



Jay-Bee Oil & Gas

Tyler County

Curly PAD

Curly 2

Wellbore #1

Design: Wellbore #1

QES Survey Certification Report

03 May, 2018

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WV Department of
Environmental Protection



Quintana Energy Services

11390 FM 830
Willis, TX 77318
Phone: (936) 856-4332
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Survey Certification Sheet

Company	Job Number	Date
Jay- Bee Oil & Gas	AM-180417	5/14/2018

Lease	Well Name	County & State
N/A	Curly 2	Tyler County, WV

API No.	Survey Depth Range	Survey Type
47-095-02443	492 feet to 14603 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
Click here to enter text.	Adam Ball

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

Digitally signed by Christopher Hughes
DN: cn=Christopher Hughes, o=QES,
ou=compliance, email=chrish@qeslp.com, c=US
Date: 2018.05.24 14:09:34 -05'00'

Christopher Hughes
MWD Compliance Manager
Quintana Energy Services

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Environmental Protection



QES Survey Certification Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well Curly 2
Project:	Tyler County	TVD Reference:	WELL @ 1144.0usft (Patterson #581)
Site:	Curly PAD	MD Reference:	WELL @ 1144.0usft (Patterson #581)
Well:	Curly 2	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Tyler County		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	Curly PAD				
Site Position:		Northing:	354,137.79 usft	Latitude:	39° 27' 49.958 N
From:	Map	Easting:	1,574,078.09 usft	Longitude:	80° 53' 49.560 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.89 °

Well	Curly 2					
Well Position	+N/-S	0.0 usft	Northing:	354,126.22 usft	Latitude:	39° 27' 49.842 N
	+E/-W	0.0 usft	Easting:	1,574,061.78 usft	Longitude:	80° 53' 49.766 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,123.4 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/19/2018	-8.52	66.66	51,934.54583287

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)	Direction (°)
		0.0	0.0	0.0	162.84

Survey Program	Date 5/2/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	<div style="text-align: right;"> RECEIVED Office of Oil and Gas JUN 12 2020 </div>
50.0	492.0	VES GYRO (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro	
517.0	14,603.0	QES MWD Surveys (Wellbore #1)	OWSG MWD - Standard	OWSG MWD - Standard	

Survey	WV Department of Environmental Protection								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)		
492.0	0.20	167.61	492.0	0.1	2.6	2.6	87.87		
Gyro Tie-In @ 492.0' MD / 492.0' TVD									
517.0	0.50	264.78	517.0	0.0	2.5	2.5	89.01		
612.0	1.65	310.22	612.0	0.9	1.0	1.3	48.26		
707.0	3.69	324.71	706.9	4.3	-1.8	4.6	336.95		
801.0	6.42	322.39	800.5	10.9	-6.8	12.8	328.15		
896.0	7.54	317.39	894.8	19.7	-14.2	24.3	324.15		
991.0	7.29	314.57	989.0	28.5	-22.7	36.5	321.42		
1,086.0	5.22	309.96	1,083.4	35.5	-30.4	46.7	319.48		
1,180.0	2.17	299.89	1,177.2	39.2	-35.2	52.6	318.06		
1,275.0	1.35	289.85	1,272.2	40.4	-37.8	55.3	316.93		



