

June 29, 2016

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

Re: Case No. PU-16-002 (Therm Billing)
Monthly Report – April 2016

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 Case No. 11,006, 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 May 2016.
2. Attachment B consists of copies of the monthly Heating Value Test Reports received from our suppliers for the month of April 2016.
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 April 2016.

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
Apr-16

Town	Heat Zone	Therm Factor
MDU-303-ALEXANDER	025	1.1438
MDU-308-ARNEGARD	025	1.1438
MDU-314-APPLE VALLEY	271	1.1443
MDU-318-BEACH	032	1.0360
MDU-319-BELFIELD	032	1.0436
MDU-323-BERTHOLD	262	1.1230
MDU-327-BISMARCK	028	1.1135
MDU-330-BOWMAN	034	0.8981
MDU-337-BURLINGTON	262	1.1472
MDU-343-CARRINGTON	273	1.1434
MDU-344-CLEVELAND	272	1.1353
MDU-364-CAVALIER	273	1.1675
MDU-365-DAWSON	271	1.1363
MDU-368-DES LACS	262	1.1311
MDU-369-DICKINSON	031	1.0727
MDU-374-FT TOTTEN	273	1.1514
MDU-375-DEVILS LAKE	273	1.1514
MDU-379-BARLOW	273	1.1434
MDU-384-EPPING	264	1.1230
MDU-387-ELDRIDGE	272	1.1434
MDU-407-GLADSTONE	031	1.0727
MDU-411-GLEN ULLIN	031	1.0805
MDU-413-GOLVA	032	1.0207
MDU-416-GARRISON	262	1.1311
MDU-417-GRAFTON	273	1.1755
MDU-429-HEBRON	031	1.0805
MDU-432-HETTINGER	903	2.4049
MDU-449-JAMESTOWN	272	1.1514
MDU-459-KILLDEER	033	1.1155
MDU-463-LANGDON	273	1.1434
MDU-469-LEFOR	031	1.0727
MDU-474-LIGNITE	263	1.0293
MDU-475-LINTON	802	1.0199
MDU-478-LINCOLN	028	1.1135
MDU-488-MCKENZIE	271	1.1443
MDU-494-MEDINA	271	1.1363
MDU-498-MANDAN	028	1.1135
MDU-500-MARMARTH	034	0.9047
MDU-505-MINOT	262	1.1472
MDU-510-MOTT	031	1.0727
MDU-512-MAX	262	1.1472
MDU-522-NEW ENGLAND	031	1.0650
MDU-524-NEW SALEM	028	1.0900
MDU-532-NEW ROCKFORD	273	1.1434
MDU-539-PARK RIVER	273	1.1675
MDU-540-PALERMO	262	1.1230
MDU-558-RAY	264	1.1230
MDU-561-REGENT	031	1.0727
MDU-563-RHAME	034	0.8914

MDU-564-RICHARDTON	031	1.0650
MDU-568-ROSS	261	0.9827
MDU-572-RUTHVILLE	262	1.1472
MDU-574-SANBORN	272	1.1514
MDU-583-SENTINEL BUTTE	032	1.0360
MDU-588-SOUTH HEART	031	1.0650
MDU-717-SPIRITWOOD	272	1.1514
MDU-590-SPRINGBROOK	264	1.1230
MDU-591-STANLEY	261	0.9898
MDU-593-STEELE	271	1.1363
MDU-598-SHEYENNE	273	1.1514
MDU-605-SURREY	262	1.1472
MDU-610-TAPPEN	271	1.1363
MDU-611-TAYLOR	031	1.0650
MDU-616-TIOGA	261	0.9970
MDU-619-TURTLE LAKE	262	1.1311
MDU-620-TRENTON	024	1.1358
MDU-624-UNDERWOOD	262	1.1311
MDU-625-VALLEY CITY	272	1.1595
MDU-629-WALHALLA	273	1.1675
MDU-632-WATFORD CITY	610	1.0890
MDU-636-WHEELOCK	264	1.1149
MDU-637-WHITE EARTH	261	0.9898
MDU-642-WILLISTON	024	1.1358
MDU-646-WASHBURN	262	1.1392
MDU-647-WILTON	262	1.1230
MDU-664-RIVERDALE	262	1.1311
MDU-691-FAIRVIEW	241	1.1425
MDU-712-MINOT AFB	262	1.1472
MDU-718-FAIRMOUNT	600	1.1130
MDU-732-NEKOMA	273	1.1434
MDU-732-MSR SITE	273	1.1376

GQ Source Analysis

GQ Source Number:	0602330	Specific Gravity:	0.7129
GQ Source Name:	WILLISTON BORDER	Dry Heat Value:	1195.70
Effective Date:	4/1/2016 9:00:00 AM	Wet Heat Value:	1174.89
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1195.70
Pressure Base:	14.730	Sample Pressure:	390.00
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	71.517		CO2	Carbon Dioxide	0.871
C2	Ethane	21.572	0.0000	N2	Nitrogen	2.640
C3	Propane	3.044	0.8362	O2	Oxygen	0.014
IC4	Isobutane	0.101	0.0329	He	Helium	
NC4	n-Butane	0.205	0.0645	H2	Hydrogen	
IC5	Isopentane	0.015	0.0055	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.018	0.0064	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% 0.946 GPM

Sample Date: 5/2/2016 12:00:00 AM
Sample Type: Composite
Sample Tech: Eric
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 24

GQ Source Analysis

GQ Source Number:	0602160	Specific Gravity:	0.7388
GQ Source Name:	FAIRVIEW BORDER	Dry Heat Value:	1207.40
Effective Date:	4/1/2016 9:00:00 AM	Wet Heat Value:	1186.39
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1207.40
Pressure Base:	14.730	Sample Pressure:	327.00
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	68.528		CO2	Carbon Dioxide	1.217
C2	Ethane	21.275	5.6730	N2	Nitrogen	3.891
C3	Propane	4.634	1.2730	O2	Oxygen	
IC4	Isobutane	0.147	0.0480	He	Helium	
NC4	n-Butane	0.281	0.0880	H2	Hydrogen	
IC5	Isopentane	0.015	0.0048	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.012	0.0038	Ar	Argon	
C6	Hexanes			CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

Totals 100.000% 7.091 GPM

Sample Date: 4/1/2016 12:00:00 AM
Sample Type: Composite
Sample Tech: RR
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 241

GQ Source Analysis

GQ Source Number:	0602230	Specific Gravity:	0.7280
GQ Source Name:	WATFORD CITY BORDER	Dry Heat Value:	1210.97
Effective Date:	3/1/2016 9:00:00 AM	Wet Heat Value:	1189.89
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1210.97
Pressure Base:	14.730	Sample Pressure:	388.00
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	69.512		CO2	Carbon Dioxide	0.981
C2	Ethane	22.367	5.9641	N2	Nitrogen	2.987
C3	Propane	3.518	0.9663	O2	Oxygen	0.006
IC4	Isobutane	0.186	0.0606	He	Helium	
NC4	n-Butane	0.384	0.1209	H2	Hydrogen	
IC5	Isopentane	0.030	0.0108	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.029	0.0104	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% 7.133 GPM

Sample Date: 4/4/2016 12:00:00 AM
Sample Type: Composite
Sample Tech: Eric
H2S: ppm

Sample Remarks:

Analysis Tech: MB
Analysis Remarks:

