



Produced Gas Isotope and Compositional Analyses

**Crestone Peak Resources Produced Gases
Colorado**

Crestone Peak Resources

May 20, 2019

GeoMark

PRODUCED GAS ISOTOPE ANALYSIS

Crestone Peak Resources

Crestone Peak Resources Produced Gases, Colorado

Sample ID	Cylinder ID Number	COGCC ID	Sampling Date	Sampling Time	Shipment	Casing Pressure (psia)	Stable Carbon Isotopes										δD Methane (‰)	δ13C CO2 (‰)
							δ13C Methane (‰)	δ13C Ethane (‰)	δ13C Propane (‰)	δ13C i-Butane (‰)	δ13C n-Butane (‰)	δ13C i-Pentane (‰)	δ13C n-Pentane (‰)	δ13C Hexane (‰)	δ13C Heptane (‰)	δ13C Octane (‰)		
Mathews 4F-14H - Intermediate CSG		431882	12/12/2018	1:50 PM	4th Shipment		-44.8	-33.5	-29.5	-32.2	-29.0						-301	-16.1
Mathews 4F-14H - Production CSG		431882	12/12/2018	1:45 PM	4th Shipment		-51.3	-33.9	-29.7	-31.8	-29.7						-268	-9.2
Mathews 4G-14H - Intermediate CSG		431879	12/12/2018	1:35 PM	4th Shipment		-45.3	-32.0	-30.5	-31.1	-29.6						-261	
Mathews 4G-14H - Production CSG		431879	12/12/2018	1:40 PM	4th Shipment		-52.0	-34.2	-30.4	-31.0	-29.9						-263	-11.3
Melbon Ranch 13-17 - Production CSG		426096	9/25/2018	9:00 AM	1st Shipment		-48.9	-34.8	-29.2	-29.4	-25.7						-255	-2.0
Melbon Ranch 13-17 - Surface CSG		426096	9/25/2018	9:00 AM	1st Shipment		-49.8	-34.8	-29.4	-32.8	-30.1						-258	
Melbon Ranch 2-8-17 - Production CSG		426104	10/1/2018	8:40 AM	1st Shipment		-49.5	-32.6	-29.6	-31.7	-28.9						-255	-0.8
Melbon Ranch 2-8-17 - Surface CSG		426104	10/1/2018	8:40 AM	1st Shipment		-50.0	-32.7	-29.7	-32.3	-29.4						-260	
Melbon Ranch 33-17 - Production CSG		426101	10/1/2018	12:15 PM	1st Shipment		-50.1	-31.6	-29.5	-31.6	-28.4						-262	-0.7
Melbon Ranch 33-17 - Surface CSG		426101	10/1/2018	12:09 PM	1st Shipment		-53.8	-34.4	-30.3	-31.8	-29.2						-259	
Melbon Ranch 4-6-17 - Surface CSG		426102	10/1/2018	9:50 AM	1st Shipment		-52.0	-36.5	-31.3	-32.9	-30.0						-252	
Melbon Ranch 4C-17H - Surface CSG		457071	11/26/2018	9:00 AM	4th Shipment		-49.8	-33.6	-28.0								-255	
Melbon Ranch 4D-17H - Surface CSG		457075	11/26/2018	9:10 AM	4th Shipment													
Melbon Ranch 4E-17H - Surface CSG		457067	11/26/2018	10:50 AM	4th Shipment		-49.0	-33.1	-29.2								-252	
Melbon Ranch 4I-17H - Surface CSG		457068	11/26/2018	9:20 AM	4th Shipment		-55.6	-34.3	-29.2								-280	
Melbon Ranch 4J-17H - Surface CSG		457070	11/26/2018	9:30 AM	4th Shipment		-47.9	-32.6	-29.7								-240	
Melbon Ranch 4K-17H - Surface CSG		457073	11/26/2018	9:05 AM	4th Shipment		-48.6	-33.0	-29.3								-251	
