



HOBBS OCD

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BTA Oil Producers, LLC

Lea County, NM

Sec 10, T25-S, R33-E

Vaca Draw 9418 10 Fed 6H

Wellbore #1

Design: Wellbore #1

QES Survey Report

25 May, 2017





Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Vaca Draw 9418 10 Fed 6H
Project:	Lea County, NM	TVD Reference:	RKB @ 3447.0usft (Rig #94)
Site:	Sec 10, T25-S, R33-E	MD Reference:	RKB @ 3447.0usft (Rig #94)
Well:	Vaca Draw 9418 10 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

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	Sec 10, T25-S, R33-E		
Site Position:		Northing:	419,638.60 usft
From:	Map	Easting:	741,405.70 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 9' 4.678 N
		Longitude:	103° 33' 11.948 W
		Grid Convergence:	0.42 °

Well	Vaca Draw 9418 10 Fed 6H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 9' 6.068 N
		Longitude:	103° 33' 30.801 W
		Ground Level:	3,422.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	4/18/2017	6.96
			Dip Angle
			(°)
			60.00
			Field Strength
			(nT)
			47,913

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0

Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	181.48

Survey Program	Date 5/25/2017		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	1,153.0	Gyro Surveys (Wellbore #1)	Good_gyro
1,290.0	14,478.0	MWD Survey (Wellbore #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.64	217.00	100.0	-0.4	-0.3	0.5	0.64	0.64	0.00
200.0	0.60	184.99	200.0	-1.4	-0.7	1.4	0.34	-0.04	-32.01
300.0	0.81	207.25	300.0	-2.6	-1.1	2.6	0.34	0.21	22.26
400.0	0.59	173.36	400.0	-3.7	-1.4	3.7	0.46	-0.22	-33.89
500.0	0.74	208.62	500.0	-4.8	-1.6	4.8	0.43	0.15	35.26
600.0	0.95	223.25	600.0	-6.0	-2.5	6.0	0.30	0.21	14.63
700.0	0.50	228.42	700.0	-6.8	-3.4	6.9	0.45	-0.45	5.17
800.0	1.17	262.53	799.9	-7.3	-4.7	7.4	0.81	0.67	34.11
900.0	0.75	252.78	899.9	-7.6	-6.3	7.8	0.45	-0.42	-9.75



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Well:	Vaca Draw 9418 10 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

