

**SANDFIRE RESOURCES, INC.  
BLACK BUTTE COPPER  
PROJECT AMBIENT AIR  
MONITORING PROGRAM  
Quarterly Data Report  
Second Quarter 2019**

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## CERTIFICATION OF DATA INTEGRITY

Bison Engineering, Inc., certifies the data in this report is an accurate summary of the air quality conditions measured at the Black Butte Copper Project air monitoring site. Every effort was made to obtain accurate and representative data and to comply with the procedures set forth in the project-specific *Quality Assurance Project Plan*, the *State of Montana Ambient Air Monitoring Program Quality Assurance Project Plan (April 2013)*, and the Environmental Protection Agency's *Quality Assurance Handbook for Air Pollution Measurement Systems: Volume I, A Field Guide to Environmental Quality Assurance (April 1994)*, *Volume II, Ambient Air Quality Program (May 2013)*, and *Volume IV, Meteorological Measurements (March 2008)*.


Preparer: Jeffrey S. Bell

Signature: 

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Date: 7/9/2019

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Title: Meteorologist

Date: 8-5-2019

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## **APPENDICES**

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- Appendix A: Meteorological Data
- Appendix B: Performance Audit Reports

## 1.0 INTRODUCTION

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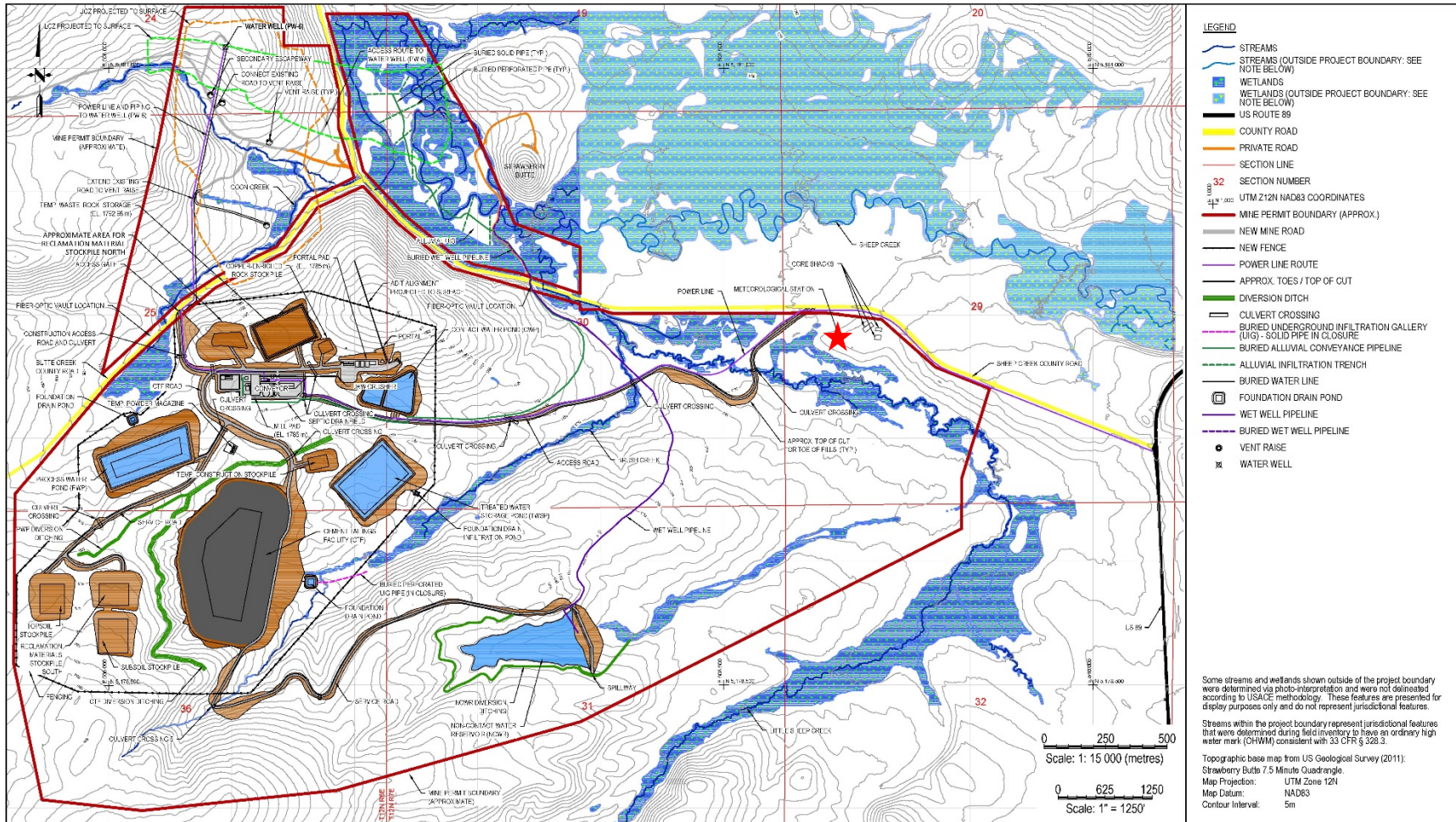
Sandfire Resources, Inc. established an ambient air monitoring site to measure wind speed, wind direction, standard deviation of wind direction, temperature at 9 meters and 2 meters, delta temperature, solar radiation, barometric pressure, and precipitation. The station was established to accurately characterize the local meteorology and collect baseline data in support of an operating permit application and various environmental studies.

The meteorological monitoring system was installed in April 2012. The site is operated by Bison Engineering, Inc., of Helena and Billings. Figure 1 shows the current location of the monitoring site, depicted by a red star. It is located to the west-southwest of the core shed buildings. On February 6, 2018 the tower was shut down to move it to a new location approximately 300 feet southwest of the original location, where monitoring resumed on March 7, 2018. Relocation activities were documented in the monitoring report for the first quarter of 2018.

This report presents the data collected during the second quarter (April through June) of 2019. In addition, a description of the monitoring system operations is presented, together with summaries of quality assurance activities, including calibrations and performance audits. Tabular summaries of the data completeness achieved, and the periods of missing data also are presented. Appendix A presents hourly meteorological data collected.

On June 23, 2015, an evaporation pan and manual precipitation gauge were installed adjacent to the existing meteorological system. The evaporation pan was not operated during the second quarter of 2019.

**Figure 1. Monitoring Site Location**



Prepared by Tetra Tech Inc. (Revised October 2018 to include alluvial UIG as included in the December 2018 Integrated Discharge Permit Application Narrative Report by Hydrometrics that was revised in February 2018, Completeness Determination by MT DEQ on May 25, 2018.)



**FIGURE 1.3**  
**Facilities Site Plan**  
**Black Butte Copper Project**  
**Mine Operating Permit Application**  
Meagher County, Montana

## 2.0 MONITORING SYSTEM OPERATIONS

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The original meteorological monitoring system began collecting data on April 30, 2012. Data were collected continuously at that location until February 6, 2018 at 1400 MST when the existing meteorological tower was relocated approximately 300 feet to the southwest of the original location. All instruments except the automatic rain gauge were operational starting March 7 at 1800 MST; the rain gauge became operational on March 8 at 1500 MST.

Steve Heck of Bison conducted performance audits of the meteorological system on April 5, 2019. That was the first quarter audit, which was delayed until April due to deep snow coverage in March. Those results were presented in the data report for the first quarter of 2019. Jeff Bell of Bison conducted performance audits of the meteorological system on June 14, 2019 and made any necessary calibration adjustments to the meteorological system following the audits. A power problem developed at the meteorological tower the day before the audit, possibly due to the battery and/or battery charger getting wet. This caused invalid barometer readings during the audit and resulted in minor data losses until the battery and charger were replaced during the following week.

Sandfire personnel indicated that cows had gotten into the site in mid-May, and that the signal cable from the rain gauge may have been broken at that time. Consequently, no valid data were reported by the rain gauge after May 18. The signal cable was replaced by Sandfire personnel shortly after the June 14 audit, but remote data review indicated that the rain gauge was still not producing valid data. On July 16, Steve Heck of Bison visited the site to investigate while traveling to another job. He discovered that the rain gauge tipping mechanism had failed. The gauge was replaced with an older unit that had been removed from the site in 2018 due to problems with its heater (the tipping bucket mechanism still worked properly). A calibration check performed on the replacement gauge produced excellent results with an indicated precipitation reading of 0.67 inches, which was the known calibration amount. The replacement gauge will be repaired or replaced during the September 2019 audit (before frozen precipitation becomes common).

The performance of the barometric pressure sensor was checked during the July 16, site visit. It showed a reading of 24.42 inches of mercury versus a known value of 24.37 inches, which is well within EPA performance criteria.

### 3.0 PERFORMANCE AUDIT DATA

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Jeff Bell of Bison conducted performance audits of the meteorological system on June 14, 2019 and made any necessary calibration adjustments to the meteorological system following the audits. The Bison report of the audits is presented in Appendix B. All results were satisfactory with the following exceptions:

- The barometric pressure sensor could not be checked due to the power problem discussed in Section 2.0. It was subsequently checked on July 16 and found to be in accurate calibration.
- The rain gauge tipping mechanism was working properly from a mechanical standpoint but was not producing a signal due to a damaged cable. The gauge was replaced with another unit on July 16 as discussed in Section 2.0.

## 4.0 CALIBRATION DATA

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Jeff Bell of Bison conducted performance audits of the meteorological system on June 14, 2019, as discussed in Section 3.0. The barometric pressure sensor could not be audited because the sensor was not reading properly due to power problems at the site. It was subsequently checked on July 16 and found to be working properly. The as-found audit results were satisfactory for all other parameters.

The wind speed / wind direction sensor was replaced with a refurbished unit during the audit to prevent bearing deterioration. The existing unit was working properly when it was removed, as documented in the audit report presented in Appendix B. No other calibration adjustments were made to the system at the time of the audit.



## 5.0 DATA COMPLETENESS

The meteorological percentages of data recovery achieved during the second quarter of 2019 are given in Tables 1 and 2. In these tables, the number of possible data values during each month of the quarter is given, together with the number of valid readings and the number of hours spent on quality assurance activities (such as calibrations, performance audits, and maintenance on the sensors). The quality assurance hours are added to the number of hours of valid data to compute the net percentage data recovery.

During the second quarter the net percentage data recovery was 96.2 percent for barometric pressure, 95.9 percent for wind speed, 52.9 percent for precipitation, and 96.4 percent for all other parameters. Precipitation data was lost due to wildlife damaging the wiring between the gauge and the datalogger; the gauge was replaced on July 16 as discussed in Section 2.0. Approximately 3.5 days of data were lost for all parameters during mid-June due to the power problem discussed in Section 2.0. Finally, 10 hours of wind speed data were lost in late April due to sensor icing.

**Table 1. Monthly Data Completeness**

<b>April 2019</b>					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
<b>Black Butte Copper Project Met Tower</b>					
Wind Speed	720	705	97.9	5	98.6
Wind Direction	720	715	99.3	5	100.0
Standard Deviation	720	715	99.3	5	100.0
Temperature 9 Meters	720	715	99.3	5	100.0
Temperature 2 Meters	720	715	99.3	5	100.0
Temperature Delta T	720	715	99.3	5	100.0
Solar Radiation	720	715	99.3	5	100.0
Barometric Pressure	720	715	99.3	5	100.0
Relative Humidity	720	715	99.3	5	100.0
Precipitation	720	715	99.3	5	100.0
<b>Total</b>	<b>7,200</b>	<b>7,140</b>	<b>99.2</b>	<b>50</b>	<b>99.9</b>

**Table 1. Monthly Data Completeness (Continued)**

<b>May 2019</b>					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
<b>Black Butte Copper Project Met Tower</b>					
Wind Speed	744	744	100.0	0	100.0
Wind Direction	744	744	100.0	0	100.0
Standard Deviation	744	744	100.0	0	100.0
Temperature 9 Meters	744	744	100.0	0	100.0
Temperature 2 Meters	744	744	100.0	0	100.0
Temperature Delta T	744	744	100.0	0	100.0
Solar Radiation	744	744	100.0	0	100.0
Barometric Pressure	744	744	100.0	0	100.0
Relative Humidity	744	744	100.0	0	100.0
Precipitation	744	432	58.1	0	58.1
<b>Total</b>	<b>7,440</b>	<b>7,128</b>	<b>95.8</b>	<b>0</b>	<b>95.8</b>

**Table 1. Monthly Data Completeness (Continued)**

<b>June 2019</b>					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
<b>Black Butte Copper Project Met Tower</b>					
Wind Speed	720	637	88.5	4	89.0
Wind Direction	720	637	88.5	4	89.0
Standard Deviation	720	637	88.5	4	89.0
Temperature 9 Meters	720	637	88.5	4	89.0
Temperature 2 Meters	720	637	88.5	4	89.0
Temperature Delta T	720	637	88.5	4	89.0
Solar Radiation	720	637	88.5	4	89.0
Barometric Pressure	720	637	88.5	0	88.5
Relative Humidity	720	637	88.5	4	89.0
Precipitation	720	0	0.0	4	0.6
<b>Total</b>	<b>7,200</b>	<b>5,733</b>	<b>79.6</b>	<b>36</b>	<b>80.1</b>

**Table 2. Quarterly Data Completeness**

<b>Second Quarter 2019</b>					
Parameter	Readings Possible	Valid Readings	Percentage Recovery	Quality Assurance Hours	Net Percentage Recovery
<b>Black Butte Copper Project Met Tower</b>					
Wind Speed	2,184	2,086	95.5	9	95.9
Wind Direction	2,184	2,096	96.0	9	96.4
Standard Deviation	2,184	2,096	96.0	9	96.4
Temperature 9 Meters	2,184	2,096	96.0	9	96.4
Temperature 2 Meters	2,184	2,096	96.0	9	96.4
Temperature Delta T	2,184	2,096	96.0	9	96.4
Solar Radiation	2,184	2,096	96.0	9	96.4
Barometric Pressure	2,184	2,096	96.0	5	96.2
Relative Humidity	2,184	2,096	96.0	9	96.4
Precipitation	2,184	1,147	52.5	9	52.9
<b>Total</b>	<b>21,840</b>	<b>20,001</b>	<b>91.6</b>	<b>86</b>	<b>92.0</b>

## 6.0 MONITORING DATA

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The hourly data values collected at the monitoring site are given in the data tables in Appendix A. Each of these tables presents one month's data for one parameter in the monitoring system. In addition, the average, maximum, and minimum values for each parameter for each day are listed (for wind direction, the prevailing wind direction for the day is given). For those hours with missing data, a code is given that explains the reason the data were missing. These codes are given in Table 3.

Monthly and quarterly wind rose distributions from the monitoring site are presented in Tables 4 through 7. These tables give the percentage frequency of occurrence of winds from 16 cardinal directions and from 22 wind speed ranges. These same data are presented graphically in Figures 2 through 5. In the wind rose figures, the length of each "petal" of the rose is proportional to the percentage of time the wind blew from that direction. On the bottom of each figure is a histogram showing the average wind speed from each of the cardinal wind directions.

**Table 3. Missing Data Codes**

<b>Mnemonic Code</b>	<b>Description</b>	<b>Equivalent EPA Null Value Reason Code</b>
Sc	Scheduled but not collected	9972
Ti	Sample time out of limits	9973
Fi	Filter damage	9976
Op	Voided by operator	9978
Mi	Miscellaneous void	9979
ND	Machine malfunction	9980
Wx	Bad weather	9981
Co	Collection error	9983
Lb	Lab error	9984
QA	Poor quality assurance results	9985
ZS	Manual zero/span check	9986
Wa	Monitoring waived	9987
Pw	Power failure	9988
Wi	Wildlife damage	9989
AZ	Automatic zero/span check	9991
Au	Performance audit	9992
Ma	Routine maintenance/repairs	9993
Ca	Multipoint calibration	9995
PZ	Precision/zero/span	9998

**Table 4. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower**

April 2019																		
Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	
Wind Speed (meters per second)	0.1 - 1.0	0.7	0.3	0.3	1.1	1.1	1.6	3.4	2.1	0.9	0.4	0.6	0.4	0.4	0.3	0.3	0.1	14.0
	1.1 - 2.0	0.6	0.6	1.6	1.0	3.5	3.5	5.4	3.3	0.3	0.7	1.0	1.0	1.3	2.1	1.4	1.7	28.9
	2.1 - 3.0	0.0	0.3	0.6	0.4	1.3	0.9	1.4	2.3	0.6	0.1	0.3	0.7	2.1	1.0	2.0	0.7	14.6
	3.1 - 4.0	0.4	0.1	0.0	0.6	0.6	0.0	0.7	1.4	0.6	0.3	0.4	0.9	3.1	2.0	0.6	0.1	11.8
	4.1 - 5.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	1.0	0.1	0.3	0.6	0.6	3.3	2.1	0.1	0.0	8.7
	5.1 - 6.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.0	0.0	0.0	0.3	1.1	2.8	0.7	0.6	0.0	7.0
	6.1 - 7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.0	0.4	0.7	2.3	0.9	0.1	0.0	5.4
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.1	0.3	0.7	0.6	0.0	0.0	2.3
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.1	0.0	0.0	1.8	0.7	0.3	0.0	3.5
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	1.0	0.0	0.4	0.0	1.8
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.9	0.0	1.3
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.3
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Calm																		0.0
Total	1.7	1.3	2.4	3.3	6.8	6.2	11.8	13.2	2.4	2.0	3.7	5.8	19.1	10.5	7.1	2.7		100.0
Average Speed	1.7	1.7	1.5	1.9	1.9	1.6	1.9	3.3	2.2	2.7	3.3	4.1	5.1	4.2	4.9	1.7		3.3

**Table 5. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower**

May 2019																		
Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	
Wind Speed (meters per second)	0.1 - 1.0	0.5	0.8	0.3	0.4	1.5	1.5	1.1	0.7	0.3	0.1	0.3	0.1	0.4	0.5	0.8	0.9	10.2
	1.1 - 2.0	0.5	0.7	0.9	1.9	3.2	5.4	3.1	1.6	0.3	0.3	0.3	0.3	0.9	0.9	1.1	0.9	22.3
	2.1 - 3.0	0.1	0.3	1.1	1.6	2.3	1.3	2.0	1.1	0.7	0.5	0.8	0.4	0.9	1.6	1.3	0.7	16.8
	3.1 - 4.0	0.0	0.1	0.3	0.9	1.9	0.5	0.8	1.6	0.9	0.4	0.5	0.5	1.1	1.9	2.2	0.7	14.4
	4.1 - 5.0	0.0	0.1	0.1	0.7	0.9	0.5	1.7	2.3	0.4	0.3	0.1	0.4	1.6	0.5	2.0	0.1	12.0
	5.1 - 6.0	0.0	0.1	0.4	0.0	0.4	1.5	2.0	3.1	0.3	0.0	0.0	0.4	1.3	1.1	0.4	0.1	11.2
	6.1 - 7.0	0.1	0.4	0.3	0.1	0.1	0.1	1.3	1.5	0.0	0.0	0.3	0.4	1.7	1.2	1.3	0.1	9.1
	7.1 - 8.0	0.0	0.3	0.1	0.1	0.1	0.0	0.4	0.9	0.3	0.0	0.1	0.0	0.5	0.0	0.3	0.0	3.2
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Calm																		0.0
Total	1.3	2.8	3.5	5.8	10.5	11.0	12.6	13.3	3.1	1.6	2.4	2.6	8.6	7.8	9.4	3.6	100.0	
Average Speed	1.8	3.0	3.0	2.6	2.6	2.5	3.6	4.5	3.6	2.9	3.3	4.0	4.4	3.7	3.7	2.3	3.4	



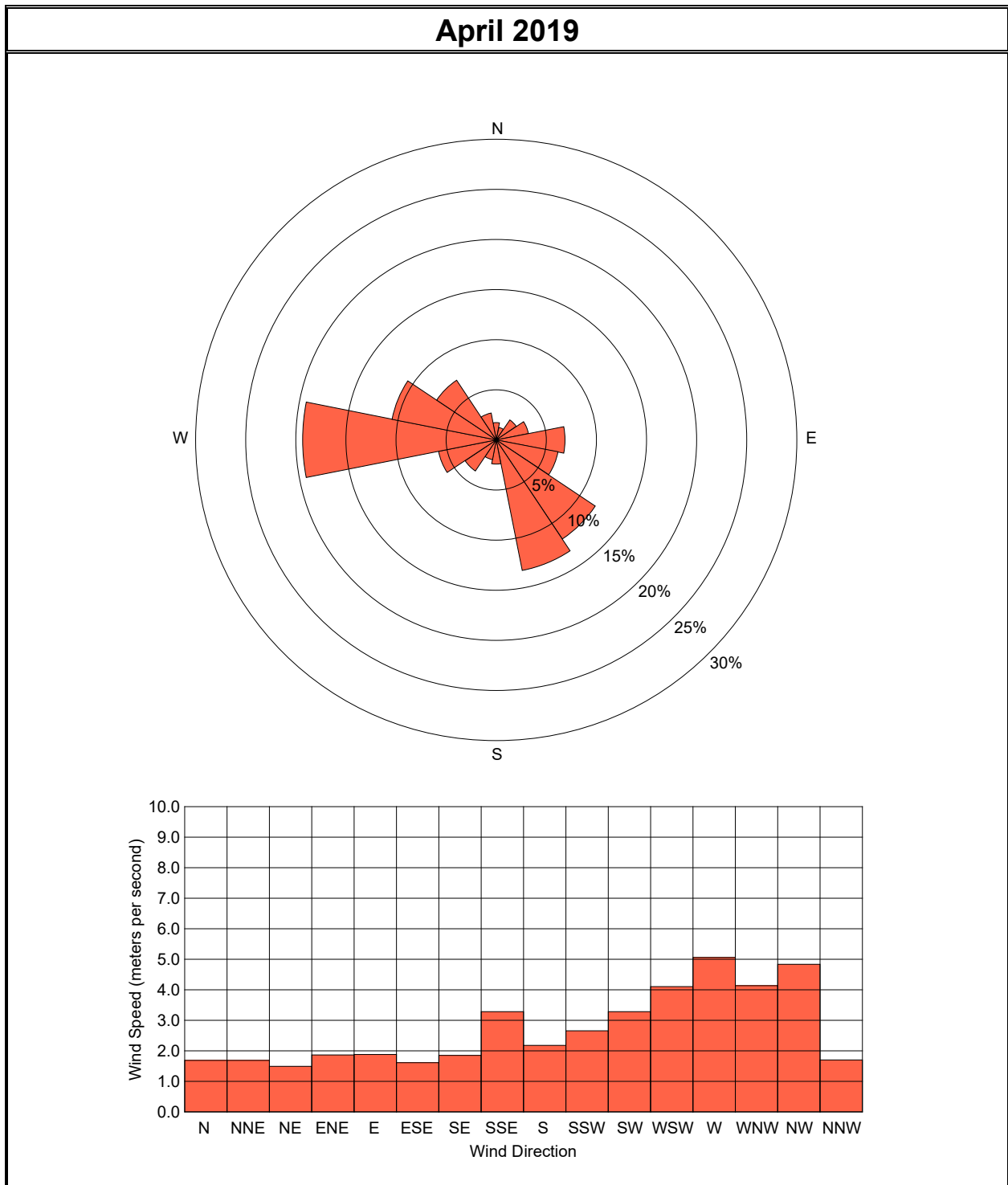
**Table 6. Monthly Wind Rose Summary, Black Butte Copper Project Met Tower**

June 2019																		
Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	
Wind Speed (meters per second)	0.1 - 1.0	0.3	0.3	0.3	0.3	0.3	0.6	1.9	1.6	0.2	0.2	0.5	0.3	0.3	0.6	0.9	0.6	9.3
	1.1 - 2.0	1.3	0.8	1.4	3.3	2.8	5.8	6.6	1.1	1.3	0.0	0.3	0.8	0.9	1.6	1.6	0.9	30.5
	2.1 - 3.0	0.2	0.0	0.3	1.4	2.8	1.6	0.8	0.9	0.3	0.3	0.6	0.9	1.4	2.0	3.0	1.6	18.2
	3.1 - 4.0	0.5	0.2	0.0	0.6	0.2	0.2	0.5	1.1	0.2	0.3	0.2	1.9	2.4	3.5	1.7	1.1	14.3
	4.1 - 5.0	0.2	0.2	0.0	0.0	0.2	0.2	0.2	0.6	0.0	0.0	0.0	1.7	2.5	3.0	1.1	0.5	10.2
	5.1 - 6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.2	0.0	0.2	1.4	2.8	1.3	1.3	0.5	8.5
	6.1 - 7.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.2	0.0	0.9	1.6	0.3	0.5	0.3	4.6
	7.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.0	0.2	1.1	0.8	0.2	0.0	0.0	2.8
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.9
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.5	0.0	0.0	0.8
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Calm																		0.0
Total	2.7	1.4	2.0	5.7	6.3	8.3	11.0	6.4	2.2	1.1	1.9	9.4	13.0	13.0	10.0	5.5		100.0
Average Speed	2.6	1.8	1.6	1.9	2.0	1.8	2.1	3.0	2.6	4.2	2.6	4.6	4.6	3.9	3.2	3.0		3.1

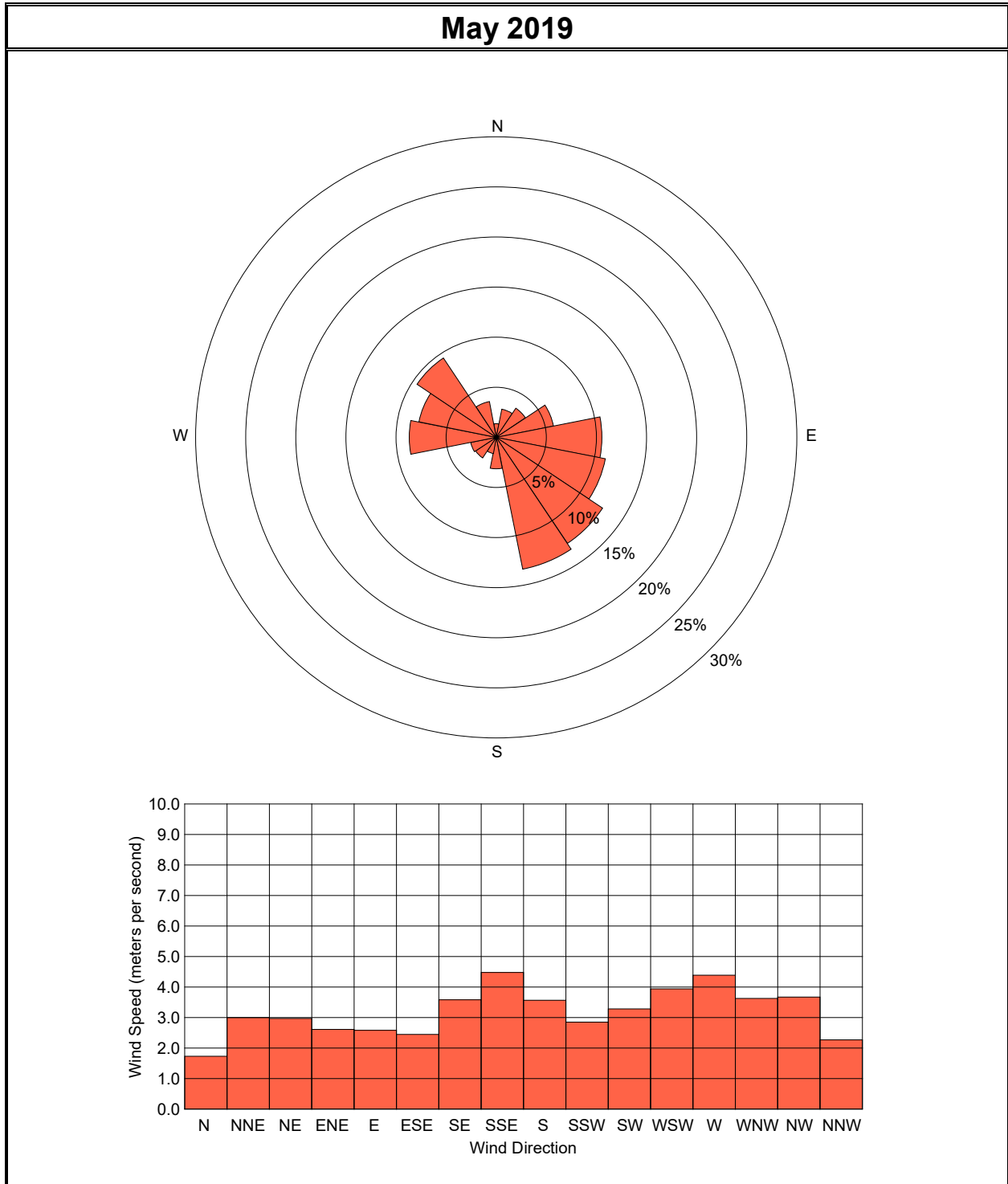
**Table 7. Quarterly Wind Rose Summary, Black Butte Copper Project Met Tower**

<b>Second Quarter 2019</b>																		
Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	
Wind Speed (meters per second)	0.1 - 1.0	0.5	0.5	0.3	0.6	1.0	1.2	2.1	1.4	0.4	0.2	0.4	0.3	0.4	0.5	0.7	0.6	11.2
	1.1 - 2.0	0.8	0.7	1.3	2.0	3.2	4.9	4.9	2.0	0.6	0.3	0.5	0.7	1.1	1.5	1.3	1.2	27.0
	2.1 - 3.0	0.1	0.2	0.7	1.2	2.1	1.2	1.4	1.4	0.5	0.3	0.6	0.7	1.5	1.5	2.1	1.0	16.5
	3.1 - 4.0	0.3	0.1	0.1	0.7	0.9	0.2	0.7	1.4	0.6	0.3	0.4	1.1	2.2	2.4	1.5	0.6	13.5
	4.1 - 5.0	0.0	0.1	0.0	0.3	0.4	0.3	0.7	1.3	0.2	0.2	0.2	0.9	2.4	1.8	1.1	0.2	10.3
	5.1 - 6.0	0.0	0.0	0.1	0.0	0.2	0.6	0.9	1.6	0.1	0.0	0.1	1.0	2.3	1.0	0.7	0.2	8.9
	6.1 - 7.0	0.1	0.1	0.1	0.0	0.0	0.0	0.6	0.9	0.0	0.0	0.2	0.7	1.9	0.8	0.7	0.1	6.5
	7.1 - 8.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.5	0.1	0.0	0.1	0.4	0.7	0.2	0.1	0.0	2.8
	8.1 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.7	0.3	0.1	0.0	1.8
	9.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.9
	10.1 - 11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4
	11.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
	12.1 - 13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	13.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Calm																		0.0
Total	1.9	1.9	2.7	4.9	8.0	8.6	11.8	11.2	2.6	1.6	2.7	5.8	13.5	10.3	8.8	3.9	100.0	
Average Speed	2.1	2.5	2.2	2.2	2.3	2.1	2.6	3.8	2.9	3.1	3.2	4.4	4.8	3.9	3.9	2.5	3.3	

