

December 29, 2017

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

Re: Case No. PU-17-002 (Therm Billing)  
Monthly Report – October 2017

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 November 2017.
2. Attachment B consists of copies of the monthly Heating Value Test Reports received from our suppliers for the month of October 2017.
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 2017.

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**  
**Nov-17**

Town	Heat Zone	Therm Factor
MDU-303-ALEXANDER	025	1.1381
MDU-308-ARNEGARD	025	1.1381
MDU-314-APPLE VALLEY	271	1.1540
MDU-318-BEACH	032	1.0193
MDU-319-BELFIELD	032	1.0268
MDU-323-BERTHOLD	262	1.1296
MDU-327-BISMARCK	028	1.1459
MDU-330-BOWMAN	034	0.9340
MDU-337-BURLINGTON	262	1.1540
MDU-343-CARRINGTON	273	1.1540
MDU-344-CLEVELAND	272	1.1459
MDU-364-CAVALIER	273	1.1783
MDU-365-DAWSON	271	1.1459
MDU-368-DES LACS	262	1.1377
MDU-369-DICKINSON	031	1.0315
MDU-374-FT TOTTEN	273	1.1621
MDU-375-DEVILS LAKE	273	1.1621
MDU-379-BARLOW	273	1.1540
MDU-384-EPPING	264	1.0730
MDU-387-ELDRIDGE	272	1.1540
MDU-407-GLADSTONE	031	1.0315
MDU-411-GLEN ULLIN	031	1.0390
MDU-413-GOLVA	032	1.0043
MDU-416-GARRISON	262	1.1377
MDU-417-GRAFTON	273	1.1865
MDU-429-HEBRON	031	1.0390
MDU-432-HETTINGER	903	2.3875
MDU-449-JAMESTOWN	272	1.1621
MDU-459-KILLDEER	033	1.1117
MDU-463-LANGDON	273	1.1540
MDU-469-LEFOR	031	1.0315
MDU-474-LIGNITE	263	1.0683
MDU-475-LINTON	802	1.0276
MDU-478-LINCOLN	028	1.1540
MDU-488-MCKENZIE	271	1.1540
MDU-494-MEDINA	271	1.1459
MDU-498-MANDAN	028	1.1540
MDU-500-MARMARTH	034	0.9204
MDU-505-MINOT	262	1.1540
MDU-510-MOTT	031	1.0315
MDU-512-MAX	262	1.1296
MDU-522-NEW ENGLAND	031	1.0240
MDU-524-NEW SALEM	028	1.1296
MDU-532-NEW ROCKFORD	273	1.1540
MDU-539-PARK RIVER	273	1.1783
MDU-540-PALERMO	262	1.1296
MDU-558-RAY	264	1.0730
MDU-561-REGENT	031	1.0315
MDU-563-RHAME	034	0.9069

MDU-564-RICHARDTON	031	1.0240
MDU-568-ROSS	261	1.1018
MDU-572-RUTHVILLE	262	1.1540
MDU-574-SANBORN	272	1.1621
MDU-583-SENTINEL BUTTE	032	1.0193
MDU-588-SOUTH HEART	031	1.0240
MDU-717-SPIRITWOOD	272	1.1621
MDU-590-SPRINGBROOK	264	1.0730
MDU-591-STANLEY	261	1.1178
MDU-593-STEELE	271	1.1459
MDU-598-SHEYENNE	273	1.1621
MDU-605-SURREY	262	1.1540
MDU-610-TAPPEN	271	1.1459
MDU-611-TAYLOR	031	1.0240
MDU-616-TIOGA	260	0.9255
MDU-619-TURTLE LAKE	262	1.1377
MDU-620-TRENTON	024	1.0864
MDU-624-UNDERWOOD	262	1.1377
MDU-625-VALLEY CITY	272	1.1702
MDU-629-WALHALLA	273	1.1783
MDU-632-WATFORD CITY	610	1.1240
MDU-636-WHEELOCK	264	1.0652
MDU-637-WHITE EARTH	261	1.1098
MDU-642-WILLISTON	024	1.0864
MDU-646-WASHBURN	262	1.1459
MDU-647-WILTON	262	1.1296
MDU-664-RIVERDALE	262	1.1377
MDU-691-FAIRVIEW	241	1.1178
MDU-712-MINOT AFB	262	1.1540
MDU-718-FAIRMOUNT	600	1.1336
MDU-732-NEKOMA	273	1.1540
MDU-732-MSR SITE	273	1.1540

# Source Daily Summary

October 2017

Number: 251

Pressure Base: 14.730

Contract Day: 1

Name: SDNY BDR-MNDK JNCTN-SDNY PLT

Temperature Base:

Contract Hour: 9

Day	Relative Densitiv	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7415	1192.0	1213.1	1208.8	1.271	3.726	67.358	23.288	3.892	0.150	0.282	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1405.40
2	0.7337	1183.7	1204.7	1200.4	1.203	3.606	68.268	23.143	3.358	0.135	0.256	0.016	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1403.03
3	0.7303	1181.7	1202.6	1198.4	1.135	3.520	68.698	23.046	3.199	0.128	0.245	0.016	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1403.85
4	0.7248	1161.3	1181.9	1186.3	1.134	3.571	70.129	21.537	3.197	0.132	0.253	0.016	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1396.60
5	0.7219	1166.3	1187.0	1182.8	1.135	3.659	70.479	21.070	3.228	0.136	0.261	0.017	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1393.71
6	0.7238	1170.3	1191.0	1186.7	1.115	3.623	70.305	21.105	3.405	0.141	0.272	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1396.58
7	0.7261	1171.7	1192.5	1188.2	1.127	3.742	69.853	21.389	3.435	0.144	0.275	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1395.99
8	0.7250	1171.9	1192.6	1188.4	1.078	3.704	69.918	21.471	3.430	0.129	0.243	0.015	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1397.26
9	0.7229	1169.7	1190.4	1186.2	1.051	3.674	70.148	21.483	3.246	0.128	0.241	0.015	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1396.79
10	0.7256	1170.9	1191.6	1187.4	1.110	3.768	69.893	21.373	3.420	0.140	0.265	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1395.52
11	0.7264	1171.2	1191.9	1187.7	1.132	3.791	69.778	21.416	3.441	0.143	0.269	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1395.16
12	0.7256	1171.0	1191.8	1187.6	1.109	3.764	69.907	21.307	3.495	0.135	0.254	0.016	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1395.71
13	0.7291	1175.6	1196.4	1192.1	1.133	3.779	69.471	21.472	3.710	0.141	0.265	0.016	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1397.74
14	0.7386	1185.9	1206.9	1202.5	1.232	3.883	68.128	22.181	4.069	0.164	0.308	0.019	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1400.99
15	0.7361	1181.5	1202.4	1198.1	1.239	3.908	68.343	22.213	3.812	0.157	0.294	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1398.12
16	0.7278	1173.6	1194.4	1190.2	1.137	3.770	69.467	21.767	3.408	0.144	0.273	0.017	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1396.76
17	0.7228	1167.6	1188.2	1183.9	1.128	3.680	70.315	21.184	3.267	0.136	0.259	0.017	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1394.32
18	0.7260	1172.0	1192.8	1188.6	1.146	3.679	69.792	21.579	3.376	0.137	0.260	0.016	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1396.58
19	0.7312	1171.6	1192.3	1187.2	1.158	4.174	69.463	20.715	3.952	0.167	0.333	0.020	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1391.04
20	0.7359	1181.0	1201.9	1197.4	1.233	3.927	68.449	22.058	3.818	0.166	0.312	0.020	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1397.77
21	0.7377	1185.2	1206.2	1201.8	1.251	3.824	67.928	22.784	3.740	0.154	0.288	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1400.92
22	0.7455	1198.8	1220.0	1215.5	1.258	3.716	66.641	23.906	4.000	0.155	0.291	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1409.54
23	0.7413	1192.1	1213.2	1208.7	1.266	3.721	66.962	24.084	3.513	0.148	0.276	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1405.67
24	0.7439	1196.5	1217.6	1213.2	1.260	3.701	66.644	24.241	3.683	0.152	0.285	0.018	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1408.41
25	0.7416	1191.9	1213.0	1208.5	1.269	3.752	67.230	23.462	3.828	0.149	0.279	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1405.16
26	0.7411	1191.6	1212.7	1208.3	1.264	3.733	67.091	23.832	3.639	0.145	0.267	0.015	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1405.30
27	0.7416	1192.6	1213.8	1209.4	1.260	3.720	66.857	24.219	3.510	0.143	0.264	0.015	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1406.11
28	0.7426	1194.4	1215.5	1211.2	1.255	3.720	66.783	24.175	3.614	0.147	0.276	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1407.14
29	0.7387	1187.3	1208.3	1204.1	1.273	3.758	67.445	23.561	3.543	0.138	0.255	0.015	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1402.48
30	0.7407	1190.7	1211.8	1207.4	1.266	3.746	67.122	23.822	3.620	0.141	0.259	0.014	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1404.67
31	0.7358	1181.4	1202.3	1198.0	1.254	3.869	68.067	22.812	3.554	0.146	0.270	0.015	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1398.28
Avg	0.7331	1180.0	1201.3	1197.3	1.190	3.749	68.611	22.442	3.561	0.144	0.272	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1400.08

