

## Gas Quality Reports

LS250 - St Joe 20" at Tonganoxie

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	1,038.9	1,020.8	0.601	1,340.55	-138.58	2.054	0.522	91.321	5.658	0.397	0.014	0.024	0.003	0.003	0.004
09/07/2019	1,042.3	1,024.2	0.602	1,343.13	-135.88	2.093	0.463	91.052	5.830	0.500	0.018	0.031	0.004	0.004	0.005
09/08/2019	1,055.3	1,036.9	0.610	1,351.40	-63.66	2.316	0.272	89.700	6.776	0.830	0.033	0.054	0.007	0.006	0.005
09/09/2019	1,055.5	1,037.1	0.609	1,352.23	-63.25	2.185	0.317	89.879	6.680	0.834	0.033	0.053	0.007	0.005	0.006
09/10/2019	1,049.8	1,031.5	0.607	1,347.41	-68.66	2.294	0.332	90.201	6.354	0.728	0.028	0.046	0.006	0.005	0.006
09/11/2019	1,052.2	1,033.9	0.610	1,347.33	-67.04	2.683	0.159	89.473	6.770	0.827	0.028	0.046	0.006	0.004	0.004
09/12/2019	1,041.5	1,023.4	0.603	1,341.37	-135.69	2.327	0.383	90.795	5.925	0.510	0.018	0.031	0.004	0.004	0.004
09/13/2019	1,033.6	1,015.6	0.597	1,337.24	-142.44	2.032	0.551	91.915	5.125	0.334	0.012	0.020	0.003	0.003	0.005
09/14/2019	1,029.2	1,011.3	0.595	1,334.72	-146.50	1.956	0.598	92.472	4.683	0.257	0.009	0.015	0.003	0.003	0.005
09/15/2019	1,029.8	1,011.8	0.595	1,335.11	-146.01	1.979	0.580	92.387	4.757	0.261	0.009	0.016	0.003	0.003	0.005
09/16/2019	1,034.7	1,016.7	0.598	1,338.40	-141.76	2.049	0.510	91.857	5.189	0.352	0.012	0.020	0.003	0.003	0.005
09/17/2019	1,039.2	1,021.1	0.600	1,341.34	-138.30	2.137	0.433	91.327	5.626	0.426	0.015	0.024	0.004	0.003	0.005
09/18/2019	1,046.0	1,027.8	0.604	1,345.42	-132.70	2.282	0.331	90.567	6.136	0.612	0.022	0.036	0.005	0.004	0.005
09/19/2019	1,044.3	1,026.1	0.604	1,344.19	-133.90	2.364	0.290	90.641	6.070	0.568	0.021	0.033	0.005	0.004	0.006
09/20/2019	1,050.0	1,031.7	0.607	1,347.59	-69.93	2.462	0.218	90.038	6.456	0.745	0.025	0.041	0.005	0.004	0.005
09/21/2019	1,052.8	1,034.5	0.609	1,349.12	-67.12	2.470	0.217	89.781	6.589	0.854	0.028	0.047	0.005	0.004	0.005
09/22/2019	1,053.4	1,035.1	0.609	1,349.80	-61.61	2.514	0.169	89.836	6.438	0.931	0.035	0.056	0.008	0.006	0.006
09/23/2019	1,054.0	1,035.7	0.610	1,349.01	-57.98	2.589	0.184	89.671	6.403	1.029	0.039	0.063	0.009	0.007	0.007
09/24/2019	1,052.7	1,034.3	0.610	1,347.84	-58.26	2.556	0.228	89.784	6.322	0.988	0.038	0.062	0.009	0.007	0.008
09/25/2019	1,040.7	1,022.6	0.602	1,341.75	-136.15	2.230	0.398	91.179	5.550	0.572	0.020	0.035	0.005	0.004	0.006
09/26/2019	1,036.1	1,018.1	0.598	1,339.58	-140.73	2.073	0.475	91.708	5.333	0.364	0.013	0.022	0.003	0.003	0.005