Zone 25

GQ Source Daily Summary

April 2016

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	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7142	1166.1	1186.8	0.872	3.345	72.027	20.081	3.179	0.124	0.300	0.031	0.039	0.000	0.000	0.000	0.000	0.000	1404.21	
2	0.7177	1170.7	1191.5	0.883	3.376	71.407	20.517	3.340	0.125	0.294	0.026	0.032	0.000	0.000	0.000	0.000	0.000	1406.42	
3	0.7189	1172.4	1193.2	0.897	3.368	71.298	20.599	3.297	0.135	0.329	0.034	0.042	0.000	0.000	0.000	0.000	0.000	1407.22	
4	0.7200	1174.6	1195.4	0.887	3.349	71.091	20.792	3.353	0.134	0.323	0.031	0.039	0.000	0.000	0.000	0.000	0.000	1408.79	
5	0.7189	1173.0	1193.8	0.885	3.351	71.403	20.451	3.339	0.142	0.348	0.036	0.046	0.000	0.000	0.000	0.000	0.000	1407.91	
6	0.7118	1163.2	1183.8	0.830	3.365	72.183	20.187	2.978	0.115	0.279	0.027	0.035	0.000	0.000	0.000	0.000	0.000	1403.12	
7	0.7172	1170.7	1191.4	0.863	3.361	71.498	20.544	3.199	0.133	0.328	0.033	0.041	0.000	0.000	0.000	0.000	0.000	1406.87	
8	0.7196	1174.1	1194.9	0.883	3.353	71.278	20.567	3.338	0.143	0.355	0.036	0.046	0.000	0.000	0.000	0.000	0.000	1408.52	
9	0.7194	1173.9	1194.6	0.880	3.349	71.236	20.649	3.347	0.135	0.328	0.033	0.042	0.000	0.000	0.000	0.000	0.000	1408.49	
10	0.7228	1179.6	1200.5	0.868	3.339	70.974	20.655	3.487	0.162	0.413	0.044	0.056	0.000	0.000	0.000	0.000	0.000	1411.98	
11	0.7200	1174.9	1195.7	0.886	3.330	71.270	20.594	3.319	0.145	0.362	0.040	0.052	0.000	0.000	0.000	0.000	0.000	1409.17	
12	0.7138	1165.4	1186.1	0.883	3.339	71.719	20.675	2.957	0.109	0.260	0.025	0.031	0.000	0.000	0.000	0.000	0.000	1403.82	
13	0.7145	1166.1	1186.8	0.897	3.339	71.685	20.652	2.981	0.112	0.271	0.027	0.035	0.000	0.000	0.000	0.000	0.000	1404.01	
14	0.7146	1166.8	1187.4	0.875	3.337	71.758	20.504	3.053	0.120	0.290	0.028	0.035	0.000	0.000	0.000	0.000	0.000	1404.72	
15	0.7134	1164.7	1185.3	0.885	3.347	71.974	20.380	2.885	0.127	0.322	0.035	0.044	0.000	0.000	0.000	0.000	0.000	1403.26	
16	0.7164	1169.9	1190.7	0.863	3.334	71.646	20.528	3.060	0.134	0.346	0.039	0.050	0.000	0.000	0.000	0.000	0.000	1406.72	
17	0.7156	1168.9	1189.6	0.851	3.334	71.703	20.504	3.084	0.127	0.318	0.034	0.044	0.000	0.000	0.000	0.000	0.000	1406.34	
18	0.7151	1168.0	1188.7	0.840	3.363	71.789	20.393	3.090	0.128	0.320	0.034	0.043	0.000	0.000	0.000	0.000	0.000	1405.71	
19	0.7128	1165.3	1185.9	0.819	3.345	72.101	20.217	3.030	0.121	0.297	0.031	0.039	0.000	0.000	0.000	0.000	0.000	1404.67	
20	0.7051	1153.9	1174.3	0.789	3.364	72.940	19.881	2.682	0.092	0.210	0.019	0.023	0.000	0.000	0.000	0.000	0.000	1398.52	
21	0.7061	1155.0	1175.4	0.817	3.349	72.838	19.966	2.646	0.097	0.233	0.024	0.030	0.000	0.000	0.000	0.000	0.000	1398.86	
22	0.7058	1155.1	1175.6	0.805	3.334	73.023	19.691	2.737	0.103	0.250	0.025	0.032	0.000	0.000	0.000	0.000	0.000	1399.26	
23	0.7041	1151.8	1172.2	0.815	3.359	73.217	19.594	2.639	0.096	0.229	0.023	0.029	0.000	0.000	0.000	0.000	0.000	1396.95	
24	0.7063	1155.5	1175.9	0.821	3.337	72.830	19.938	2.691	0.099	0.231	0.024	0.029	0.000	0.000	0.000	0.000	0.000	1399.20	
25	0.7093	1159.9	1180.4	0.833	3.325	72.390	20.199	2.877	0.101	0.227	0.021	0.025	0.000	0.000	0.000	0.000	0.000	1401.62	
26	0.7082	1157.2	1177.7	0.849	3.362	72.616	19.959	2.838	0.099	0.227	0.023	0.028	0.000	0.000	0.000	0.000	0.000	1399.46	
27	0.7065	1155.3	1175.8	0.816	3.366	72.949	19.636	2.853	0.099	0.228	0.023	0.029	0.000	0.000	0.000	0.000	0.000	1398.86	
28	0.7080	1158.2	1178.7	0.813	3.337	72.502	20.195	2.801	0.096	0.213	0.019	0.023	0.000	0.000	0.000	0.000	0.000	1400.89	
29	0.7116	1163.6	1184.2	0.824	3.331	72.076	20.393	2.970	0.111	0.244	0.022	0.028	0.000	0.000	0.000	0.000	0.000	1403.81	
30	0.7075	1157.2	1177.7	0.811	3.356	72.609	20.020	2.866	0.097	0.206	0.016	0.019	0.000	0.000	0.000	0.000	0.000	1400.12	
Avg	0.7132	1165.0	1185.7	0.851	3.348	72.001	20.299	3.031	0.119	0.286	0.029	0.036	0.000	0.000	0.000	0.000	0.000	1403.98	

Zone 2b1

GQ Source Daily Summary

April 2016

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 Wet	Heating Value Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7456	1177.2	1198.0	0.819	5.699	66.924	21.132	4.846	0.170	0.370	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1387.45	
2	0.7439	1173.0	1193.7	0.801	5.823	67.180	20.804	4.823	0.167	0.363	0.019	0.019	0.000	0.000	0.000	0.000	0.000	1384.05	
3	0.7529	1186.5	1207.5	0.852	5.760	65.768	21.926	5.083	0.178	0.391	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1391.71	
4	0.7508	1184.5	1205.5	0.853	5.692	66.067	21.806	4.982	0.174	0.382	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1391.20	
5	0.7529	1186.8	1207.8	0.851	5.747	65.772	21.937	5.075	0.179	0.394	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1392.00	
6	0.7535	1186.5	1207.6	0.845	5.832	65.661	21.925	5.121	0.179	0.393	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1391.11	
7	0.7512	1186.1	1207.1	0.853	5.631	66.031	21.911	4.952	0.177	0.398	0.023	0.024	0.000	0.000	0.000	0.000	0.000	1392.71	
8	0.7498	1183.6	1204.6	0.846	5.661	66.153	21.868	4.887	0.167	0.375	0.020	0.022	0.000	0.000	0.000	0.000	0.000	1391.11	
9	0.7510	1184.7	1205.7	0.850	5.701	66.021	21.871	4.946	0.173	0.393	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1391.30	
10	0.7519	1187.3	1208.4	0.850	5.625	65.927	21.969	5.010	0.176	0.397	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1393.53	
11	0.7504	1185.0	1206.0	0.856	5.614	66.150	21.845	4.924	0.173	0.392	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1392.22	
12	0.7516	1186.1	1207.1	0.850	5.672	65.993	21.864	4.993	0.177	0.402	0.024	0.025	0.000	0.000	0.000	0.000	0.000	1392.34	
13	0.7524	1186.2	1207.2	0.851	5.736	65.857	21.889	5.044	0.177	0.400	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1391.78	
14	0.7539	1185.5	1206.5	0.850	5.928	65.539	21.979	5.090	0.175	0.395	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1389.50	
15	0.7548	1187.0	1208.0	0.847	5.918	65.448	22.003	5.161	0.178	0.401	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1390.50	
16	0.7509	1184.8	1205.7	0.857	5.674	66.057	21.842	4.970	0.172	0.385	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1391.47	
17	0.7506	1184.2	1205.2	0.851	5.688	66.080	21.848	4.929	0.171	0.388	0.021	0.023	0.000	0.000	0.000	0.000	0.000	1391.10	
18	0.7506	1183.7	1204.7	0.834	5.746	66.059	21.822	4.932	0.171	0.389	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1390.52	
19	0.7512	1184.3	1205.3	0.835	5.768	65.989	21.818	4.974	0.174	0.397	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1390.63	
20	0.7524	1184.0	1205.0	0.836	5.894	65.798	21.820	5.031	0.176	0.399	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1389.18	
21	0.7523	1185.9	1206.9	0.833	5.777	65.865	21.843	5.060	0.176	0.401	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1391.44	
22	0.7544	1186.9	1207.9	0.831	5.921	65.523	21.920	5.180	0.178	0.404	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1390.64	
23	0.7544	1186.9	1207.9	0.830	5.913	65.564	21.868	5.198	0.179	0.404	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1390.72	
24	0.7529	1186.7	1207.7	0.828	5.788	65.803	21.824	5.140	0.177	0.396	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1391.86	
25	0.7525	1185.3	1206.3	0.830	5.835	65.842	21.753	5.136	0.175	0.389	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1390.62	
26	0.7520	1185.8	1206.8	0.834	5.754	65.938	21.771	5.085	0.176	0.398	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1391.63	
27	0.7543	1185.8	1206.8	0.854	5.937	65.546	21.881	5.155	0.179	0.404	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1389.53	
28	0.7527	1184.4	1205.4	0.853	5.875	65.782	21.793	5.086	0.175	0.394	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1389.37	
29	0.7546	1185.7	1206.7	0.854	5.968	65.511	21.864	5.177	0.179	0.404	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1389.19	
30	0.7538	1186.4	1207.4	0.852	5.860	65.648	21.865	5.148	0.179	0.403	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1390.62	
Avg	0.7519	1185.0	1205.9	0.843	5.781	65.917	21.809	5.038	0.175	0.393	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1390.70	