Zone 211

# Source Daily Summary

October 2017

Number: 571

Pressure Base: 14.730

Contract Day: 1

Name: WILLISTON BDR-CHARBN STN

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6822	1127.5	1147.5	1144.4	0.789	2.818	76.613	17.643	1.935	0.059	0.124	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1386.13	
2	0.6804	1124.5	1144.5	1141.3	0.798	2.824	77.046	17.141	1.975	0.062	0.132	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1384.20	
3	0.6787	1121.6	1141.5	1138.4	0.794	2.838	77.502	16.576	2.071	0.063	0.134	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1382.42	
4	0.6776	1119.7	1139.5	1136.4	0.792	2.862	77.616	16.532	1.982	0.062	0.132	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1381.08	
5	0.6781	1120.6	1140.4	1137.3	0.788	2.857	77.477	16.715	1.953	0.061	0.129	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1381.73	
6	0.6813	1125.9	1145.8	1142.7	0.783	2.844	76.855	17.326	1.975	0.063	0.133	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1384.99	
7	0.6810	1125.5	1145.4	1142.3	0.776	2.850	76.880	17.318	1.966	0.061	0.128	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1384.82	
8	0.6803	1124.4	1144.3	1141.2	0.791	2.836	77.070	17.098	1.992	0.062	0.131	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1384.07	
9	0.6802	1124.6	1144.5	1141.4	0.781	2.824	77.038	17.192	1.961	0.060	0.126	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1384.52	
10	0.6804	1124.3	1144.2	1141.1	0.766	2.887	76.985	17.194	1.956	0.062	0.131	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1383.89	
11	0.6803	1124.1	1144.0	1140.9	0.776	2.866	77.118	17.002	2.012	0.064	0.138	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1383.81	
12	0.6800	1124.2	1144.1	1141.0	0.794	2.805	77.199	16.959	2.027	0.062	0.132	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1384.24	
13	0.6783	1121.4	1141.2	1138.1	0.777	2.851	77.435	16.752	1.977	0.060	0.128	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1382.42	
14	0.6800	1124.1	1144.0	1140.9	0.779	2.832	77.193	16.948	2.027	0.063	0.135	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1384.14	
15	0.6792	1122.6	1142.5	1139.3	0.784	2.851	77.323	16.813	2.011	0.062	0.133	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1382.99	
16	0.6791	1122.8	1142.7	1139.6	0.769	2.847	77.255	16.947	1.985	0.058	0.120	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1383.45	
17	0.6813	1124.7	1144.6	1141.4	0.805	2.877	76.988	17.037	2.074	0.064	0.133	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1383.58	
18	0.6825	1125.3	1145.3	1142.1	0.846	2.889	77.059	16.682	2.264	0.075	0.159	0.012	0.014	0.000	0.000	0.000	0.000	0.000	1383.09	
19	0.6842	1129.2	1149.2	1146.0	0.797	2.893	76.455	17.509	2.110	0.067	0.144	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1386.06	
20	0.6817	1126.9	1146.9	1143.7	0.776	2.834	76.754	17.447	1.977	0.061	0.130	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1385.79	
21	0.6799	1123.6	1143.5	1140.4	0.787	2.850	77.139	17.043	1.960	0.063	0.135	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1383.53	
22	0.6809	1125.2	1145.2	1142.0	0.783	2.846	77.001	17.122	2.023	0.064	0.138	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1384.57	
23	0.6784	1121.1	1140.9	1137.8	0.778	2.876	77.467	16.649	2.018	0.062	0.130	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1381.97	
24	0.6795	1119.3	1139.1	1136.0	0.730	3.154	77.164	16.737	1.991	0.066	0.139	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1378.75	
25	0.6826	1123.1	1143.0	1139.7	0.705	3.252	76.553	17.241	2.004	0.071	0.151	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1380.24	
26	0.6764	1115.5	1135.2	1132.1	0.712	3.125	77.647	16.425	1.880	0.062	0.130	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1377.12	
27	0.6783	1120.8	1140.6	1137.5	0.773	2.887	77.395	16.806	1.933	0.059	0.126	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1381.77	
28	0.6799	1124.7	1144.7	1141.6	0.770	2.799	77.075	17.210	1.948	0.058	0.122	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1385.05	
29	0.6798	1124.6	1144.5	1141.5	0.778	2.790	77.087	17.218	1.925	0.060	0.124	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1384.93	
30	0.6798	1126.0	1145.9	1142.8	0.778	2.706	77.301	16.908	2.087	0.065	0.135	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1386.60	
31	0.6806	1127.6	1147.5	1144.5	0.758	2.711	76.978	17.357	2.003	0.058	0.118	0.008	0.009	0.000	0.000	0.000	0.000	0.000	1387.81	
Avg	0.6801	1124.0	1143.6	1140.5	0.778	2.870	77.118	17.018	2.000	0.062	0.132	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1383.54	

Zone 24



# Source Daily Summary

October 2017

Number: 164

Pressure Base: 14.730

Contract Day: 1

Name: N TIOGA TRANSFER-NESSON PLT

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.5857	972.1	989.3		0.007	4.413	93.115	2.348	0.101	0.005	0.010	0.000	0.000	0.000					1289.70	
2	0.5994	993.6	1011.2		0.046	4.330	90.712	4.475	0.393	0.013	0.029	0.001	0.001	0.000					1303.09	
3	0.6013	998.3	1016.0		0.007	4.287	90.085	5.359	0.242	0.005	0.013	0.000	0.000	0.000					1307.12	
4	0.5858	969.7	986.9		0.007	4.572	93.061	2.248	0.095	0.004	0.012	0.000	0.000	0.000					1286.34	
5	0.5854	969.8	987.0		0.007	4.521	93.158	2.205	0.093	0.004	0.011	0.000	0.000	0.000					1287.05	
6	0.5854	970.2	987.4		0.007	4.499	93.161	2.222	0.095	0.004	0.011	0.000	0.000	0.000					1287.53	
7	0.5853	970.4	987.6		0.007	4.478	93.187	2.218	0.094	0.004	0.011	0.000	0.000	0.000					1287.87	
8	0.5874	975.4	992.7		0.007	4.367	92.831	2.639	0.134	0.006	0.014	0.000	0.001	0.000					1292.22	
9	0.5857	973.3	990.5		0.007	4.340	93.127	2.414	0.097	0.004	0.010	0.000	0.000	0.000					1291.26	
10	0.5854	972.7	989.9		0.007	4.351	93.201	2.311	0.111	0.005	0.012	0.000	0.001	0.000					1290.75	
11	0.5845	971.4	988.6		0.007	4.342	93.380	2.145	0.105	0.005	0.013	0.000	0.000	0.000					1290.09	
12	0.5840	972.0	989.2		0.007	4.260	93.477	2.153	0.088	0.004	0.010	0.000	0.000	0.000					1291.38	
13	0.5848	972.1	989.3		0.007	4.328	93.296	2.265	0.091	0.004	0.010	0.000	0.000	0.000					1290.70	
14	0.5858	972.1	989.3		0.007	4.419	93.086	2.381	0.092	0.004	0.010	0.000	0.000	0.000					1289.63	
15	0.5854	971.0	988.2		0.007	4.448	93.174	2.265	0.092	0.004	0.011	0.000	0.000	0.000					1288.61	
16	0.5842	970.5	987.7		0.007	4.375	93.413	2.097	0.091	0.004	0.011	0.000	0.000	0.000					1289.13	
17	0.6265	1045.4	1064.0		0.007	3.783	84.865	11.230	0.100	0.004	0.010	0.000	0.000	0.000					1341.07	
18	0.6361	1062.3	1081.1		0.007	3.665	82.915	13.290	0.107	0.004	0.011	0.000	0.000	0.000					1352.32	
19	0.5842	970.5	987.6		0.007	4.369	93.427	2.090	0.090	0.004	0.011	0.000	0.000	0.000					1289.19	
20	0.5841	969.7	986.9		0.007	4.411	93.426	2.054	0.087	0.004	0.011	0.000	0.000	0.000					1288.26	
21	0.5849	969.8	987.0		0.008	4.480	93.250	2.159	0.089	0.004	0.010	0.000	0.000	0.000					1287.50	
22	0.5850	971.7	988.9		0.007	4.373	93.252	2.264	0.090	0.003	0.010	0.000	0.000	0.000					1289.90	
23	0.5850	971.8	989.0		0.007	4.371	93.243	2.275	0.090	0.003	0.010	0.000	0.000	0.000					1289.99	
24	0.5856	971.5	988.7		0.007	4.436	93.123	2.331	0.090	0.003	0.010	0.000	0.000	0.000					1289.08	
25	0.5845	970.1	987.3		0.007	4.420	93.346	2.123	0.089	0.003	0.010	0.000	0.000	0.000					1288.41	
26	0.5846	971.1	988.3		0.007	4.373	93.330	2.184	0.091	0.003	0.010	0.000	0.000	0.000					1289.54	
27	0.5835	972.0	989.2		0.007	4.216	93.580	2.090	0.092	0.003	0.011	0.000	0.000	0.000					1291.92	
28	0.5835	971.1	988.3		0.007	4.261	93.589	2.036	0.091	0.003	0.011	0.000	0.000	0.000					1290.86	
29	0.5833	971.6	988.8		0.008	4.217	93.628	2.043	0.090	0.003	0.010	0.000	0.000	0.000					1291.64	
30	0.5833	972.4	989.6		0.007	4.184	93.615	2.080	0.093	0.009	0.013	0.000	0.000	0.000					1292.58	
31	0.5873	977.5	994.8		0.006	4.234	92.827	2.822	0.088	0.010	0.012	0.000	0.000	0.000					1295.09	
Avg	0.5889	978.0	995.8		0.008	4.327	92.480	3.059	0.109	0.005	0.012	0.000	0.000	0.000					1294.51	

Zone 260

# Gas Composition and Properties

Effective October 1, 2017 09:00 - January 18, 2038 21:14

Attachment B  
Page 8 of 22

Source #: 2501030  
Name: LIGNITE PLANT

Component	Mole %	Liquid Content	Mass %
Carbon Dioxide, CO2	0.1390		0.3156
Nitrogen, N2	2.9900		4.3215
Methane, C1	77.9174		64.4917
Ethane, C2	16.9665	4.5389	26.3214
Propane, C3	1.9349	0.5315	4.4020
iso-Butane, iC4	0.0342	0.0112	0.1026
n-Butane, nC4	0.0116	0.0036	0.0348
iso-Pentane, iC5	0.0000	0.0000	0.0000
n-Pentane, nC5	0.0000	0.0000	0.0000
Neo-Pentane, NeoC5			
Hexanes Plus, C6+	0.0000	0.0000	0.0000
Water, H2O			
Hydrogen Sulfide, H2S			
Oxygen, O2	0.0063		0.0104
Carbon Monoxide, CO			
Hydrogen, H2			
Helium, He			
Argon, Ar			

Property	Total Sample	C6 Plus Fraction
Pressure Base	14.730	
Temperature Base	60.00	
HCDP @ Sample Pressure	-46.676	
Cricondentherm	-29.332	
HV, Dry @ Base P, T	1141.05	
HV, Sat @ Base P, T	1121.19	
HV, Sat @ Sample P, T	1141.05	
Relative Density	0.6698	
C6+: 100		

Totals 99.9999 5.0860 100.0000

**Sample**  
Date: 11/01/2017 Pressure: 395.0  
Type: Composite Temperature: 0.0  
Tech: ES H2O: lbs/mm  
H2S: ppm  
Remarks:

**Analysis**  
Date: 11/02/2017 Instrument: WBI- 245  
Cylinder: 384  
Tech: MB  
Remarks:

Zone 263

# Gas Composition and Properties

Effective October 1, 2017 09:00 - January 18, 2038 21:14

Attachment B  
Page 9 of 22

Source #: 3002013  
Name: EPPING BORDER

Component	Mole %	Liquid Content	Mass %
Carbon Dioxide, CO2	0.7199		1.6283
Nitrogen, N2	2.7573		3.9697
Methane, C1	78.0712		64.3682
Ethane, C2	16.5381	4.4243	25.5571
Propane, C3	1.7355	0.4767	3.9330
iso-Butane, iC4	0.0528	0.0172	0.1577
n-Butane, nC4	0.1085	0.0341	0.3241
iso-Pentane, iC5	0.0079	0.0029	0.0293
n-Pentane, nC5	0.0088	0.0032	0.0326
Neo-Pentane, NeoC5			
Hexanes Plus, C6+	0.0000	0.0000	0.0000
Water, H2O			
Hydrogen Sulfide, H2S			
Oxygen, O2	0.0000		0.0000
Carbon Monoxide, CO			
Hydrogen, H2			
Helium, He			
Argon, Ar			

Property	Total Sample	C6 Plus Fraction
Pressure Base	14.730	
Temperature Base	60.00	
HCDP @ Sample Pressure		
Cricondentherm		
HV, Dry @ Base P, T	1134.42	
HV, Sat @ Base P, T	1114.68	
HV, Sat @ Sample P, T	1134.42	
Relative Density	0.6724	
C6+: 100		

Totals 100.0000 4.9580 100.0000

## Sample

Date: 11/01/2017 Pressure: 548.0  
Type: Composite Temperature: 0.0  
Tech: ES H2O: lbs/mm  
H2S: ppm

Remarks:

## Analysis

Date: 11/02/2017 Instrument: WBI- 247  
Cylinder: 358

Tech: MB

Remarks:

