



NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 05 2019

RECEIVED

BTA Oil Producers, LLC

Eddy County, New Mexico (NAD 83)

Sec 29, T23, R28-E

Ogden 20509 29-32 Fed Com #3H

Wellbore #1

30-015-45052

Design: Wellbore #1

QES Survey Report

19 September, 2018





Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Ogden 20509 29-32 Fed Com #3H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3099.0usft (Patterson #594)
Site:	Sec 29, T23, R28-E	MD Reference:	WELL @ 3099.0usft (Patterson #594)
Well:	Ogden 20509 29-32 Fed Com #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	Sec 29, T23, R28-E		
Site Position:		Northing:	466,607.70 usft
From:	Map	Easting:	611,639.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 57.266 N
		Longitude:	104° 6' 21.036 W
		Grid Convergence:	0.12 °

Well:	Ogden 20509 29-32 Fed Com #3H		
Well Position	+N-S	0.0 usft	Northing: 466,606.70 usft
	+E-W	0.0 usft	Easting: 611,284.60 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 16' 57.263 N
		Longitude:	104° 6' 25.172 W
		Ground Level:	3,074.0 usft

Wellbore:	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	8/17/2018	7.08
			Dip Angle
			60.02
			Field Strength
			47,798.34852354

Design:	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			180.75

Survey Program	Date 9/19/2018		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	325.0	MS Surveys (Wellbore #1)	OWSG (Rev2) MWD
423.0	17,036.0	QES MWD Surveys (Wellbore #1)	OWSG (Rev2) MWD
			Description
			OWSG MWD - Standard
			OWSG 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	0.52	96.26	100.0	0.0	0.5	0.0	0.52	0.52	0.00	
200.0	0.35	71.06	200.0	0.0	1.2	0.0	0.25	-0.17	-25.20	
300.0	0.33	90.40	300.0	0.1	1.8	-0.1	0.12	-0.02	19.34	
325.0	0.32	59.78	325.0	0.1	1.9	-0.2	0.69	-0.04	-122.48	
First QES Survey @ 423.0' MD / 423.0' TVD										
423.0	0.26	32.70	423.0	0.5	2.3	-0.5	0.15	-0.06	-27.63	
609.0	0.60	48.90	609.0	1.5	3.2	-1.5	0.19	0.18	8.71	
796.0	0.70	54.70	796.0	2.8	4.9	-2.8	0.06	0.05	3.10	
984.0	0.50	38.00	984.0	4.1	6.3	-4.1	0.14	-0.11	-8.88	



