

Gas Quality Reports

LS195 - St. Joe 26" at Ottawa

Page 1 of 3

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	1,035.0	1,017.0	0.598	1,338.54	-142.00	1.919	0.598	91.829	5.333	0.285	0.010	0.017	0.003	0.003	0.005
09/07/2019	1,038.6	1,020.5	0.600	1,341.13	-139.11	1.917	0.571	91.535	5.552	0.374	0.015	0.024	0.004	0.003	0.005
09/08/2019	1,036.5	1,018.5	0.597	1,341.88	-142.03	1.793	0.545	92.038	5.301	0.292	0.009	0.014	0.002	0.002	0.005
09/09/2019	1,032.4	1,014.4	0.595	1,338.02	-144.68	1.855	0.585	92.318	4.949	0.257	0.010	0.016	0.003	0.003	0.005
09/10/2019	1,032.4	1,014.4	0.595	1,338.02	-144.68	1.855	0.585	92.318	4.949	0.257	0.010	0.016	0.003	0.003	0.005
09/11/2019	1,032.4	1,014.4	0.595	1,338.02	-144.68	1.855	0.585	92.318	4.949	0.257	0.010	0.016	0.003	0.003	0.005
09/12/2019	1,028.4	1,010.4	0.594	1,334.65	-147.50	1.860	0.637	92.669	4.584	0.218	0.008	0.013	0.003	0.003	0.007
09/13/2019	1,027.9	1,010.0	0.594	1,334.13	-147.69	1.915	0.615	92.651	4.568	0.217	0.008	0.014	0.003	0.003	0.006
09/14/2019	1,041.1	1,022.9	0.600	1,344.43	-137.63	1.950	0.444	91.541	5.547	0.461	0.016	0.026	0.004	0.003	0.006
09/15/2019	1,037.0	1,018.9	0.600	1,338.78	-139.35	2.251	0.430	91.285	5.621	0.365	0.014	0.022	0.004	0.003	0.006
09/16/2019	1,043.6	1,025.4	0.602	1,345.00	-135.70	2.088	0.404	90.931	6.096	0.429	0.015	0.024	0.004	0.003	0.005
09/17/2019	1,048.4	1,030.1	0.604	1,348.54	-70.17	2.187	0.295	90.568	6.264	0.606	0.024	0.037	0.006	0.005	0.008
09/18/2019	1,041.6	1,023.4	0.602	1,342.68	-136.04	2.209	0.389	91.041	5.809	0.488	0.019	0.029	0.005	0.004	0.007
09/19/2019	1,046.6	1,028.3	0.605	1,346.05	-132.74	2.342	0.273	90.405	6.358	0.565	0.017	0.028	0.004	0.003	0.005
09/20/2019	1,057.1	1,038.6	0.611	1,351.92	-56.52	2.515	0.167	89.456	6.742	0.997	0.038	0.063	0.009	0.007	0.008
09/21/2019	1,058.4	1,039.9	0.613	1,351.77	-50.30	2.611	0.155	89.267	6.687	1.138	0.043	0.070	0.010	0.008	0.011
09/22/2019	1,057.9	1,039.5	0.613	1,351.27	-50.23	2.531	0.219	89.378	6.589	1.136	0.045	0.073	0.010	0.008	0.011
09/23/2019	1,041.6	1,023.4	0.602	1,342.66	-135.62	2.147	0.429	91.213	5.547	0.587	0.022	0.038	0.005	0.004	0.007
09/24/2019	1,033.8	1,015.7	0.596	1,339.10	-143.63	1.898	0.540	92.108	5.192	0.229	0.008	0.014	0.003	0.002	0.006
09/25/2019	1,042.1	1,023.9	0.600	1,345.89	-137.06	1.905	0.426	91.582	5.548	0.469	0.020	0.032	0.005	0.004	0.007
09/26/2019	1,050.1	1,031.8	0.606	1,349.46	-61.16	2.356	0.185	90.455	6.113	0.777	0.034	0.056	0.008	0.007	0.009