Zone 264

# Source Daily Summary

October 2017

Number: 603

Pressure Base: 14.730

Contract Day: 1

Name: TIOGA STN-COUNTY LINE PLANT

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7058	1155.6	1176.1	1172.7	0.910	3.141	72.360	21.033	2.292	0.080	0.164	0.009	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1396.65
2	0.7058	1155.9	1176.4	1172.9	0.903	3.143	72.393	20.989	2.292	0.080	0.172	0.013	0.016	0.000	0.000	0.000	0.000	0.000	0.000	1396.85
3	0.7054	1155.4	1175.9	1172.5	0.890	3.149	72.500	20.864	2.302	0.083	0.181	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1396.72
4	0.7045	1153.9	1174.3	1170.9	0.897	3.150	72.687	20.668	2.304	0.083	0.180	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1395.74
5	0.7035	1152.8	1173.2	1169.9	0.886	3.136	72.754	20.720	2.245	0.076	0.160	0.011	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1395.47
6	0.7049	1154.3	1174.7	1171.4	0.905	3.143	72.537	20.881	2.261	0.078	0.167	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1395.95
7	0.7062	1157.0	1177.5	1174.0	0.896	3.116	72.416	20.930	2.352	0.083	0.177	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1397.82
8	0.7056	1155.9	1176.4	1173.0	0.892	3.139	72.487	20.849	2.343	0.083	0.178	0.013	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1397.08
9	0.7048	1154.8	1175.2	1171.8	0.887	3.133	72.618	20.761	2.324	0.080	0.169	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1396.56
10	0.7049	1155.2	1175.6	1172.3	0.883	3.126	72.590	20.785	2.344	0.080	0.168	0.011	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1396.98
11	0.7071	1158.3	1178.8	1175.3	0.887	3.135	72.416	20.781	2.444	0.092	0.206	0.017	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1398.44
12	0.7073	1158.9	1179.4	1175.9	0.880	3.127	72.435	20.737	2.467	0.095	0.216	0.019	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1398.95
13	0.7057	1156.2	1176.6	1173.3	0.880	3.142	72.536	20.747	2.401	0.085	0.181	0.013	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1397.40
14	0.7070	1158.0	1178.5	1175.1	0.882	3.153	72.419	20.739	2.484	0.090	0.199	0.015	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1398.22
15	0.7074	1159.0	1179.5	1176.0	0.865	3.153	72.456	20.653	2.504	0.098	0.225	0.020	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1399.00
16	0.7055	1155.6	1176.1	1172.6	0.874	3.166	72.616	20.621	2.426	0.085	0.181	0.014	0.018	0.000	0.000	0.000	0.000	0.000	0.000	1396.87
17	0.7053	1156.1	1176.5	1173.2	0.865	3.136	72.560	20.778	2.380	0.083	0.172	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1397.61
18	0.7077	1159.1	1179.7	1176.3	0.876	3.158	72.349	20.721	2.575	0.094	0.197	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1398.94
19	0.7075	1159.3	1179.9	1176.4	0.880	3.121	72.376	20.771	2.525	0.092	0.200	0.016	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1399.32
20	0.7064	1157.7	1178.2	1174.9	0.872	3.131	72.491	20.714	2.481	0.090	0.191	0.014	0.016	0.000	0.000	0.000	0.000	0.000	0.000	1398.49
21	0.7069	1158.4	1178.9	1175.5	0.874	3.126	72.469	20.706	2.495	0.092	0.200	0.016	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1398.85
22	0.7075	1159.2	1179.7	1176.2	0.868	3.149	72.457	20.604	2.569	0.097	0.216	0.018	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1399.13
23	0.7051	1155.2	1175.7	1172.3	0.866	3.170	72.706	20.503	2.455	0.086	0.183	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1396.73
24	0.7034	1152.8	1173.2	1169.9	0.871	3.154	72.874	20.483	2.348	0.080	0.167	0.011	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1395.52
25	0.7064	1156.5	1177.0	1173.6	0.890	3.178	72.519	20.621	2.478	0.088	0.193	0.015	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1396.99
26	0.7017	1149.9	1170.2	1166.9	0.860	3.186	73.124	20.283	2.289	0.076	0.158	0.011	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1393.71
27	0.7037	1152.5	1172.9	1169.6	0.877	3.187	72.888	20.395	2.356	0.083	0.182	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1394.88
28	0.7032	1151.9	1172.3	1169.0	0.867	3.186	72.967	20.338	2.357	0.082	0.176	0.013	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1394.72
29	0.7039	1152.8	1173.2	1169.9	0.863	3.210	72.919	20.256	2.465	0.084	0.174	0.013	0.016	0.000	0.000	0.000	0.000	0.000	0.000	1394.99
30	0.7062	1156.8	1177.3	1173.8	0.857	3.183	72.725	20.316	2.562	0.098	0.218	0.019	0.023	0.000	0.000	0.000	0.000	0.000	0.000	1397.56
31	0.7027	1152.7	1173.1	1169.6	0.834	3.148	73.105	20.196	2.452	0.078	0.160	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1395.99
Avg	0.7054	1156.0	1176.2	1172.8	0.879	3.151	72.605	20.659	2.406	0.086	0.184	0.014	0.017	0.000	0.000	0.000	0.000	0.000	0.000	1397.04

Zone 265

# Source Daily Summary

October 2017

Number: 043

Pressure Base: 14.730

Contract Day: 1

Name: BISMARCK STN-CLEVELAND STN

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7400	1175.5	1196.3	1191.9	0.868	5.205	67.544	21.703	4.055	0.171	0.398	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1387.24
2	0.7391	1174.6	1195.4	1191.1	0.862	5.182	67.662	21.657	4.024	0.169	0.391	0.026	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1387.09
3	0.7387	1175.2	1196.1	1191.7	0.867	5.097	67.729	21.721	3.973	0.168	0.390	0.026	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1388.19
4	0.7372	1173.5	1194.3	1190.0	0.865	5.072	67.994	21.498	3.963	0.166	0.387	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1387.48
5	0.7365	1173.2	1194.0	1189.7	0.867	5.018	68.056	21.570	3.895	0.162	0.378	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1387.84
6	0.7368	1172.9	1193.7	1189.4	0.866	5.067	68.002	21.556	3.917	0.163	0.378	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1387.21
7	0.7381	1174.6	1195.4	1191.0	0.864	5.083	67.837	21.643	3.962	0.166	0.388	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1388.01
8	0.7386	1175.9	1196.7	1192.4	0.863	5.055	67.721	21.793	3.962	0.166	0.386	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1389.05
9	0.7376	1174.9	1195.7	1191.4	0.864	5.021	67.878	21.712	3.928	0.163	0.380	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.80
10	0.7370	1174.4	1195.2	1191.0	0.860	4.998	67.963	21.683	3.909	0.161	0.374	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1388.83
11	0.7379	1174.7	1195.5	1191.2	0.862	5.065	67.923	21.540	3.990	0.169	0.394	0.027	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1388.25
12	0.7376	1175.1	1195.9	1191.5	0.862	5.014	67.955	21.601	3.949	0.167	0.393	0.028	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1388.96
13	0.7366	1173.8	1194.6	1190.3	0.866	4.991	68.048	21.605	3.894	0.162	0.379	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.46
14	0.7360	1175.1	1195.9	1191.7	0.857	4.865	68.185	21.606	3.895	0.162	0.378	0.025	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1390.61
15	0.7396	1180.1	1201.0	1196.7	0.857	4.896	67.880	21.555	4.134	0.181	0.431	0.031	0.034	0.000	0.000	0.000	0.000	0.000	0.000	1393.06
16	0.7394	1179.4	1200.3	1195.9	0.854	4.927	67.917	21.455	4.193	0.177	0.416	0.029	0.033	0.000	0.000	0.000	0.000	0.000	0.000	1392.41
17	0.7475	1178.7	1199.5	1195.1	0.846	5.740	66.764	21.140	4.866	0.177	0.411	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1384.08
18	0.7541	1182.1	1203.0	1198.6	0.856	6.137	65.939	21.042	5.328	0.192	0.447	0.029	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1381.93
19	0.7499	1179.4	1200.3	1196.0	0.853	5.917	66.699	20.629	5.194	0.196	0.452	0.029	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1382.57
20	0.7363	1169.7	1190.4	1186.0	0.870	5.211	68.098	21.328	3.888	0.165	0.385	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1383.82
21	0.7339	1168.8	1189.5	1185.2	0.863	5.046	68.386	21.404	3.729	0.156	0.364	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1385.06
22	0.7345	1169.9	1190.6	1186.3	0.867	5.034	68.312	21.444	3.758	0.159	0.371	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1385.76
23	0.7336	1169.3	1190.0	1185.8	0.860	4.996	68.453	21.377	3.744	0.156	0.363	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1385.92
24	0.7313	1165.7	1186.4	1182.3	0.859	4.995	68.776	21.175	3.651	0.150	0.346	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1383.93
25	0.7290	1164.2	1184.8	1180.7	0.846	4.901	69.209	20.867	3.635	0.149	0.345	0.023	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1384.18
26	0.7172	1149.8	1170.1	1166.3	0.736	4.830	70.917	19.867	3.191	0.127	0.291	0.020	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1378.37
27	0.7151	1147.3	1167.6	1163.8	0.729	4.796	71.218	19.705	3.115	0.122	0.276	0.018	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1377.41
28	0.7209	1153.9	1174.4	1170.5	0.761	4.888	70.300	20.292	3.288	0.131	0.299	0.020	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1379.80
29	0.7308	1164.5	1185.1	1181.2	0.823	5.079	68.801	21.112	3.653	0.147	0.338	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1382.93
30	0.7277	1162.4	1182.9	1179.0	0.814	4.931	69.226	21.033	3.497	0.139	0.317	0.021	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1383.35
31	0.7319	1167.9	1188.6	1184.5	0.828	4.971	68.788	21.083	3.758	0.155	0.362	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1385.82
Avg	0.7355	1171.0	1191.6	1187.4	0.846	5.098	68.264	21.271	3.933	0.161	0.375	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1386.01

