

December 28, 2015

Executive Secretary  
North Dakota Public Service Commission  
State Capitol Building  
Bismarck, ND 58505-0480

Re: Case No. 11,006 (Therm Billing)  
Monthly Report – October 2015

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc., herewith submits the following information, pursuant to the Ordering paragraphs one and two of the Order issued in the above-referenced docket, dated October 20, 1987 and pursuant to the North Dakota Administrative Code 69-09-01-02, part 2.

1. Attachment A is a schedule showing the thermal billing factors by community that reflect the BTU values shown on Attachment B and were used for billing purposes in November 2015.
2. Attachment B consists of copies of the monthly Heating Value Test Reports received from our suppliers for the month of October 2015.
3. Attachment C is a listing which states the type of measuring device in place at each zone.
4. Attachment D is a monthly list of the heating value data, by zone, for the most recent 12-month period and an average thereof. It is being provided pursuant to a Staff request.
5. Attachment E provides a brief explanation of the thermal variances, where applicable, for the month of October 2015.

Please acknowledge receipt by stamping or initialing the duplicate copy of this letter attached hereto and returning the same in the enclosed self-addressed, stamped envelope. Should the Commission or its Staff have any comments or questions with respect to these reports, please call me.

Sincerely,



Tamie Aberle  
Director of Regulatory Affairs

**Montana-Dakota Utilities Co.**  
**Therm Billing Factors - North Dakota**  
**November 2015**

Town	Heat Zone	Therm Factor
MDU-303-ALEXANDER	025	1.1485
MDU-308-ARNEGARD	025	1.1485
MDU-314-APPLE VALLEY	271	1.1569
MDU-318-BEACH	032	1.0350
MDU-319-BELFIELD	032	1.0426
MDU-323-BERTHOLD	262	1.1315
MDU-327-BISMARCK	028	1.1540
MDU-330-BOWMAN	034	0.9944
MDU-337-BURLINGTON	262	1.1559
MDU-343-CARRINGTON	273	1.1549
MDU-344-CLEVELAND	272	1.1468
MDU-364-CAVALIER	273	1.1793
MDU-365-DAWSON	271	1.1487
MDU-368-DES LACS	262	1.1396
MDU-369-DICKINSON	031	1.0887
MDU-374-FT TOTTEN	273	1.1631
MDU-375-DEVILS LAKE	273	1.1631
MDU-379-BARLOW	273	1.1549
MDU-384-EPPING	264	1.0975
MDU-387-ELDRIDGE	272	1.1549
MDU-407-GLADSTONE	031	1.0887
MDU-411-GLEN ULLIN	311	1.1136
MDU-413-GOLVA	032	1.0198
MDU-416-GARRISON	262	1.1396
MDU-417-GRAFTON	273	1.1875
MDU-421-HALLIDAY	031	1.0887
MDU-429-HEBRON	311	1.1136
MDU-432-HETTINGER	903	2.3875
MDU-449-JAMESTOWN	272	1.1631
MDU-459-KILLDEER	033	1.1202
MDU-463-LANGDON	273	1.1549
MDU-469-LEFOR	031	1.0887
MDU-474-LIGNITE	263	1.0578
MDU-475-LINTON	802	1.0266
MDU-478-LINCOLN	028	1.1540
MDU-488-MCKENZIE	271	1.1569
MDU-494-MEDINA	271	1.1487
MDU-498-MANDAN	028	1.1540
MDU-500-MARMARTH	034	1.0018
MDU-505-MINOT	262	1.5371
MDU-510-MOTT	031	1.0887
MDU-512-MAX	262	1.1588
MDU-522-NEW ENGLAND	031	1.0808
MDU-524-NEW SALEM	028	1.1296
MDU-532-NEW ROCKFORD	273	1.1549
MDU-539-PARK RIVER	273	1.1793
MDU-540-PALERMO	262	1.1315
MDU-558-RAY	264	1.0975
MDU-561-REGENT	031	1.0887

MDU-563-RHAME	034	0.9870
MDU-564-RICHARDTON	311	1.0976
MDU-568-ROSS	261	0.9377
MDU-572-RUTHVILLE	262	1.1559
MDU-574-SANBORN	272	1.1631
MDU-583-SENTINEL BUTTE	032	1.0350
MDU-588-SOUTH HEART	031	1.0808
MDU-717-SPIRITWOOD	272	1.1631
MDU-590-SPRINGBROOK	264	1.0900
MDU-591-STANLEY	261	0.9445
MDU-593-STEELE	271	1.1487
MDU-598-SHEYENNE	273	1.1631
MDU-605-SURREY	262	1.1559
MDU-610-TAPPEN	271	1.1487
MDU-611-TAYLOR	031	1.0808
MDU-616-TIOGA	261	0.9377
MDU-619-TURTLE LAKE	262	1.1396
MDU-620-TRENTON	024	1.1197
MDU-624-UNDERWOOD	262	1.1396
MDU-625-VALLEY CITY	272	1.1712
MDU-629-WALHALLA	273	1.1793
MDU-632-WATFORD CITY	610	1.1438
MDU-636-WHEELOCK	264	1.0821
MDU-637-WHITE EARTH	261	0.9445
MDU-642-WILLISTON	024	1.1197
MDU-646-WASHBURN	262	1.1478
MDU-647-WILTON	262	1.1315
MDU-664-RIVERDALE	262	1.1425
MDU-691-FAIRVIEW	241	1.1244
MDU-712-MINOT AFB	262	1.1559
MDU-718-FAIRMOUNT	600	1.1238
MDU-732-NEKOMA	273	1.1549
MDU-732-MSR SITE	273	1.1549



# GQ Source Analysis

<b>GQ Source Number:</b>	0602330	<b>Specific Gravity:</b>	0.6997
<b>GQ Source Name:</b>	WILLISTON BORDER	<b>Dry Heat Value:</b>	1177.45
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1156.96
<b>Effective End Date:</b>	1/18/2038 9:14:07 PM	<b>As Deliv. Heat Value:</b>	1177.45
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	330.00
<b>Viscosity:</b>		<b>Sample Temperature:</b>	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	73.629		CO2	Carbon Dioxide	0.826
C2	Ethane	20.196	5.3851	N2	Nitrogen	2.585
C3	Propane	2.391	0.6568	O2	Oxygen	0.000
IC4	Isobutane	0.100	0.0326	He	Helium	
NC4	n-Butane	0.223	0.0703	H2	Hydrogen	
IC5	Isopentane	0.021	0.0075	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.026	0.0094	Ar	Argon	
C6	Hexanes	0.004	0.0020	CO	Carbon Monoxide	
C7	Heptanes			H2O	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

