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AMBIENT AIR MONITORING MONTHLY DATA REPORT
PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
THREE CREEKS 842B STATION

JOB #: 8449-2017-10-80-C

October 2017

Prepared for:

PEACE RIVER AREA MONITORING PROGRAM COMMITTEE

Attention: LILY LIN

DATE: **November 28, 2017**

Prepared by:

A handwritten signature in blue ink, appearing to read "Wunmi Adekanmbi".

Wunmi Adekanmbi, M.Sc., EPt.
Project Manager, Customer Service, Air Services

Reviewed by:

A handwritten signature in black ink, appearing to read "Cheri Sinclair".

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services

SUMMARY

In October 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Three Creeks 842b Station, near Peace River Oil Sands Area 2, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for compliance parameters, as requested by the PRAMP Committee.

All data collected this month, with the exception of CH₄ calibration stabilization requirement, was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

Non-Conformance (THC/CH₄/NMHC): During the routine monthly calibration completed on October 18, the 15-minute stabilization period requirement was not met for the CH₄ as-found high point, as there were outlying concentrations attributed to an ongoing, low-impact, sporadic poor sample injection. This was reported to AEP under reference number: 332164.

Power Failure: Due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7, six hours of downtime were recorded on all parameters.

THC/CH₄/NMHC: On October 4, seven hours of data collected from hour 08:00 to hour 14:00 were excluded due to poor injections and two more hours of downtime were recorded due to the corrective actions taken to address the issue.

Wind System: The wind system recorded anomalous data between October 25, hour 08:00 and October 26, hour 09:00, likely due to prevalent weather conditions at the time. The data was excluded, resulting in twenty-six hours of downtime.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Peace River Area Monitoring Program Committee, Three Creeks 842b Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Peace River Area Monitoring Program Committee						MAXIMUM VALUES							OPERATIONAL TIME (%)
Three Creeks 842b Station						1-HOUR				24-HOUR			
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	1	5	9	13.0	SSW	0	1	99.2
TRS (ppb)	-	-	-	-	0.16	0.36	15	6	10.3	S	0.20	27	99.2
THC (ppm)	-	-	-	-	1.97	2.23	4	6	3.3	SE	2.05	4	98.0
CH ₄ (ppm)	-	-	-	-	1.97	2.23	4	6	3.3	SE	2.05	4	98.0
NMHC (ppm)	-	-	-	-	0.00	0.00	1	0	7.8	NW	0.00	1	98.0
RELATIVE HUMIDITY (%)	-	-	-	-	71	96	13	8	4.6	WSW	91	17	99.2
BAROMETRIC PRESSURE (millibar)	-	-	-	-	940	960	2	9	8.6	NNW	958	2	99.2
AMBIENT TEMPERATURE (°C)	-	-	-	-	3.1	20.6	5	16	20.0	WSW	12.5	5	99.2
STATION TEMPERATURE (°C)	-	-	-	-	20.6	23.1	5	19	11.9	WSW	22.1	5	99.2
VECTOR WS (kph)	-	-	-	-	5.3	34.6	6	10	-	WSW	20.0	6	95.7
VECTOR WD (sec)	-	-	-	-	247 (WSW)	-	-	-	-	-	-	-	95.7

**SOUR GAS PROCESSING INDUSTRY
MONTHLY REPORT SUMMARY**

Three Creeks 842b Station

Peace River Area Monitoring Program Committee

Plant Name / Location

Company

Licence Number	Report Date	
	YEAR	MONTH
N/A	2017	October

CONTINUOUS AMBIENT MONITORING						
PARAMETER	% TIME OPERATIONAL	ONE - HOUR AVERAGE			24 - HOUR AVERAGE	
		MAXIMUM VALUES	NO. READINGS > REGULATION	MAXIMUM VALUES	NO. READINGS > REGULATION	
SO ₂	99.2	0.001 ppm	0	0.000 ppm	0	
TRS	99.2	0.000 ppm	-	0.000 ppm	-	
THC	98.0	2.23 ppm	-	2.05 ppm	-	
CH ₄	98.0	2.23 ppm	-	2.05 ppm	-	
NMHC	98.0	0.00 ppm	-	0.00 ppm	-	
RH	99.2	96 %	-	91 %	-	
BP	99.2	960 mb	-	958 mb	-	
Ambient TPX	99.2	20.6 °C	-	12.5 °C	-	
Station TPX	99.2	23.1 °C	-	22.1 °C	-	
Wind Speed	95.7	34.6 kph	-	20.0 kph	-	
Wind Direction	95.7	-	-	-	-	

SIGNATURE OF COMPANY REPRESENTATIVE

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Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Relative Humidity (RH), Barometric Pressure (BP), Ambient Temperature (AmbTPX), Station Temperature (StnTPX), Wind Speed (WS) and Wind Direction (WD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime. These were incurred due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7.
- The routine monthly calibration was performed on October 18.
- One instance of maximum instantaneous data was discarded on October 6 at hour 11:00, due to a brief power outage. Minute data collected from 11:34-11:39 was discarded as it was impacted by the power outage, and the hourly data was re-averaged.

TOTAL REDUCED SULPHUR (TRS)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime. These were incurred due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7.
- The routine monthly calibration was performed on October 18.
- One instance of maximum instantaneous data was discarded on October 6 at hour 11:00, due to a brief power outage. Minute data collected from 11:32-11:38 was discarded as it was impacted by the power outage, and the hourly data was re-averaged.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time, for the monitoring period was 98.0%, equivalent to fifteen hours of downtime.
- Through-out the month, sporadic instances of low CH₄ concentrations were recorded from the analyzer. Such data are indicative of an intermittent issue with the switching valve within the analyzer. This analyzer demonstrated similar problems in August which were rectified by off-site maintenance and replacement of the switch value. Improvement in the frequency and duration of poor injections was gained, but not eliminated during October. Based on historical data and Maxxam's internal guidelines, CH₄ concentrations ≤ 1.80 ppm were considered poor injections. Given the low frequency and short duration of each event it is considered that these errors have a minimal impact on the reliability or accuracy of the data collected over the month. However, to eliminate bias, impacted CH₄ minutes, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly averages were re-calculated. Arrangements have been made to replace the analyzer in November.
- Higher frequency and longer duration of poor injections were observed on October 4. This prompted an immediate site visit where the fuel gas was changed out and the zero air pressure was adjusted as a corrective action. Seven hours of data collected from hour 08:00 to hour 14:00 were excluded and two more hours of downtime were recorded due to the corrective actions taken.
- The routine monthly calibration was performed on October 18. The calibration passed at all points but did not meet the 15-minute stabilization period requirement for the as-found high point, as there were few outlying concentrations attributed to the ongoing, low-impact, sporadic poor injections. This calibration is considered sufficient to validate data processed by this analyzer. Such a conclusion is supported by the proven linearity demonstrated by the multi-point calibration and the stability of the daily zero/span verification recorded during the month. This contravention was reported to AEP under reference number: 332164.
- Due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7, six hours of downtime were recorded.
- One instance of maximum instantaneous data was discarded on October 6 at hour 11:00, due to a brief power outage. Minute data collected from 11:33-11:44 was discarded as it was impacted by the power outage, and the hourly data was re-averaged.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC) - cont'd

- Four instances of maximum instantaneous data were lost between October 19 and October 27 as modifications were being made to the data logger for NMHC concentration alerts set-up.
- The canister sampler is programmed to draw in a whole air sample when the 5-minute average concentration of NMHC is above 0.30 ppm. A representative sample of ambient air is collected over a one-hour period when the canister event is triggered. No canister event was recorded this month.

WIND SPEED (WS) and WIND DIRECTION (WD)

- Operational time, for the monitoring period was 95.7%, equivalent to thirty-two hours of downtime.
- Due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7, six hours of downtime were recorded.
- The wind system recorded anomalous data between October 25, hour 08:00 and October 26, hour 09:00, likely due to prevalent weather conditions at the time. The data was excluded, resulting in twenty-six hours of downtime.
- One instance of maximum instantaneous data was discarded on October 6 at hour 11:00, due to a brief power outage.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime. These were incurred due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime. These were incurred due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7.
- Minute data collected from 11:34-11:35 was discarded as it was impacted by a brief power outage, and the hourly data was re-averaged.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime. These were incurred due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7.

STATION TEMPERATURE (StnTPX)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime. These were incurred due to a power failure that occurred from hour 22:00 on October 6, to hour 03:00 on October 7.

2.0 Project Personnel

Karla Reesor was the contact for Peace River Area Monitoring Program Committee and the Maxxam field technician was Raja Ashraf.

3.0 Plant Monthly Required AMD Summary

All data collected this month, with the exception of CH₄ calibration stabilization requirement, was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring

Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration

Maxxam AIR SOP-00209: Ambient Sulphur Monitoring

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - API 100A UV Fluorescent Analyzer

Total Reduced Sulphur - Thermo 43i - TLE UV Fluorescent Analyzer

Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer

Wind System - RM Young Unit

Relative Humidity - RM Young Unit

Barometric Pressure - Met One Unit

Ambient Temperature - RM Young Unit

Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

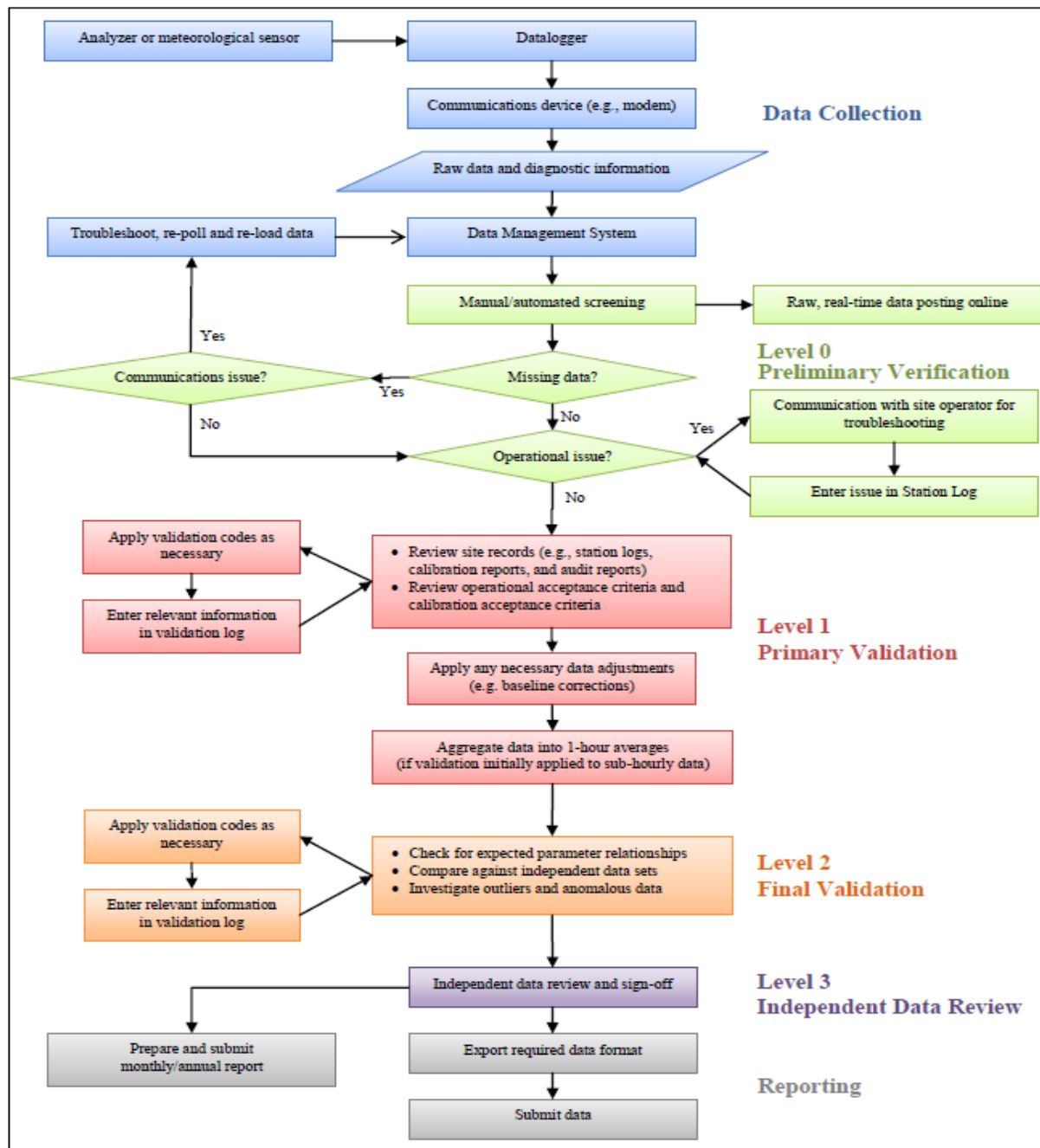
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
4	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
5	0	0	0	0	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	P	0	0	0	0	0	0	22	
7	P	P	P	P	0	S	0	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
8	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
10	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
11	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	S	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	1	0	0	0	S	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	24
20	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
28	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	1	0	0	0	NA	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
HOURLY AVG	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

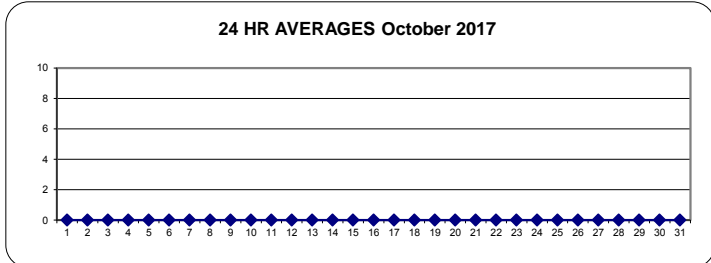
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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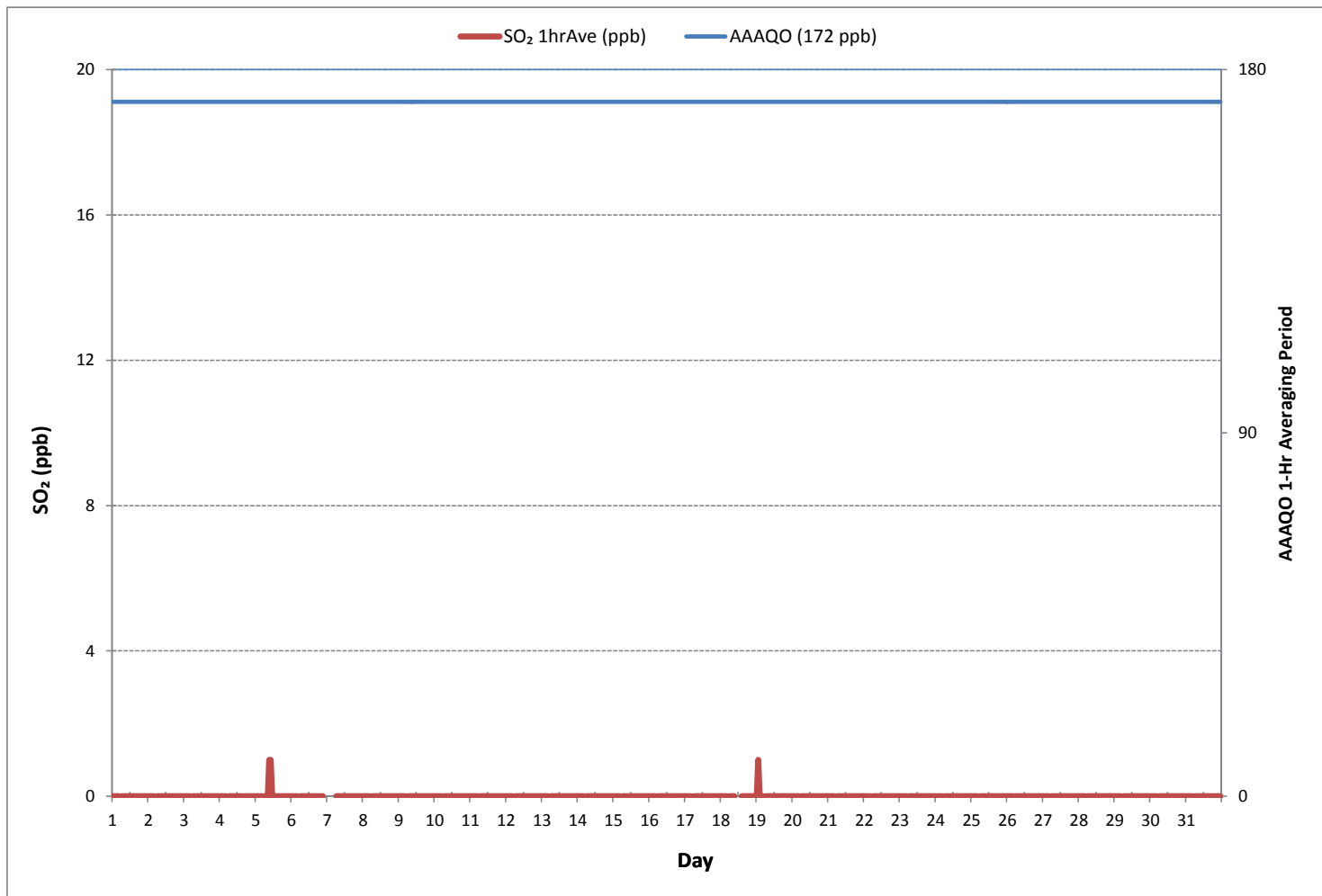
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	3
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR ON DAY 5
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	738 hrs
AMD OPERATION UPTIME:	99.2 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES October 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - October 2017

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
3	0	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24	
4	0	0	0	1	0	S	1	1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	24	
5	0	0	1	1	0	S	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	1	0	1	24	
6	1	1	0	0	1	S	1	1	1	0	0	P	0	0	0	0	1	1	1	0	0	0	0	P	P	0	1	21	
7	P	P	P	P	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	20	
8	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
9	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	24	
10	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
11	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
12	0	0	0	1	1	S	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24	
13	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
14	0	0	1	1	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24	
15	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	24	
16	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	24	
17	0	0	0	0	0	S	1	1	0	1	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	24	
18	0	0	0	0	0	S	0	0	0	0	C	C	C	C	C	0	1	1	0	1	1	1	1	1	0	0	1	24	
19	1	1	1	1	1	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	24
20	1	1	0	1	0	S	1	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	24	
21	1	0	0	0	1	S	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24
22	0	0	1	1	1	S	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24
23	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
28	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24
31	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	1	1	1	1	NA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
HOURLY AVG	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

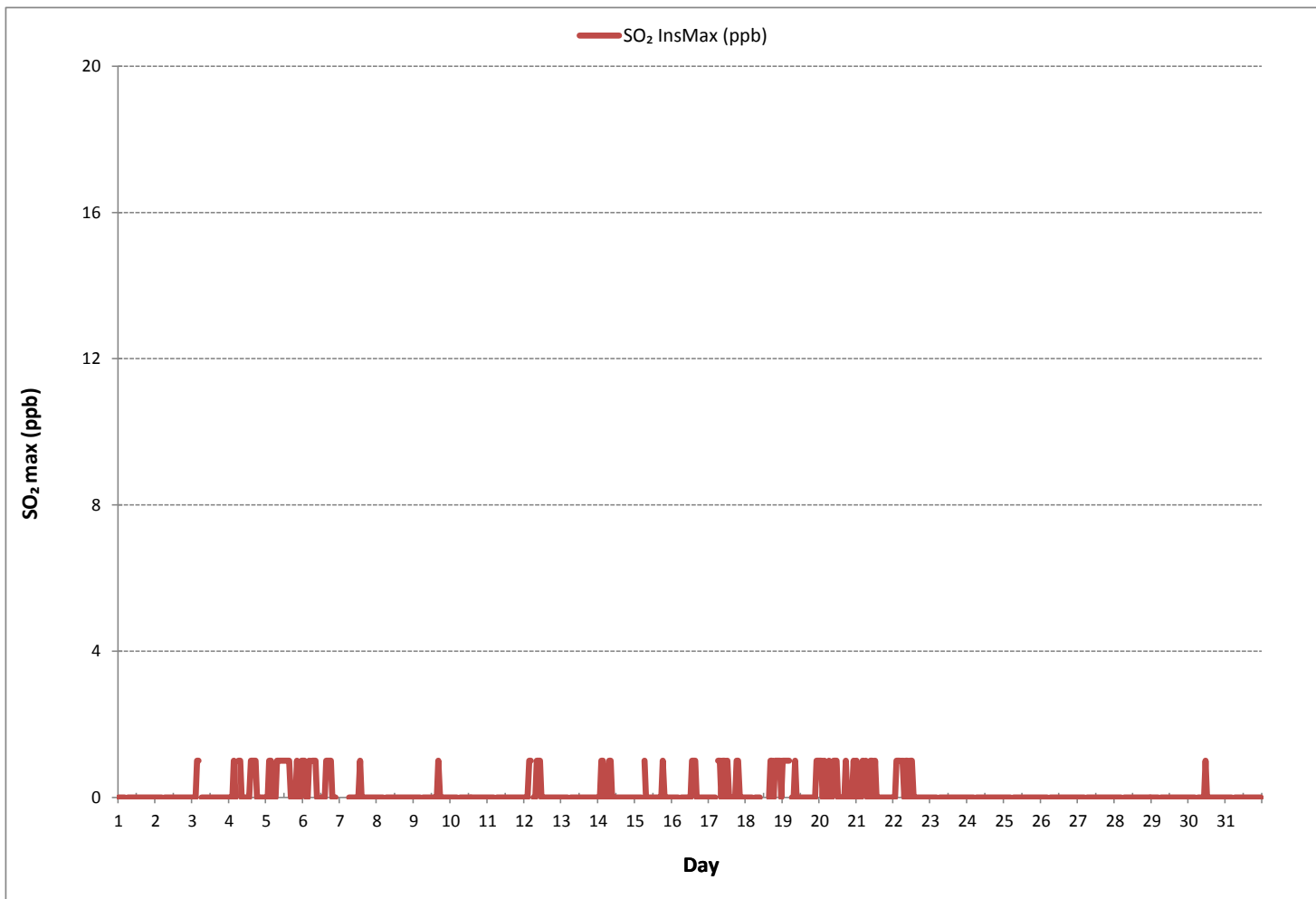
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	93
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 3 ON DAY 3
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	737 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: PRAMP_842
 Poll.: PRAMP_842-SO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

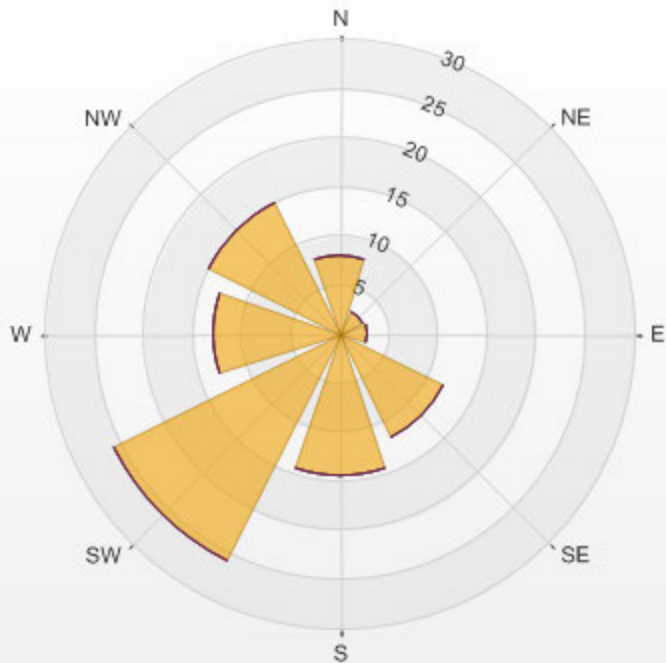
Calm: 6.70%

Calm Avg: 0.02 [ppb]

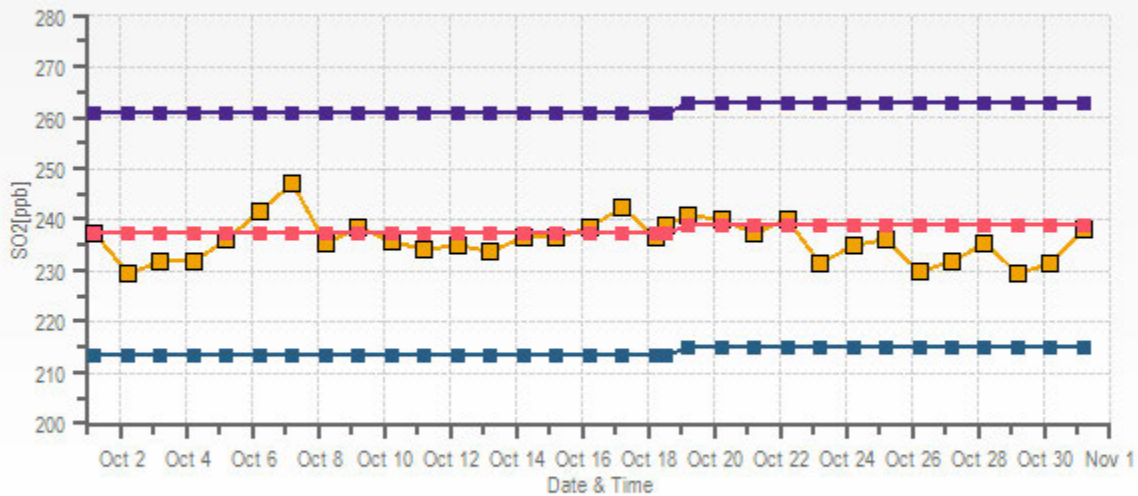
Direction	0-3	3-10	10-85	85-170	>170.0	Total
N	8.0	0.0	0.0	0.0	0.0	8.0
NE	2.6	0.0	0.0	0.0	0.0	2.6
E	2.9	0.0	0.0	0.0	0.0	2.9
SE	11.8	0.0	0.0	0.0	0.0	11.8
S	14.4	0.0	0.0	0.0	0.0	14.4
SW	25.8	0.0	0.0	0.0	0.0	25.8
W	12.8	0.0	0.0	0.0	0.0	12.8
NW	15.0	0.0	0.0	0.0	0.0	15.0
Summary	93.3	0.0	0.0	0.0	0.0	93.3

% Icon Classes (ppb) 93 0-3 0 3-10 0 10-85 0 85-170 0 >170.0

PRAMP_842 Poll.: PRAMP_842-SO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.70% Calm Poll Avg: 0.02[ppb]