Zone 271

# Source Daily Summary

October 2017

Number: 063

Pressure Base: 14.730

Contract Day: 1

Name: CLEVELAND STN-MAPLETON

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7404	1175.8	1196.6	1193.2	0.875	5.220	67.501	21.679	4.099	0.171	0.398	0.027	0.030	0.000					1387.15	
2	0.7398	1174.7	1195.5	1192.1	0.871	5.224	67.573	21.654	4.066	0.168	0.389	0.026	0.028	0.000					1386.59	
3	0.7397	1174.7	1195.5	1192.0	0.876	5.216	67.612	21.609	4.067	0.170	0.394	0.027	0.029	0.000					1386.52	
4	0.7379	1174.0	1194.8	1191.3	0.873	5.092	67.873	21.585	3.974	0.166	0.383	0.026	0.028	0.000					1387.43	
5	0.7382	1174.5	1195.3	1191.9	0.877	5.081	67.820	21.646	3.972	0.165	0.384	0.026	0.028	0.000					1387.79	
6	0.7369	1173.0	1193.8	1190.4	0.872	5.055	67.967	21.621	3.902	0.160	0.370	0.025	0.027	0.000					1387.32	
7	0.7380	1174.1	1194.9	1191.6	0.875	5.087	67.799	21.706	3.939	0.163	0.377	0.026	0.028	0.000					1387.57	
8	0.7392	1175.6	1196.4	1192.9	0.872	5.115	67.665	21.734	4.004	0.167	0.386	0.027	0.029	0.000					1388.08	
9	0.7388	1175.6	1196.4	1192.8	0.871	5.085	67.705	21.758	3.979	0.165	0.382	0.026	0.028	0.000					1388.36	
10	0.7375	1174.8	1195.6	1192.2	0.869	5.013	67.858	21.765	3.912	0.160	0.369	0.025	0.028	0.000					1388.75	
11	0.7381	1175.1	1195.9	1192.5	0.868	5.050	67.812	21.707	3.966	0.164	0.378	0.026	0.028	0.000					1388.56	
12	0.7390	1175.9	1196.7	1193.2	0.874	5.073	67.755	21.660	4.013	0.169	0.395	0.028	0.032	0.000					1388.65	
13	0.7375	1175.0	1195.8	1192.3	0.873	4.997	67.926	21.676	3.925	0.164	0.382	0.028	0.030	0.000					1388.92	
14	0.7376	1174.6	1195.4	1191.9	0.869	5.038	67.907	21.635	3.952	0.165	0.379	0.026	0.028	0.000					1388.33	
15	0.7369	1177.0	1197.8	1194.4	0.866	4.824	68.139	21.588	3.968	0.167	0.390	0.027	0.030	0.000					1391.92	
16	0.7408	1180.5	1201.4	1197.9	0.860	4.985	67.738	21.497	4.227	0.186	0.439	0.032	0.036	0.000					1392.33	
17	0.7390	1179.0	1199.8	1196.4	0.860	4.913	67.894	21.518	4.215	0.164	0.380	0.027	0.029	0.000					1392.24	
18	0.7530	1178.7	1199.6	1196.1	0.860	6.239	66.024	20.953	5.245	0.188	0.433	0.029	0.030	0.000					1378.93	
19	0.7561	1184.6	1205.6	1202.2	0.862	6.159	65.685	21.127	5.457	0.196	0.453	0.030	0.031	0.000					1383.07	
20	0.7423	1172.4	1193.2	1189.8	0.869	5.604	67.596	20.711	4.553	0.184	0.424	0.029	0.031	0.000					1381.45	
21	0.7342	1168.4	1189.1	1185.6	0.875	5.081	68.329	21.414	3.735	0.155	0.357	0.025	0.028	0.000					1384.28	
22	0.7347	1169.2	1189.9	1186.4	0.874	5.087	68.271	21.427	3.768	0.157	0.362	0.026	0.028	0.000					1384.66	
23	0.7355	1170.2	1191.0	1187.4	0.871	5.097	68.190	21.443	3.811	0.161	0.372	0.026	0.029	0.000					1385.19	
24	0.7342	1168.5	1189.2	1185.6	0.878	5.077	68.347	21.384	3.756	0.154	0.354	0.024	0.026	0.000					1384.23	
25	0.7329	1167.0	1187.7	1183.9	0.870	5.052	68.543	21.254	3.730	0.152	0.349	0.024	0.025	0.000					1383.90	
26	0.7226	1156.3	1176.7	1172.8	0.787	4.863	70.144	20.338	3.371	0.137	0.313	0.022	0.024	0.000					1380.85	
27	0.7155	1147.0	1167.3	1163.3	0.740	4.842	71.167	19.672	3.142	0.123	0.275	0.019	0.020	0.000					1376.54	
28	0.7179	1150.4	1170.7	1166.7	0.743	4.855	70.760	19.997	3.192	0.126	0.285	0.020	0.022	0.000					1378.34	
29	0.7298	1163.5	1184.1	1180.2	0.821	5.053	68.905	21.121	3.583	0.143	0.327	0.023	0.024	0.000					1382.66	
30	0.7289	1163.0	1183.6	1179.7	0.812	5.015	69.048	21.058	3.562	0.141	0.319	0.022	0.024	0.000					1382.84	
31	0.7307	1165.9	1186.5	1182.5	0.829	4.981	68.927	21.031	3.680	0.151	0.347	0.025	0.028	0.000					1384.52	
Avg	0.7362	1171.0	1192.0	1188.4	0.855	5.131	68.145	21.322	3.960	0.161	0.372	0.026	0.028	0.000					1385.74	

Zone 272

# Source Daily Summary

October 2017

Number: 061

Pressure Base: 14.730

Contract Day: 1

Name: CLEVELAND STN-GRAFTON BDR

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7403	1175.4	1196.2	1192.9	0.875	5.226	67.524	21.659	4.091	0.171	0.397	0.027	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1386.89
2	0.7396	1174.4	1195.2	1191.9	0.871	5.230	67.591	21.637	4.060	0.168	0.389	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1386.35
3	0.7396	1174.4	1195.2	1191.9	0.876	5.220	67.626	21.598	4.061	0.170	0.393	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1386.36
4	0.7379	1173.9	1194.7	1191.4	0.873	5.094	67.873	21.589	3.969	0.166	0.383	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1387.37
5	0.7381	1174.3	1195.1	1191.8	0.876	5.080	67.839	21.632	3.968	0.165	0.384	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1387.70
6	0.7368	1172.9	1193.6	1190.4	0.872	5.063	67.972	21.611	3.900	0.160	0.370	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1387.13
7	0.7379	1174.0	1194.8	1191.5	0.875	5.090	67.806	21.702	3.934	0.162	0.376	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1387.45
8	0.7391	1175.4	1196.2	1192.8	0.872	5.118	67.678	21.725	3.998	0.167	0.386	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1387.92
9	0.7388	1175.4	1196.3	1192.8	0.871	5.088	67.710	21.755	3.975	0.165	0.381	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.24
10	0.7374	1174.6	1195.4	1192.1	0.869	5.015	67.870	21.755	3.908	0.160	0.369	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1388.61
11	0.7380	1174.9	1195.7	1192.4	0.868	5.051	67.827	21.697	3.961	0.164	0.378	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.44
12	0.7388	1175.6	1196.4	1193.0	0.874	5.081	67.770	21.643	4.008	0.169	0.395	0.028	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1388.40
13	0.7374	1174.7	1195.5	1192.1	0.873	5.008	67.941	21.654	3.920	0.164	0.381	0.027	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1388.60
14	0.7374	1174.2	1195.0	1191.6	0.869	5.042	67.937	21.612	3.943	0.164	0.378	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.07
15	0.7367	1176.7	1197.6	1194.2	0.866	4.826	68.149	21.592	3.954	0.167	0.388	0.027	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1391.74
16	0.7406	1180.1	1201.0	1197.6	0.860	4.991	67.757	21.485	4.216	0.185	0.438	0.032	0.035	0.000	0.000	0.000	0.000	0.000	0.000	1392.07
17	0.7389	1178.7	1199.6	1196.3	0.860	4.917	67.908	21.508	4.208	0.164	0.379	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1392.08
18	0.7528	1178.5	1199.3	1196.0	0.860	6.234	66.047	20.952	5.230	0.187	0.432	0.028	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1378.83
19	0.7554	1183.5	1204.4	1201.1	0.863	6.169	65.753	21.095	5.422	0.194	0.446	0.029	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1382.33
20	0.7430	1173.0	1193.8	1190.5	0.870	5.626	67.487	20.774	4.571	0.185	0.427	0.029	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1381.57
21	0.7342	1168.3	1189.0	1185.6	0.876	5.090	68.324	21.408	3.735	0.156	0.358	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1384.11
22	0.7348	1169.3	1190.0	1186.6	0.876	5.089	68.254	21.433	3.772	0.158	0.365	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1384.68
23	0.7353	1170.0	1190.7	1187.3	0.872	5.093	68.218	21.428	3.802	0.160	0.372	0.026	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1385.08
24	0.7330	1168.9	1189.6	1186.4	0.885	4.921	68.561	21.383	3.671	0.158	0.370	0.024	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1386.07
25	0.7337	1168.4	1189.1	1185.7	0.872	5.041	68.397	21.391	3.740	0.154	0.355	0.024	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1384.81
26	0.7237	1157.2	1177.7	1174.2	0.788	4.907	69.949	20.455	3.402	0.137	0.315	0.022	0.025	0.000	0.000	0.000	0.000	0.000	0.000	1380.99
27	0.7159	1147.0	1167.4	1164.0	0.739	4.870	71.104	19.700	3.150	0.123	0.275	0.019	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1376.31
28	0.7181	1150.5	1170.9	1167.5	0.745	4.862	70.731	20.011	3.198	0.126	0.286	0.020	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1378.32
29	0.7299	1163.6	1184.2	1180.7	0.823	5.054	68.888	21.132	3.584	0.143	0.328	0.023	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1382.66
30	0.7292	1163.2	1183.8	1180.2	0.814	5.023	69.017	21.066	3.572	0.141	0.320	0.022	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1382.80
31	0.7306	1165.7	1186.3	1182.8	0.828	4.983	68.946	21.011	3.678	0.151	0.348	0.025	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1384.41
Avg	0.7362	1171.0	1191.9	1188.6	0.855	5.132	68.144	21.326	3.955	0.161	0.373	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1385.69

