

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

February 21, 2018

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

Re: Case No. PU-17-002 (Therm Billing)
Monthly Report – December 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 January 2018.
2. Attachment B consists of copies of the monthly Heating Value Test Reports received from our suppliers for the month of December 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 December 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
Jan-18

Town	Heat Zone	Therm Factor
MDU-303-ALEXANDER	025	1.1041
MDU-308-ARNEGARD	025	1.1041
MDU-314-APPLE VALLEY	271	1.1376
MDU-318-BEACH	032	1.0073
MDU-319-BELFIELD	032	1.0147
MDU-323-BERTHOLD	262	1.1240
MDU-327-BISMARCK	028	1.0644
MDU-330-BOWMAN	034	0.9137
MDU-337-BURLINGTON	262	1.1482
MDU-343-CARRINGTON	273	1.1376
MDU-344-CLEVELAND	272	1.1296
MDU-364-CAVALIER	273	1.1616
MDU-365-DAWSON	271	1.1296
MDU-368-DES LACS	262	1.1320
MDU-369-DICKINSON	031	1.0409
MDU-374-FT TOTTEN	273	1.1456
MDU-375-DEVILS LAKE	273	1.1456
MDU-379-BARLOW	273	1.1376
MDU-384-EPPING	264	1.0701
MDU-387-ELDRIDGE	272	1.1376
MDU-407-GLADSTONE	031	1.0409
MDU-411-GLEN ULLIN	031	1.0484
MDU-413-GOLVA	032	0.9925
MDU-416-GARRISON	262	1.1320
MDU-417-GRAFTON	273	1.1696
MDU-429-HEBRON	031	1.0484
MDU-432-HETTINGER	903	2.3875
MDU-449-JAMESTOWN	272	1.1456
MDU-459-KILLDEER	033	1.1088
MDU-463-LANGDON	273	1.1376
MDU-469-LEFOR	031	1.0409
MDU-474-LIGNITE	263	1.0873
MDU-475-LINTON	802	1.0372
MDU-478-LINCOLN	028	1.0720
MDU-488-MCKENZIE	271	1.1376
MDU-494-MEDINA	271	1.1296
MDU-498-MANDAN	028	1.0720
MDU-500-MARMARTH	034	0.9204
MDU-505-MINOT	262	1.1482
MDU-510-MOTT	031	1.0409
MDU-512-MAX	262	1.1240
MDU-522-NEW ENGLAND	031	1.0333
MDU-524-NEW SALEM	028	1.0493
MDU-532-NEW ROCKFORD	273	1.1376
MDU-539-PARK RIVER	273	1.1616
MDU-540-PALERMO	262	1.1240
MDU-558-RAY	264	1.0701
MDU-561-REGENT	031	1.0409
MDU-563-RHAME	034	0.9069

MDU-564-RICHARDTON	031	1.0333
MDU-568-ROSS	261	1.0971
MDU-572-RUTHVILLE	262	1.1482
MDU-574-SANBORN	272	1.1456
MDU-583-SENTINEL BUTTE	032	1.0073
MDU-588-SOUTH HEART	031	1.0333
MDU-717-SPIRITWOOD	272	1.1456
MDU-590-SPRINGBROOK	264	1.0786
MDU-591-STANLEY	261	1.1130
MDU-593-STEELE	271	1.1296
MDU-598-SHEYENNE	273	1.1456
MDU-605-SURREY	262	1.1482
MDU-610-TAPPEN	271	1.1296
MDU-611-TAYLOR	031	1.0333
MDU-616-TIOGA	260	0.9302
MDU-619-TURTLE LAKE	262	1.1320
MDU-620-TRENTON	024	1.0883
MDU-624-UNDERWOOD	262	1.1377
MDU-625-VALLEY CITY	272	1.1536
MDU-629-WALHALLA	273	1.1616
MDU-632-WATFORD CITY	610	1.1003
MDU-636-WHEELOCK	264	1.0709
MDU-637-WHITE EARTH	261	1.0223
MDU-642-WILLISTON	024	1.0883
MDU-646-WASHBURN	262	1.1401
MDU-647-WILTON	262	1.1296
MDU-664-RIVERDALE	262	1.1377
MDU-691-FAIRVIEW	241	1.1454
MDU-712-MINOT AFB	262	1.1482
MDU-718-FAIRMOUNT	600	1.1326
MDU-732-NEKOMA	273	1.1376
MDU-732-MSR SITE	273	1.1376

Source Daily Summary

December 2017

Number: 251

Pressure Base: 14.730

Contract Day: 1

Name: SDNY BDR-MNDK JNCTN-SDNY PLT

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7402	1191.8	1213.0	1208.4	1.244	3.663	67.094	24.103	3.459	0.144	0.265	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1406.40	
2	0.7430	1195.2	1216.4	1211.8	1.262	3.691	66.657	24.383	3.575	0.143	0.263	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1407.73	
3	0.7408	1191.0	1212.1	1207.5	1.272	3.729	67.102	23.881	3.585	0.143	0.261	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1404.79	
4	0.7406	1190.5	1211.6	1207.0	1.276	3.730	67.167	23.795	3.600	0.145	0.262	0.013	0.010	0.000	0.000	0.000	0.000	0.000	1404.49	
5	0.7071	1173.4	1194.1	1189.7	0.290	3.132	71.192	22.969	2.284	0.048	0.079	0.003	0.003	0.000	0.000	0.000	0.000	0.000	1416.92	
6	0.7023	1173.2	1193.9	1189.6	0.036	3.082	71.779	22.748	2.292	0.027	0.035	0.001	0.001	0.000	0.000	0.000	0.000	0.000	1421.37	
7	0.7182	1176.2	1197.1	1192.7	0.640	3.464	69.907	22.998	2.757	0.080	0.141	0.007	0.006	0.000	0.000	0.000	0.000	0.000	1409.42	
8	0.7390	1187.6	1208.6	1203.9	1.284	3.743	67.522	23.413	3.601	0.146	0.266	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1402.58	
9	0.7392	1187.8	1208.8	1204.1	1.284	3.750	67.557	23.316	3.640	0.151	0.275	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1402.57	
10	0.7399	1189.2	1210.3	1205.7	1.282	3.731	67.399	23.502	3.636	0.149	0.273	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1403.64	
11	0.7418	1193.1	1214.3	1209.5	1.282	3.673	66.992	23.994	3.613	0.148	0.271	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1406.42	
12	0.7411	1191.7	1212.8	1208.1	1.284	3.696	67.121	23.849	3.600	0.149	0.274	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1405.34	
13	0.7400	1189.7	1210.8	1206.1	1.285	3.708	67.366	23.569	3.625	0.149	0.272	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1404.09	
14	0.7370	1187.2	1208.2	1203.4	1.245	3.640	67.803	23.372	3.510	0.142	0.261	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1403.99	
15	0.7396	1189.9	1210.9	1206.3	1.262	3.699	67.343	23.701	3.548	0.148	0.271	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1404.63	
16	0.7402	1190.0	1211.1	1206.4	1.276	3.725	67.286	23.660	3.606	0.149	0.272	0.015	0.011	0.000	0.000	0.000	0.000	0.000	1404.22	
17	0.7404	1190.3	1211.4	1206.8	1.274	3.731	67.224	23.732	3.596	0.148	0.269	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1404.38	
18	0.7106	1174.6	1195.4	1191.0	0.356	3.285	70.766	22.947	2.491	0.055	0.092	0.004	0.003	0.000	0.000	0.000	0.000	0.000	1414.90	
19	0.7303	1187.6	1208.6	1204.1	0.893	3.529	68.324	23.700	3.231	0.110	0.195	0.010	0.008	0.000	0.000	0.000	0.000	0.000	1411.03	
20	0.7407	1190.7	1211.8	1207.1	1.275	3.733	67.110	23.861	3.606	0.141	0.251	0.012	0.009	0.000	0.000	0.000	0.000	0.000	1404.56	
21	0.7450	1198.4	1219.6	1214.8	1.257	3.696	66.450	24.338	3.854	0.137	0.245	0.013	0.010	0.000	0.000	0.000	0.000	0.000	1409.54	
22	0.7424	1193.1	1214.2	1209.5	1.279	3.736	67.108	23.578	3.836	0.156	0.282	0.015	0.011	0.000	0.000	0.000	0.000	0.000	1405.80	
23	0.7176	1180.2	1201.1	1196.6	0.561	3.286	69.990	23.142	2.798	0.078	0.134	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1414.84	
24	0.7045	1171.7	1192.5	1188.1	0.214	3.106	71.618	22.630	2.333	0.038	0.057	0.002	0.002	0.000	0.000	0.000	0.000	0.000	1417.48	
25	0.6969	1167.4	1188.1	1183.7	0.035	2.933	72.649	22.250	2.089	0.020	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1419.82	
26	0.6984	1169.6	1190.4	1186.0	0.033	2.932	72.452	22.358	2.176	0.022	0.026	0.001	0.001	0.000	0.000	0.000	0.000	0.000	1421.09	
27	0.6955	1164.8	1185.4	1181.2	0.038	2.952	72.904	22.013	2.048	0.021	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1418.09	
28	0.6649	1099.9	1119.4	1118.5	0.066	3.811	78.461	16.152	1.473	0.019	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1373.06	
29	0.6620	1101.0	1120.5	1116.7	0.065	3.642	79.001	15.868	1.394	0.015	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1373.95	
30	0.6482	1076.2	1095.3	1091.5	0.234	3.599	81.973	12.824	1.309	0.025	0.031	0.003	0.002	0.000	0.000	0.000	0.000	0.000	1357.03	
31	0.6470	1076.4	1095.4	1091.3	0.533	3.015	83.290	11.262	1.732	0.061	0.092	0.008	0.006	0.000	0.000	0.000	0.000	0.000	1358.00	
Avg	0.7192	1172.0	1193.0	1188.6	0.826	3.511	70.213	22.190	2.964	0.100	0.177	0.009	0.007	0.000	0.000	0.000	0.000	0.000	1403.62	

Zone 211

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6756	1117.5	1137.3	1134.3	0.753	2.867	77.993	16.179	1.999	0.061	0.129	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1380.43	
2	0.6766	1119.2	1139.1	1136.1	0.747	2.866	77.765	16.421	1.998	0.060	0.125	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1381.54	
3	0.6781	1122.1	1142.0	1139.1	0.739	2.843	77.443	16.778	1.997	0.059	0.122	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1383.58	
4	0.6766	1120.6	1140.5	1137.5	0.733	2.798	77.755	16.521	1.993	0.059	0.123	0.008	0.009	0.000	0.000	0.000	0.000	0.000	1383.31	
5	0.6769	1119.8	1139.6	1136.6	0.961	2.528	78.513	15.304	2.444	0.074	0.154	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1381.94	
6	0.6737	1114.2	1133.9	1130.9	1.020	2.471	79.543	13.986	2.716	0.079	0.161	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1378.30	
7	0.6779	1120.8	1140.6	1137.6	0.906	2.640	78.281	15.460	2.453	0.077	0.159	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1382.18	
8	0.6810	1126.0	1146.0	1143.0	0.830	2.729	77.293	16.685	2.219	0.072	0.149	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1385.50	
9	0.6812	1125.7	1145.6	1142.6	0.851	2.744	77.330	16.551	2.271	0.075	0.155	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1384.77	
10	0.6821	1127.1	1147.0	1144.0	0.841	2.762	77.085	16.828	2.235	0.074	0.153	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1385.57	
11	0.6795	1121.3	1141.2	1138.2	0.860	2.831	77.693	16.089	2.270	0.076	0.157	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1381.19	
12	0.6840	1127.8	1147.7	1144.7	0.860	2.863	76.841	16.834	2.343	0.077	0.158	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1384.53	
13	0.6854	1129.9	1149.9	1146.9	0.861	2.858	76.665	16.944	2.394	0.081	0.170	0.013	0.015	0.000	0.000	0.000	0.000	0.000	1385.78	
14	0.6809	1125.0	1144.9	1141.9	0.888	2.697	77.652	16.038	2.462	0.078	0.161	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1384.24	
15	0.6843	1130.2	1150.2	1147.2	0.850	2.761	76.789	16.968	2.384	0.073	0.152	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1387.20	
16	0.6820	1126.2	1146.1	1143.2	0.854	2.774	77.374	16.273	2.477	0.074	0.153	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1384.70	
17	0.6846	1130.4	1150.4	1147.4	0.850	2.776	76.710	17.051	2.364	0.073	0.152	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1387.16	
18	0.6833	1129.2	1149.2	1146.2	0.843	2.737	76.977	16.833	2.362	0.074	0.152	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1386.98	
19	0.6804	1123.0	1142.9	1139.9	0.864	2.813	77.518	16.261	2.291	0.075	0.155	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1382.27	
20	0.6811	1124.0	1143.9	1141.0	0.865	2.810	77.485	16.184	2.409	0.075	0.152	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1382.88	
21	0.6809	1124.1	1144.0	1141.0	0.861	2.792	77.485	16.265	2.339	0.076	0.158	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1383.15	
22	0.6821	1126.2	1146.1	1143.2	0.863	2.773	77.321	16.359	2.432	0.075	0.154	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1384.55	
23	0.6820	1126.2	1146.1	1143.1	0.867	2.758	77.300	16.443	2.379	0.075	0.154	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1384.62	
24	0.6809	1125.5	1145.5	1142.5	0.854	2.719	77.661	15.973	2.542	0.074	0.153	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1384.88	
25	0.6735	1117.1	1136.9	1133.9	0.858	2.529	78.866	15.272	2.246	0.067	0.140	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1382.11	
26	0.6735	1117.0	1136.8	1133.8	0.862	2.534	78.794	15.402	2.186	0.065	0.137	0.010	0.011	0.000	0.000	0.000	0.000	0.000	1381.90	
27	0.6773	1122.0	1141.9	1138.7	0.840	2.615	78.063	16.059	2.170	0.070	0.153	0.013	0.016	0.000	0.000	0.000	0.000	0.000	1384.17	
28	0.6780	1121.8	1141.6	1138.6	0.822	2.719	77.944	16.035	2.222	0.072	0.156	0.013	0.015	0.000	0.000	0.000	0.000	0.000	1383.24	
29	0.6736	1115.6	1135.3	1132.3	0.841	2.659	78.891	15.093	2.256	0.074	0.160	0.012	0.014	0.000	0.000	0.000	0.000	0.000	1380.04	
30	0.6713	1112.7	1132.4	1129.4	0.853	2.597	79.449	14.516	2.322	0.076	0.160	0.012	0.014	0.000	0.000	0.000	0.000	0.000	1378.88	
31	0.6708	1113.4	1133.1	1130.2	0.819	2.555	79.228	15.059	2.134	0.060	0.125	0.009	0.010	0.000	0.000	0.000	0.000	0.000	1380.37	
Avg	0.6790	1123.0	1142.5	1139.5	0.849	2.723	77.797	16.086	2.300	0.072	0.150	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1383.29	

