



UTILITIES CO.

A Division of MDU Resources Group, Inc.

400 North Fourth Street
Bismarck, ND 58501
(701) 222-7900

February 12, 2014

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

Re: Case No. 11,006 (Therm Billing)
Monthly Report – December 2013

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:

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 January 2014.
2. Attachment B consists of copies of the monthly Heating Value Test Reports received from our supplier for the month of December 2013. There is a report for each of the 17 thermal zones for the month.
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 December 2013.

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,

A handwritten signature in blue ink that reads 'Tamie Aberle'.

Tamie Aberle
Director of Regulatory Affairs

Montana-Dakota Utilities Co.
Therm Billing Factors - North Dakota
January 2014

Town	Heat Zone	Therm Factor
MDU-303-ALEXANDER	025	1.1249
MDU-308-ARNEGARD	025	1.1249
MDU-314-APPLE VALLEY	271	1.1048
MDU-318-BEACH	032	0.9999
MDU-319-BELFIELD	032	1.0073
MDU-323-BERTHOLD	262	1.1343
MDU-327-BISMARCK	028	1.0462
MDU-330-BOWMAN	034	0.9926
MDU-337-BURLINGTON	262	1.1588
MDU-343-CARRINGTON	273	1.1048
MDU-344-CLEVELAND	272	1.0970
MDU-364-CAVALIER	273	1.1281
MDU-365-DAWSON	271	1.0970
MDU-368-DES LACS	262	1.1425
MDU-369-DICKINSON	031	1.0240
MDU-374-FT TOTTEN	273	1.1125
MDU-375-DEVILS LAKE	273	1.1125
MDU-379-BARLOW	273	1.1048
MDU-384-EPPING	264	1.1343
MDU-387-ELDRIDGE	272	1.1048
MDU-407-GLADSTONE	031	1.0380
MDU-411-GLEN ULLIN	311	1.0314
MDU-413-GOLVA	032	0.9852
MDU-416-GARRISON	262	1.1425
MDU-417-GRAFTON	273	1.1359
MDU-429-HEBRON	311	1.0314
MDU-432-HETTINGER	903	2.3875
MDU-449-JAMESTOWN	272	1.1125
MDU-459-KILLDEER	033	1.1145
MDU-463-LANGDON	273	1.1048
MDU-469-LEFOR	031	1.0240
MDU-474-LIGNITE	263	1.0093
MDU-475-LINTON	802	0.9967
MDU-478-LINCOLN	028	1.0536
MDU-494-MEDINA	271	1.0970
MDU-498-MANDAN	028	1.0536
MDU-500-MARMARTH	034	0.9999
MDU-505-MINOT	262	1.1588
MDU-510-MOTT	031	1.0240
MDU-512-MAX	262	1.1343
MDU-522-NEW ENGLAND	031	1.0166
MDU-524-NEW SALEM	028	1.0536
MDU-532-NEW ROCKFORD	273	1.1048
MDU-539-PARK RIVER	273	1.1281
MDU-540-PALERMO	262	1.1343
MDU-558-RAY	264	1.1343
MDU-561-REGENT	031	1.0240
MDU-563-RHAME	034	0.9852
MDU-564-RICHARDTON	311	1.0166

Montana-Dakota Utilities Co.
Therm Billing Factors - North Dakota
January 2014

Town	Heat Zone	Therm Factor
MDU-568-ROSS	261	1.1187
MDU-572-RUTHVILLE	262	1.1588
MDU-574-SANBORN	272	1.1125
MDU-583-SENTINEL BUTTE	032	0.9999
MDU-588-SOUTH HEART	031	1.0166
MDU-717-SPIRITWOOD	272	1.1125
MDU-590-SPRINGBROOK	264	1.1343
MDU-591-STANLEY	261	1.1268
MDU-593-STEELE	271	1.0970
MDU-598-SHEYENNE	273	1.1125
MDU-605-SURREY	262	1.1588
MDU-610-TAPPEN	271	1.0970
MDU-611-TAYLOR	031	1.0166
MDU-616-TIOGA	261	1.1349
MDU-619-TURTLE LAKE	262	1.1425
MDU-620-TRENTON	024	1.1425
MDU-624-UNDERWOOD	262	1.1425
MDU-625-VALLEY CITY	272	1.1203
MDU-629-WALHALLA	273	1.1281
MDU-632-WATFORD CITY	025	1.1249
MDU-636-WHEELOCK	264	1.1262
MDU-637-WHITE EARTH	261	1.1268
MDU-642-WILLISTON	024	1.1425
MDU-646-WASHBURN	262	1.1507
MDU-647-WILTON	262	1.1343
MDU-664-RIVERDALE	262	1.1425
MDU-691-FAIRVIEW	241	1.1387
MDU-712-MINOT AFB	262	1.1588
MDU-732-MSR SITE	273	1.1048

