



Jay-Bee Oil & Gas

Pleasants County

P3 Pad

P3S2U

Pilot Hole

Design: Pilot Hole

QES Survey Certification Report

11 November, 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
Jay- Bee Oil & Gas	AM- 171108	2/20/2018

Lease	Well Name	County & State
N/A	P3S2U	Pleasants County, West Virginia

API No.	Survey Depth Range	Survey Type
47-073-02563	417 feet to 10441 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
9337 feet to 20601 feet MD	Steve Spicer

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: 2018.02.23 11:12:32 -06'00'

Christopher Hughes
MWD Compliance Manager

Quintana Energy Services

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WV Department of
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QES Survey Certification Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Pilot Hole	Survey Calculation Method:	Minimum Curvature
Design:	Pilot Hole	Database:	EDM 5000.1 Single User Db

Project	Pleasants 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	P3 Pad				
Site Position:		Northing:	346,394.20 usft	Latitude:	39° 26' 25.886 N
From:	Map	Easting:	1,527,700.27 usft	Longitude:	81° 3' 39.129 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.00 °

Well	P3S2U					
Well Position	+N/-S	0.0 usft	Northing:	346,366.43 usft	Latitude:	39° 26' 25.621 N
	+E/-W	0.0 usft	Easting:	1,527,753.45 usft	Longitude:	81° 3' 38.445 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	839.3 usft

Wellbore	Pilot Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/31/2017	-8.39	66.70	51,996.73372467

Design	Pilot Hole				
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	71.53

Survey Program	Date	10/31/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
417.0	10,441.0	MWD (Pilot Hole)	MWD default	MWD - Standard	

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
417.0	1.19	17.05	417.0	4.1	1.3	4.3	17.05
First MWD Survey @ 417' MD / TVD							
512.0	1.15	10.69	512.0	6.0	1.7	6.3	16.08
608.0	0.96	357.54	607.9	7.8	1.9	8.0	13.60
703.0	0.22	348.56	702.9	8.7	1.8	9.0	11.69
798.0	0.39	83.58	797.9	9.0	2.1	9.2	13.16
893.0	1.25	139.56	892.9	8.2	3.1	8.8	20.62
989.0	1.38	146.74	988.9	6.4	4.4	7.8	34.34
1,083.0	1.09	150.53	1,082.9	4.7	5.5	7.2	49.18
1,178.0	1.50	207.67	1,177.8	2.8	5.3	6.0	62.03
1,273.0	1.65	212.73	1,272.8	0.6	4.0	4.1	81.80

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Well:	P3S2U	North Reference:	Grid
Wellbore:	Pilot Hole	Survey Calculation Method:	Minimum Curvature
Design:	Pilot Hole	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 (°)	
1,368.0	1.60	225.09	1,367.8	-1.5	2.3	2.8	122.89	
1,464.0	0.77	278.44	1,463.8	-2.4	0.7	2.5	162.46	
1,559.0	0.95	339.61	1,558.7	-1.5	-0.2	1.5	185.96	
1,654.0	1.33	31.17	1,653.7	0.2	0.1	0.2	41.74	
1,749.0	1.74	58.05	1,748.7	1.9	1.9	2.7	46.08	
1,799.0	2.37	57.60	1,798.7	2.8	3.4	4.5	50.77	
1,939.0	3.12	48.85	1,938.5	6.9	8.8	11.1	51.88	
2,034.0	2.57	38.98	2,033.4	10.2	12.0	15.8	49.66	
2,129.0	1.01	14.29	2,128.3	12.7	13.6	18.6	46.95	
2,225.0	1.04	258.78	2,224.3	13.3	12.9	18.6	44.13	
2,319.0	1.76	229.14	2,318.3	12.2	11.0	16.5	42.00	
2,414.0	2.48	222.59	2,413.2	9.8	8.5	13.0	41.11	
2,510.0	1.94	203.47	2,509.2	6.8	6.5	9.4	43.80	
2,605.0	1.71	176.79	2,604.1	3.9	5.9	7.1	56.86	
2,700.0	1.00	167.50	2,699.1	1.6	6.2	6.4	75.15	
2,795.0	0.11	107.25	2,794.1	0.8	6.4	6.5	82.92	
2,890.0	0.25	0.07	2,889.1	1.0	6.5	6.6	81.46	
2,985.0	0.38	1.19	2,984.1	1.5	6.5	6.7	77.05	
3,080.0	0.59	2.88	3,079.1	2.3	6.6	7.0	70.64	
3,175.0	0.75	343.92	3,174.1	3.4	6.4	7.3	62.14	
3,270.0	1.02	299.46	3,269.1	4.4	5.5	7.1	51.34	
3,365.0	1.73	289.81	3,364.0	5.3	3.4	6.3	32.81	
3,460.0	1.16	261.79	3,459.0	5.7	1.1	5.8	11.20	
3,556.0	1.07	174.62	3,555.0	4.6	0.2	4.6	3.00	
3,651.0	2.01	153.46	3,650.0	2.3	1.1	2.5	25.42	
3,746.0	1.34	150.86	3,744.9	-0.2	2.4	2.4	95.11	
3,841.0	0.46	135.89	3,839.9	-1.5	3.2	3.5	114.71	
3,936.0	0.24	69.05	3,934.9	-1.7	3.6	4.0	114.64	
4,031.0	0.27	122.36	4,029.9	-1.7	4.0	4.3	113.16	
4,126.0	0.60	175.95	4,124.9	-2.3	4.2	4.8	118.87	
4,221.0	1.16	174.49	4,219.9	-3.8	4.3	5.8	131.03	
4,315.0	1.00	207.43	4,313.9	-5.5	4.1	6.8	143.37	
4,410.0	0.73	291.38	4,408.9	-6.0	3.1	6.7	152.49	
4,505.0	1.08	53.51	4,503.9	-5.2	3.3	6.1	147.95	
4,600.0	1.23	71.69	4,598.8	-4.4	5.0	6.6	131.37	
4,695.0	1.14	59.00	4,693.8	-3.6	6.7	7.6	117.83	
4,789.0	2.04	65.70	4,787.8	-2.4	9.1	9.4	104.74	
4,887.0	3.53	67.76	4,885.7	-0.5	13.4	13.4	92.23	
4,982.0	5.08	69.54	4,980.4	2.1	20.1	20.2	84.16	
5,077.0	6.34	74.00	5,074.9	5.0	29.1	29.5	80.30	
5,171.0	6.94	73.55	5,168.3	8.0	39.5	40.3	78.54	
5,266.0	7.98	66.41	5,262.5	12.3	51.1	52.3	76.48	
5,360.0	8.26	62.09	5,355.5	18.0	63.0	65.5	74.02	
5,455.0	8.51	63.91	5,449.5	24.3	75.3	79.2	72.10	

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QES Survey Certification Report



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Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Pilot Hole	Survey Calculation Method:	Minimum Curvature
Design:	Pilot Hole	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 (°)
5,550.0	8.66	64.04	5,543.5	30.6	88.1	93.2	70.87
5,644.0	9.04	63.57	5,636.3	36.9	101.1	107.6	69.92
5,739.0	8.41	67.41	5,730.3	42.9	114.2	122.0	69.39
5,833.0	8.76	76.23	5,823.2	47.3	127.5	135.9	69.65
5,928.0	9.51	79.84	5,917.0	50.4	142.2	150.9	70.49
6,023.0	9.58	78.25	6,010.7	53.4	157.7	166.5	71.30
6,118.0	8.68	72.09	6,104.5	57.2	172.2	181.5	71.63
6,213.0	8.63	68.51	6,198.4	62.0	185.7	195.8	71.54
6,307.0	8.93	74.85	6,291.3	66.5	199.3	210.1	71.55
6,402.0	9.14	76.55	6,385.1	70.2	213.8	225.0	71.82
6,497.0	9.19	72.32	6,478.9	74.2	228.3	240.1	71.99
6,592.0	7.90	78.03	6,572.9	77.9	241.9	254.2	72.15
6,687.0	7.20	80.90	6,667.0	80.2	254.2	266.5	72.49
6,781.0	8.91	78.24	6,760.1	82.6	267.1	279.6	72.82
6,876.0	10.16	74.44	6,853.8	86.4	282.4	295.3	73.00
6,970.0	10.18	72.75	6,946.3	91.0	298.3	311.9	73.03
7,065.0	10.15	73.39	7,039.8	95.9	314.4	328.7	73.03
7,160.0	10.07	70.74	7,133.3	101.1	330.2	345.4	72.99
7,254.0	10.38	70.76	7,225.9	106.6	346.0	362.0	72.88
7,349.0	9.89	75.37	7,319.4	111.4	362.0	378.7	72.89
7,443.0	8.99	77.67	7,412.1	115.0	377.0	394.1	73.03
7,538.0	7.41	71.25	7,506.1	118.6	390.0	407.6	73.09
7,633.0	7.79	64.31	7,600.3	123.4	401.6	420.1	72.93
7,728.0	8.93	67.11	7,694.3	129.0	414.2	433.8	72.70
7,823.0	10.05	77.22	7,788.0	133.7	429.1	449.4	72.69
7,917.0	11.34	79.49	7,880.4	137.2	446.2	466.8	72.90
8,012.0	10.54	77.29	7,973.6	140.8	463.8	484.7	73.11
8,107.0	9.10	76.47	8,067.2	144.5	479.6	500.9	73.23
8,204.0	9.03	78.08	8,163.0	147.9	494.5	516.1	73.35
8,299.0	9.00	71.54	8,256.8	151.8	508.9	531.0	73.39
8,394.0	10.11	69.79	8,350.5	157.0	523.7	546.8	73.31
8,488.0	9.18	72.35	8,443.2	162.1	538.6	562.5	73.25
8,583.0	9.05	73.24	8,537.0	166.6	553.0	577.5	73.24
8,678.0	8.61	72.68	8,630.9	170.8	566.9	592.1	73.23
8,772.0	8.47	73.37	8,723.8	174.9	580.3	606.1	73.23
8,867.0	8.51	73.35	8,817.8	178.9	593.7	620.1	73.23
8,962.0	9.03	74.36	8,911.7	183.0	607.6	634.6	73.24
9,056.0	8.49	77.90	9,004.6	186.4	621.5	648.9	73.31
9,151.0	8.66	83.82	9,098.5	188.6	635.5	662.9	73.27
9,246.0	9.18	88.08	9,192.4	189.7	650.2	677.3	73.74
9,337.0	9.00	85.90	9,282.2	190.4	664.5	691.3	74.10
9,431.0	7.60	70.80	9,375.3	193.0	677.7	704.7	74.11
9,526.0	7.80	65.00	9,469.4	197.8	689.5	717.3	73.99
9,621.0	6.10	57.90	9,563.7	203.2	699.6	728.5	73.81
9,716.0	4.00	49.10	9,658.3	208.0	706.4	736.4	73.59

