

Peace River Area Monitoring Program

DECEMBER 2023

Monthly Ambient Air Quality Monitoring Report

PRAMP-202312

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Peace River Area Monitoring Program

January 12, 2024

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Table of Contents

LIST OF ACRONYMS	4
COVER LETTER	5
NETWORK STATION SUMMARY	6
Listing of Continuous Monitoring Stations	6
Listing of Intermittent Monitoring Stations	6
Listing of PRAMP member with EPEA Facility Operating Approval	6
Calibration and Data Submission	6
Monitoring Notes during the Month of December 2023	7
986-C Station	7
842-B Station	7
Reno-B Station	7
PRC Station	7
AQHI – Grimshaw Station	7
VOCs Canister Sampling Program	8
Revisions to Alberta's Ambient Air Quality Data Warehouse	9
Deviations from Authorized Monitoring Methods	9
Disclaimer	9
Certification	
Map of PRAMP Continuous Monitoring Network	
CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY	
986 -C Station	
842-B Station	
Reno-B Station	21
PRC Station	25
AQHI – Grimshaw Station	
TABLES, CHARTS AND WIND ROSES	
986-C STATION	
842-B STATION	55
RENO -B STATION	75
PRC STATION	95
AQHI GRIMSHAW STATION	
END OF REPORT	

LIST OF ACRONYMS

AAAQOs	Alberta Ambient Air Quality Objectives
AEP	Alberta Environment and Parks
AMD	Air Monitoring Directive
AT	Ambient Temperature
BP	Barometric Pressure
CH4	Methane
EPEA	Environmental Protection and Enhancement Act
H2S	Hydrogen Sulphide
kph	kilometers per hour
mb	millibar
mm	millimeter
NMHC	Non-Methane Hydrocarbons
ppb	parts per billion
ppm	parts per million
PRAMP	Peace River Area Monitoring Program
RH	Relative Humidity
SO2	Sulphur Dioxide
ST	Station Temperature
THC	Total Hydrocarbons
TRS	Total Reduced Sulphur
VWD	Vector Wind Direction
VWS	Vector Wind Speed
WD	Wind Direction
WS	Wind Speed
°C	Degrees Celsius



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Alberta Environment and Protected Areas (EPA) 11th Floor, Oxbridge Place 9820 106 Street Edmonton, AB, T5K 2J6

January 12, 2024

RE: PRAMP – December 2023 Monthly Ambient Air Quality Monitoring Report

Enclosed is the December 2023 Monthly Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Peace River Area Monitoring Program (PRAMP) regional air quality monitoring network.

The representative of the Person Responsible for this monitoring program is

PRAMP Airshed Michael Bisaga / Lily Lin, Technical Program Managers Suite 91, 305 – 4625 Varity Drive NW Calgary, AB, T3A 0Z9 Phone #: 780-226-7068 / 587-225-2248 E-mail: <u>pramptech@prampairshed.ca</u>

This report has been prepared, review and submitted by Michael Bisaga & Lily Lin of the PRAMP Airshed. This report is also submitted on behalf of the industrial member companies to satisfy the requirements of the facility operating approvals.

PRAMP Airshed has retained the services of Bureau Veritas Canada to conduct continuous ambient monitoring on its behalf.

NETWORK STATION SUMMARY

Listing of Continuous Monitoring Stations

The PRAMP continuous ambient air quality monitoring network stations are:

- 986-C Station
- 842-B Station
- Reno-B Station
- AQHI Grimshaw
- Peace River Complex (PRC) Station

Station ID	Station Name	Latitude	Longitude
1562	986-C	56.36980	-116.92500
1561	842-B	56.27406	-116.98129
1563	Reno-B	55.890868	-117.137080
1689	AQHI-Grimshaw	56.18657	-117.604994
1698	PRC	56.38257	-116.769283

Listing of Intermittent Monitoring Stations

- VOC Canister Sampling Station
 - \circ 986-C Station
 - \circ 842-B Station
 - $\circ \quad \text{Reno-B Station} \quad$

Listing of PRAMP member with EPEA Facility Operating Approval

Company	Facility	Approval No.
Canadian Natural Upgrading Limited	Peace River Complex	1642-03-00

Calibration and Data Submission

Hourly data and calibration reports for December 2023 were submitted to Alberta's Ambient Air Data Warehouse through ETS for the 986-C station, 842-B station, Reno-B station, PRC station and AQHI-Grimshaw station.

Monitoring Notes during the Month of December 2023

986-C Station

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- No major operational issues were recorded this month.

842-B Station

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- No major operational issues were recorded this month.

Reno-B Station

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- No major operational issues were recorded this month.

PRC Station

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- No major operational issues were recorded this month.

AQHI – Grimshaw Station

- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) and /or Alberta Ambient Air Quality Guidelines (AAAQGs) where applicable, except PM2.5. One 1-hour PM2.5 exceedance was recorded this month. The recorded exceedances were believed to be the result of local buildup of emissions.

Date	Time (MST)	Parameter	Average Period	Concentration (µg/m3)	Wind speed (km/hr)	Wind Direction	Reference #
9-Dec	0	PM2.5	1-Hour	200	14.0	278°(W)	EDGE00422947

• PM2.5: A firmware update and an alignment factor was activated on the T640 PM analyzer was completed on December 20 hour 13.

VOCs Canister Sampling Program

- The canister sampling program collects a 1-hour sample of air when the continuously measured non-methane hydrocarbon (NMHC) concentration reaches a specified trigger point. The current trigger point is 0.3 ppm for non-methane hydrocarbons. The trigger point is based on real-time monitoring data that are averaged over a 5-minute period.
- The canister sample collection systems are in place at Station 986-C, 842-B, and the Reno-B Station; a canister sample collection system is not part of the suite of instruments currently deployed at both the PRC station and the AQHI-Grimshaw station.
- Sample analysis and analytical results were prepared and provided by InnoTech Alberta.
- There were no canister events recorded this month. The canister system was triggered at the 986-C station on December 26 at 03:35 due to an analyzer issue. The event is not valid.

Revisions to Alberta's Ambient Air Quality Data Warehouse

No revisions to historical data previously submitted to the Alberta's Ambient Air Quality Data Warehouse were made this month.

Deviations from Authorized Monitoring Methods

No deviations from authorized monitoring methods were recorded this month.

Disclaimer

Baseline corrections were performed on the 1-minute data. 5-minute and hourly data were calculated based on the post-baseline correction 1-minute data set. Data verification/validation were then performed on the 5-minute and hourly data. Hourly data that are included in this report are the post-validation hourly data set.

Equipment calibration / maintenance records were provided by Bureau Veritas.

Certification

This report was prepared and submitted by Lily Lin in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

Lily Lin, Technical Program Manager, PRAMP Airshed

This report was reviewed by Michael Bisaga in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. I also certify that at the time of this report's submission, all air data have been electronically uploaded to Alberta's Ambient Air Quality Data Warehouse as required by the AMD. Uploading of VOC data from the canister sampling program was not required at the time of completing this report.

Michael Bisaga, Technical Program Manager, PRAMP Airshed



Map of PRAMP Continuous Monitoring Network

Legend

- PRAMP Boundary
 Populated Place
 First Nation
- Continuous Monitoring Station
- ▲ Passive Monitoring Station
- Industrial Facilities
- In-Situ Oil Sands
- Heavy Oil/Bitumen Well or Battery
- Conventional Oil Well or Battery
- Natural Gas Well or Battery
- Gas Plant or Gas Processing
- Compressor Station or Pipeline
- Agricultural Storage and Transfer
- Pulp and Paper
- Well (Not Associated with Batteries)

Service Layer Credit: Esri, CGIAR, USGS, Esri, USGS



CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY

986 - C Station

Equipment Operation Summary

Parameter	Equipment Operational Summary
SO2 Thermo 43iQTL #1193585646	 A successful monthly calibration was performed on December 7. No operational issues were identified this month.
TRS Thermo 43iQTL #1191833341 TRS convertor CD Nova CDN-101 #530 (BV-supplied)	 A successful monthly calibration was performed on December 7. No operational issues were identified this month.
THC/CH4/NMHC Thermo 55i #12208316589 H2 Generator HG300 #191267063	 A successful monthly calibration was performed on December 7. Few NMHC concentration spikes were recorded on December 26. As the spikes were very short duration (2-minutes) and high concentrations, the validity of these events is questionable. Data were invalidated as a result. The canister system was triggered by a spike event at 03:35 on December 26. As the data were not believed to be real, the canister event is considered invalid.
RH Rotronic HC2-S3 #20626912	 The RH probe was checked on December 7. The probe passed the check requirements. No operational issues were identified this month.
BP MetOne 092 #Y23358	 The BP sensor was checked on December 7. The sensor passed the check requirements. No operational issues were identified this month.
AT Rotronic HC2-S3 #20626912	 The AT probe was checked on December 7. The probe passed the check requirements. No operational issues were identified this month.

Parameter	Equipment Operational Summary		
ST COMET #18961918	 No operational issues were identified this month. 		
Precipitation RM Young 52202 #TB 16325	 The precipitation gauge was checked on December 7. The gauge's functionality passed the check requirements. No operational issues were identified this month. 		
WS/ WD RM Young 05305AQ #180340	 Wind direction data contained in this report represents where the wind is coming from. The annual wind system calibration was completed on August 3, 2023. The anemometer sensors were check on December 7. The wind system passed the check requirements. No operational issues were identified this month. 		

Monitored Data Summary

842-B Station

Equipment Operation Summary

Parameter	Equipment Operational Summary
SO2 Thermo 43iQTL #1200736629	 A successful monthly calibration was performed on December 5. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
TRS Thermo 43iQTL #1200736630 TRS Convertor CD Nova CDN-101 #583	 A successful monthly calibration was performed on December 5. As marked change in response was noticed on the December 5's calibration, an as-found points check was completed on December 6 to confirm the December 5's calibration result. No issues were identified. Two hours of downtime were recorded due to the additional quality check. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
THC/CH4/NMHC Thermo 55i #1501663728 H2 Generator HG300 #190567058	 A successful monthly calibration was performed on December 5. Multiple flame out events began after the December 5's calibration due to a problem with the H2 generator. A successful additional zero-span check was completed On December 6. The issue improved after the zero-span check. The H2 desiccant was changed following by a successful post-repair calibration on December 6. Data were invalidated back to the time the additional zero-span check was completed. Twenty-two hours of downtime were recorded due to this event. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
RH Rotronic HC2-S3 #20370767	 The RH probe was checked on December 5. The probe passed the check requirements. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.

Parameter	Equipment Operational Summary
AT Rotronic HC2-S3 #20370767	 The AT probe was checked on December 5. The probe passed the check requirements. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
BP MetOne 092 #Y23362	 The BP sensor was checked on December 5. The sensor passed the check requirements. One hour of downtime was recorded on December 17 due to Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
ST COMET #20790297	 Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
Precipitation RM Young 52202 #TB 15878	 The precipitation gauge was checked on December 5. The sensor passed the check requirements. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.
WS/ WD RM Young 05305AQ #174802	 Wind direction data contained in this report represents where the wind is coming from. The annual wind system calibration was completed on August 3, 2023. The anemometer sensors were check on December 5. Both the wind speed sensor and wind direction sensor passed the check requirements. Data collected between December 19 hour 13 and December 20 hour 5 were lost due to a power failure. Seventeen hours of downtime were recorded due to this event.

Monitored Data Summary

Reno-B Station

Equipment Operation Summary

Parameter	Equipment Operational Summary
SO2 Thermo 43iQTL #12101910505	 A successful monthly calibration was performed on December 1. No operational issues were identified this month.
TRS Thermo 43iQTL #12101910504	 A successful monthly calibration was performed on December 1. No operational issues were identified this month.
CD Nova CDN-101 #590	
THC/CH4/NMHC Thermo 55i #12101910497 H2 Generator HG300 #210467069	 A successful monthly calibration was performed on December 1. No operational issues were identified this month.
RH Rotronic HC2-S3 #20467597	 The RH probe was checked on December 1. The probe passed the check requirements. Due to datalogger polling errors, one hour of downtime was recorded as the hourly data completeness requirement did not meet.
BP MetOne 092 #A17940	 The BP sensor was checked on December 1. The sensor passed the check requirements. Due to datalogger polling errors, one hour of downtime was recorded as the hourly data completeness requirement did not meet.

Parameter	Equipment Operational Summary
AT Rotronic HC2-S3 #20467597	 The AT probe was checked on December 1. The probe passed the check requirements. Due to datalogger polling errors, one hour of downtime was recorded as the hourly data completeness requirement did not meet.
ST COMET #NA	 No operational issues were identified this month.
Precipitation RM Young 52202 #TB 15877	 The precipitation gauge was checked and tested on December 1. The unit passed the check requirements. Due to datalogger polling errors, one hour of downtime was recorded as the hourly data completeness requirement did not meet.
WS/ WD RM Young 05305AQ #174795	 Wind direction data contained in this report represents where the wind is coming from. The annual wind system calibration was completed on August 1, 2023. The anemometer sensors were check on December 1. The wind sensors passed the check requirements. Due to datalogger polling errors, one hour of downtime was recorded as the hourly data completeness requirement did not meet.

Monitored Data Summary

PRC Station

Equipment Operation Summary

Parameter	Equipment Operational Summary
SO2 Thermo 43i #1034746225	 A successful monthly calibration was performed on December 6. The scheduled zero-span check was interrupted by Windows update on December 18. A repeat zero-span check was completed later the day to confirm the analyzer's functionality. The check results met the calibration check requirements. One hour of downtime was recorded as a result.
H2S Thermo 450i #1308857354	 A successful monthly calibration was performed on December 6. The scheduled zero-span check was interrupted by Windows update on December 18. A repeat zero-span check was completed later the day to confirm the analyzer's functionality. The check results met the calibration check requirements. One hour of downtime was recorded as a result.
TRS Thermo 450i #1034746224 TRS Convertor CD Nova CDN-101 #516	 A successful monthly calibration was performed on December 6. The scheduled zero-span check was interrupted by Windows update on December 18. A repeat zero-span check was completed later the day to confirm the analyzer's functionality. The check results met the calibration check requirements. One hour of downtime was recorded as a result.
THC/CH4/NMHC Thermo 55i #1034745845 H2 Generator HG300 #211067076	 The H2 desiccant was changed after the successful as-found points check on December 6. A successful monthly calibration was completed afterwards. The span gas cylinder was installed on December 6. The scheduled zero-span check was interrupted by Windows update on December 18. A repeat zero-span check was completed later the day to confirm the analyzer's functionality. The check results met the calibration check requirements. One hour of downtime was recorded as a result.
RH Rotronic HC2-S3 #20558318	 The RH sensor was checked on December 6. The sensor passed the check requirements. No operational issues were identified.
BP MetOne 092 #B19577	 The BP sensor was checked on December 6. The sensor passed the check requirements. No operational issues were identified.

Parameter	Equipment Operational Summary	
AT	 The AT sensor was checked on December 6. The sensor passed the check requirements. 	
Rotronic HC2-S3 #20558318	No operational issues were identified.	
ST	 No operational issues were identified. 	
Canadian Natural #NA		
WS/ WD	• Wind direction data contained in this report represents where the wind is coming from.	
RM Young 05305VK #129612	 The annual wind system calibration was completed on August 3, 2023. The anemometer sensors were checked on December 6. The sensors passed the check requirements. No operational issues were identified. 	

Monitored Data Summary

AQHI – Grimshaw Station

Equipme	ent Ope	ration	Summa	rv

Parameter	Equipment Operational Summary
SO2 Teledyne T100 #722	 A successful monthly calibration was performed on December 12. Due to datalogger polling errors, three hours of downtime were recorded as the hourly data completeness requirement did not meet.
TRS Teledyne T100U #132 TRS Convertor CD Nova CDN-101 #576	 A successful monthly calibration was performed on December 12. Due to datalogger polling errors, three hours of downtime were recorded as the hourly data completeness requirement did not meet.
NOx/NO/NO2 API 200E #594 Teledyne T200 #837	 A successful monthly calibration was performed on December 12. Due to datalogger polling errors, five hours of downtime were recorded as the hourly data completeness requirement did not meet.
O3 Teledyne T400 #824	 A successful monthly calibration was performed on December 12. Due to datalogger polling errors, five hours of downtime were recorded as the hourly data completeness requirement did not meet.
THC/CH4/NMHC Thermo 55i #1191032505 H2 Generator AMA HG300 #190567059	 A successful monthly calibration was performed on December 12. Due to datalogger polling errors, five hours of downtime were recorded as the hourly data completeness requirement did not meet.
PM2.5 Teledyne T640 #318	 A successful monthly audit was performed on December 12. A firmware update and an alignment factor activation were completed on the T640 PM analyzer on December 20 hour 13. One hour of downtime was recorded as a result. Due to datalogger polling errors, five hours of downtime were recorded as the hourly data completeness requirement did not meet.