SO2[ppb] Calibration: PRAMP_842 Monthly: 17/10 Type: Span



—■— Span Meas —■— Span Ref —■— Span Low —■— Span High

TOTAL REDUCED SULPHUR



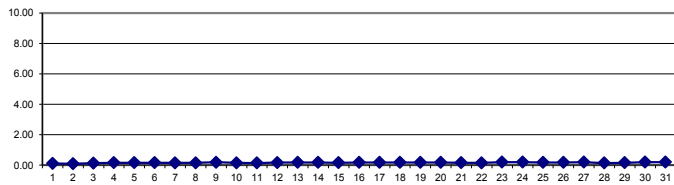
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.09	0.12	0.13	0.11	0.10	S	0.14	0.12	0.12	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.09	0.10	0.09	0.08	0.10	0.08	0.08	0.08	0.08	0.08	0.14	0.10	24
2	0.07	0.09	0.09	0.09	0.09	S	0.12	0.11	0.10	0.08	0.10	0.09	0.08	0.09	0.10	0.08	0.09	0.10	0.08	0.07	0.09	0.07	0.09	0.10	0.07	0.12	0.09	24	
3	0.12	0.12	0.15	0.12	0.11	S	0.12	0.10	0.11	0.10	0.10	0.10	0.10	0.11	0.11	0.13	0.13	0.14	0.14	0.16	0.17	0.16	0.14	0.15	0.10	0.17	0.13	24	
4	0.14	0.13	0.14	0.16	0.15	S	0.18	0.18	0.15	0.17	0.16	0.20	0.18	0.15	0.16	0.16	0.16	0.15	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.13	0.20	0.16	24
5	0.17	0.14	0.13	0.14	0.16	S	0.20	0.23	0.25	0.23	0.19	0.20	0.17	0.15	0.13	0.13	0.12	0.14	0.12	0.14	0.16	0.15	0.14	0.16	0.12	0.25	0.16	24	
6	0.16	0.16	0.18	0.16	0.15	S	0.21	0.17	0.16	0.15	0.16	0.17	0.16	0.17	0.14	0.15	0.14	0.15	0.15	0.16	0.18	0.18	P	P	0.14	0.21	0.16	22	
7	P	P	P	P	0.18	S	0.22	0.20	0.18	0.18	0.18	0.17	0.16	0.15	0.14	0.12	0.12	0.11	0.11	0.10	0.10	0.10	0.12	0.12	0.10	0.22	0.15	20	
8	0.12	0.12	0.11	0.16	0.16	S	0.15	0.14	0.13	0.12	0.13	0.15	0.13	0.13	0.13	0.15	0.16	0.16	0.17	0.18	0.17	0.17	0.18	0.11	0.18	0.15	24		
9	0.24	0.27	0.30	0.26	0.21	S	0.30	0.26	0.21	0.18	0.17	0.13	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.16	0.16	0.17	0.15	0.16	0.12	0.30	0.18	24	
10	0.15	0.15	0.13	0.15	0.14	S	0.19	0.16	0.13	0.16	0.15	0.14	0.12	0.13	0.13	0.13	0.15	0.15	0.14	0.14	0.14	0.14	0.15	0.14	0.12	0.19	0.14	24	
11	0.15	0.15	0.14	0.14	0.12	S	0.16	0.13	0.14	0.14	0.14	0.13	0.13	0.12	0.14	0.13	0.13	0.15	0.11	0.12	0.14	0.14	0.15	0.11	0.16	0.14	24		
12	0.16	0.15	0.16	0.17	0.17	S	0.21	0.17	0.17	0.19	0.20	0.19	0.17	0.16	0.17	0.15	0.15	0.16	0.19	0.15	0.18	0.15	0.13	0.15	0.13	0.21	0.17	24	
13	0.16	0.15	0.13	0.14	0.13	S	0.17	0.14	0.18	0.19	0.18	0.20	0.19	0.18	0.19	0.19	0.17	0.17	0.16	0.16	0.17	0.18	0.19	0.20	0.13	0.20	0.17	24	
14	0.19	0.18	0.19	0.19	0.18	S	0.22	0.20	0.18	0.19	0.19	0.20	0.18	0.16	0.16	0.18	0.15	0.16	0.15	0.16	0.17	0.13	0.15	0.16	0.13	0.22	0.17	24	
15	0.15	0.14	0.15	0.15	0.23	S	0.36	0.20	0.14	0.17	0.19	0.18	0.18	0.17	0.12	0.14	0.14	0.15	0.13	0.14	0.12	0.12	0.12	0.12	0.12	0.36	0.16	24	
16	0.14	0.15	0.17	0.18	0.17	S	0.19	0.17	0.18	0.17	0.16	0.16	0.18	0.17	0.17	0.16	0.16	0.20	0.20	0.19	0.18	0.16	0.17	0.18	0.14	0.20	0.17	24	
17	0.18	0.27	0.29	0.28	0.27	S	0.26	0.22	0.20	0.18	0.19	0.18	0.14	0.15	0.14	0.14	0.13	0.10	0.12	0.11	0.12	0.16	0.18	0.18	0.10	0.29	0.18	24	
18	0.17	0.18	0.22	0.22	0.23	S	0.22	0.20	0.21	0.20	0.14	0.09	0.09	C	C	C	C	0.25	0.14	0.11	0.13	0.13	0.14	0.15	0.09	0.25	0.17	24	
19	0.15	0.16	0.18	0.23	0.26	S	0.27	0.21	0.19	0.19	0.15	0.15	0.16	0.15	0.17	0.19	0.21	0.19	0.17	0.13	0.14	0.14	0.13	0.11	0.11	0.27	0.18	24	
20	0.10	0.12	0.11	0.11	0.13	S	0.26	0.22	0.20	0.22	0.26	0.23	0.20	0.15	0.15	0.13	0.15	0.14	0.14	0.14	0.17	0.19	0.19	0.19	0.10	0.26	0.17	24	
21	0.19	0.22	0.19	0.20	0.23	S	0.23	0.22	0.22	0.18	0.16	0.15	0.14	0.12	0.13	0.12	0.12	0.12	0.10	0.11	0.11	0.11	0.11	0.10	0.10	0.23	0.16	24	
22	0.10	0.11	0.10	0.13	0.11	S	0.14	0.12	0.16	0.16	0.16	0.16	0.18	0.17	0.17	0.16	0.16	0.16	0.15	0.16	0.15	0.14	0.17	0.17	0.10	0.18	0.15	24	
23	0.18	0.16	0.17	0.17	0.18	S	0.22	0.19	0.21	0.21	0.20	0.18	0.16	0.16	0.17	0.18	0.17	0.20	0.22	0.18	0.18	0.20	0.19	0.20	0.16	0.22	0.19	24	
24	0.20	0.20	0.20	0.21	0.22	S	0.25	0.24	0.24	0.19	0.19	0.17	0.17	0.19	0.17	0.17	0.17	0.17	0.18	0.18	0.17	0.18	0.18	0.18	0.17	0.25	0.19	24	
25	0.18	0.18	0.17	0.17	0.17	S	0.19	0.18	0.17	0.16	0.16	0.15	0.17	0.22	0.23	0.18	0.16	0.16	0.15	0.16	0.14	0.16	0.16	0.17	0.14	0.23	0.17	24	
26	0.21	0.21	0.20	0.19	0.16	S	0.19	0.19	0.17	0.18	0.19	0.20	0.19	0.19	0.19	0.17	0.16	0.17	0.17	0.18	0.18	0.18	0.16	0.16	0.16	0.21	0.18	24	
27	0.17	0.19	0.22	0.21	0.23	S	0.25	0.25	0.24	0.24	0.22	0.21	0.20	0.20	0.20	0.19	0.19	0.18	0.16	0.15	0.17	0.18	0.17	0.17	0.15	0.25	0.20	24	
28	0.15	0.15	0.16	0.16	0.18	S	0.19	0.17	0.17	0.14	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.11	0.10	0.11	0.12	0.13	0.10	0.19	0.14	24		
29	0.14	0.13	0.14	0.15	0.12	S	0.17	0.15	0.17	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.16	0.15	0.14	0.17	0.16	0.18	0.18	0.12	0.18	0.15	24		
30	0.18	0.20	0.20	0.20	0.20	S	0.22	0.19	0.19	0.20	0.21	0.23	0.20	0.19	0.18	0.18	0.19	0.17	0.15	0.16	0.17	0.16	0.18	0.18	0.15	0.23	0.19	24	
31	0.20	0.21	0.19	0.18	0.19	S	0.25	0.22	0.19	0.17	0.17	0.16	0.15	0.13	0.17	0.18	0.23	0.31	0.29	0.21	0.19	0.17	0.15	0.15	0.13	0.31	0.19	24	
HOURLY MAX	0.24	0.27	0.30	0.28	0.27	NA	0.36	0.26	0.25	0.24	0.26	0.23	0.20	0.22	0.23	0.19	0.23	0.31	0.29	0.21	0.19	0.20	0.19	0.20					
HOURLY AVG	0.16	0.16	0.17	0.17	0.17	NA	0.21	0.18	0.18	0.17	0.17	0.16	0.15	0.15	0.15	0.15	0.15	0.16	0.15	0.14	0.15	0.15	0.15	0.15					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

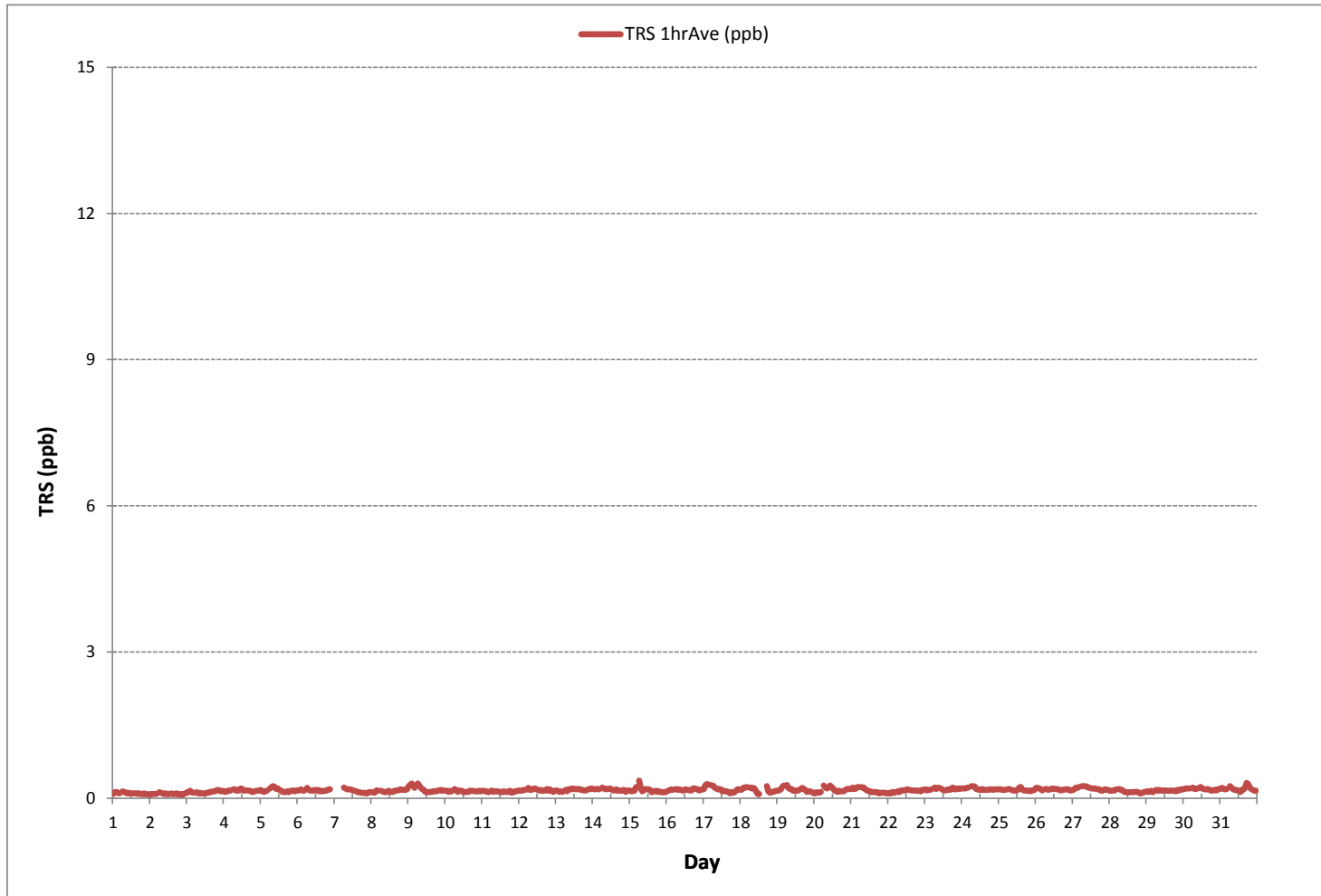
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	703
MINIMUM 1-HR AVERAGE:	0.07 ppb @ HOUR 0 ON DAY 2
MAXIMUM 1-HR AVERAGE:	0.36 ppb @ HOUR 6 ON DAY 15
MAXIMUM 24-HR AVERAGE:	0.20 ppb ON DAY 27
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	738 hrs
AMD OPERATION UPTIME:	99.2 %
STANDARD DEVIATION:	0.04
MONTHLY AVERAGE:	0.16 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - October 2017

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.02	0.05	0.07	0.05	0.05	S	0.09	0.07	0.07	0.05	0.07	0.05	0.07	0.05	0.07	0.07	0.05	0.07	0.07	0.05	0.09	0.07	0.05	0.07	0.02	0.09	0.06	24	
2	0.05	0.07	0.07	0.07	0.07	S	0.12	0.12	0.09	0.07	0.09	0.09	0.09	0.12	0.12	0.09	0.09	0.09	0.12	0.12	0.12	0.12	0.09	0.09	0.12	0.05	0.12	0.09	24
3	0.17	0.15	0.17	0.17	0.15	S	0.22	0.15	0.12	0.15	0.15	0.12	0.15	0.15	0.15	0.15	0.15	0.17	0.17	0.20	0.20	0.17	0.15	0.17	0.12	0.22	0.16	24	
4	0.15	0.15	0.17	0.17	0.15	S	0.17	0.17	0.15	0.15	0.15	0.23	0.20	0.17	0.15	0.15	0.17	0.15	0.14	0.12	0.15	0.15	0.17	0.15	0.12	0.23	0.16	24	
5	0.15	0.12	0.15	0.12	0.15	S	0.20	0.22	0.23	0.22	0.17	0.17	0.15	0.12	0.12	0.10	0.09	0.09	0.12	0.09	0.09	0.09	0.12	0.12	0.09	0.23	0.14	24	
6	0.09	0.12	0.17	0.12	0.09	S	0.17	0.12	0.15	0.15	0.12	P	0.12	0.12	0.09	0.15	0.09	0.15	0.09	0.12	0.15	0.12	P	P	0.09	0.17	0.13	21	
7	P	P	P	P	0.12	S	0.18	0.15	0.15	0.12	0.15	0.12	0.09	0.12	0.09	0.07	0.07	0.07	0.05	0.05	0.07	0.05	0.07	0.09	0.05	0.18	0.10	20	
8	0.05	0.09	0.07	0.15	0.18	S	0.15	0.09	0.12	0.09	0.12	0.12	0.12	0.09	0.09	0.15	0.12	0.15	0.17	0.18	0.15	0.15	0.18	0.20	0.05	0.20	0.13	24	
9	0.25	0.26	0.33	0.28	0.25	S	0.38	0.28	0.23	0.20	0.20	0.12	0.15	0.12	0.12	0.09	0.17	0.15	0.15	0.15	0.17	0.18	0.20	0.20	0.09	0.38	0.20	24	
10	0.20	0.15	0.12	0.17	0.18	S	0.23	0.18	0.17	0.18	0.17	0.15	0.17	0.15	0.15	0.15	0.15	0.12	0.15	0.15	0.15	0.15	0.15	0.12	0.12	0.23	0.16	24	
11	0.15	0.15	0.18	0.15	0.12	S	0.20	0.12	0.15	0.15	0.12	0.09	0.12	0.12	0.15	0.12	0.15	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.09	0.20	0.13	24	
12	0.12	0.15	0.12	0.15	0.15	S	0.25	0.18	0.20	0.20	0.18	0.20	0.15	0.20	0.17	0.17	0.15	0.20	0.22	0.17	0.20	0.18	0.15	0.20	0.12	0.25	0.18	24	
13	0.20	0.20	0.17	0.15	0.18	S	0.20	0.17	0.23	0.26	0.22	0.23	0.23	0.20	0.20	0.20	0.20	0.18	0.17	0.17	0.17	0.17	0.22	0.22	0.15	0.26	0.20	24	
14	0.20	0.18	0.20	0.18	0.18	S	0.22	0.22	0.23	0.20	0.20	0.22	0.22	0.15	0.18	0.22	0.17	0.20	0.20	0.17	0.20	0.17	0.18	0.22	0.15	0.23	0.20	24	
15	0.17	0.18	0.20	0.20	0.30	S	0.49	0.28	0.17	0.20	0.20	0.20	0.20	0.28	0.17	0.20	0.15	0.15	0.20	0.15	0.12	0.15	0.12	0.09	0.09	0.49	0.20	24	
16	0.15	0.15	0.17	0.15	0.17	S	0.20	0.15	0.15	0.15	0.12	0.12	0.18	0.15	0.15	0.12	0.15	0.20	0.17	0.17	0.15	0.12	0.17	0.15	0.12	0.20	0.15	24	
17	0.17	0.25	0.25	0.25	0.23	S	0.22	0.22	0.17	0.15	0.15	0.17	0.15	0.09	0.12	0.12	0.09	0.09	0.09	0.12	0.15	0.20	0.15	0.20	0.15	0.09	0.25	0.16	24
18	0.15	0.17	0.20	0.20	0.20	S	0.25	0.25	0.25	0.22	0.20	0.15	0.17	C	C	C	C	0.59	0.25	0.18	0.20	0.23	0.20	0.22	0.15	0.59	0.23	24	
19	0.20	0.22	0.25	0.28	0.31	S	0.33	0.25	0.22	0.25	0.22	0.20	0.22	0.20	0.20	0.25	0.26	0.25	0.23	0.20	0.20	0.22	0.22	0.20	0.20	0.33	0.23	24	
20	0.22	0.22	0.20	0.17	0.25	S	0.33	0.30	0.28	0.33	0.33	0.30	0.28	0.23	0.22	0.23	0.25	0.23	0.23	0.25	0.25	0.26	0.25	0.25	0.17	0.33	0.25	24	
21	0.28	0.28	0.28	0.30	0.33	S	0.33	0.28	0.30	0.25	0.25	0.22	0.20	0.20	0.22	0.20	0.22	0.20	0.20	0.20	0.20	0.22	0.25	0.20	0.20	0.33	0.24	24	
22	0.20	0.20	0.23	0.25	0.23	S	0.28	0.23	0.28	0.25	0.25	0.25	0.28	0.28	0.28	0.25	0.25	0.25	0.28	0.25	0.23	0.25	0.28	0.25	0.20	0.28	0.25	24	
23	0.28	0.26	0.26	0.28	0.31	S	0.36	0.28	0.30	0.30	0.28	0.25	0.25	0.23	0.25	0.25	0.22	0.30	0.28	0.25	0.23	0.22	0.22	0.23	0.22	0.36	0.26	24	
24	0.25	0.23	0.23	0.26	0.26	S	0.28	0.26	0.26	0.20	0.20	0.20	0.20	0.20	0.20	0.17	0.20	0.17	0.23	0.20	0.20	0.25	0.23	0.20	0.17	0.28	0.22	24	
25	0.20	0.20	0.22	0.22	0.20	S	0.23	0.20	0.20	0.22	0.18	0.20	0.22	0.28	0.30	0.23	0.23	0.22	0.23	0.22	0.18	0.22	0.26	0.25	0.18	0.30	0.22	24	
26	0.33	0.30	0.28	0.30	0.26	S	0.28	0.25	0.25	0.26	0.28	0.26	0.28	0.28	0.28	0.25	0.23	0.26	0.26	0.25	0.23	0.28	0.23	0.22	0.22	0.33	0.27	24	
27	0.26	0.25	0.28	0.26	0.31	S	0.38	0.30	0.33	0.31	0.28	0.28	0.26	0.26	0.26	0.25	0.26	0.26	0.23	0.23	0.30	0.28	0.28	0.26	0.23	0.38	0.28	24	
28	0.23	0.23	0.25	0.23	0.26	S	0.28	0.25	0.26	0.22	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.23	0.20	0.17	0.20	0.17	0.18	0.22	0.17	0.28	0.22	24	
29	0.23	0.23	0.26	0.23	0.23	S	0.38	0.25	0.28	0.25	0.25	0.26	0.25	0.25	0.22	0.25	0.25	0.25	0.26	0.25	0.28	0.26	0.28	0.28	0.22	0.38	0.26	24	
30	0.28	0.33	0.30	0.31	0.28	S	0.33	0.28	0.30	0.33	0.33	0.33	0.28	0.28	0.26	0.30	0.28	0.28	0.23	0.26	0.26	0.23	0.28	0.31	0.23	0.33	0.29	24	
31	0.31	0.31	0.26	0.28	0.28	S	0.39	0.30	0.31	0.26	0.26	0.28	0.23	0.23	0.26	0.25	0.30	0.39	0.36	0.28	0.26	0.23	0.22	0.26	0.22	0.39	0.28	24	
HOURLY MAX	0.33	0.33	0.33	0.31	0.33	NA	0.49	0.30	0.33	0.33	0.33	0.33	0.28	0.28	0.30	0.30	0.30	0.59	0.36	0.28	0.30	0.28	0.28	0.31					
HOURLY AVG	0.19	0.20	0.20	0.20	0.21	NA	0.26	0.21	0.21	0.20	0.20	0.19	0.19	0.18	0.18	0.18	0.18	0.20	0.19	0.18	0.18	0.18	0.19	0.19					

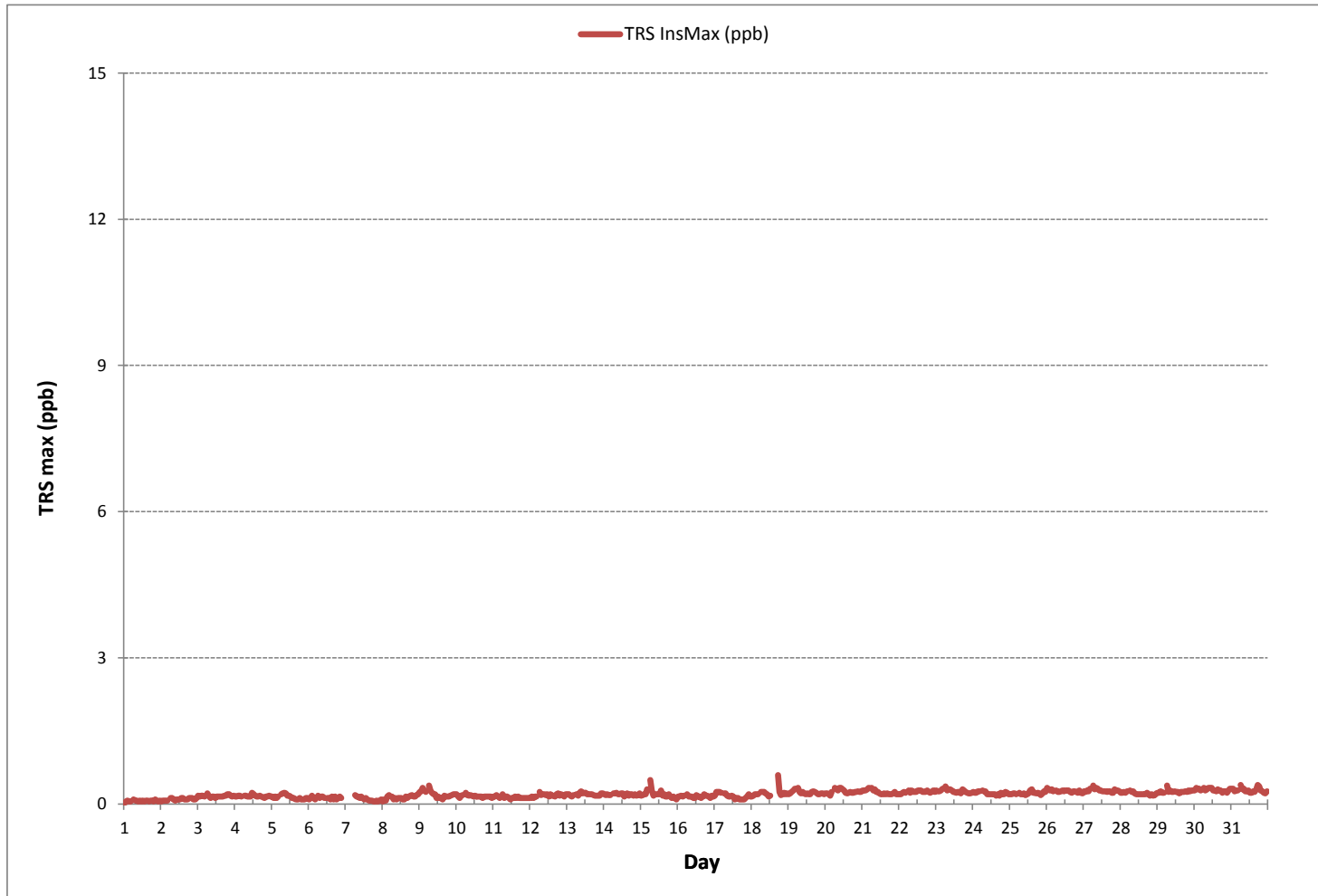
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	0.59 ppb @ HOUR 17 ON DAY 18
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	737 hrs
STANDARD DEVIATION:	0.07

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



% Icon Classes (ppb)