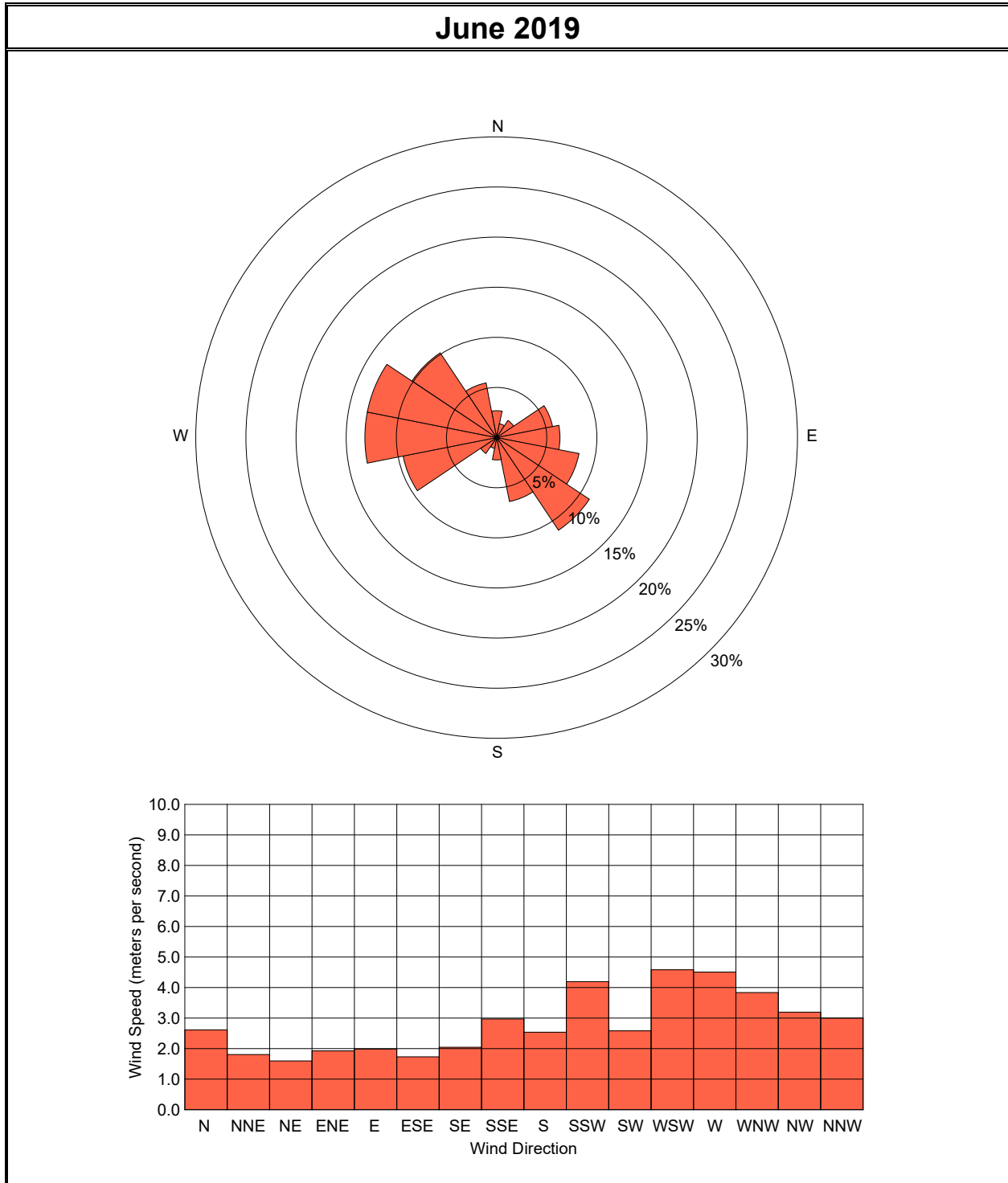
**Figure 2. Monthly Wind Rose, Black Butte Copper Project Met Tower**



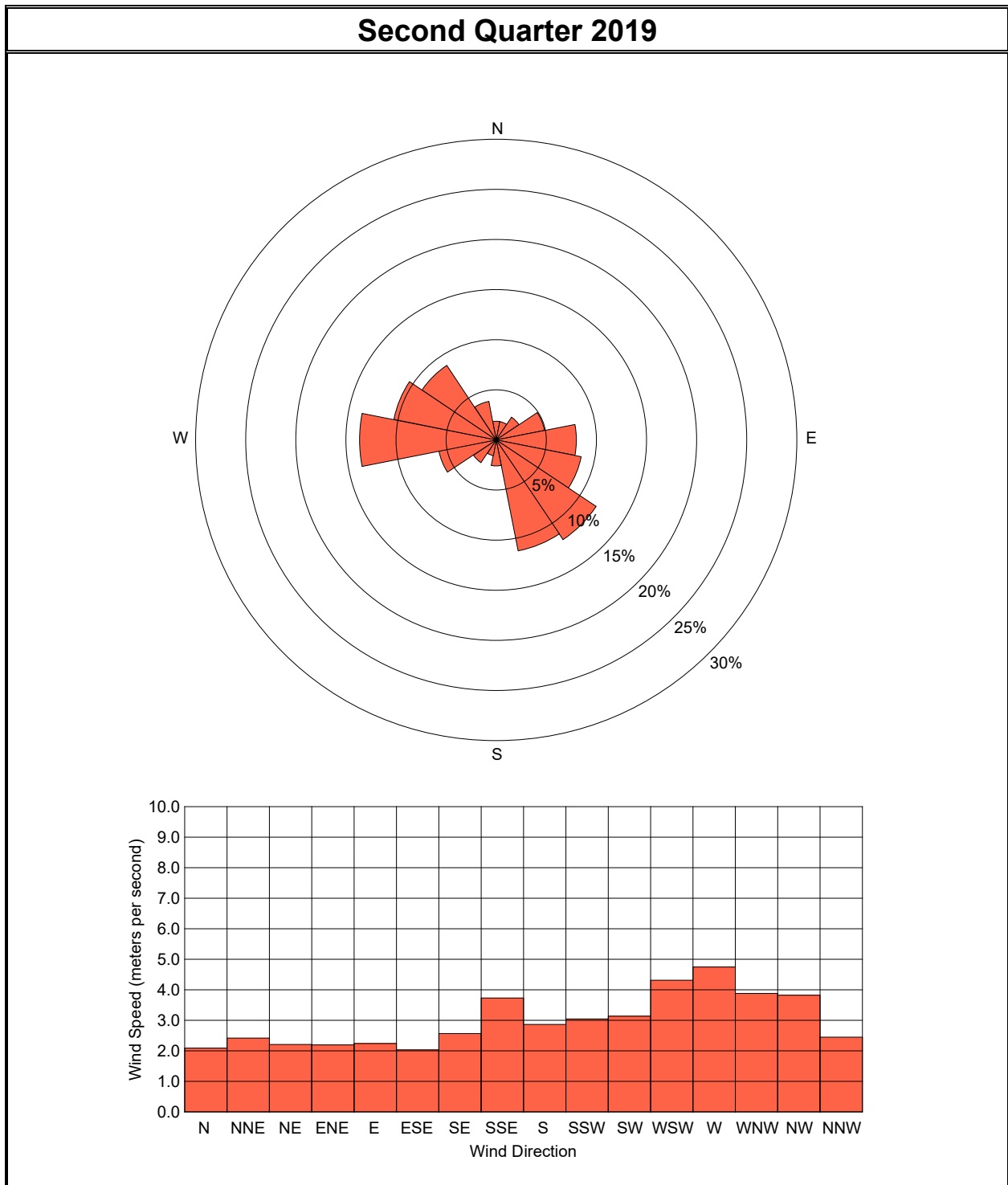
**Figure 3. Monthly Wind Rose, Black Butte Copper Project Met Tower**



**Figure 4. Monthly Wind Rose, Black Butte Copper Project Met Tower**



**Figure 5. Quarterly Wind Rose, Black Butte Copper Project Met Tower**



**APPENDIX A: HOURLY AIR QUALITY AND  
METEOROLOGICAL DATA, SECOND QUARTER 2019**

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Wind Speed (meters per second)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	1.0	0.9	1.1	0.9	1.0	0.9	0.6	0.6	1.1	2.0	4.3	3.9	3.4	2.9	2.0	3.2	4.2	4.5	4.4	1.7	1.1	0.8	0.9	1.1	2.0	4.5	0.6
2	1.1	2.0	1.5	1.8	1.5	1.0	1.3	1.8	0.7	0.6	0.9	3.6	4.3	3.3	2.7	1.9	2.9	2.9	1.5	1.2	2.5	2.9	2.2	2.2	2.0	4.3	0.6
3	3.8	3.5	2.4	1.9	1.9	2.2	1.1	0.8	0.8	1.6	2.8	1.0	1.3	1.7	3.5	2.7	1.7	3.4	0.9	0.9	2.1	2.2	1.2	1.9	2.0	3.8	0.8
4	1.3	1.1	1.3	1.4	1.0	0.9	1.2	1.2	3.6	4.7	5.0	5.0	5.6	5.1	4.1	3.3	1.2	1.2	0.6	1.8	2.4	2.0	1.1	1.0	2.4	5.6	0.6
5	1.3	1.5	0.8	1.1	1.1	1.3	0.9	0.6	Au	Au	Au	Au	Au	4.2	4.6	1.7	1.7	2.0	1.5	0.8	1.0	1.0	1.6	1.1	1.6	4.6	0.6
6	0.9	1.2	0.9	1.0	1.4	1.2	1.8	1.4	2.3	3.7	3.6	4.5	4.9	6.9	9.1	5.4	2.8	5.9	5.9	4.0	5.3	6.0	4.2	3.8	3.7	9.1	0.9
7	3.0	2.3	2.8	2.0	1.6	2.3	2.2	4.3	6.0	8.9	4.9	4.9	4.0	3.4	3.9	2.8	6.9	8.7	7.0	4.5	6.1	5.4	3.0	2.4	4.3	8.9	1.6
8	2.8	2.6	2.2	1.5	1.6	1.3	0.7	2.0	1.1	0.5	1.1	2.0	3.3	2.8	2.0	1.6	1.6	1.3	2.2	1.8	2.0	1.3	1.5	2.1	1.8	3.3	0.5
9	2.0	1.4	0.7	0.6	1.0	0.6	3.1	5.3	6.9	6.1	4.2	6.1	6.4	5.6	4.6	4.0	3.5	2.6	2.4	2.2	2.1	3.0	1.1	1.0	3.2	6.9	0.6
10	1.0	1.0	1.0	0.9	0.9	0.7	2.1	2.8	7.2	9.3	7.4	7.2	6.7	5.1	5.4	6.8	4.5	3.3	4.0	3.3	2.0	1.0	0.6	1.1	3.6	9.3	0.6
11	1.2	0.7	1.5	0.8	1.1	0.6	1.5	1.2	1.9	1.8	3.2	3.3	4.2	4.8	5.2	5.1	3.2	3.6	0.6	0.7	3.1	1.1	1.9	5.6	2.4	5.6	0.6
12	4.0	2.4	2.5	2.0	1.5	0.7	0.8	0.9	0.8	2.4	4.2	5.2	3.9	3.1	3.7	3.4	2.8	3.9	2.8	2.1	1.2	1.3	1.1	2.0	2.4	5.2	0.7
13	1.1	0.9	0.9	1.1	0.8	1.0	0.7	0.4	1.0	2.6	6.1	7.7	7.8	7.0	6.3	4.3	2.7	1.1	1.7	0.8	2.7	6.6	5.0	3.8	3.1	7.8	0.4
14	4.9	4.5	3.2	5.1	7.3	3.1	4.1	3.8	7.2	8.0	7.4	8.7	10.0	12.2	13.2	9.9	8.6	6.0	3.9	4.7	3.6	4.0	3.6	4.2	6.3	13.2	3.1
15	4.0	5.0	5.0	5.7	2.2	1.4	1.3	2.3	6.2	5.6	6.2	7.4	6.4	5.4	5.7	4.6	3.2	2.1	1.4	2.0	4.0	2.6	1.4	1.0	3.8	7.4	1.0
16	1.0	1.2	2.3	2.3	1.9	1.7	3.4	3.8	2.1	2.1	2.5	2.9	2.7	3.5	4.6	4.1	4.3	3.4	1.5	1.0	0.7	0.8	1.3	1.1	2.3	4.6	0.7
17	2.2	1.5	3.6	4.3	2.9	3.7	2.7	2.8	1.4	3.5	5.7	8.2	8.5	5.6	8.6	8.4	9.6	9.0	8.1	6.9	4.7	4.5	1.0	0.9	4.9	9.6	0.9
18	1.3	2.2	1.9	1.2	1.6	1.0	1.1	1.3	2.5	5.4	5.5	4.6	6.2	6.2	6.6	5.0	5.6	4.9	3.8	1.9	1.9	2.2	3.5	1.6	3.3	6.6	1.0
19	1.4	2.2	2.5	9.0	5.5	5.1	4.2	1.8	4.5	4.4	5.6	6.3	6.6	7.5	6.8	5.4	4.9	2.5	2.7	2.0	3.7	3.8	2.4	1.4	4.3	9.0	1.4
20	1.7	1.5	1.1	0.8	2.7	1.3	1.0	1.2	1.6	1.0	2.2	1.4	1.1	1.1	2.5	4.2	5.3	3.3	3.0	1.8	0.7	1.2	1.3	1.1	1.8	5.3	0.7
21	1.2	1.6	1.2	1.2	1.3	2.5	2.6	1.5	0.8	2.3	4.0	5.5	4.2	3.6	3.0	4.4	3.2	3.8	4.0	4.4	5.8	3.3	1.5	0.8	2.8	5.8	0.8
22	1.3	1.1	1.2	1.2	1.1	1.2	0.8	0.7	2.1	2.5	2.8	4.2	3.7	4.5	5.3	5.1	6.1	4.0	1.5	1.2	1.6	1.5	1.5	1.8	2.4	6.1	0.7
23	1.6	2.4	2.5	1.1	1.1	1.4	0.9	2.2	6.7	6.5	6.3	8.1	7.6	9.6	10.1	9.0	10.0	8.1	6.1	3.8	2.7	5.0	2.7	3.1	4.9	10.1	0.9
24	3.1	2.5	1.6	1.3	1.3	1.0	1.8	4.0	5.0	6.9	7.7	9.1	8.3	8.2	8.5	8.1	8.0	7.2	6.1	2.9	0.9	1.7	1.4	1.1	4.5	9.1	0.9
25	0.9	1.0	0.9	1.3	1.2	1.8	1.1	2.3	1.3	1.9	2.4	3.3	3.9	3.9	3.4	4.0	3.1	3.4	6.3	2.6	1.9	2.3	1.6	1.5	2.4	6.3	0.9
26	1.8	1.8	0.8	0.8	1.5	0.8	1.3	1.3	1.5	1.3	4.1	6.6	5.7	6.9	5.3	5.9	4.7	4.5	5.2	2.3	3.0	1.2	Wx	Wx	3.1	6.9	0.8
27	Wx	Wx	Wx	Wx	Wx	Wx	Wx	Wx	0.4	1.7	2.1	2.4	3.6	3.8	4.1	2.6	6.7	9.2	6.9	5.9	3.4	4.6	5.8	5.6	4.3	9.2	0.4
28	6.8	5.7	6.8	11.3	10.4	8.5	10.7	13.0	10.6	9.1	8.7	8.9	9.7	10.8	10.7	11.5	10.4	10.2	5.6	5.1	3.4	2.7	1.9	1.7	8.1	13.0	1.7
29	1.1	1.7	0.9	1.2	0.4	0.2	0.5	0.4	1.1	7.2	8.8	8.1	9.2	10.5	9.7	8.7	8.3	5.6	4.2	5.2	2.0	1.9	2.7	3.0	4.3	10.5	0.2
30	1.5	1.5	1.9	0.9	1.8	1.2	1.3	1.6	1.4	1.5	1.2	1.4	2.0	2.4	2.0	1.4	1.1	3.6	2.6	2.2	0.9	0.9	0.7	0.6	1.6	3.6	0.6
Avg	2.1	2.0	2.0	2.3	2.1	1.7	2.0	2.3	3.1	4.0	4.5	5.2	5.4	5.4	5.6	5.0	4.8	4.5	3.6	2.7	2.6	2.6	2.1	2.1	3.3	7.2	0.9
Max	6.8	5.7	6.8	11.3	10.4	8.5	10.7	13.0	10.6	9.3	8.8	9.1	10.0	12.2	13.2	11.5	10.4	10.2	8.1	6.9	6.1	6.6	5.8	5.6	8.1	13.2	3.1
Min	0.9	0.7	0.7	0.6	0.4	0.2	0.5	0.4	0.4	0.5	0.9	1.0	1.1	1.1	2.0	1.4	1.1	1.1	0.6	0.7	0.7	0.8	0.6	0.6	1.6	3.3	0.2

A-1



**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Wind Speed (meters per second)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0.6	0.7	0.8	1.1	0.7	0.7	0.3	0.3	0.6	1.3	1.8	2.1	4.0	5.0	6.5	4.7	4.4	4.5	3.5	1.6	3.2	2.1	1.7	1.5	2.2	6.5	0.3
2	1.3	0.9	0.9	1.5	1.4	2.0	1.2	2.3	2.7	6.5	5.7	6.8	4.6	6.1	5.9	4.4	7.0	4.7	4.4	1.8	2.3	2.2	1.2	1.5	3.3	7.0	0.9
3	1.3	1.0	1.3	1.4	1.5	1.3	0.6	0.9	3.2	5.9	5.1	5.7	6.5	6.7	5.9	6.5	6.7	6.2	4.5	1.9	2.9	2.9	2.3	1.6	3.5	6.7	0.6
4	1.2	0.7	1.1	1.2	1.1	0.8	0.8	0.9	3.2	6.1	5.4	6.1	6.0	4.3	4.1	3.6	3.2	3.3	2.5	3.3	3.8	3.8	2.2	2.1	2.9	6.1	0.7
5	4.1	2.5	3.1	3.4	3.0	2.9	2.5	2.5	4.0	4.1	1.5	2.9	2.4	1.5	2.1	3.9	5.9	7.1	7.1	5.9	5.9	4.4	3.0	2.7	3.7	7.1	1.5
6	2.5	1.3	0.8	0.6	0.8	0.2	0.4	1.1	1.5	1.7	2.6	2.8	3.7	2.8	3.0	2.3	3.3	5.7	6.4	5.1	2.6	1.5	1.5	1.5	2.3	6.4	0.2
7	1.5	0.8	0.5	1.2	1.3	1.0	0.6	0.6	1.5	1.7	2.8	4.8	6.1	5.0	4.1	4.2	7.5	6.4	4.5	1.7	2.8	2.8	1.2	3.7	2.8	7.5	0.5
8	2.8	0.8	1.1	1.0	0.7	0.7	1.1	1.1	2.2	2.3	3.7	1.9	3.5	1.8	1.3	2.0	3.9	3.6	2.7	1.1	1.3	1.1	0.9	1.4	1.8	3.9	0.7
9	2.0	4.0	2.7	2.1	1.0	0.7	0.6	1.6	5.5	4.7	5.7	5.4	3.9	2.9	2.8	3.0	4.1	3.2	2.4	2.0	2.1	1.8	1.3	1.1	2.8	5.7	0.6
10	1.4	1.4	1.0	1.3	1.0	0.8	0.6	1.0	1.2	4.0	5.7	5.2	6.5	7.2	5.9	5.4	6.7	6.5	4.2	2.7	1.7	0.7	0.9	1.5	3.1	7.2	0.6
11	1.2	0.9	0.5	0.5	0.8	0.5	0.6	1.2	3.7	5.0	5.9	6.3	7.0	6.6	6.1	6.4	5.2	5.3	3.4	1.3	3.2	4.2	2.6	2.7	3.4	7.0	0.5
12	1.8	1.6	1.8	1.5	1.5	1.6	1.0	0.8	3.7	5.8	5.8	4.6	5.2	4.2	4.8	6.2	7.3	5.3	3.7	1.5	3.2	2.9	2.7	2.3	3.4	7.3	0.8
13	2.0	1.5	1.9	1.4	1.3	1.1	0.7	1.0	5.7	6.8	6.8	6.7	6.3	6.5	6.2	5.6	6.1	4.7	3.3	2.0	4.9	4.1	2.1	2.1	3.8	6.8	0.7
14	2.2	2.1	2.0	1.6	1.5	1.6	0.9	0.9	1.8	3.5	4.1	5.1	6.0	6.6	7.6	6.5	7.2	7.3	3.2	3.6	4.8	3.8	1.7	1.7	3.6	7.6	0.9
15	2.2	2.2	2.6	4.1	2.8	1.9	1.6	5.7	6.4	6.5	7.5	7.0	5.6	4.5	4.1	3.3	3.5	2.4	3.5	2.2	2.3	1.3	1.6	2.0	3.6	7.5	1.3
16	1.3	2.2	1.3	4.0	2.8	4.6	5.0	5.6	5.8	6.0	6.4	6.1	8.1	6.6	8.5	5.2	7.6	5.8	5.6	5.5	4.5	3.2	5.0	5.0	5.1	8.5	1.3
17	4.4	1.9	2.7	1.9	5.0	2.8	1.6	1.3	2.1	4.0	3.8	4.5	2.1	3.3	3.2	3.7	4.2	3.9	3.5	3.4	3.5	2.0	3.2	3.0	3.1	5.0	1.3
18	2.6	3.2	2.1	2.8	2.2	3.1	3.1	2.3	3.0	3.4	2.5	2.5	5.1	7.4	8.0	6.9	6.5	5.1	5.5	5.6	4.7	6.1	5.6	4.8	4.3	8.0	2.1
19	3.9	3.2	5.0	5.1	4.2	2.0	5.3	6.1	4.6	5.3	7.0	6.9	6.7	8.5	6.5	6.6	6.0	5.3	4.9	5.3	5.1	5.5	5.4	5.5	5.4	8.5	2.0
20	5.3	4.2	6.0	5.7	5.6	5.0	5.1	4.8	4.8	6.0	6.5	6.4	4.4	5.8	7.6	7.4	4.9	4.1	6.1	5.9	3.9	3.0	4.1	4.6	5.3	7.6	3.0
21	5.5	5.0	4.1	3.2	2.8	1.1	1.9	3.7	5.4	7.0	7.2	5.4	5.1	3.6	4.0	8.5	8.4	7.9	6.1	5.7	4.1	3.2	2.0	2.5	4.7	8.5	1.1
22	1.2	1.4	3.1	4.4	2.3	2.3	1.6	1.8	3.7	4.6	6.8	7.3	7.8	6.3	6.2	6.6	6.1	5.6	3.8	1.8	0.9	2.4	3.1	5.3	4.0	7.8	0.9
23	2.8	2.0	1.4	1.4	2.3	1.8	1.1	2.1	5.9	5.8	5.9	4.6	5.5	6.5	7.2	5.3	6.3	5.8	6.2	5.2	4.5	4.0	3.8	3.8	4.2	7.2	1.1
24	1.8	0.6	0.4	0.6	0.5	1.2	0.6	0.9	1.8	4.2	4.7	4.4	3.9	4.8	6.3	7.5	6.6	8.0	3.3	1.3	1.6	3.2	2.4	1.7	3.0	8.0	0.4
25	2.0	1.7	1.0	1.4	1.0	0.8	1.4	1.8	1.4	2.8	2.9	2.2	4.5	2.5	4.0	7.0	3.3	3.4	2.8	2.2	5.8	3.8	2.5	2.4	2.7	7.0	0.8
26	1.1	1.1	0.8	1.2	0.8	0.8	0.8	3.4	4.0	4.4	5.1	5.7	8.7	7.5	6.2	6.0	4.8	4.2	4.2	4.2	1.8	2.3	1.7	1.2	3.4	8.7	0.8
27	2.0	4.0	1.8	1.8	2.1	2.2	2.5	2.0	1.7	2.3	1.9	1.7	2.8	3.7	2.1	5.5	7.2	6.5	3.0	1.9	1.7	1.3	1.2	1.1	2.7	7.2	1.1
28	0.8	1.0	1.3	1.7	1.0	0.8	1.4	1.6	3.6	2.5	3.2	2.3	2.9	3.3	4.0	4.3	4.7	4.7	3.6	2.7	3.5	3.3	2.3	1.5	2.6	4.7	0.8
29	1.7	1.3	2.2	1.5	1.2	1.8	1.3	0.9	2.7	2.8	3.6	3.9	4.2	2.9	2.6	2.6	3.2	3.2	3.9	4.8	2.0	2.2	1.9	2.7	2.5	4.8	0.9
30	1.9	1.9	2.4	2.4	2.0	1.6	0.8	0.7	1.6	3.7	4.3	4.0	5.0	4.4	3.8	4.0	4.4	6.6	7.2	4.6	2.3	1.5	4.7	3.6	3.3	7.2	0.7
31	3.7	3.5	4.1	3.9	2.2	2.1	1.7	2.1	3.9	3.4	3.2	3.0	3.6	6.3	4.0	5.2	4.7	2.6	2.5	2.2	1.0	1.9	3.0	1.6	3.1	6.3	1.0
Avg	2.3	2.0	2.0	2.2	1.9	1.7	1.6	2.0	3.3	4.3	4.7	4.7	5.1	5.0	5.0	5.2	5.5	5.1	4.2	3.2	3.2	2.9	2.5	2.6	3.4	6.9	1.0
Max	5.5	5.0	6.0	5.7	5.6	5.0	5.3	6.1	6.4	7.0	7.5	7.3	8.7	8.5	8.5	8.5	8.4	8.0	7.2	5.9	5.9	6.1	5.6	5.5	5.4	8.7	3.0
Min	0.6	0.6	0.4	0.5	0.5	0.2	0.3	0.3	0.6	1.3	1.5	1.7	2.1	1.5	1.3	2.0	3.2	2.4	2.4	1.1	0.9	0.7	0.9	1.1	1.8	3.9	0.2

A-2

**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Wind Speed (meters per second)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	1.2	1.5	0.9	1.4	1.1	1.0	0.7	0.9	0.9	2.3	3.1	3.1	3.5	3.2	4.4	3.4	3.5	3.4	3.9	2.7	1.4	4.1	3.1	2.6	2.4	4.4	0.7	
2	2.2	2.2	1.9	1.8	1.9	1.4	0.7	0.8	2.2	3.7	4.2	4.6	4.0	3.9	3.9	4.1	3.8	3.2	3.5	2.6	2.0	3.3	2.4	2.3	2.8	4.6	0.7	
3	1.9	2.2	1.8	1.5	1.5	1.1	0.9	1.0	4.0	5.8	6.2	6.7	8.3	7.7	7.9	4.8	5.6	5.8	5.2	3.3	2.9	2.0	1.7	1.7	3.8	8.3	0.9	
4	1.2	1.5	1.4	1.7	1.6	1.2	0.6	1.0	2.7	3.7	3.9	3.9	3.8	5.5	6.1	6.1	6.3	5.3	4.6	3.3	1.3	1.8	1.8	1.6	3.0	6.3	0.6	
5	1.7	1.3	1.4	1.3	1.3	1.2	0.7	1.1	4.4	3.9	5.3	5.3	5.7	5.3	6.1	5.5	4.8	3.8	2.5	1.7	2.4	3.1	1.9	0.9	3.0	6.1	0.7	
6	1.0	0.8	1.5	0.8	1.2	1.8	2.4	3.8	6.0	7.3	6.5	4.5	7.5	10.0	9.9	9.0	7.5	6.1	4.6	3.8	1.5	5.4	5.2	3.4	4.6	10.0	0.8	
7	3.3	1.3	3.0	2.3	3.2	4.0	1.8	1.8	3.6	3.7	5.3	3.6	4.4	4.2	3.7	2.7	3.1	4.5	3.7	2.7	2.7	3.2	3.6	2.8	3.3	5.3	1.3	
8	1.8	1.3	0.7	0.7	1.1	1.4	1.5	2.0	2.7	3.9	2.9	3.2	2.9	5.6	2.8	2.2	4.8	2.7	3.0	1.2	1.5	1.5	1.0	1.0	2.2	5.6	0.7	
9	1.2	1.3	1.2	1.3	1.0	1.0	0.8	2.7	5.9	6.2	7.1	7.7	8.1	7.4	6.3	6.4	6.6	7.2	5.5	3.0	1.7	2.4	3.3	2.1	4.1	8.1	0.8	
10	1.8	1.7	1.3	1.7	1.5	1.0	1.0	0.8	0.6	1.7	2.4	5.4	5.0	4.8	6.8	5.7	4.7	5.0	5.6	5.0	2.7	2.6	0.8	1.2	2.9	6.8	0.6	
11	1.6	2.7	2.6	1.0	1.6	1.3	0.6	0.5	0.8	3.0	4.4	5.9	6.0	6.8	6.8	6.8	5.8	4.7	3.9	2.8	1.6	1.3	2.3	2.3	3.2	6.8	0.5	
12	1.8	2.0	2.8	1.8	1.9	1.7	1.0	1.1	2.9	4.0	3.9	3.0	3.9	3.3	3.1	3.9	3.2	2.8	2.0	2.9	1.4	1.1	1.1	1.2	2.4	4.0	1.0	
13	1.7	1.3	1.4	1.3	1.4	1.4	1.0	0.9	1.4	4.1	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	1.6	4.1	0.9
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	4.7	4.0	4.6	3.7	6.3	6.3	2.9	1.6	1.5	1.4	1.1	3.5	6.3	1.1	
16	1.5	1.2	1.0	1.6	1.3	0.7	1.4	0.8	1.1	2.1	2.9	3.5	2.1	3.1	4.7	3.8	3.8	2.8	3.2	2.7	1.7	1.2	1.7	1.9	2.2	4.7	0.7	
17	2.6	1.5	1.3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	1.8	2.6	1.3
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	4.9	3.6	5.0	4.5	6.2	4.1	2.8	1.7	1.5	1.2	1.0	2.1	1.7	3.1	6.2	1.0	
19	1.7	1.2	1.1	1.7	1.2	1.0	0.9	0.9	4.6	8.0	7.3	7.9	8.0	7.7	9.0	9.3	9.6	9.5	8.7	6.5	3.6	1.7	2.3	2.2	4.8	9.6	0.9	
20	1.5	1.2	1.6	1.2	1.3	1.9	2.6	3.6	5.5	5.9	3.6	2.1	5.8	5.1	2.1	1.6	5.3	2.4	2.5	1.9	1.6	2.2	1.4	1.1	2.7	5.9	1.1	
21	0.9	1.4	3.5	3.2	1.7	1.3	1.8	3.0	3.6	4.7	4.9	3.9	5.1	5.4	5.6	7.2	6.1	4.5	5.0	4.1	2.9	1.9	1.2	1.5	3.5	7.2	0.9	
22	2.4	5.0	4.7	5.6	4.9	5.4	4.7	3.0	4.5	4.7	5.6	5.9	6.2	2.9	3.7	3.1	5.4	4.7	5.5	4.4	4.4	2.3	1.1	1.8	4.2	6.2	1.1	
23	2.1	2.1	1.8	1.8	1.4	1.1	0.7	0.6	2.5	5.0	6.9	6.4	5.6	8.0	6.9	5.1	4.8	5.1	4.7	2.4	1.9	1.3	1.9	3.0	3.5	8.0	0.6	
24	2.2	1.9	3.2	2.5	2.0	2.0	1.1	0.6	2.2	2.6	3.8	2.7	2.8	3.8	4.5	5.5	6.5	5.1	4.3	3.0	1.7	2.1	2.0	2.1	2.9	6.5	0.6	
25	1.6	1.4	1.4	0.9	1.9	0.8	0.8	0.8	2.8	3.2	4.0	4.5	3.5	4.7	5.2	4.5	2.9	2.6	3.0	5.1	2.6	2.3	1.6	1.5	2.7	5.2	0.8	
26	1.5	1.9	1.6	2.0	1.1	2.4	2.1	1.4	0.8	1.6	1.6	1.6	1.6	4.6	5.5	6.9	7.7	8.2	4.9	2.4	2.6	2.9	2.1	2.3	3.0	8.2	0.8	
27	1.1	1.2	1.1	1.1	1.1	1.4	3.2	2.7	2.7	3.5	4.3	3.6	3.4	3.0	6.2	6.0	5.0	4.0	5.0	1.7	1.5	2.5	2.6	1.7	2.9	6.2	1.1	
28	1.2	2.1	1.3	1.6	1.3	1.1	1.6	2.3	4.7	6.1	5.7	5.4	3.4	2.5	3.8	4.3	4.9	5.3	5.6	4.1	3.0	3.7	2.3	1.6	3.3	6.1	1.1	
29	2.3	1.0	1.2	1.4	1.7	2.0	1.0	1.5	2.9	3.3	4.8	4.3	5.1	5.1	3.6	4.1	3.0	3.3	2.6	1.8	2.0	2.6	1.7	0.9	2.6	5.1	0.9	
30	0.8	1.4	1.4	1.3	0.8	1.0	0.9	1.1	1.0	2.5	1.4	1.6	1.5	2.3	2.1	2.6	3.4	3.4	4.0	7.6	5.7	3.4	2.8	3.3	2.4	7.6	0.8	
Avg	1.7	1.7	1.8	1.7	1.6	1.6	1.4	1.6	3.0	4.1	4.5	4.4	4.6	5.0	5.2	5.0	5.0	4.6	4.3	3.2	2.3	2.4	2.1	1.9	3.1	6.3	0.9	
Max	3.3	5.0	4.7	5.6	4.9	5.4	4.7	3.8	6.0	8.0	7.3	7.9	8.3	10.0	9.9	9.3	9.6	9.5	8.7	7.6	5.7	5.4	5.2	3.4	4.8	10.0	1.3	
Min	0.8	0.8	0.7	0.7	0.8	0.7	0.6	0.5	0.6	1.6	1.4	1.6	1.5	2.3	2.1	1.6	2.9	2.4	1.7	1.2	1.2	1.0	0.8	0.9	1.6	2.6	0.5	

