

A Gyrodata Directional Survey

FINAL DEFINITIVE COPY

for

BOPCO, L.P.

Lease: NASH DRAW 8 FED Well: SWD1, 5 INCH DRILPIPE
Location: AQUILA DRILLING RIG #8; EDDY COUNTY, NEW MEXICO

Job Number: MD1113GDM685

Run Date: 20 Nov 2013

Report Generated: 25 Nov 2013 11:02

Surveyor: Daniel Hayden

Calculation Method: MINIMUM CURVATURE

Survey surface coordinates obtained from: Hand Held GPS

Survey Latitude: 32.230278 deg. N Longitude: 103.909083 deg. W

Azimuth Correction:

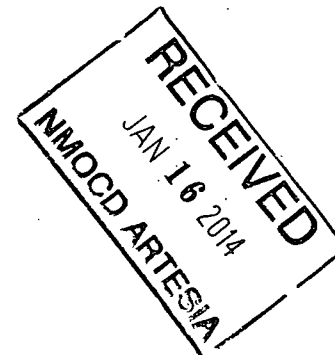
Gyro: -0.23000 deg to Grid North

Depth Reference: Rotary Table

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location



30 015 41351

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00 N 0.00 E
0 - 16817.2 FT. RATE GYROSCOPIC MULTISHOT SURVEY RUN INSIDE 5 INCH DRILLPIPE							
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO AQUILA DRILLING RIG #8 R.K.B. HEIGHT OF 25 FT.							
100.00	0.13	212.10	0.13	100.00	0.1	212.1	0.10 S 0.06 W
200.00	0.03	171.85	0.11	200.00	0.2	208.2	0.22 S 0.12 W
300.00	0.07	188.75	0.04	300.00	0.3	201.9	0.30 S 0.12 W
400.00	0.03	141.60	0.05	400.00	0.4	196.7	0.39 S 0.12 W
500.00	0.04	238.84	0.05	500.00	0.4	196.9	0.42 S 0.13 W
600.00	0.03	24.68	0.07	600.00	0.4	199.5	0.42 S 0.15 W
700.00	0.07	246.91	0.09	700.00	0.5	204.8	0.42 S 0.19 W
800.00	0.03	318.66	0.07	800.00	0.5	212.3	0.42 S 0.27 W
900.00	0.08	27.60	0.07	900.00	0.4	216.4	0.34 S 0.25 W
1000.00	0.30	293.09	0.32	1000.00	0.5	249.0	0.18 S 0.46 W
1046.03	0.15	292.82	0.33	1046.03	0.6	260.4	0.11 S 0.63 W
1140.90	0.12	238.30	0.13	1140.90	0.8	262.4	0.11 S 0.83 W
1235.37	0.20	187.60	0.16	1235.37	1.0	250.7	0.33 S 0.93 W
1330.20	0.24	177.46	0.06	1330.20	1.2	233.9	0.69 S 0.94 W
1424.99	0.23	165.99	0.05	1424.99	1.4	219.7	1.07 S 0.89 W
1519.70	0.20	168.87	0.03	1519.70	1.6	209.8	1.42 S 0.81 W
1614.56	0.18	171.63	0.02	1614.56	1.9	203.7	1.73 S 0.76 W
1709.27	0.21	189.65	0.07	1709.26	2.2	200.5	2.05 S 0.77 W

