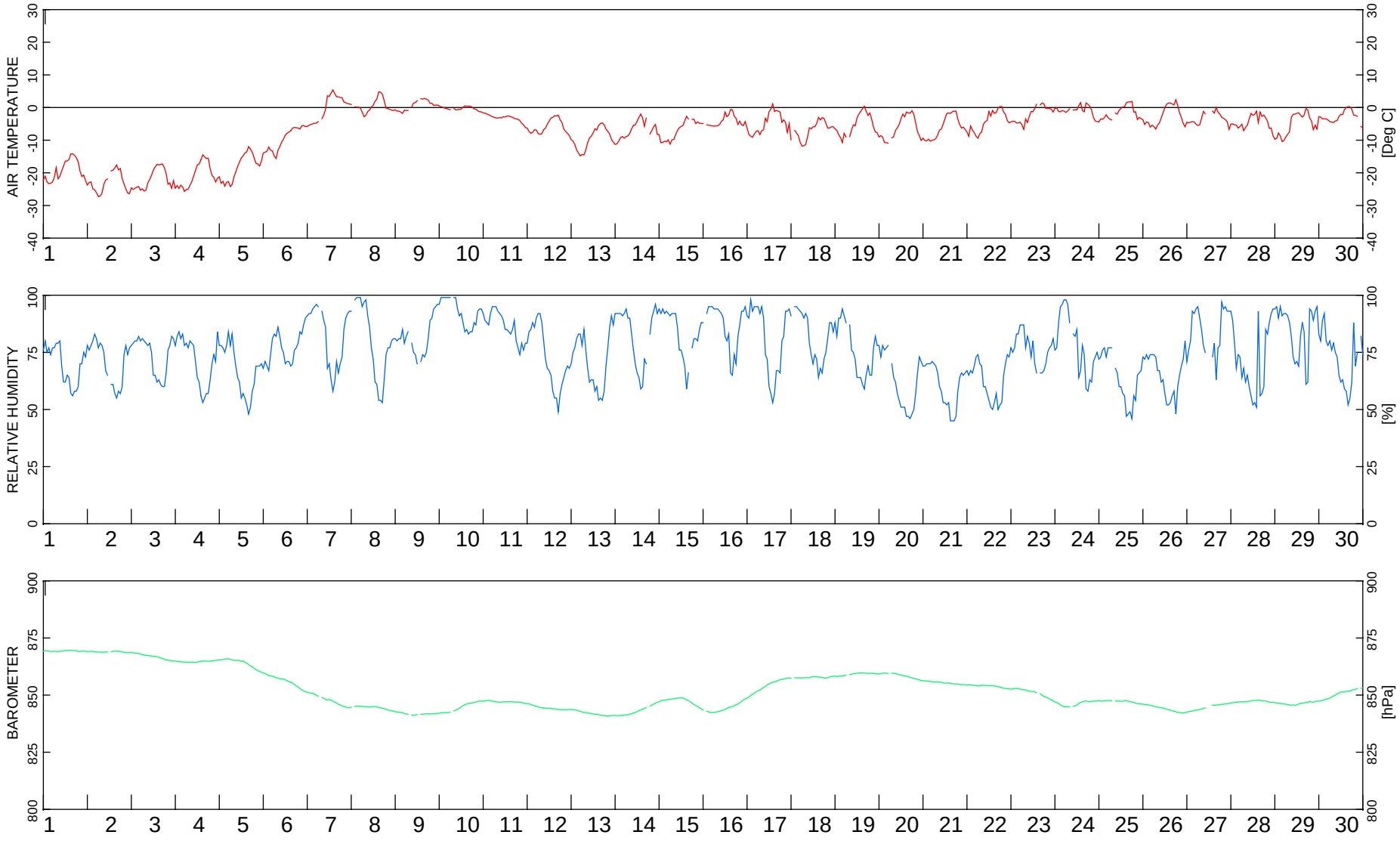
PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure G-08

Wed Dec 19 14:52:04 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



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NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
APRIL 2007