GQ Source Daily Summary

December 2013

Number: 372

Pressure Base: 14.730

Contract Day: 1

Name: NESSON PLANT-CHARBONNEAU STATION

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value		Heating Value Dry																
		Wet	Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT	
1	0.7117	1182.3	1203.2	0.833	2.179	73.297	19.134	4.177	0.140	0.230	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1426.25	
2	0.7177	1191.9	1213.0	0.831	2.154	72.813	19.051	4.639	0.180	0.315	0.010	0.008	0.000	0.000	0.000	0.000	0.000	0.000	1431.78	
3	0.7116	1182.0	1202.9	0.836	2.181	73.350	19.089	4.124	0.152	0.255	0.007	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1426.01	
4	0.7033	1168.6	1189.3	0.836	2.224	74.498	18.384	3.686	0.136	0.225	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1418.06	
5	0.7124	1183.7	1204.7	0.815	2.185	73.440	18.822	4.245	0.168	0.301	0.013	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1427.25	
6	0.7131	1183.5	1204.5	0.812	2.265	73.372	18.705	4.364	0.168	0.297	0.010	0.008	0.000	0.000	0.000	0.000	0.000	0.000	1426.33	
7	0.7105	1179.9	1200.8	0.802	2.253	73.727	18.565	4.162	0.166	0.303	0.012	0.010	0.000	0.000	0.000	0.000	0.000	0.000	1424.61	
8	0.7149	1186.3	1207.3	0.814	2.262	73.047	19.100	4.232	0.176	0.333	0.017	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1427.85	
9	0.7074	1174.7	1195.5	0.821	2.257	73.732	19.045	3.780	0.132	0.223	0.006	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1421.41	
10	0.7029	1167.6	1188.3	0.829	2.255	74.280	18.809	3.514	0.115	0.189	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1417.37	
11	0.7040	1169.3	1190.0	0.817	2.268	74.376	18.433	3.751	0.128	0.217	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1418.34	
12	0.7040	1169.5	1190.3	0.829	2.244	74.384	18.419	3.776	0.127	0.211	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1418.53	
13	0.7047	1170.4	1191.1	0.842	2.234	74.091	18.868	3.633	0.122	0.202	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1418.92	
14	0.7030	1168.2	1188.9	0.831	2.227	74.359	18.689	3.554	0.123	0.207	0.006	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1417.95	
15	0.7068	1174.2	1195.0	0.842	2.195	73.867	18.964	3.777	0.128	0.216	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1421.43	
16	0.7172	1190.5	1211.6	0.832	2.191	72.672	19.338	4.508	0.163	0.281	0.008	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1430.66	
17	0.7097	1174.6	1195.4	0.856	2.432	73.321	19.205	3.803	0.136	0.236	0.007	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1418.95	
18	0.7070	1174.4	1195.2	0.839	2.204	73.788	19.036	3.807	0.121	0.196	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1421.53	
19	0.7078	1175.5	1196.3	0.843	2.212	73.588	19.277	3.738	0.126	0.207	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1421.98	
20	0.7093	1177.6	1198.5	0.840	2.226	73.235	19.655	3.709	0.124	0.203	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1423.08	
21	0.7169	1190.0	1211.0	0.836	2.199	72.280	20.115	4.156	0.149	0.253	0.007	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1430.23	
22	0.7140	1184.8	1205.8	0.838	2.233	72.701	19.817	4.017	0.142	0.241	0.007	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1427.01	
23	0.7213	1196.6	1217.8	0.829	2.214	71.815	20.208	4.445	0.170	0.302	0.009	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1433.87	
24	0.7066	1173.0	1193.8	0.844	2.252	73.435	19.734	3.443	0.110	0.176	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1420.17	
25	0.7074	1174.2	1195.0	0.848	2.245	73.305	19.848	3.455	0.113	0.181	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1420.88	
26	0.7173	1189.1	1210.1	0.847	2.277	71.992	20.445	4.090	0.130	0.211	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1428.76	
27	0.7122	1181.5	1202.4	0.847	2.252	72.906	19.677	3.995	0.120	0.194	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1424.81	
28	0.7079	1176.0	1196.8	0.851	2.181	73.184	20.034	3.475	0.106	0.163	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1422.48	
29	0.7173	1190.7	1211.8	0.840	2.174	72.341	19.943	4.300	0.148	0.243	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1430.84	
30	0.7141	1185.6	1206.6	0.847	2.187	72.509	20.165	3.959	0.126	0.200	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1427.79	
31	0.7136	1184.5	1205.5	0.846	2.201	72.590	20.100	3.923	0.128	0.204	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1427.09	
Avg	0.7106	1180.0	1200.6	0.835	2.228	73.300	19.312	3.943	0.138	0.233	0.007	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1424.27	