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QES Survey Certification Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Pilot Hole	Survey Calculation Method:	Minimum Curvature
Design:	Pilot Hole	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 (")
9,811.0	3.10	28.60	9,753.1	212.5	710.2	741.3	73.34
9,905.0	2.50	6.00	9,847.0	216.7	711.6	743.9	73.06
10,000.0	2.10	347.60	9,942.0	220.5	711.4	744.8	72.78
10,095.0	2.30	338.90	10,036.9	224.0	710.4	744.8	72.50
10,190.0	2.20	323.40	10,131.8	227.2	708.6	744.1	72.22
10,285.0	2.20	319.70	10,226.8	230.1	706.3	742.9	71.96
10,380.0	2.30	314.80	10,321.7	232.8	703.8	741.3	71.70
10,441.0	2.30	314.80	10,382.6	234.5	702.1	740.2	71.53

TD PH @ 10441' MD / 10382.6 TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
417.0	417.0	4.1	1.3	First MWD Survey @ 417' MD / TVD
10,441.0	10,382.6	234.5	702.1	TD PH @ 10441' MD / 10382.6 TVD

Checked By: _____ Approved By: _____ Date: _____

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Jay-Bee Oil & Gas

Pleasants County

P3 Pad

P3S2U

Sidetrack #1

Survey: ST #1 Surveys

QES Survey Certification Report

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Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Pleasants 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	P3 Pad				
Site Position:		Northing:	346,394.20 usft	Latitude:	39° 26' 25.886 N
From:	Map	Easting:	1,527,700.27 usft	Longitude:	81° 3' 39.129 W
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Well	P3S2U					
Well Position	+N/-S	0.0 usft	Northing:	346,366.43 usft	Latitude:	39° 26' 25.621 N
	+E/-W	0.0 usft	Easting:	1,527,753.45 usft	Longitude:	81° 3' 38.445 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	839.3 usft

Wellbore	Sidetrack #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/14/2017	-8.39	66.71	52,002.12985648

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	9,337.0
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.0	0.0	0.0	147.70

Survey Program	Date	11/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
417.0	9,337.0	MWD (Pilot Hole)	MWD default	MWD - Standard	
9,461.0	20,601.0	ST #1 Surveys (Sidetrack #1)	MWD default	MWD - Standard	

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
9,337.0	9.00	85.90	9,282.2	190.4	664.5	691.3	74.01
ST #1 Tie-in PH @ 9337.0' MD / 9282.2' TVD							
9,461.0	13.80	73.30	9,403.8	195.4	688.4	715.6	74.16
9,508.0	16.10	65.10	9,449.2	199.7	699.7	727.6	74.07
9,556.0	16.90	46.70	9,495.2	207.3	710.8	740.0	73.74
9,603.0	17.70	36.60	9,540.1	217.7	720.0	752.0	73.17
9,650.0	16.00	49.70	9,585.1	227.7	729.2	763.9	72.66
9,697.0	15.30	67.20	9,630.4	234.3	739.9	776.0	72.43
9,744.0	15.60	84.50	9,675.7	237.3	751.9	788.5	72.49
9,791.0	17.10	97.50	9,720.8	237.0	765.1	799.0	72.79
9,839.0	19.40	110.40	9,766.4	233.3	779.5	810.0	73.34

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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 (°)	
9,886.0	22.90	121.20	9,810.3	225.8	794.7	826.1	74.14	
9,933.0	26.50	129.30	9,853.0	214.4	810.6	838.5	75.18	
9,980.0	30.10	135.30	9,894.4	199.4	827.0	850.7	76.44	
10,028.0	34.80	140.30	9,934.9	180.3	844.3	863.3	77.95	
10,075.0	40.20	142.10	9,972.1	158.0	862.2	876.5	79.62	
10,123.0	45.60	142.60	10,007.3	132.1	882.1	892.0	81.48	
10,170.0	49.70	142.60	10,039.0	104.5	903.2	909.2	83.40	
10,217.0	54.10	142.00	10,067.9	75.3	925.8	928.9	85.35	
10,264.0	58.90	142.20	10,093.9	44.4	949.9	950.9	87.33	
10,312.0	63.70	142.00	10,116.9	11.2	975.7	975.8	89.35	
10,359.0	67.80	142.50	10,136.2	-22.7	1,002.0	1,002.2	91.30	
10,407.0	71.40	142.90	10,153.0	-58.5	1,029.2	1,030.9	93.25	
10,454.0	75.00	144.00	10,166.5	-94.6	1,056.0	1,060.3	95.12	
10,502.0	78.40	144.90	10,177.6	-132.7	1,083.2	1,091.3	96.98	
10,549.0	81.20	146.20	10,185.9	-170.8	1,109.3	1,122.4	98.75	
10,596.0	82.90	146.70	10,192.4	-209.6	1,135.1	1,154.2	100.46	
10,643.0	84.20	146.20	10,197.7	-248.5	1,160.9	1,187.2	102.08	
10,691.0	86.30	145.80	10,201.7	-288.2	1,187.6	1,222.1	103.64	
10,786.0	86.20	144.90	10,207.9	-366.1	1,241.5	1,294.4	106.43	
10,881.0	86.10	148.40	10,214.2	-445.3	1,293.6	1,368.1	109.00	
10,975.0	86.20	153.40	10,220.6	-527.2	1,339.2	1,439.3	111.49	
11,070.0	89.00	154.20	10,224.5	-612.4	1,381.1	1,510.8	113.91	
11,165.0	88.70	154.00	10,226.4	-697.8	1,422.6	1,584.5	116.13	
11,259.0	88.10	154.30	10,229.1	-782.4	1,463.6	1,659.6	118.13	
11,354.0	87.80	154.40	10,232.5	-868.0	1,504.7	1,737.1	119.98	
11,449.0	87.20	153.90	10,236.6	-953.4	1,546.0	1,816.4	121.66	
11,543.0	87.60	154.20	10,240.9	-1,037.8	1,587.1	1,896.3	123.18	
11,638.0	88.00	152.00	10,244.5	-1,122.5	1,630.1	1,979.2	124.55	
11,733.0	88.10	152.00	10,247.8	-1,206.3	1,674.7	2,063.9	125.77	
11,827.0	88.40	152.80	10,250.6	-1,289.6	1,718.2	2,148.3	126.89	
11,922.0	88.80	153.40	10,252.9	-1,374.3	1,761.2	2,233.9	127.97	
12,017.0	89.20	152.00	10,254.6	-1,458.7	1,804.7	2,320.5	128.95	
12,112.0	88.00	150.50	10,256.9	-1,541.9	1,850.4	2,408.6	129.80	
12,207.0	88.10	150.50	10,260.2	-1,624.6	1,897.2	2,497.7	130.57	
12,302.0	88.00	150.60	10,263.4	-1,707.2	1,943.8	2,587.1	131.29	
12,396.0	87.80	150.90	10,266.8	-1,789.2	1,989.7	2,675.9	131.96	
12,491.0	88.20	151.10	10,270.2	-1,872.2	2,035.8	2,765.8	132.60	
12,586.0	88.00	151.70	10,273.3	-1,955.6	2,081.2	2,855.8	133.22	
12,681.0	87.40	151.30	10,277.1	-2,039.0	2,126.5	2,946.1	133.80	
12,775.0	87.20	151.00	10,281.5	-2,121.3	2,171.8	3,035.9	134.33	
12,870.0	86.50	153.60	10,286.8	-2,205.2	2,215.9	3,126.2	134.86	
12,965.0	86.50	153.40	10,292.6	-2,290.1	2,258.2	3,216.2	135.40	
13,060.0	86.00	152.60	10,298.8	-2,374.6	2,301.2	3,306.0	135.90	
13,155.0	87.80	154.10	10,303.9	-2,459.3	2,343.8	3,397.3	136.38	
13,250.0	87.70	153.60	10,307.6	-2,544.5	2,385.6	3,488.0	136.85	

