

A Gyrodata Directional Survey

Field Copy Only, not definitive

for

BTA OIL PRODUCERS

Lease: GEM Well: #11H, 5" DRILLPIPE
Location: PRECISION DRILLING #77, LEA COUNTY, NEW MEXICO

Job Number: MD0412GDM246

Run Date: 02 Apr 2012

Surveyor: Jason Solomon

Calculation Method: MINIMUM CURVATURE

Survey surface coordinates obtained from: Well Plan/Plot

Survey Latitude: 32.603855 deg. N Longitude: 103.626997 deg. W

Azimuth Correction:
Gyro: -0.38000 deg to Grid North

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet 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 TO 9640 FT RATE GYROSCOPIC MULTISHOT DROP RUN INSIDE 5" DRILLPIPE						
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO PRECISION DRILLING #77 RKB 30 FT						
200.00	0.23	287.04	0.12	200.00	0.4 287.0	0.12 N 0.38 W
400.00	0.17	326.25	0.07	400.00	1.0 297.3	0.48 N 0.93 W
600.00	0.22	53.31	0.14	600.00	1.2 320.5	0.96 N 0.79 W
637.30	0.09	72.99	0.37	637.30	1.2 325.1	1.01 N 0.70 W
826.20	0.06	113.41	0.03	826.20	1.1 335.1	1.01 N 0.47 W
1015.10	0.09	86.22	0.02	1015.10	1.0 346.7	0.98 N 0.23 W
1204.00	0.19	297.89	0.14	1204.00	1.2 342.4	1.14 N 0.36 W
1392.80	0.23	232.64	0.12	1392.80	1.4 318.4	1.06 N 0.94 W
1581.70	0.14	68.40	0.19	1581.70	1.4 311.6	0.91 N 1.03 W
1770.60	1.20	68.76	0.56	1770.58	2.0 31.1	1.71 N 1.03 E
1959.50	1.05	74.58	0.10	1959.44	5.4 57.5	2.89 N 4.54 E
2148.40	1.17	84.25	0.12	2148.31	8.9 66.5	3.54 N 8.13 E
2337.20	1.03	79.53	0.09	2337.07	12.4 71.0	4.04 N 11.72 E
2526.10	1.01	90.15	0.10	2525.94	15.7 73.9	4.35 N 15.05 E
2715.00	2.23	87.50	0.65	2714.76	20.9 77.5	4.51 N 20.39 E
2903.90	2.82	79.17	0.37	2903.48	29.2 79.0	5.54 N 28.63 E
3092.80	3.08	78.13	0.14	3092.13	38.9 78.9	7.46 N 38.16 E
3281.60	3.26	91.22	0.39	3280.64	49.2 80.2	8.38 N 48.49 E
3470.50	3.41	128.11	1.12	3469.25	58.5 85.3	4.80 N 58.28 E
3659.40	5.18	152.79	1.33	3657.62	66.9 95.4	6.25 S 66.60 E

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3848.30	5.33	157.03	0.22	3845.73	77.1 106.5	21.91 S 73.92 E
4037.20	4.41	162.15	0.54	4033.95	87.7 114.9	36.90 S 79.57 E
4226.00	3.88	161.28	0.28	4222.25	97.6 120.7	49.86 S 83.85 E
4414.90	3.03	157.53	0.47	4410.81	106.6 124.6	60.53 S 87.81 E
4603.80	2.35	160.34	0.37	4599.50	114.1 127.1	68.79 S 91.02 E
4792.70	1.94	150.38	0.29	4788.27	120.3 128.7	75.22 S 93.90 E
4981.60	2.41	167.55	0.42	4977.03	126.4 130.4	81.87 S 96.34 E
5170.40	2.93	166.70	0.28	5165.63	133.6 132.6	90.45 S 98.30 E
5359.30	2.66	177.07	0.30	5354.30	140.8 135.0	99.52 S 99.64 E
5548.20	2.61	175.65	0.04	5543.00	147.5 137.2	108.19 S 100.19 E
5737.10	2.38	174.94	0.12	5731.72	154.0 139.1	116.38 S 100.86 E
5926.00	1.54	184.42	0.48	5920.51	159.0 140.6	122.82 S 101.01 E
6114.80	1.07	202.65	0.33	6109.26	161.7 141.7	126.98 S 100.14 E
6303.70	0.93	178.48	0.23	6298.13	163.8 142.6	130.14 S 99.50 E
6492.60	1.11	173.38	0.11	6487.00	166.6 143.2	133.49 S 99.75 E
6681.50	1.05	172.20	0.03	6675.87	169.7 143.8	137.02 S 100.20 E
6870.40	1.31	168.50	0.14	6864.73	173.2 144.4	140.85 S 100.86 E
7059.20	1.01	164.88	0.16	7053.49	176.8 144.9	144.57 S 101.73 E
7248.10	0.78	176.27	0.15	7242.37	179.4 145.3	147.46 S 102.24 E
7437.00	0.77	179.27	0.02	7431.25	181.6 145.7	150.02 S 102.34 E
7625.90	0.61	188.87	0.10	7620.14	183.4 146.1	152.28 S 102.20 E
7814.80	0.62	189.03	0.01	7809.03	184.9 146.6	154.28 S 101.89 E
8003.60	0.46	179.37	0.10	7997.82	186.3 146.9	156.05 S 101.74 E
8192.50	0.44	189.67	0.04	8186.71	187.5 147.2	157.52 S 101.62 E
8381.40	0.85	164.10	0.26	8375.60	189.3 147.4	159.58 S 101.88 E

