

Gas Quality Reports

LS235 - Sedalia 20" 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%)
09/06/2019	1,063.8	1,045.2	0.615	1,356.14	-54.74	2.551	0.122	88.696	7.416	1.083	0.043	0.067	0.008	0.007	0.006
09/07/2019	1,062.8	1,044.3	0.614	1,356.52	-54.24	2.369	0.191	89.020	7.278	1.006	0.042	0.069	0.010	0.008	0.008
09/08/2019	1,066.5	1,047.9	0.616	1,358.54	-49.53	2.332	0.219	88.752	7.386	1.158	0.047	0.078	0.010	0.008	0.009
09/09/2019	1,058.8	1,040.3	0.613	1,352.11	-57.29	2.567	0.179	89.028	7.153	0.950	0.038	0.063	0.008	0.007	0.007
09/10/2019	1,058.8	1,040.3	0.613	1,352.11	-57.29	2.567	0.179	89.028	7.153	0.950	0.038	0.063	0.008	0.007	0.007
09/11/2019	1,058.8	1,040.3	0.613	1,352.11	-57.29	2.567	0.179	89.028	7.153	0.950	0.038	0.063	0.008	0.007	0.007
09/12/2019	1,053.6	1,035.2	0.610	1,348.76	-66.94	2.763	0.072	89.241	7.062	0.781	0.026	0.042	0.006	0.005	0.005
09/13/2019	1,053.7	1,035.3	0.609	1,350.30	-65.32	2.631	0.073	89.603	6.785	0.810	0.031	0.050	0.007	0.005	0.006
09/14/2019	1,059.1	1,040.6	0.611	1,354.86	-57.26	2.433	0.123	89.450	6.895	0.985	0.036	0.058	0.008	0.006	0.008
09/15/2019	1,042.9	1,024.7	0.604	1,342.05	-134.38	2.604	0.205	90.399	6.209	0.522	0.018	0.030	0.004	0.004	0.005
09/16/2019	1,047.3	1,029.0	0.605	1,346.36	-72.03	2.408	0.234	90.350	6.314	0.618	0.023	0.037	0.006	0.004	0.006
09/17/2019	1,052.5	1,034.1	0.608	1,349.84	-60.20	2.472	0.165	89.918	6.549	0.790	0.032	0.050	0.008	0.006	0.009
09/18/2019	1,044.1	1,025.9	0.604	1,343.66	-72.54	2.335	0.330	90.676	6.002	0.581	0.023	0.036	0.006	0.005	0.007
09/19/2019	1,053.0	1,034.6	0.611	1,347.06	-65.20	2.846	0.092	89.194	6.892	0.890	0.026	0.045	0.005	0.004	0.005
09/20/2019	1,059.1	1,040.6	0.613	1,353.22	-53.47	2.542	0.141	89.279	6.841	1.062	0.041	0.069	0.009	0.007	0.009
09/21/2019	1,058.7	1,040.2	0.613	1,351.63	-49.59	2.631	0.158	89.212	6.693	1.161	0.044	0.072	0.011	0.008	0.011
09/22/2019	1,061.7	1,043.2	0.615	1,353.60	-47.05	2.580	0.179	88.996	6.837	1.248	0.049	0.081	0.011	0.008	0.011
09/23/2019	1,062.5	1,044.0	0.614	1,355.86	-52.33	2.463	0.155	89.079	7.007	1.161	0.042	0.072	0.008	0.006	0.008
09/24/2019	1,059.2	1,040.7	0.607	1,359.38	-58.28	2.076	0.108	90.246	6.540	0.911	0.036	0.059	0.008	0.006	0.009
09/25/2019	1,059.4	1,040.9	0.609	1,357.84	-57.68	2.202	0.117	89.933	6.693	0.934	0.037	0.061	0.009	0.006	0.008
09/26/2019	1,046.8	1,028.6	0.606	1,344.36	-131.33	2.804	0.072	89.812	6.636	0.618	0.017	0.028	0.004	0.003	0.004