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QES Survey Certification Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #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 (°)
13,344.0	88.70	153.40	10,310.6	-2,628.6	2,427.5	3,578.1	137.28
13,439.0	88.50	152.00	10,312.9	-2,713.0	2,471.1	3,669.7	137.67
13,535.0	88.80	153.60	10,315.2	-2,798.4	2,515.0	3,762.4	138.05
13,629.0	89.10	154.90	10,316.9	-2,883.0	2,555.8	3,852.8	138.44
13,724.0	88.80	153.20	10,318.6	-2,968.4	2,597.4	3,944.3	138.81
13,819.0	88.50	153.40	10,320.9	-3,053.3	2,640.0	4,036.4	139.15
13,914.0	88.70	154.50	10,323.2	-3,138.6	2,681.7	4,128.3	139.49
14,009.0	88.30	154.10	10,325.7	-3,224.2	2,722.9	4,220.1	139.82
14,103.0	88.00	152.60	10,328.7	-3,308.1	2,765.1	4,311.5	140.11
14,198.0	87.90	153.40	10,332.1	-3,392.7	2,808.2	4,404.1	140.39
14,293.0	87.90	153.80	10,335.6	-3,477.8	2,850.4	4,496.6	140.66
14,388.0	89.50	154.20	10,337.8	-3,563.1	2,892.0	4,589.1	140.94
14,478.0	89.50	155.00	10,338.5	-3,644.4	2,930.6	4,676.6	141.20
14,573.0	88.20	151.30	10,340.5	-3,729.1	2,973.5	4,769.5	141.43
14,668.0	90.20	151.30	10,341.8	-3,812.5	3,019.1	4,863.1	141.62
14,762.0	89.60	151.50	10,341.9	-3,895.0	3,064.1	4,955.8	141.81
14,857.0	89.50	152.20	10,342.7	-3,978.8	3,108.9	5,049.4	142.00
14,952.0	89.00	152.30	10,343.9	-4,062.8	3,153.2	5,142.9	142.18
15,047.0	88.10	152.50	10,346.3	-4,147.0	3,197.2	5,236.3	142.37
15,141.0	90.10	152.50	10,347.8	-4,230.3	3,240.6	5,328.9	142.55
15,236.0	89.30	152.70	10,348.3	-4,314.7	3,284.3	5,422.5	142.72
15,331.0	88.20	151.40	10,350.4	-4,398.6	3,328.8	5,516.2	142.88
15,426.0	87.80	150.90	10,353.7	-4,481.7	3,374.6	5,610.2	143.02
15,521.0	87.70	153.70	10,357.4	-4,565.8	3,418.7	5,703.9	143.18
15,615.0	87.30	153.60	10,361.5	-4,649.9	3,460.4	5,796.2	143.34
15,710.0	89.40	153.90	10,364.3	-4,735.1	3,502.4	5,889.6	143.51
15,805.0	88.70	153.40	10,365.8	-4,820.2	3,544.6	5,983.2	143.67
15,900.0	88.60	154.20	10,368.1	-4,905.4	3,586.5	6,076.7	143.83
15,995.0	89.70	155.60	10,369.5	-4,991.4	3,626.8	6,169.9	144.00
16,090.0	89.30	156.40	10,370.3	-5,078.2	3,665.4	6,262.9	144.18
16,184.0	88.70	152.50	10,372.0	-5,163.0	3,706.0	6,355.4	144.33
16,279.0	88.70	152.20	10,374.1	-5,247.1	3,750.0	6,449.4	144.45
16,374.0	88.80	152.20	10,376.2	-5,331.1	3,794.3	6,543.6	144.56
16,469.0	89.30	153.10	10,377.8	-5,415.5	3,838.0	6,637.6	144.67
16,564.0	89.10	152.40	10,379.1	-5,500.0	3,881.5	6,731.7	144.79
16,659.0	89.40	152.50	10,380.3	-5,584.2	3,925.4	6,825.8	144.89
16,753.0	89.40	151.80	10,381.3	-5,667.3	3,969.3	6,919.1	144.99
16,848.0	89.30	151.00	10,382.4	-5,750.7	4,014.8	7,013.5	145.08
16,942.0	88.80	149.20	10,384.0	-5,832.2	4,061.6	7,107.9	145.16
17,037.0	89.40	152.00	10,385.4	-5,914.9	4,108.2	7,201.7	145.22
17,131.0	88.80	152.00	10,386.9	-5,997.9	4,152.4	7,295.0	145.28
17,226.0	89.50	155.20	10,388.3	-6,083.0	4,194.6	7,389.0	145.41
17,321.0	89.40	156.60	10,389.2	-6,169.7	4,233.4	7,482.0	145.54
17,415.0	89.40	154.80	10,390.2	-6,255.4	4,272.1	7,575.1	145.65

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QES Survey Certification Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #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 (°)
17,510.0	88.80	151.20	10,391.7	-6,340.0	4,315.2	7,669.2	145.76
17,605.0	89.40	154.20	10,393.2	-6,424.4	4,358.7	7,763.5	145.84
17,700.0	89.10	154.70	10,394.5	-6,510.1	4,399.7	7,857.4	145.95
17,795.0	89.20	153.00	10,395.9	-6,595.3	4,441.6	7,951.5	146.04
17,890.0	88.50	148.40	10,397.8	-6,678.1	4,488.0	8,046.1	146.10
17,985.0	88.30	149.00	10,400.4	-6,759.3	4,537.4	8,141.0	146.13
18,080.0	88.00	148.80	10,403.5	-6,840.6	4,586.4	8,235.8	146.16
18,174.0	88.40	151.00	10,406.4	-6,921.9	4,633.5	8,329.6	146.20
18,269.0	88.50	151.30	10,409.0	-7,005.0	4,679.4	8,424.2	146.26
18,364.0	89.30	152.70	10,410.8	-7,088.9	4,724.0	8,518.7	146.32
18,458.0	88.90	152.40	10,412.3	-7,172.3	4,767.3	8,612.1	146.39
18,553.0	88.50	152.70	10,414.5	-7,256.6	4,811.1	8,706.6	146.46
18,649.0	91.50	154.00	10,414.5	-7,342.4	4,854.1	8,801.9	146.53
18,744.0	89.60	153.70	10,413.6	-7,427.7	4,896.0	8,896.1	146.61
18,839.0	89.20	154.70	10,414.6	-7,513.2	4,937.3	8,990.3	146.69
18,933.0	89.10	155.60	10,415.9	-7,598.5	4,976.8	9,083.3	146.78
19,028.0	89.90	153.70	10,416.8	-7,684.3	5,017.5	9,177.4	146.86
19,123.0	90.20	151.30	10,416.7	-7,768.6	5,061.4	9,271.9	146.92
19,218.0	90.70	151.50	10,415.9	-7,852.0	5,106.8	9,366.6	146.96
19,313.0	89.40	152.60	10,415.9	-7,935.9	5,151.4	9,461.2	147.01
19,408.0	89.80	154.20	10,416.5	-8,020.8	5,193.9	9,555.6	147.07
19,503.0	90.80	153.70	10,416.0	-8,106.2	5,235.6	9,650.0	147.14
19,598.0	90.10	154.50	10,415.3	-8,191.6	5,277.1	9,744.3	147.21
19,693.0	89.50	153.90	10,415.6	-8,277.2	5,318.5	9,838.6	147.28
19,788.0	89.60	153.00	10,416.4	-8,362.1	5,360.9	9,933.0	147.34
19,883.0	89.40	154.30	10,417.2	-8,447.3	5,403.1	10,027.4	147.40
19,978.0	88.90	155.00	10,418.6	-8,533.1	5,443.7	10,121.7	147.46
20,072.0	90.10	154.20	10,419.4	-8,618.0	5,484.1	10,214.9	147.53
20,167.0	89.50	154.90	10,419.8	-8,703.8	5,524.9	10,309.2	147.59
20,262.0	89.10	155.10	10,420.9	-8,789.9	5,565.0	10,403.4	147.66
20,356.0	88.60	156.20	10,422.8	-8,875.5	5,603.8	10,496.5	147.73
20,451.0	89.50	156.40	10,424.4	-8,962.5	5,642.0	10,590.5	147.81
20,545.0	89.70	156.30	10,425.0	-9,048.6	5,679.7	10,683.4	147.88
20,601.0	89.70	156.30	10,425.3	-9,099.9	5,702.2	10,738.8	147.93