Parameter	Equipment Operational Summary
RH Vaisala HMP155 #N2910506	 The RH probe was checked on December 12. The Probe passed the check requirements. Due to datalogger polling errors, seven hours of downtime were recorded as the hourly data completeness requirement did not meet.
BP MetOne 092 #A2397	 The BP sensor was checked on December 12. The sensor passed the check requirements. Due to datalogger polling errors, seven hours of downtime were recorded as the hourly data completeness requirement did not meet.
AT Vaisala HMP155 #N2910506	 The AT prober was checked on December 12. The probe passed the check requirements. Due to datalogger polling errors, seven hours of downtime were recorded as the hourly data completeness requirement did not meet.
ST COMET #NA	 Due to datalogger polling errors, three hours of downtime were recorded as the hourly data completeness requirement did not meet.
WS/ WD RM Young 05305AQ #174801	 Wind direction data contained in this report represents where the wind is coming from. The last annual wind system calibration was completed on August 2, 2023. The anemometer sensors were check on December 12. Both the wind speed sensor and wind direction sensor passed the check requirements. Due to datalogger polling errors, seven hours of downtime were recorded as the hourly data completeness requirement did not meet.

Monitored Data Summary

TABLES, CHARTS AND WIND ROSES

986-C STATION

842-B STATION

RENO - B STATION

PRC STATION

AQHI GRIMSHAW STATION

END OF REPORT

This page, 146 of 146, ends the December 2023 Monthly Ambient Air Quality Monitoring Report.



Peace River Area Monitoring Program

DECEMBER 2023

Ambient Air Monitoring Calibration Report

- 842-B STATION-

CAL-PRAMP-202312-01561

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Bureau Veritas Canada

January 6, 2024

CAL-PRAMP-202312-01561 Page 1 of 21

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS










MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



	DATE:	05-De	c-2023	PREVIOUS CAL	BRATION DATE:	08-No	v-2023		
	PARAMETER:	S	02	PREVIOUS CORF	RECTION FACTOR:	1.(002		
	CLIENT:	PRA	AMP	TEMPE	RATURE (°C):	22	2.6		
	LOCATION:	84	l2b	BAROM	ETRIC (mBar):	9	27		
	PURPOSE	Rou	ıtine	START	TIME (MST):	09	:16		
PEF	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	14	:09		
ANALYZER:									
Ν	AKE/MODEL	Thermo	o 43iQTL		RANGE	500	daa		
	SERIAL #	12007	736629	FL	OW (mL/min)	4	21		
	INIT	IAL			FIN	IAL			
	BKG/OFFSET	8	.6	BKG/OFFSET 9.1					
	COEF/SLOPE	1.1	126		1.1	L45			
Expected (ref	, erence) Value	24	1.8	Expected (ref	erence) Value	25	1.9		
CALIBRATIO	N SYSTEM:			p					
	:			ZERO AIR:					
	MAKF	<u>د</u> ک	hio		MAKE	مام۲	dvne		
	MODEL:	20	10		MODFL:	T7	/01		
		7540)1122		ID:	45	68		
MFC CALIBR	ATION DATE:	08-Sei	p-2023		OXIDIZER ID:	n	/a		
CALIBRATION	GAS:			FLOWMETER	S (if applicable	e):			
	CYLINDER ID:	LL10	9693	_	HIGH ID	n n	/a		
	CONC (ppm):	25	.00	EXPIRY DATE n/a					
СҮ	LINDER (psi):	15	500		LOW ID	n/a			
	EXPIRY DATE	02-No	v-2025		EXPIRY DATE	n/a			
CALIBRATION		S:		•					
	POINT	HI	GH	N	IID	LC	W		
	TARGET	3	90	1	90	9	95		
	RANGE	300	- 400	150	- 200	50 - 100			
SCRUBBER C	HECK (15 MIN	S; TRS/H2S C	ONLY):						
	START TIME:	n	/a	SC	02 Conc (ppb)	n	/a		
	END TIME:	n	/a	Analyzer Re	sponse (ppb)	n	/a		
CALIBRATION	N:								
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR		
	(mL/min)		Αςτιμαι	INDIC	CATED	Initial	Final		
DILUENT	GAS	TOTAL	ACTUAL	Initial	Final	iiiitiai	Tillai		
3999	\geq	3999	0.00	0.16	0	\times	\geq		
3938	60.80	3999	380.10	371.7	380.7	1.023	0.998		
3971	28.80	4000	180.00	n/a	181.8	n/a	0.990		
3986	14.40	4000	90.00	n/a	90.8	n/a	0.991		
LINEAR REGR	RESSION ANAL	YSIS:		1	-				
		CORRE	LATION	SLO	OPE	INTE	RCEPT		
	VALUE	1.0	000	1.0	001	0.	1%		
COMMENTS:	·								
Sample filter	changed.								

SO2[ppb] Station: PRAMP 842-B Daily: 05-12-2023 Type: AVG 1 Min. [1 Min.]



Page 900 (Ppb)

TRS Analyzer Calibration by Dilution



	DATE	05-De	c-2023	PREVIOUS CALL	BRATION DATE:	ATE: 09-Nov-2023										
	PARAMETER:	03 DC	RS	PREVIOUS CORR	ECTION FACTOR:	00 100	99									
	CLIENT:	PR/		TEMPE	RATURE (°C):	27	,55 7 6									
		84	.2h	BAROME	TRIC (mBar):	92										
	PLIRPOSE	Install/Pc	st-Renair	START	TIME (MST):	09	-,									
DEF		Kovin Se	ahastian		TIME (MST):	16	:00									
ΔΝΔΙ ΥΖΕΡ		Kevin Se	ebastian	LIND		10	.00									
	AKE/MODEL	Thermo			RANGE	100	nnh									
	SFRIAL #	12007	26630	FL	OW (mL/min)	3	73									
		-12007 ΠΔΙ	30030	12	FIN	ι <u>Δ</u> Ι	5									
	BKG/OFFSET	17 (2	1		15	: ว										
		1	202													
Expected (ref	erence) Value	50	16	Expected (ref	coll/3LOFL	51	940 97									
		50	.40	Expected (rein	erence) value	51	.07									
CALIBRATOR	:			ZERO AIR:												
0.12.0101.011	MAKE:	Sa	bio		MAKE:	Tele	dvne									
	MODEL:	20)10		MODEL:	T7	01									
	ID:	7540	1122		ID:	4568										
MFC CALIBR	ATION DATE:	08-Sep	o-2023		OXIDIZER ID:	n/a										
CALIBRATION	N GAS:	·		FLOWMETER	S (if applicabl	e):										
	CYLINDER ID:	LL13	1374		HIGH ID	n,	/a									
	CONC (ppm):	10	.09		EXPIRY DATE	n,	/a									
C١	LINDER (psi):	18	00		LOW ID	n,	/a									
	EXPIRY DATE	03-Jar	า-2026		EXPIRY DATE	n,	/a									
CALIBRATIO	N PARAMETER	RS:														
	POINT	HI	GH	MID			W									
	TARGET	7	'8	3	8	1	9									
	RANGE	60	- 80	30	- 40	10 -	- 20									
SCRUBBER C	HECK (15 MIN	S; TRS/H2S O	NLY):													
	START TIME:	n,	/a	SC	02 Conc (ppb)	n,	/a									
	END TIME:	n,	/a	Analyzer Re	sponse (ppb)	n,	/a									
CALIBRATIO	N:															
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR									
	(mL/min)		ΑCTUAI	INDIC	ATED	Initial	Final									
DILUENT	GAS	TOTAL	, let on L	Initial	Final		- mai									
3999	$>\!\!<$	3999	0.00	0.2	0	\geq	$>\!$									
3968	30.90	3999	77.96	73.65	78.7	1.061	0.991									
3984	15.10	3999	38.10	n/a	38.63	n/a	0.986									
3993	/.50	4000	18.92	n/a	19.31	n/a	0.980									
LINEAR REG		YSIS:					CEDT									
	· · · · · · -	CORRE		SLO	JPE	INTER										
	VALUE	1.0	000	1.0	109	0.1	1%									
COMMENTS							DMMENTS:									

TRS Converter CDNOVA CDN #583. Sample filter changed.

Initial calibration failed at low point. Repeated from adjusted high.

14:00 = Daily ZS, adjusted high restarted

TRS[ppb] Station: PRAMP 842-B Daily: 05-12-2023 Type: AVG 1 Min. [1 Min.]



Page 129 [ppb]

TRS Analyzer Calibration by Dilution



	DATE:	06-De	c-2023	PREVIOUS CAL	BRATION DATE:	05-De	c-2023	
	PARAMETER:	TI	RS	PREVIOUS CORF	RECTION FACTOR:	0.9	991	
	CLIENT:	PRA	MP	TEMPE	RATURE (°C):	23	3.7	
	LOCATION:	84	2b	BAROM	ETRIC (mBar):	9	28	
	PURPOSE	As-Fe	ound	START	TIME (MST):	17	:01	
PEF	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	18	:55	
ANALYZER:								
Ν	/AKE/MODEL	Thermo	43iQTL		RANGE	100	ppb	
	SERIAL #	12007	36630	FL	OW (mL/min)	3	74	
	INIT	TIAL			FIN	IAL		
	BKG/OFFSET	15	5.2		BKG/OFFSET	n	/a	
	COEF/SLOPE	0.9	946		COEF/SLOPE	n	/a	
Expected (ref	erence) Value	51	.87	Expected (ref	erence) Value	n	/a	
CALIBRATIO	N SYSTEM:						, 	
CALIBRATOR	:			ZERO AIR:				
	MAKE:	Sa	bio		MAKE:	Tele	dvne	
	MODEL:	20	10		MODEL:	T7	/01	
	ID:	7540	1122		ID:	45	68	
MFC CALIBR	ATION DATE:	08-Sep	o-2023		n/a			
CALIBRATION	N GAS:			FLOWMETER	S (if applicable	e):		
	CYLINDER ID:	LL13	1374		HIGH ID	n	/a	
	CONC (ppm):	10	.09		EXPIRY DATE	n	/a	
C	LINDER (psi):	18	00		LOW ID	n	/a	
	EXPIRY DATE	03-Jar	n-2026		EXPIRY DATE	n	/a	
CALIBRATIO	N PARAMETER	≀S:						
	POINT	HI	GH	N	lID	LC	W	
	TARGET	7	8	3	8	19		
	RANGE	60 -	- 80	30	- 40	10	- 20	
SCRUBBER C	HECK (15 MIN	S; TRS/H2S O	NLY):					
	START TIME:	n,	/a	SC	02 Conc (ppb)	n	/a	
	END TIME:	n,	/a	Analyzer Re	sponse (ppb)	n	/a	
CALIBRATIO	N:							
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR	
	(mL/min)		ACTUAL	INDIC	CATED	Initial	Final	
DILUENT	GAS	TOTAL		Initial	Final			
3999		3999	0.00	-0.35	n/a		\geq	
3968	30.90	3999	//.96	/8.51	n/a	0.989	n/a	
3984	15.10	3999	38.10	37.42 10 F	n/a	1.009	n/a	
		4000 VCIC:	10.92	10.5	n/a	1.004	II/d	
		.1313:		CL /	ספ			
	\//\ E	CURRE		SLU	/2	INTE	10	
COMMENITE	VALUE	П,	a	<u> </u> n	/ α	n	/ α	
		NI #E00						
I KS CONVERTE		/IN #JOJ.						

As-found to confirm marked change at monthly calibration

TRS[ppb] Station: PRAMP 842-B Daily: 06-12-2023 Type: AVG 1 Min. [1 Min.]



Page 149 (Appb)

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBR	ATION:									ANALY	ZER:						
		DATE:	05-De	c-2023	PREVIOUS	CALIBRAT	ION DATE:	09-No	v-2023	1		MAKE/	MODEL	SER	RIAL	FLOW (mL/min)
	(CLIENT:	PRA	AMP	TEMF	PERATU	RE (°C):	22	2.6	1	VALUE	Therr	no 55i	15016	63728	10	94
	LOC	CATION:	84	2b	BARO	METRIC	(mBar):	92	27	PARA	METER:	C	-14	NM	IHC	T⊦	IC
	PU	RPOSE	Rou	ıtine	STA	RT TIME	E (MST):	09	:16	RANG	E (ppm):	2	0	2	0	4	0
PI	ERFORM	IED BY:	Kevin S	ebastian	E	ND TIME	E (MST):	13	:43	PREVI	OUS CF:	1.0	000	1.0	001	1.0	000
CALIBR		SYSTEM								-				-			
	CA	LIBRATO	DR:			Z	ERO AIF	र:		C	ALIBRAT	TION GA	S:	FLOWM	IETERS	(if applica	able):
		MAKE:	SA	BIO			MAKE:	А	PI	CYLIN	DER ID:	LL6	3768	F	IGH ID:	n/	/a
		MODEL:	20	10			MODEL:	T7	01	CH ₄ /C ₃ H	l ₈ (ppm):	897.0	301.0	HIGH E	EXPIRY:	n/	/a
		ID:	2680	1218			ID:	45	68	CYLIND	ER (psi):	16	00	L	_OW ID:	n/	/a
MFC CA	LIBRATIC	N DATE:	12-Se	p-2023		OXID	ZER ID:	Inte	rnal	EXPIR	Y DATE	08-No	v-2029	LOW E	EXPIRY:	n/	/a
CALIBR		PARAME	TERS:														
POI	NT (CH4	/NMHC)	HI	GH		MID		LC	W			C	H4 EQU	IVILANC	E		
	Т	ARGET	1	4		7		3	.5	C ₃ H ₈ as CH ₄ 827.8				7.8			
		RANGE	12	- 16		6 - 8		2 ·	- 4		THC a	as CH_4		1724.8			
EXPEC	TED (RE	FERENC	E) VALU	JE:						•							
			C	H4	NM	HC	Tŀ	łC				C	-14	NM	IHC	TF	łC
	INITIAL		9.	22	10.	.67	19	.89		FINAL		9.	69	10	.87	20.	.56
CALIBR	ATION:															1	
FL	OW RA	TE			(CONCE	NTRATIC	N (PPM))				CORR	ECTION	FACTO	R (CF.)	
	(mL/min))	CA	LCULAT	ED	INITIA	AL INDIC	ATED	FINA	L INDIC	ATED		INITIAL			FINAL	
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3099	X	3099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	Х	\times	\mathbb{X}	\succ	\times
3049	50.30	3099	14.56	13.44	27.99	13.99	12.88	26.87	14.56	13.43	27.99	1.041	1.043	1.042	1.000	1.000	1.000
3075	25.20	3100	7.29	6.73	14.02	n/a	n/a	n/a	7.17	6.69	13.87	n/a	n/a	n/a	1.017	1.006	1.011
3085	12.60	3098	3.65	3.37	7.01	n/a	n/a	n/a	3.58	3.32	6.90	n/a	n/a	n/a	1.019	1.014	1.017
LINEAR	REGRE	SSION A	ANALYS	IS:				Comme	nts:								
		CORRE	LATION	SLC	DPE	INTEF	RCEPT	H2 = AN	IA HG30	0 #1905	67058						
	CH4	1.0	000	1.0	001	-0.	3%	Sample	filter ch	anged.							
	NMHC	1.0	000	1.0	000	-0.	1%										
	THC	1.0	000	1.0	001	-0.	2%	Use Zero Chrom? No									

Station: PRAMP 842-B Daily: 05-12-2023 Type: AVG 1 Min. [1 Min.]



- CH4 [pp時時 16_of 21_ NMHC [ppm]

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBR	ATION:									ANALY	ZER:						
		DATE:	06-De	c-2023	PREVIOUS	CALIBRA1	FION DATE:	n	/a			MAKE/	MODEL	SER	RIAL	FLOW (mL/min)
		CLIENT:	PR/	AMP	TEMF	PERATU	RE (°C):	23	3.7		VALUE	Thern	no 55i	15016	63728	11	16
	LOC	CATION:	84	2b	BARO	METRIC	(mBar):	92	29	PARA	METER:	Cl	-14	NM	IHC	TH	HC
	PL	IRPOSE	Install/Pc	st-Repair	STA	RT TIME	E (MST):	17	:01	RANG	E (ppm):	2	0	2	20	4	0
Р	ERFORM	IED BY:	Kevin S	ebastian	E	ND TIME	E (MST):	19	:53	PREVI	OUS CF:	n	/a	n	/a	n,	/a
CALIBR	ATION S	SYSTEM															
	CA	LIBRAT	DR:			Z	ZERO All	र:		C	ALIBRAT	TON GA	S:	FLOWN	IETERS	(if applica	able):
		MAKE:	KE: SABIO MAKE:					A	PI	CYLIN	DER ID:	LL68	3768	F	HGH ID:	n,	/a
		MODEL:	20	010			MODEL:	T7	'01	CH ₄ /C ₃ H	l ₈ (ppm):	897.0	301.0	HIGH E	EXPIRY:	n,	/a
		ID:	2680	1218			ID:	45	68	CYLIND	ER (psi):	16	00	l	_OW ID:	n,	/a
MFC CA	LIBRATIC	N DATE:	12-Se	p-2023		OXID	IZER ID:	Inte	rnal	al EXPIRY DATE 08-Nov-2029 LOW EX				EXPIRY:	n,	/a	
CALIBR	RATION I	PARAME	TERS:														
POI	NT (CH4	/NMHC)	HI	GH		MID		LC	W			С	H4 EQU	IVILANC	E		
	ſ	ARGET	1	4		7		3	.5	$C_{3}H_{8}$ as CH_{4} 827.8				7.8			
		RANGE	12	- 16		6 - 8		2	- 4		THC a	s CH ₄		1724.8			
EXPEC	TED (RE	FERENC	E) VALU	JE:										•			
			CI	H4	NM	HC	Tł	HC				Cl	-14	NM	IHC	TH	HC
	INTTAL		n	/a	n,	/a	n	/a		FINAL		9.	66	10	.85	20	.51
CALIBR	ATION:													•			
FL	OW RA	ΤE			(CONCE	NTRATIC	DN (PPM)				CORR	ECTION	FACTO	R (CF.)	
	(mL/min))	CA	LCULAT	ED	INITI	AL INDIC	ATED	FINA	L INDIC	ATED		INITIAL			FINAL	
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3099	\times	3099	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	\times	Х	\times	Х	imes	\times
3049	50.30	3099	14.56	13.44	27.99	n/a	n/a	n/a	14.52	13.40	27.92	n/a	n/a	n/a	1.003	1.003	1.003
3075	25.20	3100	7.29	6.73	14.02	n/a	n/a	n/a	7.18	6.68	13.86	n/a	n/a	n/a	1.016	1.007	1.012
3085	12.60	3098	3.65	3.37	7.01	n/a	n/a	n/a	3.57	3.34	6.91	n/a	n/a	n/a	1.022	1.008	1.015
LINEAR	REGRE	SSION A	ANALYS	IS:				Comme	ents:								
		CORRE	LATION	SLC	DPE	INTEF	RCEPT	H2 = AN	IA HG30	00 #1905	67058						
	CH4	1.0	000	0.9	998	-0.	2%	H2 Des	sicant cl	hanged p	prior to t	hos pos	t-repair				
	NMHC	1.0	000	0.9	998	-0.	1%										
	THC	1.0	000	0.9	998	-0.	1%		U	Use Zero Chrom? No							

Station: PRAMP 842-B Daily: 06-12-2023 Type: AVG 1 Min. [1 Min.]