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)
1,000.0	0.76	255.87	999.9	-8.0	-7.6	8.1	0.04	0.01	3.09
1,100.0	0.79	243.33	1,099.9	-8.4	-8.9	8.6	0.17	0.03	-12.54
Gyro Tie In @ 1153.1 'MD / 1153.0 'TVD									
1,153.0	1.13	268.88	1,152.9	-8.6	-9.7	8.8	1.02	0.64	48.21
1,290.0	1.00	245.30	1,289.9	-9.1	-12.2	9.4	0.33	-0.09	-17.21
1,480.0	1.20	233.50	1,479.8	-11.0	-15.3	11.4	0.16	0.11	-6.21
1,670.0	1.10	246.10	1,669.8	-12.9	-18.5	13.4	0.14	-0.05	6.63
1,860.0	1.40	267.40	1,859.8	-13.8	-22.5	14.3	0.29	0.16	11.21
2,049.0	1.80	53.10	2,048.7	-12.1	-22.5	12.7	1.62	0.21	77.09
2,239.0	1.60	53.70	2,238.6	-8.7	-17.9	9.2	0.11	-0.11	0.32
2,429.0	1.90	38.50	2,428.6	-4.7	-13.8	5.0	0.29	0.16	-8.00
2,619.0	2.40	37.30	2,618.4	0.9	-9.5	-0.7	0.26	0.26	-0.63
2,810.0	3.00	38.90	2,809.2	8.0	-3.9	-7.9	0.32	0.31	0.84
2,999.0	3.30	38.20	2,997.9	16.1	2.6	-16.2	0.16	0.16	-0.37
3,190.0	1.60	9.70	3,188.8	23.1	6.4	-23.2	1.07	-0.89	-14.92
3,380.0	2.10	16.40	3,378.7	29.0	7.9	-29.2	0.29	0.26	3.53
3,569.0	2.20	23.20	3,567.5	35.7	10.3	-35.9	0.14	0.05	3.60
3,759.0	2.50	25.50	3,757.4	42.8	13.5	-43.1	0.17	0.16	1.21
3,949.0	0.90	63.10	3,947.3	47.2	16.6	-47.6	0.98	-0.84	19.79
4,139.0	1.30	335.30	4,137.3	49.8	17.0	-50.3	0.82	0.21	-46.21
4,329.0	1.70	326.10	4,327.2	54.1	14.6	-54.5	0.25	0.21	-4.84
4,519.0	1.40	312.90	4,517.1	58.1	11.3	-58.3	0.24	-0.16	-6.95
4,709.0	0.80	334.70	4,707.1	60.8	9.0	-61.0	0.38	-0.32	11.47
4,899.0	1.80	291.00	4,897.0	63.1	5.7	-63.2	0.71	0.53	-23.00
5,046.0	1.90	293.10	5,044.0	64.9	1.3	-64.9	0.08	0.07	1.43
5,156.0	1.90	297.10	5,153.9	66.4	-2.0	-66.4	0.12	0.00	3.64
5,346.0	6.40	303.30	5,343.4	73.7	-13.7	-73.3	2.38	2.37	3.26
5,536.0	6.90	305.90	5,532.1	86.2	-31.8	-85.3	0.31	0.26	1.37
5,726.0	5.50	302.40	5,721.0	97.8	-48.7	-96.5	0.76	-0.74	-1.84
5,916.0	5.60	304.50	5,910.1	107.9	-64.1	-106.2	0.12	0.05	1.11
6,106.0	5.90	304.10	6,099.1	118.6	-79.8	-116.5	0.16	0.16	-0.21
6,296.0	6.00	304.50	6,288.1	129.7	-96.1	-127.2	0.06	0.05	0.21
6,485.0	6.10	307.00	6,476.0	141.4	-112.2	-138.4	0.15	0.05	1.32
6,675.0	6.40	307.30	6,664.9	153.8	-128.7	-150.5	0.16	0.16	0.16
6,865.0	5.30	304.80	6,853.9	165.3	-144.3	-161.5	0.59	-0.58	-1.32
7,055.0	2.90	303.30	7,043.4	172.9	-155.6	-168.8	1.26	-1.26	-0.79
7,244.0	1.20	308.50	7,232.3	176.8	-161.1	-172.6	0.90	-0.90	2.75
7,434.0	0.90	303.10	7,422.3	178.8	-163.9	-174.5	0.17	-0.16	-2.84
7,624.0	0.80	307.50	7,612.2	180.5	-166.2	-176.1	0.06	-0.05	2.32
7,814.0	0.50	302.20	7,802.2	181.7	-168.0	-177.3	0.16	-0.16	-2.79
8,004.0	0.40	13.90	7,992.2	182.8	-168.5	-178.4	0.28	-0.05	37.74
8,194.0	0.20	47.80	8,182.2	183.7	-168.1	-179.3	0.14	-0.11	17.84
8,385.0	0.20	203.40	8,373.2	183.6	-168.0	-179.2	0.20	0.00	81.47