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**Totals**      100.000%      6.164 GPM

**Sample Date:** 11/2/2015 12:00:00 AM  
**Sample Type:** Composite  
**Sample Tech:** Eric S.  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:** MB

**Analysis Remarks:**

Zone 24

# GQ Source Analysis

<b>GQ Source Number:</b>	0602160	<b>Specific Gravity:</b>	0.7260
<b>GQ Source Name:</b>	FAIRVIEW BORDER	<b>Dry Heat Value:</b>	1182.07
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1161.50
<b>Effective End Date:</b>	1/18/2038 9:14:07 PM	<b>As Deliv. Heat Value:</b>	1182.07
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	327.00
<b>Viscosity:</b>		<b>Sample Temperature:</b>	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	69.936		CO2	Carbon Dioxide	1.354
C2	Ethane	20.546	0.0000	N2	Nitrogen	3.960
C3	Propane	3.804	1.0450	O2	Oxygen	0.012
IC4	Isobutane	0.129	0.0422	He	Helium	
NC4	n-Butane	0.232	0.0730	H2	Hydrogen	
IC5	Isopentane	0.014	0.0053	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.012	0.0045	Ar	Argon	
C6	Hexanes	0.000	0.0000	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

**Totals**      100.000%      1.170 GPM

**Sample Date:** 11/2/2015 12:00:00 AM  
**Sample Type:** Composite  
**Sample Tech:** Rocky R.  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:** MB

**Analysis Remarks:**

Zone 241

# GQ Source Analysis

<b>GQ Source Number:</b>	0602230	<b>Specific Gravity:</b>	0.7304
<b>GQ Source Name:</b>	WATFORD CITY BORDER	<b>Dry Heat Value:</b>	1215.71
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1194.55
<b>Effective End Date:</b>	1/18/2038 9:14:07 PM	<b>As Deliv. Heat Value:</b>	1215.71
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	337.00
<b>Viscosity:</b>		<b>Sample Temperature:</b>	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	70.989		CO2	Carbon Dioxide	1.003
C2	Ethane	19.452	5.1868	N2	Nitrogen	2.874
C3	Propane	4.684	1.2868	O2	Oxygen	0.009
IC4	Isobutane	0.284	0.0926	He	Helium	
NC4	n-Butane	0.602	0.1892	H2	Hydrogen	
IC5	Isopentane	0.050	0.0181	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.050	0.0179	Ar	Argon	
C6	Hexanes	0.003	0.0014	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

**Totals**      100.000%      6.793 GPM

**Sample Date:** 11/2/2015 12:00:00 AM  
**Sample Type:** Composite  
**Sample Tech:** Eric S.  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:** MB  
**Analysis Remarks:**

Zone 25

## GQ Source Daily Summary

October 2015

**Number:** 163

**Pressure Base:** 14.730

**Contract Day:** 1

**Name:** NORTH TIOGA TRANSFER-PALERMO BORDER LI

**Temperature Base:**

**Contract Hour:** 9

Day	Relative Density	Heating Value Wet	Heating Value Dry																	Wobbe	CCT
				CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10				
1	0.6075	1011.1	1029.0	0.001	4.094	88.756	6.967	0.177	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1320.24		
2	0.6110	1016.2	1034.2	0.031	4.071	88.169	7.458	0.256	0.005	0.009	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1323.04		
3	0.6091	1012.7	1030.6	0.013	4.132	88.468	7.169	0.208	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1320.57		
4	0.6143	1020.2	1038.2	0.062	4.091	87.644	7.818	0.357	0.009	0.017	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1324.61		
5	0.6178	1025.8	1044.0	0.088	4.037	87.116	8.244	0.464	0.015	0.031	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1328.16		
6	0.6069	1011.2	1029.1	0.001	4.038	88.873	6.902	0.181	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1320.98		
7	0.5936	987.0	1004.5	0.001	4.262	91.535	4.060	0.130	0.004	0.007	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1303.60		
8	0.5787	960.1	977.1	0.000	4.488	94.484	0.970	0.046	0.003	0.007	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1284.54		
9	0.5740	950.2	967.0	0.000	4.658	95.342	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1276.37		
10	0.5807	963.9	980.9	0.000	4.457	94.098	1.360	0.069	0.004	0.009	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1287.22		
11	0.5807	963.9	980.9	0.000	4.457	94.098	1.360	0.069	0.004	0.009	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1287.22		
12	0.5807	963.9	980.9	0.000	4.457	94.098	1.360	0.069	0.004	0.009	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1287.22		
13	0.5807	963.9	980.9	0.000	4.457	94.098	1.360	0.069	0.004	0.009	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1287.22		
14	0.5807	963.9	980.9	0.000	4.457	94.098	1.360	0.069	0.004	0.009	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1287.22		
15	0.5810	964.8	981.9	0.001	4.422	94.117	1.315	0.119	0.007	0.016	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1288.17		
16	0.5823	967.9	985.0	0.002	4.353	93.910	1.555	0.148	0.009	0.020	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1290.88		
17	0.5820	967.5	984.6	0.001	4.348	93.966	1.510	0.143	0.009	0.020	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1290.70		
18	0.5833	969.7	986.9	0.008	4.332	93.728	1.725	0.171	0.010	0.023	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1292.17		
19	0.5818	967.5	984.6	0.002	4.327	93.999	1.510	0.132	0.008	0.019	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1290.94		
20	0.5932	982.6	1000.0	0.072	4.372	92.072	3.041	0.362	0.020	0.050	0.005	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1298.36		
21	0.5882	975.0	992.2	0.049	4.407	92.904	2.333	0.245	0.014	0.038	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1293.66		
22	0.5845	969.3	986.5	0.028	4.442	93.432	1.935	0.137	0.007	0.016	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1290.23		
23	0.5898	977.8	995.1	0.061	4.373	92.519	2.770	0.238	0.010	0.024	0.002	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1295.65		
24	0.5963	988.4	1005.9	0.068	4.325	91.243	4.051	0.267	0.012	0.028	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1302.51		
25	0.5952	986.5	1004.0	0.100	4.285	91.640	3.551	0.368	0.015	0.035	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1301.32		
26	0.5958	987.5	1005.0	0.101	4.272	91.600	3.556	0.398	0.018	0.043	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1302.07		
27	0.5943	985.9	1003.4	0.094	4.241	91.821	3.434	0.353	0.014	0.035	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1301.58		
28	0.6034	999.2	1016.9	0.153	4.201	90.192	4.878	0.504	0.019	0.044	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1309.09		
29	0.5931	983.9	1001.3	0.065	4.301	92.068	3.119	0.379	0.018	0.042	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1300.14		
30	0.5842	972.4	989.6	0.011	4.250	93.636	1.831	0.227	0.013	0.029	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1294.68		
31	0.6029	999.8	1017.5	0.130	4.152	90.349	4.725	0.562	0.022	0.051	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1310.38		
Avg	0.5919	983.0	1000.0	0.037	4.308	92.067	3.330	0.223	0.009	0.021	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1299.70		