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
8570.30	0.95	232.85	0.54	8564.48	190.8 148.0	161.88 S 101.02 E
8759.20	1.34	214.71	0.28	8753.34	191.9 149.1	164.64 S 98.51 E
8948.00	1.43	205.97	0.12	8942.09	194.1 150.3	168.57 S 96.23 E
9136.90	1.63	231.34	0.37	9130.92	195.9 151.6	172.37 S 93.10 E
9325.80	1.37	239.90	0.18	9319.76	196.5 153.1	175.18 S 89.04 E
9514.70	1.32	237.83	0.04	9508.61	196.9 154.3	177.47 S 85.25 E
9640.60	1.42	226.49	0.23	9634.47	197.5 155.2	179.32 S 82.89 E

Final Station Closure: Distance: 197.55 ft Az: 155.19 deg.



BTA Oil Producers

**Lea County, NM
8705 JV-P Gem #11H
Sec 2, T20S, R33E**

Wellbore #1

Survey: MWD

DDC Survey Report

26 April, 2012



DDC Survey Report



Company:	BTA Oil Producers	Local Co-ordinate Reference:	Well Sec 2, T20S, R33E
Project:	Lea County, NM	TVD Reference:	GL 3588 + 29.85' KB @ 3617.8usft (Precision 77)
Site:	8705 JV-P Gem #11H	MD Reference:	GL 3588 + 29.85' KB @ 3617.8usft (Precision 77)
Well:	Sec 2, T20S, R33E	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	8705 JV-P Gem #11H		
Site Position:		Northing:	584,116.60 usft
From:	Map	Easting:	717,515.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 36' 13.879 N
		Longitude:	103° 37' 37.191 W
		Grid Convergence:	0.38 °

Well	Sec 2, T20S, R33E		
Well Position	+N/-S	0.0 usft	Northing: 584,116.60 usft
	+E/-W	0.0 usft	Easting: 717,515.60 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 36' 13.879 N
		Longitude:	103° 37' 37.191 W
		Ground Level:	3,588.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	3/23/2012	7.55
			Dip Angle (°)
			60.51
			Field Strength (nT)
			48,761

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°)
			269.72

Survey Program	Date	4/26/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
200.0	9,640.6	GYRO (Wellbore #1)	Good_gyro	Good Gyro
9,653.0	14,369.0	MWD (Wellbore #1)	MWD default	MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,640.0	1.42	226.54	9,633.9	-179.3	82.9	-82.0	0.00	0.00	0.00
Tie In @ 9641' MD / 9635' TVD									
9,640.6	1.45	226.95	9,634.5	-179.3	82.9	-82.0	4.69	4.38	67.54
9,653.0	2.00	232.90	9,646.9	-179.6	82.6	-81.7	4.69	4.47	48.02
9,684.0	4.00	288.10	9,677.8	-179.5	81.1	-80.3	10.63	6.45	178.06
9,716.0	8.40	291.60	9,709.6	-178.3	77.9	-77.0	13.79	13.75	10.94
9,747.0	12.10	294.00	9,740.1	-176.2	72.8	-72.0	12.01	11.94	7.74
9,779.0	15.30	294.20	9,771.2	-173.1	65.9	-65.1	10.00	10.00	0.63