Zone 24, 264

GQ Source Analysis

GQ Source Number:	0602160	Specific Gravity:	0.7240
GQ Source Name:	FAIRVIEW BORDER	Dry Heat Value:	1197.01
Effective Date:	12/1/2013 9:00:00 AM	Wet Heat Value:	1176.18
Effective End Date:	1/18/2038 9:14:00 PM	As Deliv. Heat Value:	1197.01
Pressure Base:	14.730	Sample Pressure:	457.00
Viscosity:		Sample Temperature:	0.00

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	69.682		CO2	Carbon Dioxide	0.869
C2	Ethane	21.688	5.7830	N2	Nitrogen	3.629
C3	Propane	3.886	1.0674	O2	Oxygen	0.000
IC4	Isobutane	0.088	0.0288	He	Helium	
NC4	n-Butane	0.157	0.0495	H2	Hydrogen	
IC5	Isopentane	0.001	0.0003	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.001	0.0002	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% 6.929 GPM

Sample Date: 12/31/2013 9:00:00 AM
Sample Type: Composite
Sample Tech: ES
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 241

GQ Source Analysis

GQ Source Number:	0602230	Specific Gravity:	0.7254
GQ Source Name:	WATFORD CITY BORDER	Dry Heat Value:	1191.42
Effective Date:	12/1/2013 9:00:00 AM	Wet Heat Value:	1170.69
Effective End Date:	1/18/2038 9:14:00 PM	As Deliv. Heat Value:	1191.42
Pressure Base:	14.730	Sample Pressure:	313.00
Viscosity:		Sample Temperature:	0.00

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	69.840		CO2	Carbon Dioxide	0.957
C2	Ethane	20.813	5.5498	N2	Nitrogen	3.963
C3	Propane	4.081	1.1210	O2	Oxygen	0.000
IC4	Isobutane	0.113	0.0370	He	Helium	
NC4	n-Butane	0.210	0.0660	H2	Hydrogen	
IC5	Isopentane	0.012	0.0045	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.011	0.0039	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% 6.782 GPM

Sample Date: 12/31/2013 9:00:00 AM
Sample Type: Composite
Sample Tech: PP
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 25

GQ Source Analysis

GQ Source Number:	2501030	Specific Gravity:	0.6318
GQ Source Name:	LIGNITE PLANT	Dry Heat Value:	1060.85
Effective Date:	12/1/2013 9:00:00 AM	Wet Heat Value:	1042.39
Effective End Date:	1/18/2038 9:14:00 PM	As Deliv. Heat Value:	1060.85
Pressure Base:	14.730	Sample Pressure:	343.00
Viscosity:		Sample Temperature:	0.00

	<u>Mol %</u>	<u>Liquid Content</u>		<u>Mol %</u>
C1 Methane	84.041		CO2 Carbon Dioxide	0.040
C2 Ethane	10.976	2.9266	N2 Nitrogen	4.392
C3 Propane	0.539	0.1479	O2 Oxygen	0.000
IC4 Isobutane	0.000	0.0000	He Helium	
NC4 n-Butane	0.001	0.0003	H2 Hydrogen	
IC5 Isopentane	0.000	0.0000	H2S Hydrogen Sulfide	
NC5 n-Pentane	0.000	0.0000	Ar Argon	
C6 Hexanes	0.012	0.0000	CO Carbon Monoxide	
C7 Heptanes			H2 Water	
C8 Octanes			Neo-C5 Neopentane	
C9 Nonanes				
C10 Decanes				

