

### Station Performance Audit Summary

Company: Palliser Facility Name: Hays  
 Approval No.: N/A Site Name: Rover  
 AENV Region: Southern AENV District: Lethbridge

Parameters audited:

H <sub>2</sub> S	X	SO <sub>2</sub>	X	NO <sub>x</sub>	X	NH <sub>3</sub>		O <sub>3</sub>	X
CO		CH <sub>4</sub>		NonCH <sub>4</sub>		THC		Ethylene	
PM <sub>2.5</sub>		PM <sub>10</sub>		TSP		BTEX		Wind Speed	X
Wind Dir	X	Amb. Temp		Stn. Temp	X	RH		Solar Radiation	
Rainfall		Precip		VWS		Other			
All parameters monitored as per approval: Yes <u>        </u> No <u>        </u> N/A <u>        </u>									

*GENERAL*

Has the location remained unchanged from previous audit?  
 Is site secure?  
 Are station operating conditions adequate?

YES	NO	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*DATA ACQUISITION*

Are strip charts in use?  
 Is a telemetry system for data acquisition in use?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*SYSTEM COMPONENTS*

Is a glass sampling manifold installed?  
 Is sampling manifold clean?  
 Is a manifold trap in place?  
 Are spare manifold ports capped?  
 Is manifold oriented so it is not exactly horizontal?  
 Are manifold ports situated to prevent water entering monitors?  
 Is manifold pump properly installed and operative?  
 Do sample lines extend at least 3/4" into manifold?  
 Are monitor sampling lines connected to manifold?  
 Are sampling lines clean?  
 Are monitors properly mounted and secure?  
 Are monitors properly exhausted from room or scrubbed?  
 Are zero and span systems operational?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*WIND EQUIPMENT*

Is wind sensor properly oriented?  
 Does wind equipment appear to be functioning properly?  
 Date of last calibration.                      Date: Unknown

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

COMMENTS: WD out reads 154 deg visual NNW.

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AUDITOR: Al Clark DATE: September 1, 2011

# NO-NOx-NO2 Analyzer Audit

File No.         Draft        

Date: September 1, 2011 Performed by: Al Clark

**Station:** Name: Rover Location: Hays Operator: AMEC  
Facility/Zone: Palliser Temp. 21.5 C BP: 694 mm/hg

**Monitor:** Make/Model: Teco 42C Serial No. 42C-65449-349  
Inlet flow (sccm): 397 Range ppm: 1.0  
Last cal. Date: Aug 1/11 Old C.F.'s NO: 0.989  
NOx: 0.995  
NO2: 0.999

NO Bkg 5.2  
NOx Bkg 5.6  
NO Coef 1.298  
NOx Coef 0.999  
NO2 Coef 1.000

**Calibration Method:** Gas Dilution / GPT  
**Calibrator:** Make/Model: Sabio 2010 AMU# 1749  
NO cylinder # 3L9007 NO conc. ppm 50.0 NOx conc. ppm 50.1

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
			NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
Air	Gas	Total						
4938	0.00	4938	0.0000	0.0000	0.0000	-0.0001	Limit ± 15%	
4952	79.60	5032	0.7909	0.7925	0.7680	0.7980	-3%	1%
4944	39.70	4984	0.3983	0.3991	0.3850	0.4020	-3%	1%
4951	19.60	4971	0.1971	0.1975	0.1940	0.2020	-2%	2%
Absolute Average Percent Difference							3%	1%

**Linear Regression Analysis:**  $y=mx+b$  (where x=calculated concentration, y=indicated concentration)

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<b>≥ 0.995</b>
m (Slope)=	<u>0.9696</u>	<u>1.0057</u>	<u>0.9954</u>	<b>0.85-1.15</b>
b (Intercept as % of full scale)=	<u>0.0692</u>	<u>0.1216</u>	<u>0.9859</u>	<b>± 3% F.S.</b>

O <sub>3</sub> Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO <sub>2</sub> Increase	% Difference vs Audit Gas	
		NO	NOx	NO <sub>2</sub>				
0.0 V	5032	0.7914	0.8030	0.0011	<del>        </del>	<del>        </del>	<del>        </del>	%Dif Limit
0.8 V	5032	0.3820	0.8000	0.4183	0.4094	0.4172	2%	± 15%
0.5 V	5032	0.5631	0.8020	0.2386	0.2283	0.2375	4%	± 15%
0.25 V	5032	0.7158	0.8020	0.0860	0.0756	0.0849	12%	± 15%
Absolute Average Percent Difference							6%	

**Converter Efficiency**  
Average Converter Efficiency 106.1%

**Remarks:** \_\_\_\_\_  
\_\_\_\_\_

# H<sub>2</sub>S ANALYZER AUDIT

File No. \_\_\_\_\_ Draft

Date: September 1, 2011 Performed by: Al Clark

## Station

Name: Rover Location: Hays  
 Facility/Zone: Palliser Operator: AMEC  
 Temp. 21.5 C Barometric Press. 694 mm/hg

## Monitor

Make/Model: Teco 45A Serial No: 45A-21122-195  
 Inlet flow (sccm): 600 Full Scale Range ppm: 0.2  
 Last cal. Date: Aug 1/11 Old C.F. 1.0054  
 Zero/Bkg 137  
 Span Coef 195

