



**APPENDIX F –
METEOROLOGICAL MONITORING ANNUAL DATA REPORT**



**Annual Data Summary
Pogo Meteorological Monitoring Program**

October 1, 2014 – September 30, 2015

**Sumitomo Metal Mining Pogo LLC
Delta Junction, Alaska**

February 2016



Annual Data Summary

Prepared for:

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This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of the undersigned.



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EXECUTIVE SUMMARY

In 2011, Sumitomo Metal Mining Pogo LLC (Pogo) contracted the services of SLR International Corporation (SLR) to install, operate, and maintain two meteorological monitoring stations for the Pogo Mine near Delta Junction, Alaska. The Pogo Mine is a gold mine which began operation in 2006 with an anticipated project life until the first quarter of 2019. It is located on state land in the upper Goodpaster River valley, located 35 miles northeast of Delta Junction, Alaska. The mine uses conventional underground mining techniques. The mine complex includes a mill, camp facilities, drystack tailings facility (DSTF), recycle water tailings pond (RTP), an airstrip, laydown and fuel storage areas, and a local network of roads.

The primary objective of this monitoring program is to collect meteorological data to support dispersion modeling for any air quality permit applications that may be required for future projects. As a secondary objective, the collected meteorological data may be used to support other environmental studies that may be prepared and have an air quality component. The data may also be used to support facility design and engineering. The meteorological data at both monitoring sites is collected in accordance with Prevention of Significant Deterioration (PSD) requirements and guidance. To meet these objectives, at least 12 contiguous months of PSD-quality meteorological data will be collected following EPA criteria and guidance. This report provides details of meteorological measurements collected during the monitoring year spanning October 1, 2014, through September 30, 2015.

Table E-1 details Quality Assurance Project Plan (QAPP) variations documented for this project during the monitoring period. QAPP variations are explained in more detail in Section 1.3. The Pogo QAPP was approved by ADEC on March 19, 2012. Tables E-2 and E-4 provide monthly valid data capture hours for the Pogo Airstrip (PAR) and Pogo Ridge (PRG) meteorological monitoring stations, respectively. Tables E-3 and E-5 provide monthly percent data capture for the PAR and PRG meteorological monitoring stations, respectively. Any data not meeting QAPP and PSD precision and accuracy criteria were invalidated and are described in Section 2.2.

Table E-1: QAPP Variation Table

Item/Procedure	Summary of QAPP Variation	Reason for the Variation
During the monitoring period, there were no variations from the approved procedures and criteria specified in the Pogo Quality Assurance Project Plan (QAPP).		

Table E-2: PAR Meteorological Data Capture – Valid Hours per Month

Period	Meteorological Parameters – Data Recovery										
	2-M Temp	10-M Temp	Delta Temp	Wind Speed	Wind Direction	Wind Sigma Theta	Precipitation	Solar Radiation	Barometric Pressure	Relative Humidity	Evaporation
October 2014	739	739	739	740	740	740	414 ⁽¹⁾	744	744	744	-(²)
November 2014	720	720	720	720	720	720	720	720	720	720	-(²)
December 2014	744	744	744	744	744	744	744	744	744	744	-(²)
1st Quarter	2,203	2,203	2,203	2,204	2,204	2,204	1,878⁽¹⁾	2,208	2,208	2,208	-(²)
January 2015	744	744	744	744	744	744	744	744	744	744	-(²)
February 2015	672	672	672	672	672	672	672	672	672	672	-(²)
March 2015	744	744	744	744	744	744	744	744	744	744	-(²)
2nd Quarter	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	-(²)
April 2015	719	719	719	719	719	719	719	719	719	719	698
May 2015	739	739	739	739	739	739	739	739	743	743	441 ⁽²⁾
June 2015	720	720	720	720	720	720	720	720	720	720	720
3rd Quarter	2,178	2,178	2,178	2,178	2,178	2,178	2,178	2,178	2,182	2,182	1,859⁽²⁾
July 2015	744	744	744	744	744	744	744	744	744	744	744
August 2015	744	744	744	744	744	744	744	744	744	744	744
September 2015	719	719	719	719	719	719	719	719	719	719	-(²)
4th Quarter	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207	1,488⁽²⁾
Year to Date	8,748	8,748	8,748	8,749	8,749	8,749	8,423	8,753	8,757	8,757	3,347⁽²⁾

¹ Data invalidated due to obstruction in gauge. Precipitation is not a mandatory input for dispersion modeling.

² Data is collected seasonally, dependent on ambient temperatures; data was collected from May 13 through August 31, 2015.

Table E-3: PAR Meteorological Data Capture – Percent Data Capture

Period	Meteorological Parameters – Data Recovery ⁽¹⁾										
	2-M Temp	10-M Temp	Delta Temp	Wind Speed	Wind Direction	Wind Sigma Theta	Precipitation	Solar Radiation	Barometric Pressure	Relative Humidity	Evaporation
October 2014	99	99	99	99	99	99	56 ⁽²⁾	100	100	100	-(3)
November 2014	100	100	100	100	100	100	100	100	100	100	-(3)
December 2014	100	100	100	100	100	100	100	100	100	100	-(3)
1st Quarter	100	100	100	100	100	100	85⁽²⁾	100	100	100	-(3)
January 2015	100	100	100	100	100	100	100	100	100	100	-(3)
February 2015	100	100	100	100	100	100	100	100	100	100	-(3)
March 2015	100	100	100	100	100	100	100	100	100	100	-(3)
2nd Quarter	100	100	100	100	100	100	100	100	100	100	-(3)
April 2015	100	100	100	100	100	100	100	100	100	100	97
May 2015	99	99	99	99	99	99	99	99	100	100	59 ⁽³⁾
June 2015	100	100	100	100	100	100	100	100	100	100	100
3rd Quarter	100	100	100	100	100	100	100	100	100	100	85⁽³⁾
July 2015	100	100	100	100	100	100	100	100	100	100	100
August 2015	100	100	100	100	100	100	100	100	100	100	100
September 2015	100	100	100	100	100	100	100	100	100	100	-(3)
4th Quarter	100	100	100	100	100	100	100	100	100	100	100⁽³⁾
Year to Date	100	100	100	100	100	100	96	100	100	100	93⁽³⁾

¹ EPA PSD-quality meteorological monitoring standards require data capture of 90 percent or greater per quarter for four consecutive quarters.

² Data invalidated due to obstruction in gauge. Precipitation is not a mandatory input for dispersion modeling.

³ Data is collected seasonally, dependent on ambient temperatures; data was collected from May 13 through August 31, 2015.

Table E-4: PRG Meteorological Data Capture – Valid Hours per Month

Period	Meteorological Parameters – Data Recovery									
	2-M Temp	10-M Temp	Delta Temp	Wind Speed	Wind Direction	Wind Sigma Theta	Precipitation	Solar Radiation	Barometric Pressure	Relative Humidity
October 2014	740	740	740	738	738	738	740	730	744	744
November 2014	720	720	720	720	720	720	720	720	720	720
December 2014	744	744	744	744	744	744	744	744	744	744
1st Quarter	2,204	2,204	2,204	2,202	2,202	2,202	2,204	2,194	2,208	2,208
January 2015	744	744	744	744	744	744	744	737	744	744
February 2015	672	672	672	640	640	640	672	647	672	672
March 2015	744	744	744	744	744	744	744	744	744	744
2nd Quarter	2,160	2,160	2,160	2,128	2,128	2,128	2,160	2,128	2,160	2,160
April 2015	718	718	718	718	718	718	718	718	718	718
May 2015	739	739	739	739	739	739	739	742	742	742
June 2015	720	720	720	720	720	720	720	720	720	720
3rd Quarter	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,180	2,180	2,180
July 2015	744	744	744	744	744	744	744	744	744	744
August 2015	744	744	744	744	744	744	744	744	744	744
September 2015	719	719	719	719	719	719	719	719	719	719
4th Quarter	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207	2,207
Year to Date	8,748	8,748	8,748	8,714	8,714	8,714	8,748	8,709	8,755	8,755

Table E-5: PRG Meteorological Data Capture – Percent Data Capture

Period	Meteorological Parameters – Data Recovery ⁽¹⁾									
	2-M Temp	10-M Temp	Delta Temp	Wind Speed	Wind Direction	Wind Sigma Theta	Precipitation	Solar Radiation	Barometric Pressure	Relative Humidity
October 2014	99	99	99	99	99	99	99	98	100	100
November 2014	100	100	100	100	100	100	100	100	100	100
December 2014	100	100	100	100	100	100	100	100	100	100
1st Quarter	100	100	100	100	100	100	100	99	100	100
January 2015	100	100	100	100	100	100	100	99	100	100
February 2015	100	100	100	95	95	95	100	96	100	100
March 2015	100	100	100	100	100	100	100	100	100	100
2nd Quarter	100	100	100	98	98	98	100	98	100	100
April 2015	100	100	100	100	100	100	100	100	100	100
May 2015	99	99	99	99	99	99	99	100	100	100
June 2015	100	100	100	100	100	100	100	100	100	100
3rd Quarter	100	100	100	100	100	100	100	100	100	100
July 2015	100	100	100	100	100	100	100	100	100	100
August 2015	100	100	100	100	100	100	100	100	100	100
September 2015	100	100	100	100	100	100	100	100	100	100
4th Quarter	100	100	100	100	100	100	100	100	100	100
Year to Date	100	100	100	99	99	99	100	99	100	100

¹ EPA PSD-quality meteorological monitoring standards require data capture of 90 percent or greater per quarter for four consecutive quarters.

1. INTRODUCTION

1.1 PROJECT SUMMARY

In 2011, Sumitomo Metal Mining Pogo LLC (Pogo) contracted the services of SLR International Corporation (SLR) to install, operate, and maintain two meteorological monitoring stations for the Pogo Mine near Delta Junction, Alaska. The Pogo Mine is a gold mine which began operation in 2006 with an anticipated project life until first quarter of 2019. It is located on state land in the upper Goodpaster River valley, 35 miles northeast of Delta Junction, Alaska. Figure 1-1 shows a map of the Pogo project area and its location within Alaska. Figure 1-2 is an aerial image showing the Pogo mine site and the airstrip and ridge meteorological stations. The mine uses conventional underground mining techniques.

The primary objective of this monitoring program is to collect meteorological data to support dispersion modeling for any air quality permit applications that may be required for future projects. As a secondary objective, the collected meteorological data may be used to support other environmental studies that may be prepared and have an air quality component. The data may also be used to support facility design and engineering.

The meteorological data at both monitoring sites is collected in accordance with Prevention of Significant Deterioration (PSD) requirements and guidance. To meet these objectives, at least 12 contiguous months of PSD-quality meteorological data will be collected following EPA criteria and guidance. The following meteorological data are collected at both stations:

- Air temperature, two meters above ground (degrees Celsius [°C])
- Air temperature, ten meters above ground (degrees Celsius [°C])
- Wind speed (meters per second [m/s])
- Wind direction (degrees [°])
- Precipitation (mm)
- Incident solar radiation (Watts per square meter [W/m²])
- Barometric pressure (millibar [mb])
- Relative humidity (percent [%])

The meteorological parameters listed above are used to calculate the following concurrent meteorological parameters:

- Vertical temperature difference (ΔT , "Delta T" (degrees Celsius [°C]))
 - $\Delta T = 10 \text{ meter Temperature} - 2 \text{ meter Temperature}$
- Wind direction standard deviation (sigma theta [σ_θ])

The PAR station also collects seasonal evaporation data (millimeters [mm]).

Station operations began to collect PSD quality data for use in dispersion modeling on October 1, 2011. The Pogo Mine Meteorological Monitoring Program Quality Assurance Project Plan was approved by ADEC on March 19, 2012.

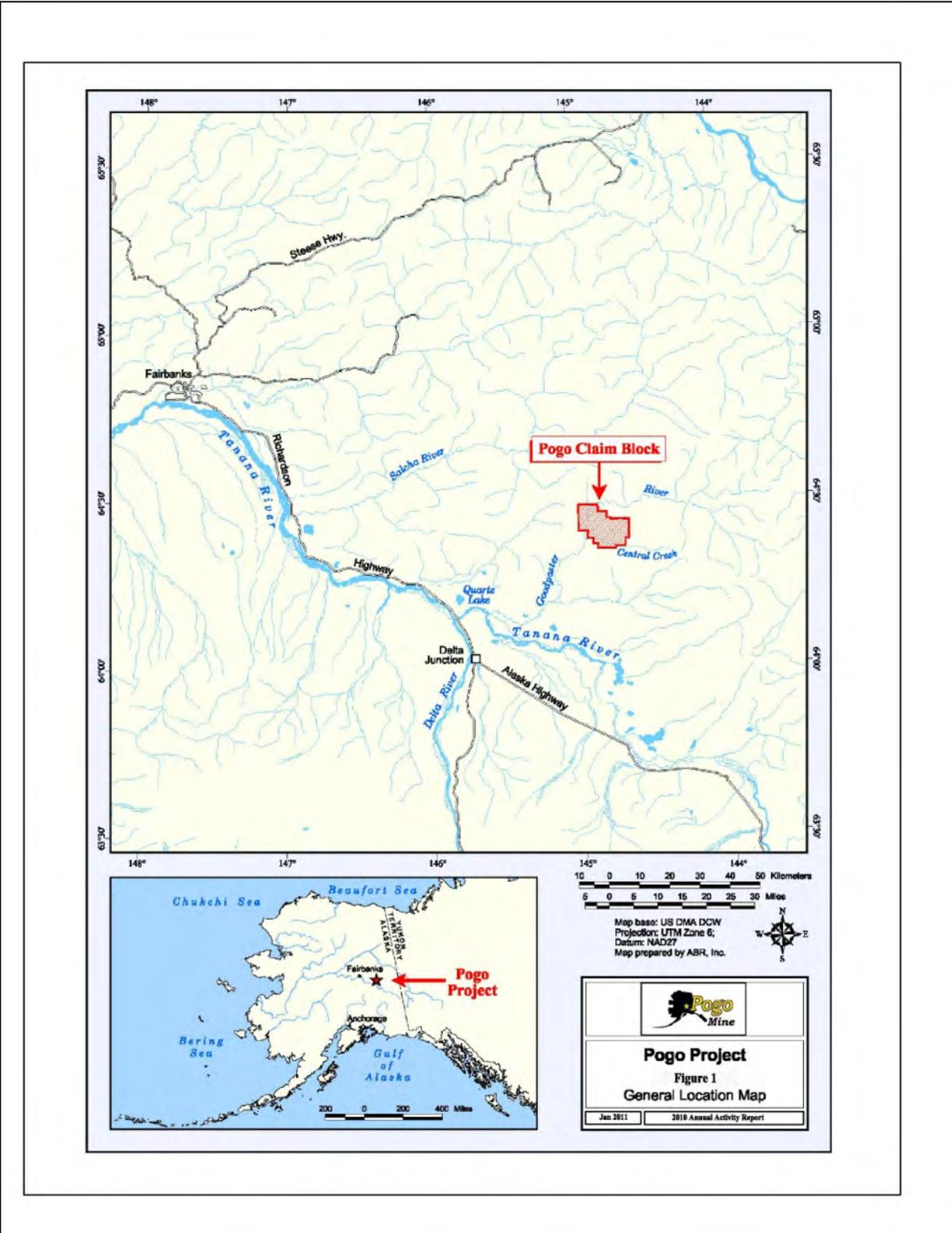


Figure 1-1: Pogo Project Area Map



Figure 1-2: Map of Pogo Mine Site and Station Locations

1.2 MEASUREMENT METHODS TABLE

Table 1-1 lists each meteorological parameter measured at the Pogo meteorological monitoring stations. The table includes the sensor manufacturer and model number, accuracy, sampling frequency, and sample averaging period. All instruments meet or exceed the EPA PSD requirements for range accuracies, thresholds, response times, resolution, damping ratios, and other measures of instrument performance. All data provided in this report came from the primary sensors unless there is a noted substitution of the secondary data set.