09/27/2019	1,028.7	1,010.8	0.596	1,332.73	-145.54	2.113	0.588	92.243	4.714	0.298	0.011	0.019	0.003	0.003	0.006
09/28/2019	1,029.9	1,011.9	0.595	1,334.97	-145.76	2.008	0.571	92.311	4.824	0.252	0.008	0.014	0.003	0.003	0.006
09/29/2019	1,033.3	1,015.3	0.598	1,336.77	-142.87	2.005	0.584	91.857	5.247	0.273	0.009	0.014	0.003	0.003	0.006
09/30/2019	1,032.2	1,014.2	0.596	1,336.78	-144.43	2.008	0.548	92.010	5.189	0.217	0.007	0.012	0.002	0.002	0.005
10/01/2019	1,032.1	1,014.1	0.596	1,336.72	-144.39	1.964	0.574	92.116	5.067	0.244	0.009	0.015	0.003	0.003	0.006
10/02/2019	1,037.9	1,019.8	0.599	1,341.04	-139.44	2.016	0.487	91.629	5.422	0.394	0.015	0.023	0.004	0.004	0.007
10/03/2019	1,029.8	1,011.8	0.593	1,336.71	-147.13	1.822	0.594	92.645	4.706	0.205	0.007	0.011	0.002	0.002	0.005
10/04/2019	1,030.2	1,012.2	0.592	1,339.49	-148.15	1.693	0.540	92.985	4.572	0.186	0.006	0.010	0.002	0.002	0.004
10/05/2019	1,027.7	1,009.7	0.590	1,337.83	-150.01	1.701	0.545	93.279	4.283	0.161	0.007	0.012	0.003	0.003	0.005
10/06/2019	1,034.3	1,016.2	0.596	1,339.45	-141.98	2.062	0.428	92.134	4.927	0.390	0.016	0.025	0.005	0.004	0.007
10/07/2019	1,028.8	1,010.9	0.590	1,338.85	-149.13	1.703	0.525	93.189	4.376	0.176	0.007	0.012	0.003	0.003	0.006
10/08/2019	1,037.1	1,019.1	0.596	1,343.00	-141.40	1.878	0.444	92.075	5.219	0.342	0.012	0.019	0.003	0.003	0.006
10/09/2019	1,037.1	1,019.1	0.596	1,343.00	-141.40	1.878	0.444	92.075	5.219	0.342	0.012	0.019	0.003	0.003	0.006
10/10/2019	1,031.5	1,013.5	0.596	1,335.63	-144.05	2.278	0.409	91.872	5.133	0.276	0.009	0.014	0.003	0.003	0.004
10/11/2019	1,033.0	1,015.0	0.595	1,339.47	-144.27	2.031	0.409	92.249	4.997	0.279	0.009	0.015	0.003	0.003	0.005
10/12/2019	1,038.5	1,020.4	0.599	1,342.33	-138.77	2.139	0.355	91.658	5.309	0.480	0.017	0.027	0.005	0.004	0.006
10/13/2019	1,026.3	1,008.4	0.592	1,333.84	-149.46	1.948	0.560	92.839	4.458	0.169	0.006	0.010	0.002	0.002	0.005
10/14/2019	1,034.3	1,016.3	0.596	1,340.21	-143.18	1.960	0.456	92.140	5.129	0.277	0.010	0.017	0.003	0.003	0.005
10/15/2019	1,030.9	1,012.9	0.594	1,337.27	-145.97	1.926	0.530	92.436	4.848	0.230	0.007	0.013	0.002	0.002	0.005
10/16/2019	1,031.6	1,013.6	0.593	1,339.74	-146.32	1.753	0.532	92.748	4.704	0.226	0.009	0.015	0.003	0.003	0.006
10/17/2019	1,033.3	1,015.3	0.592	1,343.19	-146.16	1.599	0.499	92.961	4.681	0.224	0.009	0.015	0.003	0.003	0.006
10/18/2019	1,040.6	1,022.4	0.598	1,346.15	-70.59	1.799	0.432	92.112	5.079	0.465	0.027	0.056	0.010	0.010	0.009