QES Survey Certification Report



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Project: Tyler County
Site: Curly PAD
Well: Curly 2
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Curly 2
 WELL @ 1144.0usft (Patterson #581)
 WELL @ 1144.0usft (Patterson #581)
 Grid
 Minimum Curvature
 EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
1,369.0	0.45	51.54	1,366.2	41.0	-38.5	56.3	316.80
1,464.0	0.60	123.66	1,461.2	41.0	-37.8	55.8	317.29
1,558.0	0.46	132.55	1,555.2	40.5	-37.1	54.9	317.45
1,652.0	0.24	215.50	1,649.1	40.0	-37.0	54.5	317.28
1,747.0	0.34	191.12	1,744.1	39.6	-37.2	54.3	316.83
1,842.0	0.31	159.89	1,839.1	39.1	-37.1	53.9	316.48
1,937.0	0.59	114.46	1,934.1	38.6	-36.6	53.2	316.57
2,032.0	0.32	125.45	2,029.1	38.3	-35.9	52.5	316.83
2,126.0	0.49	143.47	2,123.1	37.8	-35.5	51.8	316.83
2,221.0	0.69	114.96	2,218.1	37.2	-34.7	50.9	317.02
2,316.0	0.59	160.74	2,313.1	36.5	-34.0	49.9	317.04
2,411.0	0.46	178.07	2,408.1	35.7	-33.9	49.2	316.52
2,506.0	1.84	340.91	2,503.1	36.8	-34.3	50.3	316.95
2,600.0	4.84	334.52	2,596.9	41.8	-36.5	55.5	318.82
2,695.0	7.51	331.23	2,691.4	50.8	-41.3	65.5	320.94
2,790.0	10.02	330.27	2,785.3	63.5	-48.3	79.8	322.70
2,885.0	10.94	329.07	2,878.7	78.4	-57.1	96.9	323.93
2,980.0	10.77	324.73	2,972.0	93.3	-66.8	114.8	324.40
3,078.0	10.65	319.71	3,068.3	107.7	-78.0	133.0	324.10
3,173.0	10.42	320.34	3,161.7	121.0	-89.1	150.3	323.63
3,268.0	10.55	319.82	3,255.1	134.3	-100.2	167.6	323.26
3,364.0	10.44	316.06	3,349.5	147.3	-111.9	185.0	322.76
3,457.0	10.03	317.86	3,441.0	159.3	-123.2	201.4	322.29
3,552.0	10.25	319.25	3,534.5	171.9	-134.3	218.1	322.00
3,646.0	10.89	318.92	3,626.9	184.9	-145.6	235.3	321.79
3,741.0	9.97	315.30	3,720.4	197.5	-157.3	252.5	321.47
3,836.0	9.59	320.01	3,814.0	209.4	-168.1	268.6	321.24
3,931.0	10.03	324.73	3,907.6	222.2	-178.0	284.7	321.31
4,026.0	10.93	323.63	4,001.0	236.3	-188.1	302.0	321.47
4,120.0	10.71	322.58	4,093.3	250.4	-198.7	319.6	321.56
4,215.0	9.36	318.21	4,186.9	263.1	-209.2	336.2	321.51
4,310.0	6.14	309.24	4,281.0	272.1	-218.3	348.9	321.26
4,404.0	5.37	306.29	4,374.5	277.9	-225.7	358.0	320.91
4,501.0	4.38	310.90	4,471.2	283.0	-232.2	366.1	320.63
4,596.0	4.17	299.92	4,565.9	287.1	-237.9	372.9	320.35
4,691.0	2.18	301.94	4,660.8	289.8	-242.5	377.8	320.08
4,786.0	2.02	304.79	4,755.7	291.7	-245.4	381.2	319.93
4,881.0	1.48	324.21	4,850.7	293.6	-247.5	384.0	319.88
4,976.0	1.69	351.84	4,945.6	296.0	-248.4	386.4	320.00
5,071.0	1.89	334.65	5,040.6	298.8	-249.3	389.1	320.17
5,165.0	0.62	306.90	5,134.5	300.5	-250.3	391.1	320.21
5,260.0	0.74	329.92	5,229.5	301.4	-251.0	392.2	320.21
5,355.0	0.88	321.25	5,324.5	302.5	-251.8	393.6	320.22
5,449.0	0.62	160.05	5,418.5	302.6	-252.1	393.8	320.20
5,544.0	0.13	113.12	5,513.5	302.0	-251.8	393.2	320.18

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QES Survey Certification Report