Zone 24

Gas Composition and Properties

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

Attachment B
Page 4 of 22

Source #: 0602225
Name: WATFORD CITY WEST BORDER

Component	Mole %	Liquid Content	Mass %
Carbon Dioxide, CO2	0.9153		2.0043
Nitrogen, N2	2.6918		3.7520
Methane, C1	74.5432		59.5018
Ethane, C2	19.2483	0.0000	28.7980
Propane, C3	2.2819	0.6268	5.0066
iso-Butane, iC4	0.0927	0.0303	0.2681
n-Butane, nC4	0.1886	0.0593	0.5454
iso-Pentane, iC5	0.0152	0.0055	0.0546
n-Pentane, nC5	0.0163	0.0059	0.0585
Neo-Pentane, NeoC5			
Hexanes Plus, C6+	0.0000	0.0000	0.0000
Water, H2O			
Hydrogen Sulfide, H2S			
Oxygen, O2	0.0067		0.0107
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		
Cricodentherm		
HV, Dry @ Base P, T	1164.99	
HV, Sat @ Base P, T	1144.72	
HV, Sat @ Sample P, T	1164.99	
Relative Density	0.6944	
C6+: 100		

Totals 100.0000 0.7280 100.0000

Sample

Date: 01/02/2018 Pressure: 340.0
Type: Composite Temperature: 0.0
Tech: ES H2O: lbs/mm
H2S: ppm

Remarks:

Analysis

Date: 01/03/2018 Instrument: WBI- 1
Cylinder: 452

Tech: MB

Remarks:

Zone 25

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.5962	991.9	1009.5		0.008	4.192	91.009	4.678	0.093	0.005	0.012	0.001	0.002	0.000					1304.35	
2	0.5838	970.7	987.9		0.008	4.315	93.531	2.037	0.090	0.005	0.012	0.001	0.002	0.000					1289.97	
3	0.5835	971.2	988.4		0.007	4.253	93.600	2.033	0.088	0.005	0.012	0.001	0.002	0.000					1291.04	
4	0.5834	971.2	988.4		0.008	4.250	93.608	2.029	0.086	0.005	0.012	0.001	0.001	0.000					1291.04	
5	0.6126	1014.5	1032.5		0.232	4.019	88.531	6.534	0.597	0.023	0.054	0.003	0.005	0.002					1316.03	
6	0.6077	1007.2	1025.0		0.192	4.057	89.391	5.773	0.510	0.020	0.048	0.003	0.004	0.002					1311.90	
7	0.6508	1072.5	1091.5		0.479	3.697	81.863	12.491	1.316	0.045	0.093	0.007	0.008	0.002					1349.89	
8	0.6023	999.4	1017.1		0.135	4.120	90.306	4.956	0.434	0.016	0.034	0.003	0.003	0.000					1307.47	
9	0.5831	970.1	987.3		0.007	4.292	93.664	1.927	0.089	0.005	0.012	0.002	0.002	0.000					1289.89	
10	0.5839	970.6	987.8		0.007	4.335	93.500	2.049	0.089	0.005	0.012	0.001	0.002	0.000					1289.67	
11	0.5846	973.7	990.9		0.007	4.213	93.375	2.294	0.090	0.005	0.013	0.001	0.002	0.000					1293.00	
12	0.5823	971.8	989.0		0.007	4.106	93.866	1.910	0.089	0.005	0.013	0.001	0.002	0.000					1293.12	
13	0.5826	972.2	989.4		0.007	4.108	93.815	1.958	0.090	0.006	0.014	0.001	0.002	0.000					1293.33	
14	0.5944	988.6	1006.1		0.004	4.226	91.360	4.308	0.082	0.005	0.012	0.001	0.002	0.000					1302.01	
15	0.5839	970.4	987.6		0.007	4.347	93.493	2.044	0.088	0.005	0.012	0.001	0.002	0.000					1289.43	
16	0.5834	972.2	989.4		0.007	4.191	93.622	2.074	0.088	0.005	0.012	0.001	0.001	0.000					1292.34	
17	0.5829	971.9	989.1		0.007	4.156	93.739	1.989	0.088	0.005	0.013	0.001	0.001	0.000					1292.58	
18	0.5834	970.3	987.4		0.007	4.309	93.601	1.974	0.088	0.005	0.012	0.002	0.002	0.000					1289.77	
19	0.5836	971.1	988.3		0.007	4.271	93.572	2.043	0.088	0.005	0.012	0.001	0.001	0.000					1290.75	
20	0.5836	970.9	988.1		0.007	4.283	93.570	2.034	0.087	0.005	0.012	0.001	0.001	0.000					1290.49	
21	0.5837	970.1	987.2		0.007	4.344	93.546	1.994	0.088	0.005	0.012	0.002	0.002	0.000					1289.26	
22	0.5843	971.1	988.3		0.007	4.338	93.422	2.125	0.088	0.005	0.012	0.001	0.001	0.000					1289.95	
23	0.5831	969.6	986.8		0.007	4.318	93.663	1.906	0.087	0.005	0.012	0.001	0.001	0.000					1289.29	
24	0.5831	969.5	986.7		0.007	4.321	93.666	1.902	0.086	0.005	0.012	0.001	0.001	0.000					1289.19	
25	0.5834	972.0	989.2		0.001	4.209	93.612	2.076	0.081	0.005	0.012	0.002	0.002	0.000					1292.11	
26	0.5883	979.3	996.6		0.001	4.233	92.586	3.081	0.080	0.004	0.011	0.001	0.001	0.000					1296.27	
27	0.5822	969.9	987.1		0.004	4.214	93.871	1.802	0.085	0.006	0.014	0.001	0.002	0.000					1290.75	
28	0.5818	969.1	986.3		0.007	4.224	93.963	1.687	0.094	0.006	0.015	0.001	0.002	0.000					1290.08	
29	0.5950	991.1	1008.6		0.003	4.137	91.258	4.491	0.088	0.006	0.014	0.001	0.002	0.000					1304.56	
30	0.5858	974.6	991.9		0.001	4.281	93.114	2.491	0.089	0.006	0.014	0.002	0.002	0.000					1292.88	
31	0.5855	975.6	992.8		0.001	4.190	93.202	2.490	0.092	0.006	0.015	0.002	0.002	0.000					1294.53	
Avg	0.5893	980.0	997.5		0.039	4.211	92.546	3.006	0.169	0.008	0.018	0.002	0.002	0.000					1296.35	

Zone 260

Source Daily Summary

December 2017

Number: 601

Pressure Base: 14.730

Contract Day: 1

Name: TIOGA STN-ROBINSON LAKE PLNT

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7017	1148.0	1168.4	1164.5	0.872	3.279	73.416	19.654	2.475	0.088	0.187	0.013	0.016	0.000	0.000	0.000	0.000	0.000	0.000	1391.40
2	0.7006	1146.3	1166.6	1162.7	0.873	3.277	73.490	19.715	2.367	0.081	0.171	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1390.41
3	0.7020	1149.4	1169.8	1165.9	0.847	3.261	73.169	20.073	2.374	0.081	0.168	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1392.81
4	0.7011	1147.7	1168.0	1164.9	0.853	3.270	73.223	20.106	2.301	0.075	0.151	0.010	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1391.68
5	0.6619	1072.7	1091.7	1088.7	1.140	3.707	81.993	10.161	2.664	0.096	0.210	0.013	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1338.06
6	0.6582	1070.4	1089.4	1086.1	1.031	3.669	82.311	10.259	2.463	0.080	0.165	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1338.81
7	0.6825	1114.1	1133.8	1130.4	0.924	3.457	77.150	15.857	2.349	0.078	0.161	0.011	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1368.80
8	0.7008	1147.7	1168.0	1164.1	0.838	3.265	73.312	20.011	2.321	0.077	0.153	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1391.90
9	0.6972	1141.5	1161.7	1157.8	0.846	3.292	74.088	19.168	2.347	0.078	0.157	0.011	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1387.93
10	0.6994	1145.5	1165.8	1162.1	0.829	3.274	73.632	19.645	2.362	0.079	0.157	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1390.80
11	0.7004	1145.8	1166.1	1162.4	0.855	3.312	73.519	19.651	2.387	0.081	0.168	0.012	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1390.11
12	0.7013	1148.0	1168.3	1164.7	0.851	3.277	73.247	20.018	2.344	0.080	0.161	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1391.81
13	0.7016	1148.1	1168.4	1164.8	0.863	3.279	73.299	19.897	2.374	0.082	0.171	0.014	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1391.58
14	0.6995	1145.1	1165.4	1161.3	0.844	3.291	73.743	19.450	2.380	0.082	0.172	0.015	0.022	0.000	0.000	0.000	0.000	0.000	0.000	1389.99
15	0.7013	1148.1	1168.4	1164.5	0.847	3.274	73.171	20.171	2.286	0.075	0.152	0.010	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1391.95
16	0.7019	1149.6	1170.0	1166.2	0.834	3.257	73.087	20.226	2.350	0.076	0.150	0.009	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1393.21
17	0.7006	1147.3	1167.7	1163.8	0.834	3.278	73.309	20.017	2.314	0.075	0.152	0.010	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1391.70
18	0.7019	1149.3	1169.7	1165.8	0.839	3.269	73.181	20.058	2.386	0.081	0.163	0.011	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1392.79
19	0.7008	1147.7	1168.1	1164.3	0.834	3.270	73.238	20.126	2.286	0.075	0.150	0.009	0.011	0.000	0.000	0.000	0.000	0.000	0.000	1392.02
20	0.7013	1148.7	1169.1	1165.2	0.828	3.264	73.173	20.186	2.295	0.077	0.154	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1392.71
21	0.7006	1147.3	1167.6	1163.8	0.824	3.289	73.217	20.196	2.229	0.074	0.150	0.010	0.012	0.000	0.000	0.000	0.000	0.000	0.000	1391.74
22	0.6963	1163.6	1184.2	1180.4	0.842	1.863	74.409	20.352	2.274	0.077	0.158	0.011	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1415.93
23	0.6924	1180.2	1201.1	1197.1	0.858	0.458	75.459	20.697	2.261	0.078	0.161	0.012	0.015	0.000	0.000	0.000	0.000	0.000	0.000	1440.03
24	0.6949	1167.2	1187.9	1184.0	0.848	1.503	74.727	20.428	2.228	0.077	0.162	0.012	0.014	0.000	0.000	0.000	0.000	0.000	0.000	1421.69
25	0.6943	1155.5	1175.9	1171.9	0.812	2.220	74.763	19.719	2.183	0.082	0.183	0.016	0.021	0.000	0.000	0.000	0.000	0.000	0.000	1407.85
26	0.6960	1156.1	1176.6	1172.6	0.873	2.248	74.380	20.084	2.132	0.075	0.173	0.015	0.020	0.000	0.000	0.000	0.000	0.000	0.000	1406.93
27	0.7150	1169.2	1189.9	1185.8	0.844	3.277	72.285	19.708	3.175	0.173	0.443	0.042	0.053	0.000	0.000	0.000	0.000	0.000	0.000	1403.42
28	0.7141	1167.3	1187.9	1182.9	0.849	3.299	72.135	20.223	2.865	0.146	0.373	0.044	0.064	0.000	0.000	0.000	0.000	0.000	0.000	1401.64
29	0.7124	1164.8	1185.5	1181.2	0.854	3.276	72.220	20.214	2.912	0.127	0.317	0.034	0.045	0.000	0.000	0.000	0.000	0.000	0.000	1400.88
30	0.7082	1159.7	1180.3	1176.2	0.815	3.257	72.823	19.813	2.799	0.123	0.300	0.030	0.039	0.000	0.000	0.000	0.000	0.000	0.000	1398.92
31	0.7089	1161.0	1181.5	1177.9	0.820	3.242	72.683	19.841	2.979	0.119	0.271	0.020	0.024	0.000	0.000	0.000	0.000	0.000	0.000	1399.82
Avg	0.6984	1147.0	1167.2	1163.4	0.862	3.047	74.124	19.217	2.434	0.089	0.192	0.015	0.019	0.000	0.000	0.000	0.000	0.000	0.000	1393.20

