

Gas Quality Reports

LS495 - Grabham to Welda at Grabham
9/6/2019 - 12/6/2019

Gas Day	Gross Heating Value (HHV) (Btu/scf)	Net Heating Value (LHV) (Btu/scf)	Specific Gravity	Wobbe Index	Hydrocarbon Dewpoint (HCDP) (deg F)	N2 (mol%)	CO2 (mol%)	Methane (mol%)	Ethane (mol%)	Propane (mol%)	Isobutane (mol%)	N-Butane (mol%)	Isopentane (mol%)	N-Pentane (mol%)	C6 Plus (mol%)
09/06/2019	1,042.2	1,024.1	0.600	1,346.02	-139.00	1.797	0.496	91.332	6.098	0.263	0.005	0.008	0.001	0.001	0
09/07/2019	1,040.1	1,022.0	0.598	1,345.13	-140.77	1.704	0.538	91.719	5.772	0.252	0.006	0.008	0.001	0	0
09/08/2019	1,048.7	1,030.5	0.602	1,351.22	-134.03	1.612	0.537	91.068	6.329	0.380	0.019	0.037	0.007	0.007	0.004
09/09/2019	1,045.0	1,026.8	0.602	1,347.20	-136.86	1.730	0.563	91.008	6.391	0.286	0.007	0.011	0.002	0.001	0.001
09/10/2019	1,042.9	1,024.7	0.600	1,345.83	-138.08	1.740	0.565	91.275	6.104	0.291	0.008	0.012	0.002	0.002	0.002
09/11/2019	1,041.4	1,023.3	0.599	1,345.65	-139.60	1.682	0.568	91.541	5.930	0.263	0.006	0.008	0.001	0.001	0.001
09/12/2019	1,040.2	1,022.1	0.599	1,344.32	-140.06	1.780	0.537	91.548	5.851	0.260	0.007	0.012	0.001	0.001	0.001
09/13/2019	1,044.3	1,026.2	0.600	1,348.40	-138.13	1.699	0.497	91.251	6.304	0.234	0.005	0.008	0.001	0.001	0
09/14/2019	1,045.4	1,027.2	0.603	1,346.21	-135.95	1.889	0.529	90.651	6.637	0.273	0.008	0.011	0.001	0.001	0.001
09/15/2019	1,045.0	1,026.8	0.602	1,346.79	-136.89	1.846	0.512	90.773	6.629	0.228	0.004	0.006	0.001	0.001	0
09/16/2019	1,045.7	1,027.5	0.601	1,348.96	-137.28	1.746	0.479	90.960	6.602	0.204	0.003	0.005	0	0	0
09/17/2019	1,045.4	1,027.2	0.604	1,345.59	-135.90	1.968	0.512	90.449	6.825	0.232	0.004	0.007	0.001	0.001	0.001
09/18/2019	1,046.0	1,027.8	0.600	1,350.07	-137.41	1.681	0.471	91.098	6.531	0.208	0.004	0.006	0	0	0
09/19/2019	1,046.7	1,028.4	0.599	1,352.71	-137.93	1.510	0.458	91.452	6.364	0.198	0.006	0.011	0.001	0.001	0
09/20/2019	1,046.8	1,028.6	0.602	1,348.88	-135.46	1.766	0.506	90.829	6.608	0.253	0.008	0.017	0.003	0.005	0.004
09/21/2019	1,040.3	1,022.2	0.600	1,342.51	-139.23	1.940	0.536	91.139	6.126	0.237	0.006	0.010	0.001	0.001	0.001
09/22/2019	1,043.3	1,025.1	0.599	1,347.78	-139.09	1.724	0.482	91.301	6.299	0.186	0.003	0.004	0	0	0
09/23/2019	1,044.3	1,026.1	0.601	1,347.55	-138.05	1.775	0.494	91.025	6.512	0.186	0.003	0.004	0	0	0
09/24/2019	1,043.7	1,025.6	0.597	1,350.93	-140.20	1.499	0.471	91.764	6.099	0.161	0.003	0.003	0	0	0
09/25/2019	1,041.5	1,023.3	0.603	1,340.87	-137.42	2.094	0.563	90.601	6.440	0.290	0.004	0.006	0	0.001	0
09/26/2019	1,044.0	1,025.8	0.601	1,347.15	-137.83	1.745	0.525	91.172	6.261	0.286	0.004	0.007	0.001	0.001	0
09/27/2019	1,046.8	1,028.6	0.600	1,351.93	-137.46	1.523	0.498	91.331	6.399	0.241	0.004	0.005	0	0	0
09/28/2019	1,044.6	1,026.4	0.602	1,346.20	-136.95	1.798	0.563	90.860	6.497	0.271	0.004	0.006	0	0.001	0
09/29/2019	1,042.4	1,024.2	0.599	1,346.27	-139.28	1.751	0.518	91.296	6.223	0.202	0.003	0.005	0.001	0.001	0
09/30/2019	1,043.7	1,025.6	0.600	1,347.47	-138.43	1.715	0.520	91.210	6.335	0.208	0.004	0.007	0.001	0.001	0.001
10/01/2019	1,042.6	1,024.5	0.601	1,344.68	-138.18	1.823	0.567	91.030	6.322	0.244	0.004	0.007	0.001	0.001	0
10/02/2019	1,037.7	1,019.6	0.597	1,343.42	-142.48	1.718	0.547	91.939	5.569	0.216	0.004	0.006	0.001	0.001	0
10/03/2019	1,037.0	1,018.9	0.594	1,345.42	-144.34	1.585	0.502	92.422	5.286	0.192	0.004	0.007	0.001	0.001	0
10/04/2019	1,035.0	1,016.9	0.593	1,344.53	-145.85	1.580	0.491	92.719	5.020	0.169	0.006	0.010	0.002	0.002	0.001
10/05/2019	1,034.9	1,016.8	0.593	1,344.32	-145.59	1.611	0.478	92.725	4.963	0.200	0.006	0.010	0.002	0.002	0.002
10/06/2019	1,037.0	1,018.9	0.594	1,345.42	-143.66	1.594	0.496	92.474	5.187	0.223	0.007	0.011	0.002	0.002	0.003
10/07/2019	1,034.7	1,016.7	0.592	1,345.25	-146.30	1.561	0.457	92.868	4.920	0.176	0.005	0.008	0.002	0.002	0.002
10/08/2019	1,037.3	1,019.3	0.594	1,345.73	-144.04	1.582	0.499	92.387	5.328	0.191	0.004	0.006	0.001	0.001	0.001
10/09/2019	1,035.9	1,017.8	0.594	1,344.28	-144.77	1.610	0.514	92.493	5.172	0.192	0.005	0.009	0.002	0.002	0.001
10/10/2019	1,036.0	1,018.0	0.593	1,345.26	-145.23	1.577	0.487	92.577	5.168	0.180	0.004	0.006	0.001	0.001	0
10/11/2019	1,033.0	1,015.0	0.591	1,343.21	-147.39	1.653	0.454	92.846	4.885	0.150	0.004	0.006	0.001	0.001	0
10/12/2019	1,036.4	1,018.3	0.597	1,341.23	-142.65	1.870	0.526	91.800	5.585	0.204	0.004	0.007	0.001	0.001	0.001
10/13/2019	1,034.0	1,016.1	0.593	1,342.91	-146.03	1.726	0.455	92.559	5.080	0.166	0.004	0.007	0.001	0.001	0.001
10/14/2019	1,038.8	1,020.7	0.597	1,343.91	-141.44	1.804	0.499	91.711	5.753	0.219	0.004	0.007	0.001	0.001	0.001
10/15/2019	1,035.5	1,017.4	0.592	1,345.79	-146.07	1.530	0.471	92.793	5.024	0.170	0.004	0.006	0.001	0.001	0
10/16/2019	1,043.0	1,024.8	0.595	1,352.02	-140.04	1.416	0.440	92.379	5.419	0.284	0.015	0.032	0.006	0.006	0.003
10/17/2019	1,042.2	1,024.0	0.596	1,349.77	-70.86	1.538	0.457	92.386	5.122	0.383	0.028	0.054	0.011	0.012	0.010
10/18/2019	1,039.6	1,021.5	0.603	1,339.19	-137.31	2.148	0.560	90.936	5.919	0.366	0.023	0.034	0.006	0.004	0.003