Totals 100.000% 3.075 GPM

Sample Date: 12/31/2013 9:00:00 AM
Sample Type: Composite
Sample Tech: RR
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 263

*** End of Report ***

GQ Source Daily Summary

December 2013

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	0.7193	1159.3	1179.9	0.656	4.568	70.831	19.978	3.533	0.114	0.263	0.026	0.031	0.000	0.000	0.000	0.000	0.000	1391.16	
2	0.7108	1150.6	1171.0	0.621	4.354	72.004	19.526	3.154	0.096	0.207	0.018	0.021	0.000	0.000	0.000	0.000	0.000	1388.95	
3	0.6991	1137.9	1158.1	0.570	4.109	74.042	18.064	2.898	0.093	0.190	0.017	0.017	0.000	0.000	0.000	0.000	0.000	1385.03	
4	0.6967	1134.9	1154.9	0.570	4.064	74.657	17.444	2.899	0.103	0.219	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1383.73	
5	0.6877	1124.5	1144.4	0.524	3.924	75.996	16.707	2.531	0.090	0.185	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1380.01	
6	0.6812	1116.9	1136.7	0.503	3.807	76.987	16.142	2.288	0.081	0.157	0.018	0.018	0.000	0.000	0.000	0.000	0.000	1377.26	
7	0.6793	1115.5	1135.3	0.495	3.727	77.387	15.813	2.303	0.082	0.156	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1377.39	
8	0.6754	1108.8	1128.4	0.522	3.726	78.039	15.293	2.167	0.078	0.142	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1373.09	
9	0.6735	1105.1	1124.6	0.520	3.781	78.279	15.084	2.114	0.071	0.125	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1370.38	
10	0.6760	1107.7	1127.3	0.523	3.855	77.813	15.406	2.178	0.072	0.128	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1371.05	
11	0.6823	1115.9	1135.7	0.538	3.917	76.912	15.948	2.390	0.086	0.173	0.019	0.018	0.000	0.000	0.000	0.000	0.000	1374.91	
12	0.6886	1123.8	1143.7	0.558	4.000	75.953	16.532	2.623	0.094	0.197	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1378.22	
13	0.6840	1118.1	1137.9	0.531	3.953	76.613	16.154	2.462	0.084	0.168	0.017	0.017	0.000	0.000	0.000	0.000	0.000	1375.89	
14	0.6784	1111.2	1130.8	0.493	3.907	77.413	15.697	2.242	0.076	0.143	0.016	0.014	0.000	0.000	0.000	0.000	0.000	1373.00	
15	0.6858	1117.8	1137.6	0.559	4.105	76.095	16.552	2.445	0.075	0.142	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1373.66	
16	0.6941	1128.9	1148.9	0.597	4.149	74.776	17.469	2.741	0.082	0.160	0.013	0.012	0.000	0.000	0.000	0.000	0.000	1378.97	
17	0.6859	1121.3	1141.2	0.535	3.930	76.153	16.629	2.508	0.078	0.144	0.013	0.010	0.000	0.000	0.000	0.000	0.000	1377.93	
18	0.6882	1128.6	1148.6	0.583	3.628	75.987	16.860	2.670	0.087	0.160	0.013	0.011	0.000	0.000	0.000	0.000	0.000	1384.61	
19	0.6846	1117.5	1137.3	0.539	4.036	76.347	16.372	2.475	0.073	0.135	0.013	0.011	0.000	0.000	0.000	0.000	0.000	1374.53	
20	0.6796	1111.5	1131.2	0.519	3.962	77.235	15.718	2.327	0.074	0.138	0.014	0.013	0.000	0.000	0.000	0.000	0.000	1372.17	
21	0.6824	1115.6	1135.4	0.527	3.967	76.745	16.113	2.396	0.078	0.148	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1374.39	
22	0.6845	1118.4	1138.2	0.518	4.004	76.405	16.353	2.446	0.082	0.161	0.016	0.015	0.000	0.000	0.000	0.000	0.000	1375.75	
23	0.6803	1112.7	1132.4	0.521	3.950	77.147	15.778	2.348	0.078	0.150	0.014	0.013	0.000	0.000	0.000	0.000	0.000	1372.97	
24	0.6954	1130.7	1150.8	0.593	4.163	74.644	17.462	2.850	0.088	0.174	0.013	0.013	0.000	0.000	0.000	0.000	0.000	1379.97	
25	0.7081	1146.0	1166.3	0.619	4.387	72.507	18.922	3.235	0.099	0.204	0.014	0.014	0.000	0.000	0.000	0.000	0.000	1385.99	
26	0.7140	1152.5	1173.0	0.648	4.498	71.525	19.580	3.398	0.103	0.217	0.016	0.016	0.000	0.000	0.000	0.000	0.000	1388.13	
27	0.7235	1162.0	1182.6	0.708	4.727	69.952	20.520	3.724	0.108	0.232	0.015	0.015	0.000	0.000	0.000	0.000	0.000	1390.25	
28	0.6968	1130.2	1150.2	0.577	4.354	74.235	17.761	2.796	0.084	0.166	0.014	0.013	0.000	0.000	0.000	0.000	0.000	1377.92	
29	0.6890	1122.9	1142.8	0.558	4.091	75.672	16.811	2.587	0.085	0.167	0.015	0.014	0.000	0.000	0.000	0.000	0.000	1376.78	
30	0.6856	1119.8	1139.6	0.528	4.002	76.332	16.318	2.529	0.087	0.171	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1376.40	
31	0.6753	1105.7	1125.3	0.508	3.927	77.889	15.289	2.171	0.070	0.122	0.012	0.009	0.000	0.000	0.000	0.000	0.000	1369.36	
Avg	0.6898	1125.0	1144.8	0.557	4.051	75.567	16.913	2.627	0.086	0.169	0.016	0.015	0.000	0.000	0.000	0.000	0.000	1378.38	