Zone 261

### GQ Source Daily Summary

October 2015

Number: 091 Pressure Base: 14.730 Contract Day: 1  
 Name: MINOT BRDR-PALERMO BRDR-BISMARCK STATI Temperature Base: Contract Hour: 9

Day	Relative Density	Heating Value		CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
		Wet	Dry																
1	0.7513	1182.4	1203.3	0.806	5.940	65.919	21.755	4.934	0.188	0.420	0.020	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1388.26
2	0.7463	1175.0	1195.8	0.788	5.945	66.653	21.281	4.717	0.179	0.400	0.019	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1384.23
3	0.7441	1173.4	1194.2	0.769	5.865	67.067	20.990	4.694	0.179	0.400	0.019	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1384.39
4	0.7439	1174.0	1194.7	0.760	5.827	67.137	20.934	4.725	0.181	0.402	0.018	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1385.22
5	0.7441	1174.6	1195.4	0.763	5.802	67.125	20.956	4.732	0.182	0.405	0.018	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1385.76
6	0.7418	1172.6	1193.4	0.744	5.737	67.536	20.653	4.720	0.180	0.395	0.017	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1385.57
7	0.7496	1181.1	1202.0	0.791	5.880	66.372	21.301	4.983	0.195	0.437	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1388.32
8	0.7493	1180.4	1201.3	0.787	5.894	66.429	21.230	4.995	0.194	0.431	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1387.85
9	0.7514	1181.8	1202.7	0.802	5.984	66.082	21.412	5.040	0.197	0.441	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1387.50
10	0.7511	1182.4	1203.3	0.792	5.942	66.186	21.300	5.096	0.200	0.443	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1388.42
11	0.7478	1177.0	1197.9	0.784	5.968	66.644	21.016	4.922	0.194	0.430	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1385.21
12	0.7449	1173.1	1193.9	0.771	5.958	67.104	20.680	4.834	0.189	0.423	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1383.25
13	0.7537	1185.6	1206.6	0.794	5.984	65.678	21.725	5.149	0.198	0.431	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1389.83
14	0.7526	1183.5	1204.5	0.787	6.014	65.885	21.530	5.100	0.200	0.443	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1388.43
15	0.7553	1187.5	1208.6	0.797	6.008	65.461	21.845	5.190	0.204	0.453	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1390.65
16	0.7550	1187.4	1208.4	0.802	5.987	65.460	21.913	5.150	0.201	0.447	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1390.69
17	0.7540	1185.4	1206.4	0.803	6.013	65.554	21.881	5.078	0.196	0.435	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1389.31
18	0.7527	1183.8	1204.8	0.796	5.997	65.737	21.781	5.038	0.192	0.419	0.019	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1388.65
19	0.7488	1178.9	1199.7	0.799	5.927	66.391	21.336	4.910	0.188	0.409	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1386.45
20	0.7499	1181.2	1202.1	0.805	5.880	66.241	21.485	4.934	0.191	0.424	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1388.16
21	0.7421	1171.3	1192.0	0.748	5.839	67.567	20.452	4.752	0.187	0.416	0.020	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1383.71
22	0.7451	1175.4	1196.2	0.755	5.864	67.066	20.814	4.856	0.188	0.417	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1385.72
23	0.7448	1174.4	1195.2	0.758	5.889	67.065	20.841	4.812	0.186	0.410	0.020	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1384.86
24	0.7436	1172.6	1193.3	0.753	5.889	67.259	20.701	4.775	0.183	0.400	0.019	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1383.88
25	0.7419	1170.3	1191.0	0.757	5.863	67.555	20.476	4.736	0.180	0.394	0.019	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1382.75
26	0.7398	1167.6	1188.3	0.751	5.841	67.867	20.283	4.660	0.176	0.384	0.018	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1381.52
27	0.7411	1169.5	1190.2	0.755	5.837	67.679	20.407	4.717	0.179	0.388	0.019	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1382.62
28	0.7366	1164.4	1185.0	0.735	5.758	68.393	19.966	4.565	0.172	0.374	0.018	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1380.76
29	0.7419	1171.5	1192.2	0.767	5.781	67.454	20.725	4.696	0.171	0.369	0.019	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1384.13
30	0.7437	1173.1	1193.9	0.775	5.841	67.131	20.933	4.737	0.173	0.372	0.019	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1384.35
31	0.7447	1174.3	1195.1	0.755	5.842	67.103	20.952	4.759	0.176	0.371	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1384.88
Avg	0.7469	1177.0	1197.8	0.776	5.897	66.736	21.082	4.871	0.187	0.412	0.020	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1385.98

Zone 262

# GQ Source Analysis

<b>GQ Source Number:</b>	2501030	<b>Specific Gravity:</b>	0.6705
<b>GQ Source Name:</b>	LIGNITE PLANT	<b>Dry Heat Value:</b>	1112.32
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1092.96
<b>Effective End Date:</b>	1/18/2038 9:14:07 PM	<b>As Deliv. Heat Value:</b>	1112.32
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	357.00
<b>Viscosity:</b>		<b>Sample Temperature:</b>	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	76.490		CO2	Carbon Dioxide	0.128
C2	Ethane	17.640	4.7036	N2	Nitrogen	4.571
C3	Propane	0.944	0.2594	O2	Oxygen	0.218
IC4	Isobutane	0.002	0.0008	He	Helium	
NC4	n-Butane	0.004	0.0012	H2	Hydrogen	
IC5	Isopentane	0.000	0.0000	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.000	0.0000	Ar	Argon	
C6	Hexanes	0.002	0.0008	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

**Totals**      100.000%      4.966 GPM

**Sample Date:** 11/2/2015 12:00:00 AM  
**Sample Type:** Composite  
**Sample Tech:** Eric S.  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:** MB