93



0-1

0



1-3

0



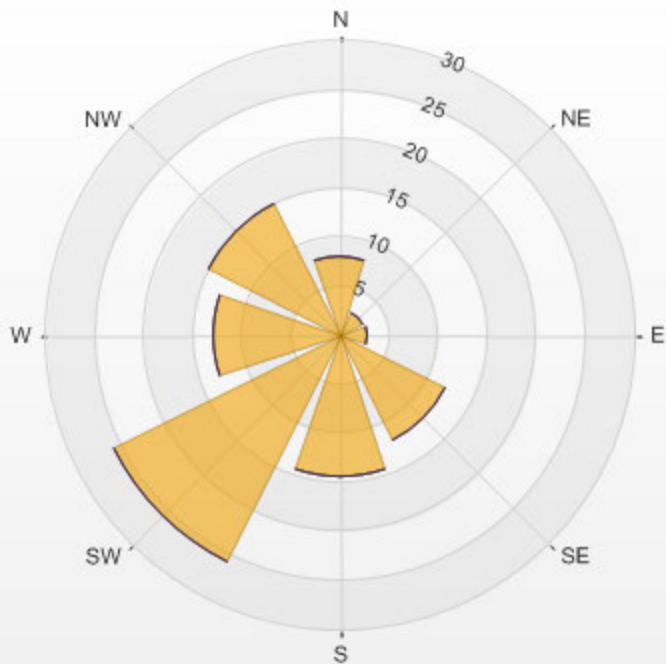
3-10

0

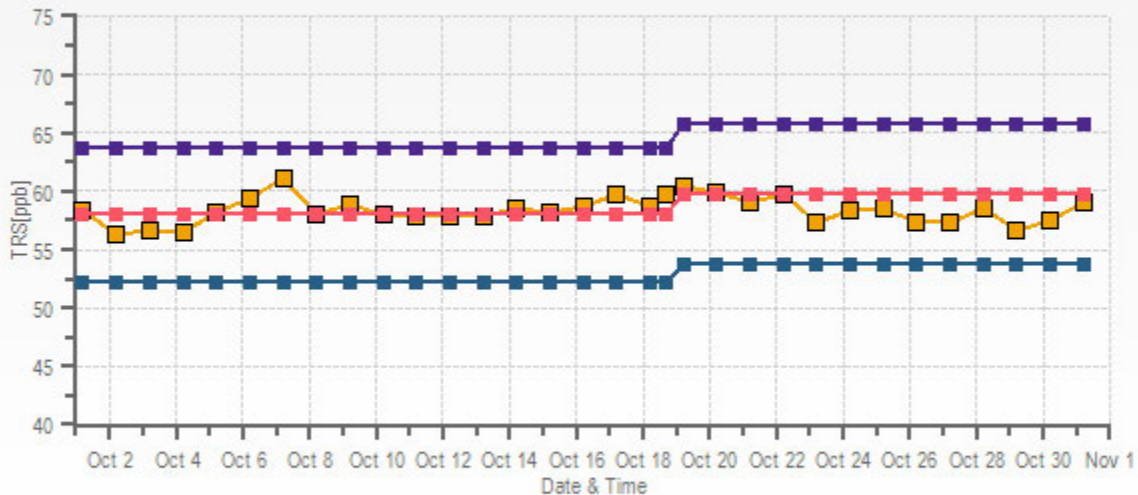


>10.0

PRAMP_842 Poll.: PRAMP_842-TRS[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.69% Calm Poll Avg: 0.17[ppb]



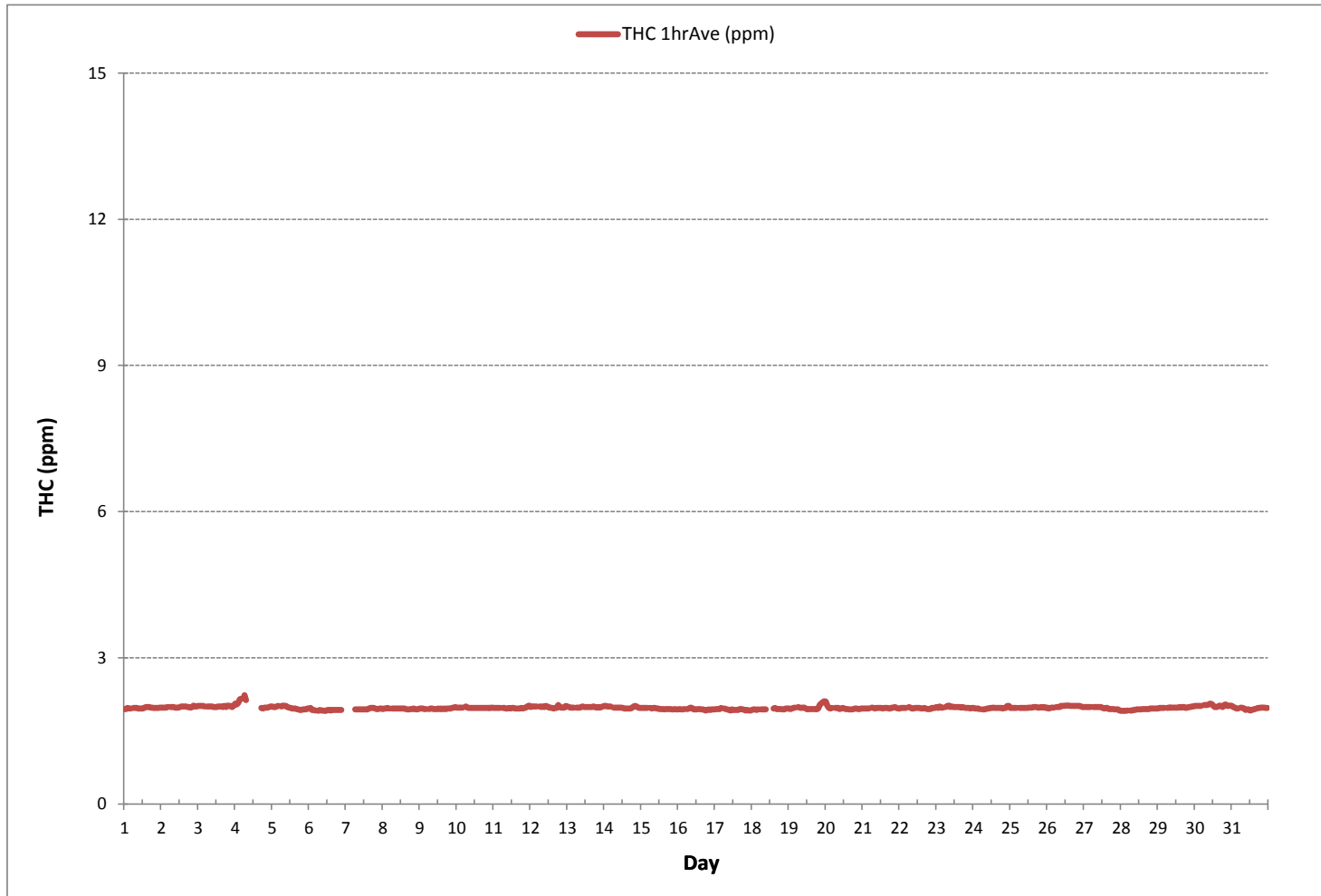
TRS[ppb] Calibration: PRAMP_842 Monthly: 17/10 Type: Span



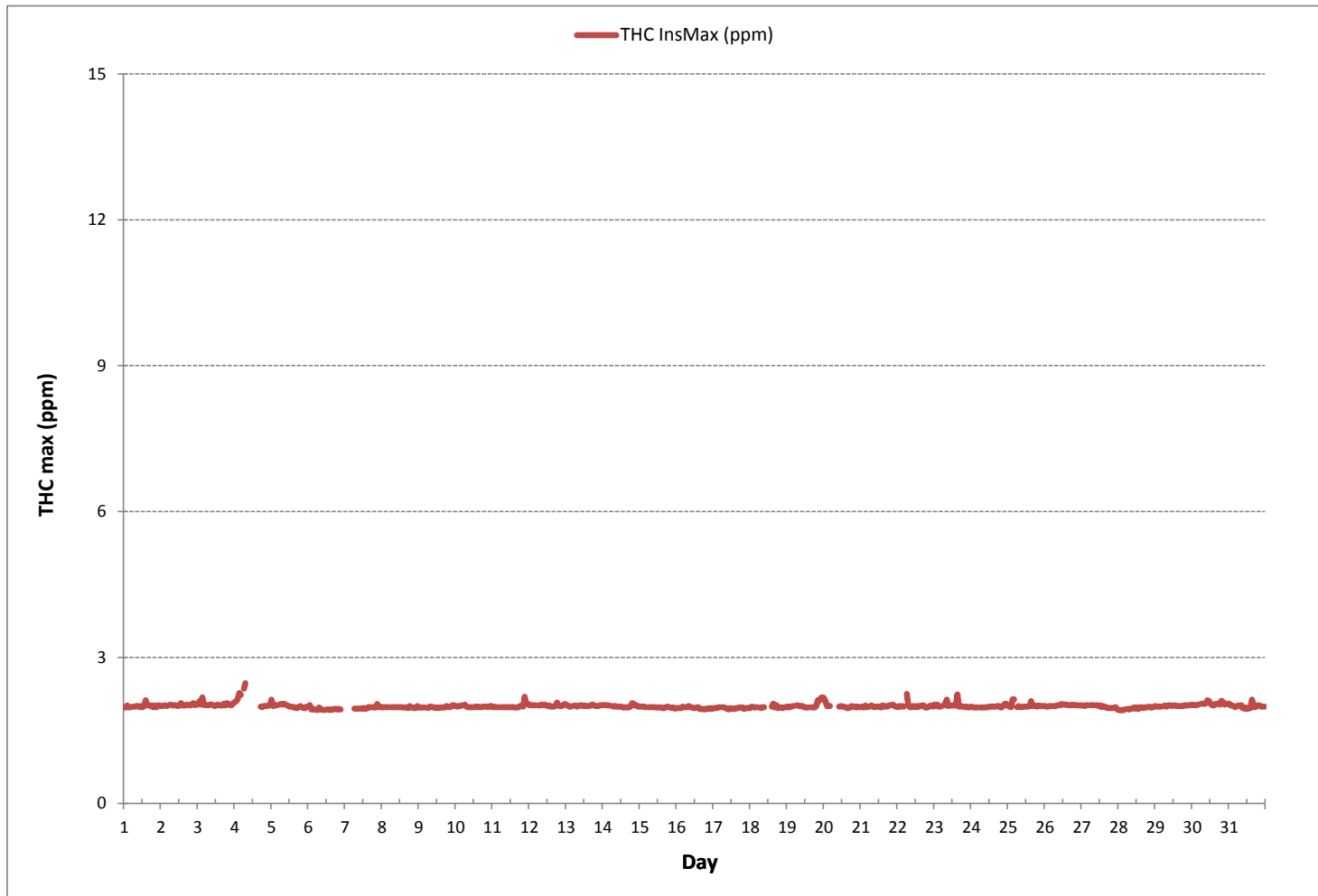
—■— Span Meas —■— Span Ref —■— Span Low —■— Span High

TOTAL HYDROCARBON

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: PRAMP_842
 Poll.: PRAMP_842-THC55[ppm]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

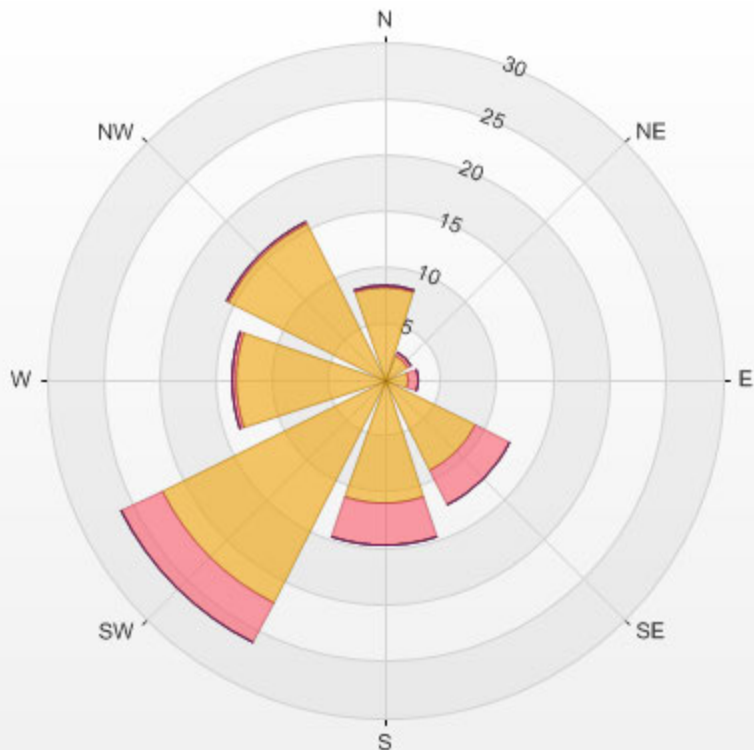
Calm: 3.29%

Calm Avg: 1.98 [ppm]

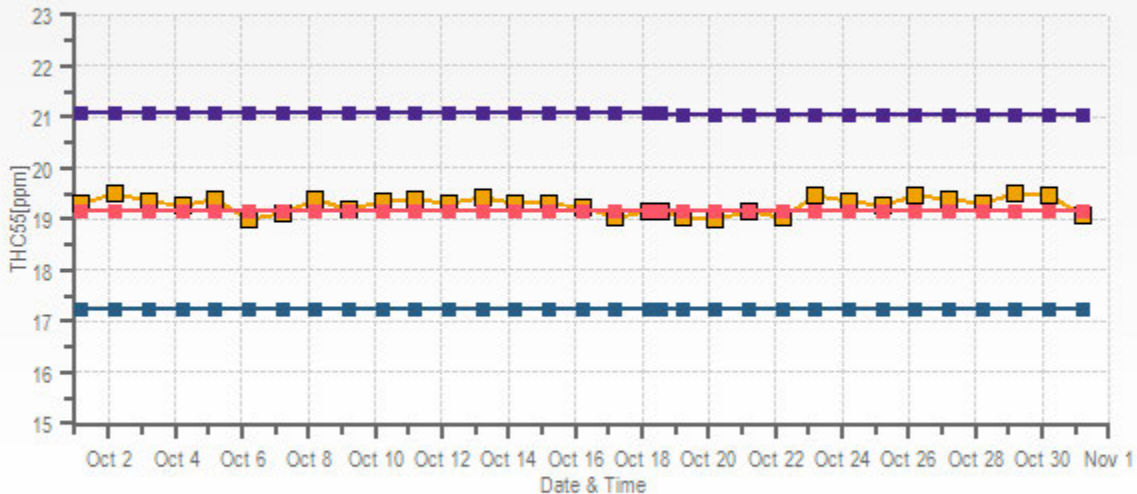
Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	8.2	0.2	0.0	0.0	0.0	8.4
NE	2.4	0.3	0.0	0.0	0.0	2.7
E	2.1	0.9	0.0	0.0	0.0	3.0
SE	9.1	3.3	0.0	0.0	0.0	12.4
S	11.1	3.7	0.0	0.0	0.0	14.8
SW	22.1	4.0	0.0	0.0	0.0	26.2
W	13.3	0.3	0.0	0.0	0.0	13.6
NW	15.6	0.2	0.0	0.0	0.0	15.7
Summary	83.9	12.9	0.0	0.0	0.0	96.7

% Icon Classes (ppm) 84 0-2 13 2-3 0 3-5 0 5-10 0 >10.0

PRAMP_842 Poll.: PRAMP_842-THC55[ppm] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 3.29% Calm Poll Avg: 1.98[ppm]



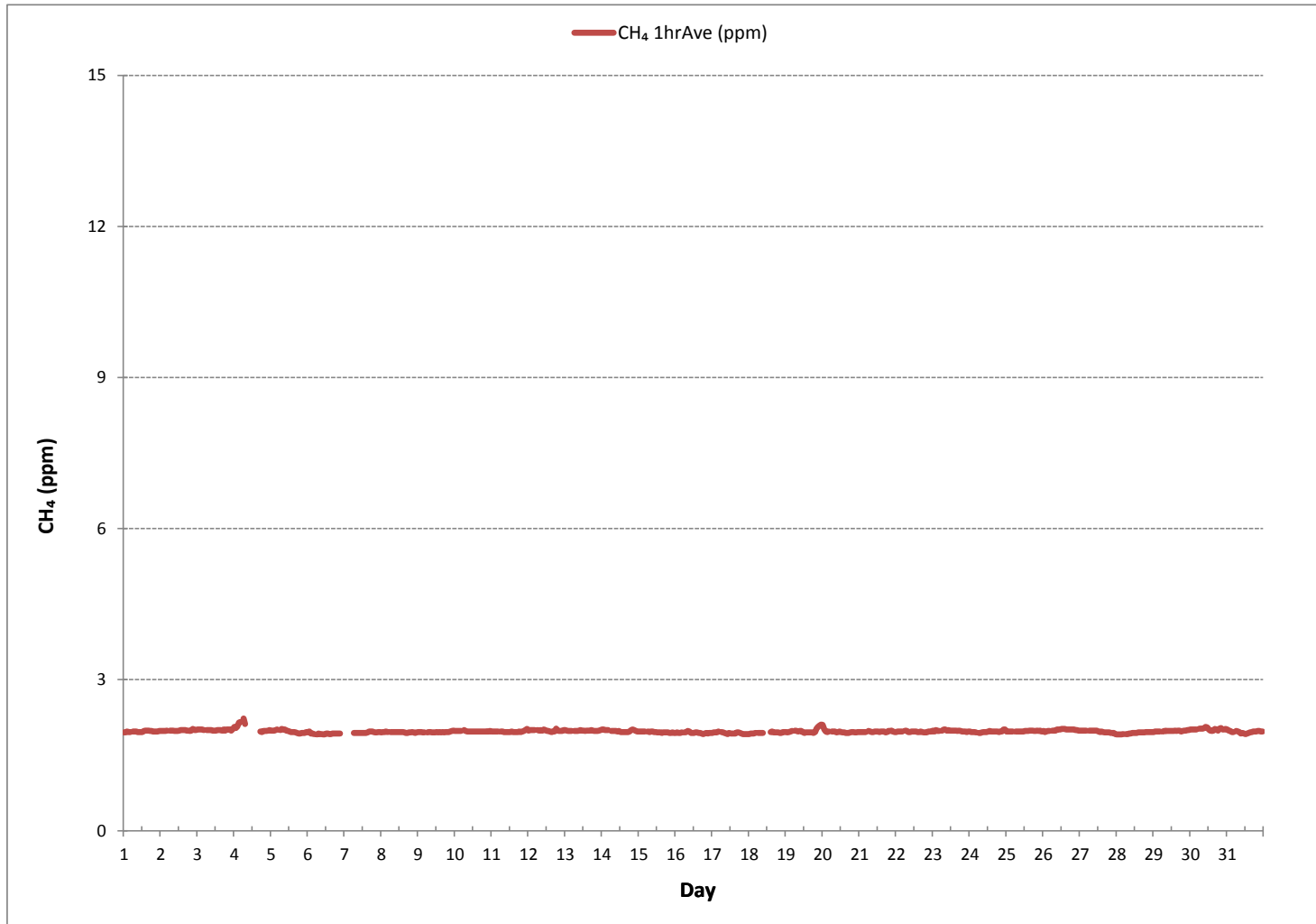
THC55[ppm] Calibration: PRAMP_842 Monthly: 17/10 Type: Span



—■— Span Meas —■— Span Ref —■— Span Low —■— Span High

METHANE

METHANE Hourly Averages (CH₄ ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - October 2017

METHANE MAX Instantaneous Maximum (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	1.96	1.97	2.00	1.98	1.97	S	1.98	1.99	1.99	1.99	1.97	1.99	1.97	1.99	2.12	2.01	2.00	1.99	2.00	1.98	2.00	1.98	2.00	2.00	1.96	2.12	1.99	24		
2	1.99	2.00	2.00	2.01	2.00	S	2.02	2.01	2.00	2.01	2.00	1.99	2.00	2.06	2.00	2.00	2.00	2.00	2.01	2.00	2.02	2.05	2.01	2.03	1.99	2.06	2.01	24		
3	2.02	2.03	2.03	2.18	2.02	S	2.01	2.01	2.02	2.03	2.01	2.00	2.01	2.00	2.01	2.00	2.00	2.04	2.01	2.05	2.03	2.01	2.01	2.06	2.00	2.18	2.03	24		
4	2.08	2.09	2.14	2.27	2.21	S	2.36	2.30	X	X	X	X	X	X	Y	Y	1.98	1.97	1.99	2.00	1.99	2.00	2.01	1.97	2.36	2.10	15			
5	2.01	1.99	2.01	2.01	2.02	S	2.03	2.02	2.04	2.02	2.01	1.99	1.98	1.99	1.97	1.96	1.95	1.98	1.99	1.97	1.95	1.96	1.98	1.95	2.04	1.99	24			
6	1.99	2.01	1.94	1.94	1.94	S	1.93	1.97	1.94	1.93	1.92	P	1.94	1.94	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	P	1.92	2.01	1.95	21		
7	P	P	P	P	1.94	S	1.94	1.94	1.94	1.94	1.95	1.95	1.94	1.95	1.95	1.97	1.98	1.98	1.98	1.96	1.96	2.03	1.97	1.98	1.94	2.03	1.96	20		
8	1.96	1.97	1.97	1.98	1.97	S	1.97	1.97	1.97	1.97	1.97	1.98	1.97	1.97	1.96	1.96	1.96	1.95	1.96	1.97	1.96	1.96	1.96	1.96	1.95	1.98	1.97	24		
9	1.96	1.97	1.97	1.96	1.96	S	1.96	1.99	1.98	1.98	1.95	1.95	1.96	1.96	1.97	1.96	1.96	1.99	1.99	1.97	1.98	2.01	2.00	1.95	2.01	1.97	24			
10	2.00	1.99	1.99	1.99	2.00	S	2.02	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	2.00	1.98	2.02	1.99	24	
11	1.98	1.98	1.98	1.98	1.98	S	1.97	1.97	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	2.00	2.00	1.99	2.18	2.03	2.04	1.97	2.18	1.99	24		
12	2.01	2.01	2.01	2.01	2.01	S	2.01	2.01	2.03	2.00	2.02	2.02	1.99	1.98	1.98	1.97	1.98	1.97	1.98	1.99	2.06	2.00	1.99	1.99	2.00	2.03	1.97	2.06	2.00	24
13	2.02	2.00	1.98	1.98	2.00	S	2.00	1.99	2.00	2.00	2.01	2.00	2.00	1.99	2.00	1.99	2.00	2.02	2.01	1.99	1.99	1.99	2.01	2.01	1.98	2.02	2.00	24		
14	2.01	2.01	2.01	2.01	2.00	S	1.99	1.98	2.00	1.99	1.98	1.98	1.98	1.97	1.96	1.96	1.96	1.98	1.98	2.06	2.04	2.01	2.01	1.99	1.96	2.06	1.99	24		
15	1.98	1.98	1.99	1.98	1.98	S	1.98	1.97	1.97	1.98	1.97	1.97	1.96	1.96	1.97	1.96	1.96	1.97	1.98	1.97	1.96	1.96	1.96	1.94	1.94	1.99	1.97	24		
16	1.95	1.96	1.95	1.95	1.98	S	1.97	1.98	1.99	1.98	1.96	1.95	1.95	1.97	1.98	1.95	1.95	1.94	1.94	1.94	1.95	1.95	1.94	1.94	1.94	1.99	1.96	24		
17	1.95	1.96	1.96	1.97	1.98	S	1.97	1.96	1.95	1.94	1.93	1.96	1.94	1.94	1.94	1.95	1.96	1.96	1.96	1.96	1.95	1.95	1.94	1.95	1.95	1.93	1.98	1.95	24	
18	1.95	1.98	1.97	1.97	1.98	S	1.96	1.95	1.97	1.97	C	C	C	C	1.98	1.98	1.96	2.02	1.97	1.97	1.96	1.96	1.98	1.97	1.95	2.02	1.97	24		
19	1.99	1.96	1.99	1.98	1.99	S	2.00	2.01	1.99	1.99	1.99	1.98	1.96	1.97	1.97	X	1.97	1.97	2.00	2.12	2.10	2.16	2.18	1.96	2.18	2.01	23			
20	2.16	2.09	1.99	1.99	1.99	S	2.01	X	2.00	X	1.98	1.99	1.99	1.99	1.97	1.95	1.95	1.97	1.99	1.98	1.98	1.97	1.98	1.98	1.95	2.16	2.00	22		
21	1.97	1.99	1.97	2.00	1.98	S	1.99	2.00	1.99	1.98	1.99	1.99	1.99	1.98	1.98	1.98	2.00	1.98	1.99	2.01	2.01	2.02	1.99	1.98	1.97	2.02	1.99	24		
22	1.97	1.99	1.98	2.00	1.99	S	2.24	2.02	1.99	1.97	1.99	1.97	2.00	1.97	2.00	1.99	2.00	2.01	1.97	1.98	1.98	2.00	2.01	1.98	1.97	2.24	2.00	24		
23	2.02	1.99	2.03	1.99	1.99	S	2.00	2.04	2.04	1.99	2.01	2.00	2.01	2.00	2.01	1.99	1.99	1.99	1.99	1.98	1.97	1.98	1.97	1.98	1.97	2.04	2.00	24		
24	1.98	1.97	1.97	1.97	1.96	S	1.97	1.96	1.96	1.97	1.97	1.98	1.98	1.98	1.98	1.98	1.98	1.99	1.99	1.97	1.98	2.00	2.04	2.04	1.96	2.04	1.98	24		
25	1.99	1.98	1.98	1.98	1.97	S	1.98	1.98	1.97	1.97	1.97	1.98	1.99	1.99	1.99	2.09	1.99	2.00	1.99	1.99	1.99	2.01	1.99	1.99	1.97	2.09	1.99	24		
26	1.99	1.98	1.98	1.99	1.99	S	2.00	2.00	2.00	2.02	2.02	2.02	2.02	2.03	2.03	2.02	2.02	2.02	2.02	2.02	2.02	2.01	2.01	2.01	1.98	2.03	2.01	24		
27	2.00	2.01	2.00	2.02	2.01	S	2.01	2.00	2.02	X	2.01	1.99	2.00	1.97	2.00	1.98	1.98	1.96	1.96	1.95	1.95	1.95	1.98	1.94	1.94	2.02	1.99	23		
28	1.92	1.92	1.91	1.92	1.92	S	1.93	1.93	1.95	1.94	1.97	1.94	1.97	1.95	1.98	1.97	1.96	1.98	1.96	1.98	1.98	1.97	1.97	1.99	1.91	1.99	1.95	24		
29	1.99	1.98	1.99	1.98	1.98	S	2.00	1.99	1.99	1.99	2.01	2.00	2.00	2.00	1.99	2.00	1.99	2.00	1.99	2.01	2.01	2.00	2.01	2.01	1.98	2.01	2.00	24		
30	2.02	2.02	2.02	2.01	2.02	S	2.04	2.04	2.04	2.05	2.09	2.09	2.03	2.02	2.01	2.03	2.04	2.04	2.02	2.10	2.09	2.02	2.04	2.04	2.01	2.10	2.04	24		
31	2.04	2.01	2.00	1.99	1.97	S	2.01	1.99	2.02	1.95	1.94	1.96	1.94	1.95	1.95	2.13	1.98	1.97	2.00	2.00	2.01	1.99	1.98	1.99	1.94	2.13	1.99	24		
HOURLY MAX	2.16	2.09	2.14	2.27	2.21	NA	2.36	2.30	2.04	2.05	2.09	2.09	2.03	2.06	2.12	2.13	2.04	2.04	2.06	2.10	2.12	2.18	2.16	2.18						
HOURLY AVG	2.00	1.99	1.99	2.00	1.99	NA	2.01	2.00	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.99	1.98	1.98	1.99	1.99	1.99	2.00	2.00	2.00						