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
1804.04	0.22	193.84	0.02	1804.03	2.5	199.3	2.39 S 0.84 W
1898.66	0.23	197.36	0.02	1898.65	2.9	198.8	2.75 S 0.94 W
1993.53	0.23	204.09	0.03	1993.52	3.3	199.1	3.11 S 1.07 W
2088.17	0.19	203.83	0.04	2088.16	3.6	199.5	3.42 S 1.21 W
2182.98	0.17	215.70	0.04	2182.97	3.9	200.3	3.68 S 1.36 W
2277.67	0.18	232.20	0.05	2277.66	4.2	201.9	3.89 S 1.56 W
2372.40	0.21	260.58	0.11	2372.39	4.4	204.8	4.01 S 1.85 W
2467.19	0.21	253.89	0.03	2467.18	4.6	208.2	4.08 S 2.19 W
2561.83	0.20	262.60	0.03	2561.82	4.9	211.2	4.15 S 2.52 W
2656.62	0.15	295.35	0.12	2656.61	5.0	214.1	4.12 S 2.79 W
2751.30	0.11	296.84	0.04	2751.29	5.0	216.6	4.03 S 2.99 W
2846.23	0.06	308.83	0.06	2846.22	5.0	218.1	3.95 S 3.11 W
2940.99	0.04	86.03	0.10	2940.98	5.0	218.4	3.92 S 3.11 W
3035.54	0.13	112.22	0.10	3035.53	5.0	217.0	3.96 S 2.98 W
3130.32	0.20	102.13	0.08	3130.31	4.9	214.0	4.03 S 2.72 W
3225.02	0.22	118.37	0.07	3225.01	4.8	210.0	4.16 S 2.40 W
3319.76	0.23	118.73	0.01	3319.75	4.8	205.5	4.33 S 2.07 W
3414.65	0.22	115.62	0.02	3414.64	4.8	201.1	4.50 S 1.74 W
3509.30	0.17	142.24	0.11	3509.29	4.9	197.6	4.69 S 1.49 W
3604.10	0.15	147.13	0.03	3604.09	5.1	195.2	4.91 S 1.34 W
3698.78	0.14	151.14	0.02	3698.76	5.3	193.3	5.11 S 1.21 W

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Location: AQUILA DRILLING RIG #8, EDDY COUNTY, NEW MEXICO

Job Number: MD1113GDM685

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLE SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
3793.40	0.12	147.27	0.02	3793.38	5.4	191.8	5.30 S 1.10 W
3888.15	0.13	141.09	0.02	3888.13	5.6	190.2	5.47 S 0.98 W
3983.09	0.17	136.64	0.04	3983.07	5.7	188.2	5.65 S 0.82 W
4078.04	0.19	129.52	0.03	4078.02	5.9	185.8	5.85 S 0.60 W
4172.89	0.12	129.75	0.07	4172.87	6.0	183.8	6.02 S 0.40 W
4267.74	0.08	129.95	0.04	4267.72	6.1	182.6	6.12 S 0.27 W
4362.52	0.03	141.42	0.05	4362.50	6.2	181.9	6.19 S 0.21 W
4457.09	0.11	275.36	0.14	4457.07	6.2	182.6	6.20 S 0.28 W
4551.82	0.21	271.57	0.11	4551.80	6.2	185.1	6.18 S 0.55 W
4646.41	0.25	279.28	0.05	4646.39	6.2	188.5	6.15 S 0.92 W
4741.29	0.25	285.29	0.03	4741.27	6.2	192.4	6.06 S 1.33 W
4836.10	0.19	298.15	0.08	4836.08	6.2	195.7	5.93 S 1.67 W
4930.73	0.20	326.82	0.10	4930.71	6.0	198.3	5.72 S 1.89 W
5025.41	0.21	258.90	0.24	5025.39	6.0	201.0	5.61 S 2.16 W
5120.05	0.23	264.00	0.03	5120.03	6.2	203.9	5.67 S 2.51 W
5214.71	0.25	262.48	0.02	5214.69	6.4	207.0	5.71 S 2.91 W
5309.36	0.25	258.09	0.02	5309.34	6.7	209.8	5.78 S 3.31 W
5403.94	0.28	260.49	0.03	5403.92	7.0	212.6	5.86 S 3.74 W
5498.43	0.26	272.79	0.06	5498.40	7.2	215.4	5.89 S 4.19 W
5593.25	0.29	268.48	0.04	5593.22	7.5	218.3	5.89 S 4.64 W
5687.98	0.42	277.52	0.15	5687.95	7.8	221.8	5.85 S 5.23 W
5782.57	0.50	274.61	0.09	5782.54	8.3	226.0	5.77 S 5.98 W