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Site:	Curly PAD	MD Reference:	WELL @ 1144.0usft (Patterson #581)
Well:	Curly 2	North Reference:	Grid
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Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	
5,639.0	0.11	269.19	5,608.5	302.0	-251.8	393.2	320.18	
5,725.0	0.60	32.60	5,694.5	302.4	-251.6	393.4	320.23	
5,819.0	1.20	21.30	5,788.5	303.7	-251.0	394.0	320.43	
5,866.0	1.10	7.00	5,835.5	304.6	-250.8	394.6	320.54	
5,914.0	1.10	118.40	5,883.5	304.8	-250.3	394.5	320.61	
5,961.0	5.40	141.50	5,930.4	302.9	-248.5	391.8	320.63	
6,008.0	9.30	144.00	5,977.0	298.1	-244.9	385.8	320.59	
6,055.0	12.40	150.20	6,023.2	290.6	-240.2	377.0	320.43	
6,103.0	15.70	154.40	6,069.7	280.3	-234.8	365.7	320.05	
6,150.0	19.60	159.50	6,114.5	267.2	-229.3	352.1	319.36	
6,198.0	23.70	162.20	6,159.1	250.5	-223.5	335.7	318.25	
6,245.0	27.90	161.60	6,201.4	231.0	-217.2	317.1	316.77	
6,293.0	32.00	160.90	6,243.0	208.3	-209.5	295.4	314.84	
6,340.0	36.10	160.20	6,281.9	183.5	-200.7	272.0	312.44	
6,387.0	40.30	159.80	6,318.9	156.2	-190.8	246.6	309.32	
6,434.0	44.70	160.20	6,353.5	126.4	-179.9	219.9	305.09	
6,482.0	48.50	163.50	6,386.5	93.3	-169.1	193.1	298.88	
6,529.0	52.80	164.10	6,416.3	58.4	-158.9	169.3	290.16	
6,577.0	58.40	163.80	6,443.4	20.3	-148.0	149.4	277.82	
6,624.0	63.90	163.10	6,466.1	-19.1	-136.3	137.6	262.01	
6,672.0	69.40	162.60	6,485.1	-61.2	-123.3	137.6	243.59	
6,719.0	73.40	162.40	6,500.1	-103.7	-109.9	151.1	226.66	
6,767.0	77.80	163.80	6,512.0	-148.2	-96.4	176.8	213.04	
6,814.0	81.20	164.00	6,520.6	-192.6	-83.6	209.9	203.46	
6,862.0	84.20	161.90	6,526.7	-238.1	-69.6	248.0	196.30	
6,909.0	86.50	159.70	6,530.5	-282.3	-54.2	287.5	190.87	
6,956.0	87.10	158.80	6,533.1	-326.2	-37.6	328.3	186.57	
7,051.0	89.60	157.00	6,535.8	-414.2	-1.8	414.2	180.26	
7,146.0	89.50	160.40	6,536.6	-502.7	32.7	503.7	176.28	
7,241.0	90.50	163.70	6,536.6	-593.0	61.9	596.2	174.04	
7,336.0	91.20	164.10	6,535.2	-684.3	88.3	690.0	172.65	
7,431.0	89.50	163.10	6,534.6	-775.4	115.1	783.9	171.56	
7,526.0	89.80	164.00	6,535.2	-866.5	142.0	878.1	170.69	
7,621.0	89.20	164.20	6,536.0	-957.9	168.0	972.5	170.05	
7,716.0	89.50	163.40	6,537.1	-1,049.1	194.5	1,067.0	169.50	
7,811.0	89.50	164.50	6,537.9	-1,140.4	220.8	1,161.6	169.04	
7,905.0	88.90	163.10	6,539.2	-1,230.7	247.0	1,255.2	168.65	
8,000.0	88.70	163.10	6,541.2	-1,321.5	274.6	1,349.8	168.26	
8,095.0	90.30	163.80	6,542.0	-1,412.6	301.7	1,444.4	167.94	
8,190.0	89.90	162.50	6,541.9	-1,503.5	329.2	1,539.1	167.65	
8,285.0	88.50	160.40	6,543.2	-1,593.6	359.4	1,633.6	167.29	
8,379.0	88.80	161.10	6,545.4	-1,682.3	390.4	1,727.0	166.93	
8,474.0	90.60	163.20	6,545.9	-1,772.7	419.5	1,821.7	166.69	
8,569.0	88.70	159.90	6,546.5	-1,862.8	449.6	1,916.3	166.43	

