

Lab #: 733587 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2A-2H Production CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16192108
 Formation:
 Sampling Point: 429491
 Date Sampled: 8/27/2019 16:30 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0127			
Hydrogen -----	0.204			
Argon -----	0.0071			
Oxygen -----	0.11			
Nitrogen -----	0.77			
Carbon Dioxide -----	0.97	1.4		
Methane -----	79.01	-49.3	-252	
Ethane -----	11.65	-33.4		
Ethylene -----	0.0001			
Propane -----	4.71	-29.2		
Propylene -----	nd			
Iso-butane -----	0.550	-31.2		
N-butane -----	1.29	-28.5		
Iso-pentane -----	0.266	-28.4		
N-pentane -----	0.298	-28.0		
Hexanes + -----	0.155			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1220

Specific gravity, calculated: 0.710

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733588 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2A-2H Surface CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16192108
 Formation:
 Sampling Point: 429491
 Date Sampled: 8/27/2019 16:10 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0153			
Hydrogen -----	0.0112			
Argon -----	0.642			
Oxygen -----	15.10			
Nitrogen -----	55.90			
Carbon Dioxide -----	0.053	-11.8		
Methane -----	24.19	-55.7	-233	
Ethane -----	1.48	-34.5		
Ethylene -----	nd			
Propane -----	1.49	-31.4		
Propylene -----	nd			
Iso-butane -----	0.280	-32.1		
N-butane -----	0.465	-29.5		
Iso-pentane -----	0.134	-28.6		
N-pentane -----	0.125	-28.2		
Hexanes + -----	0.111			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 349

Specific gravity, calculated: 0.914

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733589 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2B-2H Production CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16192108
 Formation:
 Sampling Point: 429490
 Date Sampled: 8/27/2019 16:00 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0120			
Hydrogen -----	0.332			
Argon -----	0.0063			
Oxygen -----	0.092			
Nitrogen -----	0.69			
Carbon Dioxide -----	1.23	2.0		
Methane -----	76.37	-49.1	-251	
Ethane -----	12.22	-33.0		
Ethylene -----	0.0003			
Propane -----	5.57	-29.2		
Propylene -----	nd			
Iso-butane -----	0.713	-31.6		
N-butane -----	1.74	-28.2		
Iso-pentane -----	0.370	-28.4		
N-pentane -----	0.411	-27.8		
Hexanes + -----	0.239			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1259

Specific gravity, calculated: 0.737

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733590 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2B-2H Surface CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16192108
 Formation:
 Sampling Point: 429490
 Date Sampled: 8/27/2019 15:45 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0385			
Hydrogen -----	nd			
Argon -----	0.127			
Oxygen -----	2.81			
Nitrogen -----	12.52			
Carbon Dioxide -----	0.013			
Methane -----	72.86	-55.9	-234	
Ethane -----	4.42	-34.5		
Ethylene -----	nd			
Propane -----	4.41	-31.1		
Propylene -----	nd			
Iso-butane -----	0.768	-32.0		
N-butane -----	1.25	-30.0		
Iso-pentane -----	0.317	-28.7		
N-pentane -----	0.284	-28.6		
Hexanes + -----	0.182			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1028

Specific gravity, calculated: 0.732

Remarks: Insufficient CO2 concentration for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733591 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Shaffer Newman 0-6-13 Production CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16192341
 Formation:
 Sampling Point: 296096
 Date Sampled: 8/28/2019 10:50 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0079			
Hydrogen -----	0.298			
Argon -----	0.0413			
Oxygen -----	0.96			
Nitrogen -----	3.57			
Carbon Dioxide -----	1.56	1.5		
Methane -----	69.79	-48.2	-237	
Ethane -----	12.83	-31.5		
Ethylene -----	0.0002			
Propane -----	6.18	-28.1		
Propylene -----	nd			
Iso-butane -----	0.975	-31.4		
N-butane -----	2.35	-27.7		
Iso-pentane -----	0.611	-28.3		
N-pentane -----	0.634	-27.4		
Hexanes + -----	0.191			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1263

Specific gravity, calculated: 0.787

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733592 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Shaffer Newman 0-6-13 Surface CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16192341
 Formation:
 Sampling Point: 296096
 Date Sampled: 8/28/2019 10:50 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0654			
Hydrogen -----	nd			
Argon -----	0.116			
Oxygen -----	2.44			
Nitrogen -----	11.58			
Carbon Dioxide -----	0.011			
Methane -----	80.08	-57.0	-225	
Ethane -----	3.20	-33.5		
Ethylene -----	nd			
Propane -----	1.74	-29.6		
Propylene -----	nd			
Iso-butane -----	0.277	-31.3		
N-butane -----	0.330	-28.7		
Iso-pentane -----	0.0721	-28.6		
N-pentane -----	0.0486	-28.4		
Hexanes + -----	0.0432			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 940

Specific gravity, calculated: 0.661

Remarks: Insufficient CO2 concentration for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733593 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2C-2H Production CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191919
 Formation:
 Sampling Point: 459176
 Date Sampled: 8/27/2019 14:00 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0096			
Hydrogen -----	0.374			
Argon -----	0.0073			
Oxygen -----	0.074			
Nitrogen -----	0.73			
Carbon Dioxide -----	0.013			
Methane -----	84.42	-49.0	-250	
Ethane -----	10.18	-33.2		
Ethylene -----	nd			
Propane -----	3.10	-29.5		
Propylene -----	nd			
Iso-butane -----	0.299	-31.4		
N-butane -----	0.587	-28.3		
Iso-pentane -----	0.0918	-28.1		
N-pentane -----	0.0876	-28.0		
Hexanes + -----	0.0293			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1155