Zone 262

GQ Source Analysis

GQ Source Number:	2501030	Specific Gravity:	0.6545
GQ Source Name:	LIGNITE PLANT	Dry Heat Value:	1105.12
Effective Date:	4/1/2016 9:00:00 AM	Wet Heat Value:	1085.89
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1105.12
Pressure Base:	14.730	Sample Pressure:	387.00
Viscosity:		Sample Temperature:	

	<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>	
C1	Methane	80.313		CO2	Carbon Dioxide	0.150
C2	Ethane	14.546	0.0000	N2	Nitrogen	3.689
C3	Propane	1.258	0.3455	O2	Oxygen	0.009
IC4	Isobutane	0.014	0.0044	He	Helium	
NC4	n-Butane	0.015	0.0047	H2	Hydrogen	
IC5	Isopentane	0.000	0.0000	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.000	0.0000	Ar	Argon	
C6	Hexanes	0.007	0.0032	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					
Totals			100.000%	0.358 GPM		

Sample Date: 5/2/2016 12:00:00 AM
Sample Type: Composite
Sample Tech: Eric
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 263

*** End of Report ***

GQ Source Analysis

GQ Source Number:	0702010	Specific Gravity:	0.7076
GQ Source Name:	EPPING BORDER	Dry Heat Value:	1189.51
Effective Date:	4/1/2016 9:00:00 AM	Wet Heat Value:	1168.81
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1189.51
Pressure Base:	14.730	Sample Pressure:	342.00
Viscosity:		Sample Temperature:	

	<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>	
C1	Methane	72.745		CO2	Carbon Dioxide	0.875
C2	Ethane	20.436	0.0000	N2	Nitrogen	2.519
C3	Propane	3.025	0.8309	O2	Oxygen	0.000
IC4	Isobutane	0.113	0.0369	He	Helium	
NC4	n-Butane	0.240	0.0755	H2	Hydrogen	
IC5	Isopentane	0.020	0.0073	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.024	0.0087	Ar	Argon	
C6	Hexanes	0.002	0.0011	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					
Totals			100.000%	0.960 GPM		

Sample Date: 5/2/2016 12:00:00 AM
Sample Type: Composite
Sample Tech: Eric
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 264

GQ Source Daily Summary

April 2016

Number: 161

Pressure Base: 14.730

Contract Day: 1

Name: NORTH TIOGA TRANSFER-PORTAL

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	0.7200	1174.8	1195.6	0.908	3.308	71.082	20.869	3.313	0.130	0.316	0.032	0.041	0.000	0.000	0.000	0.000	0.000	1409.00	
2	0.7190	1172.7	1193.5	0.890	3.366	71.182	20.714	3.369	0.125	0.295	0.027	0.032	0.000	0.000	0.000	0.000	0.000	1407.55	
3	0.7204	1174.6	1195.4	0.903	3.360	71.091	20.751	3.341	0.137	0.337	0.035	0.044	0.000	0.000	0.000	0.000	0.000	1408.42	
4	0.7211	1176.4	1197.2	0.891	3.342	70.945	20.872	3.404	0.138	0.335	0.032	0.040	0.000	0.000	0.000	0.000	0.000	1409.83	
5	0.7208	1175.9	1196.7	0.895	3.338	71.087	20.716	3.384	0.143	0.353	0.037	0.046	0.000	0.000	0.000	0.000	0.000	1409.50	
6	0.7141	1166.5	1187.2	0.847	3.349	71.780	20.550	3.020	0.115	0.277	0.027	0.035	0.000	0.000	0.000	0.000	0.000	1404.88	
7	0.7189	1173.3	1194.1	0.869	3.354	71.285	20.662	3.269	0.139	0.344	0.035	0.043	0.000	0.000	0.000	0.000	0.000	1408.32	
8	0.7209	1176.1	1196.9	0.890	3.344	71.082	20.713	3.378	0.146	0.363	0.037	0.046	0.000	0.000	0.000	0.000	0.000	1409.63	
9	0.7206	1175.7	1196.5	0.887	3.343	71.072	20.744	3.401	0.138	0.336	0.034	0.043	0.000	0.000	0.000	0.000	0.000	1409.48	
10	0.7247	1182.6	1203.5	0.871	3.330	70.763	20.760	3.566	0.169	0.433	0.048	0.061	0.000	0.000	0.000	0.000	0.000	1413.70	
11	0.7211	1176.6	1197.4	0.894	3.321	71.086	20.743	3.347	0.147	0.371	0.040	0.050	0.000	0.000	0.000	0.000	0.000	1410.08	
12	0.7146	1166.5	1187.2	0.887	3.334	71.589	20.791	2.971	0.109	0.261	0.025	0.031	0.000	0.000	0.000	0.000	0.000	1404.44	
13	0.7171	1169.9	1190.6	0.915	3.326	71.293	20.948	3.057	0.116	0.280	0.029	0.037	0.000	0.000	0.000	0.000	0.000	1405.97	
14	0.7188	1172.7	1193.5	0.913	3.313	71.110	21.004	3.155	0.127	0.310	0.030	0.038	0.000	0.000	0.000	0.000	0.000	1407.73	
15	0.7162	1168.7	1189.4	0.901	3.330	71.527	20.746	2.960	0.129	0.327	0.035	0.045	0.000	0.000	0.000	0.000	0.000	1405.49	
16	0.7173	1171.2	1192.0	0.868	3.330	71.513	20.629	3.085	0.136	0.349	0.039	0.051	0.000	0.000	0.000	0.000	0.000	1407.42	
17	0.7167	1170.6	1191.3	0.858	3.328	71.527	20.642	3.116	0.128	0.322	0.034	0.044	0.000	0.000	0.000	0.000	0.000	1407.24	
18	0.7165	1170.2	1190.9	0.845	3.352	71.589	20.543	3.132	0.132	0.329	0.035	0.044	0.000	0.000	0.000	0.000	0.000	1406.97	
19	0.7140	1167.2	1187.9	0.824	3.334	71.879	20.424	3.050	0.121	0.299	0.030	0.039	0.000	0.000	0.000	0.000	0.000	1405.81	
20	0.7083	1158.7	1179.2	0.810	3.346	72.376	20.366	2.752	0.093	0.214	0.019	0.023	0.000	0.000	0.000	0.000	0.000	1401.12	
21	0.7079	1157.7	1178.2	0.827	3.339	72.558	20.187	2.692	0.100	0.241	0.025	0.032	0.000	0.000	0.000	0.000	0.000	1400.34	
22	0.7095	1160.5	1181.1	0.828	3.312	72.419	20.203	2.810	0.107	0.260	0.027	0.033	0.000	0.000	0.000	0.000	0.000	1402.19	
23	0.7085	1158.4	1178.9	0.842	3.329	72.461	20.249	2.734	0.099	0.235	0.023	0.029	0.000	0.000	0.000	0.000	0.000	1400.60	
24	0.7082	1158.2	1178.7	0.833	3.325	72.539	20.167	2.742	0.101	0.237	0.024	0.030	0.000	0.000	0.000	0.000	0.000	1400.69	
25	0.7107	1162.0	1182.6	0.843	3.317	72.155	20.392	2.913	0.103	0.231	0.021	0.026	0.000	0.000	0.000	0.000	0.000	1402.76	
26	0.7123	1163.4	1184.0	0.873	3.335	71.920	20.550	2.932	0.102	0.235	0.023	0.029	0.000	0.000	0.000	0.000	0.000	1402.89	
27	0.7128	1164.8	1185.4	0.853	3.323	71.868	20.578	2.988	0.103	0.235	0.023	0.029	0.000	0.000	0.000	0.000	0.000	1404.13	
28	0.7118	1164.1	1184.7	0.835	3.310	71.857	20.745	2.887	0.100	0.222	0.020	0.025	0.000	0.000	0.000	0.000	0.000	1404.13	
29	0.7149	1168.5	1189.2	0.843	3.310	71.534	20.845	3.047	0.114	0.255	0.023	0.029	0.000	0.000	0.000	0.000	0.000	1406.51	
30	0.7127	1165.1	1185.7	0.839	3.321	71.737	20.797	2.940	0.101	0.221	0.019	0.024	0.000	0.000	0.000	0.000	0.000	1404.54	
Avg	0.7157	1169.0	1189.5	0.866	3.332	71.597	20.630	3.092	0.122	0.294	0.030	0.037	0.000	0.000	0.000	0.000	0.000	1406.04	

