

**Gas Analysis**

Lot Number: **1185328**  
Report Number: 2166985  
Reference Sample ID: 5639983

Meter # / Sample ID		Operator		Container Identity	
Clariant (Canada) INC				EX00730	
Location		Well Name		Well License No. KB Elev, m GR Elev, m	
Tundra Oil & Gas 04-10/01-10-013-28					
Field/Area		Formation		Pool	
Kent Doole					
Test Type		Sampler		Company	
No					
Multiple Recovery		Sample Point		Other Information	
n/a		Wellhead Casing			

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	80			Other ID	Schematic ID
Temperature, °C	22			Other		
Source	Sampled	Received				

2017-02-02	2017-02-08	2017-02-09		
Date Sampled (Y-M-D)	Time Sampled	Date Received (Y-M-D)	Date Reported (Y-M-D)	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	0.0056	0.0058		25.73	26.80	25.73	3678	195.6	
He	0.0060	0.0063		<b>Density Ideal Gas (AGA #5)</b>			<b>Density Real Gas (GPA 2172)</b>		
N2	0.7070	0.7357		<b>Absolute, kg/m<sup>3</sup></b>		<b>Relative</b>	<b>Absolute, kg/m<sup>3</sup></b>		
CO2	0.0392	0.0000		1.425	1.163		1.428	1.166	
H2S	0.0000	0.0000		<b>Relative Molecular Mass</b>			<b>Mole Fraction C7+ Vapour Pressure</b>		
C1	0.0015	0.0015		<b>Total Gas</b>		<b>C7+</b>	<b>Pentanes Plus, kPa</b>		
C2	0.0081	0.0085	28.8	33.69 114.23			0.0015	104	
C3	0.1356	0.1412	498.3	<b>C7+ Fraction As Gas</b>			<b>C7+ Density Liquid</b>		
iC4	0.0345	0.0359	150.6	<b>Relative Density</b>		<b>GHV (MJ/m<sup>3</sup>)</b>	Relative	kg/m <sup>3</sup>	
nC4	0.0512	0.0533	215.4	3.944		240.49	0.707	706	
iC5	0.0049	0.0051	23.9	<b>Hydrogen Sulfide</b>			<b>Compressibility Z</b>		
nC5	0.0039	0.0041	18.9	g/m <sup>3</sup>			AGA #5	GPA #2172	
C6	0.0010	0.0010	5.5	0.00			0.99725	0.99731	
C7+	0.0015	0.0016	10.2	<b>Hydrogen Sulfide</b>					
Total	1.0000	1.0000	951.6	ppm (mol/mol)	Method		Field Value (ppm)	Field Method	
				<100	Chromatography TCD				

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	Project:	Lot ID: <b>1185328</b>
Report To: Clariant (Canada) INC	ID:	Control Number:
738 - 6 Street	Name: Tundra Oil & Gas	Date Received: Feb 8, 2017
Estevan, SK, Canada	Location:	Date Reported: Feb 9, 2017
S4A 1A4	LSD: 04-10/01-10-013-28	Report Number: 2166985
Attn: Brandyn Sinclair	P.O.: 4504609869	
Sampled By: Kent Doole	Acct code:	
Company:		

---

## 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, 2261-13	08-Feb-17	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	08-Feb-17	Exova Edmonton
Natural Gas - C7/10 Composition	GPA	Method for the Extended Analysis for Natural Gas and Similar Gaseous Mixtures by Temperature Program Gas Chromatography, 2286-14	08-Feb-17	Exova Edmonton

## 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

Bill To: Clariant (Canada) INC	Project:	Lot ID: <b>1185328</b>
Report To: Clariant (Canada) INC	ID:	Control Number:
738 - 6 Street	Name: Tundra Oil & Gas	Date Received: Feb 8, 2017
Estevan, SK, Canada	Location:	Date Reported: Feb 9, 2017
S4A 1A4	LSD: 04-10/01-10-013-28	Report Number: 2166985
Attn: Brandyn Sinclair	P.O.: 4504609869	
Sampled By: Kent Doole	Acct code:	
Company:		

Contact & Affiliation	Address	Delivery Commitments
Accounts Payable Clariant (Canada) INC	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (306) 634-5808 Fax: (306) 634-6694 Email: ca.payables@clariant.com	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Brandyn Sinclair Clariant (Canada) INC	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (306) 471-7574 Fax: (306) 634-6694 Email: brandyn.sinclair@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
Craig Fox Clariant (Canada) Inc.	Virden, Manitoba Phone: (204) 851-6042 Fax: (555) 555-5555 Email: craig.fox@clariant.com	On [Report Approval] send (Test Report, COC) by Email - Merge Reports

### Notes To Clients:

The information contained on this and all other pages transmitted, is intended for the addressee only and is considered confidential. If the reader is not the intended recipient, you are hereby notified that any use, dissemination, distribution or copy of this transmission is strictly prohibited. If you receive this transmission by error, or if this transmission is not satisfactory, please notify us by telephone.

No Chain of Custody Available.