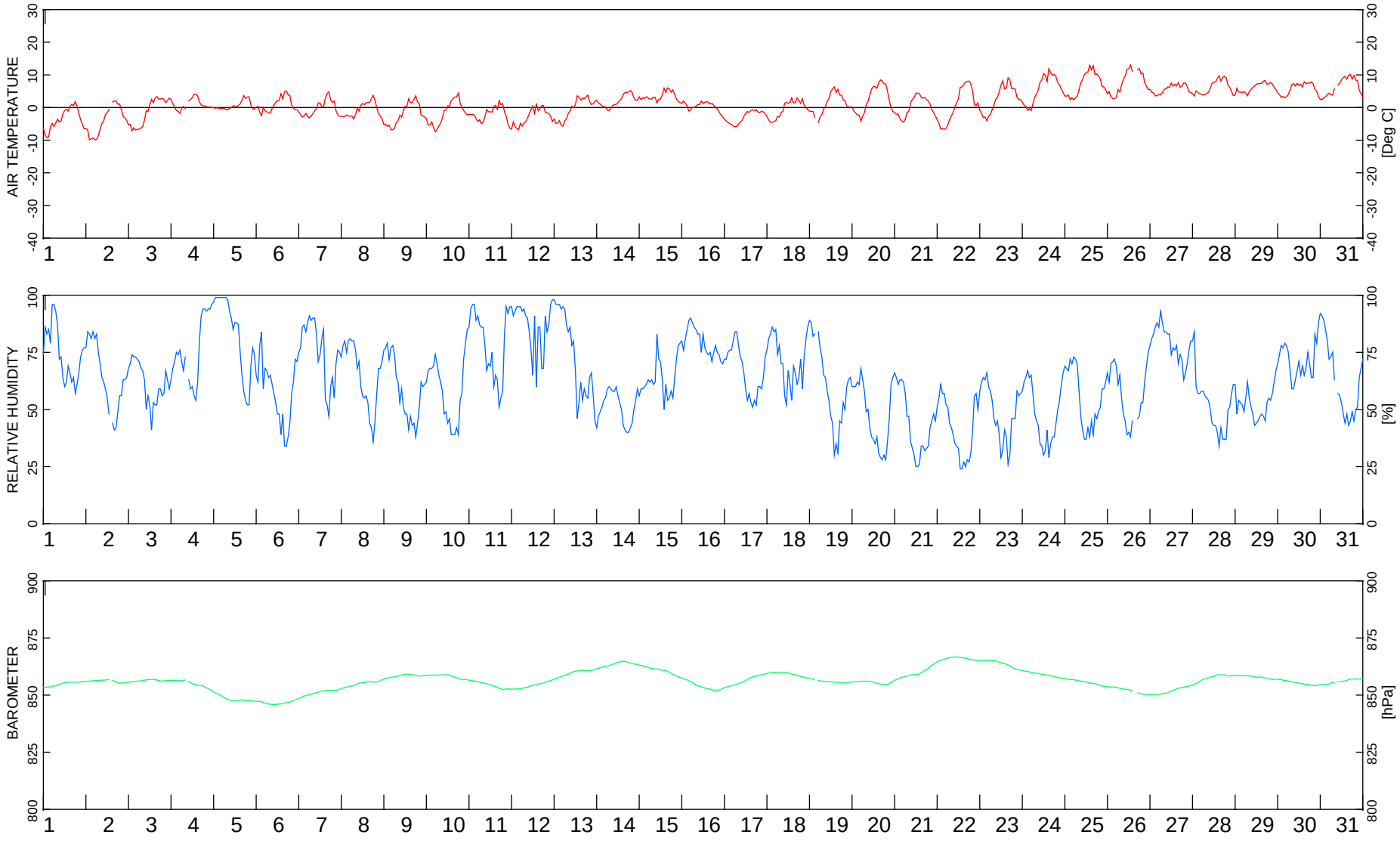
HAY & COMPANY CONSULTANTS — A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure G-09

Wed Dec 19 14:52:06 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
MAY 2007