- CH4 [pp時時 18 of 21 NMHC [ppm]

Meteorological System Checklist

			<u>BUREAU</u> VERITAS
Date:		December 5, 2023	
Technician:		Kevin Sebastian	
Station:		PRAMP 842b	
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	RM Young	52202	TB 15878
Temperature Sensor:	Rotronic	HC2A-S3	20370767
Barometric Pressure Sensor:	MetOne	92	Y23362
Relative Humidity Sensor:	Rotronic	HC2A-S3	20370767
Anemometer:	RM Young	05305AQ	174802
	PRECIPITATION SE	ENSOR CHECK	
Checklist:	Reply:	Comn	nents:
Previous check date:	November 9, 2023		
Is the sensor Level?	yes		
Is the heater operating properly?	yes		
Are the bucket drain holes clean?	yes	test time: 10:24-10:31	
Is the screen on the housing? (screen should be on between July and September	yes		
Is the housing clean?	yes		
Is the area around the housing clean and free from obstacles?	yes		
	TIP TEST - Slowly pour water until 10) tips are heard. (10 tips = 1 mm)	
# of Tips	Data Logger Response (mm):	Manual Specifica	tion = +/- 0.1 mm
10	1.0	0.	00
	AMBIENT TEMPERATU	RE SENSOR CHECK	
Previous check date:		November 9, 2023	
Parameter:		Temperature @ 2 metres	
Reference Thermometer ID:		F.S. 181341226 expires July 17, 2024	
Reference Temperature (°C):		5.5	
Station - Ambient Temperature (°C):		5.8	
Temperature Difference (°C):		0.3	
· · · · · · · · · · · · · · · · · · ·	BAROMETRIC PRESSU	RE SENSOR CHECK	
Previous check date:		November 9, 2023	
Reference Barometer ID:		Brunton 05535 Expires July 17, 2024	
Reference Pressure - Units/Reading:	millibar	92	27
Station Pressure - Units/Reading:	millibar	92	7.2
Pressure Tolerance +/- 15% of error:	788 - 1066	-0.0	02%
	RELATIVE HUMIDITY (HYGRO	DMETER) SENSOR CHECK	
Previous check date:		November 9, 2023	
Reference Hygrometer ID:		F.S. 181341226 expires July 17, 2024	
Reference Hygrometer % RH- Reading:		76.50	
Station Hygrometer % RH- Reading:		80.70	
RH Tolerance +/- 15% of difference:	65.03 - 87.98	-5.	5%
	ANEMOMETER - WIND SPEED & WI	IND DIRECTION SENSOR CHECK	
WIND SPEI	ED	WIND DI	RECTION
Previous check date:	November 9. 2023	Previous check date:	November 9. 2023
Wind Speed Observed (kph):	10~20	Wind Direction Observed:	SW
Wind speed on Data Logger (kph):	19	Wind Direction on Data Logger:	SW
,		Wind Direction Pass/Fail?:	Pass
Comments			

	Mete	eorological S	ensor Auc	lit/Calibrat	ion		
		Loca	ation Information				
Company:	F	PRAMP		Performed By:		Chris Wesson	
Audit Location:		842b	•	Reviewed By:		Limin Li	
Audit Date:	Augu	ıst 3, 2023		Start/End Time (mst):		15:57 / 17:00	
Calibration Purpose:	rout	ine annual	-	Weather Conditions:	Mix of sun an	nd clouds with ra	ain showers
		Wind	Sensor Information				
	Sensor ID	Data:			Sensor Outp	outs:	
Sensor Make:		RM Young		Velocity Voltage	Output Range:	n/a	a
Sensor Model:		05305AQ		Velocity Unit	Output Range:	0-20	00
Serial #:		174802		Direction Voltage	Output Range:	n/a	a
Previous Cal/Audit Date:		August 3, 2022		Direction Unit	Output Range:	0-36	50
		Wind C	alibrator Informatio	on			
Calibrator I.I	D. and Expiry Date: Wind Speed	RM You Audit Data **+/- 2%	of the <u>average co</u>	expires Oct 18, 2024	he limit**	-	
RPM	Wind Spee	d Generated kph	Clockwise W	/ind Speed kph	Counter Clo	ckwise Wind	Correction
					Spee	d kph	Factor
0		0		0.0	0	0.0	-
1000		18.4		18.3	10	8.3	1.007
2000		36.9	3	36.7	31	b./	1.004
3000		55.3		5.1 72.6	5:	5.1	1.003
4000		/3./	, ,	/3.0 0 0	/. 0 [^]	3.0	1.002
5000		92.2 110.6		10 5	11	0.5	1.002
7000		129.0	1	28.9	11	8.9	1.001
7000		125.0 147.4	1	28.5 47 3	12	73	1.001
9000		165.9	1	65.8	16	5.8	1.001
10000		184.3	1	84.2	18	4.2	1.001
10000			The audit meets	AMD requirements.	Average Corr	1.001	
Wind Dire	oction Audit Data	$**+/_{-}3^{\circ}$ of the abso	lute average deg	rees difference for	all noints is t	he 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 Absol Differe	ute Degrees ence
0	355	2	354	2.0	1.0	1.5	5
30	330	23	332	7.0	-2.0	4.5	<u> </u>
60	300	59	303	1.0	-3.0	2.0)
90	270	88	274	2.0	-4.0	3.0)
120	240	110	242	2.0	-2.0	2.0	י ר
130	180	179	178	1.0	2.0	1.0	5
210	150	210	146	0.0	4.0	2.0)
240	120	243	117	-3.0	3.0	3.0)
270	90	274	89	-4.0	1.0	2.5	5
300	60	304	57	-4.0	3.0	3.5	5
330	30	334	29	-4.0	1.0	2.5	5
355	0	354	2	1.0	2.0	1.5	5
The audit r	neets AMD require	ments.	A	verage Absolute Degr	ees Difference=	2.3	3
			Comments:				
		Declir Physical inspe Potentiometer	nation = 15 deg East ection completed, no noisy. Replacement	o issues required.			

END OF REPORT

CAL-PRAMP-202312-01561 Page 21 of 21



Peace River Area Monitoring Program

DECEMBER 2023

Ambient Air Monitoring Calibration Report

- 986-C STATION-

CAL-PRAMP-202312-01562

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Bureau Veritas Canada

January 6, 2024

CAL-PRAMP-202312-01562 Page 1 of 17

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS











MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



	DATE:	IBRATION DATE:	08-No	v-2023					
	PARAMETER:	S	02	PREVIOUS CORF	RECTION FACTOR:	1.0)04		
	CLIENT:	PR/	AMP	TEMPE	RATURE (°C):	21	.8		
	LOCATION:	36	36c	BAROM	ETRIC (mBar):	93	32		
	PURPOSE	Rou	ıtine	START	TIME (MST):	10	:10		
PEF	RFORMED BY:	Kevin S [,]	ebastian	END	TIME (MST):	15	:32		
ANALYZER:	<u>.</u>								
Ν	/AKE/MODEL	Thermo	o 43iQTL		RANGE	500	daa		
	SERIAL #	11935	585646	FL	OW (mL/min)	42	24		
	INIT	IAL			AL				
	BKG/OFFSET	1.	7.9		BKG/OFFSET	18	3.1		
	COEF/SLOPE	1.(037		1.0)52			
Expected (ref	, erence) Value	25	1.1	Expected (ref	, erence) Value	25	0.7		
	N SYSTEM:				,	-	-		
CALIBRATOR	:			ZERO AIR:					
	MAKE:	Sa	bio		MAKE:	Tele	dvne		
	MODEL:	20)10		MODEL:	M	701		
	ID:	7540)1122		ID:	45	68		
MFC CALIBR	ATION DATE:	08-Se	p-2023		OXIDIZER ID:	n	/a		
CALIBRATION	N GAS:			FLOWMETER	e):				
	CYLINDER ID:	LL10	9693		HIGH ID	n,	/a		
	CONC (ppm):	DNC (ppm): 25.00 EXPIRY DATE					n/a		
C١	LINDER (psi):	16	500		LOW ID	n/a			
	EXPIRY DATE	02-No	v-2025		EXPIRY DATE	XPIRY DATE n/a			
CALIBRATIO	N PARAMETER	S:							
	POINT	HI	GH	N	lID	LC	W		
	TARGET	3	90	1	90	95			
	RANGE	300	- 400	150	- 200	50 -	100		
SCRUBBER C	HECK (15 MIN	S; TRS/H2S C	DNLY):						
	START TIME:	n	/a	SC	02 Conc (ppb)	n,	/a		
	END TIME:	n	/a	Analyzer Re	esponse (ppb)	n,	/a		
CALIBRATIO	N:								
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR		
	(mL/min)		ACTUAL	INDIC		Initial	Final		
DILUENT	GAS	IUTAL		Initial	Final	< ->			
3999		3999	0.00	0.2	0	\sim	\searrow		
3939	60.80	4000	380.00	3/4./	380.7	1.015	0.998		
39/1	28.80	4000	180.00	n/a	181.8	n/a	0.990		
370/			03.30	n/a	90.4	n/a	0.995		
LINEAR REGI	RESSION ANAL								
	\/\ \E			3L0			10/		
CONANAENITO	VALUE		000	1.0	JUZ	0	L/0		
sample filter	changed.								

SO2[ppb] Station: PRAMP 986-C. Daily: 07-12-2023 Type: AVG 1 Min. [1 Min.]



Page \$000 [+76b]

TRS Analyzer Calibration by Dilution



	- · 1								
	DATE:	07-De	c-2023	PREVIOUS CAL	BRATION DATE:	08-No	v-2023		
	PARAMETER:	T	RS	PREVIOUS CORF	RECTION FACTOR:	0.9	997		
	CLIENT:	PRA	AMP	TEMPE	RATURE (°C):	2:	1.8		
	LOCATION:	98	86C	BAROM	ETRIC (mBar):	9	32		
	PURPOSE	Rou	ıtine	START	TIME (MST):	10	:10		
PEF	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	15	:33		
ANALYZER:									
N	AKE/MODEL	Thermo	o 43iQTL		RANGE	100	ppb		
	SERIAL #	11918	33341	FL	OW (mL/min)	4	19		
	INIT	IAL			FIN	IAL			
	BKG/OFFSET	15	5.9		BKG/OFFSET	15	5.8		
	COEF/SLOPE	0.9	948		COEF/SLOPE	0.9	963		
Expected (ref	erence) Value	57	.72	Expected (ref	erence) Value	55	.52		
	N SYSTEM:			, ,	,		-		
CALIBRATOR	:			ZERO AIR:					
0, 12, 2, 0, 1, 0, 1	MAKE	Sa	hio		MAKE	Tele	dyne		
	MODEL:	20	10		MODEL:	M	701		
	ID:	7540	1122		ID:	45	568		
MFC CALIBR	ATION DATE:	08-Sei	n-2023		OXIDIZER ID:	n	/a		
CALIBRATION	GAS:	00 00	0 2020	FLOWMETER	S (if applicable	e):	/ 4		
o, 12121 0, 11101	CYLINDER ID:	13	1374		HIGH ID	n n	/a		
	CONC (ppm):	10	.09		EXPIRY DATE	n/a			
CY	LINDER (psi):	18	800	1	LOW ID	n	/a		
	EXPIRY DATE	03-Jar	n-2026		EXPIRY DATE	n	/a /a		
CALIBRATIO		S:					,		
	POINT	HI	GH	N	IID	LC	W		
	TARGET	7	/8	3	8	1	9		
	RANGE	60	- 80	30	- 40	10	- 20		
SCRUBBER C	HECK (15 MIN	S: TRS/H2S C	ONLY):						
	START TIME:	n n	/a	SC	2 Conc (ppb)	n	/a		
	END TIME:	n	/a	Analyzer Re	sponse (ppb)	n	/a		
CALIBRATIO	N:		/ -				/ -		
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR		
	(mL/min)			INDIC	CATED				
DILUENT	GAS	TOTAL	ACTUAL	Initial	Final	Initial	Final		
3999	\sim	3999	0.00	0.14	0	\searrow	$\overline{}$		
3970	30.90	4001	77.93	77.67	78.93	1.005	0.987		
3987	15.10	4002	38.07	n/a	39.36	n/a	0.967		
3992	7.50	3999	18.92	n/a	19.62	n/a	0.964		
LINEAR REGE	RESSION ANAL	YSIS:			1				
		CORRE	LATION	SLO	OPE	INTEI	RCEPT		
	VALUE	1.(000	1.0)12	0.	3%		
COMMENTS				•					
TRS Converte	er CDNOVA CD	N101 #530							

TRS[ppb] Station: PRAMP 986-C. Daily: 07-12-2023. Type: AVG 1 Min. [1 Min.]



Page 129 [ppb]

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBR	ATION:									ANALYZ	ZER:						
		DATE:	07-De	c-2023	PREVIOUS	6 CALIBRAT	ION DATE:	08-No	v-2023			MAKE/	MODEL	SER	RIAL	FLOW (mL/min)
		CLIENT:	PR/	AMP	TEMF	PERATU	RE (°C):	21	8		VALUE	Therr	no 55i	122083	316589	11	23
	LOC	CATION:	98	6C	BARO	METRIC	(mBar):	93	32	PARA	METER:	C	H4	NM	IHC	TF	łC
	PL	IRPOSE	Rou	utine	STA	RT TIME	E (MST):	10	:10	RANG	E (ppm):	2	20	2	0	4	0
Р	ERFORM	/IED BY:	Kevin S	ebastian	E	ND TIME	E (MST):	14	:50	PREVI	OUS CF:	1.0	002	0.995		0.9	999
CALIBR	RATION S	SYSTEM	:														
	CA	LIBRATO	DR:			Z	ERO AIF	२:		C	ALIBRAT	FION GAS: FLOWMETERS			(if applica	able):	
		MAKE:	Sa	ıbio			MAKE:	Tele	dyne	CYLIN	DER ID:	LL6	8768	F	HGH ID:	n	/a
		MODEL:	20)10			MODEL:	M7	'01	CH₄/C ₃ ⊢	l ₈ (ppm):	897.0	301.0	HIGH E	EXPIRY:	n,	/a
		ID:	2680)1218			ID:	45	68	CYLIND	ER (psi):	16	600	L	_OW ID:	n,	/a
MFC CA	LIBRATIC	ON DATE:	12-Se	p-2023		OXID	ZER ID:	Inte	rnal	EXPIR	Y DATE	08-No	v-2029	LOW E	EXPIRY:	n,	/a
CALIBR	RATION I	PARAME	TERS:														
POI	NT (CH4	/NMHC)	HI	GH		MID		LC	W			С	H4 EQU	IVILANC	E		
	٦	ARGET	1	4		7		3	.5	$C_{3}H_{8}$ as CH_{4} 827.8				7.8			
		RANGE	12	- 16		6 - 8		2 ·	- 4		THC a	as CH ₄		1724.8			
EXPEC	TED (RE	FERENC	E) VAL	JE:													
			C	H4	NM	IHC	Tł	HC				C	H4	NM	IHC	TH	łC
	INITIAL		9.	57	11.	.17	20	.74		FINAL		9.	61	11	.01	20	.62
CALIBR	ATION:				8									8			
Fl	OW RA	TE			(CONCE	NTRATIC	N (PPM))				CORR	ECTION	FACTO	R (CF.)	
	(mL/min)	CA	LCULAT	ED	INITIA	AL INDIC	ATED	FINA	L INDIC	ATED		INITIAL			FINAL	
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3099	\succ	3099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	\succ	\times	\times	\succ	\succ	\succ
3048	50.30	3098	14.56	13.44	28.00	14.72	13.33	28.04	14.56	13.32	27.89	0.989	1.008	0.999	1.000	1.009	1.004
3073	25.20	3098	7.30	6.73	14.03	n/a	n/a	n/a	7.35	6.66	14.01	n/a	n/a	n/a	0.993	1.011	1.001
3085	12.60	3098	3.65	3.37	7.01	n/a	n/a	n/a	3.66	3.32	6.98	n/a	n/a	n/a	0.997	1.014	1.005
LINEAR	REGRE	SSION A	ANALYS	IS:				Comme	nts:								
		CORRE	LATION	SLC	OPE	INTEF	RCEPT	H2 = AN	IA HG30	0 #1912	67063					Sa	mple
	CH4	1.0	000	1.0	000	0.	1%	filter ch	anged								
	NMHC	1.0	000	0.9	991	0.0	0%										
	THC	1.0	000	0.9	996	0.0	0%	Use Zero Chrom? Yes									

Station: PRAMP 986-C Daily: 07-12-2023 Type: AVG 1 Min. [1 Min.]