Zone 223

# Source Daily Summary

October 2017

Number: 041

Pressure Base: 14.730

Contract Day: 1

Name: BISMARCK STN-GLEN ULLIN STN

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7401	1175.6	1196.4	1192.6	0.868	5.204	67.543	21.701	4.058	0.171	0.399	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1387.29
2	0.7391	1174.7	1195.5	1191.7	0.862	5.177	67.667	21.661	4.021	0.168	0.390	0.026	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1387.15
3	0.7386	1175.0	1195.8	1192.0	0.867	5.106	67.744	21.698	3.971	0.168	0.391	0.026	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1387.93
4	0.7372	1173.5	1194.2	1190.4	0.865	5.072	68.000	21.493	3.963	0.166	0.387	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1387.46
5	0.7365	1173.1	1193.9	1190.1	0.867	5.023	68.066	21.551	3.898	0.163	0.379	0.025	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1387.71
6	0.7367	1172.8	1193.6	1189.7	0.865	5.068	68.017	21.542	3.916	0.162	0.377	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1387.12
7	0.7380	1174.5	1195.3	1191.4	0.863	5.083	67.851	21.632	3.960	0.166	0.389	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1387.95
8	0.7386	1175.8	1196.6	1192.9	0.863	5.061	67.723	21.785	3.963	0.166	0.386	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.94
9	0.7376	1174.9	1195.7	1191.9	0.863	5.020	67.883	21.710	3.927	0.163	0.380	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.83
10	0.7369	1174.3	1195.1	1191.3	0.859	4.997	67.973	21.682	3.904	0.161	0.373	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1388.80
11	0.7378	1174.5	1195.3	1191.5	0.862	5.068	67.934	21.526	3.990	0.169	0.394	0.027	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1388.12
12	0.7376	1175.1	1195.9	1192.1	0.861	5.012	67.958	21.596	3.953	0.167	0.394	0.028	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1389.02
13	0.7365	1173.8	1194.6	1190.7	0.865	4.990	68.057	21.603	3.888	0.162	0.379	0.026	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1388.44
14	0.7361	1175.0	1195.8	1192.1	0.858	4.883	68.153	21.619	3.892	0.162	0.379	0.025	0.028	0.000	0.000	0.000	0.000	0.000	0.000	1390.36
15	0.7393	1179.8	1200.7	1196.8	0.857	4.894	67.902	21.556	4.118	0.180	0.428	0.030	0.034	0.000	0.000	0.000	0.000	0.000	0.000	1392.90
16	0.7394	1179.5	1200.4	1174.1	0.854	4.926	67.917	21.455	4.190	0.177	0.418	0.030	0.033	0.000	0.000	0.000	0.000	0.000	0.000	1392.44
17	0.7468	1178.5	1199.4	1165.5	0.846	5.691	66.854	21.142	4.827	0.176	0.409	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1384.50
18	0.7541	1181.8	1202.8	1195.8	0.856	6.148	65.928	21.050	5.320	0.191	0.446	0.029	0.030	0.000	0.000	0.000	0.000	0.000	0.000	1381.68
19	0.7506	1180.2	1201.1	1196.7	0.852	5.935	66.607	20.651	5.243	0.196	0.455	0.029	0.031	0.000	0.000	0.000	0.000	0.000	0.000	1382.86
20	0.7368	1170.1	1190.8	1186.9	0.871	5.229	68.035	21.339	3.914	0.167	0.389	0.027	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1383.86
21	0.7338	1168.6	1189.3	1185.6	0.864	5.045	68.401	21.388	3.731	0.156	0.362	0.025	0.027	0.000	0.000	0.000	0.000	0.000	0.000	1384.99
22	0.7347	1170.2	1190.9	1187.2	0.868	5.031	68.296	21.453	3.762	0.160	0.375	0.026	0.029	0.000	0.000	0.000	0.000	0.000	0.000	1385.95
23	0.7118	1146.2	1166.5	1162.9	0.855	4.359	72.252	18.862	3.199	0.129	0.300	0.021	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1379.61
24	0.6636	1095.5	1114.9	1111.6	0.836	2.948	80.348	13.880	1.756	0.065	0.147	0.009	0.010	0.000	0.000	0.000	0.000	0.000	0.000	1365.77
25	0.6238	1057.3	1076.0	1073.1	0.758	1.659	86.897	10.138	0.522	0.009	0.015	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1359.28
26	0.6632	1097.4	1116.8	1113.8	0.397	3.468	79.153	15.609	1.260	0.038	0.066	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1368.22
27	0.6551	1080.2	1099.3	1096.2	0.326	3.867	80.600	13.897	1.208	0.035	0.059	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1355.04
28	0.6608	1091.0	1110.4	1107.2	0.285	3.805	79.370	15.256	1.190	0.033	0.055	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1362.74
29	0.6633	1096.6	1116.0	1112.9	0.253	3.757	78.694	16.128	1.083	0.029	0.049	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1367.03
30	0.6693	1104.5	1124.1	1121.0	0.300	3.765	77.721	16.866	1.244	0.036	0.062	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1370.74
31	0.6660	1096.2	1115.6	1112.5	0.360	3.870	78.575	15.717	1.359	0.041	0.071	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1363.80
Avg	0.7174	1152.0	1172.5	1167.1	0.752	4.683	71.101	19.651	3.330	0.133	0.307	0.021	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1381.18

Zone 28

# Source Daily Summary

October 2017

Number: 271

Pressure Base: 14.730

Contract Day: 1

Name: DCKSN BRD-BLFD TSF-G.U. STN

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6779	1126.1	1146.1	1142.9	0.191	3.424	75.763	19.369	1.178	0.027	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.74
2	0.6855	1145.9	1166.2	1163.0	0.031	3.175	73.687	22.221	0.860	0.010	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1405.32
3	0.6863	1150.1	1170.4	1167.1	0.000	3.054	73.399	22.752	0.776	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.50
4	0.6859	1151.4	1171.8	1168.6	0.000	2.927	73.502	22.781	0.774	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.67
5	0.6866	1149.4	1169.7	1166.5	0.000	3.123	73.349	22.707	0.804	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1408.39
6	0.6879	1150.4	1170.7	1167.4	0.000	3.181	73.102	22.877	0.824	0.007	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1408.29
7	0.6904	1137.3	1157.5	1154.1	0.428	3.548	74.389	19.590	1.828	0.059	0.138	0.009	0.010	0.000	0.000	0.000	0.000	0.000	0.000	1389.99
8	0.6393	1070.8	1089.8	1086.7	0.818	2.200	84.566	11.138	1.147	0.036	0.084	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1359.83
9	0.6412	1080.0	1099.1	1096.1	0.603	2.154	83.354	13.127	0.718	0.014	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1369.22
10	0.6788	1134.5	1154.6	1151.4	0.114	3.115	75.147	20.735	0.857	0.011	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1398.15
11	0.6725	1111.7	1131.4	1128.2	0.261	3.687	77.123	17.482	1.341	0.035	0.067	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1376.44
12	0.6715	1109.6	1129.2	1126.1	0.260	3.719	77.285	17.332	1.302	0.035	0.063	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1374.87
13	0.6704	1106.9	1126.5	1123.4	0.304	3.717	77.665	16.806	1.389	0.040	0.072	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1372.60
14	0.6705	1107.0	1126.6	1123.5	0.305	3.717	77.688	16.747	1.423	0.041	0.073	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1372.64
15	0.6700	1105.2	1124.7	1121.6	0.338	3.727	77.960	16.315	1.522	0.046	0.083	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1370.93
16	0.6822	1135.2	1155.3	1152.0	0.105	3.409	74.642	20.738	1.048	0.020	0.035	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1395.43
17	0.6877	1148.1	1168.5	1165.0	0.016	3.279	73.219	22.569	0.892	0.010	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1405.70
18	0.6877	1149.2	1169.5	1166.3	0.001	3.232	73.161	22.746	0.841	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1407.04
19	0.6875	1148.7	1169.0	1165.6	0.000	3.250	73.152	22.770	0.812	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1406.61
20	0.6698	1119.3	1139.1	1135.6	0.310	2.897	77.611	17.984	1.097	0.033	0.058	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1388.55
21	0.6216	1053.6	1072.3	1069.3	0.816	1.589	87.733	9.084	0.693	0.029	0.044	0.006	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1356.83
22	0.6141	1043.8	1062.3	1059.4	0.832	1.459	88.886	8.374	0.434	0.005	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1352.42
23	0.6137	1043.7	1062.1	1059.2	0.818	1.451	88.949	8.345	0.423	0.005	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1352.67
24	0.6819	1140.8	1161.0	1157.7	0.057	3.116	74.361	21.663	0.783	0.008	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1402.64
25	0.6633	1100.9	1120.4	1117.2	0.345	3.345	78.962	16.078	1.178	0.031	0.056	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1372.54
26	0.6539	1079.9	1099.0	1096.1	0.361	3.715	80.928	13.653	1.238	0.036	0.064	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1356.01
27	0.6589	1088.7	1108.0	1105.1	0.266	3.793	79.709	14.965	1.179	0.031	0.054	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1361.88
28	0.6633	1098.0	1117.5	1114.5	0.214	3.723	78.631	16.280	1.080	0.026	0.045	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1368.96
29	0.6681	1102.9	1122.5	1119.5	0.297	3.750	77.958	16.640	1.252	0.035	0.063	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1370.07
30	0.6648	1095.0	1114.4	1111.4	0.347	3.845	78.799	15.541	1.354	0.039	0.069	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1363.60
31	0.6625	1091.6	1110.9	1108.0	0.331	3.860	79.265	15.051	1.380	0.039	0.068	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1361.72
Avg	0.6676	1112.0	1131.8	1128.7	0.283	3.167	77.869	17.563	1.046	0.024	0.044	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1381.91

Zone 31

# Source Daily Summary

October 2017

Number: 051

Pressure Base: 14.730

Contract Day: 1

Name: CABIN CRK STN-BELFIELD TRSFR

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6635	1091.3	1110.6	1107.2	0.350	3.942	79.182	14.954	1.442	0.043	0.078	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1360.31	
2	0.6708	1101.2	1120.7	1117.2	0.460	3.864	78.130	15.681	1.692	0.057	0.103	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1365.05	
3	0.6964	1146.8	1167.1	1164.0	0.998	2.663	74.962	18.378	2.634	0.122	0.216	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1395.14	
4	0.6514	1095.7	1115.1	1111.6	0.914	1.674	82.957	12.651	1.558	0.087	0.131	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1378.17	
5	0.6422	1075.1	1094.2	1090.8	0.783	2.262	84.153	11.367	1.260	0.061	0.099	0.009	0.007	0.000	0.000	0.000	0.000	0.000	1362.10	
6	0.6531	1082.9	1102.1	1098.8	0.747	2.869	82.108	12.531	1.540	0.068	0.122	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1360.53	
7	0.6559	1085.7	1104.9	1101.5	0.724	2.997	81.617	12.816	1.627	0.073	0.130	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1361.08	
8	0.6602	1093.0	1112.4	1108.9	0.763	2.895	80.863	13.565	1.693	0.074	0.131	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1365.82	
9	0.6549	1080.8	1099.9	1096.7	0.634	3.341	81.536	12.745	1.561	0.061	0.109	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1355.99	
10	0.6553	1080.9	1100.0	1096.2	0.602	3.422	81.410	12.825	1.554	0.062	0.113	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1355.69	
11	0.6603	1087.5	1106.8	1102.9	0.596	3.498	80.517	13.519	1.670	0.067	0.120	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1358.81	
12	0.6672	1097.0	1116.4	1112.7	0.618	3.532	79.310	14.507	1.806	0.076	0.135	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1363.61	
13	0.6666	1095.6	1115.0	1111.4	0.643	3.529	79.525	14.206	1.857	0.080	0.142	0.009	0.008	0.000	0.000	0.000	0.000	0.000	1362.38	
14	0.6700	1100.4	1119.9	1116.3	0.698	3.467	79.122	14.425	2.023	0.089	0.158	0.010	0.009	0.000	0.000	0.000	0.000	0.000	1364.93	
15	0.6678	1096.9	1116.3	1112.8	0.677	3.503	79.490	14.097	1.973	0.087	0.155	0.010	0.009	0.000	0.000	0.000	0.000	0.000	1362.86	
16	0.6900	1134.2	1154.3	1150.7	0.922	2.947	76.055	17.151	2.575	0.118	0.208	0.013	0.012	0.000	0.000	0.000	0.000	0.000	1386.28	
17	0.6624	1106.8	1126.4	1123.0	0.974	1.944	80.735	14.451	1.682	0.072	0.127	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1380.71	
18	0.6530	1095.6	1115.0	1111.8	0.932	1.803	82.212	13.522	1.372	0.053	0.093	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1376.63	
19	0.6520	1094.9	1114.3	1111.1	0.923	1.769	82.309	13.570	1.274	0.052	0.091	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1376.73	
20	0.6537	1097.5	1117.0	1113.5	0.889	1.815	82.192	13.492	1.401	0.073	0.117	0.011	0.009	0.000	0.000	0.000	0.000	0.000	1378.24	
21	0.6519	1095.2	1114.6	1111.1	0.868	1.817	82.550	13.152	1.402	0.074	0.116	0.012	0.009	0.000	0.000	0.000	0.000	0.000	1377.21	
22	0.6469	1087.2	1106.4	1103.1	0.913	1.771	83.259	12.707	1.201	0.050	0.087	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1372.46	
23	0.6439	1081.1	1100.2	1097.0	0.852	1.953	83.699	12.219	1.140	0.046	0.080	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1367.93	
24	0.6510	1084.8	1104.1	1100.5	0.798	2.474	82.482	12.644	1.427	0.059	0.103	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1365.18	
25	0.6471	1080.7	1099.8	1096.4	0.823	2.319	83.273	12.036	1.384	0.056	0.097	0.006	0.006	0.000	0.000	0.000	0.000	0.000	1364.05	
26	0.6373	1058.3	1077.1	1073.6	0.594	3.114	84.580	10.455	1.136	0.041	0.070	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1346.05	
27	0.6554	1085.4	1104.6	1101.1	0.689	3.019	81.526	13.040	1.540	0.062	0.109	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1361.30	
28	0.6560	1080.3	1099.4	1095.8	0.582	3.556	81.249	12.846	1.577	0.063	0.113	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1354.18	
29	0.6550	1078.1	1097.2	1093.7	0.600	3.566	81.476	12.585	1.586	0.062	0.111	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1352.49	
30	0.6845	1124.7	1144.6	1141.0	0.865	3.097	76.851	16.479	2.391	0.107	0.188	0.012	0.010	0.000	0.000	0.000	0.000	0.000	1380.16	
31	0.6675	1104.0	1123.5	1120.0	0.845	2.784	79.777	14.408	1.935	0.084	0.149	0.009	0.008	0.000	0.000	0.000	0.000	0.000	1371.96	
Avg	0.6595	1094.0	1112.9	1109.4	0.751	2.813	80.939	13.646	1.642	0.070	0.123	0.008	0.007	0.000	0.000	0.000	0.000	0.000	1367.23	