09/27/2019	1,053.9	1,035.6	0.611	1,348.72	-63.55	2.660	0.151	89.361	6.876	0.849	0.032	0.055	0.006	0.005	0.005
09/28/2019	1,046.2	1,027.9	0.608	1,341.91	-130.91	2.862	0.149	89.614	6.687	0.618	0.021	0.036	0.005	0.004	0.004
09/29/2019	1,051.0	1,032.7	0.608	1,348.13	-67.73	2.566	0.153	89.815	6.648	0.726	0.028	0.047	0.006	0.005	0.006
09/30/2019	1,047.8	1,029.5	0.608	1,344.23	-72.40	2.759	0.138	89.743	6.612	0.662	0.027	0.046	0.005	0.005	0.004
10/01/2019	1,053.4	1,035.1	0.610	1,349.03	-66.04	2.634	0.135	89.475	6.848	0.811	0.031	0.050	0.006	0.005	0.005
10/02/2019	1,063.5	1,044.9	0.612	1,359.37	-51.43	2.173	0.180	89.465	7.000	1.045	0.042	0.066	0.010	0.007	0.011
10/03/2019	1,056.4	1,037.9	0.609	1,353.95	-53.46	2.006	0.365	90.247	6.313	0.924	0.043	0.073	0.010	0.008	0.011
10/04/2019	1,044.9	1,026.7	0.607	1,341.52	-70.27	2.765	0.195	89.936	6.387	0.642	0.022	0.035	0.006	0.005	0.007
10/05/2019	1,042.4	1,024.2	0.603	1,342.92	-135.01	2.369	0.295	90.856	5.854	0.559	0.019	0.031	0.005	0.004	0.007
10/06/2019	1,045.6	1,027.3	0.607	1,342.05	-65.50	2.794	0.167	89.986	6.220	0.744	0.027	0.042	0.007	0.005	0.008
10/07/2019	1,037.6	1,019.5	0.601	1,338.38	-137.47	2.613	0.234	90.985	5.609	0.494	0.019	0.029	0.006	0.004	0.007
10/08/2019	1,044.6	1,026.4	0.606	1,341.87	-72.18	2.771	0.160	90.007	6.380	0.611	0.021	0.033	0.006	0.004	0.006
10/09/2019	1,044.6	1,026.4	0.606	1,341.87	-72.18	2.771	0.160	90.007	6.380	0.611	0.021	0.033	0.006	0.004	0.006
10/10/2019	1,033.9	1,015.8	0.604	1,330.41	-137.89	3.227	0.155	90.110	6.036	0.430	0.012	0.020	0.003	0.003	0.003
10/11/2019	1,044.9	1,026.7	0.608	1,340.03	-69.17	2.988	0.132	89.577	6.575	0.652	0.023	0.035	0.006	0.005	0.007
10/12/2019	1,054.5	1,036.1	0.610	1,349.60	-56.57	2.612	0.150	89.518	6.683	0.924	0.034	0.054	0.009	0.006	0.010
10/13/2019	1,031.9	1,013.9	0.601	1,331.37	-139.95	2.899	0.252	90.927	5.467	0.385	0.018	0.033	0.006	0.006	0.007
10/14/2019	1,046.0	1,027.8	0.606	1,343.56	-67.60	2.613	0.215	90.180	6.220	0.673	0.030	0.048	0.007	0.006	0.007
10/15/2019	1,044.6	1,026.3	0.606	1,341.50	-70.33	2.742	0.199	90.034	6.313	0.628	0.025	0.041	0.006	0.006	0.007
10/16/2019	1,036.0	1,017.9	0.597	1,340.31	-141.03	2.106	0.408	91.790	5.293	0.358	0.012	0.020	0.004	0.003	0.005
10/17/2019	1,057.7	1,039.3	0.611	1,353.19	-57.95	2.513	0.120	89.400	6.908	0.954	0.032	0.051	0.008	0.005	0.008
10/18/2019	1,045.3	1,027.1	0.607	1,342.17	-71.13	2.885	0.091	89.874	6.411	0.656	0.025	0.041	0.006	0.005	0.005