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9/6/2019 - 12/6/2019

Gas Day	Gross Heating Value (HHV) (Btu/scf)	Net Heating Value (LHV) (Btu/scf)	Specific Gravity	Wobbe Index	Hydrocarbon Dewpoint (HCDP) (deg F)	N2 (mol%)	CO2 (mol%)	Methane (mol%)	Ethane (mol%)	Propane (mol%)	Isobutane (mol%)	N-Butane (mol%)	Isopentane (mol%)	N-Pentane (mol%)	C6 Plus (mol%)
10/19/2019	1,034.5	1,016.5	0.593	1,343.54	-145.92	1.647	0.487	92.623	5.050	0.179	0.004	0.007	0.001	0.001	0.001
10/20/2019	1,038.2	1,020.2	0.597	1,343.38	-141.90	1.757	0.542	91.783	5.692	0.216	0.003	0.005	0.001	0.001	0
10/21/2019	1,043.1	1,025.0	0.597	1,349.65	-137.58	1.557	0.482	92.165	5.279	0.403	0.026	0.057	0.012	0.013	0.006
10/22/2019	1,046.7	1,028.5	0.600	1,351.20	-43.58	1.609	0.475	91.976	5.211	0.507	0.043	0.107	0.024	0.028	0.021
10/23/2019	1,050.8	1,032.5	0.601	1,355.68	-33.12	1.463	0.450	92.118	5.070	0.604	0.057	0.141	0.032	0.037	0.028
10/24/2019	1,045.8	1,027.6	0.597	1,353.06	-44.57	1.462	0.440	92.466	4.930	0.499	0.040	0.095	0.021	0.024	0.022
10/25/2019	1,036.5	1,018.4	0.596	1,342.53	-142.47	1.854	0.468	92.018	5.403	0.229	0.006	0.011	0.002	0.003	0.006
10/26/2019	1,034.3	1,016.4	0.595	1,341.34	-144.81	1.837	0.478	92.244	5.234	0.188	0.005	0.009	0.002	0.002	0.001
10/27/2019	1,038.4	1,020.3	0.595	1,345.63	-142.15	1.688	0.467	92.190	5.361	0.265	0.009	0.014	0.003	0.002	0.002
10/28/2019	1,036.6	1,018.6	0.591	1,348.27	-145.59	1.441	0.431	93.016	4.867	0.221	0.008	0.012	0.002	0.002	0.001
10/29/2019	1,044.0	1,025.8	0.597	1,351.13	-69.22	1.549	0.432	92.246	5.233	0.405	0.030	0.066	0.014	0.015	0.009
10/30/2019	1,041.1	1,023.0	0.600	1,343.64	-137.35	2.001	0.457	91.350	5.746	0.370	0.018	0.037	0.007	0.008	0.006
10/31/2019	1,038.9	1,020.8	0.600	1,341.00	-139.26	2.081	0.480	91.218	5.908	0.272	0.010	0.019	0.004	0.004	0.003
11/01/2019	1,036.7	1,018.7	0.597	1,341.52	-142.14	1.909	0.495	91.777	5.570	0.225	0.006	0.012	0.002	0.002	0.002
11/02/2019	1,039.8	1,021.7	0.596	1,346.58	-141.44	1.677	0.469	91.958	5.657	0.218	0.005	0.009	0.002	0.002	0.002
11/03/2019	1,040.5	1,022.4	0.598	1,345.16	-140.31	1.802	0.486	91.526	5.947	0.225	0.004	0.007	0.001	0.001	0
11/04/2019	1,035.9	1,017.8	0.595	1,342.52	-143.92	1.816	0.475	92.096	5.408	0.192	0.004	0.007	0.001	0.001	0.001
11/05/2019	1,038.8	1,020.8	0.596	1,345.28	-141.50	1.736	0.470	91.983	5.557	0.215	0.009	0.018	0.004	0.004	0.003
11/06/2019	1,042.8	1,024.7	0.597	1,349.64	-139.39	1.573	0.463	91.914	5.753	0.253	0.010	0.020	0.005	0.005	0.004
11/07/2019	1,045.4	1,027.2	0.598	1,351.96	-137.74	1.536	0.442	91.749	5.955	0.263	0.012	0.025	0.006	0.006	0.005