- CH4 [pf時e 14_of 17_ NMHC [ppm]

Meteorological System Checklist

Date:		December 7. 2023	
echnician:		Kevin Sebastian	
tation:		PRAMP 986c	
Unit:	Make:	Model:	Serial #:
recipitation Sampler:	RM Young	52202	TB 16325
emperature Sensor:	Rotronic	HC2-32	20626912
arometric Pressure Sensor:	MetOne	092	Y23358
elative Humidity Sensor:	Rotronic	HC2-S3	20626912
nemometer:	RM Young	05305AQ	180340
	PRECIPITATIO	DN SENSOR CHECK	
Checklist:	Reply:	Comr	nents:
revious check date:	November 7, 2023		
the sensor Level?	yes		
the heater operating properly?	yes		
re the bucket drain holes clean?	yes	Tested 15:28-15:35	
s the screen on the housing? (screen should e on between July and September	yes		
s the housing clean?	yes		
s the area around the housing clean and free rom obstacles?	yes		
	TIP TEST - Slowly pour water un	til 10 tips are heard. (10 tips = 1 mm)	
# of Tips	Data Logger Response (mm):	Manual Specifica	tion = +/- 0.1 mm
10	1.0	0.	.00
	AMBIENT TEMPER	ATURE SENSOR CHECK	
revious check date:		November 7, 2023	
arameter:		Temperature @ 2 metres	
eference Thermometer ID:		FS 181341226 expires July 17, 2024	
eference Temperature (°C):		-2.6	
tation - Ambient Temperature (°C):		-2.8	
emperature Difference (°C):		0.2	
	BAROMETRIC PRE	ESSURE SENSOR CHECK	
revious check date:		November 7, 2023	
eference Barometer ID:		Brunton 05535 expires July 17, 2024	
eference Pressure - Units/Reading:	millibar	9	34
tation Pressure - Units/Reading:	millibar	9	33
ressure Tolerance +/- 15% of error:	794 - 1074	0.1	11%
	RELATIVE HUMIDITY (H)	YGROMETER) SENSOR CHECK	/-
revious check date:		November 7 2023	
		FS 181341226 expires July 17 2024	
reference Hyprometer % RH- Reading		81 30	
tation Hygrometer % RH- Peading:		83.70	
PH Tolerance +/- 15% of difference:	60 11 02 50	03.70	0%
n rolerance +/- 15% of difference:			.070
	ANEINIONETER - WIND SPEED		
winD SPEEL	November 7, 2022	WIND D	November 7, 2022
revious check date:	November 7, 2023	Previous check date:	November 7, 2023
vina Speed Observed (kph):	5~10	wind Direction Observed:	E
Vind speed on Data Logger (kph):	8.8	Wind Direction on Data Logger:	E
		-	_

	Mete	eorological S	ensor Auc	lit/Calibrat	ion		
		Loc	ation Information				
Company:	P	PRAMP		Performed By:		Chris Wesson	
Audit Location:		986C	-	Reviewed By:		Limin Li	
Audit Date:	Augu	ıst 3, 2023		Start/End Time (mst):		14:01 / 15:03	
Calibration Purpose:	rout	ine annual	_	Weather Conditions:	Rain	fall heavy at tim	nes
		Wind	Sensor Information				
	Sensor ID	Data:			Sensor Outp	outs:	
Sensor Make:		RM Young		Velocity Voltage	Output Range:	n/a	9
Sensor Model:		05305AQ		Velocity Unit	Output Range:	0-20	00
Serial #:		180340		Direction Voltage	Output Range:	n/a	a 50
Previous Cal/Audit Date:		August 5, 2022		Direction onit	Output Kange.	0-50	50
		Wind C	alibrator Informatio	on			
Calibrator I.[D. and Expiry Date:	RM You	ung 18802 id# R9133	expires Oct 18, 2024	1 1	-	
	Wind Speed	Audit Data **+/- 2%	of the <u>average co</u>	orrection factor is t	ne limit**	alassia a Mila al	· · · ·
RPM	Wind Spee	d Generated kph	Clockwise W	/ind Speed kph	Counter Clo Spee	ckwise wind d kph	Correction Factor
0		0		0.0	(0.0	-
1000		18.4	1	18.3	1	8.3	1.007
2000		36.9	3	36.7	3	6./ F 1	1.004
3000		55.3		5.1 72.6	5	5.1	1.003
5000		02 2		22.0	7	2.0	1.002
6000		110.6	1	10.5	11	0.1	1.002
7000		129.0	1	28.9	12	29.3	0.999
8000		147.4	1	47.3	14	1.001	
9000		165.9	1	65.8	16	1.000	
10000		184.3	1	84.2	18	34.2	1.001
			The audit meets	AMD requirements.	Average Corr	ection Factor=	1.002
Wind Dire	ection Audit Data	$1 **+/- 3^{\circ}$ of the abso	olute <u>average deg</u>	rees difference for	all points is t	he limit**	
Generated Wind Direction	Generated Wind	Indicated Wind	Indicated Wind	Degrees Difference	Degrees	Average Abso	ute Degrees
0-360 (Up)	(Down)	Direction 0-360 (Up)	(Down)	0-360 (Up)	360-0 (Down)	Differe	ence
0	355	2	354	2.0	1 0	1.5	5
30	330	31	331	-1.0	-1.0	1.0)
60	300	60	301	0.0	-1.0	0.5	5
90	270	90	271	0.0	-1.0	0.5	5
120	240	119	240	1.0	0.0	0.5	5
150	210	148	207	2.0	3.0	2.5	5
180	180	178	178	2.0	2.0	2.0)
210	150	208	148	2.0	2.0	2.0)
240	120	240	122	0.0	-2.0	1.0)
270	90	272	90	-2.0	0.0	1.0	5
330	30	301	32	-1.0	-2.0	0	5
355	0	354	2	1.0	2.0	1.5	5
The audit r	neets AMD require	ments.	A	verage Absolute Degr	ees Difference=	1.2	2
			Comments:	-		-	
		Declir Physical inste	nation = 15 deg East	o issues			

END OF REPORT


Peace River Area Monitoring Program

DECEMBER 2023

Ambient Air Monitoring Calibration Report

- RENO-B STATION-

CAL-PRAMP-202312-01563

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Bureau Veritas Canada

January 6, 2024

CAL-PRAMP-202312-01563 Page 1 of 17

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS











MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



	DATE:	01-De	c-2023	PREVIOUS CAL	IBRATION DATE:	01-Nov-2023				
	PARAMETER:	S	02	PREVIOUS CORF	RECTION FACTOR:	0.9	998			
	CLIENT:	PRA	AMP	TEMPE	ERATURE (°C):	23	3.2			
	LOCATION:	Rer	по-В	BAROM	ETRIC (mBar):	9	26			
	PURPOSE	Rou	utine	START	TIME (MST):	09	:24			
PEF	RFORMED BY:	Kevin S	ebastian	END	TIME (MST):	14	:18			
ANALYZER:					· · ·					
N	/AKE/MODEL	Thermo	o 43iQTL		RANGE	500	dad			
	SERIAL #	12101	910505	FL	OW (mL/min)	4	31			
	INIT	IAL			FIN	IAL				
	BKG/OFFSET	1	4		BKG/OFFSET	1.	39			
	COEF/SLOPE	0.9	949		COEF/SLOPE	0.9	955			
Expected (ref	erence) Value	21	.7.8	Expected (ref	erence) Value	Value 224.4				
CALIBRATION SYSTEM:										
CALIBRATOR	:			ZERO AIR:						
	MAKE:	Sa	bio		MAKE:	Tele	dvne			
	MODEL:	20)10		MODEL:	M.	701			
	ID:	7540)1122		ID:	45	68			
MFC CALIBR	ATION DATE:	08-Se	p-2023		OXIDIZER ID:	n	/a			
CALIBRATION	N GAS:			FLOWMETER	RS (if applicable	e):				
	CYLINDER ID:	LL10	9693		HIGH ID	n	/a			
	CONC (ppm):	25	.00		EXPIRY DATE	n	/a			
CY	LINDER (psi):	14	100		LOW ID	n/a				
	EXPIRY DATE	02-No	v-2025		EXPIRY DATE	n/a				
CALIBRATIO	N PARAMETER	RS:		-						
	POINT	HI	GH	N	11D	LC)W			
	TARGET	3	90	1	90	95				
	RANGE 3			150	- 200	50 -	100			
SCRUBBER C	HECK (15 MIN	S; TRS/H2S C	DNLY):							
	START TIME:	n	/a	SC	D2 Conc (ppb)	n	/a			
	END TIME:	n	/a	Analyzer Re	esponse (ppb)	n	/a			
CALIBRATION	N:									
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR			
	(mL/min)		Αςτιμαι	INDIC	CATED	Initial	Final			
DILUENT	GAS	TOTAL	ACTUAL	Initial	Final	initial	Tinai			
3999	\geq	3999	0.00	-0.2	0	>	\geq			
3938	60.80	3999	380.10	374.7	380.7	1.014	0.998			
3971	28.80	4000	180.00	n/a	180.6	n/a	0.997			
3986	14.40	4000	90.00	n/a	89.6	n/a	1.004			
LINEAR REGR	RESSION ANAL	YSIS:								
L		CORRE	LATION	SLO	OPE	INTE	RCEPT			
	VALUE	1.0	000	1.0	002	0.	0%			
COMMENTS:	:									
Sample filter	changed									

SO2[ppb] Station: PRAMP RENO-B. Daily: 01-12-2023. Type: AVG 1 Min. [1 Min.]



- Page \$000 [}76b]

TRS Analyzer Calibration by Dilution



	DATF	01-De	r-2023	PREVIOUS CAL	BRATION DATE:	02-No	v-2023			
	PARAMETER:		RS	PREVIOUS CORF	RECTION FACTOR:	1.002				
	CLIENT:	PRA	MP	TEMPF	RATURE (°C):	23	.2			
	LOCATION:	Ren	io-B	BAROM	ETRIC (mBar):	92	26 26			
	PURPOSE	Rou	tine	START	TIME (MST):	09	.24			
PFF	REORMED BY:	Kevin Se	hastian	END	TIME (MST):	14	·18			
ANAI YZER:		iterii ot	bustian		= (.10			
N	AKE/MODEL	Thermo			RANGE	100	nnh			
	SFRIAL #	121010	910504	FL	OW (mL/min)	200	2 2 2			
	INIT		10304		FIN	IAI	AI			
	BKG/OFFSET		05		BKG/OFFSET	1	14			
		0.8	359			0.0	32			
Expected (ref	erence) Value	35	55 51	Expected (ref	erence) Value	39	46			
							.+0			
CALIBRATOR	:			ZERO AIR:						
0.12121.011	MAKE:	Sa	hio		MAKE:	Tele	dvne			
	MODEL:	20	10		MODEL:	M7	701			
	ID:	7540	1122	ID: 4568						
MFC CALIBR	ATION DATE:	08-Sep	o-2023		OXIDIZER ID:	n	/a			
CALIBRATION	I GAS:	·		FLOWMETER	S (if applicable	e):				
	CYLINDER ID: LL131374 HIGH ID n/a						/a			
CONC (ppm): 10.09					EXPIRY DATE	n,	/a			
CY	'LINDER (psi):	18	00		LOW ID	n,	/a			
	EXPIRY DATE	03-Jar	1-2026	EXPIRY DATE n/a						
CALIBRATION PARAMETERS:										
	POINT	HI	GH	M	IID	LO	W			
	TARGET	7	8	3	8	19				
	RANGE	60 -	- 80	30	- 40	10 -	- 20			
SCRUBBER C	HECK (15 MIN	S; TRS/H2S O	NLY):							
	START TIME:	n,	/a	SC	02 Conc (ppb)	n,	/a			
	END TIME:	n,	/a	Analyzer Re	sponse (ppb)	n,	/a			
CALIBRATIO	N:									
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR			
	(mL/min)		ACTUAL	INDIC	CATED	Initial	Final			
DILUENT	GAS	TOTAL		Initial	Final					
3999		3999	0.00	0.06	0					
3968	30.90	3999	//.96	/1./5	/8.16	1.088	0.998			
3985	15.10	4000	38.09	n/a	38.02	n/a	1.002			
		4000 VCIC:	10.92	TI/ d	10.04	II/d	1.004			
LINEAR REGI				SIC			CEDT			
				3LC 1 (003		1%			
	VALUE	1.0	,00	1.0		÷0.	±/0			
TRS Converte		N-101 #500								
Sample Filter	Changed	#330.					10:12			

10:15- Regulator flushed due to low response

TRS[ppb] Station: PRAMP RENO-B Daily: 01-12-2023 Type: AVG 1 Min. [1 Min.]



Page TRO [Ppb]

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:								ANALY	ZER:								
		DATE:	01-De	c-2023	PREVIOUS	S CALIBRAT	ION DATE:	02-No	v-2023			MAKE/	MODEL	SER	RIAL	FLOW (mL/min)
		CLIENT:	PR/	AMP	TEMF	PERATU	RE (°C):	23	3.2	1	VALUE	Therr	no 55i	121019	910497	10	58
	LOC	CATION:	Rer	no-B	BARO	METRIC	(mBar):	92	26	PARA	METER:	CH4		NM	IHC	TF	łC
	PL	IRPOSE	Rou	utine	STA		E (MST):	09	:24	RANG	E (ppm):	2	20	2	0	4	0
Р	ERFORM	/IED BY:	Kevin S	ebastian	E	ND TIM	E (MST):	14	:18	PREVI	OUS CF:	0.9	998	0.9	999	0.9	98
CALIBR	ATION S	SYSTEM															
CALIBRATOR:				Z	ERO AIF	र:		C	ALIBRAT	FION GA	S:	FLOWM	IETERS	(if applica	able):		
		MAKE:	Sa	bio			MAKE:	Tele	dyne	CYLIN	DER ID:	LL6	8768	F	IGH ID:	n,	/a
		MODEL:	20	010			MODEL:	M7	701	CH ₄ /C ₃ H	l ₈ (ppm):	897.0	301.0	HIGH E	EXPIRY:	n,	/a
		ID:	2670	1218			ID:	45	68	CYLIND	ER (psi):	16	600	L	_OW ID:	n,	/a
MFC CA	LIBRATIC	N DATE:	08-Se	p-2023		OXID	ZER ID:	Inte	rnal	EXPIR	Y DATE	11-Au	g-2029	LOW E	EXPIRY:	n	/a
CALIBRATION PARAMETERS:																	
POI	NT (CH4	/NMHC)	HI	GH		MID		LC	W			С	H4 EQU	IVILANC	E		
	٦	ARGET	1	4		7		3	.5	C_3H_8 as CH_4				82	7.8		
		RANGE	12 -	- 16		6 - 8		2 -	- 4		THC as CH_4				172	24.8	
EXPEC	EXPECTED (REFERENCE) VALUE:																
			Cl	H4	NM	MHC TH		HC	EINIAL			C	H4	NM	IHC	Tł	łC
	INTTAL		9.	71	11	.11	20	.83		FINAL		9.	9.83 11.01 20.		.84		
CALIBR	ATION:						-									-	
FL	OW RA	TE			(CONCE	NTRATIC	N (PPM)				CORR	ECTION	FACTO	R (CF.)	
	(mL/min))	CA	LCULAT	ED	INITI	AL INDIC	ATED	FINA	L INDIC	ATED		INITIAL			FINAL	
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3099	\times	3099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Х	Х	\times	Х	\ge	\times
3049	50.30	3099	14.56	13.44	27.99	14.12	12.83	26.95	14.55	13.43	27.98	1.031	1.047	1.039	1.001	1.000	1.001
3075	25.20	3100	7.29	6.73	14.02	n/a	n/a	n/a	7.26	6.73	14.00	n/a	n/a	n/a	1.004	1.000	1.001
3085	12.60	3098	3.65	3.37	7.01	n/a	n/a	n/a	3.65	3.41	7.06	n/a	n/a	n/a	1.000	0.987	0.994
LINEAR	REGRE	SSION A	NALYS	IS:				Comme	nts:								
		CORRE	LATION	SLO	DPE	INTEF	RCEPT	Sample	filter ch	anged							
	CH4	1.0	000	0.9	999	0.	0%										
	NMHC	1.0	000	0.9	999	0.	1%										
	THC	1.0	000	0.9	999	0.	0%		U	se Zero (Chrom?			N	0		

Station: PRAMP RENO-B Daily: 01-12-2023 Type: AVG 1 Min. [1 Min.]