Zone 271

GQ Source Daily Summary

December 2013

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 Wet	Heating Value Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6514	1083.8	1103.0	0.326	3.297	81.429	13.738	1.105	0.041	0.045	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1366.64	
2	0.6545	1087.7	1107.0	0.306	3.380	80.859	14.145	1.205	0.041	0.047	0.011	0.006	0.000	0.000	0.000	0.000	0.000	1368.34	
3	0.6512	1081.4	1100.6	0.316	3.438	81.551	13.364	1.220	0.043	0.051	0.011	0.006	0.000	0.000	0.000	0.000	0.000	1363.86	
4	0.6467	1074.5	1093.5	0.340	3.404	82.426	12.576	1.142	0.043	0.051	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1359.78	
5	0.6487	1078.1	1097.2	0.344	3.362	82.048	12.988	1.145	0.043	0.051	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1362.27	
6	0.6483	1077.6	1096.7	0.350	3.344	82.100	12.987	1.105	0.044	0.050	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1362.12	
7	0.6500	1080.7	1099.8	0.359	3.301	81.952	13.007	1.259	0.047	0.055	0.013	0.007	0.000	0.000	0.000	0.000	0.000	1364.22	
8	0.6485	1076.6	1095.7	0.414	3.329	82.235	12.697	1.205	0.047	0.053	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1360.59	
9	0.6430	1068.5	1087.5	0.394	3.337	83.209	11.857	1.087	0.045	0.052	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1356.12	
10	0.6433	1068.0	1086.9	0.377	3.420	83.151	11.828	1.107	0.046	0.053	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1355.16	
11	0.6434	1068.3	1087.2	0.366	3.428	83.101	11.890	1.097	0.045	0.053	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1355.44	
12	0.6435	1067.9	1086.8	0.353	3.478	83.082	11.854	1.119	0.044	0.052	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1354.87	
13	0.6445	1069.1	1088.0	0.343	3.516	82.886	11.991	1.147	0.044	0.053	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1355.29	
14	0.6471	1073.4	1092.4	0.342	3.498	82.422	12.411	1.210	0.045	0.054	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1358.07	
15	0.6469	1071.9	1090.8	0.386	3.512	82.484	12.300	1.202	0.045	0.054	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1356.25	
16	0.6467	1071.3	1090.3	0.375	3.540	82.520	12.241	1.211	0.044	0.052	0.011	0.006	0.000	0.000	0.000	0.000	0.000	1355.79	
17	0.6470	1073.1	1092.1	0.338	3.519	82.363	12.503	1.164	0.044	0.052	0.011	0.006	0.000	0.000	0.000	0.000	0.000	1357.72	
18	0.6468	1072.8	1091.8	0.336	3.517	82.496	12.308	1.214	0.049	0.061	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1357.58	
19	0.6452	1070.3	1089.2	0.353	3.498	82.722	12.192	1.120	0.044	0.052	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1356.03	