HAY & COMPANY CONSULTANTS — A DIVISION OF EBA

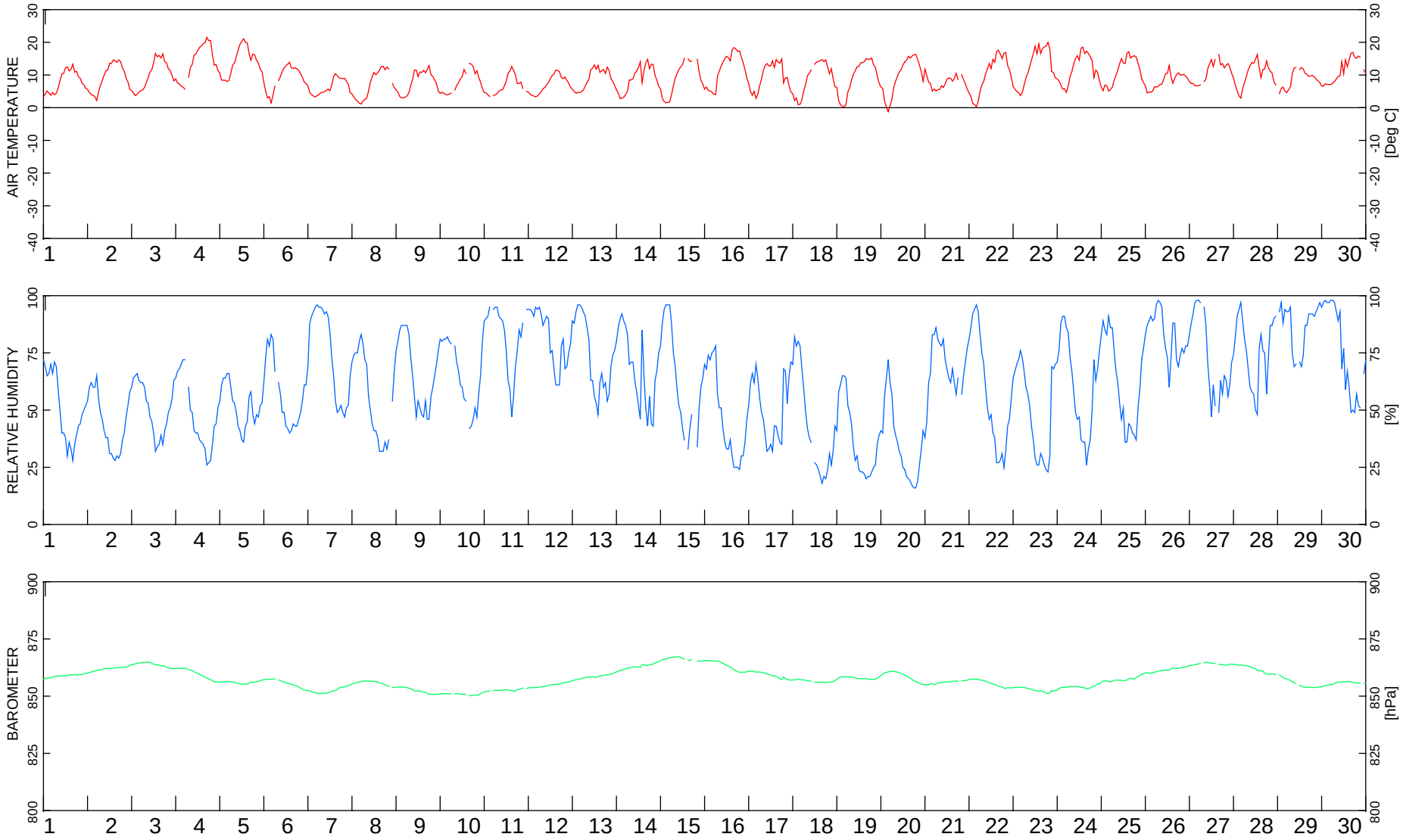
PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE: EBA-VANC

DATE: December 2007

Figure G-10

Wed Dec 19 14:52:07 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
JUNE 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0
OFFICE	DATE		
EBA-VANC	December 2007		