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Job Number: MD1113GDM685

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLE SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
5877.40	0.50	267.39	0.07	5877.37	8.9	229.8	5.75 S 6.81 W
5972.33	0.53	259.56	0.08	5972.29	9.6	232.6	5.85 S 7.65 W
6067.03	0.52	240.85	0.18	6066.99	10.5	234.0	6.14 S 8.46 W
6161.43	0.57	232.00	0.10	6161.38	11.3	234.2	6.64 S 9.20 W
6256.45	0.61	232.31	0.04	6256.40	12.3	234.0	7.24 S 9.97 W
6351.16	0.65	238.56	0.08	6351.10	13.4	234.1	7.83 S 10.83 W
6445.82	0.69	238.07	0.04	6445.76	14.5	234.5	8.41 S 11.77 W
6540.63	0.68	236.10	0.03	6540.56	15.6	234.7	9.02 S 12.73 W
6635.30	0.70	227.26	0.11	6635.22	16.7	234.4	9.73 S 13.62 W
6729.89	0.63	223.35	0.09	6729.81	17.8	233.9	10.50 S 14.40 W
6824.76	0.63	218.68	0.05	6824.67	18.8	233.2	11.29 S 15.08 W
6919.59	0.60	216.68	0.04	6919.49	19.8	232.4	12.09 S 15.70 W
7014.31	0.54	215.85	0.06	7014.21	20.7	231.7	12.85 S 16.26 W
7109.15	0.42	207.39	0.15	7109.05	21.5	231.0	13.52 S 16.68 W
7203.83	0.41	201.52	0.05	7203.72	22.1	230.2	14.15 S 16.97 W
7298.72	0.30	210.83	0.13	7298.61	22.6	229.6	14.68 S 17.22 W
7393.43	0.30	212.28	0.01	7393.32	23.1	229.2	15.10 S 17.48 W
7487.99	0.30	240.21	0.15	7487.88	23.6	229.1	15.43 S 17.83 W
7582.82	0.65	307.26	0.63	7582.71	23.9	230.5	15.23 S 18.47 W
7677.70	1.16	311.74	0.54	7677.57	24.3	234.0	14.26 S 19.61 W
7771.56	0.72	316.12	0.47	7771.42	24.6	237.5	13.21 S 20.73 W
7864.92	0.08	260.29	0.73	7864.78	24.8	238.9	12.79 S 21.20 W

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Job Number: MD1113GDM685

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
7958.83	0.54	229.09	0.50	7958.69	25.3	238.8	13.09 S 21.60 W
8053.43	1.13	263.70	0.79	8053.28	26.5	239.5	13.49 S 22.87 W
8147.07	1.43	271.50	0.37	8146.89	28.4	241.5	13.56 S 24.95 W
8335.14	1.51	267.83	0.07	8334.90	32.7	245.5	13.59 S 29.77 W
8429.41	1.38	266.37	0.14	8429.14	34.9	246.9	13.71 S 32.15 W
8522.77	1.17	266.91	0.23	8522.48	36.9	248.0	13.83 S 34.22 W
8617.10	0.92	278.79	0.35	8616.79	38.5	249.0	13.77 S 35.93 W
8710.97	0.38	302.36	0.63	8710.66	39.3	249.9	13.49 S 36.94 W
8804.91	0.16	74.50	0.53	8804.60	39.4	250.3	13.29 S 37.08 W
8898.78	1.13	128.60	1.11	8898.46	38.8	249.1	13.83 S 36.23 W
8993.31	1.87	122.96	0.80	8992.96	37.4	246.0	15.25 S 34.20 W
9087.33	1.69	122.32	0.19	9086.93	35.9	242.1	16.82 S 31.74 W
9182.58	1.42	136.97	0.50	9182.15	35.0	238.2	18.44 S 29.75 W
9276.42	1.08	154.28	0.54	9275.96	34.9	234.9	20.09 S 28.58 W
9371.12	0.97	162.01	0.19	9370.65	35.3	232.2	21.65 S 27.94 W
9465.69	1.06	127.10	0.65	9465.21	35.4	229.6	22.94 S 27.00 W
9559.50	1.60	122.33	0.59	9558.99	34.9	226.2	24.16 S 25.20 W
9653.50	1.60	129.35	0.21	9652.95	34.5	221.9	25.70 S 23.07 W
9747.60	1.33	135.30	0.33	9747.02	34.6	217.9	27.31 S 21.29 W
9841.90	1.02	144.88	0.39	9841.30	35.1	214.9	28.77 S 20.04 W
9935.89	0.72	165.55	0.46	9935.28	35.8	212.9	30.03 S 19.41 W

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Location: AQUILA DRILLING RIG #8, EDDY COUNTY, NEW MEXICO