Gas Quality Reports

LS195 - St. Joe 26" at Ottawa

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	1,025.0	1,007.2	0.594	1,330.27	-147.66	2.111	0.606	92.761	4.153	0.292	0.021	0.034	0.006	0.006	0.009
10/20/2019	1,024.9	1,007.0	0.592	1,332.50	-150.04	1.928	0.598	93.067	4.157	0.207	0.011	0.018	0.004	0.003	0.006
10/21/2019	1,029.1	1,011.1	0.594	1,335.57	-147.34	1.888	0.590	92.593	4.694	0.210	0.006	0.010	0.002	0.002	0.005
10/22/2019	1,029.1	1,011.1	0.594	1,335.57	-147.34	1.888	0.590	92.593	4.694	0.210	0.006	0.010	0.002	0.002	0.005
10/23/2019	1,029.1	1,011.1	0.594	1,335.57	-147.34	1.888	0.590	92.593	4.694	0.210	0.006	0.010	0.002	0.002	0.005
10/24/2019	1,037.7	1,019.6	0.598	1,342.41	-47.96	1.926	0.464	92.329	4.609	0.485	0.038	0.088	0.019	0.022	0.021
10/25/2019	1,040.0	1,021.9	0.599	1,343.50	-66.28	1.997	0.430	91.813	5.107	0.539	0.029	0.056	0.010	0.010	0.011
10/26/2019	1,039.2	1,021.1	0.602	1,339.74	-72.55	2.442	0.320	91.067	5.546	0.544	0.023	0.037	0.007	0.005	0.009
10/27/2019	1,033.3	1,015.3	0.598	1,336.42	-141.19	2.327	0.391	91.779	5.012	0.430	0.017	0.026	0.005	0.004	0.008
10/28/2019	1,034.4	1,016.3	0.594	1,342.36	-144.22	1.798	0.446	92.577	4.821	0.320	0.011	0.017	0.003	0.002	0.005
10/29/2019	1,039.7	1,021.6	0.596	1,347.19	-61.41	1.631	0.458	92.612	4.712	0.448	0.032	0.066	0.013	0.015	0.014
10/30/2019	1,040.2	1,022.1	0.600	1,342.89	-137.52	2.028	0.450	91.494	5.489	0.469	0.020	0.033	0.005	0.005	0.007
10/31/2019	1,040.0	1,021.8	0.600	1,343.08	-137.78	2.012	0.443	91.578	5.435	0.460	0.020	0.034	0.006	0.005	0.007
11/01/2019	1,034.6	1,016.5	0.599	1,336.52	-140.93	2.234	0.488	91.471	5.427	0.335	0.012	0.020	0.004	0.003	0.005
11/02/2019	1,035.9	1,017.8	0.597	1,340.97	-141.54	1.994	0.441	91.992	5.180	0.342	0.014	0.024	0.004	0.004	0.005
11/03/2019	1,039.9	1,021.7	0.599	1,343.84	-139.05	1.961	0.432	91.566	5.635	0.365	0.012	0.019	0.003	0.003	0.005
11/04/2019	1,036.5	1,018.4	0.598	1,340.51	-141.05	2.017	0.471	91.733	5.418	0.323	0.010	0.017	0.003	0.002	0.005
11/05/2019	1,032.5	1,014.5	0.595	1,338.84	-144.85	1.911	0.507	92.325	4.988	0.232	0.009	0.016	0.003	0.003	0.005
11/06/2019	1,034.8	1,016.8	0.596	1,340.31	-142.52	1.945	0.477	92.092	5.156	0.281	0.012	0.021	0.005	0.004	0.006
11/07/2019	1,038.9	1,020.8	0.597	1,344.11	-140.00	1.776	0.508	91.951	5.382	0.322	0.015	0.028	0.006	0.006	0.007
11/08/2019	1,038.4	1,020.2	0.597	1,344.11	-140.81	1.779	0.488	92.003	5.397	0.280	0.013	0.024	0.005	0.005	0.007
11/09/2019	1,038.6	1,020.4	0.597	1,344.44	-140.79	1.804	0.460	91.993	5.390	0.306	0.012	0.022	0.004	0.004	0.005
11/10/2019	1,037.0	1,018.9	0.597	1,342.64	-141.66	1.851	0.480	92.001	5.346	0.282	0.010	0.019	0.004	0.003	0.005
11/11/2019	1,035.7	1,017.6	0.596	1,341.72	-142.78	1.800	0.521	92.177	5.200	0.265	0.010	0.017	0.003	0.003	0.005