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QES Survey Certification Report



Company: Jay-Bee Oil & Gas
 Project: Tyler County
 Site: Curly PAD
 Well: Curly 2
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Curly 2
 TVD Reference: WELL @ 1144.0usft (Patterson #581)
 MD Reference: WELL @ 1144.0usft (Patterson #581)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
8,663.0	88.40	160.40	6,548.9	-1,951.2	481.5	2,009.7	166.14
8,758.0	88.40	160.20	6,551.5	-2,040.6	513.5	2,104.2	165.88
8,853.0	88.70	160.40	6,553.9	-2,130.0	545.5	2,198.7	165.63
8,947.0	88.50	160.40	6,556.2	-2,218.5	577.0	2,292.3	165.42
9,042.0	89.10	160.80	6,558.2	-2,308.1	608.6	2,387.0	165.23
9,136.0	88.90	159.00	6,559.9	-2,396.4	640.9	2,480.6	165.03
9,231.0	89.00	159.70	6,561.6	-2,485.2	674.4	2,575.1	164.82
9,326.0	91.40	161.10	6,561.3	-2,574.7	706.2	2,669.8	164.66
9,421.0	91.60	160.10	6,558.8	-2,664.3	737.8	2,764.6	164.52
9,515.0	91.20	164.20	6,556.5	-2,753.7	766.6	2,858.4	164.44
9,610.0	89.80	163.70	6,555.6	-2,845.0	792.9	2,953.4	164.43
9,704.0	90.00	164.80	6,555.8	-2,935.5	818.4	3,047.4	164.42
9,799.0	88.70	163.70	6,556.9	-3,026.9	844.2	3,142.4	164.42
9,893.0	88.70	163.50	6,559.0	-3,117.1	870.7	3,236.4	164.39
9,988.0	88.70	163.80	6,561.2	-3,208.2	897.4	3,331.4	164.37
10,083.0	89.40	164.30	6,562.8	-3,299.5	923.5	3,426.3	164.36
10,178.0	89.50	162.90	6,563.7	-3,390.7	950.3	3,521.3	164.34
10,272.0	89.80	163.10	6,564.2	-3,480.6	977.8	3,615.3	164.31
10,367.0	89.50	161.80	6,564.8	-3,571.1	1,006.5	3,710.2	164.26
10,462.0	89.20	159.80	6,565.9	-3,660.8	1,037.7	3,805.1	164.17
10,556.0	88.50	158.90	6,567.8	-3,748.8	1,070.9	3,898.7	164.06
10,651.0	88.70	157.90	6,570.1	-3,837.1	1,105.8	3,993.2	163.92
10,745.0	89.50	163.20	6,571.6	-3,925.7	1,137.1	4,087.0	163.85
10,840.0	89.70	162.90	6,572.2	-4,016.5	1,164.8	4,182.0	163.83
10,934.0	89.60	165.30	6,572.8	-4,106.9	1,190.5	4,276.0	163.83
11,029.0	88.90	161.80	6,574.1	-4,198.0	1,217.4	4,371.0	163.83
11,124.0	88.60	161.10	6,576.1	-4,288.1	1,247.7	4,465.9	163.78
11,218.0	88.40	161.10	6,578.6	-4,377.0	1,278.1	4,559.8	163.72
11,313.0	88.40	161.00	6,581.3	-4,466.8	1,308.9	4,654.6	163.67
11,408.0	88.10	160.50	6,584.2	-4,556.4	1,340.2	4,749.4	163.61
11,503.0	91.90	163.80	6,584.2	-4,646.8	1,369.3	4,844.4	163.58
11,597.0	90.60	160.90	6,582.1	-4,736.4	1,397.8	4,938.3	163.56
11,692.0	89.90	161.30	6,581.7	-4,826.2	1,428.6	5,033.2	163.51
11,787.0	88.20	161.20	6,583.3	-4,916.2	1,459.1	5,128.2	163.47
11,881.0	88.10	161.50	6,586.3	-5,005.2	1,489.2	5,222.0	163.43
11,975.0	89.80	161.70	6,588.0	-5,094.4	1,518.8	5,316.0	163.40
12,070.0	89.90	160.50	6,588.3	-5,184.3	1,549.6	5,410.9	163.36
12,165.0	89.10	158.70	6,589.1	-5,273.3	1,582.7	5,505.7	163.29
12,259.0	91.30	160.90	6,588.8	-5,361.5	1,615.2	5,599.5	163.23
12,354.0	90.80	159.90	6,587.0	-5,451.0	1,647.0	5,694.4	163.19
12,449.0	90.80	162.10	6,585.7	-5,540.8	1,678.0	5,789.3	163.15
12,544.0	89.50	158.70	6,585.5	-5,630.3	1,709.8	5,884.2	163.11
12,639.0	89.30	159.50	6,586.4	-5,719.0	1,743.7	5,978.9	163.04
12,734.0	90.40	162.20	6,586.7	-5,808.7	1,774.9	6,073.9	163.01