Melbon Ranch 6-4-17 - Production CSG		426094	10/1/2018	12:45 PM	1st Shipment		-49.1	-33.5	-29.0	-32.2	-29.1						-256	-1.3
Melbon Ranch 6-4-17 - Surface CSG		426094	10/1/2018	12:43 PM	1st Shipment		-51.7	-33.7	-30.7	-31.0	-28.7						-257	
Rasmussen 31-28 - Production CSG		284430	12/1/2019	2:33 PM	6th Shipment		-49.1	-31.8	-29.2	-31.6	-29.3						-238	1.1
Regnier Farms 43-19 - Production CSG		276476	2/15/2019	9:00 AM	8th Shipment		-49.8	-34.4	-30.0	-31.8	-28.7						-225	-5.1
Regnier Farms 43-19 - Surface CSG		276476	2/15/2019	9:00 AM	8th Shipment		-56.6	-34.6	-31.8	-32.1	-30.4						-207	-13.6
Ross 11-19 - Production CSG		422585	11/28/2018	10:00 AM	4th Shipment		-49.8	-32.4	-29.0	-30.8	-28.5						-244	-7.6
Ross 11-19 - Surface CSG		422585	11/28/2018	10:00 AM	4th Shipment		-57.5	-34.9	-32.2								-219	
Ross 4-2-19 - Production CSG		422581	11/28/2018	10:30 AM	4th Shipment		-50.0	-32.8	-29.4	-30.0	-28.7						-245	-1.1
Ross 4-2-19 - Surface CSG		422581	11/28/2018	10:30 AM	4th Shipment		-52.6	-34.3	-30.0	-31.8	-29.6						-248	
Ross F Unit 1 - Production CSG		244457	10/31/2018	9:30 AM	2nd Shipment		-49.5	-33.7	-28.5	-32.6	-28.2						-244	1.1
Ross F Unit 1 - Surface CSG		244457	10/31/2018	9:25 AM	5th Shipment		-52.7	-32.6	-28.1	-30.7	-27.4						-269	-16.4
Ruegge 30-4H - Production CSG		454445	12/4/2018	2:20 PM	4th Shipment		-50.5	-34.4	-30.1	-32.7	-30.1						-272	-17.2
Ruegge 30-4H - Surface CSG		454445	12/4/2018	2:25 PM	4th Shipment		-51.4	-34.4	-30.3	-32.8	-30.2						-272	
Sam 3B-25H - Surface CSG		453466	12/19/2018	9:30 AM	5th Shipment		-53.0	-34.9	-30.6									-15.3
Sam 3C-25H - Surface CSG		453462	12/19/2018	9:40 AM	5th Shipment		-54.0	-35.4	-29.7									
Sam 3G-25H - Surface CSG		453470	12/19/2018	9:45 AM	5th Shipment		-53.6	-35.8	-30.2									-14.7
Sam 3J-25H - Surface CSG		453467	12/19/2018	-	5th Shipment		-52.0	-34.8	-30.4									-13.3
Sam 3K-25H - Surface CSG		453459	12/19/2018	9:50 AM	5th Shipment		-53.1	-34.4	-28.6									-14.1
Sam 3M-25H - Surface CSG		453468	12/19/2018	10:00 AM	5th Shipment		-51.4	-34.5	-30.4								-311	
Sam 3M-25H - Surface CSG		453568	1/30/2019	4:30 PM	6th Shipment		-51.3	-34.3	-30.7								-265	
Sam 3N-25H - Surface CSG		453560	12/19/2018	10:10 AM	5th Shipment		-52.4	-32.7	-27.4									-13.8
Sam 3O-25H - Surface CSG		453471	12/19/2018	10:15 AM	5th Shipment		-51.2	-34.5	-27.7								-308	
Sam 3O-25H - Surface CSG		453471	1/31/2019	7:30 AM	6th Shipment		-51.5	-34.2	-28.1								-284	

