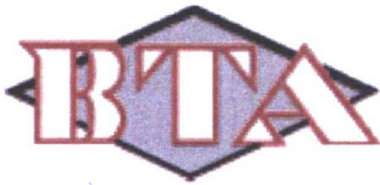


30-025-43388



BTA Oil Producers, LLC

Lea County, NM
Sec 18, T23S, R34E
Starcaster 18 Federal #1H

Wellbore #1

Survey: MWD Surveys

QES Survey Report

20 February, 2017



Quintana Energy Services

11390 FM 830

Willis, TX 77318

Phone: (936) 856-4332

Fax: (936) 856-8678

**Survey Certification Sheet**

Company	Job Number	Date
BTA Oil Producers	WT-170074	2/20/2017

Lease	Well Name	County & State
Sec18,T23S,R34E	Starcaster 18 Federal #1H	Lea, NM

API No.	Survey Depth Range	Survey Type
30-025-43388	1150 feet to 15370 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
N/A	Daniel Longoria

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Quintana Energy Services (QES). This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature.

Christopher Hughes

A large, stylized handwritten signature in black ink, appearing to read 'CH', is written over the printed name and title of Christopher Hughes.

Christopher Hughes
MWD Compliance Manager
Quintana Energy Services

Digitally signed by Christopher Hughes
DN: cn=Christopher Hughes, o=QES,
ou=compliance, email=chrish@qeslp.com, c=US
Date: 2017.02.27 09:51:18 -06'00'



Survey Report

QES

Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Starcaster 18 Federal #1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3532.3usft (Nomac #94)
Site:	Sec 18, T23S, R34E	MD Reference:	WELL @ 3532.3usft (Nomac #94)
Well:	Starcaster 18 Federal #1H	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 18, T23S, R34E		
Site Position:		Northing:	477,774.30 usft
From:	Map	Easting:	753,564.86 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 18' 39.057 N
		Longitude:	103° 30' 45.358 W
		Grid Convergence:	0.44 °

Well	Starcaster 18 Federal #1H		
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° 18' 39.057 N
		Longitude:	103° 30' 45.707 W
		Ground Level:	3,507.3 usft

Wellbore	Wellbore #1		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/11/2017	6.98	60.16	48,040

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

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	187.69

Survey Program		Date	2/3/2017	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,150.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro
1,278.0	15,370.0	MWD Surveys (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)
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Gyro Tie-In @ 1150' MD / TVD

1,150.0	0.46	226.94	1,150.0	-7.0	4.2	6.3	0.00	0.00	0.00
1,278.0	1.70	308.70	1,277.9	-6.1	2.3	5.8	1.33	0.97	63.88
1,468.0	1.80	308.50	1,467.8	-2.5	-2.2	2.8	0.05	0.05	-0.11
1,658.0	5.30	301.70	1,657.5	4.0	-12.0	-2.3	1.85	1.84	-3.58
1,848.0	5.00	300.80	1,846.7	12.8	-26.6	-9.1	0.16	-0.16	-0.47
2,038.0	4.60	306.40	2,036.0	21.6	-39.9	-16.0	0.32	-0.21	2.95
2,228.0	5.40	295.00	2,225.3	29.9	-54.1	-22.4	0.67	0.42	-6.00
2,418.0	4.70	299.20	2,414.6	37.5	-69.0	-27.9	0.42	-0.37	2.21
2,608.0	4.90	288.70	2,603.9	43.9	-83.5	-32.3	0.47	0.11	-5.53



