



Certificate of Analysis
 Number: 2500-20120188-005A

Greeley Laboratory
 2881 S. 31st Ave
 Unit 6-8
 Greeley, CO 80631

Whiting Petroleum Corporation
 Tyler Gray
 1700 Lincoln Street
 Suite 4700
 Denver, CO 80290

Dec. 21, 2020

Field: Redtail
 Station Name: Wild Horse 04-0424H
 Station Number: RTP0040
 Station Location: WH 04-0424H
 Sample Point: Meter Run
 Analyzed: 12/17/2020 10:02:53 by RHJ

Sampled By: DK Jones
 Sample Of: Gas Spot
 Sample Date: 12/14/2020 15:15
 Sample Conditions: 44.7 psig, @ 36.9 °F
 Method: GPA 2286
 Cylinder No: 2500-00134

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia		
Hydrogen Sulfide	0.001	0.001		GPM TOTAL C2+	9.155
Nitrogen	0.982	1.052		GPM TOTAL C3+	6.115
Carbon Dioxide	2.851	4.797		GPM TOTAL iC5+	1.416
Methane	64.994	39.860			
Ethane	11.307	12.998	3.040		
Propane	10.304	17.371	2.854		
Iso-butane	1.189	2.642	0.391		
n-Butane	4.587	10.193	1.454		
Iso-pentane	1.067	2.943	0.392		
n-Pentane	1.524	4.204	0.555		
Hexanes Plus	1.194	3.939	0.469		
	100.000	100.000	9.155		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9079	2.9835
Calculated Molecular Weight	26.16	86.41
Compressibility Factor	0.9944	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1476	4694
Water Sat. Gas Base BTU	1450	4613

Comments: H2S Field Content 12 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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Hydrogen Sulfide	0.001	0.001		GPM TOTAL C2+	9.155
Nitrogen	0.982	1.052		GPM TOTAL C3+	6.115
Carbon Dioxide	2.851	4.797		GPM TOTAL iC5+	1.416
Methane	64.994	39.860			
Ethane	11.307	12.998	3.040		
Propane	10.304	17.371	2.854		
Iso-Butane	1.189	2.642	0.391		
n-Butane	4.587	10.193	1.454		
Iso-Pentane	1.067	2.943	0.392		
n-Pentane	1.524	4.204	0.555		
Hexanes	0.768	2.476	0.309		
Heptanes Plus	0.426	1.463	0.160		
	100.000	100.000	9.155		

Calculated Physical Properties	Total	C7+
Relative Density Real Gas	0.9079	3.0994
Calculated Molecular Weight	26.16	89.77
Compressibility Factor	0.9944	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1476	4754
Water Sat. Gas Base BTU	1450	4671

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 Cylinder No: 2500-00134

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Hydrogen Sulfide	0.001	0.001	
Nitrogen	0.982	1.052	
Carbon Dioxide	2.851	4.797	
Methane	64.994	39.860	
Ethane	11.307	12.998	3.040
Propane	10.304	17.371	2.854
Iso-Butane	1.189	2.642	0.391
n-Butane	4.587	10.193	1.454
Iso-Pentane	1.067	2.943	0.392
n-Pentane	1.524	4.204	0.555
Hexanes	0.768	2.476	0.309
Heptanes	0.364	1.214	0.133
Octanes	0.054	0.215	0.023
Nonanes	0.007	0.025	0.003
Decane Plus	0.001	0.009	0.001
	<u>100.000</u>	<u>100.000</u>	<u>9.155</u>

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	26.16	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1475.5	7804.5
Water Sat. Gas Base BTU	1449.8	7625.7
Relative Density Real Gas	0.9079	4.9126
Compressibility Factor	0.9944	

Comments: H2S Field Content 12 ppm

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