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PRODUCED GAS ISOTOPE ANALYSIS

Crestone Peak Resources

Crestone Peak Resources Produced Gases, Colorado

Sample ID	Cylinder ID Number	COGCC ID	Sampling Date	Sampling Time	Shipment	Casing Pressure (psia)	Produce Gas Composition																Specific Gravity (Air = 1.0)	
							H ₂ Conc. (mole %)	H ₂ Conc. (mole %)	O ₂ +Ar Conc. (mole %)	N ₂ Conc. (mole %)	CO ₂ Conc. (mole %)	H ₂ S Conc. (mole %)	CO Conc. (mole %)	C ₁ Conc. (mole %)	C ₂ Conc. (mole %)	C ₂ H ₄ Conc. (mole %)	C ₃ Conc. (mole %)	C ₃ H ₆ Conc. (mole %)	iC ₄ Conc. (mole %)	nC ₄ Conc. (mole %)	iC ₅ Conc. (mole %)	nC ₅ Conc. (mole %)		C ₆ + Conc. (mole %)
Mathews 4F-14H - Intermediate CSG		431882	12/12/2018	1:50 PM	4th Shipment		0.00	0.00	0.53	3.41	0.03	0.00	0.04	92.10	1.65	0.00	1.35	0.00	0.19	0.41	0.09	0.09	0.10	0.607
Mathews 4F-14H - Production CSG		431882	12/12/2018	1:45 PM	4th Shipment		0.00	2.50	0.22	1.70	0.14	0.00	0.03	80.93	10.38	0.00	3.35	0.00	0.26	0.42	0.03	0.02	0.01	0.645
Mathews 4G-14H - Intermediate CSG		431879	12/12/2018	1:35 PM	4th Shipment		0.00	0.00	0.33	1.20	0.00	0.00	0.04	98.20	0.08	0.00	0.07	0.00	0.01	0.03	0.01	0.01	0.02	0.563
Mathews 4G-14H - Production CSG		431879	12/12/2018	1:40 PM	4th Shipment		0.00	1.80	0.28	2.37	0.25	0.00	0.04	92.84	0.56	0.01	0.56	0.01	0.21	0.53	0.06	0.04	0.01	0.585
Melbon Ranch 13-17 - Production CSG		426096	9/25/2018	9:00 AM	1st Shipment		0.00	0.36	1.13	4.21	1.48	0.00	0.00	71.63	13.04	0.00	5.26	0.00	0.69	1.58	0.27	0.25	0.10	0.750
Melbon Ranch 13-17 - Surface CSG		426096	9/25/2018	9:00 AM	1st Shipment		0.00	0.02	1.08	5.64	0.01	0.00	0.00	75.90	9.01	0.00	5.55	0.00	0.74	1.34	0.30	0.24	0.18	0.726
Melbon Ranch 2-8-17 - Production CSG		426104	10/1/2018	8:40 AM	1st Shipment		0.00	0.38	1.95	7.43	1.96	0.00	0.00	67.64	12.10	0.00	5.35	0.00	0.68	1.60	0.33	0.37	0.22	0.775
Melbon Ranch 2-8-17 - Surface CSG		426104	10/1/2018	8:40 AM	1st Shipment		0.00	0.22	2.26	10.42	0.01	0.00	0.00	60.75	13.13	0.00	7.16	0.00	1.19	2.97	0.63	0.69	0.57	0.841
Melbon Ranch 33-17 - Production CSG		426101	10/1/2018	12:15 PM	1st Shipment		0.00	0.90	1.05	4.13	1.34	0.00	0.00	73.35	11.74	0.00	4.41	0.00	0.58	1.40	0.33	0.34	0.21	0.737
Melbon Ranch 33-17 - Surface CSG		426101	10/1/2018	12:09 PM	1st Shipment		0.00	0.02	1.08	5.64	0.01	0.00	0.00	75.90	9.01	0.00	5.55	0.00	0.74	1.34	0.30	0.24	0.18	0.726
Melbon Ranch 4-6-17 - Surface CSG		426102	10/1/2018	9:50 AM	1st Shipment		0.00	0.00	0.32	2.52	0.00	0.00	0.00	81.13	8.82	0.00	5.25	0.00	0.58	0.90	0.16	0.13	0.18	0.691
Melbon Ranch 4C-17H - Surface CSG		457071	11/26/2018	9:00 AM	4th Shipment		0.00	7.14	0.43	3.07	0.00	0.00	0.04	86.59	2.63	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.548
Melbon Ranch 4D-17H - Surface CSG		457075	11/26/2018	9:10 AM	4th Shipment		0.00	92.91	0.22	6.81	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.133
Melbon Ranch 4E-17H - Surface CSG		457067	11/26/2018	10:50 AM	4th Shipment		0.00	83.92	0.66	14.32	0.00	0.00	0.00	0.98	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.211
Melbon Ranch 4J-17H - Surface CSG		457068	11/26/2018	9:20 AM	4th Shipment		0.00	78.04	1.59	20.14	0.01	0.00	0.00	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.269
Melbon Ranch 4J-17H - Surface CSG		457070	11/26/2018	9:30 AM	4th Shipment		0.00	44.74	2.24	49.32	0.00	0.00	0.00	3.21	0.36	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.03	0.557
Melbon Ranch 4K-17H - Surface CSG		457073	11/26/2018	9:05 AM	4th Shipment		0.00	88.50	0.25	10.81	0.00	0.00	0.00	0.39	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.172
Melbon Ranch 6-4-17 - Production CSG		426094	10/1/2018	12:45 PM	1st Shipment		0.00	0.67	2.24	8.40	1.36	0.00	0.00	66.19	12.37	0.00	5.42	0.00	0.68	1.63	0.35	0.40	0.28	0.778