Job Number: MD1113GDM685

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
10029.90	0.73	185.86	0.27	10029.28	36.7	211.8	31.20 S 19.32 W
10124.90	0.97	184.97	0.25	10124.27	38.0	210.8	32.60 S 19.45 W
10218.50	1.22	181.71	0.28	10217.86	39.6	209.6	34.38 S 19.55 W
10312.20	1.21	186.61	0.11	10311.54	41.4	208.4	36.36 S 19.69 W
10406.50	1.08	192.21	0.18	10405.82	43.1	207.6	38.22 S 20.00 W
10501.10	1.17	193.75	0.10	10500.40	44.9	207.0	40.03 S 20.42 W
10596.00	1.39	194.89	0.23	10595.28	47.0	206.5	42.08 S 20.94 W
10690.50	1.49	198.24	0.14	10689.75	49.3	206.0	44.36 S 21.62 W
10784.50	1.59	206.92	0.27	10783.71	51.9	205.8	46.68 S 22.59 W
10784.50	1.39	199.02	0.00	10783.71	51.9	205.8	46.68 S 22.59 W
10878.70	1.46	180.79	0.48	10877.88	54.1	205.1	48.96 S 22.98 W
10973.20	1.56	168.23	0.37	10972.35	56.2	203.9	51.43 S 22.74 W
11067.40	1.65	176.16	0.25	11066.51	58.5	202.5	54.03 S 22.38 W
11255.70	1.80	221.82	0.71	11254.74	63.7	202.3	58.94 S 24.17 W
11349.50	1.87	228.00	0.22	11348.49	66.5	203.3	61.07 S 26.29 W
11443.30	1.91	228.77	0.05	11442.24	69.3	204.4	63.12 S 28.61 W
11537.30	1.60	224.96	0.35	11536.19	72.0	205.3	65.08 S 30.71 W
11631.10	1.46	227.71	0.17	11629.96	74.3	206.0	66.81 S 32.52 W
11819.40	1.29	240.14	0.18	11818.21	78.3	207.5	69.48 S 36.13 W
11913.90	1.17	253.05	0.32	11912.68	79.9	208.4	70.29 S 37.98 W
12008.70	1.08	254.21	0.10	12007.47	81.2	209.3	70.82 S 39.77 W
12103.10	1.16	266.17	0.26	12101.85	82.4	210.3	71.12 S 41.58 W

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Location: AQUILA DRILLING RIG #8, EDDY COUNTY, NEW MEXICO

Job Number: MD1113GDM685

MEASURED INCL	AZIMUTH	DOGLEG	VERTICAL	CLOSURE	HORIZONTAL	
DEPTH		SEVERITY	DEPTH	DIST. AZIMUTH	COORDINATES	
feet	deg.	deg.	deg./ 100 ft.	feet	feet deg.	feet
12197.60	1.35	290.58	0.59	12196.33	83.1 211.6	70.80 S 43.57 W
12292.20	1.54	308.59	0.52	12290.90	83.2 213.2	69.61 S 45.61 W
12385.70	1.66	311.69	0.16	12384.36	82.9 215.0	67.93 S 47.60 W
12479.90	1.59	309.82	0.09	12478.52	82.7 216.9	66.18 S 49.62 W
12574.50	1.46	308.36	0.14	12573.09	82.7 218.6	64.59 S 51.58 W
12669.20	1.52	301.19	0.21	12667.76	82.9 220.3	63.19 S 53.60 W
12763.90	1.40	290.32	0.32	12762.43	83.5 221.9	62.14 S 55.76 W
12858.10	1.37	279.96	0.27	12856.60	84.5 223.3	61.55 S 57.95 W
12952.30	1.40	278.03	0.06	12950.77	85.8 224.5	61.19 S 60.19 W
13047.20	1.77	273.76	0.41	13045.63	87.5 225.9	60.93 S 62.80 W
13142.50	1.64	272.39	0.14	13140.89	89.5 227.2	60.78 S 65.64 W
13236.30	1.34	266.07	0.36	13234.66	91.3 228.2	60.80 S 68.07 W
13330.40	1.48	254.97	0.33	13328.73	93.2 229.0	61.19 S 70.34 W
13425.00	1.51	245.91	0.25	13423.30	95.5 229.5	62.02 S 72.66 W
13520.30	1.73	238.78	0.31	13518.56	98.2 229.9	63.27 S 75.04 W
13614.90	2.07	238.65	0.36	13613.11	101.3 230.1	64.90 S 77.72 W
13709.30	2.20	237.37	0.15	13707.44	104.7 230.4	66.77 S 80.70 W
13803.70	2.44	237.44	0.25	13801.77	108.5 230.6	68.83 S 83.92 W
13897.90	2.68	231.23	0.39	13895.87	112.7 230.8	71.28 S 87.33 W
13992.20	2.72	233.49	0.12	13990.07	117.2 230.8	74.00 S 90.84 W
14087.20	3.24	237.13	0.58	14084.94	122.1 231.0	76.79 S 94.91 W
14181.30	3.68	242.28	0.57	14178.87	127.7 231.4	79.64 S 99.82 W