Table 1-1: Meteorological Measurement Methods

Meteorological Parameter/ Manufacturer and Model	Measurement Method	Manufacturer Specified Accuracy	EPA Required Accuracy ¹	EPA Required Resolution ¹	Detectability/ Data Completeness ¹	Sampling Frequency	Averaging Period
Wind Speed <i>Primary & Secondary</i> (RM Young 05305-AQ)	Propeller type anemometer	± 0.2 m/s	± 0.2 m/s or ± 5%	0.1 m/s	90% per monitoring quarter	1 second	1 hour
Wind Direction <i>Primary & Secondary</i> (RM Young 05305-AQ)	Precision potentiometer	± 3 degrees	± 5 degrees	1.0 degree	90% per monitoring quarter	1 second	1 hour
Ambient Temperature & Vertical Temperature Difference <i>Primary & Secondary</i> (Climatronics 100093-2)	Triple element thermistor	± 0.1°C	± 0.5°C (Ambient Temperature), ± 0.1°C (Temperature Difference)	0.1°C (Ambient Temperature) 0.02°C (Temperature Difference)	90% per monitoring quarter	1 second	1 hour
Solar Radiation <i>Primary</i> (Kipp & Zonen CMP11)	Thermopile sensing element	±2%	10 W/m ² if interval average ≤200 W/m ² or ±5% of observed if interval average ≥200 W/m ²	10 W/m ²	90% per monitoring quarter ²	1 second	1 hour
Precipitation (NovaLynx 260-2500E)	Tipping bucket mechanism	±1% for rainfall ≤ 3 in/hr, ±3% for rainfall ≥ 3 and ≤ 6 in/hr	±10% or ±0.5 mm	0.3 mm	90% per monitoring quarter ²	Cumulative during precipitation event	NA
Barometric Pressure (Vaisala PTB110)	Silicone capacitive sensor	±0.3 hPa	±3 hPa	0.5 hPa	90% per monitoring quarter ²	1 second	1 hour
Relative Humidity (Rotronics HC2-S3)	Non-condensing, capacitive polymer sensor	±0.8%	±10%	1%	90% per monitoring quarter ²	1 second	1 hour
Evaporation (NovaLynx 255-100)	Float mechanism	±0.25% over 10" range	±10%	NA	90% per monitoring quarter ²	Cumulative	NA

¹ Referenced in *Meteorological Monitoring Guidance for Regulator Modeling Applications* (EPA-454/R-99-005). The 90 percent data completeness requirement applies to each meteorological variable separately and to the joint recovery of wind speed, wind direction and stability.

² The current EPA guideline dispersion model does not require this parameter; therefore, there is no completeness objective. However, every effort is made to achieve data completeness of 90 percent per monitoring quarter.

1.3 VARIATIONS FROM QAPP

There following variations from the approved procedures and criteria specified in the Pogo Monitoring Quality Assurance Project Plan (QAPP) occurred during the monitoring period.

Table 1-2: QAPP Variation Table

Item/Procedure	Summary of QAPP Variation	Reason for the Variation
During the monitoring period, there were no variations from the approved procedures and criteria specified in the Pogo Quality Assurance Project Plan (QAPP).		

2. STATION PERFORMANCE SUMMARY

2.1 SIGNIFICANT PROJECT EVENTS

Tables 2-1 and 2-2 summarize the significant events that occurred at the PAR and PRG meteorological monitoring stations relevant to the monitoring period, respectively.

Table 2-1: Chronology of Significant Events at PAR

Date	Event
October 1, 2014	Beginning of the monitoring year summarized within this report.
October 1 – 14, 2014	Precipitation data invalidated due to an obstruction discovered in the gauge during semi-annual calibrations. Data invalidated back to July 1, 2014 when sensor was clearly working accurately relative to PRG gauge, evaporation data, and nearby National Weather Service data collected in Delta Junction, Alaska.
October 14, 2014	Semi-annual calibrations performed on all meteorological sensors; all passed. Performance audits conducted by AMSTech LLC on all station sensors; all passed.
May 13, 2015	Semi-annual calibrations performed on all meteorological sensors; all passed. Performance audits conducted by AMSTech LLC on all station sensors; all passed. Evaporation pan begins valid seasonal data collection.
August 30, 2015	Evaporation data not valid past this date due to ambient temperatures falling below 0°C.
September 2, 2015	Calibration performed on evaporation sensor; passed. Sensor was decommissioned for the winter months.
September 30, 2015	End of the monitoring year summarized within this report.
October 13, 2015	Semi-annual calibrations performed on all meteorological sensors; all passed. Performance audits conducted by AMSTech LLC on all station sensors; all passed.

Table 2-2: Chronology of Significant Events at PRG

Date	Event
October 1, 2014	Beginning of the monitoring year summarized within this report.
October 15, 2014	Semi-annual calibrations performed on all meteorological sensors; all passed. Performance audits conducted by AMSTech LLC on all station sensors; all passed.
October 26 & 30, 2014	Solar radiation data were invalidated due to measurement error caused by ice accumulation on the sensor. 14 hours of data flagged.
January 19, 2015	Solar radiation data were invalidated due to measurement error caused by ice accumulation on the sensor. 7 hours of data flagged.
February 3, 4, & 5, 2015	Solar radiation data were invalidated due to measurement error caused by ice accumulation on the sensor. 22 hours of data flagged.
February 24 – 25, 2015	Wind data indicated episodes of rime ice build-up on sensor; 32 hours of data flagged invalid.
May 14, 2015	Semi-annual calibrations performed on all meteorological sensors; all passed. Performance audits conducted by AMSTech LLC on all station sensors; all passed.
September 30, 2015	End of the monitoring year summarized within this report.
October 14, 2015	Semi-annual calibrations performed on all meteorological sensors; all passed. Performance audits conducted by AMSTech LLC on all station sensors; all passed.

2.2 MISSING, INVALID AND ADJUSTED DATA

The data for the Pogo meteorological stations were carefully reviewed during the quality assurance process. Some data were removed as a result of planned site activities, including data collected during station system and performance audits and calibrations. Data known or suspected to be invalid have been removed from the data set after verifying that the removed data values do not represent actual ambient air quality conditions at the sampling station. Tables 2-3 and 2-4 present data flagged based on criteria suggested in *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA-454/R-99-005) at the PAR and PRG stations, respectively.

Table 2-3: PAR Station - Percentage of Final Data Set Flagged

Parameter	Flagging Criteria ⁽¹⁾	Percent Flagged
Wind Speed	Value is < 0 m/s or > 25 m/s	0.0%
	< 0.1 m/s variation for three consecutive hours	2.9%
	< 0.5 m/s variation for 12 consecutive hours	0.7%
Wind Direction	Value is < 0°, > 360°	0.0%
	< 1° variation over three consecutive hours	0.0%
	< 10° variation over 18 consecutive hours	0.0%
Temperature (2 meters)	> 5°C variation from previous hour	0.4%
	< 0.5°C variation for 12 consecutive hours	0.2%
	Value is > record high, < record low	0.0%
Temperature (10 meters)	> 5°C variation from previous hour	0.2%
	< 0.5°C variation for 12 consecutive hours	0.3%
	Value is > record high, < record low	0.0%
Temperature Difference, ΔT	Value is > 0.8°C during the daytime	0.1%
	Value is < -0.8°C during the night	0.0%
	Value is > 5°C, < -3°C	0.2%
Solar Radiation	> 0 w/m ² at night	0.0%
	Greater than the maximum possible value for date and latitude	0.1%
Relative Humidity	Value is > ambient temperature	0.0%
	> 5°C variation from previous hour	0.1%
	< 0.5°C variation for 12 consecutive hours	0.8%
	Equals ambient temperature for 12 consecutive hours	0.1%
Barometric Pressure	Value is < 940 mb or > 1060 mb (sea level) ⁽²⁾	2.3%
	> 6 mb variation for three consecutive hours	0.0%
Precipitation	> 25 mm in one hour	0.0%
	> 100 mm in 24 hours	0.0%

¹ Based upon Table 8-4: Suggested Data Screening Criteria in *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA-454/R-99-005).

² Calculated using elevation correction for barometric pressure.

Table 2-4: PRG Station - Percentage of Final Data Set Flagged

Parameter	Flagging Criteria ⁽¹⁾	Percent Flagged
Wind Speed	Value is < 0 m/s or > 25 m/s	0.0%
	< 0.1 m/s variation for three consecutive hours	1.4%
	< 0.5 m/s variation for 12 consecutive hours	0.1%
Wind Direction	Value is < 0°, > 360°	0.0%
	< 1° variation over three consecutive hours	0.0%
	< 10° variation over 18 consecutive hours	0.3%
Temperature (2 meters)	> 5°C variation from previous hour	0.1%
	< 0.5°C variation for 12 consecutive hours	0.4%
	Value is > record high, < record low	0.0%
Temperature (10 meters)	> 5°C variation from previous hour	0.0%
	< 0.5°C variation for 12 consecutive hours	0.4%
	Value is > record high, < record low	0.1%
Temperature Difference, ΔT	Value is > 0.8°C during the daytime	0.7%
	Value is < -0.8°C during the night	0.0%
	Value is > 5°C, < -3°C	0.0%
Solar Radiation	> 0 w/m ² at night	0.0%
	Greater than the maximum possible value for date and latitude	0.3%
Relative Humidity	Value is > ambient temperature	0.0%
	> 5°C variation from previous hour	0.0%
	< 0.5°C variation for 12 consecutive hours	1.2%
	Equals ambient temperature for 12 consecutive hours	0.1%
Barometric Pressure	Value is < 940 mb or > 1060 mb (sea level) ⁽²⁾	0.0%
	> 6 mb variation for three consecutive hours	0.0%
Precipitation	> 25 mm in one hour	0.0%
	> 100 mm in 24 hours	0.0%

¹ Based upon Table 8-4: Suggested Data Screening Criteria in *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA-454/R-99-005).

² Calculated using elevation correction for barometric pressure

2.3 NETWORK DATA COMPLETENESS

Data completeness is a measure of the amount of data actually collected compared to the amount of data that could have been collected. Data completeness was calculated by dividing the number of valid hours of data by the total number of hours during the monitoring period. The data quality objective (DQO) for data completeness for meteorological data is 90 percent for per monitoring quarter.

The Pogo meteorological monitoring stations met all PSD requirements during the 2014 – 2015 monitoring year, with the exception of precipitation and evaporation data collected at the PAR station. Precipitation data collected at the PAR station during the first monitoring quarter were invalidated due to an obstruction discovered within the gauge during semi-annual calibrations. The Evaporation pan did not start collecting data for the season until May 13, 2015 so third quarter DQOs were not met. Quarterly and annual data completeness for the airstrip and ridge monitoring stations are provided in Tables 2-5 and 2-6, respectively. Fully validated data for all parameters are provided in Appendix D.

Table 2-5: PAR Meteorological Data Capture – Percent Data Capture

Period	Meteorological Parameters – Data Recovery ⁽¹⁾										
	2-M Temp ⁽²⁾	10-M Temp ⁽²⁾	Delta Temp ⁽²⁾	Wind Speed	Wind Direction	Wind Sigma Theta	Precipitation	Solar Radiation	Barometric Pressure	Relative Humidity	Evaporation
October 2014	99	99	99	99	99	99	56 ⁽²⁾	100	100	100	_(³)
November 2014	100	100	100	100	100	100	100	100	100	100	_(³)
December 2014	100	100	100	100	100	100	100	100	100	100	_(³)
1st Quarter	100	100	100	100	100	100	85⁽²⁾	100	100	100	_(³)
January 2015	100	100	100	100	100	100	100	100	100	100	_(³)
February 2015	100	100	100	100	100	100	100	100	100	100	_(³)
March 2015	100	100	100	100	100	100	100	100	100	100	_(³)
2nd Quarter	100	100	100	100	100	100	100	100	100	100	_(³)
April 2015	100	100	100	100	100	100	100	100	100	100	97
May 2015	99	99	99	99	99	99	99	99	100	100	59 ⁽³⁾
June 2015	100	100	100	100	100	100	100	100	100	100	100
3rd Quarter	100	100	100	100	100	100	100	100	100	100	85⁽³⁾
July 2015	100	100	100	100	100	100	100	100	100	100	100
August 2015	100	100	100	100	100	100	100	100	100	100	100
September 2015	100	100	100	100	100	100	100	100	100	100	_(³)
4th Quarter	100	100	100	100	100	100	100	100	100	100	100⁽³⁾
Year to Date	100	100	100	100	100	100	96	100	100	100	93⁽³⁾

¹ EPA PSD-quality meteorological monitoring standards require data capture of 90 percent or greater per quarter for four consecutive quarters.

² Data invalidated due to obstruction in gauge. Precipitation is not a mandatory input for dispersion modeling.

³ Data is collected seasonally, dependent on ambient temperatures; data was collected from May 13 through August 31, 2015.

Table 2-6: PRG Meteorological Data Capture – Percent Data Capture

Period	Meteorological Parameters – Data Recovery ¹									
	2-M Temp	10-M Temp	Delta Temp	Wind Speed	Wind Direction	Wind Sigma Theta	Precipitation	Solar Radiation	Barometric Pressure	Relative Humidity
October 2014	99	99	99	99	99	99	99	98	100	100
November 2014	100	100	100	100	100	100	100	100	100	100
December 2014	100	100	100	100	100	100	100	100	100	100
1st Quarter	100	100	100	100	100	100	100	99	100	100
January 2015	100	100	100	100	100	100	100	99	100	100
February 2015	100	100	100	95	95	95	100	96	100	100
March 2015	100	100	100	100	100	100	100	100	100	100
2nd Quarter	100	100	100	98	98	98	100	98	100	100
April 2015	100	100	100	100	100	100	100	100	100	100
May 2015	99	99	99	99	99	99	99	100	100	100
June 2015	100	100	100	100	100	100	100	100	100	100
3rd Quarter	100	100	100	100	100	100	100	100	100	100
July 2015	100	100	100	100	100	100	100	100	100	100
August 2015	100	100	100	100	100	100	100	100	100	100
September 2015	100	100	100	100	100	100	100	100	100	100
4th Quarter	100	100	100	100	100	100	100	100	100	100
Year to Date	100	100	100	99	99	99	100	99	100	100

¹ EPA PSD-quality meteorological monitoring standards require data capture of 90 percent or greater per quarter for four consecutive quarters.

2.4 ACCURACY STATISTICS

The meteorological monitoring systems are subjected to periodic calibrations and quality assurance performance audits. All calibration and audit equipment are documented as traceable to authoritative standards. The purpose of these calibration and audit checks is to challenge the monitoring systems with known inputs or collocate traceable authoritative standards with them to verify that each instrument response is accurate to within established tolerances.

2.4.1 INSTRUMENT CALIBRATION STATISTICS

A station calibration involves reading the data acquisition system (DAS) output for each meteorological sensor and comparing the value with input from appropriate calibration equipment or from calibrated instruments collocated with the sensor. For each reading, the difference between the station value and the predicted value is compared with established PSD limits to assess the accuracy of the sensor. The results of the station calibrations are presented below in Tables 2-7 through 2-12.

Table 2-7: October 14, 2014 PAR Meteorological Calibration Summary

Parameter	Limit	Units	Max Error	Status
Time	$\leq \pm 5$	mm:ss	01:10	Pass
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	0.32	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	0.32	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	0.03	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 1.0	g-cm	0.2	Pass
Wind Direction Alignment	$\leq \pm 5$	Degree	3.0	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	1.6	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	1.3	Pass
Wind Direction Torque	≤ 11.0	g-cm	5.0	Pass
Barometric Pressure	≤ 3.0	mb	1.9	Pass
Relative Humidity (dew point)	≤ 1.5	°C	0.5	Pass
Precipitation	$\leq \pm 10$	% input	4.6	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	2.3	Pass

Table 2-8: May 13, 2015 PAR Meteorological Calibration Summary

Parameter	Limit	Units	Max Error	Status
Time	≤ ±5	mm:ss	-01:07	Pass
2-m Temperature Accuracy	≤ ±0.50	°C	-0.32	Pass
10-m Temperature Accuracy	≤ ±0.50	°C	-0.32	Pass
Air Temperature Difference	≤ ±0.10	°C	-0.07	Pass
Wind Speed Accuracy	≤ ±0.20 ± 5% known input	m/s	0.00	Pass
Wind Speed Torque	≤ 1.0	g-cm	0.2	Pass
Wind Direction Alignment	≤ ±5	Degree	1.7	Pass
Wind Direction Accuracy	≤ ±5	Degree	1.2	Pass
Wind Direction Linearity	≤ ±3	Degree	1.6	Pass
Wind Direction Torque	≤ 11.0	g-cm	6.0	Pass
Barometric Pressure	≤ 3.0	mb	0.4	Pass
Relative Humidity (dew point)	≤ 1.5	°C	1.12	Pass
Precipitation	≤ ±10	% input	8.3	Pass
Evaporation	≤ ±10	% input	7.1	Pass
Solar Radiation Accuracy	≤ ±10	W/m ²	0.6	Pass

Table 2-9: October 13, 2015 PAR Meteorological Calibration Summary

Parameter	Limit	Units	Max Error	Status
Time	≤ ±5	mm:ss	-0:06	Pass
2-m Temperature Accuracy	≤ ±0.50	°C	-0.11	Pass
10-m Temperature Accuracy	≤ ±0.50	°C	-0.11	Pass
Air Temperature Difference	≤ ±0.10	°C	-0.05	Pass
Wind Speed Accuracy	≤ ±0.20 ± 5% known input	m/s	0.00	Pass
Wind Speed Torque	≤ 1.0	g-cm	0.4	Pass
Wind Direction Alignment	≤ ±5	Degree	2.0	Pass
Wind Direction Accuracy	≤ ±5	Degree	1.7	Pass
Wind Direction Linearity	≤ ±3	Degree	2.0	Pass
Wind Direction Torque	≤ 11.0	g-cm	6.0	Pass
Barometric Pressure	≤ 3.0	mb	2.1	Pass
Relative Humidity (dew point)	≤ 1.5	°C	0.31	Pass
Precipitation	≤ ±10	% input	5.4	Pass
Evaporation ⁽¹⁾	≤ ±10	% input	3.0	Pass
Solar Radiation Accuracy	≤ ±10	W/m ²	2.9	Pass

¹ Calibration performed on September 2, 2015.