Zone 261

Source Daily Summary

December 2017

Number: 091

Pressure Base: 14.730

Contract Day: 1

Name: MNT BRD-PLRMO BRD-BIS STN

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7372	1170.8	1191.5	1188.3	0.878	5.211	68.049	21.187	4.093	0.162	0.374	0.021	0.025	0.000	0.000	0.000	0.000	0.000	1384.46	
2	0.7370	1172.1	1192.8	1189.6	0.878	5.116	68.100	21.228	4.098	0.161	0.372	0.022	0.026	0.000	0.000	0.000	0.000	0.000	1386.11	
3	0.7366	1172.5	1193.2	1190.0	0.866	5.070	68.120	21.315	4.063	0.158	0.363	0.021	0.024	0.000	0.000	0.000	0.000	0.000	1387.00	
4	0.7387	1173.6	1194.3	1191.1	0.880	5.181	67.796	21.411	4.154	0.162	0.371	0.021	0.024	0.000	0.000	0.000	0.000	0.000	1386.30	
5	0.7388	1174.8	1195.7	1192.4	0.934	5.034	67.678	21.770	4.024	0.157	0.361	0.020	0.022	0.000	0.000	0.000	0.000	0.000	1387.71	
6	0.7343	1171.2	1191.9	1188.7	0.883	4.909	68.287	21.572	3.835	0.146	0.330	0.018	0.020	0.000	0.000	0.000	0.000	0.000	1387.64	
7	0.7354	1171.4	1192.1	1188.9	0.888	4.994	68.172	21.495	3.918	0.151	0.343	0.018	0.021	0.000	0.000	0.000	0.000	0.000	1386.84	
8	0.7362	1172.1	1192.8	1189.6	0.871	5.051	68.155	21.329	4.041	0.156	0.355	0.019	0.023	0.000	0.000	0.000	0.000	0.000	1386.88	
9	0.7389	1173.8	1194.6	1191.4	0.873	5.196	67.793	21.365	4.186	0.164	0.377	0.021	0.024	0.000	0.000	0.000	0.000	0.000	1386.41	
10	0.7394	1175.0	1195.8	1192.5	0.872	5.170	67.745	21.394	4.238	0.162	0.372	0.021	0.025	0.000	0.000	0.000	0.000	0.000	1387.34	
11	0.7448	1179.4	1200.3	1197.0	0.875	5.404	67.018	21.505	4.582	0.172	0.396	0.022	0.025	0.000	0.000	0.000	0.000	0.000	1387.48	
12	0.7552	1188.2	1209.2	1205.9	0.877	5.844	65.581	21.828	5.175	0.193	0.448	0.026	0.029	0.000	0.000	0.000	0.000	0.000	1388.10	
13	0.7597	1190.6	1211.6	1208.2	0.880	6.114	64.973	21.867	5.433	0.203	0.472	0.027	0.030	0.000	0.000	0.000	0.000	0.000	1386.72	
14	0.7364	1169.5	1190.2	1186.9	0.855	5.253	68.263	20.853	4.210	0.159	0.364	0.020	0.023	0.000	0.000	0.000	0.000	0.000	1383.65	
15	0.7411	1173.8	1194.6	1191.4	0.883	5.385	67.363	21.560	4.225	0.166	0.375	0.021	0.023	0.000	0.000	0.000	0.000	0.000	1384.39	
16	0.7403	1174.4	1195.2	1191.9	0.876	5.289	67.537	21.486	4.221	0.167	0.378	0.021	0.024	0.000	0.000	0.000	0.000	0.000	1385.77	
17	0.7458	1178.9	1199.8	1196.5	0.870	5.535	66.846	21.533	4.561	0.185	0.420	0.023	0.026	0.000	0.000	0.000	0.000	0.000	1385.96	
18	0.7390	1173.0	1193.7	1190.4	0.873	5.261	67.707	21.440	4.138	0.164	0.373	0.021	0.024	0.000	0.000	0.000	0.000	0.000	1385.24	
19	0.7450	1179.7	1200.6	1197.3	0.867	5.415	66.965	21.530	4.631	0.170	0.377	0.021	0.023	0.000	0.000	0.000	0.000	0.000	1387.67	
20	0.7487	1183.4	1204.4	1201.1	0.862	5.539	66.459	21.617	4.955	0.169	0.361	0.018	0.019	0.000	0.000	0.000	0.000	0.000	1388.63	
21	0.7450	1181.4	1202.3	1199.0	0.856	5.330	66.996	21.571	4.659	0.170	0.375	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1389.63	
22	0.7470	1183.4	1204.4	1201.0	0.862	5.389	66.780	21.531	4.838	0.175	0.380	0.023	0.023	0.000	0.000	0.000	0.000	0.000	1390.05	
23	0.7451	1181.6	1202.5	1199.2	0.863	5.320	67.027	21.494	4.703	0.172	0.375	0.022	0.022	0.000	0.000	0.000	0.000	0.000	1389.68	
24	0.7384	1171.4	1192.1	1189.0	0.870	5.301	67.680	21.374	4.364	0.130	0.260	0.011	0.011	0.000	0.000	0.000	0.000	0.000	1384.05	
25	0.7349	1168.0	1188.7	1185.7	0.860	5.197	68.145	21.161	4.303	0.124	0.209	0.002	0.001	0.000	0.000	0.000	0.000	0.000	1383.38	
26	0.7370	1170.4	1191.2	1188.1	0.875	5.217	67.898	21.248	4.401	0.128	0.223	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1384.34	
27	0.7425	1179.1	1200.0	1196.9	0.865	5.218	67.449	21.221	4.713	0.167	0.338	0.015	0.015	0.000	0.000	0.000	0.000	0.000	1389.39	
28	0.7422	1177.2	1198.1	1195.0	0.873	5.300	67.254	21.466	4.648	0.151	0.296	0.008	0.005	0.000	0.000	0.000	0.000	0.000	1387.41	
29	0.7313	1162.4	1182.9	1180.0	0.881	5.173	68.441	21.254	3.995	0.091	0.159	0.004	0.003	0.000	0.000	0.000	0.000	0.000	1380.08	
30	0.7305	1161.3	1181.9	1178.9	0.867	5.178	68.518	21.185	4.072	0.076	0.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1379.68	
31	0.7362	1170.5	1191.2	1188.2	0.864	5.166	67.968	21.286	4.372	0.123	0.218	0.002	0.001	0.000	0.000	0.000	0.000	0.000	1385.06	
Avg	0.7406	1175.0	1195.8	1192.6	0.873	5.282	67.508	21.422	4.382	0.156	0.339	0.017	0.019	0.000	0.000	0.000	0.000	0.000	1386.23	

Zone 2b2

Gas Composition and Properties

Effective December 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	0.7471		1.6783
Nitrogen, N2	2.7000		3.8608
Methane, C1	77.4015		63.3827
Ethane, C2	17.0265	4.5552	26.1332
Propane, C3	1.9169	0.5266	4.3146
iso-Butane, iC4	0.0618	0.0202	0.1833
n-Butane, nC4	0.1270	0.0399	0.3768
iso-Pentane, iC5	0.0091	0.0033	0.0335
n-Pentane, nC5	0.0100	0.0036	0.0368
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	1141.86	
HV, Sat @ Base P, T	1121.99	
HV, Sat @ Sample P, T	1141.86	
Relative Density	0.6770	

C6+: 100

Totals 99.9999 5.1490 100.0000

Sample

Date: 01/02/2018 Pressure: 370.0
Type: Composite Temperature: 0.0
Tech: ES H2O: lbs/mm
H2S: ppm

Remarks:

Analysis

Date: 01/03/2018 Instrument: WBI-2
Cylinder: 338

Tech: MB

Remarks:

Zone 264

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7020	1148.5	1168.8	1165.5	0.874	3.275	73.371	19.697	2.477	0.088	0.188	0.014	0.017	0.000	0.000	0.000	0.000	0.000	1391.65	
2	0.7011	1147.2	1167.5	1164.3	0.872	3.269	73.379	19.839	2.364	0.081	0.171	0.012	0.014	0.000	0.000	0.000	0.000	0.000	1391.04	
3	0.7025	1150.2	1170.5	1167.3	0.849	3.258	73.073	20.171	2.374	0.081	0.168	0.012	0.015	0.000	0.000	0.000	0.000	0.000	1393.25	
4	0.6995	1144.7	1165.0	1161.9	0.864	3.286	73.574	19.710	2.315	0.076	0.153	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1389.62	
5	0.6558	1061.8	1080.6	1077.7	1.159	3.766	83.306	8.724	2.706	0.098	0.213	0.014	0.015	0.000	0.000	0.000	0.000	0.000	1330.66	
6	0.6557	1066.0	1084.9	1082.0	1.037	3.692	82.851	9.662	2.488	0.081	0.167	0.011	0.012	0.000	0.000	0.000	0.000	0.000	1335.98	
7	0.6826	1114.0	1133.7	1130.6	0.933	3.458	77.158	15.823	2.361	0.079	0.163	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1368.49	
8	0.7009	1148.1	1168.4	1165.2	0.836	3.260	73.267	20.069	2.319	0.076	0.152	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1392.23	
9	0.6976	1142.1	1162.3	1159.1	0.849	3.288	74.053	19.163	2.377	0.081	0.163	0.011	0.014	0.000	0.000	0.000	0.000	0.000	1388.25	
10	0.6997	1146.0	1166.3	1163.1	0.835	3.272	73.568	19.702	2.363	0.079	0.158	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1390.99	
11	0.6995	1144.3	1164.6	1161.4	0.860	3.318	73.705	19.445	2.393	0.082	0.170	0.012	0.015	0.000	0.000	0.000	0.000	0.000	1389.06	
12	0.7006	1147.2	1167.5	1164.4	0.833	3.287	73.349	19.939	2.329	0.079	0.160	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1391.53	
13	0.7014	1147.6	1168.0	1164.7	0.859	3.292	73.359	19.806	2.395	0.084	0.177	0.013	0.016	0.000	0.000	0.000	0.000	0.000	1391.26	
14	0.6999	1145.6	1165.9	1162.7	0.848	3.291	73.617	19.583	2.375	0.083	0.175	0.013	0.015	0.000	0.000	0.000	0.000	0.000	1390.33	
15	0.7016	1148.8	1169.2	1165.9	0.841	3.264	73.143	20.189	2.309	0.076	0.154	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1392.54	
16	0.7019	1149.7	1170.0	1166.8	0.834	3.258	73.076	20.240	2.346	0.076	0.150	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1393.23	
17	0.7009	1147.8	1168.1	1165.0	0.834	3.275	73.264	20.060	2.316	0.076	0.154	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1392.00	
18	0.7020	1149.5	1169.8	1166.6	0.840	3.266	73.154	20.092	2.382	0.080	0.161	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1392.90	
19	0.7009	1147.8	1168.2	1165.0	0.834	3.269	73.226	20.141	2.284	0.075	0.150	0.009	0.011	0.000	0.000	0.000	0.000	0.000	1392.08	
20	0.7014	1148.9	1169.2	1166.0	0.827	3.263	73.153	20.212	2.290	0.077	0.154	0.010	0.013	0.000	0.000	0.000	0.000	0.000	1392.82	
21	0.7007	1147.5	1167.9	1164.7	0.825	3.289	73.195	20.213	2.232	0.074	0.151	0.010	0.012	0.000	0.000	0.000	0.000	0.000	1391.84	
22	0.6960	1165.7	1186.3	1183.1	0.843	1.704	74.516	20.394	2.282	0.078	0.159	0.011	0.013	0.000	0.000	0.000	0.000	0.000	1418.76	
23	0.6931	1177.1	1197.9	1194.6	0.858	0.717	75.265	20.637	2.255	0.078	0.162	0.012	0.015	0.000	0.000	0.000	0.000	0.000	1435.48	
24	0.6951	1167.1	1187.8	1184.5	0.848	1.528	74.687	20.442	2.229	0.077	0.162	0.012	0.014	0.000	0.000	0.000	0.000	0.000	1421.34	
25	0.6938	1156.6	1177.1	1173.7	0.814	2.102	74.869	19.737	2.176	0.082	0.183	0.017	0.021	0.000	0.000	0.000	0.000	0.000	1409.73	
26	0.6957	1157.1	1177.6	1174.2	0.870	2.162	74.459	20.088	2.138	0.075	0.173	0.015	0.020	0.000	0.000	0.000	0.000	0.000	1408.50	
27	0.7145	1167.6	1188.3	1184.7	0.844	3.320	72.323	19.741	3.025	0.180	0.468	0.045	0.056	0.000	0.000	0.000	0.000	0.000	1402.10	
28	0.7123	1164.3	1184.9	1180.4	0.850	3.311	72.290	20.177	2.821	0.121	0.329	0.041	0.059	0.000	0.000	0.000	0.000	0.000	1399.90	
29	0.7123	1164.7	1185.3	1181.5	0.855	3.276	72.235	20.199	2.911	0.127	0.317	0.034	0.045	0.000	0.000	0.000	0.000	0.000	1400.81	
30	0.7072	1158.2	1178.7	1175.2	0.819	3.245	72.900	19.843	2.729	0.117	0.283	0.027	0.036	0.000	0.000	0.000	0.000	0.000	1398.19	
31	0.7091	1161.2	1181.7	1178.4	0.829	3.235	72.647	19.878	2.973	0.120	0.273	0.020	0.024	0.000	0.000	0.000	0.000	0.000	1399.87	
Avg	0.6980	1146.0	1166.5	1163.2	0.864	3.048	74.195	19.149	2.430	0.088	0.192	0.015	0.019	0.000	0.000	0.000	0.000	0.000	1392.79	