A-3

**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Wind Direction (degrees)**  
**April 2019**

Day	<< Hour >>																								Prev
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	100	106	31	100	357	119	155	277	146	297	294	281	293	318	294	303	275	270	277	32	296	164	79	134	305
2	18	96	49	87	91	57	49	126	120	138	102	161	155	152	158	249	269	260	162	70	105	95	115	162	116
3	162	145	152	144	165	140	84	128	66	96	162	1	23	1	273	270	287	279	172	157	87	104	72	226	132
4	136	44	197	60	144	112	133	87	274	260	258	282	276	264	268	277	265	265	89	83	97	36	95	125	163
5	122	122	169	134	86	110	158	163	Au	Au	Au	Au	Au	161	161	91	112	110	101	266	136	152	151	39	131
6	214	108	64	101	146	143	38	248	215	257	257	281	282	267	262	248	265	230	231	279	280	258	265	272	248
7	279	249	117	136	148	139	140	124	167	212	217	215	186	180	220	260	263	270	261	270	262	271	275	294	220
8	297	301	317	255	268	226	162	89	167	263	209	180	252	253	272	327	208	166	134	132	148	129	140	146	207
9	172	151	304	227	115	246	142	166	157	160	167	168	156	165	175	158	177	176	151	151	154	155	166	215	169
10	283	249	130	126	143	127	137	168	151	145	136	149	159	162	156	148	162	163	161	171	146	130	125	145	152
11	133	119	102	192	83	145	243	302	290	285	279	296	270	298	286	257	3	11	134	187	344	228	206	161	246
12	160	161	159	148	150	143	132	355	233	284	265	268	282	283	309	324	328	279	291	98	142	138	106	102	204
13	117	77	143	155	168	162	140	160	66	161	250	251	250	262	258	267	275	223	194	129	183	233	196	208	192
14	226	197	232	260	288	286	295	289	283	270	273	276	268	264	255	269	261	270	294	307	279	292	292	296	273
15	277	233	268	269	255	91	263	320	258	263	263	260	284	264	270	271	281	275	256	97	62	44	95	119	269
16	177	146	153	145	140	145	145	145	173	164	308	327	321	317	288	280	292	322	284	149	287	89	120	268	205
17	184	311	267	263	262	289	307	325	255	261	270	266	273	320	276	280	271	275	271	272	287	298	27	165	278
18	346	344	306	61	136	121	81	117	26	264	261	250	266	266	262	274	269	275	275	127	122	78	90	121	278
19	86	97	149	287	312	319	292	87	260	268	244	220	223	220	241	249	268	238	227	112	60	73	53	47	246
20	83	107	35	155	57	85	143	348	105	163	154	132	54	339	329	300	295	360	291	8	349	299	168	42	46
21	241	301	232	267	297	306	318	278	196	55	95	97	96	90	99	162	160	164	161	155	151	145	122	252	169
22	103	148	150	163	144	148	172	356	116	272	260	265	258	257	257	250	253	261	234	141	122	120	131	97	187
23	110	94	71	132	129	109	90	321	264	271	280	263	279	280	263	276	279	280	277	278	261	276	247	276	268
24	290	276	301	11	80	80	63	289	263	273	268	272	295	281	291	296	298	297	291	306	76	85	114	69	309
25	129	57	52	144	7	69	346	304	346	310	268	261	247	267	261	238	235	199	143	130	142	143	144	144	199
26	144	142	140	151	91	129	147	343	284	296	285	290	278	302	279	269	296	296	317	306	291	289	282	276	278
27	152	308	149	140	10	149	67	56	103	157	93	203	69	80	67	31	311	308	297	285	270	251	253	272	79
28	261	281	293	309	308	300	303	311	319	321	316	313	312	313	312	313	311	313	300	300	299	304	148	162	302
29	222	147	337	132	207	42	125	23	52	143	149	149	153	155	152	148	147	119	119	124	139	121	129	105	132
30	153	269	308	317	130	324	330	306	304	347	348	325	326	343	343	313	344	14	51	93	174	108	57	139	345
Prev	166	142	147	154	129	123	123	341	216	249	250	253	267	270	263	270	271	265	232	144	158	140	131	160	220

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Wind Direction (degrees)**  
**May 2019**

Day	<< Hour >>																								Prev
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	25	87	93	109	93	119	135	28	5	2	16	286	251	265	257	260	256	249	218	147	83	118	130	133	111
2	141	99	83	125	71	223	272	287	311	250	247	259	270	255	256	262	323	325	302	294	126	69	104	127	260
3	117	116	71	60	90	113	19	48	298	278	280	271	263	266	251	279	299	306	306	320	100	64	52	103	352
4	135	87	65	120	110	103	108	345	340	292	290	302	300	314	330	319	329	340	335	89	96	113	103	143	32
5	165	146	166	233	277	255	273	274	274	304	265	298	239	303	146	156	160	158	160	160	158	160	164	162	205
6	158	155	131	181	99	279	174	158	190	150	167	176	182	192	167	172	170	151	158	159	144	125	122	109	159
7	109	63	304	357	151	149	33	15	332	20	308	314	304	196	159	196	18	22	61	319	282	308	121	66	9
8	95	34	164	244	347	314	246	272	180	278	29	131	322	154	283	27	69	121	117	47	128	142	133	89	103
9	100	159	145	146	283	220	99	161	147	149	144	149	147	144	116	288	314	325	337	354	95	114	93	46	129
10	115	98	114	115	133	126	265	283	15	331	300	278	309	314	304	315	309	311	303	329	332	196	110	101	323
11	76	67	33	103	128	158	324	294	323	326	301	304	321	322	301	320	319	328	299	329	96	72	91	65	353
12	74	115	93	77	110	127	151	313	324	290	273	274	267	279	266	268	269	283	299	299	78	92	90	99	305
13	90	56	76	110	129	91	329	81	261	269	267	278	282	281	299	297	303	305	311	79	63	75	122	52	4
14	34	67	117	106	67	108	4	309	210	242	238	263	275	231	190	218	215	179	114	80	79	78	114	124	142
15	110	47	66	87	83	94	75	289	270	271	262	284	279	267	271	280	230	194	85	104	142	96	108	89	117
16	90	145	105	144	138	148	146	157	150	156	147	161	157	166	161	162	155	161	172	159	145	117	156	162	149
17	149	142	131	175	170	161	138	294	301	327	296	311	307	168	283	322	320	308	304	296	290	297	321	318	283
18	315	309	293	330	323	318	303	301	277	272	287	215	153	146	149	140	146	143	149	134	141	153	153	145	208
19	150	130	145	147	138	131	146	129	114	129	133	135	122	135	135	128	125	118	121	115	116	116	116	116	129
20	114	127	132	128	127	125	128	130	144	148	160	162	143	145	145	148	158	155	147	152	180	170	163	162	146
21	142	141	145	139	142	153	153	150	155	153	151	155	152	170	179	154	154	153	156	153	162	163	153	98	151
22	265	120	100	87	77	48	333	55	40	43	71	65	48	43	41	21	33	42	60	67	100	60	46	45	55
23	24	92	99	102	17	101	68	101	98	123	104	95	100	124	139	130	131	134	138	122	116	143	140	153	111
24	158	337	161	113	58	19	335	312	315	321	313	316	302	280	266	263	271	267	288	323	49	87	99	104	321
25	112	108	142	128	150	114	124	138	310	268	230	236	234	250	212	158	93	82	70	71	116	87	77	98	131
26	192	351	344	56	300	114	227	165	148	163	131	94	112	96	334	46	81	85	74	81	327	287	141	64	90
27	92	84	117	84	109	322	294	266	113	87	88	214	87	266	308	23	14	4	46	85	99	320	269	269	48
28	333	4	320	307	267	297	327	108	92	207	272	262	218	301	200	187	164	177	131	78	77	75	55	95	241
29	122	102	65	110	49	115	146	143	169	168	184	157	153	199	224	223	244	212	171	151	138	129	122	109	150
30	120	102	99	84	82	127	106	351	333	272	292	261	264	291	263	245	259	301	312	23	348	255	324	324	311
31	294	321	312	313	351	45	69	305	283	289	311	282	232	83	94	173	113	116	158	139	96	116	93	107	51
Prev	111	93	104	112	98	122	101	313	285	262	258	247	242	229	227	231	239	194	120	87	106	111	112	104	127

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Wind Direction (degrees)**  
**June 2019**

Day	<< Hour >>																								Prev
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	121	132	123	130	144	53	166	315	127	296	256	237	261	251	250	259	261	256	239	234	144	85	62	92	195
2	90	96	108	59	114	128	144	347	313	259	263	253	278	286	266	257	256	264	236	253	60	87	93	99	229
3	103	88	107	127	124	146	310	233	284	259	264	256	262	251	254	277	288	273	271	260	281	133	140	128	234
4	77	81	74	59	59	127	323	351	282	285	309	295	278	255	259	272	265	272	279	255	214	116	77	114	299
5	121	133	102	113	138	69	252	292	286	283	265	264	249	261	264	266	242	238	223	189	87	72	72	101	215
6	112	290	151	214	126	142	92	154	177	184	209	241	215	206	239	146	146	156	145	8	337	301	238	337	184
7	308	316	280	222	248	254	256	244	264	272	251	278	299	302	291	95	335	286	284	245	319	289	255	263	276
8	274	298	312	265	331	279	278	296	289	266	283	301	344	305	287	326	287	209	160	123	111	146	150	153	277
9	152	116	114	148	157	155	356	304	252	256	253	259	253	248	246	259	270	269	264	268	174	101	74	115	222
10	105	107	94	120	88	57	144	154	318	86	235	255	269	284	286	284	305	304	340	340	323	326	264	99	322
11	62	334	316	154	99	127	21	340	250	288	292	298	313	323	326	328	311	320	17	61	23	61	88	65	354
12	51	116	58	109	90	122	170	360	141	176	203	253	295	298	264	283	290	278	351	78	139	139	142	103	136
13	77	105	129	133	116	102	136	283	348	284	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	108
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	263	339	13	8	5	10	6	271	314	268	226	325
16	292	141	134	94	21	341	59	124	174	70	339	331	277	330	123	153	159	148	165	170	131	103	96	83	111
17	76	70	74	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	73
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	294	304	295	292	260	269	283	177	159	135	123	115	50	248
19	94	16	68	116	125	124	144	92	256	256	254	262	264	267	267	291	294	300	299	313	346	306	99	76	295
20	126	47	120	131	113	136	340	287	336	336	356	129	164	164	45	170	253	132	143	145	248	283	296	292	145
21	198	354	322	308	340	316	311	300	275	286	282	298	293	295	315	303	331	319	312	297	303	310	176	305	303
22	313	304	293	281	275	279	279	310	301	281	276	272	272	313	307	300	277	274	273	283	269	253	140	11	287
23	95	97	49	76	110	139	163	118	271	251	250	256	270	253	255	242	243	252	248	244	243	262	297	276	238
24	121	113	75	99	39	78	351	33	315	300	299	306	307	289	276	284	295	281	275	285	84	74	93	73	351
25	120	40	100	50	121	73	318	340	304	282	291	278	241	243	221	289	249	303	185	304	92	121	113	85	297
26	83	113	46	144	81	104	88	185	160	138	54	336	336	148	134	135	132	148	151	115	103	104	110	104	114
27	109	308	108	145	258	305	315	316	333	155	166	167	127	162	277	304	329	318	290	297	19	35	343	77	317
28	134	128	146	176	160	157	152	197	157	152	156	139	159	147	317	334	355	310	310	313	338	326	330	352	168
29	325	138	30	144	79	107	128	144	279	295	247	277	278	303	297	272	313	311	313	322	58	90	58	303	318
30	288	45	4	146	143	141	167	5	222	168	141	293	302	319	346	330	337	211	137	147	134	115	160	134	152
Prev	98	79	82	129	109	115	187	307	271	260	261	271	274	270	280	280	286	273	258	270	62	78	109	81	267

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Standard Deviation of Wind Direction (degrees)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	59	41	67	43	100	82	77	43	38	78	12	18	29	18	56	39	19	9	15	72	59	90	76	46	49	100	9
2	64	31	51	24	40	43	55	41	51	33	74	11	8	11	9	44	15	8	75	59	15	15	36	23	35	75	8
3	8	13	19	23	15	27	49	22	74	59	17	50	21	88	9	12	18	28	50	81	67	33	95	44	38	95	8
4	53	94	54	96	56	38	41	96	24	9	13	22	14	9	12	14	43	47	39	32	18	36	62	14	39	96	9
5	23	18	29	45	72	41	24	53	Au	Au	Au	Au	Au	35	11	44	30	47	26	74	36	69	60	91	44	91	11
6	69	72	12	83	33	49	53	58	32	13	16	18	13	10	10	10	16	16	8	37	15	12	22	13	29	83	8
7	9	45	32	39	24	14	21	8	58	9	16	16	27	28	23	29	11	15	8	7	9	10	22	16	21	58	7
8	17	17	44	61	65	86	91	27	38	76	35	36	24	18	18	36	87	46	9	11	10	21	17	10	38	91	9
9	13	12	36	55	35	94	20	11	6	9	8	12	11	7	17	9	14	32	15	26	15	5	35	32	22	94	5
10	32	86	24	33	32	60	44	11	6	6	10	9	7	6	8	7	13	7	4	9	15	19	54	84	24	86	4
11	31	34	15	75	31	37	56	38	20	26	16	17	15	19	26	16	80	35	36	48	58	64	51	5	35	80	5
12	8	13	8	12	10	23	26	63	73	43	8	17	14	14	19	18	51	11	11	85	50	16	72	18	28	85	8
13	61	45	55	45	70	32	38	87	72	72	18	10	12	12	11	12	12	68	47	67	39	12	11	24	39	87	10
14	12	23	25	12	9	15	16	11	9	15	13	15	14	11	12	12	9	12	22	13	13	8	8	12	13	25	8
15	19	9	21	8	46	51	67	92	12	15	20	16	15	21	24	25	22	25	84	61	13	23	36	81	34	92	8
16	75	59	16	13	17	17	13	18	10	14	89	5	15	13	8	14	12	16	39	45	54	86	50	94	33	94	5
17	30	85	14	11	14	13	17	42	49	15	13	11	25	22	13	12	10	10	10	10	10	21	71	71	25	85	10
18	60	14	77	57	42	37	67	38	67	18	15	20	15	15	13	13	11	12	19	69	44	40	21	32	34	77	11
19	52	32	62	9	9	8	35	40	41	14	15	16	15	15	13	13	20	22	15	91	24	18	25	37	27	91	8
20	46	62	66	82	36	49	63	79	86	59	21	39	46	29	47	30	13	53	63	26	92	47	75	90	54	92	13
21	71	59	69	59	28	10	12	20	51	52	12	10	16	16	22	17	17	9	6	6	5	27	78	75	31	78	5
22	52	37	25	32	44	16	38	92	51	47	37	32	27	21	19	19	14	12	45	18	44	36	24	44	34	92	12
23	48	50	55	66	89	31	72	73	12	14	16	18	18	13	14	12	12	11	13	18	17	15	24	17	30	89	11
24	15	16	48	79	52	87	40	26	12	20	15	16	12	24	14	16	13	16	15	35	77	48	37	36	32	87	12
25	62	82	55	75	70	72	69	18	95	83	60	44	43	26	46	40	40	43	6	20	17	18	17	19	47	95	6
26	20	22	48	45	26	83	83	40	36	83	16	27	16	15	15	19	14	16	12	31	20	18	11	16	31	83	11
27	46	78	75	26	96	45	85	74	33	33	71	43	24	21	13	49	16	9	12	16	14	11	12	9	38	96	9
28	12	11	13	9	9	11	11	9	9	10	11	11	10	8	11	9	9	7	12	14	11	29	92	66	17	92	7
29	97	18	54	98	62	83	67	71	72	11	7	11	9	6	9	8	8	19	18	19	41	45	19	13	36	98	6
30	61	43	13	48	22	73	44	26	24	10	15	28	15	14	20	31	48	12	13	58	84	54	70	92	38	92	10
Avg	41	41	39	45	42	44	46	44	40	33	24	21	18	19	18	21	23	22	25	39	33	32	43	41	33	86	8
Max	97	94	77	98	100	94	91	96	95	83	89	50	46	88	56	49	87	68	84	91	92	90	95	94	54	100	13
Min	8	9	8	8	9	8	11	8	6	6	7	5	7	6	8	7	8	7	4	6	5	5	8	5	13	25	4

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Standard Deviation of Wind Direction (degrees)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	60	66	35	21	62	45	69	41	35	21	28	45	30	17	17	21	13	11	10	52	9	25	21	26	33	69	9	
2	13	73	39	44	75	24	28	38	56	11	11	13	26	13	16	22	41	12	23	89	18	32	50	35	33	89	11	
3	39	52	46	39	29	40	97	67	60	16	19	21	22	20	18	26	12	12	8	53	20	26	44	29	34	97	8	
4	43	66	37	26	39	47	69	37	63	18	25	21	29	45	37	31	51	15	52	18	27	37	56	40	39	69	15	
5	8	16	7	46	25	8	22	22	17	17	65	14	35	52	52	14	5	6	5	5	6	10	11	15	20	65	5	
6	11	21	80	68	74	67	38	28	32	62	27	34	30	51	22	41	35	8	5	7	17	17	19	27	34	80	5	
7	34	67	94	88	36	31	59	72	63	83	50	19	22	91	31	90	14	14	62	94	27	33	75	29	53	94	14	
8	12	95	59	91	53	67	81	89	40	46	42	75	49	42	89	36	45	37	40	94	69	47	73	85	61	95	12	
9	74	6	14	10	74	98	56	27	13	20	16	17	22	38	84	42	25	37	37	89	41	24	40	39	39	98	6	
10	32	29	41	38	42	72	100	86	37	37	13	22	14	10	10	11	11	8	10	18	27	98	33	34	35	100	8	
11	61	43	82	99	46	72	80	36	18	18	23	18	17	17	18	16	18	14	13	100	21	13	24	16	37	100	13	
12	30	38	28	46	47	60	58	60	40	18	23	35	22	22	27	22	16	15	11	56	16	14	15	29	31	60	11	
13	30	36	36	32	28	53	79	69	15	17	20	24	22	23	25	21	18	17	17	75	14	15	35	36	32	79	14	
14	53	39	43	42	67	38	70	36	96	43	29	31	22	41	13	28	16	19	27	9	7	47	44	39	37	96	7	
15	48	24	17	24	35	58	59	12	15	16	16	21	29	23	24	32	22	20	27	34	30	43	68	37	31	68	12	
16	44	56	33	25	44	17	16	11	12	13	9	15	9	9	8	22	7	10	14	12	11	35	9	8	19	56	7	
17	16	24	38	37	11	16	73	65	24	7	17	16	60	78	72	7	7	16	11	7	9	47	11	7	28	78	7	
18	9	11	21	7	7	8	11	10	15	17	13	61	16	9	8	11	9	12	7	9	10	8	9	13	13	61	7	
19	13	17	13	8	13	19	14	17	16	15	14	13	18	18	12	13	14	16	13	13	15	14	14	14	14	14	19	8
20	15	12	11	11	11	14	15	14	17	13	8	13	16	19	10	8	7	8	7	6	19	23	11	13	13	23	6	
21	9	11	14	13	21	31	44	19	13	8	8	9	12	16	37	5	7	6	6	5	8	6	17	43	15	44	5	
22	95	70	16	15	18	44	31	80	28	40	13	18	17	20	16	20	13	16	12	19	52	23	14	12	29	95	12	
23	20	43	33	43	21	52	81	84	18	23	17	22	21	16	10	13	20	16	11	10	12	18	11	9	26	84	9	
24	20	101	47	77	46	71	76	75	44	19	26	28	38	29	20	21	18	11	29	36	40	34	16	19	39	101	11	
25	19	34	30	22	25	48	22	75	56	39	38	65	49	70	49	16	39	21	24	23	28	39	50	30	38	75	16	
26	68	81	92	80	61	59	98	13	16	10	25	17	22	17	35	39	20	12	15	19	78	25	52	77	43	98	10	
27	61	15	46	22	38	32	13	83	47	24	30	61	49	28	41	25	10	15	39	78	55	75	45	67	42	83	10	
28	90	68	23	12	74	91	38	46	28	65	26	81	85	100	27	25	16	33	16	8	9	16	25	59	44	100	8	
29	27	53	31	40	60	33	20	75	25	32	26	23	22	51	53	49	52	35	34	12	23	16	19	18	35	75	12	
30	17	26	29	21	26	22	92	84	73	19	26	25	22	28	32	25	16	29	11	27	48	44	9	20	32	92	9	
31	19	11	7	6	41	23	28	44	18	26	37	47	55	13	35	24	30	28	18	25	83	21	27	29	29	83	6	
Avg	35	42	37	37	40	44	53	49	34	26	24	30	29	33	31	25	20	17	20	36	27	30	31	31	32	78	9	
Max	95	101	94	99	75	98	100	89	96	83	65	81	85	100	89	90	52	37	62	100	83	98	75	85	61	101	16	
Min	8	6	7	6	7	8	11	10	12	7	8	9	9	9	8	5	5	6	5	5	6	6	9	7	13	19	5	

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Standard Deviation of Wind Direction (degrees)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	32	14	57	39	15	82	40	97	64	82	30	37	33	43	25	29	30	34	20	49	49	12	23	32	40	97	12	
2	23	24	38	35	23	39	93	60	56	23	21	25	27	39	40	31	16	30	20	21	72	36	17	24	35	93	16	
3	16	20	25	26	25	48	78	92	63	17	20	18	15	17	13	17	18	18	11	7	13	54	19	77	30	92	7	
4	50	45	52	43	42	54	83	38	41	31	28	50	30	19	20	21	21	16	11	16	72	23	68	28	38	83	11	
5	27	50	47	56	29	58	70	50	21	34	22	18	28	24	28	27	27	39	46	78	34	13	69	69	40	78	13	
6	59	94	56	56	41	16	28	35	13	19	27	42	18	11	47	12	11	19	13	68	44	30	94	68	38	94	11	
7	25	41	22	38	14	14	53	89	20	22	16	22	34	28	30	75	65	29	55	69	60	39	11	8	37	89	8	
8	17	36	43	70	45	13	20	10	16	16	24	29	20	35	38	47	29	50	16	66	31	40	20	23	31	70	10	
9	16	25	52	58	28	46	87	61	13	15	13	13	15	14	20	19	16	14	13	14	64	33	18	18	29	87	13	
10	23	24	45	59	96	90	68	50	87	15	66	19	23	23	16	14	16	27	14	14	34	21	62	42	40	96	14	
11	40	24	50	45	33	44	95	87	65	17	20	18	20	17	17	13	20	13	46	15	52	48	38	34	36	95	13	
12	49	28	30	35	19	25	78	48	49	15	45	28	25	41	41	24	26	18	51	23	37	43	57	76	38	78	15	
13	47	30	19	23	25	49	23	78	32	37	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	36	78	19	
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	19
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	18	46	14	25	13	14	38	38	40	71	90	37	90	13	
16	53	31	27	41	27	77	79	90	71	73	30	33	44	90	35	12	13	31	12	12	35	48	43	34	43	90	12	
17	25	74	36	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	45	74	25	
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	57	21	19	22	19	21	33	52	51	23	39	17	49	33	57	17	
19	52	60	85	41	58	78	84	52	27	15	18	14	16	16	20	13	18	13	10	24	21	52	21	25	35	85	10	
20	41	72	29	54	76	75	82	13	13	7	42	47	21	32	76	68	60	84	9	49	37	21	49	54	46	84	7	
21	45	78	12	16	17	27	34	26	15	14	19	19	17	16	26	17	13	13	11	14	25	33	64	27	25	78	11	
22	25	11	13	10	10	9	10	27	17	15	10	12	14	56	29	18	10	11	11	9	10	24	73	78	21	78	9	
23	35	28	49	50	51	54	30	75	65	21	15	15	17	11	12	18	13	13	10	11	13	33	33	59	30	75	10	
24	65	52	41	44	51	32	44	87	37	30	24	26	30	25	23	20	27	26	13	9	58	18	33	14	35	87	9	
25	32	40	39	50	31	64	53	76	38	30	30	21	35	24	27	17	47	45	12	78	22	26	30	47	38	78	12	
26	43	59	77	57	95	67	51	93	59	44	86	59	71	32	18	14	13	19	20	53	20	19	27	35	47	95	13	
27	58	59	54	75	76	57	18	69	27	25	13	22	45	26	72	17	17	12	15	39	83	36	53	65	43	83	12	
28	96	51	69	90	48	56	72	49	15	10	16	14	36	61	15	20	19	19	10	17	45	18	38	63	39	96	10	
29	41	74	84	59	49	33	89	26	52	31	23	22	36	20	44	40	24	15	14	21	47	49	90	63	44	90	14	
30	48	54	37	69	67	93	96	80	87	33	44	78	48	17	27	28	20	46	19	13	25	35	34	17	46	96	13	
Avg	40	44	44	48	42	50	60	60	41	27	28	29	28	29	31	25	24	26	20	33	39	33	43	45	37	85	12	
Max	96	94	85	90	96	93	96	97	87	82	86	78	71	90	76	75	65	84	55	78	83	54	94	90	47	97	25	
Min	16	11	12	10	10	9	10	10	13	7	10	12	14	11	12	12	10	11	9	7	10	12	11	8	21	57	7	

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature 9 Meters (degrees Celsius)**  
**April 2019**