Melbon Ranch 6-4-17 - Surface CSG		426094	10/1/2018	12:43 PM	1st Shipment		0.00	0.05	0.63	3.05	0.01	0.00	0.00	82.01	10.91	0.00	2.44	0.00	0.22	0.35	0.07	0.06	0.20	0.662
Rasmussen 31-28 - Production CSG		289430	1/21/2019	2:33 PM	6th Shipment		0.00	0.03	0.36	1.64	2.15	0.00	0.00	77.52	11.49	0.00	4.47	0.00	0.64	1.27	0.21	0.18	0.06	0.719
Regnier Farms 43-19 - Production CSG		276476	2/15/2019	9:00 AM	8th Shipment		0.00	0.12	1.76	6.85	0.54	0.00	0.10	73.31	10.44	0.00	4.54	0.00	0.59	1.34	0.22	0.17	0.02	0.728
Regnier Farms 43-19 - Surface CSG		276476	2/15/2019	9:00 AM	8th Shipment		0.00	0.01	3.78	16.37	0.02	0.00	0.11	71.63	4.10	0.00	2.72	0.00	0.47	0.57	0.12	0.08	0.04	0.709
Ross 11-19 - Production CSG		422585	11/28/2018	10:00 AM	4th Shipment		0.00	0.43	0.25	1.18	1.37	0.00	0.03	74.99	12.61	0.00	5.67	0.00	0.74	1.66	0.35	0.39	0.33	0.745
Ross 11-19 - Surface CSG		422585	11/28/2018	10:00 AM	4th Shipment		0.00	0.00	20.01	78.19	0.00	0.00	0.00	1.66	0.05	0.00	0.06	0.00	0.00	0.01	0.00	0.00	0.00	0.989
Ross 4-2-19 - Production CSG		422581	11/28/2018	10:30 AM	4th Shipment		0.00	2.02	0.25	1.30	0.96	0.00	0.03	72.68	12.49	0.00	5.75	0.00	0.82	2.07	0.52	0.62	0.49	0.753
Ross 4-2-19 - Surface CSG		422581	11/28/2018	10:30 AM	4th Shipment		0.00	0.01	0.21	1.85	0.00	0.00	0.03	81.37	9.18	0.00	4.64	0.00	0.61	1.27	0.31	0.28	0.24	0.697
Ross F Unit 1 - Production CSG		244457	10/31/2018	9:30 AM	2nd Shipment		0.00	0.14	0.27	1.13	1.87	0.00	0.03	72.82	13.50	0.00	6.22	0.00	0.88	2.27	0.45	0.35	0.07	0.766
Ross F Unit 1 - Surface CSG		244457	10/31/2018	9:25 AM	5th Shipment		0.00	0.06	1.02	10.21	0.01	0.00	0.00	86.76	1.20	0.00	0.45	0.00	0.07	0.11	0.04	0.02	0.06	0.617
Ruegge 3D-4H - Production CSG		454445	12/4/2018	2:20 PM	4th Shipment		0.00	0.23	0.16	2.12	0.03	0.00	0.03	74.81	13.99	0.00	5.79	0.00	0.62	1.43	0.27	0.29	0.23	0.733
Ruegge 3D-4H - Surface CSG		454445	12/4/2018	2:25 PM	4th Shipment		0.00	0.22	0.36	2.93	0.00	0.00	0.03	72.46	14.41	0.00	6.31	0.00	0.69	1.60	0.31	0.33	0.34	0.752
Sam 3B-25H - Surface CSG		453466	12/18/2018	9:30 AM	5th Shipment		0.00	89.86	1.31	8.73	0.01	0.00	0.00	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.162
Sam 3C-25H - Surface CSG		453462	12/18/2018	9:40 AM	5th Shipment		0.00	88.18	1.02	10.66	0.00	0.00	0.00	0.11	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.177
Sam 3G-25H - Surface CSG		453470	12/18/2018	9:45 AM	5th Shipment		0.00	84.17	2.27	13.42	0.01	0.00	0.00	0.11	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.214
Sam 3J-25H - Surface CSG		453463	12/18/2018	-	5th Shipment		0.00	83.84	1.85	14.12	0.01	0.00	0.00	0.14	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.217
Sam 3K-25H - Surface CSG		453459	12/18/2018	9:50 AM	5th Shipment		0.00	91.71	0.74	7.43	0.01	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.145
Sam 3M-25H - Surface CSG		453468	12/18/2018	10:00 AM	5th Shipment		0.00	90.41	0.47	8.63	0.00	0.00	0.00	0.42	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.155
Sam 3M-25H - Surface CSG		453568	1/30/2019	4:30 PM	6th Shipment		0.00	94.59	0.10	4.92	0.00	0.00	0.00	0.31	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.117
Sam 3N-25H - Surface CSG		453560	12/18/2018	10:10 AM	5th Shipment		0.00	71.42	4.19	24.30	0.01	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.332
Sam 3O-25H - Surface CSG		453471	10/15/2018	10:15 AM	4th Shipment		0.00	88.80	0.40	10.30	0.00	0.00	0.00	0.45	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.169
Sam 3O-25H - Surface CSG		453471	1/31/2019	7:30 AM	6th Shipment		0.00	93.79	0.11	5.71	0.00	0.00	0.00	0.36	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.124