Gas Quality Reports

LS235 - Sedalia 20" 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	1,053.7	1,035.4	0.610	1,349.52	-62.33	2.674	0.091	89.513	6.751	0.874	0.031	0.049	0.006	0.005	0.006
10/20/2019	1,064.8	1,046.2	0.616	1,356.68	-47.56	2.555	0.120	88.874	6.997	1.257	0.058	0.112	0.011	0.009	0.008
10/21/2019	1,048.4	1,030.1	0.608	1,344.67	-71.76	2.784	0.120	89.658	6.660	0.709	0.022	0.035	0.004	0.004	0.004
10/22/2019	1,048.4	1,030.1	0.608	1,344.67	-71.76	2.784	0.120	89.658	6.660	0.709	0.022	0.035	0.004	0.004	0.004
10/23/2019	1,048.4	1,030.1	0.608	1,344.67	-71.76	2.784	0.120	89.658	6.660	0.709	0.022	0.035	0.004	0.004	0.004
10/24/2019	1,045.0	1,026.8	0.607	1,340.80	-71.02	2.971	0.103	89.633	6.592	0.631	0.020	0.033	0.005	0.005	0.006
10/25/2019	1,059.2	1,040.7	0.613	1,352.46	-54.75	2.623	0.134	89.063	7.000	1.053	0.040	0.064	0.008	0.006	0.008
10/26/2019	1,045.6	1,027.4	0.608	1,340.97	-62.93	2.947	0.128	89.730	6.350	0.750	0.029	0.044	0.008	0.005	0.009
10/27/2019	1,046.1	1,027.9	0.610	1,339.85	-59.64	3.053	0.137	89.476	6.422	0.812	0.031	0.046	0.008	0.006	0.010
10/28/2019	1,034.5	1,016.4	0.594	1,342.64	-144.23	1.809	0.426	92.581	4.830	0.316	0.011	0.017	0.003	0.002	0.005
10/29/2019	1,037.4	1,019.3	0.594	1,346.18	-65.17	1.578	0.475	92.908	4.535	0.372	0.030	0.062	0.013	0.015	0.013
10/30/2019	1,036.9	1,018.8	0.598	1,340.42	-139.73	2.069	0.455	91.741	5.288	0.373	0.018	0.035	0.007	0.007	0.008
10/31/2019	1,036.0	1,017.9	0.597	1,341.10	-141.40	1.913	0.491	92.061	5.137	0.340	0.015	0.027	0.005	0.005	0.007
11/01/2019	1,053.1	1,034.7	0.609	1,348.86	-58.40	2.537	0.195	89.710	6.585	0.857	0.035	0.056	0.009	0.007	0.009
11/02/2019	1,055.0	1,036.6	0.612	1,348.10	-55.94	2.806	0.124	89.142	6.812	0.987	0.040	0.065	0.009	0.006	0.008
11/03/2019	1,054.3	1,035.9	0.612	1,347.44	-55.99	2.799	0.143	89.194	6.756	0.988	0.037	0.060	0.008	0.006	0.009
11/04/2019	1,057.7	1,039.2	0.615	1,349.05	-52.97	2.794	0.164	88.846	6.971	1.095	0.040	0.066	0.009	0.006	0.009
11/05/2019	1,045.5	1,027.2	0.604	1,345.09	-132.93	2.357	0.280	90.579	6.096	0.618	0.020	0.034	0.005	0.004	0.006
11/06/2019	1,049.5	1,031.2	0.609	1,344.82	-70.33	2.885	0.079	89.425	6.789	0.745	0.024	0.040	0.005	0.004	0.004
11/07/2019	1,042.0	1,023.8	0.605	1,339.32	-133.91	2.945	0.105	89.945	6.422	0.523	0.019	0.030	0.004	0.003	0.003
11/08/2019	1,059.3	1,040.8	0.612	1,354.04	-57.82	2.562	0.091	89.202	7.033	1.000	0.036	0.057	0.008	0.005	0.007
11/09/2019	1,057.1	1,038.7	0.612	1,350.99	-62.96	2.548	0.199	89.143	7.106	0.903	0.035	0.052	0.005	0.004	0.004
11/10/2019	1,063.8	1,045.3	0.615	1,356.01	-52.73	2.467	0.187	88.830	7.218	1.154	0.046	0.076	0.009	0.007	0.006
11/11/2019	1,062.5	1,044.0	0.613	1,357.25	-56.94	2.245	0.221	89.243	7.179	0.983	0.042	0.066	0.008	0.006	0.006
11/12/2019	1,065.5	1,047.0	0.612	1,361.89	-54.52	1.851	0.318	89.539	7.187	0.972	0.040	0.068	0.009	0.008	0.008