Figure G-11

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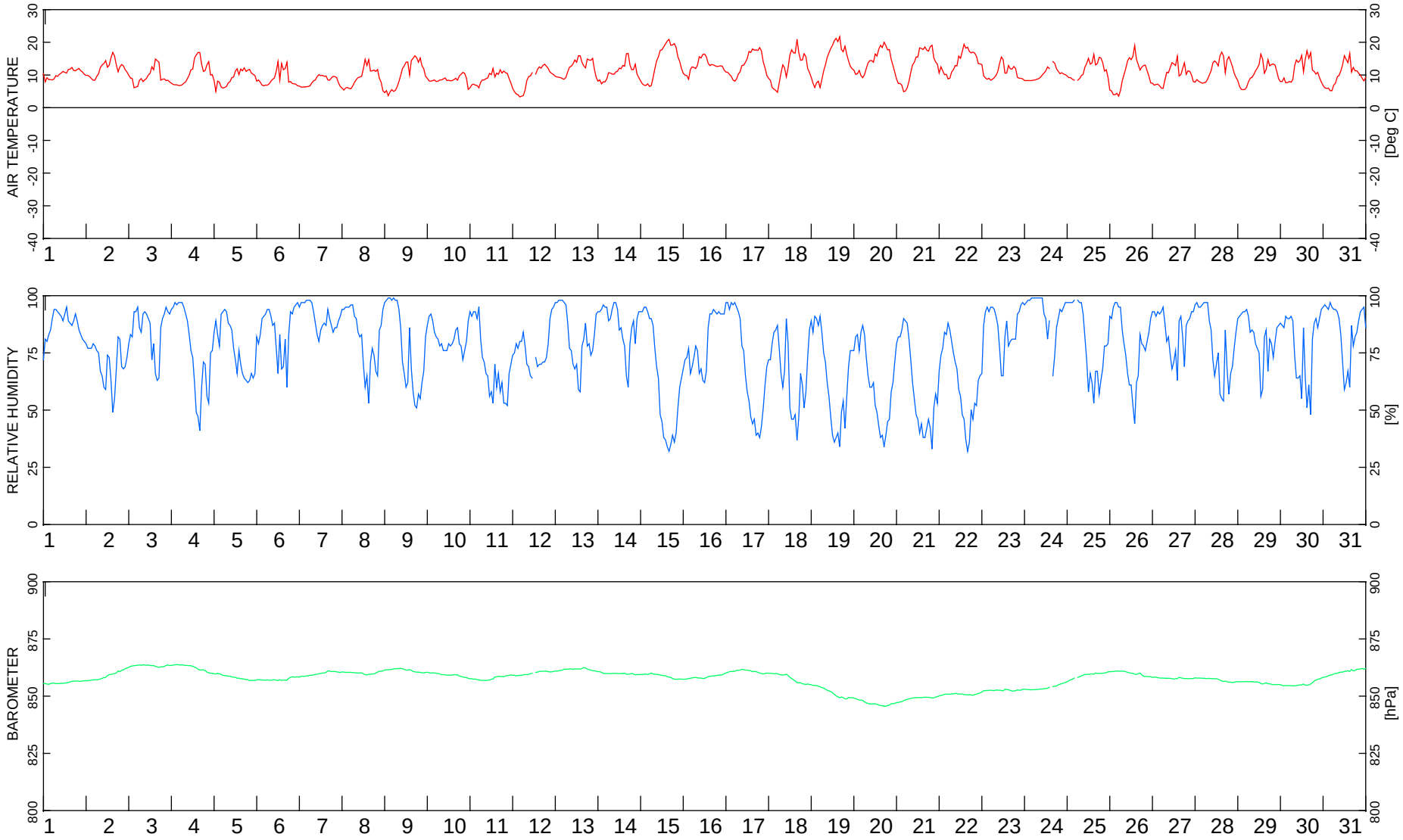


CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
JULY 2007

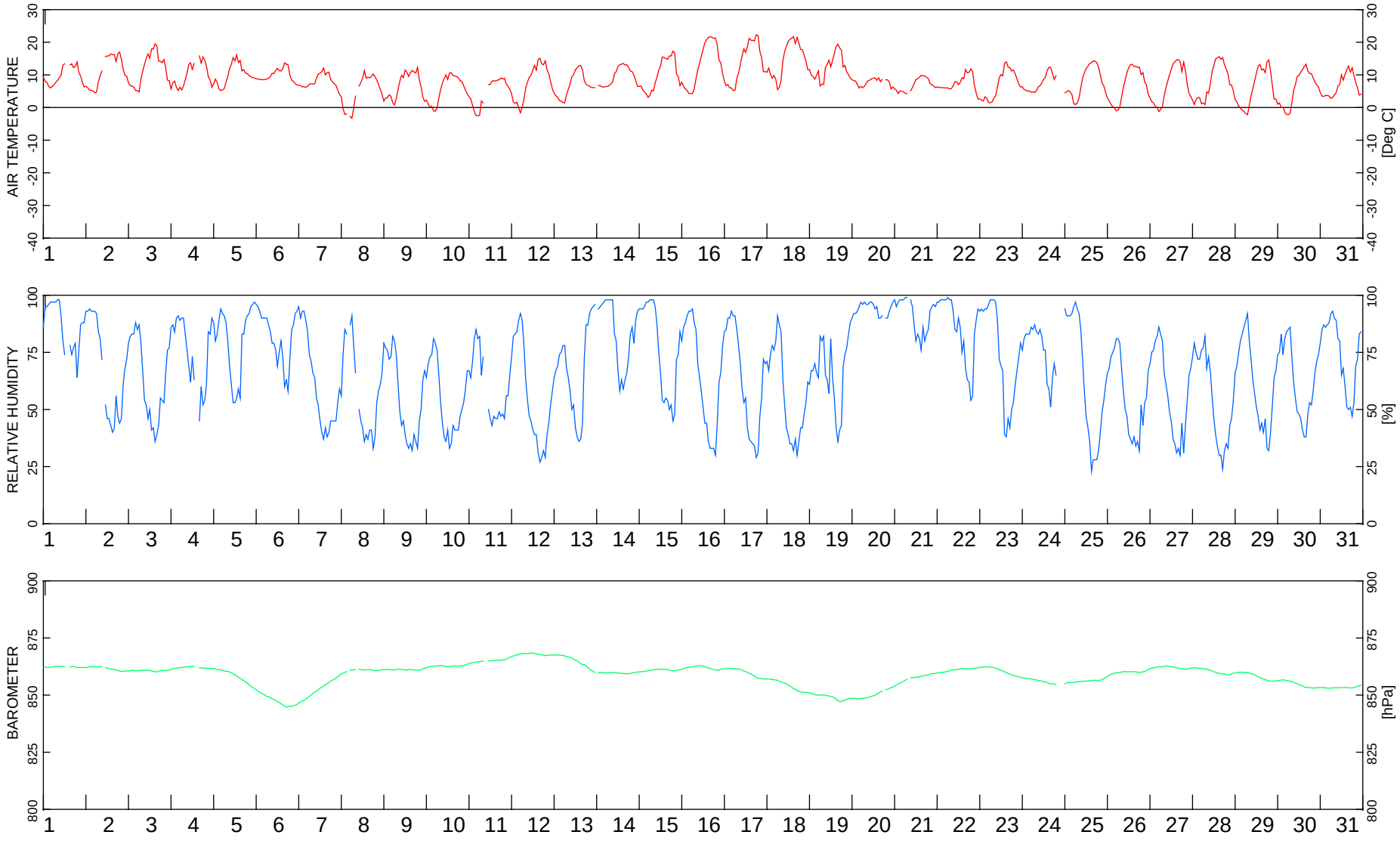
HAY & COMPANY CONSULTANTS A DIVISION OF EBA