Table 2-10: October 15, 2013 PRG Meteorological Calibration Summary

Parameter	Limit	Units	Max Error	Status
Time	$\leq \pm 5$	mm:ss	-01:19	Pass
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.26	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	0.26	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.06	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 1.0	g-cm	0.2	Pass
Wind Direction Alignment	$\leq \pm 5$	Degree	0.0	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	1.7	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	1.7	Pass
Wind Direction Torque	≤ 11.0	g-cm	6.0	Pass
Barometric Pressure	≤ 3.0	mb	1.4	Pass
Relative Humidity (dew point)	≤ 1.5	°C	0.5	Pass
Precipitation	$\leq \pm 10$	% input	-7.7	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	1.1	Pass

Table 2-11: May 14, 2015 PRG Meteorological Calibration Summary

Parameter	Limit	Units	Max Error	Status
Time	$\leq \pm 5$	mm:ss	-01:14	Pass
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.46	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.43	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	0.07	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 1.0	g-cm	0.3	Pass
Wind Direction Alignment	$\leq \pm 5$	Degree	3.2	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	1.5	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	1.1	Pass
Wind Direction Torque	≤ 11.0	g-cm	6.0	Pass
Barometric Pressure	≤ 3.0	mb	0.4	Pass
Relative Humidity (dew point)	≤ 1.5	°C	1.44	Pass
Precipitation	$\leq \pm 10$	% input	2.2	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	0.0	Pass

Table 2-12: October 14, 2015 PRG Meteorological Calibration Summary

Parameter	Limit	Units	Max Error	Status
Time	$\leq \pm 5$	mm:ss	00:04	Pass
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.29	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.30	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.06	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 1.0	g-cm	0.2	Pass
Wind Direction Alignment	$\leq \pm 5$	Degree	-3.0	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	1.3	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	1.3	Pass
Wind Direction Torque	≤ 11.0	g-cm	6.0	Pass
Barometric Pressure	≤ 3.0	mb	0.5	Pass
Relative Humidity (dew point)	≤ 1.5	°C	1.21	Pass
Precipitation	$\leq \pm 10$	% input	-7.7	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	5.6	Pass

2.4.2 INDEPENDENT QUALITY ASSURANCE AUDITS

Performance audits were performed at the Pogo monitoring stations on October 14 and 15, 2014, May 13 and 14, 2015, and October 13 and 14, 2015. The meteorological performance audit involves challenging the sensors with known inputs or by using calibrated instruments collocated with the sensor. For each reading, the difference between the station value and the expected value is compared with established PSD limits to assess the accuracy of the sensor. The results of the meteorological analyzer performance audits are presented in Tables 2-13 through 2-18. All meteorological sensors met meteorological audit acceptance criteria.

EPA recommends that a technical systems audit (TSA) be conducted to serve as a qualitative review of all aspects of a monitoring program. The systems audit includes a review of the program plan, station site, facilities, equipment, personnel, procedures, record keeping, data validation and data reporting. An annual TSA was performed in December 2014 for the Pogo monitoring stations. The audit indicated that the monitoring project is well-planned and properly sited according to criteria recommended by the EPA. Appendix C contains the complete technical systems audit report.

Table 2-13: October 14, 2014 PAR Performance Audit Summary

Parameter	Limit	Units	Max Error	Status
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	0.40	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	0.40	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.03	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 0.50	m/s	0.23	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	1	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	-2	Pass
Wind Direction Torque	≤ 0.50	m/s	0.37	Pass
Barometric Pressure	≤ 3.0	mb	0.8	Pass
Relative Humidity	≤ 7.0	% RH	1.6	Pass
Precipitation	$\leq \pm 10$	% input	6.2	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	-5.0	Pass

Table 2-14: May 13, 2015 PAR Performance Audit Summary

Parameter	Limit	Units	Max Error	Status
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.11	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.14	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.07	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 0.50	m/s	0.16	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	1	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	2	Pass
Wind Direction Torque	≤ 0.50	m/s	0.33	Pass
Barometric Pressure	≤ 3.0	mb	0.9	Pass
Relative Humidity	≤ 7.0	% RH	0.4	Pass
Precipitation	$\leq \pm 10$	% input	6.4	Pass
Evaporation	$\leq \pm 10$	% input	-2.6	Pass
Solar Radiation Accuracy	$\leq \pm 5$	% input	-0.4	Pass

Table 2-15: October 13, 2015 PAR Performance Audit Summary

Parameter	Limit	Units	Max Error	Status
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.08	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.11	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.05	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 0.50	m/s	0.32	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	2	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	-2	Pass
Wind Direction Torque	≤ 0.50	m/s	0.40	Pass
Barometric Pressure	≤ 3.0	mb	1.3	Pass
Relative Humidity	≤ 7.0	% RH	1.4	Pass
Precipitation	$\leq \pm 10$	% input	4.3	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	-2.3	Pass

Table 2-16: October 15, 2014 PRG Performance Audit Summary

Parameter	Limit	Units	Max Error	Status
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.23	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.21	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.06	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 0.50	m/s	0.23	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	3	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	3	Pass
Wind Direction Torque	≤ 0.50	m/s	0.40	Pass
Barometric Pressure	≤ 3.0	mb	0.5	Pass
Relative Humidity	≤ 7.0	% RH	1.7	Pass
Precipitation	$\leq \pm 10$	% input	-5.3	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	1.0	Pass

Table 2-17: May 14, 2015 PRG Performance Audit Summary

Parameter	Limit	Units	Max Error	Status
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.07	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.07	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.07	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 0.50	m/s	0.23	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	3	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	1	Pass
Wind Direction Torque	≤ 0.50	m/s	0.46	Pass
Barometric Pressure	≤ 3.0	mb	-0.2	Pass
Relative Humidity	≤ 7.0	% RH	1.2	Pass
Precipitation	$\leq \pm 10$	% input	-1.2	Pass
Solar Radiation Accuracy	$\leq \pm 5$	% input	2	Pass

Table 2-18: October 14, 2015 PRG Performance Audit Summary

Parameter	Limit	Units	Max Error	Status
2-m Temperature Accuracy	$\leq \pm 0.50$	°C	0.04	Pass
10-m Temperature Accuracy	$\leq \pm 0.50$	°C	-0.09	Pass
Air Temperature Difference	$\leq \pm 0.10$	°C	-0.06	Pass
Wind Speed Accuracy	$\leq \pm 0.20 \pm 5\%$ known input	m/s	0.00	Pass
Wind Speed Torque	≤ 0.50	m/s	0.23	Pass
Wind Direction Accuracy	$\leq \pm 5$	Degree	-3	Pass
Wind Direction Linearity	$\leq \pm 3$	Degree	2	Pass
Wind Direction Torque	≤ 0.50	m/s	0.46	Pass
Barometric Pressure	≤ 3.0	mb	-0.6	Pass
Relative Humidity	≤ 7.0	% RH	3.8	Pass
Precipitation	$\leq \pm 10$	% input	-5.3	Pass
Solar Radiation Accuracy	$\leq \pm 10$	W/m ²	1.0	Pass

3. MONITORING DATA NETWORK SUMMARY

3.1 AIR QUALITY DATA SUMMARY

Not applicable.

3.2 METEOROLOGICAL DATA SUMMARY

3.2.1 WIND SPEED (WS) AND WIND DIRECTION (WD) CLIMATOLOGY

Tables 3-1 and 3-7 provide the mean and maximum hourly wind speeds measured at the Pogo airstrip and ridge stations, respectively. The mean and maximum hourly wind speeds at the nearby Allen Army Airfield in Delta Junction, Alaska are included as well for comparison purposes. The Allen Army Airfield is located approximately 40 miles southwest of the Pogo monitoring stations. Figures 3-1 through 3-4 provide quarterly and annual wind roses for the Pogo meteorological stations for the 2014-2015 monitoring year. Tables 3-2 through 3-6 and Table 3-8 through 3-12 provide corresponding wind rose analysis tables. Figure 3-5 provides the wind roses superimposed over a Pogo Mine area map, each centered at the approximate location of the respective monitoring stations.

Table 3-1: Average & Maximum Wind Speeds at PAR

Monitoring Period	Mean Hourly Average Wind Speed at the Airstrip Station (m/s)	Mean Hourly Average Wind Speed at the Allen Army Airfield (m/s)	Maximum Hourly Average Wind Speed at the Airstrip Station (m/s)	Maximum Hourly Average Wind Speed at the Allen Army Airfield (m/s)
1 st Quarter	2.48	4.8	9.48	18.5
2 nd Quarter	2.11	4.8	10.58	19.5
3 rd Quarter	1.88	4.3	6.65	17.0
4 th Quarter	1.44	3.3	6.08	15.4
Year to Date	1.98	4.3	10.58	19.5

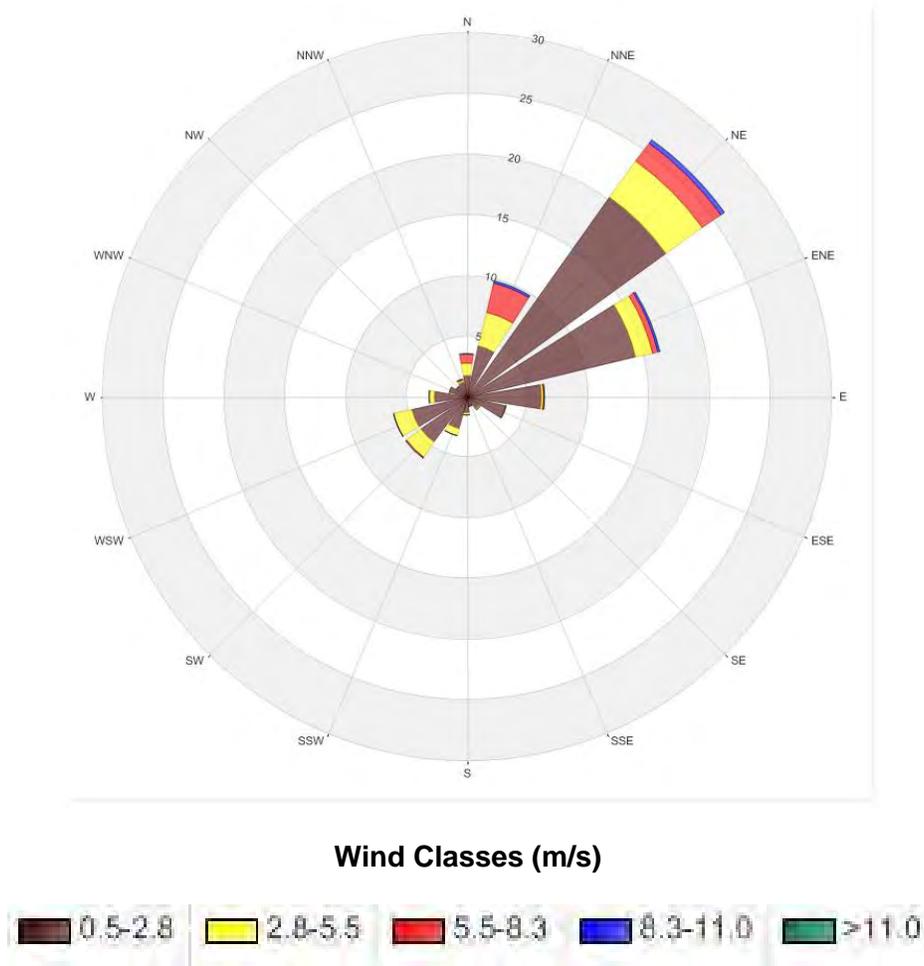
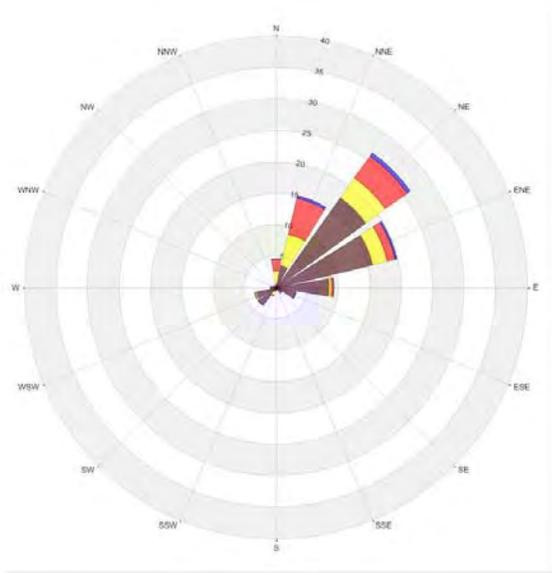
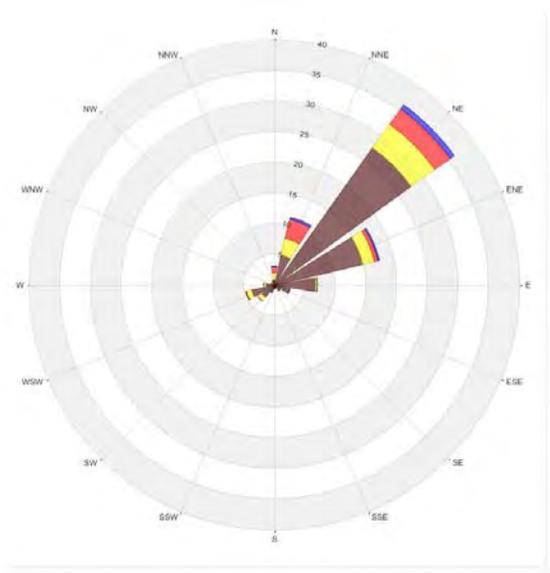


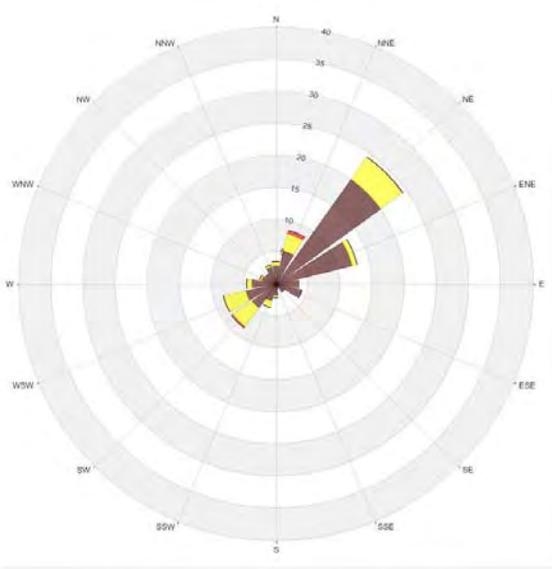
Figure 3-1: PAR Annual Wind Rose



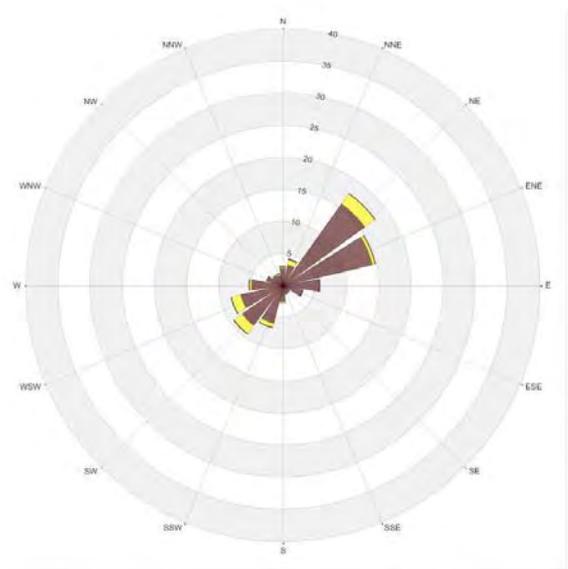
1st Quarter (10/1/14 – 12/31/14)



2nd Quarter (1/1/15 – 3/31/15)



3rd Quarter (4/1/15 – 6/30/15)



4th Quarter (7/1/15 – 9/30/15)

Wind Classes (m/s)



Figure 3-2: PAR Quarterly Wind Roses

Table 3-2: PAR Annual Wind Rose Frequency Distribution Percentage

Frequency Distribution (Percent)						
Direction	Speed (m/s)					Total
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	1.76	1.01	0.75	0.01	0.00	3.53
NNE	4.31	2.86	2.47	0.18	0.00	9.82
NE	20.21	3.69	1.86	0.33	0.00	26.09
ENE	14.30	1.42	0.49	0.11	0.00	16.32
E	6.14	0.19	0.08	0.00	0.00	6.41
ESE	3.33	0.01	0.00	0.00	0.00	3.34
SE	1.31	0.05	0.00	0.00	0.00	1.36
SSE	0.86	0.01	0.00	0.00	0.00	0.87
S	1.39	0.17	0.00	0.00	0.00	1.56
SSW	2.75	0.61	0.00	0.00	0.00	3.36
SW	4.63	1.49	0.09	0.00	0.00	6.21
WSW	4.67	1.53	0.02	0.00	0.00	6.22
W	2.73	0.40	0.00	0.00	0.00	3.13
WNW	1.39	0.15	0.00	0.00	0.00	1.54
NW	1.03	0.06	0.00	0.00	0.00	1.09
NNW	1.26	0.19	0.01	0.00	0.00	1.46
Summary	72.07	13.84	5.77	0.63	0.00	92.31⁽¹⁾

¹ The remaining 7.69 percent of data are calms (< 0.5 m/s).