Zone 2b5

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7325	1166.7	1187.4	1183.4	0.835	5.086	68.776	20.834	3.902	0.157	0.360	0.024	0.025	0.000	0.000	0.000	0.000	0.000	1383.93	
2	0.7361	1171.8	1192.5	1188.4	0.853	5.084	68.307	21.084	4.082	0.163	0.375	0.025	0.027	0.000	0.000	0.000	0.000	0.000	1386.53	
3	0.7309	1167.4	1188.0	1184.1	0.820	4.919	69.009	20.862	3.851	0.150	0.343	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1386.23	
4	0.7200	1155.3	1175.8	1172.0	0.732	4.760	70.676	19.875	3.482	0.134	0.301	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1382.33	
5	0.7130	1146.9	1167.2	1163.5	0.725	4.631	71.728	19.283	3.205	0.122	0.272	0.017	0.018	0.000	0.000	0.000	0.000	0.000	1378.98	
6	0.7150	1150.8	1171.1	1167.4	0.744	4.552	71.302	19.816	3.163	0.120	0.268	0.017	0.018	0.000	0.000	0.000	0.000	0.000	1381.71	
7	0.7159	1151.1	1171.5	1167.7	0.735	4.635	71.175	19.789	3.236	0.122	0.273	0.017	0.018	0.000	0.000	0.000	0.000	0.000	1381.16	
8	0.7255	1161.6	1182.2	1178.2	0.790	4.808	69.811	20.448	3.641	0.141	0.318	0.020	0.022	0.000	0.000	0.000	0.000	0.000	1384.51	
9	0.7289	1164.2	1184.8	1180.8	0.791	4.968	69.332	20.565	3.809	0.150	0.340	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1384.35	
10	0.7309	1167.1	1187.8	1183.8	0.794	4.977	69.014	20.780	3.896	0.150	0.343	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1385.88	
11	0.7298	1166.2	1186.9	1182.9	0.768	4.960	69.162	20.723	3.865	0.146	0.332	0.021	0.023	0.000	0.000	0.000	0.000	0.000	1385.98	
12	0.7327	1167.8	1188.5	1184.5	0.738	5.186	68.839	20.534	4.151	0.154	0.352	0.022	0.024	0.000	0.000	0.000	0.000	0.000	1385.02	
13	0.7305	1164.0	1184.6	1180.7	0.687	5.287	69.171	20.187	4.125	0.151	0.346	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1382.63	
14	0.7308	1165.2	1185.9	1181.9	0.748	5.144	69.101	20.435	4.041	0.149	0.338	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1383.88	
15	0.7256	1158.6	1179.1	1175.2	0.769	5.031	69.792	20.216	3.686	0.144	0.322	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1380.88	
16	0.7268	1161.5	1182.1	1178.2	0.781	4.949	69.545	20.560	3.656	0.143	0.322	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1383.21	
17	0.7319	1166.0	1186.6	1182.7	0.780	5.158	68.923	20.572	3.998	0.161	0.361	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1383.63	
18	0.7325	1166.7	1187.4	1183.4	0.790	5.157	68.785	20.729	3.972	0.159	0.360	0.023	0.024	0.000	0.000	0.000	0.000	0.000	1383.91	
19	0.7279	1163.0	1183.6	1179.6	0.784	4.962	69.407	20.578	3.768	0.142	0.318	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1383.88	
20	0.7225	1156.6	1177.1	1173.3	0.692	4.979	70.487	19.470	3.897	0.138	0.298	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1381.45	
21	0.7171	1152.5	1172.9	1169.2	0.668	4.757	71.177	19.409	3.561	0.125	0.269	0.017	0.018	0.000	0.000	0.000	0.000	0.000	1381.76	
22	0.7225	1157.5	1178.0	1174.2	0.708	4.903	70.506	19.518	3.890	0.139	0.297	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1382.48	
23	0.7228	1158.9	1179.4	1175.6	0.716	4.833	70.419	19.712	3.849	0.138	0.294	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1383.86	
24	0.7193	1154.6	1175.1	1171.3	0.696	4.789	70.913	19.484	3.664	0.131	0.284	0.018	0.020	0.000	0.000	0.000	0.000	0.000	1382.20	
25	0.7131	1149.0	1169.3	1165.6	0.654	4.623	71.847	19.020	3.438	0.123	0.261	0.017	0.018	0.000	0.000	0.000	0.000	0.000	1381.32	
26	0.7105	1145.5	1165.8	1162.1	0.659	4.579	72.316	18.670	3.355	0.123	0.260	0.017	0.019	0.000	0.000	0.000	0.000	0.000	1379.71	
27	0.6989	1132.6	1152.7	1149.1	0.604	4.363	74.093	17.662	2.918	0.107	0.223	0.015	0.015	0.000	0.000	0.000	0.000	0.000	1375.44	
28	0.7081	1143.8	1164.1	1160.2	0.636	4.490	73.032	17.947	3.402	0.137	0.305	0.024	0.028	0.000	0.000	0.000	0.000	0.000	1379.89	
29	0.7040	1138.5	1158.7	1154.8	0.740	4.271	73.763	17.505	3.283	0.126	0.269	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1377.48	
30	0.6989	1133.6	1153.7	1149.9	0.722	4.117	74.554	17.109	3.091	0.116	0.249	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1376.60	
31	0.6955	1130.1	1150.1	1146.2	0.731	3.996	75.102	16.839	2.941	0.128	0.230	0.016	0.017	0.000	0.000	0.000	0.000	0.000	1375.64	
Avg	0.7210	1156.0	1176.4	1172.6	0.738	4.805	70.647	19.684	3.639	0.138	0.306	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1382.14	

Zone 271

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7314	1165.7	1186.3	1182.6	0.831	5.051	68.894	20.851	3.828	0.153	0.345	0.023	0.025	0.000					1383.77	
2	0.7352	1169.7	1190.4	1186.6	0.853	5.127	68.406	21.005	4.028	0.161	0.368	0.025	0.027	0.000					1384.93	
3	0.7342	1169.9	1190.6	1186.8	0.850	5.031	68.541	21.025	3.992	0.156	0.356	0.024	0.026	0.000					1386.04	
4	0.7265	1162.8	1183.4	1179.8	0.782	4.843	69.627	20.567	3.675	0.142	0.319	0.021	0.023	0.000					1384.99	
5	0.7142	1148.3	1168.7	1165.1	0.709	4.677	71.518	19.420	3.248	0.123	0.270	0.018	0.018	0.000					1379.54	
6	0.7163	1150.7	1171.1	1167.5	0.764	4.649	71.169	19.728	3.252	0.124	0.277	0.018	0.019	0.000					1380.32	
7	0.7143	1149.7	1170.1	1166.5	0.722	4.587	71.408	19.695	3.176	0.118	0.260	0.017	0.017	0.000					1381.08	
8	0.7212	1156.0	1176.5	1172.9	0.778	4.759	70.416	20.140	3.441	0.131	0.294	0.019	0.021	0.000					1382.05	
9	0.7280	1163.6	1184.3	1180.5	0.799	4.910	69.411	20.620	3.747	0.145	0.324	0.021	0.022	0.000					1384.52	
10	0.7309	1166.0	1186.7	1182.9	0.800	5.027	69.015	20.734	3.881	0.151	0.343	0.023	0.025	0.000					1384.68	
11	0.7303	1166.7	1187.3	1183.5	0.786	4.960	69.067	20.795	3.868	0.147	0.331	0.022	0.023	0.000					1385.92	
12	0.7322	1167.7	1188.4	1184.5	0.762	5.104	68.851	20.701	4.046	0.151	0.340	0.022	0.023	0.000					1385.44	
13	0.7316	1165.5	1186.2	1182.4	0.709	5.265	68.991	20.351	4.144	0.152	0.343	0.022	0.023	0.000					1383.39	
14	0.7337	1166.3	1187.0	1183.2	0.711	5.411	68.704	20.345	4.269	0.157	0.355	0.023	0.024	0.000					1382.34	
15	0.7223	1155.6	1176.1	1172.4	0.762	4.916	70.323	19.921	3.600	0.136	0.302	0.020	0.021	0.000					1380.48	
16	0.7296	1163.4	1184.0	1180.3	0.794	5.078	69.106	20.726	3.776	0.147	0.328	0.021	0.023	0.000					1382.76	
17	0.7283	1162.5	1183.1	1179.3	0.785	5.023	69.387	20.501	3.782	0.149	0.330	0.021	0.022	0.000					1382.93	
18	0.7356	1169.0	1189.7	1186.0	0.796	5.291	68.389	20.769	4.162	0.168	0.376	0.024	0.025	0.000					1383.80	
19	0.7273	1161.5	1182.1	1178.4	0.792	4.982	69.477	20.552	3.688	0.144	0.321	0.021	0.022	0.000					1382.66	
20	0.7266	1160.2	1180.8	1177.2	0.745	5.062	69.814	19.914	3.968	0.144	0.312	0.020	0.021	0.000					1381.86	
21	0.7200	1154.3	1174.8	1171.2	0.665	4.927	70.836	19.315	3.808	0.131	0.280	0.018	0.019	0.000					1381.08	
22	0.7191	1153.7	1174.2	1170.7	0.703	4.820	70.902	19.491	3.640	0.130	0.278	0.018	0.019	0.000					1381.26	
23	0.7228	1158.1	1178.6	1175.1	0.718	4.877	70.424	19.650	3.866	0.137	0.290	0.019	0.020	0.000					1382.94	
24	0.7225	1157.7	1178.2	1174.8	0.718	4.870	70.452	19.672	3.819	0.137	0.292	0.019	0.020	0.000					1382.75	
25	0.7156	1150.6	1170.9	1167.4	0.675	4.723	71.476	19.169	3.533	0.123	0.266	0.017	0.018	0.000					1380.83	
26	0.7110	1145.6	1165.9	1162.4	0.662	4.617	72.264	18.643	3.393	0.125	0.260	0.017	0.019	0.000					1379.26	
27	0.7026	1136.3	1156.4	1152.7	0.616	4.471	73.469	18.067	3.015	0.108	0.224	0.014	0.015	0.000					1376.07	
28	0.7046	1138.9	1159.0	1155.5	0.630	4.473	73.454	17.763	3.244	0.127	0.270	0.019	0.020	0.000					1377.34	
29	0.7069	1141.6	1161.8	1158.2	0.690	4.431	73.232	17.836	3.349	0.130	0.280	0.024	0.027	0.000					1378.31	
30	0.6986	1132.1	1152.1	1148.6	0.752	4.135	74.662	16.958	3.082	0.119	0.251	0.020	0.022	0.000					1374.98	
31	0.6978	1131.7	1151.7	1148.2	0.719	4.141	74.717	16.969	3.061	0.113	0.240	0.019	0.020	0.000					1375.21	
Avg	0.7216	1156.0	1176.6	1173.0	0.744	4.846	70.529	19.739	3.657	0.138	0.304	0.020	0.022	0.000					1381.73	