Survey Report



Company: BTA Oil Producers, LLC
 Project: Lea County, NM
 Site: Sec 18, T23S, R34E
 Well: Starcaster 18 Federal #1H
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Starcaster 18 Federal #1H
 TVD Reference: WELL @ 3532.3usft (Nomac #94)
 MD Reference: WELL @ 3532.3usft (Nomac #94)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 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)
2,798.0	4.40	295.20	2,793.3	49.6	-97.8	-36.0	0.38	-0.26	3.42
2,988.0	5.40	293.60	2,982.6	56.2	-112.6	-40.7	0.53	0.53	-0.84
3,178.0	4.00	307.50	3,171.9	63.9	-126.0	-46.4	0.94	-0.74	7.32
3,368.0	5.00	294.80	3,361.4	71.4	-138.8	-52.1	0.74	0.53	-6.68
3,558.0	5.30	280.80	3,550.6	76.5	-154.9	-55.1	0.68	0.16	-7.37
3,748.0	4.10	281.80	3,740.0	79.5	-170.2	-56.0	0.63	-0.63	0.53
3,937.0	3.80	307.30	3,928.5	84.7	-181.8	-59.6	0.93	-0.16	13.49
4,127.0	4.60	287.60	4,118.0	90.8	-194.0	-64.0	0.86	0.42	-10.37
4,317.0	3.30	312.60	4,307.6	96.8	-205.3	-68.5	1.12	-0.68	13.16
4,507.0	3.40	309.10	4,497.3	104.1	-213.7	-74.5	0.12	0.05	-1.84
4,697.0	5.70	293.10	4,686.6	111.3	-226.8	-80.0	1.37	1.21	-8.42
4,887.0	4.50	283.80	4,875.9	116.8	-242.7	-83.3	0.76	-0.63	-4.89
4,920.0	4.40	284.30	4,908.8	117.4	-245.2	-83.6	0.33	-0.30	1.52
5,057.0	5.40	294.60	5,045.3	121.4	-256.1	-86.0	0.97	0.73	7.52
5,247.0	7.30	296.90	5,234.1	130.6	-275.0	-92.6	1.01	1.00	1.21
5,437.0	7.50	299.20	5,422.5	142.1	-296.6	-101.1	0.19	0.11	1.21
5,627.0	6.90	276.50	5,611.1	149.4	-318.8	-105.4	1.52	-0.32	-11.95
5,817.0	4.10	275.00	5,800.2	151.3	-336.9	-104.9	1.48	-1.47	-0.79
6,007.0	5.60	301.70	5,989.5	156.8	-351.6	-108.3	1.41	0.79	14.05
6,196.0	5.60	302.90	6,177.6	166.6	-367.2	-116.0	0.06	0.00	0.63
6,386.0	5.80	304.50	6,366.7	177.1	-382.8	-124.3	0.13	0.11	0.84
6,576.0	5.60	310.50	6,555.7	188.6	-397.8	-133.7	0.33	-0.11	3.16
6,766.0	6.80	295.00	6,744.6	199.4	-415.1	-142.0	1.08	0.63	-8.16
6,956.0	6.90	299.70	6,933.3	209.8	-435.2	-149.6	0.30	0.05	2.47
7,146.0	7.10	300.30	7,121.9	221.3	-455.2	-158.4	0.11	0.11	0.32
7,336.0	5.30	274.60	7,310.8	228.0	-474.1	-162.5	1.72	-0.95	-13.53
7,526.0	5.00	269.70	7,500.0	228.6	-491.1	-160.9	0.28	-0.16	-2.58
7,716.0	5.40	287.40	7,689.3	231.3	-507.9	-161.2	0.87	0.21	9.32
7,906.0	5.20	294.60	7,878.4	237.5	-524.3	-165.2	0.37	-0.11	3.79
8,096.0	3.80	291.80	8,067.9	243.4	-538.0	-169.3	0.75	-0.74	-1.47
8,285.0	4.80	292.40	8,256.3	248.8	-551.1	-172.8	0.53	0.53	0.32
8,475.0	4.00	293.20	8,445.8	254.4	-564.5	-176.6	0.42	-0.42	0.42
8,665.0	5.30	299.60	8,635.1	261.4	-578.3	-181.6	0.74	0.68	3.37
8,855.0	4.00	289.40	8,824.5	267.9	-592.2	-186.3	0.81	-0.68	-5.37
9,044.0	3.30	276.20	9,013.1	270.7	-603.8	-187.5	0.58	-0.37	-6.98
9,234.0	5.50	300.80	9,202.6	275.9	-617.0	-190.9	1.50	1.16	12.95
9,424.0	4.20	291.50	9,391.9	283.1	-631.3	-196.1	0.80	-0.68	-4.89
9,614.0	0.80	301.00	9,581.7	286.4	-638.9	-198.3	1.80	-1.79	5.00
9,752.0	0.30	265.60	9,719.7	286.9	-640.1	-198.6	0.42	-0.36	-25.65
9,917.0	0.90	154.60	9,884.7	285.6	-640.0	-197.4	0.63	0.36	-67.27
10,012.0	7.10	161.40	9,979.4	279.4	-637.8	-191.5	6.53	6.53	7.16
10,107.0	17.10	159.10	10,072.2	260.7	-630.9	-174.0	10.54	10.53	-2.42
10,201.0	24.50	165.80	10,160.0	228.9	-621.2	-143.7	8.26	7.87	7.13