A-10

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	-4.6	-5.9	-6.3	-6.4	-6.5	-6.0	-5.3	-4.9	-4.1	-0.5	0.5	0.6	0.0	0.7	1.7	2.1	1.9	1.6	1.1	0.3	-1.3	-3.1	-4.0	-5.5	-2.2	2.1	-6.5
2	-6.7	-7.7	-9.1	-9.3	-10.8	-11.1	-11.4	-11.3	-9.2	-6.2	-1.6	2.4	2.8	3.4	3.6	4.2	4.2	4.1	2.7	0.7	-0.7	-0.3	0.4	0.1	-2.8	4.2	-11.4
3	-0.4	-1.4	-1.1	-1.3	-1.9	-2.7	-3.9	-4.6	-2.5	1.3	3.7	4.5	5.3	6.2	6.7	6.7	6.2	5.6	4.3	3.3	2.5	1.9	2.8	3.3	1.9	6.7	-4.6
4	1.9	1.2	2.2	2.2	1.4	2.0	1.8	2.1	4.4	5.1	6.0	6.2	6.8	7.1	7.2	7.2	7.1	6.5	5.8	3.9	3.2	2.6	2.5	1.8	4.1	7.2	1.2
5	1.4	1.3	1.2	1.4	1.1	0.6	0.3	0.5	Au	Au	Au	Au	Au	7.7	5.6	4.8	5.0	4.7	4.0	2.8	1.1	0.6	0.6	1.6	2.4	7.7	0.3
6	0.7	0.0	-1.1	-1.3	-0.8	0.0	0.9	2.0	2.6	3.5	4.4	4.7	5.1	5.5	4.8	4.3	4.4	5.0	4.7	3.8	3.1	1.6	1.2	1.5	2.5	5.5	-1.3
7	1.6	1.5	1.1	0.6	0.3	0.0	1.8	4.4	5.0	4.9	5.3	5.9	5.8	6.1	7.5	8.0	8.6	7.9	5.6	4.8	4.0	3.8	3.4	3.2	4.2	8.6	0.0
8	3.0	2.7	2.9	2.8	2.5	2.2	2.0	1.8	2.3	2.6	2.6	3.4	4.5	5.3	5.8	6.0	6.0	5.3	3.5	2.8	2.4	2.9	2.3	1.8	3.3	6.0	1.8
9	1.5	0.5	0.2	0.2	0.2	0.1	0.4	0.6	0.6	0.9	1.1	1.7	2.0	2.3	1.6	1.5	1.0	1.0	0.7	0.7	0.5	0.7	0.6	0.4	0.9	2.3	0.1
10	0.2	-0.1	-0.3	-0.5	-0.6	-0.6	-0.5	-0.7	-0.8	-0.9	-0.8	-0.9	-0.8	-0.2	0.5	0.1	0.0	-0.1	-0.5	-0.9	-1.4	-1.9	-2.7	-2.7	-0.7	0.5	-2.7
11	-2.7	-2.7	-2.7	-2.7	-2.9	-2.7	-2.3	-2.1	-2.0	-1.9	-0.5	0.2	0.9	1.6	1.7	0.2	0.1	-1.1	-1.4	-1.5	-1.4	-2.0	-2.8	-3.9	-1.4	1.7	-3.9
12	-4.1	-4.2	-4.4	-4.4	-4.4	-4.3	-4.0	-3.8	-3.0	-2.4	-1.9	-1.4	-0.5	0.1	0.9	1.2	1.3	1.1	0.4	-1.0	-2.8	-4.3	-5.1	-5.0	-2.3	1.3	-5.1
13	-4.6	-4.7	-5.3	-6.5	-6.3	-7.5	-7.2	-6.5	-3.9	0.0	1.8	2.5	3.5	3.9	4.3	4.3	4.3	4.4	4.1	3.3	3.3	3.6	2.5	3.3	-0.1	4.4	-7.5
14	4.1	4.0	3.7	3.5	1.9	1.2	1.6	1.8	2.1	2.5	3.0	3.1	2.4	3.2	3.2	3.0	2.7	2.4	1.9	1.2	0.9	0.5	0.0	-0.4	2.2	4.1	-0.4
15	-0.8	-1.4	-2.0	-2.9	-3.8	-4.1	-4.2	-2.8	-1.6	-0.5	0.3	1.4	1.8	2.7	3.4	3.6	3.7	4.3	3.6	0.8	-0.1	-0.4	-1.8	-2.2	-0.1	4.3	-4.2
16	-2.0	-1.9	-0.7	0.5	0.5	0.5	1.3	0.5	-0.4	0.4	0.7	0.5	0.8	0.7	0.5	0.9	1.8	2.1	1.9	1.5	0.7	0.3	-0.1	0.5	0.5	2.1	-2.0
17	0.3	-0.3	0.8	1.2	1.0	0.9	0.8	0.9	0.3	1.2	2.6	3.6	3.9	3.2	5.9	6.2	6.3	6.0	5.3	4.4	3.6	3.3	2.2	1.8	2.7	6.3	-0.3
18	-0.4	-1.9	-2.0	-1.5	-3.3	-4.4	-4.8	-1.3	3.1	5.3	6.4	7.7	9.2	10.1	11.2	11.2	12.1	11.5	9.9	7.6	5.0	4.3	4.1	4.5	4.3	12.1	-4.8
19	4.5	5.7	7.5	10.3	9.2	8.2	8.8	8.8	11.7	12.5	13.4	14.0	14.7	15.8	16.2	15.8	15.0	15.7	15.1	9.7	6.2	5.0	4.3	2.9	10.5	16.2	2.9
20	1.4	0.6	1.5	1.5	2.6	2.3	2.6	2.9	3.7	5.4	6.3	6.8	7.6	7.9	7.3	5.2	5.2	4.7	3.9	3.1	2.7	2.4	2.1	1.9	3.8	7.9	0.6
21	1.7	1.7	1.7	1.6	1.3	1.0	1.1	1.8	1.9	2.6	3.2	3.8	4.3	4.8	4.7	3.6	4.0	4.0	3.5	2.5	1.9	1.4	0.4	-0.7	2.4	4.8	-0.7
22	-1.8	-2.6	-3.3	-3.8	-4.3	-4.8	-3.8	-0.5	3.7	5.3	6.8	7.6	8.4	9.4	10.5	11.2	11.4	10.8	9.8	7.7	4.4	2.7	1.0	0.6	3.6	11.4	-4.8
23	1.5	1.0	1.8	3.8	5.7	4.7	3.2	6.3	9.0	9.1	10.6	11.7	11.9	12.8	13.2	12.2	12.3	11.4	10.4	9.9	9.3	9.0	8.5	7.9	8.2	13.2	1.0
24	7.4	7.1	6.6	5.7	4.4	3.1	4.4	7.1	7.5	8.3	8.9	10.2	10.0	10.9	10.7	10.8	10.5	10.4	9.5	8.1	4.4	0.6	-1.5	-2.4	6.8	10.9	-2.4
25	-3.1	-4.0	-4.1	-5.3	-4.9	-3.5	-2.8	0.3	2.1	3.8	5.5	6.4	7.3	8.3	9.1	9.6	9.7	9.7	7.8	6.4	5.3	4.5	4.0	3.3	3.1	9.7	-5.3
26	3.2	3.0	2.7	2.6	1.6	0.4	0.9	2.7	4.4	6.9	7.5	7.2	5.6	4.2	3.8	3.9	3.0	3.5	2.6	0.5	0.5	0.2	0.0	-0.2	2.9	7.5	-0.2
27	-0.4	-1.0	-1.9	-3.1	-4.0	-4.6	-4.1	-2.7	-0.3	1.5	2.8	2.6	1.5	2.5	4.3	5.6	5.4	2.0	1.2	1.0	0.6	0.0	-0.7	-1.1	0.3	5.6	-4.6
28	-1.8	-2.6	-4.0	-5.4	-5.9	-6.3	-6.6	-6.8	-6.8	-7.0	-6.9	-6.8	-6.9	-6.7	-6.9	-7.0	-7.1	-7.0	-7.2	-7.6	-7.7	-8.5	-9.6	-10.9	-6.7	-1.8	-10.9
29	-11.2	-13.2	-14.8	-15.5	-16.3	-17.4	-16.1	-14.0	-10.1	-4.6	-3.8	-3.1	-2.7	-2.5	-2.3	-2.5	-2.7	-2.7	-3.0	-4.0	-4.6	-4.7	-4.6	-4.8	-7.5	-2.3	-17.4
30	-5.4	-5.3	-5.6	-5.4	-5.2	-5.6	-5.4	-4.9	-4.6	-4.9	-5.0	-4.6	-4.1	-3.8	-3.8	-3.7	-3.2	-2.1	-2.4	-3.1	-4.8	-7.5	-10.6	-12.2	-5.1	-2.1	-12.2
Avg	-0.5	-1.0	-1.2	-1.2	-1.6	-1.9	-1.7	-0.7	0.5	1.9	2.9	3.5	3.8	4.4	4.8	4.7	4.7	4.4	3.6	2.4	1.4	0.6	-0.0	-0.4	1.4	5.6	-3.5
Max	7.4	7.1	7.5	10.3	9.2	8.2	8.8	8.8	11.7	12.5	13.4	14.0	14.7	15.8	16.2	15.8	15.0	15.7	15.1	9.9	9.3	9.0	8.5	7.9	10.5	16.2	2.9
Min	-11.2	-13.2	-14.8	-15.5	-16.3	-17.4	-16.1	-14.0	-10.1	-7.0	-6.9	-6.8	-6.9	-6.7	-6.9	-7.0	-7.1	-7.0	-7.2	-7.6	-7.7	-8.5	-10.6	-12.2	-7.5	-2.3	-17.4

**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature 9 Meters (degrees Celsius)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	-14.4	-14.5	-15.3	-16.4	-17.6	-18.2	-16.8	-14.3	-11.0	-6.2	-1.8	0.0	1.5	2.3	3.3	3.4	3.3	3.2	2.2	1.3	-0.1	-0.8	-1.5	-1.8	-5.4	3.4	-18.2
2	-2.1	-2.1	-2.4	-3.1	-2.8	-0.4	0.7	1.4	1.8	2.7	2.7	2.3	1.1	1.6	2.5	3.2	3.1	2.8	3.0	1.7	-1.1	-2.4	-4.1	-5.0	0.2	3.2	-5.0
3	-6.0	-6.5	-6.9	-6.9	-7.5	-8.1	-6.5	-2.5	2.7	4.3	5.4	6.6	7.8	8.8	9.6	10.6	10.9	10.7	9.8	8.1	3.9	2.3	1.3	0.5	2.2	10.9	-8.1
4	-0.3	-0.6	-0.9	-2.1	-2.4	-2.7	-1.9	1.9	7.5	8.8	9.6	10.3	10.8	11.1	11.6	12.0	11.8	11.1	9.8	8.3	7.3	6.4	5.4	4.3	5.7	12.0	-2.7
5	3.5	3.3	3.1	1.6	-0.1	-0.5	-0.8	-0.6	-0.4	0.1	-0.7	-0.7	-0.2	1.1	2.8	3.4	2.8	1.9	0.9	0.3	0.0	-0.5	-0.6	-0.9	0.8	3.5	-0.9
6	-0.9	-1.0	-1.2	-1.4	-1.3	-1.2	-0.8	-0.1	0.3	1.5	2.6	3.9	5.8	6.5	7.0	7.7	8.2	7.7	5.7	3.9	3.1	2.5	2.3	2.2	2.6	8.2	-1.4
7	0.3	-0.4	-0.2	-0.1	-1.1	-1.9	-1.6	1.6	4.7	7.8	9.2	9.9	9.8	9.7	9.2	9.3	9.1	7.8	6.5	5.9	5.4	4.5	4.3	4.3	4.8	9.9	-1.9
8	3.1	1.4	-0.8	-2.6	-3.0	-3.5	-1.5	0.6	3.0	3.9	2.2	2.5	2.1	1.7	3.7	4.9	4.8	4.9	4.7	3.4	2.2	0.3	0.0	0.3	1.6	4.9	-3.5
9	0.7	0.4	0.0	-0.3	-1.1	-1.6	-0.6	1.6	3.0	4.0	4.6	4.7	5.2	6.1	6.6	7.0	6.9	7.2	6.7	5.7	2.2	0.0	-1.4	-2.3	2.7	7.2	-2.3
10	-3.2	-4.2	-4.7	-4.8	-5.3	-4.6	-2.8	0.1	4.0	6.7	6.8	7.2	6.2	6.2	6.0	6.0	6.7	6.6	7.0	6.6	5.1	3.6	2.6	0.9	2.4	7.2	-5.3
11	0.4	0.2	0.1	0.3	0.0	0.0	1.9	5.4	9.1	10.1	11.2	12.2	13.1	14.1	14.8	15.4	15.7	16.0	15.8	13.4	8.5	6.4	4.1	3.3	8.0	16.0	0.0
12	1.8	0.6	0.1	-0.4	-1.2	-1.3	0.9	6.5	12.3	14.4	15.8	16.6	17.3	17.4	18.1	18.7	18.7	18.0	16.9	14.3	9.7	6.3	5.5	4.1	9.6	18.7	-1.3
13	3.2	2.7	2.4	0.8	-0.2	0.0	3.5	9.0	14.0	15.0	16.0	16.7	17.4	18.1	18.6	19.0	19.2	18.9	17.8	14.0	10.2	6.9	4.6	5.1	10.5	19.2	-0.2
14	4.6	4.1	3.4	2.5	1.9	1.5	4.0	9.6	15.1	17.3	17.9	18.7	19.5	19.5	19.1	19.8	19.5	17.6	16.1	14.6	12.0	11.1	12.1	12.0	12.2	19.8	1.5
15	9.1	8.4	8.0	7.7	7.8	6.8	9.3	12.5	12.9	14.4	15.0	15.7	16.5	16.7	16.5	16.0	15.7	15.2	12.6	10.8	10.0	9.8	9.1	8.7	11.9	16.7	6.8
16	8.6	8.9	8.5	8.7	8.3	8.0	7.6	7.2	6.8	6.7	7.0	8.8	8.9	8.5	8.5	8.8	7.6	7.0	7.0	6.3	5.9	6.4	6.0	5.9	7.6	8.9	5.9
17	6.0	5.8	6.6	6.1	5.2	5.1	5.3	5.9	6.5	6.8	7.4	7.3	7.2	6.4	5.7	5.1	4.6	3.7	3.0	2.4	2.1	1.3	0.7	0.6	4.9	7.4	0.6
18	0.8	0.8	0.6	0.4	0.4	0.4	0.2	0.1	0.4	0.6	1.1	1.1	2.1	2.0	1.9	1.8	1.5	0.9	0.5	0.3	-0.2	-0.5	-1.1	-1.4	0.6	2.1	-1.4
19	-1.5	-1.4	-1.4	-1.7	-1.5	-1.5	-1.3	-1.4	-1.1	-0.7	0.0	0.4	0.4	0.5	0.3	0.6	0.6	0.6	0.8	0.5	0.3	0.2	0.3	0.0	-0.3	0.8	-1.7
20	-0.1	-0.3	-0.4	-0.5	-0.6	-0.6	-0.6	-0.3	0.1	0.9	1.0	1.7	2.2	2.9	3.5	2.8	2.4	2.4	2.3	1.9	1.5	1.6	1.4	1.3	1.1	3.5	-0.6
21	1.4	1.2	1.0	1.0	1.1	1.2	2.2	3.0	3.9	4.6	4.3	3.9	4.5	4.5	4.3	3.2	3.2	2.6	2.0	1.5	1.5	1.2	0.9	1.1	2.5	4.6	0.9
22	0.8	1.2	1.8	2.2	2.0	2.6	3.1	4.3	5.3	6.3	7.2	8.0	8.4	8.7	9.2	9.4	9.3	9.4	9.0	8.4	5.1	3.5	2.4	1.9	5.4	9.4	0.8
23	0.8	-0.8	-2.0	-2.6	-1.9	-1.9	0.2	6.6	10.1	9.7	10.1	10.7	10.8	10.2	9.1	8.8	8.8	8.5	7.0	5.3	4.9	4.6	4.5	4.1	5.2	10.8	-2.6
24	3.7	3.3	2.9	2.4	2.0	2.1	2.4	4.1	6.5	8.2	9.2	10.1	11.0	11.6	12.3	12.2	12.2	9.9	8.7	8.7	6.7	4.8	3.1	1.1	6.6	12.3	1.1
25	0.9	1.0	1.4	1.9	2.2	2.1	4.6	8.2	9.2	9.9	10.6	11.4	11.5	12.3	13.0	11.6	11.3	11.8	11.0	9.8	8.4	7.6	7.2	6.9	7.7	13.0	0.9
26	5.2	5.6	4.9	4.7	4.4	4.4	6.3	8.7	9.7	10.2	10.2	11.7	12.9	12.6	9.5	9.9	8.8	7.9	7.6	7.2	6.6	6.4	5.7	5.3	7.8	12.9	4.4
27	5.5	6.6	6.6	6.6	6.0	5.6	5.9	6.1	6.3	7.7	8.7	9.3	9.9	9.2	9.6	10.1	9.3	8.7	8.4	7.8	7.1	6.5	6.0	5.5	7.5	10.1	5.5
28	5.4	5.2	5.0	5.1	5.5	5.7	6.8	7.9	8.9	9.7	10.2	11.5	12.2	13.0	13.4	14.1	14.0	13.5	12.7	11.0	8.5	5.7	4.0	2.7	8.8	14.1	2.7
29	0.6	0.6	0.7	-0.6	-1.5	-1.6	1.4	7.3	10.6	12.3	14.0	15.0	16.1	16.7	17.5	18.0	17.9	17.8	17.1	14.7	12.9	8.8	5.8	3.2	9.4	18.0	-1.6
30	1.2	1.2	0.6	0.8	0.1	-0.5	3.3	9.0	14.3	15.7	16.7	17.6	18.5	19.2	19.7	20.0	20.2	18.8	17.1	16.1	13.7	10.8	10.2	10.1	11.4	20.2	-0.5
31	9.5	9.0	8.8	8.3	7.1	6.3	6.7	9.6	10.7	11.5	12.8	14.8	15.9	15.2	15.8	12.7	10.8	10.9	10.8	10.5	8.7	6.6	5.6	4.2	10.1	15.9	4.2
Avg	1.6	1.3	1.0	0.6	0.2	0.1	1.3	3.8	6.0	7.3	8.0	8.7	9.2	9.5	9.8	9.9	9.6	9.2	8.4	7.2	5.6	4.3	3.4	2.8	5.4	10.5	-0.8
Max	9.5	9.0	8.8	8.7	8.3	8.0	9.3	12.5	15.1	17.3	17.9	18.7	19.5	19.5	19.7	20.0	20.2	18.9	17.8	16.1	13.7	11.1	12.1	12.0	12.2	20.2	6.8
Min	-14.4	-14.5	-15.3	-16.4	-17.6	-18.2	-16.8	-14.3	-11.0	-6.2	-1.8	-0.7	-0.2	0.5	0.3	0.6	0.6	0.6	0.5	0.3	-1.1	-2.4	-4.1	-5.0	-5.4	0.8	-18.2

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature 9 Meters (degrees Celsius)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	3.1	2.4	2.4	1.5	1.1	1.2	3.4	7.8	12.1	14.4	15.4	16.6	17.7	18.4	19.0	19.3	19.6	19.7	19.2	17.3	13.9	11.2	9.7	7.6	11.4	19.7	1.1	
2	6.5	5.4	4.4	4.4	3.8	3.5	6.4	11.1	15.4	16.6	17.8	19.1	19.8	20.4	20.7	21.1	21.2	21.1	20.7	18.1	16.2	12.0	9.7	8.0	13.5	21.2	3.5	
3	6.3	6.1	4.8	4.5	3.7	4.4	7.9	12.5	16.5	17.4	18.1	19.0	19.8	20.5	21.2	20.7	21.5	21.5	20.2	18.3	16.2	13.1	9.8	7.6	13.8	21.5	3.7	
4	5.7	4.4	3.7	3.9	2.6	2.2	5.8	10.8	13.3	14.3	15.4	16.6	17.9	18.6	19.7	20.3	20.5	20.8	20.2	18.5	14.2	10.0	7.0	5.9	12.2	20.8	2.2	
5	4.3	3.4	3.1	2.1	1.2	0.8	3.9	10.1	13.9	14.5	15.6	16.4	17.5	18.3	19.0	20.0	20.1	20.1	20.1	17.7	13.0	10.8	7.8	7.2	11.7	20.1	0.8	
6	6.0	4.5	3.7	3.4	3.0	4.2	11.4	16.9	18.6	20.3	21.1	21.9	23.1	23.1	17.2	15.2	18.1	18.8	17.1	14.6	10.5	10.4	9.0	8.3	13.4	23.1	3.0	
7	7.2	6.9	6.9	5.8	4.8	3.5	3.7	4.5	5.1	5.9	6.5	6.5	7.5	8.3	8.9	8.7	8.1	7.1	6.2	6.2	5.6	3.4	2.4	1.5	5.9	8.9	1.5	
8	1.0	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.5	1.8	3.1	3.9	4.5	3.0	5.3	5.2	3.2	3.4	3.2	2.4	1.7	1.6	1.0	1.9	5.3	0.0	
9	0.8	1.4	0.8	0.0	-0.9	-1.3	0.3	4.0	5.6	6.7	8.1	8.9	9.9	10.8	11.0	11.9	12.1	12.3	12.2	11.1	6.8	3.5	2.1	0.1	5.8	12.3	-1.3	
10	-0.6	-1.7	-1.9	-2.1	-0.7	0.6	2.2	5.5	7.8	8.9	10.2	12.0	13.2	13.7	15.1	15.4	15.2	15.0	13.3	12.6	11.5	10.7	9.9	8.4	8.1	15.4	-2.1	
11	7.9	9.1	8.6	6.4	4.7	4.1	5.2	7.3	9.4	11.6	12.8	13.5	14.4	15.2	15.8	16.4	16.6	16.8	16.2	14.9	12.6	9.8	8.3	6.4	11.0	16.8	4.1	
12	5.2	3.5	3.9	2.4	2.5	2.3	6.2	11.0	15.7	17.2	18.0	18.8	19.4	20.0	20.9	21.4	21.5	21.0	20.8	19.5	16.6	14.4	11.1	10.2	13.5	21.5	2.3	
13	9.6	8.9	8.0	7.4	7.1	6.8	8.2	12.8	16.2	18.3	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	10.3	18.3	6.8	
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	17.4	17.7	17.0	17.1	16.2	15.0	13.9	12.5	11.8	11.1	10.7	14.6	17.7	10.7	
16	10.3	9.6	9.0	8.4	8.3	8.2	9.5	10.6	13.4	15.2	15.8	15.6	16.2	17.1	16.3	15.0	13.2	13.1	12.9	12.2	10.4	9.8	9.1	8.1	12.0	17.1	8.1	
17	7.9	7.7	7.7	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	7.8	7.9	7.7	
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	15.0	15.2	17.0	18.4	19.0	18.1	16.3	15.6	14.2	12.8	10.5	8.0	7.2	14.4	19.0	7.2	
19	6.2	5.1	4.2	3.5	2.1	2.2	3.8	9.2	13.0	14.0	14.5	14.9	15.9	15.7	16.4	16.0	15.4	14.3	13.4	11.5	8.6	6.1	4.3	2.0	9.7	16.4	2.0	
20	0.9	0.5	-0.5	-1.0	-0.6	1.6	4.3	5.4	5.6	4.3	5.1	6.7	6.3	4.7	5.9	7.3	6.6	4.3	4.0	4.0	2.8	2.5	2.4	2.3	3.6	7.3	-1.0	
21	2.0	2.3	2.1	1.8	1.5	2.1	2.1	2.8	3.6	4.7	6.0	6.2	7.0	7.5	7.5	8.5	7.1	7.2	5.7	4.9	4.1	3.5	2.7	3.6	4.4	8.5	1.5	
22	4.1	4.1	3.9	4.0	4.3	4.8	5.0	5.3	5.7	5.7	6.8	7.9	9.1	9.0	10.1	10.5	11.5	11.7	12.0	11.4	10.4	8.2	7.0	4.4	7.4	12.0	3.9	
23	3.4	2.2	1.4	0.6	0.1	-0.5	2.4	7.7	10.4	11.7	12.3	12.9	13.4	13.2	12.4	12.9	12.9	13.1	12.9	12.1	10.8	10.2	9.8	9.0	8.6	13.4	-0.5	
24	7.1	4.8	3.7	2.3	1.6	1.4	3.1	6.2	7.6	7.5	8.1	9.3	10.2	11.8	12.6	13.3	13.3	13.3	13.2	12.8	9.1	5.6	4.0	4.1	7.7	13.3	1.4	
25	3.3	3.2	2.7	2.4	0.9	0.3	3.5	8.4	12.0	13.2	13.9	14.3	14.7	15.5	15.4	15.3	16.0	16.3	15.2	10.0	8.4	7.0	5.3	4.4	9.2	16.3	0.3	
26	4.8	5.2	4.5	4.3	3.6	4.5	7.4	10.0	13.6	15.1	15.8	16.4	17.5	18.5	19.2	20.0	18.9	16.0	15.5	15.1	14.2	12.2	10.9	10.3	12.2	20.0	3.6	
27	8.8	7.7	7.3	7.0	9.2	10.3	10.7	13.5	15.2	16.9	17.0	18.0	19.8	20.0	15.7	13.0	14.0	15.2	14.1	13.0	11.6	10.8	10.1	9.2	12.8	20.0	7.0	
28	7.3	7.6	7.8	7.9	7.9	7.7	8.9	12.3	14.5	15.2	15.7	17.2	17.6	18.3	17.9	17.0	16.0	16.5	14.7	13.2	11.8	11.8	11.4	11.2	12.8	18.3	7.3	
29	10.9	10.8	10.4	10.2	9.3	8.9	9.5	11.1	13.7	14.7	15.6	16.3	17.4	18.0	18.5	19.3	19.6	20.0	20.0	19.0	16.6	14.8	12.6	10.9	14.5	20.0	8.9	
30	8.7	7.8	6.6	5.4	4.9	5.6	7.7	9.8	14.1	16.3	16.9	17.3	18.3	19.1	19.9	20.6	20.5	19.4	17.6	15.3	13.6	13.5	12.8	11.8	13.5	20.6	4.9	
Avg	5.5	4.9	4.4	3.7	3.3	3.4	5.5	8.7	11.2	12.3	13.0	13.9	14.7	15.4	15.4	15.6	15.6	15.2	14.5	13.1	11.0	9.2	7.8	6.7	10.2	16.3	3.4	
Max	10.9	10.8	10.4	10.2	9.3	10.3	11.4	16.9	18.6	20.3	21.1	21.9	23.1	23.1	21.2	21.4	21.5	21.5	20.8	19.5	16.6	14.8	12.8	11.8	14.6	23.1	10.7	
Min	-0.6	-1.7	-1.9	-2.1	-0.9	-1.3	0.1	0.1	0.0	0.5	1.8	3.1	3.9	4.5	3.0	5.3	5.2	3.2	3.4	3.2	2.4	1.7	1.6	0.1	1.9	5.3	-2.1	

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature 2 Meters (degrees Celsius)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	-5.5	-6.7	-7.0	-7.1	-7.2	-6.2	-5.7	-5.1	-4.5	-0.7	0.6	0.7	0.1	1.1	1.9	2.3	1.9	1.3	0.8	-0.1	-1.9	-3.7	-5.0	-6.8	-2.6	2.3	-7.2
2	-7.7	-8.6	-10.1	-10.5	-12.1	-12.3	-12.8	-12.5	-9.5	-6.8	-1.7	2.3	2.8	3.3	3.6	4.3	3.8	3.5	2.3	0.1	-1.2	-0.9	-0.3	-0.7	-3.4	4.3	-12.8
3	-1.7	-2.6	-2.0	-2.2	-3.9	-4.6	-5.6	-5.2	-2.8	0.7	3.6	5.2	5.6	6.2	5.9	5.9	5.7	5.0	3.7	2.7	1.9	1.4	2.2	2.6	1.2	6.2	-5.6
4	1.4	0.4	1.4	1.3	0.6	1.1	1.0	1.5	4.2	4.8	5.7	5.9	6.3	6.6	6.7	6.5	6.8	6.0	4.9	3.5	2.7	2.3	2.1	1.4	3.5	6.8	0.4
5	1.1	1.0	0.8	1.0	0.7	0.3	0.0	0.3	Au	Au	Au	Au	Au	6.7	4.4	4.3	4.7	4.2	3.5	2.2	0.6	0.3	0.4	0.9	2.0	6.7	0.0
6	0.2	-0.3	-1.2	-1.5	-1.3	-0.5	0.4	1.7	2.3	3.3	4.3	4.5	4.8	5.1	4.5	4.1	4.2	4.7	4.3	2.9	2.5	1.4	1.0	1.3	2.2	5.1	-1.5
7	1.2	1.1	0.7	0.3	-0.2	-0.3	1.3	3.9	4.6	4.6	5.0	5.6	5.3	5.3	6.5	7.2	7.8	7.2	5.0	4.2	3.6	3.4	2.8	2.8	3.7	7.8	-0.3
8	2.7	2.4	2.7	2.6	2.1	1.7	1.7	1.7	2.4	3.0	2.8	3.9	5.0	5.8	6.3	6.3	6.0	5.0	2.7	2.5	2.1	2.5	2.1	1.7	3.2	6.3	1.7
9	1.3	0.5	0.2	0.2	0.2	0.1	0.3	0.5	0.5	0.9	1.3	1.9	2.2	2.4	1.7	1.5	1.0	1.0	0.7	0.7	0.4	0.5	0.5	0.3	0.9	2.4	0.1
10	0.1	-0.1	-0.4	-0.5	-0.7	-0.6	-0.6	-0.7	-0.8	-0.9	-0.7	-0.6	-0.4	0.4	1.2	0.6	0.2	0.0	-0.5	-1.0	-1.6	-2.3	-3.0	-2.9	-0.7	1.2	-3.0
11	-2.8	-2.7	-2.6	-2.6	-2.8	-2.8	-2.3	-1.9	-1.8	-1.5	0.0	0.6	1.7	2.0	2.4	0.8	0.2	-1.1	-1.3	-1.4	-1.5	-2.0	-3.3	-3.9	-1.3	2.4	-3.9
12	-4.0	-4.2	-4.3	-4.3	-4.3	-4.2	-3.9	-3.5	-2.7	-1.9	-1.4	-0.8	0.0	0.6	1.2	1.6	1.5	1.2	0.0	-1.5	-3.6	-5.2	-5.7	-5.1	-2.3	1.6	-5.7
13	-4.6	-4.8	-5.7	-7.0	-6.7	-7.9	-7.6	-6.5	-3.6	0.2	2.4	2.7	4.0	4.4	4.5	4.4	4.3	4.4	3.7	2.9	3.0	3.5	2.3	3.0	-0.2	4.5	-7.9
14	3.7	3.5	3.1	3.2	1.8	0.9	1.3	1.7	2.2	2.8	3.2	3.4	2.8	3.6	3.4	3.1	2.6	2.3	1.6	0.9	0.6	0.1	-0.4	-0.7	2.1	3.7	-0.7
15	-1.0	-1.4	-2.2	-3.1	-4.0	-4.5	-4.4	-2.5	-1.1	0.1	0.7	2.2	2.3	3.6	4.2	4.1	3.8	4.8	3.1	0.2	-0.3	-0.7	-2.4	-2.7	-0.1	4.8	-4.5
16	-2.4	-2.5	-1.7	-0.2	0.1	0.0	1.0	0.5	-0.2	0.7	0.9	0.7	1.0	0.9	0.8	1.4	2.2	2.1	1.8	1.3	0.4	-0.1	-0.7	0.1	0.3	2.2	-2.5
17	-0.6	-1.0	0.3	0.8	0.6	0.6	0.7	0.9	0.4	1.2	2.6	3.8	4.0	3.0	6.0	6.3	6.4	6.0	5.2	4.0	3.1	2.7	1.0	0.9	2.5	6.4	-1.0
18	-1.4	-2.6	-3.2	-2.5	-4.2	-4.9	-5.1	-1.2	3.5	5.8	7.1	8.6	10.0	10.9	11.8	11.4	12.2	11.0	8.8	6.4	3.8	3.3	3.3	3.5	4.0	12.2	-5.1
19	2.6	4.0	6.0	9.2	7.6	6.1	7.8	8.0	11.9	12.5	13.7	14.5	14.9	16.1	16.7	15.9	14.6	15.2	14.0	8.4	5.6	4.6	3.8	2.0	9.8	16.7	2.0
20	0.3	-0.4	0.6	0.9	2.3	1.9	2.3	2.6	3.6	5.6	6.6	6.9	7.8	8.0	7.5	5.3	5.3	4.6	3.8	2.9	2.5	2.1	1.8	1.8	3.6	8.0	-0.4
21	1.5	1.5	1.4	1.4	1.0	0.9	1.1	1.9	2.1	2.9	3.6	4.3	4.9	5.3	5.1	4.1	4.5	4.4	3.6	2.4	1.7	1.0	0.0	-1.4	2.5	5.3	-1.4
22	-2.6	-3.4	-4.2	-4.7	-5.2	-5.9	-4.0	0.0	4.3	5.7	7.5	8.5	9.3	10.5	11.6	12.1	12.1	11.0	9.5	6.5	3.3	1.7	0.1	-0.1	3.5	12.1	-5.9
23	0.1	0.4	0.9	2.4	4.3	3.4	2.7	6.3	9.2	9.4	11.1	12.5	12.5	13.4	14.2	12.4	12.5	11.3	10.2	9.7	9.1	8.9	8.3	7.4	8.0	14.2	0.1
24	7.0	6.7	6.0	4.8	3.0	1.6	3.6	7.2	7.8	8.8	9.5	11.0	10.5	11.9	11.2	11.4	10.9	10.7	9.3	7.4	2.9	-0.5	-2.7	-3.5	6.5	11.9	-3.5
25	-4.0	-5.2	-5.4	-6.4	-5.8	-4.3	-2.7	0.9	2.7	4.5	6.3	7.3	8.3	9.3	10.0	10.4	10.1	10.0	7.8	6.0	4.8	3.9	3.4	2.8	3.1	10.4	-6.4
26	2.8	2.6	2.4	2.1	1.2	-0.1	0.8	2.9	4.6	7.4	8.0	7.7	5.9	4.5	4.2	4.3	3.1	3.6	2.6	0.4	0.5	0.1	0.0	-0.3	3.0	8.0	-0.3
27	-0.4	-1.4	-2.9	-4.5	-5.0	-5.4	-4.4	-2.8	-0.8	1.1	2.8	2.8	1.8	2.7	4.6	5.9	5.4	2.0	1.2	0.9	0.5	0.0	-0.8	-1.2	0.1	5.9	-5.4
28	-1.8	-2.6	-3.9	-5.3	-5.9	-6.3	-6.6	-6.8	-6.7	-6.8	-6.7	-6.5	-6.7	-6.6	-6.7	-6.9	-6.9	-6.8	-7.1	-7.6	-7.7	-8.8	-10.3	-11.4	-6.6	-1.8	-11.4
29	-11.8	-14.2	-16.1	-16.6	-17.2	-18.5	-16.3	-13.6	-9.9	-4.3	-3.5	-2.7	-2.2	-1.9	-1.7	-2.0	-2.4	-2.4	-2.8	-3.9	-4.6	-4.7	-4.6	-4.8	-7.6	-1.7	-18.5
30	-5.5	-5.3	-5.5	-5.3	-5.2	-5.6	-5.3	-4.5	-4.1	-4.4	-4.5	-4.0	-3.5	-3.4	-3.5	-3.4	-2.9	-2.2	-2.5	-3.4	-5.7	-8.7	-11.4	-13.7	-5.1	-2.2	-13.7
Avg	-1.1	-1.5	-1.7	-1.8	-2.2	-2.5	-2.0	-0.8	0.6	2.0	3.1	3.9	4.2	4.7	5.0	4.9	4.7	4.3	3.3	2.0	0.9	0.2	-0.5	-0.9	1.2	5.8	-4.1
Max	7.0	6.7	6.0	9.2	7.6	6.1	7.8	8.0	11.9	12.5	13.7	14.5	14.9	16.1	16.7	15.9	14.6	15.2	14.0	9.7	9.1	8.9	8.3	7.4	9.8	16.7	2.0
Min	-11.8	-14.2	-16.1	-16.6	-17.2	-18.5	-16.3	-13.6	-9.9	-6.8	-6.7	-6.5	-6.7	-6.6	-6.7	-6.9	-6.9	-6.8	-7.1	-7.6	-7.7	-8.8	-11.4	-13.7	-7.6	-2.2	-18.5