TD @ 20601.0' MD / 10425.3' TVD

Survey Annotations					Office of Oil and Gas
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	JUN 08 2019
		+N/S (usft)	+E/W (usft)		
9,337.0	9,282.2	190.4	664.5	ST #1 Tie-in PH @ 9337.0' MD / 9282.2' TVD	WV Department of Environmental Protection
20,601.0	10,425.3	-9,099.9	5,702.2	TD @ 20601.0' MD / 10425.3' TVD	

Checked By: _____ Approved By: _____ Date: _____



Jay-Bee Oil & Gas

Pleasants County

P3 Pad

P3S2U

Sidetrack #1

Design: Wellbore #1

Survey Report - Geographic

11 November, 2017



WV Department of
Environmental Protection



Survey Report - Geographic



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Pleasants 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	P3 Pad				
Site Position:		Northing:	346,394.20 usft	Latitude:	39° 26' 25.886 N
From:	Map	Easting:	1,527,700.27 usft	Longitude:	81° 3' 39.129 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.00 °

Well	P3S2U					
Well Position	+N/-S	0.0 usft	Northing:	346,366.42 usft	Latitude:	39° 26' 25.621 N
	+E/-W	0.0 usft	Easting:	1,527,753.45 usft	Longitude:	81° 3' 38.445 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	839.3 usft

Wellbore	Sidetrack #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/14/2017	-8.39	66.71	52,002.12985649

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	9,337.0
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.0	0.0	0.0	147.70

Survey Program	Date	11/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
417.0	9,337.0	MWD (Pilot Hole)	MWD default	MWD - Standard	
9,461.0	20,601.0	ST #1 Surveys (Sidetrack #1)	MWD default	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	346,366.42	1,527,753.45	39° 26' 25.621 N	81° 3' 38.445 W
417.0	1.19	17.05	417.0	4.1	1.3	346,370.56	1,527,754.72	39° 26' 25.662 N	81° 3' 38.430 W
512.0	1.15	10.69	512.0	6.0	1.7	346,372.44	1,527,755.19	39° 26' 25.681 N	81° 3' 38.424 W
608.0	0.96	357.54	607.9	7.8	1.9	346,374.19	1,527,755.33	39° 26' 25.698 N	81° 3' 38.423 W
703.0	0.22	348.56	702.9	8.7	1.8	346,375.17	1,527,755.26	39° 26' 25.708 N	81° 3' 38.424 W
798.0	0.39	83.58	797.9	9.0	2.1	346,375.38	1,527,755.55	39° 26' 25.710 N	81° 3' 38.421 W
893.0	1.25	139.56	892.9	8.2	3.1	346,374.63	1,527,756.54	39° 26' 25.703 N	81° 3' 38.408 W
989.0	1.38	146.74	988.9	6.4	4.4	346,372.87	1,527,757.86	39° 26' 25.686 N	81° 3' 38.391 W
1,083.0	1.09	150.53	1,082.9	4.7	5.5	346,371.14	1,527,758.92	39° 26' 25.669 N	81° 3' 38.377 W
1,178.0	1.50	207.67	1,177.8	2.8	5.3	346,369.25	1,527,758.78	39° 26' 25.650 N	81° 3' 38.378 W
1,273.0	1.65	212.73	1,272.8	0.6	4.0	346,367.00	1,527,757.47	39° 26' 25.627 N	81° 3' 38.394 W



Survey Report - Geographic



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,337.0	9,282.2	190.4	664.5	ST #1 Tie-in PH @ 9337.0' MD / 9282.2' TVD
20,601.0	10,425.3	-9,099.9	5,702.2	TD @ 20601.0' MD / 10425.3' TVD

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WV Department of
Environmental Protection



Jay-Bee Oil & Gas

Pleasants County

P3 Pad

P3S2U

Sidetrack #1

Design: Wellbore #1

QES Survey Report

11 November, 2017

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Survey Report



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Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Pleasants 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	P3 Pad				
Site Position:		Northing:	346,394.20 usft	Latitude:	39° 26' 25.886 N
From:	Map	Easting:	1,527,700.27 usft	Longitude:	81° 3' 39.129 W
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Well	P3S2U					
Well Position	+N/-S	0.0 usft	Northing:	346,366.42 usft	Latitude:	39° 26' 25.621 N
	+E/-W	0.0 usft	Easting:	1,527,753.45 usft	Longitude:	81° 3' 38.445 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft	Ground Level:	839.3 usft

Wellbore	Sidetrack #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/14/2017	-8.39	66.71	52,002.12985649

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	9,337.0
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.0	0.0	0.0	147.70

Survey Program	Date	11/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
417.0	9,337.0	MWD (Pilot Hole)	MWD default	MWD - Standard	
9,461.0	20,601.0	ST #1 Surveys (Sidetrack #1)	MWD default	MWD - Standard	

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
417.0	1.19	17.05	417.0	4.1	1.3	-2.8	0.29	0.29	0.00
512.0	1.15	10.69	512.0	6.0	1.7	-4.2	0.14	0.04	-6.69
608.0	0.96	357.54	607.9	7.8	1.9	-5.6	0.32	0.20	-13.70
703.0	0.22	348.56	702.9	8.7	1.8	-6.4	0.78	-0.78	-9.45
798.0	0.39	83.58	797.9	9.0	2.1	-6.5	0.49	0.18	100.02
893.0	1.25	139.56	892.9	8.2	3.1	-5.3	1.14	0.91	58.93
989.0	1.38	146.74	988.9	6.4	4.4	-3.1	0.22	0.14	7.48
1,083.0	1.09	150.53	1,082.9	4.7	5.5	-1.1	0.32	0.19	4.03
1,178.0	1.50	207.67	1,177.8	2.8	5.3	0.5	1.36	0.43	60.15

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Survey Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #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)	
1,273.0	1.65	212.73	1,272.8	0.6	4.0	1.7	0.22	0.16	5.33	
1,368.0	1.60	225.09	1,367.8	-1.5	2.3	2.5	0.37	-0.05	13.01	
1,464.0	0.77	278.44	1,463.8	-2.4	0.7	2.4	1.35	-0.86	55.57	
1,559.0	0.95	339.61	1,558.7	-1.5	-0.2	1.2	0.94	0.19	64.39	
1,654.0	1.33	31.17	1,653.7	0.2	0.1	-0.1	1.10	0.40	54.27	
1,749.0	1.74	58.05	1,748.7	1.9	1.9	-0.5	0.86	0.43	28.29	
1,799.0	2.37	57.60	1,798.7	2.8	3.4	-0.5	1.26	1.26	-0.90	
1,939.0	3.12	48.85	1,938.5	6.9	8.8	-1.1	0.61	0.54	-6.25	
2,034.0	2.57	38.98	2,033.4	10.2	12.0	-2.2	0.77	-0.58	-10.39	
2,129.0	1.01	14.29	2,128.3	12.7	13.6	-3.5	1.80	-1.64	-25.99	
2,225.0	1.04	258.78	2,224.3	13.3	12.9	-4.4	1.81	0.03	-120.32	
2,319.0	1.76	229.14	2,318.3	12.2	11.0	-4.5	1.06	0.77	-31.53	
2,414.0	2.48	222.59	2,413.2	9.8	8.5	-3.7	0.80	0.76	-6.89	
2,510.0	1.94	203.47	2,509.2	6.8	6.5	-2.2	0.94	-0.56	-19.92	
2,605.0	1.71	176.79	2,604.1	3.9	5.9	-0.1	0.92	-0.24	-28.08	
2,700.0	1.00	167.50	2,699.1	1.6	6.2	1.9	0.78	-0.75	-9.78	
2,795.0	0.11	107.25	2,794.1	0.8	6.4	2.8	1.00	-0.94	-63.42	
2,890.0	0.25	0.07	2,889.1	1.0	6.5	2.7	0.32	0.15	-112.82	
2,985.0	0.38	1.19	2,984.1	1.5	6.5	2.2	0.14	0.14	1.18	
3,080.0	0.59	2.88	3,079.1	2.3	6.6	1.6	0.22	0.22	1.78	
3,175.0	0.75	343.92	3,174.1	3.4	6.4	0.6	0.29	0.17	-19.96	
3,270.0	1.02	299.46	3,269.1	4.4	5.5	-0.8	0.75	0.28	-46.80	
3,365.0	1.73	289.81	3,364.0	5.3	3.4	-2.7	0.78	0.75	-10.16	
3,460.0	1.16	261.79	3,459.0	5.7	1.1	-4.2	0.94	-0.60	-29.49	
3,556.0	1.07	174.62	3,555.0	4.6	0.2	-3.8	1.60	-0.09	-90.80	
3,651.0	2.01	153.46	3,650.0	2.3	1.1	-1.3	1.14	0.99	-22.27	
3,746.0	1.34	150.86	3,744.9	-0.2	2.4	1.4	0.71	-0.71	-2.74	
3,841.0	0.46	135.89	3,839.9	-1.5	3.2	2.9	0.95	-0.93	-15.76	
3,936.0	0.24	69.05	3,934.9	-1.7	3.6	3.3	0.45	-0.23	-70.36	
4,031.0	0.27	122.36	4,029.9	-1.7	4.0	3.6	0.24	0.03	56.12	
4,126.0	0.60	175.95	4,124.9	-2.3	4.2	4.2	0.52	0.35	56.41	
4,221.0	1.16	174.49	4,219.9	-3.8	4.3	5.5	0.59	0.59	-1.54	
4,315.0	1.00	207.43	4,313.9	-5.5	4.1	6.8	0.67	-0.17	35.04	
4,410.0	0.73	291.38	4,408.9	-6.0	3.1	6.7	1.24	-0.28	88.37	
4,505.0	1.08	53.51	4,503.9	-5.2	3.3	6.1	1.68	0.37	128.56	
4,600.0	1.23	71.69	4,598.8	-4.4	5.0	6.3	0.41	0.16	19.14	
4,695.0	1.14	59.00	4,693.8	-3.6	6.7	6.6	0.29	-0.09	-13.36	
4,789.0	2.04	65.70	4,787.8	-2.4	9.1	6.9	0.98	0.98	7.13	
4,887.0	3.53	67.76	4,885.7	-0.5	13.4	7.6	1.52	1.52	6.19	
4,982.0	5.08	69.54	4,980.4	2.1	20.1	9.0	1.64	1.64	1.87	
5,077.0	6.34	74.00	5,074.9	5.0	29.1	11.3	1.41	1.41	1.59	
5,171.0	6.94	73.55	5,168.3	8.0	39.5	14.3	0.64	0.64	-0.48	
5,266.0	7.98	66.41	5,262.5	12.3	51.1	16.9	1.46	1.46	0.62	