20	0.6419	1064.8	1083.7	0.345	3.529	83.298	11.680	1.038	0.042	0.050	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1352.62	
21	0.6437	1068.0	1086.9	0.336	3.522	82.930	12.042	1.062	0.041	0.049	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1354.74	
22	0.6458	1071.0	1090.0	0.328	3.546	82.532	12.381	1.105	0.041	0.049	0.011	0.006	0.000	0.000	0.000	0.000	0.000	1356.36	
23	0.6441	1067.5	1086.4	0.358	3.556	82.896	11.981	1.103	0.040	0.050	0.010	0.006	0.000	0.000	0.000	0.000	0.000	1353.67	
24	0.6440	1067.1	1086.0	0.347	3.586	82.899	11.958	1.108	0.039	0.048	0.010	0.006	0.000	0.000	0.000	0.000	0.000	1353.30	
25	0.6476	1074.2	1093.2	0.299	3.569	82.150	12.729	1.149	0.040	0.048	0.010	0.006	0.000	0.000	0.000	0.000	0.000	1358.46	
26	0.6491	1076.0	1095.1	0.317	3.566	81.921	12.901	1.190	0.041	0.048	0.010	0.006	0.000	0.000	0.000	0.000	0.000	1359.27	
27	0.6548	1080.4	1099.6	0.421	3.680	81.086	13.291	1.391	0.048	0.066	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1358.82	
28	0.6460	1069.9	1088.9	0.345	3.607	82.476	12.378	1.087	0.041	0.048	0.011	0.006	0.000	0.000	0.000	0.000	0.000	1354.75	
29	0.6450	1069.5	1088.4	0.357	3.524	82.731	12.178	1.097	0.043	0.051	0.012	0.007	0.000	0.000	0.000	0.000	0.000	1355.22	
30	0.6464	1071.1	1090.1	0.356	3.551	82.468	12.392	1.120	0.043	0.052	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1355.90	
31	0.6440	1067.0	1085.9	0.370	3.556	82.943	11.928	1.090	0.043	0.051	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1353.17	
Avg	0.6467	1073.0	1092.0	0.351	3.481	82.431	12.475	1.149	0.043	0.052	0.011	0.007	0.000	0.000	0.000	0.000	0.000	1357.82	

Zone 28

GQ Source Analysis

GQ Source Number:	0202080	Specific Gravity:	0.6468
GQ Source Name:	RICHARDTON-GLEN ULLIN COMPRE	Dry Heat Value:	1091.62
Effective Date:	12/1/2013 9:00:00 AM	Wet Heat Value:	1072.62
Effective End Date:	1/18/2038 9:14:00 PM	As Deliv. Heat Value:	1091.62
Pressure Base:	14.730	Sample Pressure:	336.00
Viscosity:		Sample Temperature:	0.00

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	82.390		CO2	Carbon Dioxide	0.347
C2	Ethane	12.481	3.3280	N2	Nitrogen	3.510
C3	Propane	1.146	0.3150	O2	Oxygen	
IC4	Isobutane	0.044	0.0140	He	Helium	
NC4	n-Butane	0.052	0.0160	H2	Hydrogen	
IC5	Isopentane	0.011	0.0040	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.006	0.0020	Ar	Argon	
C6	Hexanes	0.013	0.0050	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	0.000
C9	Nonanes					
C10	Decanes					

Totals 100.000% 3.684 GPM

Sample Date: 1/2/2014 11:04:00 AM
Sample Type: Composite
Sample Tech: RR
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 311