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature 2 Meters (degrees Celsius)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	-15.9	-16.4	-17.0	-18.0	-18.9	-19.9	-17.8	-14.0	-10.5	-6.1	-1.2	0.4	1.7	2.3	3.3	3.7	3.3	3.1	2.0	0.9	-0.4	-1.2	-2.0	-2.2	-5.9	3.7	-19.9
2	-2.5	-2.5	-2.8	-3.8	-3.6	-1.4	0.6	1.3	1.8	2.7	2.8	2.3	1.5	2.0	3.3	4.0	3.5	3.2	3.0	1.1	-2.0	-3.0	-5.1	-6.1	0.0	4.0	-6.1
3	-6.9	-7.5	-7.7	-7.7	-8.4	-8.7	-6.1	-2.0	3.3	4.9	6.1	7.5	8.8	9.7	10.4	11.3	11.3	10.9	9.4	7.1	3.3	2.0	1.0	0.0	2.2	11.3	-8.7
4	-1.5	-1.3	-1.7	-2.7	-3.4	-3.8	-1.9	2.7	8.1	9.5	10.4	11.1	11.8	11.8	12.4	12.8	12.2	11.2	9.6	8.1	7.1	6.4	5.3	4.2	5.8	12.8	-3.8
5	3.4	3.1	3.1	1.6	0.0	-0.4	-0.7	-0.4	-0.2	0.3	-0.5	-0.4	0.2	1.6	3.4	3.9	3.2	2.3	1.1	0.5	0.0	-0.5	-0.6	-0.9	1.0	3.9	-0.9
6	-0.9	-1.0	-1.2	-1.5	-1.4	-1.1	-0.7	0.0	0.6	2.0	3.0	4.4	6.5	7.1	7.5	8.2	8.6	8.1	5.8	3.7	2.8	1.7	1.8	1.5	2.7	8.6	-1.5
7	0.0	-0.9	-0.6	-0.6	-1.6	-2.6	-1.6	2.2	5.3	8.5	10.1	10.7	10.4	10.3	9.7	9.6	9.6	8.2	6.6	5.7	4.9	3.9	3.9	4.1	4.8	10.7	-2.6
8	2.7	0.8	-2.2	-3.9	-4.1	-4.3	-1.8	0.8	3.2	4.4	2.5	3.1	2.2	1.8	4.2	5.3	5.1	5.0	4.8	3.3	1.8	0.0	-0.3	-0.1	1.4	5.3	-4.3
9	0.2	0.3	-0.1	-0.6	-1.5	-1.8	-0.5	2.0	3.5	5.0	5.8	5.5	5.8	6.8	7.2	7.8	7.7	7.8	7.0	5.4	1.6	-0.5	-2.5	-3.4	2.9	7.8	-3.4
10	-4.3	-5.4	-5.7	-6.0	-6.2	-4.9	-2.6	0.4	4.4	7.5	7.5	7.9	6.4	6.6	6.3	6.3	7.1	6.8	7.2	6.2	4.5	2.6	1.8	0.4	2.3	7.9	-6.2
11	-0.2	0.0	-0.1	-0.2	-0.4	-0.2	2.2	5.9	9.9	11.0	12.2	13.2	14.2	15.3	16.0	16.3	16.6	16.7	16.1	12.7	8.1	6.2	3.3	2.8	8.2	16.7	-0.4
12	0.7	-0.8	-1.1	-1.7	-2.5	-2.2	1.0	7.1	13.0	15.3	16.7	17.6	18.3	17.9	18.9	19.5	19.5	18.3	16.5	13.5	8.7	5.6	4.7	3.1	9.5	19.5	-2.5
13	2.2	1.8	1.5	-0.1	-1.1	-0.4	3.9	9.5	14.6	15.8	17.0	17.8	18.5	19.3	19.7	20.1	20.0	19.3	17.2	13.0	9.9	6.7	3.9	4.6	10.6	20.1	-1.1
14	4.0	3.5	2.3	1.5	0.9	0.4	4.3	10.2	15.7	17.9	18.5	19.7	20.5	20.3	19.8	20.5	19.9	17.9	16.2	14.4	11.8	10.7	11.5	11.1	12.2	20.5	0.4
15	8.7	8.2	7.8	7.5	7.4	6.5	9.2	12.7	13.3	15.3	15.9	16.8	17.6	17.5	17.0	16.4	15.9	15.3	12.5	10.5	9.8	9.7	8.9	8.6	12.0	17.6	6.5
16	8.5	8.5	8.0	8.5	8.2	7.8	7.6	7.2	6.9	6.9	7.2	9.3	9.5	9.1	9.1	9.2	8.0	7.2	7.2	6.4	5.9	6.4	6.0	5.9	7.7	9.5	5.9
17	5.9	5.7	6.4	6.0	5.2	5.1	5.4	6.1	6.8	7.2	7.8	7.6	7.5	6.7	5.9	5.3	4.8	3.9	3.1	2.5	2.1	1.3	0.8	0.7	5.0	7.8	0.7
18	0.8	0.8	0.6	0.4	0.4	0.4	0.3	0.3	0.7	1.0	1.5	1.5	2.6	2.5	2.5	2.3	1.8	1.1	0.7	0.3	-0.2	-0.5	-1.0	-1.3	0.8	2.6	-1.3
19	-1.4	-1.4	-1.4	-1.6	-1.5	-1.4	-1.1	-1.2	-0.8	-0.2	0.5	0.9	0.9	1.1	0.8	1.0	0.9	0.8	0.9	0.6	0.3	0.3	0.4	0.1	-0.1	1.1	-1.6
20	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.5	-0.1	0.5	1.3	1.4	2.1	2.6	3.5	4.2	3.2	2.7	2.6	2.4	1.9	1.5	1.6	1.4	1.4	1.3	4.2	-0.6
21	1.4	1.2	1.0	1.0	1.1	1.3	2.5	3.5	4.5	5.4	4.9	4.4	5.1	5.0	4.6	3.5	3.6	3.0	2.2	1.6	1.4	1.1	1.0	1.0	2.7	5.4	1.0
22	0.7	1.1	1.5	2.0	1.7	2.5	3.3	4.5	5.7	6.8	7.6	8.6	9.3	9.6	10.1	10.1	9.8	9.7	9.0	8.0	4.5	3.2	2.0	1.6	5.5	10.1	0.7
23	0.3	-1.8	-3.5	-4.5	-2.8	-2.7	0.3	6.9	10.6	10.1	10.5	11.1	11.2	10.5	9.4	9.1	9.0	8.8	7.2	5.3	4.9	4.6	4.4	4.1	5.1	11.2	-4.5
24	3.5	3.2	2.8	2.1	1.8	2.1	2.5	4.4	7.0	9.2	10.2	11.1	12.0	12.6	13.4	13.3	13.1	10.4	8.8	8.6	6.2	4.6	2.3	0.2	6.9	13.4	0.2
25	0.3	0.8	1.1	1.8	1.9	1.9	4.8	8.7	9.7	10.4	11.1	11.9	11.9	12.7	13.3	11.9	11.7	12.0	11.0	9.8	8.2	7.4	6.9	6.4	7.8	13.3	0.3
26	4.3	4.5	4.5	4.1	3.8	4.1	6.5	8.8	10.0	10.4	10.4	12.2	13.9	13.1	9.8	10.0	8.8	8.0	7.6	7.2	6.4	6.0	5.3	4.9	7.7	13.9	3.8
27	5.3	6.5	6.4	6.1	5.8	5.6	6.0	6.2	6.5	8.0	9.1	9.6	10.2	9.6	10.0	10.6	9.8	9.0	8.5	7.8	7.1	6.4	5.9	5.3	7.6	10.6	5.3
28	5.3	5.0	4.8	5.1	5.4	5.8	7.1	8.1	9.1	10.2	10.7	12.1	12.9	13.6	14.1	14.8	14.6	13.9	12.8	10.9	8.2	5.5	3.5	2.4	9.0	14.8	2.4
29	-0.1	-0.4	0.1	-1.5	-2.5	-2.6	1.6	7.7	11.1	12.9	14.6	15.9	17.0	17.4	18.1	18.5	18.6	18.2	17.3	14.3	12.2	7.5	4.5	1.7	9.3	18.6	-2.6
30	0.0	0.0	-0.8	-0.7	-1.5	-1.3	3.7	9.6	15.0	16.5	17.7	18.5	19.4	20.3	20.4	20.7	20.8	19.2	17.4	15.9	12.3	9.6	8.7	8.8	11.3	20.8	-1.5
31	8.6	8.1	8.0	7.4	6.3	5.8	6.6	10.2	11.5	12.4	13.7	15.7	16.7	15.9	16.4	12.9	10.8	11.1	10.9	10.5	8.1	6.0	5.4	3.9	10.1	16.7	3.9
Avg	1.1	0.8	0.4	-0.0	-0.4	-0.4	1.4	4.2	6.5	7.8	8.6	9.4	9.9	10.1	10.4	10.4	10.1	9.5	8.5	7.0	5.2	3.9	3.0	2.4	5.4	11.1	-1.4
Max	8.7	8.5	8.0	8.5	8.2	7.8	9.2	12.7	15.7	17.9	18.5	19.7	20.5	20.3	20.4	20.7	20.8	19.3	17.4	15.9	12.3	10.7	11.5	11.1	12.2	20.8	6.5
Min	-15.9	-16.4	-17.0	-18.0	-18.9	-19.9	-17.8	-14.0	-10.5	-6.1	-1.2	-0.4	0.2	1.1	0.8	1.0	0.9	0.8	0.7	0.3	-2.0	-3.0	-5.1	-6.1	-5.9	1.1	-19.9

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature 2 Meters (degrees Celsius)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	2.6	2.0	1.7	1.0	0.6	0.8	3.5	8.3	12.5	15.1	16.1	17.3	18.5	19.2	19.8	20.0	20.2	20.2	19.2	16.6	13.2	10.9	9.4	6.8	11.5	20.2	0.6
2	5.7	4.3	3.3	3.3	2.5	2.9	6.7	11.7	16.1	17.3	18.6	19.9	20.7	21.4	21.6	21.9	21.8	21.5	20.7	16.9	14.7	11.3	8.7	7.2	13.4	21.9	2.5
3	4.9	4.9	3.3	3.1	2.6	3.9	8.4	12.9	17.1	18.2	18.9	19.9	20.8	21.4	21.9	21.0	22.2	21.9	19.9	17.3	14.2	11.9	8.1	6.2	13.5	22.2	2.6
4	4.5	3.3	2.4	2.7	1.5	1.5	6.3	11.6	14.0	15.1	16.4	17.5	18.9	19.6	20.7	21.1	21.2	21.1	20.3	17.5	12.8	9.1	5.8	4.5	12.1	21.2	1.5
5	2.9	1.8	2.2	1.1	0.0	0.3	4.3	10.7	14.6	15.3	16.5	17.3	18.4	19.2	19.9	20.9	20.7	20.5	20.2	16.2	12.3	10.5	6.4	5.8	11.6	20.9	0.0
6	4.4	3.1	1.8	1.9	1.2	3.3	11.5	16.9	18.9	20.8	21.8	22.4	23.6	23.1	16.8	14.9	18.2	18.7	16.5	14.2	9.9	9.9	8.8	8.1	12.9	23.6	1.2
7	6.8	6.9	6.9	5.8	4.8	3.5	3.9	4.7	5.4	6.4	7.1	7.0	8.2	9.0	9.5	9.0	8.3	7.2	6.2	6.2	5.5	3.4	2.5	1.6	6.1	9.5	1.6
8	1.0	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	2.3	3.6	4.5	4.9	3.4	6.1	5.5	3.4	3.5	3.3	2.4	1.7	1.6	0.9	2.1	6.1	0.2
9	0.5	1.0	0.1	-0.6	-1.4	-1.9	0.6	4.3	6.0	7.3	8.8	9.4	10.9	11.8	11.7	12.6	12.5	12.6	12.4	10.5	5.9	3.0	1.9	-0.6	5.8	12.6	-1.9
10	-1.4	-2.8	-2.7	-2.8	-0.9	0.6	2.3	5.6	8.0	9.1	10.5	12.6	13.9	14.1	15.8	15.9	15.4	15.0	13.0	12.2	11.1	10.0	9.2	7.6	8.0	15.9	-2.8
11	7.2	8.5	7.9	5.5	4.0	3.7	5.3	7.5	9.6	12.3	13.7	14.4	15.3	16.3	16.8	17.3	17.3	17.5	16.6	14.8	11.7	9.0	7.8	5.8	11.1	17.5	3.7
12	4.7	2.6	3.4	1.3	1.1	1.8	6.5	11.7	16.2	17.8	18.6	19.5	20.4	20.9	21.7	22.4	22.0	21.2	20.9	18.5	15.8	13.1	9.7	9.2	13.4	22.4	1.1
13	9.0	8.3	7.3	6.6	5.8	6.0	8.1	13.2	16.9	19.0	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	10.0	19.0	5.8
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	14.7	18.4	10.3
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	18.1	18.4	17.5	17.6	16.3	15.0	13.8	12.1	11.5	10.7	10.3	14.7	18.4	10.3
16	9.9	9.2	8.5	8.2	8.0	8.2	9.7	10.9	13.9	16.0	16.6	16.5	16.7	17.8	16.7	14.9	13.4	13.4	12.9	12.0	9.7	9.2	8.8	7.7	12.0	17.8	7.7
17	7.8	7.5	7.6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	7.6	7.8	7.5
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	15.2	15.4	17.5	19.1	19.2	17.7	15.7	15.6	13.9	12.2	9.8	6.5	6.6	14.2	19.2	6.5
19	5.2	4.3	3.1	2.0	1.1	1.5	3.7	9.5	13.3	14.4	14.9	15.4	16.5	16.2	17.2	16.8	15.8	14.7	13.6	11.3	7.8	5.0	3.3	1.2	9.5	17.2	1.1
20	0.2	-0.1	-1.5	-1.9	-0.8	1.3	4.5	5.8	6.3	4.9	5.8	7.3	6.7	5.1	6.5	7.8	6.8	4.4	4.2	4.0	2.9	2.5	2.4	2.3	3.6	7.8	-1.9
21	2.0	2.4	2.1	1.8	1.6	2.2	2.2	3.1	4.0	5.3	6.7	6.5	7.8	8.1	8.0	8.9	7.1	7.3	5.7	4.9	4.0	3.1	2.4	3.6	4.6	8.9	1.6
22	3.9	4.0	3.9	4.0	4.2	4.8	5.0	5.3	5.7	5.8	7.1	8.2	9.6	9.2	10.3	10.4	11.5	11.7	11.9	11.1	10.0	7.3	6.1	3.6	7.3	11.9	3.6
23	3.2	1.7	0.8	0.0	-0.5	-0.9	2.6	8.1	10.7	12.2	12.8	13.6	13.9	13.6	12.8	13.3	13.1	13.2	12.9	11.6	10.2	9.8	9.1	8.1	8.6	13.9	-0.9
24	6.0	3.8	2.9	1.9	1.4	1.3	3.5	6.5	7.8	7.7	8.5	10.1	10.9	12.7	13.1	13.9	13.9	13.8	13.4	12.4	7.8	4.8	3.4	3.8	7.7	13.9	1.3
25	2.7	2.8	2.0	1.7	-0.1	0.1	4.1	9.1	12.8	13.9	14.7	15.0	15.2	16.0	15.7	16.1	16.5	16.9	14.7	9.8	8.3	6.5	4.3	3.5	9.3	16.9	-0.1
26	4.2	5.0	4.0	3.7	2.9	4.4	7.5	10.3	13.9	15.5	16.2	17.1	18.0	18.9	19.7	20.4	18.9	16.0	15.7	15.0	13.6	11.4	10.1	8.9	12.1	20.4	2.9
27	7.3	6.6	6.2	5.5	7.0	8.7	10.8	13.6	15.9	17.1	17.3	18.5	20.4	20.2	15.7	13.0	14.5	15.9	14.6	13.2	11.0	10.4	9.7	8.7	12.6	20.4	5.5
28	6.7	7.2	7.6	7.7	7.6	7.6	8.8	12.4	14.7	15.4	16.1	17.9	18.0	18.8	18.3	16.9	16.2	17.0	14.5	12.8	10.9	11.5	11.1	10.9	12.8	18.8	6.7
29	10.5	10.3	9.9	9.7	9.1	8.7	9.6	11.3	14.3	15.5	16.2	16.9	18.3	18.8	19.3	20.1	20.5	20.7	20.4	19.0	15.9	14.0	11.5	10.0	14.6	20.7	8.7
30	7.4	6.1	5.5	4.0	3.9	5.1	7.9	10.1	14.6	16.7	17.1	17.7	18.9	19.8	20.6	21.2	21.1	18.7	17.5	15.2	13.5	13.3	12.2	11.1	13.3	21.2	3.9
Avg	4.8	4.3	3.7	3.0	2.6	3.1	5.7	9.1	11.7	12.9	13.6	14.5	15.4	16.0	16.0	16.1	15.9	15.4	14.5	12.7	10.3	8.7	7.1	6.1	10.1	16.8	2.8
Max	10.5	10.3	9.9	9.7	9.1	8.7	11.5	16.9	18.9	20.8	21.8	22.4	23.6	23.1	21.9	22.4	22.2	21.9	20.9	19.0	15.9	14.0	12.2	11.1	14.7	23.6	10.3
Min	-1.4	-2.8	-2.7	-2.8	-1.4	-1.9	0.2	0.2	0.2	0.7	2.3	3.6	4.5	4.9	3.4	6.1	5.5	3.4	3.5	3.3	2.4	1.7	1.6	-0.6	2.1	6.1	-2.8

A-15

**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature Delta T (degrees Celsius)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0.89	0.80	0.66	0.67	0.70	0.17	0.34	0.23	0.39	0.19	-0.12	-0.06	-0.21	-0.39	-0.20	-0.15	0.03	0.29	0.31	0.42	0.52	0.68	1.01	1.29	0.35	1.29	-0.39
2	1.00	0.90	0.98	1.23	1.28	1.21	1.33	1.08	0.35	0.55	0.11	0.03	0.07	0.07	0.04	-0.18	0.36	0.53	0.41	0.58	0.50	0.62	0.74	0.87	0.61	1.33	-0.18
3	1.33	1.17	0.82	0.84	1.96	1.88	1.74	0.58	0.28	0.58	0.13	-0.67	-0.27	-0.01	0.75	0.80	0.52	0.62	0.56	0.59	0.58	0.47	0.54	0.74	0.69	1.96	-0.67
4	0.50	0.78	0.78	0.94	0.86	0.90	0.80	0.55	0.12	0.30	0.28	0.37	0.45	0.49	0.56	0.62	0.31	0.49	0.90	0.46	0.49	0.33	0.40	0.36	0.54	0.94	0.12
5	0.25	0.27	0.38	0.40	0.38	0.32	0.26	0.23	Au	Au	Au	Au	Au	0.93	1.16	0.50	0.31	0.55	0.53	0.69	0.51	0.33	0.25	0.65	0.47	1.16	0.23
6	0.49	0.36	0.06	0.20	0.49	0.45	0.51	0.33	0.22	0.14	0.03	0.22	0.37	0.37	0.35	0.25	0.28	0.32	0.39	0.98	0.57	0.22	0.21	0.25	0.34	0.98	0.03
7	0.33	0.44	0.32	0.33	0.51	0.29	0.49	0.51	0.40	0.32	0.31	0.23	0.55	0.82	0.97	0.83	0.78	0.72	0.60	0.55	0.41	0.36	0.52	0.37	0.50	0.97	0.23
8	0.29	0.27	0.19	0.23	0.41	0.42	0.22	0.09	-0.11	-0.34	-0.13	-0.46	-0.47	-0.51	-0.50	-0.29	0.09	0.31	0.80	0.36	0.32	0.34	0.18	0.17	0.08	0.80	-0.51
9	0.24	0.06	0.02	0.02	0.05	0.02	0.08	0.05	0.02	0.00	-0.19	-0.17	-0.18	-0.10	-0.01	-0.02	-0.02	0.00	0.05	0.06	0.11	0.13	0.10	0.07	0.02	0.24	-0.19
10	0.05	-0.01	0.04	0.05	0.07	0.05	0.05	-0.02	-0.02	-0.01	-0.10	-0.28	-0.43	-0.58	-0.64	-0.48	-0.32	-0.12	0.03	0.13	0.22	0.40	0.33	0.13	-0.06	0.40	-0.64
11	0.08	-0.05	-0.08	-0.09	-0.05	0.04	0.01	-0.18	-0.23	-0.43	-0.46	-0.41	-0.79	-0.48	-0.68	-0.61	-0.17	-0.07	-0.11	-0.08	0.01	0.07	0.47	0.07	-0.18	0.47	-0.79
12	-0.05	-0.06	-0.11	-0.10	-0.10	-0.06	-0.09	-0.26	-0.29	-0.47	-0.46	-0.52	-0.53	-0.48	-0.35	-0.37	-0.21	-0.15	0.39	0.53	0.79	0.95	0.62	0.10	-0.05	0.95	-0.53
13	0.00	0.15	0.36	0.51	0.45	0.44	0.39	-0.01	-0.20	-0.27	-0.62	-0.27	-0.56	-0.46	-0.22	-0.10	-0.01	0.02	0.42	0.48	0.34	0.19	0.19	0.22	0.06	0.51	-0.62
14	0.32	0.48	0.61	0.36	0.17	0.30	0.29	0.06	-0.03	-0.25	-0.23	-0.35	-0.41	-0.37	-0.14	-0.04	0.07	0.13	0.34	0.32	0.24	0.38	0.37	0.26	0.12	0.61	-0.41
15	0.17	0.06	0.14	0.22	0.23	0.33	0.25	-0.30	-0.47	-0.62	-0.40	-0.82	-0.43	-0.90	-0.73	-0.52	-0.06	-0.44	0.44	0.70	0.15	0.34	0.63	0.45	-0.07	0.70	-0.90
16	0.43	0.60	0.96	0.76	0.38	0.47	0.27	-0.03	-0.21	-0.30	-0.20	-0.16	-0.17	-0.14	-0.30	-0.48	-0.41	0.00	0.10	0.21	0.22	0.44	0.58	0.48	0.15	0.96	-0.48
17	0.95	0.70	0.50	0.35	0.38	0.27	0.15	0.03	-0.07	0.01	-0.02	-0.20	-0.07	0.14	-0.15	-0.07	-0.14	0.03	0.13	0.37	0.58	0.53	1.21	0.83	0.27	1.21	-0.20
18	1.04	0.68	1.26	0.93	0.95	0.56	0.32	-0.02	-0.34	-0.50	-0.74	-0.84	-0.76	-0.77	-0.59	-0.12	-0.17	0.58	1.16	1.18	1.19	1.07	0.72	1.05	0.33	1.26	-0.84
19	1.94	1.69	1.53	1.04	1.64	2.14	1.05	0.72	-0.18	0.00	-0.37	-0.47	-0.19	-0.31	-0.57	-0.08	0.33	0.49	1.10	1.30	0.57	0.37	0.48	0.96	0.63	2.14	-0.57
20	1.03	1.08	0.88	0.57	0.28	0.38	0.28	0.27	0.02	-0.20	-0.26	-0.17	-0.24	-0.13	-0.21	-0.10	-0.07	0.15	0.11	0.21	0.19	0.29	0.26	0.12	0.20	1.08	-0.26
21	0.24	0.17	0.35	0.18	0.25	0.09	-0.01	-0.16	-0.18	-0.27	-0.43	-0.48	-0.61	-0.46	-0.39	-0.44	-0.52	-0.34	-0.11	0.18	0.24	0.43	0.40	0.66	-0.05	0.66	-0.61
22	0.74	0.81	0.94	0.95	0.85	1.13	0.22	-0.54	-0.52	-0.39	-0.73	-0.94	-0.85	-1.06	-1.07	-0.97	-0.66	-0.17	0.34	1.19	1.06	0.98	0.92	0.79	0.13	1.19	-1.07
23	1.33	0.58	0.81	1.43	1.41	1.21	0.49	0.08	-0.21	-0.29	-0.51	-0.83	-0.58	-0.58	-0.99	-0.20	-0.20	0.03	0.16	0.23	0.23	0.19	0.25	0.50	0.19	1.43	-0.99
24	0.44	0.48	0.59	0.86	1.43	1.47	0.71	-0.12	-0.25	-0.54	-0.54	-0.83	-0.49	-1.07	-0.58	-0.54	-0.39	-0.34	0.14	0.73	1.53	1.19	1.23	1.07	0.26	1.53	-1.07
25	0.93	1.20	1.21	1.09	0.86	0.82	-0.06	-0.59	-0.56	-0.66	-0.75	-0.94	-0.91	-1.00	-0.83	-0.79	-0.41	-0.29	-0.02	0.41	0.51	0.59	0.67	0.47	0.04	1.21	-1.00
26	0.41	0.36	0.32	0.46	0.40	0.53	0.11	-0.18	-0.28	-0.52	-0.42	-0.51	-0.33	-0.25	-0.45	-0.32	-0.12	-0.05	0.03	0.07	0.07	0.02	0.03	0.10	-0.02	0.53	-0.52
27	0.07	0.46	1.00	1.31	0.96	0.79	0.27	0.14	0.45	0.36	-0.06	-0.19	-0.26	-0.20	-0.31	-0.27	0.04	0.04	0.07	0.13	0.11	0.08	0.08	0.09	0.22	1.31	-0.31
28	0.02	-0.02	-0.04	-0.01	-0.03	-0.04	-0.05	0.02	-0.11	-0.20	-0.26	-0.27	-0.21	-0.14	-0.16	-0.09	-0.15	-0.10	-0.09	-0.01	0.00	0.31	0.65	0.52	-0.02	0.65	-0.27
29	0.62	0.99	1.24	1.15	0.90	1.08	0.29	-0.38	-0.23	-0.21	-0.30	-0.41	-0.50	-0.57	-0.61	-0.48	-0.36	-0.28	-0.18	-0.09	-0.01	0.00	-0.01	-0.01	0.07	1.24	-0.61
30	0.08	-0.06	-0.04	-0.03	-0.07	-0.07	-0.13	-0.37	-0.49	-0.43	-0.48	-0.57	-0.51	-0.37	-0.33	-0.30	-0.34	0.07	0.16	0.33	0.82	1.13	0.83	1.50	0.01	1.50	-0.57
Avg	0.54	0.51	0.56	0.56	0.60	0.59	0.35	0.06	-0.09	-0.15	-0.27	-0.38	-0.33	-0.28	-0.24	-0.17	-0.05	0.10	0.31	0.44	0.44	0.45	0.50	0.50	0.19	1.04	-0.49
Max	1.94	1.69	1.53	1.43	1.96	2.14	1.74	1.08	0.45	0.58	0.31	0.37	0.55	0.93	1.16	0.83	0.78	0.72	1.16	1.30	1.53	1.19	1.23	1.50	0.69	2.14	0.23
Min	-0.05	-0.06	-0.11	-0.10	-0.10	-0.07	-0.13	-0.59	-0.56	-0.66	-0.75	-0.94	-0.91	-1.07	-1.07	-0.97	-0.66	-0.44	-0.18	-0.09	-0.01	0.00	-0.01	-0.01	-0.18	0.24	-1.07