Zone 272

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.7314	1165.4	1186.1	1182.7	0.838	5.054	68.899	20.841	3.822	0.153	0.346	0.023	0.024	0.000	0.000	0.000	0.000	0.000	1383.48	
2	0.7351	1169.4	1190.1	1186.7	0.854	5.134	68.415	20.997	4.022	0.160	0.367	0.025	0.027	0.000	0.000	0.000	0.000	0.000	1384.70	
3	0.7344	1169.9	1190.6	1187.2	0.852	5.042	68.504	21.048	3.993	0.156	0.357	0.024	0.025	0.000	0.000	0.000	0.000	0.000	1385.94	
4	0.7264	1162.6	1183.2	1179.9	0.783	4.848	69.642	20.552	3.670	0.142	0.318	0.021	0.023	0.000	0.000	0.000	0.000	0.000	1384.77	
5	0.7142	1148.2	1168.6	1165.4	0.710	4.683	71.511	19.423	3.244	0.122	0.270	0.018	0.018	0.000	0.000	0.000	0.000	0.000	1379.42	
6	0.7162	1150.4	1170.8	1167.6	0.763	4.658	71.178	19.712	3.251	0.124	0.277	0.018	0.019	0.000	0.000	0.000	0.000	0.000	1380.10	
7	0.7142	1149.5	1169.8	1166.6	0.722	4.591	71.420	19.686	3.170	0.118	0.259	0.017	0.017	0.000	0.000	0.000	0.000	0.000	1380.88	
8	0.7211	1155.8	1176.3	1173.0	0.778	4.764	70.431	20.124	3.436	0.131	0.295	0.019	0.021	0.000	0.000	0.000	0.000	0.000	1381.87	
9	0.7280	1163.4	1184.0	1180.6	0.800	4.918	69.419	20.606	3.745	0.145	0.324	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1384.29	
10	0.7309	1166.1	1186.7	1183.3	0.801	5.029	69.003	20.743	3.882	0.151	0.344	0.023	0.024	0.000	0.000	0.000	0.000	0.000	1384.67	
11	0.7304	1166.5	1187.1	1183.8	0.788	4.971	69.065	20.785	3.868	0.147	0.331	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1385.67	
12	0.7320	1167.5	1188.1	1184.8	0.762	5.108	68.868	20.684	4.042	0.151	0.339	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1385.27	
13	0.7315	1165.2	1185.9	1182.6	0.710	5.274	69.000	20.336	4.141	0.152	0.342	0.022	0.023	0.000	0.000	0.000	0.000	0.000	1383.12	
14	0.7336	1166.1	1186.7	1183.4	0.711	5.417	68.714	20.335	4.265	0.156	0.355	0.023	0.024	0.000	0.000	0.000	0.000	0.000	1382.13	
15	0.7226	1156.0	1176.5	1173.2	0.764	4.915	70.279	19.952	3.611	0.136	0.302	0.020	0.020	0.000	0.000	0.000	0.000	0.000	1380.67	
16	0.7295	1163.1	1183.7	1180.4	0.795	5.084	69.117	20.713	3.772	0.147	0.327	0.021	0.023	0.000	0.000	0.000	0.000	0.000	1382.53	
17	0.7283	1162.3	1182.9	1179.6	0.786	5.035	69.384	20.487	3.786	0.149	0.330	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1382.72	
18	0.7354	1168.7	1189.4	1186.0	0.797	5.297	68.409	20.749	4.156	0.167	0.376	0.024	0.025	0.000	0.000	0.000	0.000	0.000	1383.54	
19	0.7274	1161.4	1182.0	1178.6	0.794	4.990	69.467	20.553	3.688	0.144	0.322	0.021	0.022	0.000	0.000	0.000	0.000	0.000	1382.52	
20	0.7271	1160.6	1181.1	1177.9	0.748	5.086	69.739	19.933	3.996	0.145	0.314	0.020	0.021	0.000	0.000	0.000	0.000	0.000	1381.79	
21	0.7201	1154.4	1174.8	1171.6	0.666	4.932	70.824	19.317	3.814	0.131	0.280	0.018	0.019	0.000	0.000	0.000	0.000	0.000	1381.03	
22	0.7192	1153.8	1174.2	1171.0	0.703	4.822	70.891	19.496	3.643	0.130	0.278	0.018	0.019	0.000	0.000	0.000	0.000	0.000	1381.27	
23	0.7228	1158.1	1178.6	1175.3	0.718	4.883	70.415	19.651	3.867	0.137	0.290	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1382.84	
24	0.7226	1157.7	1178.2	1175.0	0.719	4.877	70.441	19.674	3.821	0.137	0.292	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1382.66	
25	0.7154	1150.1	1170.5	1167.3	0.675	4.729	71.507	19.140	3.525	0.123	0.265	0.017	0.018	0.000	0.000	0.000	0.000	0.000	1380.51	
26	0.7109	1145.5	1165.8	1162.5	0.661	4.611	72.294	18.623	3.389	0.124	0.260	0.018	0.019	0.000	0.000	0.000	0.000	0.000	1379.25	
27	0.7042	1138.0	1158.2	1154.8	0.627	4.493	73.241	18.190	3.077	0.111	0.230	0.015	0.015	0.000	0.000	0.000	0.000	0.000	1376.66	
28	0.7050	1139.4	1159.5	1156.2	0.632	4.480	73.397	17.791	3.259	0.128	0.274	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1377.51	
29	0.7070	1141.7	1161.9	1158.5	0.690	4.435	73.213	17.855	3.347	0.130	0.281	0.023	0.027	0.000	0.000	0.000	0.000	0.000	1378.32	
30	0.6986	1132.0	1152.1	1148.8	0.752	4.140	74.653	16.960	3.083	0.119	0.251	0.020	0.022	0.000	0.000	0.000	0.000	0.000	1374.89	
31	0.6983	1132.2	1152.3	1149.0	0.721	4.144	74.656	17.004	3.079	0.114	0.242	0.019	0.020	0.000	0.000	0.000	0.000	0.000	1375.47	
Avg	0.7217	1156.0	1176.6	1173.3	0.746	4.853	70.516	19.741	3.660	0.138	0.304	0.020	0.022	0.000	0.000	0.000	0.000	0.000	1381.63	

Zone 273

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6701	1104.6	1124.1	1121.0	0.374	3.722	77.961	16.298	1.513	0.045	0.079	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1369.98
2	0.6721	1107.8	1127.4	1124.3	0.384	3.703	77.594	16.645	1.538	0.046	0.081	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1371.87
3	0.6700	1104.8	1124.4	1121.3	0.367	3.701	77.941	16.398	1.462	0.044	0.078	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1370.47
4	0.6703	1104.3	1123.8	1120.8	0.375	3.751	77.963	16.237	1.541	0.045	0.079	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1369.46
5	0.6626	1092.1	1111.5	1108.5	0.378	3.766	79.424	14.862	1.438	0.044	0.078	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.21
6	0.6600	1090.2	1109.5	1106.5	0.330	3.712	79.783	14.719	1.336	0.039	0.070	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.51
7	0.6562	1083.3	1102.5	1099.5	0.316	3.799	80.398	14.162	1.214	0.037	0.066	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1357.73
8	0.6618	1093.1	1112.5	1109.5	0.323	3.712	79.375	15.175	1.299	0.038	0.069	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1364.31
9	0.6573	1085.4	1104.7	1101.7	0.273	3.835	80.007	14.666	1.124	0.032	0.056	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1359.35
10	0.6658	1102.2	1121.7	1118.7	0.228	3.688	78.332	16.424	1.241	0.030	0.051	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1371.43
11	0.6723	1110.1	1129.8	1126.7	0.305	3.690	77.266	17.267	1.361	0.038	0.066	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1374.70
12	0.6708	1106.9	1126.5	1123.4	0.317	3.730	77.609	16.845	1.383	0.039	0.069	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1372.18
13	0.6686	1103.7	1123.3	1120.2	0.308	3.734	77.992	16.510	1.345	0.038	0.066	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1370.48
14	0.6697	1105.1	1124.7	1121.6	0.324	3.726	77.868	16.555	1.409	0.040	0.070	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1371.08
15	0.6716	1106.5	1126.1	1123.0	0.371	3.746	77.689	16.520	1.540	0.046	0.080	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1370.87
16	0.6698	1103.5	1123.0	1120.0	0.380	3.745	78.038	16.193	1.508	0.046	0.081	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1369.00
17	0.6618	1092.2	1111.5	1108.5	0.319	3.783	79.365	15.097	1.322	0.038	0.067	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1363.04
18	0.6614	1091.7	1111.0	1108.0	0.307	3.792	79.433	15.032	1.327	0.037	0.064	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.85
19	0.6625	1093.1	1112.5	1109.5	0.331	3.765	79.306	15.109	1.371	0.040	0.069	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1363.59
20	0.6573	1084.1	1103.2	1100.3	0.329	3.835	80.290	14.116	1.315	0.039	0.067	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1357.58
21	0.6651	1097.1	1116.6	1113.6	0.335	3.761	78.904	15.386	1.494	0.041	0.071	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1365.90
22	0.6626	1092.4	1111.8	1108.8	0.378	3.743	79.516	14.716	1.512	0.045	0.078	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1362.61
23	0.6646	1095.6	1115.0	1112.0	0.382	3.740	79.100	15.130	1.515	0.045	0.079	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1364.42
24	0.6619	1092.8	1112.2	1109.2	0.329	3.731	79.506	14.872	1.439	0.041	0.071	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1363.81
25	0.6603	1090.6	1109.9	1106.9	0.324	3.724	79.758	14.703	1.374	0.039	0.068	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.65
26	0.6595	1089.0	1108.3	1105.3	0.356	3.701	79.954	14.506	1.357	0.042	0.073	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1361.46
27	0.6595	1088.4	1107.6	1104.6	0.368	3.719	80.001	14.397	1.388	0.043	0.075	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1360.70
28	0.6588	1086.6	1105.9	1102.9	0.395	3.714	80.253	14.061	1.438	0.046	0.082	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1359.27
29	0.6484	1074.8	1093.8	1090.8	0.587	3.169	82.498	12.336	1.265	0.049	0.081	0.009	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1355.08
30	0.6489	1075.6	1094.6	1091.5	0.586	3.171	82.400	12.434	1.262	0.049	0.081	0.009	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1355.50
31	0.6479	1073.3	1092.3	1088.7	0.615	3.173	82.675	12.159	1.225	0.049	0.084	0.012	0.008	0.000	0.000	0.000	0.000	0.000	0.000	1353.38
Avg	0.6629	1094.0	1113.6	1110.5	0.364	3.686	79.297	15.146	1.382	0.042	0.073	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1364.50

Zone 28

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6699	1105.0	1124.6	1121.8	0.363	3.690	78.005	16.277	1.532	0.044	0.080	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1370.85
2	0.6675	1101.7	1121.2	1118.4	0.343	3.699	78.373	16.007	1.453	0.041	0.076	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1369.16
3	0.6693	1104.1	1123.6	1120.8	0.346	3.715	78.096	16.189	1.527	0.042	0.077	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1370.28
4	0.6649	1096.3	1115.7	1112.9	0.371	3.733	79.007	15.255	1.502	0.044	0.079	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1365.18
5	0.6580	1086.9	1106.1	1103.4	0.324	3.734	80.190	14.279	1.354	0.039	0.071	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1360.48
6	0.6562	1084.6	1103.8	1101.1	0.301	3.741	80.410	14.187	1.252	0.036	0.066	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1359.46
7	0.6592	1089.7	1109.0	1106.2	0.302	3.711	79.842	14.753	1.281	0.036	0.067	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.73
8	0.6578	1088.0	1107.2	1104.4	0.245	3.774	79.877	14.865	1.151	0.030	0.054	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1362.00
9	0.6668	1103.3	1122.9	1120.0	0.250	3.680	78.212	16.458	1.307	0.032	0.057	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1371.85
10	0.6710	1109.2	1128.9	1126.0	0.278	3.665	77.488	17.095	1.369	0.036	0.064	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1374.94
11	0.6682	1103.4	1122.9	1120.1	0.299	3.732	78.070	16.414	1.375	0.038	0.068	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1370.52
12	0.6664	1101.0	1120.5	1117.6	0.292	3.720	78.399	16.137	1.344	0.036	0.065	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1369.35
13	0.6675	1102.4	1121.9	1119.1	0.304	3.713	78.267	16.203	1.400	0.038	0.069	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1370.05
14	0.6689	1103.0	1122.6	1119.7	0.343	3.744	78.169	16.095	1.522	0.043	0.077	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1369.44
15	0.6688	1102.5	1122.1	1119.2	0.366	3.731	78.237	15.998	1.535	0.044	0.081	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1368.89
16	0.6611	1091.3	1110.6	1107.8	0.318	3.767	79.548	14.890	1.359	0.038	0.070	0.005	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1362.77
17	0.6597	1089.5	1108.8	1106.0	0.294	3.778	79.745	14.759	1.320	0.035	0.063	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1362.04
18	0.6602	1090.4	1109.7	1106.9	0.310	3.752	79.708	14.756	1.362	0.037	0.067	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	1362.54
19	0.6562	1082.5	1101.7	1098.9	0.338	3.811	80.542	13.855	1.338	0.039	0.070	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1356.84
20	0.6589	1088.4	1107.7	1104.9	0.283	3.786	79.965	14.478	1.384	0.036	0.063	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	1361.47
21	0.6629	1093.4	1112.7	1109.9	0.365	3.740	79.420	14.819	1.526	0.044	0.078	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1363.49
22	0.6635	1094.6	1114.0	1111.2	0.368	3.712	79.328	14.920	1.541	0.044	0.078	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1364.48
23	0.6601	1090.3	1109.6	1106.9	0.320	3.725	79.868	14.511	1.455	0.040	0.072	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.64
24	0.6584	1088.0	1107.3	1104.6	0.304	3.727	80.115	14.358	1.383	0.037	0.067	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1361.55
25	0.6577	1086.9	1106.2	1103.4	0.335	3.687	80.298	14.185	1.374	0.040	0.072	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1360.83
26	0.6590	1089.3	1108.5	1105.7	0.331	3.678	79.986	14.540	1.346	0.039	0.071	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1362.35
27	0.6572	1084.8	1104.0	1101.1	0.374	3.713	80.513	13.836	1.430	0.043	0.079	0.006	0.005	0.000	0.000	0.000	0.000	0.000	0.000	1358.61
28	0.6537	1081.2	1100.4	1097.5	0.449	3.486	81.287	13.277	1.364	0.045	0.079	0.007	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1357.75
29	0.6450	1070.1	1089.0	1086.2	0.634	3.061	83.232	11.682	1.246	0.048	0.081	0.009	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1352.81
30	0.6485	1075.3	1094.4	1091.5	0.574	3.165	82.443	12.413	1.265	0.047	0.079	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1355.74
31	0.6456	1070.7	1089.7	1086.9	0.605	3.125	83.057	11.826	1.246	0.047	0.079	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	1352.99
Avg	0.6609	1092.0	1111.2	1108.4	0.353	3.661	79.668	14.817	1.382	0.040	0.072	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	1363.68