Table 3-3: PAR First Quarter Wind Rose Frequency Distribution Percentage

Frequency Distribution (Percent)						
Direction	Speed (m/s)					Total
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	0.59	2.09	1.91	0.00	0.00	4.59
NNE	3.58	5.17	5.94	0.36	0.00	15.05
NE	17.65	3.86	4.31	0.50	0.00	26.32
ENE	15.83	2.45	1.32	0.23	0.00	19.83
E	8.48	0.45	0.27	0.00	0.00	9.20
ESE	3.31	0.05	0.00	0.00	0.00	3.36
SE	1.13	0.05	0.00	0.00	0.00	1.18
SSE	0.50	0.00	0.00	0.00	0.00	0.50
S	0.45	0.09	0.00	0.00	0.00	0.54
SSW	0.73	0.64	0.00	0.00	0.00	1.37
SW	3.54	0.00	0.00	0.00	0.00	3.54
WSW	3.27	0.23	0.00	0.00	0.00	3.50
W	0.91	0.00	0.00	0.00	0.00	0.91
WNW	0.36	0.00	0.00	0.00	0.00	0.36
NW	0.23	0.09	0.00	0.00	0.00	0.32
NNW	0.14	0.05	0.00	0.00	0.00	0.19
Summary	60.70	15.22	13.75	1.09	0.00	90.76⁽¹⁾

¹ The remaining 9.24 percent of data are calms (< 0.5 m/s).

Table 3-4: PAR Second Quarter Wind Rose Frequency Distribution Percentage

Direction	Frequency Distribution (Percent)					Total
	Speed (m/s)					
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	0.88	1.11	1.02	0.05	0.00	3.06
NNE	5.05	2.78	3.24	0.37	0.00	11.44
NE	27.55	4.77	3.06	0.83	0.00	36.21
ENE	14.81	1.94	0.65	0.23	0.00	17.63
E	6.85	0.19	0.05	0.00	0.00	7.09
ESE	2.64	0.00	0.00	0.00	0.00	2.64
SE	1.20	0.00	0.00	0.00	0.00	1.20
SSE	0.65	0.00	0.00	0.00	0.00	0.65
S	0.69	0.05	0.00	0.00	0.00	0.74
SSW	1.30	0.09	0.00	0.00	0.00	1.39
SW	2.55	0.74	0.05	0.00	0.00	3.34
WSW	3.80	0.88	0.09	0.00	0.00	4.77
W	1.39	0.37	0.00	0.00	0.00	1.76
WNW	0.46	0.05	0.00	0.00	0.00	0.51
NW	0.23	0.05	0.00	0.00	0.00	0.28
NNW	0.51	0.14	0.05	0.00	0.00	0.70
Summary	70.56	13.16	8.21	1.48	0.00	93.41⁽¹⁾

¹ The remaining 6.59 percent of data are calms (< 0.5 m/s).

Table 3-5: PAR Third Quarter Wind Rose Frequency Distribution Percentage

Direction	Frequency Distribution (Percent)					Total
	Speed (m/s)					
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	2.89	0.55	0.09	0.00	0.00	3.53
NNE	5.28	2.75	0.55	0.00	0.00	8.58
NE	20.06	4.22	0.09	0.00	0.00	24.37
ENE	12.21	0.83	0.00	0.00	0.00	13.04
E	3.44	0.14	0.00	0.00	0.00	3.58
ESE	4.13	0.00	0.00	0.00	0.00	4.13
SE	1.65	0.00	0.00	0.00	0.00	1.65
SSE	0.87	0.00	0.00	0.00	0.00	0.87
S	1.84	0.37	0.00	0.00	0.00	2.21
SSW	2.80	1.01	0.00	0.00	0.00	3.81
SW	4.59	3.67	0.23	0.00	0.00	8.49
WSW	4.87	3.49	0.00	0.00	0.00	8.36
W	3.72	0.87	0.00	0.00	0.00	4.59
WNW	2.30	0.37	0.00	0.00	0.00	2.67
NW	1.88	0.00	0.00	0.00	0.00	1.88
NNW	2.71	0.41	0.00	0.00	0.00	3.12
Summary	75.24	18.68	0.96	0.00	0.00	94.88⁽¹⁾

¹ The remaining 5.12 percent of data are calms (< 0.5 m/s).

Table 3-6: PAR Fourth Quarter Wind Rose Frequency Distribution Percentage

Direction	Frequency Distribution (Percent)					Total
	Speed (m/s)					
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	2.67	0.27	0.00	0.00	0.00	2.94
NNE	3.35	0.72	0.14	0.00	0.00	4.21
NE	15.72	1.95	0.00	0.00	0.00	17.67
ENE	14.32	0.45	0.00	0.00	0.00	14.77
E	5.75	0.00	0.00	0.00	0.00	5.75
ESE	3.22	0.00	0.00	0.00	0.00	3.22
SE	1.27	0.14	0.00	0.00	0.00	1.41
SSE	1.40	0.05	0.00	0.00	0.00	1.45
S	2.58	0.18	0.00	0.00	0.00	2.76
SSW	6.16	0.68	0.00	0.00	0.00	6.84
SW	7.79	1.54	0.09	0.00	0.00	9.42
WSW	6.75	1.54	0.00	0.00	0.00	8.29
W	4.89	0.36	0.00	0.00	0.00	5.25
WNW	2.45	0.18	0.00	0.00	0.00	2.63
NW	1.77	0.09	0.00	0.00	0.00	1.86
NNW	1.68	0.18	0.00	0.00	0.00	1.86
Summary	81.77	8.33	0.23	0.00	0.00	90.33⁽¹⁾

¹ The remaining 9.67 percent of data are calms (< 0.5 m/s).

Table 3-7: Average & Maximum Wind Speeds at PRG

Monitoring Period	Mean Hourly Average Wind Speed at the Ridge Station (m/s)	Mean Hourly Average Wind Speed at the Allen Army Airfield (m/s)	Maximum Hourly Average Wind Speed at the Ridge Station (m/s)	Maximum Hourly Average Wind Speed at the Allen Army Airfield (m/s)
1 st Quarter	3.45	4.8	17.35	18.5
2 nd Quarter	3.07	4.8	16.85	19.5
3 rd Quarter	2.46	4.3	10.26	17.0
4 th Quarter	2.16	3.3	10.39	15.4
Year to Date	2.78	4.3	17.35	19.5

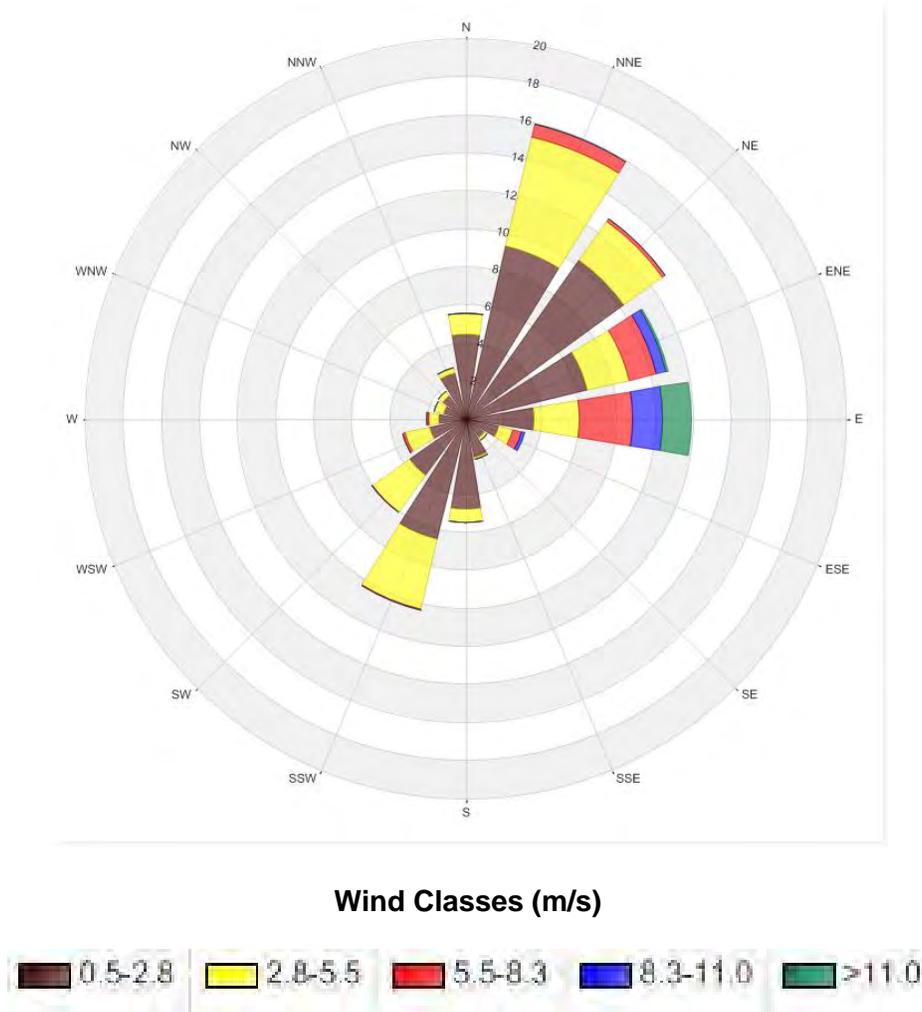
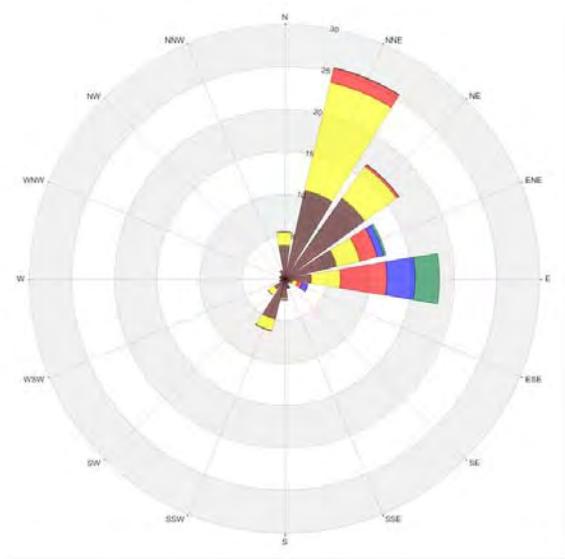
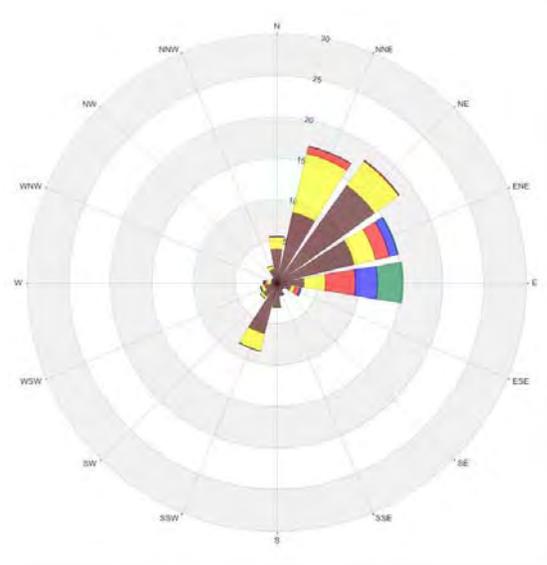


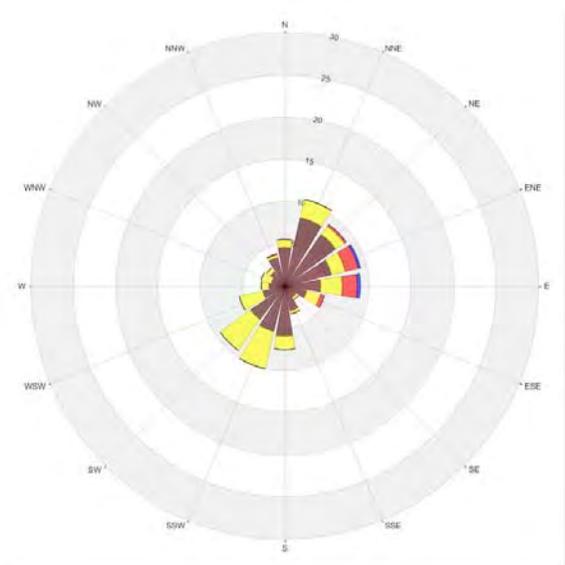
Figure 3-3: PRG Annual Wind Rose



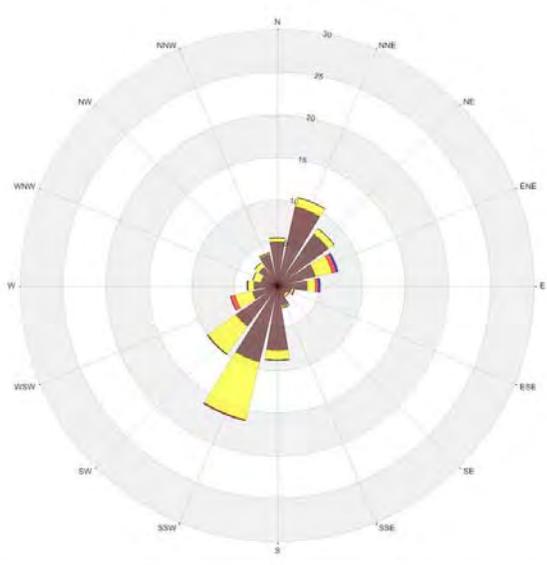
1st Quarter (10/1/14 – 12/31/14)



2nd Quarter (1/1/15 – 3/31/15)



3rd Quarter (4/1/15 – 6/30/15)



4th Quarter (7/1/15 – 9/30/15)

Wind Classes (m/s)



Figure 3-4: PRG Quarterly Wind Roses

Table 3-8: PRG Annual Wind Rose Frequency Distribution Percentage

Frequency Distribution (Percent)						
Direction	Speed (m/s)					Total
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	4.48	1.08	0.01	0.00	0.00	5.57
NNE	9.33	5.92	0.68	0.00	0.00	15.93
NE	10.26	2.52	0.17	0.00	0.00	12.95
ENE	6.58	2.25	1.48	0.53	0.10	10.94
E	3.60	2.38	2.80	1.61	1.48	11.87
ESE	1.82	0.72	0.46	0.21	0.00	3.21
SE	1.22	0.17	0.01	0.00	0.00	1.40
SSE	2.11	0.11	0.01	0.00	0.00	2.23
S	4.75	0.72	0.00	0.00	0.00	5.47
SSW	6.53	3.78	0.05	0.00	0.00	10.36
SW	3.64	2.41	0.02	0.00	0.00	6.07
WSW	1.96	1.32	0.13	0.02	0.00	3.43
W	1.45	0.52	0.08	0.02	0.00	2.07
WNW	1.19	0.54	0.00	0.00	0.00	1.73
NW	1.47	0.29	0.00	0.00	0.00	1.76
NNW	2.46	0.29	0.01	0.00	0.00	2.76
Summary	62.85	25.02	5.91	2.39	1.58	97.75⁽¹⁾

¹ The remaining 2.25 percent of data are calms (< 0.5 m/s)

Table 3-9: PRG First Quarter Wind Rose Frequency Distribution Percentage

Frequency Distribution (Percent)						
Direction	Speed (m/s)					Total
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	3.95	1.54	0.00	0.00	0.00	5.49
NNE	10.72	13.12	1.73	0.00	0.00	25.57
NE	11.67	4.63	0.32	0.00	0.00	16.62
ENE	6.40	2.72	2.13	0.73	0.32	12.30
E	3.22	3.36	5.54	3.32	2.82	18.26
ESE	1.04	0.54	0.64	0.64	0.00	2.86
SE	0.68	0.05	0.00	0.00	0.00	0.73
SSE	1.23	0.00	0.00	0.00	0.00	1.23
S	2.36	0.18	0.00	0.00	0.00	2.54
SSW	4.95	1.41	0.00	0.00	0.00	6.36
SW	1.54	0.82	0.00	0.00	0.00	2.36
WSW	0.59	0.00	0.00	0.00	0.00	0.59
W	0.41	0.00	0.00	0.00	0.00	0.41
WNW	0.54	0.00	0.00	0.00	0.00	0.54
NW	0.50	0.00	0.00	0.00	0.00	0.50
NNW	0.91	0.05	0.00	0.00	0.00	0.96
Summary	50.71	28.42	10.36	4.69	3.14	97.32⁽¹⁾