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature Delta T (degrees Celsius)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	1.58	1.89	1.78	1.59	1.28	1.65	0.96	-0.31	-0.46	-0.11	-0.64	-0.43	-0.18	0.01	-0.03	-0.23	-0.04	0.05	0.19	0.47	0.28	0.38	0.53	0.42	0.44	1.89	-0.64
2	0.32	0.45	0.44	0.65	0.81	0.95	0.11	0.04	-0.01	-0.04	-0.10	-0.07	-0.40	-0.39	-0.75	-0.77	-0.39	-0.47	-0.07	0.62	0.91	0.64	0.94	1.09	0.19	1.09	-0.77
3	0.94	0.97	0.79	0.83	0.92	0.65	-0.38	-0.51	-0.55	-0.64	-0.71	-0.81	-0.94	-0.92	-0.80	-0.73	-0.38	-0.16	0.45	0.95	0.65	0.30	0.26	0.56	0.03	0.97	-0.94
4	1.15	0.61	0.76	0.69	1.03	1.09	0.00	-0.78	-0.60	-0.73	-0.82	-0.79	-0.99	-0.72	-0.76	-0.74	-0.31	-0.07	0.20	0.13	0.14	0.09	0.06	0.11	-0.05	1.15	-0.99
5	0.11	0.15	0.01	-0.03	-0.07	-0.10	-0.13	-0.17	-0.18	-0.17	-0.24	-0.34	-0.45	-0.50	-0.51	-0.53	-0.40	-0.36	-0.20	-0.10	-0.06	-0.04	-0.02	-0.03	-0.18	0.15	-0.53
6	0.03	0.01	0.05	0.06	0.05	-0.09	-0.11	-0.15	-0.29	-0.44	-0.44	-0.54	-0.74	-0.58	-0.47	-0.44	-0.40	-0.36	-0.11	0.19	0.28	0.72	0.50	0.70	-0.11	0.72	-0.74
7	0.39	0.52	0.42	0.49	0.53	0.71	-0.04	-0.52	-0.55	-0.68	-0.89	-0.79	-0.68	-0.65	-0.44	-0.36	-0.50	-0.39	-0.10	0.24	0.46	0.63	0.45	0.18	-0.07	0.71	-0.89
8	0.40	0.60	1.40	1.33	1.17	0.78	0.29	-0.18	-0.23	-0.42	-0.25	-0.51	-0.10	-0.13	-0.43	-0.31	-0.33	-0.17	-0.13	0.12	0.37	0.42	0.24	0.51	0.19	1.40	-0.51
9	0.48	0.11	0.08	0.24	0.45	0.21	-0.18	-0.38	-0.57	-0.92	-1.21	-0.79	-0.64	-0.69	-0.60	-0.82	-0.75	-0.58	-0.24	0.34	0.62	0.55	1.06	1.03	-0.13	1.06	-1.21
10	1.13	1.20	0.94	1.20	0.88	0.34	-0.21	-0.33	-0.40	-0.78	-0.73	-0.62	-0.25	-0.40	-0.29	-0.30	-0.43	-0.21	-0.13	0.39	0.67	1.02	0.79	0.55	0.17	1.20	-0.78
11	0.60	0.25	0.23	0.50	0.42	0.18	-0.25	-0.55	-0.81	-0.86	-0.98	-0.95	-1.11	-1.16	-1.16	-0.96	-0.89	-0.65	-0.27	0.75	0.43	0.19	0.77	0.50	-0.24	0.77	-1.16
12	1.09	1.44	1.31	1.30	1.24	0.94	-0.15	-0.64	-0.74	-0.91	-0.98	-0.96	-0.99	-0.50	-0.80	-0.83	-0.79	-0.26	0.40	0.83	1.07	0.71	0.76	1.03	0.15	1.44	-0.99
13	1.03	0.90	0.90	1.02	0.90	0.40	-0.34	-0.42	-0.61	-0.77	-1.02	-1.12	-1.18	-1.17	-1.12	-1.03	-0.85	-0.43	0.59	0.98	0.35	0.26	0.75	0.46	-0.06	1.03	-1.18
14	0.58	0.61	1.11	1.03	1.01	1.10	-0.34	-0.57	-0.58	-0.59	-0.59	-0.98	-0.94	-0.73	-0.69	-0.74	-0.42	-0.31	-0.10	0.26	0.26	0.47	0.62	0.91	0.02	1.11	-0.98
15	0.43	0.21	0.22	0.18	0.36	0.27	0.10	-0.24	-0.43	-0.87	-0.83	-1.11	-1.04	-0.76	-0.49	-0.42	-0.25	-0.07	0.07	0.21	0.15	0.13	0.21	0.13	-0.16	0.43	-1.11
16	0.17	0.36	0.51	0.23	0.16	0.11	-0.02	-0.08	-0.12	-0.16	-0.27	-0.44	-0.60	-0.61	-0.62	-0.48	-0.39	-0.23	-0.14	-0.09	0.00	0.07	0.09	0.10	-0.10	0.51	-0.62
17	0.09	0.08	0.16	0.06	0.00	-0.03	-0.12	-0.24	-0.33	-0.45	-0.38	-0.33	-0.31	-0.23	-0.19	-0.21	-0.20	-0.17	-0.11	-0.05	-0.03	-0.05	-0.09	-0.09	-0.13	0.16	-0.45
18	-0.05	-0.04	-0.01	-0.02	-0.03	-0.03	-0.09	-0.17	-0.32	-0.39	-0.46	-0.38	-0.48	-0.52	-0.53	-0.49	-0.32	-0.25	-0.17	-0.09	-0.06	-0.04	-0.07	-0.06	-0.21	-0.01	-0.53
19	-0.07	-0.07	-0.06	-0.03	-0.02	-0.10	-0.22	-0.27	-0.28	-0.44	-0.52	-0.50	-0.49	-0.60	-0.48	-0.43	-0.29	-0.18	-0.11	-0.06	-0.06	-0.05	-0.03	-0.04	-0.22	-0.02	-0.60
20	-0.05	-0.04	-0.05	-0.05	-0.05	-0.07	-0.13	-0.24	-0.36	-0.39	-0.43	-0.43	-0.42	-0.64	-0.65	-0.46	-0.32	-0.21	-0.12	-0.05	-0.03	-0.02	-0.04	-0.03	-0.22	-0.02	-0.65
21	-0.03	-0.04	-0.01	0.07	0.02	-0.10	-0.26	-0.44	-0.66	-0.82	-0.66	-0.50	-0.58	-0.46	-0.29	-0.31	-0.35	-0.32	-0.16	-0.05	0.04	0.04	-0.02	0.06	-0.24	0.07	-0.82
22	0.12	0.12	0.30	0.15	0.25	0.10	-0.24	-0.26	-0.40	-0.51	-0.48	-0.59	-0.92	-0.89	-0.86	-0.66	-0.43	-0.32	0.00	0.37	0.60	0.39	0.42	0.29	-0.14	0.60	-0.92
23	0.53	1.04	1.56	1.83	0.89	0.80	-0.13	-0.34	-0.52	-0.41	-0.45	-0.40	-0.35	-0.31	-0.26	-0.30	-0.14	-0.30	-0.13	0.01	0.04	0.00	0.06	0.03	0.11	1.83	-0.52
24	0.13	0.14	0.14	0.30	0.15	0.02	-0.13	-0.31	-0.56	-0.93	-0.96	-1.01	-1.01	-0.99	-1.12	-1.10	-0.87	-0.45	-0.13	0.10	0.53	0.22	0.83	0.91	-0.25	0.91	-1.12
25	0.53	0.25	0.26	0.06	0.33	0.23	-0.25	-0.47	-0.51	-0.49	-0.45	-0.48	-0.36	-0.43	-0.39	-0.26	-0.31	-0.17	-0.01	0.06	0.18	0.15	0.36	0.49	-0.07	0.53	-0.51
26	0.86	1.16	0.46	0.63	0.60	0.26	-0.20	-0.13	-0.26	-0.25	-0.26	-0.55	-0.99	-0.49	-0.27	-0.12	0.00	-0.07	-0.02	0.03	0.14	0.34	0.37	0.36	0.07	1.16	-0.99
27	0.25	0.05	0.22	0.53	0.21	0.04	-0.08	-0.11	-0.18	-0.28	-0.37	-0.29	-0.33	-0.40	-0.38	-0.49	-0.48	-0.29	-0.08	0.00	0.04	0.11	0.14	0.22	-0.08	0.53	-0.49
28	0.14	0.19	0.21	0.03	0.10	0.00	-0.24	-0.23	-0.29	-0.43	-0.48	-0.64	-0.69	-0.65	-0.67	-0.75	-0.63	-0.39	-0.03	0.13	0.33	0.21	0.45	0.29	-0.17	0.45	-0.75
29	0.72	1.02	0.55	0.81	1.04	0.95	-0.17	-0.35	-0.47	-0.57	-0.61	-0.83	-0.92	-0.63	-0.64	-0.56	-0.63	-0.37	-0.15	0.43	0.67	1.29	1.30	1.57	0.14	1.57	-0.92
30	1.26	1.31	1.43	1.64	1.66	0.83	-0.40	-0.66	-0.66	-0.72	-0.98	-0.80	-0.92	-1.06	-0.76	-0.70	-0.58	-0.47	-0.31	0.15	1.42	1.23	1.46	1.24	0.19	1.66	-1.06
31	0.89	0.96	0.82	0.87	0.72	0.48	0.08	-0.55	-0.80	-0.87	-0.89	-0.90	-0.84	-0.66	-0.60	-0.22	0.00	-0.12	-0.02	-0.01	0.64	0.60	0.15	0.29	0.00	0.96	-0.90
Avg	0.51	0.53	0.55	0.59	0.55	0.41	-0.11	-0.34	-0.44	-0.55	-0.62	-0.64	-0.67	-0.61	-0.58	-0.54	-0.42	-0.28	-0.04	0.23	0.36	0.35	0.43	0.44	-0.04	0.84	-0.82
Max	1.58	1.89	1.78	1.83	1.66	1.65	0.96	0.04	-0.01	-0.04	-0.10	-0.07	-0.10	0.01	-0.03	-0.12	0.00	0.05	0.59	0.98	1.42	1.29	1.46	1.57	0.44	1.89	-0.45
Min	-0.07	-0.07	-0.06	-0.05	-0.07	-0.10	-0.40	-0.78	-0.81	-0.93	-1.21	-1.12	-1.18	-1.17	-1.16	-1.10	-0.89	-0.65	-0.31	-0.10	-0.06	-0.05	-0.09	-0.09	-0.25	-0.02	-1.21

A-17



**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Temperature Delta T (degrees Celsius)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0.46	0.40	0.69	0.56	0.56	0.42	-0.15	-0.46	-0.36	-0.60	-0.66	-0.65	-0.83	-0.77	-0.80	-0.73	-0.64	-0.51	0.00	0.71	0.66	0.27	0.25	0.84	-0.06	0.84	-0.83
2	0.77	1.08	1.09	1.03	1.29	0.57	-0.33	-0.68	-0.70	-0.68	-0.82	-0.83	-0.94	-1.00	-0.83	-0.75	-0.55	-0.44	-0.02	1.18	1.45	0.71	0.99	0.78	0.10	1.45	-1.00
3	1.38	1.26	1.47	1.41	1.13	0.54	-0.50	-0.41	-0.57	-0.71	-0.87	-0.87	-0.95	-0.90	-0.72	-0.32	-0.69	-0.38	0.28	1.01	2.03	1.27	1.68	1.41	0.29	2.03	-0.95
4	1.14	1.05	1.36	1.20	1.06	0.71	-0.49	-0.78	-0.64	-0.81	-1.02	-0.91	-0.95	-0.95	-0.93	-0.87	-0.65	-0.39	-0.03	0.96	1.45	0.92	1.21	1.39	0.13	1.45	-1.02
5	1.38	1.57	0.85	1.01	1.25	0.53	-0.39	-0.60	-0.70	-0.76	-0.91	-0.88	-0.87	-0.89	-0.90	-0.97	-0.59	-0.34	-0.12	1.44	0.64	0.33	1.36	1.42	0.12	1.57	-0.97
6	1.65	1.34	1.89	1.51	1.80	0.97	-0.10	-0.07	-0.25	-0.52	-0.62	-0.52	-0.53	-0.09	0.40	0.35	-0.11	0.03	0.54	0.46	0.65	0.46	0.27	0.25	0.41	1.89	-0.62
7	0.33	0.08	0.04	0.00	-0.01	-0.04	-0.18	-0.21	-0.35	-0.43	-0.52	-0.50	-0.77	-0.68	-0.58	-0.31	-0.21	-0.11	-0.02	0.05	0.10	-0.02	-0.06	-0.10	-0.19	0.33	-0.77
8	-0.07	0.01	-0.01	0.00	0.00	0.00	-0.03	-0.09	-0.14	-0.18	-0.47	-0.53	-0.61	-0.44	-0.38	-0.75	-0.30	-0.22	-0.16	-0.09	0.07	0.05	0.01	0.13	-0.18	0.13	-0.75
9	0.27	0.41	0.75	0.52	0.47	0.50	-0.31	-0.27	-0.38	-0.55	-0.68	-0.55	-0.92	-0.97	-0.66	-0.67	-0.37	-0.24	-0.14	0.63	0.92	0.52	0.22	0.76	-0.03	0.92	-0.97
10	0.84	1.16	0.88	0.65	0.17	0.08	-0.17	-0.15	-0.18	-0.21	-0.31	-0.65	-0.72	-0.47	-0.66	-0.52	-0.10	0.03	0.28	0.33	0.39	0.68	0.76	0.76	0.12	1.16	-0.72
11	0.72	0.61	0.71	0.89	0.69	0.45	-0.13	-0.20	-0.25	-0.70	-0.84	-0.95	-0.92	-1.04	-0.97	-0.92	-0.69	-0.70	-0.33	0.11	0.91	0.79	0.49	0.64	-0.07	0.91	-1.04
12	0.51	0.88	0.53	1.07	1.39	0.50	-0.31	-0.69	-0.53	-0.53	-0.66	-0.76	-0.96	-0.92	-0.80	-0.93	-0.56	-0.20	-0.07	0.95	0.79	1.23	1.42	1.09	0.10	1.42	-0.96
13	0.59	0.61	0.71	0.76	1.22	0.83	0.04	-0.45	-0.68	-0.70	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	0.29	1.22	-0.70
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	-0.64	-0.73	-0.56	-0.45	-0.11	0.00	0.14	0.40	0.36	0.40	0.43	-0.07	0.43	-0.73
16	0.42	0.46	0.46	0.24	0.26	0.06	-0.16	-0.29	-0.46	-0.72	-0.82	-0.82	-0.48	-0.71	-0.37	0.07	-0.18	-0.30	0.00	0.21	0.63	0.57	0.29	0.33	-0.05	0.63	-0.82
17	0.11	0.29	0.12	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	0.17	0.29	0.11
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	-0.27	-0.18	-0.46	-0.71	-0.23	0.38	0.55	-0.01	0.28	0.64	0.74	1.46	0.65	0.22	1.46	-0.71
19	0.91	0.82	1.11	1.45	1.00	0.73	0.05	-0.28	-0.23	-0.38	-0.43	-0.48	-0.55	-0.50	-0.78	-0.72	-0.39	-0.33	-0.21	0.19	0.78	1.02	1.02	0.89	0.20	1.45	-0.78
20	0.74	0.68	1.04	0.93	0.24	0.33	-0.27	-0.36	-0.66	-0.60	-0.68	-0.55	-0.35	-0.40	-0.63	-0.48	-0.12	-0.06	-0.15	-0.07	-0.07	0.01	-0.02	-0.02	-0.06	1.04	-0.68
21	-0.04	-0.04	-0.05	-0.06	-0.07	-0.08	-0.12	-0.29	-0.43	-0.58	-0.69	-0.31	-0.72	-0.62	-0.54	-0.36	0.03	-0.17	-0.01	0.01	0.06	0.38	0.25	0.06	-0.18	0.38	-0.72
22	0.18	0.06	0.01	0.00	0.01	0.00	-0.01	-0.02	0.00	-0.08	-0.25	-0.37	-0.52	-0.25	-0.17	0.04	0.03	0.09	0.07	0.28	0.40	0.86	0.96	0.85	0.09	0.96	-0.52
23	0.27	0.43	0.58	0.59	0.66	0.36	-0.18	-0.40	-0.33	-0.50	-0.52	-0.61	-0.47	-0.36	-0.33	-0.40	-0.16	-0.12	-0.05	0.54	0.67	0.40	0.69	0.83	0.07	0.83	-0.61
24	1.12	0.98	0.80	0.48	0.29	0.13	-0.41	-0.28	-0.20	-0.21	-0.41	-0.74	-0.71	-0.89	-0.53	-0.62	-0.65	-0.52	-0.22	0.43	1.21	0.83	0.58	0.31	0.03	1.21	-0.89
25	0.54	0.39	0.69	0.66	0.98	0.19	-0.57	-0.68	-0.79	-0.74	-0.86	-0.67	-0.45	-0.48	-0.28	-0.78	-0.51	-0.59	0.53	0.17	0.15	0.52	0.96	0.92	-0.03	0.98	-0.86
26	0.65	0.24	0.56	0.63	0.74	0.07	-0.10	-0.32	-0.35	-0.36	-0.42	-0.63	-0.57	-0.39	-0.50	-0.40	0.06	0.06	-0.14	0.13	0.62	0.78	0.87	1.33	0.11	1.33	-0.63
27	1.42	1.14	1.09	1.53	2.22	1.59	-0.14	-0.10	-0.68	-0.29	-0.31	-0.48	-0.60	-0.16	0.01	-0.05	-0.47	-0.71	-0.45	-0.14	0.54	0.40	0.40	0.49	0.26	2.22	-0.71
28	0.55	0.46	0.23	0.20	0.28	0.19	0.11	-0.03	-0.21	-0.27	-0.43	-0.76	-0.39	-0.44	-0.38	0.12	-0.12	-0.42	0.13	0.37	0.84	0.23	0.32	0.33	0.04	0.84	-0.76
29	0.44	0.53	0.49	0.55	0.17	0.12	-0.09	-0.25	-0.63	-0.78	-0.62	-0.61	-0.85	-0.82	-0.75	-0.80	-0.89	-0.70	-0.37	-0.02	0.74	0.81	1.15	0.94	-0.09	1.15	-0.89
30	1.37	1.78	1.09	1.35	1.01	0.46	-0.18	-0.34	-0.43	-0.37	-0.23	-0.37	-0.54	-0.73	-0.67	-0.67	-0.55	0.62	0.17	0.16	0.11	0.23	0.55	0.71	0.19	1.78	-0.73
Avg	0.69	0.69	0.71	0.74	0.72	0.39	-0.20	-0.33	-0.43	-0.51	-0.60	-0.63	-0.67	-0.63	-0.56	-0.49	-0.35	-0.23	-0.02	0.39	0.66	0.57	0.68	0.68	0.06	1.11	-0.77
Max	1.65	1.78	1.89	1.53	2.22	1.59	0.11	-0.02	0.00	-0.08	-0.23	-0.27	-0.18	-0.09	0.40	0.35	0.38	0.62	0.54	1.44	2.03	1.27	1.68	1.42	0.41	2.22	0.11
Min	-0.07	-0.04	-0.05	-0.06	-0.07	-0.08	-0.57	-0.78	-0.79	-0.81	-1.02	-0.95	-0.96	-1.04	-0.97	-0.97	-0.89	-0.71	-0.45	-0.14	-0.07	-0.02	-0.06	-0.10	-0.19	0.13	-1.04

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Solar Radiation (watts m<sup>2</sup>)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0	0	0	0	0	0	18	82	266	347	468	402	381	574	575	514	468	260	51	0	0	0	0	0	184	575	0
2	0	0	0	0	0	0	37	228	409	596	741	839	875	839	764	634	461	262	49	0	0	0	0	0	281	875	0
3	0	0	0	0	0	1	38	216	378	548	686	828	880	591	301	161	116	81	18	0	0	0	0	0	202	880	0
4	0	0	0	0	0	0	33	236	406	559	771	467	688	688	531	292	165	87	19	0	0	0	0	0	206	771	0
5	0	0	0	0	0	1	37	159	Au	Au	Au	Au	Au	283	192	194	144	41	35	0	0	0	0	0	57	283	0
6	0	0	0	0	0	0	12	71	220	395	519	446	386	427	312	254	161	116	67	0	0	0	0	0	141	519	0
7	0	0	0	0	0	0	27	68	90	132	114	150	97	106	80	96	127	94	9	0	0	0	0	0	50	150	0
8	0	0	0	0	0	0	25	72	174	256	386	708	657	774	624	476	176	74	16	0	0	0	0	0	184	774	0
9	0	0	0	0	0	0	45	80	171	196	318	339	304	232	99	109	65	43	16	0	0	0	0	0	84	339	0
10	0	0	0	0	0	0	7	29	115	246	394	492	584	564	516	360	209	93	37	0	0	0	0	0	152	584	0
11	0	0	0	0	0	0	17	45	90	300	499	428	874	880	829	475	195	58	25	0	0	0	0	0	196	880	0
12	0	0	0	0	0	1	39	58	279	363	721	673	520	412	483	540	383	235	77	1	0	0	0	0	199	721	0
13	0	0	0	0	0	3	29	127	326	427	728	468	765	607	322	198	125	82	16	0	0	0	0	0	176	765	0
14	0	0	0	0	0	3	52	123	291	532	408	695	623	626	461	294	161	94	21	0	0	0	0	0	183	695	0
15	0	0	0	0	0	4	70	246	450	568	424	881	698	922	810	482	210	277	56	1	0	0	0	0	254	922	0
16	0	0	0	0	0	2	29	61	143	212	264	298	317	319	324	424	414	127	14	0	0	0	0	0	123	424	0
17	0	0	0	0	0	12	40	68	96	140	242	446	289	284	596	581	435	256	129	2	0	0	0	0	151	596	0
18	0	0	0	0	0	5	126	298	489	668	795	870	929	869	717	387	376	89	29	1	0	0	0	0	277	929	0
19	0	0	0	0	0	5	54	237	478	296	639	672	473	676	748	366	212	174	90	2	0	0	0	0	213	748	0
20	0	0	0	0	0	2	24	45	93	276	171	241	347	161	241	138	155	34	14	0	0	0	0	0	81	347	0
21	0	0	0	0	0	6	42	98	169	280	454	454	626	469	275	217	283	133	45	8	0	0	0	0	148	626	0
22	0	0	0	0	0	11	140	331	522	489	806	903	921	891	808	675	423	161	45	2	0	0	0	0	297	921	0
23	0	0	0	0	0	2	37	179	244	315	516	719	464	656	789	241	317	109	36	3	0	0	0	0	193	789	0
24	0	0	0	0	0	11	115	165	189	432	495	740	557	993	565	547	433	337	102	8	0	0	0	0	237	993	0
25	0	0	0	0	0	14	149	327	520	629	813	922	872	842	794	603	299	191	61	5	0	0	0	0	293	922	0
26	0	0	0	0	0	6	38	105	208	320	252	333	204	169	229	153	140	78	54	0	0	0	0	0	95	333	0
27	0	0	0	0	0	8	32	49	89	305	254	242	241	178	335	218	113	44	33	2	0	0	0	0	89	335	0
28	0	0	0	0	0	11	96	194	304	439	539	605	591	603	563	500	385	280	90	11	0	0	0	0	217	605	0
29	0	0	0	0	0	21	74	276	404	593	737	791	987	858	708	445	269	163	87	3	0	0	0	0	267	987	0
30	0	0	0	0	0	11	60	151	175	184	146	208	260	307	192	192	154	183	80	6	0	0	0	0	96	307	0
Avg	0	0	0	0	0	5	51	147	269	381	493	561	566	560	493	359	252	142	47	2	0	0	0	0	178	653	0
Max	0	0	0	0	0	21	149	331	522	668	813	922	987	993	829	675	468	337	129	11	0	0	0	0	297	993	0
Min	0	0	0	0	0	0	7	29	89	132	114	150	97	106	80	96	65	34	9	0	0	0	0	0	50	150	0

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Solar Radiation (watts m<sup>2</sup>)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	0	0	0	0	0	20	154	281	463	698	848	941	920	534	646	617	244	155	55	7	0	0	0	0	274	941	0
2	0	0	0	0	0	15	84	108	173	231	230	199	368	376	782	666	461	333	130	12	0	0	0	0	174	782	0
3	0	0	0	0	0	29	187	364	551	711	812	902	938	851	693	630	430	292	87	8	0	0	0	0	312	938	0
4	0	0	0	0	0	22	146	354	543	707	763	744	913	667	621	509	211	115	38	2	0	0	0	0	265	913	0
5	0	0	0	0	0	4	20	52	58	95	134	208	324	367	385	252	135	129	29	2	0	0	0	0	91	385	0
6	0	0	0	0	0	17	80	188	263	326	329	568	704	442	277	356	221	165	62	13	0	0	0	0	167	704	0
7	0	0	0	0	0	29	106	295	465	741	740	551	453	420	242	229	365	213	54	12	0	0	0	0	205	741	0
8	0	0	0	0	0	25	81	100	156	264	140	668	118	224	466	243	281	112	77	4	0	0	0	0	123	668	0
9	0	0	0	0	1	48	164	385	464	771	828	456	456	727	617	526	436	312	134	25	0	0	0	0	265	828	0
10	0	0	0	0	0	34	125	174	332	503	484	375	361	431	294	317	372	188	104	17	0	0	0	0	171	503	0
11	0	0	0	0	1	43	170	383	599	754	786	833	939	902	821	694	537	364	170	27	0	0	0	0	334	939	0
12	0	0	0	0	1	53	189	382	555	723	854	905	828	345	693	661	566	246	79	13	0	0	0	0	296	905	0
13	0	0	0	0	1	89	193	401	576	737	865	947	967	922	844	717	541	290	99	12	0	0	0	0	342	967	0
14	0	0	0	0	2	47	203	382	562	686	733	916	801	695	656	677	367	273	137	36	0	0	0	0	299	916	0
15	0	0	0	0	1	46	166	277	391	725	651	903	892	595	317	282	192	83	22	6	0	0	0	0	231	903	0
16	0	0	0	0	1	41	43	62	60	86	171	423	392	461	450	316	175	93	33	4	0	0	0	0	117	461	0
17	0	0	0	0	0	10	46	100	142	234	166	166	228	136	134	121	115	72	30	6	0	0	0	0	71	234	0
18	0	0	0	0	0	13	37	84	144	213	299	309	361	356	373	300	138	89	46	8	0	0	0	0	115	373	0
19	0	0	0	0	1	64	86	114	115	230	295	249	267	341	196	179	89	50	25	4	0	0	0	0	96	341	0
20	0	0	0	0	0	11	36	92	152	185	185	194	225	406	354	204	140	80	49	12	0	0	0	0	97	406	0
21	0	0	0	0	2	57	194	275	419	497	335	261	302	305	223	223	250	185	68	9	0	0	0	0	150	497	0
22	0	0	0	0	1	40	148	245	308	519	576	683	884	789	648	456	272	247	95	28	0	0	0	0	247	884	0
23	0	0	0	0	5	77	223	400	580	332	398	375	296	221	159	186	103	191	65	10	0	0	0	0	151	580	0
24	0	0	0	0	1	17	58	214	349	590	606	669	798	763	867	735	517	254	86	40	0	0	0	0	274	867	0
25	0	0	0	0	2	40	289	411	275	370	413	483	394	552	374	369	277	159	60	14	0	0	0	0	187	552	0
26	0	0	0	0	1	31	178	158	252	195	208	696	941	500	115	78	35	100	54	27	0	0	0	0	149	941	0
27	0	0	0	0	1	15	38	43	153	306	405	262	256	263	257	326	295	146	42	6	0	0	0	0	117	405	0
28	0	0	0	0	2	28	118	158	203	302	342	675	663	599	825	818	490	309	70	31	1	0	0	0	235	825	0
29	0	0	0	0	5	68	240	427	612	771	897	969	999	972	893	760	596	413	230	66	1	0	0	0	372	999	0
30	0	0	0	0	4	76	240	420	604	756	879	958	988	966	851	728	567	372	251	103	1	0	0	0	365	988	0
31	0	0	0	0	2	41	136	356	523	658	735	911	1003	770	690	93	85	121	38	91	1	0	0	0	261	1003	0
Avg	0	0	0	0	1	37	135	248	356	481	520	594	612	545	508	428	307	198	81	21	0	0	0	0	211	722	0
Max	0	0	0	0	5	89	289	427	612	771	897	969	1003	972	893	818	596	413	251	103	1	0	0	0	372	1003	0
Min	0	0	0	0	0	4	20	43	58	86	134	166	118	136	115	78	35	50	22	2	0	0	0	0	71	234	0