Zone 265

GQ Source Daily Summary

April 2016

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																	Wobbe	CCT
				CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10				
1	0.7470	1181.4	1202.3	0.811	5.585	66.743	21.403	4.860	0.172	0.380	0.022	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1391.10		
2	0.7423	1171.8	1192.5	0.783	5.768	67.504	20.605	4.768	0.164	0.366	0.021	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1384.18		
3	0.7529	1187.5	1208.6	0.834	5.734	65.787	21.952	5.070	0.178	0.398	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1392.80		
4	0.7518	1187.1	1208.1	0.838	5.646	65.959	21.946	4.998	0.175	0.391	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1393.36		
5	0.7527	1187.5	1208.6	0.835	5.711	65.790	22.018	5.031	0.176	0.392	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1393.02		
6	0.7532	1187.6	1208.7	0.828	5.758	65.779	21.904	5.101	0.180	0.401	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1392.71		
7	0.7434	1183.8	1204.8	0.728	5.231	66.951	22.076	4.460	0.156	0.353	0.021	0.023	0.000	0.000	0.000	0.000	0.000	0.000	1397.31		
8	0.7420	1182.0	1202.9	0.716	5.230	67.081	22.073	4.376	0.147	0.336	0.020	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1396.44		
9	0.7473	1182.7	1203.6	0.808	5.535	66.607	21.680	4.775	0.165	0.381	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1392.41		
10	0.7421	1181.5	1202.4	0.756	5.207	67.295	21.686	4.502	0.154	0.355	0.021	0.023	0.000	0.000	0.000	0.000	0.000	0.000	1395.78		
11	0.7458	1183.0	1204.0	0.816	5.366	66.882	21.626	4.717	0.165	0.380	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1394.15		
12	0.7508	1185.6	1206.6	0.836	5.647	66.179	21.733	4.973	0.175	0.405	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1392.51		
13	0.7514	1185.6	1206.6	0.837	5.705	66.091	21.716	5.020	0.176	0.405	0.025	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1391.91		
14	0.7527	1184.8	1205.8	0.836	5.877	65.827	21.759	5.077	0.175	0.401	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1389.79		
15	0.7548	1187.4	1208.4	0.832	5.917	65.487	21.978	5.153	0.178	0.408	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1390.96		
16	0.7527	1188.0	1209.1	0.838	5.673	65.816	22.020	5.032	0.174	0.399	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1393.64		
17	0.7506	1185.6	1206.6	0.838	5.629	66.085	21.939	4.899	0.170	0.391	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1392.70		
18	0.7504	1184.3	1205.2	0.837	5.691	66.161	21.772	4.922	0.171	0.396	0.024	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1391.32		
19	0.7507	1184.1	1205.0	0.840	5.725	66.159	21.693	4.959	0.173	0.401	0.024	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1390.82		
20	0.7519	1183.8	1204.8	0.841	5.846	65.993	21.654	5.029	0.176	0.409	0.025	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1389.47		
21	0.7523	1185.3	1206.3	0.839	5.801	65.911	21.771	5.046	0.176	0.407	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1390.82		
22	0.7534	1186.9	1207.9	0.834	5.817	65.782	21.792	5.141	0.177	0.408	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1391.60		
23	0.7535	1186.1	1207.1	0.835	5.871	65.751	21.758	5.156	0.177	0.404	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1390.64		
24	0.7532	1187.1	1208.1	0.834	5.788	65.809	21.798	5.139	0.178	0.406	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1392.01		
25	0.7533	1187.1	1208.1	0.833	5.798	65.763	21.839	5.149	0.176	0.396	0.022	0.023	0.000	0.000	0.000	0.000	0.000	0.000	1391.92		
26	0.7516	1186.2	1207.2	0.836	5.684	66.045	21.770	5.043	0.175	0.400	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1392.52		
27	0.7542	1187.1	1208.1	0.839	5.867	65.655	21.833	5.164	0.179	0.413	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1391.16		
28	0.7518	1184.2	1205.2	0.838	5.821	65.974	21.707	5.041	0.173	0.398	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1390.01		
29	0.7541	1186.0	1207.0	0.838	5.925	65.657	21.778	5.165	0.179	0.411	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1390.02		
30	0.7539	1187.1	1208.1	0.836	5.848	65.697	21.824	5.156	0.179	0.411	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1391.38		
Avg	0.7506	1185.0	1205.9	0.822	5.690	66.141	21.770	4.964	0.172	0.393	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1391.95		

Zone 271

GQ Source Daily Summary

April 2016

Number: 063

Pressure Base: 14.730

Contract Day: 1

Name: CLEVELAND STATION-MAPLETON

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	Heating Value																
				CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT	
1	0.7208	1148.7	1169.0	0.688	5.305	70.964	18.529	4.011	0.145	0.319	0.019	0.020	0.000						1376.85	
2	0.7433	1173.6	1194.4	0.793	5.740	67.319	20.789	4.784	0.166	0.365	0.021	0.022	0.000						1385.34	
3	0.7484	1180.3	1201.2	0.816	5.777	66.491	21.379	4.939	0.173	0.380	0.022	0.023	0.000						1388.48	
4	0.7520	1186.3	1207.3	0.839	5.710	65.953	21.837	5.041	0.178	0.394	0.024	0.025	0.000						1392.28	
5	0.7504	1183.9	1204.9	0.837	5.709	66.165	21.717	4.972	0.173	0.381	0.023	0.024	0.000						1390.94	
6	0.7528	1186.0	1207.0	0.833	5.816	65.795	21.861	5.079	0.178	0.392	0.023	0.024	0.000						1391.11	
7	0.7473	1184.4	1205.4	0.778	5.483	66.498	21.920	4.734	0.167	0.373	0.023	0.024	0.000						1394.40	
8	0.7415	1181.3	1202.2	0.716	5.230	67.166	21.994	4.367	0.148	0.337	0.020	0.022	0.000						1396.05	
9	0.7440	1181.1	1202.1	0.762	5.393	66.919	21.829	4.547	0.155	0.352	0.022	0.022	0.000						1393.65	
10	0.7451	1180.8	1201.7	0.804	5.456	66.910	21.580	4.671	0.162	0.370	0.023	0.024	0.000						1392.15	
11	0.7426	1181.7	1202.6	0.769	5.217	67.230	21.708	4.516	0.157	0.358	0.022	0.023	0.000						1395.63	
12	0.7490	1183.7	1204.6	0.838	5.594	66.406	21.674	4.874	0.171	0.393	0.024	0.026	0.000						1391.91	
13	0.7511	1185.5	1206.5	0.833	5.684	66.105	21.774	4.971	0.176	0.404	0.026	0.028	0.000						1392.14	
14	0.7522	1185.0	1206.0	0.833	5.818	65.833	21.900	5.006	0.172	0.389	0.024	0.025	0.000						1390.54	
15	0.7532	1185.3	1206.3	0.831	5.901	65.683	21.897	5.068	0.175	0.397	0.024	0.025	0.000						1389.94	
16	0.7537	1186.9	1207.9	0.835	5.840	65.658	21.926	5.115	0.177	0.401	0.023	0.024	0.000						1391.39	
17	0.7499	1183.9	1204.9	0.841	5.656	66.231	21.751	4.918	0.170	0.384	0.023	0.024	0.000						1391.38	
18	0.7501	1184.0	1205.0	0.836	5.682	66.179	21.784	4.910	0.170	0.390	0.024	0.025	0.000						1391.27	
19	0.7505	1183.4	1204.4	0.838	5.747	66.125	21.756	4.923	0.171	0.390	0.025	0.026	0.000						1390.26	
20	0.7508	1183.7	1204.7	0.838	5.756	66.103	21.731	4.949	0.174	0.398	0.025	0.026	0.000						1390.35	
21	0.7532	1184.5	1205.4	0.839	5.940	65.711	21.811	5.067	0.177	0.405	0.025	0.026	0.000						1388.94	
22	0.7526	1187.2	1208.2	0.823	5.745	65.853	21.895	5.037	0.173	0.427	0.023	0.024	0.000						1392.64	
23	0.7533	1185.3	1206.3	0.836	5.899	65.719	21.803	5.119	0.175	0.399	0.025	0.025	0.000						1389.89	
24	0.7536	1186.0	1207.0	0.836	5.888	65.727	21.757	5.159	0.178	0.407	0.024	0.025	0.000						1390.38	
25	0.7525	1186.3	1207.3	0.834	5.767	65.905	21.752	5.125	0.176	0.395	0.023	0.023	0.000						1391.76	
26	0.7517	1184.9	1205.9	0.836	5.773	66.028	21.658	5.093	0.174	0.391	0.023	0.023	0.000						1390.87	
27	0.7524	1185.9	1206.9	0.838	5.777	65.918	21.740	5.101	0.177	0.402	0.023	0.024	0.000						1391.42	
28	0.7536	1185.4	1206.4	0.841	5.918	65.691	21.792	5.125	0.178	0.407	0.024	0.024	0.000						1389.66	
29	0.7522	1184.0	1205.0	0.838	5.868	65.897	21.723	5.057	0.173	0.397	0.023	0.023	0.000						1389.43	
30	0.7540	1186.0	1207.0	0.839	5.926	65.618	21.844	5.143	0.177	0.406	0.024	0.024	0.000						1389.95	
Avg	0.7493	1183.0	1203.8	0.817	5.700	66.327	21.637	4.914	0.171	0.387	0.023	0.024	0.000						1390.70	