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Project:	Lea County, NM	TVD Reference:	GL 3588 + 29.85' KB @ 3617.8usft (Precision 77)
Site:	8705 JV-P Gem #11H	MD Reference:	GL 3588 + 29.85' KB @ 3617.8usft (Precision 77)
Well:	Sec 2, T20S, R33E	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,811.0	19.00	293.50	9,801.8	-169.3	57.3	-56.5	11.58	11.56	-2.19	
9,842.0	22.40	292.30	9,830.8	-165.0	47.2	-46.4	11.05	10.97	-3.87	
9,874.0	25.20	291.60	9,860.1	-160.2	35.2	-34.4	8.79	8.75	-2.19	
9,905.0	27.90	289.80	9,887.8	-155.3	22.2	-21.5	9.09	8.71	-5.81	
9,937.0	30.20	288.90	9,915.8	-150.2	7.6	-6.9	7.32	7.19	-2.81	
9,969.0	32.00	288.40	9,943.2	-144.9	-8.1	8.8	5.68	5.63	-1.56	
10,000.0	34.70	288.10	9,969.1	-139.5	-24.3	24.9	8.73	8.71	-0.97	
10,032.0	38.30	287.00	9,994.8	-133.8	-42.4	43.1	11.43	11.25	-3.44	
10,063.0	41.70	286.10	10,018.5	-128.1	-61.5	62.1	11.13	10.97	-2.90	
10,095.0	45.10	283.70	10,041.8	-122.5	-82.7	83.3	11.81	10.63	-7.50	
10,126.0	48.90	281.70	10,062.9	-117.5	-104.9	105.4	13.13	12.26	-6.45	
10,157.0	50.80	279.60	10,082.9	-113.2	-128.1	128.7	8.02	6.13	-6.77	
10,189.0	53.40	278.20	10,102.6	-109.3	-153.1	153.6	8.83	8.13	-4.38	
10,221.0	57.20	276.10	10,120.8	-106.0	-179.2	179.7	13.04	11.88	-6.56	
10,252.0	60.40	274.70	10,136.8	-103.5	-205.6	206.1	11.02	10.32	-4.52	
10,284.0	64.20	274.00	10,151.7	-101.4	-233.8	234.3	12.03	11.88	-2.19	
10,315.0	67.20	273.80	10,164.5	-99.4	-262.0	262.5	9.70	9.68	-0.65	
10,347.0	69.10	274.00	10,176.4	-97.4	-291.6	292.1	5.97	5.94	0.63	
10,379.0	69.20	274.40	10,187.7	-95.2	-321.5	321.9	1.21	0.31	1.25	
10,410.0	71.40	273.60	10,198.2	-93.2	-350.6	351.0	7.50	7.10	-2.58	
10,442.0	75.80	271.50	10,207.2	-91.8	-381.2	381.7	15.12	13.75	-6.56	
10,474.0	77.90	271.00	10,214.5	-91.2	-412.4	412.8	6.74	6.56	-1.56	
10,505.0	78.30	270.70	10,220.9	-90.7	-442.7	443.2	1.60	1.29	-0.97	
10,611.0	88.70	272.90	10,232.9	-87.4	-547.8	548.3	10.03	9.81	2.08	
10,644.0	89.90	273.10	10,233.3	-85.7	-580.8	581.2	3.69	3.64	0.61	
10,675.0	91.70	272.80	10,232.9	-84.1	-611.7	612.1	5.89	5.81	-0.97	
10,707.0	94.30	273.30	10,231.2	-82.4	-643.7	644.0	8.27	8.13	1.56	
10,738.0	94.40	273.50	10,228.8	-80.5	-674.5	674.9	0.72	0.32	0.65	
10,770.0	92.90	272.20	10,226.8	-78.9	-706.4	706.8	6.20	-4.69	-4.06	
10,802.0	92.70	272.20	10,225.2	-77.7	-738.3	738.7	0.63	-0.63	0.00	
10,865.0	92.50	272.10	10,222.4	-75.4	-801.2	801.6	0.35	-0.32	-0.16	
10,960.0	92.20	272.40	10,218.5	-71.6	-896.1	896.4	0.45	-0.32	0.32	
11,055.0	92.20	272.20	10,214.8	-67.8	-990.9	991.3	0.21	0.00	-0.21	
11,150.0	91.60	271.40	10,211.7	-64.8	-1,085.8	1,086.1	1.05	-0.63	-0.84	
11,245.0	92.10	271.40	10,208.6	-62.5	-1,180.8	1,181.0	0.53	0.53	0.00	
11,340.0	90.90	270.00	10,206.1	-61.4	-1,275.7	1,276.0	1.94	-1.26	-1.47	
11,434.0	91.50	269.80	10,204.2	-61.5	-1,369.7	1,370.0	0.67	0.64	-0.21	
11,529.0	91.40	269.30	10,201.8	-62.3	-1,464.7	1,464.9	0.54	-0.11	-0.53	
11,624.0	90.90	270.30	10,199.9	-62.6	-1,559.6	1,559.9	1.18	-0.53	1.05	
11,719.0	91.40	270.10	10,197.9	-62.3	-1,654.6	1,654.9	0.57	0.53	-0.21	
11,813.0	92.20	270.10	10,195.0	-62.1	-1,748.6	1,748.8	0.85	0.85	0.00	
11,908.0	90.30	270.00	10,192.9	-62.0	-1,843.5	1,843.8	2.00	-2.00	-0.11	