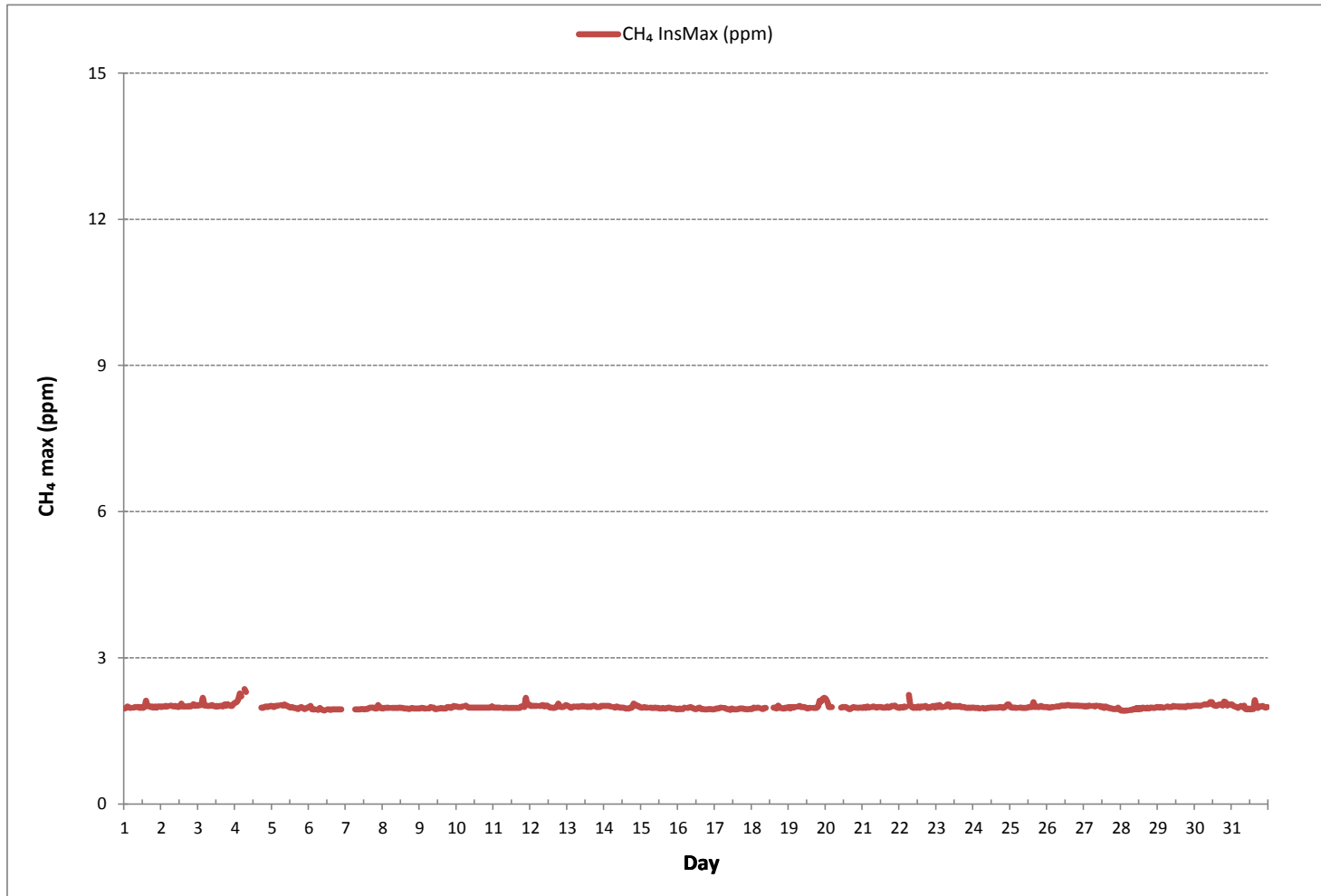
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	689
MAXIMUM INSTANTANEOUS VALUE:	2.36 ppm @ HOUR 6 ON DAY 4
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	724 hrs
STANDARD DEVIATION:	0.04

METHANE MAX Instantaneous Maximum (CH₄ ppm)



Wind: PRAMP_842
 Poll.: PRAMP_842-CH₄[ppm]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

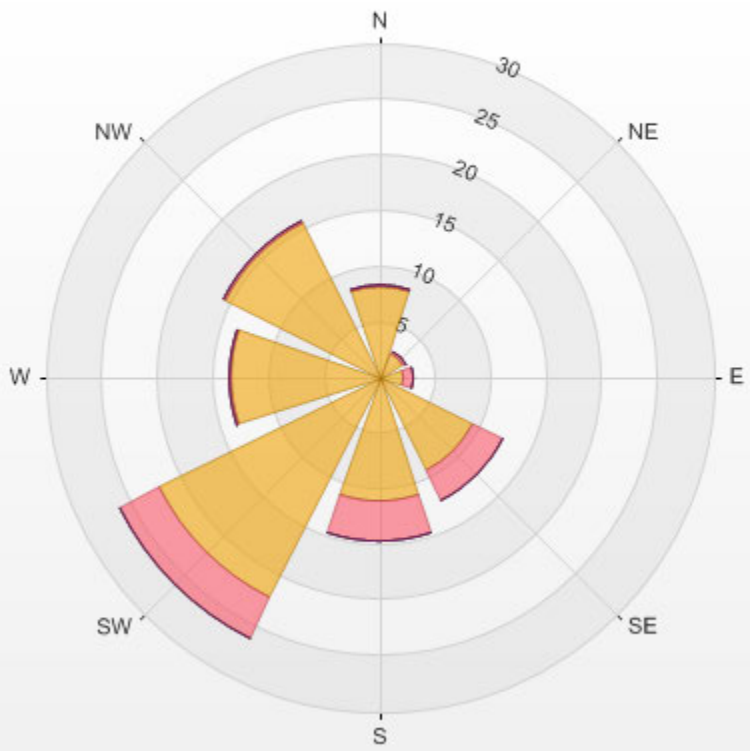
Calm: 3.29%

Calm Avg: 1.98 [ppm]

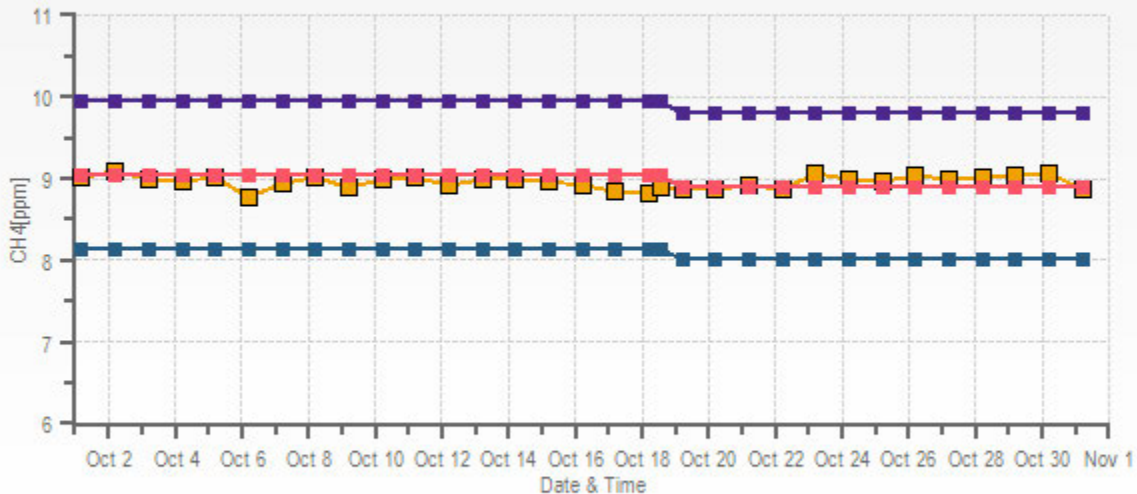
Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	8.2	0.2	0.0	0.0	0.0	8.4
NE	2.4	0.3	0.0	0.0	0.0	2.7
E	2.1	0.9	0.0	0.0	0.0	3.0
SE	9.3	3.1	0.0	0.0	0.0	12.4
S	11.2	3.6	0.0	0.0	0.0	14.8
SW	22.1	4.0	0.0	0.0	0.0	26.2
W	13.3	0.3	0.0	0.0	0.0	13.6
NW	15.6	0.2	0.0	0.0	0.0	15.7
Summary	84.2	12.6	0.0	0.0	0.0	96.7

% Icon Classes (ppm) 84 0-2 13 2-3 0 3-5 0 5-10 0 >10.0

PRAMP_842 Poll.: PRAMP_842-CH4[ppm] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 3.29% Calm Poll Avg: 1.98[ppm]



CH4[ppm] Calibration: PRAMP_842 Monthly: 17/10 Type: Span

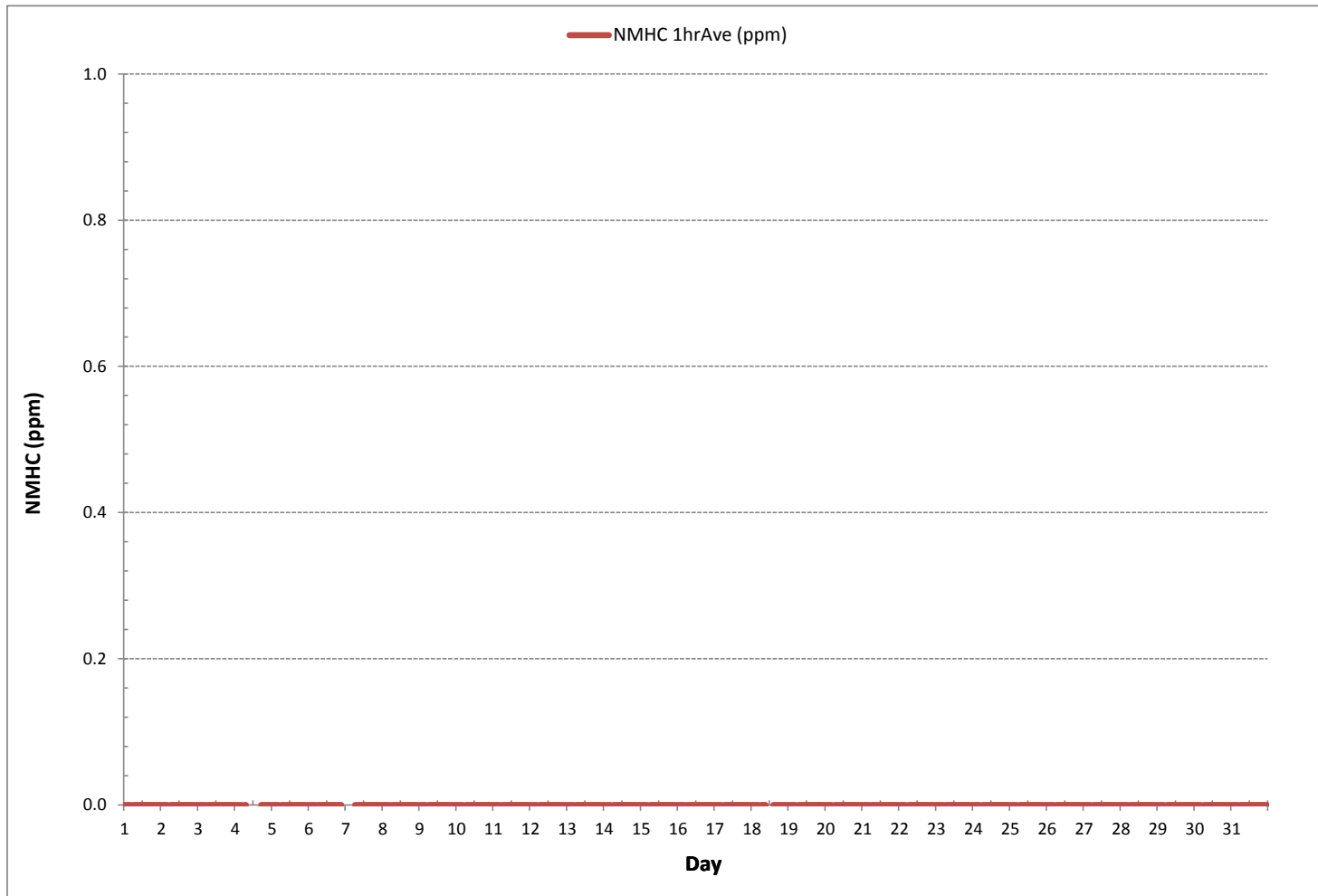


—■— Span Meas —■— Span Ref —■— Span Low —■— Span High

NON-METHANE HYDROCARBON



NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - October 2017

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	0.00	0.00	0.00	0.00	0.00	S	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
2	0.00	0.00	0.01	0.01	0.00	S	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24	
3	0.00	0.09	0.02	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	24	
4	0.00	0.00	0.00	0.00	0.00	S	0.00	0.33	X	X	X	X	X	X	X	Y	Y	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.02	15	
5	0.14	0.00	0.00	0.00	0.00	S	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	0.00	0.00	0.00	0.00	0.00	0.14	0.01	24		
6	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P	P	0.00	0.00	0.00	0.00	21	
7	P	P	P	P	0.00	S	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	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	20	
8	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00	0.00	24	
9	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	24
10	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	24	
11	0.01	0.00	0.00	0.00	0.00	S	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	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	24	
12	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	24
13	0.00	0.00	0.00	0.00	0.00	S	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	24
14	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	24	
15	0.00	0.01	0.00	0.00	0.00	S	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	0.00	0.00	24
16	0.00	0.01	0.00	0.00	0.00	S	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	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	24	
17	0.00	0.00	0.00	0.00	0.00	S	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	24	
18	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	C	C	C	C	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.00	0.00	24	
19	0.00	0.01	0.02	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	23	
20	0.01	0.00	0.00	0.00	0.01	S	0.00	X	0.00	X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	22	
21	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	24
22	0.00	0.00	0.00	0.01	0.00	S	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	0.00	0.00	24	
23	0.00	0.00	0.00	0.00	0.01	S	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.23	0.02	0.00	24	
24	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00	24	
25	0.00	0.00	0.00	0.16	0.16	S	0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.16	0.02	0.00	24	
26	0.01	0.00	0.00	0.00	0.02	S	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	24	
27	0.00	0.00	0.01	0.01	0.01	S	0.00	0.03	0.00	X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.03	0.00	0.00	23	
28	0.00	0.00	0.00	0.00	0.00	S	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	24	
29	0.00	0.00	0.00	0.01	0.01	S	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	24	
30	0.02	0.00	0.00	0.00	0.02	S	0.00	0.01	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.07	0.01	0.00	24	
31	0.00	0.00	0.00	0.00	0.01	S	0.00	0.00	0.01	0.00	0.01	0.01	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	0.00	0.00	24
HOURLY MAX	0.14	0.09	0.02	0.16	0.16	NA	0.02	0.33	0.12	0.02	0.07	0.02	0.02	0.03	0.04	0.23	0.01	0.03	0.04	0.02	0.00	0.01	0.02	0.04						
HOURLY AVG	0.01	0.00	0.00	0.01	0.01	NA	0.00	0.01	0.01	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					

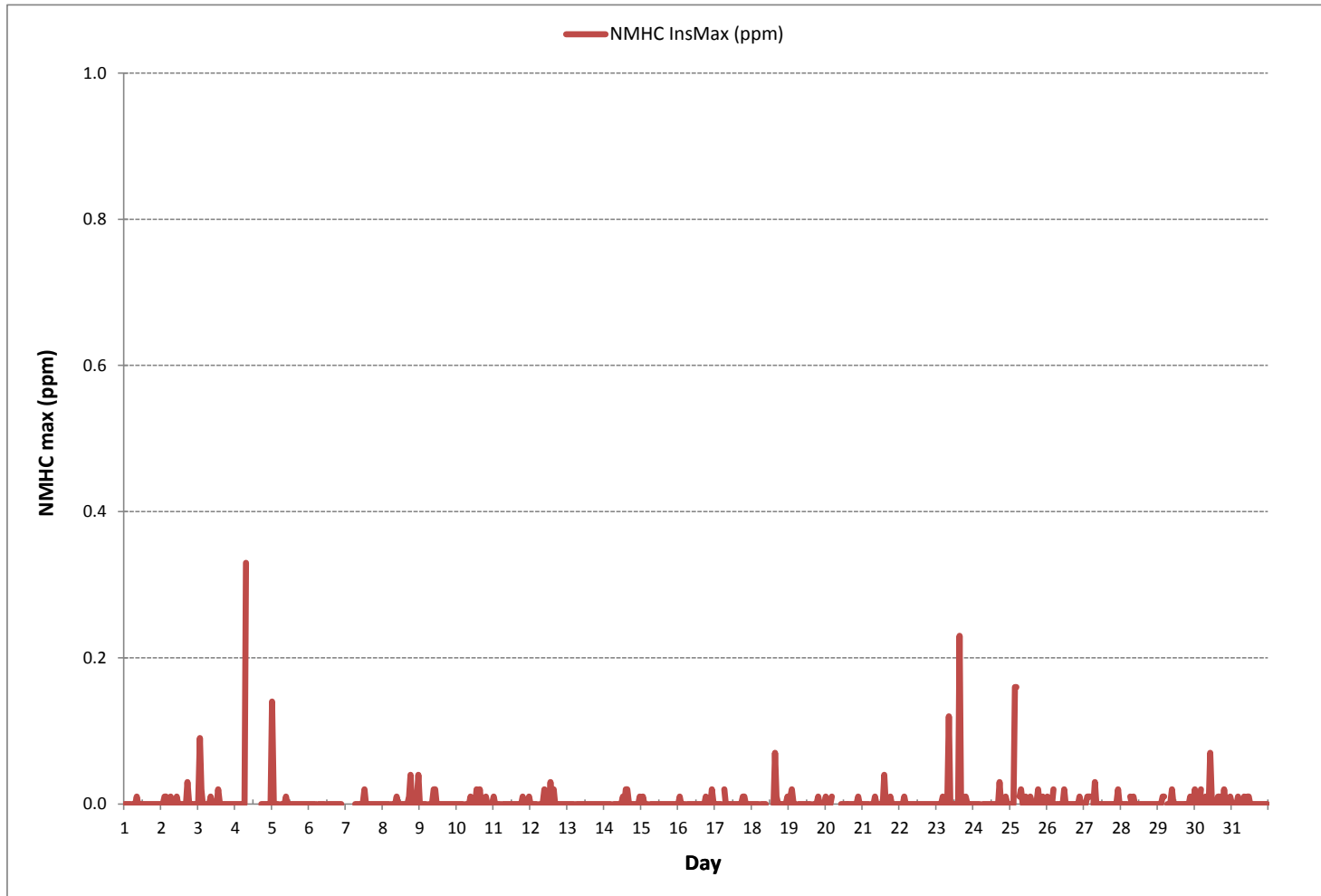
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	96
MAXIMUM INSTANTANEOUS VALUE:	0.33 ppm @ HOUR 7 ON DAY 4
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	724 hrs
STANDARD DEVIATION:	0.02

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: PRAMP_842
 Poll.: PRAMP_842-NMHC[ppm]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 3.31%

Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	8.4	0.0	0.0	0.0	0.0	8.4
NE	2.7	0.0	0.0	0.0	0.0	2.7
E	3.0	0.0	0.0	0.0	0.0	3.0
SE	12.5	0.0	0.0	0.0	0.0	12.5
S	14.4	0.0	0.0	0.0	0.0	14.4
SW	26.2	0.0	0.0	0.0	0.0	26.2
W	13.7	0.0	0.0	0.0	0.0	13.7
NW	15.8	0.0	0.0	0.0	0.0	15.8
Summary	96.7	0.0	0.0	0.0	0.0	96.7

% Icon Classes (ppm)

97 0-0.1

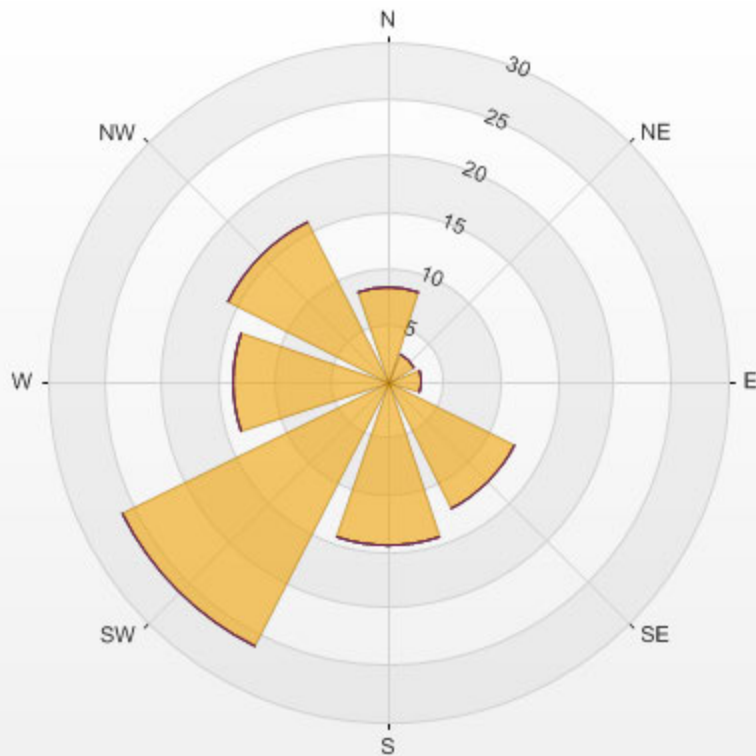
0 0.1-0.3

0 0.3-1

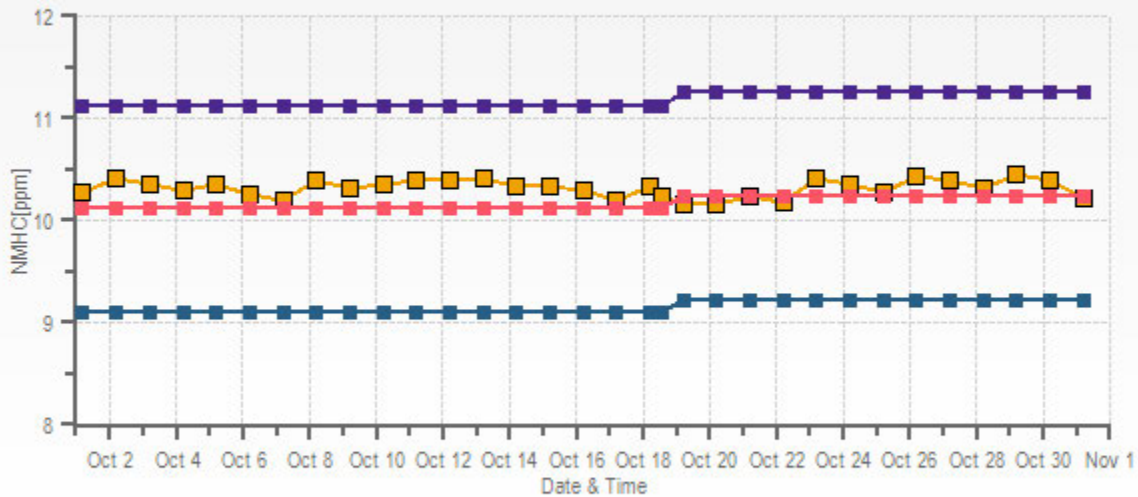
0 1-2

0 >2.0

PRAMP_842 Poll.: PRAMP_842-NMHC[ppm] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 3.31% Calm Poll Avg: 0.00[ppm]