Zone 272

GQ Source Daily Summary

April 2016

Number: 041

Pressure Base: 14.730

Contract Day: 1

Name: BISMARCK STATION-GLEN ULLIN STATION

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value	Heating Value																	
		Wet	Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT	
1	0.7024	1155.0	1175.5	0.305	3.783	72.211	21.227	2.267	0.063	0.130	0.007	0.008	0.000	0.000	0.000	0.000	0.000	0.000	1402.71	
2	0.7339	1167.3	1188.0	0.686	5.403	68.525	20.616	4.270	0.144	0.319	0.018	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1386.90	
3	0.7512	1186.2	1207.2	0.823	5.671	66.031	21.880	4.985	0.174	0.390	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1392.82	
4	0.7434	1180.8	1201.7	0.781	5.332	67.129	21.608	4.591	0.159	0.356	0.021	0.023	0.000	0.000	0.000	0.000	0.000	0.000	1393.89	
5	0.7522	1186.7	1207.7	0.835	5.715	65.860	21.971	5.005	0.175	0.392	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1392.52	
6	0.7361	1178.6	1199.5	0.634	5.002	67.860	21.940	4.086	0.137	0.305	0.018	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1398.38	
7	0.6867	1158.9	1179.5	0.005	2.540	73.503	23.066	0.863	0.008	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.28	
8	0.6867	1158.8	1179.3	0.005	2.543	73.505	23.065	0.862	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.17	
9	0.6753	1132.5	1152.5	0.369	2.514	76.847	18.858	1.296	0.035	0.071	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1402.57	
10	0.6720	1134.4	1154.5	0.266	2.249	77.009	19.439	0.978	0.020	0.035	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1408.33	
11	0.6675	1121.2	1141.0	0.450	2.351	78.387	17.530	1.177	0.032	0.063	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1396.56	
12	0.6901	1123.6	1143.4	0.842	3.718	76.274	15.861	2.943	0.101	0.231	0.014	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1376.86	
13	0.7439	1177.9	1198.8	0.837	5.469	67.328	20.999	4.769	0.167	0.384	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1389.94	
14	0.7524	1184.3	1205.2	0.836	5.879	65.868	21.738	5.055	0.174	0.401	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1389.47	
15	0.7546	1187.1	1208.1	0.832	5.920	65.507	21.965	5.143	0.177	0.408	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1390.77	
16	0.7498	1184.4	1205.4	0.837	5.628	66.285	21.700	4.942	0.171	0.392	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1392.06	
17	0.7175	1151.4	1171.8	0.836	4.604	71.645	18.622	3.820	0.132	0.303	0.018	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1383.72	
18	0.7505	1184.4	1205.3	0.837	5.692	66.152	21.777	4.926	0.171	0.396	0.024	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1391.37	
19	0.7506	1184.0	1205.0	0.840	5.723	66.163	21.694	4.956	0.173	0.401	0.024	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1390.83	
20	0.7517	1183.6	1204.6	0.841	5.842	66.023	21.636	5.021	0.177	0.410	0.025	0.026	0.000	0.000	0.000	0.000	0.000	0.000	1389.40	
21	0.7524	1185.5	1206.5	0.839	5.805	65.895	21.774	5.053	0.177	0.408	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1390.84	
22	0.7533	1186.8	1207.8	0.834	5.811	65.798	21.785	5.139	0.177	0.406	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1391.63	
23	0.7534	1185.9	1206.9	0.835	5.876	65.769	21.739	5.151	0.177	0.406	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1390.46	
24	0.7531	1186.8	1207.9	0.834	5.790	65.824	21.789	5.132	0.178	0.406	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1391.85	
25	0.7532	1187.1	1208.1	0.833	5.788	65.779	21.838	5.142	0.176	0.398	0.023	0.023	0.000	0.000	0.000	0.000	0.000	0.000	1392.05	
26	0.6789	1113.0	1132.8	0.848	3.293	78.387	14.430	2.680	0.108	0.218	0.017	0.016	0.000	0.000	0.000	0.000	0.000	0.000	1374.91	
27	0.7303	1163.1	1183.7	0.842	5.083	69.695	19.447	4.383	0.156	0.351	0.022	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1385.34	
28	0.7517	1184.2	1205.2	0.838	5.817	65.990	21.696	5.041	0.173	0.398	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1390.02	
29	0.7540	1185.9	1206.9	0.838	5.927	65.668	21.771	5.158	0.178	0.410	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1389.89	
30	0.7538	1186.8	1207.8	0.836	5.855	65.716	21.801	5.152	0.179	0.412	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1391.13	
Avg	0.7301	1170.0	1190.3	0.702	4.887	69.088	20.842	4.000	0.136	0.307	0.018	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1393.46	

Zone 28

GQ Source Daily Summary

April 2016

Number: 051

Pressure Base: 14.730

Contract Day: 1

Name: CABIN CREEK STATION-BELFIELD TRANSFER

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	0.6601	1095.8	1115.2	0.532	3.068	80.373	14.253	1.661	0.040	0.066	0.004	0.003	0.000	0.000	0.000	0.000	0.000	1372.64	
2	0.6572	1094.1	1113.5	0.595	2.806	81.016	13.847	1.618	0.041	0.069	0.004	0.004	0.000	0.000	0.000	0.000	0.000	1373.52	
3	0.6634	1098.6	1118.0	0.496	3.267	79.686	14.710	1.728	0.040	0.067	0.004	0.003	0.000	0.000	0.000	0.000	0.000	1372.68	
4	0.6659	1101.8	1121.3	0.543	3.227	79.427	14.795	1.876	0.046	0.078	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1374.21	
5	0.6735	1124.5	1144.4	0.354	2.853	77.252	17.986	1.463	0.032	0.054	0.003	0.003	0.000	0.000	0.000	0.000	0.000	1394.48	
6	0.6346	1072.6	1091.6	0.885	1.546	85.530	10.921	0.991	0.043	0.074	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1370.32	
7	0.6332	1071.0	1090.0	0.876	1.531	85.701	10.867	0.908	0.039	0.069	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1369.71	
8	0.6361	1074.2	1093.2	0.844	1.654	85.102	11.326	0.965	0.037	0.064	0.004	0.004	0.000	0.000	0.000	0.000	0.000	1370.72	
9	0.6345	1071.2	1090.2	0.834	1.698	85.375	11.062	0.925	0.036	0.063	0.004	0.004	0.000	0.000	0.000	0.000	0.000	1368.65	
10	0.6345	1073.2	1092.2	0.894	1.488	85.560	10.964	0.956	0.048	0.077	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1371.17	
11	0.6369	1075.7	1094.7	0.857	1.620	85.005	11.415	0.980	0.042	0.071	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1371.74	
12	0.6661	1122.9	1142.8	0.369	2.236	78.396	17.904	1.020	0.026	0.042	0.003	0.003	0.000	0.000	0.000	0.000	0.000	1400.00	
13	0.6809	1143.6	1163.9	0.128	2.738	75.061	20.922	1.109	0.015	0.025	0.001	0.001	0.000	0.000	0.000	0.000	0.000	1410.43	
14	0.6624	1121.1	1141.0	0.345	2.027	79.247	17.197	1.119	0.024	0.036	0.003	0.002	0.000	0.000	0.000	0.000	0.000	1401.95	
15	0.6567	1111.9	1131.6	0.359	2.038	80.006	16.806	0.743	0.018	0.024	0.003	0.002	0.000	0.000	0.000	0.000	0.000	1396.40	
16	0.6628	1121.6	1141.5	0.279	2.144	78.612	18.218	0.709	0.014	0.020	0.002	0.002	0.000	0.000	0.000	0.000	0.000	1402.06	
17	0.6813	1150.4	1170.8	0.061	2.462	74.652	21.970	0.833	0.009	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1418.43	
18	0.6733	1137.8	1158.0	0.149	2.341	76.330	20.390	0.766	0.009	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1411.22	
19	0.6495	1101.1	1120.6	0.431	1.902	81.428	15.584	0.618	0.014	0.019	0.002	0.001	0.000	0.000	0.000	0.000	0.000	1390.54	
20	0.6412	1085.5	1104.8	0.523	1.938	83.295	13.501	0.696	0.017	0.024	0.003	0.002	0.000	0.000	0.000	0.000	0.000	1379.63	
21	0.6410	1085.2	1104.4	0.591	1.834	83.620	13.063	0.810	0.028	0.044	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1379.39	
22	0.6405	1084.9	1104.1	0.607	1.777	83.847	12.816	0.848	0.038	0.053	0.008	0.006	0.000	0.000	0.000	0.000	0.000	1379.62	
23	0.6492	1093.7	1113.0	0.612	2.057	82.397	13.652	1.138	0.049	0.079	0.009	0.007	0.000	0.000	0.000	0.000	0.000	1381.35	
24	0.6512	1101.3	1120.9	0.498	1.947	81.559	15.013	0.879	0.037	0.053	0.008	0.006	0.000	0.000	0.000	0.000	0.000	1388.99	
25	0.6527	1104.8	1124.3	0.505	1.870	81.258	15.408	0.847	0.042	0.055	0.009	0.007	0.000	0.000	0.000	0.000	0.000	1391.69	
26	0.6783	1145.9	1166.2	0.138	2.342	75.393	21.264	0.813	0.018	0.027	0.003	0.002	0.000	0.000	0.000	0.000	0.000	1415.89	
27	0.6727	1135.4	1155.5	0.236	2.307	76.775	19.707	0.903	0.026	0.039	0.004	0.003	0.000	0.000	0.000	0.000	0.000	1408.57	
28	0.6863	1158.7	1179.2	0.002	2.524	73.517	23.135	0.803	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.36	
29	0.6865	1158.7	1179.2	0.002	2.544	73.458	23.186	0.790	0.008	0.012	0.000	0.001	0.000	0.000	0.000	0.000	0.000	1423.15	
30	0.6791	1147.5	1167.8	0.096	2.375	75.136	21.562	0.802	0.011	0.016	0.001	0.001	0.000	0.000	0.000	0.000	0.000	1417.19	
Avg	0.6581	1109.0	1128.5	0.455	2.205	80.134	16.115	1.011	0.028	0.045	0.004	0.003	0.000	0.000	0.000	0.000	0.000	1390.99	