¹ The remaining 2.68 percent of data are calms (< 0.5 m/s)

Table 3-10: PRG Second Quarter Wind Rose Frequency Distribution Percentage

Direction	Frequency Distribution (Percent)					Total
	Speed (m/s)					
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	4.09	1.50	0.00	0.00	0.00	5.59
NNE	8.74	7.28	0.94	0.00	0.00	16.96
NE	14.52	3.52	0.14	0.00	0.00	18.18
ENE	9.63	2.58	1.74	0.99	0.09	15.03
E	3.34	2.58	3.62	2.58	3.15	15.27
ESE	1.79	0.47	0.66	0.19	0.00	3.11
SE	1.08	0.05	0.00	0.00	0.00	1.13
SSE	1.60	0.00	0.00	0.00	0.00	1.60
S	2.91	0.05	0.00	0.00	0.00	2.96
SSW	6.39	2.11	0.05	0.00	0.00	8.55
SW	2.07	0.33	0.00	0.00	0.00	2.40
WSW	1.50	0.47	0.00	0.09	0.00	2.06
W	0.70	0.52	0.28	0.09	0.00	1.59
WNW	0.56	0.00	0.00	0.00	0.00	0.56
NW	0.66	0.00	0.00	0.00	0.00	0.66
NNW	1.69	0.47	0.00	0.00	0.00	2.16
Summary	61.27	21.93	7.43	3.94	3.24	97.81⁽¹⁾

¹ The remaining 2.19 percent of data are calms (< 0.5 m/s)

Table 3-11: PRG Third Quarter Wind Rose Frequency Distribution Percentage

Direction	Frequency Distribution (Percent)					Total
	Speed (m/s)					
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	4.64	0.83	0.05	0.00	0.00	5.52
NNE	8.31	2.20	0.05	0.00	0.00	10.56
NE	7.53	1.19	0.23	0.00	0.00	8.95
ENE	5.74	1.70	1.56	0.23	0.00	9.23
E	4.32	2.53	1.75	0.41	0.00	9.01
ESE	2.76	1.61	0.46	0.00	0.00	4.83
SE	1.70	0.37	0.00	0.00	0.00	2.07
SSE	3.12	0.28	0.05	0.00	0.00	3.45
S	6.02	1.52	0.00	0.00	0.00	7.54
SSW	5.56	4.55	0.00	0.00	0.00	10.11
SW	4.96	4.46	0.00	0.00	0.00	9.42
WSW	2.71	2.76	0.00	0.00	0.00	5.47
W	1.93	0.83	0.00	0.00	0.00	2.76
WNW	1.65	1.19	0.00	0.00	0.00	2.84
NW	2.07	0.51	0.00	0.00	0.00	2.58
NNW	3.45	0.41	0.05	0.00	0.00	3.91
Summary	66.47	26.94	4.20	0.64	0.00	98.25⁽¹⁾

¹ The remaining 1.75 percent of data are calms (< 0.5 m/s)

Table 3-12: PRG Fourth Quarter Wind Rose Frequency Distribution Percentage

Direction	Frequency Distribution (Percent)					Total
	Speed (m/s)					
	0.5-2.8	2.8-5.5	5.5-8.3	8.3-11.0	>11.0	
N	5.21	0.45	0.00	0.00	0.00	5.66
NNE	9.52	1.09	0.00	0.00	0.00	10.61
NE	7.43	0.77	0.00	0.00	0.00	8.20
ENE	4.62	1.99	0.50	0.18	0.00	7.29
E	3.53	1.04	0.32	0.14	0.00	5.03
ESE	1.72	0.27	0.09	0.00	0.00	2.08
SE	1.40	0.23	0.05	0.00	0.00	1.68
SSE	2.49	0.18	0.00	0.00	0.00	2.67
S	7.66	1.13	0.00	0.00	0.00	8.79
SSW	9.20	6.98	0.14	0.00	0.00	16.32
SW	5.94	3.99	0.09	0.00	0.00	10.02
WSW	3.04	2.04	0.50	0.00	0.00	5.58
W	2.72	0.72	0.05	0.00	0.00	3.49
WNW	1.99	0.95	0.00	0.00	0.00	2.94
NW	2.63	0.63	0.00	0.00	0.00	3.26
NNW	3.76	0.23	0.00	0.00	0.00	3.99
Summary	72.86	22.69	1.74	0.32	0.00	97.61⁽¹⁾

¹ The remaining 2.39 percent of data are calms (< 0.5 m/s)

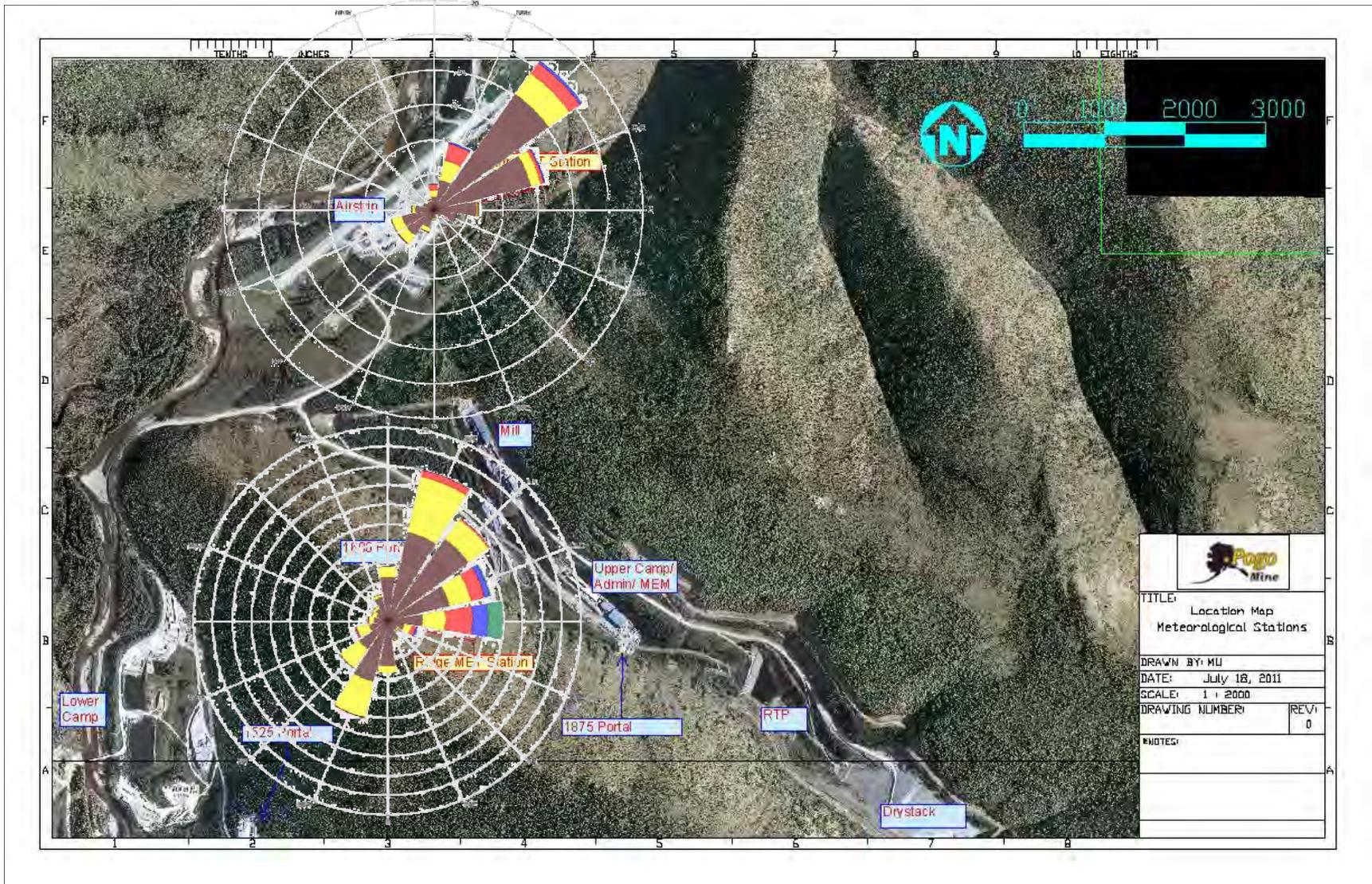


Figure 3-5: PAR and PRG Wind Roses Superimposed on Area Map

3.2.2 TEMPERATURE CLIMATOLOGY

Tables 3-13 and 3-14 provide the maximum and minimum daily mean temperatures and mean, maximum, and minimum hourly average temperatures for the 2-meter and 10-meter temperature measurements, respectively, at the Pogo airstrip station. Tables 3-15 and 3-16 provide the maximum and minimum daily mean temperatures and mean, maximum, and minimum hourly average temperatures for the 2-meter and 10-meter temperature measurements, respectively, at the Pogo ridge station.

Figures 3-6 and 3-7 provide graphs of the 2-meter and 10-meter hourly average temperatures at the PAR and PRG meteorological stations, respectively. Data from the Delta Junction meteorological station (operated by the National Weather Service) are also included on these graphs for comparison purposes only. Figures 3-8 and 3-9 provide graphs of the vertical temperature difference (the difference between 10-meter and 2-meter temperature values) for the 2014-2015 monitoring year at the two meteorological stations.

Table 3-13: PAR 2-Meter Temperature Summary

Period	Maximum Daily Mean Temperature (°C)	Minimum Daily Mean Temperature (°C)	Mean Hourly Temperature (°C)	Maximum Hourly Temperature (°C)	Minimum Hourly Temperature (°C)
October 2014	2.4	-15.1	-4.2	8.2	-19.9
November 2014	2.1	-23.4	-10.0	4.2	-29.3
December 2014	-1.7	-22.4	-11.2	1.6	-26.0
1st Quarter	2.4	-23.4	-8.5	8.2	-29.3
January 2015	1.0	-41.6	-18.6	2.9	-43.2
February 2015	1.6	-40.2	-16.6	5.2	-43.8
March 2015	1.8	-30.3	-8.4	8.6	-37.9
2nd Quarter	1.8	-41.6	-14.5	8.6	-43.8
April 2015	8.1	-5.5	1.5	13.2	-11.9
May 2015	18.2	3.2	11.4	28.6	-4.4
June 2015	18.2	7.6	13.1	27.3	-1.2
3rd Quarter	18.2	-5.5	8.7	28.6	-11.9
July 2015	21.2	10.4	14.1	29.8	3.7
August 2015	17.2	3.4	10.1	26.3	-0.9
September 2015	9.4	-2.1	4.3	18.3	-5.2
4th Quarter	21.2	-2.1	9.6	29.8	-5.2
Year to Date	21.2	-41.6	-1.1	29.8⁽¹⁾	-43.8⁽²⁾

¹ Extreme maximum temperature occurred on July 6, 2015.

² Extreme minimum temperature occurred on February 7, 2015.

Table 3-14: PAR 10-Meter Temperature Summary

Period	Maximum Daily Mean Temperature (°C)	Minimum Daily Mean Temperature (°C)	Mean Hourly Temperature (°C)	Maximum Hourly Temperature (°C)	Minimum Hourly Temperature (°C)
October 2014	2.6	-14.4	-4.0	8.4	-18.8
November 2014	2.3	-22.5	-9.4	4.5	-27.1
December 2014	-1.2	-21.3	-10.5	1.7	-24.3
1st Quarter	2.6	-22.5	-7.9	8.4	-27.1
January 2015	1.1	-39.0	-17.5	3.0	-40.9
February 2015	1.8	-37.3	-15.2	5.4	-40.2
March 2015	2.1	-29.4	-7.9	8.6	-35.1
2nd Quarter	2.1	-39.0	-13.5	8.6	-40.9
April 2015	8.6	-5.4	1.7	12.7	-11.2
May 2015	18.5	3.2	11.4	28.0	-3.7
June 2015	18.3	7.4	13.0	26.3	-0.4
3rd Quarter	18.5	-5.4	8.7	28.0	-11.2
July 2015	21.2	10.3	14.0	29.0	4.2
August 2015	17.2	3.3	10.1	25.8	-0.7
September 2015	9.7	-2.1	4.5	17.8	-5.0
4th Quarter	21.2	-2.1	9.6	29.0	-5.0
Year to Date	21.2	-39.0	-0.7	29.0⁽¹⁾	-40.9⁽²⁾

¹ Extreme maximum temperature occurred on July 6, 2015.

² Extreme minimum temperature occurred on January 27, 2015.

Table 3-15: PRG 2-Meter Temperature Summary

Period	Maximum Daily Mean Temperature (°C)	Minimum Daily Mean Temperature (°C)	Mean Hourly Temperature (°C)	Maximum Hourly Temperature (°C)	Minimum Hourly Temperature (°C)
October 2014	1.8	-14.0	-4.9	5.8	-16.8
November 2014	0.2	-19.5	-8.5	1.7	-20.6
December 2014	-1.3	-15.3	-9.4	0.4	-19.6
1st Quarter	1.8	-19.5	-7.6	5.8	-20.6
January 2015	-0.3	-33.9	-14.8	1.4	-36.5
February 2015	-0.1	-28.4	-12.1	3.3	-31.8
March 2015	2.9	-27.6	-7.8	6.3	-32.8
2nd Quarter	2.9	-33.9	-11.5	6.3	-36.5
April 2015	6.5	-5.6	0.9	10.0	-8.8
May 2015	20.0	3.0	11.9	26.9	-1.9
June 2015	19.2	5.7	12.9	25.4	0.3
3rd Quarter	20.0	-5.6	8.6	26.9	-8.8
July 2015	21.6	8.4	13.4	28.1	5.9
August 2015	17.9	1.7	9.3	24.5	-1.9
September 2015	11.1	-4.4	3.7	15.3	-5.2
4th Quarter	21.6	-4.4	8.8	28.1	-5.2
Year to Date	21.6	-33.9	-0.4	28.1⁽¹⁾	-36.5⁽²⁾

¹ Extreme maximum temperature occurred on July 6, 2015.

² Extreme minimum temperature occurred on January 26, 2015.

Table 3-16: PRG 10-Meter Temperature Summary

Period	Maximum Daily Mean Temperature (°C)	Minimum Daily Mean Temperature (°C)	Mean Hourly Temperature (°C)	Maximum Hourly Temperature (°C)	Minimum Hourly Temperature (°C)
October 2014	1.9	-13.8	-4.8	5.8	-16.5
November 2014	0.4	-18.4	-8.1	1.9	-19.7
December 2014	-1.0	-14.9	-9.0	0.7	-19.4
1st Quarter	1.9	-18.4	-7.3	5.8	-19.7
January 2015	-0.2	-33.0	-14.4	1.5	-35.7
February 2015	-0.2	-27.8	-11.7	3.3	-31.1
March 2015	2.9	-27.4	-7.6	6.1	-31.9
2nd Quarter	2.9	-33.0	-11.2	6.1	-35.7
April 2015	6.4	-5.6	0.9	9.7	-8.6
May 2015	19.9	2.8	11.7	26.0	-1.6
June 2015	18.8	5.6	12.6	24.6	0.6
3rd Quarter	19.9	-5.6	8.4	26.0	-8.6
July 2015	21.3	8.3	13.1	27.3	5.9
August 2015	17.7	1.5	9.2	23.8	-2.0
September 2015	11.0	-4.6	3.6	15.1	-5.3
4th Quarter	17.7	-4.6	8.7	27.3	-5.3
Year to Date	19.9	-33.0	-0.3	27.3⁽¹⁾	-35.7⁽²⁾

¹ Extreme maximum temperature occurred on July 6, 2015.

² Extreme minimum temperature occurred on January 27, 2015.

