

Lab #: 746662 Job #: 43749 IS-94649 Co. Job#:
 Sample Name: Wandell 6-4-7 / Production Casing Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: W63907
 Formation:
 Sampling Point: 420130
 Date Sampled: 12/10/2019 8:00 Date Received: 12/16/2019 Date Reported: 1/23/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0154			
Hydrogen -----	1.07			
Argon -----	0.0099			
Oxygen -----	0.18			
Nitrogen -----	0.89			
Carbon Dioxide -----	0.92	0.2		
Methane -----	75.67	-49.6	-255	
Ethane -----	12.18	-34.2		
Ethylene -----	nd			
Propane -----	5.76	-30.0		
Propylene -----	nd			
Iso-butane -----	0.728	-31.6		
N-butane -----	1.86	-28.4		
Iso-pentane -----	0.336	-28.7		
N-pentane -----	0.324	-28.4		
Hexanes + -----	0.0562			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1249

Specific gravity, calculated: 0.729

Remarks: Isotopes obtained online via GC-C-IRMS/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 #: 746663 Job #: 43749 IS-94649 Co. Job#:
 Sample Name: Wandell 6-4-7 / Surface Casing Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: W63907
 Formation:
 Sampling Point: 420130
 Date Sampled: 12/10/2019 7:55 Date Received: 12/16/2019 Date Reported: 1/23/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0441			
Hydrogen -----	nd			
Argon -----	0.0352			
Oxygen -----	0.70			
Nitrogen -----	3.76			
Carbon Dioxide -----	0.013			
Methane -----	55.25	-52.2	-250	
Ethane -----	17.55	-34.1		
Ethylene -----	nd			
Propane -----	15.92	-29.9		
Propylene -----	0.0002			
Iso-butane -----	1.72	-31.5		
N-butane -----	3.99	-28.6		
Iso-pentane -----	0.490	-28.7		
N-pentane -----	0.424	-28.2		
Hexanes + -----	0.108			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1509

Specific gravity, calculated: 0.916

Remarks: Insufficient CO2 concentration for isotopic analysis. Isotopes obtained online via GC-C-IRMS/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. %.