**Analysis Remarks:**

Zone 263

\*\*\* End of Report \*\*\*

# GQ Source Analysis

<b>GQ Source Number:</b>	0702010	<b>Specific Gravity:</b>	0.6903
<b>GQ Source Name:</b>	EPPING BORDER	<b>Dry Heat Value:</b>	1161.82
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1141.60
<b>Effective End Date:</b>	1/18/2038 9:14:07 PM	<b>As Deliv. Heat Value:</b>	1161.82
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	386.00
<b>Viscosity:</b>		<b>Sample Temperature:</b>	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	75.088		CO2	Carbon Dioxide	0.767
C2	Ethane	18.985	5.0623	N2	Nitrogen	2.723
C3	Propane	2.136	0.5867	O2	Oxygen	0.000
IC4	Isobutane	0.084	0.0276	He	Helium	
NC4	n-Butane	0.181	0.0570	H2	Hydrogen	
IC5	Isopentane	0.015	0.0055	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.018	0.0065	Ar	Argon	
C6	Hexanes	0.002	0.0009	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					
<b>Totals</b>		100.000%		5.747	GPM	

**Sample Date:** 11/2/2015 12:00:00 AM  
**Sample Type:** Composite  
**Sample Tech:** Eric S.  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:** MB

**Analysis Remarks:**

Zone 264

## GQ Source Daily Summary

October 2015

Number: 161

Pressure Base: 14.730

Contract Day: 1

Name: NORTH TIOGA TRANSFER-PORTAL

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value		CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT	
		Value Wet	Value Dry																	
1	0.7159	1169.1	1189.8	0.889	3.302	71.169	21.344	2.881	0.109	0.257	0.022	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1406.20	
2	0.7136	1164.0	1184.7	0.941	3.322	71.319	21.401	2.674	0.088	0.209	0.020	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1402.34	
3	0.7178	1170.4	1191.1	0.956	3.299	70.873	21.564	2.905	0.103	0.246	0.024	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1405.91	
4	0.7213	1175.2	1196.0	0.956	3.335	70.460	21.668	3.129	0.119	0.278	0.025	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1408.25	
5	0.7009	1151.6	1172.0	0.568	3.454	72.913	20.605	2.174	0.075	0.176	0.016	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1399.89	
6	0.6694	1111.5	1131.2	0.146	3.583	76.978	18.429	0.862	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1382.61	
7	0.6668	1108.1	1127.8	0.152	3.537	77.581	17.801	0.928	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1381.07	
8	0.6633	1099.8	1119.3	0.129	3.750	78.219	16.996	0.904	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1374.27	
9	0.7009	1151.6	1172.0	0.568	3.454	72.913	20.605	2.174	0.075	0.176	0.016	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1399.91	
10	0.7146	1165.5	1186.1	0.950	3.310	71.150	21.500	2.770	0.090	0.200	0.020	0.010	0.000	0.000	0.000	0.000	0.000	0.000	1403.15	
11	0.7125	1162.9	1183.5	0.913	3.326	71.425	21.380	2.633	0.085	0.199	0.018	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1402.09	
12	0.7124	1162.0	1182.6	0.943	3.325	71.439	21.416	2.568	0.082	0.191	0.016	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1401.15	
13	0.7144	1165.1	1185.7	0.950	3.318	71.209	21.435	2.759	0.088	0.203	0.017	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1402.84	
14	0.7154	1167.4	1188.1	0.906	3.336	71.314	21.131	2.882	0.110	0.264	0.024	0.032	0.000	0.000	0.000	0.000	0.000	0.000	1404.65	
15	0.7189	1173.1	1193.9	0.891	3.331	71.059	21.096	3.091	0.130	0.325	0.033	0.044	0.000	0.000	0.000	0.000	0.000	0.000	1408.11	
16	0.7194	1173.8	1194.6	0.878	3.358	71.112	21.046	2.986	0.142	0.372	0.046	0.060	0.000	0.000	0.000	0.000	0.000	0.000	1408.44	
17	0.7226	1179.4	1200.2	0.863	3.338	70.848	21.063	3.198	0.158	0.415	0.050	0.067	0.000	0.000	0.000	0.000	0.000	0.000	1411.96	
18	0.7181	1172.2	1193.0	0.857	3.369	71.131	21.117	2.989	0.128	0.325	0.037	0.047	0.000	0.000	0.000	0.000	0.000	0.000	1407.74	
19	0.7188	1172.2	1193.0	0.895	3.377	71.038	21.179	2.955	0.131	0.335	0.039	0.051	0.000	0.000	0.000	0.000	0.000	0.000	1407.07	
20	0.7215	1177.4	1198.3	0.866	3.353	70.834	21.205	3.078	0.151	0.402	0.048	0.062	0.000	0.000	0.000	0.000	0.000	0.000	1410.70	
21	0.7138	1164.2	1184.8	0.869	3.429	71.668	20.822	2.706	0.120	0.307	0.034	0.045	0.000	0.000	0.000	0.000	0.000	0.000	1402.35	
22	0.7086	1156.9	1177.3	0.853	3.423	71.963	21.026	2.418	0.081	0.191	0.019	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1398.60	
23	0.7089	1157.6	1178.1	0.857	3.404	71.737	21.341	2.379	0.077	0.175	0.014	0.016	0.000	0.000	0.000	0.000	0.000	0.000	1399.18	
24	0.7177	1169.9	1190.6	0.927	3.365	70.974	21.414	2.848	0.116	0.286	0.030	0.039	0.000	0.000	0.000	0.000	0.000	0.000	1405.37	
25	0.7145	1165.3	1185.9	0.908	3.376	71.146	21.496	2.734	0.091	0.209	0.018	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1403.00	
26	0.7137	1163.8	1184.4	0.908	3.391	71.340	21.320	2.685	0.093	0.217	0.021	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1402.00	
27	0.7135	1164.1	1184.7	0.886	3.389	71.322	21.375	2.681	0.090	0.211	0.020	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1402.54	
28	0.7108	1160.6	1181.2	0.858	3.393	71.583	21.338	2.513	0.083	0.193	0.018	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1400.98	
29	0.7125	1163.0	1183.6	0.862	3.402	71.509	21.228	2.632	0.094	0.223	0.022	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1402.16	
30	0.7111	1160.7	1181.3	0.836	3.443	71.658	21.101	2.623	0.091	0.208	0.018	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1400.85	
31	0.7099	1158.5	1179.0	0.841	3.465	71.652	21.259	2.488	0.079	0.182	0.015	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1399.29	
Avg	0.7095	1160.0	1180.4	0.801	3.395	71.985	20.894	2.556	0.093	0.225	0.023	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1401.44	