09/27/2019	1,042.9	1,024.8	0.602	1,344.33	-135.23	2.240	0.320	91.040	5.765	0.566	0.021	0.035	0.005	0.003	0.005
09/28/2019	1,032.4	1,014.4	0.598	1,334.51	-141.76	2.360	0.446	91.648	5.089	0.407	0.014	0.024	0.004	0.003	0.005
09/29/2019	1,032.8	1,014.8	0.598	1,335.93	-142.49	2.183	0.497	91.817	5.113	0.348	0.012	0.020	0.003	0.003	0.005
09/30/2019	1,034.8	1,016.8	0.599	1,337.56	-141.16	2.198	0.464	91.587	5.356	0.355	0.011	0.019	0.003	0.003	0.004
10/01/2019	1,037.4	1,019.4	0.599	1,339.98	-139.66	2.146	0.448	91.432	5.561	0.368	0.013	0.022	0.003	0.003	0.004
10/02/2019	1,032.0	1,014.0	0.596	1,336.33	-144.35	2.047	0.539	92.025	5.103	0.253	0.009	0.015	0.003	0.002	0.004
10/03/2019	1,033.3	1,015.4	0.597	1,337.49	-142.95	2.038	0.525	91.962	5.133	0.303	0.011	0.018	0.003	0.003	0.005
10/04/2019	1,034.5	1,016.5	0.597	1,338.81	-142.08	2.012	0.507	91.969	5.117	0.352	0.013	0.020	0.003	0.003	0.005
10/05/2019	1,031.2	1,013.3	0.594	1,337.82	-145.81	1.912	0.521	92.482	4.796	0.258	0.009	0.014	0.003	0.002	0.004
10/06/2019	1,030.4	1,012.4	0.593	1,337.53	-146.53	1.957	0.481	92.563	4.725	0.243	0.008	0.014	0.003	0.002	0.004
10/07/2019	1,029.6	1,011.7	0.593	1,337.49	-147.15	1.918	0.486	92.755	4.555	0.252	0.009	0.016	0.003	0.003	0.004
10/08/2019	1,030.1	1,012.2	0.593	1,338.02	-146.93	1.884	0.493	92.761	4.573	0.254	0.009	0.016	0.003	0.003	0.005
10/09/2019	1,031.3	1,013.3	0.593	1,339.21	-146.29	1.868	0.475	92.680	4.688	0.255	0.009	0.015	0.003	0.003	0.004
10/10/2019	1,038.9	1,020.9	0.600	1,341.17	-138.06	2.230	0.374	91.343	5.523	0.474	0.017	0.027	0.004	0.003	0.005
10/11/2019	1,035.5	1,017.5	0.599	1,338.26	-140.36	2.277	0.394	91.559	5.310	0.409	0.015	0.024	0.004	0.003	0.005
10/12/2019	1,033.4	1,015.4	0.596	1,338.11	-142.81	2.180	0.399	91.939	5.113	0.329	0.011	0.018	0.003	0.003	0.004
10/13/2019	1,038.0	1,020.0	0.599	1,340.66	-138.61	2.305	0.324	91.401	5.439	0.478	0.016	0.026	0.004	0.003	0.005
10/14/2019	1,033.4	1,015.4	0.597	1,337.27	-142.08	2.234	0.408	91.880	5.041	0.388	0.014	0.023	0.004	0.003	0.005
10/15/2019	1,033.0	1,015.0	0.597	1,337.33	-142.55	2.215	0.405	91.965	4.993	0.372	0.014	0.024	0.004	0.003	0.005
10/16/2019	1,038.0	1,019.9	0.600	1,340.02	-138.35	2.300	0.361	91.348	5.451	0.479	0.018	0.031	0.004	0.003	0.005
10/17/2019	1,037.7	1,019.6	0.600	1,339.97	-138.81	2.271	0.374	91.375	5.479	0.446	0.016	0.027	0.004	0.003	0.005
10/18/2019	1,041.5	1,023.4	0.602	1,342.61	-136.03	2.376	0.280	90.935	5.832	0.518	0.018	0.028	0.004	0.003	0.005

