



Well Name: GCU 217E
API# 30-045-24645
Casing Sampled: Bradenhead
Sample Type: gas

2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: SO190018
Cust No: 15950-11230

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU #217E; BHD
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: PC
Cust. Str. No.: API 3004524645

Source: BRADENHEAD
Well Flowing: Y
Pressure: 167.3 PSIA
Flow Temp: DEG. F
Ambient Temp: 82 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 4.07 PM
Sampled By: EUGENIA HAMILTON
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

NMOC
JUL 11 2019
DISTRICT III

Analysis

Component:	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.2619	0.2568	0.0290	0.00	0.0025
CO2	0.0028	0.0027	0.0000	0.00	0.0000
Methane	90.1699	88.4133	15.3220	910.72	0.4995
Ethane	6.0165	5.8993	1.6130	106.47	0.0625
Propane	2.2242	2.1809	0.6140	55.96	0.0339
Iso-Butane	0.4332	0.4248	0.1420	14.09	0.0087
N-Butane	0.4712	0.4620	0.1490	15.37	0.0095
I-Pentane	0.1593	0.1562	0.0580	6.37	0.0040
N-Pentane	0.0996	0.0977	0.0360	3.99	0.0025
Hexane Plus	0.1614	0.1583	0.0720	8.51	0.0053
Total	100.0000	98.0520	18.0350	1121.49	0.6283

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0026
BTU/CU.FT IDEAL: 1124.1
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1127.0
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1107.4
DRY BTU @ 15.025: 1149.6
REAL SPECIFIC GRAVITY: 0.6297

CYLINDER #: 7000
CYLINDER PRESSURE: 160 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 11:25:05 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

GC Method: C6+ Gas

Last Cal/Verify: 04/12/2019



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: GCU #217E; BHD
Stn. No.: API 3004524645
Mtr. No.:

BRADENHEAD
PC

04/12/2019
15950-11230

Smpl Date:	04/09/2019	07/31/2018
Test Date:	04/10/2019	08/06/2018
Run No:	SO190018	SO180160
Nitrogen:	0.2619	0.2553
CO2:	0.0028	0.0025
Methane:	90.1699	90.0320
Ethane:	6.0165	6.0515
Propane:	2.2242	2.2548
I-Butane:	0.4332	0.4172
N-Butane:	0.4712	0.4887
I-Pentane:	0.1593	0.1663
N-Pentane:	0.0996	0.1076
Hexane+:	0.1614	0.2241
BTU:	1127.0	1131.1
GPM:	18.0350	18.0640
SPG:	0.6297	0.6322



Well Name: GCU 217 E
API# 30-045 24645
Casing Sampled: Production
Sample Type: Gas

2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: SO190019
Cust No: 15950-11235

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU #217E; CSG
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: GP/DK
Cust. Str. No.: API 3004524645

Source: CASING
Well Flowing: Y
Pressure: 27.4 PSIA
Flow Temp: DEG. F
Ambient Temp: 82 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 4.10 PM
Sampled By: EUGENIA HAMILTON
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.5656	0.5472	0.0620	0.00	0.0055
CO2	1.1287	1.0920	0.1930	0.00	0.0172
Methane	76.5102	74.0247	13.0220	772.75	0.4238
Ethane	10.8945	10.5406	2.9250	192.80	0.1131
Propane	5.6783	5.4938	1.5710	142.87	0.0865
Iso-Butane	0.7894	0.7638	0.2590	25.67	0.0158
N-Butane	1.7509	1.6940	0.5540	57.12	0.0351
I-Pentane	0.5369	0.5195	0.1970	21.48	0.0134
N-Pentane	0.5161	0.4993	0.1880	20.69	0.0129
Hexane Plus	1.6294	1.5765	0.7300	85.89	0.0539
Total	100.0000	96.7514	19.7010	1319.27	0.7771

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0042
BTU/CU.FT IDEAL: 1322.3
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1327.9
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1304.8
DRY BTU @ 15.025: 1354.5
REAL SPECIFIC GRAVITY: 0.7801

CYLINDER #: 7052
CYLINDER PRESSURE: 28 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 02:03:34 AM
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

GC Method: C6+ Gas

Last Cal/Verify: 04/12/2019



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: GCU #217E; CSG
Stn. No.: API 3004524645
Mtr. No.:

CASING
GP/DK

04/12/2019
15950-11235

Smpl Date:	04/09/2019	07/31/2018
Test Date:	04/10/2019	08/03/2018
Run No:	SO190019	SO180161
Nitrogen:	0.5656	0.6131
CO2:	1.1287	1.1107
Methane:	76.5102	74.7886
Ethane:	10.8945	10.6146
Propane:	5.6783	5.4655
I-Butane:	0.7894	0.7783
N-Butane:	1.7509	1.7939
I-Pentane:	0.5369	0.6405
N-Pentane:	0.5161	0.6592
Hexane+:	1.6294	3.5356
BTU:	1327.9	1413.3
GPM:	19.7010	20.2450
SPG:	0.7801	0.8353