Zone 32

# Source Daily Summary

October 2017

Number: 111

Pressure Base: 14.730

Contract Day: 1

Name: LITTLE KNIFE PLANT

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6892	1154.5	1175.0	1170.8	0.000	3.049	72.819	23.337	0.778	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1412.07
2	0.6889	1153.8	1174.2	1169.9	0.000	3.070	72.864	23.276	0.772	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.42
3	0.6882	1155.6	1176.1	1171.8	0.000	2.891	73.025	23.305	0.759	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1414.40
4	0.6896	1154.9	1175.3	1170.7	0.000	3.066	72.758	23.354	0.803	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1412.08
5	0.6893	1154.0	1174.4	1170.0	0.000	3.095	72.806	23.276	0.804	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.27
6	0.6894	1153.1	1173.5	1168.9	0.000	3.161	72.776	23.246	0.799	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.01
7	0.6902	1154.0	1174.4	1169.9	0.000	3.179	72.625	23.360	0.818	0.008	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.36
8	0.6891	1152.4	1172.8	1168.5	0.000	3.172	72.823	23.205	0.782	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.53
9	0.6898	1153.2	1173.6	1168.7	0.000	3.190	72.705	23.274	0.813	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.77
10	0.6899	1153.1	1173.5	1169.1	0.000	3.204	72.688	23.271	0.818	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.59
11	0.6898	1153.4	1173.9	1169.4	0.000	3.176	72.699	23.296	0.810	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.08
12	0.6896	1153.0	1173.4	1168.9	0.000	3.178	72.726	23.291	0.787	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.83
13	0.6894	1152.4	1172.8	1168.4	0.000	3.197	72.766	23.230	0.788	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.27
14	0.6893	1152.4	1172.8	1168.2	0.000	3.190	72.785	23.215	0.791	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.34
15	0.6931	1158.9	1179.5	1175.0	0.000	3.151	72.189	23.675	0.966	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1413.42
16	0.6904	1153.8	1174.3	1170.1	0.000	3.209	72.597	23.337	0.838	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.95
17	0.6898	1153.1	1173.5	1169.1	0.000	3.198	72.694	23.281	0.808	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.64
18	0.6901	1154.0	1174.4	1170.0	0.000	3.166	72.644	23.368	0.802	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.48
19	0.6903	1154.0	1174.4	1169.7	0.000	3.185	72.619	23.356	0.821	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.27
20	0.6900	1153.2	1173.7	1169.2	0.000	3.204	72.655	23.318	0.805	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.66
21	0.6901	1153.3	1173.7	1169.2	0.000	3.207	72.614	23.380	0.780	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.67
22	0.6900	1153.3	1173.8	1169.4	0.000	3.202	72.642	23.340	0.797	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.74
23	0.6901	1153.6	1174.1	1169.7	0.000	3.194	72.625	23.358	0.803	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.01
24	0.6892	1152.9	1173.3	1169.0	0.000	3.156	72.800	23.237	0.787	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.97
25	0.6900	1154.1	1174.5	1170.3	0.000	3.157	72.650	23.374	0.800	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.64
26	0.6897	1152.7	1173.1	1168.8	0.000	3.210	72.680	23.326	0.765	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.28
27	0.6901	1153.7	1174.1	1169.7	0.000	3.183	72.636	23.371	0.792	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.14
28	0.6892	1152.0	1172.4	1168.0	0.000	3.202	72.800	23.199	0.779	0.008	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1408.98
29	0.6892	1153.2	1173.6	1169.4	0.000	3.134	72.774	23.327	0.746	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.38
30	0.6891	1152.4	1172.8	1168.2	0.000	3.169	72.799	23.263	0.749	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.56
31	0.6908	1154.9	1175.3	1170.7	0.000	3.181	72.611	23.266	0.920	0.009	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.84
Avg	0.6898	1154.0	1174.1	1169.6	0.000	3.159	72.706	23.313	0.803	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.38

Zone 33

# Gas Composition and Properties

Effective June 1, 2016 09:00 - January 18, 2038 21:14

Attachment B  
Page 18 of 22

Source #: 1202160  
Name: BOWMAN BORDER

Component	Mole %	Liquid Content	Mass %
Carbon Dioxide, CO2	0.2321		0.6048
Nitrogen, N2	3.4604		5.7399
Methane, C1	94.0188		89.3085
Ethane, C2	1.9955	0.5321	3.5530
Propane, C3	0.2261	0.0621	0.5904
iso-Butane, iC4	0.0203	0.0066	0.5904
n-Butane, nC4	0.0216	0.0068	0.0743
iso-Pentane, iC5	0.0028	0.0010	0.0120
n-Pentane, nC5	0.0020	0.0007	0.0085
Neo-Pentane, NeoC5			
Hexanes Plus, C6+	0.0000	0.0000	0.0000
Water, H2O			
Hydrogen Sulfide, H2S			
Oxygen, O2	0.0204		
Carbon Monoxide, CO			
Hydrogen, H2			
Helium, He			
Argon, Ar			

Property	Total Sample	C6 Plus Fraction
Pressure Base	14.730	
Temperature Base	60.00	
HCDP @ Sample Pressure		
Cricondentherm		
HV, Dry @ Base P, T	996.12	
HV, Sat @ Base P, T	978.78	
HV, Sat @ Sample P, T	996.12	
Relative Density	0.5840	

C6+: 100

Totals 100.0000 0.6100 100.4818

## Sample

Date: 07/01/2016 Pressure: 380.0  
Type: Spot Temperature:  
Tech: MG H2O: lbs/mm  
H2S: ppm

Remarks:

## Analysis

Date: 07/05/2016 Instrument: WBI- 447  
Cylinder: 100

Tech: MB

Remarks: Inactive

Zone 34

# Source Daily Summary

October 2017

Number: 471

Pressure Base: 14.730

Contract Day:

Name: SPRING CREEK I - SAX VALVE I

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Drv	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6960	1144.6	1164.9	1161.9	0.961	2.835	72.128	23.544	0.527	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1393.07
2	0.6915	1137.5	1157.7	1154.7	0.967	2.836	73.191	22.329	0.673	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.90
3	0.6848	1126.5	1146.4	1143.5	0.999	2.828	74.641	20.811	0.715	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1382.14
4	0.6777	1111.3	1131.0	1128.0	1.023	3.053	75.770	19.732	0.420	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1370.63
5	0.6806	1116.6	1136.4	1133.4	1.017	3.005	75.398	19.955	0.621	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1374.27
6	0.6783	1114.1	1133.9	1130.9	1.008	2.953	75.761	19.761	0.516	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1373.57
7	0.6785	1114.8	1134.6	1131.6	1.003	2.939	75.733	19.783	0.539	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1374.21
8	0.6784	1112.7	1132.4	1129.5	1.005	3.055	75.745	19.655	0.537	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1371.67
9	0.6802	1115.8	1135.6	1132.6	1.006	3.035	75.368	20.058	0.530	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1373.70
10	0.6810	1116.9	1136.7	1133.8	1.013	3.036	75.153	20.311	0.484	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1374.24
11	0.6776	1112.7	1132.4	1129.5	1.015	2.960	75.865	19.689	0.469	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1372.58
12	0.6783	1113.0	1132.7	1129.7	1.017	3.017	75.631	19.934	0.400	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1372.07
13	0.6792	1113.4	1133.1	1130.1	1.016	3.074	75.559	19.835	0.513	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1371.70
14	0.6820	1118.5	1138.3	1135.3	1.008	3.034	75.049	20.331	0.575	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1375.24
15	0.6829	1123.8	1143.7	1140.6	1.000	2.817	74.823	20.840	0.517	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1380.71
16	0.6906	1134.3	1154.4	1151.4	0.992	2.905	73.292	22.238	0.569	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.97
17	0.6853	1123.5	1143.4	1140.4	1.001	3.055	74.362	21.002	0.577	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1377.99
18	0.6886	1128.9	1148.9	1145.9	0.993	3.045	73.622	21.829	0.507	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1381.32
19	0.6774	1111.4	1131.1	1128.2	1.023	3.013	75.861	19.666	0.434	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1371.13
20	0.6780	1112.1	1131.8	1128.8	1.027	3.022	75.796	19.668	0.484	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1371.34
21	0.6859	1125.9	1145.9	1142.9	1.007	2.951	74.126	21.480	0.434	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1380.42
22	0.6872	1128.9	1148.9	1146.0	1.005	2.899	73.817	21.881	0.395	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1382.73
23	0.6896	1135.4	1155.5	1152.5	0.984	2.766	73.404	22.369	0.474	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1388.18
24	0.6878	1133.0	1153.0	1150.1	1.004	2.706	73.755	22.120	0.412	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1387.12
25	0.6837	1124.1	1144.0	1141.1	0.999	2.864	74.725	20.833	0.575	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1380.44
26	0.6861	1128.4	1148.4	1145.5	1.002	2.830	74.281	21.262	0.620	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1383.20
27	0.6819	1120.8	1140.7	1137.7	1.001	2.893	74.994	20.631	0.478	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1378.21
28	0.6878	1130.9	1150.9	1147.9	0.987	2.861	73.900	21.641	0.606	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1384.53
29	0.6913	1136.1	1156.2	1153.2	0.983	2.874	73.424	21.871	0.840	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1387.44
30	0.6900	1134.6	1154.7	1151.6	0.983	2.852	73.484	22.030	0.646	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1386.81
31	0.6801	1119.4	1139.3	1136.3	0.990	2.829	75.265	20.520	0.393	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1378.25
Avg	0.6838	1123.0	1143.1	1140.1	1.001	2.930	74.643	20.891	0.532	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1379.15