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Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well Curly 2
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Well:	Curly 2	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
12,828.0	90.40	161.20	6,586.0	-5,898.0	1,804.4	6,167.8	162.99
12,923.0	88.40	161.30	6,587.0	-5,987.9	1,834.9	6,262.8	162.96
13,018.0	89.80	164.20	6,588.5	-6,078.6	1,863.1	6,357.7	162.96
13,113.0	90.50	164.60	6,588.3	-6,170.1	1,888.6	6,452.7	162.98
13,207.0	89.50	165.10	6,588.3	-6,260.9	1,913.2	6,546.7	163.01
13,302.0	89.00	163.90	6,589.5	-6,352.4	1,938.6	6,641.6	163.03
13,397.0	90.10	165.00	6,590.3	-6,443.9	1,964.1	6,736.6	163.05
13,492.0	89.50	163.10	6,590.6	-6,535.3	1,990.2	6,831.6	163.06
13,587.0	90.70	165.20	6,590.4	-6,626.6	2,016.1	6,926.5	163.08
13,681.0	88.90	162.40	6,590.8	-6,716.9	2,042.3	7,020.5	163.09
13,776.0	87.90	160.70	6,593.4	-6,807.0	2,072.4	7,115.4	163.07
13,870.0	88.70	158.70	6,596.2	-6,895.1	2,105.0	7,209.2	163.02
13,965.0	88.40	158.80	6,598.6	-6,983.6	2,139.4	7,304.0	162.97
14,060.0	88.20	155.90	6,601.4	-7,071.2	2,176.0	7,398.4	162.90
14,154.0	89.80	158.40	6,603.1	-7,157.8	2,212.5	7,492.0	162.82
14,249.0	91.30	158.70	6,602.2	-7,246.2	2,247.2	7,586.7	162.77
14,343.0	89.80	158.70	6,601.3	-7,333.8	2,281.3	7,680.4	162.72
14,438.0	91.30	161.50	6,600.3	-7,423.1	2,313.7	7,775.3	162.69
14,533.0	89.10	155.70	6,600.0	-7,511.5	2,348.3	7,870.0	162.64
14,551.0	89.10	155.70	6,600.3	-7,527.9	2,355.7	7,887.9	162.62
14,603.0	89.10	155.70	6,601.1	-7,575.3	2,377.1	7,939.5	162.58

TD @ 14603.0' MD / 6601.1' TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
492.0	492.0	0.1	2.6	Gyro Tie-In @ 492.0' MD / 492.0' TVD
14,603.0	6,601.1	-7,575.3	2,377.1	TD @ 14603.0' MD / 6601.1' TVD

Checked By: _____ Approved By: _____ Date: _____

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 JUN 12 2020
 WV Department of
 Environmental Protection