GeoMark

PRODUCED GAS ISOTOPE ANALYSIS

Crestone Peak Resources

Crestone Peak Resources Produced Gases, Colorado

Sample ID	Cylinder ID Number	COGCC ID	Sampling Date	Sampling Time	Shipment	Casing Pressure (psia)	Hydrocarbon Gas Composition							
							C1 Conc. (mole %)	C2 Conc. (mole %)	C3 Conc. (mole %)	iC4 Conc. (mole %)	nC4 Conc. (mole %)	iC5 Conc. (mole %)	nC5 Conc. (mole %)	C6+ Conc. (mole %)
Mathews 4F-14H - Intermediate CSG		431882	12/12/2018	1:50 PM	4th Shipment		95.95	1.72	1.41	0.20	0.42	0.10	0.10	0.10
Mathews 4F-14H - Production CSG		431882	12/12/2018	1:45 PM	4th Shipment		84.82	10.88	3.51	0.27	0.44	0.03	0.02	0.01
Mathews 4G-14H - Intermediate CSG		431879	12/12/2018	1:35 PM	4th Shipment		92.77	0.09	0.07	0.01	0.03	0.01	0.01	0.02
Mathews 4G-14H - Production CSG		431879	12/12/2018	1:40 PM	4th Shipment		97.46	0.59	1.06	0.22	0.55	0.06	0.04	0.01
Melbon Ranch 13-17 - Production CSG		426096	9/25/2018	9:00 AM	1st Shipment		77.16	14.05	5.67	0.74	1.71	0.29	0.27	0.11
Melbon Ranch 13-17 - Surface CSG		426096	9/25/2018	9:00 AM	1st Shipment		81.39	9.66	5.95	0.79	1.44	0.32	0.25	0.19
Melbon Ranch 2-8-17 - Production CSG		426104	10/1/2018	8:40 AM	1st Shipment		76.82	13.71	6.06	0.77	1.81	0.38	0.41	0.25
Melbon Ranch 2-8-17 - Surface CSG		426104	10/1/2018	8:40 AM	1st Shipment		69.75	15.08	8.22	1.37	3.41	0.73	0.79	0.65
Melbon Ranch 33-17 - Production CSG		426101	10/1/2018	12:15 PM	1st Shipment		79.22	12.69	4.76	0.62	1.51	0.36	0.42	0.41
Melbon Ranch 33-17 - Surface CSG		426101	10/1/2018	12:09 PM	1st Shipment		81.39	9.66	5.95	0.79	1.44	0.32	0.25	0.19
Melbon Ranch 4-6-17 - Surface CSG		426102	10/1/2018	9:50 AM	1st Shipment		83.51	9.08	5.41	0.59	0.93	0.16	0.14	0.19
Melbon Ranch 4C-17H - Surface CSG		457071	11/26/2018	9:00 AM	4th Shipment		96.94	2.94	0.11	0.00	0.00	0.00	0.00	0.00
Melbon Ranch 4D-17H - Surface CSG		457075	11/26/2018	9:10 AM	4th Shipment		89.96	6.59	1.36	0.00	0.00	0.00	0.00	2.10
Melbon Ranch 4E-17H - Surface CSG		457067	11/26/2018	10:50 AM	4th Shipment		89.49	6.91	1.48	0.12	0.21	0.05	0.09	1.66
Melbon Ranch 4I-17H - Surface CSG		457068	11/26/2018	9:20 AM	4th Shipment		82.81	5.80	1.94	0.27	0.57	0.25	0.44	7.93
Melbon Ranch 4J-17H - Surface CSG		457070	11/26/2018	9:30 AM	4th Shipment		86.93	9.74	2.22	0.09	0.14	0.02	0.02	0.84
Melbon Ranch 4K-17H - Surface CSG		457073	11/26/2018	9:05 AM	4th Shipment		89.74	7.24	2.32	0.15	0.22	0.01	0.07	0.25
Melbon Ranch 6-4-17 - Production CSG		426094	10/1/2018	12:45 PM	1st Shipment		75.80	14.17	6.20	0.78	1.87	0.40	0.46	0.32