Zone 2b5

## GQ Source Daily Summary October 2015

Number: 043

Pressure Base: 14.730

Contract Day: 1

Name: BISMARCK STATION-CLEVELAND STATION

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7455	1178.0	1198.9	0.789	5.680	66.907	21.293	4.701	0.180	0.408	0.021	0.021	0.000	0.000	0.000	0.000	0.000	1388.57	
2	0.7432	1176.7	1197.5	0.767	5.587	67.338	20.991	4.687	0.180	0.408	0.021	0.021	0.000	0.000	0.000	0.000	0.000	1389.06	
3	0.7429	1177.1	1197.9	0.758	5.547	67.425	20.926	4.714	0.181	0.409	0.020	0.020	0.000	0.000	0.000	0.000	0.000	1389.81	
4	0.7426	1176.6	1197.4	0.759	5.547	67.499	20.840	4.720	0.183	0.412	0.020	0.020	0.000	0.000	0.000	0.000	0.000	1389.51	
5	0.7397	1173.9	1194.6	0.739	5.470	67.979	20.546	4.652	0.178	0.397	0.020	0.020	0.000	0.000	0.000	0.000	0.000	1389.01	
6	0.7492	1184.7	1205.6	0.795	5.620	66.586	21.297	5.015	0.196	0.444	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1392.85	
7	0.7477	1182.2	1203.1	0.781	5.650	66.827	21.078	4.983	0.195	0.440	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1391.36	
8	0.7509	1185.3	1206.3	0.804	5.723	66.294	21.429	5.055	0.199	0.450	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1392.09	
9	0.7488	1182.5	1203.5	0.788	5.722	66.659	21.120	5.022	0.197	0.446	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1390.74	
10	0.7472	1180.4	1201.3	0.784	5.699	66.923	20.958	4.950	0.196	0.443	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1389.80	
11	0.7477	1180.7	1201.6	0.790	5.725	66.785	21.082	4.947	0.193	0.434	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1389.60	
12	0.7433	1175.6	1196.4	0.765	5.661	67.537	20.533	4.845	0.189	0.424	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1387.66	
13	0.7529	1184.8	1205.8	0.794	5.953	65.906	21.539	5.118	0.199	0.445	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1389.67	
14	0.7540	1185.8	1206.8	0.796	5.992	65.742	21.616	5.150	0.202	0.456	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1389.83	
15	0.7562	1189.5	1210.6	0.804	5.963	65.361	21.964	5.192	0.205	0.464	0.023	0.024	0.000	0.000	0.000	0.000	0.000	1392.13	
16	0.7542	1186.6	1207.6	0.806	5.952	65.694	21.703	5.144	0.201	0.454	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1390.51	
17	0.7530	1184.2	1205.1	0.805	5.986	65.834	21.608	5.087	0.196	0.438	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1388.82	
18	0.7489	1179.2	1200.1	0.787	5.935	66.496	21.143	4.984	0.190	0.420	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1386.73	
19	0.7500	1182.8	1203.8	0.798	5.801	66.277	21.531	4.927	0.191	0.429	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1389.98	
20	0.7422	1172.1	1192.9	0.744	5.806	67.536	20.575	4.692	0.184	0.417	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1384.56	
21	0.7447	1176.0	1196.8	0.750	5.793	67.194	20.775	4.830	0.189	0.425	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1386.83	
22	0.7477	1178.9	1199.8	0.776	5.856	66.709	21.075	4.915	0.192	0.431	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1387.50	
23	0.7432	1172.3	1193.1	0.754	5.872	67.395	20.568	4.770	0.185	0.413	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1383.89	
24	0.7425	1172.2	1193.0	0.748	5.822	67.525	20.499	4.770	0.184	0.407	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1384.40	
25	0.7398	1168.5	1189.2	0.739	5.803	67.930	20.245	4.670	0.178	0.393	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1382.63	
26	0.7395	1167.7	1188.4	0.741	5.819	68.025	20.110	4.691	0.179	0.393	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1381.97	
27	0.7397	1168.0	1188.6	0.743	5.824	68.008	20.083	4.723	0.180	0.395	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1382.01	
28	0.7384	1167.8	1188.4	0.731	5.728	68.184	20.113	4.635	0.177	0.389	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1383.04	
29	0.7394	1169.0	1189.7	0.742	5.730	67.944	20.363	4.636	0.171	0.371	0.021	0.021	0.000	0.000	0.000	0.000	0.000	1383.57	
30	0.7433	1173.6	1194.4	0.764	5.784	67.278	20.846	4.734	0.174	0.377	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1385.35	
31	0.7470	1178.0	1198.9	0.772	5.851	66.681	21.225	4.856	0.180	0.391	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1387.10	
Avg	0.7460	1178.0	1198.6	0.771	5.771	66.983	20.957	4.865	0.188	0.420	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1387.76	

Zone 271









# GQ Source Analysis

<b>GQ Source Number:</b>	0202080	<b>Specific Gravity:</b>	0.6907
<b>GQ Source Name:</b>	RICHARDTON-GLEN ULLIN COMPRE	<b>Dry Heat Value:</b>	1178.97
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1158.45
<b>Effective End Date:</b>	1/18/2038 9:14:00 PM	<b>As Deliv. Heat Value:</b>	1178.97
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	336.00
<b>Viscosity:</b>		<b>Sample Temperature:</b>	0.00

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	73.150		CO2	Carbon Dioxide	0.073
C2	Ethane	22.645	6.0380	N2	Nitrogen	2.840
C3	Propane	1.227	0.3370	O2	Oxygen	
IC4	Isobutane	0.021	0.0070	He	Helium	
NC4	n-Butane	0.040	0.0130	H2	Hydrogen	
IC5	Isopentane	0.002	0.0010	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.002	0.0010	Ar	Argon	
C6	Hexanes			CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

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**Totals**      100.000%      6.397 GPM

**Sample Date:** 10/1/2015 10:29:00 AM  
**Sample Type:** Composite  
**Sample Tech:** RR  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:** MB

**Analysis Remarks:**

Zone 311





# GQ Source Analysis

<b>GQ Source Number:</b>	1202160	<b>Specific Gravity:</b>	0.8186
<b>GQ Source Name:</b>	BOWMAN BORDER	<b>Dry Heat Value:</b>	1084.10
<b>Effective Date:</b>	10/1/2015 9:00:00 AM	<b>Wet Heat Value:</b>	1065.23
<b>Effective End Date:</b>	1/18/2038 9:14:07 PM	<b>As Deliv. Heat Value:</b>	1084.10
<b>Pressure Base:</b>	14.730	<b>Sample Pressure:</b>	
<b>Viscosity:</b>		<b>Sample Temperature:</b>	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	52.705		CO2	Carbon Dioxide	2.722
C2	Ethane	22.614	6.0300	N2	Nitrogen	16.509
C3	Propane	4.526	1.2430	O2	Oxygen	
IC4	Isobutane	0.184	0.0600	He	Helium	
NC4	n-Butane	0.620	0.1950	H2	Hydrogen	
IC5	Isopentane	0.031	0.0110	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.089	0.0320	Ar	Argon	
C6	Hexanes			CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