Survey Report

QES

Company: BTA Oil Producers, LLC
 Project: Lea County, NM
 Site: Sec 18, T23S, R34E
 Well: Starcaster 18 Federal #1H
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Starcaster 18 Federal #1H
 TVD Reference: WELL @ 3532.3usft (Nomac #94)
 MD Reference: WELL @ 3532.3usft (Nomac #94)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 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)
10,296.0	35.90	174.10	10,242.0	181.9	-613.5	-98.2	12.75	12.00	8.74
10,391.0	47.00	178.10	10,313.1	119.3	-609.5	-36.7	12.01	11.68	4.21
10,486.0	53.80	181.80	10,373.6	46.1	-609.5	35.8	7.76	7.16	3.89
10,581.0	58.70	179.70	10,426.4	-32.8	-610.5	114.2	5.48	5.16	-2.21
10,676.0	67.90	180.20	10,469.0	-117.6	-610.4	198.2	9.70	9.68	0.53
10,770.0	79.60	182.90	10,495.3	-207.6	-612.9	287.8	12.75	12.45	2.87
10,865.0	85.80	182.00	10,507.4	-301.7	-617.0	381.6	6.59	6.53	-0.95
10,987.0	86.90	183.00	10,515.1	-423.4	-622.3	502.8	1.22	0.90	0.82
11,082.0	87.20	183.70	10,520.0	-518.1	-627.8	597.4	0.80	0.32	0.74
11,177.0	87.80	182.30	10,524.2	-612.8	-632.8	692.0	1.60	0.63	-1.47
11,272.0	88.10	184.10	10,527.6	-707.6	-638.1	786.7	1.92	0.32	1.89
11,367.0	87.70	180.90	10,531.0	-802.5	-642.2	881.2	3.39	-0.42	-3.37
11,557.0	88.40	180.70	10,537.5	-992.3	-644.9	1,069.7	0.38	0.37	-0.11
11,747.0	88.90	182.70	10,542.0	-1,182.2	-650.5	1,258.6	1.08	0.26	1.05
11,936.0	87.90	183.00	10,547.3	-1,370.9	-659.9	1,446.9	0.55	-0.53	0.16
12,126.0	88.40	184.40	10,553.4	-1,560.4	-672.2	1,636.3	0.78	0.26	0.74
12,316.0	88.40	184.30	10,558.7	-1,749.8	-686.6	1,825.9	0.05	0.00	-0.05
12,505.0	88.00	181.40	10,564.6	-1,938.4	-696.0	2,014.1	1.55	-0.21	-1.53
12,695.0	86.90	180.20	10,573.1	-2,128.2	-698.6	2,202.5	0.86	-0.58	-0.63
12,885.0	89.70	179.20	10,578.7	-2,318.1	-697.6	2,390.6	1.56	1.47	-0.53
13,075.0	89.80	181.10	10,579.6	-2,508.1	-698.1	2,578.9	1.00	0.05	1.00
13,265.0	89.40	177.60	10,580.9	-2,698.0	-696.0	2,766.9	1.85	-0.21	-1.84
13,455.0	89.50	178.30	10,582.7	-2,887.9	-689.2	2,954.1	0.37	0.05	0.37
13,645.0	90.40	178.30	10,582.9	-3,077.8	-683.5	3,141.6	0.47	0.47	0.00
13,835.0	89.90	179.00	10,582.4	-3,267.8	-679.1	3,329.2	0.45	-0.26	0.37
14,024.0	90.00	179.30	10,582.5	-3,456.7	-676.2	3,516.1	0.17	0.05	0.16
14,214.0	90.50	178.30	10,581.7	-3,646.7	-672.3	3,703.9	0.59	0.26	-0.53
14,404.0	91.20	177.20	10,578.9	-3,836.5	-664.8	3,891.0	0.69	0.37	-0.58
14,594.0	89.00	179.50	10,578.6	-4,026.4	-659.3	4,078.4	1.68	-1.16	1.21
14,783.0	89.80	179.50	10,580.5	-4,215.4	-657.7	4,265.5	0.42	0.42	0.00
14,974.0	88.70	177.80	10,583.0	-4,406.3	-653.2	4,454.1	1.06	-0.58	-0.89
15,163.0	89.30	176.70	10,586.3	-4,595.1	-644.1	4,639.9	0.66	0.32	-0.58
15,316.0	88.70	178.10	10,589.0	-4,747.9	-637.2	4,790.4	1.00	-0.39	0.92
TD @ 15370' MD / 10590' TVD									
15,370.0	88.70	178.10	10,590.2	-4,801.8	-635.4	4,843.7	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,150.0	1,150.0	-7.0	4.2	Gyro Tie-In @ 1150' MD / TVD
15,370.0	10,590.2	-4,801.8	-635.4	TD @ 15370' MD / 10590' TVD



Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Starcaster 18 Federal #1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3532.3usft (Nomac #94)
Site:	Sec 18, T23S, R34E	MD Reference:	WELL @ 3532.3usft (Nomac #94)
Well:	Starcaster 18 Federal #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Checked By: _____ Approved By: _____ Date: _____