Melbon Ranch 6-4-17 - Surface CSG		426094	10/1/2018	12:43 PM	1st Shipment		85.20	11.34	2.53	0.23	0.37	0.07	0.06	0.20
Rasmussen 31-28 - Production CSG		288430	1/21/2019	2:33 PM	8th Shipment		80.80	11.99	4.66	0.67	1.32	0.21	0.18	0.07
Regnier Farms 43-19 - Production CSG		276476	2/15/2019	9:00 AM	8th Shipment		80.89	11.52	5.01	0.65	1.47	0.24	0.19	0.02
Regnier Farms 43-19 - Surface CSG		276476	2/15/2019	9:00 AM	8th Shipment		89.85	5.14	3.41	0.59	0.71	0.15	0.10	0.05
Ross 11-19 - Production CSG		422585	11/28/2018	10:00 AM	4th Shipment		77.52	13.03	5.86	0.77	1.71	0.36	0.40	0.34
Ross 11-19 - Surface CSG		422585	11/28/2018	10:00 AM	4th Shipment		92.29	2.86	3.43	0.00	0.70	0.15	0.17	0.40
Ross 4-2-19 - Production CSG		422581	11/28/2018	10:30 AM	4th Shipment		76.15	13.09	6.02	0.86	2.17	0.55	0.65	0.52
Ross 4-2-19 - Surface CSG		422581	11/28/2018	10:30 AM	4th Shipment		83.12	9.38	4.74	0.62	1.30	0.31	0.28	0.24
Ross F Unit 1 - Production CSG		244457	10/31/2018	9:30 AM	2nd Shipment		75.42	13.98	6.44	0.91	2.35	0.46	0.36	0.08
Ross F Unit 1 - Surface CSG		244457	10/31/2018	9:25 AM	5th Shipment		97.81	1.35	0.51	0.07	0.12	0.04	0.03	0.07
Ruegge 30-4H - Production CSG		454445	12/4/2018	2:20 PM	4th Shipment		76.78	14.36	5.94	0.63	1.47	0.28	0.30	0.24
Ruegge 30-4H - Surface CSG		454445	12/4/2018	2:25 PM	4th Shipment		75.13	14.94	6.54	0.72	1.65	0.32	0.34	0.35
Sam 3B-25H - Surface CSG		453466	12/18/2018	9:30 AM	5th Shipment		86.37	9.75	2.95	0.28	0.65	0.00	0.00	0.00
Sam 3C-25H - Surface CSG		453462	12/18/2018	9:40 AM	5th Shipment		80.80	11.56	5.18	0.48	1.16	0.27	0.45	0.00
Sam 3G-25H - Surface CSG		453470	12/18/2018	9:45 AM	5th Shipment		80.81	12.77	4.63	0.50	0.99	0.30	0.00	0.00
Sam 3J-25H - Surface CSG		453467	12/18/2018	-	5th Shipment		78.25	12.60	6.29	0.65	1.51	0.29	0.42	0.00
Sam 3K-25H - Surface CSG		453459	12/18/2018	9:50 AM	5th Shipment		88.32	7.91	2.73	0.24	0.52	0.00	0.28	0.00
Sam 3M-25H - Surface CSG		453468	12/18/2018	10:00 AM	5th Shipment		84.91	10.54	3.60	0.27	0.46	0.06	0.04	0.00
Sam 3N-25H - Surface CSG		453568	1/30/2019	4:30 PM	6th Shipment		80.05	12.39	5.57	0.50	1.02	0.18	0.17	0.12
Sam 3O-25H - Surface CSG		453560	12/18/2018	10:10 AM	5th Shipment		84.10	11.29	3.43	0.45	0.72	0.00	0.00	0.00
Sam 3O-25H - Surface CSG		453471	12/18/2018	10:15 AM	5th Shipment		92.47	5.43	1.59	0.14	0.29	0.03	0.06	0.00
Sam 3O-25H - Surface CSG		453471	1/31/2019	7:30 AM	6th Shipment		89.92	6.74	2.25	0.18	0.40	0.09	0.07	0.35

