



Certificate of Analysis

Number: 2500-16060005-004A

Windsor Laboratory
208 Main Street – Unit A
Windsor, CO 80550

Amanda Graves
Sandridge
123 Robert Skerr Ave.
Oklahoma City, OK 73102

June 20, 2016

Station Name: Hebron
Station Number: 0780 4-7H
Sample Point: Flowback Separator
Cylinder No: 4030-003826
Analyzed: 06/17/2016 12:02:39 by AH

Sampled By: Bob Burns
Sample Of: Gas Spot
Sample Date: 06/15/2016
Sample Conditions: 43 psig, @ 96 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia		
Nitrogen	2.146	2.318		GPM TOTAL C2+	8.105
Carbon Dioxide	2.200	3.734		GPM TOTAL C3+	5.666
Methane	66.282	41.009		GPM TOTAL iC5+	0.748
Ethane	9.094	10.546	2.439		
Propane	10.956	18.632	3.027		
Iso-butane	1.429	3.203	0.469		
n-Butane	4.498	10.082	1.422		
Iso-pentane	1.000	2.782	0.367		
n-Pentane	1.049	2.919	0.381		
Hexanes Plus	1.346	4.775	NIL		
	100.000	100.000	8.105		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.8997	3.1590
Calculated Molecular Weight	25.93	91.49
Compressibility Factor	0.9945	

GPA 2172-09 Calculation:

Calculated Gross BTU per ft³ @ 14.696 psia & 60°F

Real Gas Dry BTU	1456	4950
Water Sat. Gas Base BTU	1431	4864

Comments: H₂O Mol% : 1.744 ; Wt% : 1.218
H₂S 0 ppm

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.



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Components	Mol. %	Wt. %	GPM at 14.696 psia		
Nitrogen	2.146	2.318		GPM TOTAL C2+	8.348
Carbon Dioxide	2.200	3.734		GPM TOTAL C3+	5.909
Methane	66.282	41.009		GPM TOTAL iC5+	0.991
Ethane	9.094	10.546	2.439		
Propane	10.956	18.632	3.027		
Iso-Butane	1.429	3.203	0.469		
n-Butane	4.498	10.082	1.422		
Iso-Pentane	1.000	2.782	0.367		
n-Pentane	1.049	2.919	0.381		
Hexanes	0.602	1.975	0.243		
Heptanes Plus	0.744	2.800	NIL		
	100.000	100.000	8.348		

Calculated Physical Properties	Total	C7+
Relative Density Real Gas	0.8997	3.3473
Calculated Molecular Weight	25.93	96.94
Compressibility Factor	0.9945	

GPA 2172-09 Calculation:

Calculated Gross BTU per ft³ @ 14.696 psia & 60°F

Real Gas Dry BTU	1456	5181
Water Sat. Gas Base BTU	1431	5091

Comments: H₂O Mol% : 1.744 ; Wt% : 1.218
H₂S 0 ppm

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Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	2.146	2.318	
Carbon Dioxide	2.200	3.734	
Methane	66.282	41.009	
Ethane	9.094	10.546	2.439
Propane	10.956	18.632	3.027
Iso-Butane	1.429	3.203	0.469
n-Butane	4.498	10.082	1.422
Iso-Pentane	1.000	2.782	0.367
n-Pentane	1.049	2.919	0.381
i-Hexanes	0.383	1.246	0.153
n-Hexane	0.219	0.729	0.090
Benzene	0.016	0.049	0.005
Cyclohexane	0.061	0.196	0.021
i-Heptanes	0.366	1.292	0.144
n-Heptane	0.061	0.233	0.028
Toluene	0.017	0.060	0.006
i-Octanes	0.155	0.633	0.070
n-Octane	0.019	0.084	0.010
Ethylbenzene	0.004	0.016	0.001
Xylenes	0.009	0.026	0.003
i-Nonanes	0.028	0.145	0.014
n-Nonane	0.004	0.016	0.002
Decane Plus	0.004	0.050	NIL
	100.000	100.000	8.652

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	25.93	137.36
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1456.0	7216.6
Water Sat. Gas Base BTU	1430.6	7090.7
Relative Density Real Gas	0.8997	4.7405
Compressibility Factor	0.9945	

Comments: H2S 0 ppm

Hydrocarbon Laboratory Manager

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