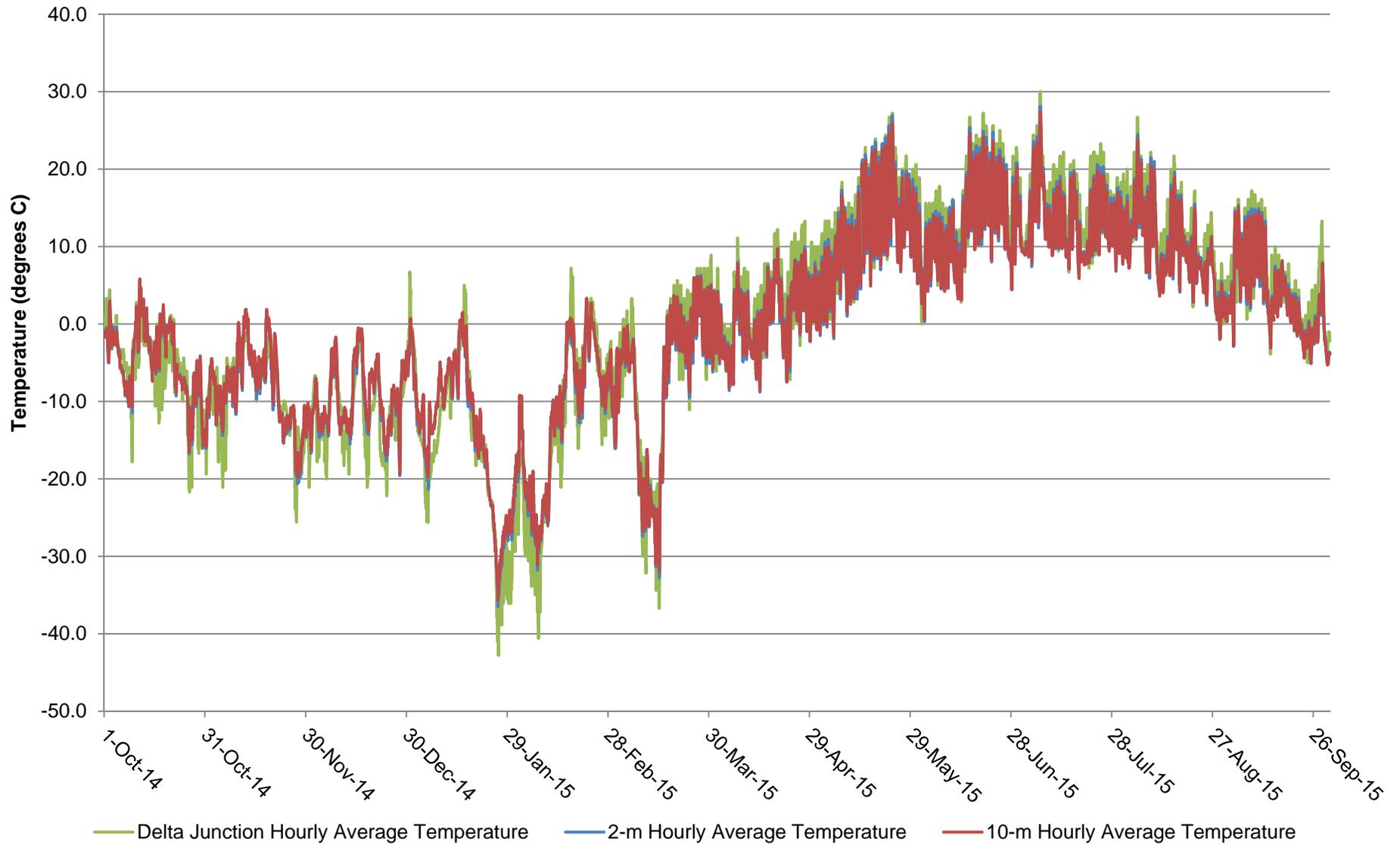


Figure 3-6: PAR Hourly Average 2-Meter and 10-Meter Temperatures

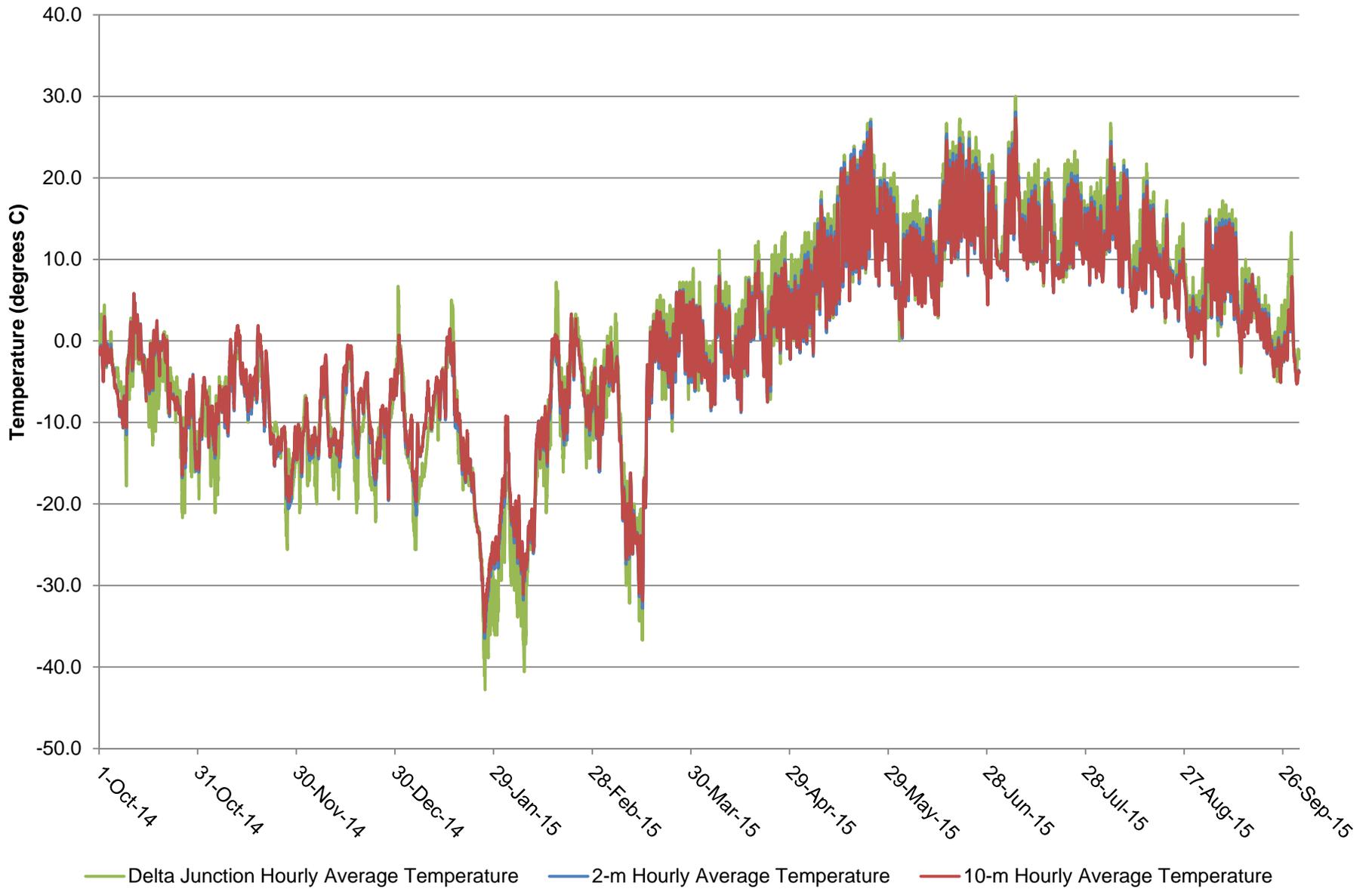


Figure 3-7: PRG Hourly Average 2-Meter and 10-Meter Temperatures

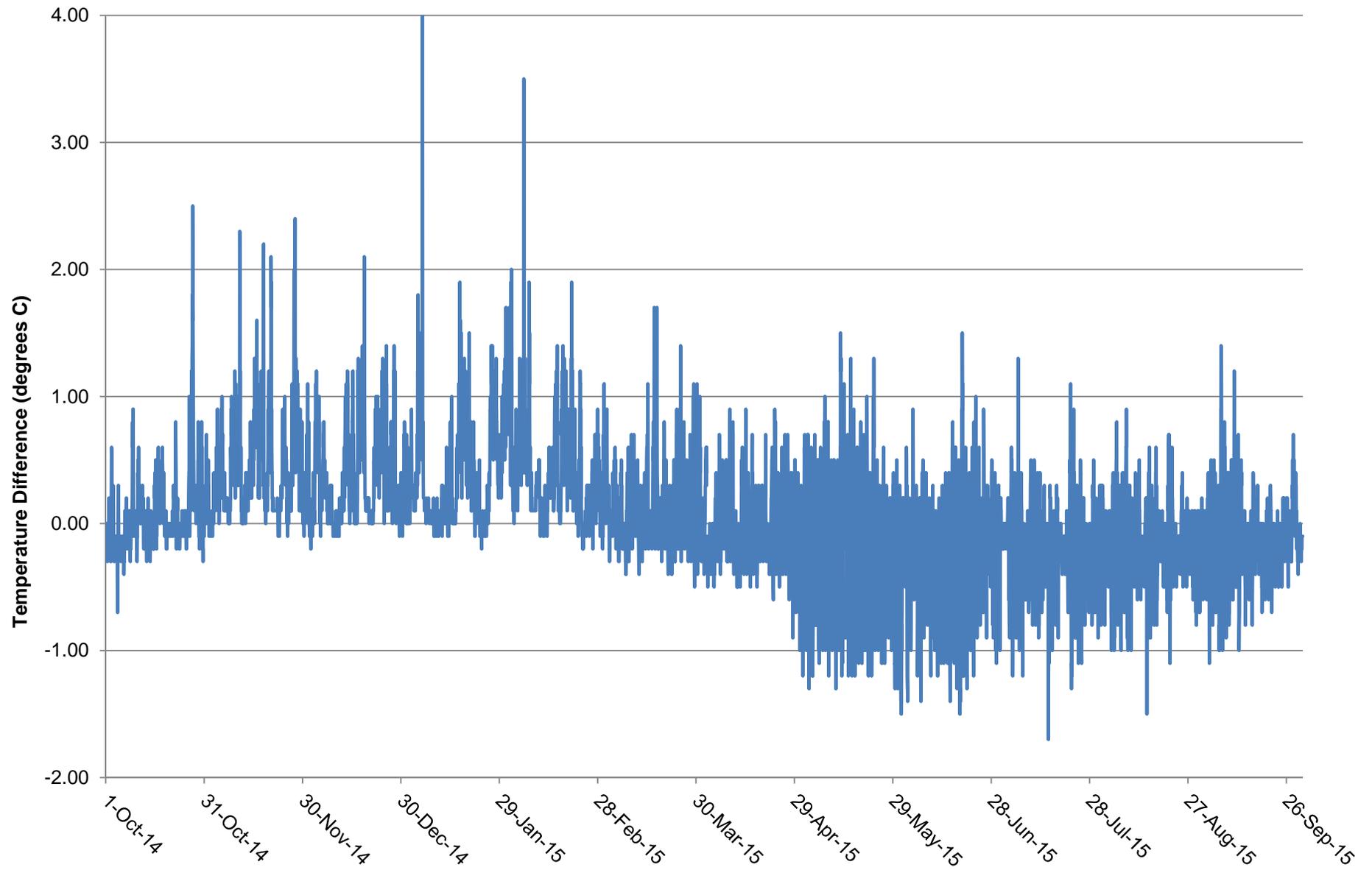


Figure 3-8: PAR Hourly Average Vertical Temperature Difference

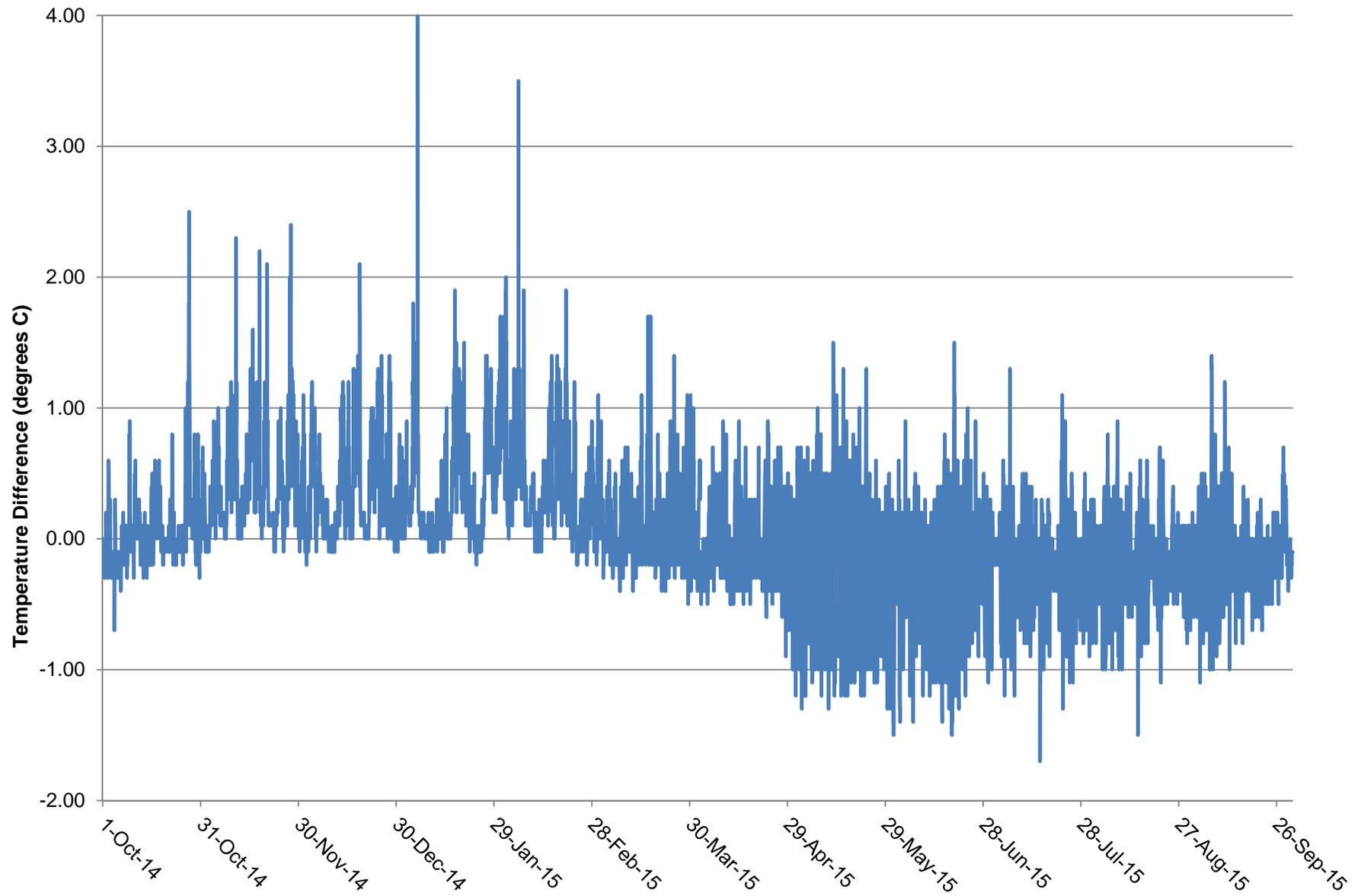


Figure 3-9: PRG Hourly Average Vertical Temperature Difference

3.2.3 OTHER METEOROLOGICAL PARAMETERS

The other meteorological parameters measured at the Pogo stations include precipitation, evaporation (at PAR only), solar radiation, and barometric pressure. Tables 3-17 and 3-18 provide summaries of these parameters for the 2014-2015 monitoring year at the airstrip and ridge stations, respectively. Figures 3-10 and 3-11 are plots of the precipitation at the airstrip and ridge stations, respectively. Figures 3-12 and 3-13 are plots of hourly average solar radiation at the airstrip and ridge stations, respectively. Figures 3-14 and 3-15 are plots of hourly average barometric pressure at the airstrip and ridge stations, respectively. Figures 3-16 and 3-17 are plots of hourly average relative humidity at the airstrip and ridge stations, respectively.

Comprehensive hourly data tables for temperature, vertical temperature difference, wind speed, wind direction, wind sigma, relative humidity, barometric pressure, solar radiation, precipitation, and evaporation are provided in Appendix D. Daily evaporation data at the PAR station are also provided in Appendix D.

Table 3-17: PAR Precipitation, Evaporation, Solar Radiation, Barometric Pressure, and Relative Humidity Summary

Period	Total Precipitation (mm)	Total Evaporation ⁽¹⁾ (mm)	Mean Solar Radiation (W/m ²)	Maximum Solar Radiation (W/m ²)	Mean Barometric Pressure (mb)	Minimum Barometric Pressure (mb)	Maximum Barometric Pressure (mb)	Mean Relative Humidity (%)	Minimum Relative Humidity (%)
October 2014	1.76	NA	30	316	954.9	934.6	976.2	81.2	44.2
November 2014	3.76	NA	5	136	962.9	941.9	981.8	74.2	42.4
December 2014	5.30	NA	1	42	955.1	933.2	987.8	75.4	34.4
1st Quarter	10.82	NA	12	316	957.6	933.2	987.8	77.0	34.4
January 2015	10.09	NA	3	52	964.8	927.8	990.9	70.1	22.3
February 2015	18.01	NA	20	267	968.2	952.9	984.5	74.6	32.9
March 2015	4.54	NA	85	522	961.2	946.4	987.5	63.2	20.2
2nd Quarter	32.64	NA	36	522	964.4	927.8	990.9	69.1	20.2
April 2015	5.55	NA	157	675	954.5	933.5	973.8	59.8	13.3
May 2015	13.20	91.79	239	791	966.2	955.4	977.1	50.7	8.9
June 2015	72.85	84.91	220	790	963.8	944.6	987.8	60.9	12.9
3rd Quarter	91.60	176.70	206	791	961.6	933.5	987.8	57.1	8.9
July 2015	117.75	55.73	169	752	962.3	952.2	973.6	75.1	25.0
August 2015	86.01	25.79	118	727	963.0	944.9	974.1	81.1	33.1
September 2015	30.63	NA	77	539	957.3	936.3	973.0	77.5	30.7
4th Quarter	234.39	81.52	122	727	960.9	936.3	973.6	77.9	25.0
Year to Date	369.45	258.22	94	791	961.2	927.8	990.9	70.3	8.9

¹ Evaporation data collection began on May 13, 2015. Evaporation data is collected seasonally; valid data was collected until August 31, 2015.