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PRODUCED GAS ISOTOPE ANALYSIS

Crestone Peak ResourcesCrestone Peak Resources Produced Gases, Colorado

Sample ID	Cylinder ID Number	COGCC ID	Sampling Date	Sampling Time	Shipment	Casing Pressure (psia)	BTU Content		Calculated Ratios			
							Total Gas (BTU/lb3)	Hydrocar. Gas (BTU/lb3)	Total HC Gas (ppm by mole)	Wetness (C2 - nC5) (C1 - nC5)	C1/C2 Ratio (mole/mole)	iC4/nC4 Ratio (mole/mole)
Mathews 4F-14H - Intermediate CSG		431882	12/12/2018	1:50 PM	4th Shipment		1,025	1,068	959,915	3.95	56	0.48
Mathews 4F-14H - Production CSG		431882	12/12/2018	1:45 PM	4th Shipment		1,110	1,164	954,154	15.17	8	0.62
Mathews 4G-14H - Intermediate CSG		431879	12/12/2018	1:35 PM	4th Shipment		998	1,014	984,256	0.21	1150	0.36
Mathews 4G-14H - Production CSG		431879	12/12/2018	1:40 PM	4th Shipment		1,002	1,051	952,580	2.53	164	0.40
Melbon Ranch 13-17 - Production CSG		426096	9/25/2018	9:00 AM	1st Shipment		1,186	1,278	928,301	22.75	5	0.43
Melbon Ranch 13-17 - Surface CSG		426096	9/25/2018	9:00 AM	1st Shipment		1,163	1,248	932,537	18.46	8	0.55
Melbon Ranch 2-8-17 - Production CSG		426104	10/1/2018	8:40 AM	1st Shipment		1,144	1,296	882,818	23.19	6	0.42
Melbon Ranch 2-8-17 - Surface CSG		426104	10/1/2018	8:40 AM	1st Shipment		1,242	1,426	870,919	29.79	5	0.40
Melbon Ranch 33-17 - Production CSG		426101	10/1/2018	12:15 PM	1st Shipment		1,171	1,265	925,819	20.45	6	0.41
Melbon Ranch 33-17 - Surface CSG		426101	10/1/2018	12:09 PM	1st Shipment		1,163	1,248	932,537	18.46	8	0.55
Melbon Ranch 4-6-17 - Surface CSG		426102	10/1/2018	9:50 AM	1st Shipment		1,176	1,211	971,560	16.34	9	0.64
Melbon Ranch 4C-17H - Surface CSG		457071	11/26/2018	9:00 AM	4th Shipment		924	1,034	893,267	3.06	33	1.49
Melbon Ranch 4D-17H - Surface CSG		457075	11/26/2018	9:10 AM	4th Shipment		1	1,159	596	8.12	14	#DIV/0!
Melbon Ranch 4E-17H - Surface CSG		457067	11/26/2018	10:50 AM	4th Shipment		13	1,158	10,939	9.01	13	0.58
Melbon Ranch 4I-17H - Surface CSG		457068	11/26/2018	9:20 AM	4th Shipment		3	1,420	2,167	10.06	14	0.47
Melbon Ranch 4J-17H - Surface CSG		457070	11/26/2018	9:30 AM	4th Shipment		43	1,155	36,640	12.33	9	0.63
Melbon Ranch 4K-17H - Surface CSG		457073	11/26/2018	9:05 AM	4th Shipment		5	1,120	4,319	10.03	12	0.66