11/08/2019	1,044.9	1,026.8	0.598	1,351.55	-138.19	1.555	0.438	91.739	5.968	0.257	0.010	0.020	0.004	0.005	0.004
11/09/2019	1,041.1	1,023.0	0.598	1,346.68	-140.01	1.687	0.498	91.753	5.786	0.243	0.008	0.016	0.004	0.004	0.002
11/10/2019	1,038.1	1,020.0	0.596	1,344.85	-142.28	1.686	0.502	92.113	5.440	0.235	0.006	0.010	0.002	0.002	0.002
11/11/2019	1,041.0	1,022.8	0.596	1,348.66	-141.58	1.582	0.453	92.025	5.729	0.201	0.003	0.005	0.001	0.001	0
11/12/2019	1,040.7	1,022.6	0.596	1,348.50	-141.42	1.610	0.434	92.087	5.630	0.216	0.006	0.011	0.002	0.002	0.002
11/13/2019	1,040.6	1,022.5	0.597	1,347.07	-140.82	1.691	0.458	91.859	5.737	0.231	0.006	0.011	0.002	0.002	0.001
11/14/2019	1,042.1	1,023.9	0.598	1,348.07	-139.50	1.665	0.466	91.779	5.791	0.264	0.009	0.016	0.004	0.004	0.003
11/15/2019	1,042.6	1,024.4	0.598	1,348.45	-139.57	1.665	0.461	91.662	5.957	0.233	0.006	0.010	0.002	0.002	0.002
11/16/2019	1,038.6	1,020.5	0.597	1,344.52	-141.94	1.728	0.508	91.890	5.649	0.208	0.005	0.008	0.002	0.001	0.001
11/17/2019	1,040.4	1,022.3	0.597	1,346.45	-140.77	1.708	0.476	91.794	5.778	0.226	0.005	0.008	0.002	0.002	0.002
11/18/2019	1,040.4	1,022.3	0.598	1,345.76	-140.51	1.721	0.503	91.707	5.825	0.222	0.006	0.009	0.002	0.002	0.003
11/19/2019	1,038.5	1,020.4	0.598	1,343.24	-141.10	1.793	0.534	91.744	5.673	0.227	0.008	0.012	0.003	0.003	0.004
11/20/2019	1,039.0	1,020.9	0.599	1,342.03	-140.42	1.876	0.563	91.375	5.953	0.217	0.005	0.007	0.001	0.001	0.002
11/21/2019	1,041.7	1,023.6	0.596	1,349.88	-141.47	1.530	0.444	92.050	5.780	0.187	0.003	0.004	0.001	0	0
11/22/2019	1,044.1	1,025.9	0.597	1,351.01	-139.54	1.521	0.463	91.749	6.053	0.198	0.005	0.007	0.002	0.001	0.001
11/23/2019	1,044.9	1,026.7	0.598	1,351.65	-138.85	1.499	0.467	91.739	6.034	0.239	0.006	0.010	0.002	0.002	0.002
11/24/2019	1,039.3	1,021.2	0.598	1,344.42	-140.98	1.794	0.494	91.701	5.766	0.226	0.005	0.008	0.002	0.002	0.002
11/25/2019	1,038.9	1,020.8	0.597	1,344.51	-141.35	1.765	0.496	91.815	5.681	0.221	0.006	0.009	0.002	0.002	0.002
11/26/2019	1,041.7	1,023.6	0.597	1,348.07	-140.50	1.648	0.466	91.758	5.912	0.200	0.005	0.008	0.001	0.001	0.001
11/27/2019	1,043.6	1,025.4	0.598	1,349.62	-139.25	1.641	0.444	91.600	6.084	0.214	0.004	0.007	0.002	0.002	0.002
11/28/2019	1,042.2	1,024.1	0.597	1,349.04	-140.31	1.636	0.437	91.802	5.888	0.224	0.004	0.007	0.001	0.001	0.001
11/29/2019	1,039.0	1,021.0	0.596	1,345.78	-141.90	1.751	0.439	91.947	5.628	0.220	0.004	0.008	0.001	0.001	0.001
11/30/2019	1,038.0	1,019.9	0.597	1,343.70	-141.88	1.844	0.459	91.839	5.611	0.229	0.005	0.008	0.002	0.002	0.002

