



Well Name: GCU 233
API# 30-045-11686
Casing Sampled: Bradenhead
Sample Type Gas

(505) 325-6622

Analysis No: SO190024
Cust No: 15950-10960

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: GCU 233; BHD
County/State: SAN JUAN NM
Location:
Lease/PA/CA:
Formation: PC
Cust. Str. No.: API 3004511686
Heat Trace: N
Remarks:

Source: BRADENHEAD
Well Flowing: Y
Pressure: 176.8 PSIA
Flow Temp: DEG. F
Ambient Temp: 72 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 04/09/2019
Sample Time: 10.14 AM
Sampled By: E. HAMILTON
Sampled by (CO): PESCO

NMCCD
DISTRICT III

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.5132	0.5024	0.0570	0.00	0.0050
CO2	0.0025	0.0024	0.0000	0.00	0.0000
Methane	89.6063	87.7214	15.2270	905.02	0.4963
Ethane	6.2734	6.1414	1.6820	111.02	0.0651
Propane	2.3717	2.3218	0.6550	59.67	0.0361
Iso-Butane	0.4094	0.4008	0.1340	13.31	0.0082
N-Butane	0.5072	0.4965	0.1600	16.55	0.0102
I-Pentane	0.1543	0.1511	0.0570	6.17	0.0038
N-Pentane	0.0929	0.0909	0.0340	3.72	0.0023
Hexane Plus	0.0691	0.0676	0.0310	3.64	0.0023
Total	100.0000	97.8963	18.0370	1119.12	0.6294

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0026
BTU/CU.FT IDEAL: 1121.7
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1124.6
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1105.0
DRY BTU @ 15.025: 1147.1
REAL SPECIFIC GRAVITY: 0.6308

CYLINDER #: 96846
CYLINDER PRESSURE: 173 PSIG
ANALYSIS DATE: 04/10/2019
ANALYSIS TIME: 01:34:28 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 233; BHD
Stn. No.:
Mtr. No.: API 3004511686

BRADENHEAD
PC

04/12/2019
15950-10960

Smpl Date:	04/09/2019	07/13/2018
Test Date:	04/10/2019	07/24/2018
Run No:	SO190024	SO180106
Nitrogen:	0.5132	0.4626
CO2:	0.0025	0.0021
Methane:	89.6063	89.1755
Ethane:	6.2734	6.4338
Propane:	2.3717	2.5413
I-Butane:	0.4094	0.4565
N-Butane:	0.5072	0.5740
I-Pentane:	0.1543	0.1720
N-Pentane:	0.0929	0.1044
Hexane+:	0.0691	0.0778
BTU:	1124.6	1132.9
GPM:	18.0370	18.1000
SPG:	0.6308	0.6355



Well Name: GCU
 API# 30-045-11686
 Casing Sampled: Production
 Sample Type: Gas
 (505) 325-6622

Analysis No: SO190025
 Cust No: 15950-10965

Well/Lease Information

Customer Name:	BP - SOUTH BHD PROJECT	Source:	CASING
Well Name:	GCU 233; CSG	Well Flowing:	Y
County/State:	SAN JUAN NM	Pressure:	8.2 PSIA
Location:		Flow Temp:	DEG. F
Lease/PA/CA:		Ambient Temp:	72 DEG. F
Formation:	PC	Flow Rate:	MCF/D
Cust. Stn. No.:		Sample Method:	Purge & Fill
	API 30045211686	Sample Date:	04/09/2019
		Sample Time:	2.22 PM
		Sampled By:	E. HAMILTON
		Sampled by (CO):	PESCO
Heat Trace:	N		
Remarks:	PRESSURED WITH HELIUM TO 30 LBS.		

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.4413	0.2193	0.0490	0.00	0.0043
CO2	4.0298	2.0024	0.6900	0.00	0.0612
Methane	84.6725	42.0741	14.3970	855.19	0.4690
Ethane	6.7478	3.3530	1.8100	119.42	0.0701
Propane	1.4212	0.7062	0.3930	35.76	0.0216
Iso-Butane	0.3308	0.1644	0.1090	10.76	0.0066
N-Butane	0.4347	0.2160	0.1370	14.18	0.0087
I-Pentane	0.2572	0.1278	0.0940	10.29	0.0064
N-Pentane	0.2095	0.1041	0.0760	8.40	0.0052
Hexane Plus	1.4552	0.7231	0.6510	76.70	0.0482
Total	100.0000	49.6904	18.4060	1130.70	0.7013

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z):	1.0032	CYLINDER #:	7036
BTU/CU.FT IDEAL:	1133.3	CYLINDER PRESSURE:	PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1137.0	ANALYSIS DATE:	04/10/2019
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1117.2	ANALYSIS TIME:	01:54:45 PM
DRY BTU @ 15.025:	1159.8	ANALYSIS RUN BY:	SHYANN ELLEDGE
REAL SPECIFIC GRAVITY:	0.7033		

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 233; CSG
Stn. No.:
Mtr. No.: API 30045211686

CASING
PC

04/12/2019
15950-10965

Smpl Date:	04/09/2019	07/13/2018
Test Date:	04/10/2019	07/23/2018
Run No:	SO190025	SO180107
Nitrogen:	0.4413	0.1437
CO2:	4.0298	3.9726
Methane:	84.6725	85.0200
Ethane:	6.7478	6.9837
Propane:	1.4212	1.5451
I-Butane:	0.3308	0.3301
N-Butane:	0.4347	0.4581
I-Pentane:	0.2572	0.2370
N-Pentane:	0.2095	0.1750
Hexane+:	1.4552	1.1347
BTU:	1137.0	1129.3
GPM:	18.4060	18.3610
SPG:	0.7033	0.6942



