



Well Name: GCU 226 E
API# 30 - 045 - 524948
Casing Sampled: Bradenhead
Sample Type Gas

ANALYSIS REPORT

Lab #: 721225 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 226E Bradenhead 30-045-24948 Co. Lab#:
Company: BP America, Inc
API/Well:
Container: IsoTube®
Field/Site Name: SJS Bradenhead
Location: Farmington NM
Formation:
Sampling Point:
Date Sampled: 5/23/2019 14:01 Date Received: 5/31/2019 Date Reported: 6/25/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0127			
Hydrogen -----	0.105			
Argon -----	0.0095			
Oxygen -----	0.012			
Nitrogen -----	1.86			
Carbon Dioxide -----	nd			
Methane -----	92.65	-44.76	-231.6	
Ethane -----	3.49	-29.59		
Ethylene -----	nd			
Propane -----	1.17	-27.32		
Propylene -----	0.0001			
Iso-butane -----	0.239	-28.94		
N-butane -----	0.258	-27.77		
Iso-pentane -----	0.0850	-27.59		
N-pentane -----	0.0503	-27.40		
Hexanes + -----	0.0573			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1056

Specific gravity, calculated: 0.601

MMOCB
JUL 11 2019
DISTRICT III

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. %.



ANALYSIS REPORT

Well Name: GCU 224 E
API# 30-045-24948
Casing Sampled: Casing-Production
Sample Type: Gas

Lab #: 721226 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 224 E Prod. Casing 30-045-24948 Co. Lab#:
Company: BP America, Inc
API/Well:
Container: IsoTube®
Field/Site Name: SJS Bradenhead
Location: Farmington NM
Formation:
Sampling Point:
Date Sampled: 5/23/2019 13:54 Date Received: 5/31/2019 Date Reported: 6/25/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0251			
Hydrogen -----	0.311			
Argon -----	0.0059			
Oxygen -----	0.014			
Nitrogen -----	0.80			
Carbon Dioxide -----	0.80			
Methane -----	68.33	-45.58	-222.0	
Ethane -----	8.77	-31.65		
Ethylene -----	nd			
Propane -----	8.59	-29.41		
Propylene -----	nd			
Iso-butane -----	2.20	-30.19		
N-butane -----	5.23	-28.08		
Iso-pentane -----	2.11	-27.54		
N-pentane -----	1.77	-26.83		
Hexanes + -----	1.04			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1521

Specific gravity, calculated: 0.897

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. %.



ANALYSIS REPORT

Well Name: GCU 226 E
API# 30 - DHS - 24948
Casing Sampled: Tubing
Sample Type: Gas

Lab #: 721227 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 226 E Tubing 30-045-24948 Co. Lab#:
Company: BP America, Inc
API/Well:
Container: IsoTube®
Field/Site Name: SJS Bradenhead
Location: Farmington NM
Formation:
Sampling Point:
Date Sampled: 5/23/2019 13:50 Date Received: 5/31/2019 Date Reported: 6/25/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0359			
Hydrogen -----	nd			
Argon -----	0.0066			
Oxygen -----	0.027			
Nitrogen -----	0.57			
Carbon Dioxide -----	1.13			
Methane -----	76.65	-42.47	-216.1	
Ethane -----	11.24	-31.45		
Ethylene -----	nd			
Propane -----	6.25	-29.01		
Propylene -----	nd			
Iso-butane -----	0.943	-29.80		
N-butane -----	1.71	-27.73		
Iso-pentane -----	0.465	-27.58		
N-pentane -----	0.362	-26.78		
Hexanes + -----	0.612			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1287

Specific gravity, calculated: 0.752

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. %.



Well Name: GCU 226E
API# 30-045-24948
Casing Sampled: Bradenhead
Sample Type: Gas
(303) 523-0022

Analysis No: SO190021
Cust No: 15950-10565

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU #226E; BHD
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: PC
Cust. Stn. No.: API 3004524948

Source: BRADENHEAD
Well Flowing: Y
Pressure: 122.8 PSIA
Flow Temp: DEG. F
Ambient Temp: 67 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 12.11 PM
Sampled By: EUGENIA HAMILTON
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	1.9194	1.8767	0.2120	0.00	0.0186
CO2	0.0025	0.0024	0.0000	0.00	0.0000
Methane	92.4629	90.4054	15.7070	933.88	0.5122
Ethane	3.5682	3.4888	0.9560	63.15	0.0370
Propane	1.2248	1.1975	0.3380	30.82	0.0186
Iso-Butane	0.2613	0.2555	0.0860	8.50	0.0052
N-Butane	0.2811	0.2748	0.0890	9.17	0.0056
I-Pentane	0.1041	0.1018	0.0380	4.16	0.0026
N-Pentane	0.0664	0.0649	0.0240	2.66	0.0017
Hexane Plus	0.1093	0.1069	0.0490	5.76	0.0036
Total	100.0000	97.7747	17.4990	1058.09	0.6052

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0023
BTU/CU.FT IDEAL: 1060.5
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1063.0
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1044.5
DRY BTU @ 15.025: 1084.3
REAL SPECIFIC GRAVITY: 0.6063

CYLINDER #: 7010
CYLINDER PRESSURE: 118 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 10:54:21 AM
ANALYSIS RUN BY: SHYANN ELLEDGE

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 04/12/2019

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: GCU #226E; BHD
Stn. No.: API 3004524948
Mtr. No.:

BRADENHEAD
PC

04/12/2019
15950-10565

Smpl Date:	04/09/2019	06/15/2018
Test Date:	04/10/2019	07/05/2018
Run No:	SO190021	SO180027
Nitrogen:	1.9194	1.2945
CO2:	0.0025	0.0042
Methane:	92.4629	91.3522
Ethane:	3.5682	4.5056
Propane:	1.2248	1.7298
I-Butane:	0.2613	0.3458
N-Butane:	0.2811	0.3921
I-Pentane:	0.1041	0.1433
N-Pentane:	0.0664	0.0923
Hexane+:	0.1093	0.1402
BTU:	1063.0	1092.0
GPM:	17.4990	17.7390
SPG:	0.6063	0.6183



Well Name: GCU 224 E
API# 30-045-24948
Casing Sampled: Production
Sample Type: GAS

Analysis No: SO190022
Cust No: 15950-10575

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU #226E; CSG
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: PC
Cust. Str. No.: API 3004524948

Source: CASING
Well Flowing: Y
Pressure: 50.7 PSIA
Flow Temp: DEG. F
Ambient Temp: 67 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 12.21 PM
Sampled By: EUGENIA HAMILTON
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.7446	0.7238	0.0820	0.00	0.0072
CO2	0.7763	0.7546	0.1330	0.00	0.0118
Methane	68.0393	66.1384	11.6040	687.20	0.3769
Ethane	8.6774	8.4350	2.3350	153.56	0.0901
Propane	8.3602	8.1266	2.3170	210.35	0.1273
Iso-Butane	2.1211	2.0618	0.6980	68.98	0.0426
N-Butane	5.1500	5.0061	1.6330	168.01	0.1034
I-Pentane	2.2712	2.2077	0.8360	90.87	0.0566
N-Pentane	2.0375	1.9806	0.7430	81.68	0.0508
Hexane Plus	1.8224	1.7715	0.8180	96.06	0.0603
Total	100.0000	97.2061	21.1990	1556.70	0.9268

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0063
BTU/CU.FT IDEAL: 1560.3
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1570.0
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1542.7
DRY BTU @ 15.025: 1601.4
REAL SPECIFIC GRAVITY: 0.9322

CYLINDER #: 77064
CYLINDER PRESSURE: 51 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 02:18:17 PM
ANALYSIS RUN BY: RICHARD WILSON

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 04/12/2019

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: GCU #226E; CSG
Stn. No.: API 3004524948
Mtr. No.:

CASING
PC

04/12/2019
15950-10575

Smpl Date:	04/09/2019	06/15/2018
Test Date:	04/10/2019	07/05/2018
Run No:	SO190022	SO180029
Nitrogen:	0.7446	0.7692
CO2:	0.7763	0.7011
Methane:	68.0393	73.7886
Ethane:	8.6774	8.3565
Propane:	8.3602	6.6373
I-Butane:	2.1211	1.5135
N-Butane:	5.1500	3.5300
I-Pentane:	2.2712	1.5544
N-Pentane:	2.0375	1.4316
Hexane+:	1.8224	1.7178
BTU:	1570.0	1445.3
GPM:	21.1990	20.3390
SPG:	0.9322	0.8511



Well Name: GCU 226 E
API# 30-045-24948
Casing Sampled: Tubing
Sample Type: Gas

Analysis No: SO190023
Cust No: 15950-10570

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU #226E; TBG
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: PC
Cust. Stn. No.: API 3004524948

Source: TUBING
Well Flowing: Y
Pressure: 53.4 PSIA
Flow Temp: DEG. F
Ambient Temp: 67 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 12.28 PM
Sampled By: EUGENIA HAMILTON
Sampled by (CO): PESCO

Heat Trace:
Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.5098	0.4952	0.0560	0.00	0.0049
CO2	1.1009	1.0693	0.1890	0.00	0.0167
Methane	75.5644	73.3966	12.8600	763.20	0.4186
Ethane	11.6982	11.3626	3.1410	207.02	0.1215
Propane	6.6537	6.4628	1.8400	167.41	0.1013
Iso-Butane	0.9390	0.9121	0.3080	30.54	0.0188
N-Butane	1.7187	1.6694	0.5440	56.07	0.0345
I-Pentane	0.4595	0.4463	0.1690	18.38	0.0114
N-Pentane	0.3642	0.3538	0.1330	14.60	0.0091
Hexane Plus	0.9916	0.9632	0.4440	52.27	0.0328
Total	100.0000	97.1313	19.6840	1309.49	0.7696

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0041
BTU/CU.FT IDEAL: 1312.5
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1317.9
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1295.0
DRY BTU @ 15.025: 1344.3
REAL SPECIFIC GRAVITY: 0.7725

CYLINDER #: 7014
CYLINDER PRESSURE: 53 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 01:51:44 PM
ANALYSIS RUN BY: RICHARD WILSON

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 04/12/2019

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: GCU #226E; TBG
Stn. No.: API 3004524948
Mtr. No.:

TUBING
PC

04/12/2019
15950-10570

Smpl Date:	04/09/2019	06/15/2018
Test Date:	04/10/2019	07/05/2018
Run No:	SO190023	SO180028
Nitrogen:	0.5098	0.5213
CO2:	1.1009	1.0971
Methane:	75.5644	76.5394
Ethane:	11.6982	11.4263
Propane:	6.6537	6.2742
I-Butane:	0.9390	0.8757
N-Butane:	1.7187	1.5353
I-Pentane:	0.4595	0.3984
N-Pentane:	0.3642	0.3197
Hexane+:	0.9916	1.0126
BTU:	1317.9	1302.0
GPM:	19.6840	19.5610
SPG:	0.7725	0.7623