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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)
8,575.0	0.70	183.60	8,563.2	182.1	-168.2	-177.7	0.27	0.26	-10.42
8,765.0	0.90	183.00	8,753.2	179.5	-168.3	-175.1	0.11	0.11	-0.32
8,859.0	1.10	192.90	8,847.2	177.8	-168.6	-173.4	0.28	0.21	10.53
8,970.0	5.60	185.00	8,958.0	171.4	-169.3	-167.0	4.07	4.05	-7.12
9,066.0	15.10	181.30	9,052.3	154.2	-170.0	-149.8	9.91	9.90	-3.85
9,161.0	23.70	180.00	9,141.8	122.7	-170.3	-118.2	9.06	9.05	-1.37
9,256.0	32.60	177.80	9,225.5	77.9	-169.3	-73.5	9.43	9.37	-2.32
9,351.0	42.90	182.00	9,300.5	19.9	-169.4	-15.5	11.17	10.84	4.42
9,446.0	54.30	182.10	9,363.2	-51.2	-172.0	55.7	12.00	12.00	0.11
9,541.0	66.40	179.20	9,410.2	-133.6	-172.8	138.0	13.01	12.74	-3.05
Crossed 330° HL @ 9549.0' MD / 9413.3' TVD									
9,549.0	67.17	179.15	9,413.3	-141.0	-172.7	145.4	9.60	9.58	-0.67
9,636.0	75.50	178.60	9,441.1	-223.3	-171.1	227.6	9.60	9.58	-0.63
9,731.0	84.20	177.80	9,457.9	-316.7	-168.1	320.9	9.20	9.16	-0.84
9,851.0	88.70	179.20	9,465.3	-436.4	-165.0	440.5	3.93	3.75	1.17
10,041.0	86.90	176.90	9,472.6	-626.1	-158.5	630.0	1.54	-0.95	-1.21
10,231.0	90.70	177.80	9,476.6	-815.8	-149.7	819.4	2.06	2.00	0.47
10,421.0	91.70	178.80	9,472.6	-1,005.7	-144.1	1,009.1	0.74	0.53	0.53
10,610.0	87.80	180.90	9,473.4	-1,194.6	-143.6	1,198.0	2.34	-2.06	1.11
10,801.0	89.10	182.50	9,478.6	-1,385.5	-149.3	1,388.9	1.08	0.68	0.84
10,990.0	90.10	185.10	9,479.9	-1,574.0	-161.8	1,577.7	1.47	0.53	1.38
11,180.0	92.30	183.60	9,475.9	-1,763.4	-176.2	1,767.4	1.40	1.16	-0.79
11,370.0	90.40	181.10	9,471.4	-1,953.2	-184.0	1,957.3	1.65	-1.00	-1.32
11,560.0	88.80	178.80	9,472.8	-2,143.2	-183.8	2,147.2	1.47	-0.84	-1.21
11,750.0	89.80	179.30	9,475.1	-2,333.1	-180.7	2,337.0	0.59	0.53	0.26
11,940.0	88.50	179.50	9,477.9	-2,523.1	-178.7	2,526.9	0.69	-0.68	0.11
12,130.0	88.70	178.10	9,482.5	-2,713.0	-174.7	2,716.6	0.74	0.11	-0.74
12,320.0	90.10	178.30	9,484.5	-2,902.9	-168.7	2,906.3	0.74	0.74	0.11
12,510.0	89.80	176.70	9,484.7	-3,092.7	-160.5	3,095.8	0.86	-0.16	-0.84
12,699.0	89.70	176.50	9,485.5	-3,281.4	-149.2	3,284.1	0.12	-0.05	-0.11
12,889.0	91.80	176.50	9,483.0	-3,471.0	-137.6	3,473.4	1.11	1.11	0.00
13,079.0	92.70	174.60	9,475.6	-3,660.3	-122.9	3,662.2	1.11	0.47	-1.00
13,269.0	87.30	178.30	9,475.6	-3,849.8	-111.2	3,851.4	3.44	-2.84	1.95
13,459.0	88.30	179.90	9,482.9	-4,039.6	-108.2	4,041.1	0.99	0.53	0.84
13,649.0	90.60	180.70	9,484.7	-4,229.6	-109.2	4,231.0	1.28	1.21	0.42
13,839.0	90.50	180.20	9,482.9	-4,419.6	-110.7	4,421.0	0.27	-0.05	-0.26
14,029.0	89.20	180.20	9,483.4	-4,609.6	-111.3	4,610.9	0.68	-0.68	0.00
Crossed 330° HL @ 14185.9' MD / 9483.6' TVD									
14,185.9	90.60	181.36	9,483.6	-4,766.4	-113.5	4,767.8	1.16	0.89	0.74
14,219.0	90.90	181.60	9,483.2	-4,799.5	-114.3	4,800.9	1.16	0.89	0.74
14,409.0	90.90	181.60	9,480.2	-4,989.4	-119.6	4,990.9	0.00	0.00	0.00
TD @ 14478.0' MD / 9479.1' TVD									
14,478.0	90.90	181.61	9,479.1	-5,058.4	-121.6	5,059.8	0.01	0.00	0.01



Survey Report



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Site:	Sec 10, T25-S, R33-E	MD Reference:	RKB @ 3447.0usft (Rig #94)
Well:	Vaca Draw 9418 10 Fed 6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,153.0	1,152.9	-8.6	-9.7	Gyro Tie In @ 1153.1 'MD / 1153.0 'TVD
9,549.0	9,413.3	-141.0	-172.7	Crossed 330' HL @ 9549.0' MD / 9413.3' TVD
14,185.9	9,483.6	-4,766.4	-113.5	Crossed 330' HL @ 14185.9' MD / 9483.6' TVD
14,478.0	9,479.1	-5,058.4	-121.6	TD @ 14478.0' MD / 9479.1' TVD

Checked By: _____	Approved By: _____	Date: _____
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