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure G-12

Wed Dec 19 14:52:10 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007



CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

HAY & COMPANY CONSULTANTS A DIVISION OF EBA

MACTUNG PROJECT 2007
HYDROMETEOROLOGICAL SURVEY

MACMILLAN PASS
WEATHER
AUGUST 2007

PROJECT NO.	DWN	CHK	REV
W23101021	TM	JAS	0

OFFICE	DATE
EBA-VANC	December 2007

Figure G-13

Wed Dec 19 14:52:11 2007:Q:\Vancouver\Data\0201-WHI\PROJECTS\1200163 - Mactung\Mactung\RED\Meteorology\MSC_Station\data_reduction_programs\Aug2006_Aug2007

APPENDIX

APPENDIX H HAYCO GENERAL CONDITIONS

PROJECT REPORT – GENERAL CONDITIONS

This Report incorporates and is subject to these "General Conditions".

1.0 PURPOSE

These General Conditions apply to this Report, which Hay & Company Consultants, a Division of EBA Engineering Consultants Ltd. (Hayco) has prepared in fulfillment of certain project specific requirements that have been previously agreed to by Hayco and its Client. The Report may include plans, drawings, profiles and other support documents that collectively constitute the Report.

2.0 USE OF REPORT

This Report pertains to a specific site, a specific development, and a specific scope of work. The Report and all supporting documents are intended for the sole use of Hayco's client. Hayco does not accept any responsibility for the accuracy of any of the data, analyses or other contents of the Report when it is used or relied upon by any party other than Hayco's Client, unless authorized in writing by Hayco. Any unauthorized use of the Report is at the sole risk of the user.

3.0 CALCULATIONS AND DESIGNS

Hayco has undertaken design calculations and has prepared project specific recommendations or designs in accordance with terms of reference that were previously set out in consultation with, and agreement of, Hayco's client. These recommendations or designs have been prepared to a standard that is consistent with industry practice. Notwithstanding, if any error or omission is detected by Hayco's client or any party that is authorized to use the Report, the error or omission should be immediately drawn to the attention of Hayco.

4.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless so stipulated in the Report, Hayco was not retained to investigate, address or consider, and has not investigated, addressed or considered any environmental or regulatory issues associated with the project specific design.

5.0 STANDARD OF CARE

Services that Hayco provided to complete this Report have been undertaken in a manner that is consistent with the approach ordinarily exercised by members of the profession currently practising under similar conditions in the jurisdiction in which the services were provided. Engineering judgement has been applied in developing design elements that are integral to this Report. No other warranty or guarantee, expressed or implied, is made concerning the content of this Report.

6.0 ALTERNATIVE REPORT FORMAT

Where Hayco submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Hayco's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by Hayco shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by Hayco shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of Hayco's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Hayco. The Client warrants that Hayco's instruments of professional service will be used only and exactly as submitted by Hayco.

The Client recognizes and agrees that electronic files submitted by Hayco have been prepared and submitted using specific software and hardware systems. Hayco makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.