NMHC[ppm] Calibration: PRAMP_842 Monthly: 17/10 Type: Span



—■— Span Meas —■— Span Ref —■— Span Low —■— Span High

WIND SPEED



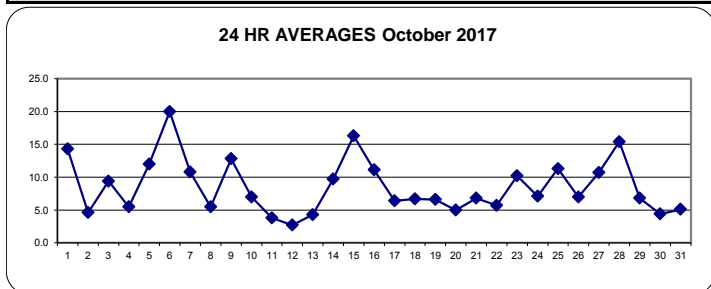
WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	7.8	10.4	13.3	12.1	14.4	14.5	12.2	15.3	16.3	19.4	18.6	17.8	17.0	15.5	17.3	15.1	14.8	13.4	15.6	13.7	13.4	12.0	16.1	15.3	7.8	19.4	14.3	24	
2	10.5	7.0	4.8	4.4	2.6	2.6	5.2	4.2	5.1	8.6	9.7	12.5	10.0	10.9	13.0	12.5	7.9	4.4	2.0	2.4	4.0	3.1	4.4	4.6	2.0	13.0	4.6	24	
3	5.6	8.5	5.8	10.3	9.3	12.0	13.1	15.4	13.8	18.8	17.5	18.1	15.8	16.6	15.5	13.3	8.8	6.5	6.0	5.4	5.1	4.0	0.9	2.5	0.9	18.8	9.4	24	
4	2.5	1.9	1.9	4.0	2.5	3.6	3.3	3.7	4.9	7.6	10.3	11.2	11.4	11.7	12.3	15.4	14.4	10.3	7.1	5.1	4.9	4.5	4.2	5.0	1.9	15.4	5.5	24	
5	7.3	7.3	10.3	9.8	3.2	5.8	9.9	12.2	11.7	13.0	14.6	19.6	20.9	20.0	22.2	23.0	20.0	17.2	16.0	11.9	10.8	10.0	14.8	19.2	3.2	23.0	12.0	24	
6	18.6	18.3	12.7	13.4	11.1	13.5	17.9	21.9	24.0	28.3	34.6	32.6	31.9	26.3	22.9	21.1	15.9	16.8	16.0	16.5	21.2	22.5	P	P	11.1	34.6	20.0	22	
7	P	P	P	P	10.9	10.5	8.9	9.3	10.4	12.0	14.3	13.0	12.8	15.0	15.2	15.3	12.6	15.5	15.7	12.9	10.4	9.7	6.3	9.3	6.3	15.7	10.8	20	
8	11.4	10.0	12.5	11.8	11.1	13.1	13.2	13.6	14.8	10.4	11.2	8.5	9.9	12.7	12.7	11.9	10.3	7.2	7.5	8.2	11.4	13.6	15.3	12.4	7.2	15.3	5.5	24	
9	15.5	16.6	17.0	17.3	14.3	16.2	13.9	13.5	14.9	16.7	23.0	23.4	19.5	23.0	20.1	22.1	15.5	13.0	8.2	6.6	6.4	5.0	4.3	4.7	4.3	23.4	12.8	24	
10	2.2	2.8	2.6	1.8	1.6	2.0	4.1	8.8	9.4	11.0	10.9	11.7	13.5	12.0	11.6	13.0	11.6	7.8	6.9	9.6	8.8	6.3	6.1	6.6	1.6	13.5	7.0	24	
11	7.5	7.1	7.6	7.4	6.1	6.5	6.6	5.7	6.1	6.6	8.2	7.3	6.0	4.7	5.0	4.4	5.6	2.4	0.9	1.7	2.4	3.0	3.1	3.2	0.9	8.2	3.8	24	
12	3.2	1.2	2.8	3.5	3.8	4.3	3.4	3.4	4.7	4.4	5.9	8.4	9.3	7.7	5.2	5.2	6.0	5.6	5.1	3.8	1.5	1.3	1.1	0.2	0.2	9.3	2.7	24	
13	3.3	4.4	4.8	4.0	2.3	3.2	3.0	1.9	4.6	6.4	7.0	7.7	6.7	6.6	8.9	5.2	10.4	10.6	12.3	11.7	8.8	8.6	11.8	14.9	1.9	14.9	4.3	24	
14	15.4	12.9	14.5	16.4	15.9	14.3	11.5	12.8	14.0	12.8	13.1	14.7	14.9	15.4	17.1	17.8	4.1	4.1	1.7	2.6	2.2	0.8	5.9	7.3	0.8	17.8	9.7	24	
15	4.5	6.8	9.1	11.4	9.4	10.8	10.3	17.8	21.4	18.9	18.4	24.0	27.1	24.5	26.5	20.7	13.8	21.2	24.3	24.6	22.6	21.7	22.3	24.9	4.5	27.1	16.3	24	
16	23.4	20.9	18.3	14.5	14.2	15.0	14.9	15.9	14.6	15.9	17.3	16.8	13.0	10.8	9.9	14.2	13.9	8.7	4.6	4.8	3.5	3.8	5.0	4.4	3.5	23.4	11.1	24	
17	4.3	6.0	4.8	4.6	4.7	4.3	4.3	1.6	1.9	0.2	4.6	10.6	12.1	11.9	13.0	14.5	18.1	16.8	18.4	17.3	17.7	16.5	13.0	11.6	0.2	18.4	6.4	24	
18	10.9	8.4	8.1	7.6	6.4	7.6	5.6	7.5	6.7	7.2	7.9	9.2	8.4	10.8	11.3	10.5	11.9	11.7	12.8	15.7	14.7	12.6	8.7	6.7	5.6	15.7	6.7	24	
19	8.5	8.2	9.7	8.9	9.6	8.2	6.7	6.3	5.7	5.6	9.2	11.6	14.0	14.8	14.4	9.7	9.4	4.8	2.7	2.8	4.4	1.7	2.6	3.1	1.7	14.8	6.6	24	
20	3.9	4.1	3.4	2.7	4.6	3.1	3.7	2.8	2.3	5.0	6.7	6.3	10.8	14.7	17.6	16.6	13.6	7.4	4.4	2.5	4.6	5.3	5.7	3.8	2.3	17.6	5.0	24	
21	3.2	1.9	3.2	5.4	10.4	9.0	6.9	8.2	11.2	14.1	16.8	18.1	17.2	18.9	17.6	16.4	7.7	1.1	3.9	6.1	3.7	5.2	7.0	7.9	1.1	18.9	6.8	24	
22	5.9	6.7	6.6	6.6	3.2	2.8	1.6	3.9	7.2	4.6	6.4	8.3	9.4	11.5	16.7	12.3	8.0	12.0	10.7	11.7	12.1	10.5	9.8	6.2	1.6	16.7	5.7	24	
23	8.6	10.7	10.0	11.2	8.7	9.9	9.6	10.2	11.0	9.9	11.8	14.1	15.8	14.3	11.6	7.6	8.0	9.5	16.0	16.7	12.0	9.1	16.0	21.4	7.6	21.4	10.2	24	
24	21.5	23.9	19.6	16.4	19.3	21.4	27.5	20.1	18.1	17.5	18.5	15.6	15.8	12.4	11.5	7.4	5.0	1.4	3.2	1.2	2.2	1.7	4.5	6.0	1.2	27.5	7.1	24	
25	9.1	9.3	9.1	10.6	12.5	14.5	14.1	13.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9.1	14.5	11.3	8
26	X	X	X	X	X	X	X	X	X	X	6.1	13.8	10.0	8.9	9.4	9.9	8.7	7.1	7.8	8.4	6.3	6.8	5.6	2.5	2.5	13.8	7.0	14	
27	8.8	8.3	4.8	3.4	3.2	2.3	4.7	5.8	6.8	7.4	8.2	12.9	16.8	18.1	19.1	17.4	15.3	13.6	16.5	16.5	15.4	13.7	15.2	26.3	2.3	26.3	10.7	24	
28	21.9	23.0	22.5	18.1	17.9	15.8	16.3	13.9	17.8	19.7	19.6	17.7	15.8	16.7	15.4	16.1	14.3	16.2	19.3	18.2	17.3	19.1	17.8	12.8	12.8	23.0	15.4	24	
29	13.7	13.2	10.4	12.6	13.5	9.7	5.8	5.5	6.1	10.0	12.8	15.8	15.4	14.6	13.5	11.1	5.7	0.2	2.0	3.6	4.5	4.6	7.2	6.6	0.2	15.8	6.8	24	
30	8.0	7.7	8.4	10.2	8.2	10.2	9.5	9.3	7.0	7.7	9.3	5.3	3.9	4.8	4.9	6.2	1.2	1.4	2.2	3.4	5.8	3.2	6.1	5.0	1.2	10.2	4.4	24	
31	7.0	5.3	6.5	11.2	8.5	6.3	6.0	7.1	10.0	10.6	10.3	10.7	13.4	14.1	12.6	13.3	13.1	11.8	11.9	10.6	9.5	9.6	8.2	8.2	5.3	14.1	5.1	24	
HOURLY MAX	23.4	23.9	22.5	18.1	19.3	21.4	27.5	21.9	24.0	28.3	34.6	32.6	31.9	26.3	26.5	23.0	20.0	21.2	24.3	24.6	22.6	22.5	22.3	26.3					
HOURLY AVG	4.0	4.8	4.1	4.5	4.3	4.5	4.3	4.9	6.2	6.4	7.6	8.5	8.8	9.4	9.8	8.7	6.2	5.0	4.5	3.9	3.5	2.9	3.2	3.3					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

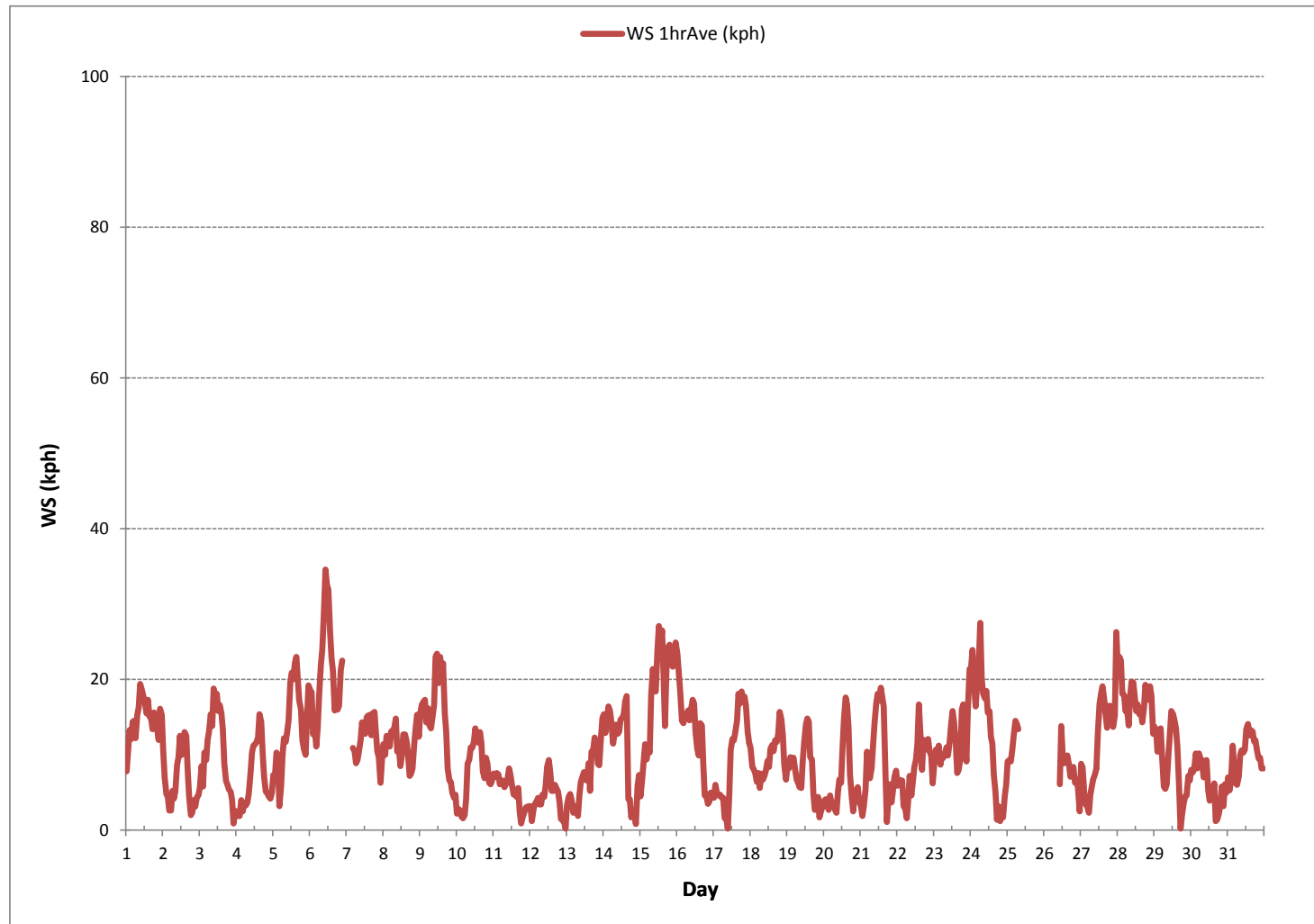
LAST CALIBRATION:	August 30, 2017
DECLINATION:	MAGNETIC DECLINATION 15 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	712
MINIMUM 1-HR AVERAGE:	0.2 kph @ HOUR 23 ON DAY 12
MAXIMUM 1-HR AVERAGE:	34.6 kph @ HOUR 10 ON DAY 6
MAXIMUM 24-HR AVERAGE:	20.0 kph ON DAY 6
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	712 hrs
AMD OPERATION UPTIME:	95.7 %
STANDARD DEVIATION:	5.9
MONTHLY AVERAGE:	5.3 kph

WIND SPEED Hourly Averages (WS kph)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - October 2017

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	18.3	30.3	24.5	24.5	33.9	38.5	30.3	34.9	40.0	39.4	38.8	41.6	44.0	39.4	35.3	35.7	36.2	35.3	34.0	33.1	31.4	31.2	49.0	46.7	18.3	49.0	35.3	24	
2	27.3	20.5	10.4	9.2	8.6	5.0	11.3	9.0	13.9	18.4	20.6	29.8	26.4	26.6	27.5	25.1	19.8	12.8	4.5	4.7	7.4	8.3	8.7	8.9	4.5	29.8	15.2	24	
3	12.2	13.4	17.6	20.4	18.1	20.6	24.6	26.3	29.2	37.2	33.0	32.2	29.0	33.8	28.7	25.0	18.6	13.6	11.8	9.4	8.7	7.7	5.4	5.4	5.4	37.2	20.1	24	
4	4.0	3.4	3.5	7.5	4.9	7.0	7.0	8.8	9.0	16.4	19.5	20.6	20.8	23.3	24.0	28.8	25.5	22.8	12.0	10.5	7.8	9.3	9.0	8.8	3.4	28.8	13.1	24	
5	13.3	16.3	18.2	15.1	12.1	12.4	17.9	20.8	21.4	22.4	29.0	34.8	35.3	37.7	40.1	39.1	38.7	38.7	33.2	23.2	21.0	19.5	30.4	32.9	12.1	40.1	26.0	24	
6	31.0	31.7	23.0	25.6	21.6	26.1	31.5	43.0	49.6	54.5	62.5	P	55.5	48.9	42.6	39.3	30.5	35.2	31.9	37.2	40.1	40.7	P	P	21.6	62.5	38.2	21	
7	P	P	P	P	19.8	21.8	20.0	19.3	20.7	22.2	29.0	28.1	28.6	39.9	42.0	49.9	35.5	47.2	38.6	32.3	30.7	26.9	13.7	23.0	13.7	49.9	29.5	20	
8	24.7	21.6	29.3	24.5	21.9	26.8	26.3	27.4	30.9	23.2	23.9	20.2	20.9	25.8	26.3	22.2	22.1	13.2	14.3	16.0	19.2	23.2	29.2	23.9	13.2	30.9	23.2	24	
9	28.2	29.1	29.8	31.6	27.3	27.5	24.5	28.3	26.1	34.3	45.0	41.9	38.6	45.5	43.5	42.8	35.8	29.1	17.3	15.9	13.3	13.9	9.7	7.7	7.7	45.5	28.6	24	
10	5.9	4.6	4.3	3.8	3.3	4.7	11.1	24.6	25.1	25.1	23.4	29.2	28.7	28.1	26.0	28.8	32.3	22.5	17.0	21.5	22.5	15.1	14.8	15.4	3.3	32.3	18.2	24	
11	16.3	17.8	16.8	16.0	13.0	15.5	13.9	13.1	12.4	16.3	17.8	19.7	17.8	15.1	13.8	18.6	13.9	6.9	2.7	3.4	4.9	5.2	4.5	5.1	2.7	19.7	12.5	24	
12	5.4	4.0	4.8	5.6	5.8	7.1	5.5	5.4	8.4	10.0	10.7	18.9	19.4	18.1	19.3	12.0	11.6	10.2	9.3	6.9	4.3	3.3	4.0	3.7	3.3	19.4	8.9	24	
13	9.1	10.7	12.0	8.7	7.5	6.2	6.8	5.7	7.6	11.4	14.8	16.9	15.3	12.7	16.1	21.5	19.5	20.4	24.3	20.7	16.2	15.1	22.1	28.8	5.7	28.8	14.6	24	
14	29.2	24.8	28.4	28.8	28.7	26.2	21.5	24.5	24.4	24.7	24.8	28.7	29.2	29.3	30.3	34.5	15.2	16.0	6.3	7.2	7.8	6.5	12.9	14.4	6.3	34.5	21.8	24	
15	11.5	15.2	17.2	17.2	19.6	22.7	31.0	39.0	42.9	37.0	34.3	44.4	48.0	43.8	47.2	43.3	27.7	47.3	49.0	54.3	41.7	44.7	45.6	46.8	11.5	54.3	36.3	24	
16	48.3	41.1	35.7	30.6	25.4	26.6	27.4	33.2	26.8	27.2	30.8	32.6	25.7	18.8	28.5	26.2	23.7	19.5	7.3	9.8	6.4	9.1	10.4	11.4	6.4	48.3	24.3	24	
17	14.2	14.1	9.8	9.2	8.7	9.8	9.3	4.9	4.7	3.6	14.4	25.1	26.4	29.4	30.6	45.8	36.6	38.1	33.6	37.8	28.9	24.9	27.6	3.6	45.8	21.5	24		
18	20.5	15.0	15.6	12.6	12.8	13.5	11.7	15.5	17.2	14.8	14.2	17.8	20.2	23.5	27.9	26.0	31.1	26.8	31.0	39.8	34.1	28.6	20.0	14.3	11.7	39.8	21.0	24	
19	20.1	16.9	18.4	18.3	16.7	19.4	17.3	18.0	12.2	13.7	21.1	25.3	26.5	30.7	27.2	17.1	18.1	8.5	5.2	7.1	8.6	5.2	5.3	7.4	5.2	30.7	16.0	24	
20	8.2	8.0	6.9	8.1	9.6	6.4	8.2	9.0	7.3	12.9	11.6	12.3	21.8	30.0	30.3	31.0	24.6	18.5	9.2	7.0	10.3	12.2	12.2	9.2	6.4	31.0	13.5	24	
21	7.1	9.1	8.1	12.6	21.7	17.7	14.4	16.7	22.4	24.4	33.3	31.6	32.3	38.2	33.2	30.3	19.1	7.3	9.8	11.8	9.6	12.4	14.8	18.1	7.1	38.2	19.0	24	
22	14.8	18.6	18.5	20.8	14.3	7.5	6.4	18.1	16.9	9.7	11.8	16.7	16.0	23.5	27.3	23.1	16.0	25.0	18.9	20.4	20.8	17.9	18.9	12.9	6.4	27.3	17.3	24	
23	17.9	19.4	18.1	19.7	17.6	22.0	21.9	19.8	20.1	19.9	22.3	29.0	29.0	25.3	24.6	20.1	16.4	19.1	29.9	30.1	32.0	20.0	35.2	42.0	16.4	42.0	23.8	24	
24	45.3	41.5	39.8	31.9	34.9	37.9	57.1	46.2	39.2	40.8	42.0	36.7	41.1	28.3	22.3	21.1	11.8	6.2	13.6	11.1	5.9	6.1	10.7	12.0	5.9	57.1	28.5	24	
25	24.0	20.6	22.8	25.9	33.6	32.1	33.3	43.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	20.6	43.0	29.4	8
26	X	X	X	X	X	X	X	X	X	X	24.0	25.7	17.8	15.7	14.6	16.3	16.0	11.4	14.4	12.9	11.5	11.4	12.8	8.7	8.7	25.7	15.2	14	
27	14.6	15.2	10.9	10.4	7.2	6.9	10.5	11.4	14.6	13.4	15.2	31.2	38.6	31.8	32.1	29.3	26.5	24.0	29.7	26.7	27.1	25.9	42.8	44.7	6.9	44.7	22.5	24	
28	43.8	40.8	41.5	38.5	32.5	37.5	39.2	36.4	38.7	40.9	43.7	38.3	33.2	30.5	35.8	39.0	37.1	44.6	47.8	42.9	36.8	39.6	46.8	29.0	29.0	47.8	39.0	24	
29	30.6	25.7	20.6	29.7	28.4	23.0	17.8	11.1	11.1	20.0	33.1	40.9	33.1	33.3	30.1	24.2	15.3	4.7	4.1	12.0	14.6	8.5	13.5	13.5	4.1	40.9	20.8	24	
30	14.4	14.8	15.8	18.9	19.8	18.0	17.7	16.8	13.0	16.7	17.5	10.8	12.3	9.0	10.5	12.2	5.8	4.6	5.2	7.0	12.9	9.2	11.7	10.0	4.6	19.8	12.7	24	
31	15.2	11.6	14.1	21.4	16.5	13.9	14.1	14.6	28.7	30.3	23.5	27.4	33.7	39.9	33.9	34.3	31.4	25.9	27.2	25.1	23.9	21.9	25.3	18.9	11.6	39.9	23.9	24	
HOURLY MAX	48.3	41.5	41.5	38.5	34.9	38.5	57.1	46.2	49.6	54.5	62.5	44.4	55.5	48.9	47.2	49.9	45.8	47.3	49.0	54.3	41.7	44.7	49.0	46.8					
HOURLY AVG	19.8	19.2	18.5	18.9	18.2	18.7	19.7	21.5	21.9	23.5	26.2	27.9	28.8	29.2	29.0	28.2	24.1	21.8	19.9	19.8	19.0	17.6	19.5	19.0					

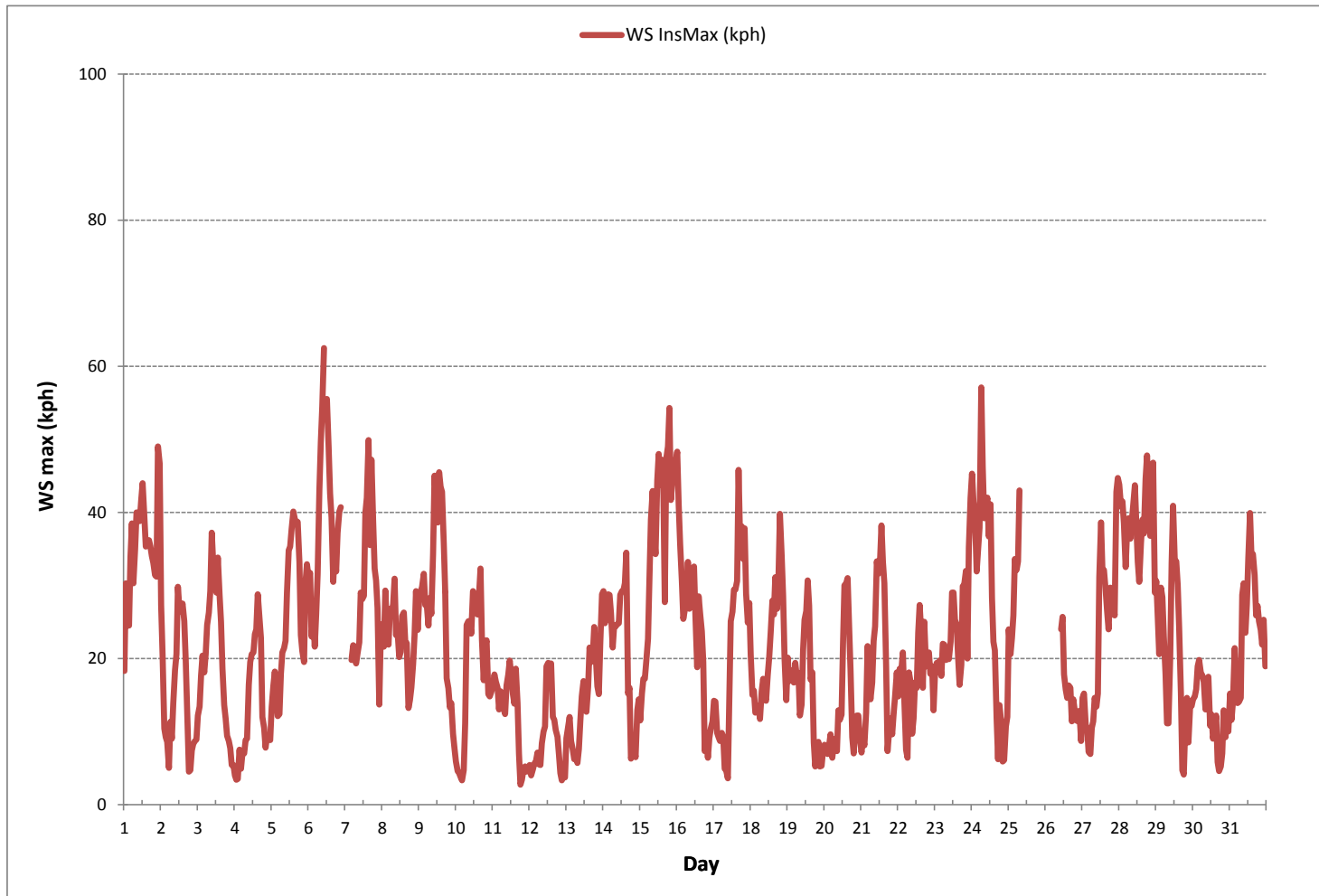
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	62.5	kph	@ HOUR	10	ON DAY	6	
OPERATIONAL TIME:						711	hrs

WIND SPEED Instantaneous Maximum (WS kph)



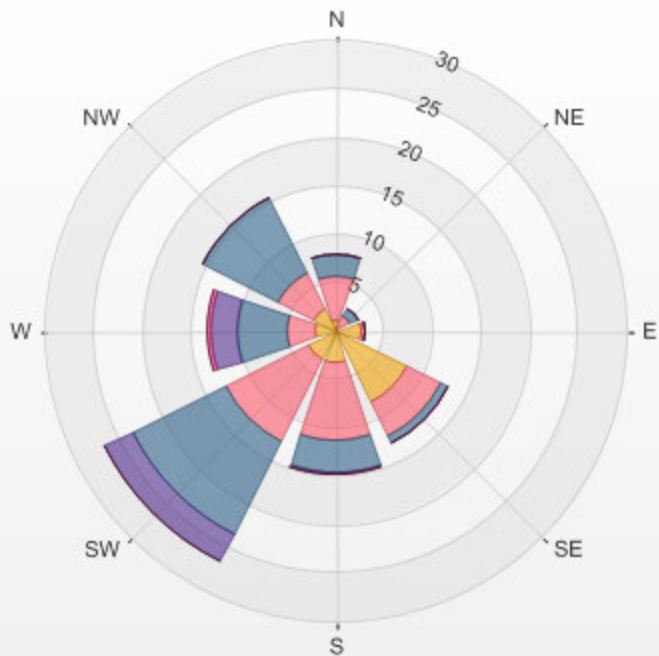
Wind: PRAMP_842
 Monitor: WSP [kph]
 Monthly: 17/10
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 1.97%

Direction	1.5-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	1.1	4.6	2.3	0.0	0.0	0.0	8.0
NE	0.6	1.4	1.0	0.0	0.0	0.0	2.9
E	3.1	0.4	0.0	0.0	0.0	0.0	3.5
SE	8.4	3.9	0.8	0.0	0.0	0.0	13.2
S	3.4	8.0	3.2	0.3	0.0	0.0	14.9
SW	3.5	9.6	10.7	3.2	0.0	0.0	27.0
W	2.1	3.0	5.2	2.5	0.4	0.0	13.2
NW	2.7	4.1	8.6	0.0	0.0	0.0	15.3
Summary	24.9	35.0	31.7	6.0	0.4	0.0	98.0

% Icon Classes (kph)	35  6.0-12.0	32  12.0-20.0	6  20.0-29.0	0  29.0-39.0	0  >39.0
	24  1.8-6.0				

PRAMP_842 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 3.09% Calm Wind Avg Speed: 1.19(kph)



