

**Gas Analysis**

Lot Number: **1045631**  
Report Number: 1977602  
Reference Sample ID: 4965056

Meter # / Sample ID: Clariant (Canada) INC dba Prairie Petro Chem Operator: \_\_\_\_\_ Container Identity: EX12415/MLFx2

Location: 03-23-012-27 Well Name: Tundra 3-23-12-27 Battery Well License No. \_\_\_\_\_ KB Elev, m \_\_\_\_\_ GR Elev, m \_\_\_\_\_

Field/Area: \_\_\_\_\_ Formation: \_\_\_\_\_ Pool: \_\_\_\_\_ Surface Location: \_\_\_\_\_

Test Type: No Sampler: P. Meikle Company: Clariant INC Sampling Method: \_\_\_\_\_

Multiple Recovery: n/a Sample Point: Gas leg on Separator Other Information: \_\_\_\_\_

Test Interval, m	Test Recovery:					
	Type of Production:	Pumping	Flowing	Gas Lift	Swab	
Perforations, m	Production Rates:	Water	m <sup>3</sup> /d	Oil	m <sup>3</sup> /d	Gas 10 <sup>3</sup> m <sup>3</sup> /d
	Gauge Pressure, kPa	250		Other ID	Schematic ID	
	Temperature, °C	22		Other		
	Source	Sampled	Received			

Date Sampled (Y-M-D): 2014-12-11 Time Sampled: \_\_\_\_\_ Date Received (Y-M-D): 2014-12-17 Date Reported (Y-M-D): 2014-12-23 Date On: \_\_\_\_\_ Date Off: \_\_\_\_\_

Comp.	Mole Fraction		Petroleum Liquid Content mL/m <sup>3</sup>	Gross Heating Value, MJ/m <sup>3</sup>			Pseudocritical Properties		
	As Received	Acid Gas Free		AGA #5 As Received	AGA #5 Acid Gas Free	GPA 2172 As Received	Pressure, kPa	Temperature, K	
H2	0.0059	0.0070		39.44	45.25	39.45	4562	251.4	
He	0.0033	0.0042		<b>Density Ideal Gas (AGA #5)</b>			<b>Density Real Gas (GPA 2172)</b>		
N2	0.3718	0.4415		Absolute, kg/m <sup>3</sup>		Relative	Absolute, kg/m <sup>3</sup> Relative		
CO2	0.1025	0.0000		1.457		1.190	1.464 1.195		
H2S	0.0556	0.0000		<b>Relative Molecular Mass</b>			<b>Mole Fraction C7+ Vapour Pressure Pentanes Plus, kPa</b>		
C1	0.0703	0.0835		<b>Total Gas</b>		<b>C7+</b>	0.0027 94		
C2	0.1728	0.2052	614.1	<b>C7+ Fraction As Gas</b>			<b>C7+ Density Liquid</b>		
C3	0.1350	0.1603	496.1	Relative Density		GHV (MJ/m <sup>3</sup> )	Relative kg/m <sup>3</sup>		
iC4	0.0239	0.0284	104.4	3.567		217.74	0.693 692		
nC4	0.0344	0.0408	144.7	<b>Hydrogen Sulfide</b>			<b>Compressibility Z</b>		
iC5	0.0104	0.0123	50.8	g/m <sup>3</sup>			AGA #5 GPA #2172		
nC5	0.0049	0.0058	23.7	80.13			0.99508 0.99471		
C6	0.0065	0.0078	35.7	<b>Hydrogen Sulfide</b>					
C7	0.0022	0.0026	13.6	ppm (mol/mol)		Method	Field Value (ppm) Field Method		
C8	0.0004	0.0005	2.7	55600		Chromatography TCD			
C9	0.0001	0.0001	0.8						
C10+	Trace	Trace	0.0						
Total	1.0000	1.0000	1486.6						

Approved by: *S Montgomery*

Sara Montgomery, B.Sc  
Quality Officer

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).  
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Note: Physical constants used in calculations from GPA Standard 2145-09. Gas properties calculated on air and moisture free basis with reference conditions 101.325 kPa and 15 °C.

## Methodology and Notes

Bill To: Clariant (Canada) INC dba	Project:	Lot ID: <b>1045631</b>
Report To: Clariant (Canada) INC dba	ID:	Control Number:
738 - 6 Street	Name: Tundra 3-23-12-27 Battery	Date Received: Dec 17, 2014
Estevan, SK, Canada	Location:	Date Reported: Dec 23, 2014
S4A 1A4	LSD: 03-23-012-27	Report Number: 1977602
Attn: Clinton Lund	P.O.:	
Sampled By: P. Meikle	Acct code:	
Company: Clariant INC		

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## Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Natural Gas - C7/10 Composition	GPA	* Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography, 2261-00	23-Dec-14	Exova Edmonton
Natural Gas - C7/10 Composition	GPA	Calculation of Gross Heating Value, Relative Density and Compressibility Factor for Natural Gas Mixtures from Compositional Analysis, 2172-09	23-Dec-14	Exova Edmonton

*\* Reference Method Modified*

## References

GPA Gas Processors Association

## Comments:

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

## Report Transmission Cover Page

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Contact & Affiliation	Address	Delivery Commitments
Accounts Payable Clariant (Canada) INC dba Prairie	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (306) 634-5808 Fax: (306) 634-6694 Email: ppc.payables@clariant.com	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Clinton Lund Clariant (Canada) INC dba Prairie	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (306) 634-5808 Fax: (306) 634-6694 Email: clinton.lund@clariant.com	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

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