11/13/2019	1,067.8	1,049.2	0.616	1,360.04	-51.56	2.076	0.345	88.772	7.612	1.040	0.047	0.081	0.011	0.009	0.007
11/14/2019	1,063.9	1,045.4	0.616	1,355.84	-55.07	2.242	0.348	88.800	7.482	0.982	0.045	0.077	0.010	0.008	0.006
11/15/2019	1,064.0	1,045.5	0.615	1,356.73	-55.33	2.158	0.357	88.938	7.435	0.973	0.043	0.073	0.009	0.008	0.006
11/16/2019	1,063.7	1,045.2	0.617	1,354.37	-54.72	2.424	0.305	88.546	7.557	1.018	0.045	0.083	0.009	0.008	0.005
11/17/2019	1,064.4	1,045.9	0.614	1,358.04	-55.16	2.172	0.287	89.029	7.383	0.993	0.042	0.070	0.009	0.007	0.007
11/18/2019	1,052.9	1,034.5	0.609	1,349.20	-67.39	2.592	0.135	89.551	6.904	0.731	0.026	0.043	0.006	0.005	0.005
11/19/2019	1,052.9	1,034.5	0.609	1,349.20	-67.39	2.592	0.135	89.551	6.904	0.731	0.026	0.043	0.006	0.005	0.005
11/20/2019	1,052.9	1,034.5	0.609	1,349.20	-67.39	2.592	0.135	89.551	6.904	0.731	0.026	0.043	0.006	0.005	0.005
11/21/2019	1,066.4	1,047.8	0.619	1,355.07	-38.57	2.474	0.319	88.359	7.497	1.109	0.062	0.123	0.020	0.020	0.015
11/22/2019	1,062.7	1,044.1	0.614	1,355.88	-51.89	2.382	0.213	88.938	7.373	0.942	0.042	0.076	0.012	0.011	0.009
11/23/2019	1,054.5	1,036.1	0.609	1,350.84	-62.55	2.495	0.159	89.573	6.910	0.762	0.030	0.049	0.008	0.006	0.007
11/24/2019	1,045.6	1,027.4	0.608	1,340.67	-131.02	2.957	0.139	89.450	6.808	0.573	0.022	0.039	0.005	0.005	0.003
11/25/2019	1,051.3	1,033.0	0.609	1,346.62	-66.65	2.712	0.150	89.443	6.885	0.719	0.028	0.045	0.007	0.006	0.006
11/26/2019	1,056.9	1,038.5	0.612	1,350.99	-60.79	2.620	0.147	89.113	7.135	0.884	0.031	0.052	0.007	0.006	0.006
11/27/2019	1,052.8	1,034.5	0.609	1,348.63	-68.62	2.624	0.144	89.441	6.986	0.724	0.025	0.041	0.006	0.005	0.005
11/28/2019	1,058.4	1,039.9	0.611	1,353.75	-60.48	2.454	0.148	89.297	7.136	0.857	0.033	0.055	0.008	0.006	0.006
11/29/2019	1,052.0	1,033.6	0.610	1,347.07	-60.78	2.711	0.146	89.444	6.837	0.752	0.033	0.053	0.009	0.007	0.008
11/30/2019	1,053.8	1,035.4	0.611	1,348.55	-59.98	2.699	0.130	89.341	6.900	0.817	0.034	0.056	0.008	0.007	0.008

TSP Name: Southern Star Central Gas Pipeline, Inc.

CSI048

TSP: 007906233

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Gas Quality Reports

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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	1,045.1	1,026.9	0.608	1,340.36	-131.23	3.055	0.076	89.417	6.818	0.566	0.020	0.035	0.005	0.004	0.004
12/02/2019	1,063.4	1,044.8	0.616	1,354.33	-51.41	2.637	0.155	88.562	7.370	1.117	0.048	0.088	0.009	0.007	0.007
12/03/2019	1,063.8	1,045.2	0.616	1,355.50	-53.11	2.412	0.250	88.680	7.506	1.005	0.043	0.078	0.010	0.009	0.007
12/04/2019	1,067.6	1,049.0	0.618	1,358.60	-47.49	2.291	0.278	88.619	7.477	1.149	0.056	0.099	0.012	0.010	0.009

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 = 52763