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Site:	8705 JV-P Gem #11H	MD Reference:	GL 3588 + 29.85' KB @ 3617.8usft (Precision 77)
Well:	Sec 2, T20S, R33E	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,003.0	91.10	269.30	10,191.8	-62.6	-1,938.5	1,938.8	1.12	0.84	-0.74	
12,098.0	91.30	268.90	10,189.8	-64.1	-2,033.5	2,033.8	0.47	0.21	-0.42	
12,192.0	91.40	268.00	10,187.6	-66.6	-2,127.4	2,127.7	0.96	0.11	-0.96	
12,287.0	92.20	269.10	10,184.6	-69.0	-2,222.4	2,222.7	1.43	0.84	1.16	
12,382.0	91.00	269.60	10,181.9	-70.1	-2,317.3	2,317.6	1.37	-1.26	0.53	
12,477.0	92.60	269.30	10,178.9	-71.0	-2,412.3	2,412.6	1.71	1.68	-0.32	
12,572.0	93.60	269.30	10,173.8	-72.2	-2,507.1	2,507.4	1.05	1.05	0.00	
12,667.0	92.70	269.10	10,168.6	-73.5	-2,602.0	2,602.3	0.97	-0.95	-0.21	
12,761.0	92.00	269.60	10,164.7	-74.6	-2,695.9	2,696.2	0.91	-0.74	0.53	
12,856.0	90.70	269.40	10,162.5	-75.4	-2,790.8	2,791.2	1.38	-1.37	-0.21	
12,951.0	90.00	271.20	10,161.9	-74.9	-2,885.8	2,886.2	2.03	-0.74	1.89	
13,046.0	90.60	270.80	10,161.4	-73.3	-2,980.8	2,981.1	0.76	0.63	-0.42	
13,141.0	90.80	270.30	10,160.2	-72.3	-3,075.8	3,076.1	0.57	0.21	-0.53	
13,236.0	92.00	270.00	10,157.9	-72.1	-3,170.8	3,171.1	1.30	1.26	-0.32	
13,330.0	90.90	268.70	10,155.5	-73.2	-3,264.7	3,265.0	1.81	-1.17	-1.38	
13,425.0	91.50	268.50	10,153.6	-75.5	-3,359.7	3,360.0	0.67	0.63	-0.21	
13,519.0	90.80	269.60	10,151.7	-77.0	-3,453.6	3,454.0	1.39	-0.74	1.17	
13,614.0	90.80	268.70	10,150.3	-78.4	-3,548.6	3,549.0	0.95	0.00	-0.95	
13,708.0	90.80	268.40	10,149.0	-80.8	-3,642.6	3,642.9	0.32	0.00	-0.32	
13,803.0	90.60	267.10	10,147.9	-84.6	-3,737.5	3,737.9	1.38	-0.21	-1.37	
13,898.0	90.90	266.30	10,146.6	-90.0	-3,832.3	3,832.7	0.90	0.32	-0.84	
13,993.0	91.80	265.00	10,144.4	-97.2	-3,927.0	3,927.5	1.66	0.95	-1.37	
14,087.0	92.90	264.50	10,140.5	-105.8	-4,020.6	4,021.0	1.29	1.17	-0.53	
14,182.0	94.00	263.30	10,134.8	-115.9	-4,114.8	4,115.4	1.71	1.16	-1.26	
14,277.0	93.90	262.60	10,128.3	-127.5	-4,208.9	4,209.5	0.74	-0.11	-0.74	
14,318.0	94.00	262.20	10,125.4	-132.9	-4,249.4	4,250.0	1.00	0.24	-0.98	
TD @ 14369' MD / 10122' TVD										
14,369.0	94.00	262.20	10,121.9	-139.8	-4,299.9	4,300.5	0.00	0.00	0.00	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
9,640.6	9,634.5	-179.3	82.9	Tie In @ 9641' MD / 9635' TVD	
14,369.0	10,121.9	-139.8	-4,299.9	TD @ 14369' MD / 10122' TVD	

Checked By: _____	Approved By: _____	Date: _____
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