11/12/2019	1,040.5	1,022.4	0.599	1,344.19	-138.18	1.877	0.488	91.653	5.502	0.416	0.018	0.031	0.005	0.005	0.006
11/13/2019	1,036.4	1,018.3	0.596	1,342.62	-142.61	1.813	0.485	92.107	5.313	0.250	0.008	0.014	0.003	0.003	0.004
11/14/2019	1,037.3	1,019.2	0.596	1,343.75	-142.08	1.753	0.492	92.126	5.347	0.242	0.009	0.018	0.004	0.004	0.005
11/15/2019	1,037.5	1,019.4	0.596	1,343.79	-141.98	1.765	0.489	92.057	5.412	0.244	0.008	0.014	0.003	0.003	0.005
11/16/2019	1,037.7	1,019.6	0.597	1,343.29	-141.71	1.795	0.502	91.933	5.492	0.249	0.008	0.013	0.002	0.002	0.004
11/17/2019	1,033.2	1,015.2	0.595	1,339.50	-144.88	1.831	0.546	92.275	5.115	0.208	0.006	0.010	0.002	0.002	0.004
11/18/2019	1,036.8	1,018.7	0.596	1,342.75	-142.32	1.826	0.483	91.997	5.441	0.224	0.007	0.012	0.002	0.002	0.005
11/19/2019	1,036.8	1,018.7	0.596	1,342.75	-142.32	1.826	0.483	91.997	5.441	0.224	0.007	0.012	0.002	0.002	0.005
11/20/2019	1,036.8	1,018.7	0.596	1,342.75	-142.32	1.826	0.483	91.997	5.441	0.224	0.007	0.012	0.002	0.002	0.005
11/21/2019	1,032.4	1,014.4	0.595	1,338.74	-145.46	1.860	0.541	92.308	5.088	0.180	0.005	0.009	0.002	0.002	0.005
11/22/2019	1,035.8	1,017.8	0.595	1,343.19	-144.01	1.715	0.501	92.292	5.278	0.190	0.005	0.009	0.002	0.002	0.004
11/23/2019	1,037.3	1,019.2	0.596	1,343.97	-142.60	1.701	0.515	92.113	5.446	0.199	0.006	0.009	0.002	0.002	0.005
11/24/2019	1,038.8	1,020.7	0.597	1,344.77	-140.81	1.729	0.499	92.034	5.396	0.291	0.013	0.027	0.003	0.003	0.005
11/25/2019	1,032.3	1,014.3	0.595	1,337.85	-144.93	1.935	0.539	92.175	5.116	0.209	0.006	0.010	0.002	0.002	0.005
11/26/2019	1,033.9	1,015.9	0.595	1,340.64	-144.79	1.815	0.515	92.276	5.187	0.186	0.005	0.009	0.002	0.002	0.004
11/27/2019	1,036.7	1,018.6	0.596	1,342.69	-142.47	1.813	0.492	92.006	5.453	0.207	0.007	0.012	0.003	0.003	0.005
11/28/2019	1,038.5	1,020.4	0.598	1,343.44	-140.39	1.850	0.484	91.850	5.447	0.326	0.012	0.020	0.003	0.003	0.005
11/29/2019	1,035.9	1,017.9	0.596	1,341.67	-142.41	1.872	0.485	92.056	5.283	0.269	0.009	0.016	0.003	0.003	0.005
11/30/2019	1,031.3	1,013.3	0.594	1,337.80	-145.76	1.944	0.502	92.395	4.905	0.224	0.007	0.012	0.003	0.002	0.005

TSP Name: Southern Star Central Gas Pipeline, Inc.

CSI048

TSP: 007906233

12/6/2019 12:15:35 AM

Gas Quality Reports

LS195 - St. Joe 26" at Ottawa

Page 3 of 3

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	1,037.5	1,019.4	0.598	1,341.67	-140.34	1.917	0.507	91.799	5.385	0.341	0.014	0.024	0.004	0.004	0.006
12/02/2019	1,037.0	1,018.9	0.596	1,343.04	-142.21	1.813	0.481	92.037	5.395	0.243	0.008	0.014	0.003	0.003	0.005
12/03/2019	1,036.4	1,018.4	0.596	1,342.35	-142.54	1.838	0.486	92.005	5.421	0.222	0.007	0.012	0.002	0.002	0.005
12/04/2019	1,035.4	1,017.3	0.596	1,341.19	-142.79	1.906	0.472	92.064	5.264	0.261	0.009	0.015	0.002	0.002	0.004

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 = 52762