**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Solar Radiation (watts m<sup>2</sup>)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	0	0	0	0	4	66	208	383	562	670	847	934	981	986	853	758	591	422	208	54	1	0	0	0	355	986	0	
2	0	0	0	0	5	80	225	397	573	730	858	941	964	965	879	744	578	381	223	40	2	0	0	0	358	965	0	
3	0	0	0	0	5	85	267	354	588	739	868	940	986	978	738	415	575	408	151	56	2	0	0	0	340	986	0	
4	0	0	0	0	4	81	242	421	605	761	896	872	976	954	883	746	587	408	228	67	2	0	0	0	364	976	0	
5	0	0	0	0	4	75	240	427	607	746	890	964	927	962	882	848	592	364	250	40	1	0	0	0	367	964	0	
6	0	0	0	0	6	92	301	284	495	761	830	651	792	346	33	160	454	316	63	22	1	0	0	0	234	830	0	
7	0	0	0	0	1	12	113	129	243	279	423	282	548	421	392	240	143	73	35	9	0	0	0	0	139	548	0	
8	0	0	0	0	0	6	18	48	115	349	514	411	592	280	260	677	233	173	55	31	1	0	0	0	157	677	0	
9	0	0	0	0	3	69	204	201	401	533	617	522	931	938	720	615	365	317	231	81	2	0	0	0	281	938	0	
10	0	0	0	0	2	36	90	142	125	228	300	644	646	363	609	472	191	118	42	15	0	0	0	0	168	646	0	
11	0	0	0	0	4	47	96	123	212	607	661	793	805	944	865	756	497	424	241	80	3	0	0	0	298	944	0	
12	0	0	0	0	6	87	244	421	599	747	881	1041	944	988	881	734	439	276	175	56	4	0	0	0	355	1041	0	
13	0	0	0	0	6	44	166	342	508	695	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	176	695	0	
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	209	595	0
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	572	595	454	365	200	96	21	1	0	0	0	209	595	0	
16	0	0	0	0	3	32	101	251	564	810	708	697	454	834	425	91	192	282	80	56	2	0	0	0	233	834	0	
17	0	0	0	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	0	0	0	
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	391	551	680	416	111	66	158	59	6	0	0	0	209	680	0	
19	0	0	0	0	7	72	123	287	350	561	499	602	677	648	811	729	463	393	264	76	3	0	0	0	274	811	0	
20	0	0	0	0	7	69	179	220	401	309	505	541	220	306	565	398	86	42	60	14	0	0	0	0	163	565	0	
21	0	0	0	0	2	10	50	138	262	437	492	175	463	418	500	340	120	142	56	13	0	0	0	0	151	500	0	
22	0	0	0	0	1	11	24	30	44	74	252	330	435	283	295	184	207	102	129	27	3	0	0	0	101	435	0	
23	0	0	0	0	6	86	244	323	337	615	625	715	532	408	359	389	224	193	168	40	1	0	0	0	219	715	0	
24	0	0	0	0	4	57	163	132	107	170	288	508	579	677	492	557	545	388	245	87	3	0	0	0	208	677	0	
25	0	0	0	0	5	92	241	426	613	741	784	547	577	519	379	532	536	360	41	10	3	0	0	0	267	784	0	
26	0	0	0	0	11	39	136	374	494	571	554	607	615	559	730	609	205	258	228	97	2	0	0	0	254	730	0	
27	0	0	0	0	5	44	171	198	561	409	400	718	822	347	59	172	468	432	248	83	6	0	0	0	214	822	0	
28	0	0	0	0	1	23	55	197	343	384	535	835	558	611	406	196	287	368	86	37	4	0	0	0	205	835	0	
29	0	0	0	0	5	34	114	299	531	701	813	656	942	766	785	797	617	440	272	127	7	0	0	0	329	942	0	
30	0	0	0	0	4	50	125	191	523	463	312	370	495	567	609	584	507	80	52	16	1	0	0	0	206	609	0	
Avg	0	0	0	0	4	54	159	259	414	542	614	638	687	637	581	504	377	275	151	49	2	0	0	0	246	749	0	
Max	0	0	0	0	11	92	301	427	613	810	896	1041	986	988	883	848	617	440	272	127	7	0	0	0	367	1041	0	
Min	0	0	0	0	0	6	18	30	44	74	252	175	220	280	33	91	86	42	35	9	0	0	0	0	0	0	0	0

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Barometric Pressure (InHg)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	24.41	24.41	24.41	24.40	24.40	24.40	24.40	24.40	24.40	24.41	24.41	24.41	24.41	24.41	24.40	24.39	24.38	24.37	24.37	24.37	24.38	24.38	24.38	24.38	24.40	24.41	24.37	
2	24.38	24.38	24.37	24.37	24.37	24.36	24.36	24.36	24.34	24.33	24.33	24.32	24.30	24.29	24.28	24.26	24.25	24.25	24.24	24.24	24.24	24.24	24.23	24.22	24.30	24.38	24.22	
3	24.22	24.21	24.20	24.20	24.19	24.20	24.21	24.21	24.21	24.21	24.21	24.21	24.21	24.21	24.20	24.21	24.22	24.22	24.22	24.23	24.24	24.25	24.26	24.26	24.22	24.26	24.19	
4	24.27	24.28	24.28	24.28	24.29	24.29	24.30	24.31	24.31	24.31	24.32	24.32	24.31	24.31	24.30	24.30	24.29	24.28	24.27	24.27	24.28	24.28	24.28	24.28	24.29	24.32	24.27	
5	24.28	24.27	24.26	24.25	24.23	24.23	24.23	24.23	Au	Au	Au	Au	Au	24.18	24.18	24.17	24.17	24.16	24.16	24.15	24.15	24.17	24.18	24.17	24.17	24.20	24.28	24.15
6	24.16	24.15	24.14	24.13	24.13	24.14	24.16	24.17	24.17	24.16	24.16	24.17	24.18	24.19	24.20	24.21	24.21	24.21	24.22	24.24	24.24	24.27	24.29	24.29	24.30	24.20	24.30	24.13
7	24.31	24.31	24.30	24.30	24.28	24.27	24.26	24.24	24.24	24.25	24.26	24.27	24.27	24.27	24.26	24.26	24.25	24.26	24.27	24.29	24.30	24.32	24.33	24.34	24.36	24.28	24.36	24.24
8	24.38	24.38	24.37	24.38	24.37	24.39	24.40	24.40	24.41	24.42	24.42	24.42	24.42	24.41	24.40	24.38	24.38	24.37	24.35	24.34	24.33	24.32	24.30	24.27	24.38	24.42	24.27	
9	24.26	24.24	24.22	24.21	24.20	24.17	24.15	24.15	24.15	24.15	24.14	24.13	24.12	24.11	24.12	24.14	24.15	24.17	24.17	24.18	24.19	24.20	24.20	24.20	24.17	24.26	24.11	
10	24.20	24.21	24.20	24.20	24.21	24.22	24.24	24.26	24.27	24.28	24.31	24.31	24.32	24.32	24.32	24.32	24.33	24.33	24.33	24.32	24.32	24.33	24.32	24.31	24.30	24.28	24.33	24.20
11	24.29	24.28	24.26	24.25	24.24	24.24	24.24	24.24	24.24	24.23	24.22	24.21	24.19	24.18	24.17	24.17	24.17	24.17	24.17	24.17	24.18	24.18	24.18	24.18	24.17	24.21	24.29	24.17
12	24.18	24.17	24.17	24.17	24.17	24.18	24.19	24.20	24.21	24.22	24.22	24.21	24.22	24.22	24.23	24.23	24.23	24.23	24.23	24.23	24.23	24.24	24.24	24.24	24.24	24.21	24.24	24.17
13	24.24	24.24	24.25	24.25	24.25	24.25	24.24	24.24	24.25	24.24	24.23	24.21	24.20	24.19	24.17	24.16	24.15	24.13	24.10	24.08	24.08	24.08	24.06	24.04	24.18	24.25	24.04	
14	24.03	24.02	24.01	24.00	24.02	24.02	24.01	24.00	24.01	24.01	24.02	24.02	24.02	24.01	24.00	24.02	24.03	24.03	24.03	24.03	24.04	24.05	24.04	24.05	24.02	24.05	24.00	
15	24.05	24.05	24.05	24.07	24.09	24.10	24.11	24.13	24.13	24.13	24.13	24.13	24.12	24.12	24.11	24.11	24.11	24.12	24.11	24.11	24.13	24.13	24.12	24.12	24.11	24.13	24.05	
16	24.12	24.12	24.11	24.10	24.10	24.11	24.12	24.14	24.14	24.14	24.15	24.16	24.17	24.18	24.20	24.22	24.24	24.26	24.27	24.28	24.30	24.31	24.31	24.32	24.19	24.32	24.10	
17	24.32	24.31	24.32	24.33	24.33	24.33	24.34	24.35	24.35	24.35	24.36	24.35	24.34	24.35	24.35	24.36	24.37	24.38	24.39	24.41	24.43	24.46	24.48	24.50	24.37	24.50	24.31	
18	24.51	24.51	24.51	24.52	24.53	24.54	24.55	24.56	24.56	24.56	24.56	24.55	24.54	24.53	24.52	24.51	24.50	24.49	24.48	24.47	24.47	24.47	24.45	24.44	24.51	24.56	24.44	
19	24.43	24.42	24.42	24.41	24.41	24.41	24.41	24.41	24.40	24.39	24.39	24.36	24.34	24.32	24.29	24.27	24.26	24.24	24.22	24.21	24.22	24.21	24.21	24.21	24.33	24.43	24.21	
20	24.21	24.20	24.20	24.21	24.21	24.21	24.22	24.22	24.21	24.21	24.21	24.20	24.19	24.18	24.17	24.17	24.18	24.20	24.21	24.23	24.26	24.27	24.27	24.29	24.21	24.29	24.17	
21	24.30	24.30	24.31	24.32	24.34	24.36	24.39	24.41	24.42	24.44	24.46	24.48	24.49	24.50	24.50	24.51	24.51	24.52	24.52	24.53	24.54	24.55	24.55	24.55	24.45	24.55	24.30	
22	24.55	24.55	24.54	24.55	24.55	24.56	24.56	24.57	24.56	24.56	24.55	24.55	24.54	24.52	24.50	24.48	24.47	24.46	24.45	24.44	24.44	24.44	24.43	24.43	24.51	24.57	24.43	
23	24.43	24.42	24.41	24.42	24.42	24.42	24.43	24.43	24.42	24.42	24.41	24.39	24.38	24.38	24.37	24.36	24.36	24.36	24.36	24.36	24.37	24.38	24.38	24.37	24.39	24.43	24.36	
24	24.37	24.37	24.36	24.36	24.36	24.36	24.36	24.37	24.36	24.36	24.36	24.35	24.35	24.35	24.35	24.35	24.36	24.37	24.39	24.41	24.42	24.44	24.45	24.47	24.38	24.47	24.35	
25	24.48	24.49	24.51	24.52	24.53	24.53	24.55	24.56	24.55	24.55	24.54	24.53	24.52	24.50	24.49	24.47	24.46	24.44	24.43	24.42	24.42	24.42	24.41	24.40	24.39	24.49	24.56	24.39
26	24.37	24.35	24.34	24.32	24.30	24.28	24.27	24.25	24.25	24.24	24.24	24.24	24.25	24.26	24.26	24.26	24.27	24.27	24.28	24.29	24.32	24.34	24.34	24.34	24.29	24.37	24.24	
27	24.34	24.33	24.31	24.31	24.30	24.28	24.27	24.26	24.23	24.21	24.19	24.16	24.13	24.09	24.05	24.03	24.03	24.07	24.08	24.09	24.11	24.12	24.12	24.11	24.18	24.34	24.03	
28	24.13	24.13	24.13	24.14	24.16	24.18	24.19	24.20	24.21	24.25	24.28	24.32	24.34	24.37	24.40	24.42	24.45	24.47	24.51	24.53	24.56	24.56	24.56	24.56	24.34	24.56	24.13	
29	24.56	24.55	24.53	24.51	24.51	24.50	24.50	24.49	24.45	24.42	24.41	24.39	24.38	24.37	24.37	24.36	24.36	24.37	24.36	24.36	24.37	24.37	24.35	24.34	24.42	24.56	24.34	
30	24.34	24.32	24.31	24.31	24.30	24.29	24.29	24.30	24.31	24.31	24.32	24.32	24.32	24.32	24.32	24.32	24.32	24.32	24.33	24.33	24.35	24.36	24.37	24.38	24.32	24.38	24.29	
Avg	24.30	24.30	24.29	24.29	24.29	24.29	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.29	24.28	24.28	24.28	24.28	24.29	24.29	24.30	24.31	24.30	24.30	24.30	24.30	24.37	24.22
Max	24.56	24.55	24.54	24.55	24.55	24.56	24.56	24.57	24.56	24.56	24.56	24.55	24.54	24.53	24.52	24.51	24.51	24.52	24.52	24.53	24.56	24.56	24.56	24.56	24.51	24.57	24.44	
Min	24.03	24.02	24.01	24.00	24.02	24.02	24.01	24.00	24.01	24.01	24.02	24.02	24.02	24.01	24.00	24.02	24.03	24.03	24.03	24.03	24.04	24.05	24.04	24.04	24.02	24.05	24.00	

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Barometric Pressure (InHg)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	24.38	24.38	24.38	24.38	24.38	24.38	24.39	24.38	24.37	24.37	24.36	24.35	24.33	24.32	24.31	24.31	24.31	24.30	24.30	24.30	24.29	24.28	24.27	24.34	24.39	24.27		
2	24.27	24.26	24.25	24.24	24.23	24.23	24.24	24.24	24.24	24.24	24.24	24.25	24.26	24.26	24.26	24.26	24.27	24.28	24.29	24.30	24.31	24.32	24.32	24.33	24.27	24.33	24.23	
3	24.34	24.34	24.34	24.34	24.34	24.34	24.33	24.34	24.34	24.34	24.34	24.33	24.33	24.32	24.30	24.29	24.29	24.30	24.30	24.31	24.31	24.32	24.31	24.31	24.32	24.34	24.29	
4	24.30	24.29	24.28	24.28	24.27	24.27	24.28	24.29	24.28	24.27	24.26	24.25	24.25	24.25	24.24	24.24	24.23	24.22	24.22	24.23	24.24	24.25	24.26	24.26	24.26	24.30	24.22	
5	24.25	24.24	24.23	24.23	24.23	24.24	24.25	24.26	24.27	24.27	24.28	24.29	24.29	24.29	24.28	24.27	24.27	24.27	24.27	24.27	24.29	24.30	24.31	24.32	24.33	24.27	24.33	24.23
6	24.32	24.32	24.31	24.31	24.32	24.32	24.34	24.35	24.36	24.37	24.38	24.38	24.37	24.37	24.36	24.36	24.36	24.36	24.36	24.36	24.37	24.38	24.39	24.39	24.39	24.36	24.39	24.31
7	24.38	24.36	24.35	24.34	24.33	24.33	24.34	24.35	24.35	24.35	24.34	24.34	24.34	24.34	24.35	24.35	24.36	24.39	24.41	24.42	24.44	24.45	24.46	24.46	24.37	24.46	24.33	
8	24.47	24.47	24.46	24.47	24.48	24.49	24.51	24.52	24.53	24.53	24.54	24.54	24.53	24.53	24.53	24.52	24.52	24.52	24.51	24.51	24.52	24.53	24.53	24.53	24.51	24.54	24.46	
9	24.53	24.53	24.52	24.51	24.50	24.50	24.52	24.52	24.51	24.51	24.51	24.50	24.49	24.48	24.45	24.44	24.42	24.42	24.42	24.42	24.41	24.41	24.39	24.39	24.47	24.53	24.39	
10	24.38	24.38	24.36	24.36	24.35	24.35	24.35	24.36	24.37	24.38	24.38	24.37	24.38	24.38	24.38	24.39	24.39	24.39	24.38	24.39	24.39	24.39	24.39	24.38	24.38	24.39	24.35	
11	24.38	24.38	24.38	24.38	24.38	24.38	24.40	24.41	24.41	24.40	24.39	24.39	24.38	24.37	24.35	24.34	24.33	24.32	24.31	24.30	24.31	24.31	24.31	24.31	24.36	24.41	24.30	
12	24.31	24.29	24.29	24.29	24.28	24.29	24.30	24.30	24.30	24.29	24.28	24.27	24.26	24.26	24.25	24.24	24.24	24.24	24.24	24.24	24.25	24.26	24.27	24.28	24.27	24.27	24.31	24.24
13	24.28	24.28	24.28	24.29	24.29	24.30	24.31	24.31	24.31	24.31	24.30	24.30	24.30	24.30	24.29	24.29	24.28	24.28	24.29	24.30	24.31	24.32	24.34	24.34	24.30	24.34	24.28	
14	24.34	24.33	24.34	24.35	24.35	24.35	24.36	24.36	24.36	24.36	24.36	24.35	24.33	24.32	24.31	24.30	24.29	24.30	24.30	24.29	24.30	24.31	24.30	24.29	24.33	24.36	24.29	
15	24.30	24.30	24.32	24.31	24.30	24.30	24.31	24.32	24.32	24.31	24.31	24.30	24.29	24.28	24.28	24.28	24.28	24.27	24.28	24.28	24.28	24.29	24.29	24.28	24.29	24.32	24.27	
16	24.27	24.26	24.26	24.26	24.25	24.24	24.25	24.25	24.25	24.24	24.23	24.20	24.19	24.18	24.17	24.16	24.15	24.14	24.13	24.15	24.16	24.14	24.14	24.12	24.20	24.27	24.12	
17	24.11	24.09	24.06	24.06	24.06	24.07	24.06	24.06	24.06	24.05	24.04	24.04	24.05	24.07	24.09	24.11	24.12	24.13	24.14	24.14	24.16	24.18	24.18	24.18	24.10	24.18	24.04	
18	24.19	24.19	24.19	24.20	24.21	24.23	24.24	24.25	24.26	24.27	24.28	24.29	24.29	24.30	24.31	24.32	24.32	24.32	24.33	24.34	24.35	24.35	24.35	24.35	24.28	24.35	24.19	
19	24.34	24.33	24.33	24.32	24.32	24.31	24.31	24.31	24.31	24.31	24.30	24.30	24.30	24.30	24.29	24.28	24.28	24.28	24.28	24.28	24.29	24.28	24.28	24.27	24.30	24.34	24.27	
20	24.26	24.25	24.24	24.24	24.23	24.23	24.23	24.22	24.22	24.21	24.21	24.21	24.22	24.21	24.22	24.21	24.21	24.21	24.20	24.19	24.20	24.20	24.20	24.19	24.22	24.26	24.19	
21	24.17	24.17	24.16	24.16	24.15	24.15	24.15	24.15	24.14	24.13	24.13	24.14	24.14	24.13	24.13	24.14	24.15	24.16	24.17	24.18	24.20	24.21	24.22	24.23	24.16	24.23	24.13	
22	24.23	24.24	24.24	24.26	24.27	24.29	24.30	24.30	24.31	24.32	24.33	24.33	24.34	24.36	24.37	24.37	24.37	24.38	24.39	24.40	24.42	24.43	24.44	24.44	24.34	24.44	24.23	
23	24.43	24.43	24.43	24.43	24.42	24.41	24.42	24.42	24.41	24.39	24.38	24.36	24.35	24.34	24.33	24.32	24.31	24.30	24.29	24.28	24.27	24.26	24.25	24.23	24.35	24.43	24.23	
24	24.21	24.19	24.19	24.18	24.18	24.18	24.18	24.18	24.18	24.19	24.18	24.18	24.18	24.18	24.18	24.19	24.20	24.22	24.23	24.25	24.26	24.26	24.27	24.20	24.27	24.18		
25	24.28	24.29	24.29	24.29	24.29	24.29	24.30	24.30	24.30	24.30	24.30	24.30	24.28	24.28	24.27	24.28	24.29	24.29	24.29	24.31	24.32	24.32	24.32	24.31	24.30	24.32	24.27	
26	24.31	24.31	24.31	24.30	24.30	24.31	24.32	24.33	24.33	24.32	24.32	24.32	24.31	24.30	24.33	24.34	24.36	24.35	24.36	24.36	24.37	24.37	24.38	24.37	24.33	24.38	24.30	
27	24.35	24.34	24.34	24.34	24.34	24.34	24.34	24.34	24.34	24.34	24.33	24.32	24.32	24.32	24.32	24.32	24.32	24.32	24.33	24.35	24.35	24.36	24.35	24.35	24.34	24.36	24.32	
28	24.35	24.35	24.35	24.35	24.36	24.37	24.38	24.39	24.40	24.40	24.41	24.40	24.40	24.40	24.39	24.39	24.39	24.39	24.40	24.41	24.41	24.42	24.43	24.43	24.39	24.43	24.35	
29	24.43	24.43	24.42	24.42	24.41	24.42	24.43	24.43	24.43	24.41	24.40	24.39	24.38	24.38	24.37	24.36	24.35	24.35	24.34	24.35	24.36	24.37	24.37	24.37	24.39	24.43	24.34	
30	24.36	24.37	24.37	24.37	24.37	24.38	24.40	24.40	24.40	24.40	24.40	24.40	24.40	24.39	24.38	24.37	24.36	24.37	24.38	24.41	24.42	24.44	24.45	24.46	24.39	24.46	24.36	
31	24.47	24.48	24.48	24.49	24.49	24.50	24.51	24.51	24.51	24.51	24.51	24.49	24.48	24.47	24.46	24.48	24.49	24.48	24.48	24.47	24.47	24.48	24.48	24.48	24.49	24.51	24.46	
Avg	24.32	24.32	24.31	24.31	24.31	24.32	24.32	24.33	24.33	24.33	24.32	24.32	24.31	24.31	24.31	24.31	24.31	24.31	24.31	24.32	24.33	24.33	24.33	24.33	24.32	24.37	24.27	
Max	24.53	24.53	24.52	24.51	24.50	24.50	24.52	24.52	24.53	24.53	24.54	24.54	24.53	24.53	24.53	24.52	24.52	24.52	24.51	24.51	24.52	24.53	24.53	24.53	24.51	24.54	24.46	
Min	24.11	24.09	24.06	24.06	24.06	24.07	24.06	24.06	24.06	24.05	24.04	24.04	24.05	24.07	24.09	24.11	24.12	24.13	24.13	24.14	24.16	24.14	24.14	24.12	24.10	24.18	24.04	

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Barometric Pressure (InHg)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1	24.47	24.46	24.46	24.45	24.45	24.45	24.46	24.46	24.46	24.45	24.44	24.43	24.42	24.40	24.39	24.37	24.36	24.36	24.35	24.36	24.37	24.38	24.38	24.38	24.42	24.47	24.35	
2	24.37	24.37	24.36	24.36	24.36	24.37	24.38	24.37	24.37	24.37	24.36	24.35	24.34	24.33	24.33	24.32	24.31	24.31	24.30	24.31	24.32	24.33	24.34	24.33	24.34	24.38	24.30	
3	24.32	24.32	24.32	24.32	24.32	24.33	24.34	24.34	24.34	24.33	24.33	24.32	24.31	24.30	24.29	24.29	24.29	24.29	24.30	24.31	24.33	24.35	24.36	24.36	24.32	24.36	24.29	
4	24.37	24.38	24.40	24.41	24.42	24.44	24.46	24.46	24.45	24.45	24.45	24.44	24.42	24.41	24.39	24.38	24.37	24.36	24.36	24.38	24.39	24.41	24.41	24.42	24.41	24.46	24.36	
5	24.43	24.43	24.44	24.45	24.45	24.46	24.47	24.47	24.47	24.46	24.45	24.44	24.43	24.42	24.40	24.38	24.37	24.36	24.35	24.34	24.34	24.34	24.34	24.34	24.32	24.41	24.32	
6	24.31	24.29	24.28	24.28	24.28	24.27	24.26	24.25	24.23	24.22	24.21	24.20	24.17	24.13	24.17	24.17	24.12	24.09	24.07	24.09	24.09	24.12	24.16	24.18	24.19	24.31	24.07	
7	24.18	24.18	24.20	24.21	24.22	24.24	24.25	24.25	24.25	24.24	24.24	24.25	24.23	24.23	24.22	24.22	24.24	24.26	24.26	24.29	24.31	24.33	24.34	24.34	24.25	24.34	24.18	
8	24.35	24.36	24.37	24.38	24.39	24.41	24.43	24.44	24.46	24.47	24.49	24.50	24.50	24.50	24.51	24.52	24.52	24.54	24.55	24.57	24.59	24.61	24.62	24.63	24.49	24.63	24.35	
9	24.64	24.65	24.65	24.66	24.67	24.68	24.70	24.71	24.71	24.71	24.71	24.72	24.71	24.71	24.71	24.70	24.69	24.69	24.68	24.68	24.68	24.69	24.69	24.68	24.69	24.72	24.64	
10	24.67	24.66	24.66	24.66	24.65	24.66	24.66	24.65	24.64	24.63	24.62	24.61	24.59	24.58	24.57	24.55	24.55	24.54	24.54	24.55	24.56	24.57	24.57	24.57	24.60	24.67	24.54	
11	24.58	24.59	24.58	24.59	24.61	24.62	24.63	24.64	24.65	24.65	24.65	24.65	24.65	24.64	24.64	24.64	24.64	24.63	24.63	24.64	24.65	24.66	24.66	24.66	24.63	24.66	24.58	
12	24.65	24.65	24.64	24.63	24.63	24.63	24.63	24.62	24.59	24.58	24.56	24.59	24.58	24.56	24.54	24.52	24.50	24.49	24.48	24.47	24.47	24.48	24.47	24.46	24.56	24.65	24.46	
13	24.45	24.44	24.44	24.43	24.43	24.43	24.43	24.43	24.42	24.40	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.43	24.45	24.40	
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	ND	ND	ND	ND	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.44	
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.46	24.45	24.45	24.44	24.44	24.45	24.47	24.48	24.50	24.50	24.49	24.47	24.50	24.44	
16	24.49	24.48	24.48	24.48	24.48	24.49	24.49	24.50	24.49	24.48	24.48	24.47	24.47	24.45	24.45	24.45	24.47	24.48	24.47	24.48	24.50	24.51	24.51	24.51	24.48	24.51	24.45	
17	24.50	24.51	24.51	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.51	24.51	24.50	
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	24.44	24.43	24.42	24.41	24.39	24.39	24.39	24.39	24.40	24.41	24.41	24.41	24.40	24.41	24.44	24.39	
19	24.39	24.38	24.36	24.35	24.34	24.33	24.32	24.32	24.30	24.28	24.27	24.26	24.24	24.24	24.22	24.22	24.22	24.24	24.26	24.28	24.30	24.31	24.31	24.30	24.29	24.39	24.22	
20	24.29	24.27	24.26	24.26	24.26	24.26	24.26	24.24	24.23	24.23	24.22	24.20	24.19	24.21	24.20	24.19	24.20	24.21	24.22	24.24	24.26	24.27	24.27	24.28	24.24	24.29	24.19	
21	24.28	24.28	24.27	24.28	24.30	24.31	24.33	24.33	24.34	24.35	24.35	24.35	24.36	24.37	24.37	24.37	24.37	24.38	24.40	24.42	24.42	24.41	24.41	24.41	24.35	24.42	24.27	
22	24.40	24.40	24.40	24.39	24.40	24.42	24.42	24.44	24.45	24.46	24.47	24.47	24.47	24.46	24.46	24.46	24.45	24.45	24.44	24.45	24.46	24.46	24.47	24.46	24.44	24.47	24.39	
23	24.45	24.45	24.44	24.43	24.42	24.42	24.42	24.42	24.42	24.40	24.39	24.38	24.37	24.36	24.37	24.36	24.35	24.35	24.35	24.34	24.35	24.36	24.35	24.35	24.39	24.45	24.34	
24	24.35	24.34	24.34	24.34	24.34	24.34	24.35	24.36	24.36	24.37	24.38	24.37	24.36	24.35	24.34	24.33	24.33	24.33	24.33	24.33	24.34	24.35	24.36	24.36	24.35	24.38	24.33	
25	24.36	24.36	24.36	24.36	24.36	24.37	24.38	24.38	24.37	24.36	24.36	24.37	24.36	24.35	24.35	24.35	24.34	24.34	24.35	24.40	24.39	24.40	24.40	24.41	24.37	24.41	24.34	
26	24.42	24.41	24.41	24.42	24.43	24.43	24.43	24.43	24.43	24.43	24.42	24.41	24.41	24.40	24.38	24.38	24.39	24.39	24.39	24.41	24.42	24.41	24.41	24.41	24.41	24.41	24.43	24.38
27	24.42	24.42	24.42	24.41	24.40	24.41	24.42	24.42	24.41	24.41	24.41	24.42	24.40	24.38	24.39	24.45	24.45	24.44	24.46	24.47	24.48	24.49	24.51	24.51	24.43	24.51	24.38	
28	24.51	24.54	24.53	24.53	24.53	24.52	24.52	24.54	24.54	24.54	24.54	24.53	24.52	24.52	24.51	24.52	24.52	24.52	24.53	24.54	24.53	24.55	24.56	24.57	24.53	24.57	24.51	
29	24.57	24.57	24.58	24.57	24.56	24.55	24.58	24.59	24.59	24.58	24.58	24.57	24.57	24.56	24.56	24.55	24.55	24.54	24.54	24.55	24.57	24.59	24.59	24.59	24.57	24.59	24.54	
30	24.58	24.58	24.57	24.57	24.58	24.60	24.60	24.61	24.60	24.58	24.58	24.57	24.57	24.56	24.55	24.53	24.52	24.52	24.54	24.56	24.58	24.59	24.59	24.58	24.57	24.61	24.52	
Avg	24.44	24.44	24.43	24.43	24.43	24.44	24.45	24.45	24.44	24.44	24.44	24.44	24.43	24.42	24.41	24.41	24.41	24.41	24.41	24.42	24.43	24.44	24.44	24.44	24.43	24.48	24.38	
Max	24.67	24.66	24.66	24.66	24.67	24.68	24.70	24.71	24.71	24.71	24.71	24.72	24.71	24.71	24.71	24.70	24.69	24.69	24.68	24.68	24.68	24.69	24.69	24.68	24.69	24.72	24.64	
Min	24.18	24.18	24.20	24.21	24.22	24.24	24.25	24.24	24.23	24.22	24.21	24.20	24.17	24.13	24.17	24.17	24.12	24.09	24.07	24.09	24.09	24.12	24.16	24.18	24.19	24.29	24.07	