WIND DIRECTION



PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - October 2017

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.		
DAY 1	NW	WNW	NW	NW	NW	NNW	NNW	NNW	NW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	NNW	24		
2	N	NNW	NNW	NW	WNW	WNW	NW	NW	NNW	NNW	NNW	NNW	NW	NW	NW	NW	NNW	N	ESE	ESE	SE	SE	SE	SE	NNW	24		
3	SSE	SSE	SSE	SSW	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SW	WSW	SW	WSW	SW	WSW	SW	WSW	WSW	WSW	WSW	SE	SSW	24	
4	ESE	ESE	ESE	ESE	E	ESE	SE	SE	SE	S	SSW	SW	SSW	SSW	SW	SSW	SW	SSW	S	SSE	SSE	SE	SE	SE	S	24		
5	SSE	SSE	SSE	SSE	SSE	SSE	S	S	SSW	SSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	SW	24	
6	WSW	WSW	SW	SSW	SW	SW	SW	WSW	WSW	WSW	WSW	W	WSW	WSW	W	WSW	W	WSW	W	WSW	WSW	WSW	WSW	WSW	P	P	WSW	22
7	P	P	P	P	WNW	W	W	W	W	WNW	W	WNW	WNW	WNW	WNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	WNW	20	
8	NW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NW	WNW	W	WSW	WSW	WSW	SW	SSW	SSE	SSE	SSE	SSE	SSE	SSE	W	24		
9	S	S	S	SSW	SW	SW	SW	WSW	WSW	WSW	WSW	W	W	W	W	W	WSW	W	WSW	W	WSW	SW	SW	WSW	WSW	24		
10	SSE	ESE	ESE	E	ESE	ESE	NNE	N	NNE	N	N	NNE	NNE	NNE	NE	NNE	NE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NNE	24		
11	NNE	NNE	NNE	NNE	N	N	N	NNW	N	N	N	N	NNW	WNW	N	W	W	ESE	ESE	ESE	ESE	ESE	ESE	ESE	N	24		
12	SE	SSW	SE	SE	SE	ESE	SE	SSE	SW	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	E	ESE	SSE	SW	24		
13	NNW	NW	N	N	NW	NW	NW	WSW	WSW	W	WNW	WNW	WNW	WSW	W	WSW	SW	SW	SW	SSW	S	S	SSE	WSW	24			
14	S	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	N	WNW	SW	WSW	SW	SSE	SW	SSW	SW	24			
15	S	S	SSE	SSE	SSE	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SW	24		
16	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	WSW	SW	WSW	WSW	SW	SW	SW	SSW	SSW	S	SSE	SE	SSE	SSE	SE	SW	24		
17	SSE	S	SE	ESE	ESE	SE	SE	ESE	ESE	NNW	NW	NW	NW	NNW	WNW	WNW	WNW	W	W	WSW	WSW	WSW	W	24				
18	WSW	WSW	WSW	WSW	WSW	SW	SSW	SSE	SSE	SSE	SSE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SSE	24		
19	SE	SSE	S	S	S	S	SSE	SSE	SSE	SSE	S	SSE	S	SSW	SSW	S	S	SE	E	E	ENE	ENE	E	E	SSE	24		
20	SE	SE	ESE	SE	SE	SSE	S	SSE	S	SW	SW	S	SW	WSW	WSW	WSW	WSW	WSW	SW	S	SW	SW	SW	SW	SW	24		
21	SSW	SSW	SSW	S	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24	
22	ESE	ESE	ESE	ESE	ESE	E	ENE	SSW	SW	SSW	SSW	SSW	SSW	SSW	SW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	24		
23	SW	SW	WSW	SW	SW	SW	SW	WSW	SW	SW	WSW	WSW	WSW	SW	WSW	SSW	S	SSW	SW	S	SE	SSE	S	SW	24			
24	SSW	SSW	SSW	S	SSW	SW	SW	WSW	W	NNW	NNW	NW	NW	NW	NW	NNW	WSW	SSW	ESE	ENE	ENE	ENE	ENE	ENE	WSW	24		
25	ENE	ENE	ENE	ENE	NE	NE	NE	NE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NE	8		
26	X	X	X	X	X	X	X	X	X	X	SSW	SW	SW	SW	SW	SW	SSW	S	S	S	SSE	SSE	SSE	SE	SSW	14		
27	S	S	SSW	S	SSE	SSE	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24		
28	WSW	WSW	WSW	W	WSW	WNW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NW	NW	NNW	NNW	24		
29	NNW	NW	NW	WNW	WNW	WNW	NW	W	W	NNW	NNW	NNW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24		
30	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24		
31	SE	SE	SE	SSE	SSE	SSE	SW	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	N	N	NNW	NNW	24		

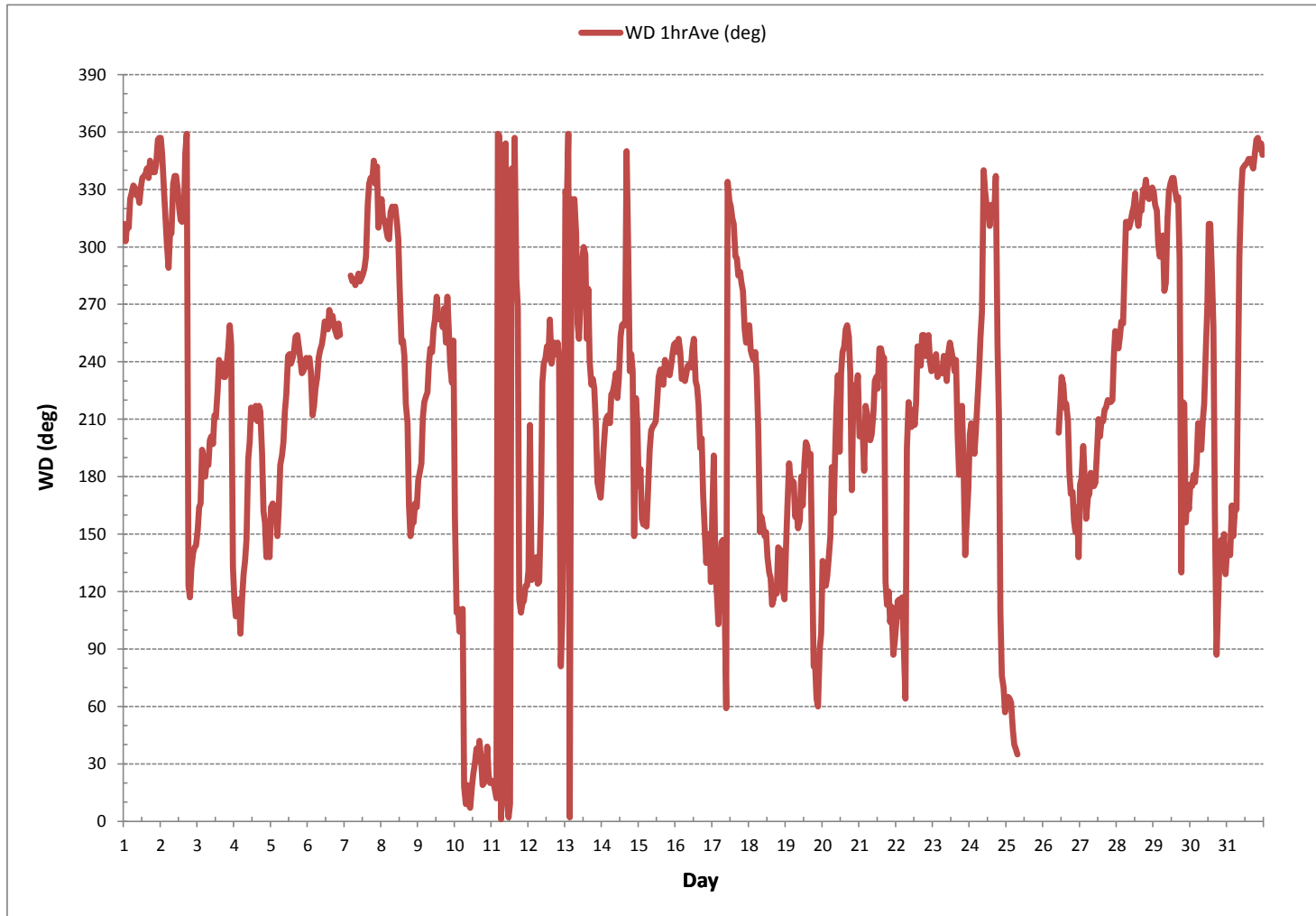
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	August 30, 2017
DECLINATION :	MAGNETIC DECLINATION 15 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	712	hrs
STANDARD DEVIATION:	82		AMD OPERATION UPTIME:	95.7	%
			MONTHLY AVERAGE:	247	(WSW)

WIND DIRECTION Hourly Averages (WD)



RELATIVE HUMIDITY



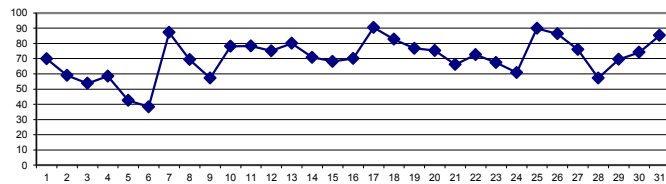
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	67	67	69	70	72	74	75	75	73	76	72	68	64	65	69	68	68	69	74	76	72	70	62	60	60	60	76	70	24
2	64	71	77	79	80	84	83	77	67	52	45	42	38	35	31	29	27	28	53	70	73	72	67	73	27	84	59	24	
3	75	74	74	68	67	71	71	69	66	56	47	43	39	33	33	31	31	31	35	39	45	52	67	73	31	75	54	24	
4	77	81	84	86	86	87	88	80	69	51	44	41	37	33	30	29	28	31	39	52	63	61	62	65	28	88	59	24	
5	60	61	60	62	68	72	70	69	62	56	51	44	36	30	24	18	15	17	17	20	25	30	28	26	15	72	43	24	
6	28	30	32	33	36	35	33	33	34	36	40	41	40	37	37	37	40	41	44	47	50	57	P	P	28	57	38	22	
7	P	P	P	P	93	92	91	91	90	88	84	80	82	83	79	91	88	84	88	91	91	85	85	87	79	93	87	20	
8	85	84	80	81	82	78	72	71	72	69	67	62	60	57	55	52	52	59	68	72	73	72	70	70	52	85	69	24	
9	68	66	68	72	69	69	71	71	65	61	54	46	40	37	40	36	40	43	50	54	52	57	67	77	36	77	57	24	
10	81	87	89	91	92	92	93	90	87	74	70	65	60	66	66	68	69	70	72	76	79	79	80	80	60	93	78	24	
11	81	81	82	82	83	84	84	85	83	80	73	68	64	62	65	60	61	63	81	87	91	92	93	93	60	93	78	24	
12	94	93	93	93	92	92	92	92	89	81	75	64	57	53	46	44	44	53	64	70	77	81	81	82	44	94	75	24	
13	82	82	87	91	94	95	95	95	96	94	83	76	73	71	68	69	66	67	66	66	69	72	81	83	66	96	80	24	
14	80	79	77	75	75	77	77	73	69	66	62	59	54	51	52	55	59	69	81	82	89	85	77	51	89	71	24		
15	85	87	87	86	83	81	79	70	75	85	84	74	63	58	52	52	51	50	49	51	55	58	59	61	49	87	68	24	
16	64	68	67	68	68	68	65	64	59	54	49	48	46	46	55	74	88	92	94	94	94	94	94	46	94	70	24		
17	95	93	94	94	94	94	94	94	94	94	94	94	95	94	94	92	89	84	78	76	76	85	90	91	76	95	91	24	
18	89	92	94	94	93	91	90	93	90	89	87	80	74	70	70	71	69	68	68	69	76	84	92	92	68	94	83	24	
19	90	87	85	86	88	87	89	87	81	74	66	61	52	50	48	52	55	66	83	88	91	92	92	92	48	92	77	24	
20	92	87	85	91	88	89	87	89	90	88	84	72	62	57	50	48	49	55	66	79	79	69	73	78	48	92	75	24	
21	78	87	86	87	81	80	82	81	74	66	58	50	47	42	38	37	37	53	76	73	70	70	68	65	37	87	66	24	
22	65	66	67	70	74	77	79	81	91	90	90	84	79	73	61	62	64	62	62	63	61	68	73	79	61	91	73	24	
23	79	79	81	79	81	80	80	78	74	69	64	58	54	53	53	50	50	52	47	56	78	85	75	61	47	85	67	24	
24	56	51	53	56	61	63	60	59	57	55	55	49	45	44	41	42	45	50	63	84	90	92	94	95	41	95	61	24	
25	96	96	96	96	96	96	96	95	93	91	88	85	85	78	86	88	87	86	80	86	92	88	89	88	78	96	90	24	
26	87	89	90	88	88	88	88	88	88	85	83	80	80	78	75	76	79	88	93	92	92	91	91	93	75	93	86	24	
27	89	88	88	92	93	93	90	85	85	80	78	73	67	64	70	70	67	68	67	65	63	64	63	60	60	93	76	24	
28	62	63	62	64	65	63	62	63	56	48	46	44	40	43	45	41	42	50	65	67	69	67	70	75	40	75	57	24	
29	76	75	77	78	78	80	83	83	82	67	55	49	46	44	43	44	45	63	81	83	76	86	87	86	43	87	69	24	
30	85	83	83	82	80	76	78	79	76	75	75	70	62	56	54	53	59	80	84	86	78	76	75	75	53	86	74	24	
31	73	72	69	68	74	76	86	87	86	86	84	81	79	88	92	92	93	95	95	95	95	94	94	94	68	95	85	24	
HOURLY MAX	96	96	96	96	96	96	96	95	96	94	94	94	95	94	94	92	93	95	95	95	95	94	94	95					
HOURLY AVG	77	77	78	79	80	80	80	79	77	72	68	63	59	57	55	55	56	60	67	71	73	75	77	78					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

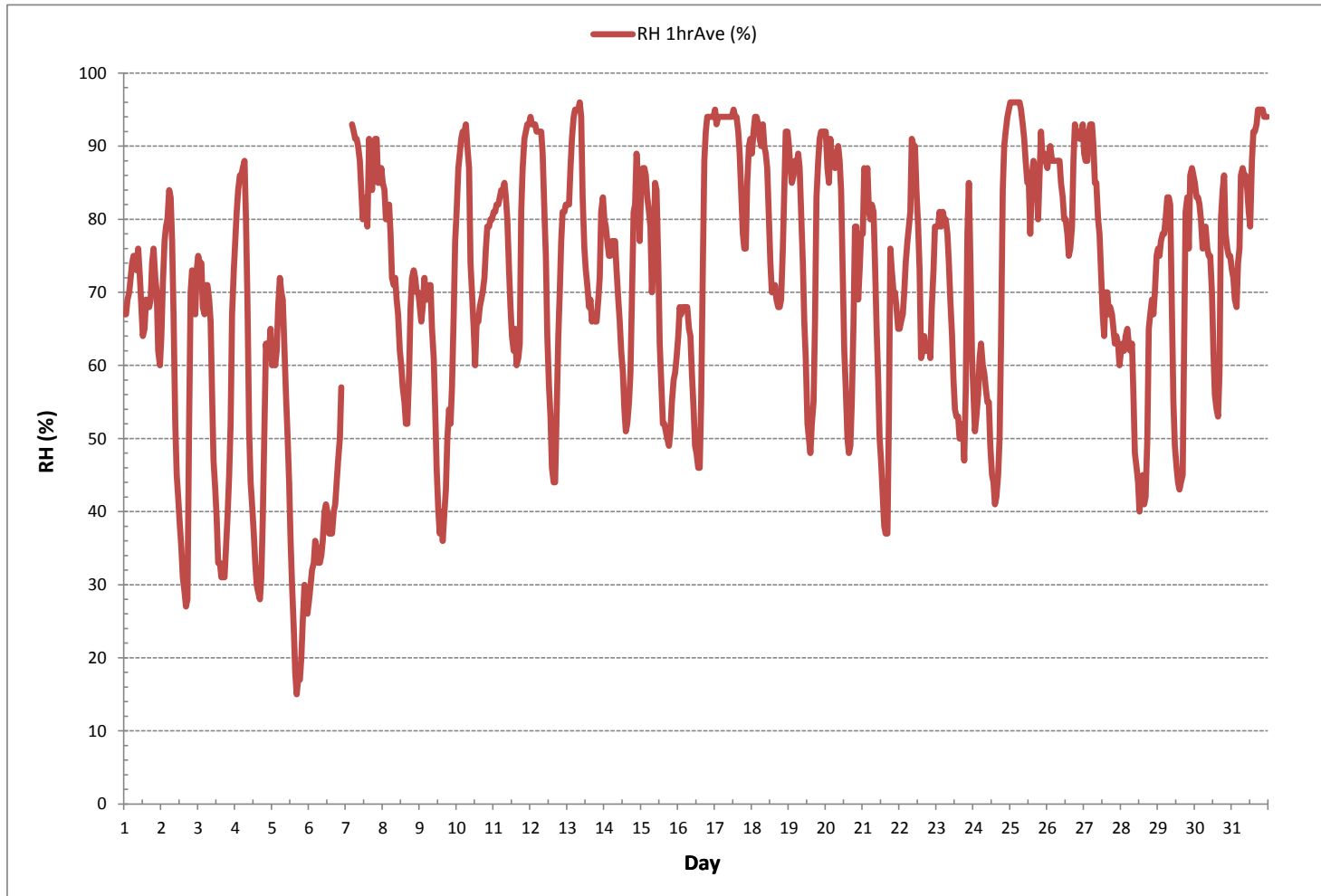
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	15	%	@ HOUR	16	ON DAY	5
MAXIMUM 1-HR AVERAGE:	96	%	@ HOUR	8	ON DAY	13
MAXIMUM 24-HR AVERAGE:	91	%			ON DAY	17
OPERATIONAL TIME:						738 hrs
AMD OPERATION UPTIME:						99.2 %
STANDARD DEVIATION:	18					MONTHLY AVERAGE: 71 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



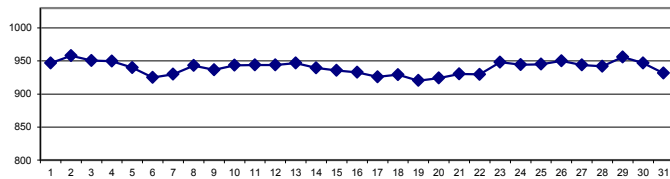
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	938	939	939	940	941	941	942	943	944	945	946	946	947	948	949	949	950	951	952	953	953	954	955	955	938	955	947	24	
2	956	956	956	957	958	958	958	959	959	960	960	960	959	959	958	958	958	958	957	957	957	957	956	956	960	958	24	24	
3	955	955	954	954	953	952	952	951	950	950	949	949	949	948	948	948	948	948	948	949	949	949	950	950	948	955	950	24	
4	950	951	951	951	952	952	952	951	952	952	951	951	951	950	949	949	949	948	948	948	948	947	947	946	946	952	950	24	
5	946	945	945	945	944	944	944	943	943	942	942	942	941	940	939	938	938	937	936	935	935	934	934	933	933	946	940	24	
6	933	932	931	930	929	928	927	926	926	925	925	924	924	923	922	921	921	921	921	921	920	921	P	P	920	933	925	22	
7	P	P	P	P	923	924	925	925	926	926	927	927	927	928	929	930	931	932	933	935	936	937	938	939	923	939	930	20	
8	939	940	941	941	942	943	943	944	945	945	946	946	946	945	945	945	944	944	943	943	942	941	941	940	939	939	946	943	24
9	938	937	937	936	935	935	935	935	935	935	935	935	936	936	936	936	936	937	937	938	938	938	938	939	935	939	936	24	
10	939	940	940	941	941	942	942	943	943	944	945	945	945	945	945	945	945	945	945	945	945	945	945	945	939	945	944	24	
11	945	945	945	944	944	944	944	944	944	944	944	944	944	944	943	943	943	943	943	943	943	944	944	944	943	945	944	24	
12	944	943	943	943	943	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	945	945	945	945	943	945	944	24	
13	946	946	947	947	947	947	947	948	948	948	949	949	949	948	948	948	947	947	946	946	945	944	943	942	942	949	947	24	
14	941	940	940	939	939	938	938	938	938	938	938	938	938	938	938	939	940	940	940	941	941	942	942	942	938	942	939	24	
15	942	942	942	941	940	939	938	937	937	936	935	935	934	933	933	933	933	932	932	932	932	932	932	932	932	942	936	24	
16	932	933	934	934	935	935	935	935	935	935	935	934	933	933	932	932	932	931	931	930	930	929	929	928	928	935	933	24	
17	927	927	927	926	925	925	924	923	922	921	921	921	921	922	922	924	926	928	929	930	930	931	932	933	921	933	926	24	
18	934	935	935	935	935	935	935	935	934	934	933	932	931	930	929	927	925	924	923	922	921	920	919	919	919	935	929	24	
19	919	919	919	919	920	920	920	920	921	921	921	921	921	921	921	921	921	921	921	920	920	920	920	921	919	921	920	24	
20	921	921	921	921	921	922	922	922	923	923	924	924	924	925	925	925	926	927	927	928	928	928	928	928	921	928	924	24	
21	929	929	930	930	931	931	931	932	932	932	933	933	932	932	931	931	931	930	930	929	928	927	926	925	925	933	930	24	
22	925	925	924	923	923	924	924	925	925	926	927	928	929	930	931	932	934	935	936	937	938	939	940	923	940	930	24		
23	941	942	944	945	946	947	948	949	950	951	951	952	952	952	952	951	950	949	947	945	943	942	941	941	952	948	24		
24	941	941	941	941	941	941	942	942	944	946	947	948	948	949	948	948	948	947	946	945	943	942	940	939	939	949	944	24	
25	937	936	934	933	932	933	934	936	938	941	944	946	948	949	951	952	953	954	954	954	955	955	955	955	932	955	945	24	
26	955	954	952	951	951	950	949	949	949	949	949	949	950	950	950	950	949	949	949	949	949	948	948	948	948	955	950	24	
27	948	947	947	947	947	946	946	946	946	946	945	945	945	944	943	943	942	942	941	941	940	939	938	938	938	948	944	24	
28	938	937	937	937	937	938	938	939	939	940	940	941	942	942	943	943	944	945	946	947	947	948	949	950	937	950	942	24	
29	951	951	952	953	953	954	955	955	956	956	957	957	958	958	958	958	958	958	957	957	957	956	955	955	951	958	956	24	
30	954	953	952	951	950	949	948	948	947	947	947	947	947	947	947	946	946	945	944	943	941	940	938	938	954	947	24		
31	937	935	933	932	930	929	928	927	928	928	928	928	929	930	930	931	932	933	934	935	936	937	937	927	937	931	24		
HOURLY MAX	956	956	956	957	958	958	958	959	959	960	960	960	959	959	958	958	958	958	958	957	957	957	956	956					
HOURLY AVG	940	940	940	940	939	939	939	939	939	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

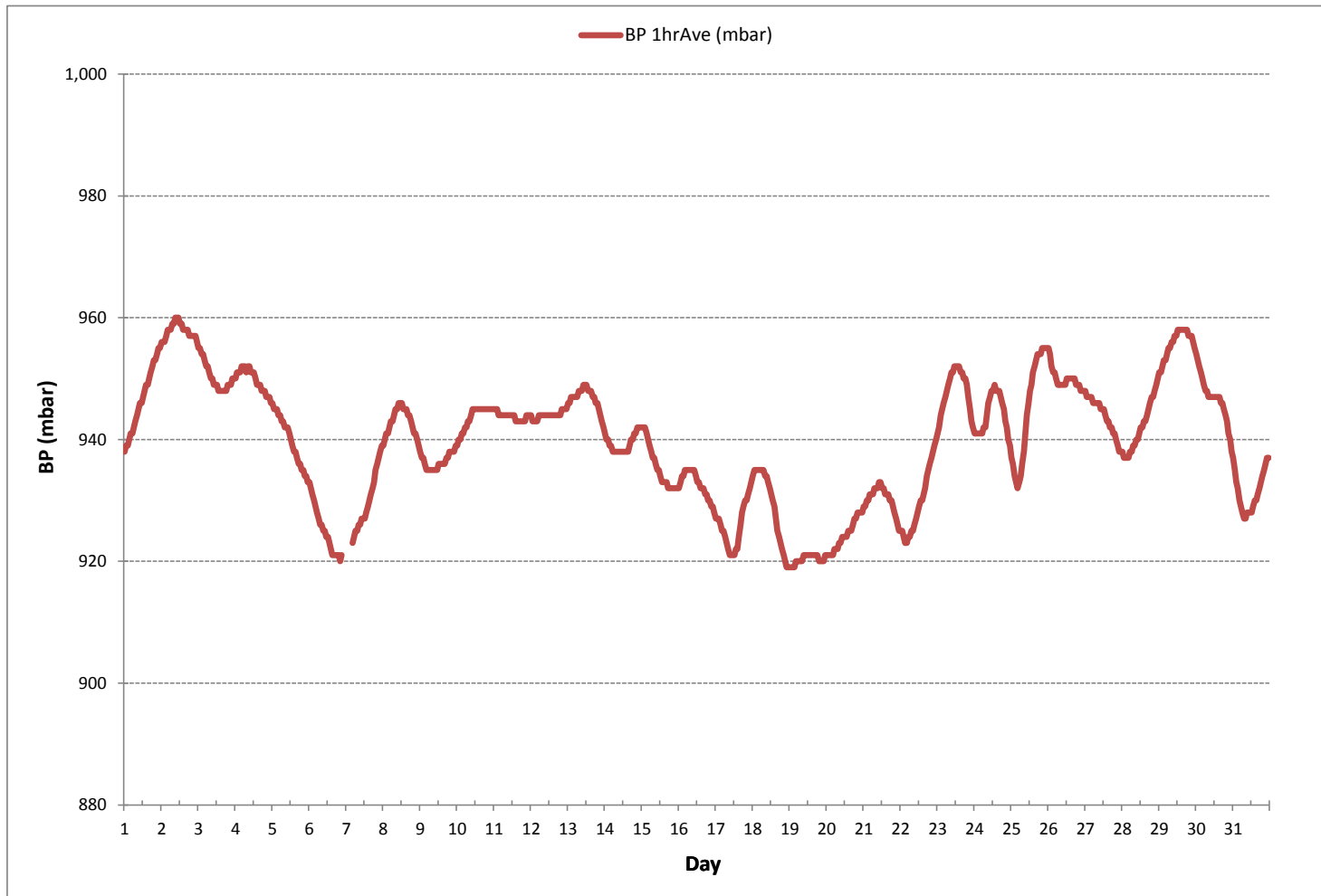
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	919	mbar	@ HOUR	22	ON DAY	18
MAXIMUM 1-HR AVERAGE:	960	mbar	@ HOUR	9	ON DAY	2
MAXIMUM 24-HR AVERAGE:	958	mbar			ON DAY	2
OPERATIONAL TIME:						738 hrs
AMD OPERATION UPTIME:						99.2 %
STANDARD DEVIATION:	10					MONTHLY AVERAGE: 940 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