Specific gravity, calculated: 0.652

Remarks: Insufficient CO2 concentration for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733594 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2C-2H Surface CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191919
 Formation:
 Sampling Point: 459176
 Date Sampled: 8/27/2019 13:50 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0225			
Hydrogen -----	0.0252			
Argon -----	0.0306			
Oxygen -----	0.12			
Nitrogen -----	2.64			
Carbon Dioxide -----	0.006			
Methane -----	89.91	-50.9	-247	
Ethane -----	6.61	-34.1		
Ethylene -----	0.0002			
Propane -----	0.627	-27.3		
Propylene -----	0.0001			
Iso-butane -----	0.0041			
N-butane -----	0.0013			
Iso-pentane -----	0.0002			
N-pentane -----	0.0002			
Hexanes + -----	0.0005			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1046

Specific gravity, calculated: 0.604

Remarks: Insufficient butane, pentane and CO2 concentrations for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733595 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2H-2H Production CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191924
 Formation:
 Sampling Point: 459173
 Date Sampled: 8/27/2019 11:30 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0093			
Hydrogen -----	0.0960			
Argon -----	0.232			
Oxygen -----	5.32			
Nitrogen -----	19.13			
Carbon Dioxide -----	0.036			
Methane -----	62.39	-49.0	-250	
Ethane -----	8.54	-33.2		
Ethylene -----	nd			
Propane -----	2.81	-29.3		
Propylene -----	nd			
Iso-butane -----	0.272	-31.6		
N-butane -----	0.567	-28.1		
Iso-pentane -----	0.0918	-28.3		
N-pentane -----	0.0952	-27.8		
Hexanes + -----	0.406			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 910

Specific gravity, calculated: 0.758

Remarks: Insufficient CO2 concentration for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733596 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2H-2H Surface CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191924
 Formation:
 Sampling Point: 459173
 Date Sampled: 8/27/2019 11:10 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0900			
Hydrogen -----	nd			
Argon -----	0.612			
Oxygen -----	13.53			
Nitrogen -----	53.79			
Carbon Dioxide -----	0.048			
Methane -----	31.85	-55.0	-227	
Ethane -----	0.0718			
Ethylene -----	nd			
Propane -----	0.0051			
Propylene -----	nd			
Iso-butane -----	0.0002			
N-butane -----	0.0003			
Iso-pentane -----	0.0001			
N-pentane -----	0.0002			
Hexanes + -----	0.0006			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 324

Specific gravity, calculated: 0.856

Remarks: Could not resolve C2 peak.
 Insufficient propane, butane, pentane and CO2 concentrations for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733597 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2J-2H Production CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191926
 Formation:
 Sampling Point: 459167
 Date Sampled: 8/27/2019 9:54 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0081			
Hydrogen -----	0.125			
Argon -----	0.0246			
Oxygen -----	0.16			
Nitrogen -----	2.19			
Carbon Dioxide -----	0.043			
Methane -----	77.89	-49.1	-252	
Ethane -----	12.47	-32.8		
Ethylene -----	nd			
Propane -----	4.71	-29.3		
Propylene -----	nd			
Iso-butane -----	0.505	-31.2		
N-butane -----	1.10	-28.8		
Iso-pentane -----	0.203	-28.5		
N-pentane -----	0.226	-27.6		
Hexanes + -----	0.341			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1218

Specific gravity, calculated: 0.710

Remarks: Insufficient CO₂ concentration for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733598 Job #: 42753 IS-94649 Co. Job#: _____
 Sample Name: Echeverria 2J-2H Surface CSG Co. Lab#: _____
 Company: Crestone Peak Resources
 API/Well: _____
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191926
 Formation: _____
 Sampling Point: 459167
 Date Sampled: 8/27/2019 9:50 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.870			
Oxygen -----	21.10			
Nitrogen -----	77.96			
Carbon Dioxide -----	0.070	-12.0		
Methane -----	0.0011			
Ethane -----	nd			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.000

Remarks: Insufficient hydrocarbon concentrations for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 733599 Job #: 42753 IS-94649 Co. Job#:
 Sample Name: Echeverria 2I-2H Surface CSG Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: 16191625
 Formation:
 Sampling Point: 459171
 Date Sampled: 8/27/2019 10:50 Date Received: 9/09/2019 Date Reported: 10/07/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0197			
Hydrogen -----	nd			
Argon -----	0.0192			
Oxygen -----	0.18			
Nitrogen -----	1.87			
Carbon Dioxide -----	0.006			
Methane -----	88.05	-50.9	-251	
Ethane -----	7.56	-35.1		
Ethylene -----	0.0001			
Propane -----	2.14	-29.6		
Propylene -----	nd			
Iso-butane -----	0.104	-31.4		
N-butane -----	0.0523	-26.6		
Iso-pentane -----	0.0005			
N-pentane -----	0.0006			
Hexanes + -----	0.0014			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1087

Specific gravity, calculated: 0.622

Remarks: Insufficient pentane and CO2 concentrations for isotopic analysis.
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.