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**Totals**      100.000%      7.571 GPM

**Sample Date:** 10/1/2015 9:00:00 AM  
**Sample Type:** Composite  
**Sample Tech:**  
**H2S:** ppm

**Sample Remarks:**

**Analysis Tech:**

**Analysis Remarks:** USED MARMATH PLANT GC AVERAGE - UNABLE TO ANALYZE BOWMAN BOTTLE PER M GENTILINI

Zone 34

Oct-15

ZONE 610

**Watford City**  
01320  
Watford City Border

01312  
Watford City East Border

**Weighted**

Begin Date	End Date	BTU			BTU			AVG	BTU	
		MCF	DK	Zone 25	MCF	DK	Zone 43			
10/1/2015	10/2/2015	117	142	1.216	11	12	1.068	1.203	10/1/2015	
10/2/2015	10/3/2015	178	217	1.216	0	0	1.060	1.216	10/2/2015	
10/3/2015	10/4/2015	217	264	1.216	0	0	1.060	1.216	10/3/2015	
10/4/2015	10/5/2015	237	288	1.216	0	0	1.071	1.216	10/4/2015	
10/5/2015	10/6/2015	271	330	1.216	1	1	1.084	1.216	10/5/2015	
10/6/2015	10/7/2015	233	284	1.216	1	1	1.099	1.216	10/6/2015	
10/7/2015	10/8/2015	184	224	1.216	1	1	1.086	1.215	10/7/2015	
10/8/2015	10/9/2015	185	224	1.216	8	9	1.089	1.211	10/8/2015	
10/9/2015	10/10/2015	151	184	1.216	1	1	1.084	1.215	10/9/2015	
10/10/2015	10/11/2015	117	142	1.216	0	0	1.080	1.216	10/10/2015	
10/11/2015	10/12/2015	226	275	1.216	1	1	1.082	1.215	10/11/2015	
10/12/2015	10/13/2015	214	260	1.216	1	1	1.082	1.215	10/12/2015	
10/13/2015	10/14/2015	203	246	1.216	1	1	1.082	1.215	10/13/2015	
10/14/2015	10/15/2015	218	265	1.216	1	1	1.085	1.215	10/14/2015	
10/15/2015	10/16/2015	296	360	1.216	13	15	1.092	1.211	10/15/2015	
10/16/2015	10/17/2015	301	366	1.216	7	8	1.102	1.213	10/16/2015	
10/17/2015	10/18/2015	261	317	1.216	1	1	1.087	1.216	10/17/2015	
10/18/2015	10/19/2015	190	231	1.216	0	0	1.090	1.216	10/18/2015	
10/19/2015	10/20/2015	179	218	1.216	3	3	1.088	1.214	10/19/2015	
10/20/2015	10/21/2015	262	319	1.216	1	1	1.088	1.216	10/20/2015	
10/21/2015	10/22/2015	265	322	1.216	14	16	1.087	1.210	10/21/2015	
10/22/2015	10/23/2015	198	241	1.216	14	15	1.086	1.207	10/22/2015	
10/23/2015	10/24/2015	295	358	1.216	1	1	1.087	1.216	10/23/2015	
10/24/2015	10/25/2015	296	360	1.216	1	1	1.086	1.216	10/24/2015	
10/25/2015	10/26/2015	335	407	1.216	2	2	1.085	1.215	10/25/2015	
10/26/2015	10/27/2015	373	454	1.216	25	28	1.094	1.208	10/26/2015	
10/27/2015	10/28/2015	439	533	1.216	49	53	1.080	1.202	10/27/2015	
10/28/2015	10/29/2015	515	626	1.216	84	90	1.079	1.197	10/28/2015	
10/29/2015	10/30/2015	452	549	1.216	55	59	1.073	1.200	10/29/2015	
10/30/2015	10/31/2015	280	341	1.216	49	53	1.078	1.195	10/30/2015	
10/31/2015	11/1/2015	316	385	1.216	44	48	1.084	1.200	10/31/2015	
		8,004	9,732		390	423	1.0832	1.2114		