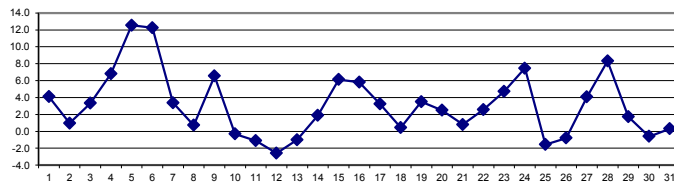
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	6.7	6.6	5.8	5.3	5.0	3.6	3.3	3.3	3.8	3.8	4.6	5.1	5.6	5.8	4.9	4.6	4.1	3.8	3.0	2.7	2.3	1.9	2.0	0.9	0.9	6.7	4.1	24	
2	-0.2	-1.4	-2.9	-3.6	-4.0	-4.8	-4.7	-3.0	-0.4	3.2	5.0	5.6	6.7	7.4	7.7	8.0	9.6	9.5	1.9	-2.6	-3.4	-3.6	-3.0	-3.8	-4.8	9.6	1.0	24	
3	-3.9	-3.2	-3.5	-2.1	-1.9	-2.5	-2.0	-1.4	-0.6	1.7	4.0	5.1	6.8	9.2	9.7	11.0	11.4	11.7	9.3	7.8	6.4	4.7	2.1	0.2	-3.9	11.7	3.3	24	
4	-0.8	-1.4	-2.1	-2.3	-2.6	-2.9	-2.9	-0.4	2.8	8.4	11.1	12.6	14.1	15.7	16.8	17.1	17.2	16.1	12.7	9.1	6.4	6.8	6.4	5.7	-2.9	17.2	6.8	24	
5	6.8	6.8	7.0	6.7	5.3	4.7	5.6	6.3	8.5	11.0	13.4	15.5	16.9	18.5	19.7	20.5	20.6	19.1	17.7	15.8	14.3	12.9	13.4	13.9	4.7	20.6	12.5	24	
6	13.4	12.9	12.1	11.4	10.9	11.5	12.3	12.5	12.4	12.9	13.1	12.1	13.4	14.4	14.1	13.8	13.0	12.4	11.4	10.5	9.9	9.0	P	P	9.0	14.4	12.2	22	
7	P	P	P	P	4.3	4.0	4.0	4.0	4.2	4.7	5.2	5.6	5.5	5.6	6.3	3.9	4.4	3.3	1.9	0.6	0.3	0.0	-0.1	-0.1	-0.1	6.3	3.4	20	
8	-0.6	-0.5	-0.7	-0.9	-0.9	-1.2	-1.2	-1.5	-1.6	-1.0	-0.3	1.0	1.6	2.9	3.7	4.5	4.8	3.1	1.0	0.1	0.1	0.7	1.8	2.2	-1.6	4.8	0.7	24	
9	3.2	4.0	4.6	5.3	6.3	6.3	5.5	5.0	6.6	7.8	9.4	10.6	10.6	11.3	10.6	11.0	10.0	9.0	6.6	5.4	4.9	3.1	1.0	-0.9	-0.9	11.3	6.6	24	
10	-1.9	-3.4	-4.3	-4.6	-5.2	-5.4	-5.1	-1.5	0.5	2.6	2.5	3.4	3.9	2.4	2.2	1.4	1.3	0.9	0.9	0.7	0.5	0.4	0.2	0.1	-5.4	3.9	-0.3	24	
11	-0.1	-0.2	-0.3	-0.5	-0.7	-1.1	-1.3	-1.4	-1.0	-0.4	0.5	1.6	2.0	2.4	1.5	2.9	2.0	1.4	-3.1	-4.4	-5.4	-6.6	-7.0	-7.5	-7.5	2.9	-1.1	24	
12	-7.3	-7.8	-8.1	-8.2	-8.5	-8.5	-9.2	-9.2	-5.6	-2.1	-0.2	1.7	2.7	3.7	4.9	5.3	4.4	2.0	-0.3	-1.2	-1.8	-2.7	-3.0	-3.0	-9.2	5.3	-2.6	24	
13	-2.7	-2.0	-1.7	-2.6	-3.4	-2.6	-2.4	-2.4	-2.2	-1.5	-0.2	0.5	1.2	1.4	1.2	1.2	0.9	0.6	0.3	-0.1	-0.9	-2.0	-2.5	-2.1	-3.4	1.4	-1.0	24	
14	-1.3	-1.0	-0.9	-0.9	-0.5	-0.6	-0.7	-0.8	0.3	1.4	2.4	4.1	5.4	6.7	7.5	7.0	6.7	6.4	3.5	0.3	-0.8	-2.3	0.7	2.7	2.7	-2.3	7.5	1.9	24
15	-0.3	-1.1	-1.4	-0.9	0.4	1.4	2.1	4.3	5.1	4.7	5.5	7.6	10.1	10.5	11.0	11.0	10.9	11.2	10.9	10.1	9.0	8.3	8.4	8.1	-1.4	11.2	6.1	24	
16	7.7	6.7	5.9	5.3	4.9	4.7	4.3	4.5	5.3	6.4	7.5	8.4	8.8	9.2	9.0	8.0	6.1	4.8	4.2	4.0	3.9	3.7	3.3	2.9	2.9	9.2	5.8	24	
17	3.3	4.6	4.0	4.1	4.2	4.6	4.6	4.4	4.5	4.8	4.9	4.2	3.5	3.4	3.3	3.3	2.9	2.6	2.4	2.0	1.5	0.7	0.2	-0.2	-0.2	4.9	3.2	24	
18	-0.1	-0.9	-1.8	-2.3	-2.6	-2.6	-3.4	-4.1	-3.1	-1.8	-0.4	1.9	3.0	3.6	3.4	3.2	3.1	3.0	3.0	3.1	2.4	1.9	1.1	1.0	-4.1	3.6	0.4	24	
19	1.5	1.6	1.3	0.6	-0.1	0.0	-0.7	-0.3	1.4	4.1	6.8	8.4	10.9	11.0	11.5	11.2	10.3	7.2	2.9	0.8	-0.6	-1.6	-1.9	-2.1	-2.1	11.5	3.5	24	
20	-1.7	-0.6	-0.6	-2.2	-0.7	-0.6	0.1	0.0	-0.7	1.4	2.9	5.6	7.9	8.5	9.2	9.2	8.5	6.3	3.4	0.2	0.6	2.4	1.1	-0.4	-2.2	9.2	2.5	24	
21	-0.6	-2.7	-2.1	-2.7	-0.7	-0.7	-1.7	-1.8	-0.1	1.7	3.4	4.5	5.4	6.1	6.7	6.8	6.6	3.0	-2.5	-2.2	-2.0	-2.0	-1.9	-1.2	-2.7	6.8	0.8	24	
22	-0.9	-0.5	-0.1	0.0	-0.5	-0.8	-1.1	-0.9	-0.3	0.2	0.6	1.6	2.5	5.1	7.8	7.7	7.1	6.9	6.6	6.1	5.7	4.0	3.0	1.7	-1.1	7.8	2.6	24	
23	1.7	1.4	0.9	1.6	0.9	1.0	0.8	1.2	2.1	3.3	4.4	6.1	7.6	8.0	8.2	8.6	8.4	7.6	8.1	7.5	5.6	4.9	6.1	7.5	0.8	8.6	4.7	24	
24	8.5	10.1	10.3	10.2	10.0	10.4	11.2	11.5	11.9	10.7	9.0	9.0	8.8	8.6	8.2	7.7	7.0	5.9	4.5	2.8	1.6	0.8	0.2	0.2	0.2	11.9	7.5	24	
25	0.2	0.1	0.1	0.1	0.1	0.1	0.0	-0.2	-0.6	-0.5	-0.2	0.0	0.4	-1.1	-1.9	-2.3	-2.6	-2.8	-4.3	-5.9	-5.0	-5.6	-5.5	-5.9	0.4	-1.6	24		
26	-4.9	-4.8	-4.3	-3.6	-3.1	-2.6	-2.3	-2.2	-0.8	0.5	1.3	1.7	2.5	3.3	3.0	2.3	0.1	-1.0	-0.3	-0.1	0.3	-0.4	-1.4	-4.9	3.3	-0.8	24		
27	-0.1	0.0	-0.4	-1.7	-1.7	-1.3	-0.9	0.4	0.8	2.3	3.4	4.9	6.4	7.7	6.6	6.8	7.6	7.4	7.3	7.6	8.0	8.0	8.7	9.8	-1.7	9.8	4.1	24	
28	9.8	9.9	10.5	10.0	10.0	10.3	10.1	9.3	9.0	9.5	9.2	9.8	12.0	11.1	10.1	10.9	10.3	7.8	5.3	4.0	3.4	3.1	2.6	1.8	1.8	12.0	8.3	24	
29	1.3	1.1	1.0	1.2	1.1	0.6	-0.4	-0.7	-0.3	3.2	5.4	6.1	6.8	7.6	7.4	6.8	6.5	1.3	-2.5	-2.2	-0.4	-3.4	-3.5	-2.9	-3.5	7.6	1.7	24	
30	-2.7	-2.5	-2.8	-2.2	-1.9	-1.1	-1.6	-1.8	-1.7	-1.1	-0.8	0.6	2.3	3.2	3.8	4.2	2.6	-2.2	-2.6	-2.8	-1.2	-0.9	-0.7	-0.6	-2.8	4.2	-0.6	24	
31	-0.1	0.1	0.5	1.1	0.6	0.7	0.4	0.9	2.1	3.2	3.1	3.4	3.9	2.2	0.5	-0.4	-1.1	-1.5	-1.6	-1.7	-1.9	-2.1	-2.4	-2.8	-2.8	3.9	0.3	24	
HOURLY MAX	13.4	12.9	12.1	11.4	10.9	11.5	12.3	12.5	12.4	12.9	13.4	15.5	16.9	18.5	19.7	20.5	20.6	19.1	17.7	15.8	14.3	12.9	13.4	13.9					
HOURLY AVG	1.1	1.1	0.9	0.7	0.8	0.8	0.7	1.1	2.0	3.3	4.4	5.4	6.4	7.0	7.1	7.0	6.7	5.4	3.6	2.6	2.0	1.5	1.0	0.8					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

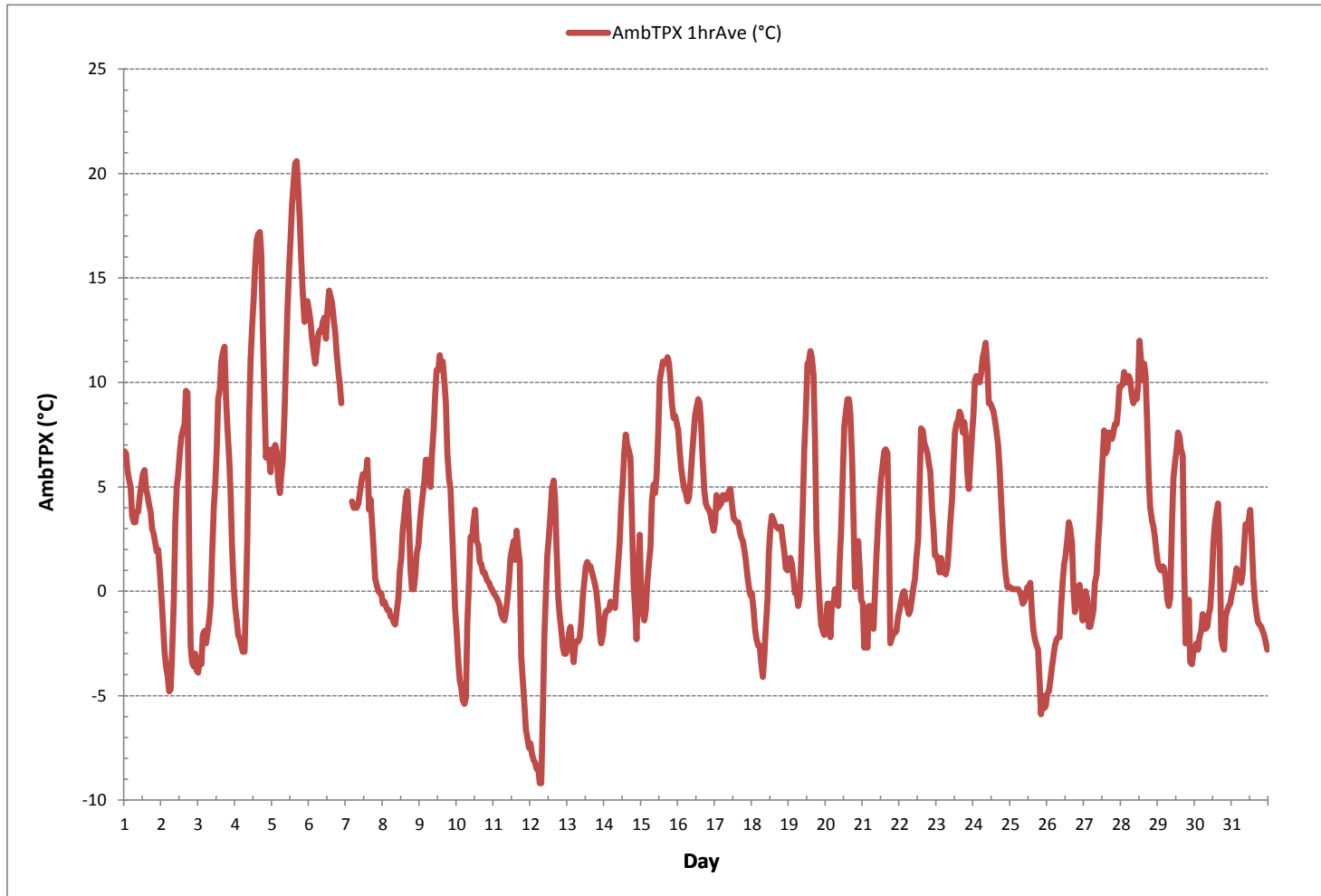
24 HR AVERAGES October 2017



MONTHLY SUMMARY

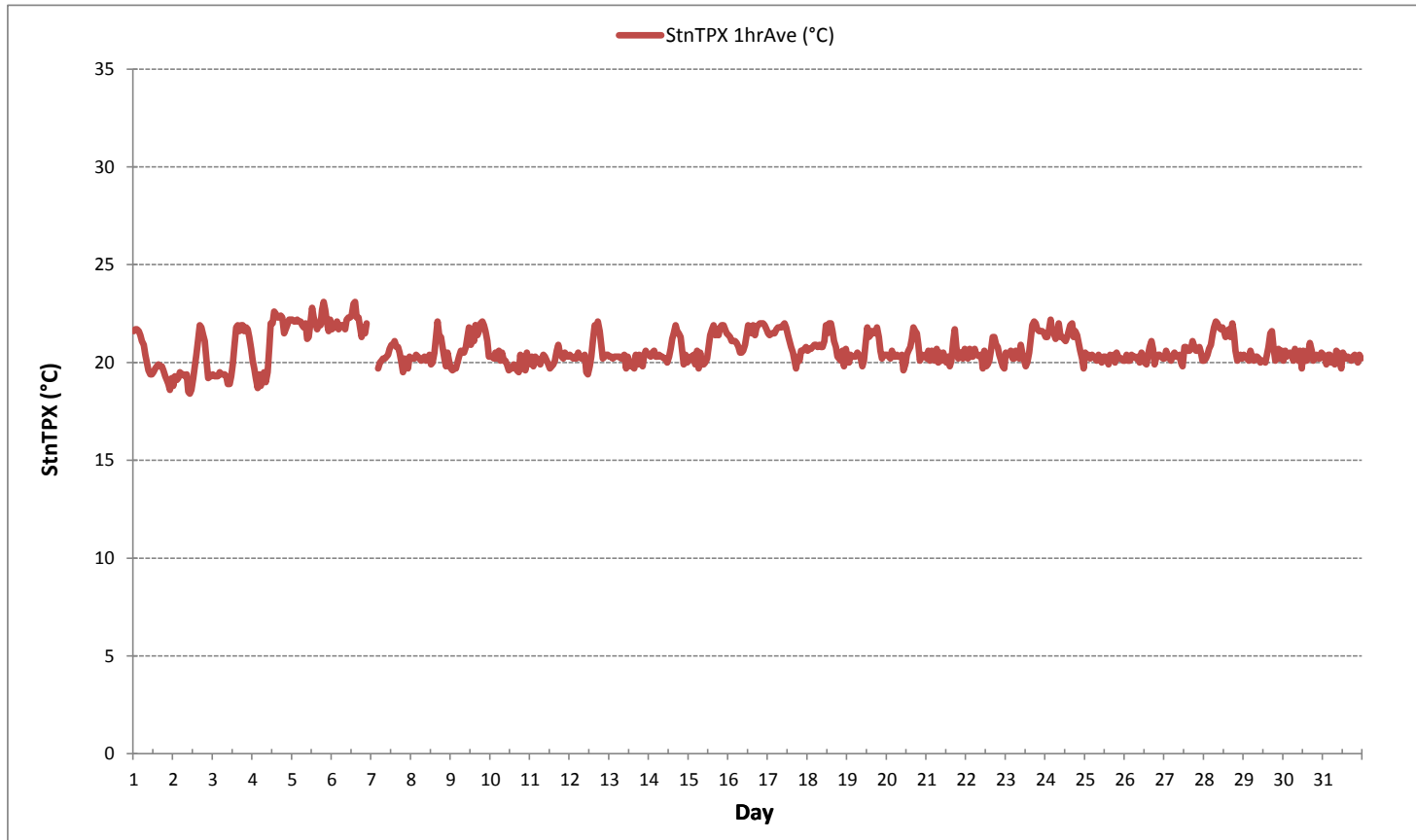
MINIMUM 1-HR AVERAGE:	-9.2 °C	@ HOUR	6	ON DAY	12
MAXIMUM 1-HR AVERAGE:	20.6 °C	@ HOUR	16	ON DAY	5
MAXIMUM 24-HR AVERAGE:	12.5 °C			ON DAY	5
OPERATIONAL TIME:				738	hrs
AMD OPERATION UPTIME:				99.2	%
STANDARD DEVIATION:	5.1	MONTHLY AVERAGE:		3.1	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



STATION TEMPERATURE

STATION TEMPERATURE Hourly Averages (StnTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

API 100A Sulphur Dioxide Analyzer Calibration

Date:	October 18, 2017	Barometer/B.P./units:	n/a	27.54	inHg
Company/Airshed:	PRAMP	Thermometer/Station Temp:	Fluke 4295 expires November 14, 2017	20.79	°C
Location/Station Name:	842b	Weather Conditions:	Cloudy/Overcast		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:21	Performed By/Reviewer:	Raja Abid	Tom Bourque	
End Time 24 hr. (mst):	14:00	Cal Gas Expiry Date:	May 23, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		

Analyzer:	ID# or Serial Number:	838	Range ppb:	500
	Last Calibration Date:	September 15, 2017	As Found C.F.:	0.999
	Previous C.F.:	1.000	New C.F.:	1.000

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: Definer Low 129069 expires February 5, 2018	<table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								
High Flow Meter ID/Expiry Date: Definer High 128686 expires February 5, 2018									
Calibrator ID/Expiry Date: API id# 690 expires March 17, 2018									
Cal Gas Cylinder I.D. # : LL 119513									
Cal Gas Conc. (ppm): 50.6									

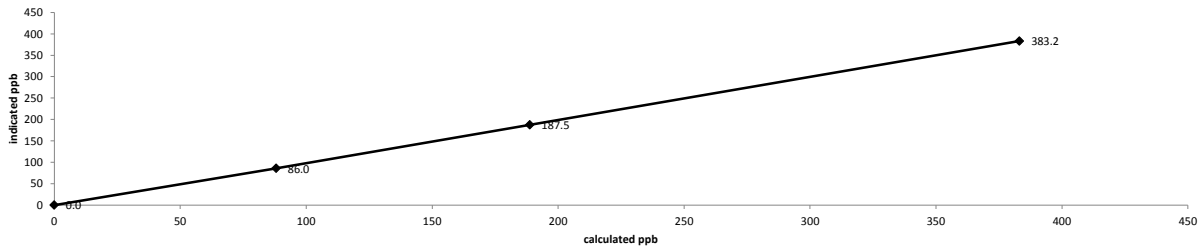
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5727	0.00	5727	0.0	0.1	n/a
as found high	5926	45.21	5971	383.2	383.5	0.999
adjusted zero	5727	0.00	5727	0.0	0.0	n/a
adjusted high	5926	45.21	5971	383.2	383.2	1.000
mid	5941	22.25	5963	188.8	187.5	1.007
low	5954	10.38	5965	88.1	86.0	1.024
calibrator zero	5727	0.00	5727	0.0	0.0	n/a
Average C.F. =						1.010

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	> or = 0.995
Slope =	0.998	0.95-1.05
b (Intercept as % of full scale) =	0.22%	± 3% F.S.
% change in C.F. from last cal =	0.06%	± 10%

API 100A Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Slope:	1.034	Slope:	1.030
Offset:	19.9	Offset:	20.2
Hvps:	686	Hvps:	685
Dcps:	2545	Dcps:	2544
Rcell Temp:	50.0	Rcell Temp:	51.2
Box Temp:	29.9	Box Temp:	29.8
Pmt Temp:	7.3	Pmt Temp:	7.3
Izs Temp:	60.0	Izs Temp:	60.1
Converter Temp:	n/a	Converter Temp:	n/a
Pres:	26.3	Pres:	26.3
Samp Fl:	636	Samp Fl:	634
Pmt:	51.5	Pmt:	54.4
Uv Lamp:	2006.9	Uv Lamp:	2016.4
Lamp Ratio:	81	Lamp Ratio:	80.9
Expected Value:	237.1	Expected Value:	238.7

Comments:

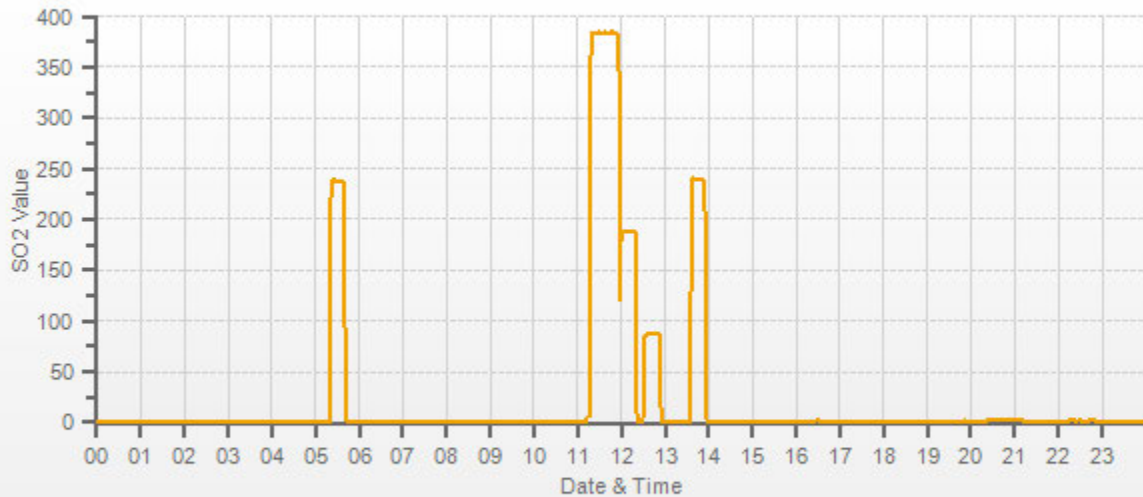
The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

Flow measurements after mid-point

11:58-11:59 - Low readings at the start of mid point were due to the calibrator resetting - the display stopped working and after reset it was OK. Barometric pressure recorded from Environment Canada website.