- CH4 [pp時]e 14_of 17_ NMHC [ppm]

Meteorological System Checklist

			BUREAU VERITAS				
Date:		December 1, 2023					
Technician:		Kevin Sebastian					
Station:		PRAMP Reno					
Unit:	Make:	Model:	Serial #:				
Precipitation Sampler:	RM Young	52202	TB 15877				
Temperature Sensor:	Rotronic	HC2-S3	20467597				
Barometric Pressure Sensor:	MetOne	92	A17940				
Relative Humidity Sensor:	Rotronic	HC2-S3	20467597				
Anemometer:	RM Young	05305AQ	174795				
et a d l'ar	PRECIPITATION	N SENSOR CHECK					
	Reply:	Audit: 12:52 12:02	nents:				
	00000015, 2025	Audit: 12.55-15.02					
is the sensor Level?	yes						
Are the bucket drain balas clean?	yes						
Is the screen on the housing? (screen should	yes						
be on between July and September	yes						
Is the housing clean?	yes						
Is the area around the housing clean and free from obstacles?	yes						
	TIP TEST - Slowly pour water un	til 10 tip are heard. (10 tips = 1 ml)					
# of Tips	Data Logger Response (ml):	Manual Specific	ation = +/- 0.1 ml				
10	1.00	0.	00				
	AMBIENT TEMPERA	TURE SENSOR CHECK					
Previous check date:		November 2, 2023					
Parameter:		Temperature @ 2 metres					
Reference Thermometer ID:	FS 181341226 expires July 17, 2024						
Reference Temperature (°C):		-11.4					
Station - Ambient Temperature (°C):		-10.8					
Temperature Difference (°C):		-0.6					
	BAROMETRIC PRES	SURE SENSOR CHECK					
Previous check date:		November 2, 2023					
Reference Barometer ID:		Equipment ID - 05535 Brunton Expiry - July 17	2024				
Reference Pressure - Units/Reading:	millibar	92	4.3				
Station Pressure - Units/Reading:	millibar	92	4.1				
Pressure Tolerance +/- 15% of error:	786 - 1063	0.0	J2%				
	RELATIVE HUMIDITY (HYC	GROMETER) SENSOR CHECK					
Previous check date:		November 2, 2023					
Reference Hygrometer ID:		FS 181341226 expires July 17, 2024					
Reference Hygrometer % RH- Reading:		82.70					
Station Hygrometer % RH- Reading:		84.20					
RH Tolerance +/- 15% of difference:	70.30 - 95.11		8%				
	ANEMOMETER - WIND SPEED &	WIND DIRECTION SENSOR CHECK					
WIND SPEE		WIND D	RECTION No. 1992				
Previous Check date:	November 2, 2023	Previous check date:	November 2, 2023				
Wind speed Observed (kph):	5~10	Wind Direction Observed:	N				
wind speed on Data Logger (kph):	9.8	Wind Direction on Data Logger:	N Page				
Commonts		wind Direction Pass/Fail?:	Pass				

	Mete	eorological S	ensor Auc	lit/Calibrat	ion			
		Loc	ation Information					
Company:	P	PRAMP		Performed By:		Chris Wesson		
Audit Location:	F	Reno-B	-	Reviewed By:		Limin Li		
Audit Date:	Augu	ıst 1, 2023	-	Start/End Time (mst):		09:54 / 11:18		
Calibration Purpose:	rout	ine annual	-	Weather Conditions:	Mainl	y cloudy with dr	izzle	
		Wind	Sensor Information					
	Sensor ID	Data:			Sensor Outp	outs:		
Sensor Make:		RM Young		Velocity Voltage	Output Range:	n/a	а	
Sensor Model:		05305AQ		Velocity Unit	Output Range:	0-20	00	
Serial #:		174795		Direction Voltage	Output Range:	n/a	а	
Previous Cal/Audit Date:		November 23, 2022		Direction Unit	Output Range:	0-36	60	
		Wind C	alibrator Informatio	on				
Calibrator I.E). and Expiry Date:		ung 18802 id# R9133	expires Oct 18, 2024	h a limit**	-		
	wind Speed		of the <u>average co</u>		Counter Cla	clauice Wind	Correction	
RPM	Wind Spee	d Generated kph	Clockwise W	/ind Speed kph	Spee	Factor		
0		0		0.0	C	0.0		
1000		18.4	1	18.3	1	8.3	1.007	
2000		36.9		36.7	3	6.7	1.004	
3000		55.3	5	55.1	5	5.1	1.003	
4000		73.7		73.6	7	3.6	1.002	
5000		92.2	(92.0	9	2.0	1.002	
6000		110.6	1	10.5	11	10.5	1.001	
/000		129.0	1	28.9	12	28.9	1.001	
8000		147.4	1	47.3 CE 0	14	47.3 E 0	1.001	
9000		187.3	1	84 2	10	24.6	0.000	
10000		104.5	The audit meets	AMD requirements	Average Corr	ection Factor=	1 002	
		**./ -0 (.)	The addit meets	AND requirements.			1.002	
Wind Dire	ection Audit Data	**+/-3 of the abso	olute <u>average deg</u>	rees difference for	<u>all points</u> is t	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 Absol Differe	lute Degrees ence	
0	355	1	354	1.0	1.0	1.0)	
30	330	30	332	0.0	-2.0	1.0)	
60	300	60	302	0.0	-2.0	1.0)	
90	270	89	272	1.0	-2.0	1.5	5	
120	240	120	241	0.0	-1.0	0.5	5	
150	210	149	211	1.0	-1.0	1.0	-	
180	180	181	182	-1.0	-2.0	1	-	
210	150	211	150	-1.0	0.0	0.5	5	
240	90	241	90	-1.0	0.0	0.5	5	
300	60	301	60	-1.0	0.0	0.5	5	
330	30	331	29	-1.0	1.0	1.0)	
355	0	354	1	1.0	1.0	1.0)	
The audit r	neets AMD require	ments.	A	verage Absolute Degr	ees Difference=	0.9	9	
			Comments:	0		-		
		Declir Physical inspe	nation = 15 deg East	nissues				

END OF REPORT



Peace River Area Monitoring Program

DECEMBER 2023

Ambient Air Monitoring Calibration Report

- AQHI - GRIMSHAW STATION-

CAL-PRAMP-202312-01689

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Bureau Veritas Canada

January 6, 2024

CAL-PRAMP-202312-01689 Page 1 of 25

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS







CAL-PRAMP-202312-01689 Page 5 of 25





03[ppb] Calibration: AQHI Grimshaw Monthly: 12-2023 Type: SpanAndZero - Zero







MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



	DATE:	12-De	c-2023	PREVIOUS CAL	BRATION DATE:	15-Nov-2023		
	PARAMETER:	SC	02	PREVIOUS CORF	RECTION FACTOR:	1.000		
	CLIENT:	PRA	MP	TEMPE	RATURE (°C):	22	2.2	
	LOCATION:	Grim	shaw	BAROM	ETRIC (mBar):	9	40	
	PURPOSE	Rou	tine	STAR	TIME (MST):	07	:46	
PEF	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	13	:17	
ANALYZER:								
Ν	/AKE/MODEL	Teledyr	ne T100		RANGE	500	dad	
	SERIAL #	72	22	FL	OW (mL/min)	4	83	
	INI	TIAL			FIN	IAL		
	BKG/OFFSET	32	2.2		BKG/OFFSET	32	2.8	
	COEF/SLOPE	0.8	394		COEF/SLOPE	0.	94	
Expected (ref	erence) Value	24	4.4	Expected (ref	erence) Value	25	5.6	
	N SYSTEM:				,			
CALIBRATOR	:			ZERO AIR:				
	MAKE:	Sa	bio		MAKE:	Tele	dvne	
	MODEL:	20	10		MODEL:	M	<u>~</u> 701	
	ID:	7540	1122		ID:	5004		
MFC CALIBR	ATION DATE:	09-Sep	o-2023		OXIDIZER ID:	n	/a	
CALIBRATION GAS: FLOWMETERS (if applicable):								
	CYLINDER ID:	LL10	9693		HIGH ID	n	/a	
CONC (ppm): 25			.00		EXPIRY DATE	n	/a	
C	CYLINDER (psi): 1400				LOW ID	n	/a	
	EXPIRY DATE	02-No	v-2025		EXPIRY DATE	n/a		
CALIBRATIO	N PARAMETER	≀S:						
	POINT	HI	GH	N	IID	LC	W	
	TARGET	39	90	1	90	95		
	RANGE	300	- 400	150	- 200	50 -	100	
SCRUBBER C	HECK (15 MIN	S; TRS/H2S O	NLY):					
	START TIME:	n,	/a	SC	02 Conc (ppb)	n	/a	
	END TIME:	n,	/a	Analyzer Re	sponse (ppb)	n	/a	
CALIBRATIO	N:					-		
	FLOW RATES		CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR	
	(mL/min)		ACTUAL	INDIC	CATED	Initial	Final	
DILUENT	GAS	TOTAL		Initial	Final			
4000	> <	4000	0.00	0.1	0	\geq	\geq	
3939	60.80	4000	380.00	361	379.9	1.053	1.000	
3971	28.80	4000	180.00	n/a	179.7	n/a	1.002	
3985	14.40	3999	90.02	n/a	90.1	n/a	0.999	
LINEAR REG	RESSION ANAL	.1515:				1817-	CEDT	
CORRELATIO				SLO	JPE	INTE		
	VALUE	1.0	000	1.0	000	0.	U%	
CONIVIENTS								
Sample filter	changed.							

08:46-08:48 Flushed out regulator to check response

SO2[ppb] Station: AQHI Grimshaw Daily: 12-12-2023 Type: AVG 1 Min. [1 Min.]



Page \$300 (Appb)

TRS Analyzer Calibration by Dilution



	DATE:	12-De	c-2023	PREVIOUS CAL	IBRATION DATE:	15-No	v-2023		
	PARAMETER:	TI	RS	PREVIOUS COR	RECTION FACTOR:	1.0)05		
	CLIENT:	PRA	MP	TEMPE	ERATURE (°C):	22	2.2		
	LOCATION:	Grim	shaw	BAROM	ETRIC (mBar):	94	40		
	PURPOSE	Rou	itine	STAR	TTIME (MST):	07	:46		
PEF	RFORMED BY:	Kevin Se	ebastian	END	D TIME (MST):	13	:17		
ANALYZER:				•					
N	AKE/MODEL	Teledyn	e T100U		RANGE	100	ppb		
	SERIAL #		32	FL	OW (mL/min)	5	35		
	INIT	IAL			FIN	IAL			
	BKG/OFFSET	58	3.6		BKG/OFFSET	60).1		
	COEF/SLOPE	0.7	708		COEF/SLOPE	0.7	726		
Expected (ref	erence) Value	46	.48	Expected (ref	erence) Value	48	.54		
	N SYSTEM:		-		,		-		
CALIBRATOR				ZERO AIR:					
0.12121.011	MAKE:	Sa	hio		MAKE:	Tele	dvne		
	MODEL:	20	10		MODEL:	M	701		
	ID:	7540)1122		ID:	4568			
MFC CALIBR	ATION DATE:	08-Sep	o-2023		OXIDIZER ID:	n	/a		
CALIBRATION GAS: FLOWMETERS (if applicable):									
	CYLINDER ID:	LL13	1374		HIGH ID	LC	W		
CONC (ppm): 10			.09		EXPIRY DATE	n	/a		
CYLINDER (psi): 180			00		LOW ID	n	/a		
	EXPIRY DATE	03-Jar	n-2026		EXPIRY DATE	n/a			
CALIBRATION	N PARAMETER	S:							
	POINT	HI	GH	N	11D	LC	W		
	TARGET	7	'8	3	38	19			
	RANGE	60 -	- 80	30	- 40	10 - 20			
SCRUBBER C	HECK (15 MIN	S; TRS/H2S O	NLY):						
	START TIME:	n,	/a	SC	D2 Conc (ppb)	n	/a		
	END TIME:	n,	/a	Analyzer Re	esponse (ppb)	n	/a		
CALIBRATION	N:								
	FLOW RATES		CON	ICENTRATION	(ppb)	CORRECTIO	ON FACTOR		
	(mL/min)		ΔΩΤΙΙΔΙ	INDI	CATED	Initial	Final		
DILUENT	GAS	TOTAL	ACTUAL	Initial	Final	initial	rindi		
4000	>	4000	0.00	0.57	0	>	$\left. \right\rangle$		
3969	30.90	4000	77.95	76.3	78.12	1.029	0.998		
3985	15.10	4000	38.09	n/a	37.32	n/a	1.021		
3992	7.50	3999	18.92	n/a	18.23	n/a	1.038		
LINEAR REGE	RESSION ANAL	YSIS:	-		-		-		
	CORRELATION			SL	OPE	INTE	RCEPT		
	VALUE	1.0	000	1.	004	-0.	5%		
COMMENTS									
Converter, Cl	DNova CDN-10)1 #576.							

TRS[ppb] Station: AQHI Grimshaw Daily: 12-12-2023 Type: AVG 1 Min. [1 Min.]



Page 159 (ppb)

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:							ANALYZER:										
		DATE:	12-De	c-2023	PREVIOU	S CALIBRAT	ION DATE:	16-No	v-2023	MAKE/I	MODEL:	Teledyr	ne T200		PREVIC	OUS CF.	
		CLIENT:	PR/	AMP	TEMF	PERATU	RE (°C):	22	2.2	SE	ERIAL #:	83	37		NOx	0.9	997
	LOC	CATION:	Grim	shaw	BARO	METRIC	(mBar):	94	40	FLOW (mL/min)	44	43		NO	0.9	998
	PL	JRPOSE	Rou	ıtine	STA	RT TIME	E (MST):	07	:46	RANG	GE (ppb)	50	00		NO2	1.0	001
Р	ERFORM	IED BY:	Kevin S	ebastian	E	ND TIME	E (MST):	14	:59		GPT FC	DR 03?			Y	es	
CALIB	RATION	SYSTEM	1:														
	CA	LIBRAT	OR:		ZERO AIR:					CALIBRAT			FION GAS: FLOWN		IETERS	(if applic	able):
		MAKE:	Sa	bio			MAKE:	Tele	dyne	CYLIN	DER ID:	EY00	01716	ŀ	HIGH ID:	n	/a
		MODEL:	20	10			MODEL:	M7	701	NO/NO>	k (PPM):	49.2	49.4	HIGH I	EXPIRY:	n	/a
		ID:	2680	1218			ID:	45	68	CYLIND	ER (psi):	10	00	I	LOW ID:	n	/a
MFC CA	LIBRATIC	ON DATE:	12-Se	o-2023		OXIDI	ZER ID:	n	/a	EXPIR	Y DATE	11-No	v-2029	LOW I	EXPIRY:	n	/a
CALIB	RATION	SETTING	GS:														
	INITIAL		N	Эх	N	0	N	02		FINAL		N	Эх	NO		N	D2
	BKG/C	OFFSET:	2	2	-0).5	n	/a		BKG/C	FFSET:	0	.6	-0).4	n	/a
S	LOPE/CO	DEF/CE:		1		1	0.9	996	S	LOPE/CO	DEF/CE:	0.9	96	0.9	994	0.9	996
EXPEC	TED (RE	FEREN	CE) VAL	UE:													
	ΙΝΙΙΤΙΔΙ		N	Эх	N	0	N	02		FINIAL		N	Эх	N	NO NO2		D2
	INTIAL		30	8.4	2	.3	30	6.1		TINAL		30	309.1		2.8		6.3
CALIB	ALIBRATION PARAMETERS:																
		POINT			Ν	IO TARG	GET (PPE	3)	NO2	FARGET	(PPB)	N	D2 RANG	GE	C	03 POIN	Т
HIGH					39	95			250			240-275			n/a		
MID					18	30			154			150-157	•		Mid		
LOW					9	0			54			50-58			Low		
		EXTRA '	1			n	/a			340		300-370 High					
													0000	FOTION	E A O T O		
FI			<u> </u>					UN (PPD)						ECTION	FACTO		
												NO		NO2	NO		
5000	GAS	101AL			NO2	0.2		-0.0			NO2						
4960	40.20	5000	395.6	397.2	1.6	396.0	395 5	-0.5	395.3	398.2	2.9		1 002	\diamondsuit	1 001	0 997	\diamondsuit
4982	18.30	5000	180.1	180.8	0.7	n/a	n/a	0.0 n/a	180.8	180.6	-0.2	n/a	n/a	\Leftrightarrow	0.996	1 001	\Leftrightarrow
4991	9.20	5000	90.5	90.9	0.4	n/a	n/a	n/a	89.6	90.1	0.4	n/a	n/a	\Leftrightarrow	1.010	1.009	\Leftrightarrow
GPT C/	ALIBRAT	ION:															
				CALIB	RATOR		INDI	CATED	(ppb)	NO DRO	OP / O3	NO2	GAIN	N	02	CO	NV.
	Point		GAS	TOTAL	O3 SE	TPOINT	NO	NOx	NO2	Conc	(ppb)	(pr	ob)	Corr. F	ACTOR	EFFIC	IENCY
RI	EFEREN	CE	40.10	5000	(0	395.8	399.1	3.3	\wedge	<	\wedge	<	\wedge	\sim	\wedge	\sim
AS-	FOUND I	HIGH	40.10	5000	2	60	131.1	398.9	267.7	26	4.7	26	4.4	1.(001	99.8	39%
ADJ	USTED I	HIGH	n/a	n/a	n	/a	n/a	n/a	n/a	n,	/a	n	/a	n	/a	n	/a
	MID		40.10	5000	1:	50	244.5	397.7	153.3	15	1.3	1:	50	1.0	009	99. ⁻	14%
	LOW		40.10	5000	5	5	343.3	400.1	56.8	52	2.5	5 53.5 0.981 101.90%				90%	
					NO2 a	adjustme	nt not ree	quired.						AV	ERAGE:	100.	31%
LINEAF		SSION	ANALYS	IS:				СОММЕ	ENTS:								
CORRELATION SLOPE INTERCEPT Sample fil				filter cha	anged	ata aliat	250 00										
	NO	1.0	000	1.0	000	-0.0)3%	Addition	iai point i	or 03: S	etpoint =	350, 03	conc = 3	302.3			
	NOx	1.0	000	1.0	003	-0.1	1%	1									
	NO2	1.0	000	0.9	994	0.1	4%										

Station: AQHI Grimshaw Daily: 12-12-2023 Type: AVG 1 Min. [1 Min.]