Survey Report



Company: BTA Oil Producers, LLC
Project: Eddy County, New Mexico (NAD 83)
Site: Sec 29, T23, R28-E
Well: Ogden 20509 29-32 Fed Com #3H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Ogden 20509 29-32 Fed Com #3H
TVD Reference: WELL @ 3099.0usft (Patterson #594)
MD Reference: WELL @ 3099.0usft (Patterson #594)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
1,174.0	0.40	27.40	1,174.0	5.3	7.1	-5.4	0.07	-0.05	-5.56
1,363.0	0.50	358.80	1,363.0	6.7	7.4	-6.8	0.13	0.05	-15.13
1,553.0	0.50	1.10	1,552.9	8.4	7.4	-8.5	0.01	0.00	1.21
1,743.0	0.50	5.80	1,742.9	10.0	7.5	-10.1	0.02	0.00	2.47
1,933.0	1.40	105.80	1,932.9	10.2	9.8	-10.4	0.82	0.47	52.63
2,122.0	0.70	354.50	2,121.9	10.7	12.0	-10.9	0.94	-0.37	-58.89
2,311.0	0.80	79.80	2,310.9	12.1	13.1	-12.3	0.54	0.05	45.13
2,465.0	0.70	82.10	2,464.9	12.4	15.1	-12.6	0.07	-0.06	1.49
2,588.0	0.90	81.30	2,587.9	12.7	16.8	-12.9	0.16	0.16	-0.65
2,778.0	0.80	77.60	2,777.8	13.2	19.6	-13.5	0.06	-0.05	-1.95
2,967.0	0.80	78.90	2,966.8	13.7	22.2	-14.0	0.01	0.00	0.69
3,156.0	0.70	89.00	3,155.8	14.0	24.6	-14.3	0.09	-0.05	5.34
3,346.0	2.60	331.10	3,345.7	17.8	23.7	-18.1	1.57	1.00	-62.05
3,536.0	3.20	329.90	3,535.5	26.2	19.0	-26.4	0.32	0.32	-0.63
3,725.0	3.40	325.70	3,724.2	35.4	13.2	-35.5	0.17	0.11	-2.22
3,915.0	3.30	323.00	3,913.9	44.4	6.7	-44.5	0.10	-0.05	-1.42
4,104.0	3.30	324.80	4,102.5	53.2	0.3	-53.2	0.05	0.00	0.95
4,293.0	3.30	322.00	4,291.2	61.9	-6.2	-61.8	0.09	0.00	-1.48
4,483.0	3.30	321.30	4,480.9	70.5	-13.0	-70.3	0.02	0.00	-0.37
4,672.0	3.10	319.70	4,669.6	78.6	-19.7	-78.4	0.12	-0.11	-0.85
4,861.0	2.70	316.50	4,858.4	85.8	-26.1	-85.4	0.23	-0.21	-1.69
5,050.0	2.80	317.40	5,047.2	92.4	-32.2	-92.0	0.06	0.05	0.48
5,239.0	2.60	314.20	5,236.0	98.8	-38.4	-98.3	0.13	-0.11	-1.69
5,427.0	2.80	347.30	5,423.8	106.2	-42.5	-105.7	0.82	0.11	17.61
5,616.0	4.50	346.40	5,612.4	117.9	-45.3	-117.3	0.90	0.90	-0.48
5,804.0	3.80	324.20	5,799.9	130.2	-50.6	-129.5	0.92	-0.37	-11.81
5,993.0	3.40	323.40	5,988.5	139.7	-57.6	-139.0	0.21	-0.21	-0.42
6,181.0	3.40	318.30	6,176.2	148.4	-64.7	-147.5	0.16	0.00	-2.71
6,370.0	2.70	333.90	6,364.9	156.6	-70.4	-155.6	0.57	-0.37	8.25
6,559.0	3.40	311.10	6,553.7	164.2	-76.5	-163.2	0.73	0.37	-12.06
6,747.0	3.20	316.50	6,741.3	171.7	-84.4	-170.6	0.20	-0.11	2.87
6,936.0	3.40	335.70	6,930.0	180.6	-90.3	-179.4	0.59	0.11	10.16
7,125.0	2.90	339.70	7,118.8	190.2	-94.3	-189.0	0.29	-0.26	2.12
7,315.0	2.60	333.00	7,308.5	198.6	-97.9	-197.3	0.23	-0.16	-3.53
7,504.0	2.10	319.00	7,497.4	205.0	-102.1	-203.7	0.40	-0.26	-7.41
7,694.0	2.50	322.00	7,687.2	210.9	-106.9	-209.5	0.22	0.21	1.58
7,884.0	2.40	316.70	7,877.0	217.1	-112.2	-215.6	0.13	-0.05	-2.79
8,074.0	1.90	305.80	8,066.9	221.8	-117.5	-220.2	0.34	-0.26	-5.74
8,264.0	1.10	302.40	8,256.8	224.6	-121.6	-223.0	0.42	-0.42	-1.79
8,454.0	1.00	232.10	8,446.8	224.6	-124.4	-222.9	0.64	-0.05	-37.00
8,643.0	2.10	178.30	8,635.8	220.1	-125.6	-218.4	0.91	0.58	-28.47
8,833.0	2.00	184.70	8,825.6	213.3	-125.8	-211.7	0.13	-0.05	3.37
8,944.0	7.60	187.50	8,936.2	204.1	-126.9	-202.4	5.05	5.05	2.52