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Survey Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
5,360.0	8.26	62.09	5,355.5	18.0	63.0	18.4	0.71	0.30	-4.60
5,455.0	8.51	63.91	5,449.5	24.3	75.3	19.7	0.38	0.26	1.92
5,550.0	8.66	64.04	5,543.5	30.6	88.1	21.2	0.16	0.16	0.14
5,644.0	9.04	63.57	5,636.3	36.9	101.1	22.8	0.41	0.40	-0.50
5,739.0	8.41	67.41	5,730.3	42.9	114.2	24.7	0.90	-0.66	4.04
5,833.0	8.76	76.23	5,823.2	47.3	127.5	28.1	1.45	0.37	9.38
5,928.0	9.51	79.84	5,917.0	50.4	142.2	33.4	0.99	0.79	3.80
6,023.0	9.58	78.25	6,010.7	53.4	157.7	39.1	0.29	0.07	-1.67
6,118.0	8.68	72.09	6,104.5	57.2	172.2	43.7	1.40	-0.95	-6.48
6,213.0	8.63	68.51	6,198.4	62.0	185.7	46.8	0.57	-0.05	-3.77
6,307.0	8.93	74.85	6,291.3	66.5	199.3	50.3	1.08	0.32	6.74
6,402.0	9.14	76.55	6,385.1	70.2	213.8	54.9	0.36	0.22	1.79
6,497.0	9.19	72.32	6,478.9	74.2	228.3	59.3	0.71	0.05	-4.45
6,592.0	7.90	78.03	6,572.9	77.9	241.9	63.4	1.62	-1.36	6.01
6,687.0	7.20	80.90	6,667.0	80.2	254.2	68.0	0.84	-0.74	3.02
6,781.0	8.91	78.24	6,760.1	82.6	267.1	72.9	1.86	1.82	-2.83
6,876.0	10.16	74.44	6,853.8	86.4	282.4	77.9	1.47	1.32	-4.00
6,970.0	10.18	72.75	6,946.3	91.0	298.3	82.5	0.32	0.02	-1.80
7,065.0	10.15	73.39	7,039.8	95.9	314.4	86.9	0.12	-0.03	0.67
7,160.0	10.07	70.74	7,133.3	101.1	330.2	91.0	0.50	-0.08	-2.79
7,254.0	10.38	70.76	7,225.9	106.6	346.0	94.8	0.33	0.33	0.02
7,349.0	9.89	75.37	7,319.4	111.4	362.0	99.2	1.00	-0.52	4.85
7,443.0	8.99	77.67	7,412.1	115.0	377.0	104.2	1.04	-0.96	2.45
7,538.0	7.41	71.25	7,506.1	118.6	390.0	108.2	1.92	-1.66	-6.76
7,633.0	7.79	64.31	7,600.3	123.4	401.6	110.3	1.04	0.40	-7.31
7,728.0	8.93	67.11	7,694.3	129.0	414.2	112.3	1.27	1.20	2.95
7,823.0	10.05	77.22	7,788.0	133.7	429.1	116.3	2.11	1.18	10.64
7,917.0	11.34	79.49	7,880.4	137.2	446.2	122.4	1.44	1.37	2.41
8,012.0	10.54	77.29	7,973.6	140.8	463.8	128.8	0.95	-0.84	-2.32
8,107.0	9.10	76.47	8,067.2	144.5	479.6	134.1	1.52	-1.52	-0.86
8,204.0	9.03	78.08	8,163.0	147.9	494.5	139.3	0.27	-0.07	1.66
8,299.0	9.00	71.54	8,256.8	151.8	508.9	143.6	1.08	-0.03	-6.88
8,394.0	10.11	69.79	8,350.5	157.0	523.7	147.2	1.21	1.17	-1.84
8,488.0	9.18	72.35	8,443.2	162.1	538.6	150.8	1.09	-0.99	2.72
8,583.0	9.05	73.24	8,537.0	166.6	553.0	154.7	0.20	-0.14	0.94
8,678.0	8.61	72.68	8,630.9	170.8	566.9	158.5	0.47	0.18	-0.59
8,772.0	8.47	73.37	8,723.8	174.9	580.3	162.2	0.18	0.18	0.73
8,867.0	8.51	73.35	8,817.8	178.9	593.7	166.0	0.04	0.04	-0.02
8,962.0	9.03	74.36	8,911.7	183.0	607.6	170.0	0.57	0.57	1.06
9,056.0	8.49	77.90	9,004.6	186.4	621.5	174.6	0.81	-0.57	3.77
9,151.0	8.66	83.82	9,098.5	188.6	635.5	180.1	0.95	0.95	6.23
9,246.0	9.18	88.08	9,192.4	189.7	650.2	187.1	0.88	0.88	4.48

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ST #1 Tie-in PH @ 9337.0' MD / 9282.2' TVD