Zone 31

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6571	1081.7	1100.8	1097.5	0.447	3.782	80.719	13.384	1.517	0.050	0.091	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1354.81	
2	0.6566	1081.0	1100.2	1096.8	0.428	3.797	80.792	13.332	1.505	0.048	0.087	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1354.58	
3	0.6535	1076.3	1095.3	1092.1	0.425	3.800	81.396	12.748	1.486	0.048	0.086	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1351.81	
4	0.6495	1070.6	1089.5	1086.3	0.418	3.784	82.120	12.133	1.404	0.046	0.084	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1348.75	
5	0.6441	1063.4	1082.3	1079.0	0.391	3.751	83.081	11.348	1.299	0.043	0.078	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1345.39	
6	0.6454	1063.8	1082.6	1079.4	0.400	3.845	82.815	11.495	1.310	0.044	0.081	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1344.40	
7	0.6465	1064.5	1083.4	1080.1	0.378	3.928	82.545	11.722	1.297	0.042	0.076	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1344.28	
8	0.6585	1084.7	1103.9	1100.5	0.366	3.850	80.268	13.902	1.484	0.043	0.077	0.005	0.004	0.000	0.000	0.000	0.000	0.000	1357.19	
9	0.6629	1088.4	1107.7	1104.3	0.459	3.894	79.688	14.146	1.653	0.053	0.096	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1357.32	
10	0.6613	1085.7	1104.9	1101.6	0.446	3.930	79.939	13.924	1.607	0.051	0.093	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1355.57	
11	0.6589	1083.0	1102.2	1098.8	0.429	3.896	80.335	13.652	1.540	0.049	0.088	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1354.64	
12	0.6604	1085.8	1105.0	1101.6	0.422	3.873	80.051	13.946	1.560	0.049	0.088	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1356.65	
13	0.6639	1090.2	1109.5	1106.2	0.451	3.888	79.509	14.313	1.679	0.053	0.096	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1358.59	
14	0.6663	1094.6	1114.0	1110.6	0.469	3.820	79.083	14.752	1.712	0.054	0.099	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1361.59	
15	0.6578	1081.4	1100.5	1097.1	0.459	3.845	80.645	13.328	1.565	0.052	0.095	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1353.76	
16	0.6520	1073.9	1092.9	1089.5	0.384	3.866	81.553	12.658	1.406	0.044	0.079	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1350.39	
17	0.6526	1075.1	1094.1	1090.8	0.376	3.866	81.428	12.776	1.424	0.043	0.077	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1351.22	
18	0.6526	1074.4	1093.4	1090.1	0.406	3.864	81.492	12.653	1.446	0.046	0.083	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1350.34	
19	0.6455	1064.1	1083.0	1079.7	0.380	3.861	82.785	11.519	1.327	0.043	0.076	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1344.76	
20	0.6597	1086.7	1105.9	1102.6	0.391	3.809	80.173	13.897	1.593	0.046	0.082	0.005	0.005	0.000	0.000	0.000	0.000	0.000	1358.35	
21	0.6613	1088.6	1107.9	1104.8	0.430	3.778	79.971	14.031	1.639	0.050	0.089	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1359.15	
22	0.6588	1084.3	1103.5	1100.3	0.434	3.797	80.444	13.580	1.596	0.050	0.089	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1356.37	
23	0.6558	1081.3	1100.4	1097.2	0.379	3.787	80.892	13.287	1.520	0.045	0.080	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1355.65	
24	0.6542	1078.9	1098.0	1094.8	0.380	3.775	81.167	13.080	1.464	0.044	0.079	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1354.39	
25	0.6527	1075.6	1094.7	1091.5	0.419	3.772	81.536	12.674	1.454	0.047	0.085	0.006	0.006	0.000	0.000	0.000	0.000	0.000	1351.82	
26	0.6547	1078.5	1097.6	1094.3	0.425	3.776	81.162	13.008	1.483	0.048	0.087	0.006	0.006	0.000	0.000	0.000	0.000	0.000	1353.37	
27	0.6545	1078.3	1097.4	1094.1	0.426	3.769	81.203	12.972	1.482	0.048	0.087	0.006	0.006	0.000	0.000	0.000	0.000	0.000	1353.30	
28	0.6354	1056.1	1074.8	1071.3	0.747	2.837	85.331	9.748	1.180	0.054	0.085	0.011	0.008	0.000	0.000	0.000	0.000	0.000	1345.06	
29	0.6356	1056.6	1075.3	1071.7	0.791	2.757	85.378	9.733	1.179	0.055	0.088	0.011	0.009	0.000	0.000	0.000	0.000	0.000	1345.42	
30	0.6428	1065.3	1084.1	1080.7	0.667	3.094	83.825	10.958	1.297	0.053	0.089	0.010	0.008	0.000	0.000	0.000	0.000	0.000	1348.93	
31	0.6377	1058.9	1077.7	1074.2	0.736	2.902	84.887	10.096	1.218	0.054	0.088	0.011	0.009	0.000	0.000	0.000	0.000	0.000	1346.14	
Avg	0.6532	1077.0	1095.6	1092.2	0.457	3.709	81.491	12.735	1.462	0.048	0.086	0.006	0.005	0.000	0.000	0.000	0.000	0.000	1352.39	

Zone 32

Source Daily Summary

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6894	1153.4	1173.8	1169.2	0.000	3.138	72.761	23.313	0.769	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.43	
2	0.6898	1153.6	1174.0	1169.5	0.000	3.167	72.671	23.361	0.782	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.27	
3	0.6891	1152.6	1173.0	1168.7	0.000	3.164	72.787	23.275	0.756	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.73	
4	0.6894	1153.1	1173.5	1169.5	0.000	3.153	72.712	23.392	0.723	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.13	
5	0.6897	1153.0	1173.4	1169.1	0.000	3.189	72.667	23.381	0.744	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.67	
6	0.6897	1153.2	1173.7	1169.1	0.000	3.174	72.659	23.409	0.739	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.00	
7	0.6895	1152.5	1172.9	1168.4	0.000	3.207	72.709	23.301	0.764	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.20	
8	0.6890	1151.8	1172.2	1167.7	0.000	3.195	72.836	23.180	0.769	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1408.93	
9	0.6897	1153.4	1173.8	1169.3	0.000	3.172	72.695	23.326	0.788	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.09	
10	0.6893	1152.7	1173.1	1168.8	0.000	3.169	72.788	23.243	0.781	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.72	
11	0.6907	1154.8	1175.2	1170.9	0.000	3.177	72.525	23.467	0.812	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.80	
12	0.6902	1154.9	1175.3	1170.9	0.000	3.119	72.621	23.451	0.790	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.50	
13	0.6904	1154.3	1174.7	1170.2	0.000	3.181	72.559	23.451	0.790	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.49	
14	0.6905	1153.8	1174.2	1169.7	0.000	3.215	72.551	23.418	0.798	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.86	
15	0.6908	1154.2	1174.6	1170.1	0.000	3.218	72.490	23.472	0.801	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.05	
16	0.6908	1154.3	1174.7	1170.3	0.000	3.215	72.481	23.494	0.792	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.13	
17	0.6908	1154.9	1175.4	1170.9	0.000	3.173	72.497	23.514	0.797	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.95	
18	0.6903	1154.9	1175.3	1171.0	0.000	3.132	72.595	23.460	0.793	0.008	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.38	
19	0.6901	1153.5	1174.0	1169.5	0.000	3.196	72.605	23.403	0.777	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.93	
20	0.6903	1153.8	1174.2	1170.0	0.000	3.205	72.521	23.511	0.746	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1409.97	
21	0.6904	1154.5	1175.0	1170.3	0.000	3.168	72.526	23.525	0.763	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.79	
22	0.6904	1154.5	1174.9	1170.4	0.000	3.167	72.527	23.537	0.751	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.75	
23	0.6898	1153.4	1173.8	1169.4	0.000	3.178	72.635	23.431	0.739	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.02	
24	0.6897	1154.0	1174.4	1170.1	0.000	3.135	72.613	23.531	0.705	0.007	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.83	
25	0.6894	1154.1	1174.5	1169.9	0.000	3.099	72.699	23.477	0.707	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.25	
26	0.6903	1155.4	1175.8	1170.9	0.000	3.102	72.554	23.579	0.747	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.97	
27	0.6898	1154.2	1174.6	1170.1	0.000	3.130	72.627	23.496	0.728	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.99	
28	0.6905	1154.8	1175.2	1170.4	0.000	3.156	72.506	23.578	0.741	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.03	
29	0.6911	1155.2	1175.7	1171.1	0.000	3.183	72.382	23.674	0.742	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.00	
30	0.6910	1155.7	1176.2	1171.1	0.000	3.145	72.442	23.615	0.779	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.69	
31	0.6912	1156.0	1176.4	1171.8	0.000	3.150	72.439	23.570	0.819	0.008	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1411.77	
Avg	0.6901	1154.0	1174.4	1169.9	0.000	3.167	72.603	23.446	0.766	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1410.49	