Gas Quality

ROW ID	LOCATION DESCRIPTION	GROSS HEATING VALUE (BTU/CF)	SPECIFIC GRAVITY	WOBBE (cal/cf)	CRICONDENTHERM (deg F)	NITROGEN (mole percent)	CARBON DIOXIDE (mole percent)	METHANE (mole percent)	ETHANE (mole percent)	PROPANE (mole percent)	NORMAL BUTANE (mole percent)	ISO BUTANE (mole percent)	PENTANE (mole percent)	ISO PENTANE (mole percent)	NEO PENTANE (mole percent)	HEXANES PLUS (mole percent)	HYDROGEN (mole percent)	HELIUM (mole percent)	PRODUCTION DATE	POSTING DATE	ChangeTimestamp	NOTES
11587	GLEN ULLIN	1058.7	0.6093	1356.3	-70.2	1.2961	0.7802	89.8513	7.2221	0.6413	0.0292	0.021	0.0028	0.0037	0	0.0005	0.1352	0.0235	9/30/2015	10/1/2015	10/1/2015 2:35:37 PM	
11587	GLEN ULLIN	1061.2	0.6114	1357.2	-68	1.3588	0.7701	89.4121	7.4748	0.7317	0.0308	0.0214	0.0024	0.0033	0	0.0006	0.1777	0.0235	10/1/2015	10/2/2015	10/2/2015 2:29:20 PM	
11587	GLEN ULLIN	1065.8	0.6146	1359.4	-64.5	1.3733	0.7824	88.829	7.9256	0.8055	0.0389	0.0268	0.0029	0.0039	0	0.0005	0.1936	0.0235	10/2/2015	10/3/2015	10/3/2015 2:29:21 PM	
11587	GLEN ULLIN	1068.9	0.6177	1360.1	-58.5	1.4468	0.7991	88.2802	8.3453	0.8326	0.0435	0.0324	0.0049	0.0064	0	0.0024	0.1897	0.0235	10/3/2015	10/4/2015	10/4/2015 2:28:42 PM	
11587	GLEN ULLIN	1066	0.6164	1357.8	-64.9	1.5362	0.7782	88.3164	8.3341	0.7525	0.0308	0.0207	0.0026	0.0034	0	0.0004	0.2063	0.0235	10/4/2015	10/5/2015	10/5/2015 2:30:25 PM	
11587	GLEN ULLIN	1063.4	0.6152	1355.8	-67.9	1.5774	0.7762	88.4366	8.2605	0.6817	0.0215	0.0134	0.0008	0.001	0	0.0001	0.214	0.0235	10/5/2015	10/6/2015	10/6/2015 2:29:35 PM	
11587	GLEN ULLIN	1056.1	0.609	1353.3	-73.1	1.4205	0.7862	89.6845	7.2676	0.6074	0.0164	0.0109	0.0003	0.0005	0	0.0001	0.1897	0.0235	10/6/2015	10/7/2015	10/7/2015 2:29:25 PM	
11587	GLEN ULLIN	1054.3	0.6073	1352.9	-74.1	1.3711	0.784	90.0102	7.0013	0.5795	0.0198	0.0139	0.0009	0.0015	0	0.0001	0.2004	0.0235	10/7/2015	10/8/2015	10/8/2015 2:29:52 PM	
11587	GLEN ULLIN	1062.6	0.6125	1357.8	-65.6	1.3282	0.805	89.2453	7.6171	0.7395	0.0336	0.0257	0.0033	0.0047	0	0.0012	0.1782	0.0136	10/8/2015	10/9/2015	10/9/2015 2:39:36 PM	
11587	GLEN ULLIN	1069.5	0.6167	1361.9	-49.5	1.3214	0.8003	88.702	7.9052	0.9228	0.0645	0.0513	0.0083	0.0111	0	0.0051	0.191	0.0134	10/9/2015	10/10/2015	10/10/2015 2:29:46 PM	
11587	GLEN ULLIN	1074.4	0.6209	1363.5	-48.2	1.3978	0.8104	87.9944	8.5144	0.9768	0.0653	0.0506	0.0084	0.011	0	0.0049	0.1496	0.0134	10/10/2015	10/11/2015	10/11/2015 2:29:43 PM	
11587	GLEN ULLIN	1070.2	0.6182	1361.1	-53.8	1.4213	0.7975	88.2833	8.2667	0.9057	0.0525	0.0397	0.0065	0.0084	0	0.0035	0.1993	0.0134	10/11/2015	10/12/2015	10/12/2015 2:29:31 PM	
11587	GLEN ULLIN	1067.8	0.6163	1360.1	-58.8	1.405	0.7856	88.5568	8.0519	0.8779	0.0438	0.0329	0.0044	0.0061	0	0.0025	0.2164	0.0134	10/12/2015	10/13/2015	10/13/2015 2:30:02 PM	
11587	GLEN ULLIN	1068	0.6168	1359.8	-58.9	1.4437	0.7879	88.4188	8.2153	0.8265	0.045	0.0324	0.0047	0.0063	0	0.0024	0.201	0.0134	10/13/2015	10/14/2015	10/14/2015 2:30:13 PM	
11587	GLEN ULLIN	1070.4	0.6177	1362	-54	1.3896	0.7791	88.3649	8.2572	0.8904	0.0523	0.0398	0.0064	0.0083	0	0.0036	0.1915	0.0134	10/14/2015	10/15/2015	10/15/2015 2:29:44 PM	
11587	GLEN ULLIN	1067.1	0.6153	1360.4	-53.6	1.3745	0.7729	88.7757	7.9256	0.8247	0.0514	0.0397	0.0068	0.0088	0	0.0041	0.1989	0.0134	10/15/2015	10/16/2015	10/16/2015 2:30:36 PM	
11587	GLEN ULLIN	1063.7	0.6128	1358.8	-60.1	1.3634	0.7552	89.2313	7.362	0.798	0.0426	0.0316	0.005	0.0064	0	0.0026	0.1857	0.0134	10/16/2015	10/17/2015	10/17/2015 2:30:27 PM	
11587	GLEN ULLIN	1060.3	0.6109	1356.6	-67.7	1.397	0.7529	89.4408	7.4223	0.7181	0.0303	0.0217	0.0027	0.0036	0	0.0011	0.1908	0.0134	10/17/2015	10/18/2015	10/18/2015 2:29:55 PM	
11587	GLEN ULLIN	1059.2	0.6104	1355.7	-70.6	1.4135	0.7574	89.5306	7.3661	0.7078	0.0218	0.0144	0.0013	0.0016	0	0	0.1685	0.0134	10/18/2015	10/19/2015	10/19/2015 2:30:00 PM	
11587	GLEN ULLIN	1059.4	0.6108	1355.6	-70.6	1.4245	0.7608	89.4033	7.4978	0.6722	0.0226	0.0149	0.0013	0.0017	0	0	0.1805	0.0134	10/19/2015	10/20/2015	10/20/2015 2:30:06 PM	
11587	GLEN ULLIN	1059.7	0.6109	1355.8	-70.3	1.42	0.7635	89.372	7.518	0.6772	0.0232	0.016	0.0015	0.0018	0	0	0.1886	0.0134	10/20/2015	10/21/2015	10/21/2015 2:32:48 PM	
11587	GLEN ULLIN	1060.4	0.6114	1356.1	-69.6	1.409	0.7711	89.3023	7.5644	0.6943	0.0254	0.0171	0.0017	0.0021	0	0	0.1963	0.0134	10/21/2015	10/22/2015	10/22/2015 2:30:19 PM	
11587	GLEN ULLIN	1062.2	0.6128	1357	-68.3	1.3974	0.7916	89.0811	7.8226	0.6766	0.0248	0.0176	0.0017	0.0024	0	0.0007	0.1671	0.0134	10/22/2015	10/23/2015	10/23/2015 2:33:05 PM	
11587	GLEN ULLIN	1064.9	0.614	1359	-64.2	1.3473	0.7976	88.9394	7.9415	0.7118	0.041	0.0277	0.0034	0.0047	0	0.0013	0.1679	0.0134	10/23/2015	10/24/2015	10/24/2015 2:31:00 PM	
11587	GLEN ULLIN	1064.9	0.6138	1359.2	-63.2	1.3377	0.788	89.0883	7.6918	0.7855	0.0632	0.0366	0.0036	0.0047	0	0.0009	0.1822	0.018	10/24/2015	10/25/2015	10/25/2015 2:31:20 PM	
11587	GLEN ULLIN	1065	0.6139	1359.2	-61.1	1.3222	0.8053	88.9802	7.885	0.726	0.041	0.0314	0.0044	0.0062	0	0.0024	0.1785	0.0237	10/25/2015	10/26/2015	10/26/2015 2:32:30 PM	
11587	GLEN ULLIN	1065.9	0.6144	1359.8	-60.6	1.3451	0.7855	88.8376	8.0356	0.7165	0.0383	0.03	0.0045	0.0063	0	0.0026	0.1812	0.0237	10/26/2015	10/27/2015	10/27/2015 2:32:41 PM	
11587	GLEN ULLIN	1063.9	0.613	1358.9	-61.4	1.331	0.7801	89.1446	7.7341	0.7251	0.0397	0.0313	0.0049	0.0065	0	0.0025	0.1833	0.0237	10/27/2015	10/28/2015	10/28/2015 2:31:40 PM	
11587	GLEN ULLIN	1062	0.6119	1357.6	-67.4	1.3881	0.7539	89.1934	7.7463	0.657	0.0284	0.0218	0.0026	0.0039	0	0.0012	0.1857	0.0237	10/28/2015	10/29/2015	10/29/2015 2:31:26 PM	
11587	GLEN ULLIN	1065.1	0.6139	1359.4	-60.9	1.3678	0.7633	88.9478	7.8961	0.7342	0.0426	0.0316	0.0045	0.0063	0	0.0023	0.1859	0.0237	10/29/2015	10/30/2015	10/30/2015 2:33:27 PM	
11587	GLEN ULLIN	1064.7	0.6143	1358.4	-61.8	1.4519	0.7533	88.8612	7.8572	0.7802	0.0412	0.0312	0.0041	0.0058	0	0.0021	0.1929	0.0185	10/30/2015	10/31/2015	10/31/2015 2:32:54 PM	