— NOX (ppb) — Разе МЮФрфb) — NO2 (ppb)

Ozone Calibration by Direct GPT



	DATE:	12-De	c-2023	PREVIOUS CAL	BRATION DATE:	16-No	v-2023			
Р	ARAMETER:	C)3	PREVIOUS CORR	ECTION FACTOR:	0.9	998			
	CLIENT:	PR/	AMP	TEMPER	ATURE (°C):	22	2.5			
	LOCATION:	Grim	shaw	BAROME	TRIC (mBar):	93	38			
	PURPOSE	Rou	ıtine	START	TIME (MST):	14	:15			
PERF	ORMED BY:	Kevin S	ebastian	END	TIME (MST):	18	:36			
ANALYZER:										
М	AKE/MODEL	Teledyr	ne T400		RANGE	500	ppb			
	SERIAL #	82	24	FL	OW (mL/min)	7:	58			
	INIT	IAL		FINAL						
B	KG/OFFSET	-1	.8	E	KG/OFFSET	-2	2.1			
C	OEF/SLOPE	0.9	987	C	OEF/SLOPE	0.9	988			
Expected (refe	erence) Value	2	62	Expected (refe	erence) Value	20	68			
CALIBRATIC	N SYSTEM:									
CALIBRATO	R:			ZERO AIR:						
	MAKE:	Sa	bio		MAKE:	Tele	dyne			
	MODEL:	20	10		MODEL:	M7	701			
ID: 2680			1218		ID:	45	68			
MFC CALIBR	ATION DATE:	12-Se	p-2023	(DXIDIZER ID:	n/a				
		CALIBRATIC	ON METHOD:		Direc	t GPT				
	GPT DATE:	12-De	c-2023	GP	T END TIME:	14	:00			
CALIBRATIC	N PARAMET	ERS:								
	POINT	HI	GH	М	ID	LC	W			
	RANGE	300	- 400	150 -	- 200	50 -	100			
CALIBRATIC	DN:									
I	FLOW RATES	6	CON	CENTRATION	(ppb)	CORRECTIO	ON FACTOR			
	(mL/min)		ACTUAL	INDIC	ATED	Initial	Final			
DILUENT	GAS	TOTAL	1010/12	Initial	Final		- mai			
5000	\sim	5000	0.0	-1.4	0.0	\geq	\geq			
5000	>>	5000	362.3	360.9	361.2	1.000	1.003			
5000	>	5000	151.3	n/a	152.2	n/a	0.994			
5000	\geq	5000	52.5	n/a	52.2	n/a	1.006			
LINEAR REG	RESSION AN					··· · 	0-D-T			
		CORRE		SLC	DPE	INTERCEPT				
	VALUE	1.(000	0.9	197	0.2	1%			
COMMENTS	:									

Sample filter changed

O3[ppb] Station: AQHI Grimshaw Daily: 12-12-2023 Type: AVG 1 Min. [1 Min.]



-Page 1939[35]
Methane/Non-Methane Analyzer Calibration by Dilution



CALIBR	ATION:									ANALY	ZER:						
		DATE:	12-De	c-2023	PREVIOUS CALIBRATION DATE:			15-No	v-2023			MAKE/	MODEL	SERIAL		FLOW (mL/min)
		CLIENT:	PR/	AMP	TEMPERATURE (°C):			22	2.2	VALUE		Thermo 55i		11910	32505	10	71
	LOC	CATION:	Grim	shaw	BARO	METRIC	(mBar):	93	39	PARA	METER:	C	-14	NM	IHC	TF	łC
	PL	JRPOSE	Rou	utine	STA	RT TIME	E (MST):	12	:47	RANG	E (ppm):	2	0	2	0	4	0
Р	ERFORM	/ED BY:	Kevin S	ebastian	E	ND TIM	E (MST):	18	:25	PREVI	OUS CF:	1.0	001	1.0	001	1.0	001
CALIBRATION SYSTEM:																	
CALIBRATOR:				Z	ERO AIF	२:		C	ALIBRAT	FION GA	S:	FLOWM	IETERS	(if applica	able):		
MAKE: Sabio		bio			MAKE:	Tele	dyne	CYLIN	DER ID:	LL6	3768	F	HGH ID:	n/	/a		
MODEL: 2010		10			MODEL:	M7	701	CH ₄ /C ₃ H	l ₈ (ppm):	897.0	301.0	HIGH E	EXPIRY:	n/	/a		
ID: 75401122			1122			ID:	45	68	CYLIND	ER (psi):	19	00	L	_OW ID:	n/	/a	
MFC CALIBRATION DATE: 08-Sep-2023			p-2023		OXID	IZER ID:	Inte	rnal	EXPIR	Y DATE	08-No	v-2029	LOW E	EXPIRY:	n/	/a	
CALIBR	RATION I	PARAME	TERS:														
POINT (CH4/NMHC) HIGH						MID LOW		W	CH4 EQI			H4 EQU	UIVILANCE				
TARGET 14			4		7 3.5				C₃H ₈ a	as CH_4			82	7.8			
		RANGE	12	- 16		6 - 8 2 - 4				THC a	as CH ₄			172	24.8		
EXPEC	TED (RE	FERENC	E) VALU	JE:						-							
			CI	H4	NM	NMHC TH		HC				C	-14	NM	IHC	TF	łC
	INITIAL		9.10		10	10.57 19		.68		FINAL		9.	59	11	.16	20	.75
CALIBR	ATION:				8		8										
FL	OW RA	TE				CONCE	NTRATIC	DN (PPM)			CORRECTI		CTION FACTOR (CF.)				
	(mL/min)	CA	LCULAT	ED	INITI/	AL INDIC	ATED	FINA	L INDIC	ATED		INITIAL			FINAL	
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3250	\ge	3250	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	\ge	\times	\succ	\ge	\succ	\times
3196	52.80	3249	14.58	13.45	28.03	14.83	13.77	28.61	14.58	13.45	28.03	0.983	0.977	0.980	1.000	1.000	1.000
3223	26.40	3249	7.29	6.73	14.01	n/a	n/a	n/a	7.28	6.75	14.03	n/a	n/a	n/a	1.001	0.996	0.999
3237	13.20	3250	3.64	3.36	7.01	n/a	n/a	n/a	3.67	3.40	7.07	n/a	n/a	n/a	0.993	0.989	0.991
LINEAR	REGRE	SSION A	ANALYS	IS:				Comme	nts:								
		CORRE	LATION	SLC	OPE	INTEF	RCEPT	H2 = AN	IA HG30	00 #1905	67059						
	CH4	1.0	000	0.9	999	0.0% Sa			Filter C	hanged							
	NMHC	1.0	000	0.9	999	0.	1%										
	THC	1.0	000	0.9	999	0.	1%		U	se Zero	Chrom?			Y	es		

Station: AQHI Grimshaw Daily: 12-12-2023 Type: AVG 1 Min. [1 Min.]



- CH4 [ppm]e 21 of 25. NMHC [ppm]

Date/Previous Audit Date:	December 12, 2023	November 16, 2023		Weather Conditions:		Mix of sun and clo	ouds
Company:	PRAM	ИР		Start Time (mst):		15:09	
Station:	Grims	haw		End Time (mst):		15:32	
Parameter:	PM 2	2.5	Perf	ormed By/Reviewer:	Kevin Seba	astian	Limin Li
nstrument Data:							
Make/Model:	Teledyne	e T640		Serial Number:		318	
Owner:	PRAM	ИР	Alarms (o	detail in comments):		Yes	
Reference Standards/I.D./Expiry	/ Date:						
Flow Standard:	DeltaCal DC1 #206578, e	xpires Nov 27, 2024		Temperature:	DeltaCal DC1 #206	i578, expires Nov 27	, 2024
Digital Manometer:	DeltaCal DC1 #206578, e	xpires Nov 27, 2024	_	Pressure:	DeltaCal DC1 #206	i578, expires Nov 27	, 2024
DIAGNOSTICS:							
Ambient Pressure (mmHg)	703.4	Am	bient Temp (°C)	-2.3	ASC H	Heater Duty (%)	0.0
Box Temp (°C)	26.5	Curi	rent PMT HV (V)	1527		LED Temp (°C)	34.88
P3 Value	47		PMT Setting (V)	1532	F	Pump PWM (%)	66
Sample Flow (L/min)	4.91	Sa	mple RH (%RH)	11.8	Sar	mple Temp (°C) 24.3	
Item:		As-found		As-lef	t	То	lerance
	Reference	T	640x	Reference	T640x		
	PM10						
Zero Test (Leak Check)	PM10		0.0	0	0.0	0.	0 to 0.2
Zero Test (Leak Check)	PM10 PM2.5		0.0	0	0.0	0.	0 to 0.2
Zero Test (Leak Check) Ambient Pressure (mmHg)	PM10 PM2.5 702.0	7	0.0 0.0 08.4	0 0 n/a	0.0 0.0 n/a	0. +/- :	0 to 0.2
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C)	PM10 PM2.5 702.0 -2.30	7	0.0 0.0 08.4 -2.3	0 0 n/a n/a	0.0 0.0 n/a	0. +/-: +/.5% of T640x	0 to 0.2 10 mm Hg +/- 2°C
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min)	PM10 PM2.5 702.0 -2.30 5.03	7	0.0 0.0 08.4 -2.3 4.98	0 0 n/a n/a	0.0 0.0 n/a n/a	0. +/-: +/-5% of T640x	0 to 0.2 10 mm Hg +/- 2°C (e.g., 4.75 – 5.25 lpm)
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) Additional Monthly Maintenan	PM10 PM2.5 702.0 -2.30 5.03 re :	7	0.0 0.0 08.4 -2.3 4.98	0 0 n/a n/a n/a	0.0 0.0 n/a n/a	0. +/- : +/-5% of T640x <i>Cor</i>	0 to 0.2 10 mm Hg +/- 2°C (e.g., 4.75 – 5.25 lpm) mpleted Yes
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) Additional Monthly Maintenand	PM10 PM2.5 702.0 -2.30 5.03	7	0.0 0.0 08.4 -2.3 4.98	0 0 n/a n/a n/a	0.0 0.0 n/a n/a Inlet cleaned?	0. +/-:	0 to 0.2 10 mm Hg t-/ 2°C (e.g., 4.75 – 5.25 lpm) mpleted Yes Yes
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) Idditional Monthly Maintenand	PM10 PM2.5 702.0 -2.30 5.03 re:	7	0.0 0.0 08.4 -2.3 4.98 San	0 0 n/a n/a n/a	0.0 0.0 n/a n/a Inlet cleaned? inner and outer)?	0. +/-:	0 to 0.2 10 mm Hg +/- 2°C (e.g., 4.75 – 5.25 lpm) mpleted Yes Yes
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) Idditional Monthly Maintenand Quarterly Audit/Calibration:	PM125 PM2.5 702.0 -2.30 5.03 e: Peak at C	7	0.0 0.0 08.4 -2.3 4.98 San	0 0 n/a n/a n/a nple tubing inspected (ot No:	0.0 0.0 n/a n/a Inlet cleaned? inner and outer)?	0. +/- :	0 to 0.2 10 mm Hg +/- 2*C (e.g., 4.75 – 5.25 lpm) mpleted Yes Yes
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (*C) Sample Flow (L/min) dditional Monthly Maintenance uarterly Audit/Calibration: SpanDust™ Standard	PM2.5 PM2.5 702.0 -2.30 5.03 :e: Peak at C 10.	hannel	0.0 0.0 08.4 -2.3 4.98 San L 10012	0 0 n/a n/a n/a n/be tubing inspected (ot No: 18-050-046	0.0 0.0 n/a n/a Inlet cleaned? inner and outer)?	0. +/- : +/-5% of T640x Cor Expiry: 1-31-2025	0 to 0.2 10 mm Hg +/- 2*C (e.g., 4.75 – 5.25 lpm) mpleted Yes Yes
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) dditional Monthly Maintenano Quarterly Audit/Calibration: SpanDust™ Standard	PM2.5 PM2.5 702.0 -2.30 5.03 e : Peak at C 10.1	hannel 9 Verification:	0.0 0.0 08.4 -2.3 4.98 San L 10012	0 0 n/a n/a n/a nple tubing inspected (ot No: 82-050-046 Calibration (if	0.0 0.0 n/a n/a Inlet cleaned? inner and outer)?	0. +/-: +/-5% of T640x Cor Expiry: 1-31-2025	0 to 0.2 10 mm Hg +/- 2*C (e.g., 4.75 – 5.25 lpm) mpleted Yes Yes
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) idditional Monthly Maintenano uarterly Audit/Calibration: SpanDust™ Standard Item:	PM12.5 PM2.5 702.0 -2.30 5.03 e : Peak at C 10.1 Reference	hannel 9 Verification:	0.0 0.0 08.4 2.3 4.98 San L 10012 640x	0 0 1/a n/a n/a n/a 10 10 10 10 10 10 10 10 10 10 10 10 10	0.0 0.0 n/a n/a Inlet cleaned? inner and outer)? needed): T640x	0. +/- +/-5% of T640x Cor Expiry: 1-31-2025 To	0 to 0.2 10 mm Hg +/- 2°C (e.g., 4.75 – 5.25 lpm) ppleted Yes Yes Ierance
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) Idditional Monthly Maintenand Uarterly Audit/Calibration: SpanDust ^w Standard Item: Peak Channel	PM12.5 702.0 -2.30 5.03 ee : Peak at C 10.1 Reference 10.9	hannel 9 Verification: 7	0.0 0.0 0.0 0.0 0.4 4.9 8 4.98 5 an 10012 640x 11	0 0 n/a n/a n/a ple tubing inspected (ot No: 18-050-046 Calibration (iff Reference 10.9	0.0 0.0 n/a n/a inlet cleaned? inner and outer)? needed): T640x n/a	0. +/- +/-5% of T640x Cor Expiry: 1-31-2025 To	0 to 0.2 10 mm Hg -/-2°C (e.g., 4.75 – 5.25 lpm) ppleted Yes Yes lerance ± 0.5
Zero Test (Leak Check) Ambient Pressure (mmHg) Ambient Temperature (°C) Sample Flow (L/min) idditional Monthly Maintenana tuarterly Audit/Calibration: SpanDust [™] Standard Item: Peak Channel PMT Setting (V)	PM125 PM2.5 702.0 -2.30 5.03 <i>e</i> : Peak at C 10.7 Reference 10.9 n/a	hannel 9 Verification: 1	0.0 0.0 0.0 0.0 0.4 4.9 8 4.98 5 4.98 5 4.98 5 4.0012 10012 640x 11 1546	0 0 n/a n/a n/a nple tubing inspected (ot No: 18-050-046 Calibration (if Reference 10.9 n/a	0.0 0.0 n/a n/a inlet cleaned? inner and outer)? needed): T640x n/a n/a	0. +/- +/-5% of T640x Cor Expiry: 1-31-2025 To	10 no 0.2 10 mm Hg -/-2*C (e.g., 4.75 - 5.25 lpm) mpleted Yes Yes lerance ± 0.5 n/a

Meteorological System Checklist

			<u>BUREAU</u> Veritas
Date:		December 12, 2023	
Technician:		Kevin Sebastian	
Station:		PRAMP Grimshaw	
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Vaisala	HMP155	N2910506
Barometric Pressure Sensor:	MetOne	92	A2397
Relative Humidity Sensor:	Vaisala	HMP155	N2910506
Anemometer:	RM Young	05305AQ	174801
	AMBIENT TEMPER	ATURE SENSOR CHECK	
Previous check date:		November 15, 2023	
Parameter:		Temperature @ 2 metres	
Reference Thermometer ID:		F.S. 181341226 expires July 17, 2024	
Reference Temperature (°C):		-2.5	
Station - Ambient Temperature (°C):		-2.3	
Temperature Difference (°C):		-0.2	
	BAROMETRIC PRE	SSURE SENSOR CHECK	
Previous check date:		November 15, 2023	
Reference Barometer ID:		Brunton 05535 Expires July 17, 2024	
Reference Pressure - Units/Reading:	millibar	93	37.7
Station Pressure - Units/Reading:	millibar	9	36
Pressure Tolerance +/- 15% of error:	797 - 1078	0.5	18%
	RELATIVE HUMIDITY (HY	GROMETER) SENSOR CHECK	
Previous check date:		November 15, 2023	
Reference Hygrometer ID:		F.S. 181341226 expires July 17, 2024	
Reference Hygrometer % RH- Reading:		66.70	
Station Hygrometer % RH- Reading:		64.80	
RH Tolerance +/- 15% of difference:	56.70 - 76.71	2.	.8%
	ANEMOMETER - WIND SPEED 8	& WIND DIRECTION SENSOR CHECK	
WIND SPE	ED	WIND D	IRECTION
Previous check date:	November 15, 2023	Previous check date:	November 15, 2023
Wind Speed Observed (kph):	5~10	Wind Direction Observed:	W
Wind speed on Data Logger (kph):	9.6	Wind Direction on Data Logger:	W
		Wind Direction Pass/Fail?:	Pass
Comments			
		No issues	