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9/6/2019 - 12/6/2019

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10/19/2019	1,043.5	1,025.4	0.604	1,342.25	-133.45	2.678	0.167	90.316	6.177	0.597	0.020	0.033	0.004	0.003	0.004
10/20/2019	1,041.2	1,023.1	0.603	1,340.98	-135.03	2.576	0.229	90.737	5.789	0.593	0.023	0.039	0.005	0.004	0.005
10/21/2019	1,041.5	1,023.4	0.602	1,341.99	-135.17	2.397	0.300	90.973	5.642	0.606	0.025	0.041	0.006	0.004	0.006
10/22/2019	1,040.9	1,022.8	0.602	1,341.39	-135.70	2.315	0.370	91.034	5.629	0.576	0.023	0.038	0.005	0.004	0.006
10/23/2019	1,042.5	1,024.4	0.603	1,343.05	-69.81	2.262	0.363	91.053	5.618	0.603	0.027	0.049	0.009	0.008	0.008
10/24/2019	1,040.0	1,021.9	0.601	1,341.57	-65.26	2.244	0.375	91.387	5.340	0.534	0.028	0.058	0.011	0.012	0.011
10/25/2019	1,039.5	1,021.4	0.601	1,340.50	-66.95	2.295	0.387	91.282	5.386	0.540	0.027	0.053	0.010	0.011	0.010
10/26/2019	1,047.2	1,029.0	0.607	1,344.56	-62.02	2.314	0.394	90.411	6.033	0.733	0.033	0.056	0.009	0.008	0.009
10/27/2019	1,044.4	1,026.2	0.605	1,342.59	-66.11	2.385	0.368	90.604	5.849	0.691	0.030	0.050	0.008	0.007	0.008
10/28/2019	1,041.8	1,023.7	0.604	1,340.50	-68.89	2.477	0.341	90.727	5.711	0.654	0.026	0.043	0.007	0.006	0.008
10/29/2019	1,049.4	1,031.1	0.608	1,345.55	-59.47	2.374	0.371	90.134	6.182	0.819	0.035	0.059	0.009	0.008	0.009
10/30/2019	1,052.8	1,034.5	0.610	1,347.91	-55.78	2.395	0.335	89.853	6.367	0.919	0.038	0.065	0.010	0.009	0.010
10/31/2019	1,047.9	1,029.6	0.607	1,344.53	-57.68	2.337	0.402	90.334	6.014	0.784	0.036	0.062	0.010	0.009	0.011
11/01/2019	1,044.0	1,025.9	0.605	1,342.38	-63.40	2.289	0.431	90.721	5.783	0.667	0.031	0.053	0.009	0.008	0.010
11/02/2019	1,039.2	1,021.1	0.602	1,339.48	-136.67	2.267	0.453	91.111	5.591	0.501	0.021	0.037	0.006	0.005	0.008
11/03/2019	1,038.3	1,020.3	0.599	1,341.10	-138.63	2.138	0.419	91.524	5.407	0.449	0.018	0.031	0.005	0.004	0.006
11/04/2019	1,041.1	1,023.0	0.601	1,342.54	-136.64	2.202	0.386	91.105	5.768	0.482	0.017	0.027	0.004	0.003	0.005
11/05/2019	1,036.5	1,018.4	0.598	1,339.95	-140.63	2.094	0.452	91.650	5.406	0.355	0.012	0.020	0.003	0.003	0.005
11/06/2019	1,033.7	1,015.7	0.596	1,338.64	-143.12	2.015	0.488	92.039	5.131	0.288	0.010	0.018	0.003	0.003	0.004
11/07/2019	1,034.7	1,016.7	0.597	1,339.44	-142.28	2.016	0.475	91.975	5.180	0.311	0.012	0.021	0.004	0.003	0.005
11/08/2019	1,038.8	1,020.8	0.600	1,341.50	-138.36	2.098	0.440	91.479	5.495	0.425	0.017	0.029	0.005	0.004	0.008
11/09/2019	1,041.5	1,023.4	0.600	1,344.27	-137.12	2.031	0.416	91.351	5.701	0.441	0.017	0.029	0.005	0.004	0.006
11/10/2019	1,054.5	1,036.2	0.610	1,350.34	-65.50	2.398	0.253	89.661	6.734	0.855	0.033	0.052	0.006	0.004	0.005
11/11/2019	1,053.7	1,035.4	0.609	1,350.00	-64.96	2.364	0.269	89.804	6.618	0.842	0.033	0.053	0.007	0.005	0.005