Survey Report



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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)	
9,038.0	20.00	183.40	9,027.3	181.8	-128.7	-180.1	13.22	13.19	-4.36	
9,133.0	33.90	187.50	9,111.8	139.1	-133.1	-137.4	14.75	14.63	4.32	
9,228.0	42.80	187.50	9,186.2	80.7	-140.8	-78.9	9.37	9.37	0.00	
9,323.0	48.80	187.00	9,252.4	13.2	-149.4	-11.2	6.33	6.32	-0.53	
FTP Crossed @ 9416.7' MD / 9309.8' TVD										
9,416.7	55.61	185.03	9,309.8	-60.4	-157.1	62.4	7.45	7.26	-2.11	
9,418.0	55.70	185.00	9,310.6	-61.5	-157.2	63.5	7.45	7.28	-1.92	
9,513.0	62.70	187.00	9,359.2	-142.5	-165.8	144.7	7.59	7.37	2.11	
9,608.0	66.70	188.90	9,399.8	-227.6	-177.7	229.9	4.58	4.21	2.00	
9,642.0	68.00	189.40	9,412.9	-258.6	-182.7	260.9	4.06	3.82	1.47	
9,761.0	71.70	189.60	9,453.8	-368.7	-201.1	371.3	3.11	3.11	0.17	
9,856.0	83.90	186.40	9,473.9	-460.5	-213.9	463.3	13.26	12.84	-3.37	
9,951.0	90.90	185.00	9,478.2	-554.9	-223.4	557.7	7.51	7.37	-1.47	
10,046.0	89.30	184.10	9,478.0	-649.6	-230.9	652.5	1.93	-1.68	-0.95	
10,139.0	88.70	183.80	9,479.7	-742.3	-237.3	745.4	0.72	-0.65	-0.32	
10,234.0	90.50	184.70	9,480.3	-837.1	-244.3	840.2	2.12	1.89	0.95	
10,328.0	90.50	184.30	9,479.5	-930.8	-251.7	934.0	0.43	0.00	-0.43	
10,422.0	90.70	184.30	9,478.5	-1,024.5	-258.8	1,027.8	0.21	0.21	0.00	
10,517.0	90.90	184.50	9,477.2	-1,119.2	-266.0	1,122.6	0.30	0.21	0.21	
10,611.0	91.40	184.10	9,475.3	-1,212.9	-273.1	1,216.4	0.68	0.53	-0.43	
10,705.0	90.60	183.80	9,473.7	-1,306.7	-279.6	1,310.2	0.91	-0.85	-0.32	
10,799.0	89.10	183.10	9,473.9	-1,400.5	-285.2	1,404.1	1.76	-1.60	-0.74	
10,893.0	88.90	182.70	9,475.5	-1,494.4	-290.0	1,498.0	0.48	-0.21	-0.43	
10,988.0	90.60	184.50	9,476.0	-1,589.2	-295.9	1,592.9	2.61	1.79	1.89	
11,082.0	90.60	184.50	9,474.8	-1,682.9	-303.3	1,686.7	0.21	0.21	0.00	
11,176.0	90.30	184.10	9,473.9	-1,776.6	-310.4	1,780.5	0.68	-0.53	-0.43	
11,270.0	91.10	184.10	9,472.8	-1,870.4	-317.1	1,874.4	0.85	0.85	0.00	
11,364.0	89.80	182.40	9,472.0	-1,964.2	-322.4	1,968.3	2.28	-1.38	-1.81	
11,457.0	89.30	182.00	9,472.8	-2,057.1	-326.0	2,061.2	0.69	-0.54	-0.43	
11,552.0	90.00	181.90	9,473.3	-2,152.1	-329.2	2,156.2	0.74	0.74	-0.11	
11,646.0	89.30	181.50	9,473.9	-2,246.0	-332.0	2,250.2	0.86	-0.74	-0.43	
11,741.0	87.80	178.90	9,476.3	-2,341.0	-332.3	2,345.1	3.16	-1.58	-2.74	
11,835.0	87.80	178.50	9,479.9	-2,434.9	-330.2	2,439.0	0.43	0.00	-0.43	
11,929.0	87.80	178.20	9,483.5	-2,528.8	-327.5	2,532.9	0.32	0.00	-0.32	
12,023.0	89.50	176.90	9,485.7	-2,622.7	-323.5	2,626.7	2.28	1.81	-1.38	
12,117.0	89.00	176.60	9,487.0	-2,716.5	-318.2	2,720.4	0.62	-0.53	-0.32	
12,211.0	90.20	176.90	9,487.6	-2,810.4	-312.8	2,814.2	1.32	1.28	0.32	
12,305.0	91.80	177.10	9,486.0	-2,904.2	-307.9	2,908.0	1.72	1.70	0.21	
12,399.0	89.10	175.70	9,485.2	-2,998.0	-302.0	3,001.7	3.24	-2.87	-1.49	
12,493.0	91.40	176.20	9,484.8	-3,091.8	-295.4	3,095.4	2.50	2.45	0.53	
12,587.0	89.50	174.80	9,484.1	-3,185.5	-288.0	3,189.0	2.51	-2.02	-1.49	
12,681.0	92.30	177.10	9,482.6	-3,279.2	-281.4	3,282.6	3.85	2.98	2.45	
12,774.0	92.20	176.90	9,479.0	-3,372.0	-276.5	3,375.3	0.24	-0.11	-0.22	
12,869.0	92.20	178.90	9,475.3	-3,466.9	-273.0	3,470.2	2.10	0.00	2.11	