Survey Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #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)
9,337.0	9.00	85.90	9,282.2	190.4	664.5	194.1	0.43	-0.20	-2.40
9,461.0	13.80	73.30	9,403.8	195.4	688.4	202.7	4.34	3.87	-10.16
9,508.0	16.10	65.10	9,449.2	199.7	699.7	205.1	6.64	4.89	-17.45
9,556.0	16.90	46.70	9,495.2	207.3	710.8	204.6	10.97	1.67	-38.33
9,603.0	17.70	36.60	9,540.1	217.7	720.0	200.7	6.60	1.70	-21.49
9,650.0	16.00	49.70	9,585.1	227.7	729.2	197.2	8.83	-3.62	27.87
9,697.0	15.30	67.20	9,630.4	234.3	739.9	197.3	10.12	-1.49	37.23
9,744.0	15.60	84.50	9,675.7	237.3	751.9	201.2	9.79	0.64	36.81
9,791.0	17.10	97.50	9,720.8	237.0	765.1	208.5	8.39	3.19	27.66
9,839.0	19.40	110.40	9,766.4	233.3	779.5	219.4	9.66	4.79	26.88
9,886.0	22.90	121.20	9,810.3	225.8	794.7	233.8	11.12	7.45	22.98
9,933.0	26.50	129.30	9,853.0	214.4	810.6	251.9	10.50	7.66	17.23
9,980.0	30.10	135.30	9,894.4	199.4	827.0	273.4	9.75	7.66	12.77
10,028.0	34.80	140.30	9,934.9	180.3	844.3	298.7	11.27	9.79	10.42
10,075.0	40.20	142.10	9,972.1	158.0	862.2	327.2	11.72	11.49	3.83
10,123.0	45.60	142.60	10,007.3	132.1	882.1	359.7	11.27	11.25	1.04
10,170.0	49.70	142.60	10,039.0	104.5	903.2	394.3	8.72	8.72	0.00
10,217.0	54.10	142.00	10,067.9	75.3	925.8	431.1	9.42	9.36	-1.28
10,264.0	58.90	142.20	10,093.9	44.4	949.9	470.1	10.22	10.21	0.43
10,312.0	63.70	142.00	10,116.9	11.2	975.7	512.0	10.01	10.00	-0.42
10,359.0	67.80	142.50	10,136.2	-22.7	1,002.0	554.6	8.78	8.72	1.06
10,407.0	71.40	142.90	10,153.0	-58.5	1,029.2	599.4	7.54	7.50	0.83
10,454.0	75.00	144.00	10,166.5	-94.6	1,056.0	644.3	7.98	7.66	2.34
10,502.0	78.40	144.90	10,177.6	-132.7	1,083.2	690.9	7.31	7.08	1.88
10,549.0	81.20	146.20	10,185.9	-170.8	1,109.3	737.1	6.55	5.96	2.77
10,596.0	82.90	146.70	10,192.4	-209.6	1,135.1	783.7	3.77	3.62	1.06
10,643.0	84.20	146.20	10,197.7	-248.5	1,160.9	830.4	2.96	2.77	-1.06
10,691.0	86.30	145.80	10,201.7	-288.2	1,187.6	878.2	4.45	4.38	-0.83
10,786.0	86.20	144.90	10,207.9	-366.1	1,241.5	972.9	0.95	-0.11	-0.95
10,881.0	86.10	148.40	10,214.2	-445.3	1,293.6	1,067.6	3.68	-0.11	3.68
10,975.0	86.20	153.40	10,220.6	-527.2	1,339.2	1,161.3	5.31	0.11	5.32
11,070.0	89.00	154.20	10,224.5	-612.4	1,381.1	1,255.6	3.07	2.95	0.84
11,165.0	88.70	154.00	10,226.4	-697.8	1,422.6	1,350.0	0.38	-0.32	-0.21
11,259.0	88.10	154.30	10,229.1	-782.4	1,463.6	1,443.4	0.71	-0.64	0.32
11,354.0	87.80	154.40	10,232.5	-868.0	1,504.7	1,537.7	0.33	-0.32	0.11
11,449.0	87.20	153.90	10,236.6	-953.4	1,546.0	1,632.0	0.82	-0.63	-0.53
11,543.0	87.60	154.20	10,240.9	-1,037.8	1,587.1	1,725.3	0.53	0.43	0.32
11,638.0	88.00	152.00	10,244.5	-1,122.5	1,630.1	1,819.8	2.35	0.42	-2.32
11,733.0	88.10	152.00	10,247.8	-1,206.3	1,674.7	1,914.5	0.11	0.11	0.00
11,827.0	88.40	152.80	10,250.6	-1,289.6	1,718.2	2,008.1	0.91	0.32	0.85
11,922.0	88.80	153.40	10,252.9	-1,374.3	1,761.2	2,102.7	0.76	0.42	0.83
12,017.0	89.20	152.00	10,254.6	-1,458.7	1,804.7	2,197.3	1.53	-0.42	-1.47
12,112.0	88.00	150.50	10,256.9	-1,541.9	1,850.4	2,292.1	2.02	-1.26	-1.58
12,207.0	88.10	150.50	10,260.2	-1,624.6	1,897.2	2,386.9	0.11	0.11	0.00

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Survey Report



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Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
12,302.0	88.00	150.60	10,263.4	-1,707.2	1,943.8	2,481.8	0.15	-0.11	0.11
12,396.0	87.80	150.90	10,266.8	-1,789.2	1,989.7	2,575.6	0.38	-0.21	0.32
12,491.0	88.20	151.10	10,270.2	-1,872.2	2,035.8	2,670.3	0.47	0.42	0.21
12,586.0	88.00	151.70	10,273.3	-1,955.6	2,081.2	2,765.1	0.67	-0.21	0.63
12,681.0	87.40	151.30	10,277.1	-2,039.0	2,126.5	2,859.8	0.76	-0.63	-0.42
12,775.0	87.20	151.00	10,281.5	-2,121.3	2,171.8	2,953.5	0.38	-0.21	-0.32
12,870.0	86.50	153.60	10,286.8	-2,205.2	2,215.9	3,048.1	2.83	-0.74	2.74
12,965.0	86.50	153.40	10,292.6	-2,290.1	2,258.2	3,142.4	0.21	0.00	-0.21
13,060.0	86.00	152.60	10,298.8	-2,374.6	2,301.2	3,236.8	0.99	-0.53	-0.84
13,155.0	87.80	154.10	10,303.9	-2,459.3	2,343.8	3,331.2	2.46	1.89	1.58
13,250.0	87.70	153.60	10,307.6	-2,544.5	2,385.6	3,425.6	0.54	-0.11	-0.53
13,344.0	88.70	153.40	10,310.6	-2,628.6	2,427.5	3,519.0	1.08	1.06	-0.21
13,439.0	88.50	152.00	10,312.9	-2,713.0	2,471.1	3,613.7	1.49	-0.21	-1.47
13,535.0	88.80	153.60	10,315.2	-2,798.4	2,515.0	3,709.2	1.70	0.31	1.67
13,629.0	89.10	154.90	10,316.9	-2,883.0	2,555.8	3,802.6	1.42	0.32	1.38
13,724.0	88.80	153.20	10,318.6	-2,968.4	2,597.4	3,897.0	1.82	-0.32	-1.79
13,819.0	88.50	153.40	10,320.9	-3,053.3	2,640.0	3,991.5	0.38	-0.32	0.21
13,914.0	88.70	154.50	10,323.2	-3,138.6	2,681.7	4,085.9	1.18	0.21	1.16
14,009.0	88.30	154.10	10,325.7	-3,224.2	2,722.9	4,180.3	0.60	-0.42	-0.42
14,103.0	88.00	152.60	10,328.7	-3,308.1	2,765.1	4,273.8	1.63	-0.32	-1.60
14,198.0	87.90	153.40	10,332.1	-3,392.7	2,808.2	4,368.3	0.85	-0.11	0.84
14,293.0	87.90	153.80	10,335.6	-3,477.8	2,850.4	4,462.7	0.42	0.00	0.42
14,388.0	89.50	154.20	10,337.8	-3,563.1	2,892.0	4,557.1	1.74	1.68	0.42
14,478.0	89.50	155.00	10,338.5	-3,644.4	2,930.6	4,646.5	0.89	0.00	0.89
14,573.0	88.20	151.30	10,340.5	-3,729.1	2,973.5	4,741.0	4.13	-1.37	-3.89
14,668.0	90.20	151.30	10,341.8	-3,812.5	3,019.1	4,835.8	2.11	2.11	0.00
14,762.0	89.60	151.50	10,341.9	-3,895.0	3,064.1	4,929.6	0.67	-0.64	0.21
14,857.0	89.50	152.20	10,342.7	-3,978.8	3,108.9	5,024.4	0.74	-0.11	0.74
14,952.0	89.00	152.30	10,343.9	-4,062.8	3,153.2	5,119.0	0.54	-0.53	0.11
15,047.0	88.10	152.50	10,346.3	-4,147.0	3,197.2	5,213.7	0.97	-0.95	0.21
15,141.0	90.10	152.50	10,347.8	-4,230.3	3,240.6	5,307.4	2.13	2.13	0.00
15,236.0	89.30	152.70	10,348.3	-4,314.7	3,284.3	5,402.0	0.87	-0.84	0.21
15,331.0	88.20	151.40	10,350.4	-4,398.6	3,328.8	5,496.7	1.79	-1.16	-1.37
15,426.0	87.80	150.90	10,353.7	-4,481.7	3,374.6	5,591.5	0.67	-0.42	-0.53
15,521.0	87.70	153.70	10,357.4	-4,565.8	3,418.7	5,686.1	2.95	-0.11	2.95
15,615.0	87.30	153.60	10,361.5	-4,649.9	3,460.4	5,779.5	0.44	-0.43	-0.11
15,710.0	89.40	153.90	10,364.3	-4,735.1	3,502.4	5,873.9	2.23	2.21	0.32
15,805.0	88.70	153.40	10,365.8	-4,820.2	3,544.6	5,968.4	0.91	0.91	-0.53
15,900.0	88.60	154.20	10,368.1	-4,905.4	3,586.5	6,062.8	0.85	0.85	0.84
15,995.0	89.70	155.60	10,369.5	-4,991.4	3,626.8	6,157.1	1.87	1.16	1.47
16,090.0	89.30	156.40	10,370.3	-5,078.2	3,665.4	6,251.1	0.94	-0.42	0.84
16,184.0	88.70	152.50	10,372.0	-5,163.0	3,706.0	6,344.4	4.20	-0.64	-4.15
16,279.0	88.70	152.20	10,374.1	-5,247.1	3,750.0	6,439.0	0.32	0.32	-0.32