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

December 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 Dry	Heating Value As Del	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6962	1151.7	1172.1	1169.0	0.950	2.432	72.883	22.489	1.212	0.012	0.020	0.001	0.000	0.000	0.000	0.000	0.000	0.000	1401.49	
2	0.6988	1155.8	1176.3	1173.2	0.944	2.438	72.525	22.651	1.409	0.012	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1403.85	
3	0.6975	1153.5	1173.9	1170.9	0.946	2.452	72.592	22.777	1.204	0.011	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1402.39	
4	0.6982	1153.2	1173.6	1170.6	0.949	2.527	72.980	21.822	1.643	0.026	0.048	0.002	0.003	0.000	0.000	0.000	0.000	0.000	1401.31	
5	0.6933	1144.1	1164.4	1161.3	0.952	2.611	74.196	20.292	1.878	0.027	0.041	0.002	0.001	0.000	0.000	0.000	0.000	0.000	1395.18	
6	0.6933	1143.0	1163.2	1160.2	0.959	2.668	74.090	20.414	1.824	0.017	0.027	0.001	0.001	0.000	0.000	0.000	0.000	0.000	1393.84	
7	0.6969	1151.2	1171.6	1168.5	0.950	2.526	73.791	20.443	2.228	0.022	0.037	0.002	0.001	0.000	0.000	0.000	0.000	0.000	1400.09	
8	0.6855	1131.5	1151.5	1148.5	0.981	2.615	74.789	20.617	0.986	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1387.56	
9	0.6930	1143.3	1163.6	1160.5	0.970	2.619	73.022	22.623	0.754	0.005	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1394.47	
10	0.6973	1150.1	1170.5	1167.4	0.959	2.620	72.440	22.913	1.049	0.007	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1398.49	
11	0.6924	1143.1	1163.3	1160.3	0.959	2.592	73.209	22.397	0.834	0.003	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1394.79	
12	0.6890	1138.3	1158.4	1155.4	0.966	2.556	73.861	21.835	0.765	0.006	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1392.32	
13	0.6943	1146.7	1167.0	1164.0	0.949	2.562	72.777	22.924	0.770	0.006	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1397.36	
14	0.6957	1148.5	1168.8	1165.7	0.954	2.580	72.734	22.750	0.918	0.017	0.038	0.004	0.004	0.000	0.000	0.000	0.000	0.000	1398.03	
15	0.6942	1146.2	1166.5	1163.3	0.962	2.562	73.450	21.665	1.292	0.020	0.042	0.004	0.004	0.000	0.000	0.000	0.000	0.000	1396.75	
16	0.7010	1158.0	1178.5	1175.4	0.942	2.514	72.125	22.963	1.385	0.022	0.043	0.003	0.003	0.000	0.000	0.000	0.000	0.000	1404.31	
17	0.7017	1159.2	1179.8	1176.5	0.944	2.499	72.261	22.647	1.528	0.032	0.072	0.008	0.009	0.000	0.000	0.000	0.000	0.000	1405.03	
18	0.7033	1161.9	1182.5	1179.3	0.942	2.483	72.081	22.673	1.720	0.029	0.061	0.005	0.006	0.000	0.000	0.000	0.000	0.000	1406.75	
19	0.7041	1163.3	1183.9	1180.8	0.940	2.484	71.783	23.057	1.664	0.021	0.043	0.004	0.004	0.000	0.000	0.000	0.000	0.000	1407.60	
20	0.6926	1142.9	1163.1	1160.1	0.964	2.617	73.528	21.716	1.133	0.014	0.026	0.001	0.001	0.000	0.000	0.000	0.000	0.000	1394.28	
21	0.6853	1130.0	1150.0	1147.0	0.972	2.699	74.625	20.899	0.801	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.97	
22	0.6934	1143.5	1163.7	1160.7	0.958	2.654	73.576	21.434	1.341	0.012	0.022	0.001	0.002	0.000	0.000	0.000	0.000	0.000	1394.31	
23	0.6951	1145.0	1165.3	1162.2	0.963	2.712	73.518	21.155	1.593	0.018	0.034	0.003	0.003	0.000	0.000	0.000	0.000	0.000	1394.46	
24	0.6898	1136.1	1156.2	1153.1	0.972	2.747	74.140	20.964	1.116	0.017	0.035	0.004	0.005	0.000	0.000	0.000	0.000	0.000	1388.85	
25	0.6853	1127.3	1147.2	1144.3	0.978	2.855	74.834	20.289	1.038	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1382.61	
26	0.6888	1134.1	1154.2	1151.3	0.967	2.783	74.621	20.149	1.410	0.021	0.042	0.003	0.003	0.000	0.000	0.000	0.000	0.000	1387.45	
27	0.6880	1131.8	1151.8	1148.9	0.985	2.820	74.142	21.186	0.850	0.007	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1385.48	
28	0.6914	1140.9	1161.1	1158.2	0.967	2.618	73.346	22.290	0.775	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1393.18	
29	0.6921	1142.7	1162.9	1160.0	0.964	2.580	73.268	22.348	0.836	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1394.62	
30	0.6931	1144.9	1165.2	1162.3	0.960	2.546	73.184	22.343	0.964	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1396.33	
31	0.6878	1135.6	1155.7	1152.8	0.972	2.589	74.149	21.464	0.825	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1390.36	
Avg	0.6938	1145.0	1165.4	1162.3	0.959	2.599	73.372	21.813	1.218	0.013	0.024	0.002	0.002	0.000	0.000	0.000	0.000	0.000	1395.79	

Zone 43



Alliance Pipeline

DAILY ANALYSIS --- USA
 ND07MD1 --- Hankinson Sales
 December 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	1,158.770	0.6665	83.8172	9.4652	3.9139	0.3861	0.6580	0.0650	0.0546	0.0273	1.1433	0.4568	0.0126
2	1,160.664	0.6677	83.7186	9.4334	4.0279	0.3910	0.6671	0.0659	0.0553	0.0281	1.1572	0.4438	0.0117
3	1,158.194	0.6660	83.9271	9.3541	3.9318	0.3838	0.6490	0.0653	0.0558	0.0304	1.1513	0.4399	0.0116
4	1,160.131	0.6676	83.7098	9.4334	4.0068	0.3906	0.6637	0.0664	0.0563	0.0314	1.1982	0.4322	0.0112
5	1,162.164	0.6690	83.5371	9.5118	4.0861	0.3923	0.6735	0.0668	0.0569	0.0305	1.1828	0.4509	0.0114
6	1,169.484	0.6770	82.4444	9.7990	4.5152	0.4131	0.7346	0.0643	0.0546	0.0282	1.4757	0.4602	0.0108
7	1,161.792	0.6691	83.5570	9.4183	4.1005	0.3993	0.6914	0.0666	0.0566	0.0289	1.2274	0.4431	0.0109
8	1,159.154	0.6666	83.9489	9.2888	3.9052	0.4018	0.6989	0.0697	0.0595	0.0306	1.1263	0.4590	0.0112
9	1,165.373	0.6710	83.3634	9.5504	4.1718	0.4089	0.7063	0.0735	0.0620	0.0305	1.1596	0.4620	0.0117
10	1,163.426	0.6697	83.5101	9.4841	4.1061	0.4055	0.6985	0.0709	0.0597	0.0301	1.1734	0.4505	0.0111
11	1,163.313	0.6694	83.5500	9.4584	4.1248	0.4023	0.6911	0.0686	0.0583	0.0293	1.1563	0.4496	0.0112
12	1,163.049	0.6693	83.5748	9.4595	4.1163	0.4004	0.6825	0.0690	0.0581	0.0297	1.1384	0.4598	0.0116
13	1,162.789	0.6695	83.5289	9.4564	4.1305	0.3967	0.6883	0.0671	0.0564	0.0293	1.1733	0.4615	0.0117
14	1,162.170	0.6689	83.5971	9.4335	4.1063	0.3939	0.6846	0.0662	0.0561	0.0287	1.1607	0.4610	0.0118
15	1,161.143	0.6683	83.6556	9.4312	4.0495	0.3933	0.6813	0.0662	0.0556	0.0290	1.1696	0.4568	0.0119
16	1,161.369	0.6681	83.6845	9.4438	4.0248	0.3928	0.6881	0.0678	0.0570	0.0291	1.1613	0.4392	0.0116
17	1,157.739	0.6660	83.8945	9.3620	3.9276	0.3804	0.6539	0.0648	0.0544	0.0277	1.1893	0.4334	0.0120
18	1,160.639	0.6682	83.6179	9.4529	4.0505	0.3880	0.6763	0.0641	0.0546	0.0275	1.2102	0.4462	0.0117
19	1,161.153	0.6684	83.6355	9.4120	4.0911	0.3894	0.6777	0.0639	0.0539	0.0272	1.1890	0.4487	0.0117
20	1,159.315	0.6666	83.8723	9.3370	4.0125	0.3805	0.6602	0.0636	0.0534	0.0270	1.1463	0.4357	0.0115
21	1,158.440	0.6662	83.9300	9.3106	3.9629	0.3801	0.6686	0.0632	0.0530	0.0278	1.1425	0.4498	0.0116
22	1,158.562	0.6663	83.9392	9.2940	3.9707	0.3801	0.6682	0.0642	0.0545	0.0285	1.1338	0.4551	0.0116
23	1,159.676	0.6668	83.8556	9.3575	3.9886	0.3876	0.6725	0.0644	0.0544	0.0283	1.1383	0.4414	0.0114
24	1,156.487	0.6645	84.0890	9.3228	3.8689	0.3689	0.6364	0.0632	0.0534	0.0281	1.1164	0.4411	0.0118
25	1,156.819	0.6645	84.1090	9.3098	3.8797	0.3724	0.6339	0.0636	0.0540	0.0283	1.0956	0.4419	0.0118
26	1,154.369	0.6621	84.3946	9.3279	3.6572	0.3706	0.6350	0.0640	0.0538	0.0282	1.0155	0.4413	0.0118
27	1,155.881	0.6634	84.2286	9.3256	3.7960	0.3708	0.6316	0.0622	0.0524	0.0271	1.0513	0.4423	0.0120
28	1,151.627	0.6611	84.4643	9.3002	3.5693	0.3665	0.6250	0.0618	0.0518	0.0264	1.0766	0.4461	0.0120
29	1,150.212	0.6601	84.5579	9.2946	3.4856	0.3647	0.6248	0.0610	0.0511	0.0262	1.0866	0.4358	0.0118
30	1,147.016	0.6580	84.7457	9.3313	3.2684	0.3616	0.6191	0.0615	0.0515	0.0263	1.0872	0.4355	0.0118
31	1,149.485	0.6591	84.6198	9.4385	3.3113	0.3683	0.6391	0.0611	0.0504	0.0249	1.0422	0.4325	0.0120
Volume	1,158.958	0.6665	83.8500	9.4048	3.9357	0.3863	0.6667	0.0653	0.0551	0.0284	1.1493	0.4468	0.0116
Weight Avg	1,158.977	0.6665	83.8484	9.4050	3.9367	0.3863	0.6668	0.0653	0.0551	0.0284	1.1496	0.4468	0.0116
Energy	1,158.977	0.6665	83.8484	9.4050	3.9367	0.3863	0.6668	0.0653	0.0551	0.0284	1.1496	0.4468	0.0116

Handwritten initials/signature

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		
12/1/2017	12/2/2017	567	661	1.165	182	213	1.172	1.167	12/1/2017
12/2/2017	12/3/2017	552	643	1.165	150	176	1.176	1.167	12/2/2017
12/3/2017	12/4/2017	604	704	1.165	158	186	1.174	1.167	12/3/2017
12/4/2017	12/5/2017	769	896	1.165	351	412	1.174	1.168	12/4/2017
12/5/2017	12/6/2017	724	843	1.165	280	327	1.164	1.165	12/5/2017
12/6/2017	12/7/2017	826	963	1.165	520	605	1.163	1.164	12/6/2017
12/7/2017	12/8/2017	723	843	1.165	342	400	1.172	1.167	12/7/2017
12/8/2017	12/9/2017	684	797	1.165	237	273	1.152	1.162	12/8/2017
12/9/2017	12/10/2017	569	663	1.165	210	244	1.164	1.165	12/9/2017
12/10/2017	12/11/2017	564	657	1.165	176	206	1.171	1.166	12/10/2017
12/11/2017	12/12/2017	667	777	1.165	241	280	1.163	1.164	12/11/2017
12/12/2017	12/13/2017	555	646	1.165	158	183	1.158	1.163	12/12/2017
12/13/2017	12/14/2017	625	728	1.165	189	220	1.167	1.165	12/13/2017
12/14/2017	12/15/2017	667	777	1.165	273	319	1.169	1.166	12/14/2017
12/15/2017	12/16/2017	424	494	1.165	295	344	1.167	1.166	12/15/2017
12/16/2017	12/17/2017	455	531	1.165	408	480	1.179	1.172	12/16/2017
12/17/2017	12/18/2017	452	527	1.165	373	440	1.180	1.172	12/17/2017
12/18/2017	12/19/2017	478	556	1.165	424	501	1.183	1.173	12/18/2017
12/19/2017	12/20/2017	512	596	1.165	471	557	1.184	1.174	12/19/2017
12/20/2017	12/21/2017	639	744	1.165	670	778	1.163	1.164	12/20/2017
12/21/2017	12/22/2017	633	737	1.165	622	716	1.150	1.158	12/21/2017
12/22/2017	12/23/2017	634	738	1.165	584	678	1.164	1.165	12/22/2017
12/23/2017	12/24/2017	658	767	1.165	590	688	1.165	1.165	12/23/2017
12/24/2017	12/25/2017	752	876	1.165	742	858	1.156	1.161	12/24/2017
12/25/2017	12/26/2017	869	1012	1.165	848	973	1.147	1.156	12/25/2017
12/26/2017	12/27/2017	889	1036	1.165	965	1114	1.154	1.159	12/26/2017
12/27/2017	12/28/2017	828	965	1.165	845	973	1.152	1.158	12/27/2017
12/28/2017	12/29/2017	807	941	1.165	905	1050	1.161	1.163	12/28/2017
12/29/2017	12/30/2017	877	1022	1.165	952	1107	1.163	1.164	12/29/2017
12/30/2017	12/31/2017	925	1078	1.165	923	1076	1.165	1.165	12/30/2017
12/31/2017	1/1/2018	940	1095	1.165	932	1077	1.156	1.161	12/31/2017
		20,868	24,313		15,016	17,454	1.1654	1.1649	