Survey Report



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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Ogden 20509 29-32 Fed Com #3H
TVD Reference: WELL @ 3099.0usft (Patterson #594)
MD Reference: WELL @ 3099.0usft (Patterson #594)
North Reference: Grid
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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)
12,982.0	90.30	178.70	9,473.3	-3,559.8	-271.1	3,563.1	2.05	-2.04	-0.22
13,057.0	90.40	178.20	9,472.7	-3,654.8	-268.5	3,858.0	0.54	0.11	-0.53
13,151.0	91.30	181.00	9,471.3	-3,748.8	-267.8	3,752.0	3.13	0.96	2.98
13,245.0	89.50	177.30	9,470.7	-3,842.7	-266.4	3,845.9	4.38	-1.91	-3.94
13,340.0	89.30	176.80	9,471.7	-3,937.6	-261.6	3,940.7	0.57	-0.21	-0.53
13,434.0	89.70	176.40	9,472.5	-4,031.4	-256.0	4,034.4	0.60	0.43	-0.43
13,528.0	90.00	176.10	9,472.7	-4,125.2	-249.8	4,128.1	0.45	0.32	-0.32
13,622.0	89.80	175.50	9,472.9	-4,219.0	-242.9	4,221.8	0.67	-0.21	-0.64
13,716.0	89.00	174.80	9,473.9	-4,312.6	-235.0	4,315.3	1.13	-0.85	-0.74
13,810.0	90.30	179.00	9,474.4	-4,406.5	-229.9	4,409.1	4.68	1.38	4.47
13,904.0	90.50	178.50	9,473.8	-4,500.4	-227.9	4,503.0	0.57	0.21	-0.53
13,998.0	90.90	175.50	9,472.6	-4,594.3	-222.9	4,596.8	3.22	0.43	-3.19
14,092.0	90.20	177.00	9,471.7	-4,688.1	-216.8	4,690.5	1.76	-0.74	1.60
14,185.0	89.00	175.70	9,472.4	-4,780.9	-210.9	4,783.2	1.90	-1.29	-1.40
14,279.0	88.90	177.50	9,474.1	-4,874.7	-205.3	4,877.0	1.92	-0.11	1.91
14,374.0	87.20	176.60	9,477.3	-4,969.5	-200.4	4,971.7	2.02	-1.79	-0.95
14,467.0	91.20	177.60	9,478.6	-5,062.4	-195.7	5,064.5	4.43	4.30	1.08
14,561.0	91.50	178.00	9,476.4	-5,156.3	-192.1	5,158.4	0.53	0.32	0.43
14,656.0	91.30	178.20	9,474.1	-5,251.2	-189.0	5,253.2	0.30	-0.21	0.21
14,750.0	91.40	178.00	9,471.9	-5,345.1	-185.8	5,347.1	0.24	0.11	-0.21
14,844.0	91.60	178.00	9,469.4	-5,439.0	-182.6	5,441.0	0.21	0.21	0.00
14,938.0	91.20	178.30	9,467.1	-5,533.0	-179.5	5,534.8	0.53	-0.43	0.32
15,032.0	91.50	178.00	9,464.9	-5,626.9	-176.5	5,628.7	0.45	0.32	-0.32
15,126.0	90.50	177.60	9,463.3	-5,720.8	-172.9	5,722.6	1.15	-1.06	-0.43
15,220.0	89.80	177.10	9,463.0	-5,814.7	-168.5	5,816.4	0.92	-0.74	-0.53
15,315.0	91.60	177.50	9,461.9	-5,909.6	-164.1	5,911.2	1.94	1.89	0.42
15,409.0	90.10	176.60	9,460.5	-6,003.4	-159.2	6,005.0	1.86	-1.60	-0.96
15,503.0	90.00	176.80	9,460.4	-6,097.3	-153.8	6,098.8	0.24	-0.11	0.21
15,598.0	87.60	175.50	9,462.4	-6,192.0	-147.4	6,193.4	2.87	-2.53	-1.37
15,692.0	87.40	175.50	9,466.5	-6,285.7	-140.1	6,287.0	0.21	-0.21	0.00
15,787.0	89.60	179.20	9,469.0	-6,380.5	-135.7	6,381.7	4.53	2.32	3.89
15,880.0	90.20	179.60	9,469.1	-6,473.5	-134.7	6,474.7	0.78	0.65	0.43
15,974.0	86.70	178.00	9,471.7	-6,567.4	-132.7	6,568.6	4.09	-3.72	-1.70
16,068.0	87.50	179.60	9,476.4	-6,661.3	-130.8	6,662.4	1.90	0.85	1.70
16,162.0	87.40	178.90	9,480.6	-6,755.2	-129.6	6,756.3	0.75	-0.11	-0.74
16,256.0	86.80	178.50	9,485.4	-6,849.0	-127.4	6,850.1	0.77	-0.84	-0.43
16,350.0	90.60	179.80	9,487.5	-6,943.0	-126.0	6,944.0	4.27	4.04	1.38
16,444.0	89.30	179.60	9,487.6	-7,037.0	-125.5	7,038.0	1.40	-1.38	-0.21
16,539.0	89.50	179.60	9,488.6	-7,132.0	-124.9	7,133.0	0.21	0.21	0.00
16,632.0	91.40	180.80	9,487.9	-7,225.0	-125.2	7,226.0	2.42	2.04	1.29
16,726.0	90.00	180.80	9,486.7	-7,318.9	-126.5	7,320.0	1.49	-1.49	0.00
LTP Crossed @ 16744.1' MD / 9486.7' TVD									
16,744.1	89.81	180.80	9,486.7	-7,337.0	-126.8	7,338.1	1.06	-1.06	0.00



Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Ogden 20509 29-32 Fed Com #3H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3099.0usft (Patterson #594)
Site:	Sec 29, T23, R28-E	MD Reference:	WELL @ 3099.0usft (Patterson #594)
Well:	Ogden 20509 29-32 Fed Com #3H	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)	
16,820.0	89.00	180.80	9,487.5	-7,412.9	-127.8	7,414.0	1.06	-1.06	0.00	
16,914.0	89.70	182.40	9,488.6	-7,506.9	-130.5	7,507.9	1.86	0.74	1.70	
16,985.0	90.40	183.10	9,488.5	-7,577.8	-133.9	7,578.9	1.39	0.99	0.99	
TD @ 17036.0' MD / 9488.2' TVD										
17,036.0	90.40	183.10	9,488.2	-7,628.7	-136.6	7,629.9	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N-S (usft)	+E-W (usft)	Comment	
423.0	423.0	0.5	2.3	First QES Survey @ 423.0' MD / 423.0' TVD	
9,416.7	9,309.8	-60.4	-157.1	FTP Crossed @ 9416.7' MD / 9309.8' TVD	
16,744.1	9,486.7	-7,337.0	-126.8	LTP Crossed @ 16744.1' MD / 9486.7' TVD	
17,036.0	9,488.2	-7,628.7	-136.6	TD @ 17036.0' MD / 9488.2' TVD	

Checked By: _____ Approved By: _____ Date: _____