Table 3-18: PRG Precipitation, Solar Radiation, Barometric Pressure, and Relative Humidity Summary

Period	Total Precipitation (mm)	Mean Solar Radiation (W/m ²)	Maximum Solar Radiation (W/m ²)	Mean Barometric Pressure (mb)	Minimum Barometric Pressure (mb)	Maximum Barometric Pressure (mb)	Mean Relative Humidity (%)	Minimum Relative Humidity (%)
October 2014	19.24	39	352	920.7	901.6	941.7	85.0	49.4
November 2014	2.26	12	243	927.8	906.7	945.4	75.4	49.3
December 2014	3.27	2	55	920.2	899.3	950.5	81.6	41.0
1st Quarter	24.77	17	352	922.8	899.3	950.5	80.7	41.0
January 2015	7.35	5	113	928.6	895.1	952.0	75.3	25.0
February 2015	0.75	31	324	932.3	916.3	947.3	76.4	39.2
March 2015	8.84	104	566	926.3	913.2	951.2	64.6	20.5
2nd Quarter	16.94	48	566	929.0	895.1	952.0	71.9	20.5
April 2015	0.00	172	722	921.1	901.1	939.2	59.3	18.1
May 2015	22.81	250	803	933.6	924.3	943.7	45.4	9.6
June 2015	5.54	231	840	931.5	913.0	953.8	57.8	14.2
3rd Quarter	28.35	218	840	928.8	901.1	953.8	54.1	9.6
July 2015	0.00	177	826	930.1	920.6	941.0	74.4	27.3
August 2015	12.34	125	693	930.4	912.1	940.2	82.1	33.6
September 2015	16.25	84	572	924.1	903.2	938.8	79.4	33.7
4th Quarter	28.59	129	826	928.3	903.2	941.0	78.6	27.3
Year to Date	98.65	103	840	927.2	895.1	953.8	71.4	9.6