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	1076.9	0.6249	1362.4	-61.5	1.4999	0.8577	86.4471	10.273	0.6344	0.0165	0.0109	0.0001	0.0005	0	0	0.0044	0.2563	11/30/2017	12/1/2017	12/1/2017 3:08:03 PM	
11587	GLEN ULLIN	1076.7	0.6247	1362.2	-62	1.5302	0.8484	86.4791	10.2875	0.5953	0.017	0.0106	0.0005	0.0006	0	0	0.0402	0.1907	12/1/2017	12/2/2017	12/2/2017 3:08:09 PM	
11587	GLEN ULLIN	1076.1	0.6244	1361.8	-61.5	1.5491	0.838	86.5702	10.1231	0.6436	0.0211	0.0124	0.0011	0.0012	0	0.0002	0.0292	0.2115	12/2/2017	12/3/2017	12/3/2017 3:07:00 PM	
11587	GLEN ULLIN	1076.6	0.6246	1362.3	-62.3	1.5736	0.8377	86.6566	10.1364	0.6204	0.0164	0.0102	0.0002	0.0002	0	0	0.1169	0.0337	12/3/2017	12/4/2017	12/4/2017 3:06:55 PM	
11587	GLEN ULLIN	1076.3	0.6247	1361.7	-62.4	1.5845	0.8523	86.6763	10.109	0.6274	0.0142	0.0091	0	0	0	0	0.088	0.0394	12/4/2017	12/5/2017	12/5/2017 3:08:05 PM	
11587	GLEN ULLIN	1073.6	0.6227	1360.5	-63.3	1.5562	0.8512	87.2228	9.5644	0.6735	0.0199	0.0122	0.0003	0.0004	0	0	0.0709	0.0271	12/5/2017	12/6/2017	12/6/2017 3:07:07 PM	
11587	GLEN ULLIN	1070.2	0.6205	1358.6	-63.8	1.5032	0.8538	87.3511	9.2423	0.7198	0.0199	0.0125	0.0002	0.0005	0	0	0.0511	0.2463	12/6/2017	12/7/2017	12/7/2017 3:07:15 PM	
11587	GLEN ULLIN	1072.9	0.623	1359.3	-61.9	1.551	0.8642	86.9288	9.627	0.7159	0.0256	0.0143	0.0013	0.0014	0	0.0001	0.011	0.2602	12/7/2017	12/8/2017	12/8/2017 3:08:48 PM	
11587	GLEN ULLIN	1072.6	0.6224	1359.5	-62.3	1.5394	0.8609	87.0663	9.6144	0.64	0.0303	0.0155	0.0024	0.0023	0	0.0003	0.0579	0.1713	12/8/2017	12/9/2017	12/9/2017 3:07:58 PM	
11587	GLEN ULLIN	1072.4	0.6225	1359.3	-62.3	1.5866	0.8349	86.8841	9.7954	0.5811	0.0318	0.0157	0.0026	0.0025	0	0.0005	0.0271	0.2387	12/9/2017	12/10/2017	12/10/2017 3:06:52 PM	
11587	GLEN ULLIN	1076.1	0.6243	1361.9	-61.1	1.5891	0.8317	86.6987	10.0152	0.6306	0.0308	0.0164	0.0023	0.0024	0	0.0004	0.1428	0.0408	12/10/2017	12/11/2017	12/11/2017 3:07:45 PM	
11587	GLEN ULLIN	1076.7	0.6251	1361.8	-61	1.613	0.8421	86.5058	10.1482	0.6404	0.0288	0.0148	0.0019	0.002	0	0	0.1719	0.0297	12/11/2017	12/12/2017	12/12/2017 3:08:24 PM	
11587	GLEN ULLIN	1075	0.6248	1360	-61.4	1.6295	0.8401	86.3843	10.2091	0.605	0.027	0.0146	0.0018	0.0018	0	0	0.0112	0.2752	12/12/2017	12/13/2017	12/13/2017 3:09:19 PM	
11587	GLEN ULLIN	1084.8	0.6316	1365	-56.5	1.6278	0.8704	85.0602	11.4548	0.6422	0.029	0.0155	0.002	0.002	0	0	0	0.2958	12/13/2017	12/14/2017	12/14/2017 3:08:44 PM	
11587	GLEN ULLIN	1084.7	0.6322	1364.2	-55.8	1.7033	0.8674	84.9804	11.3907	0.7122	0.029	0.0155	0.002	0.002	0	0	0	0.2969	12/14/2017	12/15/2017	12/15/2017 3:10:31 PM	
11587	GLEN ULLIN	1074.6	0.6241	1360.2	-62	1.5645	0.8605	86.6286	10.049	0.6107	0.0241	0.0129	0.0015	0.0015	0	0	0	0.2477	12/15/2017	12/16/2017	12/16/2017 3:08:17 PM	
11587	GLEN ULLIN	1078.1	0.6269	1361.7	-59.7	1.6244	0.8549	86.1226	10.4588	0.652	0.0291	0.0156	0.0018	0.0019	0	0	0	0.2376	12/16/2017	12/17/2017	12/17/2017 3:09:13 PM	
11587	GLEN ULLIN	1079.7	0.6278	1362.6	-59.3	1.6179	0.8588	85.9392	10.665	0.6418	0.0277	0.0147	0.0018	0.0018	0	0.0001	0.0274	0.2024	12/17/2017	12/18/2017	12/18/2017 3:10:15 PM	
11587	GLEN ULLIN	1079.9	0.6278	1362.9	-58.5	1.6222	0.8602	86.0375	10.527	0.6896	0.0322	0.0166	0.0024	0.0023	0	0.0003	0.084	0.1258	12/18/2017	12/19/2017	12/19/2017 3:10:59 PM	
11587	GLEN ULLIN	1076.5	0.6254	1361.2	-60.3	1.6045	0.8546	86.4143	10.1441	0.6812	0.0301	0.0159	0.0019	0.0019	0	0.0001	0.0818	0.1698	12/19/2017	12/20/2017	12/20/2017 3:09:41 PM	
11587	GLEN ULLIN	1074.5	0.6242	1360	-61.3	1.5972	0.847	86.5532	10.0437	0.6277	0.0278	0.0164	0.0017	0.0021	0	0.0004	0.0094	0.2723	12/20/2017	12/21/2017	12/21/2017 3:08:52 PM	
11587	GLEN ULLIN	1068.7	0.6198	1357.5	-65.2	1.5558	0.8286	87.3506	9.3764	0.5662	0.0224	0.0131	0.0006	0.0009	0	0.0002	0	0.2856	12/21/2017	12/22/2017	12/22/2017 3:09:35 PM	
11587	GLEN ULLIN	1067.4	0.6191	1356.5	-65.8	1.5732	0.8228	87.5127	9.198	0.5743	0.0224	0.0125	0.0009	0.0011	0	0	0	0.2816	12/22/2017	12/23/2017	12/23/2017 3:09:37 PM	
11587	GLEN ULLIN	1074.5	0.624	1360.3	-61.1	1.6	0.8314	86.6628	9.8534	0.7289	0.0253	0.0141	0.0014	0.0015	0	0	0	0.2819	12/23/2017	12/24/2017	12/24/2017 3:09:39 PM	
11587	GLEN ULLIN	1072	0.6221	1359.1	-62.4	1.5644	0.8396	86.9879	9.6181	0.6543	0.027	0.0157	0.0019	0.0022	0	0.0004	0.0204	0.2678	12/24/2017	12/25/2017	12/25/2017 3:08:56 PM	
11587	GLEN ULLIN	1062.7	0.6149	1355.2	-69.8	1.4532	0.8356	88.261	8.6853	0.4626	0.0158	0.0096	0.0002	0.0004	0	0.0001	0.0233	0.2542	12/25/2017	12/26/2017	12/26/2017 3:16:13 PM	
11587	GLEN ULLIN	1061.1	0.6132	1355	-70.1	1.3917	0.8168	88.5023	8.3964	0.5033	0.0184	0.0111	0.0006	0.0008	0	0.0001	0	0.3596	12/26/2017	12/27/2017	12/27/2017 3:11:38 PM	
11587	GLEN ULLIN	1060.4	0.6131	1354.3	-70	1.4061	0.8227	88.4365	8.4462	0.46	0.0209	0.0134	0.0008	0.0014	0	0.0003	0	0.3919	12/27/2017	12/28/2017	12/28/2017 3:12:21 PM	
11587	GLEN ULLIN	1061.9	0.6143	1354.9	-70.1	1.4497	0.8199	88.3042	8.6444	0.4421	0.0179	0.0109	0.0005	0.0008	0	0.0001	0	0.3093	12/28/2017	12/29/2017	12/29/2017 3:12:26 PM	
11587	GLEN ULLIN	1060.6	0.613	1354.6	-71.2	1.3769	0.8308	88.4928	8.5213	0.4047	0.016	0.0102	0.0005	0.0007	0	0.0001	0	0.3467	12/29/2017	12/30/2017	12/30/2017 3:12:05 PM	
11587	GLEN ULLIN	1063.8	0.6153	1356.1	-66.1	1.4002	0.8268	88.1365	8.6265	0.5633	0.0266	0.0197	0.0021	0.0032	0	0.0012	0	0.3946	12/30/2017	12/31/2017	12/31/2017 3:11:35 PM	
11587	GLEN ULLIN	1066.3	0.6164	1358.2	-64.7	1.3633	0.8452	88.2114	8.7586	0.5267	0.0306	0.0234	0.0027	0.0042	0	0.0017	0.0028	0.2295	12/31/2017	1/1/2018	1/1/2018 3:09:28 PM	

12/27/2017

NORTH DAKOTA HEATING VALUE ZONES		
ZONES	MEASURING DEVICE	LOCATION
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
550	Monthly Sampler & Chromatograph	Mandan Border
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	DEC 17	NOV 17	OCT 17	SEPT 17	AUG 17	JULY 17	JUNE 17	MAY 17	APRIL 17	MAR 17	FEB 17	JAN 17	ZONE
MT/ND	211	Sidney Border - MonDak Tfr - Sidney Plt	1199	1193	1210	1201	1200	1204	1201	1191	1206	1191	1194	1195	1199	211
ND	24	Williston Border - Charbonneau Station	1153	1143	1144	1144	1142	1142	1141	1141	1148	1158	1171	1173	1189	24
ND	25	Watford City West Border	1197	1165	1169	1204	1205	1202	1206	1204	1204	1200	1199	1202	1198	25
ND	28	Bismarck Station - Glen Ullin Station	1156	1114	1111	1173	1196	1195	1194	1188	1191	1161	1118	1121	1115	28
ND	31	Mandan Border / NBPL-St Anthony	1134	1111	1110	1132	1100	1169	1179	1171	1137	1147	1118	1119	1113	31
ND/MT	32	Cabin Creek Station - Belfied Transfer	1114	1096	1090	1113	1103	1136	1157	1122	1097	1104	1112	1114	1118	32
ND	33	Little Knife Plant	1177	1174	1174	1174	1177	1181	1180	1177	1177	1178	1176	1177	1181	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	1134	1165	1158	1143	1147	1151	1141	1126	1136	1141	1102	1075	1121	43
ND/MT	241	Fairview Border	1179	1190	1204	1196	1175	1169	1165	1161	1168	1167	1179	1181	1196	241
ND	260	North Tioga Transfer - Nesson Plant		998	992	996	987	993	1002	1087	1090	1082	0			260
ND	261	Tioga Comp Station - Robinson Lake Plan	1153	1167	1170	1176	1175	1177	1183	1181	1176	1170	1065	1089	1105	261
ND	262	Minot Bdr - Palermo Bdr - Bismarck Stn	1187	1196	1190	1194	1196	1195	1193	1189	1192	1189	1181	1178	1152	262
ND	263	Lignite Plant	1125	1120	1143	1141	1123	1143	1146	1135	1115	1103	1115	1112	1103	263
ND	264	Epping Border	1147	1142	1133	1134	1136	1133	1138	1133	1145	1154	1158	1172	1186	264
ND	265	Tioga Comp Station - County Line Plant	1176	1167	1170	1176	1176	1177	1184	1181	1176	1170	1174	1175	1184	265
ND	266	County Line Plant		1181	1184	1185	1189	1184	1191	1183	1185	1185	1173	1182	0	266
ND	271	Bismarck Station - Cleveland Station	1179	1176	1179	1192	1196	1195	1194	1188	1192	1189	1163	1155	1129	271
ND	272	Cleveland Station - Mapleton	1178	1177	1179	1192	1196	1195	1193	1188	1191	1187	1161	1153	1128	272
ND	273	Cleveland Station - Grafton Border	1179	1177	1179	1192	1196	1195	1194	1189	1192	1187	1162	1154	1128	273
ND	610	MDU-Watford City BTU	1177	1165	1165	1189	1190	1183	1185	1176	1183	1188	1171	1163	1170	610
ND	802	Linton	1061	1073	1075	1064	1065	1057	1054	1063	1059	1054	1054	1052	1049	802
ND	903	Hettinger Propane	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	2549	903

**THERMAL ZONE VARIANCE
DOCUMENTATION**

December 2017

ZONE	<i>BTU VARIANCE</i>	<i>REASON</i>
263	-23	Operational Change