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Location: AQUILA DRILLING RIG #8, EDDY COUNTY, NEW MEXICO

Job Number: MD1113GDM685

MEASURED DEPTH feet	INC L deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
14275.50	4.26	245.32	0.65	14272.84	134.1	232.0	82.51 S 105.67 W
14369.50	4.13	251.88	0.53	14366.59	140.7	232.8	85.02 S 112.06 W
14463.50	3.50	261.29	0.94	14460.38	146.4	233.8	86.51 S 118.11 W
14557.90	2.86	244.99	1.17	14554.64	151.3	234.5	87.94 S 123.10 W
14652.40	2.62	239.96	0.36	14649.03	155.8	234.7	90.02 S 127.10 W
14746.20	2.37	227.67	0.63	14742.74	159.8	234.7	92.40 S 130.39 W
14840.60	2.52	219.01	0.42	14837.06	163.7	234.4	95.32 S 133.14 W
14935.10	2.75	221.78	0.28	14931.46	168.0	234.0	98.63 S 135.96 W
15029.90	3.03	220.01	0.31	15026.14	172.6	233.7	102.24 S 139.09 W
15124.70	3.16	218.72	0.16	15120.80	177.6	233.3	106.20 S 142.33 W
15219.20	3.31	218.29	0.16	15215.15	182.7	232.8	110.37 S 145.65 W
15313.80	3.20	220.35	0.17	15309.60	188.0	232.5	114.53 S 149.05 W
15408.40	3.23	224.08	0.22	15404.05	193.2	232.2	118.46 S 152.62 W
15502.60	3.52	223.72	0.31	15498.08	198.7	232.0	122.45 S 156.46 W
15596.30	3.71	225.67	0.24	15591.60	204.5	231.7	126.65 S 160.62 W
15691.30	3.36	234.11	0.66	15686.42	210.4	231.7	130.43 S 165.07 W
15786.00	4.05	229.36	0.80	15780.92	216.5	231.7	134.24 S 169.86 W
15880.30	3.52	219.41	0.89	15875.01	222.7	231.5	138.64 S 174.22 W
15974.10	4.18	212.66	0.85	15968.60	228.7	231.1	143.74 S 177.90 W
16067.90	4.12	214.45	0.15	16062.16	235.2	230.6	149.40 S 181.65 W
16161.50	3.69	211.73	0.50	16155.54	241.3	230.1	154.73 S 185.13 W

A Gyrodata Directional Survey

BOPCO, L.P.

Lease: NASH DRAW 8 FED Well: SWD1, 5 INCH DRILPIPE

Location: AQUILA DRILLING RIG #8, EDDY COUNTY, NEW MEXICO

Job Number: MD1113GDM685

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLE SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
16255.50	3.13	213.44	0.61	16249.37	246.6	229.7	159.45 S 188.14 W
16349.60	3.10	224.19	0.62	16343.33	251.6	229.5	163.42 S 191.33 W
16442.90	3.42	233.50	0.66	16436.48	256.9	229.5	166.88 S 195.32 W
16630.00	3.14	221.89	0.38	16623.28	267.6	229.4	174.02 S 203.23 W
16723.50	2.50	227.84	0.75	16716.66	272.1	229.3	177.29 S 206.45 W
16817.20	1.99	239.72	0.73	16810.29	275.8	229.4	179.48 S 209.37 W

Final Station Closure: Distance: 275.77 ft Az: 229.40 deg.