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Survey Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
16,374.0	88.80	152.20	10,376.2	-5,331.1	3,794.3	6,533.7	0.11	0.11	0.00
16,469.0	89.30	153.10	10,377.8	-5,415.5	3,838.0	6,628.4	1.08	0.53	0.95
16,564.0	89.10	152.40	10,379.1	-5,500.0	3,881.5	6,723.0	0.77	-0.21	-0.74
16,659.0	89.40	152.50	10,380.3	-5,584.2	3,925.4	6,817.6	0.33	0.32	0.11
16,753.0	89.40	151.80	10,381.3	-5,667.3	3,969.3	6,911.4	0.74	0.00	-0.74
16,848.0	89.30	151.00	10,382.4	-5,750.7	4,014.8	7,006.1	0.85	-0.11	-0.84
16,942.0	88.80	149.20	10,383.9	-5,832.2	4,061.6	7,100.0	1.99	-0.53	-1.91
17,037.0	89.40	152.00	10,385.4	-5,914.9	4,108.2	7,194.9	3.01	0.63	2.95
17,131.0	88.80	152.00	10,386.9	-5,997.9	4,152.4	7,288.6	0.64	-0.64	0.00
17,226.0	89.50	155.20	10,388.3	-6,083.0	4,194.6	7,383.1	3.45	0.74	3.37
17,321.0	89.40	156.60	10,389.2	-6,169.7	4,233.4	7,477.1	1.48	-0.11	1.47
17,415.0	89.40	154.80	10,390.2	-6,255.4	4,272.1	7,570.2	1.91	0.00	-1.91
17,510.0	88.80	151.20	10,391.7	-6,340.0	4,315.2	7,664.8	3.84	-0.63	-3.79
17,605.0	89.40	154.20	10,393.2	-6,424.4	4,358.7	7,759.4	3.22	0.63	3.16
17,700.0	89.10	154.70	10,394.5	-6,510.1	4,399.7	7,853.7	0.61	-0.32	0.53
17,795.0	89.20	153.00	10,395.9	-6,595.3	4,441.6	7,948.2	1.79	0.11	-1.79
17,890.0	88.50	148.40	10,397.8	-6,678.1	4,488.0	8,043.0	4.90	-0.74	-4.84
17,985.0	88.30	149.00	10,400.4	-6,759.3	4,537.4	8,137.9	0.67	-0.21	0.63
18,080.0	88.00	148.80	10,403.5	-6,840.6	4,586.4	8,232.9	0.38	-0.32	-0.21
18,174.0	88.40	151.00	10,406.4	-6,921.9	4,633.5	8,326.7	2.38	0.43	2.34
18,269.0	88.50	151.30	10,409.0	-7,005.0	4,679.4	8,421.5	0.33	0.11	0.32
18,364.0	89.30	152.70	10,410.8	-7,088.9	4,724.0	8,516.2	1.70	0.84	1.47
18,458.0	88.90	152.40	10,412.3	-7,172.3	4,767.3	8,609.9	0.53	-0.43	-0.32
18,553.0	88.50	152.70	10,414.5	-7,256.6	4,811.1	8,704.5	0.53	-0.42	0.32
18,649.0	91.50	154.00	10,414.5	-7,342.4	4,854.1	8,800.0	3.41	3.13	1.35
18,744.0	89.60	153.70	10,413.6	-7,427.7	4,896.0	8,894.5	2.02	-2.00	-0.32
18,839.0	89.20	154.70	10,414.6	-7,513.2	4,937.3	8,988.9	1.13	-0.42	1.05
18,933.0	89.10	155.60	10,415.9	-7,598.5	4,976.8	9,082.1	0.96	-0.11	0.96
19,028.0	89.90	153.70	10,416.8	-7,684.3	5,017.5	9,176.4	2.17	0.84	-2.00
19,123.0	90.20	151.30	10,416.7	-7,768.6	5,061.4	9,271.0	2.55	0.32	-2.53
19,218.0	90.70	151.50	10,415.9	-7,852.0	5,106.8	9,365.8	0.57	0.53	0.21
19,313.0	89.40	152.60	10,415.9	-7,935.9	5,151.4	9,460.5	1.79	-1.37	1.16
19,408.0	89.80	154.20	10,416.5	-8,020.8	5,193.9	9,555.1	1.74	0.42	1.68
19,503.0	90.80	153.70	10,416.0	-8,106.2	5,235.6	9,649.5	1.18	1.05	-0.53
19,598.0	90.10	154.50	10,415.3	-8,191.6	5,277.1	9,743.9	1.12	-0.74	0.84
19,693.0	89.50	153.90	10,415.6	-8,277.2	5,318.5	9,838.3	0.89	-0.63	-0.63
19,788.0	89.60	153.00	10,416.4	-8,362.1	5,360.9	9,932.8	0.95	0.11	-0.95
19,883.0	89.40	154.30	10,417.2	-8,447.3	5,403.1	10,027.3	1.38	-0.21	1.37
19,978.0	88.90	155.00	10,418.6	-8,533.1	5,443.7	10,121.6	0.91	-0.53	0.74
20,072.0	90.10	154.20	10,419.4	-8,618.0	5,484.1	10,214.9	1.53	1.28	-0.85
20,167.0	89.50	154.90	10,419.8	-8,703.8	5,524.9	10,309.2	0.97	0.63	0.74
20,262.0	89.10	155.10	10,420.9	-8,789.9	5,565.0	10,403.4	0.47	-0.42	0.21
20,356.0	88.60	156.20	10,422.8	-8,875.5	5,603.8	10,496.5	1.29	0.53	0.17

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Survey Report



Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well P3S2U
Project:	Pleasants County	TVD Reference:	well @ 859.9usft (Patterson #581)
Site:	P3 Pad	MD Reference:	well @ 859.9usft (Patterson #581)
Well:	P3S2U	North Reference:	Grid
Wellbore:	Sidetrack #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)
20,451.0	89.50	156.40	10,424.4	-8,962.5	5,642.0	10,590.4	0.97	0.95	0.21
20,545.0	89.70	156.30	10,425.0	-9,048.6	5,679.7	10,683.4	0.24	0.21	-0.11
TD @ 20601.0' MD / 10425.3' TVD									
20,601.0	89.70	156.30	10,425.3	-9,099.9	5,702.2	10,738.7	0.00	0.00	0.00

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,337.0	9,282.2	190.4	664.5	ST #1 Tie-in PH @ 9337.0' MD / 9282.2' TVD
20,601.0	10,425.3	-9,099.9	5,702.2	TD @ 20601.0' MD / 10425.3' TVD

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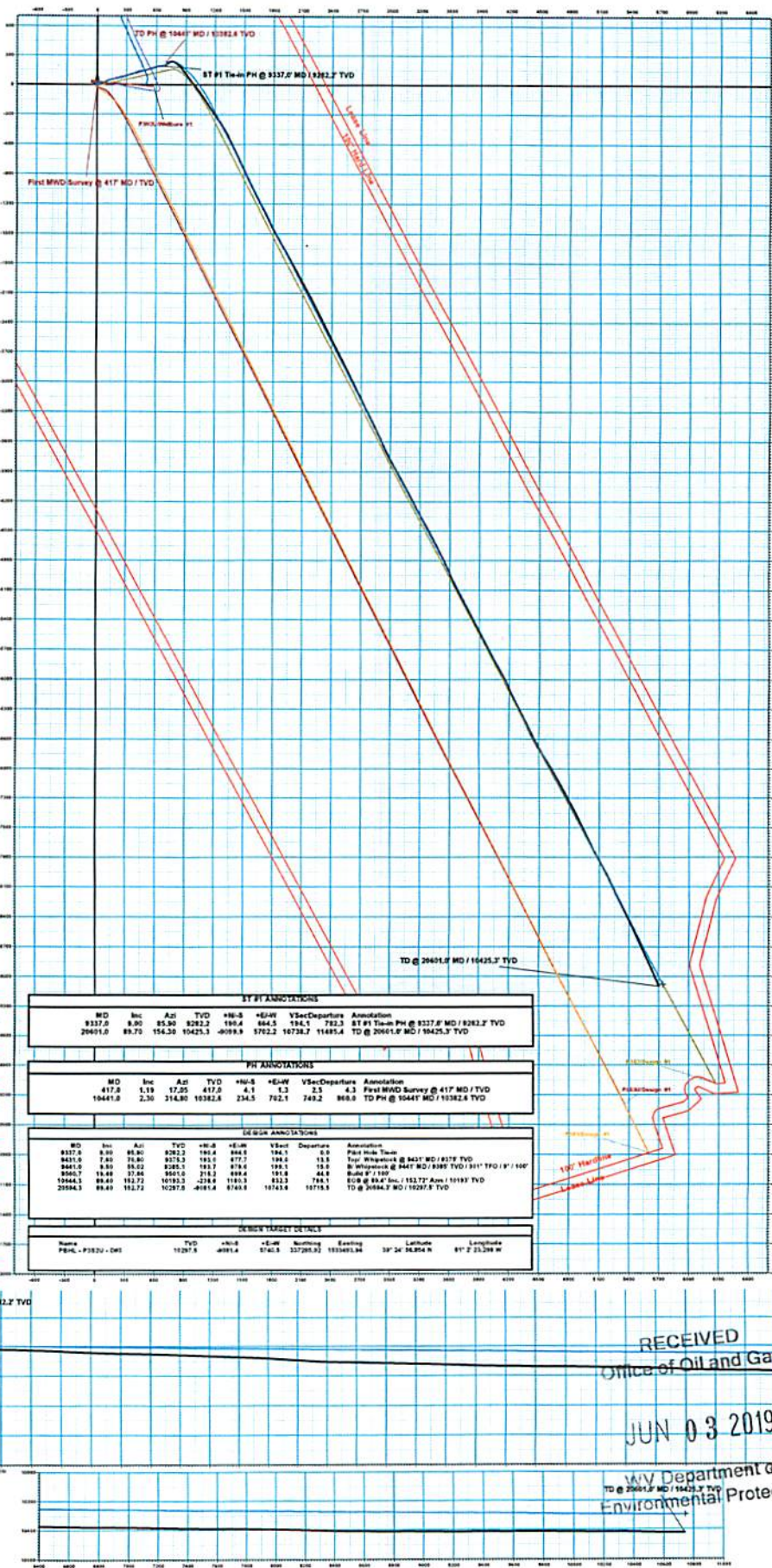
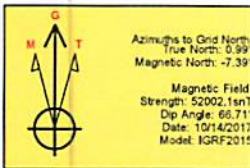
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Environmental Protection