SO2[ppb] Station: PRAMP_842 Daily: 17/10/18 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 431-TLE Total Reduced Sulphur Analyzer Calibration

Date: <u>October 18, 2017</u>	Barometer/B.P./units: <u>n/a</u>	<u>27.54</u>	<u>inHg</u>
Company/Airshed: <u>PRAMP</u>	Thermometer/Station Temp: <u>Fluke 4295 expires November 14, 2017</u>	<u>20.79</u>	<u>°C</u>
Location/Station Name: <u>842b</u>	Weather Conditions: <u>Cloudy/Overcast</u>		
Parameter: <u>Total Reduced Sulphur</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>13:14</u>	Performed By/Reviewer: <u>Raja Abid</u>	<u>Tom Bourque</u>	
End Time 24 hr. (mst): <u>16:55</u>	Cal Gas Expiry Date: <u>December 1, 2018</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>CD NOVA-CDN 101s/n #553</u>		

Analyzer: ID# or Serial Number: <u>1162460023</u>	Range ppb: <u>100</u>
Last Calibration Date: <u>September 15, 2017</u>	As Found C.F.: <u>1.010</u>
Previous C.F.: <u>0.999</u>	New C.F.: <u>1.000</u>

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):								
Low Flow Meter ID/Expiry Date: <u>Definer Low 129069 expires February 5, 2018</u>	<table border="1" style="display: inline-table;"><tr><th>Point</th><th>ppb</th></tr><tr><td>High</td><td>78</td></tr><tr><td>Mid</td><td>38</td></tr><tr><td>Low</td><td>19</td></tr></table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: <u>13:50/14:00</u>
Point	ppb									
High	78									
Mid	38									
Low	19									
High Flow Meter ID/Expiry Date: <u>Definer High 128686 expires February 5, 2018</u>		SO2 Analyzer Range: <u>500</u>								
Calibrator ID/Expiry Date: <u>API id# 829 expires January 27, 2018</u>		Target Concentration (ppb): <u>380</u>								
Cal Gas Cylinder I.D. #: <u>BLM 001927</u>		As Found Zero: <u>0.0</u>								
Cal Gas Conc. (ppm): <u>10.3</u>		Analyzer Response: (ppb): <u>0.0</u>								
		Zero Corrected Result (ppb): <u>0.0</u>								

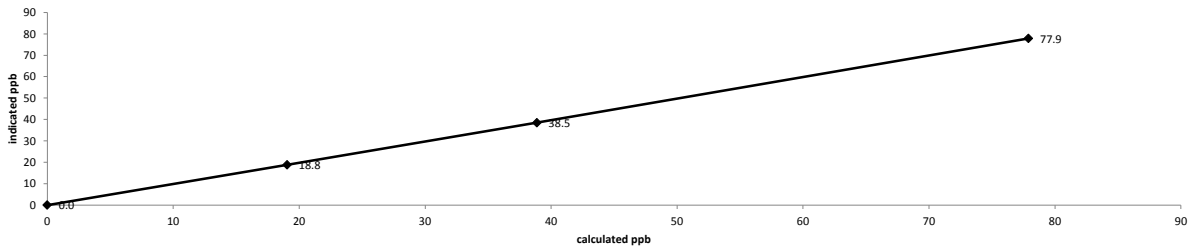
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7422	0.00	7422	0.0	0.1	n/a
as found high	7404	56.42	7460	77.9	77.2	1.010
adjusted zero	7422	0.00	7422	0.0	0.0	n/a
adjusted high	7404	56.42	7460	77.9	77.9	1.000
mid	7299	27.65	7327	38.9	38.5	1.010
low	7422	13.75	7436	19.0	18.8	1.013
calibrator zero	7422	0.00	7422	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	<u>> or = 0.995</u>
Slope =	<u>0.999</u>		<u>0.95-1.05</u>
b (Intercept as % of full scale) =	<u>0.18%</u>		<u>± 3% F.S.</u>
% change in C.F. from last cal =	<u>-1.14%</u>		<u>± 10%</u>

Thermo 431-TLE Total Reduced Sulphur Analyzer Calibration



<table style="width: 100%;"> <tr><td style="text-align: right;">Bkg:</td><td><u>2.70</u></td></tr> <tr><td style="text-align: right;">Coef:</td><td><u>0.853</u></td></tr> <tr><td style="text-align: right;">Pmt:</td><td><u>-725.2</u></td></tr> <tr><td style="text-align: right;">Flash:</td><td><u>976</u></td></tr> <tr><td style="text-align: right;">Internal:</td><td><u>30.4</u></td></tr> <tr><td style="text-align: right;">Chamber:</td><td><u>45.0</u></td></tr> <tr><td style="text-align: right;">Perm Oven Gas:</td><td><u>45.00</u></td></tr> <tr><td style="text-align: right;">Perm Oven Heater:</td><td><u>44.11</u></td></tr> <tr><td style="text-align: right;">Pressure:</td><td><u>669.9</u></td></tr> <tr><td style="text-align: right;">Sample Flow:</td><td><u>0.410</u></td></tr> <tr><td style="text-align: right;">Lamp Intensity:</td><td><u>89</u></td></tr> <tr><td style="text-align: right;">Converter:</td><td><u>850</u></td></tr> <tr><td style="text-align: right;">Converter Set:</td><td><u>850</u></td></tr> <tr><td style="text-align: right;">Averaging Time:</td><td><u>120</u></td></tr> <tr><td style="text-align: right;">Expected Value:</td><td><u>57.9</u></td></tr> </table>	Bkg:	<u>2.70</u>	Coef:	<u>0.853</u>	Pmt:	<u>-725.2</u>	Flash:	<u>976</u>	Internal:	<u>30.4</u>	Chamber:	<u>45.0</u>	Perm Oven Gas:	<u>45.00</u>	Perm Oven Heater:	<u>44.11</u>	Pressure:	<u>669.9</u>	Sample Flow:	<u>0.410</u>	Lamp Intensity:	<u>89</u>	Converter:	<u>850</u>	Converter Set:	<u>850</u>	Averaging Time:	<u>120</u>	Expected Value:	<u>57.9</u>	<table style="width: 100%;"> <tr><td style="text-align: right;">Bkg:</td><td><u>2.66</u></td></tr> <tr><td style="text-align: right;">Coef:</td><td><u>0.848</u></td></tr> <tr><td style="text-align: right;">Pmt:</td><td><u>-725.6</u></td></tr> <tr><td style="text-align: right;">Flash:</td><td><u>976</u></td></tr> <tr><td style="text-align: right;">Internal:</td><td><u>29.5</u></td></tr> <tr><td style="text-align: right;">Chamber:</td><td><u>44.9</u></td></tr> <tr><td style="text-align: right;">Perm Oven Gas:</td><td><u>45.00</u></td></tr> <tr><td style="text-align: right;">Perm Oven Heater:</td><td><u>44.10</u></td></tr> <tr><td style="text-align: right;">Pressure:</td><td><u>653.4</u></td></tr> <tr><td style="text-align: right;">Sample Flow:</td><td><u>0.402</u></td></tr> <tr><td style="text-align: right;">Lamp Intensity:</td><td><u>88</u></td></tr> <tr><td style="text-align: right;">Converter:</td><td><u>850</u></td></tr> <tr><td style="text-align: right;">Converter Set:</td><td><u>850</u></td></tr> <tr><td style="text-align: right;">Averaging Time:</td><td><u>120</u></td></tr> <tr><td style="text-align: right;">Expected Value:</td><td><u>59.7</u></td></tr> </table>	Bkg:	<u>2.66</u>	Coef:	<u>0.848</u>	Pmt:	<u>-725.6</u>	Flash:	<u>976</u>	Internal:	<u>29.5</u>	Chamber:	<u>44.9</u>	Perm Oven Gas:	<u>45.00</u>	Perm Oven Heater:	<u>44.10</u>	Pressure:	<u>653.4</u>	Sample Flow:	<u>0.402</u>	Lamp Intensity:	<u>88</u>	Converter:	<u>850</u>	Converter Set:	<u>850</u>	Averaging Time:	<u>120</u>	Expected Value:	<u>59.7</u>
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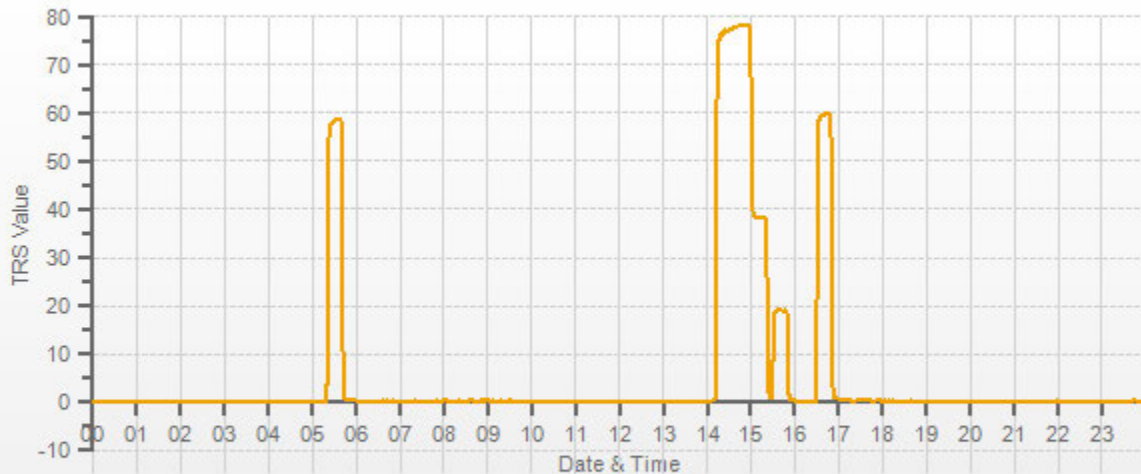
Comments:

The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

Flow measurements after mid-point

Barometric pressure recorded from Environment Canada website.

TRS[ppb] Station: PRAMP_842 Daily: 17/10/18 Type: AVG 1 Min. [1 Min.]



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	October 18, 2017	Barometer/B.P./units:	n/a	27.54	inHg
Company/Airshed:	PRAMP	Thermometer/Station Temp:	Fluke 4295 expires November 14, 2017	20.79	°C
Location/Station Name:	842b	Weather Conditions:	Cloudy/Overcast		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	10:21/13:57	Performed By/Reviewer:	Raja Abid	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	January 9, 2021		

Analyzer:	ID# or Serial Number:	1236656188	Correction Factors:			
	Measured Flow:	1016.4 cc/min	Previous C.F.:	As Found C.F.:	New C.F.:	
	Last Calibration Date:	September 28, 2017	CH ₄ =	1.000	1.016	1.000
	Range ppm:	20 CH4/20 NMHC/40 THC	NMHC =	0.999	0.995	1.000
			THC =	0.999	1.006	1.000

Calibration Standards:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Low Flow Meter ID/Expiry Date:	Definer Low 129069 expires February 5, 2018	Point	CH4	NMHC	THC
High Flow Meter ID/Expiry Date:	Definer High 128686 expires February 5, 2018	High	13.00	13.00	26.00
Calibrator ID/Expiry Date:	API id# 829 expires January 27, 2018	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL 19638	Low	3.00	3.00	6.00
CH4 Cylinder Conc. =	880.0 304.0 =C ₂ H ₆ Cylinder Conc.				
CH ₂ expressed as C ₂ H ₆ =	836.0 1716.0 =total CH4 equivalent				

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
as found zero	2974	0.00	2974	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2929	50.53	2980	14.92	14.18	29.10	14.69	14.25	28.92	1.016	0.995	1.006
adjusted zero	2974	0.00	2974	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2929	50.53	2980	14.92	14.18	29.10	14.92	14.18	29.10	1.000	1.000	1.000
mid	2957	26.11	2983	7.70	7.32	15.02	7.73	7.35	15.10	0.996	0.996	0.995
low	2983	12.97	2996	3.81	3.62	7.43	3.87	3.65	7.53	0.984	0.991	0.986
calibrator zero	2974	0.00	2974	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
										Average C.F. =		
										0.994 0.995 0.994		

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	1.000	1.000	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
Slope =	0.999	1.000	0.999	
b (Intercept as % of full scale) =	0.15%	0.09%	0.14%	
% change in C.F. from last cal =	-1.58%	0.42%	-0.72%	

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply:	-287.8	Calibration History cnt'd:	NM Peak Area:	n/a
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	n/a
	Filter:	175.0		Methane End:	n/a
	Column Oven:	75.1		Backflush:	n/a
	Internal:	30.3		NMNV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	1850 50	Run History>1:	NMHC End:	n/a
	Fuel:	1650 50		Date:	18Oct17
	Span Gas:	1550 18		Time:	10:38
	Zero Air Generator:	55		CH ₄ PK HT:	0
Internal Pressures:	Carrier:	30.5		CH ₄ RT:	8.0
	Fuel:	40.0		CH ₄ Baseline:	1321
	Air:	24.8		CH ₄ LOD:	36
FID Status:	Status:	LIT		CH ₄ SD:	12
	Counts:	276438		CH ₄ CONC:	0.00
	Flame:	338.3		NM PK HT:	0
	Det Base:	175.0		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	7Oct17@2:24		NM CONC:	0.00
	Flameouts:	1		NM Base Start:	1299
	Det Oven at Start:	36.4		NM Base End:	1310
	Col Oven at Start:	32.1		NM LOD:	16
Calibration History:	Time:	n/a		NM Start IDX:	7
	Type:	n/a		NM End IDX:	59
	Status:	n/a		NM Max Slope:	8.3e-01
	Check/Adjust:	n/a		NM Min Slope:	-5.7e-01
	CH ₄ Span Conc:	n/a	Expected Values:	NM PT Count:	0
	CH ₄ SP Ratio:	n/a		Previous CH ₄ :	9.04
	CH ₄ RT:	n/a		Previous NMHC:	10.11
	CH ₄ PK IDX:	n/a		Previous THC:	19.15
	CH ₄ PK HT:	n/a		New CH ₄ :	8.90
	NM Span Conc:	n/a		New NMHC:	10.24
	NM SP Ratio:	n/a		New THC:	19.14

Comments:
 The analyzer sample inlet filter was changed.

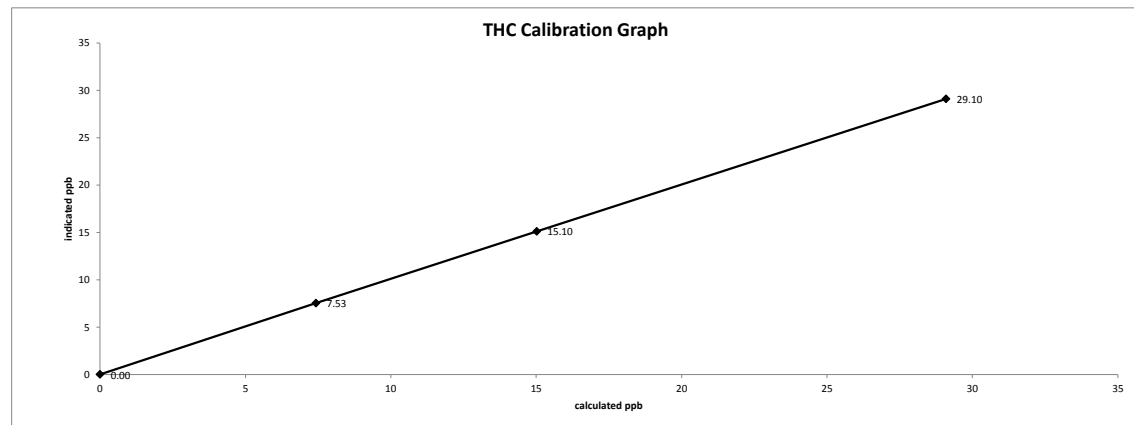
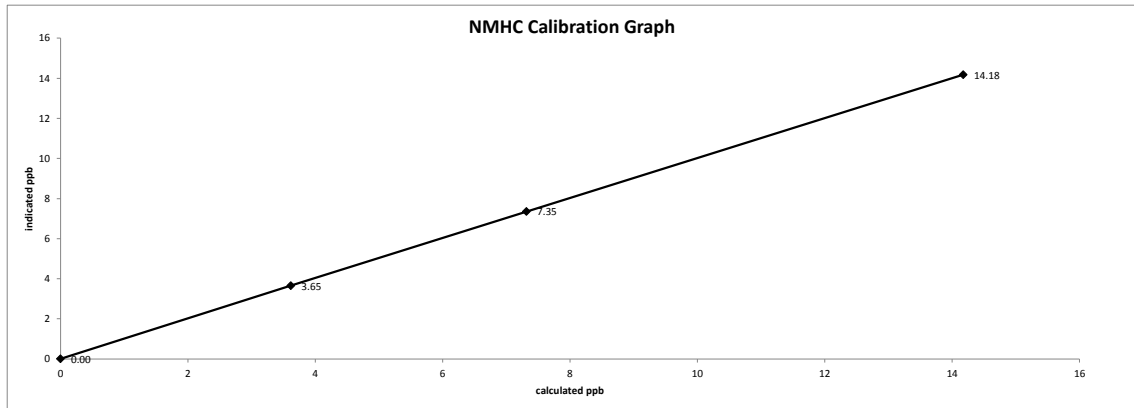
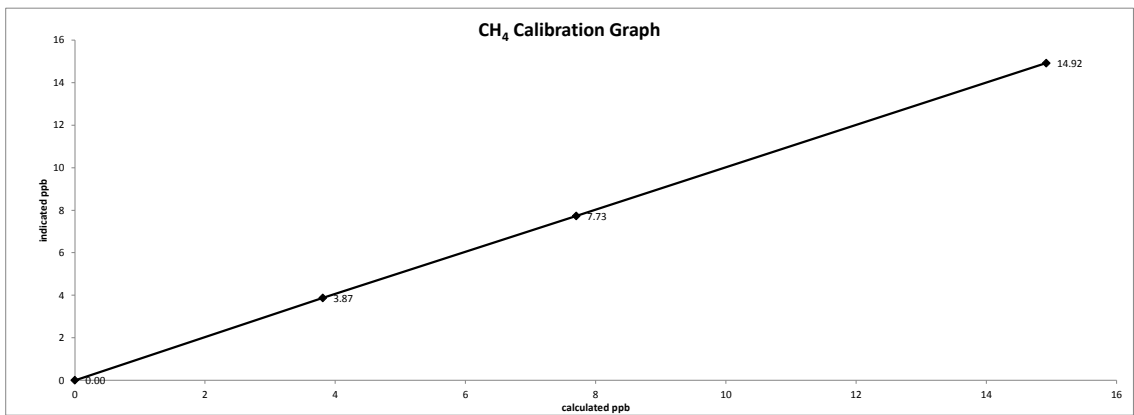
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

The manifold blower was found to be working normally.

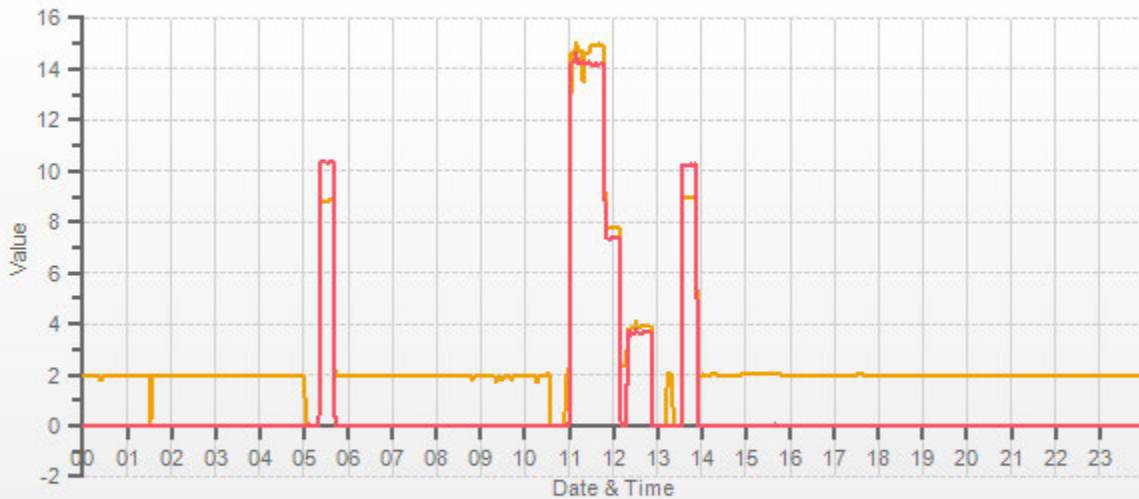
Flow measurements after mid-point
 Barometric pressure recorded from Environment Canada website.

Date: October 18, 2017
Company/Airshed: PRAMP
Location/Station Name: 842b

Start/End Time 24 hr. (mst): 10:21/13:57
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



Station: PRAMP_842 Daily: 17/10/18 Type: AVG 1 Min. [1 Min.]



— CH4[ppm] — NMHC[ppm]

WIND SYSTEM

Meteorological Sensor Audit/Calibration						
Location Information						
Company:	PRAMP	Performed By:	Chris Wesson			
Audit Location:	842b	Reviewed By:	Tom Bourque			
Audit Date:	August 30, 2017	Start /EndTime (mst):	10:50 / 11:20			
Calibration Purpose:	installation	Weather Conditions:	Cloudy/Overcast			
Wind Sensor Information						
Sensor ID Data:			Sensor Outputs:			
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1V			
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200kmh			
Serial #:	124638	Direction Voltage Output Range:	0-1V			
Previous Cal/Audit Date:	n/a or unknown	Direction Unit Output Range:	0-360°			
Wind Calibrator Information						
Calibrator Make/ Model:	RM Young	Serial #:	CA 4039			
Maxxam Unit ID #:	n/a	Certification Date:	February 24, 2017			
Wind Speed Audit Data **+/- 2% of the average correction factor is the limit**						
RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor		
0	0	0.1	0.1	-		
1000	18.4	18.4	18.5	1.000		
2000	36.9	36.7	36.7	1.004		
3000	55.3	55.1	55.1	1.004		
4000	73.7	73.4	73.4	1.004		
5000	92.2	91.8	91.8	1.004		
6000	110.6	110.2	110.2	1.003		
7000	129.0	128.6	128.6	1.003		
8000	147.4	147.1	147.0	1.003		
9000	165.9	165.5	165.5	1.002		
10000	184.3	184.2	184.1	1.001		
The audit meets AMD requirements.			Average Correction Factor=	1.003		
Wind Direction Audit Data **+/- 5° of the absolute average degrees difference for all points is the limit**						
Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	1	353	0.5	2.0	1.3
30	330	28	329	2.0	1.0	1.5
60	300	59	299	1.0	1.0	1.0
90	270	89	269	1.0	1.0	1.0
120	240	118	239	2.0	1.0	1.5
150	210	149	209	1.0	1.0	1.0
180	180	178	179	2.0	1.0	1.5
210	150	208	150	2.0	0.0	1.0
240	120	238	119	2.0	1.0	1.5
270	90	268	89	2.0	1.0	1.5
300	60	298	59	2.0	1.0	1.5
330	30	328	29	2.0	1.5	1.8
355	0	353	0	2.0	0.4	1.2
The audit meets AMD requirements.				Average Absolute Degrees Difference=	1.3	
Comments:						

CALIBRATORS

Company Maxxam Operator: Mike

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>690</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 30, 2016\</u>	Temperature (°C)	<u>23.3</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>704.3mmHg</u>
NO [PPM]	<u>49.0 NOx [PPM]</u>		<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)			
Pt. #1	<u>4898</u>	Pt. #2	<u>4942</u>
		Pt. #3	<u>4953</u>
Gas Flow (sccm)			
Pt. #1	<u>79.2</u>	Pt. #2	<u>38.6</u>
		Pt. #3	<u>19.3</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4977	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4977	79.2	0.7792	0.7792	0.7841	0.0012	0.7854	1%	1%
4981	38.6	0.3797	0.3797	0.3813	0.0006	0.3819	0%	1%
492	19.3	0.1902	0.1902	0.1927	0.0002	0.1929	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0056	0.90-1.10		m (Slope)=	1.0073
b (Intercept % of FS)=	0.0357	± 3% F.S.		b (Intercept % of FS)=	0.0304

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4977	0.000	0.0000	0.7928	0.0014	0.7941	NO ₂	% Diff. Limit
4977	0.500	0.5448	0.2480	0.5391	0.7871	-1%	± 10%
4977	0.250	0.2862	0.5066	0.2861	0.7926	-1%	± 10%
4977	0.100	0.1221	0.6707	0.1193	0.7914	-3%	± 10%
Absolute Average Percent Difference						2%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9894	0.90-1.10	
b (Intercept % of FS)=	0.0719	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Last Calibration Date	<u>March 15, 2017</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 17, 2017
Location: McIntyre Center Edmonton

Company Maxxam **Operator:** Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>829</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)			
Pt. #1	<u>4846</u>	Pt. #2	<u>4888</u>
		Pt. #3	<u>4908</u>
Gas Flow (sccm)			
Pt. #1	<u>80.6</u>	Pt. #2	<u>38.9</u>
		Pt. #3	<u>18.4</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	0.0001	0.0001	Limit ± 10%	
4927	80.6	0.8016	0.8016	0.8021	0.0015	0.8036	0.1%	0.2%
4927	38.9	0.3867	0.3867	0.3862	0.0001	0.3863	-0.1%	-0.1%
4927	18.4	0.1830	0.1830	0.1820	0.0004	0.1824	-0.5%	-0.4%
Absolute Average Percent Difference							0.2%	0.1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0010	0.90-1.10		m (Slope)=	1.0027
b (Intercept % of FS)=	-0.0604	± 3% F.S.		b (Intercept % of FS)=	-0.0652

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4927	0	0.0000	0.8016	0.0010	0.8020	NO ₂	% Diff. Limit
4927	500	0.5450	0.2566	0.5421	0.7987	-0.7%	± 10%
4927	250	0.2797	0.5219	0.2797	0.8016	-0.4%	± 10%
4927	80	0.0954	0.7062	0.0958	0.8026	-0.6%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9931	0.90-1.10	
b (Intercept % of FS)=	0.1220	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>AMU1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Last Calibration Date	<u>January 25, 2017</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS: _____

Auditor: Shea Beaton Date: January 27, 2017
Operator Signature: [Signature] Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-086CGA

Company: Maxxam Operator's Name: Chris Wesson
Cylinder #: LL119513 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model: Teco 146i
Serial Number: AMU 1809
Last Verification Date: June 17, 2016
Gas Type: SO2 Conc. 98.07
Cylinder Number: CAL016625

Flow Measurement Device:

Make/Model: Bios DC2
Serial Number: AMU 1659
Temp. °C: 23.0 C
B.P. 700 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
Last Calibration: Date: June 17/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01654	60.462	50.1
4976	82.3	0.828	0.01654	60.462	50.1
4985	40.8	0.411	0.00818	122.181	50.2
4965	20.2	0.203	0.00407	245.792	49.9
Average Cylinder Concentration:					50.1

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: June 17, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-109CGA

Company: Maxxam Operator's Name: Chris Wesson
 Cylinder #: BLM001927 Concentration PPM: 10.3 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: February 2, 2016
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015584

Flow Measurement Device:

Make/Model: Bios DC-2
 Serial Number: Bios D
 Temp. °C: 24.5
 B.P. 702mmHg

Reference Analyzer:

Make/Model: Thermo 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 15.3 Span: 1.126 Range: 0.1
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5025	0.0	0.000	0.00748	283.417	10.4
5058	37.84	0.078	0.00748	133.668	10.4
5059	17.85	0.036	0.00353	283.417	10.3
5031	9.15	0.019	0.00182	549.836	10.2
Average Cylinder Concentration:					10.3

Previous Stated Concentration PPM: 10.3

Percent variance from Stated: 0.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: *[Signature]*

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2013-298CGA

Company: Maxxam Operators name: Theo
 Cylinder #: LL19638 Conc CH4 (PPM) 880/304 Tolerance (%) 2 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
 Serial Number AMU 1690
 Last Verification Date October 17, 2013

Gas Type CH4 Conc. 999.2
 Cylinder Number D751932

Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC2
 Serial Number AMU 1659
 Temp. °C 21.0 C
 B.P. 706 mmhg

Reference Analyzer:

Make/Model Teco 55C Serial/AMU Number: 1625
 Instrument Settings Zero: N/A Span: N/A Range: 20
 Last Calibration: Date: Oct 17/13 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
3500	0.0	0.04	0.00	0.01481	67.534	889	309
3505	51.9	13.16	12.58	0.01481	67.534	889	309
3487	22.2	5.64	5.43	0.00637	157.072	886	310
3458	10.8	2.80	2.73	0.00312	320.185	897	318
Average Cylinder Concentration:						890	312

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>880</u>	<u>304</u>
Percent variance from Stated: <u>1.2</u>	<u>2.7</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance, Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance, **DO NOT USE** this cylinder

Auditor: Al Clark Date: October 17, 2013
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Peace River Area Monitoring Program Committee	Three Creeks 842b Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Wunmi Adekanmbi	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

November 28, 2017





Report Issued Date (dd-mm-yyyy)

***APPENDIX IV
DATA VALIDATION CERTIFICATION FORM***



Validation Certificate Form

Client: <u>Peace River Area Monitoring Program Committee</u>	Project #: <u>8449-2017-10-80-C</u>
Site: <u>Three Creeks 842b Station</u>	Contact: <u>Karla Reesor</u>

Level 0 Preliminary Verification	<u></u>	Date <u>November 9, 2017</u>
Level 1 Primary Validation	<u></u>	Date <u>November 9, 2017</u>
Level 2 Final Validation	<u></u>	Date <u>November 28, 2017</u>
Level 3 Independent Data Review	<u></u>	Date <u>November 28, 2017</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.