Zone 43



# Alliance Pipeline

DAILY ANALYSIS --- USA  
 ND07MD1 --- Hankinson Sales  
 October 2017

DAY	Heating Value (BTU/ft3)	Relative Density	C1 Mol%	C2 Mol%	C3 Mol%	IC4 Mol%	NC4 Mol%	IC5 Mol%	NC5 Mol%	C6+ Mol%	N2 Mol%	CO2 Mol%	Hel Mol%
1	1,160.309	0.6690	83.6281	9.3505	3.9645	0.4131	0.7288	0.0758	0.0642	0.0309	1.2597	0.4719	0.0124
2	1,156.335	0.6661	84.0260	9.1278	3.8681	0.3963	0.7008	0.0740	0.0631	0.0310	1.2274	0.4730	0.0124
3	1,158.304	0.6671	83.9305	9.1928	3.9051	0.4026	0.7197	0.0741	0.0628	0.0312	1.1919	0.4767	0.0125
4	1,156.509	0.6660	84.0558	9.0526	3.9274	0.3937	0.7021	0.0704	0.0603	0.0312	1.2500	0.4453	0.0112
5	1,156.373	0.6654	84.1351	9.0828	3.9033	0.3822	0.6805	0.0723	0.0630	0.0319	1.1695	0.4672	0.0123
6	1,149.318	0.6623	84.4329	8.9104	3.7888	0.3495	0.6100	0.0640	0.0559	0.0304	1.2408	0.5042	0.0131
7	1,148.474	0.6618	84.4677	8.9674	3.7383	0.3451	0.5922	0.0608	0.0530	0.0313	1.1915	0.5395	0.0132
8	1,150.046	0.6617	84.5012	8.9890	3.7231	0.3556	0.6130	0.0637	0.0545	0.0318	1.1671	0.4890	0.0119
9	1,151.862	0.6628	84.4083	8.9900	3.7980	0.3618	0.6313	0.0644	0.0548	0.0316	1.1628	0.4850	0.0120
10	1,148.037	0.6607	84.5579	9.0043	3.6797	0.3430	0.5803	0.0624	0.0525	0.0290	1.1883	0.4905	0.0119
11	1,155.071	0.6668	83.7691	9.2251	4.0033	0.3647	0.6512	0.0613	0.0513	0.0276	1.3536	0.4808	0.0118
12	1,150.850	0.6624	84.4034	8.9925	3.7974	0.3557	0.6139	0.0639	0.0532	0.0290	1.1986	0.4804	0.0121
13	1,148.571	0.6605	84.6526	8.9424	3.6750	0.3486	0.5976	0.0636	0.0527	0.0288	1.1370	0.4895	0.0122
14	1,152.207	0.6633	84.2692	9.0757	3.8301	0.3584	0.6281	0.0628	0.0523	0.0275	1.2093	0.4743	0.0124
15	1,152.532	0.6634	84.2611	9.0744	3.8366	0.3615	0.6270	0.0646	0.0541	0.0285	1.2172	0.4630	0.0120
16	1,152.753	0.6638	84.1512	9.2161	3.7993	0.3585	0.6223	0.0640	0.0543	0.0291	1.2023	0.4906	0.0124
17	1,151.054	0.6617	84.5062	9.0173	3.7545	0.3601	0.6130	0.0609	0.0509	0.0269	1.1190	0.4794	0.0118
18	1,150.689	0.6605	84.7496	8.8801	3.7428	0.3624	0.6056	0.0619	0.0511	0.0274	1.0168	0.4899	0.0123
19	1,156.036	0.6642	84.0213	9.5687	3.7243	0.3679	0.6307	0.0605	0.0502	0.0276	1.0490	0.4874	0.0124
20	1,158.136	0.6675	83.7924	9.2560	3.9797	0.3921	0.7064	0.0639	0.0531	0.0272	1.2428	0.4739	0.0126
21	1,153.512	0.6644	84.1119	9.1637	3.8760	0.3667	0.6309	0.0613	0.0504	0.0261	1.2201	0.4804	0.0124
22	1,150.545	0.6626	84.3416	9.0450	3.7643	0.3605	0.6301	0.0597	0.0494	0.0260	1.2186	0.4926	0.0122
23	1,150.722	0.6630	84.2716	9.0594	3.7998	0.3583	0.6215	0.0604	0.0500	0.0267	1.2576	0.4830	0.0117
24	1,151.240	0.6630	84.2741	9.0817	3.8009	0.3588	0.6243	0.0601	0.0493	0.0267	1.2282	0.4841	0.0120
25	1,150.592	0.6626	84.3579	8.9899	3.8070	0.3594	0.6232	0.0600	0.0487	0.0273	1.2356	0.4794	0.0116
26	1,151.112	0.6629	84.3274	9.0275	3.7852	0.3648	0.6350	0.0612	0.0499	0.0283	1.2284	0.4806	0.0118
27	1,150.988	0.6629	84.3013	9.0477	3.8037	0.3598	0.6210	0.0604	0.0501	0.0274	1.2446	0.4715	0.0125
28	1,152.741	0.6639	84.0970	9.2443	3.8268	0.3587	0.6205	0.0595	0.0493	0.0244	1.2264	0.4802	0.0130
29	1,151.826	0.6631	84.1944	9.2064	3.7845	0.3584	0.6209	0.0583	0.0472	0.0239	1.2238	0.4700	0.0122
30	1,151.810	0.6633	84.1694	9.1936	3.8014	0.3567	0.6205	0.0581	0.0479	0.0257	1.2553	0.4591	0.0123
31	1,154.547	0.6653	83.8816	9.3535	3.8878	0.3639	0.6299	0.0593	0.0488	0.0253	1.2685	0.4687	0.0127
Volume	1,152.661	0.6637	84.2261	9.1089	3.8186	0.3656	0.6362	0.0633	0.0530	0.0282	1.2075	0.4804	0.0122
Weight Avg Energy	1,152.669	0.6637	84.2255	9.1091	3.8187	0.3657	0.6363	0.0633	0.0530	0.0282	1.2075	0.4804	0.0122

*Handwritten:* 1000

**Watford City**

		01325			01312			Weighted	
		Watford City West Border			Watford City East Border				
Begin Date	End Date	MCF	DK	BTU	MCF	DK	BTU	AVG	
				Zone 25			Zone 43		
10/1/2017	10/2/2017	246	296	1.204	71	83	1.165	1.195	10/1/2017
10/2/2017	10/3/2017	346	417	1.204	70	81	1.158	1.196	10/2/2017
10/3/2017	10/4/2017	450	542	1.204	87	99	1.146	1.195	10/3/2017
10/4/2017	10/5/2017	352	424	1.204	86	98	1.131	1.190	10/4/2017
10/5/2017	10/6/2017	346	417	1.204	76	86	1.136	1.192	10/5/2017
10/6/2017	10/7/2017	224	269	1.204	54	61	1.134	1.190	10/6/2017
10/7/2017	10/8/2017	241	290	1.204	58	66	1.135	1.191	10/7/2017
10/8/2017	10/9/2017	348	418	1.204	85	97	1.132	1.190	10/8/2017
10/9/2017	10/10/2017	374	450	1.204	82	93	1.136	1.192	10/9/2017
10/10/2017	10/11/2017	280	337	1.204	80	91	1.137	1.189	10/10/2017
10/11/2017	10/12/2017	303	365	1.204	64	73	1.132	1.191	10/11/2017
10/12/2017	10/13/2017	442	531	1.204	107	121	1.133	1.190	10/12/2017
10/13/2017	10/14/2017	423	510	1.204	100	113	1.133	1.190	10/13/2017
10/14/2017	10/15/2017	415	500	1.204	132	151	1.138	1.188	10/14/2017
10/15/2017	10/16/2017	359	432	1.204	112	128	1.144	1.190	10/15/2017
10/16/2017	10/17/2017	278	335	1.204	135	156	1.154	1.188	10/16/2017
10/17/2017	10/18/2017	204	246	1.204	113	130	1.143	1.182	10/17/2017
10/18/2017	10/19/2017	329	396	1.204	83	96	1.149	1.193	10/18/2017
10/19/2017	10/20/2017	213	256	1.204	129	146	1.131	1.176	10/19/2017
10/20/2017	10/21/2017	182	219	1.204	110	125	1.132	1.177	10/20/2017
10/21/2017	10/22/2017	384	462	1.204	115	131	1.146	1.191	10/21/2017
10/22/2017	10/23/2017	311	375	1.204	110	126	1.149	1.190	10/22/2017
10/23/2017	10/24/2017	396	476	1.204	151	175	1.156	1.191	10/23/2017
10/24/2017	10/25/2017	304	366	1.204	129	148	1.153	1.189	10/24/2017
10/25/2017	10/26/2017	319	384	1.204	152	174	1.144	1.185	10/25/2017
10/26/2017	10/27/2017	614	739	1.204	268	308	1.148	1.187	10/26/2017
10/27/2017	10/28/2017	531	639	1.204	231	264	1.141	1.185	10/27/2017
10/28/2017	10/29/2017	315	380	1.204	127	146	1.151	1.189	10/28/2017
10/29/2017	10/30/2017	566	681	1.204	123	143	1.156	1.195	10/29/2017
10/30/2017	10/31/2017	655	788	1.204	238	275	1.155	1.191	10/30/2017
10/31/2017	11/1/2017	565	681	1.204	184	211	1.139	1.188	10/31/2017
		11,315	13,621		3,662	4,195	1.1431	1.1892	