11/12/2019	1,046.8	1,028.6	0.606	1,345.14	-63.33	2.289	0.365	90.524	6.030	0.687	0.030	0.050	0.008	0.007	0.009
11/13/2019	1,043.8	1,025.6	0.604	1,343.43	-65.07	2.204	0.421	90.917	5.733	0.620	0.029	0.049	0.008	0.008	0.010
11/14/2019	1,040.5	1,022.3	0.600	1,343.57	-137.92	1.982	0.453	91.497	5.590	0.417	0.017	0.029	0.005	0.004	0.007
11/15/2019	1,039.2	1,021.1	0.598	1,344.04	-139.95	1.861	0.467	91.780	5.523	0.324	0.012	0.021	0.004	0.003	0.005
11/16/2019	1,040.3	1,022.2	0.599	1,343.97	-138.72	1.922	0.467	91.533	5.667	0.363	0.013	0.024	0.003	0.003	0.005
11/17/2019	1,046.1	1,027.9	0.604	1,346.01	-133.30	2.084	0.431	90.712	6.157	0.542	0.021	0.038	0.005	0.004	0.004
11/18/2019	1,043.9	1,025.7	0.602	1,345.34	-135.40	2.017	0.443	91.048	5.950	0.480	0.019	0.032	0.004	0.004	0.005
11/19/2019	1,045.7	1,027.5	0.604	1,345.84	-133.52	2.243	0.322	90.627	6.213	0.530	0.019	0.032	0.005	0.004	0.005
11/20/2019	1,051.1	1,032.8	0.608	1,348.17	-68.99	2.390	0.270	89.902	6.657	0.693	0.026	0.044	0.006	0.005	0.005
11/21/2019	1,053.4	1,035.1	0.610	1,348.91	-63.02	2.384	0.307	89.649	6.788	0.762	0.031	0.056	0.008	0.007	0.006
11/22/2019	1,039.3	1,021.2	0.599	1,343.12	-139.37	1.956	0.458	91.597	5.596	0.347	0.013	0.023	0.004	0.003	0.005
11/23/2019	1,038.1	1,020.0	0.597	1,343.32	-141.12	1.851	0.477	91.850	5.515	0.272	0.009	0.016	0.003	0.003	0.004
11/24/2019	1,039.5	1,021.4	0.598	1,344.21	-139.93	1.882	0.453	91.699	5.615	0.313	0.010	0.018	0.003	0.003	0.004
11/25/2019	1,043.0	1,024.8	0.604	1,341.64	-134.46	2.564	0.260	90.306	6.332	0.482	0.017	0.030	0.004	0.003	0.003
11/26/2019	1,043.4	1,025.2	0.604	1,343.06	-134.56	2.372	0.319	90.614	6.109	0.524	0.018	0.031	0.004	0.003	0.004
11/27/2019	1,039.2	1,021.1	0.600	1,342.08	-138.91	2.104	0.415	91.380	5.688	0.368	0.012	0.022	0.003	0.003	0.004
11/28/2019	1,039.5	1,021.4	0.599	1,343.04	-139.21	2.028	0.421	91.459	5.716	0.333	0.011	0.020	0.003	0.003	0.004
11/29/2019	1,040.2	1,022.1	0.600	1,343.34	-138.38	2.043	0.417	91.412	5.690	0.388	0.014	0.024	0.004	0.003	0.004
11/30/2019	1,040.8	1,022.7	0.601	1,342.91	-137.27	2.201	0.358	91.152	5.804	0.433	0.015	0.026	0.004	0.003	0.005

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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%)
12/01/2019	1,039.4	1,021.3	0.600	1,341.66	-138.04	2.211	0.375	91.273	5.653	0.434	0.016	0.026	0.004	0.003	0.005
12/02/2019	1,041.4	1,023.2	0.601	1,343.17	-136.72	2.134	0.404	91.175	5.769	0.457	0.017	0.030	0.005	0.004	0.006
12/03/2019	1,043.1	1,025.0	0.602	1,344.28	-135.39	2.128	0.402	91.009	5.905	0.488	0.019	0.033	0.005	0.004	0.007
12/04/2019	1,041.1	1,023.0	0.600	1,343.51	-137.49	2.067	0.421	91.258	5.797	0.404	0.015	0.027	0.004	0.003	0.005

**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 = 48033