GQ Source Analysis

GQ Source Number:	1202160	Specific Gravity:	0.7025
GQ Source Name:	BOWMAN BORDER	Dry Heat Value:	1082.40
Effective Date:	12/2/2013 9:00:00 AM	Wet Heat Value:	1063.56
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1082.40
Pressure Base:	14.730	Sample Pressure:	
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	71.876		CO2	Carbon Dioxide	1.190
C2	Ethane	16.959	4.5220	N2	Nitrogen	8.030
C3	Propane	1.724	0.4740	O2	Oxygen	
IC4	Isobutane	0.054	0.0180	He	Helium	
NC4	n-Butane	0.137	0.0430	H2	Hydrogen	
IC5	Isopentane	0.008	0.0030	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.017	0.0060	Ar	Argon	
C6	Hexanes	0.005	0.0020	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	0.000
C9	Nonanes					
C10	Decanes					
Totals		100.000%		5.068 GPM		

Sample Date: 12/30/2013 2:32:00 PM
Sample Type: Composite
Sample Tech: MIKE GENTILINI
H2S: ppm

Sample Remarks:

Analysis Tech: MIKE GENTILINI

Analysis Remarks:

Zone 34

NORTH DAKOTA HEATING VALUE ZONES		
ZONES	MEASURING DEVICE	LOCATION
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
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

MONTANA DAKOTA UTILITIES CO
NORTH DAKOTA
HEATING VALUE DATA
12 MONTH ACCUMULATIVE AT 14.73 psia, 60 f. DRY

STATE	ZONE	ZONE BOUNDARY	12 MONTH AVERAGE	DEC 13	NOV 13	OCT 13	SEPT 13	AUG 13	JULY 13	JUNE 13	MAY 13	APR 13	MAR 13	FEB 13	JAN 13	ZONE
MT/ND	211	Sidney Area	1207	1204	1209	1211	1206	1208	1209	1212	1201	1213	1206	1202	1203	211
ND	24	Williston Area	1202	1201	1207	1204	1199	1196	1198	1196	1197	1216	1204	1204	1204	24
ND	25	Watford City Area	1191	1191	1197	1183	1198	1193	1193	1188	1154	1200	1201	1196	1192	25
ND/MT	241	Fairview Area	1199	1197	1189	1198	1202	1203	1205	1205	1203	1203	1195	1196	1191	241
ND	261	Williston - Tioga - Minot Line	1163	1193	1166	1175	1180	1165	1172	1156	1159	1163	1123	1139	1160	261
ND	262	Minot Area	1183	1201	1192	1197	1196	1185	1191	1181	1177	1172	1170	1168	1163	262
ND	263	Tioga - Portal	1112	1061	1096	1125	1130	1130	1127	1123	1117	1116	1116	1116	1069	263
ND	264	Williston - Ray	1202	1201	1207	1204	1199	1196	1198	1196	1197	1216	1204	1204	1204	264
ND	271	Bismarck - Cleveland	1168	1145	1164	1184	1199	1187	1191	1183	1175	1167	1145	1144	1137	271
ND	272	Cleveland - Mapleton	1169	1145	1164	1184	1199	1187	1192	1183	1178	1169	1147	1145	1138	272
ND	273	Cleveland - Grafton	1169	1145	1164	1184	1199	1188	1192	1184	1177	1169	1146	1145	1138	273
ND	28	Bismarck - Cabin Creek	1142	1092	1105	1147	1199	1187	1191	1182	1173	1117	1102	1100	1108	28
ND	31	Dickinson Area	1111	1092	1107	1126	1079	1098	1112	1130	1163	1117	1103	1098	1105	31
ND	311	Taylor Take-Off - Glen Ullin Comp		1092	1104	1108	1094	1135	1188	1097	1163	1117	1103	1098	1105	
ND/MT	32	Cabin Creek - Dickinson	1101	1082	1096	1095	1115	1135	1142	1094	1100	1088	1089	1086	1094	32
ND	33	Killdeer	1180	1180	1180	1182	1183	1182	1183	1180	1179	1177	1176	1177	1177	33
ND	34	Bowman Area	1131	1082	1118	1118	1145	1127	1140	1121	1136	1146	1144	1147	1143	34
ND	35	Baker Field - North Dakota	979	0	0	0	0	0	0	0	0	0	0	0	979	35

**THERMAL ZONE VARIANCE
DOCUMENTATION**

December 2013

<i>ZONE</i>	<i>BTU VARIANCE</i>	<i>REASON</i>
28	-52	Mix of gas in the area
31	47	Mix of gas in the area
32	-20	Mix of gas in the area
34	-27	Mix of gas in the area