Melbon Ranch 6-4-17 - Production CSG		426094	10/1/2018	12:45 PM	1st Shipment		1,143	1,308	873,338	23.96	5	0.42
Melbon Ranch 6-4-17 - Surface CSG		426094	10/1/2018	12:43 PM	1st Shipment		1,116	1,159	962,587	14.63	8	0.62
Rasmussen 31-28 - Production CSG		289430	1/21/2019	2:53 PM	6th Shipment		1,179	1,230	958,257	19.05	7	0.51
Regnier Farms 43-19 - Production CSG		276476	2/15/2019	9:00 AM	8th Shipment		1,119	1,234	906,249	19.09	7	0.44
Regnier Farms 43-19 - Surface CSG		276476	2/15/2019	9:00 AM	8th Shipment		908	1,139	797,209	10.10	17	0.83
Ross 11-19 - Production CSG		422585	11/28/2018	10:00 AM	4th Shipment		1,247	1,289	967,361	22.21	6	0.45
Ross 11-19 - Surface CSG		422585	11/28/2018	10:00 AM	4th Shipment		20	1,124	18,024	7.34	32	0.00
Ross 4-2-19 - Production CSG		422581	11/28/2018	10:30 AM	4th Shipment		1,263	1,323	954,473	23.46	6	0.40
Ross 4-2-19 - Surface CSG		422581	11/28/2018	10:30 AM	4th Shipment		1,197	1,223	978,906	16.67	9	0.48
Ross F Unit 1 - Production CSG		244457	10/31/2018	9:30 AM	2nd Shipment		1,269	1,314	965,600	24.53	5	0.39
Ross F Unit 1 - Surface CSG		244457	10/31/2018	9:25 AM	5th Shipment		920	1,037	887,053	2.13	72	0.60
Ruegge 3O-4H - Production CSG		454445	12/4/2018	2:20 PM	4th Shipment		1,249	1,282	974,356	23.03	5	0.43
Ruegge 3O-4H - Surface CSG		454445	12/4/2018	2:25 PM	4th Shipment		1,262	1,308	964,532	24.60	5	0.44
Sam 3B-25H - Surface CSG		453466	12/18/2018	9:30 AM	5th Shipment		1	1,149	895	13.63	9	0.43
Sam 3C-25H - Surface CSG		453462	12/18/2018	9:40 AM	5th Shipment		2	1,234	1,345	19.10	7	0.42
Sam 3G-25H - Surface CSG		453470	12/18/2018	9:45 AM	5th Shipment		2	1,219	1,388	19.19	6	0.50
Sam 3J-25H - Surface CSG		453467	12/18/2018	-	5th Shipment		2	1,270	1,732	21.75	6	0.43
Sam 3K-25H - Surface CSG		453459	12/18/2018	9:50 AM	5th Shipment		1	1,137	1,119	11.68	11	0.47
Sam 3M-25H - Surface CSG		453468	12/18/2018	10:00 AM	5th Shipment		6	1,165	4,916	15.90	8	0.56
Sam 3M-25H - Surface CSG		453568	1/30/2019	4:30 PM	6th Shipment		5	1,237	3,899	19.85	6	0.49
Sam 3N-25H - Surface CSG		453560	12/18/2018	10:10 AM	5th Shipment		1	1,174	814	15.90	7	0.63
Sam 3O-25H - Surface CSG		453471	12/18/2018	10:15 AM	5th Shipment		5	1,087	4,872	7.53	17	0.50
Sam 3O-25H - Surface CSG		453471	1/31/2019	7:30 AM	6th Shipment		4	1,126	3,961	9.76	13	0.46