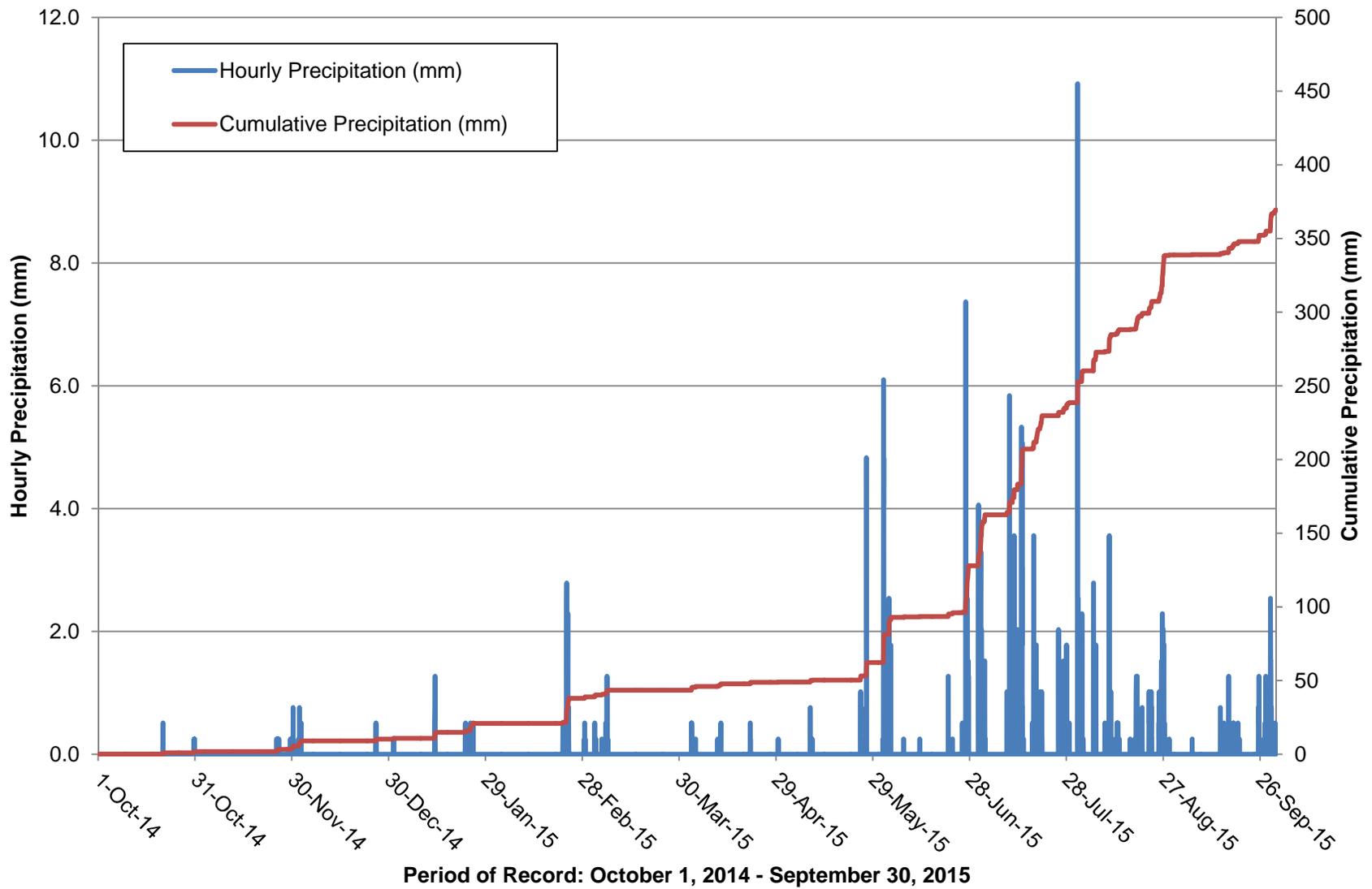


Figure 3-10: PAR Precipitation

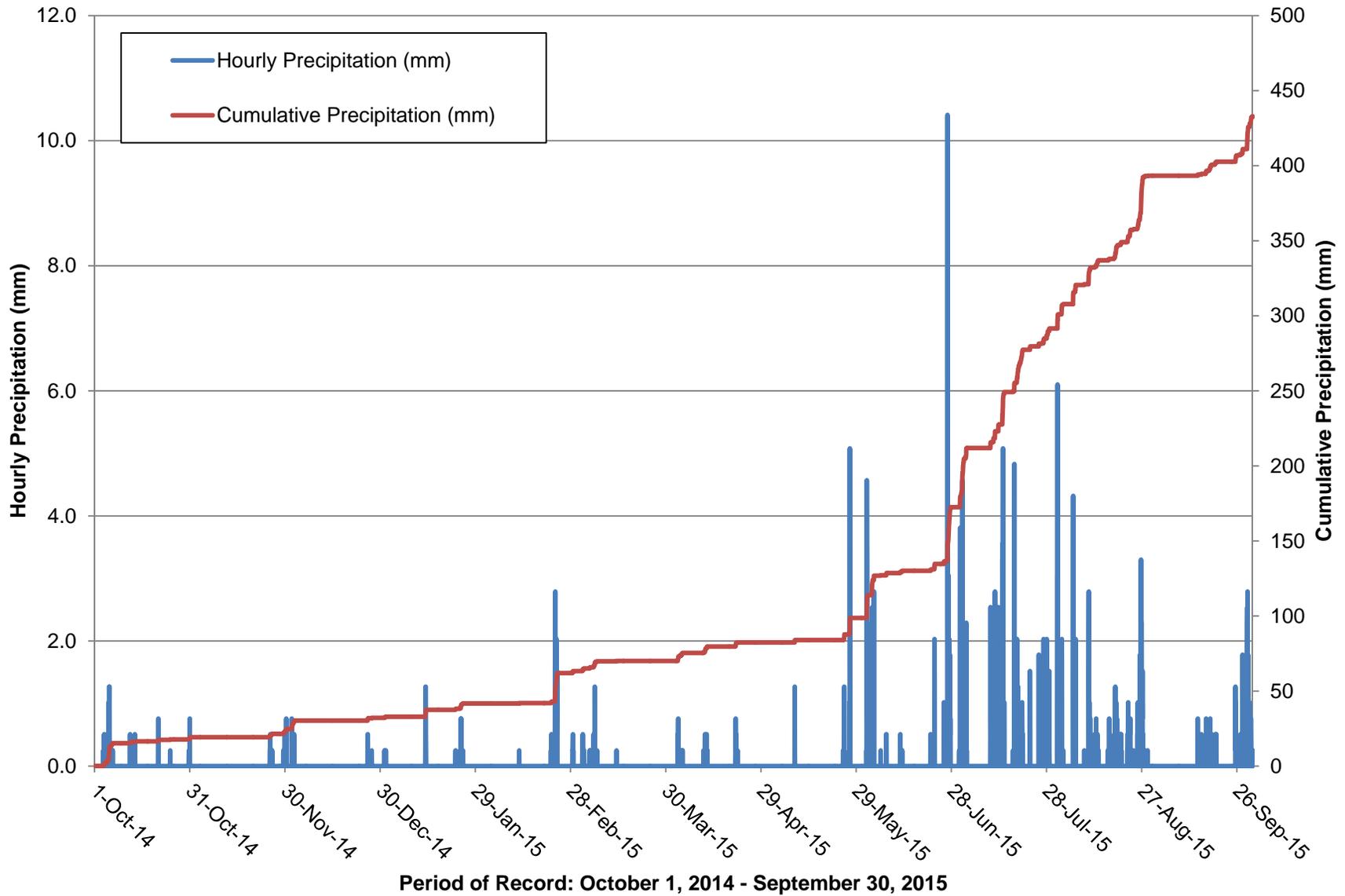


Figure 3-11: PRG Precipitation

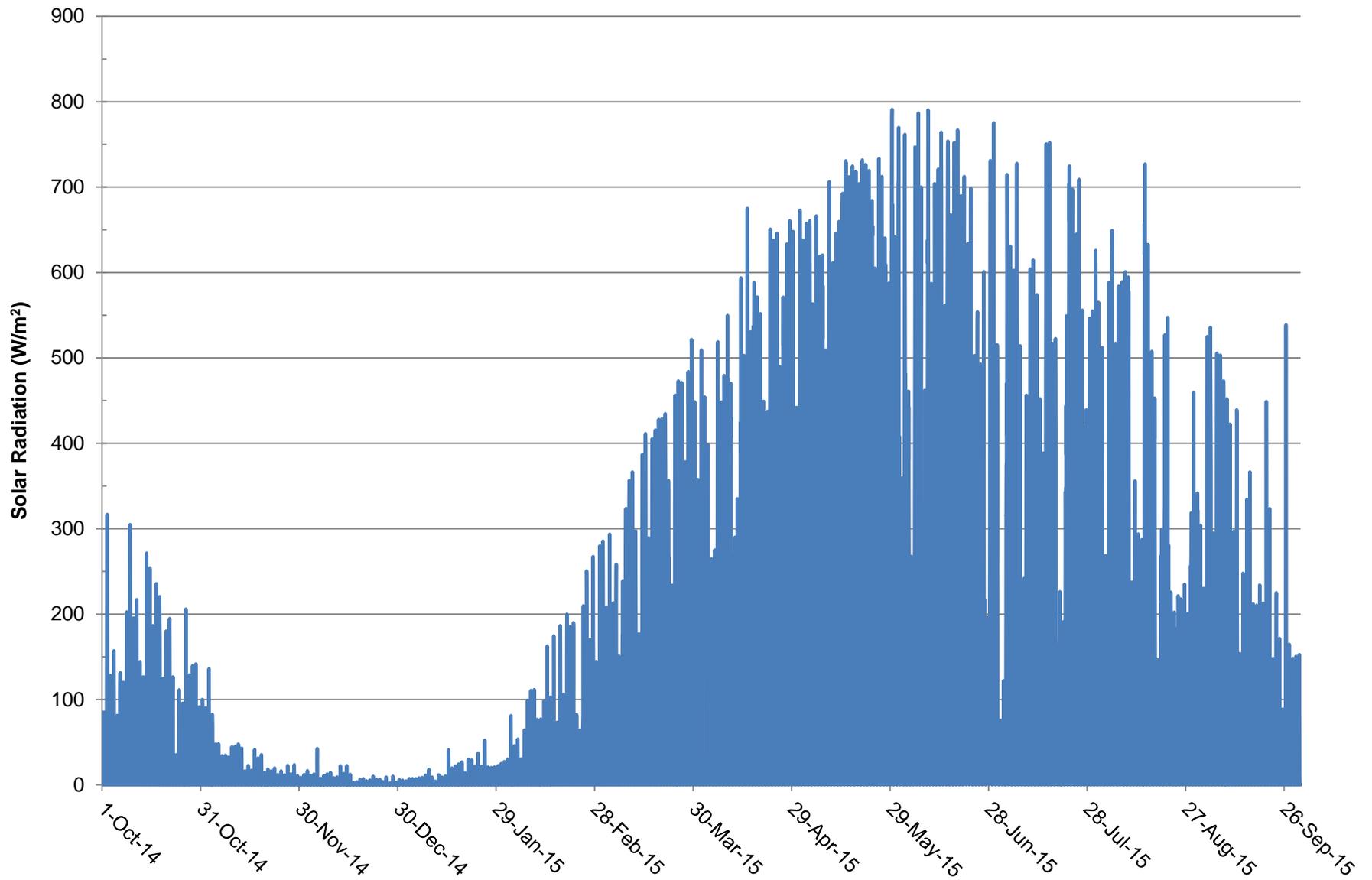


Figure 3-12: PAR Hourly Average Solar Radiation

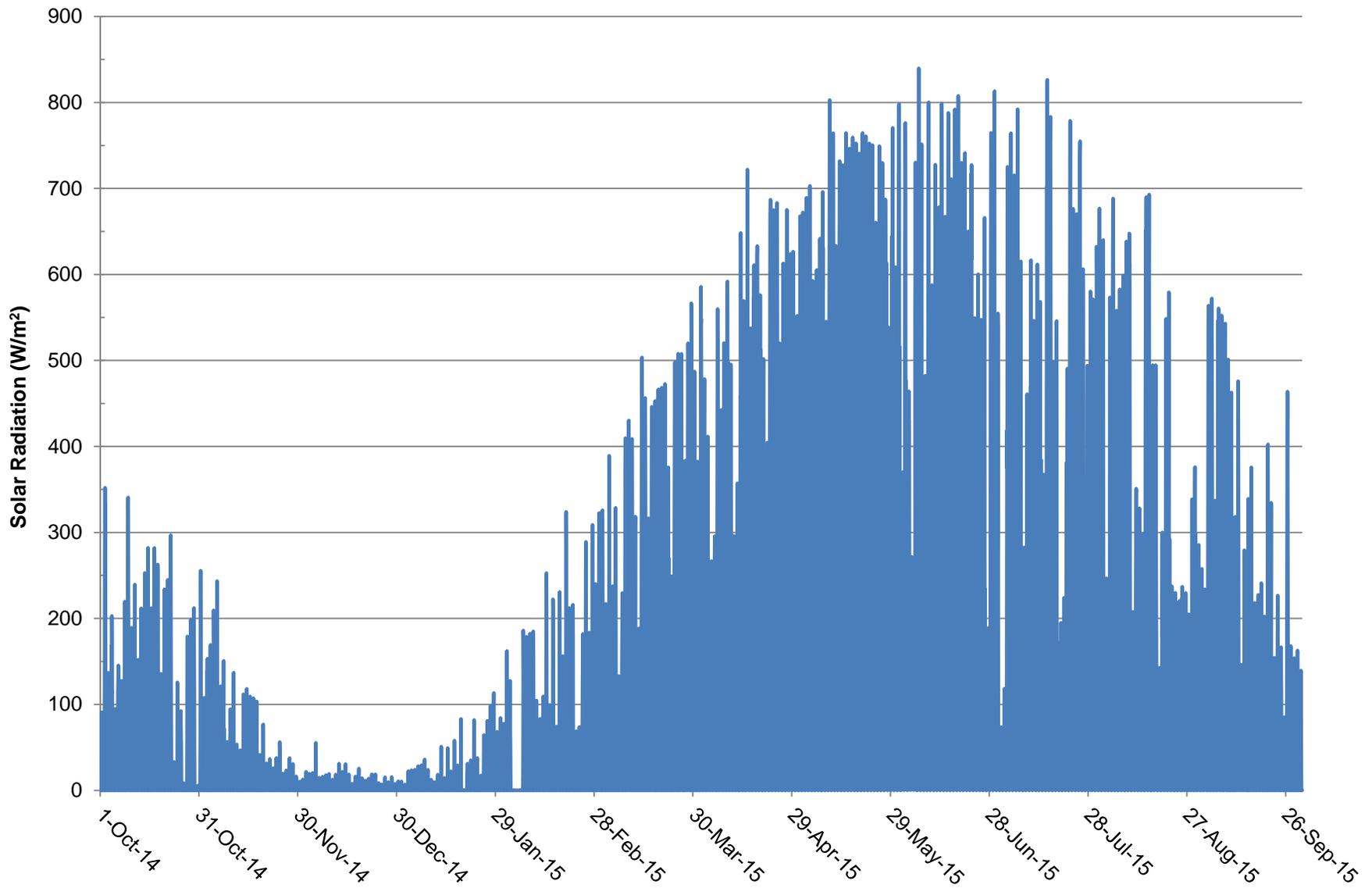


Figure 3-13: PRG Hourly Average Solar Radiation

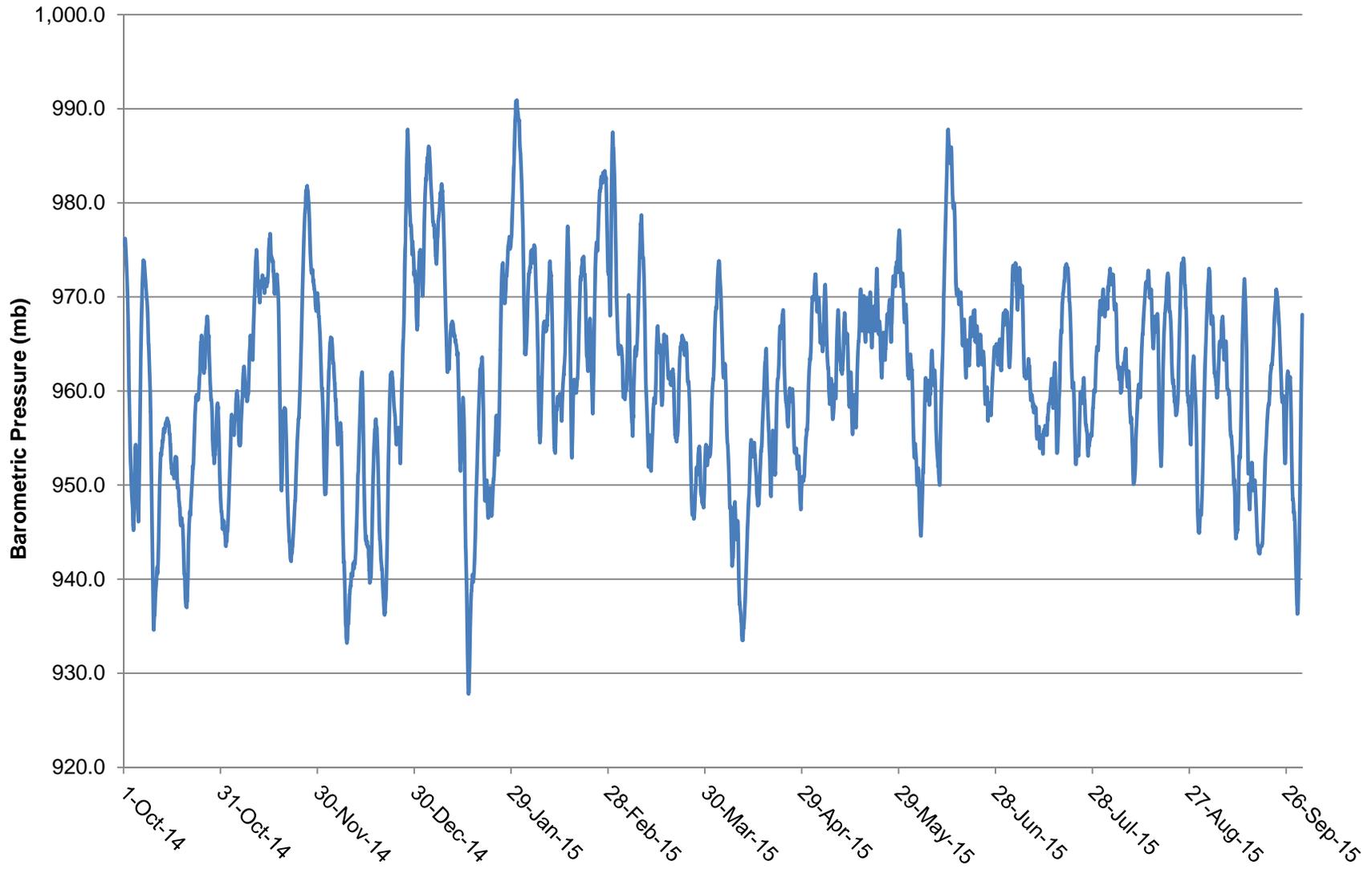


Figure 3-14: PAR Hourly Average Barometric Pressure

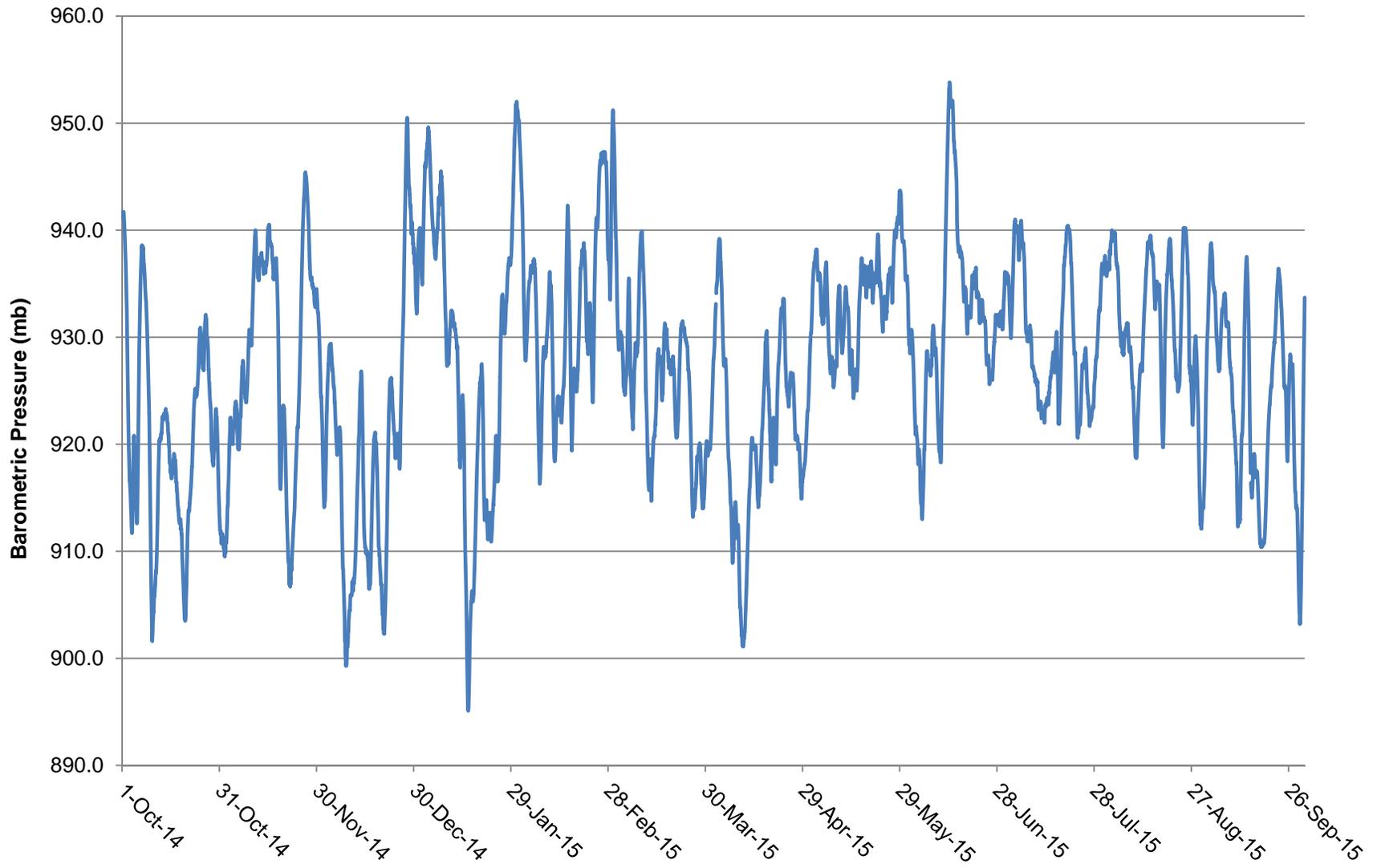


Figure 3-15: PRG Hourly Average Barometric Pressure

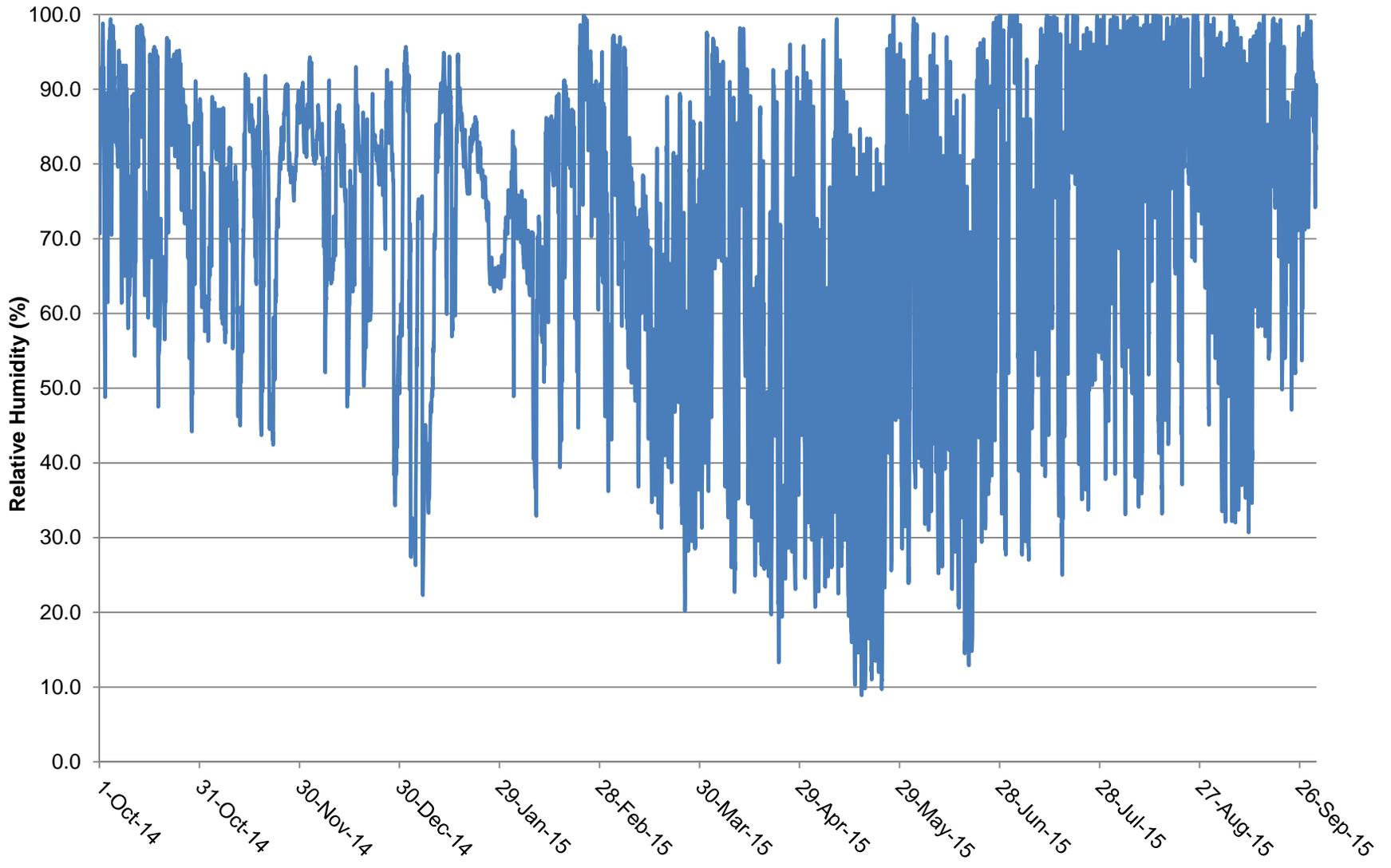


Figure 3-16: PAR Hourly Average Relative Humidity

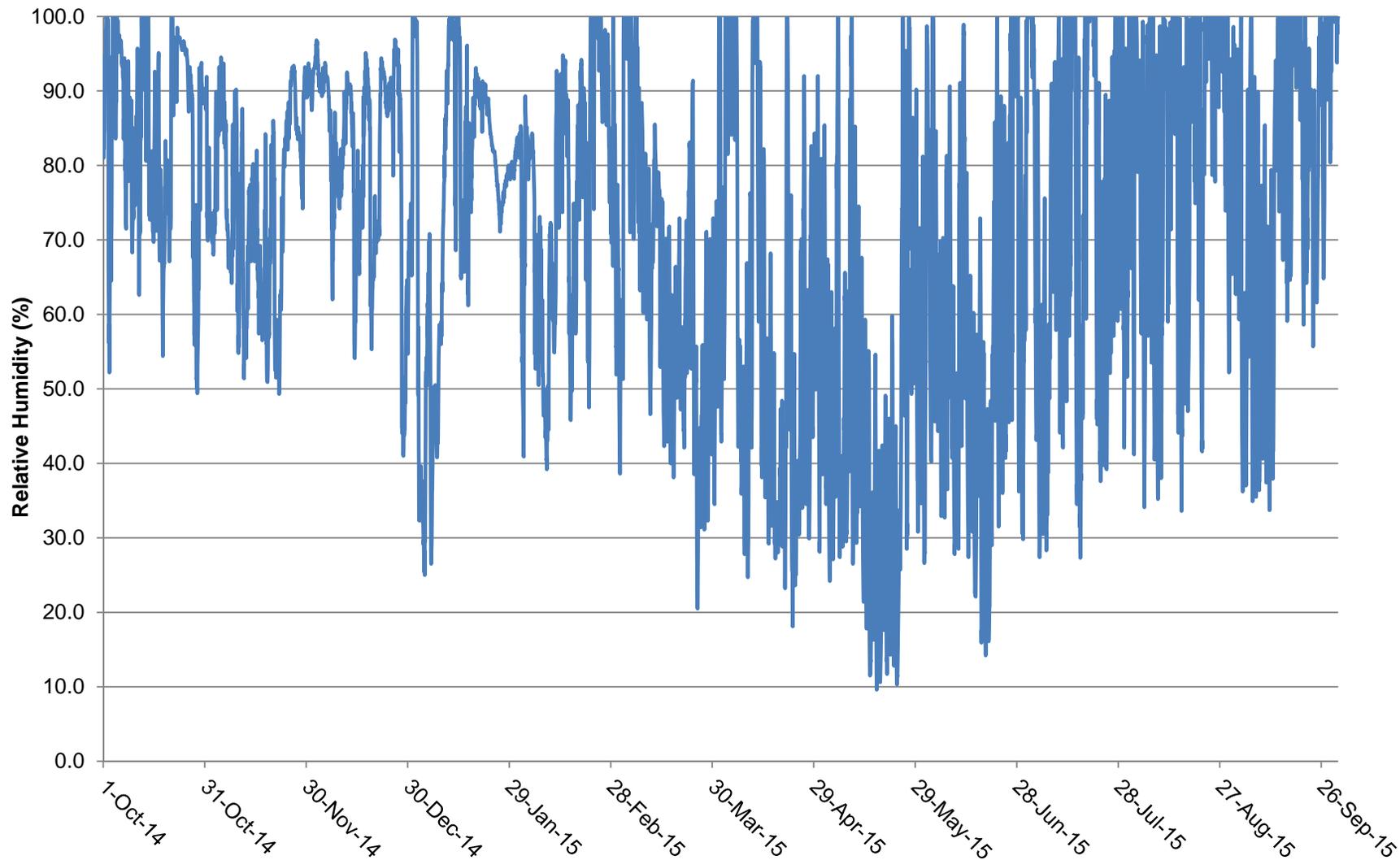


Figure 3-17: PRG Hourly Average Relative Humidity

APPENDIX A

DATA PROCESSING SPECIFICATIONS AND STATISTICAL FORMULAE

APPENDIX B

PRECISION DATA

Not applicable.

APPENDIX C
ACCURACY DATA

APPENDIX D

CONTINUOUS DATA SUMMARIES

PAR Meteorological Data

PRG Meteorological Data

APPENDIX E

VALIDATED MANUAL PARTICULATE (FIELD AND LABORATORY) DATA

Not applicable.