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Relative Humidity (% RH)**  
**April 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	84.7	87.5	87.5	86.6	86.2	87.1	86.7	82.7	74.6	69.5	70.2	70.4	76.4	62.7	51.5	54.7	59.4	61.7	64.8	66.5	73.3	79.6	82.2	84.2	74.6	87.5	51.5
2	85.9	83.0	86.5	84.4	84.9	84.3	83.1	79.2	67.4	54.2	52.5	37.8	39.7	37.0	39.4	34.6	45.4	48.4	48.4	56.5	58.3	58.5	55.9	58.7	61.0	86.5	34.6
3	63.0	66.7	62.4	61.2	66.1	69.3	71.8	61.4	51.9	50.7	54.6	43.3	45.2	44.3	52.7	53.3	55.4	63.8	70.9	76.0	77.1	79.6	76.5	75.0	62.2	79.6	43.3
4	79.6	81.9	81.4	80.4	83.5	81.9	80.6	71.7	64.9	62.7	56.4	54.9	53.2	54.2	53.1	53.3	49.4	53.6	60.8	68.2	71.7	74.8	75.2	81.0	67.9	83.5	49.4
5	82.5	83.6	87.6	88.7	88.7	89.6	90.1	83.1	Au	Au	Au	Au	Au	57.9	75.8	82.5	80.1	86.9	87.2	90.4	91.5	92.5	92.7	92.9	85.5	92.9	57.9
6	92.7	92.8	92.8	92.5	92.5	92.7	92.9	92.0	85.6	73.1	66.4	65.5	63.9	58.2	52.2	54.3	54.8	51.9	56.4	61.5	63.5	73.6	75.2	73.2	73.8	92.9	51.9
7	73.0	74.1	77.8	78.9	81.3	82.9	74.6	60.5	59.4	63.2	63.9	64.0	67.4	68.0	62.0	58.0	53.2	54.2	69.1	75.9	77.0	73.0	74.6	74.2	69.2	82.9	53.2
8	75.0	78.1	76.9	75.5	76.4	78.4	79.3	81.3	75.7	67.0	69.4	66.8	64.2	62.9	60.1	58.7	63.6	71.9	83.6	86.4	88.6	89.0	88.4	88.7	75.2	89.0	58.7
9	89.0	90.1	91.4	91.7	92.2	92.2	91.5	87.6	88.0	84.8	83.7	81.8	80.9	80.3	84.6	86.5	89.2	88.9	90.6	90.8	91.5	91.3	90.7	91.0	88.3	92.2	80.3
10	91.3	91.5	91.4	91.1	90.6	90.0	87.9	86.9	84.6	80.1	75.7	76.3	75.4	71.0	67.7	67.3	68.9	73.6	76.4	75.3	79.6	83.1	85.6	87.3	81.2	91.5	67.3
11	87.3	87.1	86.7	88.9	89.6	89.8	88.0	81.5	78.8	77.6	70.3	65.8	62.1	60.5	59.4	73.0	74.9	86.4	89.3	90.2	86.0	87.3	88.3	84.8	80.6	90.2	59.4
12	82.7	82.5	82.7	84.2	85.6	85.7	85.9	86.3	78.4	76.9	78.5	79.4	74.6	69.8	57.1	50.9	51.0	56.6	59.6	69.1	79.6	85.9	85.1	84.5	75.5	86.3	50.9
13	83.4	83.3	86.2	87.4	87.7	87.2	86.9	84.4	78.0	68.8	59.8	54.8	50.6	50.6	51.0	51.9	54.3	51.6	58.4	63.6	66.1	68.2	78.8	73.0	69.4	87.7	50.6
14	66.2	67.2	68.4	67.4	77.4	81.6	72.2	66.4	62.6	57.0	52.6	56.4	58.2	45.6	36.0	35.7	36.9	39.2	42.0	46.1	46.9	50.3	53.0	55.3	55.9	81.6	35.7
15	57.4	62.6	66.6	70.3	73.8	74.8	72.8	63.5	61.2	55.6	51.5	47.0	46.3	43.4	41.5	41.5	42.8	38.3	45.7	60.3	63.6	63.9	71.2	75.3	58.0	75.3	38.3
16	77.8	78.1	73.2	61.4	58.1	58.3	55.8	66.4	81.4	79.2	80.9	87.1	87.8	87.9	85.9	84.7	78.1	77.7	81.1	84.4	87.3	89.3	90.7	86.8	78.3	90.7	55.8
17	83.9	81.6	72.5	70.8	73.4	73.9	74.6	77.0	83.5	80.6	73.1	67.9	66.9	74.6	53.6	48.8	47.5	47.3	49.5	54.1	57.8	59.5	66.6	67.1	66.9	83.9	47.3
18	75.5	80.4	82.6	81.3	83.7	85.5	80.2	72.2	61.4	55.6	53.2	49.4	46.5	44.2	41.7	42.6	40.5	44.7	51.9	60.8	69.8	72.9	72.4	72.3	63.4	85.5	40.5
19	76.8	72.2	66.3	53.8	59.0	66.1	59.0	57.5	47.4	47.3	44.2	40.8	38.4	35.9	35.2	36.1	37.6	34.1	35.9	53.4	65.2	69.2	72.9	77.9	53.4	77.9	34.1
20	82.3	86.5	85.1	85.4	85.5	88.8	91.1	91.5	92.6	89.6	87.0	86.8	80.6	78.3	83.5	90.1	86.5	82.4	82.8	87.3	88.5	88.4	89.2	88.5	86.6	92.6	78.3
21	89.2	88.4	88.2	87.8	89.1	90.2	90.1	86.6	82.8	78.1	70.8	63.4	62.4	58.8	61.3	71.4	69.6	69.2	74.1	77.4	80.5	80.8	83.3	86.4	78.3	90.2	58.8
22	88.2	89.1	89.3	89.2	89.0	88.4	83.4	74.5	63.1	56.4	50.5	48.6	47.6	43.9	37.2	33.1	38.3	46.6	51.0	60.4	73.2	77.7	83.4	83.4	66.1	89.3	33.1
23	81.8	81.0	80.3	74.9	66.6	72.6	78.3	65.1	54.0	55.7	51.1	47.7	48.4	45.6	45.8	50.7	51.1	57.4	62.6	61.3	63.2	63.6	65.1	66.6	62.1	81.8	45.6
24	68.6	68.6	68.0	71.5	77.0	81.7	77.2	62.3	56.6	52.2	46.2	35.0	32.1	27.1	26.1	26.8	26.7	26.5	28.9	33.9	46.9	64.2	72.2	76.5	52.2	81.7	26.1
25	78.8	82.5	82.7	83.9	84.2	80.9	76.5	66.5	55.5	52.3	45.4	37.3	34.9	31.2	27.4	26.2	24.4	30.0	48.7	54.0	59.4	62.7	64.6	68.6	56.6	84.2	24.4
26	68.6	67.7	68.2	69.8	74.9	81.8	82.1	73.8	64.1	49.7	45.8	43.1	57.2	66.7	69.5	70.3	81.7	77.7	80.1	90.5	91.6	91.7	91.3	91.2	72.9	91.7	43.1
27	90.7	90.3	90.5	90.0	89.2	89.3	89.9	90.9	88.7	76.4	70.7	72.0	83.9	81.7	72.1	61.6	58.3	76.8	73.3	65.0	66.3	71.9	60.4	53.8	77.2	90.9	53.8
28	57.8	65.6	79.6	80.7	81.6	81.0	79.4	80.1	80.0	78.8	77.6	77.0	77.8	78.1	76.2	75.9	74.1	71.8	71.9	73.3	73.1	77.0	80.1	82.1	76.3	82.1	57.8
29	81.9	82.5	82.0	80.9	78.8	78.2	79.3	77.1	65.3	57.0	58.8	59.0	59.1	58.6	57.2	55.2	56.9	55.5	60.7	73.7	76.8	75.2	74.2	73.9	69.1	82.5	55.2
30	75.1	77.9	79.2	77.4	78.9	81.8	79.5	72.5	71.5	80.3	83.9	78.9	75.2	79.8	84.0	85.1	82.0	69.5	65.1	70.1	79.0	85.0	83.8	82.4	78.2	85.1	65.1
Avg	79.0	80.1	80.5	79.6	80.8	82.2	80.7	76.1	71.0	66.6	63.6	60.6	60.6	58.6	56.7	57.2	57.8	59.8	64.0	69.2	73.1	76.0	77.5	77.9	70.4	86.3	50.1
Max	92.7	92.8	92.8	92.5	92.5	92.7	92.9	92.0	92.6	89.6	87.0	87.1	87.8	87.9	85.9	90.1	89.2	88.9	90.6	90.8	91.6	92.5	92.7	92.9	88.3	92.9	80.3
Min	57.4	62.6	62.4	53.8	58.1	58.3	55.8	57.5	47.4	47.3	44.2	35.0	32.1	27.1	26.1	26.2	24.4	26.5	28.9	33.9	46.9	50.3	53.0	53.8	52.2	75.3	24.4

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Relative Humidity (% RH)**  
**May 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	80.2	79.6	78.7	78.1	77.3	76.7	80.5	77.4	64.4	57.7	51.8	43.0	40.1	39.2	38.5	39.2	40.4	43.3	53.2	59.6	70.5	75.0	78.5	79.9	62.6	80.5	38.5
2	81.8	81.6	82.4	84.9	81.0	68.2	53.3	49.6	49.4	46.4	49.7	53.9	66.4	67.2	60.3	56.9	55.9	58.2	56.3	62.7	75.7	78.2	82.6	85.1	66.2	85.1	46.4
3	85.6	85.9	85.9	85.6	85.2	83.8	77.5	69.6	52.5	49.9	46.3	42.8	39.0	35.5	33.0	29.7	28.7	29.6	32.5	38.8	55.1	60.4	66.4	71.5	57.1	85.9	28.7
4	78.6	79.4	79.3	83.1	84.1	84.5	80.2	64.6	43.3	41.6	39.7	34.1	32.6	33.5	33.2	32.6	34.0	39.7	47.5	54.5	59.6	65.4	74.4	80.6	57.5	84.5	32.6
5	85.5	85.6	87.8	88.7	90.3	90.5	90.1	88.1	86.1	81.5	88.6	87.2	85.7	80.1	75.8	77.9	80.4	83.1	85.6	86.5	86.8	88.5	89.4	85.8	90.5	75.8	
6	88.6	87.7	88.7	89.8	90.5	89.9	86.2	81.9	82.2	80.8	77.2	71.9	66.2	64.6	62.8	58.9	58.6	63.3	72.0	79.1	81.5	84.1	84.1	84.2	78.1	90.5	58.6
7	86.6	88.6	89.2	89.4	90.1	90.2	89.2	76.4	67.9	53.0	48.5	45.4	46.0	47.3	53.5	49.9	46.2	54.4	62.4	62.4	62.4	67.2	67.8	70.9	66.9	90.2	45.4
8	77.5	81.6	86.0	87.8	89.0	88.1	87.2	82.4	71.9	65.3	79.8	83.8	82.1	85.3	74.5	63.7	63.4	62.3	68.1	69.6	78.4	87.4	86.7	86.0	78.7	89.0	62.3
9	82.1	83.7	85.9	87.2	87.9	88.6	81.2	61.6	54.2	46.9	43.4	41.8	38.3	35.1	32.8	31.8	34.2	32.0	37.5	46.0	62.4	70.3	76.7	79.7	59.2	88.6	31.8
10	82.6	84.8	85.3	85.9	85.8	85.4	81.0	75.2	57.5	47.9	59.2	63.5	79.6	81.6	81.6	83.6	75.5	71.8	71.2	73.8	80.0	86.2	87.5	89.2	77.3	89.2	47.9
11	90.2	90.3	90.3	90.6	90.7	90.9	85.4	73.0	56.1	49.2	46.9	42.0	37.7	32.5	30.7	28.0	28.9	31.6	34.3	44.7	60.9	65.3	75.1	76.5	60.1	90.9	28.0
12	82.6	86.4	86.5	87.4	88.8	88.3	80.7	64.4	43.8	37.1	34.3	32.1	30.5	31.0	28.7	27.1	25.8	27.4	31.8	41.0	58.8	68.8	72.1	77.8	55.5	88.8	25.8
13	80.6	81.2	81.9	85.7	87.3	86.0	75.2	54.0	34.0	29.0	24.9	22.5	21.7	20.5	19.9	20.4	19.3	20.3	25.4	37.1	46.6	56.7	70.1	66.2	48.6	87.3	19.3
14	68.0	69.9	75.4	78.4	78.7	79.4	68.7	49.3	33.5	27.1	26.0	25.6	23.9	24.3	26.6	24.3	26.8	35.4	43.1	47.8	55.6	58.6	59.4	62.9	48.7	79.4	23.9
15	69.7	71.0	74.5	80.0	79.4	81.5	69.7	48.6	45.4	37.6	33.3	30.4	30.7	31.6	32.9	34.0	36.4	39.2	59.8	76.1	79.0	78.3	84.6	86.2	57.9	86.2	30.4
16	86.0	85.0	84.1	83.9	81.0	80.9	83.1	84.1	85.7	85.5	84.5	76.7	76.4	78.2	77.8	75.3	79.3	81.6	80.0	82.2	85.1	83.5	85.5	85.9	82.1	86.0	75.3
17	86.6	87.1	84.3	85.6	89.5	90.3	88.2	85.2	85.2	86.3	82.5	79.7	80.2	84.1	85.5	86.5	85.2	86.6	88.4	88.4	88.9	89.8	91.6	92.3	86.6	92.3	79.7
18	92.4	92.1	91.8	92.1	91.9	90.1	89.8	91.1	89.6	89.1	87.0	86.7	84.8	83.4	80.7	78.6	79.0	83.1	84.6	82.9	83.8	80.5	81.5	81.2	86.2	92.4	78.6
19	80.6	79.7	78.8	78.7	77.2	76.6	77.2	78.3	77.3	77.0	73.5	72.0	73.7	73.4	75.5	73.8	73.8	73.1	71.8	73.4	76.6	76.8	74.4	75.5	75.8	80.6	71.8
20	76.1	76.0	75.6	75.4	75.3	75.7	75.0	73.9	73.7	71.6	74.6	73.4	72.5	70.9	65.6	73.4	80.2	81.4	81.4	80.9	81.6	80.0	82.3	83.8	76.3	83.8	65.6
21	83.5	84.8	83.5	82.4	82.3	82.8	73.1	70.6	67.5	66.7	71.6	76.4	74.0	76.9	80.1	85.5	84.0	85.4	87.3	87.5	85.5	86.1	88.2	85.2	80.5	88.2	66.7
22	85.5	82.7	76.0	72.6	76.1	74.9	72.9	65.4	60.2	56.0	49.8	44.7	43.7	44.2	42.2	43.2	43.0	40.0	44.8	49.1	64.9	74.4	76.3	76.2	60.8	85.5	40.0
23	80.6	83.9	88.1	88.6	87.1	84.0	79.4	55.3	35.7	40.4	38.8	36.8	37.5	42.3	50.5	52.2	49.6	52.2	63.8	75.5	78.5	80.7	80.2	80.1	64.2	88.6	35.7
24	82.9	84.2	85.8	87.7	89.4	88.1	88.1	79.8	64.7	52.7	45.8	40.1	37.8	37.5	37.1	39.9	38.9	54.6	59.5	58.0	69.5	77.3	83.3	88.1	65.5	89.4	37.1
25	89.1	87.1	88.4	87.9	88.1	88.4	77.7	63.8	58.6	56.8	50.7	47.3	51.2	47.1	45.5	57.3	56.4	55.4	58.2	65.2	78.4	79.2	80.4	81.1	68.3	89.1	45.5
26	87.0	87.5	88.0	89.5	90.2	90.7	84.9	77.0	71.3	71.0	71.8	63.4	56.9	57.7	65.9	66.4	73.8	81.6	77.5	76.7	77.5	79.3	81.8	86.5	77.2	90.7	56.9
27	84.2	79.0	77.9	78.6	81.1	84.0	83.7	84.4	87.6	73.3	64.7	62.3	61.3	74.5	69.4	66.1	69.5	72.6	72.5	74.2	76.7	82.2	85.3	87.4	76.4	87.6	61.3
28	88.2	88.0	89.2	88.9	87.7	86.2	80.9	76.0	70.0	64.0	65.1	54.1	50.9	46.0	46.9	42.0	40.9	42.3	47.8	53.8	60.9	72.0	77.3	80.1	66.6	89.2	40.9
29	85.9	87.7	85.6	86.3	88.9	88.4	82.9	63.3	46.0	36.5	25.9	26.6	19.9	15.4	13.9	15.9	18.7	18.7	25.1	36.1	39.0	55.4	67.2	76.8	50.3	88.9	13.9
30	83.9	82.4	82.7	82.5	84.2	83.1	69.7	54.9	34.8	32.7	31.2	30.8	28.6	25.0	22.9	20.7	21.3	33.2	39.5	43.2	54.2	63.1	68.4	71.3	51.8	84.2	20.7
31	77.4	80.7	81.1	83.0	83.8	82.0	80.6	67.0	65.1	63.2	60.8	53.5	46.2	47.3	46.2	65.8	79.0	78.9	83.0	80.0	86.8	90.7	90.4	90.0	73.4	90.7	46.2
Avg	82.9	83.4	83.8	84.7	85.2	84.5	79.8	70.5	61.8	57.2	55.7	53.0	52.1	52.0	51.3	51.6	52.5	55.2	59.5	64.1	71.0	75.5	79.0	80.9	67.8	87.5	46.2
Max	92.4	92.1	91.8	92.1	91.9	90.9	90.1	91.1	89.6	89.1	88.6	87.2	85.7	85.3	85.5	86.5	85.2	86.6	88.4	88.4	88.9	90.7	91.6	92.3	86.6	92.4	79.7
Min	68.0	69.9	74.5	72.6	75.3	68.2	53.3	48.6	33.5	27.1	24.9	22.5	19.9	15.4	13.9	15.9	18.7	18.7	25.1	36.1	39.0	55.4	59.4	62.9	48.6	79.4	13.9

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Relative Humidity (% RH)**  
**June 2019**

Day	<< Hour >>																								Avg	Max	Min
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	91.9	92.7	92.8	93.0	93.2	93.3	93.5	86.4	62.0	56.3	50.5	45.4	39.3	34.8	35.9	33.7	31.5	30.0	32.8	43.4	59.2	72.3	75.6	81.6	63.4	93.5	30.0
2	86.6	87.1	90.2	89.3	90.1	89.7	79.3	68.1	50.1	47.1	43.3	37.1	33.9	29.4	29.2	27.5	26.0	27.9	31.5	43.3	52.2	64.7	74.6	78.3	57.4	90.2	26.0
3	86.1	86.9	88.1	89.6	90.4	88.3	76.5	64.0	46.6	44.4	41.5	38.5	33.3	32.5	27.8	29.9	26.9	26.4	29.3	39.8	50.3	55.7	69.4	77.3	55.8	90.4	26.4
4	79.5	83.7	84.5	83.6	86.0	83.8	73.7	57.2	41.9	37.3	37.4	32.8	28.6	31.1	31.2	29.7	28.1	27.7	28.4	32.1	44.5	59.8	73.3	76.0	53.0	86.0	27.7
5	80.3	82.5	81.1	83.7	85.2	80.8	69.6	48.8	30.1	29.7	27.3	25.0	24.2	24.0	24.9	24.5	24.3	24.4	26.2	39.5	54.1	58.2	72.5	75.7	49.9	85.2	24.0
6	79.1	82.9	86.3	86.7	88.1	86.6	63.7	40.2	34.9	29.6	31.6	31.2	25.7	25.5	48.6	58.9	43.7	41.9	50.7	65.4	85.2	85.4	80.6	82.6	59.8	88.1	25.5
7	86.3	88.5	88.3	87.7	87.0	86.3	85.8	81.8	79.2	73.0	68.1	68.4	59.9	53.2	46.2	46.4	47.3	53.6	55.7	52.4	56.8	78.5	83.5	88.8	70.9	88.8	46.2
8	89.9	90.8	91.5	91.9	92.2	92.7	92.3	90.4	87.7	85.9	80.2	73.0	70.7	66.3	75.2	58.7	63.2	82.6	82.6	83.3	87.0	89.5	90.0	90.5	83.3	92.7	58.7
9	91.2	88.7	87.6	89.4	89.3	89.6	85.7	75.6	67.6	61.5	55.8	52.4	47.3	42.4	40.6	36.0	33.7	31.3	32.4	39.7	58.1	72.2	75.9	84.1	63.7	91.2	31.3
10	85.1	87.7	87.2	88.1	86.7	84.6	80.2	70.6	58.2	52.4	47.9	42.9	41.0	41.0	37.8	37.7	38.6	40.3	52.0	55.8	60.2	66.9	69.1	76.2	62.0	88.1	37.7
11	80.2	76.0	79.8	84.7	88.0	89.2	88.4	84.0	74.0	56.1	52.9	48.3	41.2	39.0	34.0	35.0	35.8	37.6	40.4	44.6	57.5	70.7	74.2	78.6	62.1	89.2	34.0
12	82.2	86.8	84.4	88.6	89.2	86.2	76.8	64.0	44.8	40.1	39.8	38.5	37.7	35.8	33.7	33.0	34.0	36.7	38.2	49.0	58.8	66.0	79.4	81.6	58.6	89.2	33.0
13	81.7	83.3	87.4	89.1	90.3	90.1	85.8	69.4	53.6	46.2	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	77.7	90.3	46.2
14	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Au	Au	Au	Au	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw			
15	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	43.7	43.0	47.6	46.8	53.8	56.0	60.5	66.4	70.6	74.0	76.8	58.1	76.8	43.0
16	77.8	81.0	82.7	84.6	84.4	84.8	78.5	72.0	53.1	45.3	46.4	48.9	45.9	45.7	53.3	59.8	73.6	75.5	73.1	76.8	84.8	87.8	87.4	88.1	70.5	88.1	45.3
17	87.8	89.2	88.6	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	88.5	89.2	87.8
18	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	Pw	62.8	64.0	53.1	42.8	38.7	44.6	58.1	61.2	75.9	80.9	84.6	89.5	89.4	65.0	89.5	38.7
19	89.7	91.1	91.2	92.7	92.8	92.9	92.1	80.5	54.0	47.9	45.7	42.1	32.4	31.2	26.9	25.1	24.8	26.2	28.5	37.3	64.0	74.1	78.5	84.5	60.3	92.9	24.8
20	85.9	87.8	89.4	88.9	89.0	84.7	72.0	62.4	58.7	69.1	66.8	56.4	63.0	74.1	64.2	54.3	62.2	80.9	84.6	85.6	86.6	87.6	87.6	88.3	76.3	89.4	54.3
21	89.1	89.7	89.9	90.1	90.9	89.8	88.5	85.4	80.2	73.1	66.0	64.6	59.0	58.1	62.6	57.1	68.2	66.2	78.1	83.9	86.8	89.4	91.3	91.6	78.7	91.6	57.1
22	89.2	87.2	88.3	88.9	89.6	89.1	88.9	89.9	88.1	89.0	82.9	80.7	74.4	77.5	73.6	70.2	61.7	61.3	59.1	61.1	65.0	75.3	78.0	87.5	79.0	89.9	59.1
23	88.7	90.3	91.4	91.5	91.8	92.2	85.0	71.3	60.2	55.9	53.9	52.9	50.0	51.7	55.6	55.2	53.2	54.1	55.3	63.3	71.6	68.5	57.9	60.6	67.6	92.2	50.0
24	69.8	77.2	81.2	84.9	86.8	86.7	82.7	78.3	71.7	76.3	74.2	65.8	61.3	51.9	47.7	42.9	44.2	43.5	43.2	44.7	64.0	77.9	82.8	83.2	67.6	86.8	42.9
25	86.1	87.3	87.4	88.5	89.4	86.2	77.0	59.8	40.4	38.7	38.8	41.0	39.2	36.4	39.1	41.6	37.7	38.1	49.6	79.9	86.6	88.6	91.1	92.0	64.2	92.0	36.4
26	92.1	90.6	90.9	91.6	91.5	91.2	85.1	76.9	54.8	43.6	41.8	40.9	37.8	39.1	39.0	37.7	42.1	51.5	57.7	61.2	66.6	75.4	79.8	80.4	65.0	92.1	37.7
27	84.5	87.8	89.0	89.9	85.8	81.6	78.4	70.1	62.4	57.5	60.9	55.2	48.4	49.1	69.9	81.0	71.3	56.9	66.9	74.1	80.8	79.4	83.1	84.9	72.9	89.9	48.4
28	88.5	89.8	89.4	88.7	89.8	90.3	89.1	69.8	60.3	59.4	57.9	49.9	46.7	40.1	43.1	46.6	54.6	42.1	42.6	49.9	59.8	60.7	63.0	66.3	64.1	90.3	40.1
29	65.7	67.7	71.1	72.3	75.8	77.8	74.3	66.2	46.4	43.0	42.0	42.5	37.9	36.5	35.1	32.9	31.2	30.7	31.2	36.8	44.4	53.7	66.2	69.7	52.1	77.8	30.7
30	78.4	83.2	83.7	87.8	88.7	88.8	82.7	76.2	56.4	54.2	52.5	53.7	49.2	40.6	38.4	31.1	32.4	45.7	61.0	74.7	78.2	71.3	69.9	72.8	64.7	88.8	31.1
Avg	84.2	85.8	86.8	87.9	88.5	87.6	81.8	71.5	58.4	54.3	52.2	49.7	45.8	43.8	44.4	43.4	43.8	46.1	49.9	57.6	67.1	73.5	77.7	81.0	65.1	89.0	40.5
Max	92.1	92.7	92.8	93.0	93.2	93.3	93.5	90.4	88.1	89.0	82.9	80.7	74.4	77.5	75.2	81.0	73.6	82.6	84.6	85.6	87.0	89.5	91.3	92.0	88.5	93.5	87.8
Min	65.7	67.7	71.1	72.3	75.8	77.8	63.7	40.2	30.1	29.6	27.3	25.0	24.2	24.0	24.9	24.5	24.3	24.4	26.2	32.1	44.4	53.7	57.9	60.6	49.9	76.8	24.0

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Precipitation (inches)**  
**May 2019**

Day	<< Hour >>																								Tot	Max				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.10	0.04	0.10	0.04		
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.10	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.02	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.03	0.10	0.03
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.04	0.02	0.04	0.02	0.04	0.02
16	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.00	0.01	0.14	0.07	0.14	0.07	0.14	0.07
17	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.07	0.04	0.03	0.02	0.02	0.05	0.00	0.00	0.00	0.00	0.39	0.12	0.39	0.12	0.39	0.12
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.03	0.02	0.03	0.02
19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tot	0.04	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.04	0.12	0.13	0.09	0.06	0.03	0.04	0.02	0.05	0.02	0.10	0.02	0.05	0.92	0.00	0.92	0.00	0.92	0.00
Max	0.03	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.03	0.10	0.12	0.07	0.04	0.03	0.02	0.02	0.05	0.02	0.07	0.02	0.03	0.39	0.12	0.39	0.12	0.39	0.12

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**Sandfire Resources America Inc.**  
**Black Butte Copper Project Met Tower Air Monitoring Summary**  
**Precipitation (inches)**  
**June 2019**

Day	<< Hour >>																								Tot	Max	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Au	Au	Au	Au	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Tot																											
Max																											

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**APPENDIX B: PERFORMANCE AUDIT REPORTS**  
**SECOND QUARTER 2019**

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# BISON ENGINEERING, INC.

## PRELIMINARY METEOROLOGICAL AUDIT REPORT

Client : Tintina Resources  
SITE : Black Butte

DATE : 06/14/19

Audit Start Time : 11:00 MST      Audit End Time : 14:30 MST  
AUDITOR: Jeff Bell      PRECEDING CALIBRATION BY: Steve Heck

### Temperature

Audit Device : Control Company Digital Thermometer  
Model Number : 4000      Serial Number : 140251289  
Last certified : 06/04/19  
Sensor Make : Climatronics  
Model Number : 100093      Serial Number Upper: P12535      Serial Number Lower: P12535

### Temperature bath results as is

	9m	9m	2m	2m	9m - 2m
Audit Value	DAS Value	DAS Diff.	DAS Value	DAS Diff.	DAS Diff.
	oC	oC	oC	oC	oC
0.22	0.21	-0.01	0.23	0.01	0.02
21.85	21.82	-0.03	21.82	-0.03	0.00
40.76	40.78	0.02	40.78	0.02	0.00

### Wind Direction

Alignment Audit Device :	Nextar	Model Number :	X3-T	Linearity Audit Device :	Climatronics	Model Number :	101966	Serial Number :	72	Setpoint	Linearity Check from DAS (as found)						
Sensor height :	10 Meter	Sensor Make :	Climatronics	Model Number :	102083	Serial Number :	P1336C	0	2.9	2.7	2.9	2.7	6.1	5.9			
Crossarm Orientation :	N-S	Magnetic Declination :	12	Measured Degrees :	0.5	Sensor response aligned with crossarm (as found) :	0.0	30	38.1	35.9	6.1	5.9	60	64.8	64.8	4.8	4.8
Sensor response aligned with crossarm (as left) :	0.0	210	212.7	212.7	2.7	2.7	270	273.6	273.6	3.6	3.6	300	301.9	302.1	1.9	2.1	
	0.0	240	242.7	242.7	2.7	2.7	330	331.2	331.2	1.2	1.2	Max Diff	6.1	5.9			

### Linearity Check from DAS (as left)

Setpoint	Clockwise	Counter-CW	Diff CW	Diff CCW
0	0.1	0.2	0.1	0.2
90	90.6	91.0	0.6	1.0
180	180.0	181.0	0.0	1.0
270	270.7	271.0	0.7	1.0
		Max Diff	0.7	1.0

**Wind Speed**

Audit Device : RYoung  
Model Number : 18811 Serial Number : CA02929  
Last certified : 6/5/19  
Sensor height : 10 Meter  
Sensor Make : Climatronics  
Model Number : 102083 Serial Number : P1336C

**Synchronous motor checks**

Known Value	Audit Value	DAS Station Value	DAS Diff. MPS
0	0.2	0.2	0.0
300	6.7	6.7	0.0
600	13.1	13.1	0.0
990	21.4	21.4	0.0

**Relative Humidity**

Audit Device : Control company Hygrometer  
Model Number : 4185 Serial Number : 61644981  
Last certified : 5/29/19  
Sensor height : 10 Meter  
Sensor Make : Met One  
Model Number : 083E-0-35 Serial Number : P18245

Audit RH %RH	Audit Station RH %RH	Audit Diff %RH
44.9	43.5	-1.4

**Barometric Pressure**

Audit Device : Delta Cal  
Model Number : Delta Cal Serial Number : 999  
Last certified : 05/03/18  
Sensor Make : Climatronics  
Model Number : 102653-G0 Serial Number : 42017

Audit Value In Hg	Station Value In Hg	Audit Diff. In Hg	Bar Pressure was offline at the time of the audit.
NA	NA	#VALUE!	

**Solar Radiation**

Audit Device : Li Cor  
Model Number : LI-200 Serial Number : PY82228  
Last certified : 05/21/15 uA/m<sup>2</sup> : 98.51  
Sensor Make : Met One  
Model Number : 096-1 Serial Number : PY69829

Audit Value w/m2	DAS Station Value w/m2	DAS Diff. %
450	458	1.8

**Precipitation**

Audit Device : Fisher Scientific  
Model Number : S32814A Serial Number : 250 ml  
Last certified : NA  
Sensor Make : Climatronics  
Model Number : 100097-1-G0-H0 Serial Number : N3939  
Opening : 8 Inch  
Bucket Tip : 0.254 MM  
Bucket Tip Volume : 8.24 ML  
Level checked : OK  
Wind Screen in place : OK

Known Value ML	Known Value Bucket Tips	Station Value Bucket Tips	% Diff
250.0	30	28	-7.7
250.0	30	28	-7.7

Signature Site Operator : \_\_\_\_\_

Signature Auditor : \_\_\_\_\_

Note: These preliminary results are subject to appropriate changes following verification of audit equipment, procedures, and calculations.