Well Name: GCU 233
API# 30 - 045 - 11686
Casing Sampled: Tubing
Sample Type: Gas

Analysis No: SO190026
Cust No: 15950-10970

Well/Lease Information

Customer Name:	BP - SOUTH BHD PROJECT	Source:	TUBING
Well Name:	GCU 233; TBG	Well Flowing:	Y
County/State:	SAN JUAN NM	Pressure:	8.1 PSIA
Location:		Flow Temp:	DEG. F
Lease/PA/CA:		Ambient Temp:	72 DEG. F
Formation:	PC	Flow Rate:	MCF/D
Cust. Str. No.:		Sample Method:	Purge & Fill
	API 30045211686	Sample Date:	04/09/2019
		Sample Time:	2:19 PM
		Sampled By:	E. HAMILTON
		Sampled by (CO):	PESCO
Heat Trace:	N		
Remarks:	PRESSURED WITH HELIUM TO 30 LBS.		

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.1936	0.0946	0.0210	0.00	0.0019
CO2	4.0510	1.9791	0.6930	0.00	0.0616
Methane	85.3588	41.7013	14.5110	862.12	0.4728
Ethane	6.7996	3.3219	1.8230	120.33	0.0706
Propane	1.4300	0.6986	0.3950	35.98	0.0218
Iso-Butane	0.3255	0.1590	0.1070	10.58	0.0065
N-Butane	0.4127	0.2016	0.1300	13.46	0.0083
I-Pentane	0.2121	0.1036	0.0780	8.49	0.0053
N-Pentane	0.1521	0.0743	0.0550	6.10	0.0038
Hexane Plus	1.0646	0.5201	0.4760	56.12	0.0352
Total	100.0000	48.8541	18.2890	1113.18	0.6877

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z):	1.003	CYLINDER #:	7066
BTU/CU.FT IDEAL:	1115.8	CYLINDER PRESSURE:	PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1119.1	ANALYSIS DATE:	04/10/2019
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1099.6	ANALYSIS TIME:	01:39:56 PM
DRY BTU @ 15.025:	1141.5	ANALYSIS RUN BY:	SHYANN ELLEDGE
REAL SPECIFIC GRAVITY:	0.6895		

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 233; TBG
Stn. No.:
Mtr. No.: API 30045211686

TUBING
PC

04/12/2019
15950-10970

Smpl Date:	04/09/2019	07/13/2018
Test Date:	04/10/2019	07/23/2018
Run No:	SO190026	SO180108
Nitrogen:	0.1936	0.1311
CO2:	4.0510	3.9693
Methane:	85.3588	85.1124
Ethane:	6.7996	6.9792
Propane:	1.4300	1.5446
I-Butane:	0.3255	0.3282
N-Butane:	0.4127	0.4534
I-Pentane:	0.2121	0.2328
N-Pentane:	0.1521	0.1696
Hexane+:	1.0646	1.0794
BTU:	1119.1	1126.6
GPM:	18.2890	18.3430
SPG:	0.6895	0.6923



ANALYSIS REPORT

Well Name: GCU 233
API# 30 - 045 - 11686
Casing Sampled: Bradenhead
Sample Type gas

Lab #: 721240 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 233 Bradenhead 30-045-11686 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 14:33 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 -----	0.0174			
Hydrogen -----	0.383			
Argon -----	0.0050			
Oxygen -----	0.015			
Nitrogen -----	0.48			
Carbon Dioxide -----	nd			
Methane -----	89.36	-42.78	-211.0	
Ethane -----	6.19	-29.51		
Ethylene -----	nd			
Propane -----	2.37	-27.23		
Propylene -----	0.0003			
Iso-butane -----	0.417	-28.20		
N-butane -----	0.499	-26.47		
Iso-pentane -----	0.137	-26.59		
N-pentane -----	0.0773	-25.79		
Hexanes + -----	0.0449			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1119

Specific gravity, calculated: 0.626

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 233
API# 30 - 045 - 11686
Casing Sampled: Production
Sample Type: GAS

Lab #: 721241 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 233 Prod. Casing 30-045-11686 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 14:36 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 -----	nd			
Hydrogen -----	nd			
Argon -----	nd			
Oxygen -----	0.043			
Nitrogen -----	0.22			
Carbon Dioxide -----	4.07			
Methane -----	85.51	-42.44	-210.5	
Ethane -----	7.03	-29.18		
Ethylene -----	nd			
Propane -----	1.55	-26.47		
Propylene -----	nd			
Iso-butane -----	0.340	-28.27		
N-butane -----	0.447	-26.36		
Iso-pentane -----	0.214	-26.58		
N-pentane -----	0.148	-24.90		
Hexanes + -----	0.424			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1092

Specific gravity, calculated: 0.672

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 233
API# 30-045-11686
Casing Sampled: Tubing
Sample Type: Gas

Lab #: 721242 Job #: 41736 IS-104125 Co. Job#:
Sample Name: GCU 233 Tubing 30-045-11686 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 14:29 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 -----	nd			
Hydrogen -----	nd			
Argon -----	0.0052			
Oxygen -----	0.12			
Nitrogen -----	0.47			
Carbon Dioxide -----	4.05			
Methane -----	85.21	-42.47	-216.5	
Ethane -----	7.00	-29.24		
Ethylene -----	nd			
Propane -----	1.55	-26.75		
Propylene -----	nd			
Iso-butane -----	0.340	-28.48		
N-butane -----	0.448	-26.52		
Iso-pentane -----	0.216	-26.90		
N-pentane -----	0.150	-25.40		
Hexanes + -----	0.439			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1090

Specific gravity, calculated: 0.674

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. %.