	Mete	eorological S	ensor Auc	lit/Calibrat	ion		
		Loca	ation Information				
Company:	F	PRAMP		Performed By:		Chris Wesson	
Audit Location:	Gr	rimshaw	-	Reviewed By:		Limin Li	
Audit Date:	Augu	ust 2, 2023	-	Start/End Time (mst):		14:55 / 16:16	
Calibration Purpose:	rout	ine annual	-	Weather Conditions:	Mainly clo	oudy with sunny	[,] breaks
		Wind	Sensor Information				
	Sensor ID	Data:			Sensor Outp	uts:	
Sensor Make:		RM Young		Velocity Voltage	Output Range:	n/a	3
Sensor Model:		05305AQ		Velocity Unit	Output Range:	0-20)0
Serial #:		174801		Direction Voltage	Output Range:	n/a	3
Previous Cal/Audit Date:		July 12, 2022		Direction Unit	Output Range:	0-36	50
		Wind C	alibrator Informatio	on			
Calibrator I.I). and Expiry Date: Wind Speed	RM You Audit Data **+/- 2%	of the average co	expires Oct 18, 2024	he limit**	-	
					Counter Clo	ckwise Wind	Correction
RPM	Wind Speed	d Generated kph	Clockwise W	/ind Speed kph	Spee	d kph	Factor
0		0		0.0	0	.0	-
1000		18.4	1	18.3	18	1.007	
2000		36.9	3	36.7	36	1.004	
3000		55.3		55.1	55	5.1	1.003
4000		73.7	1	73.6	/:	3.6	1.002
5000		92.2	3	92.0 40.5	5.	2.0	1.002
6000		110.6	1	10.5	11	0.5	1.001
/000		129.U	1	28.9 47 2	14	8.9 7 7	1.001
<u>8000</u> 0000		147.4 165 Q	1	47.5 cf Q	16	7.5 E Q	1.001
1000		105.5	- 1	9.50 9.4 7		2.0 A 7	1.000
10000		104.5	The audit meets	ΔMD requirements.	Average Corr	ection Factor=	1 002
Wind Dire	Audit Data	**·/ 2 ⁰ of the above		AND requirements	-Il - ainte is t	L = 1:=:+*	1.002
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 Absol Differe	ute Degrees ence
0	355	2	354	2.0	1.0	1.5	;
30	330	29	333	1.0	-3.0	2.0)
60	300	58	300	2.0	0.0	1.0)
90	270	88	2/1	2.0	-1.0	1.5)
120	240	119	237	1.0	3.0	2.0) -
190	190	149	200	2.0	4.0	2.5	5
210	150	206	148	4.0	2.0	3.0	י ו
210	120	238	119	2.0	1.0	1.5	,
270	90	272	87	-2.0	3.0	2.5	5
300	60	304	57	-4.0	3.0	3.5	5
330	30	333	30	-3.0	0.0	1.5	5
355	0	354	1	1.0	1.0	1.0)
The audit r	neets AMD require	ments.	A	verage Absolute Degr	ees Difference=	2.0)
			Comments:				
		Declir Horizon Potentiometer	nation = 15 deg East Ital bearings replace noisy. Replacement	d. required.			

END OF REPORT



Peace River Area Monitoring Program

DECEMBER 2023

Ambient Air Monitoring Calibration Report

- PEACE RIVER COMPLEX (PRC) STATION-

CAL-PRAMP-202312-01698

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Bureau Veritas Canada

January 6, 2024

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS













MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



	DATE:	06-De	c-2023	PREVIOUS CAL	BRATION DATE:	01-No	v-2023	
	PARAMETER:	SC	02	PREVIOUS CORF	RECTION FACTOR:	0.9	999	
	CLIENT:	PR/	AMP	TEMPE	RATURE (°C):	21	L.4	
	LOCATION:	Peace River	Compliance	BAROM	ETRIC (mBar):	9	32	
	PURPOSE	Rou	itine	START	TIME (MST):	10	:36	
PEF	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	15	:44	
ANALYZER:					, ,			
N	/AKE/MODEL	Therr	mo 43i		RANGE	500	nnh	
	SFRIAL #	10347	746225	FL	OW (ml/min)	4	36	
	INIT		40225		FIN	 ΙΔΙ		
	BKG/OFFSET	1(0.0		BKG/OFFSET	20	12	
		13	147			1 1	151	
Exported (rof	COET/SEOFE	26	0.6	Exported (rof		2.	72	
		20	9.0	Expected (ref	erence) value	Z	12	
CALIBRATIO	N STSTEIVI:			7500 410				
CALIBRATOR		-		ZEKU AIK:	N A A 1/-	_ ·		
	MAKE:	Sa	bio		MAKE:	Tele	dyne	
	MODEL:	20	010		MODEL:	M	701	
	ID:	/540	01122		ID:	50	04	
MFC CALIBR	RATION DATE:	08-Sep	p-2023		OXIDIZER ID:	n,	/a	
CALIBRATION	N GAS:		0.000	FLOWINETER	S (IT applicable	e):	1.	
	CYLINDER ID:	25	19693			n	/a /-	
	CONC (ppm):	25	.00			n	/a	
0	CINDER (psi):	16	00			n	/a /-	
		02-100	v-2025		EXPIRY DATE	n	/a	
CALIBRATIO								
	POINT		GH	IV				
	TARGET	3	90	1	90		100	
	RANGE	300	- 400	150	- 200	50 -	100	
SCRUBBER C	HECK (15 MIN	S; TRS/H2S 0	DNLY):				1	
	START TIME:	n	/a	SO2 Conc (ppb)			n/a	
	END TIME:	n,	/a	Analyzer Re	sponse (ppb)	n	/a	
CALIBRATIO			601		(CORRECTI		
	FLOW RATES		CON		(ppb)	CORRECTIO	JN FACTOR	
		TOTAL	ACTUAL			Initial	Final	
DILUENT	GAS	TUTAL	0.00	initial	Final			
3999	C0.00	3999	0.00	U 201 7	U 2024	0.000	0.005	
3939	50.80	4000	380.00	381./	382.1	0.996	0.995	
39/U	28.80	3999	100.05	n/a	101.5	n/a	0.992	
		SARA	90.02	II/d	90.4	n/a	0.990	
LINEAK KEG	KESSIUN ANAI	.1315:						
		CORKE		SLO		INTE		
	VALUE	1.(000	1.0	106	0.	U%	
COMMENTS	:							
Sample filter	changed.							

SO2[ppb] Station: Peace River Complex [PRC] Daily: 06-12-2023 Type: AVG 1 Min. [1 Min.]



Page \$100 (Popb)

H2S Analyzer Calibration by Dilution



	DATE:	06-De	c-2023	PREVIOUS CALI	BRATION DATE:	01-Nov	v-2023	
	PARAMETER:	Н	2S	PREVIOUS CORR	ECTION FACTOR:	0.9	99	
	CLIENT:	PRA	AMP	TEMPE	RATURE (°C):	21	4	
	LOCATION:	Peace River	Compliance	BAROME	TRIC (mBar):	93	32	
	PURPOSE	Rou	ıtine	START	TIME (MST):	10	:36	
PEI	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	15	:44	
ANALYZER:								
Ν	/AKE/MODEL	Therm	no 450i		RANGE	100	ppb	
	SERIAL #	13088	357354	FLC	DW (mL/min)	93	31	
	INIT	ΓIAL			FIN	AL		
	BKG/OFFSET	14	1.9		BKG/OFFSET	15	5.7	
	COEF/SLOPE	1.()45		COEF/SLOPE	1.0	91	
Expected (ref	erence) Value	35	5.4	Expected (refe	erence) Value	38	3.2	
CALIBRATIO	N SYSTEM:			P	,			
				ZERO AIR:				
	MAKE:	Sa	bio		MAKE:	Tele	dvne	
	MODEL:	20)10		MODEL:	M7	701	
	ID:	7540)1122		ID:	45	68	
MFC CALIBR	ATION DATE:	08-Se	p-2023		OXIDIZER ID:	n	/a	
CALIBRATION	N GAS:			FLOWMETERS (if applicable):				
	CYLINDER ID:	LL13	1374		HIGH ID	n,	/a	
	CONC (ppm):	10	.09		EXPIRY DATE	n,	/a	
C	LINDER (psi):	18	800		LOW ID	n,	/a	
	EXPIRY DATE	03-Jar	า-2026		EXPIRY DATE	n,	/a	
CALIBRATIO	N PARAMETER	₹S:		-				
	POINT	HI	GH	M	ID	LO	W	
	TARGET	7	'8	3	8	19 10 - 20		
	RANGE	60	- 80	30 -	40			
SCRUBBER C	HECK (15 MIN	IS; TRS/H2S O	NLY):					
	START TIME:	n	/a	SO	2 Conc (ppb)	n,	/a	
	END TIME:	n	/a	Analyzer Re	sponse (ppb)	n,	/a	
CALIBRATIO	N:							
	FLOW RATES		CON	CENTRATION	ppb)	CORRECTIO	ON FACTOR	
	(mL/min)		Αςτιμαι	INDIC	ATED	Initial	Final	
DILUENT	GAS	TOTAL	ACTUAL	Initial	Final	IIIItidi	Filldi	
	\langle	3999	0.00	0.2	0	$>\!$	>	
3999	\sim		-	75 7	78.1	1.032	0.998	
3999 3969	30.90	4000	77.95	75.7	_			
3999 3969 3984	30.90 15.10	4000 3999	77.95 38.10	n/a	38.1	n/a	1.000	
3999 3969 3984 3992	30.90 15.10 7.50	4000 3999 3999	77.95 38.10 18.92	n/a n/a	38.1 19.1	n/a n/a	1.000 0.991	
3999 3969 3984 3992 LINEAR REGI	30.90 15.10 7.50 RESSION ANAL	4000 3999 3999 YSIS:	77.95 38.10 18.92	n/a n/a	38.1 19.1	n/a n/a	1.000 0.991	
3999 3969 3984 3992 LINEAR REGI	30.90 15.10 7.50 RESSION ANAL	4000 3999 3999 L YSIS: CORRE	77.95 38.10 18.92 LATION	n/a n/a SLC	38.1 19.1	n/a n/a INTEF	1.000 0.991 RCEPT	
3999 3969 3984 3992 LINEAR REGI	30.90 15.10 7.50 RESSION ANAL VALUE	4000 3999 3999 L YSIS: CORRE 1.0	77.95 38.10 18.92 LATION 000	n/a n/a SLC	38.1 19.1 0PE 01	n/a n/a INTEF 0.0	1.000 0.991 RCEPT 0%	

H2S[ppb] Station: Peace River Complex [PRC] Daily: 06-12-2023 Type: AVG 1 Min. [1 Min.]



Page [4329f [39bb]

TRS Analyzer Calibration by Dilution



	ΝΛΤΕ ·		c 2022	DREVIOUS CAL			1 2022		
	DATE.					02-190	v-2025		
		ו		TEMDE		0.5	996		
		PK/			TRIC (m Bor):	2.	1.4		
	LUCATION:	Peace River	compliance	BARUIVI		9.	32		
	PURPOSE	Rou	itine	START	TIME (MST):	10	:36		
PEF	RFORMED BY:	Kevin Se	ebastian	END	TIME (MST):	15	:44		
ANALYZER:									
N	1AKE/MODEL	Therm	no 450i		RANGE	100	ppb		
	SERIAL #	10347	46224	FL	OW (mL/min)	7	00		
	INIT	TAL			FIN	IAL			
	BKG/OFFSET	26	5.4		BKG/OFFSET	28	3.2		
	COEF/SLOPE	1.(023		COEF/SLOPE	1.0)83		
Expected (refe	erence) Value	51	.25	Expected (ref	erence) Value	55	.14		
CALIBRATION	N SYSTEM:			•					
CALIBRATOR				ZERO AIR:					
	MAKE:	Sa	hio	_	MAKE:	Tele	dvne		
	MODEL:	20	010		MODEL:	M	701		
	ID:	7540)1122		ID:	45	68		
MFC CALIBR	ATION DATE:	08-Sei	0-2023		OXIDIZER ID:	n	/a		
CALIBRATION	GAS:			FLOWMETERS (if applicable):					
	CYLINDER ID:	LL13	1374		HIGH ID	-,. n	/a		
	CONC (ppm):	10	.09		EXPIRY DATE	n	/a		
СҮ	LINDER (psi):	18	300		LOW ID	n	/a		
	EXPIRY DATE	03-Jar	n-2026		EXPIRY DATE	n	/a		
CALIBRATION		RS:							
	POINT	HI	GH	N	IID	LC	W		
	TARGET	7	78	3	8	19			
	RANGE	60	- 80	30 - 40 10 - 20					
	HECK (15 MIN	S- TRS/H2S O		50	10	10	20		
SCRODDERC	START TIME	n n	/a	SC)2 Conc (ppb)	n	/a		
	FND TIME:	n	/a /a	Analyzer Re	sponse (ppb)	n	/a		
	<u>ارتاری</u>		74	, analyzer ne	sponse (pps)		ŭ		
CALIBITATIO	FLOW RATES		CON	CENTRATION	(nnh)	CORRECTIO	ON FACTOR		
	(ml /min)		con		TATED	conneern	Shi i Aerok		
DILLIENT	GAS	τοται	ACTUAL	Initial	Final	Initial	Final		
3999		3000	0.00	0.02	0	\sim	\checkmark		
3969	30.90	4000	77.95	74.06	77.97	1 053	1 000		
3984	15 10	3999	38.10	n/a	38.1	n/a	1.000		
3992	7.50	3999	18.92	n/a	18,82	n/a	1.005		
LINFAR REGE	ESSION ANAL	YSIS:	10:01	, a	10:01		1.000		
		CORRE		SL)PF	INTE	RCEPT		
	VALLIF	1 (000	1 (001	0	0%		
	VALUE 1.000 1.001 0.0%								
TDS Converte		NI 101 #F12							
		101 #310							

TRS[ppb] Station: Peace River Complex [PRC] Daily: 06-12-2023 Type: AVG 1 Min. [1 Min.]



Page 199 (Popb)

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBR	ATION:									ANALY	ZER:						
		DATE:	06-De	c-2023	PREVIOUS	6 CALIBRAT	ION DATE:	01-No	v-2023			MAKE/	MODEL	SER	IAL	FLOW (mL/min)
		CLIENT:	PRA	AMP	TEMPERATURE (°C):			21	.4	VALUE		Therr	no 55i	1034745845		10	88
	LOC	CATION:	Peace River	r Compliance	BARO	METRIC	METRIC (mBar):		32	PARA	METER:	CH4		NM	HC	TF	łC
	PL	IRPOSE	Rou	utine	START TIME (MST):			10	:36	RANG	E (ppm):	2	0	2	0	4	0
Р	ERFORM	/IED BY:	Kevin S	ebastian	E	ND TIME	E (MST):	15	:44	PREVI	OUS CF:	1.0	001	1.0	01	1.0	001
CALIBRATION SYSTEM:																	
CALIBRATOR:						Z	ERO AIF	२:		C	ALIBRAT	FION GA	S:	FLOWM	IETERS	(if applica	able):
MAKE: Sabio			bio			MAKE:	Tele	dyne	CYLIN	DER ID:	LL6	3768	F	IIGH ID:	n,	/a	
		MODEL:	20)10			MODEL:	M7	701	CH ₄ /C ₃ F	l ₈ (ppm):	897.0	301.0	HIGH E	EXPIRY:	n,	/a
ID: 26801218			1218			ID:	45	68	CYLIND	ER (psi):	16	00	l	OW ID:	n,	/a	
MFC CALIBRATION DATE: 12-Sep-2023			p-2023		OXID	ZER ID:	Inte	rnal	EXPIR	Y DATE	08-No	v-2029	LOW E	EXPIRY:	n,	/a	
CALIBR	ATION F	PARAME	TERS:														
POINT (CH4/NMHC) HIGH						MID LOW			CH4 EQUIVILANCE								
TARGET 14			4		7		3.	3.5 C ₃ H ₈			as CH_4			82	7.8		
		RANGE	12	- 16		6 - 8 2 - 4			- 4		THC a	as CH_4			172	24.8	
EXPEC	TED (RE	FERENC	E) VALU	JE:													
			CI	H4	NM	NMHC TH		HC				C	-14	NM	HC	TF	łC
	INTTAL		9.62		11.08 20		.70	.70			9.	85	11	.03	20	.88	
CALIBR	ATION:						-									-	
FL	OW RA	TE			CONCENTRATIC			N (PPM)		CORREC		ECTION FACTOR (CF.)		R (CF.)			
	(mL/min))	CA	LCULAT	ED	INITIA	AL INDIC	ATED	FINA	L INDIC/	ATED	ED INITIAL FIN			FINAL		
DILUENT	GAS	TOTAL	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC	CH4	NMHC	THC
3099	\times	3099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Х	Х	\times	\times	\ge	\times
3049	50.30	3099	14.56	13.44	27.99	14.27	13.44	27.72	14.61	13.47	28.08	1.020	1.000	1.010	0.997	0.997	0.997
3074	25.10	3099	7.27	6.70	13.97	n/a	n/a	n/a	7.31	6.74	14.05	n/a	n/a	n/a	0.994	0.995	0.994
3085	12.60	3098	3.65	3.37	7.01	n/a	n/a	n/a	3.67	3.39	7.06	n/a	n/a	n/a	0.994	0.993	0.994
LINEAR	REGRE	SSION A	ANALYS	IS:				Comme	nts:								
		CORRE	LATION	SLO	DPE	INTEF	RCEPT	H2 Dess	sicant cl	hanged a	after AF	high.					
	CH4	1.0	000	1.0	003	0.0	0%	H2 = AN	IA HG30	00 #2110	67076						
	NMHC	1.0	000	1.0	002	0.0	0%										
	THC	1.0	000	1.0	003	0.0	0%		U	se Zero	Chrom?			N	0		

Station: Peace River Complex [PRC] Daily: 06-12-2023 Type: AVG 1 Min. [1 Min.]