Company Name: Jay-Bee Oil & Gas
 P3S2U
 Pleasants County
 Rig: Patterson #581
 Created By: WJB Jircik
 Date: 11/11/2017

P3S2U
 Pleasants County
 Q171315 & AM-171108
 Design #3

PROJECT DETAILS: Pleasants County
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: West Virginia Northern Zone
 System Datum: Mean Sea Level

WELL DETAIL: P3S2U
 +N-S +E-W Northing Easting Ground Level Elevation
 0.0 0.0 349368.81 192773.81 838.3 34° 24' 26.82" N
 811° 7' 36.46" W



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 Environmental Protection

Vertical Section at 147.70° (200 uM/in)

Company Name: Jay-Bee Oil & Gas
 P3S2U
 Pleasants County
 Rig: Patterson #581
 Created By: Will Jirick
 Date: 11/11/2017

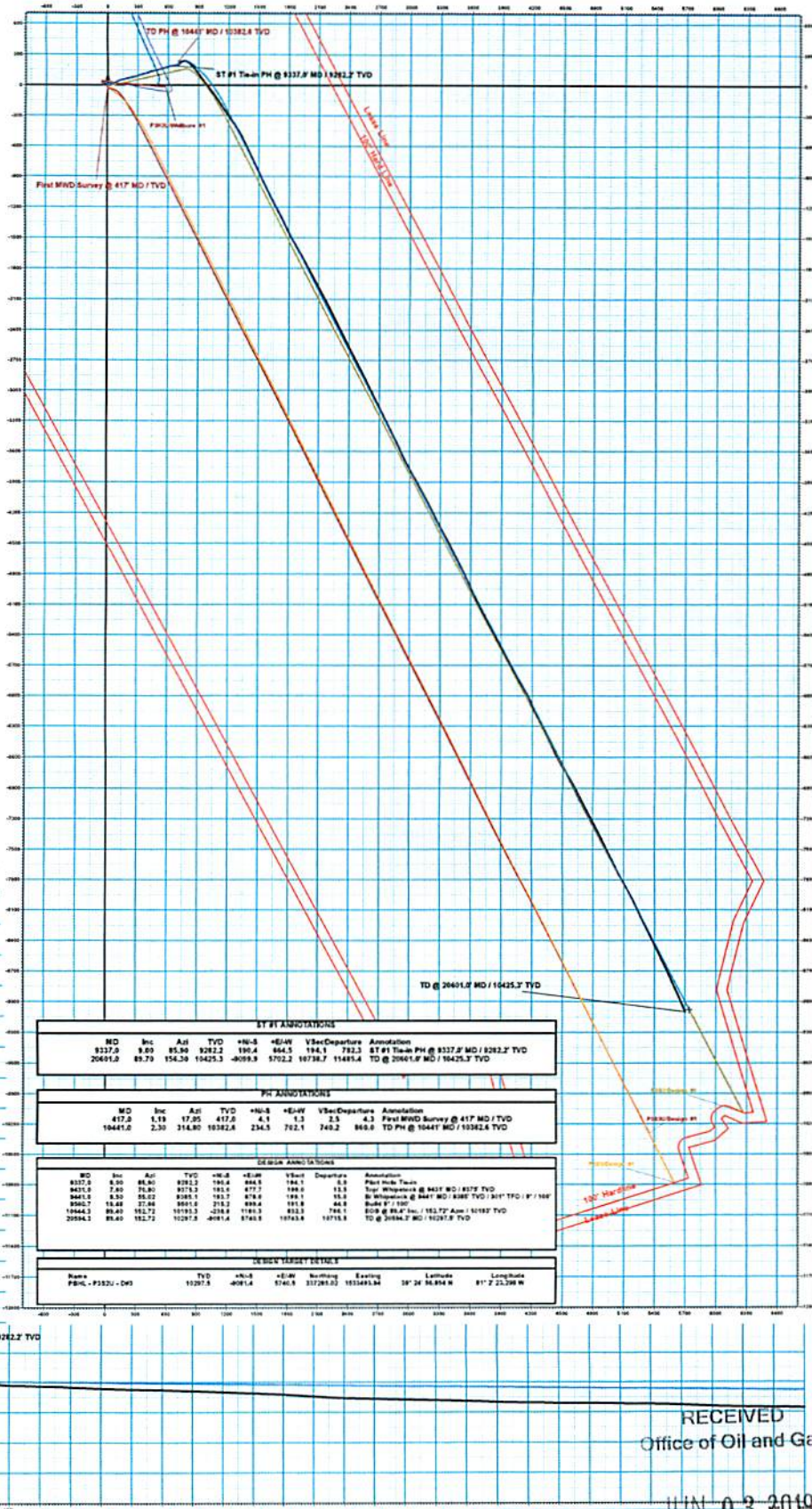
P3S2U
 Pleasants County
 Q171315 & AM-171108
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PROJECT DETAILS: Pleasants County
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: West Virginia Northern Zone
 System Datum: Mean Sea Level

WELL DETAILS: P3S2U
 +NLS: 0.0 +E/W: 0.0 Northing: 54838.43 Easting: 192793.45
 Ground Level: 858.3 Longitude: 81° 2' 38.445" W
 Easting: 192793.45 39° 26' 25.821" N



Azimuths to Grid North
 True North: 0.95
 Magnetic North: -7.35
 Magnetic Field
 Strength: 52002.1nT
 Dip Angle: 66.715
 Date: 10/14/2017
 Model: IGRF2015



ST #1 ANNOTATIONS

MD	Inc	Azi	TVD	+NLS	+E/W	VSec	Departure	Annotation
937.0	8.00	85.90	9282.2	190.4	864.5	194.1	782.3	ST #1 Tool PH @ 937.0 MD / 9282.2 TVD
20691.0	89.79	154.39	10425.3	-8099.9	5702.2	10738.7	114891.4	TD @ 20691.0 MD / 10425.3 TVD

PH ANNOTATIONS

MD	Inc	Azi	TVD	+NLS	+E/W	VSec	Departure	Annotation
417.0	1.19	17.95	417.0	4.1	1.3	2.3	4.3	First MWD Survey @ 417 MD / TVD
10441.0	2.30	314.80	10382.4	234.5	792.1	740.2	848.0	TD PH @ 10441 MD / 10382.4 TVD

DE GRUN ANNOTATIONS

MD	Inc	Azi	TVD	+NLS	+E/W	VSec	Departure	Annotation
937.0	8.00	85.90	9282.2	190.4	864.5	194.1	782.3	ST #1 Tool PH
9431.0	7.80	76.80	9575.3	181.1	877.7	198.0	113.1	Top Whimperina @ 9431 MD / 9575 TVD
9441.0	8.50	85.00	9381.1	183.7	878.6	198.1	19.0	80 Whimperina @ 9441 MD / 9381 TVD / 301' TFC / 8' / 100'
9592.7	15.48	37.48	9601.8	213.2	899.4	191.8	44.8	Suble # 1 / 100'
10644.3	89.40	152.72	10193.5	-238.9	5748.3	10263.3	788.1	COB @ 89.4' Inc. / 10193.5' Ann / 10193 TVD
20594.3	89.40	152.72	10297.8	-4081.4	5748.3	10743.8	10718.8	TD @ 20594.3 MD / 10297.8 TVD

WELLBORE DETAILS

Name	TVD	+NLS	+E/W	Northing	Easting	Latitude	Longitude
P3S2U - DMS	10297.8	-4081.4	5748.3	337289.03	185249.84	39° 24' 54.894" N	81° 2' 23.266" W



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Vertical Section at 147.70' (200 us/in)