ROW ID	LOCATION DESCRIPTION	GROSS HEATING VALUE (BTU/CF)	SPECIFIC GRAVITY	WOBBE (cal)	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	1084.1	0.6279	1368.2	-34.8	1.4316	0.8271	86.5803	9.7949	0.9635	0.0836	0.0654	0.0115	0.0158	0	0.0117	0.1066	0.1082	9/30/2017	10/1/2017	10/1/2017 3:10:29 PM	
11587	GLEN ULLIN	1069.9	0.6189	1360	-60.4	1.4398	0.8015	87.611	9.1661	0.6162	0.0303	0.0237	0.0029	0.0042	0	0.0028	0.028	0.2738	10/1/2017	10/2/2017	10/2/2017 3:11:07 PM	
11587	GLEN ULLIN	1060	0.6122	1354.7	-71.8	1.4274	0.793	88.8808	8.1377	0.505	0.0109	0.0071	0	0	0	0	0.0154	0.2236	10/2/2017	10/3/2017	10/3/2017 3:10:11 PM	
11587	GLEN ULLIN	1073.1	0.6201	1362.7	-44	1.3462	0.8249	87.862	8.6796	0.879	0.0592	0.0471	0.0077	0.0107	0	0.0079	0.0829	0.1919	10/3/2017	10/4/2017	10/4/2017 3:10:27 PM	
11587	GLEN ULLIN	1065.2	0.6153	1358	-55.1	1.3326	0.8534	88.6692	8.124	0.6873	0.0425	0.0345	0.0049	0.0071	0	0.0044	0.1223	0.1175	10/4/2017	10/5/2017	10/5/2017 3:09:32 PM	
11587	GLEN ULLIN	1062.7	0.6134	1356.9	-68.1	1.3436	0.8398	89.0502	7.9619	0.606	0.0312	0.0191	0.002	0.0026	0	0.0008	0.0967	0.0474	10/5/2017	10/6/2017	10/6/2017 3:08:32 PM	
11587	GLEN ULLIN	1064	0.6155	1356.3	-68.5	1.4254	0.8382	88.2379	8.6697	0.5335	0.0148	0.0105	0.0006	0.0011	0	0.0003	0.0311	0.238	10/6/2017	10/7/2017	10/7/2017 3:11:26 PM	
11587	GLEN ULLIN	1061.8	0.6146	1354.3	-70	1.4795	0.8179	88.1827	8.6804	0.4736	0.0112	0.0073	0	0.0002	0	0	0.0052	0.3421	10/7/2017	10/8/2017	10/8/2017 3:08:19 PM	
11587	GLEN ULLIN	1060.7	0.614	1353.6	-70.7	1.482	0.8233	88.2657	8.605	0.4555	0.0089	0.0059	0	0	0	0	0.0073	0.3466	10/8/2017	10/9/2017	10/9/2017 3:10:47 PM	
11587	GLEN ULLIN	1058.9	0.6128	1352.6	-71.9	1.4888	0.8302	88.5523	8.3742	0.4225	0.0109	0.0065	0.0003	0.0003	0	0	0.0392	0.2745	10/9/2017	10/10/2017	10/10/2017 3:10:49 PM	
11587	GLEN ULLIN	1059.9	0.6129	1353.8	-72.1	1.4619	0.8387	88.7199	8.3438	0.4026	0.013	0.0075	0.0004	0.0004	0	0	0.1254	0.0872	10/10/2017	10/11/2017	10/11/2017 3:11:07 PM	
11587	GLEN ULLIN	1059.1	0.6124	1353.4	-72.8	1.4481	0.8456	88.7836	8.3005	0.3863	0.01	0.0064	0	0	0	0	0.0927	0.1268	10/11/2017	10/12/2017	10/12/2017 3:10:29 PM	
11587	GLEN ULLIN	1061.4	0.6137	1354.9	-72	1.4327	0.8537	88.7023	8.4808	0.3861	0.0099	0.0064	0	0	0	0	0.0831	0.0445	10/12/2017	10/13/2017	10/13/2017 3:13:18 PM	
11587	GLEN ULLIN	1058.8	0.6129	1352.5	-72	1.486	0.8319	88.5164	8.4017	0.4208	0.0092	0.0058	0	0	0	0	0.0332	0.2951	10/13/2017	10/14/2017	10/14/2017 3:13:44 PM	
11587	GLEN ULLIN	1059.5	0.6137	1352.5	-71.3	1.5089	0.8336	88.3352	8.5282	0.4381	0.0089	0.0055	0	0	0	0	0	0.3417	10/14/2017	10/15/2017	10/15/2017 3:10:51 PM	
11587	GLEN ULLIN	1059.5	0.6137	1352.5	-71.3	1.5089	0.8336	88.3352	8.5282	0.4381	0.0089	0.0055	0	0	0	0	0	0.3417	10/15/2017	10/16/2017	10/16/2017 3:13:29 PM	
11587	GLEN ULLIN	1059.5	0.6137	1352.5	-71.3	1.5089	0.8336	88.3352	8.5282	0.4381	0.0089	0.0055	0	0	0	0	0	0.3417	10/16/2017	10/17/2017	10/17/2017 3:13:59 PM	
11587	GLEN ULLIN	1059.5	0.6137	1352.5	-71.3	1.5089	0.8336	88.3352	8.5282	0.4381	0.0089	0.0055	0	0	0	0	0	0.3417	10/17/2017	10/18/2017	10/18/2017 3:13:57 PM	
11587	GLEN ULLIN	1067.4	0.6181	1357.6	-67.6	1.4627	0.8314	87.4944	9.4349	0.4392	0.0115	0.0071	0.0001	0.0001	0	0	0.006	0.3134	10/18/2017	10/19/2017	10/19/2017 3:13:15 PM	
11587	GLEN ULLIN	1073.1	0.6214	1361.3	-48.5	1.4697	0.8197	87.4608	9.151	0.7382	0.0527	0.0414	0.0071	0.0095	0	0.0059	0.0439	0.1999	10/19/2017	10/20/2017	10/20/2017 3:13:42 PM	
11587	GLEN ULLIN	1071.8	0.6199	1361.3	-48.6	1.4431	0.8138	87.8752	8.7918	0.7637	0.0539	0.0423	0.0073	0.0097	0	0.006	0.0908	0.1037	10/20/2017	10/21/2017	10/21/2017 3:10:59 PM	
11587	GLEN ULLIN	1060.8	0.6134	1354.4	-71.9	1.4643	0.8287	88.7087	8.372	0.4387	0.0086	0.0056	0	0	0	0	0.0669	0.1067	10/21/2017	10/22/2017	10/22/2017 3:16:57 PM	
11587	GLEN ULLIN	1061.6	0.6137	1355.1	-71.3	1.4506	0.8267	88.653	8.4197	0.4582	0.0097	0.0065	0	0	0	0	0.0669	0.1095	10/22/2017	10/23/2017	10/23/2017 3:14:39 PM	
11587	GLEN ULLIN	1064.2	0.6159	1356.1	-69.2	1.4647	0.8274	88.1387	8.8205	0.4887	0.0123	0.008	0	0.0001	0	0	0.002	0.2368	10/23/2017	10/24/2017	10/24/2017 3:15:25 PM	
11587	GLEN ULLIN	1056.5	0.6096	1353.1	-73.8	1.3246	0.8296	89.3848	7.7146	0.4588	0.0131	0.0087	0	0.0001	0	0	0.0022	0.2634	10/24/2017	10/25/2017	10/25/2017 3:13:54 PM	
11587	GLEN ULLIN	1059.2	0.6125	1353.4	-72.1	1.441	0.828	88.7274	8.2742	0.4466	0.0091	0.006	0	0	0	0	0.0025	0.2665	10/25/2017	10/26/2017	10/26/2017 3:13:58 PM	
11587	GLEN ULLIN	1058.5	0.6121	1352.9	-72.5	1.4372	0.836	88.8449	8.1615	0.4503	0.0081	0.0055	0	0	0	0	0.008	0.249	10/26/2017	10/27/2017	10/27/2017 3:14:25 PM	
11587	GLEN ULLIN	1059.5	0.6124	1353.9	-72.2	1.4215	0.8499	88.8932	8.1586	0.4532	0.0105	0.0072	0.0002	0.0004	0	0.0001	0.1104	0.0943	10/27/2017	10/28/2017	10/28/2017 3:13:55 PM	
11587	GLEN ULLIN	1069	0.6188	1358.9	-67.4	1.4376	0.8657	87.6764	9.3454	0.4875	0.0081	0.0056	0	0	0	0	0.1055	0.0677	10/28/2017	10/29/2017	10/29/2017 3:14:01 PM	
11587	GLEN ULLIN	1068.8	0.6188	1358.7	-66.9	1.4414	0.8377	87.5149	9.4058	0.5139	0.008	0.0054	0	0	0	0	0.0225	0.2496	10/29/2017	10/30/2017	10/30/2017 3:14:05 PM	
11587	GLEN ULLIN	1067.6	0.6179	1358.1	-67.5	1.4513	0.825	87.6455	9.2784	0.5038	0.0079	0.0054	0	0	0	0	0.0028	0.2795	10/30/2017	10/31/2017	10/31/2017 3:15:43 PM	
11587	GLEN ULLIN	1114.6	0.6642	1367.7	-20.4	3.7728	0.3459	78.9756	15.4262	1.376	0.0683	0.0395	0.0031	0.0039	0	0.0222	0	0	10/31/2017	11/1/2017	11/1/2017 3:13:13 PM	

FORM 801

<b>NORTH DAKOTA HEATING VALUE ZONES</b>		
<b>ZONES</b>	<b>MEASURING DEVICE</b>	<b>LOCATION</b>
211	Chromatograph	Sidney Border
24	Monthly Sampler	Williston Border
241	Monthly Sampler	Fairview Border
25	Monthly Sampler	Watford City West Border
260	Chromatograph	North Tioga Transfer
261	Chromatograph	Tioga Comp Station – Robinson Lake Plant
262	Chromatograph	Minot Border
263	Monthly Sampler	Lignite Plant
264	Monthly Sampler	Epping Border
265	Chromatograph	Tioga Comp Station – County Line Plant
271	Chromatograph	Bismarck – Cleveland
272	Chromatograph	Cleveland – Mapleton
273	Chromatograph	Cleveland – Grafton
28	Chromatograph	Bismarck Station
31	Chromatograph	Dickinson Border
32	Chromatograph	Cabin Creek Station
33	Chromatograph	Little Knife Plant
34	Monthly Sampler	Bowman Border
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	OCT 17	SEPT 17	AUG 17	JULY 17	JUNE 17	MAY 17	APRIL 17	MAR 17	FEB 17	JAN 17	DEC 16	NOV 16	ZONE
MT/ND	211	Sidney Border - MonDak Tfr - Sidney Plt	1198	1201	1200	1204	1201	1191	1206	1191	1194	1195	1199	1199	1200	211
ND	24	Williston Border - Charbonneau Station	1161	1144	1142	1142	1141	1141	1148	1158	1171	1173	1189	1190	1187	24
ND	25	Watford City West Border	1201	1204	1205	1202	1206	1204	1204	1200	1199	1202	1198	1193	1200	25
ND	28	Bismarck Station - Glen Ullin Station	1157	1173	1196	1195	1194	1188	1191	1161	1118	1121	1115	1112	1122	28
ND	31	Dickinson Brd - Belfield Tfr - G Ullin Stn	1135	1132	1100	1169	1179	1171	1137	1147	1118	1119	1113	1110	1120	31
ND/MT	32	Cabin Creek Station - Belfield Transfer	1116	1113	1103	1136	1157	1122	1097	1104	1112	1114	1118	1118	1099	32
ND	33	Little Knife Plant	1180	1174	1177	1181	1180	1177	1177	1178	1176	1177	1181	1200	1179	33
ND	34	Bowman Border	996	996	996	996	996	996	996	996	996	996	996	996	996	34
ND	43	Spring Creek I - Sax Valve I	1127	1143	1147	1151	1141	1126	1136	1141	1102	1075	1121	1122	1114	43
ND/MT	241	Fairview Border	1179	1196	1175	1169	1165	1161	1168	1167	1179	1181	1196	1200	1193	241
ND	260	North Tioga Transfer - Nesson Plant		996	987	993	1002	1087	1090	1082	0					260
ND	261	Tioga Comp Station - Robinson Lake Plan	1136	1176	1175	1177	1183	1181	1176	1170	1065	1089	1105	1096	1034	261
ND	262	Minot Bdr - Palermo Bdr - Bismarck Stn	1179	1194	1196	1195	1193	1189	1192	1189	1181	1178	1152	1144	1147	262
ND	263	Lignite Plant	1124	1141	1123	1143	1146	1135	1115	1103	1115	1112	1103	1110	1138	263
ND	264	Epping Border	1153	1134	1136	1133	1138	1133	1145	1154	1158	1172	1186	1186	1158	264
ND	265	Tioga Comp Station - County Line Plant	1177	1176	1176	1177	1184	1181	1176	1170	1174	1175	1184	1170	1182	265
ND	266	County Line Plant		1185	1189	1184	1191	1183	1185	1185	1173	1182	0			266
ND	271	Bismarck Station - Cleveland Station	1172	1192	1196	1195	1194	1188	1192	1189	1163	1155	1129	1127	1140	271
ND	272	Cleveland Station - Mapleton	1171	1192	1196	1195	1193	1188	1191	1187	1161	1153	1128	1126	1139	272
ND	273	Cleveland Station - Grafton Border	1171	1192	1196	1195	1194	1189	1192	1187	1162	1154	1128	1127	1139	273
ND	610	MDU-Watford City BTU	1178	1189	1190	1183	1185	1176	1183	1188	1171	1163	1170	1162	1176	610
ND	802	Linton	1057	1064	1065	1062	1057	1054	1063	1059	1054	1052	1049	1051	1058	802
ND	903	Hettinger Propane	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	903

**THERMAL ZONE VARIANCE  
DOCUMENTATION**

**October 2017**

<b><i>ZONE</i></b>	<b><i>BTU VARIANCE</i></b>	<b><i>REASON</i></b>
28	21	Source & Direction of Flow Change
241	-33	Operational Change