- CH4 [pp時]e 17_of 20_ NMHC [ppm]

Meteorological System Checklist

Date:: December 6, 2023 Deter: December 6, 2023 Technickan: Kevin Sebastian Station: Peace River Compliance Unit: Make: Model: Serial II: Precipitation Sampler: RM Young 52.02 T8 16325 Emperature Sensor: Rotronic HC2-53 20558318 Barometric Pressure Sensor: Rotronic HC2-53 20558318 Amenometer: Rotronic HC2-53 20558318 Barometric Pressure Sensor: Rotronic HC2-53 20558318 Amenometer: RM Young 03305VK 129612 Amenometer: Rotronic FS. 181341226 expires July 17, 2024 Reference Thermometer ID: S. November 1, 2023 Parameter: J.2 J.2 Station - Ambient Temperature (°C): J.2 J.2 Station - Moleine (°C): J.2 J.2 BarOMETRIC PRESSURE SENSOR CHECK Previous check date: November 1, 2023 Previous check date: Millibar 933 Pressure Sensor CHECK Previous check			VERITAS								
Technician:Kevin SebastianStation:Peake Rive ComplianceUnit:Make:Model:Serial #:Precipitation Sampler:RM Young\$2202TB 16325Temperature Sensor:RM KorneHC2-532055818Barometric Pressure Sensor:MetOne092B19577Relative Humidity Sensor:RM Young03305VK129612Amemoreter:RM Young03305VK129612Amemoreter:RM Young03305VK129612Previous check date:November 1, 202320558318Parameter:RM Young03305VK129612Barometric Pressure (*C):Temperature @ 2 metresEReference Thermometer ID:S. S. 181341226 expires July 17, 2024EReference Thermometer ID:3.03.2Station - Ambient Temperature (*C):3.03.2Station - Ambient Temperature (*C):Surnot OS355 Expires July 17, 2024Reference Pressure - Units/Reading:millibar928.3Station Pressure - Units/Reading:millibar928.3Station Pressure - Units/Reading:millibar928.3Previous check date:November 1, 202393.1Previous check date:November 1, 202393.1Previous check date:November 1, 202393.3Station Pressure - Units/Reading:millibar92.3Station Pressure - Units/Reading:millibar92.3Station Pressure - Units/Reading:Millibar92.3Reference Pressure - Un		December 6, 2023									
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ANEMOMETER - WIND SPEED & WIND DIRECTION SENSOR CHECK WIND SPEED WIND DIRECTION Previous check date: November 1, 2023 Previous check date: November 1, 2023 Wind Speed Observed (kph): 10~20 Wind Direction Observed: W Wind speed on Data Logger (kph): 12 Wind Direction n Data Logger: Pass Wind Direction Pass/Fail?: Pass Pass	51.60 - 69.81	-8.2	2%								
WIND SPEED WIND DIRECTION Previous check date: November 1, 2023 Wind Speed Observed (kph): 10~20 Wind Speed on Data Logger (kph): 12 Wind Direction on Data Logger: Wind Direction Pass/Fail?:	ANEMOMETER - WIND SPEED	& WIND DIRECTION SENSOR CHECK									
Previous check date: November 1, 2023 Previous check date: November 1, 2023 Wind Speed Observed (kph): 10~20 Wind Direction Observed: W Wind speed on Data Logger (kph): 12 Wind Direction on Data Logger: W Wind Direction Pass/Fail?: Pass	D	WIND DIF	RECTION								
Wind Speed Observed (kph): 10~20 Wind Direction Observed: W Wind speed on Data Logger (kph): 12 Wind Direction on Data Logger: W Wind Direction Pass/Fail?: Pass	November 1, 2023	Previous check date:	November 1, 2023								
Wind speed on Data Logger (kph): 12 Wind Direction on Data Logger: W Wind Direction Pass/Fail?: Pass	10~20	Wind Direction Observed:	w								
Wind Direction Pass/Fail?: Pass	12	Wind Direction on Data Logger:	W								
		Wind Direction Pass/Fail?:	Pass								
Comments											
Comments		Make: RM Young Rotronic MetOne Rotronic RM Young AMBIENT TEMPEF BAROMETRIC PRE millibar millibar millibar 789 - 1068 RELATIVE HUMIDITY (HY S1.60 - 69.81 ANEMOMETER - WIND SPEED D November 1, 2023 10~20 12	December 6, 2023 Kevin Sebastian Peace River Compliance Make: Model: RM Young 52202 Rotronic HC2-S3 MetOne 092 Rotronic HC2-S3 MetOne 092 Rotronic HC2-S3 MetOne 092 Rotronic HC2-S3 MYoung 05305VK AMBIENT TEMPERATURE SENSOR CHECK November 1, 2023 Temperature @ 2 metres F.S. 181341226 expires July 17, 2024 3.0 0.2 BAROMETRIC PRESSURE SENSOR CHECK November 1, 2023 Barunton 05535 Expires July 17, 2024 0.2 Millibar 928 millibar 931 789 - 1068 -0.2 RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK November 1, 2023 F.S. 181341226 expires July 17, 2024 60.70 65.70 51.60 - 69.81 -8.7 ANEMOMETER - WIND SPEED & WIND DIRECTION SENSOR CHECK WIND DIR November 1, 2023 Previous check date: 10°20 Nonder 1, 2023								

No issues.

	Mete	eorological S	ensor Auc	lit/Calibrat	ion		
	_	Loca	ation Information				
Company:	F	RAMP		Performed By:		Chris Wesson	
Audit Location:	PRC (Compliance		Reviewed By:		Limin Li	
Audit Date:	Augu	ust 3, 2023		Start/End Time (mst):		10:40 / 11:32	
Calibration Purpose:	rout	ine annual		Weather Conditions:	Mainh	y cloudy with dri	zzle
		Wind	Sensor Information				
	Sensor ID	Data:			Sensor Outp	uts:	
Sensor Make:		RM Young		Velocity Voltage	Output Range:	0-1	
Sensor Model:		05305VK		Velocity Unit	Output Range:	0-20	00
Serial #:		129612		Direction Voltage	Output Range:	0-1	
Previous Cal/Audit Date:		August 17, 2022		Direction Unit	Output kange:	0-30	50
		Wind C	alibrator Informatio	on			
Calibrator I.I). and Expiry Date: Wind Speed	RM You Audit Data **+/- 2%	ing 18802 id# R9133 of the average co	expires Oct 18, 2024	he limit**	-	
RPM	Wind Spee	d Generated kph	Clockwise W	/ind Speed kph	Counter Clo	ckwise Wind d kob	Correction Factor
0		0		0.1	0	.1	-
1000		18.4	1	18.6	18	0.994	
2000		36.9	3	37.1	3	0.995	
3000		55.3	5	55.5	5	5.4	0.997
4000		73.7	7	74.0	73	3.8	0.998
5000		92.2	ç	92.5	92	2.4	0.997
6000		110.6	1	11.0	11	1.0	0.996
7000		129.0	1	29.6	12	9.6	0.995
8000		147.4	1	48.0	14	8.3	0.995
9000		165.9	1	66.7	16	6.6	0.995
10000		184.3	1	85.3	18	5.3	0.995
		_	The audit meets	AMD requirements.	Average Corr	ection Factor=	0.996
Wind Dire	ction Audit Data	1 **+/- 3° of the abso	lute <u>average deg</u>	rees difference for	all points is t	he 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 Absol Differe	ute Degrees ence
0	355	0	352	0.0	3.0	1.5	;
30	330	31	328	-1.0	2.0	1.5	;
60	300	59	298	1.0	2.0	1.5	;
90	270	90	270	0.0	0.0	0.0)
120	240	120	240	0.0	0.0	0.0)
150	210	151	210	-1.0	0.0	0.5)
180	180	180	180	0.0	0.0	0.0	,
210	130	211	130	-1.0	0.0	0.5	;;
270	90	271	91	-1.0	-1.0	1.0)
300	60	299	59	1.0	1.0	1.0)
330	30	328	29	2.0	1.0	1.5	5
355	0	353	1	2.0	1.0	1.5	5
The audit r	neets AMD require	ments.	A	verage Absolute Degr	ees Difference=	0.8	}
			Comments:				
		Declir Physical inspectio	nation = 15 deg East n completed, bearin	igs replaced			

END OF REPORT

MONITOR	SOP
SULPHUR DIOXIDE (SO₂)	Bureau Veritas EMS SOP-00209: Ambient Sulphur Monitoring
HYDROGEN SULPHIDE (H₂S)	Bureau Veritas EMS SOP-00209: Ambient Sulphur Monitoring
TOTAL REDUCED SULPHUR (TRS)	Bureau Veritas EMS SOP-00209: Ambient Sulphur Monitoring
TOTAL HYDROCARBONS (THC), METHANE (CH4), NON-METHANE(NMHC)	Bureau Veritas EMS SOP-00001: Methane, Non- Methane Hydrocarbon Analyzer Monitoring
OXIDES OF NITROGEN (NOx), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO₂)	Bureau Veritas EMS SOP-00213: Ambient NO/NO₂/NOx Monitoring
OZONE (O3)	Bureau Veritas EMS SOP-00212: Ambient O3 Monitoring
PARTICULATE MATTER < 2.5 MICRONS (PM₂.₅)	Bureau Veritas EMS SOP-00015: Teledyne API PM Monitor Model T640
WIND SPEED (WS) & WIND DIRECTION (WD)	Bureau Veritas EMS SOP-00013: RM Young Wind Monitor Calibration



Peace River Area Monitoring Program

DECEMBER 2023

Monthly Ambient Air Quality Monitoring Integrated Sampling Report

PRAMP-202312-INTEGRATED

January 12, 2024

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Table of Contents

NETWORK STATION SUMMARY	5
Listing of Integrated Sampling Stations	5
Listing of Passives: 1-Month Exposure Sampling Sites	5
List of Contractors who performed the air monitoring activities	5
Monitoring Notes during the Month of December 2023	6
Revisions to Alberta's Ambient Air Quality Data Warehouse	6
Deviations from Authorized Monitoring Methods	6
Certification	7
Map of PRAMP Continuous Monitoring and Integrated Sampling Network	8
INTEGRATED SAMPLING RESULTS SUMMARY	9
ANALYTICAL SAMPLING RESULTS1	0
NMHC Canisters – VOCs1	1
Passives2	0
	-



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January 12, 2024

Alberta Environment and Protected Areas (EPA) 11th Floor, Oxbridge Place 9820 106 Street Edmonton, AB, T5K 2J6

RE: PRAMP –December 2023 Monthly Ambient Air Quality Monitoring Integrated Sampling Report

Enclosed is the December 2023 Monthly Ambient Air Quality Monitoring Integrated Sampling Report for the Peace River Area Monitoring Program's (PRAMP) regional air quality monitoring network. This report summarizes monitoring data for samples collected using integrated methods, including volatile organic compounds (NMHC canister sampling program), hydrogen sulphide, and sulphur dioxide (passive sampling program).

The representative of the Person Responsible for this monitoring program is

PRAMP Airshed Michael Bisaga / Lily Lin, Technical Program Managers Suite 91, 305 – 4625 Varsity Drive NW Calgary, AB, T3A 029 Phone #: 780-226-7068 / 587-225-2248 E-mail: pramptech@prampairshed.ca

This report has been prepared, reviewed and submitted by Michael Bisaga & Lily Lin of the PRAMP Airshed. This report is also submitted on behalf of the industrial member companies to satisfy the requirements of the facility Operating Approvals.

NETWORK STATION SUMMARY

Listing of Integrated Sampling Stations

- 986-C Station
- 842-B Station
- Reno-B Station
- Peace River Complex (PRC) Station

Station Name	986-C	842-B	Reno-B	PRC
Station ID	1562	1561	1563	1698
Coordinates	56.36980, -116.92500	56.27406, -116.98129	55.86936, -117.05739	56.38257, -116.769283
NMHC Canister (VOCs)	V	V	V	
Passives:				
2-Month exposure	V			
(PACs)				
Passives:				
1-Month Exposure				V
(H ₂ S, SO ₂)				

Listing of Passives: 1-Month Exposure Sampling Sites

Site ID	Latitude	Longitude	
1	56.377841	-116.787142	
2	56.378638	-116.780496	
3	56.382958	-116.783813	
4	56.377044	-116.794220	
7	56.384796	-116.780488	
8	56.388710	-116.771234	
9	56.388943	-116.756205	
10	56.388642	-116.797817	
11	56.383771	-116.841165	
12	56.388962	-116.885263	
13	56.390972	-116.822083	
14	56.424825	-116.853181	

List of Contractors who performed the air monitoring activities

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Prepared By	Electronic Submission Conducted By
NMHC Canister (VOCs)	Bureau Veritas	InnoTech Alberta Inc	PRAMP	PRAMP
Passives: PACs	PRAMP	ECCC	AEP	AEP
Passives: H ₂ S, SO ₂	PRAMP	Bureau Veritas	PRAMP	PRAMP

Monitoring Notes during the Month of December 2023

- NMHC Canister Sampling Program Volatile Organic Compounds (VOCs)
 - The canister sampling program collects a 1-hour sample of air when the continuously measured non-methane hydrocarbon (NMHC) concentration reaches a specified trigger point. The current trigger point is 0.3 ppm for non-methane hydrocarbons. The trigger point is based on real-time monitoring data that are averaged over a 5-minute period.
 - There were no valid canister events recorded this month. The canister system was triggered at the 986-C station on December 26 at 03:35due to an analyzer issue. The event is not valid.

• Passive Polycyclic Aromatic Compounds (PACs) Sampling Program

- The PAC sampling program began in December 2019, and is designed to collect a 2-month integrated sample.
- The sample media for sampling period of November and December were installed on October 31. They were removed on December 31.
- The sample media for sampling period of January and February 2024 were installed on December 31. They are scheduled to be removed by the end February.

• Passives H₂S and SO₂ Sampling Program

• The passive sample filters were installed at the stations on December 1 and were removed on December 29.

Revisions to Alberta's Ambient Air Quality Data Warehouse

No revisions to historical data previously submitted to the Alberta's Ambient Air Quality Data Warehouse were made this month.

Deviations from Authorized Monitoring Methods

There were no deviations from authorized monitoring methods.

Certification

The report was prepared and submitted by Lily Lin in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

Lily Lin, Technical Program Manager, PRAMP Airshed

The report was reviewed by Mike Bisaga in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. I also certify that at the time of this report's submission, all air data have been electronically uploaded to Alberta ETS as required by the AMD.

pa.

Michael Bisaga, Technical Program Manager, PRAMP Airshed

January 12, 2024



Map of PRAMP Continuous Monitoring and Integrated Sampling Network

Legend

- PRAMP Boundary Populated Place
- First Nation
- Continuous Monitoring Station
- ▲ Passive Monitoring Station

Industrial Facilities

- In-Situ Oil Sands
- Heavy Oil/Bitumen Well or Battery
- Conventional Oil Well or Battery
- Natural Gas Well or Battery
- Gas Plant or Gas Processing
- Compressor Station or Pipeline
- Agricultural Storage and Transfer
- Pulp and Paper
- Well (Not Associated with Batteries)

Service Layer Credit: Esri, CGIAR, USGS, Esri, USGS



INTEGRATED SAMPLING RESULTS SUMMARY

• NMHC analytical results

No analytical results are attached as there were canister events recorded this month.

• Passive analytical results

	H₂S		SO2	
Minimum (ppb)	0.10	#1	0.2	#1
Maximum (ppb)	0.23	#14	0.5	#2
Average (ppb)	0.15	-	0.31	-
ANALYTICAL SAMPLING RESULTS

NMHC Canisters – VOCs

Passives

End of Report



Peace River Area Monitoring Program

DECEMBER 2023

Ambient Air Monitoring

Certified Laboratory Analysis Report

LAB-PRAMP-202312

Operation and Maintenance: Bureau Veritas Canada

Data Validation and Report: Peace River Area Monitoring Program

January 6, 2024

Table of Contents

NMHC Canister Analytical Results		
Passive Sampling Analytical Results	48	
End of Deport		

NMHC Canister Analytical Results

Passive Sampling Analytical Results

End of Report