Well Name: GCU 217E
API# 30-045-24645
Casing Sampled: Tubing
Sample Type: gas

2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: SO190020
Cust No: 15950-11490

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU 217E; TBG
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: GP / DK
Cust. Stn. No.: API 30-045-24645

Source: TUBING
Well Flowing: Y
Pressure: 28.9 PSIA
Flow Temp: DEG. F
Ambient Temp: 82 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 4.11 PM
Sampled By: EUGENIA HAMILTON
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	1.2971	1.2720	0.1430	0.00	0.0125
CO2	0.5534	0.5427	0.0950	0.00	0.0084
Methane	86.2476	84.5802	14.6590	871.10	0.4777
Ethane	7.8750	7.7227	2.1110	139.36	0.0818
Propane	2.4615	2.4139	0.6800	61.93	0.0375
Iso-Butane	0.3708	0.3636	0.1220	12.06	0.0074
N-Butane	0.4651	0.4561	0.1470	15.17	0.0093
I-Pentane	0.1417	0.1390	0.0520	5.67	0.0035
N-Pentane	0.1082	0.1061	0.0390	4.34	0.0027
Hexane Plus	0.4796	0.4703	0.2140	25.28	0.0159
Total	100.0000	98.0666	18.2620	1134.92	0.6568

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0028
BTU/CU.FT IDEAL: 1137.5
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1140.7
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1120.9
DRY BTU @ 15.025: 1163.5
REAL SPECIFIC GRAVITY: 0.6584

CYLINDER #: 8005
CYLINDER PRESSURE: 21 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 01:19:40 PM
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 217E; TBG
Stn. No.: API 30-045-24645
Mtr. No.:

TUBING
GP / DK

04/12/2019
15950-11490

Smpl Date: 04/09/2019
Test Date: 04/10/2019
Run No: SO190020

Nitrogen: 1.2971
CO2: 0.5534
Methane: 86.2476
Ethane: 7.8750
Propane: 2.4615
I-Butane: 0.3708
N-Butane: 0.4651
I-Pentane: 0.1417
N-Pentane: 0.1082
Hexane+: 0.4796

BTU: 1140.7
GPM: 18.2620
SPG: 0.6584



ANALYSIS REPORT

Well Name: GCU 217E
API# 30-045-24645
Casing Sampled: Bradenhead
Sample Type: Gas

Lab #: 721228 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 217E Bradenhead 30-045-24645 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 15:15 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 -----	0.0205			
Hydrogen -----	0.0286			
Argon -----	nd			
Oxygen -----	0.013			
Nitrogen -----	0.27			
Carbon Dioxide -----	nd			
Methane -----	89.81	-42.65	-204.6	
Ethane -----	6.07	-29.46		
Ethylene -----	0.0001			
Propane -----	2.30	-27.25		
Propylene -----	0.0002			
Iso-butane -----	0.436	-28.59		
N-butane -----	0.507	-26.67		
Iso-pentane -----	0.169	-26.91		
N-pentane -----	0.108	-26.21		
Hexanes + -----	0.272			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1132

Specific gravity, calculated: 0.632

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 217 E
API# 30-045-24645
Casing Sampled: Production
Sample Type: Gas

Lab #: 721229 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 217E Prod. Casing 30-045-24645 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 15:10 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 -----	0.0435			
Hydrogen -----	nd			
Argon -----	0.0073			
Oxygen -----	0.031			
Nitrogen -----	0.61			
Carbon Dioxide -----	1.05			
Methane -----	75.23	-45.15	-234.0	
Ethane -----	10.32	-33.12		
Ethylene -----	nd			
Propane -----	5.11	-29.82		
Propylene -----	nd			
Iso-butane -----	0.766	-30.27		
N-butane -----	1.95	-28.47		
Iso-pentane -----	0.820	-27.95		
N-pentane -----	0.905	-27.80		
Hexanes + -----	3.16			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1388

Specific gravity, calculated: 0.816

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 217 E
API# 30-045-24645
Casing Sampled: Tubing
Sample Type GAS

Lab #: 721230 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 217E Tubing 30-045-24645 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 15:00 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 -----	0.0307			
Hydrogen -----	0.0149			
Argon -----	0.0090			
Oxygen -----	0.021			
Nitrogen -----	0.82			
Carbon Dioxide -----	0.96			
Methane -----	88.42	-41.75	-201.1	
Ethane -----	7.24	-29.66		
Ethylene -----	nd			
Propane -----	1.69	-27.00		
Propylene -----	nd			
Iso-butane -----	0.226	-28.27		
N-butane -----	0.298	-26.49		
Iso-pentane -----	0.0914	-27.33		
N-pentane -----	0.0661	-26.27		
Hexanes + -----	0.115			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1098

Specific gravity, calculated: 0.631

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. %.