Zone 32

GQ Source Daily Summary

April 2016

Number: 111

Pressure Base: 14.730

Contract Day: 1

Name: LITTLE KNIFE PLANT-BELFIELD TRANSFER

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	0.6869	1159.7	1180.3	0.003	2.511	73.459	23.149	0.859	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.08
2	0.6873	1160.4	1180.9	0.003	2.509	73.435	23.116	0.918	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.46
3	0.6873	1160.1	1180.7	0.004	2.520	73.422	23.139	0.894	0.008	0.012	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1424.18
4	0.6865	1159.1	1179.7	0.003	2.511	73.531	23.077	0.858	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.74
5	0.6869	1159.5	1180.1	0.003	2.526	73.461	23.121	0.870	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.81
6	0.6868	1159.7	1180.2	0.002	2.507	73.492	23.107	0.872	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.10
7	0.6870	1159.6	1180.2	0.004	2.523	73.462	23.109	0.883	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.88
8	0.6877	1160.6	1181.1	0.004	2.536	73.386	23.101	0.947	0.010	0.015	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1424.26
9	0.6898	1163.9	1184.5	0.004	2.529	73.089	23.294	1.048	0.012	0.021	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1426.17
10	0.6870	1159.4	1180.0	0.004	2.541	73.406	23.192	0.840	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.57
11	0.6874	1160.0	1180.5	0.003	2.547	73.355	23.204	0.871	0.008	0.012	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1423.84
12	0.6878	1160.8	1181.4	0.003	2.531	73.332	23.185	0.929	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.47
13	0.6880	1161.1	1181.6	0.003	2.532	73.333	23.152	0.960	0.008	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.59
14	0.6933	1169.3	1190.0	0.004	2.524	72.913	22.962	1.539	0.022	0.035	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1429.14
15	0.6866	1158.6	1179.1	0.005	2.549	73.498	23.089	0.841	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.00
16	0.6873	1159.9	1180.5	0.005	2.530	73.392	23.183	0.871	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.96
17	0.6869	1159.2	1179.8	0.005	2.539	73.449	23.137	0.850	0.008	0.012	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1423.46
18	0.6864	1158.7	1179.2	0.003	2.532	73.487	23.157	0.803	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.27
19	0.6858	1157.8	1178.4	0.001	2.527	73.583	23.099	0.773	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1422.89
20	0.6876	1160.7	1181.2	0.003	2.520	73.300	23.308	0.852	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.52
21	0.6891	1163.2	1183.8	0.003	2.510	73.035	23.537	0.896	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1426.01
22	0.6888	1162.4	1183.0	0.003	2.520	73.131	23.414	0.910	0.008	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1425.49
23	0.6882	1161.6	1182.1	0.003	2.520	73.203	23.382	0.875	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1425.00
24	0.6870	1159.6	1180.1	0.002	2.531	73.347	23.327	0.775	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1423.79
25	0.6873	1160.8	1181.4	0.000	2.486	73.296	23.417	0.782	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1425.03
26	0.6869	1160.0	1180.6	0.000	2.495	73.375	23.341	0.771	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.48
27	0.6873	1160.2	1180.7	0.000	2.522	73.380	23.228	0.848	0.008	0.013	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1424.26
28	0.6875	1160.4	1181.0	0.000	2.531	73.210	23.496	0.745	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.30
29	0.6888	1162.7	1183.3	0.001	2.511	73.059	23.565	0.848	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1425.77
30	0.6894	1164.0	1184.6	0.003	2.488	73.042	23.492	0.955	0.008	0.012	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1426.73
Avg	0.6877	1161.0	1181.3	0.003	2.522	73.329	23.236	0.889	0.008	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1424.54

Zone 33

GQ Source Daily Summary

April 2016

Number: 471

Pressure Base: 14.730

Contract Day:

Name: SPRING CREEK I INTERCONNECT

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	0.6843	1125.9	1145.9	0.967	2.860	74.738	20.691	0.739	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.22	
2	0.6839	1125.2	1145.1	0.967	2.868	74.702	20.832	0.627	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.72	
3	0.6839	1125.4	1145.4	0.966	2.855	74.610	21.028	0.537	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.01	
4	0.6844	1125.8	1145.7	0.967	2.880	74.632	20.858	0.655	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.92	
5	0.6869	1131.0	1151.1	0.962	2.805	74.138	21.417	0.670	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.81	
6	0.6841	1126.2	1146.2	0.966	2.828	74.577	21.084	0.542	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.75	
7	0.6875	1131.3	1151.4	0.962	2.838	74.202	21.152	0.824	0.008	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.63	
8	0.6846	1126.8	1146.8	0.965	2.843	74.469	21.181	0.536	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.96	
9	0.6879	1132.2	1152.3	0.962	2.826	74.134	21.203	0.858	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1389.27	
10	0.6881	1132.5	1152.6	0.961	2.829	74.089	21.244	0.858	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1389.43	
11	0.6875	1131.0	1151.0	0.963	2.859	74.098	21.330	0.734	0.006	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.19	
12	0.6881	1132.2	1152.3	0.963	2.844	74.049	21.297	0.841	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1389.06	
13	0.6897	1133.6	1153.7	0.962	2.906	74.004	21.001	1.118	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1389.20	
14	0.6835	1124.6	1144.5	0.975	2.860	74.848	20.622	0.691	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.32	
15	0.6841	1125.6	1145.5	0.971	2.857	74.745	20.720	0.702	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.98	
16	0.6843	1126.0	1146.0	0.969	2.851	74.634	20.907	0.634	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.34	
17	0.6876	1131.3	1151.3	0.968	2.840	74.288	20.943	0.950	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.49	
18	0.6830	1124.1	1144.0	0.970	2.847	74.774	20.893	0.512	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.27	
19	0.6829	1124.0	1143.9	0.971	2.846	74.806	20.844	0.529	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.18	
20	0.6837	1125.7	1145.6	0.969	2.816	74.817	20.708	0.683	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.52	
21	0.6828	1123.9	1143.8	0.970	2.842	74.924	20.629	0.630	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.21	
22	0.6780	1115.4	1135.1	0.974	2.903	75.797	19.801	0.518	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1378.56	
23	0.6786	1116.3	1136.1	0.982	2.886	75.793	19.725	0.602	0.005	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1379.15	
24	0.6817	1121.1	1140.9	0.978	2.895	75.397	19.863	0.853	0.006	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1381.83	
25	0.6774	1114.2	1133.9	0.987	2.897	75.920	19.694	0.496	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1377.73	
26	0.6735	1107.3	1127.0	0.989	2.946	76.584	19.104	0.369	0.003	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1373.22	
27	0.6737	1107.0	1126.6	0.994	2.978	76.494	19.209	0.318	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1372.59	
28	0.6755	1110.4	1130.0	0.987	2.949	76.109	19.648	0.300	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1374.99	
29	0.6791	1116.1	1135.9	0.980	2.955	75.461	20.189	0.409	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1378.36	
30	0.6745	1109.1	1128.8	0.988	2.930	76.471	19.151	0.448	0.005	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1374.41	
Avg	0.6828	1123.0	1143.3	0.972	2.871	74.943	20.566	0.639	0.004	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1383.54	