31 record(s) retrieved

Zone 802

NORTH DAKOTA HEATING VALUE ZONES		
<b>ZONES</b>	<b>MEASURING DEVICE</b>	<b>LOCATION</b>
211	Chromatograph	Sidney Area
24	Chromatograph	Williston Area
241	Monthly Sampler	Fairview Area
25	Monthly Sampler	Watford City Area
261	Chromatograph	Williston – Tioga – Minot Line
262	Chromatograph	Minot Area
263	Monthly Sampler	Tioga – Portal
264	Chromatograph	Williston – Ray
265	Chromatograph	North Tioga
271	Chromatograph	Bismarck – Cleveland
272	Chromatograph	Cleveland – Mapleton
273	Chromatograph	Cleveland – Grafton
28	Chromatograph	Bismarck
31	Chromatograph	Dickinson
311	Monthly Sampler	Taylor Take-Off – Glen Ullin Comp
32	Chromatograph	Cabin Creek – Dickinson
33	Chromatograph	Killdeer
34	Monthly Sampler	Bowman Area
600	Chromatograph	Hankinson Area
610	Monthly Sampler & Chromatograph	Watford City
802	Chromatograph	Linton

MONTANA DAKOTA UTILITIES CO  
 NORTH DAKOTA  
 HEATING VALUE DATA

STATE	ZONE	ZONE BOUNDARY	12 MONTH AVERAGE	OCT 15	SEPT 15	AUG 15	JULY 15	JUNE 15	MAY 15	APRIL 15	MAR 15	FEB 15	JAN 15	DEC 14	NOV 14	ZONE
MT/ND	211	Sidney Area	1204	1188	1193	1196	1199	1205	1202	1204	1205	1209	1215	1214	1215	211
ND	24	Williston Area	1180	1177	1166	1179	1185	1187	1206	1174	1171	1180	1173	1180	1182	24
ND	25	Watford City Border	1204	1216	1198	1198	1188	1207	1220	1212	1207	1196	1203	1201	1199	25
ND/MT	241	Fairview Area	1195	1182	1177	1188	1195	1195	1197	1198	1196	1202	1203	1203	1203	241
ND	261	Williston - Tioga - Minot Line	1020	1000	1042	1015	1028	1026	1006	1021	992	1004	1015	1035	1058	261
ND	262	Minot Area	1185	1198	1201	1201	1201	1185	1188	1188	1175	1173	1173	1169	1171	262
ND	263	Tioga - Portal	1103	1112	1104	1117	1121	1107	1090	1090	1084	1121	1097	1094	1097	263
ND	264	Williston - Ray	1172	1162	1154	1146	1170	1187	1189	1174	1171	1180	1173	1180	1182	264
ND	265	North Tioga Transfer - Portal	1188	1180	1188	1188	1191	1187	1187	1183	1187	1197	1195	1190	0	265
ND	271	Bismarck - Cleveland	1179	1199	1203	1199	1201	1186	1189	1186	1171	1139	1151	1160	1159	271
ND	272	Cleveland - Mapleton	1177	1197	1202	1199	1200	1186	1188	1185	1169	1137	1149	1157	1157	272
ND	273	Cleveland - Grafton	1177	1197	1203	1199	1200	1185	1189	1182	1167	1137	1149	1158	1158	273
ND	28	Bismarck - Cabin Creek	1159	1196	1203	1200	1201	1186	1189	1170	1133	1089	1101	1116	1118	28
ND	31	Dickinson Area	1135	1161	1161	1145	1181	1127	1129	1136	1139	1091	1104	1122	1125	31
ND	311	Taylor Take-Off - Glen Ullin Comp	1140	1179	1168	1158	1200	1168	1171	1096	1115	1090	1094	1114	1121	311
ND/MT	32	Cabin Creek - Dickinson	1133	1120	1176	1173	1181	1169	1165	1118	1110	1079	1091	1103	1110	32
ND	33	Killdeer	1182	1186	1186	1191	1185	1183	1183	1180	1179	1177	1177	1178	1176	33
ND	34	Bowman Area	1101	1084	1025	1133	1176	1121	1130	1123	1099	1068	1049	1089	1116	34
ND	610	MDU-Watford City BTU	1192	1211	1197	1197	1145	1175	1216	1202	1192	1190	1189	1195	1193	
ND	802	Linton	1058	1064	1055	1055	1057	1068	1064	1064	1054	1054	1056	1055	1054	802
ND	903	Hettinger Propane	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	903

**THERMAL ZONE VARIANCE  
DOCUMENTATION**

**October 2015**

<b>ZONE</b>	<b><i>BTU VARIANCE</i></b>	<b><i>REASON</i></b>
261	-42	Supply Changes
32	-56	Direction/Volume Changes
34	59	Supply Changes