## Calibrator

Calibration Method: GAS DILUTION  
 Make/Model: R&R MFC 201 AMU #: 1691  
 Cylinder #: CAL011014 H<sub>2</sub>S Concentration PPM: 9.5

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
5069	0.0	5069	0.0000	-0.0015		
3987	51.9	4039	0.1221	0.1061	-12%	± 15%
4018	22.0	4040	0.0517	0.0464	-7%	± 15%
3977	9.0	3986	0.0215	0.0180	-9%	± 15%
Absolute Average Percent Difference					9%	

## Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 0.9997  
 m (Slope)= 0.8803  
 b (Intercept as % of full scale)= -0.3610

**LIMITS**  
 ≥ **0.995**  
**0.85-1.15**  
 ± **3% F.S.**

## Remarks:

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# SO<sub>2</sub> ANALYZER AUDIT

File No. \_\_\_\_\_ Draft

Date: September 1, 2011 Performed by: Al Clark

## Station

Name: Rover Location: Hays  
 Facility/Zone: Palliser Operator: AMEC  
 Temp. 21.5 C Barometric Press. 694 mm/hg

## Monitor

Make/Model: Teco 43CTL Serial No: 43CTL-74200-376  
 Inlet flow (sccm): 628 Full Scale Range ppm: 0.5  
 Last cal. Date: Aug 1/11 Old C.F. 1.0113  
 Zero/Bkg 2.43  
 Span Coef 1.051

## Calibrator

Calibration Method: GAS DILUTION  
 Make/Model: R&R MFC 201 AMU #: 1691  
 Cylinder #: CLM004813 SO<sub>2</sub> Concentration PPM: 50.3

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
5069	0.0	5069	0.0000	-0.0002		
4007	32.2	4039	0.4010	0.3884	-3%	± 15%
4023	17.4	4040	0.2166	0.2086	-4%	± 15%
3978	8.2	3986	0.1035	0.0971	-6%	± 15%
Absolute Average Percent Difference					4%	

### Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.= 1.0000  
 m (Slope)= 0.9712  
 b (Intercept as % of full scale)= -0.3220

**LIMITS**  
 ≥ **0.995**  
**0.85-1.15**  
 ± **3% F.S.**

### Remarks:

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# STATION AUDIT

File No.                      Draft                     

Date: September 1, 2011

Performed by:                      Al Clark                     

## Station

Name:                      Rover                     

Location:                      Hays                     

Facility/Zone:                      Palliser                     

Operator:                      AMEC                     

Temp:                      21.5 C                     

Barometric Press:                      694 mm/hg                     

## Location

Latitude N                      50° 05' 46.7"                     

Longitude W                      111° 47' 53.0"                     

Elevation                      781m                     

Status of Site Documentation                      On site - complete                     

Manifold Material                      Glass                       
Manifold Condition                      Good                     

## Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>                    </u> 3.2 kph / 154 deg <u>                    </u>	<u>                    </u> 5-10 kph / NNW <u>                    </u>
Station Temperature	<u>                    </u> 23.12 C <u>                    </u>	<u>                    </u> 22.67 C <u>                    </u>
Relative Humidity	<u>                    </u> N/A <u>                    </u>	<u>                    </u> N/A <u>                    </u>
Ambient Temperature	<u>                    </u> N/A <u>                    </u>	<u>                    </u> N/A <u>                    </u>
Solar Radiation	<u>                    </u> N/A <u>                    </u>	<u>                    </u> N/A <u>                    </u>
Precipitation	<u>                    </u> N/A <u>                    </u>	<u>                    </u> N/A <u>                    </u>

## Remarks:

                     Program set to 540 FS not 360 FS for WD. WS program OK.

# O<sub>3</sub> ANALYZER AUDIT

File No.                      Draft

Date: September 1, 2011 Performed by:                      Al Clark

## Station

Name:                      Rover Location:                      Hays  
Facility/Zone:                      Palliser Operator:                      AMEC  
Temp.                      22.0 C Barometric Press.                      693 mm/hg

## Monitor

Make/Model:                      Teco 49C Serial No:                      49C-57337-312  
Inlet flow (sccm):                      614 / 542 Full Scale Range ppm:                      0.5  
Last cal. Date:                      Aug 1/11 Old C.F.                      1.0037  
  
Zero/Bkg                      0.5  
Span Coeff.                      1.097

## Calibrator

Calibration Method:                      Gas Dilution / GPT  
Make/Model:                      Sabio 2010 AMU # :                      1749  
NO cylinder # :                      N/A NO concentration ppm:                      N/A

Ozone Setting	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0.0 V	4977	<del>                    </del>	4977	0.000	0.000		
0.8 V	4977	<del>                    </del>	4977	0.424	0.407	-4%	± 15%
0.5 V	4977	<del>                    </del>	4977	0.235	0.226	-4%	± 15%
0.25 V	4977	<del>                    </del>	4977	0.078	0.075	-4%	± 15%
Absolute Average Percent Difference						4%	

### Linear Regression Analysis:

$y=mx+b$  (where  $x$ =calculated concentration,  $y$ =indicated concentration)

Correlation Coeff.=                      1.0000  
m (Slope)=                      0.9600  
b (Intercept as % of full scale)=                      0.0247

**LIMITS**  
≥ **0.995**  
**0.85-1.15**  
± **3% F.S.**

### Remarks:

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