Zone 43

GQ Source Analysis

GQ Source Number:	1202160	Specific Gravity:	0.5745
GQ Source Name:	BOWMAN BORDER	Dry Heat Value:	981.57
Effective Date:	4/28/2016 9:00:00 AM	Wet Heat Value:	964.49
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	981.57
Pressure Base:	14.730	Sample Pressure:	312.00
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	95.601		CO2	Carbon Dioxide	0.119
C2	Ethane	0.589	0.1569	N2	Nitrogen	3.612
C3	Propane	0.044	0.0121	O2	Oxygen	0.021
IC4	Isobutane	0.010	0.0031	He	Helium	
NC4	n-Butane	0.004	0.0014	H2	Hydrogen	
IC5	Isopentane	0.000	0.0000	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.000	0.0000	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% 0.174 GPM

Sample Date: 4/28/2016 12:00:00 AM
Sample Type: Spot
Sample Tech: MG
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 34

Apr-16

ZONE 610

Watford City

Effective 2-3-16

01325

Watford City West Border

01312

Watford City East Border

Weighted

Begin Date	End Date	BTU			BTU			AVG BTU	
		MCF	DK	Zone 25	MCF	DK	Zone 43		
4/1/2016	4/2/2016	266	321	1.211	344	394	1.146	1.174	4/1/2016
4/2/2016	4/3/2016	70	84	1.211	196	224	1.145	1.162	4/2/2016
4/3/2016	4/4/2016	181	219	1.211	249	286	1.145	1.173	4/3/2016
4/4/2016	4/5/2016	104	126	1.211	239	274	1.146	1.166	4/4/2016
4/5/2016	4/6/2016	254	307	1.211	285	328	1.151	1.179	4/5/2016
4/6/2016	4/7/2016	262	317	1.211	267	306	1.146	1.178	4/6/2016
4/7/2016	4/8/2016	269	325	1.211	268	308	1.151	1.181	4/7/2016
4/8/2016	4/9/2016	236	285	1.211	260	298	1.147	1.177	4/8/2016
4/9/2016	4/10/2016	177	213	1.211	194	224	1.152	1.180	4/9/2016
4/10/2016	4/11/2016	412	499	1.211	377	434	1.153	1.183	4/10/2016
4/11/2016	4/12/2016	284	343	1.211	351	404	1.151	1.178	4/11/2016
4/12/2016	4/13/2016	134	162	1.211	268	309	1.152	1.172	4/12/2016
4/13/2016	4/14/2016	71	86	1.211	143	165	1.154	1.173	4/13/2016
4/14/2016	4/15/2016	70	84	1.211	144	165	1.145	1.167	4/14/2016
4/15/2016	4/16/2016	268	323	1.211	256	293	1.146	1.179	4/15/2016
4/16/2016	4/17/2016	335	405	1.211	310	355	1.146	1.180	4/16/2016
4/17/2016	4/18/2016	341	412	1.211	316	364	1.151	1.182	4/17/2016
4/18/2016	4/19/2016	280	338	1.211	286	328	1.144	1.177	4/18/2016
4/19/2016	4/20/2016	197	238	1.211	193	221	1.144	1.178	4/19/2016
4/20/2016	4/21/2016	89	108	1.211	140	160	1.146	1.171	4/20/2016
4/21/2016	4/22/2016	130	157	1.211	156	178	1.144	1.174	4/21/2016
4/22/2016	4/23/2016	95	115	1.211	167	190	1.135	1.163	4/22/2016
4/23/2016	4/24/2016	180	217	1.211	163	185	1.136	1.175	4/23/2016
4/24/2016	4/25/2016	342	413	1.211	267	305	1.141	1.180	4/24/2016
4/25/2016	4/26/2016	324	391	1.211	312	354	1.134	1.173	4/25/2016
4/26/2016	4/27/2016	339	410	1.211	315	354	1.127	1.171	4/26/2016
4/27/2016	4/28/2016	281	340	1.211	278	314	1.127	1.169	4/27/2016
4/28/2016	4/29/2016	209	252	1.211	244	276	1.130	1.167	4/28/2016
4/29/2016	4/30/2016	122	148	1.211	193	219	1.136	1.165	4/29/2016
4/30/2016	5/1/2016	99	120	1.211	212	239	1.129	1.155	4/30/2016
		6,421	7,758		7,393	8,454	1.1433	1.1735	

ROW ID	LOCATION DESCRIPTION	GROSS HEATING VALUE (BTU/C)	SPECIFIC GRAVITY	WOBBE (calc)	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	Change/timestamp	NOTES
11587	GLEN ULLIN	1059.2	0.61	1356.2	-74.3	1.2958	0.8068	89.2703	8.0661	0.3525	0.0082	0.0063	0.0001	0.0002	0	0	0.1762	0.0186	3/31/2016	4/1/2016	4/1/2016 2:43:34 PM	
11587	GLEN ULLIN	1058.7	0.6098	1355.8	-74.2	1.3225	0.7979	89.3269	7.9499	0.3886	0.0095	0.0068	0	0.0002	0	0	0.1797	0.0184	4/1/2016	4/2/2016	4/2/2016 2:43:37 PM	
11587	GLEN ULLIN	1058.8	0.6097	1356.1	-73.6	1.2949	0.8067	89.3704	7.8933	0.4071	0.0121	0.009	0.0005	0.0008	0	0.0003	0.1884	0.0161	4/2/2016	4/3/2016	4/3/2016 2:43:27 PM	
11587	GLEN ULLIN	1058.9	0.6101	1355.6	-74	1.3222	0.8105	89.2607	8.0127	0.3714	0.0107	0.0079	0.0003	0.0006	0	0.0001	0.1864	0.0175	4/3/2016	4/4/2016	4/4/2016 2:44:41 PM	
11587	GLEN ULLIN	1057.6	0.6095	1354.7	-74.6	1.3164	0.8261	89.4046	7.8617	0.3731	0.0105	0.0078	0.0002	0.0004	0	0	0.1839	0.016	4/4/2016	4/5/2016	4/5/2016 2:43:41 PM	
11587	GLEN ULLIN	1058.4	0.6096	1355.5	-73.9	1.2895	0.821	89.4377	7.8211	0.4095	0.0133	0.0101	0.0007	0.0012	0	0	0.1798	0.016	4/5/2016	4/6/2016	4/6/2016 2:45:48 PM	
11587	GLEN ULLIN	1057.6	0.6093	1354.9	-74.8	1.3136	0.8142	89.4422	7.8549	0.3666	0.0099	0.007	0.0001	0.0003	0	0	0.1742	0.016	4/6/2016	4/7/2016	4/7/2016 2:44:23 PM	
11587	GLEN ULLIN	1061	0.6113	1357	-73.2	1.2649	0.8367	89.077	8.2624	0.3618	0.0093	0.0064	0.0002	0.0002	0	0	0.1655	0.016	4/7/2016	4/8/2016	4/8/2016 2:44:52 PM	
11587	GLEN ULLIN	1057.5	0.609	1355.1	-75.4	1.2903	0.8178	89.4793	7.8953	0.3242	0.0079	0.0054	0	0	0	0	0.1641	0.016	4/8/2016	4/9/2016	4/9/2016 2:43:46 PM	
11587	GLEN ULLIN	1060.6	0.6113	1356.6	-72.8	1.3181	0.8195	89.0641	8.2153	0.3763	0.0124	0.0089	0.0006	0.0008	0	0.0004	0.1662	0.016	4/9/2016	4/10/2016	4/10/2016 2:44:29 PM	
11587	GLEN ULLIN	1064.3	0.6132	1359.1	-67.8	1.2351	0.8477	88.8813	8.3305	0.4653	0.0272	0.0207	0.0032	0.0044	0	0.0013	0.1678	0.016	4/10/2016	4/11/2016	4/11/2016 2:43:58 PM	
11587	GLEN ULLIN	1062	0.6122	1357.3	-72.4	1.2629	0.8534	88.926	8.3832	0.3693	0.0119	0.0082	0.0005	0.0007	0	0	0.1691	0.016	4/11/2016	4/12/2016	4/12/2016 2:45:39 PM	
11587	GLEN ULLIN	1063.9	0.6133	1358.5	-70.3	1.2606	0.8544	88.7893	8.4726	0.4171	0.0177	0.0133	0.0015	0.0021	0	0.0005	0.1568	0.016	4/12/2016	4/13/2016	4/13/2016 2:44:36 PM	
11587	GLEN ULLIN	1067.8	0.6158	1360.7	-60.5	1.2846	0.8357	88.528	8.5267	0.5693	0.039	0.031	0.0048	0.0068	0	0.0029	0.1558	0.016	4/13/2016	4/14/2016	4/14/2016 2:44:35 PM	
11587	GLEN ULLIN	1065.3	0.6143	1359.1	-59.4	1.2938	0.8362	88.8151	8.2087	0.5686	0.0411	0.0333	0.0055	0.0076	0	0.0032	0.1695	0.016	4/14/2016	4/15/2016	4/15/2016 2:45:51 PM	
11587	GLEN ULLIN	1062.4	0.6126	1357.4	-64.3	1.2981	0.8397	89.058	8.0535	0.4965	0.0328	0.0264	0.004	0.0058	0	0.0023	0.1655	0.016	4/15/2016	4/16/2016	4/16/2016 2:43:54 PM	
11587	GLEN ULLIN	1057.3	0.6093	1354.5	-74.5	1.3081	0.8321	89.5042	7.7846	0.3679	0.0133	0.0099	0.0006	0.0012	0	0.0002	0.1612	0.016	4/16/2016	4/17/2016	4/17/2016 2:43:59 PM	
11587	GLEN ULLIN	1062.1	0.6125	1357.1	-70.3	1.2899	0.8542	89.0093	8.1586	0.468	0.0211	0.0165	0.0018	0.0028	0	0.0007	0.161	0.016	4/17/2016	4/18/2016	4/18/2016 2:45:12 PM	
11587	GLEN ULLIN	1064	0.6132	1358.8	-67.7	1.2473	0.8447	88.9495	8.2484	0.4846	0.0283	0.0224	0.0031	0.0044	0	0.0013	0.1508	0.016	4/18/2016	4/19/2016	4/19/2016 2:44:14 PM	
11587	GLEN ULLIN	1062.1	0.6119	1357.8	-69.5	1.262	0.8282	89.1368	8.0678	0.4639	0.0276	0.0215	0.0027	0.004	0	0.0011	0.1689	0.016	4/19/2016	4/20/2016	4/20/2016 2:44:49 PM	
11587	GLEN ULLIN	1057.2	0.6084	1355.4	-73.6	1.2506	0.8147	89.746	7.5418	0.4154	0.0206	0.0158	0.0018	0.0028	0	0.0007	0.1745	0.016	4/20/2016	4/21/2016	4/21/2016 2:44:22 PM	
11587	GLEN ULLIN	1064.4	0.6126	1359.9	-58.6	1.1884	0.8349	89.1984	7.9824	0.5391	0.0419	0.0349	0.0058	0.008	0	0.0035	0.1484	0.016	4/21/2016	4/22/2016	4/22/2016 2:45:51 PM	
11587	GLEN ULLIN	1065.8	0.614	1360.2	-51.6	1.2261	0.8393	89.0939	7.9203	0.6324	0.0572	0.0472	0.0085	0.0113	0	0.0053	0.1429	0.016	4/22/2016	4/23/2016	4/23/2016 2:43:56 PM	
11587	GLEN ULLIN	1067.1	0.6153	1360.4	-50.9	1.2466	0.8556	88.8888	8.0323	0.6773	0.0602	0.0496	0.0088	0.0117	0	0.0053	0.149	0.016	4/23/2016	4/24/2016	4/24/2016 2:44:20 PM	
11587	GLEN ULLIN	1071.8	0.6189	1362.4	-46	1.2797	0.8695	88.2804	8.5036	0.7463	0.0687	0.0567	0.0102	0.0136	0	0.0065	0.1497	0.016	4/24/2016	4/25/2016	4/25/2016 2:45:29 PM	
11587	GLEN ULLIN	1065.8	0.6144	1359.7	-51.3	1.2354	0.8598	89.0498	7.9126	0.6479	0.0593	0.0485	0.0088	0.0115	0	0.0052	0.148	0.016	4/25/2016	4/26/2016	4/26/2016 2:45:39 PM	
11587	GLEN ULLIN	1060.5	0.6107	1357	-55.6	1.2263	0.841	89.6875	7.395	0.5756	0.0504	0.0412	0.0072	0.0096	0	0.0044	0.1466	0.016	4/26/2016	4/27/2016	4/27/2016 2:45:22 PM	
11587	GLEN ULLIN	1061.1	0.6107	1357.9	-57.7	1.1679	0.8536	89.6606	7.4921	0.5518	0.0478	0.0392	0.0069	0.0091	0	0.0038	0.1519	0.016	4/27/2016	4/28/2016	4/28/2016 2:48:38 PM	
11587	GLEN ULLIN	1062.8	0.6115	1359.1	-56.1	1.1272	0.866	89.5649	7.6224	0.5599	0.0492	0.0403	0.0072	0.0094	0	0.0041	0.1335	0.016	4/28/2016	4/29/2016	4/29/2016 2:43:46 PM	
11587	GLEN ULLIN	1066.7	0.6144	1360.8	-52.9	1.1727	0.862	89.0334	8.0518	0.6075	0.0554	0.0444	0.0083	0.0106	0	0.0048	0.1337	0.016	4/29/2016	4/30/2016	4/30/2016 2:44:40 PM	
11587	GLEN ULLIN	1066	0.6142	1360.2	-57	1.1761	0.8777	89.0087	8.1177	0.5745	0.0465	0.0374	0.0062	0.0085	0	0.0037	0.1277	0.016	4/30/2016	5/1/2016	5/1/2016 2:45:11 PM	