TSP Name: Southern Star Central Gas Pipeline, Inc.

CSI048

TSP: 007906233

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Gas Day	Gross Heating Value (HHV) (Btu/scf)	Net Heating Value (LHV) (Btu/scf)	Specific Gravity	Wobbe Index	Hydrocarbon Dewpoint (HCDP) (deg F)	N2 (mol%)	CO2 (mol%)	Methane (mol%)	Ethane (mol%)	Propane (mol%)	Isobutane (mol%)	N-Butane (mol%)	Isopentane (mol%)	N-Pentane (mol%)	C6 Plus (mol%)
12/01/2019	1,043.0	1,024.8	0.597	1,350.13	-140.27	1.590	0.432	91.783	5.993	0.191	0.003	0.006	0.001	0.001	0
12/02/2019	1,043.2	1,025.0	0.598	1,349.46	-139.67	1.655	0.431	91.640	6.050	0.209	0.004	0.007	0.001	0.001	0.001
12/03/2019	1,042.5	1,024.4	0.598	1,347.80	-139.46	1.740	0.446	91.510	6.059	0.231	0.004	0.007	0.001	0.001	0.001
12/04/2019	1,038.0	1,020.0	0.594	1,346.59	-143.08	1.672	0.415	92.329	5.345	0.215	0.007	0.012	0.002	0.002	0.001

NOTES:

Wobbe Index: Interchangeability constant calculated using the Gross (or Higher) Heating Value (HHV) divided by the square root of the Specific Gravity

Hydrocarbon Dewpoint (HCDP): Theoretically determined value using the Redlich-Kwong equation of state (EOS)

Selection: Business Unit ID = 70; Analysis_Key = 52312