31 record(s) retrieved

June 8/01

NORTH DAKOTA HEATING VALUE ZONES		
ZONES	MEASURING DEVICE	LOCATION
211	Chromatograph	Sidney Area
24	Monthly Sampler	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	Monthly Sampler	Williston – Ray
265	Chromatograph	North Tioga
271	Chromatograph	Bismarck – Cleveland
272	Chromatograph	Cleveland – Mapleton
273	Chromatograph	Cleveland – Grafton
28	Chromatograph	Bismarck
31	Chromatograph	Dickinson
32	Chromatograph	Cabin Creek – Dickinson
33	Chromatograph	Killdeer
34	Monthly Sampler	Bowman Area
43	Chromatograph	Spring Creek
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	APR 16	MAR 16	FEB 16	JAN 16	DEC 15	NOV 15	OCT 15	SEPT 15	AUG 15	JULY 15	JUNE 15	MAY 15	ZONE
MT/ND	211	Sidney Area	1202	1207	1213	1209	1207	1204	1195	1188	1193	1196	1199	1205	1202	211
ND	24	Williston Area	1189	1196	1194	1195	1195	1199	1183	1177	1166	1179	1185	1187	1206	24
ND	25	Watford City Border	1210	1211	1211	1213	1216	1216	1223	1216	1198	1198	1188	1207	1220	25
ND/MT	241	Fairview Area	1194	1207	1201	1201	1199	1199	1184	1182	1177	1188	1195	1195	1197	241
ND	261	Williston - Tioga - Minot Line	1046	1186	1048	1035	1052	1066	1047	1000	1042	1015	1028	1026	1006	261
ND	262	Minot Area	1194	1206	1189	1190	1189	1188	1192	1198	1201	1201	1201	1185	1188	262
ND	263	Tioga - Portal	1103	1105	1082	1107	1092	1082	1112	1112	1104	1117	1121	1107	1090	263
ND	264	Williston - Ray	1176	1190	1189	1181	1183	1180	1178	1162	1154	1146	1170	1187	1189	264
ND	265	North Tioga Transfer - Portal	1188	1190	1186	1187	1190	1188	1189	1180	1188	1188	1191	1187	1187	265
ND	271	Bismarck - Cleveland	1191	1206	1186	1181	1172	1181	1192	1199	1203	1199	1201	1186	1189	271
ND	272	Cleveland - Mapleton	1190	1204	1185	1180	1171	1180	1191	1197	1202	1199	1200	1186	1188	272
ND	273	Cleveland - Grafton	1190	1201	1185	1179	1171	1180	1190	1197	1203	1199	1200	1185	1189	273
ND	28	Bismarck - Cabin Creek	1173	1190	1154	1142	1131	1137	1148	1196	1203	1200	1201	1186	1189	28
ND	31	Dickinson Area	1142	1114	1144	1139	1130	1136	1135	1161	1161	1145	1181	1127	1129	31
ND	311	Taylor Take-Off - Glen Ullin Comp	1170	0	0	0	0	0	1147	1179	1168	1158	1200	1168	1171	311
ND/MT	32	Cabin Creek - Dickinson	1142	1129	1121	1125	1117	1117	1111	1120	1176	1173	1181	1169	1165	32
ND	33	Killdeer	1184	1181	1181	1183	1182	1186	1185	1186	1186	1191	1185	1183	1183	33
ND	34	Bowman Area	1087	982	979	1082	1103	1121	1102	1084	1025	1133	1176	1121	1130	34
ND	43	Spring Creek - Garden Crk Plant	1115	1143	1112	1091	1087	1092	1088	1083	1100	1162	1129	1099	1196	43
ND	610	MDU-Watford City BTU	1178	1174	1153	1140	1155	1174	1197	1211	1197	1197	1145	1175	1216	610
ND	802	Linton	1061	1062	1057	1056	1060	1066	1073	1064	1055	1055	1057	1068	1064	802
ND	903	Hettinger Propane	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	903

**THERMAL ZONE VARIANCE
DOCUMENTATION**

April 2016

<i>ZONE</i>	<i>BTU VARIANCE</i>	<i>REASON</i>
43	31	Operational Changes
261	138	Supply Changes – Maintenance
263	23	Supply Changes – Maintenance
271	20	Supply Changes – Maintenance
28	36	Supply Changes – Maintenance
31	-30	Operational Changes